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## REMEDIAL ACTION WORK PLAN

**National Grid  
Former Tidewater Facility  
200 Taft Street  
Pawtucket, Rhode Island**

June 2018

GZA File No.: 05.0043654.00



**PREPARED FOR:**

Rhode Island Department of Environmental Management  
Providence, Rhode Island

**PREPARED By:**

**GZA GeoEnvironmental, Inc.**

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June 15, 2018  
GZA Project No. 05.0043654.00

Mr. Joseph Martella  
Rhode Island Department of Environmental Management  
Office of Waste Management  
235 Promenade Street  
Providence, Rhode Island 02908

Re: *Remedial Action Work Plan*  
Former Tidewater Facility  
200 Taft Street  
Pawtucket, Rhode Island  
Site Remediation File No. SR-26-0934A/ (Formerly RIDEM Case No. 95-022)

Dear Mr. Martella:

On behalf of The Narragansett Electric Company d/b/a National Grid (National Grid), GZA GeoEnvironmental, Inc. (GZA) has prepared the enclosed *Remedial Action Work Plan (RAWP)* for the Former Tidewater Facility located in Pawtucket, Rhode Island (herein referred to as the Site). This RAWP was prepared consistent with the requirements of Rule 9.00 of the Rhode Island Department of Environmental Management (RIDEM) *Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases (Remediation Regulations)* and includes draft Environmental Land Usage Restrictions (ELURs) and a Soil Management Plan (SMP). As described further herein, RIDEM issued a *Remedial Decision Letter (RDL)* dated April 19, 2018 which formally approved the Site investigation, identified the preferred remedial approach for the Site, and authorized submittal of this RAWP.

Consistent with the October 2013 *Public Involvement Plan (PIP)* established for the Site, an updated fact sheet and notice describing the availability of the RAWP will be distributed to abutters and interested parties along with a date, time, and location for a community outreach event to present this RAWP to the public. This RAWP will be revised to address RIDEM comments as well as those received from the public and subsequently re-submitted to RIDEM as a *RAWP Addendum*. National Grid is prepared to proceed with final design, permitting, and implementation of the remedy described in the *RAWP Addendum* following receipt of an *Order of Approval* from RIDEM.





We look forward to continuing to work cooperatively with RIDEM and the community on this Site. Should you have any questions or comments regarding the information presented herein, please do not hesitate to contact the undersigned or Mr. Kenneth Lento (National Grid) at 781-907-3655.

Very truly yours,

GZA GEOENVIRONMENTAL, INC.

A handwritten signature in blue ink that reads "David Rusczyk".

David Rusczyk, P.E.  
Associate Principal  
860-858-3110 – [david.rusczyk@gza.com](mailto:david.rusczyk@gza.com)

A handwritten signature in blue ink that reads "James J. Clark".

James J. Clark, P.E., LEP  
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A handwritten signature in blue ink that reads "Todd Greene".

Todd Greene, P.E.  
Associate Principal  
401-427-2714 – [todd.greene@gza.com](mailto:todd.greene@gza.com)

cc: Michele Leone, National Grid  
Kenneth Lento, National Grid



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## EXECUTIVE SUMMARY

GZA GeoEnvironmental, Inc. (GZA) has prepared this *Remedial Action Work Plan* (RAWP), on behalf of The Narragansett Electric Company d/b/a National Grid (National Grid), for the former Tidewater Facility located in Pawtucket, Rhode Island (herein referred to as the Site). The RAWP summarizes the results of a Limited Design Investigation (LDI) program to supplement the existing available data, provides technical details on the Site remedy, describes Best Management Practices and the air monitoring program to be implemented during construction of the remedy, and outlines a schedule for execution.

The Site was the former location of the Tidewater manufactured gas plant (MGP) and the Pawtucket No. 1 Power Station and consists of approximately 23 acres across five separate lots owned by National Grid and portions of three lots owned by the City of Pawtucket. The Site is located between Taft Street and an extension of Tidewater and Thornton Streets to the west and the Seekonk River to the east and is now largely vacant except for an active natural gas regulating station located in the northwest portion of the Site and an active switching station and electric substation in the central portion of the Site. The Site is secured with a locked perimeter chain-link fence.

On April 19, 2018, the Rhode Island Department of Environmental Management (RIDEM) issued a *Remedial Decision Letter* (RDL) that formally approved the Site Investigation Report (SIR) and the proposed remedial alternative and required submittal of a RAWP, which provides details and a schedule for implementation of the proposed remedy.

The overall objective of the Site remedy is to protect human health and the environment relative to the identified impacts. Specific remedial objectives for Site soil, groundwater, and air based on the nature and extent of the observed impacts and the current and foreseeable future use of the Site are as follows:

- Mitigation of future human exposure to impacted soils at concentrations above the Method 1 Industrial/Commercial Direct Exposure Criteria (I/C-DEC);
- Mitigation of potential tracking and erosion of near surface impacted soils;
- Mitigation of potential migration of observed Non-Aqueous Phase Liquid (NAPL) impacts to the Seekonk River;
- Reduction in the extent, mass, and mobility of NAPLs to the extent practical;
- Limiting further degradation of groundwater quality; and,
- Addressing potential volatilization issues in the event of future construction of buildings at the Site.

The RIDEM approved remedy to meet these remedial objectives is summarized below:

- Excavation and off-Site disposal of apparent source materials from three areas. These source area excavations include an approximately 100 square foot area proximate to a former underground tank (UGTT-1); a wooden raceway area which includes various sized piping and two concrete structures/vaults formerly used to transfer petroleum between portions of the Site; and an approximately 750 square foot area of fill impacted with crystallized naphthalene in the northern portion of the Site.
- Installation of engineered controls (caps and fencing) to mitigate direct contact with impacted soils and prevent tracking and erosion of materials. Approximately 50% of the engineered cap will also be designed



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## EXECUTIVE SUMMARY

to be impermeable to mitigate further degradation of groundwater quality. Construction of these engineered caps will require significant regrading of the Site to create a relatively uniform surface sloping down from the western edges of the Site to the river. Approximately 22,500 cubic yards (CY) of soil will be cut from portions of the Site and re-used as fill in low lying portions of the Site to achieve the subgrade elevations of the engineered caps. In addition, approximately 11,500 CY of imported clean soil will also be necessary to fill the low-lying portions of the Site to achieve the subgrade elevation of the engineered cap. Upon achieving subgrade, approximately 45,000 CY of clean fill material will be imported to construct the engineered caps. An engineered cap will not be installed within the heavily wooded and steep slopes along the southwestern and western portions of the Site due to concerns regarding destabilizing the banks and removing mature trees along portions of the Site perimeter. Access to these slopes will be restricted via the installation of additional chain link fencing which will serve as an engineered control.

- Installation of an approximately 1,300-foot long subsurface containment wall along the eastern (downgradient) edge of portions of the Site to mitigate the potential migration of NAPL impacts towards the Seekonk River. A portion of the containment wall will be installed outboard of the existing bulkhead walls within the Seekonk River to also serve as a replacement to the existing deteriorated bulkheads. The containment wall will consist of steel sheet pile walls with sealed interlock joints driven or vibrated into the ground using a crane mounted hammer.
- Routine NAPL gauging and manual recovery activities will be performed at new recovery wells installed on the upgradient side of the containment wall and as well as certain existing wells. NAPL gauging and recovery activities will initially be performed quarterly for the 1<sup>st</sup> year after installation of the containment wall and then bi-annually after the 1<sup>st</sup> year. The results of these NAPL gauging and recovery activities will be documented in annual reports submitted to RIDEM.
- The long term natural attenuation groundwater monitoring program will consist of the collection of groundwater samples from 27 existing monitoring wells on an annual basis. Groundwater samples will be analyzed for volatile organic compounds (VOCs). The results of this groundwater monitoring program will be documented in annual reports submitted to RIDEM.
- Environmental Land Usage Restrictions (ELURs) will be placed on the property records that outline certain use restrictions for the parcels that comprise the Site. The ELURs will include an integral Soil Management Plan (SMP) that establishes the procedures and provisions should future construction/maintenance activities at the Site require the need to disturb soils beneath the engineered caps and within the areas restricted by the engineered control fencing. The SMP serves to supplement, and will be initiated by, the RIDEM notification requirement established by the ELURs for the Site.
- The engineered controls (caps and fencing), the containment wall, and monitoring and recovery well network will be inspected at least annually for evidence of ground surface settlement, erosion, or other damage. Any observed deficiencies will be repaired in an expedited manner. The results of these inspection and repair activities will be documented in annual reports submitted to RIDEM.

The remedy also includes measures associated with an United States Environmental Protection Agency (EPA) approved remedy to address identified polychlorinated biphenyl (PCB) impacted material (soil, traprock, and concrete) within the fenced, active electrical substation. These remedial measures include excavation and off-



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Site disposal of approximately 95 tons of trap rock, soil, and concrete proximate to the active electrical substation with PCB impacts greater than 50 milligrams per kilogram (mg/kg), placement of a deed restriction on the substation area, securing the substation area with fencing (which is already in-place), and installation of signage on the fencing.

The RAWP summarizes the results of a Limited Design Investigation (LDI) program implemented to collect supplemental data to facilitate the design of the Site remedy. The LDI program was performed between September 21, 2017 and December 28, 2017 and included test pits, test borings, and the collection and analysis of surface and subsurface soil samples. The LDI program also included bathymetric and topographic surveys within the Seekonk River and along the adjacent shoreline to facilitate the design of the containment wall and development of a three-dimensional hydrostratigraphic numerical model of the Site to evaluate whether installation of the proposed containment wall would result in unacceptable groundwater mounding conditions that could potentially alter groundwater flow around the containment wall or to other portions of the Site. The results of the modeling indicated the installation of the containment wall creates an approximately 0.5-foot groundwater mound immediately upgradient of the wall. This localized groundwater mound does not cause a significant alteration of groundwater flow directions upgradient of the wall.

During the implementation of the remedy, Best Management Practices (BMPs) will be implemented to mitigate the potential off-Site migration of contaminants and exposure risks to on-Site workers and the public. These BMPs include implementation of dust and nuisance odor control measures; installation of sedimentation and erosion controls along the waterfront and the north and south perimeter of the Site; installation of a turbidity curtain within the river prior to work on the banks of the river and during installation of the containment wall; limiting the size of temporary working stockpiles; covering of temporary working stockpiles during the work days (to the extent practical) and during all non-working hours; management of any saturated excavated materials in a lined material management area; installation of tracking pads/wheel wash stations; and restricting access to the Site using a combination of the existing chain link fencing supplemented with temporary construction fencing as necessary.

During construction of the remedy, a robust air monitoring program will be implemented to protect the surrounding community as well as Site workers from potential exposure to Site impacts. This program will provide continuous (24-hours per day, 7-days a week), real-time measurement of airborne concentrations of certain compounds that will allow rapid identification of conditions in the event elevated emissions are detected and the aggressive application of engineering controls to keep air quality parameters within acceptable limits. The air monitoring program was designed consistent with the Site-specific *Air Quality Monitoring Plan* established for the Tidewater Site and includes both Tier I (Real Time Monitoring) and Tier II (Time-Integrated Monitoring). The Tier I program will involve the use of both portable, hand held instrumentation to continuously monitor active work zones where earth disturbing/stockpiling is occurring and the deployment of state of the art stationary air monitoring stations along the perimeter of the Site. The Tier II sampling program will involve the collection and analysis of ambient air samples to periodically verify the Tier I results and provide a comparison to the RIDEM Acceptable Ambient Level (AALs) and the applicable action levels established in the Tidewater AQMP.

We anticipate that several permits will be required to construct the remedy including a Coastal Resource Management Council (CRMC) Assent and variance, a Rhode Island Pollutant Discharge Elimination System





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## EXECUTIVE SUMMARY

(RIPDES) *General Permit for Stormwater Discharges Associated with Construction Activities*, a RIDEM Office of Water Resources *Water Quality Certification*, and a Narragansett Bay Commission Sewer alteration permit.

Consistent with the PIP, a Community Outreach Event will be held to present this RAWP to the public. This meeting will be held between 6 p.m. and 8 p.m. on July 17, 2018 at the Blackstone Academy Charter School located at 334 Pleasant Street, Pawtucket, RI. This RAWP will be revised based on comments received from RIDEM and the public and a RAWP Addendum will be subsequently re-submitted to RIDEM. The tentative milestone schedule for submittal of the RAWP Addendum and implementation of the RIDEM approved remedy is as follows:

- Community Outreach Event to Present RAWP: Within 1 to 2 months after submittal of RAWP to RIDEM
- Submittal of Summary of Community Outreach Event to RIDEM: 20 days after event
- Revise and Submit *RAWP Addendum* to RIDEM: 60 days after receipt of RIDEM and Public Comments
- RIDEM Issues *Order of Approval*: 30 to 60 days after submittal of the revised RAWP
- Remedy Design and Permitting: 10 to 12 months after receipt of *Order of Approval*
- Implementation/Construction of Remedy: Approximately 18 months (Anticipated to start in the fall of 2019)
- Additional Community Outreach Events: Prior to implementation of the remedy, periodically during implementation, and 30 days following completion of the remedy
- Submittal of Remedial Action Closure Report to RIDEM: Within 2 to 3 months of remedy Completion



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## EXECUTIVE SUMMARY

A GZA GeoEnvironmental, Inc. (GZA) preparou este *Plano de Trabalho de Ação Remedial* (RAWP), em nome da Narragansett Electric Company d/ b/a National Grid (National Grid), para a antiga localidade de Tidewater situada em Pawtucket, Rhode Island (aqui referido como o Ste). O projeto RAWP resume os resultados de um Programa de Projeto de Investigação Limitada (LDI) para suplementar os dados disponíveis existentes, fornece detalhes técnicos sobre a remediação do site, descreve as melhores práticas de gerenciamento e o programa de monitoramento do ar a ser implementado durante a construção da remediação e descreve um cronograma para execução.

O Site era a antiga localização da Fábrica de Gás da Tidewater (MGP) e da Central de Energia No.1 de Pawtucket que consiste aproximadamente de 23 acres em cinco lotes separados, detidos por National Grid e partes de três lotes detidos pela Cidade de Pawtucket. O site está localizado entre a rua Taft e uma extensão das ruas Tidewater e Thornton a oeste e o rio Seekonk a leste e por grande parte vazio, exceto um posto regulador de gas natural situado na parte noroeste do site e um posto de ligações elétricas em actividade e uma subestação elétrica na parte central do site. O espaço está fechado com uma cerca de arame no perímetro.

No dia 19 de abril de 2018, o Departamento de Gestão Ambiental de Rhode Island (RIDEM) emitiu uma Carta de Decisão Remediativa (RDL) que formalmente aprovou o Relatório de Investigação do Site (SIR) e a proposta alternativa de remediação e apresentação obrigatória do RAWP, qual fornece detalhes e um cronograma para a implementação da remediação proposta.

O objetivo geral da remediação do Site é proteger a saúde humana e o meio ambiente em relação aos impactos identificados. Os objetivos corretivos específicos para os solos do Site, as águas subterrâneas e o ar com base a natureza e a extensão dos impactos observados e o uso atual e previsível futuro do Site, são os seguintes:

- mitigação da futura exposição humana aos solos impactados em concentrações acima do critério do método 1 da exposição direta industrial/comercial (I/C-DEC);
- mitigação do rastreamento e erosão potenciais dos solos impactados;
- mitigação da migração potencial dos impactos líquidos de fase não aquosos (NAPL) observados no Rio Seekonk;
- redução na medida possível, da extensão da massa e mobilidade dos NAPLs;
- limitando ainda mais a degradação da qualidade das águas subterrâneas; e,
- abordando possíveis problemas de volatilização em caso de futura construção de edifícios no site.

O remediação RIDEM aprovada para cumprir estes objectivos correctores é resumido abaixo:

- escavação e eliminação externa de materiais de fonte, aparente em três áreas. Estas escavações de materiais de fonte incluem uma área de aproximadamente 100 pés quadrados, perto do antigo tanque subterrâneo (UGTT-1); uma área de pista de madeira que inclui vários tamanhos de tubulação e duas estruturas/abóbodas concretas, anteriormente usadas para a transferência de petróleo entre porções do site; e uma área de aproximadamente 750 pés quadrados, impactada com naftaleno cristalizado na porção norte do site.



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- A instalação de controlos de engenharia (tampas e cercas) para atenuar o contato direto com os solos impactados e evitar rastreamento e erosão das materiais. Aproximadamente 50% das tampas de engenharia estão também projetadas para ser impermeáveis e atenuar ainda mais a degradação da qualidade das águas subterrâneas. A construção dessas tampas exigirá uma reclassificação significativa do Site para criar uma superfície relativamente uniforme, das bordas oeste do Site ao Rio. Aproximadamente 22.500 jardas cúbicas (CY) de solo serão cortadas de partes do site e reutilizadas para encherem as camadas baixas do Site e alcançarem as elevações aterradas das tampas de engenharia. Além disso, cerca de 11.500 jardas cúbicas (CY) de solo limpo importado será também necessário para encherem as camadas baixas do Site para alcançarem a elevação aterrada da tampa de engenharia. Após ter atingido a sob-base, aproximadamente 45.000 CY de materia limpa será importada para construir as tampas de engenharia. Nenhuma tampa de engenharia será instalada dentro das encostas íngremes e densamente arborizadas ao longo das porções sudoeste e oeste do site, devido as apreensões relativo a desestabilização dos bancos e a remoção de árvores maduros ao longo das partes do perímetro do Site. O acesso às estas pistas será restrita por causa da instalação da cerca adicional que servirá de controle da engenharia.
- Instalação de um muro de contenção de aproximadamente 1.300 pés ao longo do lado leste (degradado) das partes do Site para mitigar a migração potencial dos impactos NAPL em direção ao Rio Seekonk. Uma parte da parede de contenção será instalada fora das paredes anteparas existentes dentro do Rio Seekonk para servir também como substituto dos muros anteparas deteriorados existentes. A parede de contenção consistirá de paredes de estacas-pranchas de aço com rótulas de intertravamento seladas ou vibradas no solo, usando uma grua montada com um martelo.
- Atividades de rotina de medição e recuperação manual do NAPL, serão realizadas em novos poços de recuperação instalados no lado renovado da parede de contenção e também em alguns poços já existentes. As atividades de medição e recuperação do NAPL serão inicialmente realizadas trimestralmente durante o primeiro ano após a instalação da parede de contenção e duas vezes por ano, depois do primeiro ano. Os resultados destas actividades de medição e recuperação do NAPL, serão documentados nos relatórios anuais submetidos ao RIDEM.
- O programa longo prazo de monitoramento de atenuação natural das águas subterrâneas, consistirá na recolha de amostras de águas subterrâneas de 27 poços já existentes numa base anual. As amostras de águas subterrâneas serão analisadas por compostos orgânicos voláteis (COV). Os resultados deste programa de monitoramento das águas subterrâneas serão documentados em relatórios anuais submetidos a RIDEM.
- Restrições de uso da terra ambiental (ELURs) serão colocados nos registros de propriedade que delineiam certas restrições de uso para as parcelas que compõem o Site. Os ELURs incluirão um Plano Integral de Gereciamento do Solo (SMP) que estabelece os procedimentos e as disposições que deveriam exigir as futuras actividades de construção/manutenção do Site, em caso tiver a necessidade de perturbar os solos sob as tampas de engenharia e dentro das áreas restritas pela cerca de controle de engenharia. O SMP serve para complementar e será iniciada pela RIDEM, com exigência de notificação estabelecida pelos ELURs para o Site.
- Os controlos de engenharia (tampas e cerca), a parede de contenção e monitoramento e recuperação da rede dos poços, serão inspeccionadas pelo menos anualmente por evidências de assentamento da superfície de solo, erosão ou outros danos. Quaisquer deficiências observadas serão reparadas de forma expedita. Os



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resultados destas actividades de inspeção e reparação, serão documentados nos relatórios anuais submetidos ao RIDEM.

A remediação inclui também as medidas associadas com uma Agência de Protecção Ambiental dos Estados Unidos (EPA), remediação aprovada para tratar a materia identificada, o polychlorinated biphenyl (PCB) materia impactada (solo, rocha de armadilha e concreto) dentro da cerca, uma subestação elétrica ativa. Estas medidas correctivas incluem, escavação e eliminação, fora do site de aproximadamente 95 toneladas de rocha de armadilha, solo, e concreto perto da subestação elétrica ativa com impactos de PCB superior a 50 miligramas por quilo (mg/kg), emissão de um ato de restrição na área da subestação, proteção a área da subestação com uma cerca (que já existe no Site) e instalação de sinalização sobre a cerca.

O RAWP resume os resultados de um programa LDI (Projeto de Investigação Limitada) implementado para coletar dados suplementares a fim de facilitar a concepção do site de remediação. O programa LDI foi realizado entre o 21 de setembro de 2017 e o 28 de dezembro de 2017 e incluiu testes de poços, sondagens, coleta e análise das amostras do solo, superfície e subsuperfície. O programa LDI também incluiu levantamentos batimétricos e topográficos dentro do Rio Seekonk e ao longo da costa adjacente para facilitar o desenho da parede de contenção e o desenvolvimento de um modelo numérico tridimensional de hidroestratigráficas do Site, para avaliar se a instalação da parede de contenção proposta, resultaria condições de subida inaceitável das águas subterrâneas que potencialmente poderiam alterar o fluxo das águas subterrâneas ao redor da parede de contenção ou de outras partes do Site. Os resultados da modelagem indicaram que a instalação da parede de contenção cria um aumento das águas subterrâneas de aproximadamente 0.5-pé imediatamente após a elevação da parede. Este aumento localizado no lençol freático não causa uma alteração significativa das direções do fluxo da água subterrânea com a reparação da parede.

Durante a execução da remediação, as Melhores Práticas de Gestão (BMPs) serão implementadas para minimizar a possibilidade de migração fora do Site de contaminantes e riscos de exposição no Site para os trabalhadores e o público. Estas BMPs incluem a implementação de medidas de controle de poeira e incômodo de odor; instalação de controles de sedimentação e erosão ao longo da orla marítima e a norte e perímetro sul do Site; instalação de uma camada de turbidez dentro do Rio antes de trabalhar nos bancos do Rio e durante a instalação do muro de contenção; limitando o tamanho dos estoques de trabalho temporário; cobrindo os estoques de trabalho temporário, durante os dias de trabalho (na medida do possível) e fora das horas de trabalho; gestão de todos os materiais escavados saturados numa área revestida de gestão de material; instalação de estações de lavagem das protecções/rodas; e restringindo o acesso ao site usando ambos uma cadeia ligando a cerca existente com uma cerca temporária da construção, conforme necessário.

Durante a construção da remediação, um programa robusto de monitoramento do ar será implementado para proteger a comunidade do entorno, bem como os trabalhadores do Site da exposição potencial aos impactos do Site. Este programa fornecerá medições contínuas (24 horas por dia, 7 dias por semana) em tempo real de concentrações no ar de certos compostos que permitirão a identificação rápida das condições, no caso de emissões elevadas serem detectadas e a aplicação agressiva da engenharia de controles para manter os parâmetros de qualidade do ar dentro dos limites aceitáveis. O programa de monitoramento do ar foi projetado consistente com o plano de monitoramento da qualidade do ar, especificamente desenhado para o Site de Tidewater e inclui tanto o Tier I (Monitoramento Em Tempo Real) e Tier II (Monitoramento Em Tempo Integrado). O programa Tier I envolverá o uso de instrumentação portátil e manual para monitorar continuamente as zonas ativas de trabalho onde ocorre a perturbação/estocagem de terra e a implantação de estações de monitoramento





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do ar de última geração, ao longo do perímetro do Site. O programa Tier II de amostragem envolverá a coleta e análise das amostras do ar ambiente para verificar periodicamente os resultados de Tier I e fornecer uma comparação ao RIDEM -Nível Ambiental Aceitável (AALs) e os níveis de ação aplicáveis estabelecidos no Tidewater AQMP.

Nós antecipamos que várias autorizações serão requeridas para construir a remediação, incluindo aprovações e variações, um Conselho de Gestão dos Recursos Costeiros (CRMC) um Sistema de Eliminação das Descargas Poluentes de Rhode Island (RIPDES), uma licença geral de descarga das águas pluviais associada com as atividades de construção, um RIDEM Escritório dos Recursos Hídricos certificação da qualidade da água e uma alteração da licença da Baía de Narragansett da Comissão dos esgotos.

Consistente com o PIP, um evento de sensibilização da Comunidade será realizado para apresentar este projecto RAWP ao público. Essa reunião será realizada entre 18:00 às 20:00 horas no dia 17 de julho de 2018 na Blackstone Academy Charter School localizada na 334 Pleasant Street, Pawtucket, RI. Este projecto RAWP será revisto com base nos comentários recebidos do RIDEM e o público e será posteriormente re-submetido a RIDEM. O projeto de cronograma para a finalização do RAWP e a implementação da remediação RIDEM, aprovada é como se segue:

- Evento de sensibilização comunitária para apresentar o plano RAWP Dentro de 1 a 2 meses após o envio de projecto RAWP a RIDEM
- Envio do resumo do evento de sensibilização comunitária a RIDEM: 20 dias após o evento
- Rever e reenviar RAWP a RIDEM: 60 dias após o recebimento a RIDEM e resposta dos comentários públicos
- Questões do RIDEM em *ordem de aprovação*: 30 a 60 dias após a apresentação da Revisão do RAWP
- Remediação da planificação e do licenciamento: 10 a 12 meses após o recebimento da *ordem de aprovação*
- Implementação/construção da remediação: Cerca de 18 meses (de antecipação para começar no outono de 2019)
- Eventos adicionais de sensibilização: Antes da implementação da remediação, periodicamente durante a implementação, e 30 dias após a conclusão da remediação
- Submissão do relatório da conclusão das acções correctivas para o RIDEM: Dentro de 3 meses da conclusão da remediação



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GZA GeoEnvironmental, Inc. (GZA) ha elaborado este *Plan de trabajo de saneamiento* (RAWP), en nombre de The Narragansett Electric Company, de nombre comercial National Grid (National Grid), para las antiguas instalaciones de Tidewater ubicadas en Pawtucket, Rhode Island (en adelante, el Sitio). El RAWP resume los resultados de un programa de Investigación de Diseño Limitado (LDI) para complementar los datos disponibles existentes, proporciona detalles técnicos sobre el saneamiento del Sitio, describe las Prácticas de Gestión Recomendadas (BMP, Best Management Practices) y el programa de monitoreo del aire que se implementará durante la construcción del saneamiento y detalla un cronograma de ejecución.

El Sitio era la antigua ubicación de la planta Tidewater Manufactured Gas Plant (MGP) y la Pawtucket No. 1 Power Station y consta de aproximadamente 23 acres en cinco lotes separados que son propiedad de National Grid y partes de tres lotes que son propiedad de la ciudad de Pawtucket. El Sitio está ubicado entre Taft Street y una extensión de las calles Tidewater Street y Thornton Street al oeste y el río Seekonk al este y ahora está vacante en gran parte a excepción de una estación reguladora de gas natural activa ubicada en la zona noroeste del Sitio y una estación de conmutación activa y subestación eléctrica en la zona central del Sitio. El Sitio está protegido con una cerca de alambre perimetral cerrada.

El 19 de abril de 2018, el Departamento de Gestión Ambiental de Rhode Island (RIDEM, Rhode Island Department of Environmental Management) emitió una *Carta de Decisión sobre el Saneamiento (RDL, Remedial Decision Letter)* que formalmente aprobó el Informe de Investigación del Sitio (SIR, Site Investigation Report) y la alternativa de saneamiento propuesta y la presentación necesaria de un RAWP, que proporciona detalles y un cronograma para la implementación del saneamiento propuesto.

El objetivo general del saneamiento del Sitio es proteger la salud humana y el medioambiente en relación con los impactos identificados. Los objetivos de saneamiento específicos para el suelo, el agua subterránea y el aire del Sitio, en función de la naturaleza y el grado de los impactos observados y el uso actual y previsible en el futuro del Sitio, son los siguientes:

- Mitigación de la exposición humana futura a suelos afectados con concentraciones superiores a los Parámetros Comerciales/Industriales de Exposición Directa de Método 1 (I/C-DEC, Industrial/Commercial Direct Exposure Criteria).
- Mitigación del potencial rastreo y erosión de los suelos afectados cerca de la superficie.
- Mitigación de la potencial migración de los impactos de líquidos de fase no acuosa (NAPL) observados en el río Seekonk.
- Reducción en el grado, la masa y la movilidad de los NAPL en la medida de lo posible.
- Limitación de una mayor degradación de la calidad del agua subterránea.
- Abordaje de los posibles problemas de volatilización en caso de una construcción futura de edificios en el Sitio.



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El saneamiento aprobado por el RIDEM para cumplir con estos objetivos de saneamiento se resume a continuación:

- Excavación y desecho fuera de las instalaciones de materiales de origen aparentes de tres áreas. Estas excavaciones en el área de origen incluyen un área de aproximadamente 100 pies cuadrados cercana a un antiguo tanque subterráneo (UGTT-1); un área de conductos eléctricos de madera que incluye tuberías de diversos tamaños y dos estructuras/bóvedas de concreto utilizadas anteriormente para transferir petróleo entre las partes del Sitio; y un área de relleno de aproximadamente 750 pies cuadrados afectada por naftalina cristalizada en la parte norte del Sitio.
- Instalación de controles diseñados (cubiertas y cercas) para mitigar el contacto directo con los suelos afectados y evitar el rastreo y la erosión de los materiales. Aproximadamente el 50 % de la cubierta diseñada también se proyectará para que sea impermeable a fin de mitigar una mayor degradación de la calidad del agua subterránea. La construcción de estas cubiertas diseñadas exigirá una renovación significativa del Sitio para crear una superficie relativamente uniforme que se incline desde los bordes occidentales del Sitio hasta el río. Aproximadamente 22 500 yardas cúbicas (yd<sup>3</sup>) de suelo se cortarán de partes del Sitio y se reutilizarán como relleno en las partes bajas del Sitio a fin de lograr las elevaciones de explanada de las cubiertas diseñadas. Además, aproximadamente 11 500 yd<sup>3</sup> de suelo limpio importado también serán necesarias para llenar las partes bajas del Sitio a fin de lograr la elevación de la explanada de la cubierta diseñada. Al alcanzar la explanada, se importarán aproximadamente 45 000 yd<sup>3</sup> de material de relleno limpio para construir las cubiertas diseñadas. No se instalará una cubierta diseñada en las pendientes boscosas y pronunciadas a lo largo de las partes suroeste y oeste del Sitio debido a las preocupaciones sobre la desestabilización de las orillas y la eliminación de árboles maduros en partes del perímetro del Sitio. El acceso a estas pendientes se restringirá mediante la instalación de cercas de alambre adicionales que servirán como control diseñado.
- Instalación de una barrera de contención subsuperficial de aproximadamente 1300 pies de longitud a lo largo del borde oriental (aguas abajo) de algunas partes del Sitio a fin de mitigar la posible migración de impactos de NAPL hacia el río Seekonk. Una parte de la barrera de contención se instalará en la parte exterior de los mamparos existentes dentro del río Seekonk para que sirva también como reemplazo de los mamparos deteriorados existentes. La barrera de contención estará formada por muros de láminas de acero con juntas de interbloqueo selladas impulsadas o insertadas por vibración en el suelo mediante un martillo montado en una grúa.
- Se realizarán actividades de rutina de medición y recuperación manual de los NAPL en los nuevos pozos de recuperación instalados en el lado de gradiente ascendente de la barrera de contención y también en ciertos pozos existentes. Las actividades de medición y recuperación de los NAPL se realizarán inicialmente de manera trimestral durante el primer año después de la instalación de la barrera de contención y luego dos veces al año después del primer año. Los resultados de estas actividades de medición y recuperación de los NAPL se documentarán en los informes anuales presentados al RIDEM.
- El programa de monitoreo de agua subterránea de atenuación natural a largo plazo consistirá en la recolección de muestras de agua subterránea de 27 pozos de monitoreo existentes sobre una base anual. Las muestras de agua subterránea se analizarán en busca de compuestos orgánicos volátiles (VOC, volatile organic



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compounds). Los resultados de este programa de monitoreo de aguas subterráneas se documentarán en los informes anuales presentados al RIDEM.

- Las Restricciones Ambientales del Uso de la Tierra (ELUR, Environmental Land Usage Restrictions) se colocarán en los registros de la propiedad que describen ciertas restricciones de uso para las parcelas que constituyen el Sitio. Las ELUR incluirán un Plan de Gestión del Suelo (SMP, Soil Management Plan) integral que establece los procedimientos y las disposiciones en caso de que las futuras actividades de construcción/mantenimiento en el Sitio exijan la alteración del suelo debajo de las cubiertas diseñadas y dentro de las áreas restringidas por la cerca de control diseñado. El SMP sirve para complementar, y será iniciado por, el requisito de notificación del RIDEM establecido por las ELUR para el Sitio.
- Los controles diseñados (cubiertas y cercas), la barrera de contención y la red de pozos de monitoreo y recuperación se inspeccionarán al menos una vez al año en busca de evidencia de asentamiento, erosión u otros daños en la superficie del suelo. Cualquier deficiencia observada se reparará de la manera más rápida posible. Los resultados de estas actividades de inspección y reparación se documentarán en informes anuales presentados al RIDEM.

El saneamiento también incluye medidas asociadas con un saneamiento aprobado por la Agencia de Protección Ambiental de los Estados Unidos (EPA, Environmental Protection Agency) para abordar el material afectado de bifenilo policlorado (PCB) identificado (suelo, rocas fragmentarias y concreto) dentro de la subestación eléctrica activa cercada. Estas medidas de saneamiento incluyen la excavación y el desecho fuera de las instalaciones de aproximadamente 95 toneladas de rocas fragmentarias, suelo y concreto cerca de la subestación eléctrica activa con impactos de PCB mayores a 50 miligramos por kilogramo (mg/kg), la colocación de una restricción de escritura en el área de la subestación, la protección del área de la subestación con cercas (que ya está implementado) y la instalación de señalización en la cerca.

El RAWP resume los resultados de un programa de Investigación de Diseño Limitado (LDI) implementado para recopilar datos complementarios a fin de facilitar el diseño del saneamiento del Sitio. El programa de LDI se realizó entre el 21 de septiembre de 2017 y el 28 de diciembre de 2017 e incluyó fosas para pruebas, pruebas de sondeo y la recolección y análisis de muestras de suelo superficial y subsuperficial. El programa de LDI también incluyó estudios topográficos y batimétricos dentro del río Seekonk y a lo largo de la costa adyacente para facilitar el diseño de la barrera de contención y el desarrollo de un modelo numérico hidroestratigráfico tridimensional del Sitio a fin de evaluar si la instalación de la barrera de contención propuesta provocaría condiciones inaceptables de montículos de aguas subterráneas que podrían alterar el flujo de agua subterránea alrededor de la barrera de contención o a otras partes del Sitio. Los resultados del modelado indicaron que la instalación de la barrera de contención crea un montículo de agua subterránea de unos 0,5 pies inmediatamente cuesta arriba de la barrera. Este montículo de agua subterránea localizado no causa una alteración significativa de las direcciones de flujo del agua subterránea cuesta arriba de la barrera.

Durante la implementación del saneamiento, se implementarán las Prácticas de Gestión Recomendadas (BMP) para mitigar la posible migración de contaminantes fuera del Sitio y los riesgos de exposición para los trabajadores del Sitio y el público. Estas BMP incluyen la implementación de medidas de control de polvo y olores desagradables; la instalación de controles de sedimentación y erosión a lo largo de la costa y el perímetro norte y sur del Sitio; la instalación de una cortina de turbidez dentro del río antes de trabajar en las orillas del río y durante la instalación





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de la barrera de contención; la limitación del tamaño de los depósitos temporales de trabajo; la cobertura de los depósitos temporales de trabajo durante los días de trabajo (en la medida de lo posible) y durante el horario no laborable; el manejo de cualquier material excavado saturado en un área de gestión de material revestido; la instalación de placas de goma/estaciones de lavado de ruedas; y la restricción del acceso al Sitio mediante una combinación del cercado de alambre existente complementado con cercas temporales para construcción, según sea necesario.

Durante la construcción del saneamiento, se implementará un sólido programa de monitoreo del aire para proteger a la comunidad circundante y a los trabajadores del Sitio de la posible exposición a los contaminantes del Sitio. Este programa proporcionará mediciones continuas en tiempo real (24 horas al día, 7 días a la semana) de concentraciones en el aire de ciertos compuestos que permitirán una rápida identificación de las condiciones en caso de que se detecten emisiones elevadas y la aplicación agresiva de controles diseñados para mantener los parámetros de calidad del aire dentro de los límites aceptables. El programa de monitoreo del aire se diseñó de acuerdo con el *Plan de Control de la Calidad del Aire* (AQMP, Air Quality Monitoring Plan) específico del Sitio establecido para el Sitio Tidewater e incluye tanto el Nivel I (Monitoreo en Tiempo Real) como el Nivel II (Monitoreo de Tiempo Integrado). El programa de Nivel I implicará el uso de instrumentos manuales y portátiles para controlar continuamente las zonas de trabajo activas donde se está produciendo una perturbación/acumulación de suelo y el despliegue de estaciones fijas de vanguardia para el monitoreo del aire a lo largo del perímetro del Sitio. El programa de muestreo de Nivel II involucrará la recolección y análisis de muestras de aire ambiental para verificar periódicamente los resultados de Nivel I y proporcionar una comparación con el Nivel Ambiental Aceptable (AAL, Acceptable Ambient Level) del RIDEM y los niveles de acción aplicables establecidos en el AQMP de Tidewater.

Anticipamos que se necesitarán varios permisos para construir el saneamiento, incluida una aprobación y varianza del Consejo de Gestión de Recursos Costeros (CRMC, Coastal Resource Management Council), un Permiso General del Sistema de Eliminación de Contaminantes de Rhode Island (RIPDES, Rhode Island Pollutant Discharge Elimination System) para *Descargas de Aguas Pluviales Asociadas con Actividades de Construcción*, un Certificado de Calidad del Agua (WQC, Water Quality Certification) de la *Oficina de Recursos Hídricos (Office of Water Resources) del RIDEM* y un permiso de alteración del alcantarillado de la Comisión de la Bahía de Narragansett (NBC, Narragansett Bay Commission).

De acuerdo con el Plan de Participación Pública (PIP, Public Involvement Plan), se llevará a cabo un Evento de Alcance Comunitario para presentar este RAWP al público. Esta reunión se llevará a cabo entre las 6 p. m. y las 8 p. m., el 17 de julio de 2018, en la Blackstone Academy Charter School ubicada en 334 Pleasant Street, Pawtucket, RI. Este RAWP se revisará en función de los comentarios recibidos por parte del RIDEM y del público, y se volverá a enviar un Anexo de RAWP posteriormente al RIDEM. El cronograma provisional de hitos para la presentación del Anexo de RAWP y la implementación del saneamiento aprobado por el RIDEM es el siguiente:



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- Evento de Alcance Comunitario para presentar el RAWP: Dentro de 1 a 2 meses después de la presentación del RAWP al RIDEM
- Presentación del Resumen del Evento de Alcance Comunitario al RIDEM: 20 días después del evento
- Revisión y envío del *Anexo del RAWP* al RIDEM: 60 días después de la recepción del RIDEM y comentarios públicos
- El RIDEM publica la *Orden de aprobación*: 30 a 60 días después de la presentación del RAWP revisado
- Diseño y permisos para el saneamiento: 10 a 12 meses después de la recepción de la *Orden de aprobación*
- Implementación/construcción del saneamiento: Aproximadamente 18 meses (se anticipa que comenzará en el otoño de 2019)
- Eventos adicionales de alcance comunitario: Antes de la implementación del saneamiento, periódicamente durante la implementación y 30 días después de la finalización del saneamiento
- Presentación del Informe de Cierre del Saneamiento al RIDEM: Dentro de 2 a 3 meses de la finalización del saneamiento



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## 1.0 INTRODUCTION

GZA GeoEnvironmental, Inc. (GZA) has prepared this *Remedial Action Work Plan* (RAWP), on behalf of The Narragansett Electric Company d/b/a National Grid (National Grid), for the former Tidewater Facility located at the terminus of Tidewater and Merry Streets in Pawtucket, Rhode Island (herein referred to as the Site). The Site is also defined as Pawtucket Tax Assessors Plat (A.P.) 54B Lot 826, A.P. 65B Lots 662, 645, 647, 649 and portions of Lot 648, and portions of A.P. 67B Lots 11 and 21. These properties are collectively referred to herein as the "Site." A Site Locus Plan is provided as **Drawing 1** and an Aerial Site Plan depicting the Site boundaries is provided as **Drawing 2A**. This RAWP has been prepared consistent with the requirements of Rule 9.00 of the Rhode Island Department of Environmental Management (RIDEM) *Rules and Regulations for the Investigation and Remediation of Hazardous Materials Releases (Remediation Regulations)*, most recently amended in November 2011 and in response to an April 19, 2018 *Remedial Decision Letter* (RDL) issued by RIDEM which formally approved the Site investigation and identified the preferred remedial approach for the Site. This RAWP serves to present the planned remedy for the Site which consists of the following:

- Limited removal of observed source material in the immediate vicinity of a former underground storage tank (UGTT-1), raceway structures, and an area of fill observed to contain crystallized naphthalene;
- Installation of engineered controls in the form of engineered caps designed to: (1) mitigate potential direct exposure to impacted soils, (2) mitigate potential erosion and tracking of impacted surface soils, and (3) mitigate further degradation of groundwater quality. As described herein, chain-link fencing will serve as the engineered control to restrict access to impacted materials on the steep wooded slopes along the southwestern and western boundaries of the Site to avoid clear cutting the existing vegetation and trees and potentially destabilizing the slopes;
- Physical containment of non-aqueous phase liquid (NAPL) impacts via installation of a containment wall along the eastern edge of portions of the Site. Note: as described further herein, portions of this containment wall will also serve to replace certain existing aging bulkheads along the riverfront;
- Focused NAPL recovery from a network of wells;
- Routine natural attenuation groundwater monitoring;
- Implementation of Environmental Land Usage Restrictions (ELURs) that restrict certain activities and uses and ensures the engineered controls and containment wall are not disturbed. In addition, the ELURs will require that potential volatilization issues are addressed for future buildings constructed at the Site due to exceedances of the GB Groundwater Objectives. The ELURs will include a post-remedial construction Soil Management Plan (SMP) which will outline procedures for managing materials should disturbances below the engineered cap be required. As required by the RDL, drafts of the ELURs and the SMP are included in **Appendix B**; and,
- Annual engineered cap and containment wall inspections and maintenance.

As detailed in GZA's July 2011 Remedial Alternative Evaluation (RAE) report, this remedy was selected due to its ability to achieve the remedial objectives in a relatively timely manner with low risks to both on-Site workers and the surrounding community during implementation and the comparatively limited impact to the surrounding community associated with potential migration and tracking of impacted materials during off-Site transport. Implementation risks will be managed



through the use of Best Management Practices (BMPs) and engineered controls such as wetting or mulching work surfaces, covering stockpiles, and use of odor suppressing foams as described herein.

This RAWP also includes remedial measures associated with an United States Environmental Protection Agency (EPA) approved *Self-Implementing Plan* (SIP) to address identified polychlorinated biphenyl (PCB) impacted material (soil, traprock, and concrete) within the fenced, active electrical substation. Because these PCB impacted materials are located proximate to the active substation, implementation of these PCB remedial measures will need to be performed coincident with a planned electric outage.

In addition, this RAWP includes integration of the Site remedy with the planned substation upgrades which include construction of an approximately 1,080 square foot control house building directly east of the existing substation, demolition of the existing Pawtucket No. 1 substation building, and re-routing of below grade conductors. These Pawtucket No. 1 substation upgrades will be designed and constructed in a coordinated manner consistent with the requirements of this RAWP, including the engineered capping requirements and management of materials consistent with the SMP included in **Appendix B**.

During implementation of the remedial measures outlined herein, perimeter air monitoring will be performed consistent with the requirements of the April 2011 *Air Quality Monitoring Plan* (AQMP) previously developed for the Site. These air monitoring activities are outlined in more detail in Section 11.00.

The Tidewater Site is a Public Involvement Plan (PIP) site. In October 2013, National Grid prepared a PIP for this Site consistent with RIDEM requirements. The PIP establishes procedures for National Grid's sharing of information with the public and describes how the public will be able to comment on plans for the investigation and cleanup of the Tidewater Site. A copy of the October 2013 PIP is included as **Appendix J** for reference. Consistent with the PIP, upon submittal of this RAWP to RIDEM, National Grid will prepare and distribute an updated Site Fact Sheet and schedule a community outreach event to review the planned Site remedy described herein and solicit public feedback. We currently anticipate this event will be held during the summer of 2018. National Grid will inform the public of the planned date, time, and place for this community outreach event at least 3 weeks in advance.

This RAWP is organized as follows:

- Section 1.00 contains this introduction;
- Section 2.00 contains a Site description and a brief summary of Site history;
- Sections 3.00 through 19.00 provide the information required by Rules 9.02 through 9.18 of the *Remediation Regulations*; and,
- Section 20.00 contains the Certification per Rule 9.19 of the *Remediation Regulations*.

This RAWP is subject to the Limitations included in **Appendix A**.

## 2.0 BACKGROUND

The following provides a brief Site description and a summary of relevant past Site operations. For further details, please refer to the January 2011 SIDR.



**2.1 SITE LOCATION AND DESCRIPTION**

The Site was the former location of the Tidewater Manufactured Gas Plant (MGP) and the Pawtucket No. 1 Power Station. The Site consists of approximately 23 acres across eight separate lots located between Taft Street and an extension of Tidewater and Thornton Streets to the west and the Seekonk River to the east. The Site is now largely vacant except for an active natural gas regulating station located in the northwest portion of the Site and an active switching station and electric substation in the central portion of the Site. The Site is secured with a locked perimeter chain-link fence. For discussion purposes, the Site has been subdivided into four areas, as described below and shown on **Drawing 2A**:

- North Fill Area (NFA) (northern portions of A.P. 54B Lot 826);
- Former Gas Plant Area (FGPA) (southern portions of A.P. 54B Lot 826 and A.P. 65B Lot 662);
- Former Power Plant Area (FPPA) (A.P. 65B Lot 645); and
- South Fill Area (SFA) (A.P. 65B Lots 647 and 649, portions of Lot 648, and portions of A.P. 67B Lots 11 and 21).

The following table lists the uses of the properties abutting the Site based on a review of the City of Pawtucket tax assessor’s records. As shown on **Drawing 2A**, the eastern Site property boundaries abut the Seekonk River.

ADJOINING PROPERTIES USAGE	
Description	Direction
Residential properties (A.P. 65B Lots 613, 614, 615 and 616); The International Charter School; the Blackstone Academy; George W. Smith and Son, Inc. Construction Company; and the Red Barn Studio Company (A.P. 54B Lot 497).	West and Northwest
Francis J. Varieur School (A.P. 65B Lot 644) and the Max Read Athletic Field (A.P. 65B Lots 646, 650 and 564 and A.P. 67B Lot 21)	South and Southwest
Undeveloped property owned by the City of Pawtucket (A.P. 54B Lot 827)	North

Current Site features that were taken into consideration in developing this RAWP include the following:

- The ground surface within the footprint of former buildings in the FGPA, as well as the area surrounding the active natural gas regulating station and substation consists of processed gravel;
- Paved driveways and parking areas are present on the north and west sides of the Pawtucket No. 1 substation building in the central portion of the Site and the fenced portion of Tidewater Street;
- Portions of the access road located to the south and southeast of the substation were previously capped consistent with a RIDEM approved *Short-Term Response Action Plan (STRAP)* with a 20-mil polyethylene liner overlain by bedding sand and a layer of processed gravel or traprock;
- Four water hydrants are present on-Site (two in the FGPA and two in the FPPA). One of the two hydrants in the FPPA is active. The other three hydrants are abandoned;
- Two transmission towers are present in the southeastern portion of the FPPA. Active overhead electric transmission lines extend from the substation to the towers and subsequently across the Seekonk River;



- A manmade shoreline (consisting of bulkheads and steel structures) exists along the majority of the shoreline adjacent to the FPPA and the southern portions of the FGPA. The remaining portions of the riverfront along the FGPA and NFA consist of stone retaining walls and rip rap embankments. The shoreline along the southern portions of the FPPA and SFA consists of rip rap, brick, clinker, and some vegetation leading down to tidal marsh flats;
- An engineered cap is present on the surface of an approximately 50-foot long section of the riverbank in the FGPA. The cap consists of an approximately 12-inch thick layer of sand mixed with organo-clay underlying two layers of geotextile fabric enclosing a ½-inch thick layer of organo-clay underlying a layer of armor mats which was installed consistent with a RIDEM approved STRAP;
- A Narragansett Bay Commission (NBC) 48-inch diameter sanitary sewer interceptor, a 24-inch diameter reinforced concrete pipe (RCP) City of Pawtucket storm drain, a 24-inch diameter combined storm/sanitary sewer overflow (CSO) (maintained by NBC), and a 48-inch diameter City of Pawtucket storm drain traverse the Site (see **Drawings 2B and 2C**). A portion of the 24-inch CSO pipe directly adjacent and discharging to the river has failed resulting in erosion of the surrounding ground surface. On-Site stormwater runoff is predominantly transported via overland flow. There are also several catch basins in the area of the Pawtucket No. 1 substation, as depicted on **Drawing 2C**;
- Concrete foundations and slabs associated with former Site structures are visible on the ground surface in the eastern portion of the FGPA; and,
- Chain link fencing surrounds the northern, western, and southern edges of the Site. Additional interior chain link fencing is also present around the substation area, the Pawtucket No. 1 substation building, the transmission towers, the natural gas regulator station, and the SFA.

Our current understanding of Site utilities is shown on **Drawings 2B and 2C**. The layout of these utilities should be considered approximate and additional active and/or abandoned underground utility lines and structures are potentially present.

## 2.2 SITE HISTORY

The following sections contain brief summaries of relevant historic uses for each of the four Site areas. Refer to the January 2011 SIDR for more detailed information on former Site uses and ownership history.

### North Fill Area

The NFA was primarily used for coal and lumber storage from the late-1800s through the mid-1900s. The area has been primarily vacant land since that time. Currently, the NFA consists of vacant wooded/vegetated land.

### Former Gas Plant Area

The MGP operated from the 1880s to approximately 1968. From the 1880s until 1954, the MGP generated gas using the coal carbonization and carbureted water gas processes. Coal was used as the principal fuel to produce coal gas in the coal carbonization process, while coke (enriched with fuel oil) was used to produce carbureted water gas. Coal and tars were also commonly used as feedstock in the carbureted water gas process. Coal and coke storage areas were reportedly located on the NFA, FGPA, and the FPPA. These raw materials were barged to the Site and the storage areas were generally positioned along the Seekonk River. In the later years of operation (1954 until the late-1960s), the MGP produced gas for



peak shaving purposes. Residual by-products were generated during certain operational production phases of the MGP processes. In 1968, the MGP facility was decommissioned. Based on available information, it appears that the majority of the above-ground MGP structures and tanks were razed at that time or before. The last of the two remaining gasholders on the Site (Nos. 7 and 8) were decommissioned and removed from the Site in 2010. Presently, there is an active natural gas regulating station present in the southwestern corner of the FGPA.

### **Former Power Plant Area**

In 1890, the Pawtucket Gas Company commenced building the Pawtucket No. 1 Station for power generation purposes. The No. 1 Station operated from the early-1890s until 1975. The station used coal and petroleum-based products for electricity generation. In addition, the plant used residual byproduct tar from the MGP for power generation. Petroleum products were historically stored in three, large above ground storage tanks (ASTs) formerly located in the southern portion of the FPPA. These tanks, with a capacity of 897,750 gallons each, were used to store fuel oil for the former power plant and MGP operational purposes. In addition, a former underground fuel conveyance system consisting of piping and a wooden raceway extended from the former AST area on the FPPA north towards two former, 21,000-gallon underground storage tanks (USTs) and the FGPA portion of the Site. Presently, transmission towers, an electrical substation and the Pawtucket No. 1 substation switching building are present in the FPPA.

### **South Fill Area**

Historical mapping from 1895 shows a large cove present to the south of the No. 1 Station encompassing a large section of the southwest portion of the FPPA and the majority of the SFA. This area appears filled on the historical mapping from 1939. The SFA is presently vacant consisting primarily of vacant wooded/vegetated land.

Between July 18, 2016 and August 26, 2016, a RIDEM approved *Short Term Response Action* (STRA) was performed within the SFA to address a sinkhole or “washout” area adjacent to the river. The STRA included limited removal of brush/vegetation, stabilization, and capping of the washout area with a 40-mil LLDPE liner, installation of two new concrete manholes and approximately 60 linear feet of new concrete stormwater drain line and an engineered outfall to convey stormwater from the City of Pawtucket’s Max Read Field area to the river, backfill of the washout area with clean import fill, and hydroseeding to establish grass cover over the former washout area. This impermeable cap mitigates direct contact with impacted Site materials and infiltration of precipitation into the underlying impacted soils consistent with the engineered caps described in this RAWP.

## **2.3 REGULATORY HISTORY**

Based on the results of multiple rounds of Site investigations, RIDEM concluded that a release of hazardous materials had occurred at the Site and subsequently issued *Letters of Responsibility* (LOR) to Valley Gas Company and Blackstone Valley Electric Company (BVEC) dated September 12, 1995. In response to the LORs, Atlantic Environmental Services, Inc. (Atlantic) (on behalf of Valley Gas Company and BVEC) completed a Site Investigation program and submitted a *Remedial Investigation Report* to RIDEM on December 30, 1996 which concluded that impacts from former manufactured gas plant (MGP) operations were observed throughout the Site at varying concentrations. In August 2006, Valley Gas Company and BVEC were acquired by National Grid. On behalf of National Grid, Vanasse Hangen Brustlin, Inc. (VHB) subsequently completed a Site investigation program to further evaluate the findings of the previous investigations. VHB submitted a *Site Investigation Report* to RIDEM in November 2006 which included an exposure assessment and outlined proposed remedial alternatives to achieve compliance with the applicable regulations. GZA subsequently submitted a November 2009 *Supplemental Site Investigation Workplan* (SSIWP) to RIDEM with the objective to fill certain data gaps identified during a review of the historic Site investigation studies. This supplemental investigation program was performed between December 2009 and November 2010





and the results were summarized in a January 2011 *Site Investigation Data Report* (SIDR). The January 2011 SIDR in combination with a July 2011 RAE report were submitted to RIDEM and collectively these reports served to fulfill the requirements described in Section 7.08 of the *Remediation Regulations* for a *Site Investigation Report* (SIR). RIDEM subsequently issued a *Program Letter* dated May 25, 2017 that indicated the Site investigation was complete and described the proposed remedy.

Consistent with the October 2013 PIP established for the Site and Rule 7.07C of the *Remediation Regulations*, an initial community meeting was held on July 26, 2017 to summarize the results of the Site investigation and to present the planned remediation. A 14-day public comment period followed the initial community meeting. One comment related to the project schedule was received and RIDEM provided a written response to this comment on August 15, 2017.

## 2.4 ENVIRONMENTAL SETTING

Site topography generally slopes toward the Seekonk River, with an approximate maximum elevation of 35 feet NAVD88 (North American Vertical Datum 1988) along the western boundary of the Site to approximate elevation 8 feet (NAVD88) along the river's edge (eastern boundary of the Site). The Site is within Federal Emergency Management Agency (FEMA) Flood Zones VE (Elevation 13, NAVD88) and AE (Elevation 12, NAVD88). The eastern portion of the Site is also located within the 200-foot jurisdictional limit of the Coastal Resources Management Council (CRMC) as shown on **Drawings 2B and 2C**. The surface of the Site consists primarily of vegetation and gravel. Certain areas of pavement, concrete, and compacted gravel surfaces also exist as shown on **Drawings 2B and 2C**.

Based on observations made during various rounds of Site investigations, subsurface stratigraphy generally consists of fill materials underlain by stratified gravel, sands, silt, and clay, underlain by glacial till and bedrock. The fill materials generally consisted of varying percentages of sand, coal, ash, slag, and former building/structure debris. The thickness of these fill materials has been observed to range from approximately 1 to 2 feet in the northwestern portion of the Site to over 20 feet in the southern portion. Foundations and other features associated with former gas and power plant structures, buildings, concrete and brick foundations, tanks, piping, etc. were encountered within the fill. The native materials encountered in the northwestern portion of the Site were consistent with estuarine deposits, while the native materials encountered beneath the fills across the remainder of the Site consisted of glacial outwash and marine deposits. The estuarine, glacial outwash and marine deposits are underlain by glacial till and bedrock.

The elevation of the top of the glacial till is inferred to generally slope downward from west to east across the Site as the estuarine and outwash deposits thicken proximate to the river. Along the river, the top of the glacial till was encountered at approximate elevations -16 feet (NAVD88) in the northern portion of the FGPA to approximate elevation -70 feet (NAVD88) in the SFA. The bedrock surface was encountered at approximate elevation 4 feet (NAVD88) along the northwestern portion of the Site and is also inferred to slope down to the east and southeast towards the river. Along the river, the top of the bedrock surface was encountered at approximate elevations -28 feet (NAVD88) in the NFA to -45 feet (NAVD88) in the northern portion of the FPPA. Bedrock was not encountered above elevation -70 feet (NAVD88) in the southern portion of the Site adjacent to the river. Shallow bedrock, encountered at approximately 5 feet below grade, along with a bedrock outcrop was also observed in the central portion of the FGPA, west and east of a concrete retaining wall. The ground surface elevation drops approximately 10 feet on the east side of this retaining wall. The bedrock high in the central portion of the FGPA extends from the outcrop approximately 400 feet south towards the FPPA.

The Seekonk River is tidally influenced and has been designated by CRMC as Type 4 waters, defined as multipurpose waters and Type 6 waters, industrial waterfronts and commercial navigation channels. It is classified as SB1{a} waters by RIDEM. The SB1 portion of the classification is assigned to saline waters designated for primary and secondary contact recreational activities and wildlife habitat; suitable for aquacultural uses, navigation and industrial cooling; and good aesthetic value.



The designation assumes that primary contact recreational activities may be impacted due to pathogens from approved wastewater discharges, and the “{a}” indicates that it is a “...partial use designation due to impacts from Combined Sewer Overflows (CSOs).” The groundwater underlying the Site is classified by RIDEM as GB indicating a groundwater resource which RIDEM has designated as not suitable for public or private drinking water use. The Site is located approximately 1.4 miles to the nearest GA designated area (drinking water that has been designated as suitable for public or private drinking water use), located east of the Site, near Slater Park, on the east side of the Seekonk River. The Site and surrounding area are serviced by municipal drinking water. There are no public drinking water supplies within a 1-mile radius of the Site. The closest Wellhead Protection Area (WHPA) is approximately 1.2 miles to the north of the Site.

Site groundwater elevations are tidally influenced and have been observed to fluctuate approximately 5 feet between mean low and high water. Observed groundwater elevations have ranged from approximately 9 to 26 feet NAVD88 (near the northwestern portion of the Site) to elevations 3 to -1 feet NAVD88 proximate to the Seekonk River. In general, groundwater is encountered within the fill materials across the FPPA and SFA where the fill thicknesses are more significant and within the underlying native materials in the FGPA and NFA.

### 3.0 LIMITED DESIGN INVESTIGATIONS (RULE 9.05)

Between September 21, 2017 and December 28, 2017, a Limited Design Investigation (LDI) program was performed generally consistent with the RIDEM approved June 2017 *Limited Design Investigation Workplan*. The goal of these LDIs was to collect sufficient supplemental data to facilitate the design of the RIDEM approved remedy. As summarized in **Tables 1A** through **1C**, these explorations included test pits, test borings, and the collection and analysis of surface and subsurface soil samples. Summaries of the soil analytical testing results can be found in **Tables 2A, 2B, 3, 4A, 4B, 5A, 5B, 6A, and 6B**. A summary of the Quality Assurance and Quality Control (QA/QC) environmental testing results can be found in **Tables 7, 8, 9, and 10**.

Prior to performing these investigations, GZA obtained Finding of No Significant Impact (FONSI) Assents from the CRMC due to certain of the LDI exploration locations being within 200-feet of a coastal feature, and as such, subject to their jurisdiction. Separate Assents were obtained for the lots owned by National Grid and the lots owned by the City of Pawtucket. Copies of these Assents are included in **Appendix C**.

#### 3.1 SURFACE SOIL SAMPLING

On September 21, 22, 26, and 27, 2017, October 2, 2017, and December 8, 2017, GZA collected seventy (70) surface soil samples (GZ-SS-501 to GZ-SS-570) from the western and northern portions of the Site and proximate to the transmission towers (5 of the 70 samples). The primary objective of these surface samples was to evaluate surface soil quality along the steep slopes of the western portion of the Site, in the NFA, and proximate to the transmission towers to facilitate evaluation of capping requirements in these areas. Surface sampling locations are depicted on **Drawings 3A** and **3B** and logs for these explorations are included in **Appendix D**. Laboratory data reports are included in **Appendix E**.

Surface soil samples were collected using a stainless-steel hand-auger from depths ranging from ground surface to approximately 1.5 to 2 feet below ground surface (bgs). Each sample was visually evaluated for the presence of environmental impact, classified according to a modified Burmister soil classification system, and screened for the presence of organic vapors using a handheld photoionization detector (PID). Surface soil observations generally indicated the following:

- Recovered soils generally consisted of fill comprised of sands and gravels with varying percentages of brick, slag, asphalt, concrete, glass, metal, and ash fragments;



- Visible blue staining<sup>1</sup> was observed at surface soil sampling locations GZ-SS-532, GZ-SS-538, GZ-SS-540, and GZ-SS-541 (SFA), GZ-SS-529 (FPPA), and GZ-SS-562, GZ-SS-563 and GZ-SS-565 (NFA);
- PID screening results detected the presence of organic vapors in sample GZ-SS-569 (NFA) at a concentration of 0.1 parts per million (ppm). The remainder of the PID screening results did not detect the presence of organic vapors within the recovered soil samples; and,
- Olfactory impacts were not observed in the surface soil samples except for naphthalene like odors observed in the general area of samples GZ-SS-535 and GZ-SS-536 in the SFA.

Each surface soil sample was analyzed for volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs), inorganics, total cyanide, and total petroleum hydrocarbons (TPH). The results of the analytical testing are summarized in **Tables 2A** and **2B** and the extent of I/C-DEC and GB Leachability Criteria exceedances are depicted on **Drawings 4A, 4B, 5A, and 5B**. Note: No exceedances of the Upper Concentration Limits (UCLs) were detected in surface soils during the LDI program. The analytical results indicated the following:

- Arsenic and PAHs (primarily benzo[a]pyrene, benzo[b]fluoranthene, dibenzo[a,h]anthracene, indeno [123-cd]pyrene, and benzo[a]anthracene) were consistently detected at concentrations above the Industrial/Commercial Direct Exposure Criteria (I/C-DEC) in surface soils within the NFA, FPPA, and SFA. These compounds were not detected above the I/C-DEC in the 8 samples collected and analyzed during the LDI program from the FGPA;
- Lead was detected in 4 surface soil samples from the FPPA at concentrations above the I/C-DEC;
- TPH was detected in 8 of the 70 samples at concentrations above the I/C-DEC and GB Leachability Criterion of 2,500 milligrams per kilogram (mg/kg). Six of these 8 samples were collected within the SFA;
- The highest total cyanide concentration detected was 587 mg/kg (sample GZ-SS-532 in the SFA) below the I/C-DEC of 10,000 mg/kg. Total cyanide concentrations within samples where visible blue staining was observed ranged from 1.51 mg/kg to 587 mg/kg (sample GZ-SS-532 in the SFA), respectively; and,
- VOCs were detected in 1 sample (GZ-SS-503) in the NFA, 7 samples in the FPPA, and 6 samples in the SFA at concentrations above the laboratory's reporting limit but below the GB Leachability Criteria and the I/C-DEC.

### 3.2 FORMER TRANSFORMER AREA – CONCRETE AND SURFACE SAMPLING

On September 28, 2017, GZA collected eight (8) concrete (GZ-CS-501 to GZ-CS-508) and surface soil samples from six (6) locations (GZ-SS-FT-501 to GZ-SS-FT-506) in a small portion of the FPPA located west of the current substation area that historically contained transformers prior to construction of the existing substation. The objective of these concrete and surface samples was to evaluate PCB concentrations in this Former Transformer Area. Surface sample locations are depicted on **Drawing 3B** and logs for these explorations are included in **Appendix D**.

Concrete samples were collected from observed stained areas from each equipment pad. At each location, approximately 20 grams of concrete was collected from the upper 0.5-inch of concrete utilizing an electric impact hammer drill, a 0.75-

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<sup>1</sup> Blue stained soils observed at former MGP sites indicate the likely presence of cyanide complexes associated with former gas purifying operations. These complexes are typically inert and relatively immobile in the environment.



inch masonry drill bit and disposable sampling trays. Consistent with the requirements of the *Toxic Substances Control Act* (TSCA) 40 CFR 761.265 (Subpart N), surface soil samples were collected from the upper 3-inches, 9 to 12-inches bgs, and 21 to 24-inches bgs using stainless steel hand augers at each soil sampling location. Surface soil observations generally indicated the following:

- Surface soils generally consisted of fill comprised of sands and gravels with varying percentages of brick and slag;
- PID field screening results did not detect the presence of organic vapors; and,
- No visual or olfactory evidence of environmental impacts were observed within the recovered soil samples.

Each surface soil and concrete sample was analyzed for PCBs via EPA Method 8082A using manual soxhlet extraction per EPA Method 3540. The results of the analytical testing are summarized in **Table 3** and the sample locations are depicted on **Drawing 8**. Laboratory data reports are included in **Appendix E**. The analytical results indicated PCBs were detected in 1 of the 8 concrete samples at a concentration of 0.2 mg/kg and in 4 of the 18 soil samples at a high concentration of 0.3 mg/kg. These detected PCB concentrations were below the I/C-DEC and GB Leachability Criteria of 10 mg/kg.

### 3.3 TEST PIT EXPLORATIONS

Between September 14 and 26, 2017 and December 19 and 28, 2017, Moran Environmental Recovery LLC of Randolph, Massachusetts completed 64 test pits (GZ-TP-501 through GZ-TP-509, GZ-TP-509A, GZ-TP-510 through GZ-TP-512, GZ-TP-516A, GZ-TP-516B, GZ-TP-516C, GZ-TP-517 through GZ-TP-518, GZ-TP-518A, GZ-TP-519, GZ-TP-521 through GZ-TP-535, GZ-TP-535A, GZ-TP-535B, GZ-TP-536 through GZ-TP-560, GZ-SV-1, and GZ-SV-2) throughout the Site with the exception of the SFA. The objective of these test pits was to evaluate soil quality in the NFA and FGPA, locate the former raceway in order to facilitate the future abandonment of the structure, and to evaluate the presence of potential obstructions (e.g., tie rods and foundations) adjacent to the shoreline that might impede the installation of the containment wall. Test pit locations are depicted on **Drawings 3A** and **3B** and logs for these explorations are included in **Appendix D**.

Test pits ranged in depth from approximately 2 to 14 feet bgs and the excavated soils were temporarily stockpiled on polyethylene sheeting directly adjacent to each test pit. Upon documenting subsurface conditions and collecting and field screening subsurface soil samples, each test pit was backfilled with the original excavated material in approximately the same sequence as removed; that is, the last material removed was the first material replaced. Subsurface observations generally indicated the following:

- Consistent with previous explorations at the Site, fill materials were observed to extend to depths of 2 feet bgs to deeper than the base of certain test pits (approximately 14 feet bgs) in the NFA, FGPA and adjacent to the river. Fill materials generally consisted of sands and gravels with varying percentages of brick, slag, coal, concrete, asphalt, plastic, wood, metal, and ash fragments. Outwash deposits were observed below the fill in test pits GZ-TP-501, GZ-TP-502, GZ-TP-503, GZ-TP-511, GZ-TP-512, GZ-TP-534, GZ-TP-536, GZ-TP-537, GZ-TP-544, GZ-TP-551, GZ-TP-558, GZ-TP-559 and GZ-TP-560;
- Organic silt was observed below the fill and outwash deposits in test pit GZ-TP-543;
- Visible impacts ranging from coatings to saturation with a naphthalene like odor was observed between 2 and 3 feet bgs in test pit GZ-TP-529 (FGPA);



- Visible impacts ranging from staining to saturation with petroleum like odors were observed at various depths within test pits GZ-TP-522 and GZ-TP-523 in the FPPA and test pits GZ-TP-527 and GZ-TP-530 in the FGPA ranging from ground surface to 8 feet bgs;
- Blue stained soils were observed in the fill materials in test pits GZ-TP-516B (0-0.5' bgs) and GZ-TP-539 (0-1' and 2-5' bgs). Test pit GZ-TP-516B was performed in the FGPA and test pit GZ-TP-539 was performed in the NFA;
- Hardened tar was observed in the fill materials at test pits GZ-TP-501 and GZ-TP-504 in the NFA and test pit GZ-TP-552 in the FGPA;
- Remnants of the former wooden raceway including cast iron and wood piping and two concrete vaults were observed in test pits GZ-TP-516, GZ-TP-516A, GZ-TP-516B, GZ-TP-516C, GZ-TP-517, GZ-TP-518, GZ-TP-521, GZ-TP-522, GZ-TP-525 and GZ-TP-526. Residual petroleum like liquid was observed within the raceway components in test pits GZ-TP-516A, GZ-TP-516C, and GZ-TP-526;
- A manhole was observed approximately 4 feet bgs in test pit GZ-TP-518A;
- Inactive below grade clay and steel pipes ranging from 4 to 14-inches in diameter were observed in test pits GZ-TP-508, GZ-TP-511, GZ-TP-516B, GZ-TP-516C, GZ-TP-518, GZ-TP-521 and GZ-TP-522;
- Concrete slabs were observed within the fill materials in test pits GZ-TP-508, GZ-TP-518, GZ-TP-518A, GZ-TP-530, GZ-TP-549, GZ-TP-550 and GZ-TP-553; and,
- Potential tie back rods associated with the existing bulkhead wall were observed approximately 5 feet bgs in test pits GZ-TP-509 and GZ-TP-509A and approximately 8 feet bgs in test pit GZ-TP-524.

Surface and subsurface soil samples were collected from test pits GZ-TP-501 through GZ-TP-512 and GZ-TP-524 and analyzed for VOCs, PAHs, inorganics, total cyanide and TPH. Soil samples collected from test pits GZ-TP-532 through GZ-TP-548 were analyzed for total cyanide. The results of the analytical testing are summarized in **Tables 4A, 4B, 5A, and 5B** and the extent of I/C-DEC and GB Leachability Criteria exceedances are depicted on **Drawings 4A, 4B, 5A, 5B, 6A, 6B, 7A, and 7B**. Laboratory data reports are included in **Appendix E**. The analytical results indicated the following:

#### Surface Soils (0-2 ft bgs):

- Exceedances of the I/C-DEC for PAHs (benzo [a] pyrene, benzo [b] fluoranthene, benzo [a] anthracene, dibenzo [a,h] anthracene and/or indeno [1,2,3-cd] pyrene) were detected in surface soils at 3 test pit locations (2 in the NFA and 1 in the FGPA);
- Exceedances of the I/C-DEC for arsenic were detected in surface soils at 4 test pit locations (2 in the NFA and 2 in the FGPA);
- TPH was detected at concentrations above the I/C-DEC and the GB Leachability Criterion in the surface soil at test pit GZ-TP-501 located proximate to the former coke storage area in the NFA;
- Acetone was detected in 2 samples (GZ-TP-503, 0-2' and GZ-TP-508, 0-2') at concentrations below the I/C-DEC. Test pit GZ-TP-503 is located in the NFA and test pit GZ-TP-508 is located in the FGPA. No other VOCs were detected above the laboratory reporting limit;



- The highest total cyanide concentration detected in surface soils was 696 mg/kg from test pit GZ-TP-546 (FGPA) below the I/C-DEC of 10,000 mg/kg; and,
- No UCL exceedances were detected in the surface soil samples analyzed from these test pits.

#### Subsurface Soils (>2 ft bgs):

- Exceedances of the I/C-DEC for arsenic were detected in 2 samples collected between 4 and 5 feet bgs (GZ-TP-506) and 10 and 11 feet bgs (GZ-TP-508) in the FGPA proximate to the former coal storage area and propane gas tanks;
- Exceedances of the I/C-DEC for PAHs (benzo [a] pyrene, benzo [b] fluoranthene, benzo [a] anthracene, and/or dibenzo [a,h] anthracene) were detected in 2 subsurface soil samples in the FGPA collected between 2 to 3 feet bgs (GZ-TP-510) proximate to the former Coal Storage Area and 3 to 4 feet bgs (GZ-TP-512) proximate to former Gas Holder #5;
- VOCs were not detected at concentrations above the laboratory's reporting limits;
- The highest total cyanide concentration detected in subsurface soils was 353 mg/kg from test pit GZ-TP-553 (FGPA) below the I/C-DEC of 10,000 mg/kg; and,
- No UCL exceedances were detected in the subsurface soil samples analyzed from these test pits.

### 3.4 BORING EXPLORATIONS

Between October 9 and November 8, 2017 and December 6 and 12, 2017, Aquifer Drilling and Testing of Mineola, New York performed 23 boring explorations to evaluate the potential presence of subsurface obstructions along the alignment of the proposed containment wall and to collect geotechnical information to facilitate the design of the containment wall. Four of the borings (GZ-SB-514 through GZ-SB-517) were performed proximate to a future control house building to be constructed as part of planned Pawtucket No. 1 substation upgrades to evaluate the quality of fill. Borings GZ-WB-501 through GZ-WB-504 were performed within the Seekonk River using a barge mounted drill rig. Borings GZ-BW-502, GZ-BW-503, GZ-BW-504A, GZ-BW-506 through GZ-BW-509, GZ-BW-511 through GZ-BW-513, GZ-SB-514 and GZ-SB-515 were performed via rotasonic drilling techniques with collection of continuous cores. Borings GZ-BW-501, GZ-BK-501, GZ-BK-502, GZ-BW-505, GZ-BW-510, GZ-SB-516, GZ-SB-517 and GZ-WB-501 through GZ-WB-504 were performed via standard wash and drive drilling techniques with collection of continuous samples. For most of the land based boring explorations, the upper 6 feet was cleared for the presence of utilities utilizing a combination of an air knife and vacuum excavation. Boring locations are depicted on **Drawings 3A** and **3B** and logs for these explorations are included in **Appendix D**. Subsurface conditions along the eastern edge of the Site are also depicted as cross sections on **Drawings 9A** and **9B**. Cross section locations are shown on **Drawings 3A** and **3B**.

Boring explorations ranged in depth from approximately 16 to 82 feet bgs. Upon documenting subsurface conditions, each boring was backfilled with a cement and bentonite grout mix via a tremie pipe. Excess soil generated during the performance of the boring explorations was containerized in 55-gallon drums and disposed off-Site to a licensed receiving facility pre-approved by National Grid by Clean Harbors Environmental Services of Cranston, RI. Subsurface observations generally indicated the following:

- Consistent with previous explorations at the Site, fill materials were observed to extend to depths as deep as 25 feet bgs. Fill materials generally consisted of sands and gravels with varying percentages of brick, slag, coal, concrete,





asphalt, wood, glass, metal, and ash fragments. Outwash deposits were generally observed below the fill in most borings;

- Organic silt was observed below the fill in borings GZ-BK-501, GZ-BW-510 and GZ-BW-511;
- Glacial till was observed in each of the deep borings (except GZ-BW-512) at depths ranging from 31 feet (elevation -25.8', NAVD88) to 76.7 feet (elevation -61.4, NAVD88) bgs. Glacial till was not observed at a depth of 70 feet bgs (elevation -54.3) at boring GZ-BW-512 within the northeastern portion of the SFA. In general, the till is encountered shallower in the northern portion of the Site along the river and has been observed to dip downward towards the southern portion of the Site;
- Pockets and lenses of visible impacts ranging from NAPL sheens to NAPL saturation with naphthalene like odors were observed in borings GZ-BW-501, GZ-BW-502, GZ-BW-503, GZ-BW-504A, GZ-BW-506, GZ-BW-512, GZ-WB-501, and GZ-WB-504. These visible impacts were observed at various depths ranging from ground surface (GZ-BW-502) to 49.5 feet bgs (approximate elevation -43.7, NAVD88) (GZ-BW-502);
- Pockets and lenses of visible impacts ranging from NAPL sheens to NAPL saturation with petroleum like odors were observed in borings GZ-BW-503, GZ-BW-504A, GZ-BW-506, GZ-BW-509, and GZ-BW-512. These visible impacts were observed at various depths ranging from 6 feet to 15 feet bgs;
- Blue stained soils were observed between 2 and 8 feet bgs within borings GZ-SB-514, GZ-SB-516 and GZ-SB-517 proximate to the proposed location of the new control house;
- Wood chips potentially associated with residual purifier wastes were observed in shallow borings GZ-SB-514 and GZ-SB-515 approximately 4 to 10 feet bgs proximate to the proposed control house;
- Observed impacts within borings GZ-BW-505, GZ-BW-507, and GZ-BW-511 were limited to petroleum like odors, purifier waste like odors in borings GZ-BW-508 and GZ-BW-513, and naphthalene like odors in GZ-WB-502 and GZ-WB-503; and,
- No visible or olfactory impacts were noted in boring GZ-SB-515.

Select soil samples from each boring were analyzed for VOCs and naphthalene. In addition, the samples collected from the borings performed proximate to the proposed control house were also analyzed for TPH, metals, PAHs, and total cyanide. The results of the analytical testing are summarized in **Tables 6A and 6B** and the extent of I/C-DEC and GB Leachability Criteria exceedances are depicted on **Drawings 4A, 4B, 5A, 5B, 6A, 6B, 7A, and 7B**. Laboratory data reports are included in **Appendix E**. As indicated in **Table 6A**, VOCs and naphthalene were not detected at concentrations above the I/C-DEC or GB Leachability Criteria in the soil samples analyzed from the borings performed along the shoreline of the Site or within the river. As indicated in **Table 6B**, arsenic and PAHs were detected at concentrations above the I/C-DEC within the samples analyzed from the borings performed proximate to the proposed control house. TPH (1 sample) and beryllium (2 samples) were also detected at concentrations above the I/C-DEC in soil proximate to the proposed control house. The detected TPH concentration also exceeded the GB Leachability Criteria. Detected total cyanide concentrations were below the I/C-DEC or 10,000 mg/kg.

In addition to the analytical testing, select soil samples were submitted for geotechnical laboratory testing to support the design of the containment wall. Four (4) undisturbed sediment samples were collected from the water-based borings GZ-



WB-501 through GZ-WB-503 using Shelby Tubes for analysis for water content, Atterberg limits, grain size and soil strength. Ten (10) soil samples were collected from the land-based borings (GZ-BW-501, GZ-BK-501, GZ-BK-502, GZ-BW-503, GZ-BW-504, GZ-BW-505, GZ-BW-509, GZ-BW-510, GZ-BW-511 and GZ-BW-512) and tested for grain size using a sieve or hydrometer. An additional ten (10) soil samples were collected from the land-based borings (GZ-BW-501, GZ-BW-502, GZ-BK-502, GZ-BW-503, GZ-BW-506, GZ-BW-507, GZ-BW-509, GZ-BW-511, GZ-BW-512, and GZ-BW-513) and analyzed for pH, sulfate, chloride, and resistivity. Geotechnical laboratory testing results are summarized in **Appendix F**.

### 3.5 BATHYMETRIC SURVEY

On October 11 and 12, 2017, GZA performed bathymetric and topographic surveys within the Seekonk River adjacent to the Site and along the adjacent shoreline to facilitate the design of the containment wall along the river. Prior to the start of the surveys, GZA established field control points including horizontal and vertical field bench mark stations and installed a tide board. The tidal bench mark utilized for the survey was the tidal station disk set by the National Ocean Service (NOS) stamped 3433 A 1994, as listed on the benchmark sheets for the Tidal Station No. 8453433, Rumford, Seekonk River, RI.

The bathymetric survey was performed with survey runs performed at approximately 15-foot centers, parallel to the shoreline using a 20-foot Carolina Skiff survey vessel. Spacing intervals met or exceeded the U.S. Army Corp of Engineers (USACE) Hydrographic Surveying – Engineering Manual for survey line spacing intervals for a single transducer system. Bathymetric survey equipment consisted of an echo sounder, Differential Global Positioning System (DGPS) equipment, and the Hypack data acquisition software.

The topographic survey was focused on the shoreline of the Site and was performed using both a Leica Real Time Kinematic (RTK) Differential Global Positioning System (DGPS) and a Topcon GTS235W total station with a Spectrac Precision Nomad data collector. The shoreline survey was focused on delineating the various existing shoreline structures including: granite block walls, rip rap slopes, articulating concrete mattress, timber and steel sheeting, granite block and concrete wall, intake and outfall structures, sinkholes, salt marsh and vegetated shoreline.

The results of the surveys were incorporated into the base map for the Site, **Drawings 2B and 2C**.

### 3.6 GROUNDWATER MODEL

As part of the LDI work, GZA developed a three-dimensional hydrostratigraphic numerical model of the Site to evaluate whether installation of the proposed containment wall would result in unacceptable groundwater mounding conditions that could potentially alter groundwater flow around the containment wall or to other portions of the Site. The model was created using the available Site-specific boring data, Site hydraulic head data, and precipitation data for the Site area, and the results of on-Site hydraulic conductivity testing.

The numeric model was used to simulate the changes to groundwater flow directions and elevations upon installation of the containment wall.

As expected, the installation of the containment wall does not result in significant alterations to groundwater flow patterns and depths. This simulation indicated that the stagnation zone created by the containment wall results in an approximately 0.5-foot groundwater mound immediately upgradient of the wall. As anticipated, this localized groundwater mound does not cause a significant alteration of groundwater flow directions upgradient of the wall.

A detailed summary of the modeling effort is provided in **Appendix G**.



### 3.7 QUALITY ASSURANCE AND CONTROL SAMPLES

QA/QC samples consisting of duplicates and trip blanks were collected and analyzed during the performance of the LDI program. One duplicate soil sample was collected for approximately every 20 soil samples analyzed and 1 trip blank sample was submitted with each cooler shipped to the laboratory that contained a sample to be analyzed for VOCs. The results of this QA/QC testing are summarized in **Tables 7, 8, 9, and 10**.

As indicated in **Table 7**, 11 trip blank samples were submitted to the laboratory and VOCs were not detected within these samples at concentrations above the laboratory's reporting limits. As indicated in **Tables 8, 9, and 10**, 6 blind duplicate soil samples were analyzed during the course of the LDI program. The average relative percent difference<sup>2</sup> (RPD) between the duplicate sample and the corresponding sample results ranged from 0% to approximately 30% and generally indicated a good correlation (<25% RPD) between the results. The highest RPD values (consistently higher than 50%) were associated with the PAH and total cyanide data between sample GZ-SS-565 (0-2') and its duplicate. These results suggest this sample was not homogenized sufficiently prior to collection; however, the results do not affect the usability or the interpretation of the LDI data.

## **4.0 REMEDIAL OBJECTIVES (RULE 9.02)**

The overall remedial objective for the Site is to protect human health and the environment relative to the identified impacts. Consistent with Rule 9.02 of the *Remediation Regulations* and the July 2011 *Remedial Alternative Evaluation Report* (RAE), the following sections outline specific remedial objectives for Site soil, groundwater, and air based on the nature and extent of the observed impacts and our understanding of the current and foreseeable future use of the Site.

### 4.1 SOIL OBJECTIVES

The primary exposure pathway of concern associated with the identified surface and subsurface soil impacts is direct contact. Based on this exposure pathway, the remedial objectives for soils are to: (1) mitigate current and future human exposure to soils impacted with contaminants at concentrations above the Method 1 I/C-DEC, and (2) mitigate tracking and erosion of surface impacted soils. As described further herein, these remedial soil objectives will be achieved via the removal and off-Site disposal of certain source area materials, the installation of engineered controls (caps and fencing), and implementation of an ELUR. The identified PCB impacted materials proximate to the active substation will be addressed via excavation and off-Site disposal of materials with PCB concentrations greater than 50 mg/kg, placement of an EPA low occupancy deed restriction on the substation area, securing the substation area with fencing (which is already in-place), and installation of large mark (ML) signage on the fencing indicating the presence of PCB containing materials.

The most prominent visual observations of impacted soils were generally within areas of the Site where former historical Site operations were heavily concentrated (*i.e.*, eastern portion of the FGPA along the riverfront and the footprint of the former fuel oil tanks in the FPPA). General observations in each portion of the Site are as follows:

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$$^2 RPD = \frac{(C_1 - C_2) \times 100}{(C_1 + C_2) / 2}$$

where  $C_1$  = analyte concentration of first analysis  
 $C_2$  = analyte concentration of replicate analysis



- NFA: Limited visual and/or olfactory evidence of impacts were noted within the surface and subsurface soils in the NFA with the exception of a localized area of fill impacted with crystallized naphthalene in the northern portion of the NFA; localized NAPL globs with naphthalene like odors at a depth of 14 to 16 feet bgs; isolated pockets of blue stained surface soils in the northwestern portion of the NFA; and, an area of hardened tar with a naphthalene/creosote-like odor in surface soils in the northwestern portion of the NFA proximate to the northern property boundary.
- FGPA: Subsurface explorations indicate the presence of MGP residuals including wood chips and bluish-green colored soils. The most significant impacts were observed within the footprint of the former MGP operations in the southern and southeastern portions of the FGPA including in the vicinity of former UGTT-4. Subsurface foundations of former MGP structures were also observed within the fill in the central, southern, and eastern portions of the FGPA including a wooden raceway equipped with piping and concrete vaults. Explorations completed in the vicinity of these former MGP features exhibited MGP residual impacts, ranging from sheens to solidified tar-like material in the shallow fill materials.
- FPPA: Observed impacts appear to be primarily related to former petroleum storage proximate to former Oil Tanks No. 1 and 2 and the former 20,000-gallon USTs. Fuel oil-like impacts including separate phase product were also noted proximate to a wooden raceway in the eastern portion of the FPPA. Other significant observations noted in the FPPA include blue/green staining in the shallow soil adjacent to the access road south of the substation (which were previously capped under a RIDEM approved STRAP), within the vicinity of former fuel Oil Tanks No. 1, 2 and 3, and along the western property line south of Bowles Court. Evidence of limited amounts of white powder (assumed to be indicative of naphthalene crystals) was observed to be commingled within the fill on the southern and southwestern portion of the FPPA.
- SFA: MGP residual impacts were evident throughout the SFA including visual observations of hardened tar on the face of the former south washout area and in the surface soils adjacent to the northern fence line separating the SFA and FPPA. In addition, observations of blue staining were noted in the northern portion of the SFA.

Results of the analytical testing of surface soils indicate widespread exceedances of the I/C-DEC for arsenic and PAHs (primarily benzo[a]pyrene, benzo[b]fluoranthene and benzo[a]anthracene) through-out the Site. TPH and lead were also consistently detected within surface soils at concentrations above the I/C-DEC and GB Leachability Criteria (TPH only). VOC impacts above the GB Leachability Criteria were limited to the detection of ethylbenzene in one sample (TP-307) in the FGPA and total cyanide was detected in two surface soils (TP-335 and TP-380) within the FPPA at concentrations above the I/C-DEC. Numeric Upper Concentration Limit (UCL) exceedances within surface soils were limited to PAHs in samples TP-5 (proximate to the former water gas house), TP-14 (FGPA), MW-339D (proximate to the former propane gas tanks and former gas holders), and SS-44 in the SFA<sup>3</sup>; TPH in samples from explorations MW-339D (FGPA) and TP-327, TP-335, TP-370, TP-387B, and TP-386B within the FPPA; lead in sample SS-142 (proximate to former Gasholder No. 8) in the FGPA; and total cyanide in samples from TP-335 and TP-380 within the FPPA.

Consistent with Site wide conditions, arsenic and PAHs were consistently detected at concentrations above the I/C-DEC and TPH and lead were sporadically detected at concentrations above the I/C-DEC and GB Leachability Criteria (TPH only) within the surface soils along the steep, heavily vegetated slopes on the western edges of the Site. Detected cyanide concentrations were below the I/C-DEC and no UCL exceedances were detected within the surface soils along the steep slopes on the western edges of the Site.

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<sup>3</sup> Sample location was within the footprint of the South Washout area and was addressed during the 2016 Short Term Response Action.



Subsurface soils (those located greater than 2 feet below ground surface) are characterized by similar impacts as surface soils (i.e., TPH and PAHs above the I/C-DEC and the GB Leachability Criteria [TPH only]). Numeric UCL exceedances for TPH were more frequent in subsurface soils than surface soils and numeric UCL exceedances for PAHs were similar in frequency in surface and subsurface soils. Arsenic and lead were detected less frequently in subsurface samples at concentrations above the I/C-DEC when compared to surface soil detections. Cyanide was not detected in subsurface soils at concentrations above the I/C-DEC.

In addition, PCBs were detected proximate to the northwestern portion of the active substation during response activities related to a release of mineral oil dielectric fluid (MODF) from a damaged capacitor in May 2007. PCBs were detected in surface and subsurface soils, traprock, and the concrete foundations of certain substation infrastructure at concentrations above 50 mg/kg proximate to the northwest corner of the active substation. As indicated previously, a Self-Implementing Plan (SIP) was previously approved by EPA to address these PCB impacts. The schedule for this work will require coordination with a planned substation outage.

## 4.2 GROUNDWATER OBJECTIVES

### 4.2.1 Non-Aqueous Phase Liquids

The primary exposure pathway of concern associated with the identified NAPL impacts is potential migration of NAPL to the Seekonk River either via groundwater flow or through the permeable fill materials used to backfill below grade utilities. Based on this exposure pathway, the remedial objective for groundwater includes the mitigation of the potential migration of NAPL impacts to the Seekonk River and a reduction of the extent, mass, and mobility of the identified NAPL impacts to the extent practical. As described further herein, this objective will be achieved via the installation of a containment wall; manual NAPL recovery activities; removal and off-Site disposal of certain identified source areas; and removal and/or sealing and capping of inactive pipes and drains observed within the bank of the river.

Light NAPL (LNAPL) and dense NAPL (DNAPL) impacts have been detected within isolated areas in the northern and eastern portions of the FGPA, FPPA and SFA adjacent to and downgradient of former Site structures. The majority of these former structures were proximate to below and above grade tanks, vaults, or holders used for the storage and management of manufactured gas, tar, or petroleum related products.

In 2017, LNAPL was detected in 7 monitoring wells (MW-210, MW-3, MW-312S, MW-313S, MW-326S, MW-335S and M&E MW-5) in the northern and eastern portions of the FGPA and FPPA at thicknesses ranging from trace levels (less than 0.01 feet) to 2.1 feet. The most persistent and significant levels of LNAPL were measured in wells MW-210, MW-312S and M&E MW-5. As indicated on **Drawings 3A** and **3B**, these wells are located proximate to the former wood piping raceway and piping associated with former ASTs and former USTs. Fingerprint analysis of recoverable LNAPL collected from a well on the FGPA indicated a petroleum product in the boiling range of No. 2 fuel oil/diesel.

In 2017, DNAPL was detected in 8 monitoring wells (MW-4, MW-303, MW-339S, MW-339D, MW-341, MW-1, MW-320S and MW-320D) in the northern and eastern portions of the FGPA, FPPA and SFA at thicknesses ranging from trace levels (less than 0.01 feet) to 14.5 feet. The most persistent and significant levels of DNAPL were measured in monitoring wells MW-303, MW-341, and MW-320 S/D. As depicted on **Drawings 3A** and **3B**, MW-303 and MW-341 are located in the FGPA where former MGP operations were concentrated (i.e., gas holders, clarification tanks, filters, boiling tanks) and proximate to the former wooden raceway and associated piping and vaults. Monitoring well MW-341 is located downgradient of the former No. 8 Gas Holder. Monitoring wells MW-320 S/D are located in the northeastern portion of the SFA where coal waste from the gasification process was received.



We also note that isolated pockets of visible sheening have been historically observed within the Seekonk River directly east of certain active and inactive pipes and drains. These areas of observed sheening are located adjacent to an inactive drain pipe in the southeastern corner of the FGPA, proximate to the active NBC outfall east of the FPPA, and east of the active City of Pawtucket storm sewer drain in the SFA. The visible surface water impacts east of the FGPA and in the SFA are also consistent with elevated PAH and TPH concentrations detected within river sediments proximate to these two areas during a July 2008 sediment study performed by Anchor QEA LLC of Beverly, Massachusetts.

#### 4.2.2 Dissolved Phase Groundwater Objectives

Groundwater quality at the Site is generally characterized by a few isolated exceedances of the GB Groundwater Objectives for benzene, ethylbenzene, and naphthalene, primarily in areas of the Site where former MGP features were historically located. Total VOC concentrations detected during a 2017 monitoring event ranged from 0.0013 milligrams per Liter (mg/L) to 16.95 mg/L. Five samples exceeded the GB Groundwater Objective for one or more VOCs. Three samples exceeded the Method 2 GB Groundwater Objective for naphthalene, four samples exceeded the Method 1 GB Groundwater Objective for benzene, and one sample exceeded the Method 1 GB Groundwater Objective for ethylbenzene. The presence of these compounds in groundwater samples is typical for former MGP and power plant sites and consistent with historical sampling results for the Tidewater Site. None of the VOCs detected in groundwater in 2017 exceeded UCLs.

The two potential pathways/routes of exposure for dissolved phase groundwater impacts at this Site are (1) migration towards the Seekonk River and (2) potential volatilization into overlying buildings. The Site however is within a GB Groundwater Resource Area and the nearest GA and WHPA are located approximately 1.4 miles (to the east) and 2.1 miles (to the north) from the Site, respectively. Given the observed groundwater flow patterns on-Site, the regional groundwater flow direction (towards the Seekonk River) and the locations of the nearest public drinking water supplies and WHPA (not located hydraulically downgradient of the Site), it is not expected that impacts from the Site would affect these groundwater drinking water resource areas. Furthermore, groundwater at the Site is not expected to be classified as a potential future source of drinking water, therefore drinking-water related exposures do not appear to pose a significant level of risk at the Site.

Based on the potential exposure pathways and these conditions, the remedial objective for the observed dissolved phase groundwater impacts involves limiting further degradation of groundwater quality via infiltration. This objective will be accomplished via recovery of the observed NAPL to the extent practical; removal of certain identified source materials including former UGTT-1 and the wooden raceway; and installation of an impermeable cap over portions of the Site. These measures combined with natural attenuation mechanisms will serve to improve dissolved phase groundwater quality over time.

As described in Section 8.03 of the *Remediation Regulations*, GB Groundwater Objectives are based on the potential for VOCs to volatilize from the groundwater into indoor air. Currently, the only building located on Site is the Pawtucket No. 1 substation building, which is unoccupied except for routine maintenance activities. As part of pending substation upgrades/improvements, the Pawtucket No. 1 substation building will be demolished and a new smaller control house (approximately 1,080 square feet) will be constructed directly south of the existing building. Consistent with the draft ELUR attached in **Appendix B**, the new control house building will be equipped with a vapor barrier to mitigate potential volatilization exposure risks.





#### 4.3 AIR OBJECTIVES

Impacts to air quality at the Site are limited to potential indoor air quality impacts associated with volatilization of contaminants from groundwater into overlying structures. As described above, the current Site building houses electrical switch gear equipment and will be demolished as part of planned substation upgrade/improvements. As indicated in the draft ELUR attached in **Appendix B**, structures constructed over groundwater containing GB Groundwater Objective exceedances will require engineered controls to address potential volatilization issues.

#### 4.4 REMEDIAL OBJECTIVES SUMMARY

In summary, the identified remedial objectives for the Site are:

- Mitigation of future human exposure to impacted soils at concentrations above the Method 1 I/C-DEC via installation of engineered controls (caps and fencing) and placement of an ELUR on the property records;
- Mitigation of potential tracking and erosion of near surface impacted soils via installation of engineered controls (caps and fencing);
- Mitigation of future exposure to soils impacted with elevated concentrations of PCBs via excavation and off-Site disposal of Site materials (soil, traprock, and concrete) impacted with PCBs greater than 50 mg/kg, placement of an EPA low occupancy deed restriction on the substation area, securing the substation area with fencing (which is already in-place), and installation of ML signage on the fencing;
- Mitigation of potential migration of observed NAPL impacts to the Seekonk River via installation of a subsurface containment wall, monitoring and manual recovery of observed NAPL impacts, and removal of certain identified source areas that potentially serve as continuing sources;
- Reduction in the extent, mass, and mobility of NAPLs to the extent practical to address UCL exceedances via removal and off-Site disposal of certain identified residual source materials;
- Limiting further degradation of groundwater quality via installation of an impermeable engineered cap and removal of certain identified residual source materials coupled with natural attenuation mechanisms; and
- Addressing potential volatilization issues in the event of future construction of buildings at the Site consistent with the draft ELUR in **Appendix B**.

### **5.0 PROPOSED REMEDY (RULE 9.03)**

This section explains how the RIDEM approved remedy meets the remedial objectives listed in Section 4.4.

#### 5.1 MITIGATION OF FUTURE HUMAN EXPOSURE TO IMPACTED SOILS AND TRACKING AND EROSION OF SURFACE IMPACTED SOILS

Surface (less than 2 feet below grade) and deeper soil impacts were detected through-out the Site at concentrations above the Method 1 I/C-DEC. Mitigation of the potential for direct human contact to these impacted materials and potential tracking and erosion of the shallow surface impacts will be accomplished via a combination of capping and fencing. The limits of the various proposed engineered caps, the existing engineered caps, and the proposed fencing along the toe of



the banks in the western portion of the Site are depicted on **Drawing 10**. Engineered caps will be installed across the majority of the Site and an ELUR will be recorded on the property records. The engineered cap installed in the central portion of the Site (approximately 50% of the Site) where the bulk of the former MGP and power plant operations were performed and the petroleum products were formerly stored and managed will also be designed as an impermeable cap to mitigate infiltration of precipitation through impacted soils and further groundwater degradation. Former activities in the northern portion of the Site were generally limited to the storage of coal. Consistent with these former activities, observations of NAPL have not been historically observed in this portion of the Site and groundwater impacts are less significant than those observed in the FGPA and FPPA. Given these observations, the engineered cap in the northern portion of the Site will be designed as a permeable cap. Installation of these engineered caps will require significant regrading of the Site to create a relatively uniform surface sloping down from the western edges of the Site to the river. We currently anticipate that achievement of Site subgrade elevations will require approximately 22,500 cubic yards (CY) of soil to be cut from portions of the Site and re-used as fill in low lying areas of the Site. We also estimate that an additional 11,500 CY of imported clean fill will also be necessary to fill the balance of the low-lying portions of the Site to achieve the subgrade elevations of the engineered caps.

We also note permeable engineered caps, approved by RIDEM, were previously installed in four areas of the Site. These caps include:

- In 2009, an approximately 50-foot long section of the riverbank in the FPGA was capped with an approximately 12-inch thick layer of sand underlying a reactive core mat underlying an armor layer.
- In 2010, portions of the unpaved access road and parking area south and southeast of the active substation were capped as part of a RIDEM approved *Short Term Response Action*.
- In the FGPA, the area proximate to the active natural gas regulating facility was capped during the 2011 regulator station rebuild.
- In 2016, the south washout area in the SFA was capped as part of a RIDEM approved *Short Term Response Action*.

The extent of these previously installed caps is depicted on **Drawing 10**. These caps will remain to the extent practicable and integrated into the overall engineered barrier. The transitions from new cap areas to older cap areas may require some alteration of the older caps that will depend on further design analysis of the remedy. In addition to these four previously installed engineered caps, the footprint of former Gasholder Nos. 7 and 8 in the northwestern portion of the FGPA was capped in late 2010. This previously installed cap will require some regrading to achieve the subgrade elevations for the new engineered caps described in this RAWP.

Access to the relatively steep, heavily vegetated/wooded slopes located along the western and southern perimeter of the Site will be controlled via installation and maintenance of fencing. Installation of surface engineered caps is not feasible in these areas given the steepness and heavily vegetated/wooded nature of these areas. Given the steepness of the slopes, there are concerns that clear cutting the existing vegetation and trees will destabilize these slopes and increase the potential risk of future failure of the slopes during heavy precipitation events. We also note that the existing vegetation and trees also serve as a buffer to screen the residential properties from the active substation area. Access to these areas is currently restricted with chain link fencing on the perimeter of the Site and additional chain link fencing will be installed within the interior limits of the Site to further restrict access to these slopes.

The engineered controls will be supplemented with placement of ELURs on the property records for the various parcels that ensures the engineered caps and fencing are not disturbed and are inspected annually and repaired (as necessary). The ELURs will also include a SMP that establishes the procedures and provisions should future construction/maintenance



activities at the Site require the need to disturb soils beneath the engineered caps. Drafts of the ELURs and SMP are included in **Appendix B**.

## 5.2 MITIGATION OF FUTURE HUMAN EXPOSURE TO ELEVATED PCB CONCENTRATIONS

Elevated PCB impacts were detected in the vicinity of the active substation area during the response to a release of MODF from a damaged capacitor. Mitigation of potential human exposure to these PCB impacted materials will be achieved via the excavation and off-Site disposal of certain materials (soil, traprock, and concrete) impacted with PCBs at concentrations above 50 mg/kg consistent with the EPA approved SIP. Following excavation of the identified impacted material, confirmatory sampling will be performed to confirm that potential residual PCB impacts are below 50 mg/kg. These active remedial measures will be supplemented with placement of an EPA low-occupancy deed restriction on the substation area, limiting access to the impacted area with chain link fencing (which is already in place), and installation of large mark (ML) signage on the fencing.

These PCB impacted materials are located within the vicinity of an active substation. Given the risks associated with working in the vicinity of energized electrical equipment, these remedial measures will be implemented concurrent with a planned outage.

## 5.3 CONTAINMENT OF NAPL AND REDUCTION IN EXTENT, MASS AND MOBILITY OF NAPL

As indicated previously, NAPL has been observed in the eastern portions of the FGPA, FPPA and SFA adjacent to and downgradient of former MGP and petroleum storage/management related structures. Due to the relatively permeable nature of the Site soils and the physical characteristics of LNAPL, there is a potential for the observed LNAPL impacts in the eastern portion of the Site to migrate to the adjacent Seekonk River and evidence of sheen outbreaks ranging from spots to bands have been observed in the Seekonk River adjacent to areas where upland LNAPL impacts have been noted (adjacent to GZ-BW-509 and GZ-TP-527). DNAPL is less mobile in the environment and the observed DNAPL impacts in the eastern portion of the Site are not expected to migrate laterally significant distances from the source areas.

In order to mitigate the potential migration of NAPLs to the river, an approximately 1,300-foot long containment wall will be installed along the eastern edges of the Site, including downgradient of where the NAPL impacts have been observed. Portions of the containment wall will be installed within the Seekonk River to serve as a replacement to the existing bulkheads which are in generally poor condition. The northern portion of the containment wall will extend to approximate elevation -32 feet<sup>4</sup> and the southern portion will extend to approximate elevation -40 feet (approximately 40 to 45 feet bgs). We anticipate the northern portion of the containment wall will extend into underlying glacial till. Given the assumed undulating surface of the till, the sheetpile tip elevation for the northern portion of the containment wall may be adjusted to account for the till surface elevation.

NAPL impacts have not been observed in the vicinity of the transmission towers adjacent to the Seekonk River. Given the lack of NAPL impacts in this area and the risks associated with construction proximate to the towers and active overhead transmission wires, there will be an approximately 230-foot gap within the containment wall. An engineered cap consisting of a layer of riprap will be installed on the shoreline within this gap to mitigate direct contact with impacted Site materials. In addition, and as shown on **Drawing 10**, the containment wall north and south of this gap will be equipped with wingwalls extending towards the west designed to contain NAPL. Recovery wells will also be positioned proximate to these wingwalls (See **Drawing 18**).

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<sup>4</sup> All elevations are referenced to NAVD88.



The approximate layout of the proposed containment wall is depicted on **Drawing 10**.

During installation of the containment wall, inactive utilities and pipes present within the bank of the river will be capped/sealed to mitigate these features from acting as preferential migration pathways for the observed LNAPL. Similarly, the NBC and City of Providence drain lines will be extended through the containment wall and the penetration sealed to mitigate potential preferential migration pathways.

Containment of the observed NAPL impacts will be supplemented with quarterly NAPL gauging and manual recovery activities for the 1<sup>st</sup> year subsequent to installation. These NAPL recovery operations will be focused on the monitoring wells where NAPL has been observed and a series of new recovery wells (7 new wells) installed immediately upgradient of the containment wall. The frequency of the NAPL gauging and recovery activities will be modified to bi-annually after the 1<sup>st</sup> year. Subsequent modifications to this frequency will be based on observations made and subject to RIDEM approval.

The ELUR placed on property records for the Site will ensure that the containment wall is not disturbed and that it is inspected annually and repaired (as necessary).

#### 5.4 LIMIT FURTHER DEGRADATION OF GROUNDWATER QUALITY

The installation of the impermeable engineered cap and the manual recovery of the observed NAPL impacts as described above will serve to limit further degradation of groundwater quality. These measures will be supplemented with the removal and off-Site disposal of certain identified materials that are likely acting as continuing sources to observed groundwater impacts. These sources include the wooden raceway and associated piping and vaults within the eastern portions of the FGPA and FPPA, the former UGTT-1 within the FGPA, and the area fill impacted with crystallized naphthalene observed within the NFA. We estimate the excavation to remove UGTT-1 and the wooden raceway and associated piping and vaults will cover an approximately 1,500 square foot area to depths ranging from approximately 2 to 6 feet bgs and the excavation to remove the area of fill with crystallized naphthalene will cover an approximately 750 square foot area to an approximate depth of approximately 3 feet bgs. The approximate extent of these excavations is depicted on **Drawing 10**.

#### 5.5 MITIGATE POTENTIAL VOLATILIZATION ISSUES

Certain dissolved phase VOCs were detected within Site groundwater at concentrations in excess of the GB Groundwater Objectives. As described in Section 4.2, the GB Groundwater Objectives are based on the potential for VOCs to volatilize from the groundwater into indoor air. The Pawtucket No. 1 substation is the only building located on Site and it is not occupied; in addition, this building will be demolished as part of pending substation upgrades. A new smaller control house (approximately 1,080 square feet) will be constructed directly south of the Pawtucket No. 1 substation building as part of these substation upgrades. As indicated previously, consistent with the ELUR, this new control house and any other future buildings constructed over areas where there are exceedances of the GB Groundwater Objectives will be equipped with an engineered control to mitigate potential exposure risks to impacted vapors.

We also note that natural attenuation mechanisms combined with recovery of the observed NAPL to the extent practical, removal of the identified source areas, and installation of the impermeable engineered cap will result in improved Site groundwater quality in the long term. Site groundwater quality will be routinely monitored as described in **Section 11.0**.



## 6.0 REMEDIATION OF IMPACTED GROUNDWATER (RULE 9.04)

As described in Section 4.2, the remedial objectives for groundwater are designed to limit further degradation of Site groundwater quality and mitigate potential volatilization risks in the event of the construction of future buildings on the Site.

Limiting further degradation of groundwater will be accomplished via installation of the impermeable cap over approximately 50% of the Site to prevent infiltration of precipitation through impacted materials, recovery of NAPL from certain existing monitoring wells and recovery wells installed immediately upgradient of the containment wall to the extent practical, and removal of certain source materials likely acting as on-going sources including the wooden raceway and associated components, the area of fill impacted with crystallized naphthalene in the NFA, and UGTT-1. These measures combined with natural attenuation mechanism will result in improvement to groundwater quality over time. In order to mitigate potential volatilization risks, the ELUR placed on the Site's property records will require future buildings constructed on the Site over areas where there are exceedances of the GB Groundwater Objectives be equipped with an engineered control. A draft of the ELUR is included in **Appendix B**.

## 7.0 POINTS OF COMPLIANCE (RULE 9.06)

The following remedial objectives for this Site were identified in Section 4.4:

- Mitigation of future human exposure to soils impacted with contaminants at concentrations above the Method 1 I/C-DEC;
- Mitigation of potential tracking and erosion of near surface impacted soils;
- Mitigation of future exposure to soils impacted with elevated concentrations of PCBs;
- Mitigation of potential migration of observed NAPL impacts to the Seekonk River;
- Reduction in the extent, mass, and mobility of NAPLs;
- Limiting further degradation of groundwater quality; and
- Addressing potential volatilization issues in the event of future construction of buildings at the Site.

Based on these remedial objectives, points of compliance to determine whether these remedial objectives are, or are being achieved will include:

- The quality of the imported fill used for construction of the engineered caps will be tested to confirm compliance with the Residential Direct Exposure Criteria (R-DEC) (See Section 11.3 for testing parameters and frequency). In addition, the integrity of the engineered controls (caps and fencing), containment wall, and monitoring and recovery well network will be inspected at least annually as required by the ELUR and repairs (if required) will be made expeditiously to ensure the remedial objectives are achieved;



- Evaluation of routine NAPL gauging data from the existing monitoring and recovery wells to be installed upgradient of the containment wall. This data will be used to confirm that the wall is serving to contain the identified NAPL impacts and the effectiveness of the routine NAPL recovery program;
- The results of routine groundwater monitoring will be used to evaluate the effectiveness of the NAPL recovery activities, the source area excavations/removal, the impermeable cap, and natural attenuation mechanisms in improving overall Site groundwater quality; and,
- Potential volatilization issues will be monitored via an evaluation of groundwater quality trends. In addition, in the event future buildings are constructed on the Site over areas where there are GB Groundwater Objective exceedances, the mechanisms installed to address potential volatilization risks will be monitored for consistency with their respective objectives.

### 8.0 PROPOSED SCHEDULE FOR REMEDIATION (RULE 9.07)

The following is a tentative milestone schedule for the finalization of the RAWP and implementation of the RIDEM approved remedy. This milestone schedule includes the required public outreach events and notice periods as outlined in the November 2012 (Revised October 2013) PIP:

- |  |   |
|--|---|
| • Community Outreach Event to Present RAWP:                  | Within 1 to 2 months after submittal of RAWP to RIDEM   |
| • Submittal of Summary of Community Outreach Event to RIDEM: | 20 days after event   |
| • Revise and Submit <i>RAWP Addendum</i> to RIDEM:           | 60 days after receipt of RIDEM and Public Comments  |
| • RIDEM Issues <i>Order of Approval</i> :                    | 30 to 60 days after submittal of the <i>RAWP Addendum</i>   |
| • Remedy Design and Permitting:                              | 10 to 12 months after receipt of <i>Order of Approval</i>   |
| • Implementation/Construction of Remedy:                     | Approximately 18 months (Anticipated to start in the fall of 2019)  |
| • Additional Community Outreach Events:                      | Prior to implementation of the remedy, periodically during implementation, and 30 days following completion of the remedy |
| • Submittal of Remedial Action Closure Report to RIDEM:      | Within 2 to 3 months of remedy completion   |

We also note the EPA approved PCB remedy within the active substation will be scheduled to be performed concurrent with a planned outage. The schedule for this PCB remedy will be provided in a separate notification to RIDEM and EPA





once it is determined. In addition, the planned upgrades to the Pawtucket No. 1 substation, including demolition of the existing building and construction of the new control house, will be integrated into this overall Site remedy.

### 9.0 CONTRACTORS AND CONSULTANTS (RULE 9.08)

The engineering consultant involved in the implementation of the remedy is identified below. Once the General Contractor(s) are selected they will be identified to RIDEM under separate cover.

Firm	Role	Contact	Address	Phone Number
GZA	Engineering Consultant	David Rusczyk	655 Winding Brook Drive, Suite 402, Glastonbury, CT 06033	860-858-3110
<i>To be determined</i>	General Contractor	---	<i>To be determined</i>	---

### 10.0 SITE PLAN (RULE 9.09)

A Site plan that depicts the final installed remedy is included as **Drawing 18**. This Site plan also depicts the long-term groundwater monitoring and recovery well network.

### 11.0 DESIGN STANDARDS AND TECHNICAL SPECIFICATIONS (RULE 9.10)

The following sections describe each of the proposed elements designed to meet the stated remedial objectives. In addition, this section also outlines certain Best Management Practices (BMPs) that will be implemented during the performance of the remedial work to mitigate the potential off-Site migration of impacted Site materials, describes the necessary permits/approvals to construct the remedy, and outlines the air monitoring program designed to mitigate potential exposure risks to off-Site receptors. Remedial design details are included on **Drawings 10** through **18**. These Drawings and details were prepared under the supervision of Mr. Todd Greene of GZA, a State of Rhode Island licensed Professional Engineer (P.E. License No. 8567).

Abandonment of certain existing monitoring wells (29 wells) will be required to facilitate implementation of the remedy. A listing of the wells to be abandoned is provided in **Table 11** and depicted on **Drawings 3A and 3B**. These wells will be abandoned consistent with *Appendix 1* of the *Rhode Island Water Quality Regulations*. The remaining existing monitoring well network will be protected and reset as necessary during remedial implementation activities. This procedure may require adjusting the heights of some of the well casings to match proposed final Site grades and installation of new curb boxes. Upon completion of the remedy, the heights of the adjusted well casings will be surveyed relative to NAVD88. We anticipate that the routine NAPL gauging and recovery and groundwater monitoring well network will consist of 39 wells as summarized in **Table 12** and depicted on **Drawing 18**.

In addition, to facilitate the construction of the engineered cap and containment wall, certain existing Site features will require demolition and removal. As shown on **Drawing 11**, these features include but are not limited to, the following:



- With the exception of the slopes in the southwestern portion of the Site and the southern end of the Site, the existing vegetation and trees will be cleared and grubbed to implement the remedy. The resulting organic waste will be disposed/recycled off-Site at a facility permitted to accept this material. Tree stumps will be removed and disposed off-Site in accordance with all state, local and federal regulations. Organic waste and stumps will not be re-used as on-Site fill;
- Several concrete walls and foundations associated with former MGP related structures are present in the central and eastern portions of the FGPA. These concrete structures will be removed to a depth of at least one-foot below the final grade as necessary to install the engineered caps and the containment walls. Non-stained concrete debris will be processed on-Site to 3-inch minus and will either be re-used as fill below the engineered cap or disposed off-Site. Stained concrete debris will be disposed off-Site in accordance with all state, local and federal regulations;
- Certain sections of the existing chain link fencing within the limits of the Site exterior fencing will be removed to the extent necessary to implement the remedy. The resulting chain link fencing debris will be disposed/recycled off-Site in accordance with all state, local and federal regulations;
- The chain link fencing and concrete slabs/foundations in the former transformer area in the western portion of the FPPA will be removed to a depth of at least one-foot below the final grade as necessary to install the engineered caps. Non-stained concrete debris will be processed on-Site to 3-inch minus and re-used as fill below the engineered cap. Stained concrete debris will be disposed off-Site in accordance with all state, local and federal regulations. The chain link fencing debris will be disposed/recycled off-Site in accordance with all state, local and federal regulations;
- Any observed inactive drains and/or pipes observed within the riverbank adjacent to the Site will be sealed and/or capped to mitigate potential preferential contaminant migration pathways;
- The bedrock outcrop present in the central portion of the FGPA will be removed as necessary to facilitate installation of the engineered cap. The bedrock will be removed via hydraulic hammering and the resulting debris will be re-used as fill below the engineered cap;
- As shown on **Drawing 11**, three abandoned hydrants (2 located in the FGPA and 1 located in the FPPA) will be removed and the resulting debris will be disposed off-Site in accordance with all state, local and federal regulations; and,
- An inactive manhole observed while excavating GZ-TP-518A east of the existing Pawtucket No. 1 substation will be filled and abandoned in-place.

### 11.1 SOURCE AREA REMOVAL

As described above, three excavations will be performed to address observed potential sources of NAPL and an area of fill impacted with crystallized naphthalene. The first source area excavation is proximate to former UGTT-1 located in center of the FGPA. In June 2010, approximately 2.5 feet of petroleum/fuel-oil-like impacted water was measured within this structure. Laboratory results from a sample of the water indicated the presence of benzene, toluene, ethylbenzene, xylenes [BTEX], naphthalene, TPH and several PAHs. TPH fingerprinting indicated the presence of a weathered petroleum product in the boiling range of Fuel Oil No. 2/diesel. During this source area excavation, the overlying 4-inch thick concrete pad, the tank/structure, and the impacted soils immediately adjacent to this structure will be excavated and disposed off-Site. Prior to excavation, any observed liquids (groundwater and NAPL) will be removed from the tank/structure (if present) and the interior of the tank/structure cleaned to remove any residual sludges. The resulting



liquid and sludge waste will be disposed off-Site. Upon cleaning, the impacted soil immediately adjacent to the tank/structure will be excavated and disposed off-Site. We anticipate that the excavation will extend approximately 4 feet bgs and over an approximately 10-foot by 10-foot area. The resulting impacted soil will be disposed off-Site in accordance with all state, local and federal regulations. Due to the installation of the impermeable cap in the vicinity of this source area excavation, confirmatory soil samples will not be collected from the base and sidewalls of the excavation.

The second source area excavation is associated with the presence of a wooden raceway and associated piping and two concrete structures/vaults used to transfer petroleum from the FPPA to the FGPA. The wooden portion of the raceway is approximately 218-feet long, 18-inches wide, 6-inches deep and was observed at depths ranging from 1 to 2 feet bgs. The raceway cast iron piping is estimated to cover an approximately 840 feet and ranged in size from 6 to 14-inches in diameter at depths ranging from approximately 1 to 2.5 feet bgs. Concrete structures/vaults associated with the raceway were observed at two locations. These structures varied in size, although they were generally 3.5 feet in width. The vertical extent of the concrete structure observed in test pit TP-379 is approximately 6 feet bgs. The vertical extent of the other remaining concrete structure is unknown (>7 feet bgs). Black petroleum-like liquid (No. 4 fuel oil based on fingerprint analysis) has been observed within portions of the raceway and associated components. These raceway components and associated liquids will be removed, collected, and disposed off-Site. Due to the installation of the impermeable cap and containment wall in the vicinity of this source area excavation, confirmatory soil samples will not be collected from the base and sidewalls of these excavations.

The area of fill impacted with crystallized naphthalene is located in the northern portion of the NFA and covers an approximate 25-foot by 30-foot area to an average depth of approximately 3 feet. This excavation will result in the generation of approximately 84 CY of impacted material for off-Site disposal. Due to the installation of the engineered cap in the vicinity of this source area excavation, confirmatory soil samples will not be collected from the base and sidewalls of the excavation.

During the excavation of these source areas, any groundwater (and NAPL) or stormwater collected will be containerized in temporary storage tanks or fractionation tanks prior to off-Site disposal. Samples of the collected water will be collected and analyzed based on the frequency and the parameters required by the selected disposal facility<sup>5</sup>.

The excavated materials will either be loaded directly into polyethylene lined trucks for off-Site disposal or temporarily stockpiled on-Site outside the 200-foot CRMC jurisdictional zone. Temporary stockpiles will be covered with polyethylene sheeting during non-working hours as described below.

Copies of all manifest(s) and Bills of Lading (BOLs) documenting the off-Site disposal of these materials will be included in the *Remedial Action Closure Report*. Upon completion, the excavations will be backfilled to the subgrade of the engineered cap with Site materials generated during re-grading to achieve the subgrade of the engineered cap or clean imported fill (See Section 11.3 for imported fill testing requirements).

## 11.2 POLYCHLORINATED BIPHENYLS

Consistent with the EPA approved SIP, these elevated PCB impacted materials require excavation and off-Site disposal. Based on the available data, approximately 95 tons of PCB-impacted trap rock, soil, and concrete will be removed during these remedial measures. Due to the proximity of the active electrical substation and the presence of subsurface

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<sup>5</sup> As an alternative, groundwater and/or collected stormwater generated during the course of the work may be treated on-Site and discharged to the Seekonk River under a Rhode Island Pollutant Discharge Elimination System Remediation Permit.



utilities, we anticipate these remedial measures will be implemented concurrent with a planned outage. Note: depending on timing, this work may be performed separate from the overall Site remedy.

We also note that an unknown concrete structure was encountered within the PCB release area at an approximate depth of 3.5 feet bgs. During performance of the remedial excavation, this concrete structure will be exposed to determine whether it is associated with a former structure or an electrical duct. If the structure is no longer in use, a sample will be collected and analyzed for PCBs on an expedited turnaround time. In the event that PCB concentrations are greater than 50 mg/kg, the concrete will be removed and disposed off-Site. If the structure is part of an electrical duct not scheduled for removal or modification during the substation upgrades, a sample will be collected and analyzed for PCBs on an expedited turnaround time. If laboratory analytical results of the concrete indicate PCB concentrations greater than 50 mg/kg, the cables within the ductwork will be pulled and the PCB-impacted section of ductwork will be removed, replaced, and the cables reinstalled.

All excavated material will be temporarily stockpiled on and covered by polyethylene sheeting for subsequent off-Site disposal. Staked haybales will be placed around the stockpile. Any hand tools used during removal activities will be cleaned and decontaminated in accordance with §761.79(c)(2)(ii) and Subpart S, Double Wash/ Rinse Method for Decontaminating Non-Porous Surfaces.

Following excavation, confirmatory samples will be collected from each media at grid intervals of 1.5 meters (approximately 5 feet) and analyzed for PCBs by EPA Method 8082 and a manual soxhlet extraction with results reported on a dry weight basis. Following the removal of the PCB-impacted soil and receipt of the analytical resulting confirming residual PCB impacts are less than 50 mg/kg, the excavation will be backfilled with clean imported fill.

### 11.3 ENGINEERED CONTROLS

As depicted on **Drawing 10**, the engineered controls will consist of engineered caps across the majority of the Site and additional interior fencing to restrict access to wooded areas along the western and southern Site boundaries. The engineered cap will be constructed across the majority of the Site to supplement the existing caps in the SFA, proximate to the substation, and proximate to the natural gas regulating station. The engineered cap will be designed to mitigate direct contact with impacted soils and prevent tracking and erosion of materials. A portion of the new engineered cap (50%) will also be designed as impermeable to mitigate further degradation of groundwater quality. As indicated above, an engineered cap will not be installed within the heavily wooded and steep slopes along the western portions of the FPPA and SFA due to concerns regarding destabilizing the banks. Access to these slopes will be restricted via the installation of additional chain link fencing which will serve as an engineered control. Refer to **Drawing 10** for a layout of this engineered control fencing.

The engineered caps will consist of the following:

- In the existing paved portions of the Site, the engineered cap will consist of a minimum 2-inch layer of top course and a minimum 2-inch layer of binder course installed directly over the existing asphalt surface. These paved areas are limited to the area to the west and north of the Pawtucket Station No. 1 building;
- In the northern portion of the Site, the cap will be designed to be permeable with a minimum 6-inch layer of topsoil underlain by a minimum 6-inch layer of compacted granular fill underlain by a geotextile fabric that acts as a warning barrier. The existing shoreline along the northern portion of the Site currently consists of granite block walls and natural slopes. The installation of the cap in this area will likely include modifications to this portion of the current



shoreline features to ensure cap stability and limit the potential for future cap erosion. These modifications will likely involve removal of the granite blocks and installation of stabilized slopes;

- The impermeable cap will consist of a minimum 6-inch layer of topsoil (northern portion) or 6-inch thick layer of gravel (southern portion) underlain by a minimum 18-inch layer of processed gravel, sand or other clean fill underlain by a liner system which includes a doubled-sided composite drainage net, a 40-mil HDPE liner, and an 8 oz non-woven geotextile;
- A crushed stone permeable cap will be installed to the east of the Pawtucket No. 1 substation building and the substation. This cap will consist of a minimum 6-inch layer of crushed stone underlain by a minimum 6-inch layer of compacted granular fill underlain by a geotextile fabric that acts as a warning barrier;
- Along portions of the riverfront, in the western portion of the NFA, and west of the natural gas regulating station, the engineered cap will be constructed with rip-rap to stabilize the slopes and mitigate potential erosion. In these areas, the engineered cap will consist of a minimum 12-inch layer of RIDOT R-3 rip rap (8-inch minus stone) underlain by a geotextile fabric that acts as a warning barrier; and,
- An access road and staging area will be constructed to the south of the substation to allow crane access to the transmission towers for long term maintenance related activities. This road and staging area will be constructed with a minimum 6" layer of compacted granular fill underlain by a minimum 18-inch layer of processed gravel, sand or clean fill underlain by a liner system which includes a doubled-sided composite drainage net, a 40-mil HDPE liner, and an 8 oz non-woven geotextile underlain by existing soil subgrade.

Construction of these engineered caps will require significant regrading of the Site to create a relatively uniform surface sloping down from the western edges of the Site to the river. We anticipate approximately 22,500 CY of soil will be cut from portions of the Site and re-used as fill in low lying portions of the Site to achieve the subgrade elevations of the engineered caps. We currently estimate that an additional 11,500 CY of imported clean soil will also be necessary to fill the low-lying portions of the Site to achieve the subgrade elevations of the engineered caps. The cut/fill analysis may be revised based on further refinement of the grades to minimize the amount of material to be moved and brought to the Site to achieve subgrade elevations. An additional 45,000 CY of clean imported and non-impacted material (soil, crushed stone, riprap) will be necessary to construct the engineered caps.

Approximately 56,500 CY of clean fill material will be imported to re-grade the Site to achieve subgrade for the engineered cap (11,500 CY) and to construct the engineered caps (45,000 CY). Approximately 2,800 truck-loads (20 CY/truck) of clean fill will be required to construct the engineered cap. BMPs will be installed at all Site exit points to minimize the potential off-Site migration/tracking of Site materials while importing clean fill to the Site.

All clean fill imported to the Site must meet RIDEM's Residential Direct Exposure Criteria or be declared "non-jurisdictional". For the purpose of this project, only clean native soil from a sand and gravel pit may be considered "non-jurisdictional", contingent upon receipt of paperwork from the sand and gravel pit certifying the origin and content prior to the delivery of the material. All imported granular material must be tested in accordance with criteria set forth below and the testing results must be below the R-DEC:



Analyte	EPA Test Method	Minimum Frequency of Testing
Total Petroleum Hydrocarbons	8100M	One sample per 1,000 CY
Volatile Organic Compounds	8260	One sample per 1,000 CY
Semi-Volatile Organic Compounds	8270	One sample per 1,000 CY
Priority Pollutant Metals (13)	6010 & 7471A	One sample per 1,000 CY
Arsenic & Lead	6010	One sample per 500 CY

#### 11.4 CONTAINMENT WALL

An approximately 1,300-foot long containment wall will be installed along the eastern (downgradient) edge of portions of the FGPA, the FPPA and the SFA to mitigate the potential migration of NAPL impacts towards the Seekonk River. Portions of this containment wall will be installed outboard of the existing bulkhead walls within the Seekonk River to also serve as a replacement to the existing deteriorated bulkheads. The approximate layout of this containment wall is depicted on **Drawings 10 and 14 and 18** and anticipated containment wall sectional profiles are depicted on **Drawings 15 through 17**. The containment wall will consist of steel sheet pile walls with sealed interlock joints driven or vibrated into the ground using a crane mounted hammer and extending to elevation -32 (NAVD88) on the northern end and elevation -40 feet (NAVD88) in the central and southern portions of the wall. Note, given the assumed undulating surface of the till, the sheetpile tip elevation for the northern portion of the containment wall may be adjusted to account for the till surface elevation. A NAPL compatible sealant will be applied within the steel interlocks at the time of driving to minimize potential for migration through the containment walls and specific interlock joints of sheet pile pairs will be shop welded to create a uniform sealed joint prior to installation. This steel sheet pile bulkhead will act as a cantilever wall system eliminating the need for upland bracing in the form of tiebacks or a deadman system.

Pre-excavation will be required to remove potential obstructions along the alignment of the upland portions of the containment wall. Depending on the nature of the observed impacts, the soil generated during these pre-excavation activities may be re-used as on-Site fill to achieve the subgrade elevations for the engineered cap and reduce the required volume of import material to the Site.

Demolition and preclearing of existing bulkhead wall structures (e.g. steel sheeting and timber piling) will also be required to install the containment wall within the Seekonk River. These demolition and preclearing activities will likely require the removal of a limited amount of sediment proximate to the existing bulkhead wall structures. The resulting demolition debris and sediment will be disposed off-Site in accordance with state, local and federal laws, and regulations. In areas where the containment wall is installed within the uplands portion of the Site, riprap will be placed outboard of the sheetpile wall and along the bank to provide shoreline erosion protection of the existing slope and structural support. Subsequent to wall installation, the area between the back of the sheet pile wall and existing waterfront structures will be backfilled with imported clean fill.

As indicated previously, there will be a gap in the containment wall proximate to the transmission towers due to the lack of observed NAPL in this area and concerns regarding the installation of long steel sheets proximate to the high voltage wires spanning the Seekonk River. The riverbank in this area will be improved with a minimum 6-inch layer of bedding material wrapped in a geotextile fabric underlying a minimum 12-inch thick layer of riprap to armor the slope and to limit direct contact with impacted soils. The armored slope (approx. 2.5H:1V) will extend approximately 40 feet from the Mean





High Water (MHW) line to the top of the existing slope. In addition, and as shown on **Drawing 10**, the containment wall north and south of this gap will be equipped with wingwalls extending towards the west designed to contain NAPL.

During installation of the containment wall, any identified inactive drain pipes will be capped and sealed to mitigate the pipes as acting as preferential migration pathways for NAPL. The deteriorated NBC CSO pipe will also be extended through the containment wall and the penetration through the wall sealed to mitigate the potential migration of NAPL.

Seven (7) recovery wells will be installed on the upgradient side of the containment wall to supplement the existing groundwater monitoring well network and facilitate the removal of accumulated NAPL (if any). The approximate locations are shown on **Drawing 18**. The actual locations of these wells will be dependent on Site logistical constraints. These wells will be installed to a similar elevation as the containment wall (approximate elevation -32 to -40 feet, NAVD88). Each well will be equipped with a single 4-inch diameter Schedule 40 PVC well screen that extends from the bottom of the well and spans the natural groundwater table.

### 11.5 VOLATILE EMISSIONS EVALUATION

GZA performed an evaluation of potential volatile emissions prior to implementation of the RIDEM approved remedy. The primary elements of the remedy requiring excavation and management of impacted materials that could potentially result in volatile emissions include:

- Re-grading of the Site to achieve the subgrade for the engineered cap;
- Construction of the containment wall; and,
- Performance of the focused source area removals.

The applicability of Regulation No. 9 was evaluated based on potential volatile emissions calculations/modeling performed consistent with published EPA guidance. This emissions modeling was developed for the specific earthwork activities listed above. The results of this evaluation are included in **Appendix H** and indicate that implementation of the RIDEM preferred remedy **does not** have the potential to increase emissions by greater than the minimum quantities specified in Appendix A of RIDEM APC Regulation No. 9, and, therefore, a minor source permit is not required for this activity.

### 11.6 NAPL RECOVERY

As described above, the containment wall will be equipped with seven (7) 4-inch diameter wells installed on the upgradient side of the wall for the collection and manual recovery of NAPL. As indicated in **Table 12**, NAPL gauging will also be performed on the existing monitoring well network (40 wells). The proposed monitoring and recovery well network is shown on **Drawing 18**.

Based on the existing data set, we anticipate manual LNAPL recovery activities will be focused at existing wells MW-210, MW-3, MW-312S, MW-313S, MW-313D, MW-326S, MW-335S, MW-335D, and M&E MW-5 and manual DNAPL recovery will be focused at existing wells MW-4, MW-303, MW-339S/D, MW-341, MW-1, MW-320S and MW-320D. NAPL gauging and recovery activities will initially be performed quarterly for the 1<sup>st</sup> year after installation of the containment wall. The frequency of the NAPL gauging and recovery activities will be modified to bi-annually after the 1<sup>st</sup> year. Subsequent modifications to this frequency will be based on observations made and subject to RIDEM approval.

The results of these NAPL gauging and recovery activities will be documented in annual reports submitted to RIDEM.



### 11.7 NATURAL ATTENUATION GROUNDWATER MONITORING

The identified dissolved phase groundwater impacts will be addressed via excavation and off-Site disposal of certain source areas, recovery/removal of the identified NAPLs to the extent practicable, and installation of an impermeable cap combined with natural attenuation monitoring. Consistent with the current groundwater monitoring program, the long term natural attenuation groundwater monitoring program will consist of the collection of groundwater samples from existing monitoring wells MW-7, MW-310S, MW-310D, and MW-311 in the NFA, wells MW-201, MW-208, MW-312D, MW-326D, MW-333S, and MW-333D in the FGPA, wells M&E MW-2, MW-6, MW-109, MW-314S, MW-314D, MW-316S, MW-316D, and MW-337 in the FPPA, and wells MW-107, MW-318S, MW-334S and MW-334D in the SFA on an annual basis (refer to **Table 12** and **Drawing 18**). Note, groundwater samples will not be collected from wells with measurable amounts of NAPL.

Groundwater sampling will be performed in general accordance with the United States EPA's September 2017 *Low Stress (low flow) Purging and Sampling Procedure*. As part of this sampling methodology, well stabilization will be determined through the measurement of specific water quality parameters (pH, temperature, specific conductance, dissolved oxygen, oxidation reduction potential, and turbidity) during the purging process. Purging will continue until these parameters have stabilized. Groundwater samples will be analyzed for VOCs. In addition, a Matrix Spike/Matrix Spike Duplicate, a blind duplicate, and a VOC trip blank (in each cooler submitted to the laboratory) will be analyzed each sampling round. The results of this natural attenuation groundwater monitoring program will be documented in annual reports submitted to RIDEM.

After five (5) years, the frequency and number of wells sampled will be re-evaluated and this annual program may be modified. No changes will be made without prior RIDEM approval.

### 11.8 ENGINEERED CONTROLS, CONTAINMENT WALL, AND WELL INSPECTIONS AND MAINTENANCE

The engineered controls (caps and fencing), the containment wall, and monitoring and recovery well network will be inspected at least annually by a qualified environmental professional for evidence of ground surface settlement, erosion, or other damage. Any observed deficiencies will be repaired in an expedited manner.

Consistent with the ELUR, the results of these inspection and repair activities will be documented in annual reports prepared by a qualified environmental professional and submitted to RIDEM.

### 11.9 ENVIRONMENTAL LAND USAGE RESTRICTION

The use of ELURs is an integral component of the remedy. The ELURs will include the following restrictions:

- For the northern portion of the Site (AP 54B, Lot 826 and AP 65B, Lot 662), with the exception of Restricted Residential Activity which would allow passive recreational use but prohibit certain uses/activities including occupied residences at grade level, vegetable gardens, licensed daycares, and elementary and secondary schools, no residential use of these two lots shall be permitted. For the balance of the Site (AP 65B, Lots 645, 647, 649, and the southern portions of Lot 648 and the southern portions of AP 67B, Lots 11 and 21), no residential use of these lots shall be permitted;
- Prohibits potable and irrigation use of Site groundwater;
- Prohibits disturbance of soil beneath the engineered caps without permission from RIDEM, except as permitted in the SMP;
- Prohibits human exposure to soil containing hazardous materials and/or petroleum at concentration exceeding RIDEM approved direct exposure criteria;



- Requires appropriate vapor control measures be included on structures constructed over groundwater containing hazardous materials and/or petroleum at concentrations exceeding RIDEM approved GB Groundwater Objectives; and,
- Requires that the engineered controls (caps and fencing), containment wall, and monitoring and recovery well network remain in-place and in good condition.

Draft versions of these proposed ELURs are included in **Appendix B**.

The ELURs include an integral SMP that establishes the procedures and provisions should future construction/maintenance activities at the Site require the need to disturb soils beneath the engineered cap and within the area restricted by the engineered control fencing. The SMP serves to supplement, and will be initiated by, the RIDEM notification requirement established by the ELURs for the Site. The draft ELURs included in **Appendix B** include a SMP for the Site.

#### 11.10 BEST MANAGEMENT PRACTICES

During the implementation of the remedy, the following Best Management Practices (BMPs) will be implemented. These BMPs are specifically designed to mitigate the potential off-Site migration of contaminants and exposure risks to on-Site workers and the public.

##### 11.10.1 Dust Control

Dust control measures will be employed to mitigate potential exposure of on-Site workers to airborne particulate matter and the potential for a release of airborne particulate matter beyond the limits of the Site in accordance with RIDEM *Air Pollution Control Regulation No. 5, Fugitive Dust*. Methods of dust control will consist of sprinkling the ground surface with water, use of calcium chloride, covering of temporary stockpiles, use of tarpaulins on trucks, mulching, or similar methods.

As described below, work zone and perimeter air monitoring for particulate concentrations will be performed during the implementation of the remedial work. This monitoring will include both visible observations as well as measurements of particulate dust using portable field instruments and air monitoring stations. The anticipated locations of the air monitoring stations are depicted on **Drawing 11**. The numeric limits for particulates established for the Site at the work zone and the perimeter of the Site will be 1,000 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ) and 150  $\mu\text{g}/\text{m}^3$ , respectively. In addition to these numeric limits, the generation of visible dust will not be permitted during the work.

##### 11.10.2 Odor Control

Specific engineered controls will be employed as necessary during the work to control nuisance odors. These control measures include covering of stockpiles of soil, use of tarpaulins on trucks, limiting the extent of exposed surfaces containing odorous materials, and the use of odor suppressant foams. These foams will be employed within excavations, areas of stockpiling, and during the transport of potentially odorous materials.

##### 11.10.3 Sedimentation and Erosion Controls

Prior to the commencement of any Site work, hay bales and silt fencing will be installed downgradient (east side) along the waterfront, as well as along the north and south perimeter of the Site. A turbidity curtain will also be installed within the river prior to work along the banks of the river and during installation of the containment wall. Additional sedimentation and erosion control measures will be installed as necessary consistent with CRMC and Rhode Island



Pollutant Discharge Elimination System (RIPDES) requirements. The planned layout of these sedimentation and erosion control devices are shown on **Drawing 11** and details are provided in **Drawing 12**. These sedimentation and erosion control devices will be inspected at least weekly during implementation of the remedy and after each storm event with an intensity greater than 1-inch. Any deficiencies identified during these inspections will be addressed immediately.

#### 11.10.4 Soil Management Techniques

Dry (non-saturated) excavated materials will be staged on-Site directly on the existing ground surface in temporary working stockpiles no larger than 1,000 CY. Stockpiles will be covered with a layer of 10-mil polyethylene sheeting during the work days (to the extent practical) and during all non-working hours to control the generation of wind-blown dusts and potential migration of soils with stormwater runoff. Stockpile areas will be equipped with appropriate controls to limit the loss of the cover and protect against storm water erosion. These controls will include the installation of haybales or straw wattles surrounding the perimeter of the stockpiles and weighting the polyethylene cover with sand bags or concrete blocks. Stockpiles will be inspected at least daily by Site personnel.

Any saturated excavated materials will be temporarily staged on Site in a lined materials management area. The materials management area will be equipped with a bermed perimeter constructed with haybales or soil and the liner will extend over the top of the berms. The edges of the liner will be secured with sand bags or concrete block. Accumulated liquids will be removed from the saturated materials management area via pumping and containerized for off-Site disposal. Stockpiles will be covered with a layer of 10-mil polyethylene sheeting during the work days (to the extent practical) and during all non-working hours to control the generation of wind-blown dusts and potential migration of soils with stormwater runoff. Residual soils within the saturated materials management area will either be disposed off-Site or used as fill to achieve the subgrade for the engineered cap if sufficiently dry and stable.

#### 11.10.5 Off-Site Tracking Control and Site Security

Tracking pads/wheel wash stations will be installed and maintained to mitigate the off-Site tracking of sediments and other materials. The conceptual layout of the tracking pads/wheel wash stations are shown on **Drawing 11** and details are provided on **Drawing 12**.

The existing chain link fencing will be maintained around the perimeter of the Site to prevent access by the general public. In the event the work requires temporary removal of the existing chain link fencing, temporary construction fencing will be utilized to maintain a secure Site throughout the remedial work.

#### 11.11 AIR MONITORING PROGRAM

As indicated in Section 11.5 and documented in **Appendix H**, GZA performed an evaluation of potential volatile emissions during implementation of the RIDEM approved remedy. The results of this evaluation indicated that implementation of the remedy **does not** have the potential to increase emissions by greater than the minimum quantities specified in Appendix A of RIDEM APC Regulation No. 9, and, therefore, a minor source permit is not required for this activity.

During construction of the remedy, a state of the art, robust air monitoring program will be implemented to protect the surrounding community as well as Site workers from potential exposure to Site impacts. This program will provide continuous (24-hours per day, 7-days a week), real-time measurement of airborne concentrations of certain compounds that will allow rapid identification of conditions in the event elevated emissions are detected and the aggressive application of engineering controls to keep air quality parameters within acceptable limits. The air monitoring program will be designed generally consistent with the Site-specific AQMP established for the Tidewater Site and include both Tier



I (Real Time Monitoring) and Tier II (Time-Integrated Monitoring) with the objectives being to: (1) minimize exposure risks to both on-Site workers and the surrounding community associated with airborne constituents; (2) provide an early warning of Site conditions allowing oversight personnel to proactively manage potential air quality issues via implementation of engineered controls and/or adjustments to work practices/procedures; and (3) quantify air quality monitoring data for comparison to relevant action levels. The real time field data and the time integrated sampling results will be maintained on-Site during performance of the remedial work. In addition, this air monitoring data will be summarized in the *Remedial Action Closure Report*.

#### 11.11.1 Tier I - Real Time Monitoring

The real time monitoring program will involve the use of both portable, hand held instrumentation to continuously monitor active work zones where earth disturbing/stockpiling is occurring and the deployment of state of the art stationary air monitoring units along the perimeter of the Site.

Portable, hand held instrumentation will include PIDs (Photovac 2020) and particulate meters (DustTrak). PIDs measure total volatile organic compound concentrations by passing the air sample past an analytical detector and electronically measuring the resulting response. The PIDs are configured to respond to total organic compounds without any differentiation as to individual compound concentrations with a detection limit of 10 parts per billion by volume (ppbv). The DustTrack provides direct, real-time measurement of particulate (or dust) concentrations. The measurement of dust levels is accomplished using infrared electromagnetic radiation to sense airborne particles. Dust meters will be configured to respond only to dust particles < 10 micron in diameter (PM10) with a detection limit of 1 ug/m<sup>3</sup> (microgram per cubic meter).

The stationary perimeter air monitoring locations will be selected based on prevailing wind direction and the locations of nearby sensitive receptors. We currently anticipate the installation of 11 stations in the approximate locations depicted on **Drawing 11**. These units will be installed at the beginning of the remedial work and remain in place until the work is complete. The automated perimeter monitoring system will consist of individual monitoring stations with associated analytical instrumentation, a meteorological system, a computer control system, and an alarm system linked to the analytical instrumentation by an integrated communication/telemetry package. The instrumentation within each perimeter station located along the western and northern property boundaries (8 of 11 units) will consist of a gas chromatograph (GC) for the measurement of total VOCs (TVOCs) and benzene and a respirable particulate meter for the direct measurement of dust concentrations. The remaining 3 units will be located along the eastern property boundary proximate to the Seekonk River and will consist of a photoionization detector (PID) for the measurement of TVOCs and a respirable particulate meter for the measurement of dust. The instrumentation will be housed within weather tight enclosures that are environmentally controlled via individual heating and air conditioning systems. The system is also configured with onboard battery backup and a data logger allowing up to 8 hours of continuous recording in the event of power interruptions. Descriptions of the key analytical instruments within each station are provided below.

#### Gas Chromatographs

VOC concentrations on the western and northern property boundaries will be measured utilizing field gas chromatographs. The GCs measure volatile organic compounds by passing the air sample past an analytical detector and electronically measuring the resulting response. The GCs can be configured to operate in either TVOC mode or in a compound specific mode. In the TVOC mode, if the TVOC level exceeds a pre-determined value, the GC switches to a compound-specific analysis for measurement of individual compounds including benzene. The detection limit of the GC for individual compounds is 10 parts per billion (ppb).



During implementation of the remedy, the perimeter air monitoring stations on the western and northern property boundaries will be programmed to provide the on-Site operator a warning alarm when the average TVOC concentration over a 15-minute consecutive period exceeds 0.25 ppm (approximately 75% of the perimeter Action Level for benzene of 0.35 ppm established in the AQMP) and the GC will switch to directly measuring benzene concentrations. The deployment of the 8 GC units was specifically selected given their ability to more effectively and efficiently monitor potential benzene levels for this large-scale project when compared to the hand-held Voyager unit described in the AQMP.

#### Respirable Particulate

Direct-reading real-time particulate meters (ThermoMIE DataRam) will be used to monitor for particulates (or dust). The measurement of dust levels is accomplished using infrared electromagnetic radiation to sense airborne particles. The dust meter can be configured to respond only to dust particles < 10 micron in diameter (PM10), dust particles < 2.5 microns (PM2.5), or total suspended particulate.

During implementation of the remedy, the perimeter air monitoring stations will be programmed to provide the on-Site operator a warning alarm when the average particulate concentration over a 15-minute consecutive period exceeds 112  $\mu\text{g}/\text{m}^3$  (approximately 75% of the Action Level for respirable particulates of 150  $\mu\text{g}/\text{m}^3$  established in the AQMP).

#### Meteorological System

An on-Site meteorological tower (RM Young sensors) will be used to measure wind speed, direction, dry-bulb temperature, and relative humidity. The central computer system receives continuous information from the meteorological system and computes a 2-minute running average wind speed and direction value. The 2-minute running average wind direction will be used to identify which of the monitoring stations is upwind, downwind, or crosswind. This information is stored electronically, and printed out in daily reports.

#### Computer Control System

Data generated by the instrumentation, meteorological station, as well as operational parameters, will be continuously uploaded via radio telemetry links to a central computer system located in the Site construction trailer. The central computer system communicates with each perimeter monitoring station every minute to obtain the latest data values from the individual sensors. The retrieved data are then displayed on the central computer screen, and stored in a database along with the meteorological data and other operational status information. The monitoring data is automatically archived and used to print out summary graphs at the end of each day. The system will allow for communication between the instruments, environmental control equipment, meteorological station, alarm display, and the central computer.

The following table outlines the Action Levels for the Tier I monitoring previously established for the Tidewater Site in the AQMP. This table also outlines warning level alarm conditions for the perimeter air monitoring stations.





**Tier I – Warning and Action Levels – Real Time Monitoring**

COMPOUND	WORK ZONE PERIMETER	PROPERTY LINE <sup>1</sup>	
		WARNING LEVEL	ACTION LEVEL
Total VOCs	1.0 ppm	0.25 ppm <sup>2</sup>	0.5 ppm
Respirable Particulate (PM10)	1,000 ug/m <sup>3</sup>	112 ug/m <sup>3</sup>	150 ug/m <sup>3</sup>
Benzene	Not applicable	0.25 ppm	0.35 ppm

**Note:**

1. All warning and action levels for the property line are 15-minute average concentrations.
2. Upon reaching a 15-minute average concentration for TVOCs, the GC will switch to directly measuring benzene concentrations.

In the event the portable, hand-held air monitoring equipment at the perimeter of the work zone indicate exceedances of these action levels, engineered controls such as wetting or covering materials with tarpaulins or applying odor suppressing foams will be implemented to mitigate exposure risks of on-Site workers and to proactively mitigate potential exceedances at the perimeter of the Site. The Site perimeter air monitoring stations will be used to supplement the work zone monitoring to mitigate potential exposure risks to off-Site sensitive receptors and will be programmed to collect air quality measurements every minute. Based on these measurements, the air monitoring stations will automatically provide a warning alarm to the on-Site operator when TVOC concentrations exceed an average of 0.25 ppm over a 15-minute consecutive period and when particulate concentrations exceed an average of 112 µg/m<sup>3</sup> over a 15-minute consecutive period. These warning notifications will allow the source of the elevated levels to be identified and the subsequent implementation of engineered controls and/or modification of work practices before exceeding an action level.

11.11.2 Tier II - Time Integrated Sampling

The Tier II sampling program involves the collection and analysis of ambient air samples to routinely verify the Tier I results and provide a comparison to the RIDEM Acceptable Ambient Level (AALs) and the applicable action levels established in the Tidewater AQMP. Target compounds for the time integrated sampling include benzene, toluene, ethylbenzene, xylenes (BTEX), and naphthalene. Samples will be collected using SUMMA stainless steel canisters and analyzed via USEPA Method TO-15 by a certified laboratory. The SUMMA canister is passively filled with air via a mass flow controller which allows for uniform filling of the canister over an eight-hour sampling period. Time integrated air quality samples will be collected at the perimeter of the Site at an upwind and a downwind location based on the prevailing wind directions. At a minimum, samples will be collected on a weekly basis during earth disturbing/stockpiling activities. This sampling frequency is subject to modification based on the Tier I and Tier II monitoring results. The laboratory results will be available 48 hours after collection.

11.12 REGULATORY PERMITS/APPROVALS

We anticipate the following permits/approvals are necessary to implement the remedy.

- A CRMC Assent will be required since the Site is located within their 200-foot jurisdictional area. In addition, a variance consistent with Section 120 of the *Coastal Resources Management Program* will also be required due to grading/filling within 50-feet of the shoreline of the Seekonk River;
- A Rhode Island Pollutant Discharge Elimination System (RIPDES) *General Permit for Stormwater Discharges Associated with Construction Activities*;



- A *Water Quality Certification* to fulfill the requirements of Section 401 of the *Clean Water Act* since the remedial work involves considerable land disturbance adjacent to a coastal water body; and
- A NBC Sewer alteration permit since work associated with the containment wall will require alterations be made to the existing NBC CSO (combined sewer overflow) line that runs through the FPPA and discharges into the Seekonk River.

National Grid will submit applications to CRMC, RIDEM and NBC for these permits/approvals and Site remedial activities will not be initiated until these authorizations are received. Note: a preliminary permitting coordination meeting will be scheduled through RIDEM's Office of Customer and Technical Assistance with the various regulatory agencies prior to preparation of the permit applications necessary to implement the remedy.

As indicated above, GZA evaluated the applicability of RIDEM's *Air Pollution Control Regulation No. 9 – Air Pollution Control Permits* to the remedy. The results of this evaluation indicate that the remedial activities do not have the potential to increase emissions of listed air contaminants by greater than the minimum quantity specified in Appendix A of the regulations and a *Minor Source Permit* is therefore not required. The results of this evaluation are included in **Appendix H**.

#### **12.0 SET-UP PLANS (RULE 9.11)**

As indicated above, prior to the performance of any intrusive Site activities, sedimentation and erosion controls will be installed to mitigate the potential migration of Site materials. The layout of these sedimentation and erosion control devices are shown on **Drawing 11** and sedimentation and erosion control details are provided on **Drawing 12**.

An equipment staging area will be set-up on Site outside of the 200-foot zone regulated by the CRMC. This area will be utilized for light maintenance activities on the equipment and refueling operations. No construction vehicles actively will be fueled in a manner that would allow an inadvertent release to flow into the adjacent surface water. All oil, hydraulic fluid, or other hazardous materials will be stored in original containers; fuels will be stored in tightly sealed containers which are clearly marked; and all such material will be stored under a roof or in a covered enclosure.

#### **13.0 EFFLUENT DISPOSAL (RULE 9.12)**

To the extent practical, soils disturbed during the work will be used as on-Site fill to achieve the subgrade elevations for the engineered cap. In the event that excess soils are generated that cannot be used as on-Site fill, the soil will be disposed off-Site. Prior to off-Site disposal, composite samples will be collected from the stockpiled excess soil and analyzed based on the frequency and the parameters required by the selected disposal facility.

Any groundwater, NAPL, or stormwater collected during the work will be containerized in temporary storage tanks or fractionation tanks prior to off-Site disposal. Samples of the collected liquids will be collected and analyzed based on the frequency and the parameters required by the selected disposal facility. As an alternative, groundwater and/or collected stormwater generated during the work may be re-injected on-Site under a *Temporary Groundwater Discharge Approval* under Rule 13 of the October 2014 *Rules for the Discharge of Non-Sanitary Wastewater and Other Fluid to or Below the Ground Surface*. Based on the quality of the groundwater observed at the Site, dewatering fluids would be containerized within fractionation tanks and processed through filtration units for the removal of suspended solids prior to re-injection into the subsurface. Subsequent to removal of the suspended solids, the groundwater will be infiltrated into the ground surface proximate to the work area in a non-erosive manner using infiltration basins. The infiltration basins will be



constructed using geotextile fabric and haybales. We understand that discharge of dewatering fluids under Rule 13 will require prior review and approved by RIDEM.

Copies of all manifest(s) and Bills of Lading (BOLs) documenting the off-Site disposal of these materials will be included in the *Remedial Action Closure Report*.

#### 14.0 CONTINGENCY PLAN (RULE 9.13)

Unexpected conditions may be encountered during excavation. The following provides a listing of points of contacts in the event of an unexpected incident involving impacted soil and/or groundwater.

Firm	Contact	Address	Phone Number
GZA GeoEnvironmental, Inc.	David Rusczyk	655 Winding Brook Drive, Suite 402 Glastonbury, Connecticut 06033	(860) 858-3110 860-250-8556 (cell)
National Grid	Kenneth Lento	Project Manager National Grid 40 Sylvan Road Waltham, MA 02451	(781) 907-3655 (617) 791-2627 (cell)
Clean Harbors	Jim DeWolf	8 Dexter Road East Providence, RI 02914	(401) 265-3196 (cell)
RIDEM, DEM Project Manager	Joseph Martella	235 Promenade Street Providence, Rhode Island 02903	(401) 222-2797 Ext. 7109
RIDEM 24-Hour Emergency Response	NA	235 Promenade Street Providence, Rhode Island 02903	(401) 222-3070

GZA has prepared a *Contingency Plan/Health & Safety Plan*, attached as **Appendix I**, to address unanticipated conditions/incidents encountered at the property during construction. The *Contingency/Health & Safety Plan* is applicable to GZA personnel and will be available at the Site at all times during the implementation of the remedial action described herein. The Contractor selected to perform the work outlined in this report will be required to prepare and implement a Site-Specific Health and Safety Plan during the remediation activities as well.

#### 15.0 OPERATING LOG (RULE 9.14)

An Operating Log will be developed and maintained at the Site during the performance of the remedial work outlined herein. The log will subsequently be maintained by National Grid for a minimum period of three years. The Operating Log will include, at a minimum, the following information:

- Dates and time periods during which the remedial work described herein was performed;
- Daily Field Reports (DFRs) will be prepared during remedy implementation which will summarize personnel and equipment on-Site, work performed, health and safety monitoring conducted, results of air quality monitoring, etc.;
- Records of any laboratory analysis and field screening performed as part of the remedial action;
- Description of instances under which the Contingency Plan was implemented; and,



- Inspection reports detailing compliance with the remedial specifications described herein and the actions taken to address non-compliant practices/conditions.

A copy of the Operating Log will be provided to the Department at the completion of the project as part of the *Remedial Action Closure Report*. In addition, bi-weekly email updates regarding the status of the work being performed at the Site will be submitted to the Department during the remedial work and posted to the project's webpage.

#### **16.0 SECURITY PROCEDURES (RULE 9.15)**

Access to the Site during the remedial activities will be limited to National Grid, the engineering consultant, and the contractor and their sub-contractors performing the work. As indicated on **Drawing 11**, the existing chain-link fencing surrounding and within the Site will be used to restrict access to the soil disturbance areas. The existing chain-link fencing will be supplemented with temporary construction fencing as necessary to facilitate implementation of the remedy and to maintain a secure Site at all times. In addition, appropriate signage will be hung on two bulletin boards located adjacent to the Site as indicated on **Drawing 11**. The fencing will be locked at the end of each day as part of the daily shutdown procedures.

#### **17.0 SHUTDOWN, CLOSURE AND POST CLOSURE REQUIREMENTS (RULE 9.16)**

In the event that the remedial work is suspended for an extended period, (i.e., greater than 1 week), RIDEM will be notified. Daily shut-down procedures will include covering and securing of all soil stockpiles, as well as locking the internal and perimeter fencing.

Following completion of the remedial work, annual compliance inspections of the engineered caps, monitoring and recovery well network, fencing, and containment wall will be performed to ensure that the provisions of the ELUR are being maintained. In addition, routine NAPL gauging and recovery activities and natural attenuation groundwater monitoring will be performed consistent with the schedule outlined above. The results of these routine gauging, recovery, and monitoring activities will be documented in annual reports submitted to RIDEM.

#### **18.0 INSTITUTIONAL CONTROLS AND NOTICES (RULE 9.17)**

As indicated previously, public notice of the preferred remedy described herein was performed on June 13, 2017 consistent with Rule 7.07C of the *Remediation Regulations* subsequent to receipt of the Program Letter from RIDEM. Site abutters will be notified in writing at least one week prior to initiation of construction activities.

The ELUR described in Section 11.7 and included in **Appendix B** will be legally recorded on the land records for the Site. In addition, the property owner will maintain a copy of the ELUR and associated *Soil Management Plan*.

#### **19.0 COMPLIANCE DETERMINATION (RULE 9.18)**

As long as the remedial measures described in this plan are implemented and maintained, the Site will be considered to be in compliance with the *Remediation Regulations*. At the completion of the remedial construction activities described herein, a *Remedial Action Closure Report* will be submitted to RIDEM documenting the work performed.

To evaluate and record compliance with the provisions of the ELUR, a qualified environmental professional will evaluate the compliance status of the Site on an annual basis. Upon completion of the evaluation, the environmental professional will prepare and simultaneously submit to RIDEM, an evaluation report detailing the findings of the inspection and noting



any compliance violations at the Site. If the Property is determined to be out of compliance with the terms of the ELUR, the responsible party will submit a corrective action plan in writing to RIDEM within ten (10) days of receipt of the evaluation report, indicating the plans to bring the Site into compliance with the ELUR, including, at a minimum, a schedule for implementation of the plan.

#### 20.0 CERTIFICATION (RULE 9.19)

To address Rule 9.19 of the *Remediation Regulations*, the following statements of certification are provided.

*GZA GeoEnvironmental, Inc. certifies to the best of its knowledge, that this Remedial Action Work Plan is complete and accurate.*

A handwritten signature in blue ink that reads "James J. Clark".

James J. Clark  
Principal-In-Charge  
GZA GeoEnvironmental, Inc

*The Narragansett Electric Company certifies, to the best of its knowledge, that this Remedial Action Work Plan is a complete and accurate representation of the site and the release and contains all known facts surrounding the release.*

A handwritten signature in blue ink that reads "Elizabeth M. Greene".

Elizabeth M Greene  
Manager, Site Investigation and Remediation – New England  
The Narragansett Electric Company



## TABLES



**TABLE 1A**  
**LDI TEST PIT LOCATIONS AND RATIONALE**

Former Tidewater Facility  
Pawtucket, Rhode Island

File No. 05.0043654.00

6/13/2018

Page 1 of 2

<b>Explorations</b>	<b>Site Area</b>	<b>General Location and/or Purpose</b>
GZ-TP-501	NFA	SS-109/Evaluate Fill Quality and Extent of Impermeable Cap
GZ-TP-502	NFA	GZ-TP-548/Evaluate Fill Quality and Extent of Impermeable Cap
GZ-TP-503	NFA	Limit of Coal Pile/Evaluate Fill Quality and Extent of Impermeable Cap
GZ-TP-504	NFA	Frac Staging Area/Evaluate Fill Quality and Extent of Impermeable Cap
GZ-TP-505	NFA	Coke Storage Area/Evaluate Fill Quality and Extent of Impermeable Cap
GZ-TP-506	FGPA	GZ-TP-542 and Coke Storage Area/Evaluate Fill Quality and Extent of Impermeable Cap
GZ-TP-507	FGPA	Coke Storage Area/Evaluate Fill Quality and Extent of Impermeable Cap
GZ-TP-508	FGPA	Coal Storage Area/Evaluate Fill Quality and Extent of Impermeable Cap
GZ-TP-509	FGPA	Coal Storage Area/Locate Potential Tie Back Rods
GZ-TP-509A	FGPA	Coal Storage Area/Locate Potential Tie Back Rods
GZ-TP-510	FGPA	Coal Storage Area/Evaluate Fill Quality and Extent of Impermeable Cap
GZ-TP-511	FGPA	GWTT-SOIL-1-111010/Evaluate Fill Quality and Extent of Impermeable Cap
GZ-TP-512	FGPA	RIDEM SS-1/Evaluate Fill Quality and Extent of Impermeable Cap
GZ-TP-516	FGPA	SS-146A/Locate Former Raceway Piping
GZ-TP-516A	FGPA	GZA TP-4/Locate Former Raceway Piping
GZ-TP-516B	FGPA	Store House/Locate Former Raceway Piping
GZ-TP-516C	FGPA	Store House/Locate Former Raceway Piping
GZ-TP-517	FGPA	TP-225/Locate Former Raceway Piping
GZ-TP-518	FPPA	Coal Storage Area/Locate Former Raceway Piping
GZ-TP-518A	FPPA	Coal Storage Area/Locate Former Raceway Piping
GZ-TP-519	FPPA	Coal Storage Area/Locate Former Raceway Piping
GZ-TP-521	FPPA	VHB-300 and MW-104/Locate Former Raceway Piping
GZ-TP-522	FPPA	TP-388D/Locate Former Raceway Piping
GZ-TP-523	FPPA	TP-111/Locate Former Raceway Piping
GZ-TP-524	FGPA	Coal Storage/Evaluate Fill Quality and Extent of Impermeable Cap
GZ-TP-525	FGPA	TP-367/Locate Former Raceway Piping
GZ-TP-526	FPPA	TP-327/Locate Former Raceway Piping
GZ-TP-527	FGPA	Coal Shed Area/Locate Potential Tie Back Rods
GZ-TP-528	FGPA	Coal Shed Area/Locate Potential Tie Back Rods
GZ-TP-529	FGPA	TB-13 and TB-304/Locate Potential Tie Back Rods
GZ-TP-530	FGPA	TP-205/Locate Potential Tie Back Rods
GZ-TP-531	FGPA	#5 Gas Holder Area/Locate Bedrock Outcrop
GZ-TP-532	NFA	TP-364 and TP-358/Evaluate Fill Quality and Extent of Impermeable Cap
GZ-TP-533	NFA	SS-131/Evaluate Fill Quality and Extent of Impermeable Cap
GZ-TP-534	NFA	Garage-Storage Area/Evaluate Fill Quality and Extent of Impermeable Cap
GZ-TP-535A	NFA	Garage/Evaluate Fill Quality and Extent of Impermeable Cap
GZ-TP-535B	NFA	Garage/Evaluate Fill Quality and Extent of Impermeable Cap

**TABLE 1A**  
**LDI TEST PIT LOCATIONS AND RATIONALE**

Former Tidewater Facility  
Pawtucket, Rhode Island

<b>Explorations</b>	<b>Site Area</b>	<b>General Location and/or Purpose</b>
GZ-TP-536	NFA	Stove Coke Storage/Evaluate Fill Quality and Extent of Impermeable Cap
GZ-TP-537	NFA	SS-112 and MW-5/Evaluate Fill Quality and Extent of Impermeable Cap
GZ-TP-538	NFA	TP-16/Evaluate Fill Quality and Extent of Impermeable Cap
GZ-TP-539	NFA	ROAD-3-111010/Evaluate Fill Quality and Extent of Impermeable Cap
GZ-TP-540	NFA	Coke Storage Area/Evaluate Fill Quality and Extent of Impermeable Cap
GZ-TP-541	NFA	Coke Storage Area/Evaluate Fill Quality and Extent of Impermeable Cap
GZ-TP-542	FGPA	GZA TP-3/Evaluate Fill Quality and Extent of Impermeable Cap
GZ-TP-543	FGPA	SS-133/Evaluate Fill Quality and Extent of Impermeable Cap
GZ-TP-544	FGPA	Coal Storage Area/Evaluate Fill Quality and Extent of Impermeable Cap
GZ-TP-545	FGPA	Coal Storage Area/Evaluate Fill Quality and Extent of Impermeable Cap
GZ-TP-546	FGPA	SS-118/Evaluate Fill Quality and Extent of Impermeable Cap
GZ-TP-547	FGPA	SS-140/Evaluate Fill Quality and Extent of Impermeable Cap
GZ-TP-548	NFA	GZ-TP-502/Evaluate Fill Quality and Extent of Impermeable Cap
GZ-TP-549	FGPA	Former No.8 Gas Holder Area/Evaluate Fill Quality and Extent of Impermeable Cap
GZ-TP-550	FGPA	Former No.8 Gas Holder Area/Evaluate Fill Quality and Extent of Impermeable Cap
GZ-TP-551	FGPA	MW-341/Evaluate Fill Quality and Extent of Impermeable Cap
GZ-TP-552	FGPA	ROAD-2-111010/Evaluate Fill Quality and Extent of Impermeable Cap
GZ-TP-553	FGPA	Coal Storage and Propane Gas Tanks Area/Assess Blue Soils
GZ-TP-554	FGPA	SS-119/Evaluate Fill Quality and Extent of Impermeable Cap
GZ-TP-555	FGPA	Coal Storage Area/Evaluate Fill Quality and Extent of Impermeable Cap
GZ-TP-556	NFA	Coke Storage Area and TB-300/Evaluate Fill Quality and Extent of Impermeable Cap
GZ-TP-557	NFA	Coke Storage Area/Evaluate Fill Quality and Extent of Impermeable Cap
GZ-TP-558	NFA	Coke Storage Area/Evaluate Fill Quality and Extent of Impermeable Cap
GZ-TP-559	NFA	TP-364/Evaluate Fill Quality and Extent of Impermeable Cap
GZ-TP-560	NFA	TB-16/Evaluate Fill Quality and Extent of Impermeable Cap
GZ-SV-1	FGPA	SS-117/Locate Gas Line
GZ-SV-2	FGPA	Northeast of Natural Gas Facility/Locate Gas Line

**Notes:**

1. Test pits performed by Moran Environmental Recovery under the observation of GZA personnel.

**Legend:**

Area

FGPA = Former Gas Plant Area

FPPA = Former Power Plant Area

SFA = South Fill Area

**TABLE 1B**  
**LDI TEST BORING LOCATIONS AND RATIONALE**

Former Tidewater Facility  
Pawtucket, Rhode Island

<b>Exploration</b>	<b>Site Area</b>	<b>General Location and/or Purpose</b>
GZ-BK-501	NFA	Coke Storage Area/Bulkhead Evaluation
GZ-BW-501	FGPA	Storage and Tar Boiling Areas/Barrier Wall Evaluation
GZ-BW-502	FGPA	MW-303/Barrier Wall Evaluation
GZ-BK-502	FPPA	Transmission Tower Area/Bulkhead Evaluation
GZ-BW-503	FGPA	SG-205/Barrier Wall Evaluation
GZ-BW-504A	FGPA	SG-206/Barrier Wall Evaluation
GZ-BW-505	FGPA	TB-12/Barrier Wall Evaluation
GZ-BW-506	FPPA	Coal Storage Area/Barrier Wall Evaluation
GZ-BW-507	FPPA	Coal Storage Area/Barrier Wall Evaluation
GZ-BW-508	FPPA	Coal Storage Area/Barrier Wall Evaluation
GZ-BW-509	FPPA	Coal Storage Area/Barrier Wall Evaluation
GZ-BK-510	FPPA	Coal Storage Area/Bulkhead Evaluation
GZ-BW-511	FPPA	Coal Pile Area/Barrier Wall Evaluation
GZ-BW-512	SFA	MW-318/Barrier Wall Evaluation
GZ-BW-513	SFA	TP-2/Barrier Wall Evaluation
GZ-SB-514	FPPA	East of Existing Substation/Control House Evaluation
GZ-SB-515	FPPA	East of Existing Substation/Control House Evaluation
GZ-SB-516	FPPA	East of Existing Substation/Control House Evaluation
GZ-SB-517	FPPA	East of Existing Substation/Control House Evaluation
GZ-WB-501	FGPA	Bulkhead Evaluation
GZ-WB-502	FGPA	Bulkhead Evaluation
GZ-WB-503	FPPA	Bulkhead Evaluation
GZ-WB-504	NFA	Bulkhead Evaluation

**Notes:**

1. Boring performed by Aquifer Drilling & Testing under the observation of GZA personnel.
2. Borings GZ-WB-501 through GZ-WB-504 were performed within the Seekonk River via a barge.

**Legend:**

NFA = North Fill Area

**TABLE 1C**  
**LDI SURFACE SOIL SAMPLE LOCATIONS AND RATIONALE**

Former Tidewater Facility  
Pawtucket, Rhode Island

<b>Exploration</b>	<b>Site Area</b>	<b>General Location and/or Purpose</b>
GZ-SS-501	NFA	SG-100/Evaluate Surface Soil Quality and Capping Requirements
GZ-SS-502	NFA	TP-213/Evaluate Surface Soil Quality and Capping Requirements
GZ-SS-503	NFA	Stove Coke Storage Area/Evaluate Surface Soil Quality and Capping Requirements
GZ-SS-504	FGPA	Former No.8 Gas Holder Area/Evaluate Surface Soil Quality and Capping Requirements
GZ-SS-505	FGPA	Booster House/Evaluate Surface Soil Quality and Capping Requirements
GZ-SS-506	FGPA	Former No.7 Gas Holder Area/Evaluate Surface Soil Quality and Capping Requirements
GZ-SS-507	FGPA	North of Natural Gas Regulation Facility/Evaluate Surface Soil Quality and Capping Requirements
GZ-SS-508	FPPA	SG-114/Evaluate Surface Soil Quality and Capping Requirements
GZ-SS-509	FPPA	SG-106/Evaluate Surface Soil Quality and Capping Requirements
GZ-SS-510	FPPA	SG-106/Evaluate Surface Soil Quality and Capping Requirements
GZ-SS-511	FPPA	TP-113/Evaluate Surface Soil Quality and Capping Requirements
GZ-SS-512	FGPA	Propane Compressor and Control House Area/Evaluate Surface Soil Quality and Capping Requirements
GZ-SS-513	FGPA	Relief Holder #4 Area/Evaluate Surface Soil Quality and Capping Requirements
GZ-SS-514	FGPA	Relief Holder #4 Area/Evaluate Surface Soil Quality and Capping Requirements
GZ-SS-515	FPPA	SG-107/Evaluate Surface Soil Quality and Capping Requirements
GZ-SS-516	FPPA	West of Former Transformer Area/Evaluate Surface Soil Quality and Capping Requirements
GZ-SS-517	FPPA	South of Former Transformer Area/Evaluate Surface Soil Quality and Capping Requirements
GZ-SS-518	FPPA	TP-114/Evaluate Surface Soil Quality and Capping Requirements
GZ-SS-519	FPPA	TP-114/Evaluate Surface Soil Quality and Capping Requirements
GZ-SS-520	FPPA	East of B-108/Evaluate Surface Soil Quality and Capping Requirements
GZ-SS-521	FPPA	East of B-108/Evaluate Surface Soil Quality and Capping Requirements
GZ-SS-522	FPPA	East of B-108/Evaluate Surface Soil Quality and Capping Requirements
GZ-SS-523	FPPA	East of B-108/Evaluate Surface Soil Quality and Capping Requirements
GZ-SS-524	FPPA	East of SG-109/Evaluate Surface Soil Quality and Capping Requirements
GZ-SS-525	FPPA	West of TP-344/Evaluate Surface Soil Quality and Capping Requirements
GZ-SS-526	FPPA	TP-346/Evaluate Surface Soil Quality and Capping Requirements
GZ-SS-527	FPPA	RIDEM SS-1/Evaluate Surface Soil Quality and Capping Requirements
GZ-SS-528	FPPA	SS-143A/Evaluate Surface Soil Quality and Capping Requirements
GZ-SS-529	FPPA	SS-143B/Evaluate Surface Soil Quality and Capping Requirements
GZ-SS-530	FPPA	SS-143B/Evaluate Surface Soil Quality and Capping Requirements
GZ-SS-531	FPPA	SS-143C/Evaluate Surface Soil Quality and Capping Requirements
GZ-SS-532	SFA	East of SG-111/Evaluate Surface Soil Quality and Capping Requirements
GZ-SS-533	SFA	East of SG-111/Evaluate Surface Soil Quality and Capping Requirements
GZ-SS-534	SFA	East of SG-111/Evaluate Surface Soil Quality and Capping Requirements
GZ-SS-535	SFA	East of SG-111/Evaluate Surface Soil Quality and Capping Requirements
GZ-SS-536	SFA	RIDEM SS-9/Evaluate Surface Soil Quality and Capping Requirements
GZ-SS-537	SFA	SS-6/Evaluate Surface Soil Quality and Capping Requirements
GZ-SS-538	SFA	MW-107/Evaluate Surface Soil Quality and Capping Requirements
GZ-SS-539	SFA	RIDEM SS-7/Evaluate Surface Soil Quality and Capping Requirements

**TABLE 1C**  
**LDI SURFACE SOIL SAMPLE LOCATIONS AND RATIONALE**

Former Tidewater Facility  
Pawtucket, Rhode Island

<b>Exploration</b>	<b>Site Area</b>	<b>General Location and/or Purpose</b>
GZ-SS-540	SFA	RIDEM SS-7/Evaluate Surface Soil Quality and Capping Requirements
GZ-SS-541	SFA	TB-5/Evaluate Surface Soil Quality and Capping Requirements
GZ-SS-542	SFA	TB-5/Evaluate Surface Soil Quality and Capping Requirements
GZ-SS-543	SFA	SS-18/Evaluate Surface Soil Quality and Capping Requirements
GZ-SS-544	SFA	MW-321/Evaluate Surface Soil Quality and Capping Requirements
GZ-SS-545	SFA	MW-321/Evaluate Surface Soil Quality and Capping Requirements
GZ-SS-546	SFA	MW-321/Evaluate Surface Soil Quality and Capping Requirements
GZ-SS-547	SFA	B-106/Evaluate Surface Soil Quality and Capping Requirements
GZ-SS-548	SFA	B-106/Evaluate Surface Soil Quality and Capping Requirements
GZ-SS-549	SFA	SS-19/Evaluate Surface Soil Quality and Capping Requirements
GZ-SS-550	SFA	South of B-106/Evaluate Surface Soil Quality and Capping Requirements
GZ-SS-551	SFA	South of B-106/Evaluate Surface Soil Quality and Capping Requirements
GZ-SS-552	SFA	South of B-106/Evaluate Surface Soil Quality and Capping Requirements
GZ-SS-553	SFA	South of B-106/Evaluate Surface Soil Quality and Capping Requirements
GZ-SS-554	SFA	South of B-106/Evaluate Surface Soil Quality and Capping Requirements
GZ-SS-555	SFA	South of B-106/Evaluate Surface Soil Quality and Capping Requirements
GZ-SS-556	FPPA	Tower Area/Evaluate Surface Soil Quality and Capping Requirements
GZ-SS-557	FPPA	Tower Area/Evaluate Surface Soil Quality and Capping Requirements
GZ-SS-558	FPPA	Tower Area/Evaluate Surface Soil Quality and Capping Requirements
GZ-SS-559	FPPA	Tower Area/Evaluate Surface Soil Quality and Capping Requirements
GZ-SS-560	FPPA	Tower Area/Evaluate Surface Soil Quality and Capping Requirements
GZ-SS-561	FGPA	Frac Staging Area/Evaluate Surface Soil Quality and Capping Requirements
GZ-SS-562	NFA	Coal Pile Area/Evaluate Surface Soil Quality and Capping Requirements
GZ-SS-563	NFA	Stove Coke Storage Area/Evaluate Surface Soil Quality and Capping Requirements
GZ-SS-564	NFA	Garage Area/Evaluate Surface Soil Quality and Capping Requirements
GZ-SS-565	NFA	Garage Area/Evaluate Surface Soil Quality and Capping Requirements
GZ-SS-566	NFA	Garage Area/Evaluate Surface Soil Quality and Capping Requirements
GZ-SS-567	NFA	TP-16/Evaluate Surface Soil Quality and Capping Requirements
GZ-SS-568	NFA	TP-16/Evaluate Surface Soil Quality and Capping Requirements
GZ-SS-569	NFA	TP-16 and SS-34/Evaluate Surface Soil Quality and Capping Requirements
GZ-SS-570	NFA	SS-34/Evaluate Surface Soil Quality and Capping Requirements
GZ-SS-FT-501	FPPA	Former Transformer Area
GZ-SS-FT-502	FPPA	Former Transformer Area
GZ-SS-FT-503	FPPA	Former Transformer Area
GZ-SS-FT-504	FPPA	Former Transformer Area
GZ-SS-FT-505	FPPA	Former Transformer Area
GZ-SS-FT-506	FPPA	Former Transformer Area

**TABLE 1C**  
**LDI SURFACE SOIL SAMPLE LOCATIONS AND RATIONALE**  
Former Tidewater Facility  
Pawtucket, Rhode Island

Exploration	Site Area	General Location and/or Purpose
GZ-CS-501 (Concrete)	FPPA	Former Transformer Area
GZ-CS-502 (Concrete)	FPPA	Former Transformer Area
GZ-CS-503 (Concrete)	FPPA	Former Transformer Area
GZ-CS-504 (Concrete)	FPPA	Former Transformer Area
GZ-CS-505 (Concrete)	FPPA	Former Transformer Area
GZ-CS-506 (Concrete)	FPPA	Former Transformer Area
GZ-CS-507 (Concrete)	FPPA	Former Transformer Area
GZ-CS-508 (Concrete)	FPPA	Former Transformer Area

**Notes:**

1. Boring performed by Aquifer Drilling & Testing under the observation of GZA personnel.
2. Borings GZ-WB-501 through GZ-WB-504 were performed within the Seekonk River via a barge.

**Legend:**

NFA = North Fill Area  
FGPA = Former Gas Plant Area  
FPPA = Former Power Plant Area  
SFA = South Fill Area



Table 2A  
Summary of LDI Analytical  
VOCs - Surface Soil Testing Results  
Former Tidewater Facility  
Pawtucket, RI

	Units	RIDEM GB Leachability Criteria	RIDEM Industrial/ Commercial DEC	RIDEM UCL	1709662-01 GZ-SS-501 (0-2') 09/21/2017	1709662-02 GZ-SS-502 (0-2') 09/21/2017	1709662-03 GZ-SS-503 (0-2') 09/21/2017	1712222-02 GZ-SS-562 (0-2') 12/8/2017	1712222-03 GZ-SS-563 (0-2') 12/8/2017	1712222-04 GZ-SS-564 (0-2') 12/8/2017	1712222-05 GZ-SS-565 (0-2') 12/8/2017	1712222-07 GZ-SS-566 (0-2') 12/8/2017
<b>VOLATILE ORGANICS</b>												
1,1,1,2-Tetrachloroethane	mg/kg	NE	220	10,000	0.0047 U	0.0042 U	0.0029 U	0.0082 U	0.0043 U	0.0052 U	0.0058 U	0.0069 U
1,1,1-Trichloroethane	mg/kg	160	10,000	10,000	0.0047 U	0.0042 U	0.0029 U	0.0082 U	0.0043 U	0.0052 U	0.0058 U	0.0069 U
1,1,2,2-Tetrachloroethane	mg/kg	NE	29	10,000	0.0047 U	0.0042 U	0.0029 U	0.0082 U	0.0043 U	0.0052 U	0.0058 U	0.0069 U
1,1,2-Trichloroethane	mg/kg	NE	100	10,000	0.0047 U	0.0042 U	0.0029 U	0.0082 U	0.0043 U	0.0052 U	0.0058 U	0.0069 U
1,1-Dichloroethane	mg/kg	NE	10,000	10,000	0.0047 U	0.0042 U	0.0029 U	0.0082 U	0.0043 U	0.0052 U	0.0058 U	0.0069 U
1,1-Dichloroethene	mg/kg	1	9.5	10,000	0.0047 U	0.0042 U	0.0029 U	0.0082 U	0.0043 U	0.0052 U	0.0058 U	0.0069 U
1,1-Dichloropropene	mg/kg	NE	NE	10,000	0.0047 U	0.0042 U	0.0029 U	0.0082 U	0.0043 U	0.0052 U	0.0058 U	0.0069 U
1,2,3-Trichlorobenzene	mg/kg	NE	NE	10,000	0.0047 U	0.0042 U	0.0029 U	0.0082 U	0.0043 U	0.0052 U	0.0058 U	0.0069 U
1,2,3-Trichloropropane	mg/kg	NE	NE	10,000	0.0047 U	0.0042 U	0.0029 U	0.0082 U	0.0043 U	0.0052 U	0.0058 U	0.0069 U
1,2,4-Trichlorobenzene	mg/kg	NE	10,000	10,000	0.0047 U	0.0042 U	0.0029 U	0.0082 U	0.0043 U	0.0052 U	0.0058 U	0.0069 U
1,2,4-Trimethylbenzene	mg/kg	NE	NE	10,000	0.0047 U	0.0042 U	0.0029 U	0.0082 U	0.0043 U	0.0052 U	0.0058 U	0.0069 U
1,2-Dibromo-3-Chloropropane	mg/kg	NE	NE	10,000	0.0047 U	0.0042 U	0.0029 U	0.0082 U	0.0043 U	0.0052 U	0.0058 U	0.0069 U
1,2-Dibromoethane (EDB)	mg/kg	NE	0.07	10,000	0.0047 U	0.0042 U	0.0029 U	0.0082 U	0.0043 U	0.0052 U	0.0058 U	0.0069 U
1,2-Dichlorobenzene	mg/kg	NE	10,000	10,000	0.0047 U	0.0042 U	0.0029 U	0.0082 U	0.0043 U	0.0052 U	0.0058 U	0.0069 U
1,2-Dichloroethane	mg/kg	2.3	63	10,000	0.0047 U	0.0042 U	0.0029 U	0.0082 U	0.0043 U	0.0052 U	0.0058 U	0.0069 U
1,2-Dichloropropane	mg/kg	70	84	10,000	0.0047 U	0.0042 U	0.0029 U	0.0082 U	0.0043 U	0.0052 U	0.0058 U	0.0069 U
1,3,5-Trimethylbenzene	mg/kg	NE	NE	10,000	0.0047 U	0.0042 U	0.0029 U	0.0082 U	0.0043 U	0.0052 U	0.0058 U	0.0069 U
1,3-Dichlorobenzene	mg/kg	NE	10,000	10,000	0.0047 U	0.0042 U	0.0029 U	0.0082 U	0.0043 U	0.0052 U	0.0058 U	0.0069 U
1,3-Dichloropropane	mg/kg	NE	NE	10,000	0.0047 U	0.0042 U	0.0029 U	0.0082 U	0.0043 U	0.0052 U	0.0058 U	0.0069 U
1,4-Dichlorobenzene	mg/kg	NE	240	10,000	0.0047 U	0.0042 U	0.0029 U	0.0082 U	0.0043 U	0.0052 U	0.0058 U	0.0069 U
1,4-Dioxane	mg/kg	NE	NE	10,000	0.0949 U	0.0833 U	0.0586 U	0.164 U	0.0866 U	0.105 U	0.116 U	0.138 U
1-Chlorohexane	mg/kg	NE	NE	10,000	0.0047 U	0.0042 U	0.0029 U	0.0082 U	0.0043 U	0.0052 U	0.0058 U	0.0069 U
2,2-Dichloropropane	mg/kg	NE	NE	10,000	0.0047 U	0.0042 U	0.0029 U	0.0082 U	0.0043 U	0.0052 U	0.0058 U	0.0069 U
2-Butanone (MEK)	mg/kg	NE	10,000	10,000	0.0474 U	0.0417 U	0.0293 U	0.082 U	0.0433 U	0.0523 U	0.0581 U	0.0689 U
2-Chlorotoluene	mg/kg	NE	NE	10,000	0.0047 U	0.0042 U	0.0029 U	0.0082 U	0.0043 U	0.0052 U	0.0058 U	0.0069 U
2-Hexanone	mg/kg	NE	NE	10,000	0.0474 U	0.0417 U	0.0293 U	0.082 U	0.0433 U	0.0523 U	0.0581 U	0.0689 U
4-Chlorotoluene	mg/kg	NE	NE	10,000	0.0047 U	0.0042 U	0.0029 U	0.0082 U	0.0043 U	0.0052 U	0.0058 U	0.0069 U
4-Isopropyltoluene	mg/kg	NE	NE	10,000	0.0047 U	0.0042 U	0.0036 U	0.0082 U	0.0043 U	0.0052 U	0.0058 U	0.0069 U
4-Methyl-2-Pentanone (MIBK)	mg/kg	NE	10,000	10,000	0.0474 U	0.0417 U	0.0293 U	0.082 U	0.0433 U	0.0523 U	0.0581 U	0.0689 U
Acetone	mg/kg	NE	10,000	10,000	0.0474 U	0.0417 U	0.0585 U	0.082 U	0.0433 U	0.0523 U	0.0581 U	0.0689 U
Benzene	mg/kg	4.3	200	10,000	0.0047 U	0.0042 U	0.0029 U	0.0082 U	0.0043 U	0.0052 U	0.0058 U	0.0069 U
Bromobenzene	mg/kg	NE	NE	10,000	0.0047 U	0.0042 U	0.0029 U	0.0082 U	0.0043 U	0.0052 U	0.0058 U	0.0069 U
Bromochloromethane	mg/kg	NE	NE	10,000	0.0047 U	0.0042 U	0.0029 U	0.0082 U	0.0043 U	0.0052 U	0.0058 U	0.0069 U
Bromodichloromethane	mg/kg	NE	92	10,000	0.0047 U	0.0042 U	0.0029 U	0.0082 U	0.0043 U	0.0052 U	0.0058 U	0.0069 U
Bromoform	mg/kg	NE	720	10,000	0.0047 U	0.0042 U	0.0029 U	0.0082 U	0.0043 U	0.0052 U	0.0058 U	0.0069 U
Bromomethane	mg/kg	NE	2,900	10,000	0.0095 U	0.0083 U	0.0059 U	0.0164 U	0.0087 U	0.0105 U	0.0116 U	0.0138 U
Carbon Disulfide	mg/kg	NE	NE	10,000	0.0047 U	0.0042 U	0.0029 U	0.0082 U	0.0043 U	0.0052 U	0.0058 U	0.0069 U
Carbon Tetrachloride	mg/kg	5	44	10,000	0.0047 U	0.0042 U	0.0029 U	0.0082 U	0.0043 U	0.0052 U	0.0058 U	0.0069 U
Chlorobenzene	mg/kg	100	10,000	10,000	0.0047 U	0.0042 U	0.0029 U	0.0082 U	0.0043 U	0.0052 U	0.0058 U	0.0069 U
Chloroethane	mg/kg	NE	NE	10,000	0.0095 U	0.0083 U	0.0059 U	0.0164 U	0.0087 U	0.0105 U	0.0116 U	0.0138 U
Chloroform	mg/kg	NE	940	10,000	0.0047 U	0.0042 U	0.0029 U	0.0082 U	0.0043 U	0.0052 U	0.0058 U	0.0069 U
Chloromethane	mg/kg	NE	NE	10,000	0.0095 U	0.0083 U	0.0059 U	0.0164 U	0.0087 U	0.0105 U	0.0116 U	0.0138 U
cis-1,2-Dichloroethene	mg/kg	6	10,000	10,000	0.0047 U	0.0042 U	0.0029 U	0.0082 U	0.0043 U	0.0052 U	0.0058 U	0.0069 U
cis-1,3-Dichloropropene	mg/kg	NE	NE	10,000	0.0047 U	0.0042 U	0.0029 U	0.0082 U	0.0043 U	0.0052 U	0.0058 U	0.0069 U
Dibromochloromethane	mg/kg	NE	NE	10,000	0.0047 U	0.0042 U	0.0029 U	0.0082 U	0.0043 U	0.0052 U	0.0058 U	0.0069 U
Dibromomethane	mg/kg	NE	NE	10,000	0.0047 U	0.0042 U	0.0029 U	0.0082 U	0.0043 U	0.0052 U	0.0058 U	0.0069 U
Dichlorodifluoromethane	mg/kg	NE	NE	10,000	0.0095 U	0.0083 U	0.0059 U	0.0164 U	0.0087 U	0.0105 U	0.0116 U	0.0138 U
Diethylether	mg/kg	NE	NE	10,000	0.0047 U	0.0042 U	0.0029 U	0.0082 U	0.0043 U	0.0052 U	0.0058 U	0.0069 U
Di-isopropyl ether	mg/kg	NE	NE	10,000	0.0047 U	0.0042 U	0.0029 U	0.0082 U	0.0043 U	0.0052 U	0.0058 U	0.0069 U
Ethyl tertiary-butyl ether	mg/kg	NE	NE	10,000	0.0047 U	0.0042 U	0.0029 U	0.0082 U	0.0043 U	0.0052 U	0.0058 U	0.0069 U
Ethylbenzene	mg/kg	62	10,000	10,000	0.0047 U	0.0042 U	0.0029 U	0.0082 U	0.0043 U	0.0052 U	0.0058 U	0.0069 U

**Table 2A**  
**Summary of LDI Analytical**  
**VOCs - Surface Soil Testing Results**  
**Former Tidewater Facility**  
**Pawtucket, RI**

	Units	RIDEM GB Leachability Criteria	RIDEM Industrial/ Commercial DEC	RIDEM UCL	1709662-01 GZ-SS-501 (0-2') 09/21/2017	1709662-02 GZ-SS-502 (0-2') 09/21/2017	1709662-03 GZ-SS-503 (0-2') 09/21/2017	1712222-02 GZ-SS-562 (0-2') 12/8/2017	1712222-03 GZ-SS-563 (0-2') 12/8/2017	1712222-04 GZ-SS-564 (0-2') 12/8/2017	1712222-05 GZ-SS-565 (0-2') 12/8/2017	1712222-07 GZ-SS-566 (0-2') 12/8/2017
<b>VOLATILE ORGANICS</b>												
Hexachlorobutadiene	mg/kg	NE	73	10,000	0.0047 U	0.0042 U	0.0029 U	0.0082 U	0.0043 U	0.0052 U	0.0058 U	0.0069 U
Isopropylbenzene	mg/kg	NE	10,000	10,000	0.0047 U	0.0042 U	0.0029 U	0.0082 U	0.0043 U	0.0052 U	0.0058 U	0.0069 U
Methyl tert-butyl ether	mg/kg	100	10,000	10,000	0.0047 U	0.0042 U	0.0029 U	0.0082 U	0.0043 U	0.0052 U	0.0058 U	0.0069 U
Methylene Chloride	mg/kg	NE	760	10,000	0.0237 U	0.0208 U	0.0146 U	0.041 U	0.0216 U	0.0262 U	0.029 U	0.0344 U
Naphthalene	mg/kg	NE	10,000	10,000	0.0047 U	0.0042 U	0.0029 U	0.0082 U	0.0043 U	0.0052 U	0.0058 U	0.0069 U
n-Butylbenzene	mg/kg	NE	NE	10,000	0.0047 U	0.0042 U	0.0029 U	0.0082 U	0.0043 U	0.0052 U	0.0058 U	0.0069 U
n-Propylbenzene	mg/kg	NE	NE	10,000	0.0047 U	0.0042 U	0.0029 U	0.0082 U	0.0043 U	0.0052 U	0.0058 U	0.0069 U
sec-Butylbenzene	mg/kg	NE	NE	10,000	0.0047 U	0.0042 U	0.0029 U	0.0082 U	0.0043 U	0.0052 U	0.0058 U	0.0069 U
Styrene	mg/kg	64	190	10,000	0.0047 U	0.0042 U	0.0029 U	0.0082 U	0.0043 U	0.0052 U	0.0058 U	0.0069 U
tert-Butylbenzene	mg/kg	NE	NE	10,000	0.0047 U	0.0042 U	0.0029 U	0.0082 U	0.0043 U	0.0052 U	0.0058 U	0.0069 U
Tertiary-amyl methyl ether	mg/kg	NE	NE	10,000	0.0047 U	0.0042 U	0.0029 U	0.0082 U	0.0043 U	0.0052 U	0.0058 U	0.0069 U
Tetrachloroethene	mg/kg	4.2	110	10,000	0.0047 U	0.0042 U	0.0029 U	0.0082 U	0.0043 U	0.0052 U	0.0058 U	0.0069 U
Tetrahydrofuran	mg/kg	NE	NE	10,000	0.0047 U	0.0042 U	0.0029 U	0.0082 U	0.0043 U	0.0052 U	0.0058 U	0.0069 U
Toluene	mg/kg	54	10,000	10,000	0.0047 U	0.0042 U	0.0029 U	0.0082 U	0.0043 U	0.0052 U	0.0058 U	0.0069 U
trans-1,2-Dichloroethene	mg/kg	92	10,000	10,000	0.0047 U	0.0042 U	0.0029 U	0.0082 U	0.0043 U	0.0052 U	0.0058 U	0.0069 U
trans-1,3-Dichloropropene	mg/kg	NE	NE	10,000	0.0047 U	0.0042 U	0.0029 U	0.0082 U	0.0043 U	0.0052 U	0.0058 U	0.0069 U
Trichloroethene	mg/kg	20	520	10,000	0.0047 U	0.0042 U	0.0029 U	0.0082 U	0.0043 U	0.0052 U	0.0058 U	0.0069 U
Trichlorofluoromethane	mg/kg	NE	NE	10,000	0.0047 U	0.0042 U	0.0029 U	0.0082 U	0.0043 U	0.0052 U	0.0058 U	0.0069 U
Vinyl Acetate	mg/kg	NE	NE	10,000	0.0047 U	0.0042 U	0.0029 U	0.0082 U	0.0043 U	0.0052 U	0.0058 U	0.0069 U
Vinyl Chloride	mg/kg	NE	3	10,000	0.0095 U	0.0083 U	0.0059 U	0.0164 U	0.0087 U	0.0105 U	0.0116 U	0.0138 U
o-Xylene	mg/kg	NE	10,000	10,000	0.0047 U	0.0042 U	0.0029 U	0.0082 U	0.0043 U	0.0052 U	0.0058 U	0.0069 U
m&p-Xylene	mg/kg	NE	10,000	10,000	0.0095 U	0.0083 U	0.0059 U	0.0164 U	0.0087 U	0.0105 U	0.0116 U	0.0138 U
Total Xylenes	mg/kg	NE	10,000	10,000	0.0095 U	0.0083 U	0.0059 U	0.0164 U	0.0087 U	0.0105 U	0.0116 U	0.0138 U

**Notes**

NE = Not Established

NA = Not Analyzed

NFA = North Fill Area

FGPA = Former Gas Plant Area

FPPA = Former Power Plant Area

SFA = South Fill Area

**Detected concentrations are bolded.**

**Gray shaded cells indicates the concentration exceeds the RIDEM Method 1**

**Industrial/Commercial \Direct Exposure Criteria (I/C DEC).**

Detection limits highlighted in *blue and in italics* exceed the RIDEM Method 1 Criteria.

Underlined concentrations exceed the RIDEM Method 1 GB Leachability Criteria.

**A concentration with a bold border exceeds the Upper Concentration Limit.**

Undetected analytes have a "U" qualifier.

Any analytes reported from a diluted run of the original analysis have a "D" qualifier.

Blank cells indicate a sample was not analyzed for that parameter

"E" qualifier indicates estimated concentration above the quantitation limit.

**Table 2A**  
**Summary of LDI Analytical**  
**VOCs - Surface Soil Testing Results**  
**Former Tidewater Facility**  
**Pawtucket, RI**

	Units	RIDEM GB Leachability Criteria	RIDEM Industrial/ Commercial DEC	RIDEM UCL	1712222-08 GZ-SS-567 (0-2') 12/8/2017	1712222-09 GZ-SS-568 (0-2') 12/8/2017	1712222-10 GZ-SS-569 (0-2') 12/8/2017	1712222-11 GZ-SS-570 (0-2') 12/8/2017	1709662-04 GZ-SS-504 (0-2') 09/21/2017	1709662-05 GZ-SS-505 (0-2') 09/21/2017	1709662-06 GZ-SS-506 (0-2') 09/21/2017	1709662-07 GZ-SS-507 (0-2') 09/22/2017
<b>VOLATILE ORGANICS</b>												
1,1,1,2-Tetrachloroethane	mg/kg	NE	220	10,000	0.0035 U	0.0032 U	0.0031 U	0.0039 U	0.0041 U	0.0034 U	0.005 U	0.004 U
1,1,1-Trichloroethane	mg/kg	160	10,000	10,000	0.0035 U	0.0032 U	0.0031 U	0.0039 U	0.0041 U	0.0034 U	0.005 U	0.004 U
1,1,2,2-Tetrachloroethane	mg/kg	NE	29	10,000	0.0035 U	0.0032 U	0.0031 U	0.0039 U	0.0041 U	0.0034 U	0.005 U	0.004 U
1,1,2-Trichloroethane	mg/kg	NE	100	10,000	0.0035 U	0.0032 U	0.0031 U	0.0039 U	0.0041 U	0.0034 U	0.005 U	0.004 U
1,1-Dichloroethane	mg/kg	NE	10,000	10,000	0.0035 U	0.0032 U	0.0031 U	0.0039 U	0.0041 U	0.0034 U	0.005 U	0.004 U
1,1-Dichloroethene	mg/kg	1	9.5	10,000	0.0035 U	0.0032 U	0.0031 U	0.0039 U	0.0041 U	0.0034 U	0.005 U	0.004 U
1,1-Dichloropropene	mg/kg	NE	NE	10,000	0.0035 U	0.0032 U	0.0031 U	0.0039 U	0.0041 U	0.0034 U	0.005 U	0.004 U
1,2,3-Trichlorobenzene	mg/kg	NE	NE	10,000	0.0035 U	0.0032 U	0.0031 U	0.0039 U	0.0041 U	0.0034 U	0.005 U	0.004 U
1,2,3-Trichloropropane	mg/kg	NE	NE	10,000	0.0035 U	0.0032 U	0.0031 U	0.0039 U	0.0041 U	0.0034 U	0.005 U	0.004 U
1,2,4-Trichlorobenzene	mg/kg	NE	10,000	10,000	0.0035 U	0.0032 U	0.0031 U	0.0039 U	0.0041 U	0.0034 U	0.005 U	0.004 U
1,2,4-Trimethylbenzene	mg/kg	NE	NE	10,000	0.0035 U	0.0032 U	0.0031 U	0.0039 U	0.0041 U	0.0034 U	0.005 U	0.004 U
1,2-Dibromo-3-Chloropropane	mg/kg	NE	NE	10,000	0.0035 U	0.0032 U	0.0031 U	0.0039 U	0.0041 U	0.0034 U	0.005 U	0.004 U
1,2-Dibromoethane (EDB)	mg/kg	NE	0.07	10,000	0.0035 U	0.0032 U	0.0031 U	0.0039 U	0.0041 U	0.0034 U	0.005 U	0.004 U
1,2-Dichlorobenzene	mg/kg	NE	10,000	10,000	0.0035 U	0.0032 U	0.0031 U	0.0039 U	0.0041 U	0.0034 U	0.005 U	0.004 U
1,2-Dichloroethane	mg/kg	2.3	63	10,000	0.0035 U	0.0032 U	0.0031 U	0.0039 U	0.0041 U	0.0034 U	0.005 U	0.004 U
1,2-Dichloropropane	mg/kg	70	84	10,000	0.0035 U	0.0032 U	0.0031 U	0.0039 U	0.0041 U	0.0034 U	0.005 U	0.004 U
1,3,5-Trimethylbenzene	mg/kg	NE	NE	10,000	0.0035 U	0.0032 U	0.0031 U	0.0039 U	0.0041 U	0.0034 U	0.005 U	0.004 U
1,3-Dichlorobenzene	mg/kg	NE	10,000	10,000	0.0035 U	0.0032 U	0.0031 U	0.0039 U	0.0041 U	0.0034 U	0.005 U	0.004 U
1,3-Dichloropropane	mg/kg	NE	NE	10,000	0.0035 U	0.0032 U	0.0031 U	0.0039 U	0.0041 U	0.0034 U	0.005 U	0.004 U
1,4-Dichlorobenzene	mg/kg	NE	240	10,000	0.0035 U	0.0032 U	0.0031 U	0.0039 U	0.0041 U	0.0034 U	0.005 U	0.004 U
1,4-Dioxane	mg/kg	NE	NE	10,000	0.0694 U	0.0648 U	0.0618 U	0.0788 U	0.0825 U	0.0674 U	0.0994 U	0.0795 U
1-Chlorohexane	mg/kg	NE	NE	10,000	0.0035 U	0.0032 U	0.0031 U	0.0039 U	0.0041 U	0.0034 U	0.005 U	0.004 U
2,2-Dichloropropane	mg/kg	NE	NE	10,000	0.0035 U	0.0032 U	0.0031 U	0.0039 U	0.0041 U	0.0034 U	0.005 U	0.004 U
2-Butanone (MEK)	mg/kg	NE	10,000	10,000	0.0347 U	0.0324 U	0.0309 U	0.0394 U	0.0412 U	0.0337 U	0.0497 U	0.0397 U
2-Chlorotoluene	mg/kg	NE	NE	10,000	0.0035 U	0.0032 U	0.0031 U	0.0039 U	0.0041 U	0.0034 U	0.005 U	0.004 U
2-Hexanone	mg/kg	NE	NE	10,000	0.0347 U	0.0324 U	0.0309 U	0.0394 U	0.0412 U	0.0337 U	0.0497 U	0.0397 U
4-Chlorotoluene	mg/kg	NE	NE	10,000	0.0035 U	0.0032 U	0.0031 U	0.0039 U	0.0041 U	0.0034 U	0.005 U	0.004 U
4-Isopropyltoluene	mg/kg	NE	NE	10,000	0.0035 U	0.0032 U	0.0031 U	0.0039 U	0.0041 U	0.0034 U	0.005 U	0.004 U
4-Methyl-2-Pentanone (MIBK)	mg/kg	NE	10,000	10,000	0.0347 U	0.0324 U	0.0309 U	0.0394 U	0.0412 U	0.0337 U	0.0497 U	0.0397 U
Acetone	mg/kg	NE	10,000	10,000	0.0347 U	0.0324 U	0.0309 U	0.0394 U	0.0412 U	0.0337 U	0.0497 U	0.0397 U
Benzene	mg/kg	4.3	200	10,000	0.0035 U	0.0032 U	0.0031 U	0.0039 U	0.0041 U	0.0034 U	0.005 U	0.004 U
Bromobenzene	mg/kg	NE	NE	10,000	0.0035 U	0.0032 U	0.0031 U	0.0039 U	0.0041 U	0.0034 U	0.005 U	0.004 U
Bromochloromethane	mg/kg	NE	NE	10,000	0.0035 U	0.0032 U	0.0031 U	0.0039 U	0.0041 U	0.0034 U	0.005 U	0.004 U
Bromodichloromethane	mg/kg	NE	92	10,000	0.0035 U	0.0032 U	0.0031 U	0.0039 U	0.0041 U	0.0034 U	0.005 U	0.004 U
Bromoform	mg/kg	NE	720	10,000	0.0035 U	0.0032 U	0.0031 U	0.0039 U	0.0041 U	0.0034 U	0.005 U	0.004 U
Bromomethane	mg/kg	NE	2,900	10,000	0.0069 U	0.0065 U	0.0062 U	0.0079 U	0.0082 U	0.0067 U	0.0099 U	0.0079 U
Carbon Disulfide	mg/kg	NE	NE	10,000	0.0035 U	0.0032 U	0.0031 U	0.0039 U	0.0041 U	0.0034 U	0.005 U	0.004 U
Carbon Tetrachloride	mg/kg	5	44	10,000	0.0035 U	0.0032 U	0.0031 U	0.0039 U	0.0041 U	0.0034 U	0.005 U	0.004 U
Chlorobenzene	mg/kg	100	10,000	10,000	0.0035 U	0.0032 U	0.0031 U	0.0039 U	0.0041 U	0.0034 U	0.005 U	0.004 U
Chloroethane	mg/kg	NE	NE	10,000	0.0069 U	0.0065 U	0.0062 U	0.0079 U	0.0082 U	0.0067 U	0.0099 U	0.0079 U
Chloroform	mg/kg	NE	940	10,000	0.0035 U	0.0032 U	0.0031 U	0.0039 U	0.0041 U	0.0034 U	0.005 U	0.004 U
Chloromethane	mg/kg	NE	NE	10,000	0.0069 U	0.0065 U	0.0062 U	0.0079 U	0.0082 U	0.0067 U	0.0099 U	0.0079 U
cis-1,2-Dichloroethene	mg/kg	6	10,000	10,000	0.0035 U	0.0032 U	0.0031 U	0.0039 U	0.0041 U	0.0034 U	0.005 U	0.004 U
cis-1,3-Dichloropropene	mg/kg	NE	NE	10,000	0.0035 U	0.0032 U	0.0031 U	0.0039 U	0.0041 U	0.0034 U	0.005 U	0.004 U
Dibromochloromethane	mg/kg	NE	NE	10,000	0.0035 U	0.0032 U	0.0031 U	0.0039 U	0.0041 U	0.0034 U	0.005 U	0.004 U
Dibromomethane	mg/kg	NE	NE	10,000	0.0035 U	0.0032 U	0.0031 U	0.0039 U	0.0041 U	0.0034 U	0.005 U	0.004 U
Dichlorodifluoromethane	mg/kg	NE	NE	10,000	0.0069 U	0.0065 U	0.0062 U	0.0079 U	0.0082 U	0.0067 U	0.0099 U	0.0079 U
Diethylether	mg/kg	NE	NE	10,000	0.0035 U	0.0032 U	0.0031 U	0.0039 U	0.0041 U	0.0034 U	0.005 U	0.004 U
Di-isopropyl ether	mg/kg	NE	NE	10,000	0.0035 U	0.0032 U	0.0031 U	0.0039 U	0.0041 U	0.0034 U	0.005 U	0.004 U
Ethyl tertiary-butyl ether	mg/kg	NE	NE	10,000	0.0035 U	0.0032 U	0.0031 U	0.0039 U	0.0041 U	0.0034 U	0.005 U	0.004 U
Ethylbenzene	mg/kg	62	10,000	10,000	0.0035 U	0.0032 U	0.0031 U	0.0039 U	0.0041 U	0.0034 U	0.005 U	0.004 U

Table 2A  
Summary of LDI Analytical  
VOCs - Surface Soil Testing Results  
Former Tidewater Facility  
Pawtucket, RI

	Units	RIDEM GB Leachability Criteria	RIDEM Industrial/ Commercial DEC	RIDEM UCL	1712222-08 GZ-SS-567 (0-2') 12/8/2017	1712222-09 GZ-SS-568 (0-2') 12/8/2017	1712222-10 GZ-SS-569 (0-2') 12/8/2017	1712222-11 GZ-SS-570 (0-2') 12/8/2017	1709662-04 GZ-SS-504 (0-2') 09/21/2017	1709662-05 GZ-SS-505 (0-2') 09/21/2017	1709662-06 GZ-SS-506 (0-2') 09/21/2017	1709662-07 GZ-SS-507 (0-2') 09/22/2017
<b>VOLATILE ORGANICS</b>												
Hexachlorobutadiene	mg/kg	NE	73	10,000	0.0035 U	0.0032 U	0.0031 U	0.0039 U	0.0041 U	0.0034 U	0.005 U	0.004 U
Isopropylbenzene	mg/kg	NE	10,000	10,000	0.0035 U	0.0032 U	0.0031 U	0.0039 U	0.0041 U	0.0034 U	0.005 U	0.004 U
Methyl tert-butyl ether	mg/kg	100	10,000	10,000	0.0035 U	0.0032 U	0.0031 U	0.0039 U	0.0041 U	0.0034 U	0.005 U	0.004 U
Methylene Chloride	mg/kg	NE	760	10,000	0.0173 U	0.0162 U	0.0154 U	0.0197 U	0.0206 U	0.0168 U	0.0249 U	0.0199 U
Naphthalene	mg/kg	NE	10,000	10,000	0.0035 U	0.0032 U	0.0031 U	0.0039 U	0.0041 U	0.0034 U	0.005 U	0.004 U
n-Butylbenzene	mg/kg	NE	NE	10,000	0.0035 U	0.0032 U	0.0031 U	0.0039 U	0.0041 U	0.0034 U	0.005 U	0.004 U
n-Propylbenzene	mg/kg	NE	NE	10,000	0.0035 U	0.0032 U	0.0031 U	0.0039 U	0.0041 U	0.0034 U	0.005 U	0.004 U
sec-Butylbenzene	mg/kg	NE	NE	10,000	0.0035 U	0.0032 U	0.0031 U	0.0039 U	0.0041 U	0.0034 U	0.005 U	0.004 U
Styrene	mg/kg	64	190	10,000	0.0035 U	0.0032 U	0.0031 U	0.0039 U	0.0041 U	0.0034 U	0.005 U	0.004 U
tert-Butylbenzene	mg/kg	NE	NE	10,000	0.0035 U	0.0032 U	0.0031 U	0.0039 U	0.0041 U	0.0034 U	0.005 U	0.004 U
Tertiary-amyl methyl ether	mg/kg	NE	NE	10,000	0.0035 U	0.0032 U	0.0031 U	0.0039 U	0.0041 U	0.0034 U	0.005 U	0.004 U
Tetrachloroethene	mg/kg	4.2	110	10,000	0.0035 U	0.0032 U	0.0031 U	0.0039 U	0.0041 U	0.0034 U	0.005 U	0.004 U
Tetrahydrofuran	mg/kg	NE	NE	10,000	0.0035 U	0.0032 U	0.0031 U	0.0039 U	0.0041 U	0.0034 U	0.005 U	0.004 U
Toluene	mg/kg	54	10,000	10,000	0.0035 U	0.0032 U	0.0031 U	0.0039 U	0.0041 U	0.0034 U	0.005 U	0.004 U
trans-1,2-Dichloroethene	mg/kg	92	10,000	10,000	0.0035 U	0.0032 U	0.0031 U	0.0039 U	0.0041 U	0.0034 U	0.005 U	0.004 U
trans-1,3-Dichloropropene	mg/kg	NE	NE	10,000	0.0035 U	0.0032 U	0.0031 U	0.0039 U	0.0041 U	0.0034 U	0.005 U	0.004 U
Trichloroethene	mg/kg	20	520	10,000	0.0035 U	0.0032 U	0.0031 U	0.0039 U	0.0041 U	0.0034 U	0.005 U	0.004 U
Trichlorofluoromethane	mg/kg	NE	NE	10,000	0.0035 U	0.0032 U	0.0031 U	0.0039 U	0.0041 U	0.0034 U	0.005 U	0.004 U
Vinyl Acetate	mg/kg	NE	NE	10,000	0.0035 U	0.0032 U	0.0031 U	0.0039 U	0.0041 U	0.0034 U	0.005 U	0.004 U
Vinyl Chloride	mg/kg	NE	3	10,000	0.0069 U	0.0065 U	0.0062 U	0.0079 U	0.0082 U	0.0067 U	0.0099 U	0.0079 U
o-Xylene	mg/kg	NE	10,000	10,000	0.0035 U	0.0032 U	0.0031 U	0.0039 U	0.0041 U	0.0034 U	0.005 U	0.004 U
m&p-Xylene	mg/kg	NE	10,000	10,000	0.0069 U	0.0065 U	0.0062 U	0.0079 U	0.0082 U	0.0067 U	0.0099 U	0.0079 U
Total Xylenes	mg/kg	NE	10,000	10,000	0.0069 U	0.0065 U	0.0062 U	0.0079 U	0.0082 U	0.0067 U	0.0099 U	0.0079 U

**Notes**

NE = Not Established

NA = Not Analyzed

NFA = North Fill Area

FGPA = Former Gas Plant Area

FPPA = Former Power Plant Area

SFA = South Fill Area

**Detected concentrations are bolded.**

**Gray shaded cells indicates the concentration exceeds the RIDEM Method 1**

**Industrial/Commercial \Direct Exposure Criteria (I/C DEC).**

Detection limits highlighted in *blue and in italics* exceed the RIDEM Method 1 Criteria.

Underlined concentrations exceed the RIDEM Method 1 GB Leachability Criteria.

**A concentration with a bold border exceeds the Upper Concentration Limit.**

Undetected analytes have a "U" qualifier.

Any analytes reported from a diluted run of the original analysis have a "D" qualifier.

Blank cells indicate a sample was not analyzed for that parameter

"E" qualifier indicates estimated concentration above the quantitation limit.

**Table 2A**  
**Summary of LDI Analytical**  
**VOCs - Surface Soil Testing Results**  
**Former Tidewater Facility**  
**Pawtucket, RI**

	Units	RIDEM GB Leachability Criteria	RIDEM Industrial/ Commercial DEC	RIDEM UCL	1709662-12 GZ-SS-512 (0-2') 09/22/2017	1709662-13 GZ-SS-513 (0-2') 09/22/2017	1709662-14 GZ-SS-514 (0-2') 09/22/2017	17012222-01 GZ-SS-561 (1-2') 12/8/2017	1709662-08 GZ-SS-508 (0-2') 09/21/2017	1709662-09 GZ-SS-509 (0-2') 09/21/2017	1709662-10 GZ-SS-510 (0-2') 09/21/2017	1709662-11 GZ-SS-511 (0-2') 09/22/2017
<b>VOLATILE ORGANICS</b>												
1,1,1,2-Tetrachloroethane	mg/kg	NE	220	10,000	0.0034 U	0.0035 U	0.0031 U	0.0045 U	0.004 U	0.0048 U	0.0045 U	0.0042 U
1,1,1-Trichloroethane	mg/kg	160	10,000	10,000	0.0034 U	0.0035 U	0.0031 U	0.0045 U	0.004 U	0.0048 U	0.0045 U	0.0042 U
1,1,2,2-Tetrachloroethane	mg/kg	NE	29	10,000	0.0034 U	0.0035 U	0.0031 U	0.0045 U	0.004 U	0.0048 U	0.0045 U	0.0042 U
1,1,2-Trichloroethane	mg/kg	NE	100	10,000	0.0034 U	0.0035 U	0.0031 U	0.0045 U	0.004 U	0.0048 U	0.0045 U	0.0042 U
1,1-Dichloroethane	mg/kg	NE	10,000	10,000	0.0034 U	0.0035 U	0.0031 U	0.0045 U	0.004 U	0.0048 U	0.0045 U	0.0042 U
1,1-Dichloroethene	mg/kg	1	9.5	10,000	0.0034 U	0.0035 U	0.0031 U	0.0045 U	0.004 U	0.0048 U	0.0045 U	0.0042 U
1,1-Dichloropropene	mg/kg	NE	NE	10,000	0.0034 U	0.0035 U	0.0031 U	0.0045 U	0.004 U	0.0048 U	0.0045 U	0.0042 U
1,2,3-Trichlorobenzene	mg/kg	NE	NE	10,000	0.0034 U	0.0035 U	0.0031 U	0.0045 U	0.004 U	0.0048 U	0.0045 U	0.0042 U
1,2,3-Trichloropropane	mg/kg	NE	NE	10,000	0.0034 U	0.0035 U	0.0031 U	0.0045 U	0.004 U	0.0048 U	0.0045 U	0.0042 U
1,2,4-Trichlorobenzene	mg/kg	NE	10,000	10,000	0.0034 U	0.0035 U	0.0031 U	0.0045 U	0.004 U	0.0048 U	0.0045 U	0.0042 U
1,2,4-Trimethylbenzene	mg/kg	NE	NE	10,000	0.0034 U	0.0035 U	0.0031 U	0.0045 U	0.004 U	0.0048 U	0.0045 U	0.0042 U
1,2-Dibromo-3-Chloropropane	mg/kg	NE	NE	10,000	0.0034 U	0.0035 U	0.0031 U	0.0045 U	0.004 U	0.0048 U	0.0045 U	0.0042 U
1,2-Dibromoethane (EDB)	mg/kg	NE	0.07	10,000	0.0034 U	0.0035 U	0.0031 U	0.0045 U	0.004 U	0.0048 U	0.0045 U	0.0042 U
1,2-Dichlorobenzene	mg/kg	NE	10,000	10,000	0.0034 U	0.0035 U	0.0031 U	0.0045 U	0.004 U	0.0048 U	0.0045 U	0.0042 U
1,2-Dichloroethane	mg/kg	2.3	63	10,000	0.0034 U	0.0035 U	0.0031 U	0.0045 U	0.004 U	0.0048 U	0.0045 U	0.0042 U
1,2-Dichloropropane	mg/kg	70	84	10,000	0.0034 U	0.0035 U	0.0031 U	0.0045 U	0.004 U	0.0048 U	0.0045 U	0.0042 U
1,3,5-Trimethylbenzene	mg/kg	NE	NE	10,000	0.0034 U	0.0035 U	0.0031 U	0.0045 U	0.004 U	0.0048 U	0.0045 U	0.0042 U
1,3-Dichlorobenzene	mg/kg	NE	10,000	10,000	0.0034 U	0.0035 U	0.0031 U	0.0045 U	0.004 U	0.0048 U	0.0045 U	0.0042 U
1,3-Dichloropropane	mg/kg	NE	NE	10,000	0.0034 U	0.0035 U	0.0031 U	0.0045 U	0.004 U	0.0048 U	0.0045 U	0.0042 U
1,4-Dichlorobenzene	mg/kg	NE	240	10,000	0.0034 U	0.0035 U	0.0031 U	0.0045 U	0.004 U	0.0048 U	0.0045 U	0.0042 U
1,4-Dioxane	mg/kg	NE	NE	10,000	0.0686 U	0.0705 U	0.0616 U	0.09 U	0.0805 U	0.095 U	0.0902 U	0.0839 U
1-Chlorohexane	mg/kg	NE	NE	10,000	0.0034 U	0.0035 U	0.0031 U	0.0045 U	0.004 U	0.0048 U	0.0045 U	0.0042 U
2,2-Dichloropropane	mg/kg	NE	NE	10,000	0.0034 U	0.0035 U	0.0031 U	0.0045 U	0.004 U	0.0048 U	0.0045 U	0.0042 U
2-Butanone (MEK)	mg/kg	NE	10,000	10,000	0.0343 U	0.0353 U	0.0308 U	0.045 U	0.0403 U	0.0475 U	0.0451 U	0.042 U
2-Chlorotoluene	mg/kg	NE	NE	10,000	0.0034 U	0.0035 U	0.0031 U	0.0045 U	0.004 U	0.0048 U	0.0045 U	0.0042 U
2-Hexanone	mg/kg	NE	NE	10,000	0.0343 U	0.0353 U	0.0308 U	0.045 U	0.0403 U	0.0475 U	0.0451 U	0.042 U
4-Chlorotoluene	mg/kg	NE	NE	10,000	0.0034 U	0.0035 U	0.0031 U	0.0045 U	0.004 U	0.0048 U	0.0045 U	0.0042 U
4-Isopropyltoluene	mg/kg	NE	NE	10,000	0.0034 U	0.0035 U	0.0031 U	0.0045 U	0.004 U	0.0048 U	0.0045 U	0.0042 U
4-Methyl-2-Pentanone (MIBK)	mg/kg	NE	10,000	10,000	0.0343 U	0.0353 U	0.0308 U	0.045 U	0.0403 U	0.0475 U	0.0451 U	0.042 U
Acetone	mg/kg	NE	10,000	10,000	0.0343 U	0.0353 U	0.0308 U	0.045 U	<b>0.0598</b> -	0.0475 U	0.0451 U	0.042 U
Benzene	mg/kg	4.3	200	10,000	0.0034 U	0.0035 U	0.0031 U	0.0045 U	0.004 U	0.0048 U	0.0045 U	0.0042 U
Bromobenzene	mg/kg	NE	NE	10,000	0.0034 U	0.0035 U	0.0031 U	0.0045 U	0.004 U	0.0048 U	0.0045 U	0.0042 U
Bromochloromethane	mg/kg	NE	NE	10,000	0.0034 U	0.0035 U	0.0031 U	0.0045 U	0.004 U	0.0048 U	0.0045 U	0.0042 U
Bromodichloromethane	mg/kg	NE	92	10,000	0.0034 U	0.0035 U	0.0031 U	0.0045 U	0.004 U	0.0048 U	0.0045 U	0.0042 U
Bromoform	mg/kg	NE	720	10,000	0.0034 U	0.0035 U	0.0031 U	0.0045 U	0.004 U	0.0048 U	0.0045 U	0.0042 U
Bromomethane	mg/kg	NE	2,900	10,000	0.0069 U	0.0071 U	0.0062 U	0.009 U	0.0081 U	0.0095 U	0.009 U	0.0084 U
Carbon Disulfide	mg/kg	NE	NE	10,000	0.0034 U	0.0035 U	0.0031 U	0.0045 U	0.004 U	0.0048 U	0.0045 U	0.0042 U
Carbon Tetrachloride	mg/kg	5	44	10,000	0.0034 U	0.0035 U	0.0031 U	0.0045 U	0.004 U	0.0048 U	0.0045 U	0.0042 U
Chlorobenzene	mg/kg	100	10,000	10,000	0.0034 U	0.0035 U	0.0031 U	0.0045 U	0.004 U	0.0048 U	0.0045 U	0.0042 U
Chloroethane	mg/kg	NE	NE	10,000	0.0069 U	0.0071 U	0.0062 U	0.009 U	0.0081 U	0.0095 U	0.009 U	0.0084 U
Chloroform	mg/kg	NE	940	10,000	0.0034 U	0.0035 U	0.0031 U	0.0045 U	0.004 U	0.0048 U	0.0045 U	0.0042 U
Chloromethane	mg/kg	NE	NE	10,000	0.0069 U	0.0071 U	0.0062 U	0.009 U	0.0081 U	0.0095 U	0.009 U	0.0084 U
cis-1,2-Dichloroethene	mg/kg	6	10,000	10,000	0.0034 U	0.0035 U	0.0031 U	0.0045 U	0.004 U	0.0048 U	0.0045 U	0.0042 U
cis-1,3-Dichloropropene	mg/kg	NE	NE	10,000	0.0034 U	0.0035 U	0.0031 U	0.0045 U	0.004 U	0.0048 U	0.0045 U	0.0042 U
Dibromochloromethane	mg/kg	NE	NE	10,000	0.0034 U	0.0035 U	0.0031 U	0.0045 U	0.004 U	0.0048 U	0.0045 U	0.0042 U
Dibromomethane	mg/kg	NE	NE	10,000	0.0034 U	0.0035 U	0.0031 U	0.0045 U	0.004 U	0.0048 U	0.0045 U	0.0042 U
Dichlorodifluoromethane	mg/kg	NE	NE	10,000	0.0069 U	0.0071 U	0.0062 U	0.009 U	0.0081 U	0.0095 U	0.009 U	0.0084 U
Diethylether	mg/kg	NE	NE	10,000	0.0034 U	0.0035 U	0.0031 U	0.0045 U	0.004 U	0.0048 U	0.0045 U	0.0042 U
Di-isopropyl ether	mg/kg	NE	NE	10,000	0.0034 U	0.0035 U	0.0031 U	0.0045 U	0.004 U	0.0048 U	0.0045 U	0.0042 U
Ethyl tertiary-butyl ether	mg/kg	NE	NE	10,000	0.0034 U	0.0035 U	0.0031 U	0.0045 U	0.004 U	0.0048 U	0.0045 U	0.0042 U
Ethylbenzene	mg/kg	62	10,000	10,000	0.0034 U	0.0035 U	0.0031 U	0.0045 U	0.004 U	0.0048 U	0.0045 U	0.0042 U

**Table 2A**  
**Summary of LDI Analytical**  
**VOCs - Surface Soil Testing Results**  
**Former Tidewater Facility**  
**Pawtucket, RI**

	Units	RIDEM GB Leachability Criteria	RIDEM Industrial/ Commercial DEC	RIDEM UCL	1709662-12 GZ-SS-512 (0-2') 09/22/2017	1709662-13 GZ-SS-513 (0-2') 09/22/2017	1709662-14 GZ-SS-514 (0-2') 09/22/2017	17012222-01 GZ-SS-561 (1-2') 12/8/2017	1709662-08 GZ-SS-508 (0-2') 09/21/2017	1709662-09 GZ-SS-509 (0-2') 09/21/2017	1709662-10 GZ-SS-510 (0-2') 09/21/2017	1709662-11 GZ-SS-511 (0-2') 09/22/2017
<b>VOLATILE ORGANICS</b>												
Hexachlorobutadiene	mg/kg	NE	73	10,000	0.0034 U	0.0035 U	0.0031 U	0.0045 U	0.004 U	0.0048 U	0.0045 U	0.0042 U
Isopropylbenzene	mg/kg	NE	10,000	10,000	0.0034 U	0.0035 U	0.0031 U	0.0045 U	0.004 U	0.0048 U	0.0045 U	0.0042 U
Methyl tert-butyl ether	mg/kg	100	10,000	10,000	0.0034 U	0.0035 U	0.0031 U	0.0045 U	0.004 U	0.0048 U	0.0045 U	0.0042 U
Methylene Chloride	mg/kg	NE	760	10,000	0.0172 U	0.0176 U	0.0154 U	0.0225 U	0.0201 U	0.0238 U	0.0225 U	0.021 U
Naphthalene	mg/kg	NE	10,000	10,000	0.0034 U	0.0035 U	0.0031 U	0.0045 U	0.004 U	0.0048 U	0.0045 U	0.0042 U
n-Butylbenzene	mg/kg	NE	NE	10,000	0.0034 U	0.0035 U	0.0031 U	0.0045 U	0.004 U	0.0048 U	0.0045 U	0.0042 U
n-Propylbenzene	mg/kg	NE	NE	10,000	0.0034 U	0.0035 U	0.0031 U	0.0045 U	0.004 U	0.0048 U	0.0045 U	0.0042 U
sec-Butylbenzene	mg/kg	NE	NE	10,000	0.0034 U	0.0035 U	0.0031 U	0.0045 U	0.004 U	0.0048 U	0.0045 U	0.0042 U
Styrene	mg/kg	64	190	10,000	0.0034 U	0.0035 U	0.0031 U	0.0045 U	0.004 U	0.0048 U	0.0045 U	0.0042 U
tert-Butylbenzene	mg/kg	NE	NE	10,000	0.0034 U	0.0035 U	0.0031 U	0.0045 U	0.004 U	0.0048 U	0.0045 U	0.0042 U
Tertiary-amyl methyl ether	mg/kg	NE	NE	10,000	0.0034 U	0.0035 U	0.0031 U	0.0045 U	0.004 U	0.0048 U	0.0045 U	0.0042 U
Tetrachloroethene	mg/kg	4.2	110	10,000	0.0034 U	0.0035 U	0.0031 U	0.0045 U	0.004 U	0.0048 U	0.0045 U	0.0042 U
Tetrahydrofuran	mg/kg	NE	NE	10,000	0.0034 U	0.0035 U	0.0031 U	0.0045 U	0.004 U	0.0048 U	0.0045 U	0.0042 U
Toluene	mg/kg	54	10,000	10,000	0.0034 U	0.0035 U	0.0031 U	0.0045 U	0.004 U	0.0048 U	0.0045 U	0.0042 U
trans-1,2-Dichloroethene	mg/kg	92	10,000	10,000	0.0034 U	0.0035 U	0.0031 U	0.0045 U	0.004 U	0.0048 U	0.0045 U	0.0042 U
trans-1,3-Dichloropropene	mg/kg	NE	NE	10,000	0.0034 U	0.0035 U	0.0031 U	0.0045 U	0.004 U	0.0048 U	0.0045 U	0.0042 U
Trichloroethene	mg/kg	20	520	10,000	0.0034 U	0.0035 U	0.0031 U	0.0045 U	0.004 U	0.0048 U	0.0045 U	0.0042 U
Trichlorofluoromethane	mg/kg	NE	NE	10,000	0.0034 U	0.0035 U	0.0031 U	0.0045 U	0.004 U	0.0048 U	0.0045 U	0.0042 U
Vinyl Acetate	mg/kg	NE	NE	10,000	0.0034 U	0.0035 U	0.0031 U	0.0045 U	0.004 U	0.0048 U	0.0045 U	0.0042 U
Vinyl Chloride	mg/kg	NE	3	10,000	0.0069 U	0.0071 U	0.0062 U	0.009 U	0.0081 U	0.0095 U	0.009 U	0.0084 U
o-Xylene	mg/kg	NE	10,000	10,000	0.0034 U	0.0035 U	0.0031 U	0.0045 U	0.004 U	0.0048 U	0.0045 U	0.0042 U
m&p-Xylene	mg/kg	NE	10,000	10,000	0.0069 U	0.0071 U	0.0062 U	0.009 U	0.0081 U	0.0095 U	0.009 U	0.0084 U
Total Xylenes	mg/kg	NE	10,000	10,000	0.0069 U	0.0071 U	0.0062 U	0.009 U	0.0081 U	0.0095 U	0.009 U	0.0084 U

**Notes**

NE = Not Established

NA = Not Analyzed

NFA = North Fill Area

FGPA = Former Gas Plant Area

FPPA = Former Power Plant Area

SFA = South Fill Area

**Detected concentrations are bolded.**

**Gray shaded cells indicates the concentration exceeds the RIDEM Method 1 Industrial/Commercial \Direct Exposure Criteria (I/C DEC).**

Detection limits highlighted in *blue and in italics* exceed the RIDEM Method 1 Criteria.

Underlined concentrations exceed the RIDEM Method 1 GB Leachability Criteria.

**A concentration with a bold border exceeds the Upper Concentration Limit.**

Undetected analytes have a "U" qualifier.

Any analytes reported from a diluted run of the original analysis have a "D" qualifier.

Blank cells indicate a sample was not analyzed for that parameter

"E" qualifier indicates estimated concentration above the quantitation limit.



Table 2A  
Summary of LDI Analytical  
VOCs - Surface Soil Testing Results  
Former Tidewater Facility  
Pawtucket, RI

	Units	RIDEM GB Leachability Criteria	RIDEM Industrial/ Commercial DEC	RIDEM UCL	1709662-15 GZ-SS-515 (0-2') 09/22/2017	1709662-16 GZ-SS-516 (0-2') 09/22/2017	1709662-17 GZ-SS-517 (0-2') 09/22/2017	1709754-01 GZ-SS-518 (0-2') 09/26/2017	1709754-02 GZ-SS-519 (0-2') 09/26/2017	1709754-03 GZ-SS-520 (0-2') 09/26/2017	1709754-04 GZ-SS-521 (0-2') 09/26/2017	1709754-05 GZ-SS-522 (0-2') 09/26/2017
<b>VOLATILE ORGANICS</b>												
1,1,1,2-Tetrachloroethane	mg/kg	NE	220	10,000	0.0033 U	0.0047 U	0.0026 U	0.0057 U	0.0031 U	0.004 U	0.0034 U	0.004 U
1,1,1-Trichloroethane	mg/kg	160	10,000	10,000	0.0033 U	0.0047 U	0.0026 U	0.0057 U	0.0031 U	0.004 U	0.0034 U	0.004 U
1,1,2,2-Tetrachloroethane	mg/kg	NE	29	10,000	0.0033 U	0.0047 U	0.0026 U	0.0057 U	0.0031 U	0.004 U	0.0034 U	0.004 U
1,1,2-Trichloroethane	mg/kg	NE	100	10,000	0.0033 U	0.0047 U	0.0026 U	0.0057 U	0.0031 U	0.004 U	0.0034 U	0.004 U
1,1-Dichloroethane	mg/kg	NE	10,000	10,000	0.0033 U	0.0047 U	0.0026 U	0.0057 U	0.0031 U	0.004 U	0.0034 U	0.004 U
1,1-Dichloroethene	mg/kg	1	9.5	10,000	0.0033 U	0.0047 U	0.0026 U	0.0057 U	0.0031 U	0.004 U	0.0034 U	0.004 U
1,1-Dichloropropene	mg/kg	NE	NE	10,000	0.0033 U	0.0047 U	0.0026 U	0.0057 U	0.0031 U	0.004 U	0.0034 U	0.004 U
1,2,3-Trichlorobenzene	mg/kg	NE	NE	10,000	0.0033 U	0.0047 U	0.0026 U	0.0057 U	0.0031 U	0.004 U	0.0034 U	0.004 U
1,2,3-Trichloropropane	mg/kg	NE	NE	10,000	0.0033 U	0.0047 U	0.0026 U	0.0057 U	0.0031 U	0.004 U	0.0034 U	0.004 U
1,2,4-Trichlorobenzene	mg/kg	NE	10,000	10,000	0.0033 U	0.0047 U	0.0026 U	0.0057 U	0.0031 U	0.004 U	0.0034 U	0.004 U
1,2,4-Trimethylbenzene	mg/kg	NE	NE	10,000	0.0033 U	0.0047 U	0.0026 U	0.0057 U	0.0031 U	0.004 U	0.0034 U	0.004 U
1,2-Dibromo-3-Chloropropane	mg/kg	NE	NE	10,000	0.0033 U	0.0047 U	0.0026 U	0.0057 U	0.0031 U	0.004 U	0.0034 U	0.004 U
1,2-Dibromoethane (EDB)	mg/kg	NE	0.07	10,000	0.0033 U	0.0047 U	0.0026 U	0.0057 U	0.0031 U	0.004 U	0.0034 U	0.004 U
1,2-Dichlorobenzene	mg/kg	NE	10,000	10,000	0.0033 U	0.0047 U	0.0026 U	0.0057 U	0.0031 U	0.004 U	0.0034 U	0.004 U
1,2-Dichloroethane	mg/kg	2.3	63	10,000	0.0033 U	0.0047 U	0.0026 U	0.0057 U	0.0031 U	0.004 U	0.0034 U	0.004 U
1,2-Dichloropropane	mg/kg	70	84	10,000	0.0033 U	0.0047 U	0.0026 U	0.0057 U	0.0031 U	0.004 U	0.0034 U	0.004 U
1,3,5-Trimethylbenzene	mg/kg	NE	NE	10,000	0.0033 U	0.0047 U	0.0026 U	0.0057 U	0.0031 U	0.004 U	0.0034 U	0.004 U
1,3-Dichlorobenzene	mg/kg	NE	10,000	10,000	0.0033 U	0.0047 U	0.0026 U	0.0057 U	0.0031 U	0.004 U	0.0034 U	0.004 U
1,3-Dichloropropane	mg/kg	NE	NE	10,000	0.0033 U	0.0047 U	0.0026 U	0.0057 U	0.0031 U	0.004 U	0.0034 U	0.004 U
1,4-Dichlorobenzene	mg/kg	NE	240	10,000	0.0033 U	0.0047 U	0.0026 U	0.0057 U	0.0031 U	0.004 U	0.0034 U	0.004 U
1,4-Dioxane	mg/kg	NE	NE	10,000	0.0656 U	0.095 U	0.052 U	0.114 U	0.0621 U	0.0795 U	0.0678 U	0.0807 U
1-Chlorohexane	mg/kg	NE	NE	10,000	0.0033 U	0.0047 U	0.0026 U	0.0057 U	0.0031 U	0.004 U	0.0034 U	0.004 U
2,2-Dichloropropane	mg/kg	NE	NE	10,000	0.0033 U	0.0047 U	0.0026 U	0.0057 U	0.0031 U	0.004 U	0.0034 U	0.004 U
2-Butanone (MEK)	mg/kg	NE	10,000	10,000	0.0328 U	0.0475 U	0.026 U	0.0569 U	0.0311 U	0.0397 U	0.0339 U	0.0404 U
2-Chlorotoluene	mg/kg	NE	NE	10,000	0.0033 U	0.0047 U	0.0026 U	0.0057 U	0.0031 U	0.004 U	0.0034 U	0.004 U
2-Hexanone	mg/kg	NE	NE	10,000	0.0328 U	0.0475 U	0.026 U	0.0569 U	0.0311 U	0.0397 U	0.0339 U	0.0404 U
4-Chlorotoluene	mg/kg	NE	NE	10,000	0.0033 U	0.0047 U	0.0026 U	0.0057 U	0.0031 U	0.004 U	0.0034 U	0.004 U
4-Isopropyltoluene	mg/kg	NE	NE	10,000	0.0033 U	0.0047 U	0.0026 U	0.0057 U	0.0031 U	<b>0.0042</b>	0.0034 U	<b>0.006</b>
4-Methyl-2-Pentanone (MIBK)	mg/kg	NE	10,000	10,000	0.0328 U	0.0475 U	0.026 U	0.0569 U	0.0311 U	0.0397 U	0.0339 U	0.0404 U
Acetone	mg/kg	NE	10,000	10,000	0.0328 U	0.0475 U	0.026 U	0.0569 U	0.0311 U	0.0397 U	0.0339 U	0.0404 U
Benzene	mg/kg	4.3	200	10,000	0.0033 U	0.0047 U	0.0026 U	0.0057 U	0.0031 U	0.004 U	0.0034 U	0.004 U
Bromobenzene	mg/kg	NE	NE	10,000	0.0033 U	0.0047 U	0.0026 U	0.0057 U	0.0031 U	0.004 U	0.0034 U	0.004 U
Bromochloromethane	mg/kg	NE	NE	10,000	0.0033 U	0.0047 U	0.0026 U	0.0057 U	0.0031 U	0.004 U	0.0034 U	0.004 U
Bromodichloromethane	mg/kg	NE	92	10,000	0.0033 U	0.0047 U	0.0026 U	0.0057 U	0.0031 U	0.004 U	0.0034 U	0.004 U
Bromoform	mg/kg	NE	720	10,000	0.0033 U	0.0047 U	0.0026 U	0.0057 U	0.0031 U	0.004 U	0.0034 U	0.004 U
Bromomethane	mg/kg	NE	2,900	10,000	0.0066 U	0.0095 U	0.0052 U	0.0114 U	0.0062 U	0.0079 U	0.0068 U	0.0081 U
Carbon Disulfide	mg/kg	NE	NE	10,000	0.0033 U	0.0047 U	0.0026 U	0.0057 U	0.0031 U	0.004 U	0.0034 U	0.004 U
Carbon Tetrachloride	mg/kg	5	44	10,000	0.0033 U	0.0047 U	0.0026 U	0.0057 U	0.0031 U	0.004 U	0.0034 U	0.004 U
Chlorobenzene	mg/kg	100	10,000	10,000	0.0033 U	0.0047 U	0.0026 U	0.0057 U	0.0031 U	0.004 U	0.0034 U	0.004 U
Chloroethane	mg/kg	NE	NE	10,000	0.0066 U	0.0095 U	0.0052 U	0.0114 U	0.0062 U	0.0079 U	0.0068 U	0.0081 U
Chloroform	mg/kg	NE	940	10,000	0.0033 U	0.0047 U	0.0026 U	0.0057 U	0.0031 U	0.004 U	0.0034 U	0.004 U
Chloromethane	mg/kg	NE	NE	10,000	0.0066 U	0.0095 U	0.0052 U	0.0114 U	0.0062 U	0.0079 U	0.0068 U	0.0081 U
cis-1,2-Dichloroethene	mg/kg	6	10,000	10,000	0.0033 U	0.0047 U	0.0026 U	0.0057 U	0.0031 U	0.004 U	0.0034 U	0.004 U
cis-1,3-Dichloropropene	mg/kg	NE	NE	10,000	0.0033 U	0.0047 U	0.0026 U	0.0057 U	0.0031 U	0.004 U	0.0034 U	0.004 U
Dibromochloromethane	mg/kg	NE	NE	10,000	0.0033 U	0.0047 U	0.0026 U	0.0057 U	0.0031 U	0.004 U	0.0034 U	0.004 U
Dibromomethane	mg/kg	NE	NE	10,000	0.0033 U	0.0047 U	0.0026 U	0.0057 U	0.0031 U	0.004 U	0.0034 U	0.004 U
Dichlorodifluoromethane	mg/kg	NE	NE	10,000	0.0066 U	0.0095 U	0.0052 U	0.0114 U	0.0062 U	0.0079 U	0.0068 U	0.0081 U
Diethylether	mg/kg	NE	NE	10,000	0.0033 U	0.0047 U	0.0026 U	0.0057 U	0.0031 U	0.004 U	0.0034 U	0.004 U
Di-isopropyl ether	mg/kg	NE	NE	10,000	0.0033 U	0.0047 U	0.0026 U	0.0057 U	0.0031 U	0.004 U	0.0034 U	0.004 U
Ethyl tertiary-butyl ether	mg/kg	NE	NE	10,000	0.0033 U	0.0047 U	0.0026 U	0.0057 U	0.0031 U	0.004 U	0.0034 U	0.004 U
Ethylbenzene	mg/kg	62	10,000	10,000	0.0033 U	0.0047 U	0.0026 U	0.0057 U	0.0031 U	0.004 U	0.0034 U	0.004 U



**Table 2A**  
**Summary of LDI Analytical**  
**VOCs - Surface Soil Testing Results**  
**Former Tidewater Facility**  
**Pawtucket, RI**

	Units	RIDEM GB Leachability Criteria	RIDEM Industrial/ Commercial DEC	RIDEM UCL	1709662-15 GZ-SS-515 (0-2') 09/22/2017	1709662-16 GZ-SS-516 (0-2') 09/22/2017	1709662-17 GZ-SS-517 (0-2') 09/22/2017	1709754-01 GZ-SS-518 (0-2') 09/26/2017	1709754-02 GZ-SS-519 (0-2') 09/26/2017	1709754-03 GZ-SS-520 (0-2') 09/26/2017	1709754-04 GZ-SS-521 (0-2') 09/26/2017	1709754-05 GZ-SS-522 (0-2') 09/26/2017
<b>VOLATILE ORGANICS</b>												
Hexachlorobutadiene	mg/kg	NE	73	10,000	0.0033 U	0.0047 U	0.0026 U	0.0057 U	0.0031 U	0.004 U	0.0034 U	0.004 U
Isopropylbenzene	mg/kg	NE	10,000	10,000	0.0033 U	0.0047 U	0.0026 U	0.0057 U	0.0031 U	0.004 U	0.0034 U	0.004 U
Methyl tert-butyl ether	mg/kg	100	10,000	10,000	0.0033 U	0.0047 U	0.0026 U	0.0057 U	0.0031 U	0.004 U	0.0034 U	0.004 U
Methylene Chloride	mg/kg	NE	760	10,000	0.0164 U	0.0237 U	0.013 U	0.0284 U	0.0155 U	0.0199 U	0.017 U	0.0202 U
Naphthalene	mg/kg	NE	10,000	10,000	0.0033 U	0.0047 U	0.0026 U	0.0057 U	0.0031 U	0.004 U	0.0034 U	0.004 U
n-Butylbenzene	mg/kg	NE	NE	10,000	0.0033 U	0.0047 U	0.0026 U	0.0057 U	0.0031 U	0.004 U	0.0034 U	0.004 U
n-Propylbenzene	mg/kg	NE	NE	10,000	0.0033 U	0.0047 U	0.0026 U	0.0057 U	0.0031 U	0.004 U	0.0034 U	0.004 U
sec-Butylbenzene	mg/kg	NE	NE	10,000	0.0033 U	0.0047 U	0.0026 U	0.0057 U	0.0031 U	0.004 U	0.0034 U	0.004 U
Styrene	mg/kg	64	190	10,000	0.0033 U	0.0047 U	0.0026 U	0.0057 U	0.0031 U	0.004 U	0.0034 U	0.004 U
tert-Butylbenzene	mg/kg	NE	NE	10,000	0.0033 U	0.0047 U	0.0026 U	0.0057 U	0.0031 U	0.004 U	0.0034 U	0.004 U
Tertiary-amyl methyl ether	mg/kg	NE	NE	10,000	0.0033 U	0.0047 U	0.0026 U	0.0057 U	0.0031 U	0.004 U	0.0034 U	0.004 U
Tetrachloroethene	mg/kg	4.2	110	10,000	0.0033 U	0.0047 U	0.0026 U	0.0057 U	0.0031 U	0.004 U	0.0034 U	0.004 U
Tetrahydrofuran	mg/kg	NE	NE	10,000	0.0033 U	0.0047 U	0.0026 U	0.0057 U	0.0031 U	0.004 U	0.0034 U	0.004 U
Toluene	mg/kg	54	10,000	10,000	0.0033 U	0.0047 U	0.0026 U	0.0057 U	0.0031 U	0.004 U	0.0034 U	0.004 U
trans-1,2-Dichloroethene	mg/kg	92	10,000	10,000	0.0033 U	0.0047 U	0.0026 U	0.0057 U	0.0031 U	0.004 U	0.0034 U	0.004 U
trans-1,3-Dichloropropene	mg/kg	NE	NE	10,000	0.0033 U	0.0047 U	0.0026 U	0.0057 U	0.0031 U	0.004 U	0.0034 U	0.004 U
Trichloroethene	mg/kg	20	520	10,000	0.0033 U	0.0047 U	0.0026 U	0.0057 U	0.0031 U	0.004 U	0.0034 U	0.004 U
Trichlorofluoromethane	mg/kg	NE	NE	10,000	0.0033 U	0.0047 U	0.0026 U	0.0057 U	0.0031 U	0.004 U	0.0034 U	0.004 U
Vinyl Acetate	mg/kg	NE	NE	10,000	0.0033 U	0.0047 U	0.0026 U	0.0057 U	0.0031 U	0.004 U	0.0034 U	0.004 U
Vinyl Chloride	mg/kg	NE	3	10,000	0.0066 U	0.0095 U	0.0052 U	0.0114 U	0.0062 U	0.0079 U	0.0068 U	0.0081 U
o-Xylene	mg/kg	NE	10,000	10,000	0.0033 U	0.0047 U	0.0026 U	0.0057 U	0.0031 U	0.004 U	0.0034 U	0.004 U
m&p-Xylene	mg/kg	NE	10,000	10,000	0.0066 U	0.0095 U	0.0052 U	0.0114 U	0.0062 U	0.0079 U	0.0068 U	0.0081 U
Total Xylenes	mg/kg	NE	10,000	10,000	0.0066 U	0.0095 U	0.0052 U	0.0114 U	0.0062 U	0.0079 U	0.0068 U	0.0081 U

**Notes**

NE = Not Established

NA = Not Analyzed

NFA = North Fill Area

FGPA = Former Gas Plant Area

FPPA = Former Power Plant Area

SFA = South Fill Area

**Detected concentrations are bolded.**

**Gray shaded cells indicates the concentration exceeds the RIDEM Method 1 Industrial/Commercial \Direct Exposure Criteria (I/C DEC).**

Detection limits highlighted in *blue and in italics* exceed the RIDEM Method 1 Criteria.

Underlined concentrations exceed the RIDEM Method 1 GB Leachability Criteria.

**A concentration with a bold border exceeds the Upper Concentration Limit.**

Undetected analytes have a "U" qualifier.

Any analytes reported from a diluted run of the original analysis have a "D" qualifier.

Blank cells indicate a sample was not analyzed for that parameter

"E" qualifier indicates estimated concentration above the quantitation limit.

Table 2A  
Summary of LDI Analytical  
VOCs - Surface Soil Testing Results  
Former Tidewater Facility  
Pawtucket, RI

	Units	RIDEM GB Leachability Criteria	RIDEM Industrial/ Commercial DEC	RIDEM UCL	1709754-06 GZ-SS-523 (0-2') 09/26/2017	1709754-07 GZ-SS-524 (0-2') 09/26/2017	1709754-08 GZ-SS-525 (0-2') 09/26/2017	1709754-09 GZ-SS-526 (0-2') 09/26/2017	1709754-10 GZ-SS-527 (0-2') 09/26/2017	1709754-12 GZ-SS-528 (0-2') 09/26/2017	1709754-13 GZ-SS-529 (0-2') 09/26/2017	1709754-14 GZ-SS-530 (0-2') 09/26/2017
<b>VOLATILE ORGANICS</b>												
1,1,1,2-Tetrachloroethane	mg/kg	NE	220	10,000	0.0036 U	0.0038 U	0.0033 U	0.0042 U	0.0049 U	0.004 U	0.0042 U	0.0042 U
1,1,1-Trichloroethane	mg/kg	160	10,000	10,000	0.0036 U	0.0038 U	0.0033 U	0.0042 U	0.0049 U	0.004 U	0.0042 U	0.0042 U
1,1,2,2-Tetrachloroethane	mg/kg	NE	29	10,000	0.0036 U	0.0038 U	0.0033 U	0.0042 U	0.0049 U	0.004 U	0.0042 U	0.0042 U
1,1,2-Trichloroethane	mg/kg	NE	100	10,000	0.0036 U	0.0038 U	0.0033 U	0.0042 U	0.0049 U	0.004 U	0.0042 U	0.0042 U
1,1-Dichloroethane	mg/kg	NE	10,000	10,000	0.0036 U	0.0038 U	0.0033 U	0.0042 U	0.0049 U	0.004 U	0.0042 U	0.0042 U
1,1-Dichloroethene	mg/kg	1	9.5	10,000	0.0036 U	0.0038 U	0.0033 U	0.0042 U	0.0049 U	0.004 U	0.0042 U	0.0042 U
1,1-Dichloropropene	mg/kg	NE	NE	10,000	0.0036 U	0.0038 U	0.0033 U	0.0042 U	0.0049 U	0.004 U	0.0042 U	0.0042 U
1,2,3-Trichlorobenzene	mg/kg	NE	NE	10,000	0.0036 U	0.0038 U	0.0033 U	0.0042 U	0.0049 U	0.004 U	0.0042 U	0.0042 U
1,2,3-Trichloropropane	mg/kg	NE	NE	10,000	0.0036 U	0.0038 U	0.0033 U	0.0042 U	0.0049 U	0.004 U	0.0042 U	0.0042 U
1,2,4-Trichlorobenzene	mg/kg	NE	10,000	10,000	0.0036 U	0.0038 U	0.0033 U	0.0042 U	0.0049 U	0.004 U	0.0042 U	0.0042 U
1,2,4-Trimethylbenzene	mg/kg	NE	NE	10,000	0.0036 U	0.0038 U	0.0033 U	0.0042 U	0.0049 U	0.004 U	0.0042 U	0.0042 U
1,2-Dibromo-3-Chloropropane	mg/kg	NE	NE	10,000	0.0036 U	0.0038 U	0.0033 U	0.0042 U	0.0049 U	0.004 U	0.0042 U	0.0042 U
1,2-Dibromoethane (EDB)	mg/kg	NE	0.07	10,000	0.0036 U	0.0038 U	0.0033 U	0.0042 U	0.0049 U	0.004 U	0.0042 U	0.0042 U
1,2-Dichlorobenzene	mg/kg	NE	10,000	10,000	0.0036 U	0.0038 U	0.0033 U	0.0042 U	0.0049 U	0.004 U	0.0042 U	0.0042 U
1,2-Dichloroethane	mg/kg	2.3	63	10,000	0.0036 U	0.0038 U	0.0033 U	0.0042 U	0.0049 U	0.004 U	0.0042 U	0.0042 U
1,2-Dichloropropane	mg/kg	70	84	10,000	0.0036 U	0.0038 U	0.0033 U	0.0042 U	0.0049 U	0.004 U	0.0042 U	0.0042 U
1,3,5-Trimethylbenzene	mg/kg	NE	NE	10,000	0.0036 U	0.0038 U	0.0033 U	0.0042 U	0.0049 U	0.004 U	0.0042 U	0.0042 U
1,3-Dichlorobenzene	mg/kg	NE	10,000	10,000	0.0036 U	0.0038 U	0.0033 U	0.0042 U	0.0049 U	0.004 U	0.0042 U	0.0042 U
1,3-Dichloropropane	mg/kg	NE	NE	10,000	0.0036 U	0.0038 U	0.0033 U	0.0042 U	0.0049 U	0.004 U	0.0042 U	0.0042 U
1,4-Dichlorobenzene	mg/kg	NE	240	10,000	0.0036 U	0.0038 U	0.0033 U	0.0042 U	0.0049 U	0.004 U	0.0042 U	0.0042 U
1,4-Dioxane	mg/kg	NE	NE	10,000	0.071 U	0.0762 U	0.0659 U	0.0847 U	0.0986 U	0.0794 U	0.0843 U	0.085 U
1-Chlorohexane	mg/kg	NE	NE	10,000	0.0036 U	0.0038 U	0.0033 U	0.0042 U	0.0049 U	0.004 U	0.0042 U	0.0042 U
2,2-Dichloropropane	mg/kg	NE	NE	10,000	0.0036 U	0.0038 U	0.0033 U	0.0042 U	0.0049 U	0.004 U	0.0042 U	0.0042 U
2-Butanone (MEK)	mg/kg	NE	10,000	10,000	0.0355 U	0.0381 U	0.0329 U	0.0424 U	0.0493 U	0.0397 U	0.0422 U	0.0425 U
2-Chlorotoluene	mg/kg	NE	NE	10,000	0.0036 U	0.0038 U	0.0033 U	0.0042 U	0.0049 U	0.004 U	0.0042 U	0.0042 U
2-Hexanone	mg/kg	NE	NE	10,000	0.0355 U	0.0381 U	0.0329 U	0.0424 U	0.0493 U	0.0397 U	0.0422 U	0.0425 U
4-Chlorotoluene	mg/kg	NE	NE	10,000	0.0036 U	0.0038 U	0.0033 U	0.0042 U	0.0049 U	0.004 U	0.0042 U	0.0042 U
4-Isopropyltoluene	mg/kg	NE	NE	10,000	0.008 -	0.0038 U	0.0033 U	0.0042 U	0.0049 U	0.004 U	0.0042 U	0.0042 U
4-Methyl-2-Pentanone (MIBK)	mg/kg	NE	10,000	10,000	0.0355 U	0.0381 U	0.0329 U	0.0424 U	0.0493 U	0.0397 U	0.0422 U	0.0425 U
Acetone	mg/kg	NE	10,000	10,000	0.0355 U	0.094 -	0.0329 U	0.0424 U	0.0493 U	0.0397 U	0.0422 U	0.122 -
Benzene	mg/kg	4.3	200	10,000	0.0036 U	0.0038 U	0.0033 U	0.0042 U	0.0049 U	0.004 U	0.0042 U	0.0042 U
Bromobenzene	mg/kg	NE	NE	10,000	0.0036 U	0.0038 U	0.0033 U	0.0042 U	0.0049 U	0.004 U	0.0042 U	0.0042 U
Bromochloromethane	mg/kg	NE	NE	10,000	0.0036 U	0.0038 U	0.0033 U	0.0042 U	0.0049 U	0.004 U	0.0042 U	0.0042 U
Bromodichloromethane	mg/kg	NE	92	10,000	0.0036 U	0.0038 U	0.0033 U	0.0042 U	0.0049 U	0.004 U	0.0042 U	0.0042 U
Bromoform	mg/kg	NE	720	10,000	0.0036 U	0.0038 U	0.0033 U	0.0042 U	0.0049 U	0.004 U	0.0042 U	0.0042 U
Bromomethane	mg/kg	NE	2,900	10,000	0.0071 U	0.0076 U	0.0066 U	0.0085 U	0.0099 U	0.0079 U	0.0084 U	0.0085 U
Carbon Disulfide	mg/kg	NE	NE	10,000	0.0036 U	0.0038 U	0.0033 U	0.0042 U	0.0049 U	0.004 U	0.0042 U	0.0042 U
Carbon Tetrachloride	mg/kg	5	44	10,000	0.0036 U	0.0038 U	0.0033 U	0.0042 U	0.0049 U	0.004 U	0.0042 U	0.0042 U
Chlorobenzene	mg/kg	100	10,000	10,000	0.0036 U	0.0038 U	0.0033 U	0.0042 U	0.0049 U	0.004 U	0.0042 U	0.0042 U
Chloroethane	mg/kg	NE	NE	10,000	0.0071 U	0.0076 U	0.0066 U	0.0085 U	0.0099 U	0.0079 U	0.0084 U	0.0085 U
Chloroform	mg/kg	NE	940	10,000	0.0036 U	0.0038 U	0.0033 U	0.0042 U	0.0049 U	0.004 U	0.0042 U	0.0042 U
Chloromethane	mg/kg	NE	NE	10,000	0.0071 U	0.0076 U	0.0066 U	0.0085 U	0.0099 U	0.0079 U	0.0084 U	0.0085 U
cis-1,2-Dichloroethene	mg/kg	6	10,000	10,000	0.0036 U	0.0038 U	0.0033 U	0.0042 U	0.0049 U	0.004 U	0.0042 U	0.0042 U
cis-1,3-Dichloropropene	mg/kg	NE	NE	10,000	0.0036 U	0.0038 U	0.0033 U	0.0042 U	0.0049 U	0.004 U	0.0042 U	0.0042 U
Dibromochloromethane	mg/kg	NE	NE	10,000	0.0036 U	0.0038 U	0.0033 U	0.0042 U	0.0049 U	0.004 U	0.0042 U	0.0042 U
Dibromofluoromethane	mg/kg	NE	NE	10,000	0.0036 U	0.0038 U	0.0033 U	0.0042 U	0.0049 U	0.004 U	0.0042 U	0.0042 U
Dichlorodifluoromethane	mg/kg	NE	NE	10,000	0.0071 U	0.0076 U	0.0066 U	0.0085 U	0.0099 U	0.0079 U	0.0084 U	0.0085 U
Diethylether	mg/kg	NE	NE	10,000	0.0036 U	0.0038 U	0.0033 U	0.0042 U	0.0049 U	0.004 U	0.0042 U	0.0042 U
Di-isopropyl ether	mg/kg	NE	NE	10,000	0.0036 U	0.0038 U	0.0033 U	0.0042 U	0.0049 U	0.004 U	0.0042 U	0.0042 U
Ethyl tertiary-butyl ether	mg/kg	NE	NE	10,000	0.0036 U	0.0038 U	0.0033 U	0.0042 U	0.0049 U	0.004 U	0.0042 U	0.0042 U
Ethylbenzene	mg/kg	62	10,000	10,000	0.0036 U	0.0038 U	0.0033 U	0.0042 U	0.0049 U	0.004 U	0.0042 U	0.0042 U

**Table 2A**  
**Summary of LDI Analytical**  
**VOCs - Surface Soil Testing Results**  
**Former Tidewater Facility**  
**Pawtucket, RI**

	Units	RIDEM GB Leachability Criteria	RIDEM Industrial/ Commercial DEC	RIDEM UCL	1709754-06 GZ-SS-523 (0-2') 09/26/2017	1709754-07 GZ-SS-524 (0-2') 09/26/2017	1709754-08 GZ-SS-525 (0-2') 09/26/2017	1709754-09 GZ-SS-526 (0-2') 09/26/2017	1709754-10 GZ-SS-527 (0-2') 09/26/2017	1709754-12 GZ-SS-528 (0-2') 09/26/2017	1709754-13 GZ-SS-529 (0-2') 09/26/2017	1709754-14 GZ-SS-530 (0-2') 09/26/2017
<b>VOLATILE ORGANICS</b>												
Hexachlorobutadiene	mg/kg	NE	73	10,000	0.0036 U	0.0038 U	0.0033 U	0.0042 U	0.0049 U	0.004 U	0.0042 U	0.0042 U
Isopropylbenzene	mg/kg	NE	10,000	10,000	0.0036 U	0.0038 U	0.0033 U	0.0042 U	0.0049 U	0.004 U	0.0042 U	0.0042 U
Methyl tert-butyl ether	mg/kg	100	10,000	10,000	0.0036 U	0.0038 U	0.0033 U	0.0042 U	0.0049 U	0.004 U	0.0042 U	0.0042 U
Methylene Chloride	mg/kg	NE	760	10,000	0.0178 U	0.019 U	0.0165 U	0.0212 U	0.0247 U	0.0198 U	0.0211 U	0.0212 U
Naphthalene	mg/kg	NE	10,000	10,000	0.0036 U	0.0038 U	0.0033 U	0.0042 U	0.0049 U	0.004 U	0.0042 U	0.0042 U
n-Butylbenzene	mg/kg	NE	NE	10,000	0.0036 U	0.0038 U	0.0033 U	0.0042 U	0.0049 U	0.004 U	0.0042 U	0.0042 U
n-Propylbenzene	mg/kg	NE	NE	10,000	0.0036 U	0.0038 U	0.0033 U	0.0042 U	0.0049 U	0.004 U	0.0042 U	0.0042 U
sec-Butylbenzene	mg/kg	NE	NE	10,000	0.0036 U	0.0038 U	0.0033 U	0.0042 U	0.0049 U	0.004 U	0.0042 U	0.0042 U
Styrene	mg/kg	64	190	10,000	0.0036 U	0.0038 U	0.0033 U	0.0042 U	0.0049 U	0.004 U	0.0042 U	0.0042 U
tert-Butylbenzene	mg/kg	NE	NE	10,000	0.0036 U	0.0038 U	0.0033 U	0.0042 U	0.0049 U	0.004 U	0.0042 U	0.0042 U
Tertiary-amyl methyl ether	mg/kg	NE	NE	10,000	0.0036 U	0.0038 U	0.0033 U	0.0042 U	0.0049 U	0.004 U	0.0042 U	0.0042 U
Tetrachloroethene	mg/kg	4.2	110	10,000	0.0036 U	0.0038 U	0.0033 U	0.0042 U	0.0049 U	0.004 U	0.0042 U	0.0042 U
Tetrahydrofuran	mg/kg	NE	NE	10,000	0.0036 U	0.0038 U	0.0033 U	0.0042 U	0.0049 U	0.004 U	0.0042 U	0.0042 U
Toluene	mg/kg	54	10,000	10,000	0.0036 U	0.0038 U	0.0033 U	0.0042 U	0.0049 U	0.004 U	0.0042 U	0.0042 U
trans-1,2-Dichloroethene	mg/kg	92	10,000	10,000	0.0036 U	0.0038 U	0.0033 U	0.0042 U	0.0049 U	0.004 U	0.0042 U	0.0042 U
trans-1,3-Dichloropropene	mg/kg	NE	NE	10,000	0.0036 U	0.0038 U	0.0033 U	0.0042 U	0.0049 U	0.004 U	0.0042 U	0.0042 U
Trichloroethene	mg/kg	20	520	10,000	0.0036 U	0.0038 U	0.0033 U	0.0042 U	0.0049 U	0.004 U	0.0042 U	0.0042 U
Trichlorofluoromethane	mg/kg	NE	NE	10,000	0.0036 U	0.0038 U	0.0033 U	0.0042 U	0.0049 U	0.004 U	0.0042 U	0.0042 U
Vinyl Acetate	mg/kg	NE	NE	10,000	0.0036 U	0.0038 U	0.0033 U	0.0042 U	0.0049 U	0.004 U	0.0042 U	0.0042 U
Vinyl Chloride	mg/kg	NE	3	10,000	0.0071 U	0.0076 U	0.0066 U	0.0085 U	0.0099 U	0.0079 U	0.0084 U	0.0085 U
o-Xylene	mg/kg	NE	10,000	10,000	0.0036 U	0.0038 U	0.0033 U	0.0042 U	0.0049 U	0.004 U	0.0042 U	0.0042 U
m&p-Xylene	mg/kg	NE	10,000	10,000	0.0071 U	0.0076 U	0.0066 U	0.0085 U	0.0099 U	0.0079 U	0.0084 U	0.0085 U
Total Xylenes	mg/kg	NE	10,000	10,000	0.0071 U	0.0076 U	0.0066 U	0.0085 U	0.0099 U	0.0079 U	0.0084 U	0.0085 U

**Notes**

NE = Not Established

NA = Not Analyzed

NFA = North Fill Area

FGPA = Former Gas Plant Area

FPPA = Former Power Plant Area

SFA = South Fill Area

**Detected concentrations are bolded.**

**Gray shaded cells indicates the concentration exceeds the RIDEM Method 1 Industrial/Commercial \Direct Exposure Criteria (I/C DEC).**

Detection limits highlighted in *blue and in italics* exceed the RIDEM Method 1 Criteria.

Underlined concentrations exceed the RIDEM Method 1 GB Leachability Criteria.

**A concentration with a bold border exceeds the Upper Concentration Limit.**

Undetected analytes have a "U" qualifier.

Any analytes reported from a diluted run of the original analysis have a "D" qualifier.

Blank cells indicate a sample was not analyzed for that parameter

"E" qualifier indicates estimated concentration above the quantitation limit.

Table 2A  
Summary of LDI Analytical  
VOCs - Surface Soil Testing Results  
Former Tidewater Facility  
Pawtucket, RI

	Units	RIDEM GB Leachability Criteria	RIDEM Industrial/ Commercial DEC	RIDEM UCL	1709754-15 GZ-SS-531 (0-2') 09/26/2017	1709779-06 GZ SS-556 (0-2') 09/27/2017	1709779-07 GZ SS-557 (0-2') 09/27/2017	1709779-08 GZ SS-558 (0-2') 09/27/2017	1709779-09 GZ SS-559 (0-2') 09/27/2017	1709779-10 GZ SS-560 (0-2') 09/27/2017	1709754-16 GZ-SS-532 (0-2') 09/26/2017	1709754-17 GZ-SS-533 (0-2') 09/26/2017
<b>VOLATILE ORGANICS</b>												
1,1,1,2-Tetrachloroethane	mg/kg	NE	220	10,000	0.0055 U	0.0045 U	0.0037 U	0.004 U	0.0056 U	0.0055 U	0.0031 U	0.0045 U
1,1,1-Trichloroethane	mg/kg	160	10,000	10,000	0.0055 U	0.0045 U	0.0037 U	0.004 U	0.0056 U	0.0055 U	0.0031 U	0.0045 U
1,1,2,2-Tetrachloroethane	mg/kg	NE	29	10,000	0.0055 U	0.0045 U	0.0037 U	0.004 U	0.0056 U	0.0055 U	0.0031 U	0.0045 U
1,1,2-Trichloroethane	mg/kg	NE	100	10,000	0.0055 U	0.0045 U	0.0037 U	0.004 U	0.0056 U	0.0055 U	0.0031 U	0.0045 U
1,1-Dichloroethane	mg/kg	NE	10,000	10,000	0.0055 U	0.0045 U	0.0037 U	0.004 U	0.0056 U	0.0055 U	0.0031 U	0.0045 U
1,1-Dichloroethene	mg/kg	1	9.5	10,000	0.0055 U	0.0045 U	0.0037 U	0.004 U	0.0056 U	0.0055 U	0.0031 U	0.0045 U
1,1-Dichloropropene	mg/kg	NE	NE	10,000	0.0055 U	0.0045 U	0.0037 U	0.004 U	0.0056 U	0.0055 U	0.0031 U	0.0045 U
1,2,3-Trichlorobenzene	mg/kg	NE	NE	10,000	0.0055 U	0.0045 U	0.0037 U	0.004 U	0.0056 U	0.0055 U	0.0031 U	0.0045 U
1,2,3-Trichloropropane	mg/kg	NE	NE	10,000	0.0055 U	0.0045 U	0.0037 U	0.004 U	0.0056 U	0.0055 U	0.0031 U	0.0045 U
1,2,4-Trichlorobenzene	mg/kg	NE	10,000	10,000	0.0055 U	0.0045 U	0.0037 U	0.004 U	0.0056 U	0.0055 U	0.0031 U	0.0045 U
1,2,4-Trimethylbenzene	mg/kg	NE	NE	10,000	0.0055 U	0.0045 U	0.0037 U	0.004 U	0.0056 U	0.0055 U	0.0031 U	0.0045 U
1,2-Dibromo-3-Chloropropane	mg/kg	NE	NE	10,000	0.0055 U	0.0045 U	0.0037 U	0.004 U	0.0056 U	0.0055 U	0.0031 U	0.0045 U
1,2-Dibromoethane (EDB)	mg/kg	NE	0.07	10,000	0.0055 U	0.0045 U	0.0037 U	0.004 U	0.0056 U	0.0055 U	0.0031 U	0.0045 U
1,2-Dichlorobenzene	mg/kg	NE	10,000	10,000	0.0055 U	0.0045 U	0.0037 U	0.004 U	0.0056 U	0.0055 U	0.0031 U	0.0045 U
1,2-Dichloroethane	mg/kg	2.3	63	10,000	0.0055 U	0.0045 U	0.0037 U	0.004 U	0.0056 U	0.0055 U	0.0031 U	0.0045 U
1,2-Dichloropropane	mg/kg	70	84	10,000	0.0055 U	0.0045 U	0.0037 U	0.004 U	0.0056 U	0.0055 U	0.0031 U	0.0045 U
1,3,5-Trimethylbenzene	mg/kg	NE	NE	10,000	0.0055 U	0.0045 U	0.0037 U	0.004 U	0.0056 U	0.0055 U	0.0031 U	0.0045 U
1,3-Dichlorobenzene	mg/kg	NE	10,000	10,000	0.0055 U	0.0045 U	0.0037 U	0.004 U	0.0056 U	0.0055 U	0.0031 U	0.0045 U
1,3-Dichloropropane	mg/kg	NE	NE	10,000	0.0055 U	0.0045 U	0.0037 U	0.004 U	0.0056 U	0.0055 U	0.0031 U	0.0045 U
1,4-Dichlorobenzene	mg/kg	NE	240	10,000	0.0055 U	0.0045 U	0.0037 U	0.004 U	0.0056 U	0.0055 U	0.0031 U	0.0045 U
1,4-Dioxane	mg/kg	NE	NE	10,000	0.11 U	0.0901 U	0.0747 U	0.0791 U	0.112 U	0.11 U	0.0622 U	0.0894 U
1-Chlorohexane	mg/kg	NE	NE	10,000	0.0055 U	0.0045 U	0.0037 U	0.004 U	0.0056 U	0.0055 U	0.0031 U	0.0045 U
2,2-Dichloropropane	mg/kg	NE	NE	10,000	0.0055 U	0.0045 U	0.0037 U	0.004 U	0.0056 U	0.0055 U	0.0031 U	0.0045 U
2-Butanone (MEK)	mg/kg	NE	10,000	10,000	0.0548 U	0.0451 U	0.0373 U	0.0395 U	0.056 U	0.055 U	0.0311 U	0.0447 U
2-Chlorotoluene	mg/kg	NE	NE	10,000	0.0055 U	0.0045 U	0.0037 U	0.004 U	0.0056 U	0.0055 U	0.0031 U	0.0045 U
2-Hexanone	mg/kg	NE	NE	10,000	0.0548 U	0.0451 U	0.0373 U	0.0395 U	0.056 U	0.055 U	0.0311 U	0.0447 U
4-Chlorotoluene	mg/kg	NE	NE	10,000	0.0055 U	0.0045 U	0.0037 U	0.004 U	0.0056 U	0.0055 U	0.0031 U	0.0045 U
4-Isopropyltoluene	mg/kg	NE	NE	10,000	0.0055 U	0.0045 U	0.0037 U	0.004 U	0.0056 U	0.0055 U	0.0031 U	0.0045 U
4-Methyl-2-Pentanone (MIBK)	mg/kg	NE	10,000	10,000	0.0548 U	0.0451 U	0.0373 U	0.0395 U	0.056 U	0.055 U	0.0311 U	0.0447 U
Acetone	mg/kg	NE	10,000	10,000	0.0548 U	0.0451 U	0.0373 U	0.0395 U	0.056 U	0.055 U	0.0311 U	0.0447 U
Benzene	mg/kg	4.3	200	10,000	0.0055 U	0.0045 U	0.0037 U	0.004 U	0.0056 U	0.0055 U	0.0031 U	0.0045 U
Bromobenzene	mg/kg	NE	NE	10,000	0.0055 U	0.0045 U	0.0037 U	0.004 U	0.0056 U	0.0055 U	0.0031 U	0.0045 U
Bromochloromethane	mg/kg	NE	NE	10,000	0.0055 U	0.0045 U	0.0037 U	0.004 U	0.0056 U	0.0055 U	0.0031 U	0.0045 U
Bromodichloromethane	mg/kg	NE	92	10,000	0.0055 U	0.0045 U	0.0037 U	0.004 U	0.0056 U	0.0055 U	0.0031 U	0.0045 U
Bromoform	mg/kg	NE	720	10,000	0.0055 U	0.0045 U	0.0037 U	0.004 U	0.0056 U	0.0055 U	0.0031 U	0.0045 U
Bromomethane	mg/kg	NE	2,900	10,000	0.011 U	0.009 U	0.0075 U	0.0079 U	0.0112 U	0.011 U	0.0062 U	0.0089 U
Carbon Disulfide	mg/kg	NE	NE	10,000	0.0055 U	0.0045 U	0.0037 U	0.004 U	0.0056 U	0.0055 U	0.0031 U	0.0045 U
Carbon Tetrachloride	mg/kg	5	44	10,000	0.0055 U	0.0045 U	0.0037 U	0.004 U	0.0056 U	0.0055 U	0.0031 U	0.0045 U
Chlorobenzene	mg/kg	100	10,000	10,000	0.0055 U	0.0045 U	0.0037 U	0.004 U	0.0056 U	0.0055 U	0.0031 U	0.0045 U
Chloroethane	mg/kg	NE	NE	10,000	0.011 U	0.009 U	0.0075 U	0.0079 U	0.0112 U	0.011 U	0.0062 U	0.0089 U
Chloroform	mg/kg	NE	940	10,000	0.0055 U	0.0045 U	0.0037 U	0.004 U	0.0056 U	0.0055 U	0.0031 U	0.0045 U
Chloromethane	mg/kg	NE	NE	10,000	0.011 U	0.009 U	0.0075 U	0.0079 U	0.0112 U	0.011 U	0.0062 U	0.0089 U
cis-1,2-Dichloroethene	mg/kg	6	10,000	10,000	0.0055 U	0.0045 U	0.0037 U	0.004 U	0.0056 U	0.0055 U	0.0031 U	0.0045 U
cis-1,3-Dichloropropene	mg/kg	NE	NE	10,000	0.0055 U	0.0045 U	0.0037 U	0.004 U	0.0056 U	0.0055 U	0.0031 U	0.0045 U
Dibromochloromethane	mg/kg	NE	NE	10,000	0.0055 U	0.0045 U	0.0037 U	0.004 U	0.0056 U	0.0055 U	0.0031 U	0.0045 U
Dibromomethane	mg/kg	NE	NE	10,000	0.0055 U	0.0045 U	0.0037 U	0.004 U	0.0056 U	0.0055 U	0.0031 U	0.0045 U
Dichlorodifluoromethane	mg/kg	NE	NE	10,000	0.011 U	0.009 U	0.0075 U	0.0079 U	0.0112 U	0.011 U	0.0062 U	0.0089 U
Diethylether	mg/kg	NE	NE	10,000	0.0055 U	0.0045 U	0.0037 U	0.004 U	0.0056 U	0.0055 U	0.0031 U	0.0045 U
Di-isopropyl ether	mg/kg	NE	NE	10,000	0.0055 U	0.0045 U	0.0037 U	0.004 U	0.0056 U	0.0055 U	0.0031 U	0.0045 U
Ethyl tertiary-butyl ether	mg/kg	NE	NE	10,000	0.0055 U	0.0045 U	0.0037 U	0.004 U	0.0056 U	0.0055 U	0.0031 U	0.0045 U
Ethylbenzene	mg/kg	62	10,000	10,000	0.0055 U	0.0045 U	0.0037 U	0.004 U	0.0056 U	0.0055 U	0.0031 U	0.0045 U

Table 2A  
Summary of LDI Analytical  
VOCs - Surface Soil Testing Results  
Former Tidewater Facility  
Pawtucket, RI

	Units	RIDEM GB Leachability Criteria	RIDEM Industrial/ Commercial DEC	RIDEM UCL	1709754-15 GZ-SS-531 (0-2') 09/26/2017	1709779-06 GZ SS-556 (0-2') 09/27/2017	1709779-07 GZ SS-557 (0-2') 09/27/2017	1709779-08 GZ SS-558 (0-2') 09/27/2017	1709779-09 GZ SS-559 (0-2') 09/27/2017	1709779-10 GZ SS-560 (0-2') 09/27/2017	1709754-16 GZ-SS-532 (0-2') 09/26/2017	1709754-17 GZ-SS-533 (0-2') 09/26/2017
<b>VOLATILE ORGANICS</b>												
Hexachlorobutadiene	mg/kg	NE	73	10,000	0.0055 U	0.0045 U	0.0037 U	0.004 U	0.0056 U	0.0055 U	0.0031 U	0.0045 U
Isopropylbenzene	mg/kg	NE	10,000	10,000	0.0055 U	0.0045 U	0.0037 U	0.004 U	0.0056 U	0.0055 U	0.0031 U	0.0045 U
Methyl tert-butyl ether	mg/kg	100	10,000	10,000	0.0055 U	0.0045 U	0.0037 U	0.004 U	0.0056 U	0.0055 U	0.0031 U	0.0045 U
Methylene Chloride	mg/kg	NE	760	10,000	0.0274 U	0.0225 U	0.0187 U	0.0198 U	0.028 U	0.0275 U	0.0155 U	0.0224 U
Naphthalene	mg/kg	NE	10,000	10,000	0.0055 U	0.0045 U	0.0037 U	0.004 U	0.0056 U	0.0055 U	0.0031 U	0.0045 U
n-Butylbenzene	mg/kg	NE	NE	10,000	0.0055 U	0.0045 U	0.0037 U	0.004 U	0.0056 U	0.0055 U	0.0031 U	0.0045 U
n-Propylbenzene	mg/kg	NE	NE	10,000	0.0055 U	0.0045 U	0.0037 U	0.004 U	0.0056 U	0.0055 U	0.0031 U	0.0045 U
sec-Butylbenzene	mg/kg	NE	NE	10,000	0.0055 U	0.0045 U	0.0037 U	0.004 U	0.0056 U	0.0055 U	0.0031 U	0.0045 U
Styrene	mg/kg	64	190	10,000	<b>0.0059</b> -	0.0045 U	0.0037 U	0.004 U	0.0056 U	0.0055 U	0.0031 U	0.0045 U
tert-Butylbenzene	mg/kg	NE	NE	10,000	0.0055 U	0.0045 U	0.0037 U	0.004 U	0.0056 U	0.0055 U	0.0031 U	0.0045 U
Tertiary-amyl methyl ether	mg/kg	NE	NE	10,000	0.0055 U	0.0045 U	0.0037 U	0.004 U	0.0056 U	0.0055 U	0.0031 U	0.0045 U
Tetrachloroethene	mg/kg	4.2	110	10,000	0.0055 U	0.0045 U	0.0037 U	0.004 U	0.0056 U	0.0055 U	0.0031 U	0.0045 U
Tetrahydrofuran	mg/kg	NE	NE	10,000	0.0055 U	0.0045 U	0.0037 U	0.004 U	0.0056 U	0.0055 U	0.0031 U	0.0045 U
Toluene	mg/kg	54	10,000	10,000	0.0055 U	0.0045 U	0.0037 U	0.004 U	0.0056 U	0.0055 U	0.0031 U	0.0045 U
trans-1,2-Dichloroethene	mg/kg	92	10,000	10,000	0.0055 U	0.0045 U	0.0037 U	0.004 U	0.0056 U	0.0055 U	0.0031 U	0.0045 U
trans-1,3-Dichloropropene	mg/kg	NE	NE	10,000	0.0055 U	0.0045 U	0.0037 U	0.004 U	0.0056 U	0.0055 U	0.0031 U	0.0045 U
Trichloroethene	mg/kg	20	520	10,000	0.0055 U	0.0045 U	0.0037 U	0.004 U	0.0056 U	0.0055 U	0.0031 U	0.0045 U
Trichlorofluoromethane	mg/kg	NE	NE	10,000	0.0055 U	0.0045 U	0.0037 U	0.004 U	0.0056 U	0.0055 U	0.0031 U	0.0045 U
Vinyl Acetate	mg/kg	NE	NE	10,000	0.0055 U	0.0045 U	0.0037 U	0.004 U	0.0056 U	0.0055 U	0.0031 U	0.0045 U
Vinyl Chloride	mg/kg	NE	3	10,000	0.011 U	0.009 U	0.0075 U	0.0079 U	0.0112 U	0.011 U	0.0062 U	0.0089 U
o-Xylene	mg/kg	NE	10,000	10,000	0.0055 U	0.0045 U	0.0037 U	0.004 U	0.0056 U	0.0055 U	0.0031 U	0.0045 U
m&p-Xylene	mg/kg	NE	10,000	10,000	0.011 U	0.009 U	0.0075 U	0.0079 U	0.0112 U	0.011 U	0.0062 U	0.0089 U
Total Xylenes	mg/kg	NE	10,000	10,000	0.011 U	0.009 U	0.0075 U	0.0079 U	0.0112 U	0.011 U	0.0062 U	0.0089 U

**Notes**

NE = Not Established

NA = Not Analyzed

NFA = North Fill Area

FGPA = Former Gas Plant Area

FPPA = Former Power Plant Area

SFA = South Fill Area

Detected concentrations are bolded.

Gray shaded cells indicates the concentration exceeds the RIDEM Method 1 Industrial/Commercial \Direct Exposure Criteria (I/C DEC).

Detection limits highlighted in *blue and in italics* exceed the RIDEM Method 1 Criteria.

Underlined concentrations exceed the RIDEM Method 1 GB Leachability Criteria.

**A concentration with a bold border** exceeds the Upper Concentration Limit.

Undetected analytes have a "U" qualifier.

Any analytes reported from a diluted run of the original analysis have a "D" qualifier.

Blank cells indicate a sample was not analyzed for that parameter

"E" qualifier indicates estimated concentration above the quantitation limit.

Table 2A  
Summary of LDI Analytical  
VOCs - Surface Soil Testing Results  
Former Tidewater Facility  
Pawtucket, RI

	Units	RIDEM GB Leachability Criteria	RIDEM Industrial/ Commercial DEC	RIDEM UCL	1709754-18 GZ-SS-534 (0-2') 09/26/2017	1709779-01 GZ SS-535 (0-2') 09/27/2017	1709779-02 GZ SS-536 (0-2') 09/27/2017	1709779-03 GZ SS-537 (0-2') 09/27/2017	1709779-04 GZ SS-538 (0-2') 09/27/2017	1709779-05 GZ SS-539 (0-2') 09/27/2017	1710025-01 GZ-SS-540 (0-2 ft) 10/02/2017	1710025-01RE1 GZ-SS-540 (0-2 ft) 10/02/2017
<b>VOLATILE ORGANICS</b>												
1,1,1,2-Tetrachloroethane	mg/kg	NE	220	10,000	0.0046 U	0.0042 U	0.0051 U	0.0041 U	0.0036 U	0.0044 U	0.0032 U	0.0043 U
1,1,1-Trichloroethane	mg/kg	160	10,000	10,000	0.0046 U	0.0042 U	0.0051 U	0.0041 U	0.0036 U	0.0044 U	0.0032 U	0.0043 U
1,1,2,2-Tetrachloroethane	mg/kg	NE	29	10,000	0.0046 U	0.0042 U	0.0051 U	0.0041 U	0.0036 U	0.0044 U	0.0032 U	0.0043 U
1,1,2-Trichloroethane	mg/kg	NE	100	10,000	0.0046 U	0.0042 U	0.0051 U	0.0041 U	0.0036 U	0.0044 U	0.0032 U	0.0043 U
1,1-Dichloroethane	mg/kg	NE	10,000	10,000	0.0046 U	0.0042 U	0.0051 U	0.0041 U	0.0036 U	0.0044 U	0.0032 U	0.0043 U
1,1-Dichloroethene	mg/kg	1	9.5	10,000	0.0046 U	0.0042 U	0.0051 U	0.0041 U	0.0036 U	0.0044 U	0.0032 U	0.0043 U
1,1-Dichloropropene	mg/kg	NE	NE	10,000	0.0046 U	0.0042 U	0.0051 U	0.0041 U	0.0036 U	0.0044 U	0.0032 U	0.0043 U
1,2,3-Trichlorobenzene	mg/kg	NE	NE	10,000	0.0046 U	0.0042 U	0.0051 U	0.0041 U	0.0036 U	0.0044 U	0.0032 U	0.0043 U
1,2,3-Trichloropropane	mg/kg	NE	NE	10,000	0.0046 U	0.0042 U	0.0051 U	0.0041 U	0.0036 U	0.0044 U	0.0032 U	0.0043 U
1,2,4-Trichlorobenzene	mg/kg	NE	10,000	10,000	0.0046 U	0.0042 U	0.0051 U	0.0041 U	0.0036 U	0.0044 U	0.0032 U	0.0043 U
1,2,4-Trimethylbenzene	mg/kg	NE	NE	10,000	0.0313 -	0.0042 U	0.0051 U	0.0041 U	0.0036 U	0.0044 U	0.0032 U	0.0043 U
1,2-Dibromo-3-Chloropropane	mg/kg	NE	NE	10,000	0.0046 U	0.0042 U	0.0051 U	0.0041 U	0.0036 U	0.0044 U	0.0032 U	0.0043 U
1,2-Dibromoethane (EDB)	mg/kg	NE	0.07	10,000	0.0046 U	0.0042 U	0.0051 U	0.0041 U	0.0036 U	0.0044 U	0.0032 U	0.0043 U
1,2-Dichlorobenzene	mg/kg	NE	10,000	10,000	0.0187 -	0.0042 U	0.0051 U	0.0041 U	0.0036 U	0.0044 U	0.0032 U	0.0043 U
1,2-Dichloroethane	mg/kg	2.3	63	10,000	0.0046 U	0.0042 U	0.0051 U	0.0041 U	0.0036 U	0.0044 U	0.0032 U	0.0043 U
1,2-Dichloropropane	mg/kg	70	84	10,000	0.0046 U	0.0042 U	0.0051 U	0.0041 U	0.0036 U	0.0044 U	0.0032 U	0.0043 U
1,3,5-Trimethylbenzene	mg/kg	NE	NE	10,000	0.0114 -	0.0042 U	0.0051 U	0.0041 U	0.0036 U	0.0044 U	0.0032 U	0.0043 U
1,3-Dichlorobenzene	mg/kg	NE	10,000	10,000	0.0068 -	0.0042 U	0.0051 U	0.0041 U	0.0036 U	0.0044 U	0.0032 U	0.0043 U
1,3-Dichloropropane	mg/kg	NE	NE	10,000	0.0046 U	0.0042 U	0.0051 U	0.0041 U	0.0036 U	0.0044 U	0.0032 U	0.0043 U
1,4-Dichlorobenzene	mg/kg	NE	240	10,000	0.0068 -	0.0042 U	0.0051 U	0.0041 U	0.0036 U	0.0044 U	0.0032 U	0.0043 U
1,4-Dioxane	mg/kg	NE	NE	10,000	0.0924 U	0.0833 U	0.103 U	0.0825 U	0.0723 U	0.0885 U	0.0642 U	0.0859 U
1-Chlorohexane	mg/kg	NE	NE	10,000	0.0046 U	0.0042 U	0.0051 U	0.0041 U	0.0036 U	0.0044 U	0.0032 U	0.0043 U
2,2-Dichloropropane	mg/kg	NE	NE	10,000	0.0046 U	0.0042 U	0.0051 U	0.0041 U	0.0036 U	0.0044 U	0.0032 U	0.0043 U
2-Butanone (MEK)	mg/kg	NE	10,000	10,000	0.0462 U	0.0417 U	0.0515 U	0.0412 U	0.0362 U	0.0442 U	0.0321 U	0.043 U
2-Chlorotoluene	mg/kg	NE	NE	10,000	0.0046 U	0.0042 U	0.0051 U	0.0041 U	0.0036 U	0.0044 U	0.0032 U	0.0043 U
2-Hexanone	mg/kg	NE	NE	10,000	0.0462 U	0.0417 U	0.0515 U	0.0412 U	0.0362 U	0.0442 U	0.0321 U	0.043 U
4-Chlorotoluene	mg/kg	NE	NE	10,000	0.0046 U	0.0042 U	0.0051 U	0.0041 U	0.0036 U	0.0044 U	0.0032 U	0.0043 U
4-Isopropyltoluene	mg/kg	NE	NE	10,000	0.0046 U	0.0042 U	0.0051 U	0.0041 U	0.0036 U	0.0044 U	0.0032 U	0.0043 U
4-Methyl-2-Pentanone (MIBK)	mg/kg	NE	10,000	10,000	0.0462 U	0.0417 U	0.0515 U	0.0412 U	0.0362 U	0.0442 U	0.0321 U	0.043 U
Acetone	mg/kg	NE	10,000	10,000	0.0462 U	0.0417 U	0.0515 U	0.0412 U	0.0362 U	0.0442 U	0.0321 U	0.043 U
Benzene	mg/kg	4.3	200	10,000	0.0399 -	0.0042 U	0.0051 U	0.0041 U	0.0036 U	0.0044 U	0.0032 U	0.0043 U
Bromobenzene	mg/kg	NE	NE	10,000	0.0046 U	0.0042 U	0.0051 U	0.0041 U	0.0036 U	0.0044 U	0.0032 U	0.0043 U
Bromochloromethane	mg/kg	NE	NE	10,000	0.0046 U	0.0042 U	0.0051 U	0.0041 U	0.0036 U	0.0044 U	0.0032 U	0.0043 U
Bromodichloromethane	mg/kg	NE	92	10,000	0.0046 U	0.0042 U	0.0051 U	0.0041 U	0.0036 U	0.0044 U	0.0032 U	0.0043 U
Bromoform	mg/kg	NE	720	10,000	0.0046 U	0.0042 U	0.0051 U	0.0041 U	0.0036 U	0.0044 U	0.0032 U	0.0043 U
Bromomethane	mg/kg	NE	2,900	10,000	0.0092 U	0.0083 U	0.0103 U	0.0082 U	0.0072 U	0.0088 U	0.0064 U	0.0086 U
Carbon Disulfide	mg/kg	NE	NE	10,000	0.0046 U	0.0048 -	0.0051 U	0.0041 U	0.0036 U	0.0044 U	0.0032 U	0.0043 U
Carbon Tetrachloride	mg/kg	5	44	10,000	0.0046 U	0.0042 U	0.0051 U	0.0041 U	0.0036 U	0.0044 U	0.0032 U	0.0043 U
Chlorobenzene	mg/kg	100	10,000	10,000	0.0046 U	0.0042 U	0.0051 U	0.0041 U	0.0036 U	0.0044 U	0.0032 U	0.0043 U
Chloroethane	mg/kg	NE	NE	10,000	0.0092 U	0.0083 U	0.0103 U	0.0082 U	0.0072 U	0.0088 U	0.0064 U	0.0086 U
Chloroform	mg/kg	NE	940	10,000	0.0046 U	0.0042 U	0.0051 U	0.0041 U	0.0036 U	0.0044 U	0.0032 U	0.0043 U
Chloromethane	mg/kg	NE	NE	10,000	0.0092 U	0.0083 U	0.0103 U	0.0082 U	0.0072 U	0.0088 U	0.0064 U	0.0086 U
cis-1,2-Dichloroethene	mg/kg	6	10,000	10,000	0.0046 U	0.0042 U	0.0051 U	0.0041 U	0.0036 U	0.0044 U	0.0032 U	0.0043 U
cis-1,3-Dichloropropene	mg/kg	NE	NE	10,000	0.0046 U	0.0042 U	0.0051 U	0.0041 U	0.0036 U	0.0044 U	0.0032 U	0.0043 U
Dibromochloromethane	mg/kg	NE	NE	10,000	0.0046 U	0.0042 U	0.0051 U	0.0041 U	0.0036 U	0.0044 U	0.0032 U	0.0043 U
Dibromomethane	mg/kg	NE	NE	10,000	0.0046 U	0.0042 U	0.0051 U	0.0041 U	0.0036 U	0.0044 U	0.0032 U	0.0043 U
Dichlorodifluoromethane	mg/kg	NE	NE	10,000	0.0092 U	0.0083 U	0.0103 U	0.0082 U	0.0072 U	0.0088 U	0.0064 U	0.0086 U
Diethylether	mg/kg	NE	NE	10,000	0.0046 U	0.0042 U	0.0051 U	0.0041 U	0.0036 U	0.0044 U	0.0032 U	0.0043 U
Di-isopropyl ether	mg/kg	NE	NE	10,000	0.0046 U	0.0042 U	0.0051 U	0.0041 U	0.0036 U	0.0044 U	0.0032 U	0.0043 U
Ethyl tertiary-butyl ether	mg/kg	NE	NE	10,000	0.0046 U	0.0042 U	0.0051 U	0.0041 U	0.0036 U	0.0044 U	0.0032 U	0.0043 U
Ethylbenzene	mg/kg	62	10,000	10,000	0.0088 -	0.0042 U	0.0051 U	0.0041 U	0.0036 U	0.0044 U	0.0032 U	0.0043 U



Table 2A  
Summary of LDI Analytical  
VOCs - Surface Soil Testing Results  
Former Tidewater Facility  
Pawtucket, RI

	Units	RIDEM GB Leachability Criteria	RIDEM Industrial/ Commercial DEC	RIDEM UCL	1709754-18 GZ-SS-534 (0-2') 09/26/2017	1709779-01 GZ SS-535 (0-2') 09/27/2017	1709779-02 GZ SS-536 (0-2') 09/27/2017	1709779-03 GZ SS-537 (0-2') 09/27/2017	1709779-04 GZ SS-538 (0-2') 09/27/2017	1709779-05 GZ SS-539 (0-2') 09/27/2017	1710025-01 GZ-SS-540 (0-2 ft) 10/02/2017	1710025-01RE1 GZ-SS-540 (0-2 ft) 10/02/2017
<b>VOLATILE ORGANICS</b>												
Hexachlorobutadiene	mg/kg	NE	73	10,000	0.0046 U	0.0042 U	0.0051 U	0.0041 U	0.0036 U	0.0044 U	0.0032 U	0.0043 U
Isopropylbenzene	mg/kg	NE	10,000	10,000	0.0046 U	0.0042 U	0.0051 U	0.0041 U	0.0036 U	0.0044 U	0.0032 U	0.0043 U
Methyl tert-butyl ether	mg/kg	100	10,000	10,000	0.0046 U	0.0042 U	0.0051 U	0.0041 U	0.0036 U	0.0044 U	0.0032 U	0.0043 U
Methylene Chloride	mg/kg	NE	760	10,000	0.0231 U	0.0208 U	0.0257 U	0.0206 U	0.0181 U	0.0221 U	0.016 U	0.0215 U
Naphthalene	mg/kg	NE	10,000	10,000	<b>0.693</b> E	0.0042 U	<b>0.0396</b> -	<b>0.0122</b> -	<b>0.0451</b> -	<b>0.0126</b> -	0.0032 U	0.0043 U
n-Butylbenzene	mg/kg	NE	NE	10,000	0.0046 U	0.0042 U	0.0051 U	0.0041 U	0.0036 U	0.0044 U	0.0032 U	0.0043 U
n-Propylbenzene	mg/kg	NE	NE	10,000	0.0046 U	0.0042 U	0.0051 U	0.0041 U	0.0036 U	0.0044 U	0.0032 U	0.0043 U
sec-Butylbenzene	mg/kg	NE	NE	10,000	0.0046 U	0.0042 U	0.0051 U	0.0041 U	0.0036 U	0.0044 U	0.0032 U	0.0043 U
Styrene	mg/kg	64	190	10,000	<b>0.0252</b> -	0.0042 U	0.0051 U	0.0041 U	0.0036 U	0.0044 U	0.0032 U	0.0043 U
tert-Butylbenzene	mg/kg	NE	NE	10,000	0.0046 U	0.0042 U	0.0051 U	0.0041 U	0.0036 U	0.0044 U	0.0032 U	0.0043 U
Tertiary-amyl methyl ether	mg/kg	NE	NE	10,000	0.0046 U	0.0042 U	0.0051 U	0.0041 U	0.0036 U	0.0044 U	0.0032 U	0.0043 U
Tetrachloroethene	mg/kg	4.2	110	10,000	0.0046 U	0.0042 U	0.0051 U	0.0041 U	0.0036 U	0.0044 U	0.0032 U	0.0043 U
Tetrahydrofuran	mg/kg	NE	NE	10,000	0.0046 U	0.0042 U	0.0051 U	0.0041 U	0.0036 U	0.0044 U	0.0032 U	0.0043 U
Toluene	mg/kg	54	10,000	10,000	<b>0.0798</b> -	0.0042 U	0.0051 U	0.0041 U	0.0036 U	0.0044 U	0.0032 U	0.0043 U
trans-1,2-Dichloroethene	mg/kg	92	10,000	10,000	0.0046 U	0.0042 U	0.0051 U	0.0041 U	0.0036 U	0.0044 U	0.0032 U	0.0043 U
trans-1,3-Dichloropropene	mg/kg	NE	NE	10,000	0.0046 U	0.0042 U	0.0051 U	0.0041 U	0.0036 U	0.0044 U	0.0032 U	0.0043 U
Trichloroethene	mg/kg	20	520	10,000	0.0046 U	0.0042 U	0.0051 U	0.0041 U	0.0036 U	0.0044 U	0.0032 U	0.0043 U
Trichlorofluoromethane	mg/kg	NE	NE	10,000	0.0046 U	0.0042 U	0.0051 U	0.0041 U	0.0036 U	0.0044 U	0.0032 U	0.0043 U
Vinyl Acetate	mg/kg	NE	NE	10,000	0.0046 U	0.0042 U	0.0051 U	0.0041 U	0.0036 U	0.0044 U	0.0032 U	0.0043 U
Vinyl Chloride	mg/kg	NE	3	10,000	0.0092 U	0.0083 U	0.0103 U	0.0082 U	0.0072 U	0.0088 U	0.0064 U	0.0086 U
o-Xylene	mg/kg	NE	10,000	10,000	<b>0.0378</b> -	0.0042 U	0.0051 U	0.0041 U	0.0036 U	0.0044 U	0.0032 U	0.0043 U
m&p-Xylene	mg/kg	NE	10,000	10,000	<b>0.0741</b> -	0.0083 U	0.0103 U	0.0082 U	0.0072 U	0.0088 U	0.0064 U	0.0086 U
Total Xylenes	mg/kg	NE	10,000	10,000	<b>0.112</b> -	0.0083 U	0.0103 U	0.0082 U	0.0072 U	0.0088 U	0.0064 U	0.0086 U

**Notes**

NE = Not Established

NA = Not Analyzed

NFA = North Fill Area

FGPA = Former Gas Plant Area

FPPA = Former Power Plant Area

SFA = South Fill Area

**Detected concentrations are bolded.**

**Gray shaded cells indicates the concentration exceeds the RIDEM Method 1 Industrial/Commercial \Direct Exposure Criteria (I/C DEC).**

Detection limits highlighted in *blue and in italics* exceed the RIDEM Method 1 Criteria.

Underlined concentrations exceed the RIDEM Method 1 GB Leachability Criteria.

**A concentration with a bold border exceeds the Upper Concentration Limit.**

Undetected analytes have a "U" qualifier.

Any analytes reported from a diluted run of the original analysis have a "D" qualifier.

Blank cells indicate a sample was not analyzed for that parameter

"E" qualifier indicates estimated concentration above the quantitation limit.



**Table 2A**  
**Summary of LDI Analytical**  
**VOCs - Surface Soil Testing Results**  
**Former Tidewater Facility**  
**Pawtucket, RI**

	Units	RIDEM GB Leachability Criteria	RIDEM Industrial/ Commercial DEC	RIDEM UCL	1710025-02 GZ-SS-541 (0-2 ft) 10/02/2017	1710025-03 GZ-SS-542 (0-2 ft) 10/02/2017	1710025-04 GZ-SS-543 (0-2 ft) 10/02/2017	1710025-05 GZ-SS-544 (0-2 ft) 10/02/2017	1710025-06 GZ-SS-545 (0-2 ft) 10/02/2017	1710025-07 GZ-SS-546 (0-2 ft) 10/02/2017	1710025-08 GZ-SS-547 (0-2 ft) 10/02/2017	1710025-09 GZ-SS-548 (0-2 ft) 10/02/2017
<b>VOLATILE ORGANICS</b>												
1,1,1,2-Tetrachloroethane	mg/kg	NE	220	10,000	0.0026 U	0.0058 U	0.004 U	0.0036 U	0.0044 U	0.0041 U	0.0042 U	0.0051 U
1,1,1-Trichloroethane	mg/kg	160	10,000	10,000	0.0026 U	0.0058 U	0.004 U	0.0036 U	0.0044 U	0.0041 U	0.0042 U	0.0051 U
1,1,2,2-Tetrachloroethane	mg/kg	NE	29	10,000	0.0026 U	0.0058 U	0.004 U	0.0036 U	0.0044 U	0.0041 U	0.0042 U	0.0051 U
1,1,2-Trichloroethane	mg/kg	NE	100	10,000	0.0026 U	0.0058 U	0.004 U	0.0036 U	0.0044 U	0.0041 U	0.0042 U	0.0051 U
1,1-Dichloroethane	mg/kg	NE	10,000	10,000	0.0026 U	0.0058 U	0.004 U	0.0036 U	0.0044 U	0.0041 U	0.0042 U	0.0051 U
1,1-Dichloroethene	mg/kg	1	9.5	10,000	0.0026 U	0.0058 U	0.004 U	0.0036 U	0.0044 U	0.0041 U	0.0042 U	0.0051 U
1,1-Dichloropropene	mg/kg	NE	NE	10,000	0.0026 U	0.0058 U	0.004 U	0.0036 U	0.0044 U	0.0041 U	0.0042 U	0.0051 U
1,2,3-Trichlorobenzene	mg/kg	NE	NE	10,000	0.0026 U	0.0058 U	0.004 U	0.0036 U	0.0044 U	0.0041 U	0.0042 U	0.0051 U
1,2,3-Trichloropropane	mg/kg	NE	NE	10,000	0.0026 U	0.0058 U	0.004 U	0.0036 U	0.0044 U	0.0041 U	0.0042 U	0.0051 U
1,2,4-Trichlorobenzene	mg/kg	NE	10,000	10,000	0.0026 U	0.0058 U	0.004 U	0.0036 U	0.0044 U	0.0041 U	0.0042 U	0.0051 U
1,2,4-Trimethylbenzene	mg/kg	NE	NE	10,000	0.0026 U	0.0058 U	0.004 U	0.0036 U	0.0044 U	0.0041 U	0.0042 U	0.0051 U
1,2-Dibromo-3-Chloropropane	mg/kg	NE	NE	10,000	0.0026 U	0.0058 U	0.004 U	0.0036 U	0.0044 U	0.0041 U	0.0042 U	0.0051 U
1,2-Dibromoethane (EDB)	mg/kg	NE	0.07	10,000	0.0026 U	0.0058 U	0.004 U	0.0036 U	0.0044 U	0.0041 U	0.0042 U	0.0051 U
1,2-Dichlorobenzene	mg/kg	NE	10,000	10,000	0.0026 U	0.0058 U	0.004 U	0.0036 U	0.0044 U	0.0041 U	0.0042 U	0.0051 U
1,2-Dichloroethane	mg/kg	2.3	63	10,000	0.0026 U	0.0058 U	0.004 U	0.0036 U	0.0044 U	0.0041 U	0.0042 U	0.0051 U
1,2-Dichloropropane	mg/kg	70	84	10,000	0.0026 U	0.0058 U	0.004 U	0.0036 U	0.0044 U	0.0041 U	0.0042 U	0.0051 U
1,3,5-Trimethylbenzene	mg/kg	NE	NE	10,000	0.0026 U	0.0058 U	0.004 U	0.0036 U	0.0044 U	0.0041 U	0.0042 U	0.0051 U
1,3-Dichlorobenzene	mg/kg	NE	10,000	10,000	0.0026 U	0.0058 U	0.004 U	0.0036 U	0.0044 U	0.0041 U	0.0042 U	0.0051 U
1,3-Dichloropropane	mg/kg	NE	NE	10,000	0.0026 U	0.0058 U	0.004 U	0.0036 U	0.0044 U	0.0041 U	0.0042 U	0.0051 U
1,4-Dichlorobenzene	mg/kg	NE	240	10,000	0.0026 U	0.0058 U	0.004 U	0.0036 U	0.0044 U	0.0041 U	0.0042 U	0.0051 U
1,4-Dioxane	mg/kg	NE	NE	10,000	0.0521 U	0.116 U	0.0792 U	0.0716 U	0.0888 U	0.0825 U	0.0846 U	0.101 U
1-Chlorohexane	mg/kg	NE	NE	10,000	0.0026 U	0.0058 U	0.004 U	0.0036 U	0.0044 U	0.0041 U	0.0042 U	0.0051 U
2,2-Dichloropropane	mg/kg	NE	NE	10,000	0.0026 U	0.0058 U	0.004 U	0.0036 U	0.0044 U	0.0041 U	0.0042 U	0.0051 U
2-Butanone (MEK)	mg/kg	NE	10,000	10,000	0.0261 U	0.0579 U	0.0396 U	0.0358 U	0.0444 U	0.0412 U	0.0423 U	0.0507 U
2-Chlorotoluene	mg/kg	NE	NE	10,000	0.0026 U	0.0058 U	0.004 U	0.0036 U	0.0044 U	0.0041 U	0.0042 U	0.0051 U
2-Hexanone	mg/kg	NE	NE	10,000	0.0261 U	0.0579 U	0.0396 U	0.0358 U	0.0444 U	0.0412 U	0.0423 U	0.0507 U
4-Chlorotoluene	mg/kg	NE	NE	10,000	0.0026 U	0.0058 U	0.004 U	0.0036 U	0.0044 U	0.0041 U	0.0042 U	0.0051 U
4-Isopropyltoluene	mg/kg	NE	NE	10,000	0.0026 U	0.0058 U	0.004 U	0.0036 U	0.0044 U	0.0041 U	0.0042 U	0.0051 U
4-Methyl-2-Pentanone (MIBK)	mg/kg	NE	10,000	10,000	0.0261 U	0.0579 U	0.0396 U	0.0358 U	0.0444 U	0.0412 U	0.0423 U	0.0507 U
Acetone	mg/kg	NE	10,000	10,000	0.0261 U	0.0579 U	0.0396 U	0.0358 U	0.0444 U	0.0412 U	0.0423 U	0.0507 U
Benzene	mg/kg	4.3	200	10,000	0.0026 U	0.0058 U	0.004 U	0.0036 U	0.0044 U	0.0041 U	0.0042 U	0.0051 U
Bromobenzene	mg/kg	NE	NE	10,000	0.0026 U	0.0058 U	0.004 U	0.0036 U	0.0044 U	0.0041 U	0.0042 U	0.0051 U
Bromochloromethane	mg/kg	NE	NE	10,000	0.0026 U	0.0058 U	0.004 U	0.0036 U	0.0044 U	0.0041 U	0.0042 U	0.0051 U
Bromodichloromethane	mg/kg	NE	92	10,000	0.0026 U	0.0058 U	0.004 U	0.0036 U	0.0044 U	0.0041 U	0.0042 U	0.0051 U
Bromoform	mg/kg	NE	720	10,000	0.0026 U	0.0058 U	0.004 U	0.0036 U	0.0044 U	0.0041 U	0.0042 U	0.0051 U
Bromomethane	mg/kg	NE	2,900	10,000	0.0052 U	0.0116 U	0.0079 U	0.0072 U	0.0089 U	0.0082 U	0.0085 U	0.0101 U
Carbon Disulfide	mg/kg	NE	NE	10,000	0.0026 U	0.0058 U	0.004 U	0.0036 U	0.0044 U	0.0041 U	0.0042 U	0.0051 U
Carbon Tetrachloride	mg/kg	5	44	10,000	0.0026 U	0.0058 U	0.004 U	0.0036 U	0.0044 U	0.0041 U	0.0042 U	0.0051 U
Chlorobenzene	mg/kg	100	10,000	10,000	0.0026 U	0.0058 U	0.004 U	0.0036 U	0.0044 U	0.0041 U	0.0042 U	0.0051 U
Chloroethane	mg/kg	NE	NE	10,000	0.0052 U	0.0116 U	0.0079 U	0.0072 U	0.0089 U	0.0082 U	0.0085 U	0.0101 U
Chloroform	mg/kg	NE	940	10,000	0.0026 U	0.0058 U	0.004 U	0.0036 U	0.0044 U	0.0041 U	0.0042 U	0.0051 U
Chloromethane	mg/kg	NE	NE	10,000	0.0052 U	0.0116 U	0.0079 U	0.0072 U	0.0089 U	0.0082 U	0.0085 U	0.0101 U
cis-1,2-Dichloroethene	mg/kg	6	10,000	10,000	0.0026 U	0.0058 U	0.004 U	0.0036 U	0.0044 U	0.0041 U	0.0042 U	0.0051 U
cis-1,3-Dichloropropene	mg/kg	NE	NE	10,000	0.0026 U	0.0058 U	0.004 U	0.0036 U	0.0044 U	0.0041 U	0.0042 U	0.0051 U
Dibromochloromethane	mg/kg	NE	NE	10,000	0.0026 U	0.0058 U	0.004 U	0.0036 U	0.0044 U	0.0041 U	0.0042 U	0.0051 U
Dibromomethane	mg/kg	NE	NE	10,000	0.0026 U	0.0058 U	0.004 U	0.0036 U	0.0044 U	0.0041 U	0.0042 U	0.0051 U
Dichlorodifluoromethane	mg/kg	NE	NE	10,000	0.0052 U	0.0116 U	0.0079 U	0.0072 U	0.0089 U	0.0082 U	0.0085 U	0.0101 U
Diethylether	mg/kg	NE	NE	10,000	0.0026 U	0.0058 U	0.004 U	0.0036 U	0.0044 U	0.0041 U	0.0042 U	0.0051 U
Di-isopropyl ether	mg/kg	NE	NE	10,000	0.0026 U	0.0058 U	0.004 U	0.0036 U	0.0044 U	0.0041 U	0.0042 U	0.0051 U
Ethyl tertiary-butyl ether	mg/kg	NE	NE	10,000	0.0026 U	0.0058 U	0.004 U	0.0036 U	0.0044 U	0.0041 U	0.0042 U	0.0051 U
Ethylbenzene	mg/kg	62	10,000	10,000	0.0026 U	0.0058 U	0.004 U	0.0036 U	0.0044 U	0.0041 U	0.0042 U	0.0051 U

**Table 2A**  
**Summary of LDI Analytical**  
**VOCs - Surface Soil Testing Results**  
**Former Tidewater Facility**  
**Pawtucket, RI**

	Units	RIDEM GB Leachability Criteria	RIDEM Industrial/ Commercial DEC	RIDEM UCL	1710025-02 GZ-SS-541 (0-2 ft) 10/02/2017	1710025-03 GZ-SS-542 (0-2 ft) 10/02/2017	1710025-04 GZ-SS-543 (0-2 ft) 10/02/2017	1710025-05 GZ-SS-544 (0-2 ft) 10/02/2017	1710025-06 GZ-SS-545 (0-2 ft) 10/02/2017	1710025-07 GZ-SS-546 (0-2 ft) 10/02/2017	1710025-08 GZ-SS-547 (0-2 ft) 10/02/2017	1710025-09 GZ-SS-548 (0-2 ft) 10/02/2017
<b>VOLATILE ORGANICS</b>												
Hexachlorobutadiene	mg/kg	NE	73	10,000	0.0026 U	0.0058 U	0.004 U	0.0036 U	0.0044 U	0.0041 U	0.0042 U	0.0051 U
Isopropylbenzene	mg/kg	NE	10,000	10,000	0.0026 U	0.0058 U	0.004 U	0.0036 U	0.0044 U	0.0041 U	0.0042 U	0.0051 U
Methyl tert-butyl ether	mg/kg	100	10,000	10,000	0.0026 U	0.0058 U	0.004 U	0.0036 U	0.0044 U	0.0041 U	0.0042 U	0.0051 U
Methylene Chloride	mg/kg	NE	760	10,000	0.013 U	0.0289 U	0.0198 U	0.0179 U	0.0222 U	0.0206 U	0.0212 U	0.0253 U
Naphthalene	mg/kg	NE	10,000	10,000	0.0026 U	0.0058 U	0.004 U	0.0036 U	0.0044 U	0.0041 U	0.0042 U	0.0051 U
n-Butylbenzene	mg/kg	NE	NE	10,000	0.0026 U	0.0058 U	0.004 U	0.0036 U	0.0044 U	0.0041 U	0.0042 U	0.0051 U
n-Propylbenzene	mg/kg	NE	NE	10,000	0.0026 U	0.0058 U	0.004 U	0.0036 U	0.0044 U	0.0041 U	0.0042 U	0.0051 U
sec-Butylbenzene	mg/kg	NE	NE	10,000	0.0026 U	0.0058 U	0.004 U	0.0036 U	0.0044 U	0.0041 U	0.0042 U	0.0051 U
Styrene	mg/kg	64	190	10,000	0.0026 U	0.0058 U	0.004 U	0.0036 U	0.0044 U	0.0041 U	0.0042 U	0.0051 U
tert-Butylbenzene	mg/kg	NE	NE	10,000	0.0026 U	0.0058 U	0.004 U	0.0036 U	0.0044 U	0.0041 U	0.0042 U	0.0051 U
Tertiary-amyl methyl ether	mg/kg	NE	NE	10,000	0.0026 U	0.0058 U	0.004 U	0.0036 U	0.0044 U	0.0041 U	0.0042 U	0.0051 U
Tetrachloroethene	mg/kg	4.2	110	10,000	0.0026 U	0.0058 U	0.004 U	0.0036 U	0.0044 U	0.0041 U	0.0042 U	0.0051 U
Tetrahydrofuran	mg/kg	NE	NE	10,000	0.0026 U	0.0058 U	0.004 U	0.0036 U	0.0044 U	0.0041 U	0.0042 U	0.0051 U
Toluene	mg/kg	54	10,000	10,000	0.0026 U	0.0058 U	0.004 U	0.0036 U	0.0044 U	0.0041 U	0.0042 U	0.0051 U
trans-1,2-Dichloroethene	mg/kg	92	10,000	10,000	0.0026 U	0.0058 U	0.004 U	0.0036 U	0.0044 U	0.0041 U	0.0042 U	0.0051 U
trans-1,3-Dichloropropene	mg/kg	NE	NE	10,000	0.0026 U	0.0058 U	0.004 U	0.0036 U	0.0044 U	0.0041 U	0.0042 U	0.0051 U
Trichloroethene	mg/kg	20	520	10,000	0.0026 U	0.0058 U	0.004 U	0.0036 U	0.0044 U	0.0041 U	0.0042 U	0.0051 U
Trichlorofluoromethane	mg/kg	NE	NE	10,000	0.0026 U	0.0058 U	0.004 U	0.0036 U	0.0044 U	0.0041 U	0.0042 U	0.0051 U
Vinyl Acetate	mg/kg	NE	NE	10,000	0.0026 U	0.0058 U	0.004 U	0.0036 U	0.0044 U	0.0041 U	0.0042 U	0.0051 U
Vinyl Chloride	mg/kg	NE	3	10,000	0.0052 U	0.0116 U	0.0079 U	0.0072 U	0.0089 U	0.0082 U	0.0085 U	0.0101 U
o-Xylene	mg/kg	NE	10,000	10,000	0.0026 U	0.0058 U	0.004 U	0.0036 U	0.0044 U	0.0041 U	0.0042 U	0.0051 U
m&p-Xylene	mg/kg	NE	10,000	10,000	0.0052 U	0.0116 U	0.0079 U	0.0072 U	0.0089 U	0.0082 U	0.0085 U	0.0101 U
Total Xylenes	mg/kg	NE	10,000	10,000	0.0052 U	0.0116 U	0.0079 U	0.0072 U	0.0089 U	0.0082 U	0.0085 U	0.0101 U

**Notes**

NE = Not Established

NA = Not Analyzed

NFA = North Fill Area

FGPA = Former Gas Plant Area

FPPA = Former Power Plant Area

SFA = South Fill Area

**Detected concentrations are bolded.**

**Gray shaded cells indicates the concentration exceeds the RIDEM Method 1 Industrial/Commercial \Direct Exposure Criteria (I/C DEC).**

Detection limits highlighted in *blue and in italics* exceed the RIDEM Method 1 Criteria.

Underlined concentrations exceed the RIDEM Method 1 GB Leachability Criteria.

**A concentration with a bold border exceeds the Upper Concentration Limit.**

Undetected analytes have a "U" qualifier.

Any analytes reported from a diluted run of the original analysis have a "D" qualifier.

Blank cells indicate a sample was not analyzed for that parameter

"E" qualifier indicates estimated concentration above the quantitation limit.

**Table 2A**  
**Summary of LDI Analytical**  
**VOCs - Surface Soil Testing Results**  
**Former Tidewater Facility**  
**Pawtucket, RI**

	Units	RIDEM GB Leachability Criteria	RIDEM Industrial/ Commercial DEC	RIDEM UCL	1710025-09RE1 GZ-SS-548 (0-2 ft) 10/02/2017	1710025-10 GZ-SS-549 (0-2 ft) 10/02/2017	1710025-11 GZ-SS-550 (0-2 ft) 10/02/2017	1710025-12 GZ-SS-551 (0-2 ft) 10/02/2017	1710025-12RE1 GZ-SS-551 (0-2 ft) 10/02/2017	1710025-13 GZ-SS-552 (0-2 ft) 10/02/2017	1710025-14 GZ-SS-553 (0-2 ft) 10/02/2017	1710025-15 GZ-SS-554 (0-2 ft) 10/02/2017	1710025-16 GZ-SS-555 (0-2 ft) 10/02/2017	
<b>VOLATILE ORGANICS</b>														
1,1,1,2-Tetrachloroethane	mg/kg	NE	220	10,000	0.0053 U	0.0029 U	0.0045 U	0.0046 U	0.0033 U	0.0046 U	0.0038 U	0.0023 U	0.0034 U	
1,1,1-Trichloroethane	mg/kg	160	10,000	10,000	0.0053 U	0.0029 U	0.0045 U	0.0046 U	0.0033 U	0.0046 U	0.0038 U	0.0023 U	0.0034 U	
1,1,2,2-Tetrachloroethane	mg/kg	NE	29	10,000	0.0053 U	0.0029 U	0.0045 U	0.0046 U	0.0033 U	0.0046 U	0.0038 U	0.0023 U	0.0034 U	
1,1,2-Trichloroethane	mg/kg	NE	100	10,000	0.0053 U	0.0029 U	0.0045 U	0.0046 U	0.0033 U	0.0046 U	0.0038 U	0.0023 U	0.0034 U	
1,1-Dichloroethane	mg/kg	NE	10,000	10,000	0.0053 U	0.0029 U	0.0045 U	0.0046 U	0.0033 U	0.0046 U	0.0038 U	0.0023 U	0.0034 U	
1,1-Dichloroethene	mg/kg	1	9.5	10,000	0.0053 U	0.0029 U	0.0045 U	0.0046 U	0.0033 U	0.0046 U	0.0038 U	0.0023 U	0.0034 U	
1,1-Dichloropropene	mg/kg	NE	NE	10,000	0.0053 U	0.0029 U	0.0045 U	0.0046 U	0.0033 U	0.0046 U	0.0038 U	0.0023 U	0.0034 U	
1,2,3-Trichlorobenzene	mg/kg	NE	NE	10,000	0.0053 U	0.0029 U	0.0045 U	0.0046 U	0.0033 U	0.0046 U	0.0038 U	0.0023 U	0.0034 U	
1,2,3-Trichloropropane	mg/kg	NE	NE	10,000	0.0053 U	0.0029 U	0.0045 U	0.0046 U	0.0033 U	0.0046 U	0.0038 U	0.0023 U	0.0034 U	
1,2,4-Trichlorobenzene	mg/kg	NE	10,000	10,000	0.0053 U	0.0029 U	0.0045 U	0.0046 U	0.0033 U	0.0046 U	0.0038 U	0.0023 U	0.0034 U	
1,2,4-Trimethylbenzene	mg/kg	NE	NE	10,000	0.0053 U	0.0029 U	0.0045 U	0.0046 U	0.0033 U	0.0046 U	0.0038 U	0.0023 U	0.0034 U	
1,2-Dibromo-3-Chloropropane	mg/kg	NE	NE	10,000	0.0053 U	0.0029 U	0.0045 U	0.0046 U	0.0033 U	0.0046 U	0.0038 U	0.0023 U	0.0034 U	
1,2-Dibromoethane (EDB)	mg/kg	NE	0.07	10,000	0.0053 U	0.0029 U	0.0045 U	0.0046 U	0.0033 U	0.0046 U	0.0038 U	0.0023 U	0.0034 U	
1,2-Dichlorobenzene	mg/kg	NE	10,000	10,000	0.0053 U	0.0029 U	0.0045 U	0.0046 U	0.0033 U	0.0046 U	0.0038 U	0.0023 U	0.0034 U	
1,2-Dichloroethane	mg/kg	2.3	63	10,000	0.0053 U	0.0029 U	0.0045 U	0.0046 U	0.0033 U	0.0046 U	0.0038 U	0.0023 U	0.0034 U	
1,2-Dichloropropane	mg/kg	70	84	10,000	0.0053 U	0.0029 U	0.0045 U	0.0046 U	0.0033 U	0.0046 U	0.0038 U	0.0023 U	0.0034 U	
1,3,5-Trimethylbenzene	mg/kg	NE	NE	10,000	0.0053 U	0.0029 U	0.0045 U	0.0046 U	0.0033 U	0.0046 U	0.0038 U	0.0023 U	0.0034 U	
1,3-Dichlorobenzene	mg/kg	NE	10,000	10,000	0.0053 U	0.0029 U	0.0045 U	0.0046 U	0.0033 U	0.0046 U	0.0038 U	0.0023 U	0.0034 U	
1,3-Dichloropropane	mg/kg	NE	NE	10,000	0.0053 U	0.0029 U	0.0045 U	0.0046 U	0.0033 U	0.0046 U	0.0038 U	0.0023 U	0.0034 U	
1,4-Dichlorobenzene	mg/kg	NE	240	10,000	0.0053 U	0.0029 U	0.0045 U	0.0046 U	0.0033 U	0.0046 U	0.0038 U	0.0023 U	0.0034 U	
1,4-Dioxane	mg/kg	NE	NE	10,000	0.105 U	0.0573 U	0.0892 U	0.0911 U	0.0656 U	0.0916 U	0.0755 U	0.0452 U	0.0681 U	
1-Chlorohexane	mg/kg	NE	NE	10,000	0.0053 U	0.0029 U	0.0045 U	0.0046 U	0.0033 U	0.0046 U	0.0038 U	0.0023 U	0.0034 U	
2,2-Dichloropropane	mg/kg	NE	NE	10,000	0.0053 U	0.0029 U	0.0045 U	0.0046 U	0.0033 U	0.0046 U	0.0038 U	0.0023 U	0.0034 U	
2-Butanone (MEK)	mg/kg	NE	10,000	10,000	0.0526 U	0.0286 U	0.0446 U	0.0456 U	0.0328 U	0.0458 U	0.0377 U	0.0226 U	0.034 U	
2-Chlorotoluene	mg/kg	NE	NE	10,000	0.0053 U	0.0029 U	0.0045 U	0.0046 U	0.0033 U	0.0046 U	0.0038 U	0.0023 U	0.0034 U	
2-Hexanone	mg/kg	NE	NE	10,000	0.0526 U	0.0286 U	0.0446 U	0.0456 U	0.0328 U	0.0458 U	0.0377 U	0.0226 U	0.034 U	
4-Chlorotoluene	mg/kg	NE	NE	10,000	0.0053 U	0.0029 U	0.0045 U	0.0046 U	0.0033 U	0.0046 U	0.0038 U	0.0023 U	0.0034 U	
4-Isopropyltoluene	mg/kg	NE	NE	10,000	0.0053 U	0.0029 U	0.0045 U	0.0046 U	0.0033 U	0.0046 U	0.0038 U	0.0023 U	0.0034 U	
4-Methyl-2-Pentanone (MIBK)	mg/kg	NE	10,000	10,000	0.0526 U	0.0286 U	0.0446 U	0.0456 U	0.0328 U	0.0458 U	0.0377 U	0.0226 U	0.034 U	
Acetone	mg/kg	NE	10,000	10,000	0.0526 U	0.0286 U	0.0446 U	0.0456 U	0.0328 U	<b>0.0479</b>	-	0.0377 U	0.0226 U	0.034 U
Benzene	mg/kg	4.3	200	10,000	0.0053 U	0.0029 U	0.0045 U	0.0046 U	0.0033 U	0.0046 U	0.0038 U	0.0023 U	0.0034 U	
Bromobenzene	mg/kg	NE	NE	10,000	0.0053 U	0.0029 U	0.0045 U	0.0046 U	0.0033 U	0.0046 U	0.0038 U	0.0023 U	0.0034 U	
Bromochloromethane	mg/kg	NE	NE	10,000	0.0053 U	0.0029 U	0.0045 U	0.0046 U	0.0033 U	0.0046 U	0.0038 U	0.0023 U	0.0034 U	
Bromodichloromethane	mg/kg	NE	92	10,000	0.0053 U	0.0029 U	0.0045 U	0.0046 U	0.0033 U	0.0046 U	0.0038 U	0.0023 U	0.0034 U	
Bromoform	mg/kg	NE	720	10,000	0.0053 U	0.0029 U	0.0045 U	0.0046 U	0.0033 U	0.0046 U	0.0038 U	0.0023 U	0.0034 U	
Bromomethane	mg/kg	NE	2,900	10,000	0.0105 U	0.0057 U	0.0089 U	0.0091 U	0.0066 U	0.0092 U	0.0075 U	0.0045 U	0.0068 U	
Carbon Disulfide	mg/kg	NE	NE	10,000	0.0053 U	0.0029 U	0.0045 U	0.0046 U	0.0033 U	0.0046 U	0.0038 U	0.0023 U	0.0034 U	
Carbon Tetrachloride	mg/kg	5	44	10,000	0.0053 U	0.0029 U	0.0045 U	0.0046 U	0.0033 U	0.0046 U	0.0038 U	0.0023 U	0.0034 U	
Chlorobenzene	mg/kg	100	10,000	10,000	0.0053 U	0.0029 U	0.0045 U	0.0046 U	0.0033 U	0.0046 U	0.0038 U	0.0023 U	0.0034 U	
Chloroethane	mg/kg	NE	NE	10,000	0.0105 U	0.0057 U	0.0089 U	0.0091 U	0.0066 U	0.0092 U	0.0075 U	0.0045 U	0.0068 U	
Chloroform	mg/kg	NE	940	10,000	0.0053 U	0.0029 U	0.0045 U	0.0046 U	0.0033 U	0.0046 U	0.0038 U	0.0023 U	0.0034 U	
Chloromethane	mg/kg	NE	NE	10,000	0.0105 U	0.0057 U	0.0089 U	0.0091 U	0.0066 U	0.0092 U	0.0075 U	0.0045 U	0.0068 U	
cis-1,2-Dichloroethene	mg/kg	6	10,000	10,000	0.0053 U	0.0029 U	0.0045 U	0.0046 U	0.0033 U	0.0046 U	0.0038 U	0.0023 U	0.0034 U	
cis-1,3-Dichloropropene	mg/kg	NE	NE	10,000	0.0053 U	0.0029 U	0.0045 U	0.0046 U	0.0033 U	0.0046 U	0.0038 U	0.0023 U	0.0034 U	
Dibromochloromethane	mg/kg	NE	NE	10,000	0.0053 U	0.0029 U	0.0045 U	0.0046 U	0.0033 U	0.0046 U	0.0038 U	0.0023 U	0.0034 U	
Dibromomethane	mg/kg	NE	NE	10,000	0.0053 U	0.0029 U	0.0045 U	0.0046 U	0.0033 U	0.0046 U	0.0038 U	0.0023 U	0.0034 U	
Dichlorodifluoromethane	mg/kg	NE	NE	10,000	0.0105 U	0.0057 U	0.0089 U	0.0091 U	0.0066 U	0.0092 U	0.0075 U	0.0045 U	0.0068 U	
Diethylether	mg/kg	NE	NE	10,000	0.0053 U	0.0029 U	0.0045 U	0.0046 U	0.0033 U	0.0046 U	0.0038 U	0.0023 U	0.0034 U	
Di-isopropyl ether	mg/kg	NE	NE	10,000	0.0053 U	0.0029 U	0.0045 U	0.0046 U	0.0033 U	0.0046 U	0.0038 U	0.0023 U	0.0034 U	
Ethyl tertiary-butyl ether	mg/kg	NE	NE	10,000	0.0053 U	0.0029 U	0.0045 U	0.0046 U	0.0033 U	0.0046 U	0.0038 U	0.0023 U	0.0034 U	
Ethylbenzene	mg/kg	62	10,000	10,000	0.0053 U	0.0029 U	0.0045 U	0.0046 U	0.0033 U	0.0046 U	0.0038 U	0.0023 U	0.0034 U	

**Table 2A**  
**Summary of LDI Analytical**  
**VOCs - Surface Soil Testing Results**  
**Former Tidewater Facility**  
**Pawtucket, RI**

	Units	RIDEM GB Leachability Criteria	RIDEM Industrial/ Commercial DEC	RIDEM UCL	1710025-09RE1 GZ-SS-548 (0-2 ft) 10/02/2017	1710025-10 GZ-SS-549 (0-2 ft) 10/02/2017	1710025-11 GZ-SS-550 (0-2 ft) 10/02/2017	1710025-12 GZ-SS-551 (0-2 ft) 10/02/2017	1710025-12RE1 GZ-SS-551 (0-2 ft) 10/02/2017	1710025-13 GZ-SS-552 (0-2 ft) 10/02/2017	1710025-14 GZ-SS-553 (0-2 ft) 10/02/2017	1710025-15 GZ-SS-554 (0-2 ft) 10/02/2017	1710025-16 GZ-SS-555 (0-2 ft) 10/02/2017
<b>VOLATILE ORGANICS</b>													
Hexachlorobutadiene	mg/kg	NE	73	10,000	0.0053 U	0.0029 U	0.0045 U	0.0046 U	0.0033 U	0.0046 U	0.0038 U	0.0023 U	0.0034 U
Isopropylbenzene	mg/kg	NE	10,000	10,000	0.0053 U	0.0029 U	0.0045 U	0.0046 U	0.0033 U	0.0046 U	0.0038 U	0.0023 U	0.0034 U
Methyl tert-butyl ether	mg/kg	100	10,000	10,000	0.0053 U	0.0029 U	0.0045 U	0.0046 U	0.0033 U	0.0046 U	0.0038 U	0.0023 U	0.0034 U
Methylene Chloride	mg/kg	NE	760	10,000	0.0263 U	0.0143 U	0.0223 U	0.0228 U	0.0164 U	0.0229 U	0.0189 U	0.0113 U	0.017 U
Naphthalene	mg/kg	NE	10,000	10,000	0.0053 U	0.0029 U	0.0045 U	0.0046 U	0.0033 U	0.0046 U	0.0038 U	0.0023 U	0.0034 U
n-Butylbenzene	mg/kg	NE	NE	10,000	0.0053 U	0.0029 U	0.0045 U	0.0046 U	0.0033 U	0.0046 U	0.0038 U	0.0023 U	0.0034 U
n-Propylbenzene	mg/kg	NE	NE	10,000	0.0053 U	0.0029 U	0.0045 U	0.0046 U	0.0033 U	0.0046 U	0.0038 U	0.0023 U	0.0034 U
sec-Butylbenzene	mg/kg	NE	NE	10,000	0.0053 U	0.0029 U	0.0045 U	0.0046 U	0.0033 U	0.0046 U	0.0038 U	0.0023 U	0.0034 U
Styrene	mg/kg	64	190	10,000	0.0053 U	0.0029 U	0.0045 U	0.0046 U	0.0033 U	0.0046 U	0.0038 U	0.0023 U	0.0034 U
tert-Butylbenzene	mg/kg	NE	NE	10,000	0.0053 U	0.0029 U	0.0045 U	0.0046 U	0.0033 U	0.0046 U	0.0038 U	0.0023 U	0.0034 U
Tertiary-amyl methyl ether	mg/kg	NE	NE	10,000	0.0053 U	0.0029 U	0.0045 U	0.0046 U	0.0033 U	0.0046 U	0.0038 U	0.0023 U	0.0034 U
Tetrachloroethene	mg/kg	4.2	110	10,000	0.0053 U	0.0029 U	0.0045 U	0.0046 U	0.0033 U	0.0046 U	0.0038 U	0.0023 U	0.0034 U
Tetrahydrofuran	mg/kg	NE	NE	10,000	0.0053 U	0.0029 U	0.0045 U	0.0046 U	0.0033 U	0.0046 U	0.0038 U	0.0023 U	0.0034 U
Toluene	mg/kg	54	10,000	10,000	0.0053 U	0.0029 U	0.0045 U	0.0046 U	0.0033 U	0.0046 U	0.0038 U	0.0023 U	0.0034 U
trans-1,2-Dichloroethene	mg/kg	92	10,000	10,000	0.0053 U	0.0029 U	0.0045 U	0.0046 U	0.0033 U	0.0046 U	0.0038 U	0.0023 U	0.0034 U
trans-1,3-Dichloropropene	mg/kg	NE	NE	10,000	0.0053 U	0.0029 U	0.0045 U	0.0046 U	0.0033 U	0.0046 U	0.0038 U	0.0023 U	0.0034 U
Trichloroethene	mg/kg	20	520	10,000	0.0053 U	0.0029 U	0.0045 U	0.0046 U	0.0033 U	0.0046 U	0.0038 U	0.0023 U	0.0034 U
Trichlorofluoromethane	mg/kg	NE	NE	10,000	0.0053 U	0.0029 U	0.0045 U	0.0046 U	0.0033 U	0.0046 U	0.0038 U	0.0023 U	0.0034 U
Vinyl Acetate	mg/kg	NE	NE	10,000	0.0053 U	0.0029 U	0.0045 U	0.0046 U	0.0033 U	0.0046 U	0.0038 U	0.0023 U	0.0034 U
Vinyl Chloride	mg/kg	NE	3	10,000	0.0105 U	0.0057 U	0.0089 U	0.0091 U	0.0066 U	0.0092 U	0.0075 U	0.0045 U	0.0068 U
o-Xylene	mg/kg	NE	10,000	10,000	0.0053 U	0.0029 U	0.0045 U	0.0046 U	0.0033 U	0.0046 U	0.0038 U	0.0023 U	0.0034 U
m&p-Xylene	mg/kg	NE	10,000	10,000	0.0105 U	0.0057 U	0.0089 U	0.0091 U	0.0066 U	0.0092 U	0.0075 U	0.0045 U	0.0068 U
Total Xylenes	mg/kg	NE	10,000	10,000	0.0105 U	0.0057 U	0.0089 U	0.0091 U	0.0066 U	0.0092 U	0.0075 U	0.0045 U	0.0068 U

**Notes**

NE = Not Established

NA = Not Analyzed

NFA = North Fill Area

FGPA = Former Gas Plant Area

FPPA = Former Power Plant Area

SFA = South Fill Area

**Detected concentrations are bolded.**

**Gray shaded cells indicates the concentration exceeds the RIDEM Method 1 Industrial/Commercial \Direct Exposure Criteria (I/C DEC).**

Detection limits highlighted in *blue and in italics* exceed the RIDEM Method 1 Criteria.

Underlined concentrations exceed the RIDEM Method 1 GB Leachability Criteria.

**A concentration with a bold border exceeds the Upper Concentration Limit.**

Undetected analytes have a "U" qualifier.

Any analytes reported from a diluted run of the original analysis have a "D" qualifier.

Blank cells indicate a sample was not analyzed for that parameter

"E" qualifier indicates estimated concentration above the quantitation limit.

Table 2B  
Summary of LDI Analytical  
TPH, PAHs, and Metals - Surface Soil Testing Results  
Former Tidewater Facility  
Pawtucket, RI

	Units	RIDEM GB Leachability Criteria	RIDEM Industrial/ Commercial DEC	RIDEM UCL	1709662-01 GZ-SS-501 (0-2') 09/21/2017	1709662-02 GZ-SS-502 (0-2') 09/21/2017	1709662-03 GZ-SS-503 (0-2') 09/21/2017	1712222-02 GZ-SS-562 (0-2') 12/08/2017	1712222-03 GZ-SS-563 (0-2') 12/08/2017	1712222-04 GZ-SS-564 (0-2') 12/08/2017	1712222-05 GZ-SS-565 (0-2') 12/08/2017	1712222-07 GZ-SS-566 (0-2') 12/08/2017								
<b>TOTAL PETROLEUM HYDROCARBON</b>																				
Hydrocarbon Content	mg/kg	2,500	2,500	30,000	87.1	-	40.6	U	268	-	1,150	D	203	-	43.7	U	234	-	4,920	D
<b>METALS</b>																				
Antimony	mg/kg	NE	820	10,000	1.97	U, D	1.92	U, D	2.08	U, D	2.12	U, D	2.21	U, D	1.77	U, D	1.88	U, D	2.42	U, D
Arsenic	mg/kg	NE	7	10,000	4.46	-	7.33	-	4.37	-	9.36	-	10.4	-	7.02	-	14.5	-	11.9	D
Beryllium	mg/kg	NE	1.3	10,000	0.23	-	0.26	-	0.28	-	0.16	-	0.49	-	0.52	-	0.1	U	0.37	-
Cadmium	mg/kg	NE	1,000	10,000	0.49	U	0.48	U	0.52	U	0.53	U	0.55	U	0.44	U	0.47	U	0.6	U
Chromium	mg/kg	NE	10,000	10,000	7.33	-	14.9	-	6.85	-	11.7	-	9.21	-	11.7	-	9.33	-	8.55	-
Copper	mg/kg	NE	10,000	10,000	19.2	-	22.1	-	16.6	-	38.5	-	92.9	-	19.6	-	33.2	-	58.1	-
Lead	mg/kg	NE	500	10,000	79.8	-	52.5	-	70.2	-	98.8	-	44.4	-	38.4	-	51.3	-	486	-
Nickel	mg/kg	NE	10,000	10,000	6.6	-	9.58	-	7.6	-	7.66	-	7.82	-	13.3	-	7.97	-	7.69	-
Silver	mg/kg	NE	10,000	10,000	0.49	U	0.48	U	0.52	U	0.53	U	0.55	U	0.44	U	0.47	U	0.6	U
Thallium	mg/kg	NE	140	10,000	1.97	U, D	1.92	U, D	2.08	U, D	2.12	U, D	2.21	U, D	1.77	U, D	1.88	U, D	2.42	U, D
Zinc	mg/kg	NE	10,000	10,000	49.5	-	43.9	-	65.3	-	17.1	-	25.5	-	46	-	12.4	-	69.5	-
Selenium	mg/kg	NE	10,000	10,000	1.97	U, D	1.92	U, D	2.08	U, D	2.12	U, D	2.21	U, D	1.77	U, D	1.88	U, D	2.42	U, D
Mercury	mg/kg	NE	610	10,000	0.107	-	0.065	-	0.171	-	0.317	-	0.385	-	0.041	-	0.077	-	0.453	-
<b>PAHS BY GCMS</b>																				
2-Methylnaphthalene	mg/kg	NE	10,000	10,000	0.343	U	0.337	U	0.364	U	0.887	-	0.423	U	0.422	U	0.428	U	6.52	-
Acenaphthene	mg/kg	NE	10,000	10,000	0.343	U	0.337	U	0.364	U	0.396	U	0.423	U	0.422	U	0.428	U	2.71	-
Acenaphthylene	mg/kg	NE	10,000	10,000	0.343	U	0.337	U	0.364	U	5.64	-	0.703	-	0.422	U	0.957	-	40.6	D
Anthracene	mg/kg	NE	10,000	10,000	0.424	-	0.337	U	0.364	U	3.36	-	0.437	-	0.422	U	0.834	-	25.6	D
Benzo [a] Anthracene	mg/kg	NE	7.8	10,000	1.21	-	0.343	-	0.453	-	7.54	-	1.42	-	0.654	-	1.74	-	74.5	D
Benzo [a] Pyrene	mg/kg	NE	0.8	10,000	1	-	0.354	-	0.473	-	6.75	-	1.29	-	0.492	-	0.733	-	43.7	D
Benzo [b] Fluoranthene	mg/kg	NE	7.8	10,000	1.12	-	0.396	-	0.628	-	9.38	D	1.16	-	0.422	U	2.35	-	31.6	D
Benzo [g,h,i] Perylene	mg/kg	NE	10,000	10,000	0.343	U	0.337	U	0.364	U	5.87	-	1.26	-	0.422	U	1.4	-	11.5	-
Benzo [k] Fluoranthene	mg/kg	NE	78	10,000	0.92	-	0.337	U	0.399	-	5.75	D	1.18	-	0.439	-	1.5	-	33.4	D
Chrysene	mg/kg	NE	780	10,000	1.22	-	0.358	-	0.483	-	7.71	-	1.86	-	0.725	-	2.55	-	61.7	D
Dibenzo [a,h] Anthracene	mg/kg	NE	0.8	10,000	0.193	-	0.169	U	0.183	U	3.4	-	0.689	-	0.219	-	0.788	-	8.75	-
Fluoranthene	mg/kg	NE	10,000	10,000	2.56	-	0.66	-	0.833	-	9.5	-	1.9	-	1.02	-	2.8	-	110	D
Fluorene	mg/kg	NE	10,000	10,000	0.343	U	0.337	U	0.364	U	0.396	U	0.423	U	0.422	U	0.428	U	3.26	-
Indeno [1,2,3-cd] Pyrene	mg/kg	NE	7.8	10,000	0.351	-	0.337	U	0.364	U	5.71	-	1.09	-	0.422	U	1.34	-	12.2	-
Naphthalene	mg/kg	NE	10,000	10,000	0.343	U	0.337	U	0.364	U	1.59	-	0.423	U	0.422	U	0.428	U	10.8	-
Phenanthrene	mg/kg	NE	10,000	10,000	1.65	-	0.337	U	0.364	U	4.4	-	1.65	-	1.37	-	1.71	-	47.9	D
Pyrene	mg/kg	NE	10,000	10,000	1.7	-	0.51	-	0.599	-	14.5	D	2.35	-	1.38	-	3.1	-	161	D
<b>SUBCONTRACTED ANALYTES</b>																				
Total Cyanide	mg/kg	NE	10,000	10,000	1.02	U	1.02	U	1.03	U	37.3	D	1.51	-	1.29	-	25.5	-	10.1	-

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Detected concentrations are bolded.

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Industrial/Commercial Direct Exposure Criteria (I/C DEC).

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Table 2B  
Summary of LDI Analytical  
TPH, PAHs, and Metals - Surface Soil Testing Results  
Former Tidewater Facility  
Pawtucket, RI

	Units	RIDEM GB Leachability Criteria	RIDEM Industrial/ Commercial DEC	RIDEM UCL	1712222-08 GZ-SS-567 (0-2') 12/08/2017	1712222-09 GZ-SS-568 (0-2') 12/08/2017	1712222-10 GZ-SS-569 (0-2') 12/08/2017	1712222-11 GZ-SS-570 (0-2') 12/08/2017	1709662-04 GZ-SS-504 (0-2') 09/21/2017	1709662-05 GZ-SS-505 (0-2') 09/21/2017	1709662-06 GZ-SS-506 (0-2') 09/21/2017	1709662-07 GZ-SS-507 (0-2') 09/22/2017
<b>TOTAL PETROLEUM HYDROCARBON</b>												
Hydrocarbon Content	mg/kg	2,500	2,500	30,000	192 D	504 D	42.6 U	585 -	54.9 -	114 -	40.7 U	521 D
<b>METALS</b>												
Antimony	mg/kg	NE	820	10,000	1.84 U, D	1.75 U, D	1.71 U, D	2.48 U, D	2.01 U, D	2.1 U, D	1.99 U, D	2 U, D
Arsenic	mg/kg	NE	7	10,000	4.61 U, D	4.3 -	4.37 -	28.1 -	2.51 U	2.63 U	2.49 U	4.91 -
Beryllium	mg/kg	NE	1.3	10,000	0.25 -	0.25 -	0.32 -	0.14 U	0.12 -	0.12 U	0.14 -	0.28 -
Cadmium	mg/kg	NE	1,000	10,000	0.56 -	0.44 U	0.43 U	1.21 -	0.5 U	0.53 U	0.5 U	0.5 U
Chromium	mg/kg	NE	10,000	10,000	5.67 -	9.47 -	9.04 -	41.4 -	2.53 -	2.74 -	1.81 -	8.94 -
Copper	mg/kg	NE	10,000	10,000	25.3 -	20.2 -	16 -	140 -	7.64 -	5.99 -	5.25 -	16.8 -
Lead	mg/kg	NE	500	10,000	101 -	89 -	12.8 -	146 -	35.9 -	93.3 -	4.97 U	73.8 -
Nickel	mg/kg	NE	10,000	10,000	7.66 -	9.53 -	9.76 -	38.9 -	2.53 -	2.74 -	2.49 U	10.5 -
Silver	mg/kg	NE	10,000	10,000	0.46 U	0.44 U	0.43 U	6.2 U, D	0.5 U	0.53 U	0.5 U	0.5 U
Thallium	mg/kg	NE	140	10,000	1.84 U, D	1.75 U, D	1.71 U, D	2.48 U, D	2.01 U, D	2.1 U, D	1.99 U, D	2 U, D
Zinc	mg/kg	NE	10,000	10,000	74.3 -	64.3 -	28.1 -	221 -	16.6 -	23 -	32.1 -	94.9 -
Selenium	mg/kg	NE	10,000	10,000	1.84 U, D	1.75 U, D	1.71 U, D	2.48 U, D	2.01 U, D	2.1 U, D	1.99 U, D	2 U, D
Mercury	mg/kg	NE	610	10,000	0.18 -	0.072 -	0.034 U	0.282 -	0.281 -	0.358 -	0.03 U	0.044 -
<b>PAHS BY GCMS</b>												
2-Methylnaphthalene	mg/kg	NE	10,000	10,000	0.372 U	0.373 U	0.411 U	1.11 -	0.348 U	0.362 U	0.361 U	0.361 U
Acenaphthene	mg/kg	NE	10,000	10,000	0.372 U	0.373 U	0.411 U	0.471 U	0.348 U	0.362 U	0.361 U	0.361 U
Acenaphthylene	mg/kg	NE	10,000	10,000	0.695 -	0.887 -	0.411 U	3.62 -	0.348 U	0.362 U	0.361 U	0.409 -
Anthracene	mg/kg	NE	10,000	10,000	0.551 -	1.21 -	0.411 U	2.91 -	0.348 U	0.362 U	0.361 U	0.361 U
Benzo [a] Anthracene	mg/kg	NE	7.8	10,000	2.03 -	3.15 -	0.411 U	6.18 -	0.381 -	0.456 -	0.361 U	1.67 -
Benzo [a] Pyrene	mg/kg	NE	0.8	10,000	1.93 -	2.64 -	0.206 U	4.76 -	0.502 -	0.477 -	0.181 U	1.71 -
Benzo [b] Fluoranthene	mg/kg	NE	7.8	10,000	1.87 -	1.96 -	0.411 U	3.52 -	0.657 -	0.695 -	0.361 U	2.63 -
Benzo [g,h,i] Perylene	mg/kg	NE	10,000	10,000	1.28 -	1.62 -	0.411 U	2.78 -	0.348 U	0.362 U	0.361 U	0.698 -
Benzo [k] Fluoranthene	mg/kg	NE	78	10,000	1.25 -	2.44 -	0.411 U	3.64 -	0.439 -	0.45 -	0.361 U	1.82 -
Chrysene	mg/kg	NE	780	10,000	1.91 -	2.93 -	0.206 U	6.19 -	0.475 -	0.539 -	0.181 U	1.54 -
Dibenzo [a,h] Anthracene	mg/kg	NE	0.8	10,000	0.711 -	0.968 -	0.206 U	1.55 -	0.174 U	0.182 U	0.181 U	0.342 -
Fluoranthene	mg/kg	NE	10,000	10,000	2.95 -	5.56 -	0.411 U	8.13 -	0.599 -	0.826 -	0.361 U	3 -
Fluorene	mg/kg	NE	10,000	10,000	0.372 U	0.373 U	0.411 U	1.23 -	0.348 U	0.362 U	0.361 U	0.361 U
Indeno [1,2,3-cd] Pyrene	mg/kg	NE	7.8	10,000	1.2 -	1.58 -	0.411 U	2.43 -	0.348 U	0.362 U	0.361 U	0.712 -
Naphthalene	mg/kg	NE	10,000	10,000	0.372 U	0.373 U	0.411 U	2.19 -	0.348 U	0.362 U	0.361 U	0.361 U
Phenanthrene	mg/kg	NE	10,000	10,000	1.09 -	3.67 -	0.411 U	14.4 D	0.348 U	0.362 U	0.361 U	0.507 -
Pyrene	mg/kg	NE	10,000	10,000	2.71 -	4.89 -	0.411 U	13.7 D	0.466 -	0.601 -	0.361 U	1.83 -
<b>SUBCONTRACTED ANALYTES</b>												
Total Cyanide	mg/kg	NE	10,000	10,000	1.02 U	1.11 U	1.14 U	19.2 -	1 U	2.97 -	1.02 U	333 D

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Detected concentrations are bolded.

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Table 2B  
Summary of LDI Analytical  
TPH, PAHs, and Metals - Surface Soil Testing Results  
Former Tidewater Facility  
Pawtucket, RI

	Units	RIDEM GB Leachability Criteria	RIDEM Industrial/ Commercial DEC	RIDEM UCL	1709662-12 GZ-SS-512 (0-2') 09/22/2017	1709662-13 GZ-SS-513 (0-2') 09/22/2017	1709662-14 GZ-SS-514 (0-2') 09/22/2017	1712222-01 GZ-SS-561 (1-2') 12/08/2017	1709662-08 GZ-SS-508 (0-2') 09/21/2017	1709662-09 GZ-SS-509 (0-2') 09/21/2017	1709662-10 GZ-SS-510 (0-2') 09/21/2017	1709662-11 GZ-SS-511 (0-2') 09/22/2017
<b>TOTAL PETROLEUM HYDROCARBON</b>												
Hydrocarbon Content	mg/kg	2,500	2,500	30,000	41.9 U	481 D	311 D	38.8 U	39.4 U	77.2 -	90.6 -	169 -
<b>METALS</b>												
Antimony	mg/kg	NE	820	10,000	2.14 U, D	1.81 U, D	1.57 U, D	2 U, D	1.68 U, D	2.14 U, D	1.8 U, D	1.91 U, D
Arsenic	mg/kg	NE	7	10,000	3.16 -	3.07 -	3.66 -	2.5 U	5.61 -	6.41 -	6.6 -	5.65 -
Beryllium	mg/kg	NE	1.3	10,000	0.3 -	0.17 -	0.22 -	0.18 -	0.26 -	0.3 -	0.31 -	0.33 -
Cadmium	mg/kg	NE	1,000	10,000	0.53 U	0.45 U	0.39 U	0.5 U	0.42 U	0.53 U	0.45 U	0.48 U
Chromium	mg/kg	NE	10,000	10,000	12.1 -	7.95 -	6.51 -	5.23 -	8.72 -	9.3 -	6.01 -	9.32 -
Copper	mg/kg	NE	10,000	10,000	7.25 -	12.3 -	10.2 -	6.43 -	13.7 -	17.3 -	11.9 -	18.4 -
Lead	mg/kg	NE	500	10,000	15.7 -	30.7 -	80 -	4.99 U	72.6 -	71.8 -	140 -	80.4 -
Nickel	mg/kg	NE	10,000	10,000	7.01 -	7.47 -	6.2 -	3.52 -	10.1 -	10.1 -	6.5 -	13.9 -
Silver	mg/kg	NE	10,000	10,000	0.53 U	0.45 U	0.39 U	0.5 U	0.42 U	0.53 U	0.45 U	0.48 U
Thallium	mg/kg	NE	140	10,000	2.14 U, D	1.81 U, D	1.57 U, D	0.5 U	1.68 U, D	2.14 U, D	1.8 U, D	1.91 U, D
Zinc	mg/kg	NE	10,000	10,000	25.6 -	30.5 -	28.1 -	22.6 -	86 -	89.9 -	41.4 -	63.1 -
Selenium	mg/kg	NE	10,000	10,000	2.14 U, D	1.81 U, D	1.57 U, D	2 U, D	1.68 U, D	2.14 U, D	1.8 U, D	1.91 U, D
Mercury	mg/kg	NE	610	10,000	0.057 -	0.041 -	0.601 D	0.028 U	0.061 -	0.065 -	0.131 -	0.083 -
<b>PAHS BY GCMS</b>												
2-Methylnaphthalene	mg/kg	NE	10,000	10,000	0.373 U	0.348 U	0.336 U	0.378 U	0.343 U	0.368 U	0.373 U	0.354 U
Acenaphthene	mg/kg	NE	10,000	10,000	0.373 U	0.348 U	0.336 U	0.378 U	0.343 U	0.986 -	0.373 U	0.354 U
Acenaphthylene	mg/kg	NE	10,000	10,000	0.373 U	1.18 -	1.61 -	0.378 U	0.343 U	1.75 -	0.373 U	1.19 -
Anthracene	mg/kg	NE	10,000	10,000	0.373 U	0.598 -	0.657 -	0.378 U	0.343 U	6.35 -	0.373 U	0.664 -
Benzo [a] Anthracene	mg/kg	NE	7.8	10,000	0.557 -	3.01 -	3.81 -	0.378 U	0.343 U	24.2 D	0.373 U	4.99 -
Benzo [a] Pyrene	mg/kg	NE	0.8	10,000	0.939 -	3.09 -	3.65 -	0.19 U	0.172 U	20.9 D	0.317 -	4.78 -
Benzo [b] Fluoranthene	mg/kg	NE	7.8	10,000	0.697 -	3.16 -	3.03 -	0.378 U	0.343 U	18.6 D	0.456 -	5.27 -
Benzo [g,h,i] Perylene	mg/kg	NE	10,000	10,000	0.594 -	1.62 -	1.42 -	0.378 U	0.343 U	6.33 -	0.373 U	1.88 -
Benzo [k] Fluoranthene	mg/kg	NE	78	10,000	0.669 -	2.91 -	3.59 -	0.378 U	0.343 U	17.6 D	0.373 U	5.06 -
Chrysene	mg/kg	NE	780	10,000	0.549 -	3.24 -	4.22 -	0.19 U	0.172 U	21.8 D	0.39 -	4.26 -
Dibenzo [a,h] Anthracene	mg/kg	NE	0.8	10,000	0.303 -	0.78 -	0.78 -	0.19 U	0.172 U	3.36 -	0.187 U	0.947 -
Fluoranthene	mg/kg	NE	10,000	10,000	0.639 -	3.95 -	5.42 -	0.378 U	0.343 U	55.4 D	0.726 -	11.9 D
Fluorene	mg/kg	NE	10,000	10,000	0.373 U	0.348 U	0.336 U	0.378 U	0.343 U	1.42 -	0.373 U	0.354 U
Indeno [1,2,3-cd] Pyrene	mg/kg	NE	7.8	10,000	0.554 -	1.51 -	1.4 -	0.378 U	0.343 U	6.19 -	0.373 U	1.91 -
Naphthalene	mg/kg	NE	10,000	10,000	0.373 U	0.402 -	0.337 -	0.378 U	0.343 U	0.655 -	0.373 U	0.354 U
Phenanthrene	mg/kg	NE	10,000	10,000	0.373 U	2.25 -	2.58 -	0.378 U	0.343 U	30.2 D	0.373 U	1.89 -
Pyrene	mg/kg	NE	10,000	10,000	0.589 -	4.11 -	5.84 -	0.378 U	0.343 U	42 D	0.483 -	6.91 -
<b>SUBCONTRACTED ANALYTES</b>												
Total Cyanide	mg/kg	NE	10,000	10,000	50.7 D	12 -	7.32 -	1 U	0.97 U	2.48 -	3.49 -	1.97 -

**Notes**

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NA = Not Analyzed

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SFA = South Fill Area

Detected concentrations are bolded.

Gray shaded cells indicates the concentration exceeds the RIDEM Method 1

Industrial/Commercial Direct Exposure Criteria (I/C DEC).

Detection limits highlighted in *blue and in italics* exceed the RIDEM Method 1 Criteria.

Underlined concentrations exceed the RIDEM Method 1 GB Leachability Criteria.

A concentration with a bold border exceeds the Upper Concentration Limit.

Undetected analytes have a "U" qualifier.

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Blank cells indicate a sample was not analyzed for that parameter

"E" qualifier indicates estimated concentration above the quantitation limit.



Table 2B  
Summary of LDI Analytical  
TPH, PAHs, and Metals - Surface Soil Testing Results  
Former Tidewater Facility  
Pawtucket, RI

	Units	RIDEM GB Leachability Criteria	RIDEM Industrial/ Commercial DEC	RIDEM UCL	1709662-15 GZ-SS-515 (0-2') 09/22/2017	1709662-16 GZ-SS-516 (0-2') 09/22/2017	1709662-17 GZ-SS-517 (0-2') 09/22/2017	1709754-01 GZ-SS-518 (0-2') 09/26/2017	1709754-02 GZ-SS-519 (0-2') 09/26/2017	1709754-03 GZ-SS-520 (0-2') 09/26/2017	1709754-04 GZ-SS-521 (0-2') 09/26/2017	1709754-05 GZ-SS-522 (0-2') 09/26/2017
<b>TOTAL PETROLEUM HYDROCARBON</b>												
Hydrocarbon Content	mg/kg	2,500	2,500	30,000	40.5 U	179 -	642 D	1520 D	178 -	785 D	40.5 U	1190 D
<b>METALS</b>												
Antimony	mg/kg	NE	820	10,000	1.44 U, D	2.13 U, D	1.94 U, D	24 D	2.14 U, D	1.99 U, D	1.95 U, D	1.68 U, D
Arsenic	mg/kg	NE	7	10,000	3.64 D	5.32 U, D	7.79 -	4.11 -	4.26 -	6.44 -	6.12 -	6.16 -
Beryllium	mg/kg	NE	1.3	10,000	0.21 -	0.14 -	0.25 -	0.24 -	0.27 -	0.32 -	0.22 -	0.57 -
Cadmium	mg/kg	NE	1,000	10,000	0.36 U	0.53 U	0.7 -	1.06 -	0.53 U	0.73 -	0.49 U	0.42 U
Chromium	mg/kg	NE	10,000	10,000	5.12 -	3.57 -	10.5 -	26.1 -	4.29 -	7.84 -	5.63 -	8.69 -
Copper	mg/kg	NE	10,000	10,000	8.3 -	10.3 -	26.1 -	76.5 -	22.2 -	55.2 -	32.6 -	140 -
Lead	mg/kg	NE	500	10,000	22.4 -	56.8 -	262 -	4130 D	49.8 -	294 -	41 -	514 -
Nickel	mg/kg	NE	10,000	10,000	5.63 -	4.18 -	9.39 -	14.1 -	6.91 -	14.7 -	6.44 -	14.1 -
Silver	mg/kg	NE	10,000	10,000	0.36 U	0.53 U	0.48 U	0.63 U	0.53 U	0.5 U	0.49 U	0.42 U
Thallium	mg/kg	NE	140	10,000	1.44 U, D	2.13 U, D	1.94 U, D	2.52 U, D	2.14 U, D	1.99 U, D	1.95 U, D	1.68 U, D
Zinc	mg/kg	NE	10,000	10,000	23.8 -	26.5 -	181 -	348 -	41.9 -	325 -	27.3 -	277 -
Selenium	mg/kg	NE	10,000	10,000	1.44 U, D	2.13 U, D	1.94 U, D	2.52 U, D	2.14 U, D	1.99 U, D	1.95 U, D	1.68 U, D
Mercury	mg/kg	NE	610	10,000	0.029 U	0.319 -	0.223 -	0.704 -	0.04 -	0.274 -	0.129 -	0.52 -
<b>PAHS BY GCMS</b>												
2-Methylnaphthalene	mg/kg	NE	10,000	10,000	0.365 U	0.372 U	0.367 U	0.974 U, D	0.377 U	0.372 U	0.348 U	1.68 D
Acenaphthene	mg/kg	NE	10,000	10,000	0.365 U	0.372 U	0.367 U	0.974 U, D	0.377 U	0.372 U	0.348 U	0.725 U, D
Acenaphthylene	mg/kg	NE	10,000	10,000	0.365 U	0.372 U	1.22 -	2.06 D	0.492 -	3.68 -	0.348 U	6.28 D
Anthracene	mg/kg	NE	10,000	10,000	0.365 U	0.372 U	0.704 -	1.43 D	0.377 U	2.02 -	0.348 U	2.58 D
Benzo [a] Anthracene	mg/kg	NE	7.8	10,000	0.365 U	0.58 -	6.61 -	6.99 D	1.87 -	9.89 D	0.348 U	11.7 D
Benzo [a] Pyrene	mg/kg	NE	0.8	10,000	0.183 U	0.607 -	7.58 -	6.89 D	1.73 -	10.1 D	0.174 U	10.3 D
Benzo [b] Fluoranthene	mg/kg	NE	7.8	10,000	0.365 U	0.787 -	8.34 D	8.3 D	2.1 -	14.5 D	0.348 U	12.5 D
Benzo [g,h,i] Perylene	mg/kg	NE	10,000	10,000	0.365 U	0.372 U	3.25 -	5.36 D	1.49 -	7.01 -	0.348 U	7.19 D
Benzo [k] Fluoranthene	mg/kg	NE	78	10,000	0.365 U	0.461 -	5.97 -	3.85 D	1.11 -	5.46 D	0.348 U	4.23 D
Chrysene	mg/kg	NE	780	10,000	0.191 -	0.644 -	5.7 -	6.2 D	1.5 -	8.08 -	0.174 U	12 D
Dibenzo [a,h] Anthracene	mg/kg	NE	0.8	10,000	0.183 U	0.186 U	1.64 -	2.24 D	0.492 -	3.45 -	0.174 U	2.81 D
Fluoranthene	mg/kg	NE	10,000	10,000	0.365 U	0.97 -	10.1 D	10.1 D	2.43 -	11.5 D	0.348 U	12.3 D
Fluorene	mg/kg	NE	10,000	10,000	0.365 U	0.372 U	0.367 U	0.974 U, D	0.377 U	0.372 U	0.348 U	1.03 D
Indeno [1,2,3-cd] Pyrene	mg/kg	NE	7.8	10,000	0.365 U	0.372 U	3.3 -	4.79 D	1.34 -	6.82 -	0.348 U	6.75 D
Naphthalene	mg/kg	NE	10,000	10,000	0.365 U	0.372 U	0.367 U	0.489 U, D	0.377 U	0.372 U	0.348 U	2.43 D
Phenanthrene	mg/kg	NE	10,000	10,000	0.365 U	0.372 U	1.72 -	3.66 D	0.579 -	3.12 -	0.348 U	5.99 D
Pyrene	mg/kg	NE	10,000	10,000	0.365 U	0.84 -	6.62 -	9.99 D	2.62 -	13.9 D	0.348 U	16.4 D
<b>SUBCONTRACTED ANALYTES</b>												
Total Cyanide	mg/kg	NE	10,000	10,000	2.85 -	6.99 -	11.5 -	61.7 D	2.56 -	8.96 -	1.54 -	21.6 -

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SFA = South Fill Area

Detected concentrations are bolded.

Gray shaded cells indicates the concentration exceeds the RIDEM Method 1

Industrial/Commercial Direct Exposure Criteria (I/C DEC).

Detection limits highlighted in *blue and in italics* exceed the RIDEM Method 1 Criteria.

Underlined concentrations exceed the RIDEM Method 1 GB Leachability Criteria.

A concentration with a bold border exceeds the Upper Concentration Limit.

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Table 2B  
Summary of LDI Analytical  
TPH, PAHs, and Metals - Surface Soil Testing Results  
Former Tidewater Facility  
Pawtucket, RI

	Units	RIDEM GB Leachability Criteria	RIDEM Industrial/ Commercial DEC	RIDEM UCL	1709754-06		1709754-07		1709754-08		1709754-09		1709754-10		1709754-12		1709754-13		1709754-14		
					GZ-SS-523 (0-2') 09/26/2017		GZ-SS-524 (0-2') 09/26/2017		GZ-SS-525 (0-2') 09/26/2017		GZ-SS-526 (0-2') 09/26/2017		GZ-SS-527 (0-2') 09/26/2017		GZ-SS-528 (0-2') 09/26/2017		GZ-SS-529 (0-2') 09/26/2017		GZ-SS-530 (0-2') 09/26/2017		
<b>TOTAL PETROLEUM HYDROCARBON</b>																					
Hydrocarbon Content	mg/kg	2,500	2,500	30,000	54.5	-	364	-	82.2	-	255	-	2110	D	173	-	2020	D	478	D	
<b>METALS</b>																					
Antimony	mg/kg	NE	820	10,000	2.06	U, D	13.6	D	15.3	D	1.88	U, D	2.06	U, D	1.63	U, D	1.7	U, D	1.96	U, D	
Arsenic	mg/kg	NE	7	10,000	5.75	-	5.8	-	6.95	-	5	-	3.64	-	3.4	-	4.13	-	5.56	-	
Beryllium	mg/kg	NE	1.3	10,000	0.35	-	0.22	-	0.26	-	0.28	-	0.11	U	0.09	U	0.12	-	0.11	-	
Cadmium	mg/kg	NE	1,000	10,000	0.52	U	0.5	U	0.52	U	0.47	U	0.51	U	0.41	U	0.43	U	0.69	-	
Chromium	mg/kg	NE	10,000	10,000	8.27	-	34.1	-	22.2	-	8.28	-	1.03	U	4.49	-	5.92	-	8.39	-	
Copper	mg/kg	NE	10,000	10,000	15.2	-	46	-	45.7	-	42.4	-	14	-	10	-	10.9	-	27.6	-	
Lead	mg/kg	NE	500	10,000	45.9	-	1210	-	1270	-	403	-	44.3	-	16.7	-	18.4	-	42.3	-	
Nickel	mg/kg	NE	10,000	10,000	11.5	-	27	-	30.3	-	15.6	-	2.61	-	4.34	-	6.05	-	11.2	-	
Silver	mg/kg	NE	10,000	10,000	0.52	U	0.64	-	0.52	U	0.47	U	0.51	U	0.41	U	0.43	U	0.49	U	
Thallium	mg/kg	NE	140	10,000	2.06	U, D	1.99	U, D	2.09	U, D	1.88	U, D	2.06	U, D	1.63	U, D	1.7	U, D	1.96	U, D	
Zinc	mg/kg	NE	10,000	10,000	33.7	-	100	-	120	-	127	-	3.89	-	13.1	-	17.5	-	27.6	-	
Selenium	mg/kg	NE	10,000	10,000	2.06	U, D	1.99	U, D	2.09	U, D	1.88	U, D	2.06	U, D	1.63	U, D	1.7	U, D	1.96	U, D	
Mercury	mg/kg	NE	610	10,000	0.049	-	0.391	-	0.327	-	0.273	-	0.413	-	0.056	-	0.065	-	0.225	-	
<b>PAHs BY GCMS</b>																					
2-Methylnaphthalene	mg/kg	NE	10,000	10,000	0.35	U	0.964	-	0.337	U	0.355	U	2.44	-	0.357	U	0.955	-	0.357	U	
Acenaphthene	mg/kg	NE	10,000	10,000	0.35	U	0.351	U	0.337	U	0.355	U	0.368	U	0.357	U	0.359	U	0.357	U	
Acenaphthylene	mg/kg	NE	10,000	10,000	0.35	U	1.76	-	0.337	U	0.429	-	5.7	-	0.359	-	3.88	-	0.606	-	
Anthracene	mg/kg	NE	10,000	10,000	0.35	U	1.14	-	0.337	U	0.578	-	2.5	-	0.357	U	1.68	-	0.732	-	
Benzo [a] Anthracene	mg/kg	NE	7.8	10,000	0.526	-	3.89	-	0.672	-	4.17	-	11.2	D	0.754	-	6.58	-	2.07	-	
Benzo [a] Pyrene	mg/kg	NE	0.8	10,000	0.483	-	3.49	-	0.66	-	4.01	-	6.55	-	0.666	-	6.9	-	1.48	-	
Benzo [b] Fluoranthene	mg/kg	NE	7.8	10,000	0.558	-	4.12	-	0.657	-	4.28	-	10.5	D	1.61	-	6.96	-	3.7	-	
Benzo [g,h,i] Perylene	mg/kg	NE	10,000	10,000	0.383	-	2.53	-	0.337	U	1.55	-	3.61	-	0.544	-	4.34	-	1.08	-	
Benzo [k] Fluoranthene	mg/kg	NE	7.8	10,000	0.35	U	1.9	-	0.607	-	3.91	-	10.1	D	1.21	-	6.96	-	2.6	-	
Chrysene	mg/kg	NE	780	10,000	0.565	-	3.75	-	0.67	-	4.17	-	12.8	D	0.96	-	7.49	-	2.18	-	
Dibenzo [a,h] Anthracene	mg/kg	NE	0.8	10,000	0.175	U	1.06	-	0.169	U	0.817	-	2.43	-	0.259	-	1.77	-	0.571	-	
Fluoranthene	mg/kg	NE	10,000	10,000	0.733	-	4.16	-	1.26	-	8.24	-	22.3	D	1.42	-	9.7	D	4.83	-	
Fluorene	mg/kg	NE	10,000	10,000	0.35	U	0.351	U	0.337	U	0.355	U	0.368	U	0.357	U	0.359	U	0.357	U	
Indeno [1,2,3-cd] Pyrene	mg/kg	NE	7.8	10,000	0.35	U	2.45	-	0.337	U	1.54	-	4.11	-	0.534	-	3.53	-	1.18	-	
Naphthalene	mg/kg	NE	10,000	10,000	0.35	U	1.17	-	0.337	U	0.355	U	5.06	-	0.357	U	1.51	-	0.367	-	
Phenanthrene	mg/kg	NE	10,000	10,000	0.474	-	2.53	-	0.458	-	2.64	-	8.12	-	0.357	U	5.42	-	2.17	-	
Pyrene	mg/kg	NE	10,000	10,000	1.07	-	4.78	-	0.99	-	5.39	-	18.8	D	0.943	-	13.7	D	3.38	-	
<b>SUBCONTRACTED ANALYTES</b>																					
Total Cyanide	mg/kg	NE	10,000	10,000	1.75	-	3.03	-	3.13	-	16.8	-	195	D	81.5	D	86	D	258	D	

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TPH, PAHs, and Metals - Surface Soil Testing Results  
Former Tidewater Facility  
Pawtucket, RI

	Units	RIDEM GB Leachability Criteria	RIDEM Industrial/ Commercial DEC	RIDEM UCL	1709754-15 GZ-SS-531 (0-2') 09/26/2017	1709779-06 GZ-SS-556 (0-2') 09/27/2017	1709779-07 GZ-SS-557 (0-2') 09/27/2017	1709779-08 GZ-SS-558 (0-2') 09/27/2017	1709779-09 GZ-SS-559 (0-2') 09/27/2017	1709779-10 GZ-SS-560 (0-2') 09/27/2017	1709754-16 GZ-SS-532 (0-2') 09/26/2017	1709754-17 GZ-SS-533 (0-2') 09/26/2017
<b>TOTAL PETROLEUM HYDROCARBON</b>												
Hydrocarbon Content	mg/kg	2,500	2,500	30,000	2170 D	119 -	201 -	2300 D	7240 D	722 -	1520 D	524 D
<b>METALS</b>												
Antimony	mg/kg	NE	820	10,000	2.01 U, D	1.79 U, D	2.97 D	11.5 D	4.47 D	2.14 U, D	1.92 U, D	2.05 U, D
Arsenic	mg/kg	NE	7	10,000	6.01 -	9.57 -	6.6 -	19.8 -	6.43 -	6.65 -	4.46 -	2.56 U
Beryllium	mg/kg	NE	1.3	10,000	0.11 U	0.43 -	0.43 -	0.37 -	0.31 -	0.43 -	0.11 U	0.11 U
Cadmium	mg/kg	NE	1,000	10,000	0.5 U	4.83 -	2.17 -	1.52 -	0.84 -	0.54 U	0.48 U	0.51 U
Chromium	mg/kg	NE	10,000	10,000	5.17 -	9.64 -	7.88 -	7.94 -	6.16 -	4.08 -	5.54 -	1.91 -
Copper	mg/kg	NE	10,000	10,000	15.5 -	32.1 -	39.8 -	55.3 -	28.5 -	33.3 -	12.5 -	2.56 U
Lead	mg/kg	NE	500	10,000	85.7 -	137 -	178 -	469 -	153 -	130 -	46 -	5.12 U
Nickel	mg/kg	NE	10,000	10,000	2.52 U	13.3 -	12.5 -	9.54 -	8.24 -	11.1 -	2.76 -	2.56 U
Silver	mg/kg	NE	10,000	10,000	0.5 U	0.45 U	0.63 -	0.55 -	0.53 U	0.54 U	0.48 U	0.51 U
Thallium	mg/kg	NE	140	10,000	2.01 U, D	1.79 U, D	2.09 U, D	1.8 U, D	2.12 U, D	2.14 U, D	1.92 U, D	2.05 U, D
Zinc	mg/kg	NE	10,000	10,000	13 -	674 -	624 -	205 -	210 -	135 -	10.2 -	3.78 -
Selenium	mg/kg	NE	10,000	10,000	2.94 D	1.79 U, D	2.09 U, D	2.16 D	2.12 U, D	2.14 U, D	1.92 U, D	2.05 U, D
Mercury	mg/kg	NE	610	10,000	0.532 -	0.276 -	0.56 -	0.589 -	0.19 -	0.08 -	0.183 -	0.053 -
<b>PAHS BY GCMS</b>												
2-Methylnaphthalene	mg/kg	NE	10,000	10,000	0.751 U	0.364 U	0.378 U	7.49 -	3.15 -	4.86 -	0.679 U	0.342 U
Acenaphthene	mg/kg	NE	10,000	10,000	0.751 U	0.364 U	0.378 U	1.52 U	1.57 U	0.418 U	0.679 U	0.342 U
Acenaphthylene	mg/kg	NE	10,000	10,000	2.52 -	0.364 U	0.378 U	7.27 -	32.7 -	0.47 -	10.8 -	2.15 -
Anthracene	mg/kg	NE	10,000	10,000	1.04 -	0.364 U	0.381 -	3.09 -	10.1 -	0.418 U	6.04 -	1.52 -
Benzo [a] Anthracene	mg/kg	NE	7.8	10,000	2.87 -	1.15 -	2.38 -	11.7 -	49.3 D	1.66 -	10 -	5.64 -
Benzo [a] Pyrene	mg/kg	NE	0.8	10,000	1.63 -	1.34 -	3.91 -	13.5 -	72.5 D	1.27 -	9.79 -	4.68 -
Benzo [b] Fluoranthene	mg/kg	NE	7.8	10,000	10.1 -	1.79 -	4.08 -	19.1 -	96.9 D	1.93 -	31.5 D	6.2 -
Benzo [g,h,i] Perylene	mg/kg	NE	10,000	10,000	2.27 -	1.23 -	4.67 -	12.5 -	56.8 D	1.2 -	12.6 -	3.54 -
Benzo [k] Fluoranthene	mg/kg	NE	78	10,000	7.68 -	0.59 -	1.65 -	5.17 -	36.7 D	0.792 -	13.7 D	2.39 -
Chrysene	mg/kg	NE	780	10,000	4.68 -	1.12 -	2.28 -	10.9 -	43.9 D	1.88 -	10.3 -	4.63 -
Dibenzo [a,h] Anthracene	mg/kg	NE	0.8	10,000	1.26 -	0.464 -	1.52 -	5.01 -	23 -	0.486 -	6.13 -	1.44 -
Fluoranthene	mg/kg	NE	10,000	10,000	3.07 -	1.5 -	2.85 -	14.9 -	52.8 D	1.74 -	7.68 -	9.79 D
Fluorene	mg/kg	NE	10,000	10,000	0.751 U	0.364 U	0.378 U	1.52 U	1.57 U	0.418 U	0.679 U	0.342 U
Indeno [1,2,3-cd] Pyrene	mg/kg	NE	7.8	10,000	2.74 -	1.04 -	3.68 -	12.2 -	54.9 D	0.98 -	12.8 -	3.33 -
Naphthalene	mg/kg	NE	10,000	10,000	1.13 -	0.364 U	1.67 -	6.22 -	4 -	3.18 -	0.679 U	0.342 U
Phenanthrene	mg/kg	NE	10,000	10,000	0.953 -	0.52 -	1.37 -	7.18 -	4.53 -	3.51 -	2.09 -	1.97 -
Pyrene	mg/kg	NE	10,000	10,000	2.48 -	1.57 -	2.94 -	14.4 -	67 D	1.99 -	7.1 -	9.67 D
<b>SUBCONTRACTED ANALYTES</b>												
Total Cyanide	mg/kg	NE	10,000	10,000	407 D	33 D	27 D	21.1 D	21 D	9.21 -	587 D	14.4 -

**Notes**

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FPPA = Former Power Plant Area

SFA = South Fill Area

Detected concentrations are bolded.

Gray shaded cells indicates the concentration exceeds the RIDEM Method 1

Industrial/Commercial Direct Exposure Criteria (I/C DEC).

Detection limits highlighted in *blue and in italics* exceed the RIDEM Method 1 Criteria.

Underlined concentrations exceed the RIDEM Method 1 GB Leachability Criteria.

A concentration with a bold border exceeds the Upper Concentration Limit.

Undetected analytes have a "U" qualifier.

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Table 2B  
Summary of LDI Analytical  
TPH, PAHs, and Metals - Surface Soil Testing Results  
Former Tidewater Facility  
Pawtucket, RI

	Units	RIDEM GB Leachability Criteria	RIDEM Industrial/ Commercial DEC	RIDEM UCL	1709754-18 GZ-SS-534 (0-2') 09/26/2017	1709779-01 GZ-SS-535 (0-2') 09/27/2017	1709779-02 GZ-SS-536 (0-2') 09/27/2017	1709779-03 GZ-SS-537 (0-2') 09/27/2017	1709779-04 GZ-SS-538 (0-2') 09/27/2017	1709779-05 GZ-SS-539 (0-2') 09/27/2017	1710025-01 GZ-SS-540 (0-2') 10/02/2017	1710025-02 GZ-SS-541 (0-2') 10/02/2017								
<b>TOTAL PETROLEUM HYDROCARBON</b>																				
Hydrocarbon Content	mg/kg	2,500	2,500	30,000	26600	D	3510	D	7910	D	3810	D	652	D	3490	D	546	D	266	-
<b>METALS</b>																				
Antimony	mg/kg	NE	820	10,000	2.08	U, D	1.98	U, D	2.02	U, D	1.89	U, D	2	U, D	2.03	U, D	1.96	U, D	1.7	U, D
Arsenic	mg/kg	NE	7	10,000	4.27	-	5.86	-	5.93	-	6.53	-	4.18	-	9.45	-	6.62	-	7.63	-
Beryllium	mg/kg	NE	1.3	10,000	0.22	-	0.14	-	0.15	-	0.1	U	0.21	-	0.19	-	0.2	-	0.14	-
Cadmium	mg/kg	NE	1,000	10,000	0.52	U	0.49	U	0.5	U	0.47	U	0.5	U	0.51	U	0.49	U	0.42	U
Chromium	mg/kg	NE	10,000	10,000	7	-	2.68	-	7.4	-	2.32	-	8.38	-	4.05	U, D	7.51	-	3.71	-
Copper	mg/kg	NE	10,000	10,000	22.9	-	33	-	35.7	-	29.2	-	39.2	-	71.3	-	22.3	-	13.5	-
Lead	mg/kg	NE	500	10,000	170	-	154	-	125	-	115	-	99.8	-	247	-	59.9	-	35.9	-
Nickel	mg/kg	NE	10,000	10,000	12.5	-	52	-	12.7	-	7.18	-	16.8	-	64.9	-	7.23	-	3.97	-
Silver	mg/kg	NE	10,000	10,000	0.52	U	0.49	U	0.5	U	0.58	-	0.82	-	0.51	U	0.49	U	0.42	U
Thallium	mg/kg	NE	140	10,000	2.08	U, D	1.98	U, D	2.02	U, D	1.89	U, D	2	U, D	2.03	U, D	1.96	U, D	1.7	U, D
Zinc	mg/kg	NE	10,000	10,000	67.2	-	39.1	-	29.3	-	12.4	-	67.8	-	48.9	-	49.1	-	21.4	-
Selenium	mg/kg	NE	10,000	10,000	2.08	U, D	1.98	U, D	2.02	U, D	1.89	U, D	2	U, D	2.03	U, D	1.96	U, D	1.7	U, D
Mercury	mg/kg	NE	610	10,000	0.422	-	1.24	D	1.09	D	0.433	-	0.201	-	1.43	D	0.069	-	0.077	-
<b>PAHS BY GCMS</b>																				
2-Methylnaphthalene	mg/kg	NE	10,000	10,000	252	D	9.96	-	22.9	-	15.5	-	0.438	-	6.57	-	0.367	U	0.57	-
Acenaphthene	mg/kg	NE	10,000	10,000	28.4	D	1.54	-	3.44	-	2.17	-	0.34	U	1.1	-	0.367	U	0.339	U
Acenaphthylene	mg/kg	NE	10,000	10,000	274	D	27.3	-	52.2	D	24.6	D	1.96	-	12	-	0.786	-	0.583	-
Anthracene	mg/kg	NE	10,000	10,000	249	D	23.1	-	36.1	-	13.8	-	1.27	-	8.18	-	0.367	U	0.339	U
Benzo [a] Anthracene	mg/kg	NE	7.8	10,000	605	D	68.2	D	114	D	51.6	D	4.79	-	29.6	D	1.29	-	0.793	-
Benzo [a] Pyrene	mg/kg	NE	0.8	10,000	416	D	30.5	-	76	D	34.2	D	4.18	-	22.3	D	1.48	-	0.632	-
Benzo [b] Fluoranthene	mg/kg	NE	7.8	10,000	270	D	35.4	-	67.4	D	34.5	D	5.27	-	24.1	D	2.28	-	1.44	-
Benzo [g,h,i] Perylene	mg/kg	NE	10,000	10,000	121	D	18.7	-	25.1	-	12.1	-	1.91	-	11.4	-	1.02	-	0.49	-
Benzo [k] Fluoranthene	mg/kg	NE	78	10,000	314	D	11.9	-	34.3	-	33.7	D	3.71	-	24.7	D	1.75	-	1.1	-
Chrysene	mg/kg	NE	780	10,000	613	D	72.7	D	122	D	57.1	D	4.9	-	32.9	D	1.54	-	1.06	-
Dibenzo [a,h] Anthracene	mg/kg	NE	0.8	10,000	68.5	D	8.38	-	15.6	-	6.75	-	0.884	-	5.28	-	0.463	-	0.249	-
Fluoranthene	mg/kg	NE	10,000	10,000	880	D	91.7	D	178	D	69.4	D	8.17	-	39.6	D	2.01	-	1.18	-
Fluorene	mg/kg	NE	10,000	10,000	259	D	18	-	33.9	-	14	-	0.541	-	6.55	-	0.367	U	0.339	U
Indeno [1,2,3-cd] Pyrene	mg/kg	NE	7.8	10,000	116	D	16.6	-	22.6	-	11.5	-	1.68	-	9.41	-	0.958	-	0.486	-
Naphthalene	mg/kg	NE	10,000	10,000	188	D	14.6	-	27.9	-	14	-	0.85	-	9.82	-	0.713	-	1.4	-
Phenanthrene	mg/kg	NE	10,000	10,000	1420	D	168	D	243	D	95.4	D	4.77	-	44.1	D	0.7	-	0.485	-
Pyrene	mg/kg	NE	10,000	10,000	1150	D	137	D	199	D	75.7	D	6.22	-	44.6	D	1.69	-	0.968	-
<b>SUBCONTRACTED ANALYTES</b>																				
Total Cyanide	mg/kg	NE	10,000	10,000	111	D	126	D	234	D	238	D	88.8	D	280	D	251	D	363	D

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Detected concentrations are bolded.

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Table 2B  
Summary of LDI Analytical  
TPH, PAHs, and Metals - Surface Soil Testing Results  
Former Tidewater Facility  
Pawtucket, RI

	Units	RIDEM GB Leachability Criteria	RIDEM Industrial/ Commercial DEC	RIDEM UCL	1710025-03 GZ-SS-542 (0-2') 10/02/2017	1710025-04 GZ-SS-543 (0-2') 10/02/2017	1710025-05 GZ-SS-544 (0-2') 10/02/2017	1710025-06 GZ-SS-545 (0-2') 10/02/2017	1710025-06RE1 GZ-SS-545 (0-2') 10/02/2017 Re-Analysis	1710025-07 GZ-SS-546 (0-2') 10/02/2017	1710025-08 GZ-SS-547 (0-2') 10/02/2017	1710025-09 GZ-SS-548 (0-2') 10/02/2017								
<b>TOTAL PETROLEUM HYDROCARBON</b>																				
Hydrocarbon Content	mg/kg	2,500	2,500	30,000	177	-	112	-	136	-	2990	D	-	365	D	313	D	357	D	
<b>METALS</b>																				
Antimony	mg/kg	NE	820	10,000	1.81	U, D	1.96	U, D	1.59	U, D	2.07	U, D	-	1.71	U, D	1.8	U, D	2.06	U, D	
Arsenic	mg/kg	NE	7	10,000	5.1	-	3.18	-	4.77	-	5.6	-	-	2.44	-	3.5	-	3.95	-	
Beryllium	mg/kg	NE	1.3	10,000	0.22	-	0.24	-	0.1	-	0.2	-	-	0.09	U	0.11	-	0.2	-	
Cadmium	mg/kg	NE	1,000	10,000	0.45	U	0.49	U	0.4	U	0.92	-	-	0.43	U	0.45	U	0.51	U	
Chromium	mg/kg	NE	10,000	10,000	6.6	-	7.26	-	10.9	-	10.5	-	-	8.22	-	9.63	-	17.2	-	
Copper	mg/kg	NE	10,000	10,000	19.5	-	18.2	-	15.2	-	67.8	-	-	17	-	19	-	33.3	-	
Lead	mg/kg	NE	500	10,000	45.3	-	92.8	-	61.8	-	208	-	-	112	-	58.2	-	163	-	
Nickel	mg/kg	NE	10,000	10,000	13.2	-	12.2	-	8.35	-	47.3	-	-	7.92	-	8.02	-	10.2	-	
Silver	mg/kg	NE	10,000	10,000	0.45	U	0.49	U	0.4	U	0.52	U	-	0.43	U	0.45	U	0.63	-	
Thallium	mg/kg	NE	140	10,000	1.81	U, D	1.96	U, D	1.59	U, D	2.07	U, D	-	1.71	U, D	1.8	U, D	2.06	U, D	
Zinc	mg/kg	NE	10,000	10,000	54.1	-	103	-	27	-	114	-	-	45.2	-	27.4	-	80.6	-	
Selenium	mg/kg	NE	10,000	10,000	1.81	U, D	1.96	U, D	1.59	U, D	2.07	U, D	-	1.71	U, D	1.8	U, D	2.06	U, D	
Mercury	mg/kg	NE	610	10,000	0.135	-	0.145	-	0.142	-	0.824	D	-	0.18	-	0.097	-	0.226	-	
<b>PAHs BY GC/MS</b>																				
2-Methylnaphthalene	mg/kg	NE	10,000	10,000	0.34	U	0.348	U	0.346	U	10.3	-	9.92	D	0.368	U	0.364	U	0.353	U
Acenaphthene	mg/kg	NE	10,000	10,000	0.34	U	0.348	U	0.346	U	1.77	-	7.14	U, D	0.368	U	0.364	U	0.353	U
Acenaphthylene	mg/kg	NE	10,000	10,000	0.425	-	0.348	U	0.346	U	17.6	-	20.5	D	0.368	U	0.425	-	0.353	U
Anthracene	mg/kg	NE	10,000	10,000	0.34	U	0.348	U	0.389	-	12.1	-	12.4	D	0.368	U	0.364	U	0.353	U
Benzo [a] Anthracene	mg/kg	NE	7.8	10,000	1.05	-	0.765	-	1.28	-	44.4	D	44.4	D	0.768	-	1.23	-	1.24	-
Benzo [a] Pyrene	mg/kg	NE	0.8	10,000	0.949	-	0.782	-	1.13	-	32.4	D	32.4	D	0.737	-	1.1	-	1.16	-
Benzo [b] Fluoranthene	mg/kg	NE	7.8	10,000	1.03	-	0.946	-	1.58	-	22.7	D	22.7	D	1.19	-	1.59	-	1.48	-
Benzo [g,h,i] Perylene	mg/kg	NE	10,000	10,000	0.459	-	0.375	-	0.556	-	17.7	-	12.2	D	0.397	-	0.565	-	0.55	-
Benzo [k] Fluoranthene	mg/kg	NE	78	10,000	1.03	-	0.745	-	1.21	-	30.8	D	30.8	D	0.736	-	1.07	-	0.992	-
Chrysene	mg/kg	NE	780	10,000	1.09	-	0.771	-	1.38	-	48.1	D	48.1	D	0.856	-	1.24	-	1.24	-
Dibenzo [a,h] Anthracene	mg/kg	NE	0.8	10,000	0.218	-	0.18	-	0.283	-	8.79	-	6.53	D	0.196	-	0.29	-	0.282	-
Fluoranthene	mg/kg	NE	10,000	10,000	1.96	-	1.49	-	2.62	-	60.3	D	60.3	D	1.56	-	2.64	-	2.95	-
Fluorene	mg/kg	NE	10,000	10,000	0.34	U	0.348	U	0.346	U	9.04	-	8.49	D	0.368	U	0.364	U	0.353	U
Indeno [1,2,3-cd] Pyrene	mg/kg	NE	7.8	10,000	0.424	-	0.356	-	0.544	-	15.6	-	11.4	D	0.395	-	0.549	-	0.532	-
Naphthalene	mg/kg	NE	10,000	10,000	0.34	U	0.348	U	0.346	U	14.4	-	15.3	D	0.368	U	0.364	U	0.353	U
Phenanthrene	mg/kg	NE	10,000	10,000	1.07	-	0.573	-	1.53	-	53.7	D	53.7	D	0.59	-	1.06	-	1.4	-
Pyrene	mg/kg	NE	10,000	10,000	1.6	-	1.12	-	1.89	-	62.5	D	62.5	D	1.27	-	2.21	-	2.34	-
<b>SUBCONTRACTED ANALYTES</b>																				
Total Cyanide	mg/kg	NE	10,000	10,000	38.5	D	7.5	-	94.6	D	143	D	-	68.7	D	117	D	18.5	-	

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<b>TOTAL PETROLEUM HYDROCARBON</b>																		
Hydrocarbon Content	mg/kg	2,500	2,500	30,000	83.5	-	182	-	217	-	158	-	74.1	-	127	-	94.8	-
<b>METALS</b>																		
Antimony	mg/kg	NE	820	10,000	1.96	U, D	1.85	U, D	1.79	U, D	1.72	U, D	2.03	U, D	1.6	U, D	1.5	U, D
Arsenic	mg/kg	NE	7	10,000	2.92	-	3.74	-	4.26	-	3.03	-	2.54	U	3.7	-	3.93	-
Beryllium	mg/kg	NE	1.3	10,000	0.29	-	0.1	U	0.15	-	0.1	-	0.11	U	0.14	-	0.25	-
Cadmium	mg/kg	NE	1,000	10,000	0.49	U	0.46	U	0.45	U	0.43	U	0.51	U	0.4	U	0.37	U
Chromium	mg/kg	NE	10,000	10,000	7.07	-	48.6	-	15.5	-	9.22	-	9.68	-	15.4	-	9.13	-
Copper	mg/kg	NE	10,000	10,000	13.3	-	23.3	-	17.1	-	14.8	-	12.5	-	18.6	-	21.4	-
Lead	mg/kg	NE	500	10,000	44.5	-	57.6	-	50.9	-	47	-	38	-	132	-	135	-
Nickel	mg/kg	NE	10,000	10,000	8.87	-	17.9	-	7.67	-	7.13	-	6.02	-	7.78	-	9.53	-
Silver	mg/kg	NE	10,000	10,000	0.49	U	0.46	U	0.45	U	0.43	U	0.51	U	0.4	U	0.37	U
Thallium	mg/kg	NE	140	10,000	1.96	U, D	1.85	U, D	1.79	U, D	1.72	U, D	2.03	U, D	1.6	U, D	1.5	U, D
Zinc	mg/kg	NE	10,000	10,000	131	-	38.6	-	30.4	-	22.4	-	25.4	-	35.9	-	61.7	-
Selenium	mg/kg	NE	10,000	10,000	1.96	U, D	1.85	U, D	1.79	U, D	1.72	U, D	2.03	U, D	1.6	U, D	1.5	U, D
Mercury	mg/kg	NE	610	10,000	0.047	-	0.154	-	0.185	-	0.089	-	0.042	-	0.086	-	0.101	-
<b>PAHS BY GCMS</b>																		
2-Methylnaphthalene	mg/kg	NE	10,000	10,000	0.365	U	0.361	U	0.368	U	0.35	U	0.342	U	0.358	U	0.359	U
Acenaphthene	mg/kg	NE	10,000	10,000	0.365	U	0.361	U	0.368	U	0.35	U	0.342	U	0.358	U	0.359	U
Acenaphthylene	mg/kg	NE	10,000	10,000	0.365	U	0.361	U	0.4	-	0.35	U	0.342	U	0.358	U	0.359	U
Anthracene	mg/kg	NE	10,000	10,000	0.365	U	0.361	U	0.45	-	0.35	U	0.342	U	0.358	U	0.359	U
Benzo [a] Anthracene	mg/kg	NE	7.8	10,000	0.365	U	0.548	-	1.54	-	0.458	-	0.342	U	0.526	-	0.443	-
Benzo [a] Pyrene	mg/kg	NE	0.8	10,000	0.202	-	0.477	-	1.05	-	0.386	-	0.323	-	0.439	-	0.461	-
Benzo [b] Fluoranthene	mg/kg	NE	7.8	10,000	0.365	U	0.734	-	1.29	-	0.552	-	0.44	-	0.582	-	0.606	-
Benzo [g,h,i] Perylene	mg/kg	NE	10,000	10,000	0.365	U	0.485	-	0.901	-	0.392	-	0.342	U	0.378	-	0.377	-
Benzo [k] Fluoranthene	mg/kg	NE	7.8	10,000	0.365	U	0.361	U	0.611	-	0.35	U	0.342	U	0.358	U	0.359	U
Chrysene	mg/kg	NE	780	10,000	0.215	-	0.579	-	1.55	-	0.492	-	0.349	-	0.533	-	0.47	-
Dibenzo [a,h] Anthracene	mg/kg	NE	0.8	10,000	0.183	U	0.183	-	0.347	-	0.175	U	0.171	U	0.18	U	0.18	U
Fluoranthene	mg/kg	NE	10,000	10,000	0.365	U	0.661	-	2.08	-	0.623	-	0.411	-	0.759	-	0.69	-
Fluorene	mg/kg	NE	10,000	10,000	0.365	U	0.361	U	0.368	U	0.35	U	0.342	U	0.358	U	0.359	U
Indeno [1,2,3-cd] Pyrene	mg/kg	NE	7.8	10,000	0.365	U	0.414	-	0.749	-	0.35	U	0.342	U	0.358	U	0.359	U
Naphthalene	mg/kg	NE	10,000	10,000	0.365	U	0.361	U	0.368	U	0.35	U	0.342	U	0.358	U	0.359	U
Phenanthrene	mg/kg	NE	10,000	10,000	0.365	U	0.361	U	1.83	-	0.361	-	0.342	U	0.492	-	0.359	U
Pyrene	mg/kg	NE	10,000	10,000	0.365	U	0.674	-	2.34	-	0.636	-	0.426	-	0.757	-	0.675	-
<b>SUBCONTRACTED ANALYTES</b>																		
Total Cyanide	mg/kg	NE	10,000	10,000	1.45	-	56.3	D	30.7	D	28.4	D	7.48	-	14	-	3.59	-

**Notes**

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Detected concentrations are bolded.

Gray shaded cells indicates the concentration exceeds the RIDEM Method 1

Industrial/Commercial \Direct Exposure Criteria (I/C DEC).

Detection limits highlighted in *blue and in italics* exceed the RIDEM Method 1 Criteria.

Underlined concentrations exceed the RIDEM Method 1 GB Leachability Criteria.

A concentration with a bold border exceeds the Upper Concentration Limit.

Undetected analytes have a "U" qualifier.

Any analytes reported from a diluted run of the original analysis have a "D" qualifier.

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"E" qualifier indicates estimated concentration above the quantitation limit.

**Table 3**  
**Summary of LDI Analytical**  
**PCB Testing Results - Former Transformer Area**  
**Former Tidewater Facility**  
**Pawtucket, RI**

	Units	RIDEM GB Leachability Criteria	RIDEM Industrial/ Commercial DEC	RIDEM UCL	1709819-01  GZ-CS-501 (0-0.5") 09/28/2017  (Concrete)	1709819-02  GZ-CS-502 (0-0.5") 09/28/2017  (Concrete)	1709819-03  GZ-CS-503 (0-0.5") 09/28/2017  (Concrete)	1709819-04  GZ-CS-504 (0-0.5") 09/28/2017  (Concrete)	1709819-05  GZ-CS-505 (0-0.5") 09/28/2017  (Concrete)	1709819-06  GZ-CS-506 (0-0.5") 09/28/2017  (Concrete)	1709819-07  GZ-CS-507 (0-0.5") 09/28/2017  (Concrete)	1709819-08  GZ-CS-508 (0-0.5") 09/28/2017  (Concrete)	1709820-01  GZ-SS-FT-501 (0-0.25') 9/28/2017  (Soil)	1709820-02  GZ-SS-FT-501 (0.75'-1') 9/28/2017  (Soil)	1709820-03  GZ-SS-FT-501 (1.75'-2') 9/28/2017  (Soil)
<b>POLYCHLORINATED BIPHENYLS</b>															
Aroclor 1268	mg/kg	10	10	10,000	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.06 U	0.06 U	0.05 U
Aroclor 1262	mg/kg	10	10	10,000	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.06 U	0.06 U	0.05 U
Aroclor 1260	mg/kg	10	10	10,000	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	<b>0.2</b> -	0.2 U	0.2 U	<b>0.3</b> -	0.06 U	0.05 U
Aroclor 1254	mg/kg	10	10	10,000	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.06 U	0.06 U	0.05 U
Aroclor 1248	mg/kg	10	10	10,000	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.06 U	0.06 U	0.05 U
Aroclor 1242/1016	mg/kg	10	10	10,000	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.06 U	0.06 U	0.05 U
Aroclor 1232	mg/kg	10	10	10,000	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.06 U	0.06 U	0.05 U
Aroclor 1221	mg/kg	10	10	10,000	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.06 U	0.06 U	0.05 U

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**Table 3**  
**Summary of LDI Analytical**  
**PCB Testing Results - Former Transformer Area**  
**Former Tidewater Facility**  
**Pawtucket, RI**

	Units	RIDEM GB Leachability Criteria	RIDEM Industrial/ Commercial DEC	RIDEM UCL	1709820-04  GZ-SS-FT-502 (0-0.25') 9/28/2017  (Soil)	1709820-05  GZ-SS-FT-502 (0.75-1') 9/28/2017  (Soil)	1709820-06  GZ-SS-FT-502 (1.75'-2') 9/28/2017  (Soil)	1709820-07  GZ-SS-FT-503 (0-0.25') 9/28/2017  (Soil)	1709820-08  GZ-SS-FT-503 (0.75-1') 9/28/2017  (Soil)	1709820-09  GZ-SS-FT-503 (1.75'-2') 9/28/2017  (Soil)	1709820-10  GZ-SS-FT-504 (0-0.25') 9/28/2017  (Soil)	1709820-11  GZ-SS-FT-504 (0.75-1') 9/28/2017  (Soil)	1709820-12  GZ-SS-FT-504 (1.75'-2') 9/28/2017  (Soil)	1709820-13  GZ-SS-FT-505 (0-0.25') 9/28/2017  (Soil)	
<b>POLYCHLORINATED BIPHENYLS</b>															
Aroclor 1268	mg/kg	10	10	10,000	0.05 U	0.06 U	0.06 U	0.06 U	0.05 U	0.06 U	0.06 U	0.06 U	0.05 U	0.06 U	
Aroclor 1262	mg/kg	10	10	10,000	0.05 U	0.06 U	0.06 U	0.06 U	0.05 U	0.06 U	0.06 U	0.06 U	0.05 U	0.06 U	
Aroclor 1260	mg/kg	10	10	10,000	<b>0.2</b> -	0.06 U	0.06 U	<b>0.2</b> -	<b>0.08</b> -	0.06 U	<b>0.07</b> -	0.06 U	0.05 U	0.06 U	
Aroclor 1254	mg/kg	10	10	10,000	<b>0.1</b> -	0.06 U	0.06 U	0.06 U	0.05 U	0.06 U	0.06 U	0.06 U	0.05 U	0.06 U	
Aroclor 1248	mg/kg	10	10	10,000	0.05 U	0.06 U	0.06 U	0.06 U	0.05 U	0.06 U	0.06 U	0.06 U	0.05 U	0.06 U	
Aroclor 1242/1016	mg/kg	10	10	10,000	0.05 U	0.06 U	0.06 U	0.06 U	0.05 U	0.06 U	0.06 U	0.06 U	0.05 U	0.06 U	
Aroclor 1232	mg/kg	10	10	10,000	0.05 U	0.06 U	0.06 U	0.06 U	0.05 U	0.06 U	0.06 U	0.06 U	0.05 U	0.06 U	
Aroclor 1221	mg/kg	10	10	10,000	0.05 U	0.06 U	0.06 U	0.06 U	0.05 U	0.06 U	0.06 U	0.06 U	0.05 U	0.06 U	

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**Table 3**  
**Summary of LDI Analytical**  
**PCB Testing Results - Former Transformer Area**  
**Former Tidewater Facility**  
**Pawtucket, RI**

	Units	RIDEM GB Leachability Criteria	RIDEM Industrial/ Commercial DEC	RIDEM UCL	1709820-14  GZ-SS-FT-505 (0.75'-1') 9/28/2017  (Soil)	1709820-15  GZ-SS-FT-505 (1.75'-2') 9/28/2017  (Soil)	1709820-16  GZ-SS-FT-506 (0-0.25') 9/28/2017  (Soil)	1709820-17  GZ-SS-FT-506 (0.75'-1') 9/28/2017  (Soil)	1709820-18  GZ-SS-FT-506 (1.75'-2') 9/28/2017  (Soil)
<b>POLYCHLORINATED BIPHENYLS</b>									
Aroclor 1268	mg/kg	10	10	10,000	0.06 U	0.05 U	0.05 U	0.05 U	0.05 U
Aroclor 1262	mg/kg	10	10	10,000	0.06 U	0.05 U	0.05 U	0.05 U	0.05 U
Aroclor 1260	mg/kg	10	10	10,000	0.06 U	0.05 U	0.05 U	0.05 U	0.05 U
Aroclor 1254	mg/kg	10	10	10,000	0.06 U	0.05 U	0.05 U	0.05 U	0.05 U
Aroclor 1248	mg/kg	10	10	10,000	0.06 U	0.05 U	0.05 U	0.05 U	0.05 U
Aroclor 1242/1016	mg/kg	10	10	10,000	0.06 U	0.05 U	0.05 U	0.05 U	0.05 U
Aroclor 1232	mg/kg	10	10	10,000	0.06 U	0.05 U	0.05 U	0.05 U	0.05 U
Aroclor 1221	mg/kg	10	10	10,000	0.06 U	0.05 U	0.05 U	0.05 U	0.05 U

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**Gray shaded cells indicates the concentration exceeds the RIDEM Method 1 Industrial/Commercial \Direct Exposure Criteria (I/C DEC).**

Detection limits highlighted in *blue and in italics* exceed the RIDEM Method 1 Criteria.

Underlined concentrations exceed the RIDEM Method 1 GB Leachability Criteria.

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Table 4A  
Summary of LDI Analytical  
VOCs - Surface Soil Test Pit Results  
Former Tidewater Facility  
Pawtucket, RI

	Units	RIDEM GB Leachability Criteria	RIDEM Industrial/ Commercial DEC	RIDEM UCL	1709470-01	1709470-03	1709470-05	1709470-07	1709470-09	1709470-11	1709470-13	1709493-13	1709493-09	1709493-05	1709493-01	1709493-03	1709493-07
					TP-501 (0-1.5') 09/14/2017	TP-502 (0-1') 09/14/2017	TP-503 (0-2') 09/15/2017	TP-504 (1.5-2') 09/15/2017	TP-505 (0-2') 09/15/2017	TP-506 (1-2') 09/15/2017	TP-507 (0-2') 09/15/2017	TP-508 (0-2') 09/18/2017	TP-509 (0-2') 09/18/2017	TP-510 (0-2') 09/18/2017	TP-511 (1-2') 09/18/2017	TP-512 (0-2') 09/18/2017	TP-524 (0-2') 09/18/2017
<b>VOLATILE ORGANICS</b>																	
1,1,2-Tetrachloroethane	mg/kg	NE	220	10,000	0.0049 U	0.0072 U	0.0052 U	0.004 U	0.0032 U	0.0035 U	0.0052 U	0.0055 U	0.0024 U	0.0055 U	0.0053 U	0.0041 U	0.0027 U
1,1,1-Trichloroethane	mg/kg	160	10,000	10,000	0.0049 U	0.0072 U	0.0052 U	0.004 U	0.0032 U	0.0035 U	0.0052 U	0.0055 U	0.0024 U	0.0055 U	0.0053 U	0.0041 U	0.0027 U
1,1,2,2-Tetrachloroethane	mg/kg	NE	29	10,000	0.0049 U	0.0072 U	0.0052 U	0.004 U	0.0032 U	0.0035 U	0.0052 U	0.0055 U	0.0024 U	0.0055 U	0.0053 U	0.0041 U	0.0027 U
1,1,2-Trichloroethane	mg/kg	NE	100	10,000	0.0049 U	0.0072 U	0.0052 U	0.004 U	0.0032 U	0.0035 U	0.0052 U	0.0055 U	0.0024 U	0.0055 U	0.0053 U	0.0041 U	0.0027 U
1,1-Dichloroethane	mg/kg	NE	10,000	10,000	0.0049 U	0.0072 U	0.0052 U	0.004 U	0.0032 U	0.0035 U	0.0052 U	0.0055 U	0.0024 U	0.0055 U	0.0053 U	0.0041 U	0.0027 U
1,1-Dichloroethene	mg/kg	1	9.5	10,000	0.0049 U	0.0072 U	0.0052 U	0.004 U	0.0032 U	0.0035 U	0.0052 U	0.0055 U	0.0024 U	0.0055 U	0.0053 U	0.0041 U	0.0027 U
1,1-Dichloropropene	mg/kg	NE	NE	10,000	0.0049 U	0.0072 U	0.0052 U	0.004 U	0.0032 U	0.0035 U	0.0052 U	0.0055 U	0.0024 U	0.0055 U	0.0053 U	0.0041 U	0.0027 U
1,2,3-Trichlorobenzene	mg/kg	NE	NE	10,000	0.0049 U	0.0072 U	0.0052 U	0.004 U	0.0032 U	0.0035 U	0.0052 U	0.0055 U	0.0024 U	0.0055 U	0.0053 U	0.0041 U	0.0027 U
1,2,3-Trichloropropane	mg/kg	NE	NE	10,000	0.0049 U	0.0072 U	0.0052 U	0.004 U	0.0032 U	0.0035 U	0.0052 U	0.0055 U	0.0024 U	0.0055 U	0.0053 U	0.0041 U	0.0027 U
1,2,4-Trichlorobenzene	mg/kg	NE	10,000	10,000	0.0049 U	0.0072 U	0.0052 U	0.004 U	0.0032 U	0.0035 U	0.0052 U	0.0055 U	0.0024 U	0.0055 U	0.0053 U	0.0041 U	0.0027 U
1,2,4-Trimethylbenzene	mg/kg	NE	NE	10,000	0.0049 U	0.0072 U	0.0052 U	0.004 U	0.0032 U	0.0035 U	0.0052 U	0.0055 U	0.0024 U	0.0055 U	0.0053 U	0.0041 U	0.0027 U
1,2-Dibromo-3-Chloropropane	mg/kg	NE	NE	10,000	0.0049 U	0.0072 U	0.0052 U	0.004 U	0.0032 U	0.0035 U	0.0052 U	0.0055 U	0.0024 U	0.0055 U	0.0053 U	0.0041 U	0.0027 U
1,2-Dibromoethane (EDB)	mg/kg	NE	0.07	10,000	0.0049 U	0.0072 U	0.0052 U	0.004 U	0.0032 U	0.0035 U	0.0052 U	0.0055 U	0.0024 U	0.0055 U	0.0053 U	0.0041 U	0.0027 U
1,2-Dichlorobenzene	mg/kg	NE	10,000	10,000	0.0049 U	0.0072 U	0.0052 U	0.004 U	0.0032 U	0.0035 U	0.0052 U	0.0055 U	0.0024 U	0.0055 U	0.0053 U	0.0041 U	0.0027 U
1,2-Dichloroethane	mg/kg	2.3	63	10,000	0.0049 U	0.0072 U	0.0052 U	0.004 U	0.0032 U	0.0035 U	0.0052 U	0.0055 U	0.0024 U	0.0055 U	0.0053 U	0.0041 U	0.0027 U
1,2-Dichloropropane	mg/kg	70	84	10,000	0.0049 U	0.0072 U	0.0052 U	0.004 U	0.0032 U	0.0035 U	0.0052 U	0.0055 U	0.0024 U	0.0055 U	0.0053 U	0.0041 U	0.0027 U
1,3,5-Trimethylbenzene	mg/kg	NE	NE	10,000	0.0049 U	0.0072 U	0.0052 U	0.004 U	0.0032 U	0.0035 U	0.0052 U	0.0055 U	0.0024 U	0.0055 U	0.0053 U	0.0041 U	0.0027 U
1,3-Dichlorobenzene	mg/kg	NE	10,000	10,000	0.0049 U	0.0072 U	0.0052 U	0.004 U	0.0032 U	0.0035 U	0.0052 U	0.0055 U	0.0024 U	0.0055 U	0.0053 U	0.0041 U	0.0027 U
1,3-Dichloropropane	mg/kg	NE	NE	10,000	0.0049 U	0.0072 U	0.0052 U	0.004 U	0.0032 U	0.0035 U	0.0052 U	0.0055 U	0.0024 U	0.0055 U	0.0053 U	0.0041 U	0.0027 U
1,4-Dichlorobenzene	mg/kg	NE	240	10,000	0.0049 U	0.0072 U	0.0052 U	0.004 U	0.0032 U	0.0035 U	0.0052 U	0.0055 U	0.0024 U	0.0055 U	0.0053 U	0.0041 U	0.0027 U
1,4-Dioxane	mg/kg	NE	NE	10,000	0.0977 U	0.144 U	0.104 U	0.0804 U	0.0638 U	0.0709 U	0.104 U	0.11 U	0.047 U	0.111 U	0.107 U	0.081 U	0.0542 U
1-Chlorohexane	mg/kg	NE	NE	10,000	0.0049 U	0.0072 U	0.0052 U	0.004 U	0.0032 U	0.0035 U	0.0052 U	0.0055 U	0.0024 U	0.0055 U	0.0053 U	0.0041 U	0.0027 U
2,2-Dichloropropane	mg/kg	NE	NE	10,000	0.0049 U	0.0072 U	0.0052 U	0.004 U	0.0032 U	0.0035 U	0.0052 U	0.0055 U	0.0024 U	0.0055 U	0.0053 U	0.0041 U	0.0027 U
2-Butanone (MEK)	mg/kg	NE	10,000	10,000	0.0488 U	0.072 U	0.0519 U	0.0402 U	0.0319 U	0.0354 U	0.0519 U	0.052 U	0.0235 U	0.0554 U	0.0534 U	0.0405 U	0.0271 U
2-Chlorotoluene	mg/kg	NE	NE	10,000	0.0049 U	0.0072 U	0.0052 U	0.004 U	0.0032 U	0.0035 U	0.0052 U	0.0055 U	0.0024 U	0.0055 U	0.0053 U	0.0041 U	0.0027 U
2-Hexanone	mg/kg	NE	NE	10,000	0.0488 U	0.072 U	0.0519 U	0.0402 U	0.0319 U	0.0354 U	0.0519 U	0.052 U	0.0235 U	0.0554 U	0.0534 U	0.0405 U	0.0271 U
4-Chlorotoluene	mg/kg	NE	NE	10,000	0.0049 U	0.0072 U	0.0052 U	0.004 U	0.0032 U	0.0035 U	0.0052 U	0.0055 U	0.0024 U	0.0055 U	0.0053 U	0.0041 U	0.0027 U
4-Isopropyltoluene	mg/kg	NE	NE	10,000	0.0049 U	0.0072 U	0.0052 U	0.004 U	0.0032 U	0.0035 U	0.0052 U	0.0055 U	0.0024 U	0.0055 U	0.0053 U	0.0041 U	0.0027 U
4-Methyl-2-Pentanone (MIBK)	mg/kg	NE	10,000	10,000	0.0488 U	0.072 U	0.0519 U	0.0402 U	0.0319 U	0.0354 U	0.0519 U	0.160 U	0.0235 U	0.0554 U	0.0534 U	0.0405 U	0.0271 U
Acetone	mg/kg	NE	10,000	10,000	0.0488 U	0.072 U	0.0519 U	0.0402 U	0.0319 U	0.0354 U	0.0519 U	0.160 U	0.0235 U	0.0554 U	0.0534 U	0.0405 U	0.0271 U
Benzene	mg/kg	4.3	200	10,000	0.0049 U	0.0072 U	0.0052 U	0.004 U	0.0032 U	0.0035 U	0.0052 U	0.0055 U	0.0024 U	0.0055 U	0.0053 U	0.0041 U	0.0027 U
Bromobenzene	mg/kg	NE	NE	10,000	0.0049 U	0.0072 U	0.0052 U	0.004 U	0.0032 U	0.0035 U	0.0052 U	0.0055 U	0.0024 U	0.0055 U	0.0053 U	0.0041 U	0.0027 U
Bromochloromethane	mg/kg	NE	NE	10,000	0.0049 U	0.0072 U	0.0052 U	0.004 U	0.0032 U	0.0035 U	0.0052 U	0.0055 U	0.0024 U	0.0055 U	0.0053 U	0.0041 U	0.0027 U
Bromodichloromethane	mg/kg	NE	92	10,000	0.0049 U	0.0072 U	0.0052 U	0.004 U	0.0032 U	0.0035 U	0.0052 U	0.0055 U	0.0024 U	0.0055 U	0.0053 U	0.0041 U	0.0027 U
Bromoform	mg/kg	NE	720	10,000	0.0049 U	0.0072 U	0.0052 U	0.004 U	0.0032 U	0.0035 U	0.0052 U	0.0055 U	0.0024 U	0.0055 U	0.0053 U	0.0041 U	0.0027 U
Bromomethane	mg/kg	NE	2,900	10,000	0.0098 U	0.0144 U	0.0104 U	0.008 U	0.0064 U	0.0071 U	0.0104 U	0.011 U	0.0047 U	0.0111 U	0.0107 U	0.0081 U	0.0054 U
Carbon Disulfide	mg/kg	NE	NE	10,000	0.0049 U	0.0072 U	0.0052 U	0.004 U	0.0032 U	0.0035 U	0.0052 U	0.0055 U	0.0024 U	0.0055 U	0.0053 U	0.0041 U	0.0027 U
Carbon Tetrachloride	mg/kg	5	44	10,000	0.0049 U	0.0072 U	0.0052 U	0.004 U	0.0032 U	0.0035 U	0.0052 U	0.0055 U	0.0024 U	0.0055 U	0.0053 U	0.0041 U	0.0027 U
Chlorobenzene	mg/kg	100	10,000	10,000	0.0049 U	0.0072 U	0.0052 U	0.004 U	0.0032 U	0.0035 U	0.0052 U	0.0055 U	0.0024 U	0.0055 U	0.0053 U	0.0041 U	0.0027 U
Chloroethane	mg/kg	NE	NE	10,000	0.0098 U	0.0144 U	0.0104 U	0.008 U	0.0064 U	0.0071 U	0.0104 U	0.011 U	0.0047 U	0.0111 U	0.0107 U	0.0081 U	0.0054 U
Chloroform	mg/kg	NE	940	10,000	0.0049 U	0.0072 U	0.0052 U	0.004 U	0.0032 U	0.0035 U	0.0052 U	0.0055 U	0.0024 U	0.0055 U	0.0053 U	0.0041 U	0.0027 U
Chloromethane	mg/kg	NE	NE	10,000	0.0098 U	0.0144 U	0.0104 U	0.008 U	0.0064 U	0.0071 U	0.0104 U	0.011 U	0.0047 U	0.0111 U	0.0107 U	0.0081 U	0.0054 U
cis-1,2-Dichloroethene	mg/kg	6	10,000	10,000	0.0049 U	0.0072 U	0.0052 U	0.004 U	0.0032 U	0.0035 U	0.0052 U	0.0055 U	0.0024 U	0.0055 U	0.0053 U	0.0041 U	0.0027 U
cis-1,3-Dichloropropene	mg/kg	NE	NE	10,000	0.0049 U	0.0072 U	0.0052 U	0.004 U	0.0032 U	0.0035 U	0.0052 U	0.0055 U	0.0024 U	0.0055 U	0.0053 U	0.0041 U	0.0027 U
Dibromochloromethane	mg/kg	NE	NE	10,000	0.0049 U	0.0072 U	0.0052 U	0.004 U	0.0032 U	0.0035 U	0.0052 U	0.0055 U	0.0024 U	0.0055 U	0.0053 U	0.0041 U	0.0027 U
Dibromomethane	mg/kg	NE	NE	10,000	0.0049 U	0.0072 U	0.0052 U	0.004 U	0.0032 U	0.0035 U	0.0052 U	0.0055 U	0.0024 U	0.0055 U	0.0053 U	0.0041 U	0.0027 U
Dichlorodifluoromethane	mg/kg	NE	NE	10,000	0.0098 U	0.0144 U	0.0104 U	0.008 U	0.0064 U	0.0071 U	0.0104 U	0.011 U	0.0047 U	0.0111 U	0.0107 U	0.0081 U	0.0054 U
Diethylether	mg/kg	NE	NE	10,000	0.0049 U	0.0072 U	0.0052 U	0.004 U	0.0032 U	0.0035 U	0.0052 U	0.0055 U	0.0024 U	0.0055 U	0.0053 U	0.0041 U	0.0027 U
Diisopropyl ether	mg/kg	NE	NE	10,000	0.0049 U	0.0072 U	0.0052 U	0.004 U	0.0032 U	0.0035 U	0.0052 U	0.0055 U	0.0024 U	0.0055 U	0.0053 U	0.0041 U	0.0027 U
Ethyl tertiary-butyl ether	mg/kg	NE	NE	10,000	0.0049 U	0.0072 U	0.0052 U	0.004 U	0.0032 U	0.0035 U	0.0052 U	0.0055 U	0.0024 U	0.0055 U	0.0053 U	0.0041 U	0.0027 U
Ethylbenzene	mg/kg	62	10,000	10,000	0.0049 U	0.0072 U	0.0052 U	0.004 U	0.0032 U	0.0035 U	0.0052 U	0.0055 U	0.0024 U	0.0055 U	0.0053 U	0.0041 U	0.0027 U
Hexachlorobutadiene	mg/kg	NE	73	10,000	0.0049 U	0.0072 U											

**Table 4B**  
**Summary of LDI Analytical**  
**TPH, PAHs, and Metals - Surface Soil Test Pit Results**  
**Former Tidewater Facility**  
**Pawtucket, RI**

	Units	RIDEM GB Leachability Criteria	RIDEM Industrial/ Commercial DEC	RIDEM UCL	1709470-01 TP-501 (0-1.5') 09/14/2017	1709470-03 TP-502 (0-1') 09/14/2017	1709470-05 TP-503 (0-2') 09/15/2017	1709470-07 TP-504 (1.5-2') 09/15/2017	1709470-09 TP-505 (0-2') 09/15/2017	1712474-07 GZ-TP-532 (0-1') 12/19/2017	1712474-08 GZ-TP-532 (1-2') 12/19/2017	1712474-11 GZ-TP-533 (0-1') 12/19/2017
<b>TOTAL PETROLEUM HYDROCARBON</b>												
Hydrocarbon Content	mg/kg	2,500	2,500	30,000	6000 D	186 -	2020 D	1250 D	287 D	NA	NA	NA
<b>METALS</b>												
Antimony	mg/kg	NE	820	10,000	2.09 U, D	2.94 U, D	1.73 U, D	1.5 U, D	1.88 U, D	NA	NA	NA
Arsenic	mg/kg	NE	7	10,000	4.21 -	12.5 -	7.91 -	2.07 -	2.35 U	NA	NA	NA
Beryllium	mg/kg	NE	1.3	10,000	0.27 -	0.71 -	0.32 -	0.18 -	0.23 -	NA	NA	NA
Cadmium	mg/kg	NE	1,000	10,000	0.52 U	0.73 U	0.43 U	0.38 U	0.47 U	NA	NA	NA
Chromium	mg/kg	NE	10,000	10,000	3.49 -	3.86 -	6.29 -	9.06 -	3.81 -	NA	NA	NA
Copper	mg/kg	NE	10,000	10,000	50.4 -	22.5 -	61.8 -	8.33 -	9.06 -	NA	NA	NA
Lead	mg/kg	NE	500	10,000	31.5 -	26.3 -	93.8 -	52.7 -	17.3 -	NA	NA	NA
Nickel	mg/kg	NE	10,000	10,000	7.04 -	6.1 -	7.31 -	5.73 -	3.8 -	NA	NA	NA
Silver	mg/kg	NE	10,000	10,000	0.52 U	0.73 U	0.43 U	0.38 U	0.47 U	NA	NA	NA
Thallium	mg/kg	NE	140	10,000	2.09 U, D	2.94 U, D	1.73 U, D	1.5 U, D	1.88 U, D	NA	NA	NA
Zinc	mg/kg	NE	10,000	10,000	12 -	10.5 -	18.8 -	30.7 -	29.7 -	NA	NA	NA
Selenium	mg/kg	NE	10,000	10,000	2.09 U, D	2.94 U, D	1.73 U, D	1.5 U, D	1.88 U, D	NA	NA	NA
Mercury	mg/kg	NE	610	10,000	0.078 -	0.06 -	0.118 -	0.04 -	0.027 U	NA	NA	NA
<b>PAHS BY GCMS</b>												
2-Methylnaphthalene	mg/kg	NE	10,000	10,000	12.5 D	0.51 U	1.16 -	1.41 U, D	0.65 U, D	NA	NA	NA
Acenaphthene	mg/kg	NE	10,000	10,000	2.47 D	0.51 U	0.371 -	1.41 U, D	0.65 U, D	NA	NA	NA
Acenaphthylene	mg/kg	NE	10,000	10,000	16.5 D	0.51 U	6.92 -	1.41 U, D	0.65 U, D	NA	NA	NA
Anthracene	mg/kg	NE	10,000	10,000	12.2 D	0.51 U	4.39 -	1.41 U, D	0.65 U, D	NA	NA	NA
Benzo [a] Anthracene	mg/kg	NE	7.8	10,000	28.5 D	0.51 U	12.8 D	2.76 D	1.36 D	NA	NA	NA
Benzo [a] Pyrene	mg/kg	NE	0.8	10,000	18.2 D	0.256 U	11.2 D	2.3 D	1.33 D	NA	NA	NA
Benzo [b] Fluoranthene	mg/kg	NE	7.8	10,000	28.2 D	0.51 U	13 D	2.69 D	1.41 D	NA	NA	NA
Benzo [g,h,i] Perylene	mg/kg	NE	10,000	10,000	7.75 D	0.51 U	6.26 -	1.26 D	0.65 U, D	NA	NA	NA
Benzo [k] Fluoranthene	mg/kg	NE	78	10,000	17.5 D	0.51 U	5.78 D	1.92 D	1.34 D	NA	NA	NA
Chrysene	mg/kg	NE	780	10,000	27.8 D	0.256 U	12.6 D	2.73 D	1.39 D	NA	NA	NA
Dibenzo [a,h] Anthracene	mg/kg	NE	0.8	10,000	4.3 D	0.256 U	2.62 -	0.646 D	0.406 D	NA	NA	NA
Fluoranthene	mg/kg	NE	10,000	10,000	87.5 D	0.51 U	15.7 D	7.81 D	1.83 D	NA	NA	NA
Fluorene	mg/kg	NE	10,000	10,000	6.22 D	0.51 U	0.907 -	1.41 U, D	0.65 U, D	NA	NA	NA
Indeno [1,2,3-cd] Pyrene	mg/kg	NE	7.8	10,000	7.81 D	0.51 U	5.75 -	1.01 D	0.65 U, D	NA	NA	NA
Naphthalene	mg/kg	NE	10,000	10,000	28.8 D	0.51 U	2.16 -	0.709 U, D	0.65 U, D	NA	NA	NA
Phenanthrene	mg/kg	NE	10,000	10,000	70.6 D	0.51 U	11.5 D	2.98 D	0.65 U, D	NA	NA	NA
Pyrene	mg/kg	NE	10,000	10,000	52.8 D	0.51 U	30.1 D	5.88 D	1.69 D	NA	NA	NA
<b>SUBCONTRACTED ANALYTES</b>												
Total Cyanide	mg/kg	NE	10,000	10,000	7.48 -	1.44 -	123 D	2.44 -	1.01 U	1.8 -	1.01 U	10.4 -

**Notes**

NE = Not Established

NA = Not Analyzed

NFA = North Fill Area

FGPA = Former Gas Plant Area

FPPA = Former Power Plant Area

SFA = South Fill Area

Detected concentrations are bolded.

Gray shaded cells indicates the concentration exceeds the RIDEM Method 1

Industrial/Commercial Direct Exposure Criteria (I/C DEC).

Detection limits highlighted in *blue and in italics* exceed the RIDEM Method 1 Criteria.

Underlined concentrations exceed the RIDEM Method 1 GB Leachability Criteria.

A concentration with a bold border exceeds the Upper Concentration Limit.

Undetected analytes have a "U" qualifier.

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**Table 4B**  
**Summary of LDI Analytical**  
**TPH, PAHs, and Metals - Surface Soil Test Pit Results**  
**Former Tidewater Facility**  
**Pawtucket, RI**

	Units	RIDEM GB Leachability Criteria	RIDEM Industrial/ Commercial DEC	RIDEM UCL	1712474-12 GZ-TP-533 (1-2') 12/19/2017	1712473-01 GZ-TP-534 (0-1') 12/19/2017	1712473-05 GZ-TP-535A (0-1') 12/19/2017	1712473-06 GZ-TP-535A (1-2') 12/19/2017	1712473-07 GZ-TP-536 (0-1') 12/19/2017	1712473-08 GZ-TP-536 (1-2') 12/19/2017	1712473-11 GZ-TP-537 (1-2') 12/19/2017	1712473-09 GZ-TP-538 (0-1') 12/19/2017								
<b>TOTAL PETROLEUM HYDROCARBON</b>																				
Hydrocarbon Content	mg/kg	2,500	2,500	30,000	NA	NA	NA	NA	NA	NA	NA	NA								
<b>METALS</b>																				
Antimony	mg/kg	NE	820	10,000	NA	NA	NA	NA	NA	NA	NA	NA								
Arsenic	mg/kg	NE	7	10,000	NA	NA	NA	NA	NA	NA	NA	NA								
Beryllium	mg/kg	NE	1.3	10,000	NA	NA	NA	NA	NA	NA	NA	NA								
Cadmium	mg/kg	NE	1,000	10,000	NA	NA	NA	NA	NA	NA	NA	NA								
Chromium	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	NA								
Copper	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	NA								
Lead	mg/kg	NE	500	10,000	NA	NA	NA	NA	NA	NA	NA	NA								
Nickel	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	NA								
Silver	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	NA								
Thallium	mg/kg	NE	140	10,000	NA	NA	NA	NA	NA	NA	NA	NA								
Zinc	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	NA								
Selenium	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	NA								
Mercury	mg/kg	NE	610	10,000	NA	NA	NA	NA	NA	NA	NA	NA								
<b>PAHS BY GCMS</b>																				
2-Methylnaphthalene	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	NA								
Acenaphthene	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	NA								
Acenaphthylene	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	NA								
Anthracene	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	NA								
Benzo [a] Anthracene	mg/kg	NE	7.8	10,000	NA	NA	NA	NA	NA	NA	NA	NA								
Benzo [a] Pyrene	mg/kg	NE	0.8	10,000	NA	NA	NA	NA	NA	NA	NA	NA								
Benzo [b] Fluoranthene	mg/kg	NE	7.8	10,000	NA	NA	NA	NA	NA	NA	NA	NA								
Benzo [g,h,i] Perylene	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	NA								
Benzo [k] Fluoranthene	mg/kg	NE	78	10,000	NA	NA	NA	NA	NA	NA	NA	NA								
Chrysene	mg/kg	NE	780	10,000	NA	NA	NA	NA	NA	NA	NA	NA								
Dibenzo [a,h] Anthracene	mg/kg	NE	0.8	10,000	NA	NA	NA	NA	NA	NA	NA	NA								
Fluoranthene	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	NA								
Fluorene	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	NA								
Indeno [1,2,3-cd] Pyrene	mg/kg	NE	7.8	10,000	NA	NA	NA	NA	NA	NA	NA	NA								
Naphthalene	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	NA								
Phenanthrene	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	NA								
Pyrene	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	NA								
<b>SUBCONTRACTED ANALYTES</b>																				
Total Cyanide	mg/kg	NE	10,000	10,000	<b>6.77</b>	-	<b>8.3</b>	-	1.07	U	1.33	U	1.05	U	<b>2.94</b>	-	<b>5.62</b>	-	<b>10.8</b>	-

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**Table 4B**  
**Summary of LDI Analytical**  
**TPH, PAHs, and Metals - Surface Soil Test Pit Results**  
**Former Tidewater Facility**  
**Pawtucket, RI**

	Units	RIDEM GB Leachability Criteria	RIDEM Industrial/ Commercial DEC	RIDEM UCL	1712473-10 GZ-TP-538 (1-2') 12/19/2017	1712474-13 GZ-TP-539 (0-0.5') 12/20/2017	1712474-09 GZ-TP-540 (0-0.5') 12/19/2017	1712474-10 GZ-TP-540 (1-2') 12/19/2017	1712474-05 GZ-TP-541 (0-1') 12/19/2017	1712474-06 GZ-TP-541 (1-2') 12/19/2017	1712473-03 GZ-TP-548 (1-2') 12/19/2017	1709470-11 TP-506 (1-2') 09/15/2017					
<b>TOTAL PETROLEUM HYDROCARBON</b>																	
Hydrocarbon Content	mg/kg	2,500	2,500	30,000	NA	NA	NA	NA	NA	NA	NA	40.9 U					
<b>METALS</b>																	
Antimony	mg/kg	NE	820	10,000	NA	NA	NA	NA	NA	NA	NA	1.89 U, D					
Arsenic	mg/kg	NE	7	10,000	NA	NA	NA	NA	NA	NA	NA	2.36 U					
Beryllium	mg/kg	NE	1.3	10,000	NA	NA	NA	NA	NA	NA	NA	0.2 -					
Cadmium	mg/kg	NE	1,000	10,000	NA	NA	NA	NA	NA	NA	NA	0.47 U					
Chromium	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	2.17 -					
Copper	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	6.77 -					
Lead	mg/kg	NE	500	10,000	NA	NA	NA	NA	NA	NA	NA	4.72 U					
Nickel	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	2.36 U					
Silver	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	0.47 U					
Thallium	mg/kg	NE	140	10,000	NA	NA	NA	NA	NA	NA	NA	1.89 U, D					
Zinc	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	32 -					
Selenium	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	1.89 U, D					
Mercury	mg/kg	NE	610	10,000	NA	NA	NA	NA	NA	NA	NA	0.03 U					
<b>PAHS BY GCMS</b>																	
2-Methylnaphthalene	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	0.359 U					
Acenaphthene	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	0.359 U					
Acenaphthylene	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	0.359 U					
Anthracene	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	0.359 U					
Benzo [a] Anthracene	mg/kg	NE	7.8	10,000	NA	NA	NA	NA	NA	NA	NA	0.359 U					
Benzo [a] Pyrene	mg/kg	NE	0.8	10,000	NA	NA	NA	NA	NA	NA	NA	0.18 U					
Benzo [b] Fluoranthene	mg/kg	NE	7.8	10,000	NA	NA	NA	NA	NA	NA	NA	0.359 U					
Benzo [g,h,i] Perylene	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	0.359 U					
Benzo [k] Fluoranthene	mg/kg	NE	78	10,000	NA	NA	NA	NA	NA	NA	NA	0.359 U					
Chrysene	mg/kg	NE	780	10,000	NA	NA	NA	NA	NA	NA	NA	0.18 U					
Dibenzo [a,h] Anthracene	mg/kg	NE	0.8	10,000	NA	NA	NA	NA	NA	NA	NA	0.18 U					
Fluoranthene	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	0.359 U					
Fluorene	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	0.359 U					
Indeno [1,2,3-cd] Pyrene	mg/kg	NE	7.8	10,000	NA	NA	NA	NA	NA	NA	NA	0.359 U					
Naphthalene	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	0.359 U					
Phenanthrene	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	0.359 U					
Pyrene	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	0.359 U					
<b>SUBCONTRACTED ANALYTES</b>																	
Total Cyanide	mg/kg	NE	10,000	10,000	3.76	-	571 D	1.09	-	1.88	-	102 D	12.1	-	1.75	-	0.99 U

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**Former Tidewater Facility**  
**Pawtucket, RI**

	Units	RIDEM GB Leachability Criteria	RIDEM Industrial/ Commercial DEC	RIDEM UCL	1709470-13 TP-507 (0-2') 09/15/2017	1709493-13 TP-508 (0-2') 09/18/2017	1709493-09 TP-509 (0-2') 09/18/2017	1709493-05 TP-510 (0-2') 09/18/2017	1709493-01 TP-511 (1-2') 09/18/2017	1709493-03 TP-512 (0-2') 09/18/2017	1709493-07 TP-524 (0-2') 09/18/2017	1712473-15 GZ-TP-542 (1-2') 12/19/2017
<b>TOTAL PETROLEUM HYDROCARBON</b>												
Hydrocarbon Content	mg/kg	2,500	2,500	30,000	191 U, D	41 U	41.6 U	<b>1,240</b> D	41.5 U	<b>296</b> D	<b>785</b> -	NA
<b>METALS</b>												
Antimony	mg/kg	NE	820	10,000	1.59 U, D	4.64 U	5.41 U	4.92 U	4.08 U	5.08 U	<b>8.54</b> -	NA
Arsenic	mg/kg	NE	7	10,000	<b>2.88</b> -	<b>6.87</b> -	<b>5.03</b> -	<b>10</b> -	<b>5.64</b> -	<b>2.73</b> -	<b>9.4</b> -	NA
Beryllium	mg/kg	NE	1.3	10,000	<b>0.27</b> -	<b>0.27</b> -	<b>0.34</b> -	0.11 U	<b>0.11</b> -	<b>0.21</b> -	<b>0.11</b> -	NA
Cadmium	mg/kg	NE	1,000	10,000	0.4 U	0.46 U	0.54 U	0.49 U	0.41 U	0.51 U	0.45 U	NA
Chromium	mg/kg	NE	10,000	10,000	<b>7.61</b> -	<b>4.74</b> -	<b>8.06</b> -	<b>1.09</b> -	<b>6.67</b> -	<b>5.15</b> -	<b>2.73</b> -	NA
Copper	mg/kg	NE	10,000	10,000	<b>15.4</b> -	<b>29</b> -	<b>13</b> -	<b>26.1</b> -	<b>11.6</b> -	<b>11.4</b> -	<b>43.6</b> -	NA
Lead	mg/kg	NE	500	10,000	<b>21.6</b> -	<b>35.3</b> -	<b>15.7</b> -	<b>295</b> -	<b>18.9</b> -	<b>27.7</b> -	<b>200</b> -	NA
Nickel	mg/kg	NE	10,000	10,000	<b>8.08</b> -	<b>7.4</b> -	<b>8.83</b> -	<b>11.6</b> -	<b>3.89</b> -	<b>6.12</b> -	<b>10</b> -	NA
Silver	mg/kg	NE	10,000	10,000	0.4 U	0.46 U	0.54 U	0.49 U	0.41 U	0.51 U	0.45 U	NA
Thallium	mg/kg	NE	140	10,000	1.59 U, D	4.64 U	5.41 U	4.92 U	4.08 U	5.08 U	4.54 U	NA
Zinc	mg/kg	NE	10,000	10,000	<b>26.7</b> -	<b>20.1</b> -	<b>28.8</b> -	<b>27</b> -	<b>13.6</b> -	<b>48.4</b> -	<b>23.5</b> -	NA
Selenium	mg/kg	NE	10,000	10,000	1.59 U, D	4.64 U, D	5.41 U, D	4.92 U, D	4.08 U, D	5.08 U, D	4.54 U, D	NA
Mercury	mg/kg	NE	610	10,000	0.031 U	<b>0.179</b> -	0.031 U	<b>0.097</b> -	<b>0.032</b> -	0.03 U	<b>0.09</b> -	NA
<b>PAHS BY GCMS</b>												
2-Methylnaphthalene	mg/kg	NE	10,000	10,000	0.348 U	0.371 U	0.354 U	<b>4.01</b> D	0.366 U	0.338 U	<b>1.06</b> -	NA
Acenaphthene	mg/kg	NE	10,000	10,000	0.348 U	0.371 U	0.354 U	<b>8.45</b> D	0.366 U	0.338 U	0.368 U	NA
Acenaphthylene	mg/kg	NE	10,000	10,000	0.348 U	0.371 U	0.354 U	1.58 U, D	<b>0.389</b> -	0.338 U	0.368 U	NA
Anthracene	mg/kg	NE	10,000	10,000	0.348 U	0.371 U	0.354 U	<b>19.6</b> D	0.366 U	0.338 U	0.368 U	NA
Benzo [a] Anthracene	mg/kg	NE	7.8	10,000	<b>0.89</b> -	0.371 U	0.354 U	<b>32.4</b> D	<b>0.551</b> -	<b>1.02</b> -	<b>1.07</b> -	NA
Benzo [a] Pyrene	mg/kg	NE	0.8	10,000	<b>0.795</b> -	0.186 U	0.177 U	<b>24.3</b> D	<b>0.423</b> -	<b>0.992</b> -	<b>0.652</b> -	NA
Benzo [b] Fluoranthene	mg/kg	NE	7.8	10,000	<b>0.759</b> -	0.371 U	0.354 U	<b>27.5</b> D	<b>0.609</b> -	<b>1.18</b> -	<b>1.21</b> -	NA
Benzo [g,h,i] Perylene	mg/kg	NE	10,000	10,000	<b>0.376</b> -	0.371 U	0.354 U	<b>7.72</b> D	0.366 U	<b>0.552</b> -	0.368 U	NA
Benzo [k] Fluoranthene	mg/kg	NE	78	10,000	<b>0.666</b> -	0.371 U	0.354 U	<b>22.4</b> D	0.366 U	<b>0.966</b> -	<b>0.848</b> -	NA
Chrysene	mg/kg	NE	780	10,000	<b>0.776</b> -	0.186 U	0.177 U	<b>32.2</b> D	<b>0.569</b> -	<b>1.01</b> -	<b>1.41</b> -	NA
Dibenzo [a,h] Anthracene	mg/kg	NE	0.8	10,000	<b>0.207</b> -	0.186 U	0.177 U	<b>5.25</b> D	0.183 U	<b>0.262</b> -	0.185 U	NA
Fluoranthene	mg/kg	NE	10,000	10,000	<b>2.22</b> -	0.371 U	0.354 U	<b>85.7</b> D	<b>0.734</b> -	<b>1.89</b> -	<b>2.55</b> -	NA
Fluorene	mg/kg	NE	10,000	10,000	0.348 U	0.371 U	0.354 U	<b>9.29</b> D	0.366 U	0.338 U	0.368 U	NA
Indeno [1,2,3-cd] Pyrene	mg/kg	NE	7.8	10,000	<b>0.351</b> -	0.371 U	0.354 U	<b>8.18</b> D	0.366 U	<b>0.485</b> -	0.368 U	NA
Naphthalene	mg/kg	NE	10,000	10,000	0.348 U	0.371 U	0.354 U	<b>7.31</b> D	0.366 U	0.338 U	<b>3.81</b> -	NA
Phenanthrene	mg/kg	NE	10,000	10,000	<b>0.645</b> -	0.371 U	0.354 U	<b>72.7</b> D	<b>0.371</b> -	<b>0.483</b> -	<b>1.97</b> -	NA
Pyrene	mg/kg	NE	10,000	10,000	<b>1.92</b> -	0.371 U	0.354 U	<b>59.3</b> D	<b>0.799</b> -	<b>1.59</b> -	<b>1.41</b> -	NA
<b>SUBCONTRACTED ANALYTES</b>												
Total Cyanide	mg/kg	NE	10,000	10,000	0.99 U	0.95 U	1.1 U	<b>3.16</b> -	<b>19.1</b> -	<b>5.5</b> -	1.05 U	1.1 U

**Notes**

NE = Not Established

NA = Not Analyzed

NFA = North Fill Area

FGPA = Former Gas Plant Area

FPPA = Former Power Plant Area

SFA = South Fill Area

Detected concentrations are bolded.

Gray shaded cells indicates the concentration exceeds the RIDEM Method 1

Industrial/Commercial Direct Exposure Criteria (I/C DEC).

Detection limits highlighted in *blue and in italics* exceed the RIDEM Method 1 Criteria.

Underlined concentrations exceed the RIDEM Method 1 GB Leachability Criteria.

A concentration with a bold border exceeds the Upper Concentration Limit.

Undetected analytes have a "U" qualifier.

Any analytes reported from a diluted run of the original analysis have a "D" qualifier.

Blank cells indicate a sample was not analyzed for that parameter



**Table 4B**  
**Summary of LDI Analytical**  
**TPH, PAHs, and Metals - Surface Soil Test Pit Results**  
**Former Tidewater Facility**  
**Pawtucket, RI**

	Units	RIDEM GB Leachability Criteria	RIDEM Industrial/ Commercial DEC	RIDEM UCL	1712473-13 GZ-TP-543 (1-2') 12/19/2017	1712474-03 GZ-TP-544 (0-0.5') 12/19/2017	1712474-04 GZ-TP-544 (1-2') 12/19/2017	1712474-01 GZ-TP-545 (0-1') 12/19/2017	1712474-02 GZ-TP-545 (1-2') 12/19/2017	1712473-19 GZ-TP-546 (0-0.5') 12/19/2017	1712473-20 GZ-TP-546 (1-2') 12/19/2017	1712473-17 GZ-TP-547 (1-2') 12/19/2017		
<b>TOTAL PETROLEUM HYDROCARBON</b>														
Hydrocarbon Content	mg/kg	2,500	2,500	30,000	NA	NA	NA	NA	NA	NA	NA	NA		
<b>METALS</b>														
Antimony	mg/kg	NE	820	10,000	NA	NA	NA	NA	NA	NA	NA	NA		
Arsenic	mg/kg	NE	7	10,000	NA	NA	NA	NA	NA	NA	NA	NA		
Beryllium	mg/kg	NE	1.3	10,000	NA	NA	NA	NA	NA	NA	NA	NA		
Cadmium	mg/kg	NE	1,000	10,000	NA	NA	NA	NA	NA	NA	NA	NA		
Chromium	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	NA		
Copper	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	NA		
Lead	mg/kg	NE	500	10,000	NA	NA	NA	NA	NA	NA	NA	NA		
Nickel	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	NA		
Silver	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	NA		
Thallium	mg/kg	NE	140	10,000	NA	NA	NA	NA	NA	NA	NA	NA		
Zinc	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	NA		
Selenium	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	NA		
Mercury	mg/kg	NE	610	10,000	NA	NA	NA	NA	NA	NA	NA	NA		
<b>PAHS BY GCMS</b>														
2-Methylnaphthalene	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	NA		
Acenaphthene	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	NA		
Acenaphthylene	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	NA		
Anthracene	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	NA		
Benzo [a] Anthracene	mg/kg	NE	7.8	10,000	NA	NA	NA	NA	NA	NA	NA	NA		
Benzo [a] Pyrene	mg/kg	NE	0.8	10,000	NA	NA	NA	NA	NA	NA	NA	NA		
Benzo [b] Fluoranthene	mg/kg	NE	7.8	10,000	NA	NA	NA	NA	NA	NA	NA	NA		
Benzo [g,h,i] Perylene	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	NA		
Benzo [k] Fluoranthene	mg/kg	NE	78	10,000	NA	NA	NA	NA	NA	NA	NA	NA		
Chrysene	mg/kg	NE	780	10,000	NA	NA	NA	NA	NA	NA	NA	NA		
Dibenzo [a,h] Anthracene	mg/kg	NE	0.8	10,000	NA	NA	NA	NA	NA	NA	NA	NA		
Fluoranthene	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	NA		
Fluorene	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	NA		
Indeno [1,2,3-cd] Pyrene	mg/kg	NE	7.8	10,000	NA	NA	NA	NA	NA	NA	NA	NA		
Naphthalene	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	NA		
Phenanthrene	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	NA		
Pyrene	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	NA		
<b>SUBCONTRACTED ANALYTES</b>														
Total Cyanide	mg/kg	NE	10,000	10,000	<b>10.9</b>	-	<b>134</b> D	<b>2.29</b>	-	<b>209</b> D	1.18 U	<b>696</b> D	<b>252</b> D	<b>41.9</b> D

**Notes**

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Gray shaded cells indicates the concentration exceeds the RIDEM Method 1

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A concentration with a bold border exceeds the Upper Concentration Limit.

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Blank cells indicate a sample was not analyzed for that parameter

Table 5A  
Summary of LDI Analytical  
VOCs - Subsurface Soil Test Pit Results  
Former Tidewater Facility  
Pawtucket, RI

	Units	RIDEM GB Leachability Criteria	RIDEM Industrial/ Commercial DEC	RIDEM UCL	1709470-02 TP-501 (3_5-4') 09/14/2017	1709470-04 TP-502 (4-5') 09/14/2017	1709470-06 TP-503 (5-6') 09/15/2017	1709470-08 TP-504 (4-5') 09/15/2017	1709470-10 TP-505 (4-5') 09/15/2017	1709470-12 TP-506 (10-11') 09/15/2017	1709470-14 TP-507 (10-11') 09/15/2017	
<b>VOLATILE ORGANICS</b>												
1,1,1,2-Tetrachloroethane	mg/kg	NE	220	10,000	0.0059 U	0.0052 U	0.0056 U	0.0051 U	0.0028 U	0.0043 U	0.005 U	
1,1,1-Trichloroethane	mg/kg	160	10,000	10,000	0.0059 U	0.0052 U	0.0056 U	0.0051 U	0.0028 U	0.0043 U	0.005 U	
1,1,2,2-Tetrachloroethane	mg/kg	NE	29	10,000	0.0059 U	0.0052 U	0.0056 U	0.0051 U	0.0028 U	0.0043 U	0.005 U	
1,1,2-Trichloroethane	mg/kg	NE	100	10,000	0.0059 U	0.0052 U	0.0056 U	0.0051 U	0.0028 U	0.0043 U	0.005 U	
1,1-Dichloroethane	mg/kg	NE	10,000	10,000	0.0059 U	0.0052 U	0.0056 U	0.0051 U	0.0028 U	0.0043 U	0.005 U	
1,1-Dichloroethene	mg/kg	1	9.5	10,000	0.0059 U	0.0052 U	0.0056 U	0.0051 U	0.0028 U	0.0043 U	0.005 U	
1,1-Dichloropropene	mg/kg	NE	NE	10,000	0.0059 U	0.0052 U	0.0056 U	0.0051 U	0.0028 U	0.0043 U	0.005 U	
1,2,3-Trichlorobenzene	mg/kg	NE	NE	10,000	0.0059 U	0.0052 U	0.0056 U	0.0051 U	0.0028 U	0.0043 U	0.005 U	
1,2,3-Trichloropropane	mg/kg	NE	NE	10,000	0.0059 U	0.0052 U	0.0056 U	0.0051 U	0.0028 U	0.0043 U	0.005 U	
1,2,4-Trichlorobenzene	mg/kg	NE	10,000	10,000	0.0059 U	0.0052 U	0.0056 U	0.0051 U	0.0028 U	0.0043 U	0.005 U	
1,2,4-Trimethylbenzene	mg/kg	NE	NE	10,000	0.0059 U	0.0052 U	0.0056 U	0.0051 U	0.0028 U	0.0043 U	0.005 U	
1,2-Dibromo-3-Chloropropane	mg/kg	NE	NE	10,000	0.0059 U	0.0052 U	0.0056 U	0.0051 U	0.0028 U	0.0043 U	0.005 U	
1,2-Dibromoethane (EDB)	mg/kg	NE	0.07	10,000	0.0059 U	0.0052 U	0.0056 U	0.0051 U	0.0028 U	0.0043 U	0.005 U	
1,2-Dichlorobenzene	mg/kg	NE	10,000	10,000	0.0059 U	0.0052 U	0.0056 U	0.0051 U	0.0028 U	0.0043 U	0.005 U	
1,2-Dichloroethane	mg/kg	2.3	63	10,000	0.0059 U	0.0052 U	0.0056 U	0.0051 U	0.0028 U	0.0043 U	0.005 U	
1,2-Dichloropropane	mg/kg	70	84	10,000	0.0059 U	0.0052 U	0.0056 U	0.0051 U	0.0028 U	0.0043 U	0.005 U	
1,3,5-Trimethylbenzene	mg/kg	NE	NE	10,000	0.0059 U	0.0052 U	0.0056 U	0.0051 U	0.0028 U	0.0043 U	0.005 U	
1,3-Dichlorobenzene	mg/kg	NE	10,000	10,000	0.0059 U	0.0052 U	0.0056 U	0.0051 U	0.0028 U	0.0043 U	0.005 U	
1,3-Dichloropropane	mg/kg	NE	NE	10,000	0.0059 U	0.0052 U	0.0056 U	0.0051 U	0.0028 U	0.0043 U	0.005 U	
1,4-Dichlorobenzene	mg/kg	NE	240	10,000	0.0059 U	0.0052 U	0.0056 U	0.0051 U	0.0028 U	0.0043 U	0.005 U	
1,4-Dioxane	mg/kg	NE	NE	10,000	0.119 U	0.104 U	0.112 U	0.102 U	0.0567 U	0.0863 U	0.1 U	
1-Chlorohexane	mg/kg	NE	NE	10,000	0.0059 U	0.0052 U	0.0056 U	0.0051 U	0.0028 U	0.0043 U	0.005 U	
2,2-Dichloropropane	mg/kg	NE	NE	10,000	0.0059 U	0.0052 U	0.0056 U	0.0051 U	0.0028 U	0.0043 U	0.005 U	
2-Butanone (MEK)	mg/kg	NE	10,000	10,000	0.0594 U	0.0519 U	0.0559 U	0.0512 U	0.0283 U	0.0432 U	0.0501 U	
2-Chlorotoluene	mg/kg	NE	NE	10,000	0.0059 U	0.0052 U	0.0056 U	0.0051 U	0.0028 U	0.0043 U	0.005 U	
2-Hexanone	mg/kg	NE	NE	10,000	0.0594 U	0.0519 U	0.0559 U	0.0512 U	0.0283 U	0.0432 U	0.0501 U	
4-Chlorotoluene	mg/kg	NE	NE	10,000	0.0059 U	0.0052 U	0.0056 U	0.0051 U	0.0028 U	0.0043 U	0.005 U	
4-Isopropyltoluene	mg/kg	NE	NE	10,000	0.0059 U	0.0052 U	0.0056 U	0.0051 U	0.0028 U	0.0043 U	0.005 U	
4-Methyl-2-Pentanone (MIBK)	mg/kg	NE	10,000	10,000	0.0594 U	0.0519 U	0.0559 U	0.0512 U	0.0283 U	0.0432 U	0.0501 U	
Acetone	mg/kg	NE	10,000	10,000	0.0594 U	0.0519 U	0.0559 U	0.0512 U	0.0283 U	0.0432 U	0.0501 U	
Benzene	mg/kg	4.3	200	10,000	0.0059 U	0.0052 U	0.0056 U	0.0051 U	0.0028 U	0.0043 U	0.005 U	
Bromobenzene	mg/kg	NE	NE	10,000	0.0059 U	0.0052 U	0.0056 U	0.0051 U	0.0028 U	0.0043 U	0.005 U	
Bromochloromethane	mg/kg	NE	NE	10,000	0.0059 U	0.0052 U	0.0056 U	0.0051 U	0.0028 U	0.0043 U	0.005 U	
Bromodichloromethane	mg/kg	NE	92	10,000	0.0059 U	0.0052 U	0.0056 U	0.0051 U	0.0028 U	0.0043 U	0.005 U	
Bromoform	mg/kg	NE	720	10,000	0.0059 U	0.0052 U	0.0056 U	0.0051 U	0.0028 U	0.0043 U	0.005 U	
Bromomethane	mg/kg	NE	2,900	10,000	0.0119 U	0.0104 U	0.0112 U	0.0102 U	0.0057 U	0.0086 U	0.01 U	
Carbon Disulfide	mg/kg	NE	NE	10,000	0.0059 U	0.0052 U	0.0056 U	0.0051 U	0.0028 U	0.0043 U	0.005 U	
Carbon Tetrachloride	mg/kg	5	44	10,000	0.0059 U	0.0052 U	0.0056 U	0.0051 U	0.0028 U	0.0043 U	0.005 U	
Chlorobenzene	mg/kg	100	10,000	10,000	0.0059 U	0.0052 U	0.0056 U	0.0051 U	0.0028 U	0.0043 U	0.005 U	
Chloroethane	mg/kg	NE	NE	10,000	0.0119 U	0.0104 U	0.0112 U	0.0102 U	0.0057 U	0.0086 U	0.01 U	
Chloroform	mg/kg	NE	940	10,000	0.0059 U	0.0052 U	0.0056 U	0.0051 U	0.0028 U	0.0043 U	0.005 U	
Chloromethane	mg/kg	NE	NE	10,000	0.0119 U	0.0104 U	0.0112 U	0.0102 U	0.0057 U	0.0086 U	0.01 U	
cis-1,2-Dichloroethene	mg/kg	6	10,000	10,000	0.0059 U	0.0052 U	0.0056 U	0.0051 U	0.0028 U	0.0043 U	0.005 U	
cis-1,3-Dichloropropene	mg/kg	NE	NE	10,000	0.0059 U	0.0052 U	0.0056 U	0.0051 U	0.0028 U	0.0043 U	0.005 U	
Dibromochloromethane	mg/kg	NE	NE	10,000	0.0059 U	0.0052 U	0.0056 U	0.0051 U	0.0028 U	0.0043 U	0.005 U	
Dibromomethane	mg/kg	NE	NE	10,000	0.0059 U	0.0052 U	0.0056 U	0.0051 U	0.0028 U	0.0043 U	0.005 U	
Dichlorodifluoromethane	mg/kg	NE	NE	10,000	0.0119 U	0.0104 U	0.0112 U	0.0102 U	0.0057 U	0.0086 U	0.01 U	
Diethylether	mg/kg	NE	NE	10,000	0.0059 U	0.0052 U	0.0056 U	0.0051 U	0.0028 U	0.0043 U	0.005 U	
Di-isopropyl ether	mg/kg	NE	NE	10,000	0.0059 U	0.0052 U	0.0056 U	0.0051 U	0.0028 U	0.0043 U	0.005 U	
Ethyl tertiary-butyl ether	mg/kg	NE	NE	10,000	0.0059 U	0.0052 U	0.0056 U	0.0051 U	0.0028 U	0.0043 U	0.005 U	
Ethylbenzene	mg/kg	62	10,000	10,000	0.0059 U	0.0052 U	0.0056 U	0.0051 U	0.0028 U	0.0043 U	0.005 U	
Hexachlorobutadiene	mg/kg	NE	73	10,000	0.0059 U	0.0052 U	0.0056 U	0.0051 U	0.0028 U	0.0043 U	0.005 U	

**Table 5A**  
**Summary of LDI Analytical**  
**VOCs - Subsurface Soil Test Pit Results**  
**Former Tidewater Facility**  
**Pawtucket, RI**

	Units	RIDEM GB Leachability Criteria	RIDEM Industrial/ Commercial DEC	RIDEM UCL	1709470-02 TP-501 (3_5-4') 09/14/2017	1709470-04 TP-502 (4-5') 09/14/2017	1709470-06 TP-503 (5-6') 09/15/2017	1709470-08 TP-504 (4-5') 09/15/2017	1709470-10 TP-505 (4-5') 09/15/2017	1709470-12 TP-506 (10-11') 09/15/2017	1709470-14 TP-507 (10-11') 09/15/2017	
<b>VOLATILE ORGANICS</b>												
Isopropylbenzene	mg/kg	NE	10,000	10,000	0.0059 U	0.0052 U	0.0056 U	0.0051 U	0.0028 U	0.0043 U	0.005 U	
Methyl tert-butyl ether	mg/kg	100	10,000	10,000	0.0059 U	0.0052 U	0.0056 U	0.0051 U	0.0028 U	0.0043 U	0.005 U	
Methylene Chloride	mg/kg	NE	760	10,000	0.0297 U	0.0259 U	0.028 U	0.0256 U	0.0142 U	0.0216 U	0.025 U	
Naphthalene	mg/kg	NE	10,000	10,000	0.0059 U	0.0052 U	0.0056 U	0.0051 U	0.0028 U	0.0043 U	0.005 U	
n-Butylbenzene	mg/kg	NE	NE	10,000	0.0059 U	0.0052 U	0.0056 U	0.0051 U	0.0028 U	0.0043 U	0.005 U	
n-Propylbenzene	mg/kg	NE	NE	10,000	0.0059 U	0.0052 U	0.0056 U	0.0051 U	0.0028 U	0.0043 U	0.005 U	
sec-Butylbenzene	mg/kg	NE	NE	10,000	0.0059 U	0.0052 U	0.0056 U	0.0051 U	0.0028 U	0.0043 U	0.005 U	
Styrene	mg/kg	64	190	10,000	0.0059 U	0.0052 U	0.0056 U	0.0051 U	0.0028 U	0.0043 U	0.005 U	
tert-Butylbenzene	mg/kg	NE	NE	10,000	0.0059 U	0.0052 U	0.0056 U	0.0051 U	0.0028 U	0.0043 U	0.005 U	
Tertiary-amyl methyl ether	mg/kg	NE	NE	10,000	0.0059 U	0.0052 U	0.0056 U	0.0051 U	0.0028 U	0.0043 U	0.005 U	
Tetrachloroethene	mg/kg	4.2	110	10,000	0.0059 U	0.0052 U	0.0056 U	0.0051 U	0.0028 U	0.0043 U	0.005 U	
Tetrahydrofuran	mg/kg	NE	NE	10,000	0.0059 U	0.0052 U	0.0056 U	0.0051 U	0.0028 U	0.0043 U	0.005 U	
Toluene	mg/kg	54	10,000	10,000	0.0059 U	0.0052 U	0.0056 U	0.0051 U	0.0028 U	0.0043 U	0.005 U	
trans-1,2-Dichloroethene	mg/kg	92	10,000	10,000	0.0059 U	0.0052 U	0.0056 U	0.0051 U	0.0028 U	0.0043 U	0.005 U	
trans-1,3-Dichloropropene	mg/kg	NE	NE	10,000	0.0059 U	0.0052 U	0.0056 U	0.0051 U	0.0028 U	0.0043 U	0.005 U	
Trichloroethene	mg/kg	20	520	10,000	0.0059 U	0.0052 U	0.0056 U	0.0051 U	0.0028 U	0.0043 U	0.005 U	
Trichlorofluoromethane	mg/kg	NE	NE	10,000	0.0059 U	0.0052 U	0.0056 U	0.0051 U	0.0028 U	0.0043 U	0.005 U	
Vinyl Acetate	mg/kg	NE	NE	10,000	0.0059 U	0.0052 U	0.0056 U	0.0051 U	0.0028 U	0.0043 U	0.005 U	
Vinyl Chloride	mg/kg	NE	3	10,000	0.0119 U	0.0104 U	0.0112 U	0.0102 U	0.0057 U	0.0086 U	0.01 U	
o-Xylene	mg/kg	NE	10,000	10,000	0.0059 U	0.0052 U	0.0056 U	0.0051 U	0.0028 U	0.0043 U	0.005 U	
m&p-Xylene	mg/kg	NE	10,000	10,000	0.0119 U	0.0104 U	0.0112 U	0.0102 U	0.0057 U	0.0086 U	0.01 U	
Total Xylenes	mg/kg	NE	10,000	10,000	0.0119 U	0.0104 U	0.0112 U	0.0102 U	0.0057 U	0.0086 U	0.01 U	

**Notes**

NE = Not Established

NA = Not Analyzed

NFA = North Fill Area

FGPA = Former Gas Plant Area

FPPA = Former Power Plant Area

SFA = South Fill Area

**Detected concentrations are bolded.**

**Gray shaded cells indicates the concentration exceeds the RIDEM Method 1**

**Industrial/Commercial \Direct Exposure Criteria (I/C DEC).**

Detection limits highlighted in *blue and in italics* exceed the RIDEM Method 1 Criteria.

Underlined concentrations exceed the RIDEM Method 1 GB Leachability Criteria.

**A concentration with a bold border exceeds the Upper Concentration Limit.**

Undetected analytes have a "U" qualifier.

Any analytes reported from a diluted run of the original analysis have a "D" qualifier.

Blank cells indicate a sample was not analyzed for that parameter

Table 5A  
Summary of LDI Analytical  
VOCs - Subsurface Soil Test Pit Results  
Former Tidewater Facility  
Pawtucket, RI

	Units	RIDEM GB Leachability Criteria	RIDEM Industrial/ Commercial DEC	RIDEM UCL	1709493-14 TP-508 (4-5') 09/18/2017	1709493-10 TP-509 (5-6') 09/18/2017	1709493-06 TP-510 (2-3') 09/18/2017	1709493-02 TP-511 (3-4') 09/18/2017	1709493-04 TP-512 (3-4') 09/18/2017	1709493-08 TP-524 (5-6') 09/18/2017
<b>VOLATILE ORGANICS</b>										
1,1,1,2-Tetrachloroethane	mg/kg	NE	220	10,000	0.0058 U	0.004 U	0.0046 U	0.0055 U	0.0048 U	0.0045 U
1,1,1-Trichloroethane	mg/kg	160	10,000	10,000	0.0058 U	0.004 U	0.0046 U	0.0055 U	0.0048 U	0.0045 U
1,1,2,2-Tetrachloroethane	mg/kg	NE	29	10,000	0.0058 U	0.004 U	0.0046 U	0.0055 U	0.0048 U	0.0045 U
1,1,2-Trichloroethane	mg/kg	NE	100	10,000	0.0058 U	0.004 U	0.0046 U	0.0055 U	0.0048 U	0.0045 U
1,1-Dichloroethane	mg/kg	NE	10,000	10,000	0.0058 U	0.004 U	0.0046 U	0.0055 U	0.0048 U	0.0045 U
1,1-Dichloroethene	mg/kg	1	9.5	10,000	0.0058 U	0.004 U	0.0046 U	0.0055 U	0.0048 U	0.0045 U
1,1-Dichloropropene	mg/kg	NE	NE	10,000	0.0058 U	0.004 U	0.0046 U	0.0055 U	0.0048 U	0.0045 U
1,2,3-Trichlorobenzene	mg/kg	NE	NE	10,000	0.0058 U	0.004 U	0.0046 U	0.0055 U	0.0048 U	0.0045 U
1,2,3-Trichloropropane	mg/kg	NE	NE	10,000	0.0058 U	0.004 U	0.0046 U	0.0055 U	0.0048 U	0.0045 U
1,2,4-Trichlorobenzene	mg/kg	NE	10,000	10,000	0.0058 U	0.004 U	0.0046 U	0.0055 U	0.0048 U	0.0045 U
1,2,4-Trimethylbenzene	mg/kg	NE	NE	10,000	0.0058 U	0.004 U	0.0046 U	0.0055 U	0.0048 U	0.0045 U
1,2-Dibromo-3-Chloropropane	mg/kg	NE	NE	10,000	0.0058 U	0.004 U	0.0046 U	0.0055 U	0.0048 U	0.0045 U
1,2-Dibromoethane (EDB)	mg/kg	NE	0.07	10,000	0.0058 U	0.004 U	0.0046 U	0.0055 U	0.0048 U	0.0045 U
1,2-Dichlorobenzene	mg/kg	NE	10,000	10,000	0.0058 U	0.004 U	0.0046 U	0.0055 U	0.0048 U	0.0045 U
1,2-Dichloroethane	mg/kg	2.3	63	10,000	0.0058 U	0.004 U	0.0046 U	0.0055 U	0.0048 U	0.0045 U
1,2-Dichloropropane	mg/kg	70	84	10,000	0.0058 U	0.004 U	0.0046 U	0.0055 U	0.0048 U	0.0045 U
1,3,5-Trimethylbenzene	mg/kg	NE	NE	10,000	0.0058 U	0.004 U	0.0046 U	0.0055 U	0.0048 U	0.0045 U
1,3-Dichlorobenzene	mg/kg	NE	10,000	10,000	0.0058 U	0.004 U	0.0046 U	0.0055 U	0.0048 U	0.0045 U
1,3-Dichloropropane	mg/kg	NE	NE	10,000	0.0058 U	0.004 U	0.0046 U	0.0055 U	0.0048 U	0.0045 U
1,4-Dichlorobenzene	mg/kg	NE	240	10,000	0.0058 U	0.004 U	0.0046 U	0.0055 U	0.0048 U	0.0045 U
1,4-Dioxane	mg/kg	NE	NE	10,000	0.115 U	0.0804 U	0.0926 U	0.109 U	0.096 U	0.0894 U
1-Chlorohexane	mg/kg	NE	NE	10,000	0.0058 U	0.004 U	0.0046 U	0.0055 U	0.0048 U	0.0045 U
2,2-Dichloropropane	mg/kg	NE	NE	10,000	0.0058 U	0.004 U	0.0046 U	0.0055 U	0.0048 U	0.0045 U
2-Butanone (MEK)	mg/kg	NE	10,000	10,000	0.0575 U	0.0402 U	0.0463 U	0.0547 U	0.048 U	0.0447 U
2-Chlorotoluene	mg/kg	NE	NE	10,000	0.0058 U	0.004 U	0.0046 U	0.0055 U	0.0048 U	0.0045 U
2-Hexanone	mg/kg	NE	NE	10,000	0.0575 U	0.0402 U	0.0463 U	0.0547 U	0.048 U	0.0447 U
4-Chlorotoluene	mg/kg	NE	NE	10,000	0.0058 U	0.004 U	0.0046 U	0.0055 U	0.0048 U	0.0045 U
4-Isopropyltoluene	mg/kg	NE	NE	10,000	0.0058 U	0.004 U	0.0046 U	0.0055 U	0.0048 U	0.0045 U
4-Methyl-2-Pentanone (MIBK)	mg/kg	NE	10,000	10,000	0.0575 U	0.0402 U	0.0463 U	0.0547 U	0.048 U	0.0447 U
Acetone	mg/kg	NE	10,000	10,000	0.0575 U	0.0402 U	0.0463 U	0.0547 U	0.048 U	0.0447 U
Benzene	mg/kg	4.3	200	10,000	0.0058 U	0.004 U	0.0046 U	0.0055 U	0.0048 U	0.0045 U
Bromobenzene	mg/kg	NE	NE	10,000	0.0058 U	0.004 U	0.0046 U	0.0055 U	0.0048 U	0.0045 U
Bromochloromethane	mg/kg	NE	NE	10,000	0.0058 U	0.004 U	0.0046 U	0.0055 U	0.0048 U	0.0045 U
Bromodichloromethane	mg/kg	NE	92	10,000	0.0058 U	0.004 U	0.0046 U	0.0055 U	0.0048 U	0.0045 U
Bromoform	mg/kg	NE	720	10,000	0.0058 U	0.004 U	0.0046 U	0.0055 U	0.0048 U	0.0045 U
Bromomethane	mg/kg	NE	2,900	10,000	0.0115 U	0.008 U	0.0093 U	0.0109 U	0.0096 U	0.0089 U
Carbon Disulfide	mg/kg	NE	NE	10,000	0.0058 U	0.004 U	0.0046 U	0.0055 U	0.0048 U	0.0045 U
Carbon Tetrachloride	mg/kg	5	44	10,000	0.0058 U	0.004 U	0.0046 U	0.0055 U	0.0048 U	0.0045 U
Chlorobenzene	mg/kg	100	10,000	10,000	0.0058 U	0.004 U	0.0046 U	0.0055 U	0.0048 U	0.0045 U
Chloroethane	mg/kg	NE	NE	10,000	0.0115 U	0.008 U	0.0093 U	0.0109 U	0.0096 U	0.0089 U
Chloroform	mg/kg	NE	940	10,000	0.0058 U	0.004 U	0.0046 U	0.0055 U	0.0048 U	0.0045 U
Chloromethane	mg/kg	NE	NE	10,000	0.0115 U	0.008 U	0.0093 U	0.0109 U	0.0096 U	0.0089 U
cis-1,2-Dichloroethene	mg/kg	6	10,000	10,000	0.0058 U	0.004 U	0.0046 U	0.0055 U	0.0048 U	0.0045 U
cis-1,3-Dichloropropene	mg/kg	NE	NE	10,000	0.0058 U	0.004 U	0.0046 U	0.0055 U	0.0048 U	0.0045 U
Dibromochloromethane	mg/kg	NE	NE	10,000	0.0058 U	0.004 U	0.0046 U	0.0055 U	0.0048 U	0.0045 U
Dibromomethane	mg/kg	NE	NE	10,000	0.0058 U	0.004 U	0.0046 U	0.0055 U	0.0048 U	0.0045 U
Dichlorodifluoromethane	mg/kg	NE	NE	10,000	0.0115 U	0.008 U	0.0093 U	0.0109 U	0.0096 U	0.0089 U
Diethylether	mg/kg	NE	NE	10,000	0.0058 U	0.004 U	0.0046 U	0.0055 U	0.0048 U	0.0045 U
Di-isopropyl ether	mg/kg	NE	NE	10,000	0.0058 U	0.004 U	0.0046 U	0.0055 U	0.0048 U	0.0045 U
Ethyl tertiary-butyl ether	mg/kg	NE	NE	10,000	0.0058 U	0.004 U	0.0046 U	0.0055 U	0.0048 U	0.0045 U
Ethylbenzene	mg/kg	62	10,000	10,000	0.0058 U	0.004 U	0.0046 U	0.0055 U	0.0048 U	0.0045 U
Hexachlorobutadiene	mg/kg	NE	73	10,000	0.0058 U	0.004 U	0.0046 U	0.0055 U	0.0048 U	0.0045 U

**Table 5A**  
**Summary of LDI Analytical**  
**VOCs - Subsurface Soil Test Pit Results**  
**Former Tidewater Facility**  
**Pawtucket, RI**

	Units	RIDEM GB Leachability Criteria	RIDEM Industrial/ Commercial DEC	RIDEM UCL	1709493-14 TP-508 (4-5') 09/18/2017	1709493-10 TP-509 (5-6') 09/18/2017	1709493-06 TP-510 (2-3') 09/18/2017	1709493-02 TP-511 (3-4') 09/18/2017	1709493-04 TP-512 (3-4') 09/18/2017	1709493-08 TP-524 (5-6') 09/18/2017
<b>VOLATILE ORGANICS</b>										
Isopropylbenzene	mg/kg	NE	10,000	10,000	0.0058 U	0.004 U	0.0046 U	0.0055 U	0.0048 U	0.0045 U
Methyl tert-butyl ether	mg/kg	100	10,000	10,000	0.0058 U	0.004 U	0.0046 U	0.0055 U	0.0048 U	0.0045 U
Methylene Chloride	mg/kg	NE	760	10,000	0.0288 U	0.0201 U	0.0231 U	0.0273 U	0.024 U	0.0224 U
Naphthalene	mg/kg	NE	10,000	10,000	0.0058 U	0.004 U	0.0046 U	0.0055 U	0.0048 U	0.0045 U
n-Butylbenzene	mg/kg	NE	NE	10,000	0.0058 U	0.004 U	0.0046 U	0.0055 U	0.0048 U	0.0045 U
n-Propylbenzene	mg/kg	NE	NE	10,000	0.0058 U	0.004 U	0.0046 U	0.0055 U	0.0048 U	0.0045 U
sec-Butylbenzene	mg/kg	NE	NE	10,000	0.0058 U	0.004 U	0.0046 U	0.0055 U	0.0048 U	0.0045 U
Styrene	mg/kg	64	190	10,000	0.0058 U	0.004 U	0.0046 U	0.0055 U	0.0048 U	0.0045 U
tert-Butylbenzene	mg/kg	NE	NE	10,000	0.0058 U	0.004 U	0.0046 U	0.0055 U	0.0048 U	0.0045 U
Tertiary-amyl methyl ether	mg/kg	NE	NE	10,000	0.0058 U	0.004 U	0.0046 U	0.0055 U	0.0048 U	0.0045 U
Tetrachloroethene	mg/kg	4.2	110	10,000	0.0058 U	0.004 U	0.0046 U	0.0055 U	0.0048 U	0.0045 U
Tetrahydrofuran	mg/kg	NE	NE	10,000	0.0058 U	0.004 U	0.0046 U	0.0055 U	0.0048 U	0.0045 U
Toluene	mg/kg	54	10,000	10,000	0.0058 U	0.004 U	0.0046 U	0.0055 U	0.0048 U	0.0045 U
trans-1,2-Dichloroethene	mg/kg	92	10,000	10,000	0.0058 U	0.004 U	0.0046 U	0.0055 U	0.0048 U	0.0045 U
trans-1,3-Dichloropropene	mg/kg	NE	NE	10,000	0.0058 U	0.004 U	0.0046 U	0.0055 U	0.0048 U	0.0045 U
Trichloroethene	mg/kg	20	520	10,000	0.0058 U	0.004 U	0.0046 U	0.0055 U	0.0048 U	0.0045 U
Trichlorofluoromethane	mg/kg	NE	NE	10,000	0.0058 U	0.004 U	0.0046 U	0.0055 U	0.0048 U	0.0045 U
Vinyl Acetate	mg/kg	NE	NE	10,000	0.0058 U	0.004 U	0.0046 U	0.0055 U	0.0048 U	0.0045 U
Vinyl Chloride	mg/kg	NE	3	10,000	0.0115 U	0.008 U	0.0093 U	0.0109 U	0.0096 U	0.0089 U
o-Xylene	mg/kg	NE	10,000	10,000	0.0058 U	0.004 U	0.0046 U	0.0055 U	0.0048 U	0.0045 U
m&p-Xylene	mg/kg	NE	10,000	10,000	0.0115 U	0.008 U	0.0093 U	0.0109 U	0.0096 U	0.0089 U
Total Xylenes	mg/kg	NE	10,000	10,000	0.0115 U	0.008 U	0.0093 U	0.0109 U	0.0096 U	0.0089 U

**Notes**

NE = Not Established

NA = Not Analyzed

NFA = North Fill Area

FGPA = Former Gas Plant Area

FPPA = Former Power Plant Area

SFA = South Fill Area

**Detected concentrations are bolded.**

**Gray shaded cells indicates the concentration exceeds the RIDEM Method 1**

**Industrial/Commercial \Direct Exposure Criteria (I/C DEC).**

Detection limits highlighted in *blue and in italics* exceed the RIDEM Method 1 Criteria.

Underlined concentrations exceed the RIDEM Method 1 GB Leachability Criteria.

**A concentration with a bold border exceeds the Upper Concentration Limit.**

Undetected analytes have a "U" qualifier.

Any analytes reported from a diluted run of the original analysis have a "D" qualifier.

Blank cells indicate a sample was not analyzed for that parameter

Table 5B  
Summary of LDI Analytical  
TPH, PAHs, and Metals - Subsurface Soil Test Pit Results  
Former Tidewater Facility  
Pawtucket, RI

	Units	RIDEM GB Leachability Criteria	RIDEM Industrial/ Commercial DEC	RIDEM UCL	1709470-02 GZ-TP-501 (3-5-4') 09/14/2017	1709470-04 GZ-TP-502 (4-5') 09/14/2017	1709470-06 GZ-TP-503 (5-6') 09/15/2017	1709470-08 GZ-TP-504 (4-5') 09/15/2017	1709470-10 GZ-TP-505 (4-5') 09/15/2017	1712473-02 GZ-TP-534 (2-3') 12/19/2017	1712473-12 GZ-TP-537 (2-3') 12/19/2017						
<b>TOTAL PETROLEUM HYDROCARBON</b>																	
Hydrocarbon Content	mg/kg	2,500	2,500	30,000	121	-	40.3	U	43.3	U	1080	D	195	D	NA	NA	
<b>METALS</b>																	
Antimony	mg/kg	NE	820	10,000	1.98	U, D	1.87	U, D	2.14	U, D	1.69	U, D	1.94	U, D	NA	NA	
Arsenic	mg/kg	NE	7	10,000	5.91	-	4.89	-	3.94	-	2.11	U	5.23	-	NA	NA	
Beryllium	mg/kg	NE	1.3	10,000	0.42	-	0.51	-	0.4	-	0.25	-	0.29	-	NA	NA	
Cadmium	mg/kg	NE	1,000	10,000	0.49	U	0.47	U	0.53	U	0.42	U	0.48	U	NA	NA	
Chromium	mg/kg	NE	10,000	10,000	7.23	-	6.08	-	1.86	-	4.63	-	7.76	-	NA	NA	
Copper	mg/kg	NE	10,000	10,000	101	-	29.4	-	83.6	-	8.68	-	14.6	-	NA	NA	
Lead	mg/kg	NE	500	10,000	87.5	-	36.3	-	35.4	-	21	-	24.2	-	NA	NA	
Nickel	mg/kg	NE	10,000	10,000	7.4	-	8.4	-	4.99	-	5.9	-	8.84	-	NA	NA	
Silver	mg/kg	NE	10,000	10,000	0.49	U	0.47	U	0.53	U	0.42	U	0.48	U	NA	NA	
Thallium	mg/kg	NE	140	10,000	1.98	U, D	1.87	U, D	2.14	U, D	1.69	U, D	1.94	U, D	NA	NA	
Zinc	mg/kg	NE	10,000	10,000	92.3	-	13.3	-	6.09	-	21.3	-	33.2	-	NA	NA	
Selenium	mg/kg	NE	10,000	10,000	1.98	U, D	1.87	U, D	2.14	U, D	1.69	U, D	1.94	U, D	NA	NA	
Mercury	mg/kg	NE	610	10,000	0.139	-	0.143	-	0.029	U	0.028	U	0.037	-	NA	NA	
<b>PAHs BY GCMS</b>																	
2-Methylnaphthalene	mg/kg	NE	10,000	10,000	0.366	U	0.365	U	0.378	U	1.35	U, D	0.324	U	NA	NA	
Acenaphthene	mg/kg	NE	10,000	10,000	0.366	U	0.365	U	0.378	U	1.35	U, D	0.324	U	NA	NA	
Acenaphthylene	mg/kg	NE	10,000	10,000	0.462	-	0.365	U	0.378	U	1.35	U, D	0.324	U	NA	NA	
Anthracene	mg/kg	NE	10,000	10,000	0.501	-	0.365	U	0.378	U	1.35	U, D	0.324	U	NA	NA	
Benzo [a] Anthracene	mg/kg	NE	7.8	10,000	0.879	-	0.365	U	0.378	U	2.01	D	0.952	-	NA	NA	
Benzo [a] Pyrene	mg/kg	NE	0.8	10,000	0.718	-	0.183	U	0.189	U	2	D	0.964	-	NA	NA	
Benzo [b] Fluoranthene	mg/kg	NE	7.8	10,000	0.923	-	0.365	U	0.378	U	2.22	D	1.23	-	NA	NA	
Benzo [g,h,i] Perylene	mg/kg	NE	10,000	10,000	0.442	-	0.365	U	0.378	U	1.06	D	0.553	-	NA	NA	
Benzo [k] Fluoranthene	mg/kg	NE	78	10,000	0.366	U	0.365	U	0.378	U	1.08	D	0.827	-	NA	NA	
Chrysene	mg/kg	NE	780	10,000	0.754	-	0.183	U	0.189	U	1.78	D	0.97	-	NA	NA	
Dibenzo [a,h] Anthracene	mg/kg	NE	0.8	10,000	0.185	-	0.183	U	0.189	U	0.439	D	0.278	-	NA	NA	
Fluoranthene	mg/kg	NE	10,000	10,000	1.94	-	0.367	-	0.378	U	3.57	D	1.99	-	NA	NA	
Fluorene	mg/kg	NE	10,000	10,000	0.366	U	0.365	U	0.378	U	1.35	U, D	0.324	U	NA	NA	
Indeno [1,2,3-cd] Pyrene	mg/kg	NE	7.8	10,000	0.414	-	0.365	U	0.378	U	0.884	D	0.459	-	NA	NA	
Naphthalene	mg/kg	NE	10,000	10,000	0.653	-	0.365	U	0.378	U	0.679	U, D	0.324	U	NA	NA	
Phenanthrene	mg/kg	NE	10,000	10,000	1.93	-	0.397	-	0.378	U	1.76	D	0.704	-	NA	NA	
Pyrene	mg/kg	NE	10,000	10,000	1.92	-	0.365	U	0.378	U	3.23	D	1.55	-	NA	NA	
<b>SUBCONTRACTED ANALYTES</b>																	
Total Cyanide	mg/kg	NE	10,000	10,000	1.07	U	1.01	U	1.1	U	0.96	U	1.02	U	1.03	U	6.75

**Notes**

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SFA = South Fill Area

Detected concentrations are bolded.

Gray shaded cells indicates the concentration exceeds the RIDEM Method 1

Industrial/Commercial \Direct Exposure Criteria (I/C DEC).

Detection limits highlighted in blue and in italics exceed the RIDEM Method 1 Criteria.

Underlined concentrations exceed the RIDEM Method 1 GB Leachability Criteria.

A concentration with a bold border exceeds the Upper Concentration Limit.

Undetected analytes have a "U" qualifier.

Any analytes reported from a diluted run of the original analysis have a "D" qualifier.

Blank cells indicate a sample was not analyzed for that parameter

Table 5B  
Summary of LDI Analytical  
TPH, PAHs, and Metals - Subsurface Soil Test Pit Results  
Former Tidewater Facility  
Pawtucket, RI

	Units	RIDEM GB Leachability Criteria	RIDEM Industrial/ Commercial DEC	RIDEM UCL	1712474-14 GZ-TP-539 (3_5-4') 12/19/2017	1712473-04 GZ-TP-548 (3-4') 12/19/2017	1709470-12 GZ-TP-506 (10-11') 09/15/2017	1709470-14 GZ-TP-507 (10-11') 09/15/2017	1709493-14 GZ-TP-508 (4-5') 09/18/2017	1709493-10 GZ-TP-509 (5-6') 09/18/2017	1709493-06 GZ-TP-510 (2-3') 09/18/2017	1709493-02 GZ-TP-511 (3-4') 09/18/2017
<b>TOTAL PETROLEUM HYDROCARBON</b>												
Hydrocarbon Content	mg/kg	2,500	2,500	30,000	NA	NA	<b>2370</b> D	47.3 U	<b>77.6</b> -	41.4 U	<b>1,640</b> D	40.6 U
<b>METALS</b>												
Antimony	mg/kg	NE	820	10,000	NA	NA	1.66 U, D	2.44 U, D	5.17 U	5.24 U	6.47 U	4.16 U
Arsenic	mg/kg	NE	7	10,000	NA	NA	<b>11</b> -	<b>5.5</b> -	<b>27.8</b> -	<b>3.99</b> -	<b>6.79</b> -	<b>6.75</b> -
Beryllium	mg/kg	NE	1.3	10,000	NA	NA	<b>0.28</b> -	<b>0.34</b> -	<b>0.23</b> -	<b>0.25</b> -	0.14 U	<b>0.37</b> -
Cadmium	mg/kg	NE	1,000	10,000	NA	NA	0.42 U	0.61 U	0.52 U	0.52 U	0.65 U	0.42 U
Chromium	mg/kg	NE	10,000	10,000	NA	NA	<b>27.4</b> -	<b>10.7</b> -	<b>6.38</b> -	<b>5.93</b> -	<b>2.14</b> -	<b>15.2</b> -
Copper	mg/kg	NE	10,000	10,000	NA	NA	<b>79.3</b> -	<b>21.7</b> -	<b>10.8</b> -	<b>16.5</b> -	<b>19.9</b> -	<b>26.3</b> -
Lead	mg/kg	NE	500	10,000	NA	NA	<b>32.3</b> -	<b>7.04</b> -	<b>23</b> -	<b>16.6</b> -	<b>45.7</b> -	<b>33.1</b> -
Nickel	mg/kg	NE	10,000	10,000	NA	NA	<b>12.2</b> -	<b>8.99</b> -	<b>6.03</b> -	<b>8.08</b> -	<b>6.41</b> -	<b>16.7</b> -
Silver	mg/kg	NE	10,000	10,000	NA	NA	0.42 U	0.61 U	0.52 U	0.52 U	6.47 U, D	0.42 U
Thallium	mg/kg	NE	140	10,000	NA	NA	1.66 U, D	2.44 U, D	5.17 U	5.24 U	0.65 U	4.16 U
Zinc	mg/kg	NE	10,000	10,000	NA	NA	<b>17.6</b> -	<b>22.1</b> -	<b>21.9</b> -	<b>28.5</b> -	6.47 U	<b>67.6</b> -
Selenium	mg/kg	NE	10,000	10,000	NA	NA	1.66 U, D	2.44 U, D	5.17 U, D	5.24 U, D	<b>35</b> -	4.16 U, D
Mercury	mg/kg	NE	610	10,000	NA	NA	<b>0.049</b> -	0.039 U	<b>0.103</b> -	0.033 U	<b>0.063</b> -	0.029 U
<b>PAHS BY GC/MS</b>												
2-Methylnaphthalene	mg/kg	NE	10,000	10,000	NA	NA	<b>0.397</b> -	0.424 U	0.386 U	0.375 U	<b>3.18</b> -	0.349 U
Acenaphthene	mg/kg	NE	10,000	10,000	NA	NA	0.357 U	0.424 U	0.386 U	0.375 U	<b>2.18</b> -	0.349 U
Acenaphthylene	mg/kg	NE	10,000	10,000	NA	NA	0.357 U	0.424 U	0.386 U	0.375 U	<b>1.05</b> -	0.349 U
Anthracene	mg/kg	NE	10,000	10,000	NA	NA	0.357 U	0.424 U	0.386 U	0.375 U	<b>7.21</b> -	0.349 U
Benzo [a] Anthracene	mg/kg	NE	7.8	10,000	NA	NA	0.357 U	0.424 U	<b>1.09</b> -	0.375 U	<b>25.2</b> D	0.349 U
Benzo [a] Pyrene	mg/kg	NE	0.8	10,000	NA	NA	0.179 U	0.213 U	<b>0.797</b> -	0.188 U	<b>19.6</b> D	0.175 U
Benzo [b] Fluoranthene	mg/kg	NE	7.8	10,000	NA	NA	0.357 U	0.424 U	<b>0.662</b> -	0.375 U	<b>19.1</b> D	0.349 U
Benzo [g,h,i] Perylene	mg/kg	NE	10,000	10,000	NA	NA	0.357 U	0.424 U	<b>0.488</b> -	0.375 U	<b>4.38</b> -	0.349 U
Benzo [k] Fluoranthene	mg/kg	NE	78	10,000	NA	NA	0.357 U	0.424 U	<b>0.657</b> -	0.375 U	<b>9.05</b> -	0.349 U
Chrysene	mg/kg	NE	780	10,000	NA	NA	0.179 U	0.213 U	<b>1.05</b> -	0.188 U	<b>24.5</b> D	0.175 U
Dibenzo [a,h] Anthracene	mg/kg	NE	0.8	10,000	NA	NA	0.179 U	0.213 U	<b>0.263</b> -	0.188 U	<b>3.01</b> -	0.175 U
Fluoranthene	mg/kg	NE	10,000	10,000	NA	NA	0.357 U	0.424 U	<b>2.2</b> -	0.375 U	<b>58</b> D	0.349 U
Fluorene	mg/kg	NE	10,000	10,000	NA	NA	0.357 U	0.424 U	0.386 U	0.375 U	<b>3</b> -	0.349 U
Indeno [1,2,3-cd] Pyrene	mg/kg	NE	7.8	10,000	NA	NA	0.357 U	0.424 U	<b>0.438</b> -	0.375 U	<b>4.63</b> -	0.349 U
Naphthalene	mg/kg	NE	10,000	10,000	NA	NA	0.357 U	0.424 U	0.386 U	0.375 U	<b>32.4</b> D	0.349 U
Phenanthrene	mg/kg	NE	10,000	10,000	NA	NA	<b>0.401</b> -	0.424 U	0.885 -	0.375 U	<b>42.1</b> D	0.349 U
Pyrene	mg/kg	NE	10,000	10,000	NA	NA	0.357 U	0.424 U	<b>1.93</b> -	0.375 U	<b>35.3</b> D	0.349 U
<b>SUBCONTRACTED ANALYTES</b>												
Total Cyanide	mg/kg	NE	10,000	10,000	<b>39.1</b> D	1.45 U	<b>2.11</b> -	<b>2.35</b> -	<b>2.71</b> -	1.1 U	<b>23.2</b> -	<b>6.27</b> -

**Notes**

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**Detected concentrations are bolded.**

Gray shaded cells indicates the concentration exceeds the RIDEM Method 1

Industrial/Commercial \Direct Exposure Criteria (I/C DEC).

Detection limits highlighted in *blue and in italics* exceed the RIDEM Method 1 Criteria.

Underlined concentrations exceed the RIDEM Method 1 GB Leachability Criteria.

A concentration with a bold border exceeds the Upper Concentration Limit.

Undetected analytes have a "U" qualifier.

Any analytes reported from a diluted run of the original analysis have a "D" qualifier.

Blank cells indicate a sample was not analyzed for that parameter



Table 5B  
Summary of LDI Analytical  
TPH, PAHs, and Metals - Subsurface Soil Test Pit Results  
Former Tidewater Facility  
Pawtucket, RI

	Units	RIDEM GB Leachability Criteria	RIDEM Industrial/ Commercial DEC	RIDEM UCL	1709493-04 GZ-TP-512 (3-4') 09/18/2017	1709493-08 GZ-TP-524 (5-6') 09/18/2017	1712473-16 GZ-TP-542 (2-3') 12/19/2017	1712473-14 GZ-TP-543 (2-3') 12/19/2017	1712473-18 GZ-TP-547 (2-3') 12/19/2017	1712618-01 GZ-TP-553 (3-4') 12/28/2017						
<b>TOTAL PETROLEUM HYDROCARBON</b>																
Hydrocarbon Content	mg/kg	2,500	2,500	30,000	162	-	40.3	U	NA	NA	NA	NA				
<b>METALS</b>																
Antimony	mg/kg	NE	820	10,000	4.19	U	5.45	U	NA	NA	NA	NA				
Arsenic	mg/kg	NE	7	10,000	3.42	-	4.29	-	NA	NA	NA	NA				
Beryllium	mg/kg	NE	1.3	10,000	0.26	-	0.54	-	NA	NA	NA	NA				
Cadmium	mg/kg	NE	1,000	10,000	0.42	U	0.55	U	NA	NA	NA	NA				
Chromium	mg/kg	NE	10,000	10,000	3.77	-	13.9	-	NA	NA	NA	NA				
Copper	mg/kg	NE	10,000	10,000	19.2	-	10.4	-	NA	NA	NA	NA				
Lead	mg/kg	NE	500	10,000	26.1	-	8.12	-	NA	NA	NA	NA				
Nickel	mg/kg	NE	10,000	10,000	7.13	-	8.27	-	NA	NA	NA	NA				
Silver	mg/kg	NE	10,000	10,000	0.42	U	0.55	U	NA	NA	NA	NA				
Thallium	mg/kg	NE	140	10,000	4.19	U	5.45	U	NA	NA	NA	NA				
Zinc	mg/kg	NE	10,000	10,000	8.93	-	30.1	-	NA	NA	NA	NA				
Selenium	mg/kg	NE	10,000	10,000	4.19	U, D	5.45	U, D	NA	NA	NA	NA				
Mercury	mg/kg	NE	610	10,000	0.088	-	0.032	U	NA	NA	NA	NA				
<b>PAHS BY GC/MS</b>																
2-Methylnaphthalene	mg/kg	NE	10,000	10,000	0.552	-	0.381	U	NA	NA	NA	NA				
Acenaphthene	mg/kg	NE	10,000	10,000	0.377	U	0.381	U	NA	NA	NA	NA				
Acenaphthylene	mg/kg	NE	10,000	10,000	0.377	U	0.381	U	NA	NA	NA	NA				
Anthracene	mg/kg	NE	10,000	10,000	0.377	U	0.381	U	NA	NA	NA	NA				
Benzo [a] Anthracene	mg/kg	NE	7.8	10,000	1.33	-	0.381	U	NA	NA	NA	NA				
Benzo [a] Pyrene	mg/kg	NE	0.8	10,000	1.88	-	0.202	-	NA	NA	NA	NA				
Benzo [b] Fluoranthene	mg/kg	NE	7.8	10,000	2.53	-	0.381	U	NA	NA	NA	NA				
Benzo [g,h,i] Perylene	mg/kg	NE	10,000	10,000	2.38	-	0.381	U	NA	NA	NA	NA				
Benzo [k] Fluoranthene	mg/kg	NE	78	10,000	0.778	-	0.381	U	NA	NA	NA	NA				
Chrysene	mg/kg	NE	780	10,000	1.65	-	0.259	-	NA	NA	NA	NA				
Dibenzo [a,h] Anthracene	mg/kg	NE	0.8	10,000	0.805	-	0.191	U	NA	NA	NA	NA				
Fluoranthene	mg/kg	NE	10,000	10,000	1.63	-	0.501	-	NA	NA	NA	NA				
Fluorene	mg/kg	NE	10,000	10,000	0.377	U	0.381	U	NA	NA	NA	NA				
Indeno [1,2,3-cd] Pyrene	mg/kg	NE	7.8	10,000	1.85	-	0.381	U	NA	NA	NA	NA				
Naphthalene	mg/kg	NE	10,000	10,000	1.9	-	0.381	U	NA	NA	NA	NA				
Phenanthrene	mg/kg	NE	10,000	10,000	1.11	-	0.381	U	NA	NA	NA	NA				
Pyrene	mg/kg	NE	10,000	10,000	1.76	-	0.386	-	NA	NA	NA	NA				
<b>SUBCONTRACTED ANALYTES</b>																
Total Cyanide	mg/kg	NE	10,000	10,000	18.4	-	1.04	U	0.99	U	9.17	-	123	D	353	-

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Table 6A  
Summary of LDI Analytical  
VOCs - Soil Boring Results  
Former Tidewater Facility  
Pawtucket, RI

	Units	RIDEM GB Leachability Criteria	RIDEM Industrial/ Commercial DEC	RIDEM UCL	1710601-01 GZ-BK-501 (2-4') 10/24/2017	1710683-01 GZ-BW-501 (0-2') 10/25/2017	1710285-01 GZ-BW-502 (0-2') 10/9/2017	1710285-03 GZ-BW-503 (2-4') 10/10/2017	1710285-02 GZ-BW-504A (0-2') 10/10/2017	1710285-04 GZ-BW-505 (0-2') 10/10/2017	1710285-06 GZ-BW-506 (0-2') 10/10/2017	1710790-02 GZ-BK-502 (0-2') 10/30/2017
<b>VOLATILE ORGANICS</b>												
1,1,1,2-Tetrachloroethane	mg/kg	NE	220	10,000	0.206 U	0.004 U	0.233 U	0.259 U	0.005 U	0.0054 U	0.0041 U	0.0052 U
1,1,1-Trichloroethane	mg/kg	160	10,000	10,000	0.206 U	0.004 U	0.233 U	0.259 U	0.005 U	0.0054 U	0.0041 U	0.0052 U
1,1,2,2-Tetrachloroethane	mg/kg	NE	29	10,000	0.206 U	0.004 U	0.233 U	0.259 U	0.005 U	0.0054 U	0.0041 U	0.0052 U
1,1,2-Trichloroethane	mg/kg	NE	100	10,000	0.206 U	0.004 U	0.233 U	0.259 U	0.005 U	0.0054 U	0.0041 U	0.0052 U
1,1-Dichloroethane	mg/kg	NE	10,000	10,000	0.206 U	0.004 U	0.233 U	0.259 U	0.005 U	0.0054 U	0.0041 U	0.0052 U
1,1-Dichloroethene	mg/kg	1	9.5	10,000	0.206 U	0.004 U	0.233 U	0.259 U	0.005 U	0.0054 U	0.0041 U	0.0052 U
1,1-Dichloropropene	mg/kg	NE	NE	10,000	0.206 U	0.004 U	0.233 U	0.259 U	0.005 U	0.0054 U	0.0041 U	0.0052 U
1,2,3-Trichlorobenzene	mg/kg	NE	NE	10,000	0.206 U	0.004 U	0.233 U	0.259 U	0.005 U	0.0054 U	0.0041 U	0.0052 U
1,2,3-Trichloropropane	mg/kg	NE	NE	10,000	0.206 U	0.004 U	0.233 U	0.259 U	0.005 U	0.0054 U	0.0041 U	0.0052 U
1,2,4-Trichlorobenzene	mg/kg	NE	10,000	10,000	0.206 U	0.004 U	0.233 U	0.259 U	0.005 U	0.0054 U	0.0041 U	0.0052 U
1,2,4-Trimethylbenzene	mg/kg	NE	NE	10,000	0.136 J	0.004 U	0.408 -	19 -	0.005 U	0.0054 U	0.0041 U	0.0052 U
1,2-Dibromo-3-Chloropropane	mg/kg	NE	NE	10,000	1.03 U	0.004 U	1.17 U	1.3 U	0.005 U	0.0054 U	0.0041 U	0.0052 U
1,2-Dibromoethane (EDB)	mg/kg	NE	0.07	10,000	0.206 U	0.004 U	0.233 U	0.259 U	0.005 U	0.0054 U	0.0041 U	0.0052 U
1,2-Dichlorobenzene	mg/kg	NE	10,000	10,000	0.206 U	0.004 U	0.233 U	0.259 U	0.005 U	0.0054 U	0.0041 U	0.0052 U
1,2-Dichloroethane	mg/kg	2.3	63	10,000	0.206 U	0.004 U	0.233 U	0.259 U	0.005 U	0.0054 U	0.0041 U	0.0052 U
1,2-Dichloropropane	mg/kg	70	84	10,000	0.206 U	0.004 U	0.233 U	0.259 U	0.005 U	0.0054 U	0.0041 U	0.0052 U
1,3,5-Trimethylbenzene	mg/kg	NE	NE	10,000	0.0536 J	0.004 U	0.154 J	6.47 -	0.005 U	0.0054 U	0.0041 U	0.0052 U
1,3-Dichlorobenzene	mg/kg	NE	10,000	10,000	0.206 U	0.004 U	0.233 U	0.259 U	0.005 U	0.0054 U	0.0041 U	0.0052 U
1,3-Dichloropropane	mg/kg	NE	NE	10,000	0.206 U	0.004 U	0.233 U	0.259 U	0.005 U	0.0054 U	0.0041 U	0.0052 U
1,4-Dichlorobenzene	mg/kg	NE	240	10,000	0.206 U	0.004 U	0.233 U	0.259 U	0.005 U	0.0054 U	0.0041 U	0.0052 U
1,4-Dioxane	mg/kg	NE	NE	10,000	41.2 U	0.0809 U	46.6 U	51.9 U	0.101 U	0.109 U	0.0826 U	0.104 U
1-Chlorohexane	mg/kg	NE	NE	10,000	0.206 U	0.004 U	0.233 U	0.259 U	0.005 U	0.0054 U	0.0041 U	0.0052 U
2,2-Dichloropropane	mg/kg	NE	NE	10,000	0.206 U	0.004 U	0.233 U	0.259 U	0.005 U	0.0054 U	0.0041 U	0.0052 U
2-Butanone (MEK)	mg/kg	NE	10,000	10,000	1.03 U	0.0405 U	1.17 U	1.3 U	0.0505 U	0.0543 U	0.0413 U	0.0519 U
2-Chlorotoluene	mg/kg	NE	NE	10,000	0.206 U	0.004 U	0.233 U	0.259 U	0.005 U	0.0054 U	0.0041 U	0.0052 U
2-Hexanone	mg/kg	NE	NE	10,000	1.03 U	0.0405 U	1.17 U	1.3 U	0.0505 U	0.0543 U	0.0413 U	0.0519 U
4-Chlorotoluene	mg/kg	NE	NE	10,000	0.206 U	0.004 U	0.233 U	0.259 U	0.005 U	0.0054 U	0.0041 U	0.0052 U
4-Isopropyltoluene	mg/kg	NE	NE	10,000	0.206 U	0.004 U	0.233 U	0.14 J	0.005 U	0.0054 U	0.0041 U	0.0052 U
4-Methyl-2-Pentanone (MIBK)	mg/kg	NE	10,000	10,000	1.03 U	0.0405 U	1.17 U	1.3 U	0.0505 U	0.0543 U	0.0413 U	0.0519 U
Acetone	mg/kg	NE	10,000	10,000	1.03 U	0.0405 U	1.17 U	1.3 U	0.0505 U	0.0543 U	0.0413 U	0.0519 U
Benzene	mg/kg	4.3	200	10,000	0.272 -	0.004 U	0.203 J	34 D	0.005 U	0.0054 U	0.0041 U	0.0052 U
Bromobenzene	mg/kg	NE	NE	10,000	0.206 U	0.004 U	0.233 U	0.259 U	0.005 U	0.0054 U	0.0041 U	0.0052 U
Bromochloromethane	mg/kg	NE	NE	10,000	0.206 U	0.004 U	0.233 U	0.259 U	0.005 U	0.0054 U	0.0041 U	0.0052 U
Bromodichloromethane	mg/kg	NE	92	10,000	0.206 U	0.004 U	0.233 U	0.259 U	0.005 U	0.0054 U	0.0041 U	0.0052 U
Bromoform	mg/kg	NE	720	10,000	0.206 U	0.004 U	0.233 U	0.259 U	0.005 U	0.0054 U	0.0041 U	0.0052 U
Bromomethane	mg/kg	NE	2,900	10,000	0.206 U	0.0081 U	0.233 U	0.259 U	0.0101 U	0.0109 U	0.0083 U	0.0104 U
Carbon Disulfide	mg/kg	NE	NE	10,000	0.206 U	0.004 U	0.233 U	0.259 U	0.005 U	0.0054 U	0.0041 U	0.0052 U
Carbon Tetrachloride	mg/kg	5	44	10,000	0.206 U	0.004 U	0.233 U	0.259 U	0.005 U	0.0054 U	0.0041 U	0.0052 U
Chlorobenzene	mg/kg	100	10,000	10,000	0.206 U	0.004 U	0.233 U	0.259 U	0.005 U	0.0054 U	0.0041 U	0.0052 U
Chloroethane	mg/kg	NE	NE	10,000	0.206 U	0.0081 U	0.233 U	0.259 U	0.0101 U	0.0109 U	0.0083 U	0.0104 U
Chloroform	mg/kg	NE	940	10,000	0.206 U	0.004 U	0.233 U	0.259 U	0.005 U	0.0054 U	0.0041 U	0.0052 U
Chloromethane	mg/kg	NE	NE	10,000	0.206 U	0.0081 U	0.233 U	0.259 U	0.0101 U	0.0109 U	0.0083 U	0.0104 U
cis-1,2-Dichloroethene	mg/kg	6	10,000	10,000	0.206 U	0.004 U	0.233 U	0.259 U	0.005 U	0.0054 U	0.0041 U	0.0052 U
cis-1,3-Dichloropropene	mg/kg	NE	NE	10,000	0.206 U	0.004 U	0.233 U	0.259 U	0.005 U	0.0054 U	0.0041 U	0.0052 U
Dibromochloromethane	mg/kg	NE	NE	10,000	0.206 U	0.004 U	0.233 U	0.259 U	0.005 U	0.0054 U	0.0041 U	0.0052 U
Dibromomethane	mg/kg	NE	NE	10,000	0.206 U	0.004 U	0.233 U	0.259 U	0.005 U	0.0054 U	0.0041 U	0.0052 U
Dichlorodifluoromethane	mg/kg	NE	NE	10,000	0.206 U	0.0081 U	0.233 U	0.259 U	0.0101 U	0.0109 U	0.0083 U	0.0104 U
Diethylether	mg/kg	NE	NE	10,000	0.206 U	0.004 U	0.233 U	0.259 U	0.005 U	0.0054 U	0.0041 U	0.0052 U
Di-isopropyl ether	mg/kg	NE	NE	10,000	0.206 U	0.004 U	0.233 U	0.259 U	0.005 U	0.0054 U	0.0041 U	0.0052 U
Ethyl tertiary-butyl ether	mg/kg	NE	NE	10,000	0.206 U	0.004 U	0.233 U	0.259 U	0.005 U	0.0054 U	0.0041 U	0.0052 U
Ethylbenzene	mg/kg	62	10,000	10,000	0.0309 J	0.004 U	0.0885 J	2.58 -	0.005 U	0.0054 U	0.0041 U	0.0052 U
Hexachlorobutadiene	mg/kg	NE	73	10,000	0.206 U	0.004 U	0.233 U	0.259 U	0.005 U	0.0054 U	0.0041 U	0.0052 U
Isopropylbenzene	mg/kg	NE	10,000	10,000	0.206 U	0.004 U	0.233 U	0.14 J	0.005 U	0.0054 U	0.0041 U	0.0052 U
Methyl tert-butyl ether	mg/kg	100	10,000	10,000	0.206 U	0.004 U	0.233 U	0.259 U	0.005 U	0.0054 U	0.0041 U	0.0052 U
Methylene Chloride	mg/kg	NE	760	10,000	0.412 U	0.0202 U	0.466 U	0.519 U	0.0252 U	0.0272 U	0.0207 U	0.0259 U
Naphthalene	mg/kg	NE	10,000	10,000	9.73 -	0.0096 -	42.1 D	2080 D	0.005 U	0.0054 U	0.0041 U	0.0052 U

Table 6A  
Summary of LDI Analytical  
VOCs - Soil Boring Results  
Former Tidewater Facility  
Pawtucket, RI

	Units	RIDEM GB Leachability Criteria	RIDEM Industrial/ Commercial DEC	RIDEM UCL	1710601-01		1710683-01		1710285-01		1710285-03		1710285-02		1710285-04		1710285-06		1710790-02	
					GZ-BK-501 (2-4') 10/24/2017		GZ-BW-501 (0-2') 10/25/2017		GZ-BW-502 (0-2') 10/9/2017		GZ-BW-503 (2-4') 10/10/2017		GZ-BW-504A (0-2') 10/10/2017		GZ-BW-505 (0-2') 10/10/2017		GZ-BW-506 (0-2') 10/10/2017		GZ-BK-502 (0-2') 10/30/2017	
n-Butylbenzene	mg/kg	NE	NE	10,000	0.206	U	0.004	U	0.233	U	0.259	U	0.005	U	0.0054	U	0.0041	U	0.0052	U
n-Propylbenzene	mg/kg	NE	NE	10,000	0.206	U	0.004	U	0.233	U	<b>0.521</b>	-	0.005	U	0.0054	U	0.0041	U	0.0052	U
sec-Butylbenzene	mg/kg	NE	NE	10,000	0.206	U	0.004	U	0.233	U	<b>0.0726</b>	J	0.005	U	0.0054	U	0.0041	U	0.0052	U
Styrene	mg/kg	64	190	10,000	<b>0.0865</b>	J	0.004	U	<b>0.664</b>	-	<b>18</b>	-	0.005	U	0.0054	U	0.0041	U	0.0052	U
tert-Butylbenzene	mg/kg	NE	NE	10,000	0.206	U	0.004	U	0.233	U	0.259	U	0.005	U	0.0054	U	0.0041	U	0.0052	U
Tertiary-amyl methyl ether	mg/kg	NE	NE	10,000	0.206	U	0.004	U	0.233	U	0.259	U	0.005	U	0.0054	U	0.0041	U	0.0052	U
Tetrachloroethene	mg/kg	4.2	110	10,000	0.206	U	0.004	U	0.233	U	0.259	U	0.005	U	0.0054	U	0.0041	U	0.0052	U
Tetrahydrofuran	mg/kg	NE	NE	10,000	1.03	U	0.004	U	1.17	U	1.3	U	0.005	U	0.0054	U	0.0041	U	0.0052	U
Toluene	mg/kg	54	10,000	10,000	<b>0.41</b>	-	0.004	U	<b>0.515</b>	-	<b>41.5</b>	D	0.005	U	0.0054	U	0.0041	U	0.0052	U
trans-1,2-Dichloroethene	mg/kg	92	10,000	10,000	0.206	U	0.004	U	0.233	U	0.259	U	0.005	U	0.0054	U	0.0041	U	0.0052	U
trans-1,3-Dichloropropene	mg/kg	NE	NE	10,000	0.206	U	0.004	U	0.233	U	0.259	U	0.005	U	0.0054	U	0.0041	U	0.0052	U
Trichloroethene	mg/kg	20	520	10,000	0.206	U	0.004	U	0.233	U	0.259	U	0.005	U	0.0054	U	0.0041	U	0.0052	U
Trichlorofluoromethane	mg/kg	NE	NE	10,000	0.206	U	0.004	U	0.233	U	0.259	U	0.005	U	0.0054	U	0.0041	U	0.0052	U
Vinyl Acetate	mg/kg	NE	NE	10,000	0.206	U	0.004	U	0.233	U	0.259	U	0.005	U	0.0054	U	0.0041	U	0.0052	U
Vinyl Chloride	mg/kg	NE	3	10,000	0.206	U	0.0081	U	0.233	U	0.259	U	0.0101	U	0.0109	U	0.0083	U	0.0104	U
o-Xylene	mg/kg	NE	10,000	10,000	<b>0.138</b>	J	0.004	U	<b>0.24</b>	-	<b>15.6</b>	-	0.005	U	0.0054	U	0.0041	U	0.0052	U
m&p-Xylene	mg/kg	NE	10,000	10,000	<b>0.29</b>	J	0.0081	U	<b>0.552</b>	-	<b>33.4</b>	-	0.0101	U	0.0109	U	0.0083	U	0.0104	U
Total Xylenes	mg/kg	NE	10,000	10,000	<b>0.429</b>	D	0.0081	U	<b>0.792</b>	D	<b>49</b>	D	0.0101	U	0.0109	U	0.0083	U	0.0104	U

Notes

NE = Not Established

NA = Not Analyzed

NFA = North Fill Area

FGPA = Former Gas Plant Area

FPPA = Former Power Plant Area

SFA = South Fill Area

Detected concentrations are bolded.

Gray shaded cells indicates the concentration exceeds the RIDEM Method 1

Industrial/Commercial \Direct Exposure Criteria (I/C DEC).

Detection limits highlighted in *blue and in italics* exceed the RIDEM Method 1 Criteria.

Underlined concentrations exceed the RIDEM Method 1 GB Leachability Criteria.

**A concentration with a bold border exceeds the Upper Concentration Limit.**

Undetected analytes have a "U" qualifier.

Any analytes reported from a diluted run of the original analysis have a "D" qualifier.

Blank cells indicate a sample was not analyzed for that parameter

Table 6A  
Summary of LDI Analytical  
VOCs - Soil Boring Results  
Former Tidewater Facility  
Pawtucket, RI

	Units	RIDEM GB Leachability Criteria	RIDEM Industrial/ Commercial DEC	RIDEM UCL	1710285-07 GZ-BW-507 (2-4') 10/11/2017	1710517-01 GZ-BW-508 (0-2') 10/18/2017	1710350-01 GZ-BW-509 (2-4') 10/11/2017	1710790-01 GZ-BW-510 (0-2') 10/30/2017	1710517-02 GZ-BW-511 (2-4') 10/19/2017	1710518-01 GZ-SB-514 (3-4') 10/18/2017	1710571-01 GZ-SB-514 (10-11') 10/20/2017	1710518-02 GZ-SB-515 (0-2') 10/18/2017
<b>VOLATILE ORGANICS</b>												
1,1,1,2-Tetrachloroethane	mg/kg	NE	220	10,000	0.0056 U	0.0019 U	0.0043 U	0.0034 U	0.0045 U	0.0072 U	0.0055 U	0.0042 U
1,1,1-Trichloroethane	mg/kg	160	10,000	10,000	0.0056 U	0.0019 U	0.0043 U	0.0034 U	0.0045 U	0.0072 U	0.0055 U	0.0042 U
1,1,2,2-Tetrachloroethane	mg/kg	NE	29	10,000	0.0056 U	0.0019 U	0.0043 U	0.0034 U	0.0045 U	0.0072 U	0.0055 U	0.0042 U
1,1,2-Trichloroethane	mg/kg	NE	100	10,000	0.0056 U	0.0019 U	0.0043 U	0.0034 U	0.0045 U	0.0072 U	0.0055 U	0.0042 U
1,1-Dichloroethane	mg/kg	NE	10,000	10,000	0.0056 U	0.0019 U	0.0043 U	0.0034 U	0.0045 U	0.0072 U	0.0055 U	0.0042 U
1,1-Dichloroethene	mg/kg	1	9.5	10,000	0.0056 U	0.0019 U	0.0043 U	0.0034 U	0.0045 U	0.0072 U	0.0055 U	0.0042 U
1,1-Dichloropropene	mg/kg	NE	NE	10,000	0.0056 U	0.0019 U	0.0043 U	0.0034 U	0.0045 U	0.0072 U	0.0055 U	0.0042 U
1,2,3-Trichlorobenzene	mg/kg	NE	NE	10,000	0.0056 U	0.0019 U	0.0043 U	0.0034 U	0.0045 U	0.0072 U	0.0055 U	0.0042 U
1,2,3-Trichloropropane	mg/kg	NE	NE	10,000	0.0056 U	0.0019 U	0.0043 U	0.0034 U	0.0045 U	0.0072 U	0.0055 U	0.0042 U
1,2,4-Trichlorobenzene	mg/kg	NE	10,000	10,000	0.0056 U	0.0019 U	0.0043 U	0.0034 U	0.0045 U	0.0072 U	0.0055 U	0.0042 U
1,2,4-Trimethylbenzene	mg/kg	NE	NE	10,000	0.0056 U	0.0019 U	0.0043 U	0.0034 U	0.0045 U	0.0072 U	0.0055 U	0.0042 U
1,2-Dibromo-3-Chloropropane	mg/kg	NE	NE	10,000	0.0056 U	0.0019 U	0.0043 U	0.0034 U	0.0045 U	0.0072 U	0.0055 U	0.0042 U
1,2-Dibromoethane (EDB)	mg/kg	NE	0.07	10,000	0.0056 U	0.0019 U	0.0043 U	0.0034 U	0.0045 U	0.0072 U	0.0055 U	0.0042 U
1,2-Dichlorobenzene	mg/kg	NE	10,000	10,000	0.0056 U	0.0019 U	0.0043 U	0.0034 U	0.0045 U	0.0072 U	0.0055 U	0.0042 U
1,2-Dichloroethane	mg/kg	2.3	63	10,000	0.0056 U	0.0019 U	0.0043 U	0.0034 U	0.0045 U	0.0072 U	0.0055 U	0.0042 U
1,2-Dichloropropane	mg/kg	70	84	10,000	0.0056 U	0.0019 U	0.0043 U	0.0034 U	0.0045 U	0.0072 U	0.0055 U	0.0042 U
1,3,5-Trimethylbenzene	mg/kg	NE	NE	10,000	0.0056 U	0.0019 U	0.0043 U	0.0034 U	0.0045 U	0.0072 U	0.0055 U	0.0042 U
1,3-Dichlorobenzene	mg/kg	NE	10,000	10,000	0.0056 U	0.0019 U	0.0043 U	0.0034 U	0.0045 U	0.0072 U	0.0055 U	0.0042 U
1,3-Dichloropropane	mg/kg	NE	NE	10,000	0.0056 U	0.0019 U	0.0043 U	0.0034 U	0.0045 U	0.0072 U	0.0055 U	0.0042 U
1,4-Dichlorobenzene	mg/kg	NE	240	10,000	0.0056 U	0.0019 U	0.0043 U	0.0034 U	0.0045 U	0.0072 U	0.0055 U	0.0042 U
1,4-Dioxane	mg/kg	NE	NE	10,000	0.113 U	0.0387 U	0.087 U	0.0675 U	0.0894 U	0.143 U	0.109 U	0.0849 U
1-Chlorohexane	mg/kg	NE	NE	10,000	0.0056 U	0.0019 U	0.0043 U	0.0034 U	0.0045 U	0.0072 U	0.0055 U	0.0042 U
2,2-Dichloropropane	mg/kg	NE	NE	10,000	0.0056 U	0.0019 U	0.0043 U	0.0034 U	0.0045 U	0.0072 U	0.0055 U	0.0042 U
2-Butanone (MEK)	mg/kg	NE	10,000	10,000	0.0563 U	0.0193 U	0.0435 U	0.0337 U	0.0447 U	0.0717 U	0.0547 U	0.0424 U
2-Chlorotoluene	mg/kg	NE	NE	10,000	0.0056 U	0.0019 U	0.0043 U	0.0034 U	0.0045 U	0.0072 U	0.0055 U	0.0042 U
2-Hexanone	mg/kg	NE	NE	10,000	0.0563 U	0.0193 U	0.0435 U	0.0337 U	0.0447 U	0.0717 U	0.0547 U	0.0424 U
4-Chlorotoluene	mg/kg	NE	NE	10,000	0.0056 U	0.0019 U	0.0043 U	0.0034 U	0.0045 U	0.0072 U	0.0055 U	0.0042 U
4-Isopropyltoluene	mg/kg	NE	NE	10,000	0.0056 U	0.0019 U	0.0043 U	0.0034 U	0.0045 U	0.0072 U	0.0055 U	0.0042 U
4-Methyl-2-Pentanone (MIBK)	mg/kg	NE	10,000	10,000	0.0563 U	0.0193 U	0.0435 U	0.0337 U	0.0447 U	0.0717 U	0.0547 U	0.0424 U
Acetone	mg/kg	NE	10,000	10,000	0.0563 U	0.0229 -	0.0435 U	0.0337 U	0.0447 U	0.0717 U	0.0649 -	0.0424 U
Benzene	mg/kg	4.3	200	10,000	0.0056 U	0.0019 U	0.0043 U	0.0034 U	0.0045 U	0.0072 U	0.0055 U	0.0042 U
Bromobenzene	mg/kg	NE	NE	10,000	0.0056 U	0.0019 U	0.0043 U	0.0034 U	0.0045 U	0.0072 U	0.0055 U	0.0042 U
Bromochloromethane	mg/kg	NE	NE	10,000	0.0056 U	0.0019 U	0.0043 U	0.0034 U	0.0045 U	0.0072 U	0.0055 U	0.0042 U
Bromodichloromethane	mg/kg	NE	92	10,000	0.0056 U	0.0019 U	0.0043 U	0.0034 U	0.0045 U	0.0072 U	0.0055 U	0.0042 U
Bromoform	mg/kg	NE	720	10,000	0.0056 U	0.0019 U	0.0043 U	0.0034 U	0.0045 U	0.0072 U	0.0055 U	0.0042 U
Bromomethane	mg/kg	NE	2,900	10,000	0.0113 U	0.0039 U	0.0087 U	0.0067 U	0.0089 U	0.0143 U	0.0109 U	0.0085 U
Carbon Disulfide	mg/kg	NE	NE	10,000	0.0056 U	0.0019 U	0.0043 U	0.0034 U	0.0045 U	0.0072 U	0.0055 U	0.0042 U
Carbon Tetrachloride	mg/kg	5	44	10,000	0.0056 U	0.0019 U	0.0043 U	0.0034 U	0.0045 U	0.0072 U	0.0055 U	0.0042 U
Chlorobenzene	mg/kg	100	10,000	10,000	0.0056 U	0.0019 U	0.0043 U	0.0034 U	0.0045 U	0.0072 U	0.0055 U	0.0042 U
Chloroethane	mg/kg	NE	NE	10,000	0.0113 U	0.0039 U	0.0087 U	0.0067 U	0.0089 U	0.0143 U	0.0109 U	0.0085 U
Chloroform	mg/kg	NE	940	10,000	0.0056 U	0.0019 U	0.0043 U	0.0034 U	0.0045 U	0.0072 U	0.0055 U	0.0042 U
Chloromethane	mg/kg	NE	NE	10,000	0.0113 U	0.0039 U	0.0087 U	0.0067 U	0.0089 U	0.0143 U	0.0109 U	0.0085 U
cis-1,2-Dichloroethene	mg/kg	6	10,000	10,000	0.0056 U	0.0019 U	0.0043 U	0.0034 U	0.0045 U	0.0072 U	0.0055 U	0.0042 U
cis-1,3-Dichloropropene	mg/kg	NE	NE	10,000	0.0056 U	0.0019 U	0.0043 U	0.0034 U	0.0045 U	0.0072 U	0.0055 U	0.0042 U
Dibromochloromethane	mg/kg	NE	NE	10,000	0.0056 U	0.0019 U	0.0043 U	0.0034 U	0.0045 U	0.0072 U	0.0055 U	0.0042 U
Dibromomethane	mg/kg	NE	NE	10,000	0.0056 U	0.0019 U	0.0043 U	0.0034 U	0.0045 U	0.0072 U	0.0055 U	0.0042 U
Dichlorodifluoromethane	mg/kg	NE	NE	10,000	0.0113 U	0.0039 U	0.0087 U	0.0067 U	0.0089 U	0.0143 U	0.0109 U	0.0085 U
Diethylether	mg/kg	NE	NE	10,000	0.0056 U	0.0019 U	0.0043 U	0.0034 U	0.0045 U	0.0072 U	0.0055 U	0.0042 U
Di-isopropyl ether	mg/kg	NE	NE	10,000	0.0056 U	0.0019 U	0.0043 U	0.0034 U	0.0045 U	0.0072 U	0.0055 U	0.0042 U
Ethyl tertiary-butyl ether	mg/kg	NE	NE	10,000	0.0056 U	0.0019 U	0.0043 U	0.0034 U	0.0045 U	0.0072 U	0.0055 U	0.0042 U
Ethylbenzene	mg/kg	62	10,000	10,000	0.0056 U	0.0019 U	0.0043 U	0.0034 U	0.0045 U	0.0072 U	0.0055 U	0.0042 U
Hexachlorobutadiene	mg/kg	NE	73	10,000	0.0056 U	0.0019 U	0.0043 U	0.0034 U	0.0045 U	0.0072 U	0.0055 U	0.0042 U
Isopropylbenzene	mg/kg	NE	10,000	10,000	0.0056 U	0.0019 U	0.0043 U	0.0034 U	0.0045 U	0.0072 U	0.0055 U	0.0042 U
Methyl tert-butyl ether	mg/kg	100	10,000	10,000	0.0056 U	0.0019 U	0.0043 U	0.0034 U	0.0045 U	0.0072 U	0.0055 U	0.0042 U
Methylene Chloride	mg/kg	NE	760	10,000	0.0282 U	0.0097 U	0.0217 U	0.0169 U	0.0224 U	0.0359 U	0.0273 U	0.0212 U
Naphthalene	mg/kg	NE	10,000	10,000	0.0056 U	0.0019 U	0.0048 -	0.0034 U	0.0045 U	0.0072 U	0.0055 U	0.0042 U

**Table 6A**  
**Summary of LDI Analytical**  
**VOCs - Soil Boring Results**  
**Former Tidewater Facility**  
**Pawtucket, RI**

	Units	RIDEM GB Leachability Criteria	RIDEM Industrial/ Commercial DEC	RIDEM UCL	1710285-07		1710517-01		1710350-01		1710790-01		1710517-02		1710518-01		1710571-01		1710518-02	
					GZ-BW-507 (2-4') 10/11/2017		GZ-BW-508 (0-2') 10/18/2017		GZ-BW-509 (2-4') 10/11/2017		GZ-BW-510 (0-2') 10/30/2017		GZ-BW-511 (2-4') 10/19/2017		GZ-SB-514 (3-4') 10/18/2017		GZ-SB-514 (10-11') 10/20/2017		GZ-SB-515 (0-2') 10/18/2017	
n-Butylbenzene	mg/kg	NE	NE	10,000	0.0056	U	0.0019	U	0.0043	U	0.0034	U	0.0045	U	0.0072	U	0.0055	U	0.0042	U
n-Propylbenzene	mg/kg	NE	NE	10,000	0.0056	U	0.0019	U	0.0043	U	0.0034	U	0.0045	U	0.0072	U	0.0055	U	0.0042	U
sec-Butylbenzene	mg/kg	NE	NE	10,000	0.0056	U	0.0019	U	0.0043	U	0.0034	U	0.0045	U	0.0072	U	0.0055	U	0.0042	U
Styrene	mg/kg	64	190	10,000	0.0056	U	0.0019	U	0.0043	U	0.0034	U	0.0045	U	0.0072	U	0.0055	U	0.0042	U
tert-Butylbenzene	mg/kg	NE	NE	10,000	0.0056	U	0.0019	U	0.0043	U	0.0034	U	0.0045	U	0.0072	U	0.0055	U	0.0042	U
Tertiary-amyl methyl ether	mg/kg	NE	NE	10,000	0.0056	U	0.0019	U	0.0043	U	0.0034	U	0.0045	U	0.0072	U	0.0055	U	0.0042	U
Tetrachloroethene	mg/kg	4.2	110	10,000	0.0056	U	0.0019	U	0.0043	U	0.0034	U	0.0045	U	0.0072	U	0.0055	U	0.0042	U
Tetrahydrofuran	mg/kg	NE	NE	10,000	0.0056	U	0.0019	U	0.0043	U	0.0034	U	0.0045	U	0.0072	U	0.0055	U	0.0042	U
Toluene	mg/kg	54	10,000	10,000	0.0056	U	0.0019	U	0.0043	U	0.0034	U	0.0045	U	0.0072	U	0.0055	U	0.0042	U
trans-1,2-Dichloroethene	mg/kg	92	10,000	10,000	0.0056	U	0.0019	U	0.0043	U	0.0034	U	0.0045	U	0.0072	U	0.0055	U	0.0042	U
trans-1,3-Dichloropropene	mg/kg	NE	NE	10,000	0.0056	U	0.0019	U	0.0043	U	0.0034	U	0.0045	U	0.0072	U	0.0055	U	0.0042	U
Trichloroethene	mg/kg	20	520	10,000	0.0056	U	0.0019	U	0.0043	U	0.0034	U	0.0045	U	0.0072	U	0.0055	U	0.0042	U
Trichlorofluoromethane	mg/kg	NE	NE	10,000	0.0056	U	0.0019	U	0.0043	U	0.0034	U	0.0045	U	0.0072	U	0.0055	U	0.0042	U
Vinyl Acetate	mg/kg	NE	NE	10,000	0.0056	U	0.0019	U	0.0043	U	0.0034	U	0.0045	U	0.0072	U	0.0055	U	0.0042	U
Vinyl Chloride	mg/kg	NE	3	10,000	0.0113	U	0.0039	U	0.0087	U	0.0067	U	0.0089	U	0.0143	U	0.0109	U	0.0085	U
o-Xylene	mg/kg	NE	10,000	10,000	0.0056	U	0.0019	U	0.0043	U	0.0034	U	0.0045	U	0.0072	U	0.0055	U	0.0042	U
m&p-Xylene	mg/kg	NE	10,000	10,000	0.0113	U	0.0039	U	0.0087	U	0.0067	U	0.0089	U	0.0143	U	0.0109	U	0.0085	U
Total Xylenes	mg/kg	NE	10,000	10,000	0.0113	U	0.461	U,D	0.0087	U	0.0067	U	0.0089	U	0.0143	U	0.0109	U	0.0085	U

**Notes**

NE = Not Established

NA = Not Analyzed

NFA = North Fill Area

FGPA = Former Gas Plant Area

FPPA = Former Power Plant Area

SFA = South Fill Area

**Detected concentrations are bolded.**

**Gray shaded cells indicates the concentration exceeds the RIDEM Method 1 Industrial/Commercial \Direct Exposure Criteria (I/C DEC).**

Detection limits highlighted in *blue and in italics* exceed the RIDEM Method 1 Criteria.

Underlined concentrations exceed the RIDEM Method 1 GB Leachability Criteria.

**A concentration with a bold border exceeds the Upper Concentration Limit.**

Undetected analytes have a "U" qualifier.

Any analytes reported from a diluted run of the original analysis have a "D" qualifier.

Blank cells indicate a sample was not analyzed for that parameter

Table 6A  
Summary of LDI Analytical  
VOCs - Soil Boring Results  
Former Tidewater Facility  
Pawtucket, RI

	Units	RIDEM GB Leachability Criteria	RIDEM Industrial/ Commercial DEC	RIDEM UCL	1710571-02 GZ-SB-515 (8-9') 10/20/2017	1710793-01 GZ-SB-516 (0-2') 10/30/2017	1710793-02 GZ-SB-516 (3-4') 10/30/2017	1710793-03 GZ-SB-517 (2-4') 10/30/2017	1710793-04 GZ-SB-517 (4-6') 10/30/2017	1710573-02 GZ-BW-512 (2-4') 10/20/2017	1710573-01 GZ-BW-513 (0-2') 10/19/2017
<b>VOLATILE ORGANICS</b>											
1,1,1,2-Tetrachloroethane	mg/kg	NE	220	10,000	0.0061 U	0.004 U	0.0078 U	0.0045 U	0.0069 U	0.0039 U	0.0074 U
1,1,1-Trichloroethane	mg/kg	160	10,000	10,000	0.0061 U	0.004 U	0.0078 U	0.0045 U	0.0069 U	0.0039 U	0.0074 U
1,1,2,2-Tetrachloroethane	mg/kg	NE	29	10,000	0.0061 U	0.004 U	0.0078 U	0.0045 U	0.0069 U	0.0039 U	0.0074 U
1,1,2-Trichloroethane	mg/kg	NE	100	10,000	0.0061 U	0.004 U	0.0078 U	0.0045 U	0.0069 U	0.0039 U	0.0074 U
1,1-Dichloroethane	mg/kg	NE	10,000	10,000	0.0061 U	0.004 U	0.0078 U	0.0045 U	0.0069 U	0.0039 U	0.0074 U
1,1-Dichloroethene	mg/kg	1	9.5	10,000	0.0061 U	0.004 U	0.0078 U	0.0045 U	0.0069 U	0.0039 U	0.0074 U
1,1-Dichloropropene	mg/kg	NE	NE	10,000	0.0061 U	0.004 U	0.0078 U	0.0045 U	0.0069 U	0.0039 U	0.0074 U
1,2,3-Trichlorobenzene	mg/kg	NE	NE	10,000	0.0061 U	0.004 U	0.0078 U	0.0045 U	0.0069 U	0.0039 U	0.0074 U
1,2,3-Trichloropropane	mg/kg	NE	NE	10,000	0.0061 U	0.004 U	0.0078 U	0.0045 U	0.0069 U	0.0039 U	0.0074 U
1,2,4-Trichlorobenzene	mg/kg	NE	10,000	10,000	0.0061 U	0.004 U	0.0078 U	0.0045 U	0.0069 U	0.0039 U	0.0074 U
1,2,4-Trimethylbenzene	mg/kg	NE	NE	10,000	0.0061 U	0.004 U	0.0078 U	0.0045 U	0.0069 U	0.0039 U	0.0074 U
1,2-Dibromo-3-Chloropropane	mg/kg	NE	NE	10,000	0.0061 U	0.004 U	0.0078 U	0.0045 U	0.0069 U	0.0039 U	0.0074 U
1,2-Dibromoethane (EDB)	mg/kg	NE	0.07	10,000	0.0061 U	0.004 U	0.0078 U	0.0045 U	0.0069 U	0.0039 U	0.0074 U
1,2-Dichlorobenzene	mg/kg	NE	10,000	10,000	0.0061 U	0.004 U	0.0078 U	0.0045 U	0.0069 U	0.0039 U	0.0074 U
1,2-Dichloroethane	mg/kg	2.3	63	10,000	0.0061 U	0.004 U	0.0078 U	0.0045 U	0.0069 U	0.0039 U	0.0074 U
1,2-Dichloropropane	mg/kg	70	84	10,000	0.0061 U	0.004 U	0.0078 U	0.0045 U	0.0069 U	0.0039 U	0.0074 U
1,3,5-Trimethylbenzene	mg/kg	NE	NE	10,000	0.0061 U	0.004 U	0.0078 U	0.0045 U	0.0069 U	0.0039 U	0.0074 U
1,3-Dichlorobenzene	mg/kg	NE	10,000	10,000	0.0061 U	0.004 U	0.0078 U	0.0045 U	0.0069 U	0.0039 U	0.0074 U
1,3-Dichloropropane	mg/kg	NE	NE	10,000	0.0061 U	0.004 U	0.0078 U	0.0045 U	0.0069 U	0.0039 U	0.0074 U
1,4-Dichlorobenzene	mg/kg	NE	240	10,000	0.0061 U	0.004 U	0.0078 U	0.0045 U	0.0069 U	0.0039 U	0.0074 U
1,4-Dioxane	mg/kg	NE	NE	10,000	0.121 U	0.0804 U	0.156 U	0.09 U	0.138 U	0.0779 U	0.148 U
1-Chlorohexane	mg/kg	NE	NE	10,000	0.0061 U	0.004 U	0.0078 U	0.0045 U	0.0069 U	0.0039 U	0.0074 U
2,2-Dichloropropane	mg/kg	NE	NE	10,000	0.0061 U	0.004 U	0.0078 U	0.0045 U	0.0069 U	0.0039 U	0.0074 U
2-Butanone (MEK)	mg/kg	NE	10,000	10,000	0.0607 U	0.0402 U	0.0781 U	0.045 U	0.069 U	0.0389 U	0.0742 U
2-Chlorotoluene	mg/kg	NE	NE	10,000	0.0061 U	0.004 U	0.0078 U	0.0045 U	0.0069 U	0.0039 U	0.0074 U
2-Hexanone	mg/kg	NE	NE	10,000	0.0607 U	0.0402 U	0.0781 U	0.045 U	0.069 U	0.0389 U	0.0742 U
4-Chlorotoluene	mg/kg	NE	NE	10,000	0.0061 U	0.004 U	0.0078 U	0.0045 U	0.0069 U	0.0039 U	0.0074 U
4-Isopropyltoluene	mg/kg	NE	NE	10,000	0.0061 U	0.004 U	0.0078 U	0.0045 U	0.0069 U	0.0039 U	0.0074 U
4-Methyl-2-Pentanone (MIBK)	mg/kg	NE	10,000	10,000	0.0607 U	0.0402 U	0.0781 U	0.045 U	0.069 U	0.0389 U	0.0742 U
Acetone	mg/kg	NE	10,000	10,000	0.0607 U	0.0402 U	0.0781 U	0.045 U	0.069 U	0.0389 U	0.0742 U
Benzene	mg/kg	4.3	200	10,000	0.0061 U	0.004 U	0.0078 U	0.0045 U	0.0069 U	0.0039 U	<b>0.0532</b> -
Bromobenzene	mg/kg	NE	NE	10,000	0.0061 U	0.004 U	0.0078 U	0.0045 U	0.0069 U	0.0039 U	0.0074 U
Bromochloromethane	mg/kg	NE	NE	10,000	0.0061 U	0.004 U	0.0078 U	0.0045 U	0.0069 U	0.0039 U	0.0074 U
Bromodichloromethane	mg/kg	NE	92	10,000	0.0061 U	0.004 U	0.0078 U	0.0045 U	0.0069 U	0.0039 U	0.0074 U
Bromoform	mg/kg	NE	720	10,000	0.0061 U	0.004 U	0.0078 U	0.0045 U	0.0069 U	0.0039 U	0.0074 U
Bromomethane	mg/kg	NE	2,900	10,000	0.0121 U	0.008 U	0.0156 U	0.009 U	0.0138 U	0.0078 U	0.0148 U
Carbon Disulfide	mg/kg	NE	NE	10,000	0.0061 U	0.004 U	0.0078 U	0.0045 U	0.0111 -	0.0039 U	0.0074 U
Carbon Tetrachloride	mg/kg	5	44	10,000	0.0061 U	0.0061 -	0.0078 U	0.0045 U	0.0069 U	0.0039 U	0.0074 U
Chlorobenzene	mg/kg	100	10,000	10,000	0.0061 U	0.004 U	0.0078 U	0.0045 U	0.0069 U	0.0039 U	0.0074 U
Chloroethane	mg/kg	NE	NE	10,000	0.0121 U	0.008 U	0.0156 U	0.009 U	0.0138 U	0.0078 U	0.0148 U
Chloroform	mg/kg	NE	940	10,000	0.0061 U	0.004 U	0.0078 U	0.0045 U	0.0069 U	0.0039 U	0.0074 U
Chloromethane	mg/kg	NE	NE	10,000	0.0121 U	0.008 U	0.0156 U	0.009 U	0.0138 U	0.0078 U	0.0148 U
cis-1,2-Dichloroethene	mg/kg	6	10,000	10,000	0.0061 U	0.004 U	0.0078 U	0.0045 U	0.0069 U	0.0039 U	0.0074 U
cis-1,3-Dichloropropene	mg/kg	NE	NE	10,000	0.0061 U	0.004 U	0.0078 U	0.0045 U	0.0069 U	0.0039 U	0.0074 U
Dibromochloromethane	mg/kg	NE	NE	10,000	0.0061 U	0.004 U	0.0078 U	0.0045 U	0.0069 U	0.0039 U	0.0074 U
Dibromomethane	mg/kg	NE	NE	10,000	0.0061 U	0.004 U	0.0078 U	0.0045 U	0.0069 U	0.0039 U	0.0074 U
Dichlorodifluoromethane	mg/kg	NE	NE	10,000	0.0121 U	0.008 U	0.0156 U	0.009 U	0.0138 U	0.0078 U	0.0148 U
Diethylether	mg/kg	NE	NE	10,000	0.0061 U	0.004 U	0.0078 U	0.0045 U	0.0069 U	0.0039 U	0.0074 U
Di-isopropyl ether	mg/kg	NE	NE	10,000	0.0061 U	0.004 U	0.0078 U	0.0045 U	0.0069 U	0.0039 U	0.0074 U
Ethyl tertiary-butyl ether	mg/kg	NE	NE	10,000	0.0061 U	0.004 U	0.0078 U	0.0045 U	0.0069 U	0.0039 U	0.0074 U
Ethylbenzene	mg/kg	62	10,000	10,000	0.0061 U	0.004 U	0.0078 U	0.0045 U	0.0069 U	0.0039 U	0.0074 U
Hexachlorobutadiene	mg/kg	NE	73	10,000	0.0061 U	0.004 U	0.0078 U	0.0045 U	0.0069 U	0.0039 U	0.0074 U
Isopropylbenzene	mg/kg	NE	10,000	10,000	0.0061 U	0.004 U	0.0078 U	0.0045 U	0.0069 U	0.0039 U	0.0074 U
Methyl tert-butyl ether	mg/kg	100	10,000	10,000	0.0061 U	0.004 U	0.0078 U	0.0045 U	0.0069 U	0.0039 U	0.0074 U
Methylene Chloride	mg/kg	NE	760	10,000	0.0304 U	0.0201 U	0.0391 U	0.0225 U	0.0345 U	0.0195 U	0.0371 U
Naphthalene	mg/kg	NE	10,000	10,000	0.0061 U	0.0084 -	0.0078 U	0.005 -	0.0105 -	0.0039 U	<b>0.0793</b> -

Table 6A  
Summary of LDI Analytical  
VOCs - Soil Boring Results  
Former Tidewater Facility  
Pawtucket, RI

	Units	RIDEM GB Leachability Criteria	RIDEM Industrial/ Commercial DEC	RIDEM UCL	1710571-02		1710793-01		1710793-02		1710793-03		1710793-04		1710573-02		1710573-01	
					GZ-SB-515 (8-9') 10/20/2017		GZ-SB-516 (0-2') 10/30/2017		GZ-SB-516 (3-4') 10/30/2017		GZ-SB-517 (2-4') 10/30/2017		GZ-SB-517 (4-6') 10/30/2017		GZ-BW-512 (2-4') 10/20/2017		GZ-BW-513 (0-2') 10/19/2017	
n-Butylbenzene	mg/kg	NE	NE	10,000	0.0061	U	0.004	U	0.0078	U	0.0045	U	0.0069	U	0.0039	U	0.0074	U
n-Propylbenzene	mg/kg	NE	NE	10,000	0.0061	U	0.004	U	0.0078	U	0.0045	U	0.0069	U	0.0039	U	0.0074	U
sec-Butylbenzene	mg/kg	NE	NE	10,000	0.0061	U	0.004	U	0.0078	U	0.0045	U	0.0069	U	0.0039	U	0.0074	U
Styrene	mg/kg	64	190	10,000	0.0061	U	0.004	U	0.0078	U	0.0045	U	0.0069	U	0.0039	U	<b>0.0351</b>	-
tert-Butylbenzene	mg/kg	NE	NE	10,000	0.0061	U	0.004	U	0.0078	U	0.0045	U	0.0069	U	0.0039	U	0.0074	U
Tertiary-amyl methyl ether	mg/kg	NE	NE	10,000	0.0061	U	0.004	U	0.0078	U	0.0045	U	0.0069	U	0.0039	U	0.0074	U
Tetrachloroethene	mg/kg	4.2	110	10,000	0.0061	U	0.004	U	0.0078	U	0.0045	U	0.0069	U	0.0039	U	0.0074	U
Tetrahydrofuran	mg/kg	NE	NE	10,000	0.0061	U	0.004	U	0.0078	U	0.0045	U	0.0069	U	0.0039	U	0.0074	U
Toluene	mg/kg	54	10,000	10,000	0.0061	U	0.004	U	0.0078	U	0.0045	U	0.0069	U	0.0039	U	<b>0.0215</b>	-
trans-1,2-Dichloroethene	mg/kg	92	10,000	10,000	0.0061	U	0.004	U	0.0078	U	0.0045	U	0.0069	U	0.0039	U	0.0074	U
trans-1,3-Dichloropropene	mg/kg	NE	NE	10,000	0.0061	U	0.004	U	0.0078	U	0.0045	U	0.0069	U	0.0039	U	0.0074	U
Trichloroethene	mg/kg	20	520	10,000	0.0061	U	0.004	U	0.0078	U	0.0045	U	0.0069	U	0.0039	U	0.0074	U
Trichlorofluoromethane	mg/kg	NE	NE	10,000	0.0061	U	0.004	U	0.0078	U	0.0045	U	0.0069	U	0.0039	U	0.0074	U
Vinyl Acetate	mg/kg	NE	NE	10,000	0.0061	U	0.004	U	0.0078	U	0.0045	U	0.0069	U	0.0039	U	0.0074	U
Vinyl Chloride	mg/kg	NE	3	10,000	0.0121	U	0.008	U	0.0156	U	0.009	U	0.0138	U	0.0078	U	0.0148	U
o-Xylene	mg/kg	NE	10,000	10,000	0.0061	U	0.004	U	0.0078	U	0.0045	U	0.0069	U	0.0039	U	0.0074	U
m&p-Xylene	mg/kg	NE	10,000	10,000	0.0121	U	0.008	U	0.0156	U	0.009	U	0.0138	U	0.0078	U	0.0148	U
Total Xylenes	mg/kg	NE	10,000	10,000	0.0121	U	0.008	U	0.0156	U	0.009	U	0.0138	U	0.0078	U	0.0148	U

**Notes**

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NFA = North Fill Area

FGPA = Former Gas Plant Area

FPPA = Former Power Plant Area

SFA = South Fill Area

**Detected concentrations are bolded.**

**Gray shaded cells indicates the concentration exceeds the RIDEM Method 1 Industrial/Commercial \Direct Exposure Criteria (I/C DEC).**

Detection limits highlighted in *blue and in italics* exceed the RIDEM Method 1 Criteria.

Underlined concentrations exceed the RIDEM Method 1 GB Leachability Criteria.

**A concentration with a bold border exceeds the Upper Concentration Limit.**

Undetected analytes have a "U" qualifier.

Any analytes reported from a diluted run of the original analysis have a "D" qualifier.

Blank cells indicate a sample was not analyzed for that parameter



Table 6B  
Summary of LDI Analytical  
TPH, PAH and Metals - Soil Boring Results  
Former Tidewater Facility  
Pawtucket, RI

	Units	RIDEM GB Leachability Criteria	RIDEM Industrial/ Commercial DEC	RIDEM UCL	1710601-01 GZ-BK-501 (2-4') 10/24/2017	1710683-01 GZ-BW-501 (0-2') 10/25/2017	1710285-01 GZ-BW-502 (0-2') 10/9/2017	1710285-03 GZ-BW-503 (2-4') 10/10/2017	1710285-02 GZ-BW-504A (0-2') 10/10/2017	1710285-04 GZ-BW-505 (0-2') 10/10/2017	1710285-06 GZ-BW-506 (0-2') 10/10/2017	1710790-02 GZ-BK-502 (0-2') 10/30/2017
<b>TOTAL PETROLEUM HYDROCARBON</b>												
Hydrocarbon Content	mg/kg	2,500	2,500	30,000	NA	NA	NA	NA	NA	NA	NA	NA
<b>METALS</b>												
Antimony	mg/kg	NE	820	10,000	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	mg/kg	NE	7	10,000	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	mg/kg	NE	1.3	10,000	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	mg/kg	NE	1,000	10,000	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	NA
Copper	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	NA
Lead	mg/kg	NE	500	10,000	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	NA
Silver	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	mg/kg	NE	140	10,000	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	mg/kg	NE	610	10,000	NA	NA	NA	NA	NA	NA	NA	NA
<b>PAHS BY GCMS</b>												
2-Methylnaphthalene	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	NA
Benzo [a] Anthracene	mg/kg	NE	7.8	10,000	NA	NA	NA	NA	NA	NA	NA	NA
Benzo [a] Pyrene	mg/kg	NE	8.0	10,000	NA	NA	NA	NA	NA	NA	NA	NA
Benzo [b] Fluoranthene	mg/kg	NE	7.8	10,000	NA	NA	NA	NA	NA	NA	NA	NA
Benzo [g,h,i] Perylene	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	NA
Benzo [k] Fluoranthene	mg/kg	NE	7.8	10,000	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	mg/kg	NE	780	10,000	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzo [a,h] Anthracene	mg/kg	NE	0.8	10,000	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	NA
Indeno [1,2,3-cd] Pyrene	mg/kg	NE	7.8	10,000	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	mg/kg	NE	10,000	10,000	<b>87.9</b>	<b>61.8</b>	<b>250</b>	<b>7230</b>	<b>0.705</b>	<b>3.24</b>	<b>3.15</b>	<b>0.9</b>
Phenanthrene	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	NA
<b>SUBCONTRACTED ANALYTES</b>												
Total Cyanide	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	NA

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Blank cells indicate a sample was not analyzed for that parameter

Table 6B  
Summary of LDI Analytical  
TPH, PAH and Metals - Soil Boring Results  
Former Tidewater Facility  
Pawtucket, RI

	Units	RIDEM GB Leachability Criteria	RIDEM Industrial/ Commercial DEC	RIDEM UCL	1710285-07 GZ-BW-507 (2-4') 10/11/2017	1710517-01 GZ-BW-508 (0-2') 10/18/2017	1710350-01 GZ-BW-509 (2-4') 10/11/2017	1710790-01 GZ-BW-510 (0-2') 10/30/2017	1710517-02 GZ-BW-511 (2-4') 10/19/2017	1710518-01 GZ-SB-514 (3-4') 10/18/2017	1710571-01 GZ-SB-514 (10-11') 10/20/2017	1710518-02 GZ-SB-515 (0-2') 10/18/2017				
<b>TOTAL PETROLEUM HYDROCARBON</b>																
Hydrocarbon Content	mg/kg	2,500	2,500	30,000	NA	NA	NA	NA	NA	580	D	59.1	-	2,380	D	
<b>METALS</b>																
Antimony	mg/kg	NE	820	10,000	NA	NA	NA	NA	NA	4.95	U	2.57	U, D	4.61	U	
Arsenic	mg/kg	NE	7	10,000	NA	NA	NA	NA	NA	5.62	D	13	-	10.4	-	
Beryllium	mg/kg	NE	1.3	10,000	NA	NA	NA	NA	NA	0.12	-	0.42	-	0.43	-	
Cadmium	mg/kg	NE	1,000	10,000	NA	NA	NA	NA	NA	0.50	U	0.64	U	0.46	U	
Chromium	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	4.04	-	62.6	-	5.67	-	
Copper	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	10.9	-	43.2	-	59.9	-	
Lead	mg/kg	NE	500	10,000	NA	NA	NA	NA	NA	78.90	-	97.5	-	191	-	
Nickel	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	0.367	-	0.41	-	1.41	D	
Silver	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	4.71	-	8.69	-	13.5	-	
Thallium	mg/kg	NE	140	10,000	NA	NA	NA	NA	NA	4.95	U, D	0.64	U, D	2.3	U, D	
Zinc	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	0.50	U	0.64	U	0.46	U	
Selenium	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	4.95	U	2.57	U, D	4.61	U	
Mercury	mg/kg	NE	610	10,000	NA	NA	NA	NA	NA	14.1	-	46.3	-	95.1	-	
<b>PAHS BY GCMS</b>																
2-Methylnaphthalene	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	0.425	U	0.52	U	11.1	D	
Acenaphthene	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	0.425	U	0.52	U	7.12	-	
Acenaphthylene	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	1.53	-	0.52	U	4.43	-	
Anthracene	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	0.615	-	0.68	-	17.4	D	
Benzo [a] Anthracene	mg/kg	NE	7.8	10,000	NA	NA	NA	NA	NA	8.97	-	1.34	-	32.5	D	
Benzo [a] Pyrene	mg/kg	NE	8.0	10,000	NA	NA	NA	NA	NA	18.3	D	0.958	-	27.3	D	
Benzo [b] Fluoranthene	mg/kg	NE	7.8	10,000	NA	NA	NA	NA	NA	19.9	D	0.793	-	32.3	D	
Benzo [g,h,i] Perylene	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	21.3	D	0.52	U	15.5	D	
Benzo [k] Fluoranthene	mg/kg	NE	78	10,000	NA	NA	NA	NA	NA	12.3	D	0.927	-	20.1	D	
Chrysene	mg/kg	NE	780	10,000	NA	NA	NA	NA	NA	8.09	-	1.04	-	30.1	D	
Dibenzo [a,h] Anthracene	mg/kg	NE	0.8	10,000	NA	NA	NA	NA	NA	4.78	-	0.261	U	6.68	-	
Fluoranthene	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	10.4	-	2.19	-	63.6	D	
Fluorene	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	0.425	U	0.52	U	8.16	-	
Indeno [1,2,3-cd] Pyrene	mg/kg	NE	7.8	10,000	NA	NA	NA	NA	NA	18	D	0.52	U	15.5	D	
Naphthalene	mg/kg	NE	10,000	10,000	2.88	D	4.5	-	1.34	D	0.4	U	1.1	-	1.1	-
Phenanthrene	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	1.12	-	1.05	-	53.4	D	
Pyrene	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	9.79	-	1.68	-	56.3	D	
<b>SUBCONTRACTED ANALYTES</b>																
Total Cyanide	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	70.5	D	1.46	U	39.7	D	

**Notes**

NE = Not Established

NA = Not Analyzed

NFA = North Fill Area

FGPA = Former Gas Plant Area

FPPA = Former Power Plant Area

SFA = South Fill Area

Detected concentrations are bolded.

Gray shaded cells indicates the concentration exceeds the RIDEM Method 1 Industrial/Commercial \Direct Exposure Criteria (I/C DEC).

Detection limits highlighted in *blue and in italics* exceed the RIDEM Method 1 Criteria.

Underlined concentrations exceed the RIDEM Method 1 GB Leachability Criteria.

A concentration with a bold border exceeds the Upper Concentration Limit.

Undetected analytes have a "U" qualifier.

Any analytes reported from a diluted run of the original analysis have a "D" qualifier.

Blank cells indicate a sample was not analyzed for that parameter

Table 6B  
Summary of LDI Analytical  
TPH, PAH and Metals - Soil Boring Results  
Former Tidewater Facility  
Pawtucket, RI

	Units	RIDEM GB Leachability Criteria	RIDEM Industrial/ Commercial DEC	RIDEM UCL	1710571-02 GZ-SB-515 (8-9') 10/20/2017	1710793-01 GZ-SB-516 (0-2') 10/30/2017	1710793-02 GZ-SB-516 (3-4') 10/30/2017	1710793-03 GZ-SB-517 (2-4') 10/30/2017	1710793-04 GZ-SB-517 (4-6') 10/30/2017	1710573-02 GZ-BW-512 (2-4') 10/20/2017	1710573-01 GZ-BW-513 (0-2') 10/19/2017
<b>TOTAL PETROLEUM HYDROCARBON</b>											
Hydrocarbon Content	mg/kg	2,500	2,500	30,000	547 D	2460 D	357 D	8310 D	710 D	NA	NA
<b>METALS</b>											
Antimony	mg/kg	NE	820	10,000	0.59 U, D	2.06 U, D	2.62 U, D	2.01 U, D	2.94 U, D	NA	NA
Arsenic	mg/kg	NE	7	10,000	4.86 D	14.6 -	32.7 U, D	12.2 -	36.7 U, D	NA	NA
Beryllium	mg/kg	NE	1.3	10,000	0.13 U	0.52 -	1.44 U, D	0.37 -	1.62 U, D	NA	NA
Cadmium	mg/kg	NE	1,000	10,000	0.59 U	0.51 U	6.54 U, D	1.01 -	7.35 U, D	NA	NA
Chromium	mg/kg	NE	10,000	10,000	2.63 -	9.5 -	13.1 U, D	11.1 -	14.7 U, D	NA	NA
Copper	mg/kg	NE	10,000	10,000	4.25 -	85.9 -	32.7 U, D	86.1 -	36.7 U, D	NA	NA
Lead	mg/kg	NE	500	10,000	389 -	124 -	65.4 U, D	333 -	73.5 U, D	NA	NA
Nickel	mg/kg	NE	10,000	10,000	0.075 -	0.544 -	1.42 D	0.566 D	0.271 -	NA	NA
Silver	mg/kg	NE	10,000	10,000	2.96 U	11.8 -	32.7 U, D	19.9 -	36.7 U, D	NA	NA
Thallium	mg/kg	NE	140	10,000	0.59 U, D	2.06 U, D	2.62 U, D	2.01 U, D	2.94 U, D	NA	NA
Zinc	mg/kg	NE	10,000	10,000	0.59 U	0.51 U	6.54 U, D	0.5 U	7.35 U, D	NA	NA
Selenium	mg/kg	NE	10,000	10,000	0.59 U, D	2.06 U, D	2.62 U, D	2.01 U, D	0.73 U, D	NA	NA
Mercury	mg/kg	NE	610	10,000	2.96 U	114 -	32.7 U, D	279 -	36.7 U, D	NA	NA
<b>PAHS BY GCMS</b>											
2-Methylnaphthalene	mg/kg	NE	10,000	10,000	0.494 U	13.6 D	0.517 U	5.89 -	0.557 U	NA	NA
Acenaphthene	mg/kg	NE	10,000	10,000	0.494 U	0.563 -	0.517 U	0.658 -	0.557 U	NA	NA
Acenaphthylene	mg/kg	NE	10,000	10,000	0.632 -	17.9 D	1.12 -	7.12 -	1.27 -	NA	NA
Anthracene	mg/kg	NE	10,000	10,000	0.857 -	11.2 D	0.517 U	4.91 -	0.832 -	NA	NA
Benzo [a] Anthracene	mg/kg	NE	7.8	10,000	10.4 -	25.2 D	4.76 -	8.47 -	8.59 -	NA	NA
Benzo [a] Pyrene	mg/kg	NE	8.0	10,000	14.7 D	18.5 D	7.68 -	6.96 -	10.9 -	NA	NA
Benzo [b] Fluoranthene	mg/kg	NE	7.8	10,000	16.2 D	19.2 D	10.4 D	8.46 D	11.7 D	NA	NA
Benzo [g,h,i] Perylene	mg/kg	NE	10,000	10,000	7.88 -	6.81 -	15.9 D	5.73 -	10.4 -	NA	NA
Benzo [k] Fluoranthene	mg/kg	NE	78	10,000	8.61 -	16.4 D	5.98 D	6.19 D	9.82 D	NA	NA
Chrysene	mg/kg	NE	780	10,000	9.01 -	26.8 D	4.13 -	9.16 -	7.62 -	NA	NA
Dibenzo [a,h] Anthracene	mg/kg	NE	0.8	10,000	3.07 -	4.12 -	4.76 -	3.55 -	4.4 -	NA	NA
Fluoranthene	mg/kg	NE	10,000	10,000	16.9 D	29.6 D	5.61 -	12.5 D	11.4 -	NA	NA
Fluorene	mg/kg	NE	10,000	10,000	0.494 U	1.14 -	0.517 U	3.44 -	0.557 U	NA	NA
Indeno [1,2,3-cd] Pyrene	mg/kg	NE	7.8	10,000	7.05 -	6.45 -	10.2 -	5.83 -	9.07 -	NA	NA
Naphthalene	mg/kg	NE	10,000	10,000	1.54 -	24.6 D	1.6 -	5.56 -	0.951 -	0.4 U	516 D
Phenanthrene	mg/kg	NE	10,000	10,000	2.58 -	31.7 D	1.02 -	14.8 D	1.24 -	NA	NA
Pyrene	mg/kg	NE	10,000	10,000	17.5 D	50.3 D	7.98 -	20.1 D	18.3 D	NA	NA
<b>SUBCONTRACTED ANALYTES</b>											
Total Cyanide	mg/kg	NE	10,000	10,000	78 D	87.5 D	197 D	128 D	124 D	NA	NA

**Notes**

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Detected concentrations are bolded.

Gray shaded cells indicates the concentration exceeds the RIDEM Method 1 Industrial/Commercial \Direct Exposure Criteria (I/C DEC).

Detection limits highlighted in blue and in italics exceed the RIDEM Method 1 Criteria.

Underlined concentrations exceed the RIDEM Method 1 GB Leachability Criteria.

A concentration with a bold border exceeds the Upper Concentration Limit.

Undetected analytes have a "U" qualifier.

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Table 7  
Summary of LDI Analytical  
Quality Assurance/Quality Control Samples - Trip Blank VOCs  
Former Tidewater Facility  
Pawtucket, RI

	Units	RIDEM GB Leachability Criteria	RIDEM Industrial/ Commercial DEC	RIDEM UCL	1709470-16 TB-091417 09/14/2017	1709493-12 TB-091817 09/18/2017	1709754-19 Trip Blank 9/26/2017	1709779-11 TB-092717 09/27/2017	1710025-17 TB-100217 10/02/2017	1710285-08 TB-100917 10/09/2017	1710350-02 TB-101317 10/11/2017	1710573-03 TB-102017 10/20/2017	1710601-02 TB-102417 10/24/2017	1710683-02 TB-102617 10/26/2017	1712222-12 TB-120817 12/08/2017
<b>VOLATILE ORGANICS</b>															
1,1,1,2-Tetrachloroethane	mg/kg	NE	220	10,000	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
1,1,1-Trichloroethane	mg/kg	160	10,000	10,000	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
1,1,2,2-Tetrachloroethane	mg/kg	NE	29	10,000	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
1,1,2-Trichloroethane	mg/kg	NE	100	10,000	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
1,1-Dichloroethane	mg/kg	NE	10,000	10,000	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
1,1-Dichloroethene	mg/kg	1	9.5	10,000	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
1,1-Dichloropropene	mg/kg	NE	NE	10,000	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
1,2,3-Trichlorobenzene	mg/kg	NE	NE	10,000	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
1,2,3-Trichloropropane	mg/kg	NE	NE	10,000	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
1,2,4-Trichlorobenzene	mg/kg	NE	10,000	10,000	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
1,2,4-Trimethylbenzene	mg/kg	NE	NE	10,000	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
1,2-Dibromo-3-Chloropropane	mg/kg	NE	NE	10,000	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
1,2-Dibromoethane (EDB)	mg/kg	NE	0.07	10,000	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
1,2-Dichlorobenzene	mg/kg	NE	10,000	10,000	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
1,2-Dichloroethane	mg/kg	2.3	63	10,000	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
1,2-Dichloropropane	mg/kg	70	84	10,000	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
1,3,5-Trimethylbenzene	mg/kg	NE	NE	10,000	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
1,3-Dichlorobenzene	mg/kg	NE	10,000	10,000	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
1,3-Dichloropropane	mg/kg	NE	NE	10,000	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
1,4-Dichlorobenzene	mg/kg	NE	240	10,000	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
1,4-Dioxane	mg/kg	NE	NE	10,000	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
1-Chlorohexane	mg/kg	NE	NE	10,000	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
2,2-Dichloropropane	mg/kg	NE	NE	10,000	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
2-Butanone (MEK)	mg/kg	NE	10,000	10,000	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
2-Chlorotoluene	mg/kg	NE	NE	10,000	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
2-Hexanone	mg/kg	NE	NE	10,000	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
4-Chlorotoluene	mg/kg	NE	NE	10,000	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
4-Isopropyltoluene	mg/kg	NE	NE	10,000	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
4-Methyl-2-Pentanone (MIBK)	mg/kg	NE	10,000	10,000	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Acetone	mg/kg	NE	10,000	10,000	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Benzene	mg/kg	4.3	200	10,000	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Bromobenzene	mg/kg	NE	NE	10,000	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Bromochloromethane	mg/kg	NE	NE	10,000	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Bromodichloromethane	mg/kg	NE	92	10,000	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Bromoform	mg/kg	NE	720	10,000	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Bromomethane	mg/kg	NE	2,900	10,000	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Carbon Disulfide	mg/kg	NE	NE	10,000	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Carbon Tetrachloride	mg/kg	5	44	10,000	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Chlorobenzene	mg/kg	100	10,000	10,000	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Chloroethane	mg/kg	NE	NE	10,000	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Chloroform	mg/kg	NE	940	10,000	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Chloromethane	mg/kg	NE	NE	10,000	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
cis-1,2-Dichloroethene	mg/kg	6	10,000	10,000	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
cis-1,3-Dichloropropene	mg/kg	NE	NE	10,000	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Dibromochloromethane	mg/kg	NE	NE	10,000	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Dibromomethane	mg/kg	NE	NE	10,000	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Dichlorodifluoromethane	mg/kg	NE	NE	10,000	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Diethylether	mg/kg	NE	NE	10,000	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U

Table 7  
Summary of LDI Analytical  
Quality Assurance/Quality Control Samples - Trip Blank VOCs  
Former Tidewater Facility  
Pawtucket, RI

	Units	RIDEM GB Leachability Criteria	RIDEM Industrial/ Commercial DEC	RIDEM UCL	1709470-16 TB-091417 09/14/2017	1709493-12 TB-091817 09/18/2017	1709754-19 Trip Blank 9/26/2017	1709779-11 TB-092717 09/27/2017	1710025-17 TB-100217 10/02/2017	1710285-08 TB-100917 10/9/2017	1710350-02 TB-101317 10/11/2017	1710573-03 TB-102017 10/20/2017	1710601-02 TB-102417 10/24/2017	1710683-02 TB-102617 10/26/2017	1712222-12 TB-120817 12/08/2017
<b>VOLATILE ORGANICS</b>															
Di-isopropyl ether	mg/kg	NE	NE	10,000	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Ethyl tertiary-butyl ether	mg/kg	NE	NE	10,000	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Ethylbenzene	mg/kg	62	10,000	10,000	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Hexachlorobutadiene	mg/kg	NE	73	10,000	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Isopropylbenzene	mg/kg	NE	10,000	10,000	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Methyl tert-butyl ether	mg/kg	100	10,000	10,000	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Methylene Chloride	mg/kg	NE	760	10,000	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U
Naphthalene	mg/kg	NE	10,000	10,000	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
n-Butylbenzene	mg/kg	NE	NE	10,000	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
n-Propylbenzene	mg/kg	NE	NE	10,000	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
sec-Butylbenzene	mg/kg	NE	NE	10,000	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Styrene	mg/kg	64	190	10,000	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
tert-Butylbenzene	mg/kg	NE	NE	10,000	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Tertiary-amyl methyl ether	mg/kg	NE	NE	10,000	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Tetrachloroethene	mg/kg	4.2	110	10,000	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Tetrahydrofuran	mg/kg	NE	NE	10,000	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Toluene	mg/kg	54	10,000	10,000	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
trans-1,2-Dichloroethene	mg/kg	92	10,000	10,000	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
trans-1,3-Dichloropropene	mg/kg	NE	NE	10,000	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Trichloroethene	mg/kg	20	520	10,000	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Trichlorofluoromethane	mg/kg	NE	NE	10,000	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Vinyl Acetate	mg/kg	NE	NE	10,000	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Vinyl Chloride	mg/kg	NE	3	10,000	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
o-Xylene	mg/kg	NE	10,000	10,000	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
m&p-Xylene	mg/kg	NE	10,000	10,000	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Total Xylenes	mg/kg	NE	10,000	10,000	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U

**Notes**

NE = Not Established

NA = Not Analyzed

NFA = North Fill Area

FGPA = Former Gas Plant Area

FPPA = Former Power Plant Area

SFA = South Fill Area

Detected concentrations are bolded.

Gray shaded cells indicates the concentration exceeds the RIDEM Method 1 Industrial/Commercial \Direct Exposure Criteria (I/C DEC).

Detection limits highlighted in *blue and in italics* exceed the RIDEM Method 1 Criteria.

Underlined concentrations exceed the RIDEM Method 1 GB Leachability Criteria.

**A concentration with a bold border exceeds the Upper Concentration Limit.**

Undetected analytes have a "U" qualifier.

Any analytes reported from a diluted run of the original analysis have a "D" qualifier.

Blank cells indicate a sample was not analyzed for that parameter

Table 8  
 Summary of LDI Analytical  
 Quality Assurance/Quality Control Samples - Blind Duplicate VOCs  
 Former Tidewater Facility  
 Pawtucket, RI

	Units	RIDEM GB Leachability Criteria	RIDEM Industrial/ Commercial DEC	RIDEM UCL	1709470-15 TP-597 (1-2') 09/15/2017 Duplicate of TP-506 (1-2')	1709470-11 TP-506 (1-2') 09/15/2017	1709493-11 TP-598 (0-2') 09/18/2017 Duplicate of TP-509 (0-2')	1709493-09 TP-509 (0-2') 09/18/2017	1709754-11 bd092617 09/26/2017 Duplicate of GZ-SS-520 (0-2')	1709754-03 GZ-SS-520 (0-2') 09/26/2017	1710285-05 BD0101017 10/10/2017 Duplicate of GZ-BW-505 (0-2')	1710285-04 GZ-BW-505 (0-2') 10/10/2017	1712222-06 BD-120817 12/08/2017 Duplicate of GZ-SS-565 (0-2')	1712222-05 GZ-SS-565 (0-2') 12/8/2017
<b>VOLATILE ORGANICS</b>														
1,1,1,2-Tetrachloroethane	mg/kg	NE	220	10,000	0.0036 U	0.0035 U	0.0046 U	0.0024 U	0.004 U	0.004 U	0.0045 U	0.0054 U	0.0033 U	0.0058 U
1,1,1-Trichloroethane	mg/kg	160	10,000	10,000	0.0036 U	0.0035 U	0.0046 U	0.0024 U	0.004 U	0.004 U	0.0045 U	0.0054 U	0.0033 U	0.0058 U
1,1,2,2-Tetrachloroethane	mg/kg	NE	29	10,000	0.0036 U	0.0035 U	0.0046 U	0.0024 U	0.004 U	0.004 U	0.0045 U	0.0054 U	0.0033 U	0.0058 U
1,1,2-Trichloroethane	mg/kg	NE	100	10,000	0.0036 U	0.0035 U	0.0046 U	0.0024 U	0.004 U	0.004 U	0.0045 U	0.0054 U	0.0033 U	0.0058 U
1,1-Dichloroethane	mg/kg	NE	10,000	10,000	0.0036 U	0.0035 U	0.0046 U	0.0024 U	0.004 U	0.004 U	0.0045 U	0.0054 U	0.0033 U	0.0058 U
1,1-Dichloroethene	mg/kg	1	9.5	10,000	0.0036 U	0.0035 U	0.0046 U	0.0024 U	0.004 U	0.004 U	0.0045 U	0.0054 U	0.0033 U	0.0058 U
1,1-Dichloropropene	mg/kg	NE	NE	10,000	0.0036 U	0.0035 U	0.0046 U	0.0024 U	0.004 U	0.004 U	0.0045 U	0.0054 U	0.0033 U	0.0058 U
1,2,3-Trichlorobenzene	mg/kg	NE	NE	10,000	0.0036 U	0.0035 U	0.0046 U	0.0024 U	0.004 U	0.004 U	0.0045 U	0.0054 U	0.0033 U	0.0058 U
1,2,3-Trichloropropane	mg/kg	NE	NE	10,000	0.0036 U	0.0035 U	0.0046 U	0.0024 U	0.004 U	0.004 U	0.0045 U	0.0054 U	0.0033 U	0.0058 U
1,2,4-Trichlorobenzene	mg/kg	NE	10,000	10,000	0.0036 U	0.0035 U	0.0046 U	0.0024 U	0.004 U	0.004 U	0.0045 U	0.0054 U	0.0033 U	0.0058 U
1,2,4-Trimethylbenzene	mg/kg	NE	NE	10,000	0.0036 U	0.0035 U	0.0046 U	0.0024 U	0.004 U	0.004 U	0.0045 U	0.0054 U	0.0033 U	0.0058 U
1,2-Dibromo-3-Chloropropane	mg/kg	NE	NE	10,000	0.0036 U	0.0035 U	0.0046 U	0.0024 U	0.004 U	0.004 U	0.0045 U	0.0054 U	0.0033 U	0.0058 U
1,2-Dibromoethane (EDB)	mg/kg	NE	0.07	10,000	0.0036 U	0.0035 U	0.0046 U	0.0024 U	0.004 U	0.004 U	0.0045 U	0.0054 U	0.0033 U	0.0058 U
1,2-Dichlorobenzene	mg/kg	NE	10,000	10,000	0.0036 U	0.0035 U	0.0046 U	0.0024 U	0.004 U	0.004 U	0.0045 U	0.0054 U	0.0033 U	0.0058 U
1,2-Dichloroethane	mg/kg	2.3	63	10,000	0.0036 U	0.0035 U	0.0046 U	0.0024 U	0.004 U	0.004 U	0.0045 U	0.0054 U	0.0033 U	0.0058 U
1,2-Dichloropropane	mg/kg	70	84	10,000	0.0036 U	0.0035 U	0.0046 U	0.0024 U	0.004 U	0.004 U	0.0045 U	0.0054 U	0.0033 U	0.0058 U
1,3,5-Trimethylbenzene	mg/kg	NE	NE	10,000	0.0036 U	0.0035 U	0.0046 U	0.0024 U	0.004 U	0.004 U	0.0045 U	0.0054 U	0.0033 U	0.0058 U
1,3-Dichlorobenzene	mg/kg	NE	10,000	10,000	0.0036 U	0.0035 U	0.0046 U	0.0024 U	0.004 U	0.004 U	0.0045 U	0.0054 U	0.0033 U	0.0058 U
1,3-Dichloropropane	mg/kg	NE	NE	10,000	0.0036 U	0.0035 U	0.0046 U	0.0024 U	0.004 U	0.004 U	0.0045 U	0.0054 U	0.0033 U	0.0058 U
1,4-Dichlorobenzene	mg/kg	NE	240	10,000	0.0036 U	0.0035 U	0.0046 U	0.0024 U	0.004 U	0.004 U	0.0045 U	0.0054 U	0.0033 U	0.0058 U
1,4-Dioxane	mg/kg	NE	NE	10,000	0.071 U	0.0709 U	0.0916 U	0.047 U	0.0794 U	0.0795 U	0.0897 U	0.109 U	0.0664 U	0.116 U
1-Chlorohexane	mg/kg	NE	NE	10,000	0.0036 U	0.0035 U	0.0046 U	0.0024 U	0.004 U	0.004 U	0.0045 U	0.0054 U	0.0033 U	0.0058 U
2,2-Dichloropropane	mg/kg	NE	NE	10,000	0.0036 U	0.0035 U	0.0046 U	0.0024 U	0.004 U	0.004 U	0.0045 U	0.0054 U	0.0033 U	0.0058 U
2-Butanone (MEK)	mg/kg	NE	10,000	10,000	0.0355 U	0.0354 U	0.0458 U	0.0235 U	0.0397 U	0.0397 U	0.0448 U	0.0543 U	0.0332 U	0.0581 U
2-Chlorotoluene	mg/kg	NE	NE	10,000	0.0036 U	0.0035 U	0.0046 U	0.0024 U	0.004 U	0.004 U	0.0045 U	0.0054 U	0.0033 U	0.0058 U
2-Hexanone	mg/kg	NE	NE	10,000	0.0355 U	0.0354 U	0.0458 U	0.0235 U	0.0397 U	0.0397 U	0.0448 U	0.0543 U	0.0332 U	0.0581 U
4-Chlorotoluene	mg/kg	NE	NE	10,000	0.0036 U	0.0035 U	0.0046 U	0.0024 U	0.004 U	0.004 U	0.0045 U	0.0054 U	0.0033 U	0.0058 U
4-Isopropyltoluene	mg/kg	NE	NE	10,000	0.0036 U	0.0035 U	0.0046 U	0.0024 U	0.004 U	0.0042	0.0045 U	0.0054 U	0.0033 U	0.0058 U
4-Methyl-2-Pentanone (MIBK)	mg/kg	NE	10,000	10,000	0.0355 U	0.0354 U	0.0458 U	0.0235 U	0.0397 U	0.0397 U	0.0448 U	0.0543 U	0.0332 U	0.0581 U
Acetone	mg/kg	NE	10,000	10,000	0.0355 U	0.0354 U	0.0458 U	0.0235 U	0.0397 U	0.0397 U	0.0448 U	0.0543 U	0.0332 U	0.0581 U
Benzene	mg/kg	4.3	200	10,000	0.0036 U	0.0035 U	0.0046 U	0.0024 U	0.004 U	0.004 U	0.0045 U	0.0054 U	0.0033 U	0.0058 U
Bromobenzene	mg/kg	NE	NE	10,000	0.0036 U	0.0035 U	0.0046 U	0.0024 U	0.004 U	0.004 U	0.0045 U	0.0054 U	0.0033 U	0.0058 U
Bromochloromethane	mg/kg	NE	NE	10,000	0.0036 U	0.0035 U	0.0046 U	0.0024 U	0.004 U	0.004 U	0.0045 U	0.0054 U	0.0033 U	0.0058 U
Bromodichloromethane	mg/kg	NE	92	10,000	0.0036 U	0.0035 U	0.0046 U	0.0024 U	0.004 U	0.004 U	0.0045 U	0.0054 U	0.0033 U	0.0058 U
Bromoform	mg/kg	NE	720	10,000	0.0036 U	0.0035 U	0.0046 U	0.0024 U	0.004 U	0.004 U	0.0045 U	0.0054 U	0.0033 U	0.0058 U
Bromomethane	mg/kg	NE	2,900	10,000	0.0071 U	0.0071 U	0.0092 U	0.0047 U	0.0079 U	0.0079 U	0.009 U	0.0109 U	0.0066 U	0.0116 U
Carbon Disulfide	mg/kg	NE	NE	10,000	0.0036 U	0.0035 U	0.0046 U	0.0024 U	0.004 U	0.004 U	0.0045 U	0.0054 U	0.0033 U	0.0058 U
Carbon Tetrachloride	mg/kg	5	44	10,000	0.0036 U	0.0035 U	0.0046 U	0.0024 U	0.004 U	0.004 U	0.0045 U	0.0054 U	0.0033 U	0.0058 U
Chlorobenzene	mg/kg	100	10,000	10,000	0.0036 U	0.0035 U	0.0046 U	0.0024 U	0.004 U	0.004 U	0.0045 U	0.0054 U	0.0033 U	0.0058 U
Chloroethane	mg/kg	NE	NE	10,000	0.0071 U	0.0071 U	0.0092 U	0.0047 U	0.0079 U	0.0079 U	0.009 U	0.0109 U	0.0066 U	0.0116 U
Chloroform	mg/kg	NE	940	10,000	0.0036 U	0.0035 U	0.0046 U	0.0024 U	0.004 U	0.004 U	0.0045 U	0.0054 U	0.0033 U	0.0058 U
Chloromethane	mg/kg	NE	NE	10,000	0.0071 U	0.0071 U	0.0092 U	0.0047 U	0.0079 U	0.0079 U	0.009 U	0.0109 U	0.0066 U	0.0116 U
cis-1,2-Dichloroethene	mg/kg	6	10,000	10,000	0.0036 U	0.0035 U	0.0046 U	0.0024 U	0.004 U	0.004 U	0.0045 U	0.0054 U	0.0033 U	0.0058 U
cis-1,3-Dichloropropene	mg/kg	NE	NE	10,000	0.0036 U	0.0035 U	0.0046 U	0.0024 U	0.004 U	0.004 U	0.0045 U	0.0054 U	0.0033 U	0.0058 U
Dibromochloromethane	mg/kg	NE	NE	10,000	0.0036 U	0.0035 U	0.0046 U	0.0024 U	0.004 U	0.004 U	0.0045 U	0.0054 U	0.0033 U	0.0058 U
Dibromomethane	mg/kg	NE	NE	10,000	0.0036 U	0.0035 U	0.0046 U	0.0024 U	0.004 U	0.004 U	0.0045 U	0.0054 U	0.0033 U	0.0058 U
Dichlorodifluoromethane	mg/kg	NE	NE	10,000	0.0071 U	0.0071 U	0.0092 U	0.0047 U	0.0079 U	0.0079 U	0.009 U	0.0109 U	0.0066 U	0.0116 U
Diethylether	mg/kg	NE	NE	10,000	0.0036 U	0.0035 U	0.0046 U	0.0024 U	0.004 U	0.004 U	0.0045 U	0.0054 U	0.0033 U	0.0058 U

Table 8  
Summary of LDI Analytical  
Quality Assurance/Quality Control Samples - Blind Duplicate VOCs  
Former Tidewater Facility  
Pawtucket, RI

	Units	RIDEM GB Leachability Criteria	RIDEM Industrial/ Commercial DEC	RIDEM UCL	1709470-15 TP-597 (1-2') 09/15/2017 Duplicate of TP-506 (1-2')	1709470-11 TP-506 (1-2') 09/15/2017	1709493-11 TP-598 (0-2') 09/18/2017 Duplicate of TP-509 (0-2')	1709493-09 TP-509 (0-2') 09/18/2017	1709754-11 bd092617 09/26/2017 Duplicate of GZ-SS-520 (0-2')	1709754-03 GZ-SS-520 (0-2') 09/26/2017	1710285-05 BD0101017 10/10/2017 Duplicate of GZ-BW-505 (0-2')	1710285-04 GZ-BW-505 (0-2') 10/10/2017	1712222-06 BD-120817 12/08/2017 Duplicate of GZ-SS-565 (0-2')	1712222-05 GZ-SS-565 (0-2') 12/8/2017
<b>VOLATILE ORGANICS</b>														
Di-isopropyl ether	mg/kg	NE	NE	10,000	0.0036 U	0.0035 U	0.0046 U	0.0024 U	0.004 U	0.004 U	0.0045 U	0.0054 U	0.0033 U	0.0058 U
Ethyl tertiary-butyl ether	mg/kg	NE	NE	10,000	0.0036 U	0.0035 U	0.0046 U	0.0024 U	0.004 U	0.004 U	0.0045 U	0.0054 U	0.0033 U	0.0058 U
Ethylbenzene	mg/kg	62	10,000	10,000	0.0036 U	0.0035 U	0.0046 U	0.0024 U	0.004 U	0.004 U	0.0045 U	0.0054 U	0.0033 U	0.0058 U
Hexachlorobutadiene	mg/kg	NE	73	10,000	0.0036 U	0.0035 U	0.0046 U	0.0024 U	0.004 U	0.004 U	0.0045 U	0.0054 U	0.0033 U	0.0058 U
Isopropylbenzene	mg/kg	NE	10,000	10,000	0.0036 U	0.0035 U	0.0046 U	0.0024 U	0.004 U	0.004 U	0.0045 U	0.0054 U	0.0033 U	0.0058 U
Methyl tert-butyl ether	mg/kg	100	10,000	10,000	0.0036 U	0.0035 U	0.0046 U	0.0024 U	0.004 U	0.004 U	0.0045 U	0.0054 U	0.0033 U	0.0058 U
Methylene Chloride	mg/kg	NE	760	10,000	0.0178 U	0.0177 U	0.0229 U	0.0118 U	0.0199 U	0.0199 U	0.0224 U	0.0272 U	0.0166 U	0.029 U
Naphthalene	mg/kg	NE	10,000	10,000	0.0036 U	0.0035 U	0.0046 U	0.0024 U	0.004 U	0.004 U	0.0045 U	0.0054 U	0.0033 U	0.0058 U
n-Butylbenzene	mg/kg	NE	NE	10,000	0.0036 U	0.0035 U	0.0046 U	0.0024 U	0.004 U	0.004 U	0.0045 U	0.0054 U	0.0033 U	0.0058 U
n-Propylbenzene	mg/kg	NE	NE	10,000	0.0036 U	0.0035 U	0.0046 U	0.0024 U	0.004 U	0.004 U	0.0045 U	0.0054 U	0.0033 U	0.0058 U
sec-Butylbenzene	mg/kg	NE	NE	10,000	0.0036 U	0.0035 U	0.0046 U	0.0024 U	0.004 U	0.004 U	0.0045 U	0.0054 U	0.0033 U	0.0058 U
Styrene	mg/kg	64	190	10,000	0.0036 U	0.0035 U	0.0046 U	0.0024 U	0.004 U	0.004 U	0.0045 U	0.0054 U	0.0033 U	0.0058 U
tert-Butylbenzene	mg/kg	NE	NE	10,000	0.0036 U	0.0035 U	0.0046 U	0.0024 U	0.004 U	0.004 U	0.0045 U	0.0054 U	0.0033 U	0.0058 U
Tertiary-amyl methyl ether	mg/kg	NE	NE	10,000	0.0036 U	0.0035 U	0.0046 U	0.0024 U	0.004 U	0.004 U	0.0045 U	0.0054 U	0.0033 U	0.0058 U
Tetrachloroethene	mg/kg	4.2	110	10,000	0.0036 U	0.0035 U	0.0046 U	0.0024 U	0.004 U	0.004 U	0.0045 U	0.0054 U	0.0033 U	0.0058 U
Tetrahydrofuran	mg/kg	NE	NE	10,000	0.0036 U	0.0035 U	0.0046 U	0.0024 U	0.004 U	0.004 U	0.0045 U	0.0054 U	0.0033 U	0.0058 U
Toluene	mg/kg	54	10,000	10,000	0.0036 U	0.0035 U	0.0046 U	0.0024 U	0.004 U	0.004 U	0.0045 U	0.0054 U	0.0033 U	0.0058 U
trans-1,2-Dichloroethene	mg/kg	92	10,000	10,000	0.0036 U	0.0035 U	0.0046 U	0.0024 U	0.004 U	0.004 U	0.0045 U	0.0054 U	0.0033 U	0.0058 U
trans-1,3-Dichloropropene	mg/kg	NE	NE	10,000	0.0036 U	0.0035 U	0.0046 U	0.0024 U	0.004 U	0.004 U	0.0045 U	0.0054 U	0.0033 U	0.0058 U
Trichloroethene	mg/kg	20	520	10,000	0.0036 U	0.0035 U	0.0046 U	0.0024 U	0.004 U	0.004 U	0.0045 U	0.0054 U	0.0033 U	0.0058 U
Trichlorofluoromethane	mg/kg	NE	NE	10,000	0.0036 U	0.0035 U	0.0046 U	0.0024 U	0.004 U	0.004 U	0.0045 U	0.0054 U	0.0033 U	0.0058 U
Vinyl Acetate	mg/kg	NE	NE	10,000	0.0036 U	0.0035 U	0.0046 U	0.0024 U	0.004 U	0.004 U	0.0045 U	0.0054 U	0.0033 U	0.0058 U
Vinyl Chloride	mg/kg	NE	3	10,000	0.0071 U	0.0071 U	0.0092 U	0.0047 U	0.0079 U	0.0079 U	0.009 U	0.0109 U	0.0066 U	0.0116 U
o-Xylene	mg/kg	NE	10,000	10,000	0.0036 U	0.0035 U	0.0046 U	0.0024 U	0.004 U	0.004 U	0.0045 U	0.0054 U	0.0033 U	0.0058 U
m&p-Xylene	mg/kg	NE	10,000	10,000	0.0071 U	0.0071 U	0.0092 U	0.0047 U	0.0079 U	0.0079 U	0.009 U	0.0109 U	0.0066 U	0.0116 U
Total Xylenes	mg/kg	NE	10,000	10,000	0.0071 U	0.0071 U	0.0092 U	0.0047 U	0.0079 U	0.0079 U	0.009 U	0.0109 U	0.0066 U	0.0116 U

**Notes**

NE = Not Established

NA = Not Analyzed

NFA = North Fill Area

FGPA = Former Gas Plant Area

FPPA = Former Power Plant Area

SFA = South Fill Area

Detected concentrations are bolded.

Gray shaded cells indicates the concentration exceeds the RIDEM Method 1 Industrial/Commercial \Direct Exposure Criteria (I/C DEC).

Detection limits highlighted in blue and in italics exceed the RIDEM Method 1 Criteria.

Underlined concentrations exceed the RIDEM Method 1 GB Leachability Criteria.

A concentration with a bold border exceeds the Upper Concentration Limit.

Undetected analytes have a "U" qualifier.

Any analytes reported from a diluted run of the original analysis have a "D" qualifier.

Blank cells indicate a sample was not analyzed for that parameter

TP-597 is a blind duplicate for TP-506

TP-598 is a blind duplicate for TP-509

bd092617 is a blind duplicate for GZ-SS-520

BD0101017 is a blind duplicate for GZ-BW-505

BD-120817 is a blind duplicate for GZ-SS-565



Table 9  
Summary of LDI Analytical  
Quality Assurance/Quality Control Samples - TPH, PAHs, and Metals  
Former Tidewater Facility  
Pawtucket, RI

	Units	RIDEM GB Leachability Criteria	RIDEM Industrial/ Commercial DEC	RIDEM UCL	1709470-15  TP-597 (1-2') 09/15/2017 Duplicate of TP-506 (1-2')	1709470-11  TP-506 (1-2') 09/15/2017	1709493-11  TP-598 (0-2') 09/18/2017 Duplicate of TP-509 (0-2')	1709493-09  TP-509 (0-2') 09/18/2017	1709754-11  bd092617 (0-2') 09/26/2017 Duplicate of GZ-SS-520 (0-2')	1709754-03  GZ-SS-520 (0-2') 09/26/2017	1710285-05  BD0101017 10/10/2017 Duplicate of GZ-BW-505 (0-2')	1710285-04  GZ-BW-505 (0-2') 10/10/2017	1712222-06  BD-120817 12/08/2017 Duplicate of GZ-SS-565 (0-2')	1712222-05  GZ-SS-565 (0-2') 12/08/2017
<b>TOTAL PETROLEUM HYDROCARBON</b>														
Hydrocarbon Content	mg/kg	2,500	2,500	30,000	40.2 U	40.9 U	40.9 U	41.6 U	690 D	785 D	NA	NA	708 D	234 -
<b>METALS</b>														
Antimony	mg/kg	NE	820	10,000	2.01 U, D	1.89 U, D	5.17 U	5.41 U	1.89 U, D	1.99 U, D	NA	NA	2.57 U, D	1.88 U, D
Arsenic	mg/kg	NE	7	10,000	2.51 U	2.36 U	<b>3.44</b> -	<b>5.03</b> -	<b>4.77</b> -	<b>6.44</b> -	NA	NA	<b>15.7</b> D	<b>14.5</b> -
Beryllium	mg/kg	NE	1.3	10,000	<b>0.19</b> -	<b>0.2</b> -	<b>0.24</b> -	<b>0.34</b> -	<b>0.21</b> -	<b>0.32</b> -	NA	NA	0.14 U	<b>0.1</b> U
Cadmium	mg/kg	NE	1,000	10,000	0.5 U	0.47 U	0.52 U	0.54 U	0.47 U	<b>0.73</b> -	NA	NA	0.64 U	0.47 U
Chromium	mg/kg	NE	10,000	10,000	<b>2.24</b> -	<b>2.17</b> -	<b>6.84</b> -	<b>8.06</b> -	<b>5.36</b> -	<b>7.84</b> -	NA	NA	<b>8.52</b> -	<b>9.33</b> -
Copper	mg/kg	NE	10,000	10,000	<b>5.65</b> -	<b>6.77</b> -	<b>8.57</b> -	<b>13</b> -	<b>30.5</b> -	<b>55.2</b> -	NA	NA	<b>35.2</b> -	<b>33.2</b> -
Lead	mg/kg	NE	500	10,000	5.03 U	4.72 U	<b>7.35</b> -	<b>15.7</b> -	<b>151</b> -	<b>294</b> -	NA	NA	<b>44.6</b> -	<b>51.3</b> -
Nickel	mg/kg	NE	10,000	10,000	2.51 U	2.36 U	<b>6.39</b> -	<b>8.83</b> -	<b>8.55</b> -	<b>14.7</b> -	NA	NA	<b>8.88</b> -	<b>7.97</b> -
Silver	mg/kg	NE	10,000	10,000	0.5 U	0.47 U	0.52 U	0.54 U	0.47 U	0.5 U	NA	NA	0.64 U	0.47 U
Thallium	mg/kg	NE	140	10,000	2.01 U, D	1.89 U, D	5.17 U	5.41 U	1.89 U, D	1.99 U, D	NA	NA	2.57 U, D	1.88 U, D
Zinc	mg/kg	NE	10,000	10,000	<b>23.6</b> -	<b>32</b> -	<b>19.3</b> -	<b>28.8</b> -	<b>171</b> -	<b>325</b> -	NA	NA	<b>8.62</b> -	<b>12.4</b> -
Selenium	mg/kg	NE	10,000	10,000	2.01 U, D	1.89 U, D	5.17 U, D	5.41 U, D	1.89 U, D	1.99 U, D	NA	NA	2.57 U, D	1.88 U, D
Mercury	mg/kg	NE	610	10,000	0.035 U	0.03 U	0.036 U	0.031 U	<b>0.178</b> -	<b>0.274</b> -	NA	NA	<b>0.102</b> -	<b>0.077</b> -
<b>PAHS BY GCMS</b>														
2-Methylnaphthalene	mg/kg	NE	10,000	10,000	0.37 U	0.359 U	0.372 U	0.354 U	0.354 U	0.372 U	NA	NA	<b>1.57</b> -	0.428 U
Acenaphthene	mg/kg	NE	10,000	10,000	0.37 U	0.359 U	0.372 U	0.354 U	0.354 U	0.372 U	NA	NA	0.444 U	0.428 U
Acenaphthylene	mg/kg	NE	10,000	10,000	0.37 U	0.359 U	0.372 U	0.354 U	<b>2.16</b> -	<b>3.68</b> -	NA	NA	<b>4.48</b> -	<b>0.957</b> -
Anthracene	mg/kg	NE	10,000	10,000	0.37 U	0.359 U	0.372 U	0.354 U	<b>1.47</b> -	<b>2.02</b> -	NA	NA	<b>4.44</b> -	<b>0.834</b> -
Benzo [a] Anthracene	mg/kg	NE	7.8	10,000	0.37 U	0.359 U	0.372 U	0.354 U	<b>7.35</b> -	<b>9.89</b> D	NA	NA	<b>6.9</b> -	<b>1.74</b> -
Benzo [a] Pyrene	mg/kg	NE	0.8	10,000	0.185 U	0.18 U	0.187 U	0.177 U	<b>7.07</b> -	<b>10.1</b> D	NA	NA	<b>2.6</b> -	<b>0.733</b> -
Benzo [b] Fluoranthene	mg/kg	NE	7.8	10,000	0.37 U	0.359 U	0.372 U	0.354 U	<b>8.07</b> D	<b>14.5</b> D	NA	NA	<b>7.77</b> -	<b>2.35</b> -
Benzo [g,h,i] Perylene	mg/kg	NE	10,000	10,000	0.37 U	0.359 U	0.372 U	0.354 U	<b>3.41</b> -	<b>7.01</b> -	NA	NA	<b>4.99</b> -	<b>1.4</b> -
Benzo [k] Fluoranthene	mg/kg	NE	78	10,000	0.37 U	0.359 U	0.372 U	0.354 U	<b>7.55</b> D	<b>5.46</b> D	NA	NA	<b>6.78</b> -	<b>1.5</b> -
Chrysene	mg/kg	NE	780	10,000	0.185 U	0.18 U	0.187 U	0.177 U	<b>6.34</b> -	<b>8.08</b> -	NA	NA	<b>8.66</b> -	<b>2.55</b> -
Dibenzo [a,h] Anthracene	mg/kg	NE	0.8	10,000	0.185 U	0.18 U	0.187 U	0.177 U	<b>1.67</b> -	<b>3.45</b> -	NA	NA	<b>2.92</b> -	<b>0.788</b> -
Fluoranthene	mg/kg	NE	10,000	10,000	0.37 U	0.359 U	0.372 U	0.354 U	<b>13.8</b> D	<b>11.5</b> D	NA	NA	<b>10.4</b> -	<b>2.8</b> -
Fluorene	mg/kg	NE	10,000	10,000	0.37 U	0.359 U	0.372 U	0.354 U	0.354 U	0.372 U	NA	NA	0.444 U	0.428 U
Indeno [1,2,3-cd] Pyrene	mg/kg	NE	7.8	10,000	0.37 U	0.359 U	0.372 U	0.354 U	<b>3.42</b> -	<b>6.82</b> -	NA	NA	<b>5.13</b> -	<b>1.34</b> -
Naphthalene	mg/kg	NE	10,000	10,000	0.37 U	0.359 U	0.372 U	0.354 U	0.354 U	0.372 U	<b>2.1</b> -	<b>3.24</b> -	<b>2.47</b> -	0.428 U
Phenanthrene	mg/kg	NE	10,000	10,000	0.37 U	0.359 U	0.372 U	0.354 U	<b>4.64</b> -	<b>3.12</b> -	NA	NA	<b>5.14</b> -	<b>1.71</b> -
Pyrene	mg/kg	NE	10,000	10,000	0.37 U	0.359 U	0.372 U	0.354 U	<b>10.4</b> D	<b>13.9</b> D	NA	NA	<b>10.6</b> -	<b>3.1</b> -
<b>SUBCONTRACTED ANALYTES</b>														
Total Cyanide	mg/kg	NE	10,000	10,000	1.02 U	0.99 U	1.06 U	1.1 U	4.22 -	<b>8.96</b> -	NA	NA	1.06 U	<b>25.5</b> -

**Notes**

NE = Not Established

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NFA = North Fill Area

FGPA = Former Gas Plant Area

FPPA = Former Power Plant Area

SFA = South Fill Area

Detected concentrations are bolded.

Gray shaded cells indicates the concentration exceeds the RIDEM Method 1 Industrial/Commercial \Direct Exposure Criteria (I/C DEC).

Detection limits highlighted in blue and in italics exceed the RIDEM Method 1 Criteria.

Underlined concentrations exceed the RIDEM Method 1 GB Leachability Criteria.

A concentration with a bold border exceeds the Upper Concentration Limit.

Undetected analytes have a "U" qualifier.

Any analytes reported from a diluted run of the original analysis have a "D" qualifier.

Blank cells indicate a sample was not analyzed for that parameter

TP-597 is a blind duplicate for TP-506

TP-598 is a blind duplicate for TP-509

bd092617 is a blind duplicate for GZ-SS-520

BD0101017 is a blind duplicate for GZ-BW-505

BD-120817 is a blind duplicate for GZ-SS-565

**Table 10**  
**Summary of LDI Analytical**  
**Quality Assurance/Quality Control Samples - PCBs**  
**Former Tidewater Facility**  
**Pawtucket, RI**

	Units	RIDEM GB Leachability Criteria	RIDEM Industrial/ Commercial DEC	RIDEM UCL	1709820-19  BD-092817 9/28/2017 Duplicate of GZ-SS-FT-501 (0-0.25')		1709820-01  GZ-SS-FT-501 (0-0.25') 9/28/2017  (Soil)	
<b>POLYCHLORINATED BIPHENYLS</b>								
Aroclor 1268	mg/kg	10	10	10,000	0.05	U	0.06	U
Aroclor 1262	mg/kg	10	10	10,000	0.05	U	0.06	U
Aroclor 1260	mg/kg	10	10	10,000	<b>0.3</b>	-	<b>0.3</b>	-
Aroclor 1254	mg/kg	10	10	10,000	0.05	U	0.06	U
Aroclor 1248	mg/kg	10	10	10,000	0.05	U	0.06	U
Aroclor 1242/1016	mg/kg	10	10	10,000	0.05	U	0.06	U
Aroclor 1232	mg/kg	10	10	10,000	0.05	U	0.06	U
Aroclor 1221	mg/kg	10	10	10,000	0.05	U	0.06	U

**Notes**

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SFA = South Fill Area

**Detected concentrations are bolded.**

**Gray shaded cells indicates the concentration exceeds the RIDEM Method 1 Industrial/Commercial \Direct Exposure Criteria (I/C DEC).**

Detection limits highlighted in *blue and in italics* exceed the RIDEM Method 1 Criteria.

Underlined concentrations exceed the RIDEM Method 1 GB Leachability Criteria.

**A concentration with a bold border exceeds the Upper Concentration Limit.**

Undetected analytes have a "U" qualifier.

Any analytes reported from a diluted run of the original analysis have a "D" qualifier.

Blank cells indicate a sample was not analyzed for that parameter

BD-092817 is a blind duplicate for GZ-SS-FT-501

**Table 11**  
**List of Wells to be Abandoned**  
**Former Tidewater Facility**  
**Pawtucket, RI**

Site Area	Well ID	Measured Well Depth (Feet below Top of PVC)	Top of PVC Elevation (Feet)	Range of LNAPL Observed (feet)	Range of DNAPL Observed (feet)
NFA	MW-5	11.60	31.31	NP	NP
NFA	MW-204	16.77	8.60	NP	NP
NFA	MW-205	15.00	11.47	NP	NP
NFA	MW-206	28.77	36.28	NP	NP
FGPA	MW-202	13.80	13.61	NP	NP
FGPA	MW-203	14.80	9.45	NP	NP
FGPA	MW-207	11.75	13.70	NP	NP
FGPA	MW-209	21.05	23.90	NP	NP
FGPA	MW-336	15.00	11.87	NP	NP
FPPA	M&E MW-1	15.05	8.39	NP	NP
FPPA	M&E MW-4	7.81	-	NP	NP
FPPA	MW-101	16.00	10.15	NP	NP
FPPA	MW-102	26.80	18.86	NP	NP
FPPA	MW-103	16.90	10.56	NP	NP
FPPA	MW-104	14.90	10.72	NP	NP
FPPA	MW-105	27.55	21.35	NP	NP
FPPA	MW-315S	26.40	10.15	NP	NP
FPPA	MW-315D	41.70	9.82	NP	NP
FPPA	MW-317S	27.40	24.65	NP	NP
FPPA	MW-317D	36.20	24.72	NP	NP
FPPA	MW-338S	18.45	13.18	NP	NP
FPPA	MW-338D	39.65	12.73	NP	NP
FPPA	MW-400	24.30	28.85	NP	NP
FPPA	MW-401	19.30	24.18	NP	NP
SFA	MW-318D	43.60	17.80	NP	NP
SFA	MW-321S	12.55	5.87	NP	NP
SFA	MW-321D	29.10	5.89	NP	NP
SFA	MW-319S	27.10	19.12	NP	NP
SFA	MW-319D	43.85	19.56	NP	NP

**Notes**

NFA = North Fill Area  
FGPA = Former Gas Plant Area  
FPPA = Former Power Plant Area  
SFA = South Fill Area

NP - Indicates No Product observed.

1. This table presents top of PVC Elevations surveyed December 2017 using the NAVD 88 Datum.

**Table 12**  
**List of Long Term Groundwater Monitoring Wells**  
**Former Tidewater Facility**  
**Pawtucket, RI**

Site Area	Well ID	Measured Well Depth (Feet below Top of PVC)	Top of PVC Elevation (Feet)	Range of LNAPL Observed (feet)	Range of DNAPL Observed (feet)
NFA	MW-7	27.45	31.14	NP	NP
NFA	MW-310S	17.35	8.76	NP	NP
NFA	MW-310D	36.20	8.31	NP	NP
NFA	MW-311	22.00	9.35	NP	NP
FGPA	MW-201	15.00	13.01	NP	NP
FGPA	MW-208	21.75	27.33	NP	NP
FGPA	MW-210	17.28	10.61	NP-2.06	NP
FGPA	MW-3	17.00	10.59	NP-trace	NP
FGPA	MW-4	17.65	9.92	NP	trace
FGPA	MW-303	41.85	8.48	NP	1.45 - 5.74
FGPA	MW-312S	23.55	9.94	0.1 - 1.05	NP
FGPA	MW-312D	31.90	9.82	NP	NP
FGPA	MW-313S	24.90	11.14	NP-trace	NP
FGPA	MW-313D	47.35	11.33	NP	NP
FGPA	MW-326S	26.60	11.90	NP-trace	NP
FGPA	MW-326D	45.05	11.26	NP	NP
FGPA	MW-333S	18.30	11.67	NP	NP
FGPA	MW-333D	45.20	11.56	NP	NP
FGPA	MW-335S	15.75	10.75	NP-0.01	NP
FGPA	MW-335D	36.50	11.24	NP	NP
FGPA	MW-339S	12.35	14.52	NP	NP-trace
FGPA	MW-339D	20.95	14.80	NP	trace
FGPA	MW-341	30.10	18.70	NP	0.31 - 0.76
FPPA	M&E MW-2	13.85	9.97	NP	NP
FPPA	M&E MW-5 (1)	16.88	8.14	NP-0.99	NP
FPPA	MW-6	19.03	12.73	NP	NP
FPPA	MW-109	19.30	13.33	NP	NP
FPPA	MW-314S	24.50	9.58	NP	NP
FPPA	MW-314D	43.40	9.59	NP	NP
FPPA	MW-316S	22.30	23.81	NP	NP
FPPA	MW-316D	31.55	23.97	NP	NP
FPPA	MW-337	20.00	12.75	NP	NP
SFA	MW-1	23.20	18.88	NP	trace
SFA	MW-107	27.35	21.08	NP	NP
SFA	MW-318S	27.00	18.14	NP	NP
SFA	MW-320S	10.95	7.05	NP	0.15 - 1.15
SFA	MW-320D	25.70	8.02	NP	trace - 14.52
SFA	MW-334S	28.80	20.54	NP	NP
SFA	MW-334D	43.20	20.74	NP	NP

**Notes**

NFA = North Fill Area  
FGPA = Former Gas Plant Area  
FPPA = Former Power Plant Area  
SFA = South Fill Area

NP - Indicates No Product observed.

1. Found to have casing broken on December 3, 2010.
2. This table presents top of PVC Elevations surveyed December 2017 using the NAVD 88 Datum.
3. Trace = less than 0.01 inches.
4. Monitoring wells included in the natural attenuation groundwater monitoring program are highlighted in red.



## DRAWINGS



# REMEDIAL ACTION WORK PLAN FORMER TIDEWATER FACILITY PAWTUCKET, RHODE ISLAND

## JUNE 2018

PREPARED FOR:

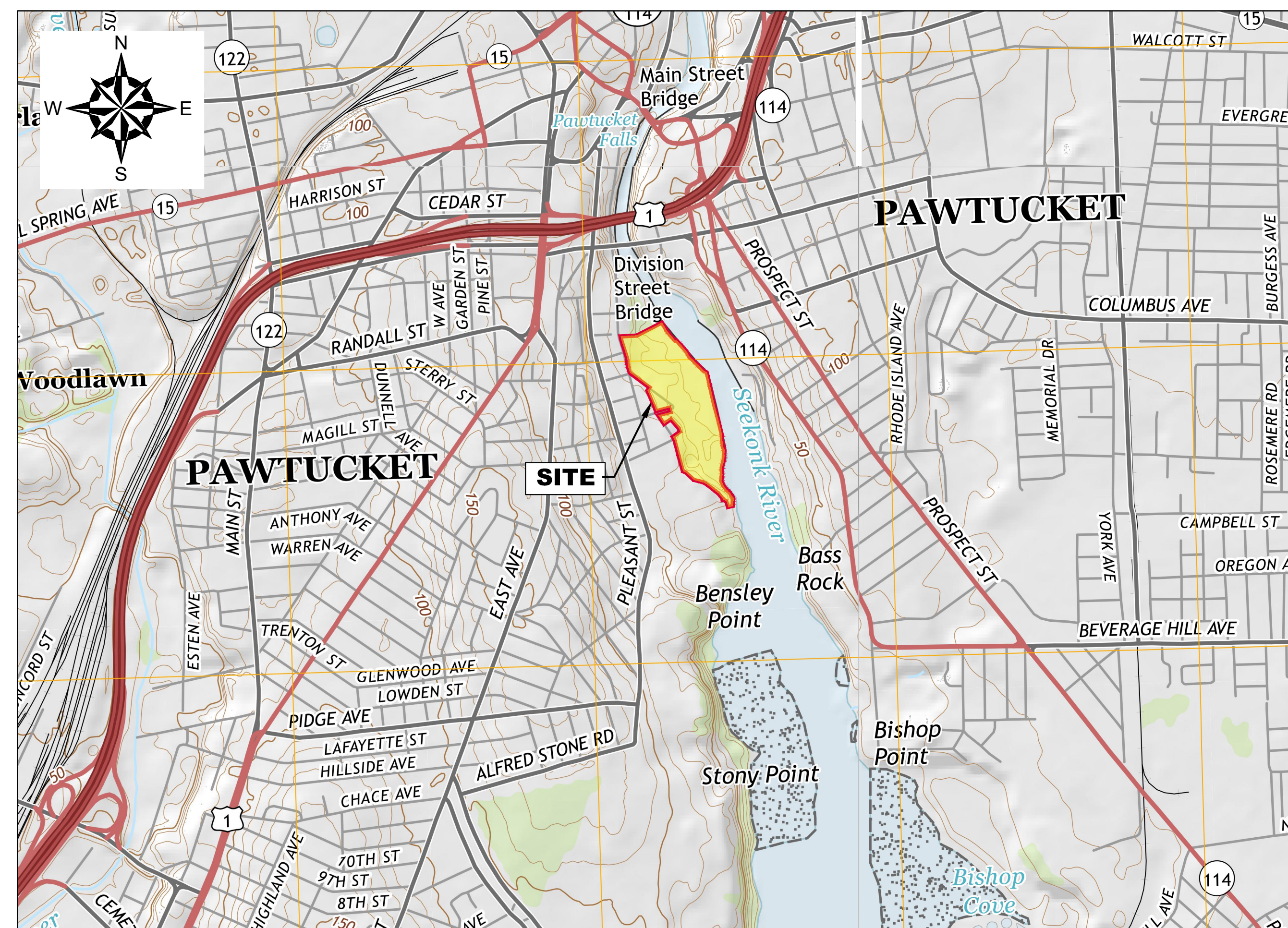
**nationalgrid**

PREPARED BY:



**GZA**  
GZA GEORENVIROMENTAL, INC.  
530 BROADWAY  
PROVIDENCE, RHODE ISLAND 02909

TODD R. GREENE  
Mo. [Signature]  
REGISTERED  
PROFESSIONAL ENGINEER  
CIVIL



**PROJECT LOCUS MAP**

SOURCE: USGSSTORE.GOV



INDEX OF DRAWINGS	
DWG #	TITLE
1	COVER SHEET (LOCUS PLAN & INDEX OF DRAWINGS)
2A	AERIAL SITE PLAN
2B	EXISTING CONDITIONS PLAN NORTHERN PORTION OF THE SITE
2C	EXISTING CONDITIONS PLAN SOUTHERN PORTION OF THE SITE
3A	EXPLORATION LOCATION PLAN NORTHERN PORTION OF THE SITE
3B	EXPLORATION LOCATION PLAN SOUTHERN PORTION OF THE SITE
4A	SHALLOW SURFACE SOIL DISTRIBUTION (0-2') VOC, TPH, PAH IMPACTS NORTHERN PORTION OF THE SITE
4B	SHALLOW SURFACE SOIL DISTRIBUTION (0-2') VOC, TPH, PAH IMPACTS SOUTHERN PORTION OF THE SITE
5A	SHALLOW SURFACE SOIL DISTRIBUTION (0-2') INORGANIC IMPACTS NORTHERN PORTION OF THE SITE
5B	SHALLOW SURFACE SOIL DISTRIBUTION (0-2') INORGANIC IMPACTS SOUTHERN PORTION OF THE SITE
6A	SUBSURFACE SOIL DISTRIBUTION (> 2') VOC, TPH, PAH IMPACTS NORTHERN PORTION OF THE SITE
6B	SUBSURFACE SOIL DISTRIBUTION (> 2') VOC, TPH, PAH IMPACTS SOUTHERN PORTION OF THE SITE
7A	SUBSURFACE SOIL DISTRIBUTION (> 2') INORGANIC IMPACTS NORTHERN PORTION OF THE SITE
7B	SUBSURFACE SOIL DISTRIBUTION (> 2') INORGANIC IMPACTS SOUTHERN PORTION OF THE SITE
8	PCB TESTING RESULTS FORMER TRANSFORMER AREA
9A	SUBSURFACE PROFILE A
9B	SUBSURFACE PROFILE B
10	REMEDIAL LAYOUT PLAN
11	TEMPORARY FACILITIES & SITE CONTROL PLAN
12	SEDIMENTATION AND EROSION CONTROL DETAILS
13	ENGINEERED CAP DETAILS
14	CONTAINMENT WALL LAYOUT
15	CONTAINMENT WALL SECTIONS A & B
16	CONTAINMENT WALL SECTIONS C & D
17	CONTAINMENT WALL SECTIONS E & F
18	FINAL CONDITIONS PLAN

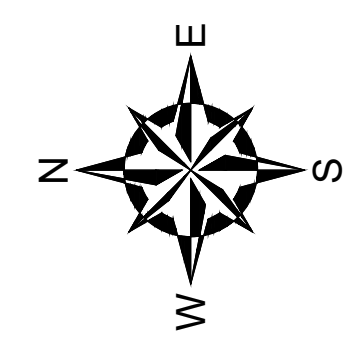
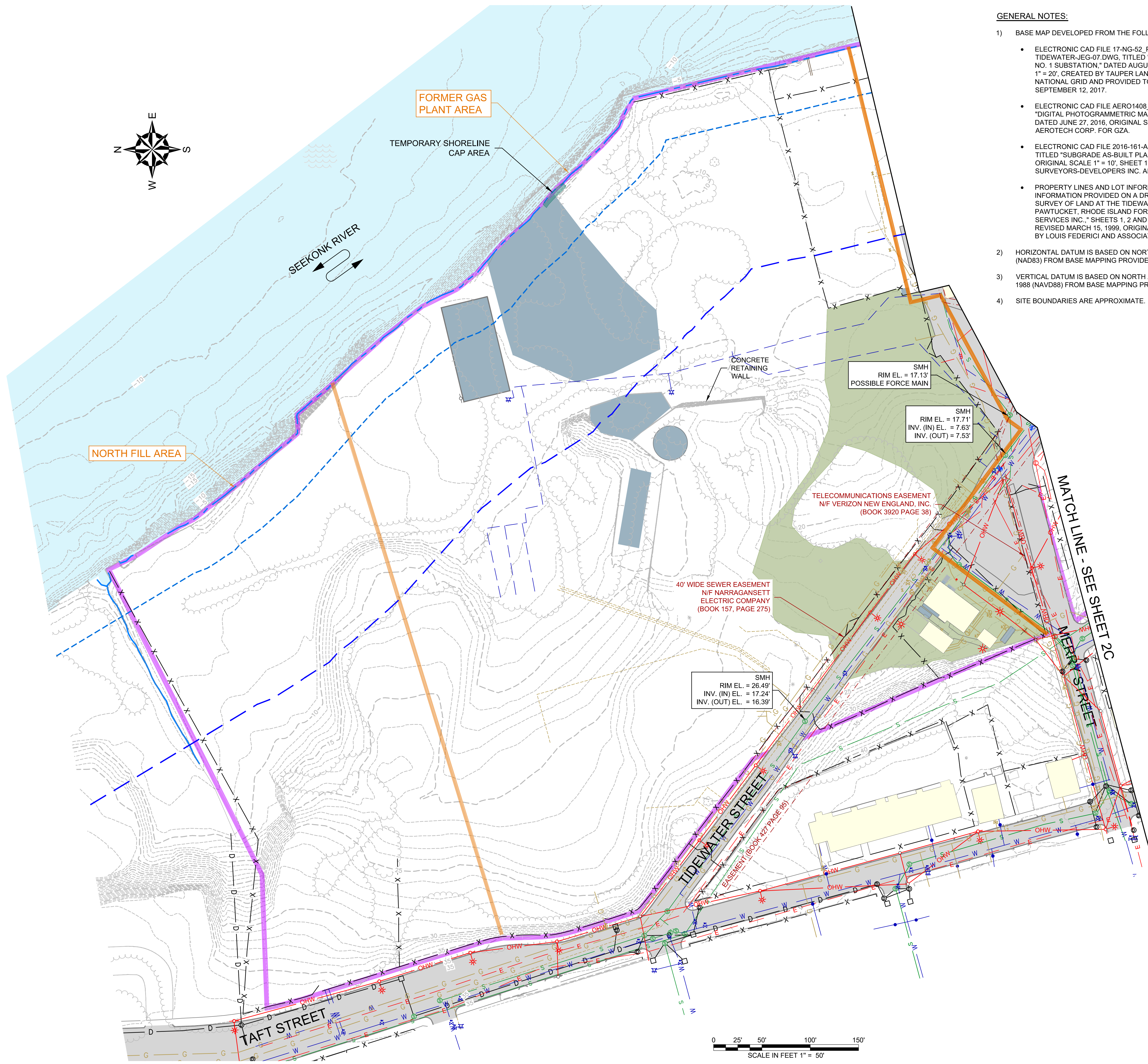
THE INFORMATION SHOWN ON THE DRAWING IS SOLELY FOR USE BY NATIONAL GRID OR THE NATIONAL GRID'S DESIGNATED REPRESENTATIVE FOR THE SPECIFIC PROJECT AND LOCATION IDENTIFIED ON THE DRAWING. THE DRAWING SHALL NOT BE TRANSFERRED, REUSED, COPIED, OR ALTERED IN ANY MANNER FOR USE AT ANY OTHER LOCATION OR FOR ANY OTHER PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF GZA AND NATIONAL GRID. ANY TRANSFER, REUSE, OR MODIFICATION TO THE DRAWING BY OTHERS, WITHOUT THE PRIOR WRITTEN EXPRESS CONSENT OF GZA AND NATIONAL GRID, WILL BE AT THE USER'S SOLE RISK AND WITHOUT ANY RISK OR LIABILITY TO GZA AND NATIONAL GRID.







2018 - GZA GeoEnvironmental, Inc. GZA-2018-0004-USA/PAW/PAW-17-7-10-DWG EXISTING CONDITIONS PLAN NORTHERN PORTION OF THE SITE JUNE 13, 2018 8:24 AM USA THEBAULT



**GENERAL NOTES:**

- 1) BASE MAP DEVELOPED FROM THE FOLLOWING:
  - ELECTRONIC CAD FILE 17-NG-52\_PAWTUCKET NO1 SUB TIDEWATER-JEG-07.DWG, TITLED "AS BUILT PLAN PAWTUCKET NO. 1 SUBSTATION," DATED AUGUST 22, 2017, ORIGINAL SCALE 1" = 20', CREATED BY TAUPER LAND SURVEY, INC. FOR NATIONAL GRID AND PROVIDED TO GZA ON SEPTEMBER 12, 2017.
  - ELECTRONIC CAD FILE AERO1408\_PROJECT.DWG, TITLED "DIGITAL PHOTOGRAMMETRIC MAPPING FOR TIDEWATER," DATED JUNE 27, 2016, ORIGINAL SCALE 1" = 40', CREATED BY AEROTECH CORP. FOR GZA.
  - ELECTRONIC CAD FILE 2016-161-AS BUILT-MID-WAY.DWG, TITLED "SUBGRADE AS-BUILT PLAN," DATED JULY 2016, ORIGINAL SCALE 1" = 10', SHEET 1 OF 1, CREATED BY NATIONAL SURVEYORS-DEVELOPERS INC. AND PROVIDED BY NRC.
  - PROPERTY LINES AND LOT INFORMATION ESTABLISHED FROM INFORMATION PROVIDED ON A DRAWING TITLED "PERIMETER SURVEY OF LAND AT THE TIDEWATER FORMER MGP SITE IN PAWTUCKET, RHODE ISLAND FOR ATLANTIC ENVIRONMENTAL SERVICES INC.," SHEETS 1, 2 AND 3, DATED APRIL 1996, REVISED MARCH 15, 1999, ORIGINAL SCALE 1"=60', DEVELOPED BY LOUIS FEDERICI AND ASSOCIATES.
- 2) HORIZONTAL DATUM IS BASED ON NORTH AMERICAN DATUM 1983 (NAD83) FROM BASE MAPPING PROVIDED BY AEROTECH CORP.
- 3) VERTICAL DATUM IS BASED ON NORTH AMERICAN VERTICAL DATUM 1988 (NAVD88) FROM BASE MAPPING PROVIDED BY AEROTECH CORP.
- 4) SITE BOUNDARIES ARE APPROXIMATE.

**LEGEND:**

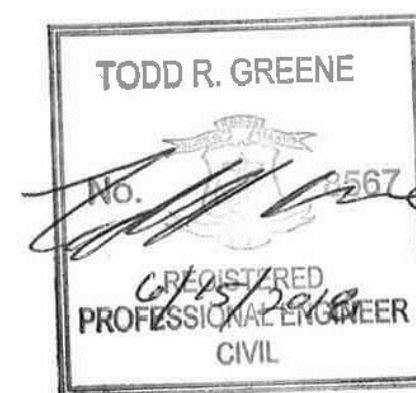
- EXISTING CONTOUR (MAJOR 5 FOOT INTERVAL)
- EXISTING CONTOUR (MINOR 1 FOOT INTERVAL)
- EXISTING PAVEMENT
- EASEMENT AREA
- 200-FOOT CRMC SETBACK
- 50-FOOT BUFFER
- EDGE OF WATER
- EXISTING FENCE
- SITE BOUNDARY
- SITE AREA BOUNDARY
- TREELINE
- EXISTING BUILDING
- EXISTING CONCRETE SURFACE
- EXISTING COMPACTED GRAVEL/STONE SURFACE

**UTILITY LEGEND:**

- DRAIN MANHOLE
- ELECTRIC MANHOLE
- SEWER MANHOLE
- CATCH BASIN
- UTILITY POLE
- LIGHT POLE
- LIGHT POST
- HYDRANT
- WATER VALVE
- GAS VALVE
- CURB BOX
- EXISTING WATER LINE
- PRESUMED ABANDONED WATER LINE
- EXISTING GAS LINE
- PRESUMED ABANDONED GAS LINE
- OHW EXISTING OVERHEAD LINE
- HVOHW EXISTING HIGH VOLTAGE OVERHEAD LINE
- E EXISTING UNDERGROUND ELECTRIC
- S EXISTING SEWER LINE
- D EXISTING DEDICATED STORMWATER LINE
- T EXISTING COMMUNICATIONS LINE
- UNKNOWN UTILITY LINE

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<b>REMEDIAL ACTION WORK PLAN</b>			
<b>FORMER TIDEWATER FACILITY</b>			
<b>PAWTUCKET, RHODE ISLAND</b>			
<b>EXISTING CONDITIONS PLAN</b>			
<b>NORTHERN PORTION OF THE SITE</b>			
PREPARED BY:		PREPARED FOR:	
 <b>GZA GeoEnvironmental, Inc.</b> Engineers and Scientists www.gza.com		 <b>nationalgrid</b>	
PROJ MGR:	DR:	REVIEWED BY:	CHECKED BY:
DESIGNED BY:	SLM:	DRAWN BY:	LDT:
DATE:	JUNE 2018	PROJECT NO.:	43654.00
		SCALE:	AS NOTED
		REVISION NO.:	0
			<b>DRAWING</b>
			<b>2B</b>
			SHEET NO. 3 OF 28



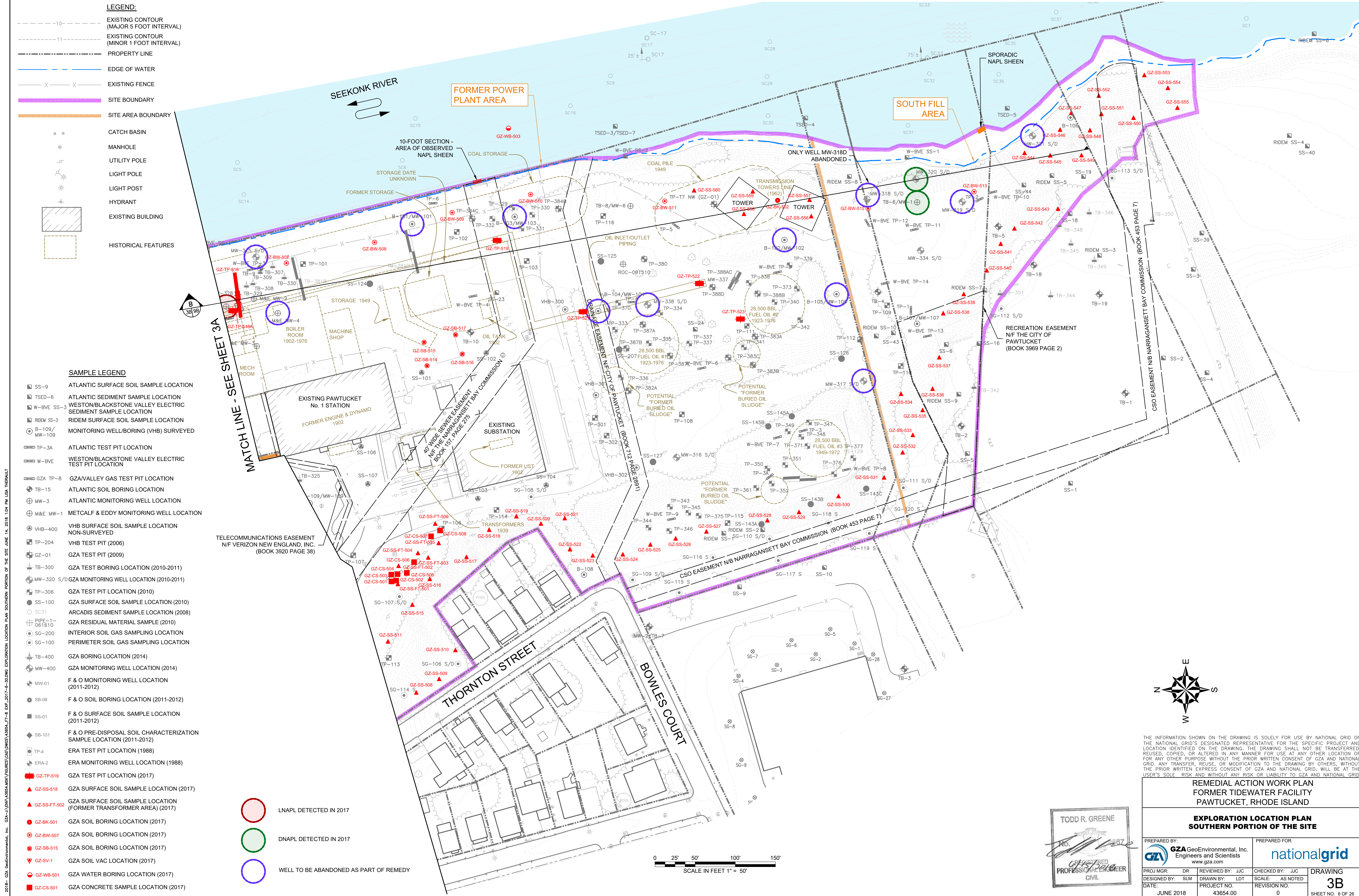










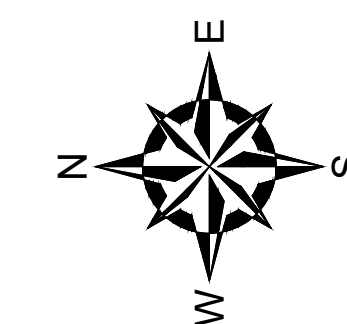


**LEGEND:**

- - - - -10- - - - - EXISTING CONTOUR (MAJOR 5 FOOT INTERVAL)
- - - - -11- - - - - EXISTING CONTOUR (MINOR 1 FOOT INTERVAL)
- - - - - PROPERTY LINE
- - - - - EDGE OF WATER
- - - - - EXISTING FENCE
- - - - - SITE BOUNDARY
- - - - - SITE AREA BOUNDARY
- CATCH BASIN
- MANHOLE
- UTILITY POLE
- LIGHT POLE
- LIGHT POST
- HYDRANT
- ▭ EXISTING BUILDING
- ▭ HISTORICAL FEATURES

**SAMPLE LEGEND**

- ▣ SS-9 ATLANTIC SURFACE SOIL SAMPLE LOCATION
- ▣ TSED-6 ATLANTIC SEDIMENT SAMPLE LOCATION
- ▣ W-BVE SS-3 WESTON/BLACKSTONE VALLEY ELECTRIC SEDIMENT SAMPLE LOCATION
- ▣ RIDEM SS-3 RIDEM SURFACE SOIL SAMPLE LOCATION
- B-109/MW-109 MONITORING WELL/BORING (VHB) SURVEYED
- ▣ TP-3A ATLANTIC TEST PIT LOCATION
- ▣ W-BVE WESTON/BLACKSTONE VALLEY ELECTRIC TEST PIT LOCATION
- ▣ GZA TP-8 GZA VALLEY GAS TEST PIT LOCATION
- TB-15 ATLANTIC SOIL BORING LOCATION
- MW-3 ATLANTIC MONITORING WELL LOCATION
- M&E MW-1 METCALF & EDDY MONITORING WELL LOCATION
- VHB-400 VHB SURFACE SOIL SAMPLE LOCATION NON-SURVEYED
- ▣ TP-204 VHB TEST PIT (2006)
- ▣ GZ-01 GZA TEST PIT (2009)
- TB-300 GZA TEST BORING LOCATION (2010-2011)
- MW-320 S/D GZA MONITORING WELL LOCATION (2010-2011)
- ▣ TP-306 GZA TEST PIT LOCATION (2010)
- SS-100 GZA SURFACE SOIL SAMPLE LOCATION (2010)
- SC31 ARCADIS SEDIMENT SAMPLE LOCATION (2008)
- PIPE-1-061610 GZA RESIDUAL MATERIAL SAMPLE (2010)
- SG-200 INTERIOR SOIL GAS SAMPLING LOCATION
- SG-100 PERIMETER SOIL GAS SAMPLING LOCATION
- TB-400 GZA BORING LOCATION (2014)
- MW-400 GZA MONITORING WELL LOCATION (2014)
- MW-01 F & O MONITORING WELL LOCATION (2011-2012)
- SB-08 F & O SOIL BORING LOCATION (2011-2012)
- ▣ SS-01 F & O SURFACE SOIL SAMPLE LOCATION (2011-2012)
- ▣ SB-101 F & O PRE-DISPOSAL SOIL CHARACTERIZATION SAMPLE LOCATION (2011-2012)
- ▣ TP-4 ERA TEST PIT LOCATION (1988)
- ▣ ERA-2 ERA MONITORING WELL LOCATION (1988)
- ▣ GZ-TP-519 GZA TEST PIT LOCATION (2017)
- ▣ GZ-SS-518 GZA SURFACE SOIL SAMPLE LOCATION (2017)
- ▣ GZ-SS-FT-502 GZA SURFACE SOIL SAMPLE LOCATION (FORMER TRANSFORMER AREA) (2017)
- GZ-BK-501 GZA SOIL BORING LOCATION (2017)
- GZ-BW-507 GZA SOIL BORING LOCATION (2017)
- GZ-SB-515 GZA SOIL BORING LOCATION (2017)
- GZ-SV-1 GZA SOIL VAC LOCATION (2017)
- GZ-WB-501 GZA WATER BORING LOCATION (2017)
- ▣ GZ-CS-501 GZA CONCRETE SAMPLE LOCATION (2017)
- LNAPL DETECTED IN 2017
- DNAPL DETECTED IN 2017
- WELL TO BE ABANDONED AS PART OF REMEDY



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<b>REMEDIAL ACTION WORK PLAN FORMER TIDEWATER FACILITY PAWTUCKET, RHODE ISLAND</b>			
<b>EXPLORATION LOCATION PLAN SOUTHERN PORTION OF THE SITE</b>			
PREPARED BY: <b>GZA</b> GeoEnvironmental, Inc. Engineers and Scientists www.gza.com		PREPARED FOR: <b>nationalgrid</b>	
PROJ MGR: SLM	DESIGNED BY: SLM	REVIEWED BY: JJC	CHECKED BY: JJC
DATE: JUNE 2018	PROJECT NO: 43654.00	DRAWN BY: LDT	SCALE: AS NOTED
		REVISION NO: 0	REVISION NO: 0
			<b>3B</b>
			SHEET NO. 6 OF 28

TODD R. GREENE  
No. 015167  
PROFESSIONAL REGISTERED CIVIL ENGINEER

2018 - GZA GeoEnvironmental, Inc. GZA-VA-DNA-MSA-USA-TOURISM-ADVISORY-000000-EXP-2017-04-30-DRAWING EXPLORATION LOCATION PLAN SOUTHERN PORTION OF THE SITE DATE 14, 2018 1:04 PM LISA THERIAULT







**LEGEND:**

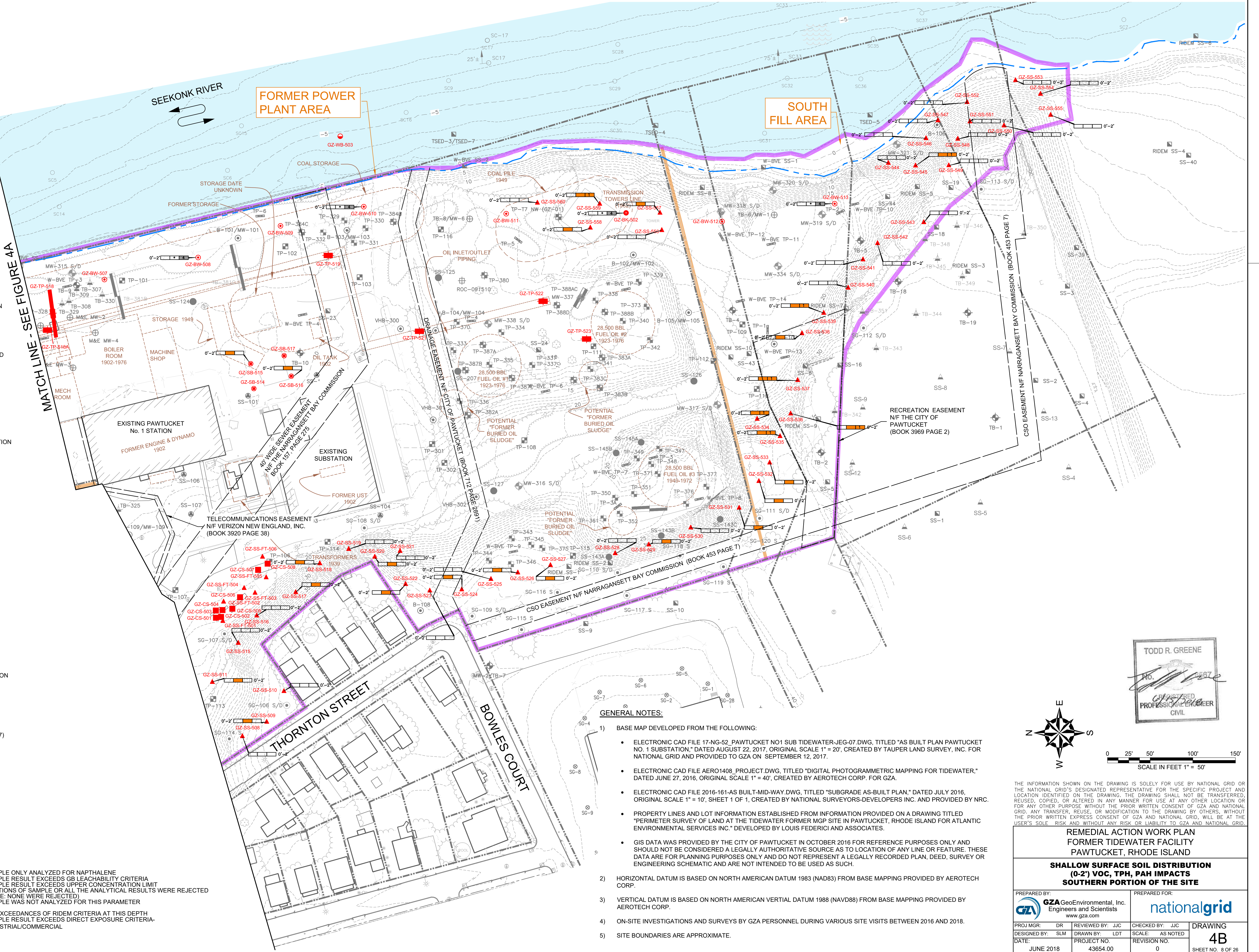
- - - - - 10' - - - - - EXISTING CONTOUR (MAJOR 5 FOOT INTERVAL)
- - - - - 11' - - - - - EXISTING CONTOUR (MINOR 1 FOOT INTERVAL)
- - - - - PROPERTY LINE
- - - - - EDGE OF WATER
- X - X - - - - EXISTING FENCE
- - - - - SITE BOUNDARY
- - - - - SITE AREA BOUNDARY
- - - - - - CATCH BASIN
- - - - - - MANHOLE
- - - - - - UTILITY POLE
- - - - - - LIGHT POLE
- - - - - - LIGHT POST
- - - - - - HYDRANT
- ▭ - - - - - EXISTING BUILDING
- ▭ - - - - - HISTORICAL FEATURES

**SAMPLE LEGEND**

- SS-9 ATLANTIC SURFACE SOIL SAMPLE LOCATION
- TSED-6 ATLANTIC SEDIMENT SAMPLE LOCATION
- W-BVE SS-3 WESTON/BLACKSTONE VALLEY ELECTRIC SEDIMENT SAMPLE LOCATION
- RIDEM SS-3 RIDEM SURFACE SOIL SAMPLE LOCATION
- B-109/MW-109 MONITORING WELL/BORING (VHB) SURVEYED
- TP-3A ATLANTIC TEST PIT LOCATION
- W-BVE WESTON/BLACKSTONE VALLEY ELECTRIC TEST PIT LOCATION
- GZA TP-8 GZA/VALLEY GAS TEST PIT LOCATION
- TB-15 ATLANTIC SOIL BORING LOCATION
- MW-3 ATLANTIC MONITORING WELL LOCATION
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- MW-320 S/GZA MONITORING WELL LOCATION (2010-2011)
- TP-306 GZA TEST PIT LOCATION (2010)
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- PIPE-1-061610 GZA RESIDUAL MATERIAL SAMPLE (2010)
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- SB-101 F & O PRE-DISPOSAL SOIL CHARACTERIZATION SAMPLE LOCATION (2011-2012)
- TP-4 ERA TEST PIT LOCATION (1988)
- ERA-2 ERA MONITORING WELL LOCATION (1988)
- GZ-TP-519 GZA TEST PIT LOCATION (2017)
- GZ-SS-518 GZA SURFACE SOIL SAMPLE LOCATION (2017)
- GZ-SS-FT-502 GZA SURFACE SOIL SAMPLE LOCATION (FORMER TRANSFORMER AREA) (2017)
- GZ-BK-501 GZA SOIL BORING LOCATION (2017)
- GZ-BW-507 GZA SOIL BORING LOCATION (2017)
- GZ-SB-515 GZA SOIL BORING LOCATION (2017)
- GZ-SV-1 GZA SOIL VAC LOCATION (2017)
- GZ-WB-501 GZA WATER BORING LOCATION (2017)
- GZ-CS-501 GZA CONCRETE SAMPLE LOCATION (2017)

**IMPACTS LEGEND:**

- DEPTH OF SAMPLE
- TPH
- PAHs
- VOCs
- SAMPLE ONLY ANALYZED FOR NAPHTHALENE
- SAMPLE RESULT EXCEEDS GB LEACHABILITY CRITERIA
- SAMPLE RESULT EXCEEDS UPPER CONCENTRATION LIMIT
- PORTIONS OF SAMPLE OR ALL THE ANALYTICAL RESULTS WERE REJECTED (NOTE: NONE WERE REJECTED)
- SAMPLE WAS NOT ANALYZED FOR THIS PARAMETER
- NO EXCEEDANCES OF RIDEM CRITERIA AT THIS DEPTH
- SAMPLE RESULT EXCEEDS DIRECT EXPOSURE CRITERIA-INDUSTRIAL/COMMERCIAL



- GENERAL NOTES:**
- BASE MAP DEVELOPED FROM THE FOLLOWING:
    - ELECTRONIC CAD FILE 17-NG-52\_PAWTUCKET NO1 SUB TIDEWATER-JEG-07.DWG, TITLED "AS BUILT PLAN PAWTUCKET NO. 1 SUBSTATION," DATED AUGUST 22, 2017, ORIGINAL SCALE 1" = 20', CREATED BY TAUPER LAND SURVEY, INC. FOR NATIONAL GRID AND PROVIDED TO GZA ON SEPTEMBER 12, 2017.
    - ELECTRONIC CAD FILE AERO1408\_PROJECT.DWG, TITLED "DIGITAL PHOTOGRAMMETRIC MAPPING FOR TIDEWATER," DATED JUNE 27, 2016, ORIGINAL SCALE 1" = 40', CREATED BY AEROTECH CORP. FOR GZA.
    - ELECTRONIC CAD FILE 2016-161-AS-BUILT-MID-WAY.DWG, TITLED "SUBGRADE AS-BUILT PLAN," DATED JULY 2016, ORIGINAL SCALE 1" = 10', SHEET 1 OF 1, CREATED BY NATIONAL SURVEYORS-DEVELOPERS INC. AND PROVIDED BY NRC.
    - PROPERTY LINES AND LOT INFORMATION ESTABLISHED FROM INFORMATION PROVIDED ON A DRAWING TITLED "PERIMETER SURVEY OF LAND AT THE TIDEWATER FORMER MGP SITE IN PAWTUCKET, RHODE ISLAND FOR ATLANTIC ENVIRONMENTAL SERVICES INC." DEVELOPED BY LOUIS FEDERICI AND ASSOCIATES.
    - GIS DATA WAS PROVIDED BY THE CITY OF PAWTUCKET IN OCTOBER 2016 FOR REFERENCE PURPOSES ONLY AND SHOULD NOT BE CONSIDERED A LEGALLY AUTHORITY SOURCE AS TO LOCATION OF ANY LINE OR FEATURE. THESE DATA ARE FOR PLANNING PURPOSES ONLY AND DO NOT REPRESENT A LEGALLY RECORDED PLAN, DEED, SURVEY OR ENGINEERING SCHEMATIC AND ARE NOT INTENDED TO BE USED AS SUCH.
  - HORIZONTAL DATUM IS BASED ON NORTH AMERICAN DATUM 1983 (NAD83) FROM BASE MAPPING PROVIDED BY AEROTECH CORP.
  - VERTICAL DATUM IS BASED ON NORTH AMERICAN VERTICAL DATUM 1988 (NAVD88) FROM BASE MAPPING PROVIDED BY AEROTECH CORP.
  - ON-SITE INVESTIGATIONS AND SURVEYS BY GZA PERSONNEL DURING VARIOUS SITE VISITS BETWEEN 2016 AND 2018.
  - SITE BOUNDARIES ARE APPROXIMATE.

TODD R. GREENE  
No. 0567  
REGISTERED PROFESSIONAL ENGINEER  
CIVIL

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**REMEDIAL ACTION WORK PLAN  
FORMER TIDEWATER FACILITY  
PAWTUCKET, RHODE ISLAND**

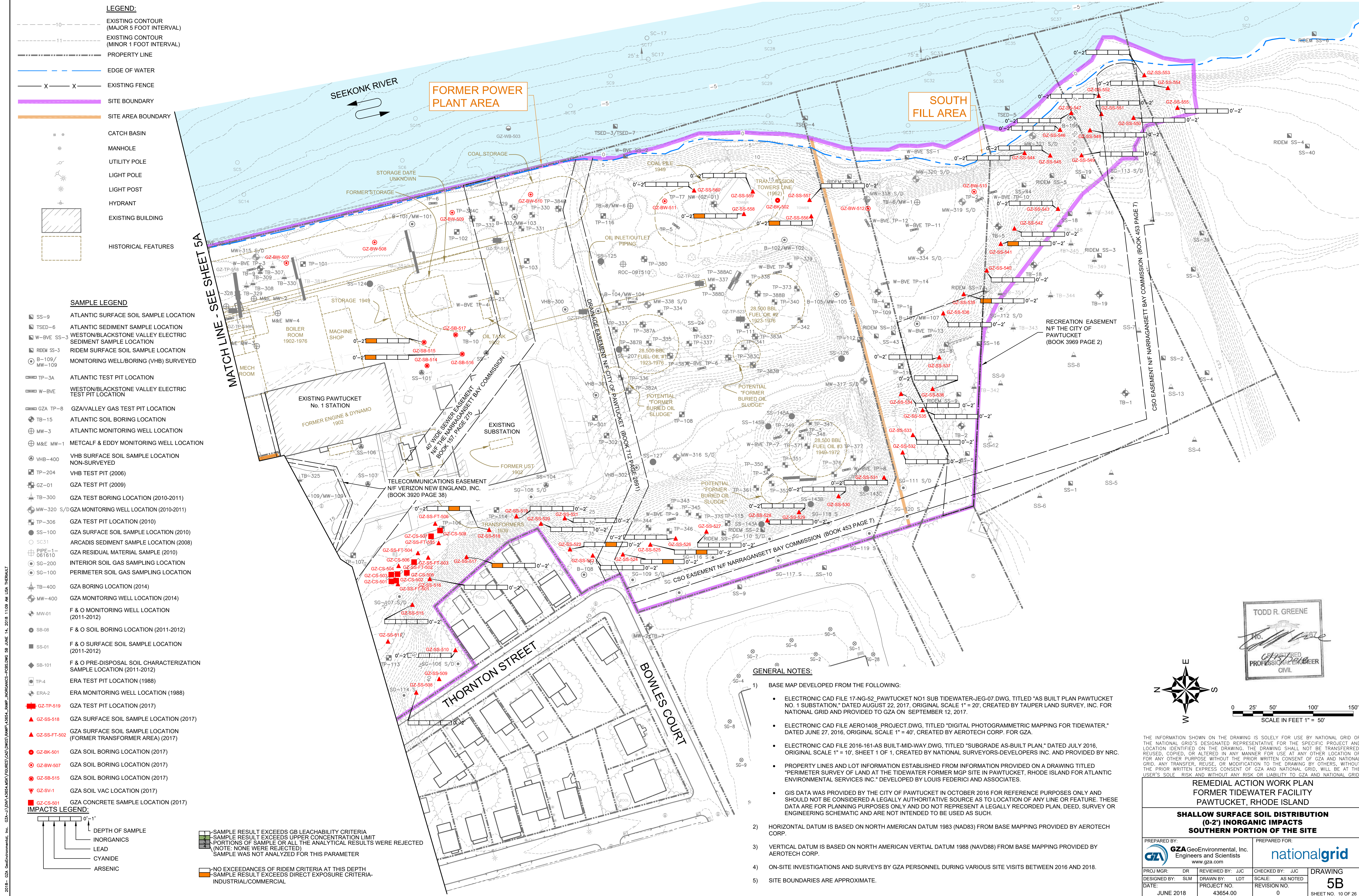
**SHALLOW SURFACE SOIL DISTRIBUTION  
(0-2') VOC, TPH, PAH IMPACTS  
SOUTHERN PORTION OF THE SITE**

PREPARED BY: <b>GZA</b> GeoEnvironmental, Inc. Engineers and Scientists www.gza.com		PREPARED FOR: <b>nationalgrid</b>	
PROJ MGR: DR	DESIGNED BY: SLM	REVIEWED BY: JJC	CHECKED BY: JJC
DATE: JUNE 2018	PROJECT NO: 43654.00	DRAWN BY: LDT	SCALE: AS NOTED
		REVISION NO: 0	
			<b>DRAWING 4B</b>
			SHEET NO. 8 OF 28









**LEGEND:**

- - - - - 10' - - - - - EXISTING CONTOUR (MAJOR 5 FOOT INTERVAL)
- - - - - 11' - - - - - EXISTING CONTOUR (MINOR 1 FOOT INTERVAL)
- - - - - PROPERTY LINE
- - - - - EDGE OF WATER
- X - X - - - - EXISTING FENCE
- - - - - SITE BOUNDARY
- - - - - SITE AREA BOUNDARY
- - - - - - CATCH BASIN
- - - - - - MANHOLE
- - - - - - UTILITY POLE
- - - - - - LIGHT POLE
- - - - - - LIGHT POST
- - - - - - HYDRANT
- ▭ - - - - - EXISTING BUILDING
- ▭ - - - - - HISTORICAL FEATURES

**SAMPLE LEGEND**

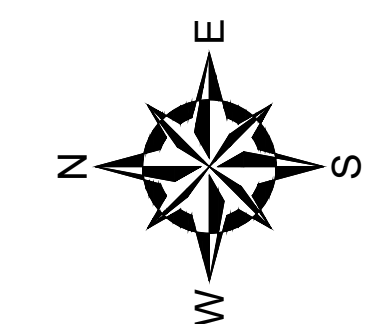
- SS-9 ATLANTIC SURFACE SOIL SAMPLE LOCATION
- TSED-6 ATLANTIC SEDIMENT SAMPLE LOCATION
- W-BVE SS-3 WESTON/BLACKSTONE VALLEY ELECTRIC SEDIMENT SAMPLE LOCATION
- RIDEM SS-3 RIDEM SURFACE SOIL SAMPLE LOCATION
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- ▭ TP-3A ATLANTIC TEST PIT LOCATION
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- ▭ GZ-BW-507 GZA SOIL BORING LOCATION (2017)
- ▭ GZ-SB-515 GZA SOIL BORING LOCATION (2017)
- ▭ GZ-SV-1 GZA SOIL VAC LOCATION (2017)
- ▭ GZ-CS-001 GZA CONCRETE SAMPLE LOCATION (2017)

**IMPACTS LEGEND:**

- 0'-1' DEPTH OF SAMPLE
- █ SAMPLE RESULT EXCEEDS GB LEACHABILITY CRITERIA
- █ SAMPLE RESULT EXCEEDS UPPER CONCENTRATION LIMIT PORTIONS OF SAMPLE OR ALL THE ANALYTICAL RESULTS WERE REJECTED (NOTE: NONE WERE REJECTED)
- █ LEAD
- █ CYANIDE
- █ ARSENIC
- █ NO EXCEEDANCES OF RIDEM CRITERIA AT THIS DEPTH
- █ SAMPLE RESULT EXCEEDS DIRECT EXPOSURE CRITERIA- INDUSTRIAL/COMMERCIAL

**GENERAL NOTES:**

- 1) BASE MAP DEVELOPED FROM THE FOLLOWING:
  - ELECTRONIC CAD FILE 17-NG-52\_PAWTUCKET NO1 SUB TIDEWATER-JEG-07.DWG, TITLED "AS BUILT PLAN PAWTUCKET NO. 1 SUBSTATION," DATED AUGUST 22, 2017, ORIGINAL SCALE 1" = 20', CREATED BY TAUPER LAND SURVEY, INC. FOR NATIONAL GRID AND PROVIDED TO GZA ON SEPTEMBER 12, 2017.
  - ELECTRONIC CAD FILE AERO1408\_PROJECT.DWG, TITLED "DIGITAL PHOTOGRAMMETRIC MAPPING FOR TIDEWATER," DATED JUNE 27, 2016, ORIGINAL SCALE 1" = 40', CREATED BY AEROTECH CORP. FOR GZA.
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- 5) SITE BOUNDARIES ARE APPROXIMATE.



TODD R. GREENE  
 No. 0567  
 REGISTERED PROFESSIONAL ENGINEER  
 CIVIL

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<b>REMEDIAL ACTION WORK PLAN FORMER TIDEWATER FACILITY PAWTUCKET, RHODE ISLAND</b>			
<b>SHALLOW SURFACE SOIL DISTRIBUTION (0-2') INORGANIC IMPACTS SOUTHERN PORTION OF THE SITE</b>			
PREPARED BY: <b>GZA</b> GeoEnvironmental, Inc. Engineers and Scientists www.gza.com	PREPARED FOR: <b>nationalgrid</b>		
PROJ MGR: DR	DESIGNED BY: SLM	REVIEWED BY: JJC	CHECKED BY: JJC
DATE: JUNE 2018	PROJECT NO. 43654.00	DRAWN BY: LDT	SCALE: AS NOTED
		REVISION NO. 0	DRAWING <b>5B</b>
			SHEET NO. 10 OF 28



**GENERAL NOTES:**

- BASE MAP DEVELOPED FROM THE FOLLOWING:
  - ELECTRONIC CAD FILE 17-NG-52\_PAWTUCKET NO1 SUB TIDEWATER-JEG-07.DWG, TITLED "AS BUILT PLAN PAWTUCKET NO. 1 SUBSTATION," DATED AUGUST 22, 2017, ORIGINAL SCALE 1" = 20', CREATED BY TAUPER LAND SURVEY, INC. FOR NATIONAL GRID AND PROVIDED TO GZA ON SEPTEMBER 12, 2017.
  - ELECTRONIC CAD FILE AERO1408\_PROJECT.DWG, TITLED "DIGITAL PHOTGRAMMETRIC MAPPING FOR TIDEWATER," DATED JUNE 27, 2016, ORIGINAL SCALE 1" = 40', CREATED BY AEROTECH CORP. FOR GZA.
  - ELECTRONIC CAD FILE 2016-161-AS BUILT-MID-WAY.DWG, TITLED "SUBGRADE AS-BUILT PLAN," DATED JULY 2016, ORIGINAL SCALE 1" = 10', SHEET 1 OF 1, CREATED BY NATIONAL SURVEYORS-DEVELOPERS INC. AND PROVIDED BY NRC.
  - PROPERTY LINES AND LOT INFORMATION ESTABLISHED FROM INFORMATION PROVIDED ON A DRAWING TITLED "PERIMETER SURVEY OF LAND AT THE TIDEWATER FORMER MGP SITE IN PAWTUCKET, RHODE ISLAND FOR ATLANTIC ENVIRONMENTAL SERVICES INC." DEVELOPED BY LOUIS FEDERICI AND ASSOCIATES.
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- SITE BOUNDARIES ARE APPROXIMATE.

**LEGEND:**

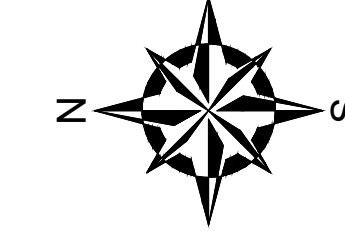
- EXISTING CONTOUR (MAJOR 5 FOOT INTERVAL)
- EXISTING CONTOUR (MINOR 1 FOOT INTERVAL)
- PROPERTY LINE
- EDGE OF WATER
- EXISTING FENCE
- SITE BOUNDARY
- SITE AREA BOUNDARY
- CATCH BASIN
- MANHOLE
- UTILITY POLE
- LIGHT POLE
- LIGHT POST
- HYDRANT
- EXISTING BUILDING
- HISTORICAL FEATURES

**SAMPLE LEGEND**

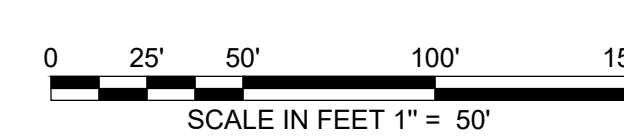
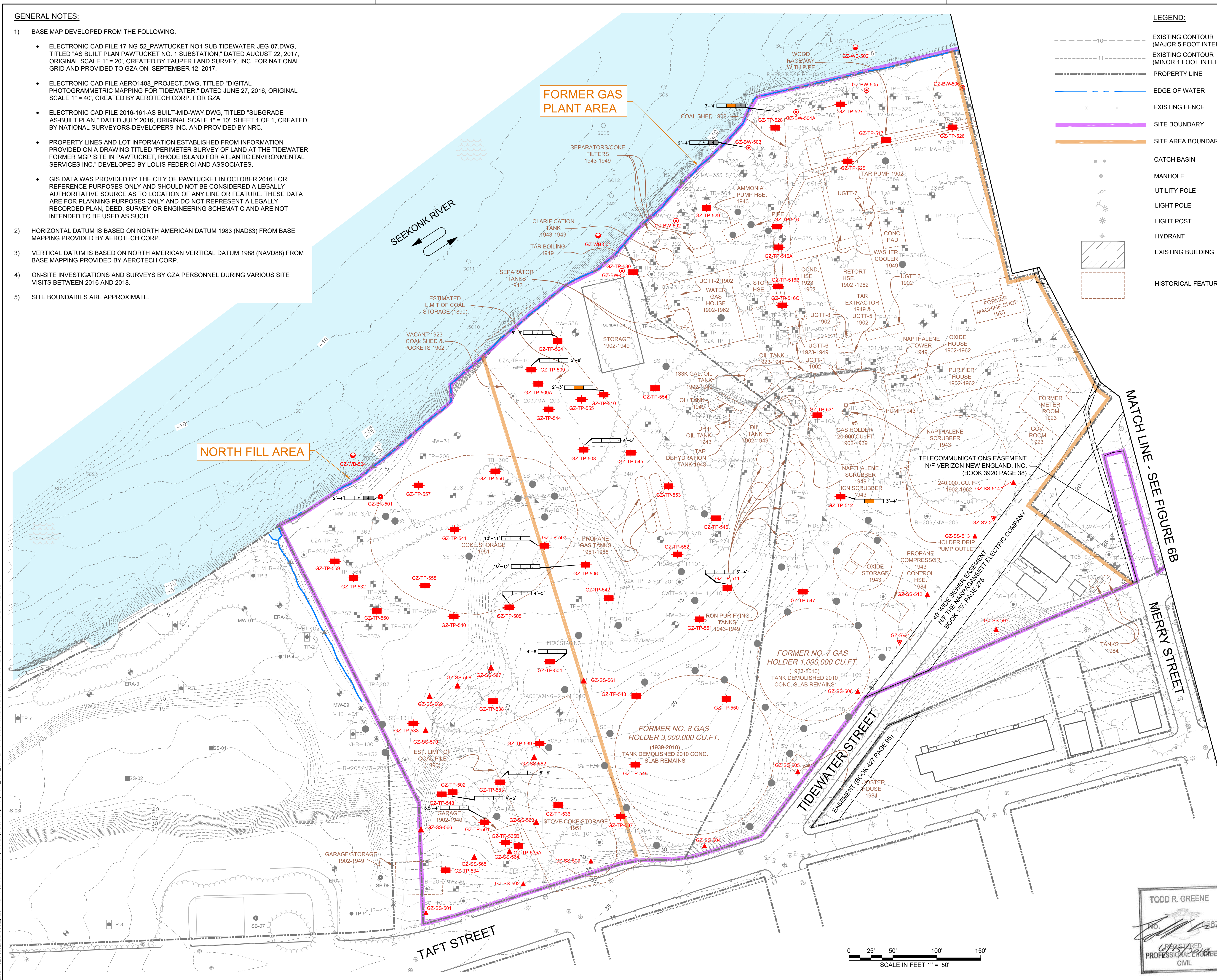
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- RDEM SS-3 RIDEM SURFACE SOIL SAMPLE LOCATION
- B-109/ MW-109 MONITORING WELL/BORING (VHB) SURVEYED
- TP-3A ATLANTIC TEST PIT LOCATION
- W-BVE WESTON/BLACKSTONE VALLEY ELECTRIC TEST PIT LOCATION
- GZA TP-8 GZA/VALLEY GAS TEST PIT LOCATION
- TB-15 ATLANTIC SOIL BORING LOCATION
- MW-3 ATLANTIC MONITORING WELL LOCATION
- M&E MW-1 METCALF & EDDY MONITORING WELL LOCATION
- VHB-400 VHB SURFACE SOIL SAMPLE LOCATION NON-SURVEYED
- TP-204 VHB TEST PIT (2006)
- GZ-01 GZA TEST PIT (2009)
- TB-300 GZA TEST BORING LOCATION (2010-2011)
- MW-320 S/D GZA MONITORING WELL LOCATION (2010-2011)
- TP-306 GZA TEST PIT LOCATION (2010)
- SS-100 GZA SURFACE SOIL SAMPLE LOCATION (2010)
- SC31 ARCADIS SEDIMENT SAMPLE LOCATION (2008)
- PIPE-1-061610 GZA RESIDUAL MATERIAL SAMPLE (2010)
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- SG-100 PERIMETER SOIL GAS SAMPLING LOCATION
- TB-400 GZA BORING LOCATION (2014)
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- SB-08 F & O SOIL BORING LOCATION (2011-2012)
- SS-01 F & O SURFACE SOIL SAMPLE LOCATION (2011-2012)
- SB-101 F & O PRE-DISPOSAL SOIL CHARACTERIZATION SAMPLE LOCATION (2011-2012)
- TP-4 ERA TEST PIT LOCATION (1988)
- ERA-2 ERA MONITORING WELL LOCATION (1988)
- GZ-TP-519 GZA TEST PIT LOCATION (2017)
- GZ-SS-518 GZA SURFACE SOIL SAMPLE LOCATION (2017)
- GZ-SS-FT-502 GZA SURFACE SOIL SAMPLE LOCATION (FORMER TRANSFORMER AREA) (2017)
- GZ-BK-501 GZA SOIL BORING LOCATION (2017)
- GZ-BW-507 GZA SOIL BORING LOCATION (2017)
- GZ-SB-515 GZA SOIL BORING LOCATION (2017)
- GZ-SV-1 GZA SOIL VAC LOCATION (2017)
- GZ-WB-501 GZA WATER BORING LOCATION (2017)
- GZ-CS-501 GZA CONCRETE SAMPLE LOCATION (2017)

**IMPACTS LEGEND:**

- DEPTH OF SAMPLE
- TPH
- PAHs
- VOCs
- SAMPLE RESULT EXCEEDS GB LEACHABILITY CRITERIA
- SAMPLE RESULT EXCEEDS UPPER CONCENTRATION LIMIT (PORTIONS OF SAMPLE OR ALL THE ANALYTICAL RESULTS WERE REJECTED (NOTE: NONE WERE REJECTED) SAMPLE WAS NOT ANALYZED FOR THIS PARAMETER)
- NO EXCEEDANCES OF RIDEM CRITERIA AT THIS DEPTH
- SAMPLE RESULT EXCEEDS DIRECT EXPOSURE CRITERIA INDUSTRIAL/COMMERCIAL



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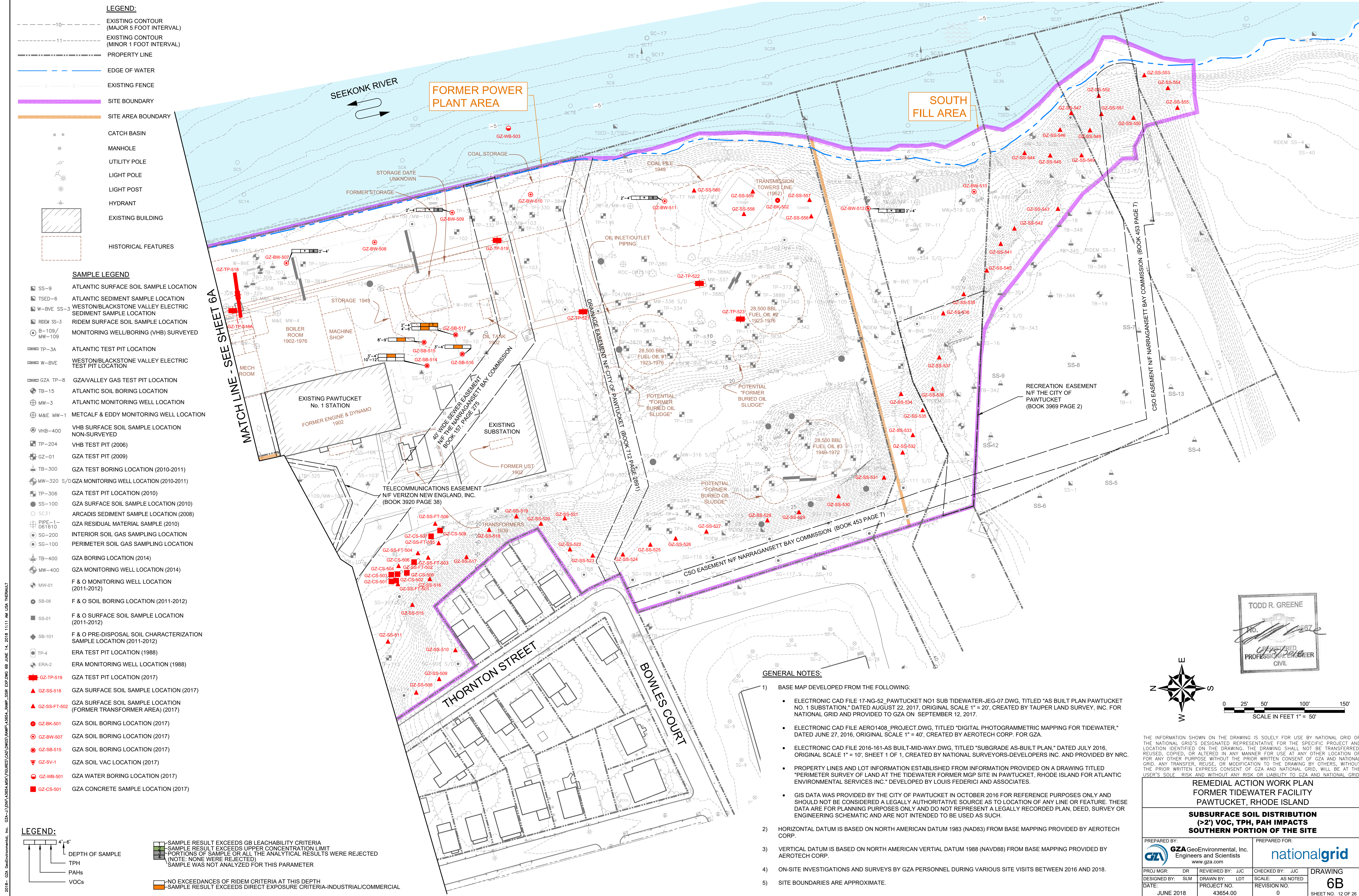


TODD R. GREENE  
 No. [Signature]  
 REGISTERED PROFESSIONAL ENGINEER  
 CIVIL

<b>REMEDIAL ACTION WORK PLAN FORMER TIDEWATER FACILITY PAWTUCKET, RHODE ISLAND</b>			
<b>SUBSURFACE SOIL DISTRIBUTION (&gt;2') VOC, TPH, PAH IMPACTS NORTHERN PORTION OF THE SITE</b>			
PREPARED BY: <b>GZA</b> GeoEnvironmental, Inc. Engineers and Scientists www.gza.com	PREPARED FOR: <b>nationalgrid</b>		
PROJ MGR: DR	DESIGNED BY: SLM	REVIEWED BY: JJC	CHECKED BY: JJC
DATE: JUNE 2018	PROJECT NO: 43654.00	DRAWN BY: LDT	SCALE: AS NOTED
		REVISION NO: 0	DRAWING NO: <b>6A</b>
			SHEET NO. 11 OF 28

2018 - GZA, GeoEnvironmental, Inc. GZA-PAWTUCKET-RI-2018-1110 AM-GZA-THERMAL SOIL SUBSURFACE SOIL DISTRIBUTION JUNE 14, 2018 11:10 AM-GZA-THERMAL





**LEGEND:**

- - - - -10- EXISTING CONTOUR (MAJOR 5 FOOT INTERVAL)
- - - - -11- EXISTING CONTOUR (MINOR 1 FOOT INTERVAL)
- - - - - PROPERTY LINE
- - - - - EDGE OF WATER
- - - - - EXISTING FENCE
- - - - - SITE BOUNDARY
- - - - - SITE AREA BOUNDARY
- CATCH BASIN
- MANHOLE
- UTILITY POLE
- LIGHT POLE
- LIGHT POST
- HYDRANT
- ▭ EXISTING BUILDING
- ▭ HISTORICAL FEATURES

**SAMPLE LEGEND**

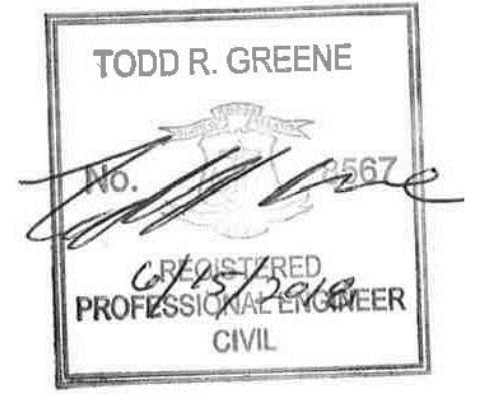
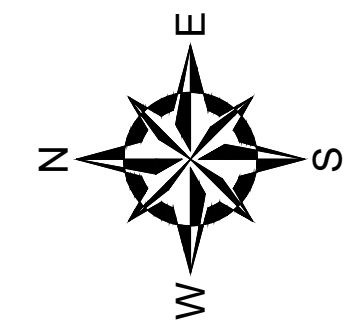
- SS-9 ATLANTIC SURFACE SOIL SAMPLE LOCATION
- TSED-6 ATLANTIC SEDIMENT SAMPLE LOCATION
- W-BVE SS-3 WESTON/BLACKSTONE VALLEY ELECTRIC SEDIMENT SAMPLE LOCATION
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- GZA TP-8 GZA/VALLEY GAS TEST PIT LOCATION
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- GZ-CS-501 GZA CONCRETE SAMPLE LOCATION (2017)

**LEGEND:**

- 4'-6" DEPTH OF SAMPLE
- TPH
- PAHs
- VOCs
- NO EXCEEDANCES OF RIDEM CRITERIA AT THIS DEPTH
- SAMPLE RESULT EXCEEDS GB LEACHABILITY CRITERIA
- SAMPLE RESULT EXCEEDS UPPER CONCENTRATION LIMIT
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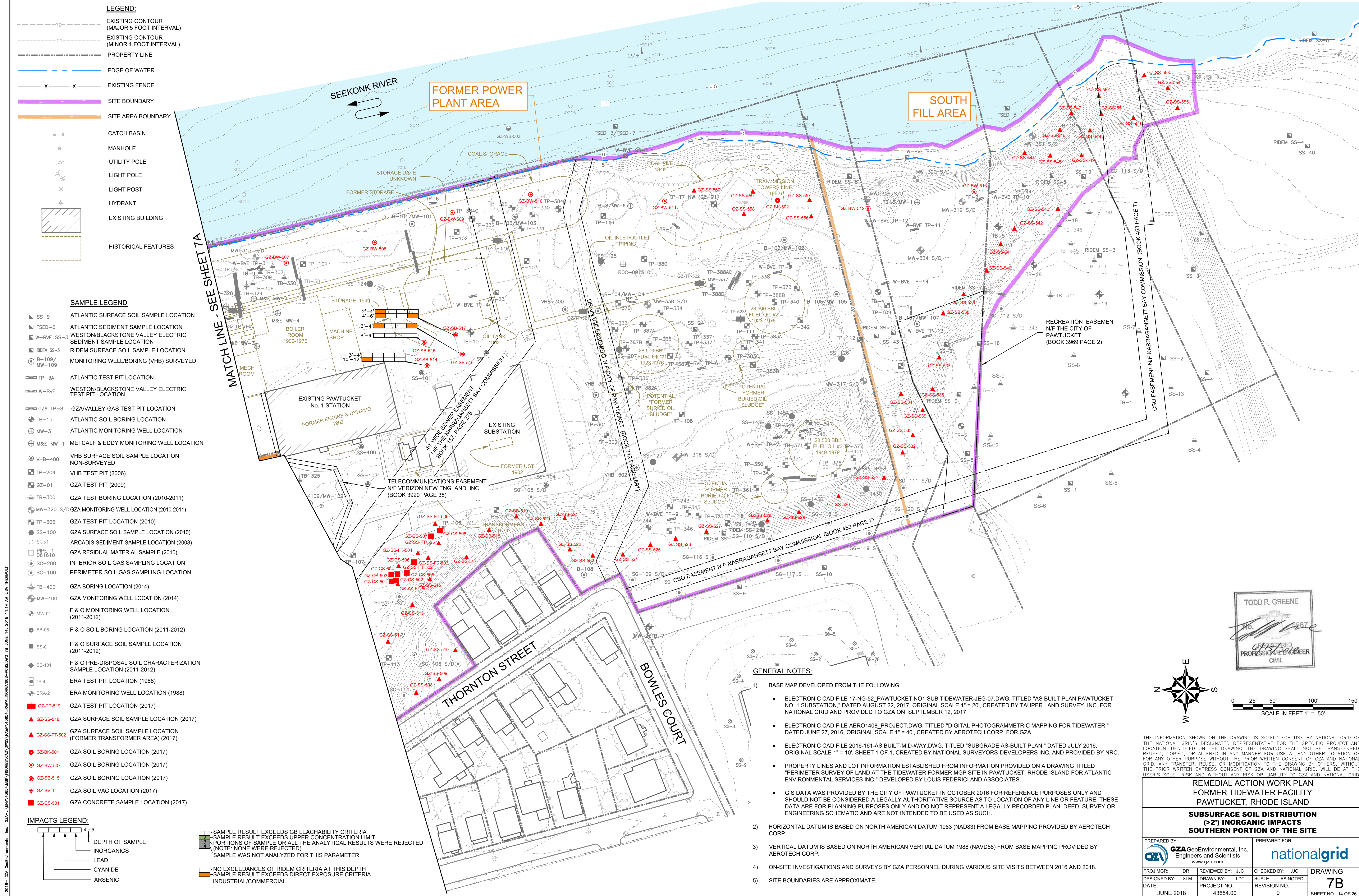
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<b>SUBSURFACE SOIL DISTRIBUTION (&gt;2') VOC, TPH, PAH IMPACTS SOUTHERN PORTION OF THE SITE</b>			
PREPARED BY: <b>GZA</b> GeoEnvironmental, Inc. Engineers and Scientists www.gza.com	PREPARED FOR: <b>nationalgrid</b>		
PROJ MGR: DR	DESIGNED BY: SLM	REVIEWED BY: JJC	CHECKED BY: JJC
DATE: JUNE 2018	DRAWN BY: LDT	SCALE: AS NOTED	PROJECT NO. 43654.00
		REVISION NO. 0	DRAWING <b>6B</b>
			SHEET NO. 12 OF 28

2018 - GZA GeoEnvironmental, Inc. GZA-2018-161-AS BUILT-MID-WAY (FORMER TIDEWATER FACILITY) PAWTUCKET, RHODE ISLAND. DATE: JUNE 14, 2018 11:17 AM. USA. THERMAL.









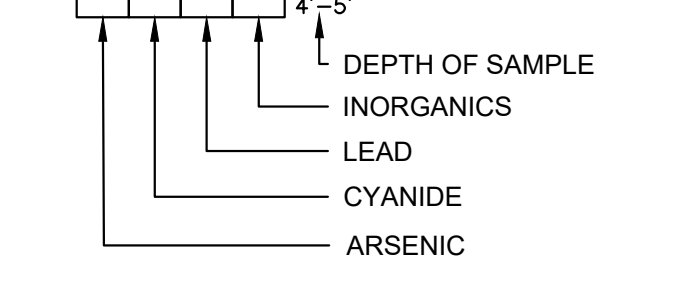
**LEGEND:**

- - - - - 10' - - - - - EXISTING CONTOUR (MAJOR 5 FOOT INTERVAL)
- - - - - 11' - - - - - EXISTING CONTOUR (MINOR 1 FOOT INTERVAL)
- - - - - PROPERTY LINE
- - - - - EDGE OF WATER
- X - X - - - - EXISTING FENCE
- - - - - SITE BOUNDARY
- - - - - SITE AREA BOUNDARY
- - - - - - CATCH BASIN
- - - - - - MANHOLE
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**IMPACTS LEGEND:**

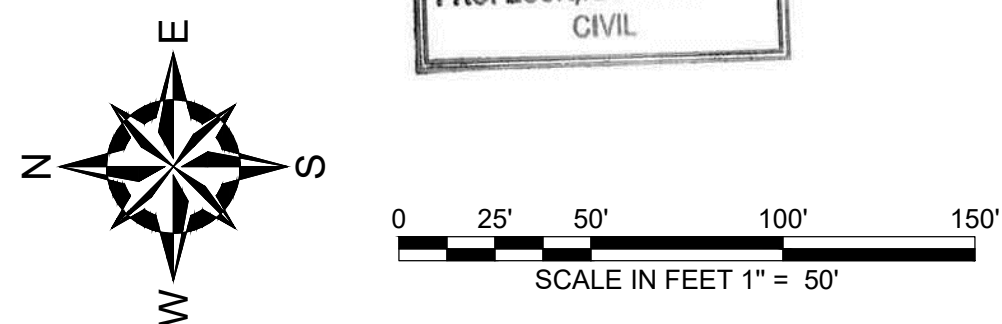


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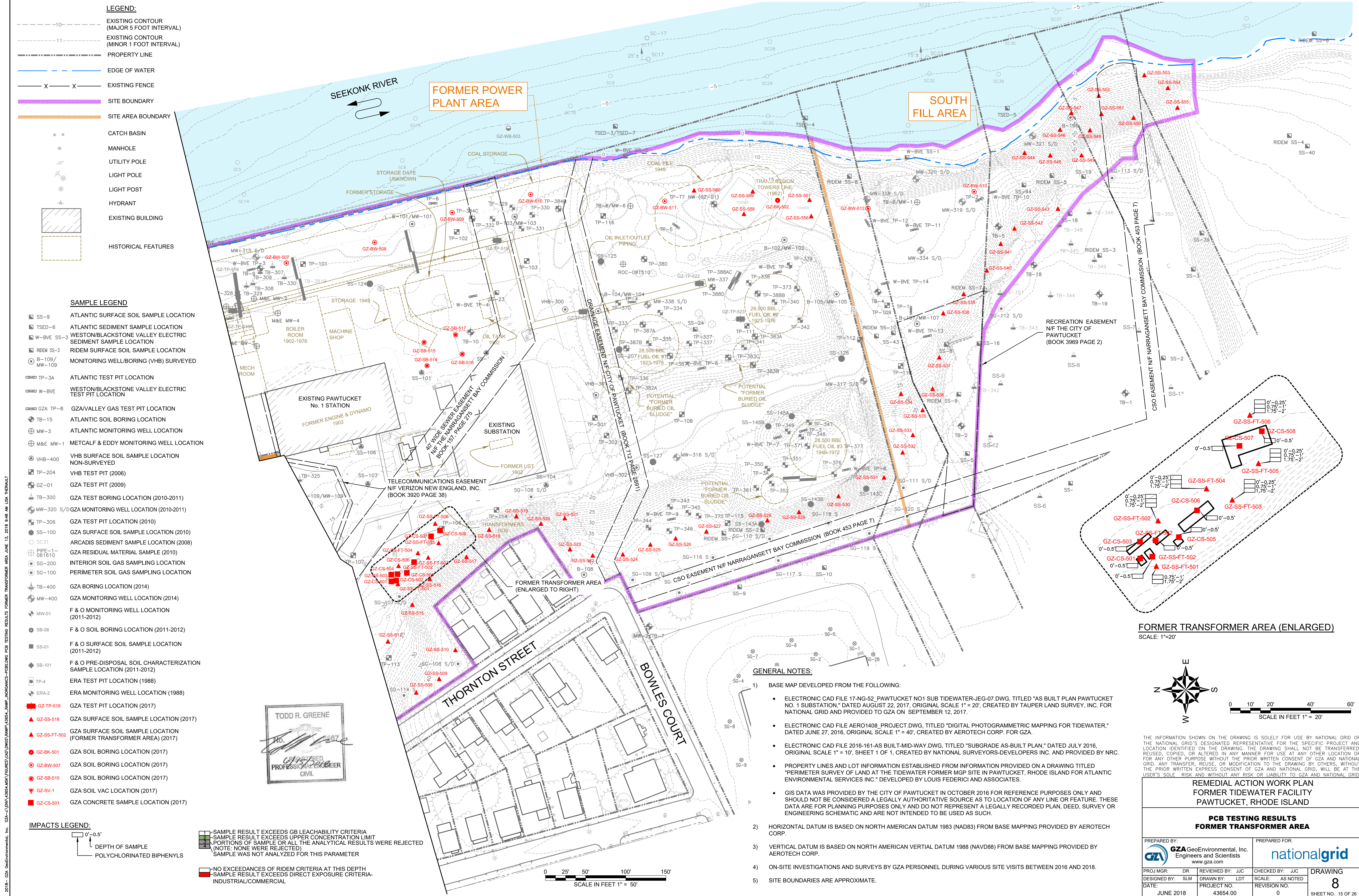
TODD R. GREENE  
 No. 267  
 REGISTERED PROFESSIONAL ENGINEER  
 CIVIL



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<b>SUBSURFACE SOIL DISTRIBUTION (&gt;2') INORGANIC IMPACTS SOUTHERN PORTION OF THE SITE</b>			
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		REVISION NO: 0	DRAWING NO: 7B
			SHEET NO. 14 OF 28





**LEGEND:**

- - - - - 10 - - - - - EXISTING CONTOUR (MAJOR 5 FOOT INTERVAL)
- - - - - 11 - - - - - EXISTING CONTOUR (MINOR 1 FOOT INTERVAL)
- - - - - PROPERTY LINE
- - - - - EDGE OF WATER
- X - X - - - - EXISTING FENCE
- - - - - SITE BOUNDARY
- - - - - SITE AREA BOUNDARY
- CATCH BASIN
- MANHOLE
- UTILITY POLE
- LIGHT POLE
- LIGHT POST
- HYDRANT
- ▭ EXISTING BUILDING
- ▭ HISTORICAL FEATURES

**SAMPLE LEGEND**

- SS-9 ATLANTIC SURFACE SOIL SAMPLE LOCATION
- TSED-6 ATLANTIC SEDIMENT SAMPLE LOCATION
- W-BVE SS-3 WESTON/BLACKSTONE VALLEY ELECTRIC SEDIMENT SAMPLE LOCATION
- RDEM SS-3 RIDEM SURFACE SOIL SAMPLE LOCATION
- B-109/ MW-109 MONITORING WELL/BORING (VHB) SURVEYED
- TP-3A ATLANTIC TEST PIT LOCATION
- W-BVE WESTON/BLACKSTONE VALLEY ELECTRIC TEST PIT LOCATION
- GZA TP-8 GZA/VALLEY GAS TEST PIT LOCATION
- TB-15 ATLANTIC SOIL BORING LOCATION
- MW-3 ATLANTIC MONITORING WELL LOCATION
- M&E MW-1 METCALF & EDDY MONITORING WELL LOCATION
- VHB-400 VHB SURFACE SOIL SAMPLE LOCATION NON-SURVEYED
- TP-204 VHB TEST PIT (2006)
- GZ-01 GZA TEST PIT (2009)
- TB-300 GZA TEST BORING LOCATION (2010-2011)
- MW-320 S/D GZA MONITORING WELL LOCATION (2010-2011)
- TP-306 GZA TEST PIT LOCATION (2010)
- SS-100 GZA SURFACE SOIL SAMPLE LOCATION (2010)
- SC31 ARCADIS SEDIMENT SAMPLE LOCATION (2008)
- PIPE-1-061610 GZA RESIDUAL MATERIAL SAMPLE (2010)
- SG-200 INTERIOR SOIL GAS SAMPLING LOCATION
- SG-100 PERIMETER SOIL GAS SAMPLING LOCATION
- TB-400 GZA BORING LOCATION (2014)
- MW-400 GZA MONITORING WELL LOCATION (2014)
- MW-01 F & O MONITORING WELL LOCATION (2011-2012)
- SB-08 F & O SOIL BORING LOCATION (2011-2012)
- SS-01 F & O SURFACE SOIL SAMPLE LOCATION (2011-2012)
- SB-101 F & O PRE-DISPOSAL SOIL CHARACTERIZATION SAMPLE LOCATION (2011-2012)
- TP-4 ERA TEST PIT LOCATION (1988)
- ERA-2 ERA MONITORING WELL LOCATION (1988)
- GZ-TP-519 GZA TEST PIT LOCATION (2017)
- GZ-SS-518 GZA SURFACE SOIL SAMPLE LOCATION (2017)
- GZ-SS-FT-502 GZA SURFACE SOIL SAMPLE LOCATION (FORMER TRANSFORMER AREA) (2017)
- GZ-BK-501 GZA SOIL BORING LOCATION (2017)
- GZ-BW-507 GZA SOIL BORING LOCATION (2017)
- GZ-SB-515 GZA SOIL BORING LOCATION (2017)
- GZ-SV-1 GZA SOIL VAC LOCATION (2017)
- GZ-CS-501 GZA CONCRETE SAMPLE LOCATION (2017)

**IMPACTS LEGEND:**

- ▭ SAMPLE RESULT EXCEEDS GB LEACHABILITY CRITERIA
- ▭ SAMPLE RESULT EXCEEDS UPPER CONCENTRATION LIMIT PORTIONS OF SAMPLE OR ALL THE ANALYTICAL RESULTS WERE REJECTED (NOTE: NONE WERE REJECTED)
- ▭ SAMPLE WAS NOT ANALYZED FOR THIS PARAMETER
- ▭ NO EXCEEDANCES OF RIDEM CRITERIA AT THIS DEPTH
- ▭ SAMPLE RESULT EXCEEDS DIRECT EXPOSURE CRITERIA- INDUSTRIAL/COMMERCIAL

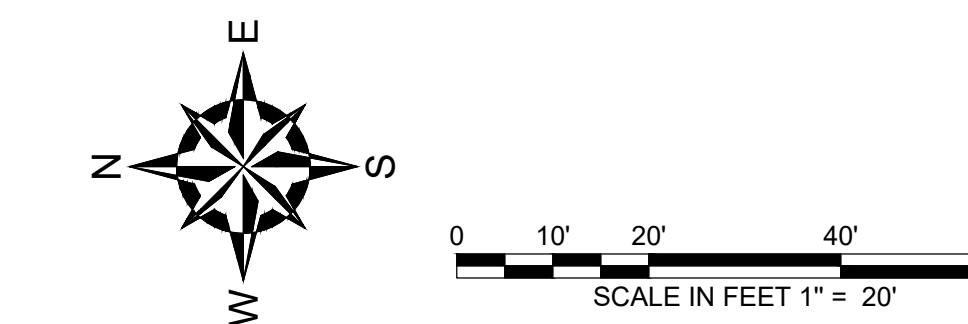
TODD R. GREENE  
 No. 0287  
 REGISTERED PROFESSIONAL ENGINEER  
 CIVIL

**GENERAL NOTES:**

- 1) BASE MAP DEVELOPED FROM THE FOLLOWING:
  - ELECTRONIC CAD FILE 17-NG-52\_PAWTUCKET NO1 SUB TIDEWATER-JEG-07.DWG, TITLED "AS BUILT PLAN PAWTUCKET NO. 1 SUBSTATION," DATED AUGUST 22, 2017, ORIGINAL SCALE 1" = 20', CREATED BY TAUPER LAND SURVEY, INC. FOR NATIONAL GRID AND PROVIDED TO GZA ON SEPTEMBER 12, 2017.
  - ELECTRONIC CAD FILE AERO1408\_PROJECT.DWG, TITLED "DIGITAL PHOTOGRAMMETRIC MAPPING FOR TIDEWATER," DATED JUNE 27, 2016, ORIGINAL SCALE 1" = 40', CREATED BY AEROTECH CORP. FOR GZA.
  - ELECTRONIC CAD FILE 2016-161-AS BUILT-MID-WAY.DWG, TITLED "SUBGRADE AS-BUILT PLAN," DATED JULY 2016, ORIGINAL SCALE 1" = 10', SHEET 1 OF 1, CREATED BY NATIONAL SURVEYORS-DEVELOPERS INC. AND PROVIDED BY NRC.
  - PROPERTY LINES AND LOT INFORMATION ESTABLISHED FROM INFORMATION PROVIDED ON A DRAWING TITLED "PERIMETER SURVEY OF LAND AT THE TIDEWATER FORMER MGP SITE IN PAWTUCKET, RHODE ISLAND FOR ATLANTIC ENVIRONMENTAL SERVICES INC." DEVELOPED BY LOUIS FEDERICI AND ASSOCIATES.
  - GIS DATA WAS PROVIDED BY THE CITY OF PAWTUCKET IN OCTOBER 2016 FOR REFERENCE PURPOSES ONLY AND SHOULD NOT BE CONSIDERED A LEGALLY AUTHORITY SOURCE AS TO LOCATION OF ANY LINE OR FEATURE. THESE DATA ARE FOR PLANNING PURPOSES ONLY AND DO NOT REPRESENT A LEGALLY RECORDED PLAN, DEED, SURVEY OR ENGINEERING SCHEMATIC AND ARE NOT INTENDED TO BE USED AS SUCH.
- 2) HORIZONTAL DATUM IS BASED ON NORTH AMERICAN DATUM 1983 (NAD83) FROM BASE MAPPING PROVIDED BY AEROTECH CORP.
- 3) VERTICAL DATUM IS BASED ON NORTH AMERICAN VERTICAL DATUM 1988 (NAV88) FROM BASE MAPPING PROVIDED BY AEROTECH CORP.
- 4) ON-SITE INVESTIGATIONS AND SURVEYS BY GZA PERSONNEL DURING VARIOUS SITE VISITS BETWEEN 2016 AND 2018.
- 5) SITE BOUNDARIES ARE APPROXIMATE.

**FORMER TRANSFORMER AREA (ENLARGED)**

SCALE: 1"=20'



THE INFORMATION SHOWN ON THE DRAWING IS SOLELY FOR USE BY NATIONAL GRID OR THE NATIONAL GRID'S DESIGNATED REPRESENTATIVE FOR THE SPECIFIC PROJECT AND LOCATION IDENTIFIED ON THE DRAWING. THE DRAWING SHALL NOT BE TRANSFERRED, REUSED, COPIED, OR ALTERED IN ANY MANNER FOR USE AT ANY OTHER LOCATION OR FOR ANY OTHER PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF GZA AND NATIONAL GRID. ANY TRANSFER, REUSE, OR MODIFICATION TO THE DRAWING BY OTHERS, WITHOUT THE PRIOR WRITTEN EXPRESS CONSENT OF GZA AND NATIONAL GRID, WILL BE AT THE USER'S SOLE RISK AND WITHOUT ANY RISK OR LIABILITY TO GZA AND NATIONAL GRID.

<b>REMEDIAL ACTION WORK PLAN FORMER TIDEWATER FACILITY PAWTUCKET, RHODE ISLAND</b>				
<b>PCB TESTING RESULTS FORMER TRANSFORMER AREA</b>				
PREPARED BY: <b>GZA</b> GeoEnvironmental, Inc. Engineers and Scientists www.gza.com		PREPARED FOR: <b>nationalgrid</b>		
PROJ MGR: DR	DESIGNED BY: SLM	REVIEWED BY: JJC	CHECKED BY: JJC	DRAWING
DATE: JUNE 2018	PROJECT NO: 43654.00	SCALE: AS NOTED	REVISION NO: 0	<b>8</b>
				SHEET NO. 15 OF 28

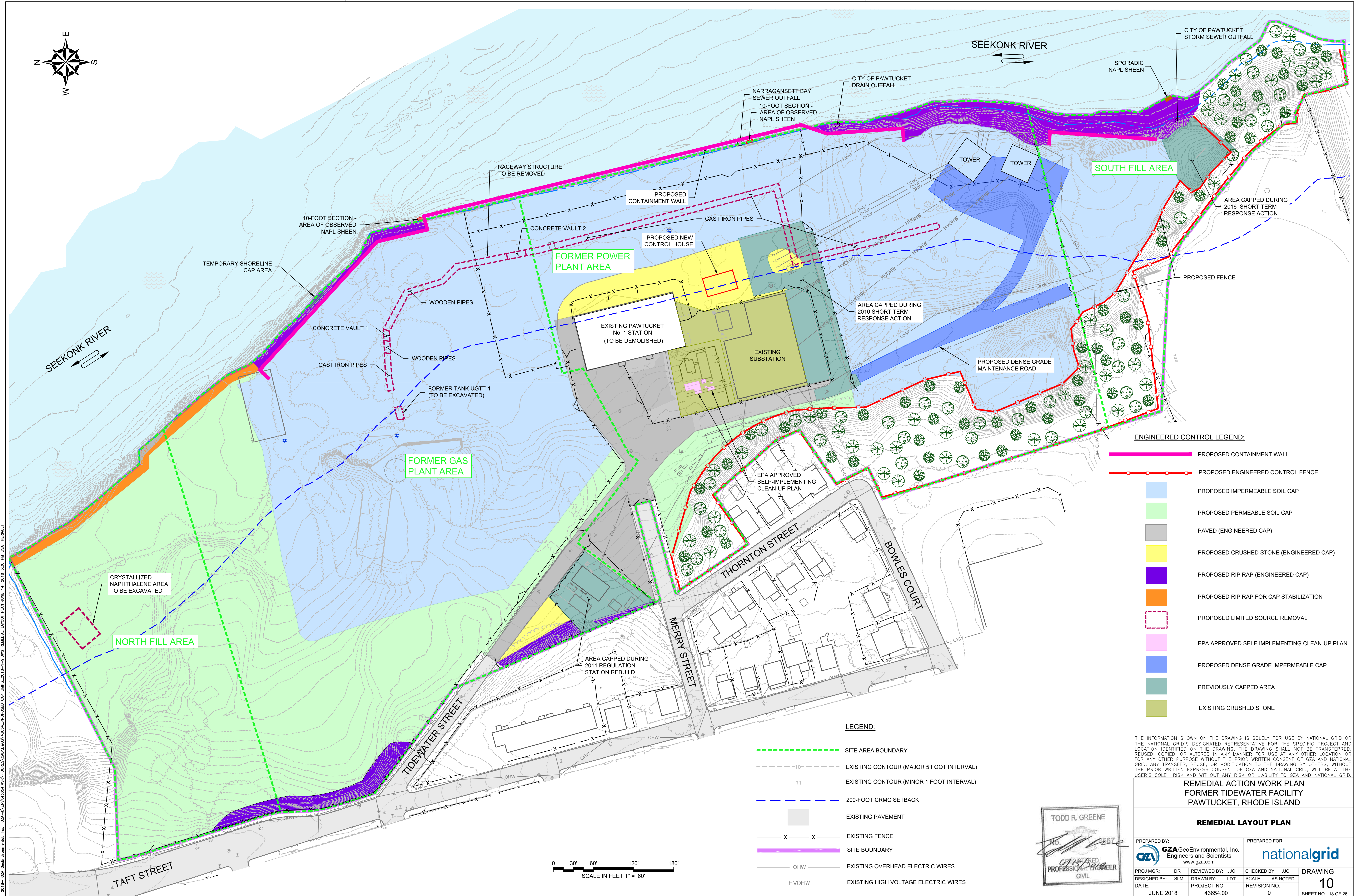
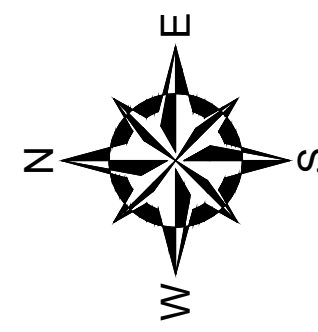












- ENGINEERED CONTROL LEGEND:**
- PROPOSED CONTAINMENT WALL
  - PROPOSED ENGINEERED CONTROL FENCE
  - PROPOSED IMPERMEABLE SOIL CAP
  - PROPOSED PERMEABLE SOIL CAP
  - PAVED (ENGINEERED CAP)
  - PROPOSED CRUSHED STONE (ENGINEERED CAP)
  - PROPOSED RIP RAP (ENGINEERED CAP)
  - PROPOSED RIP RAP FOR CAP STABILIZATION
  - PROPOSED LIMITED SOURCE REMOVAL
  - EPA APPROVED SELF-IMPLEMENTING CLEAN-UP PLAN
  - PROPOSED DENSE GRADE IMPERMEABLE CAP
  - PREVIOUSLY CAPPED AREA
  - EXISTING CRUSHED STONE

- LEGEND:**
- SITE AREA BOUNDARY
  - EXISTING CONTOUR (MAJOR 5 FOOT INTERVAL)
  - EXISTING CONTOUR (MINOR 1 FOOT INTERVAL)
  - 200-FOOT CRMC SETBACK
  - EXISTING PAVEMENT
  - EXISTING FENCE
  - SITE BOUNDARY
  - EXISTING OVERHEAD ELECTRIC WIRES
  - EXISTING HIGH VOLTAGE ELECTRIC WIRES



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**REMEDIAL ACTION WORK PLAN  
FORMER TIDEWATER FACILITY  
PAWTUCKET, RHODE ISLAND**

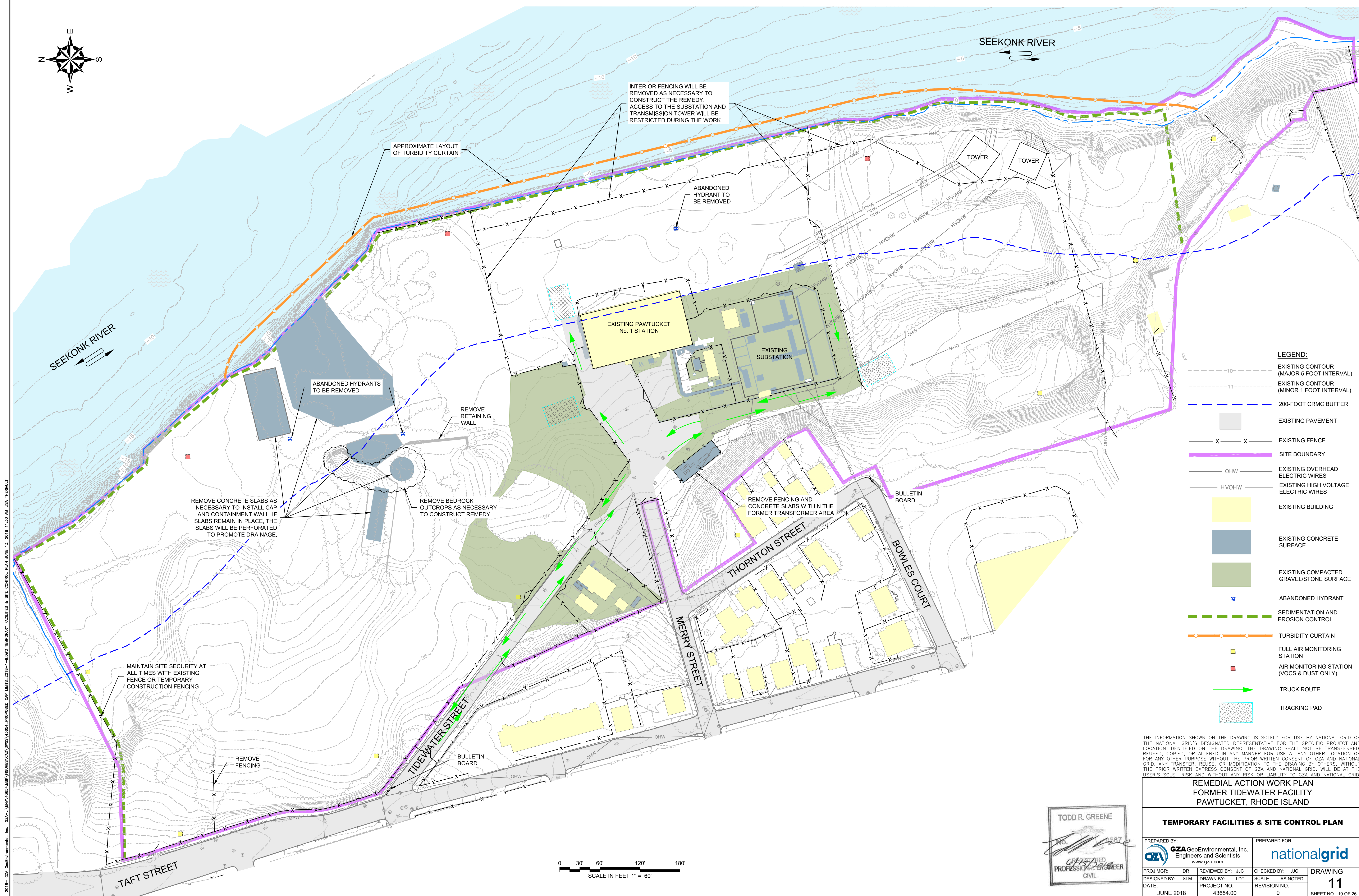
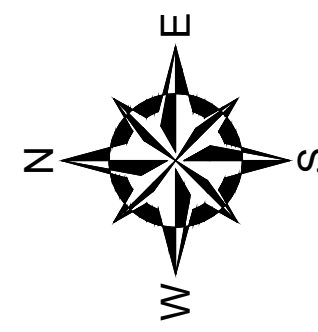
**REMEDIAL LAYOUT PLAN**

TODD R. GREENE  
REGISTERED PROFESSIONAL ENGINEER  
CIVIL

PREPARED BY: <b>GZA</b> GeoEnvironmental, Inc. Engineers and Scientists www.gza.com		PREPARED FOR: <b>nationalgrid</b>	
PROJ MGR: DR	DESIGNED BY: SLM	REVIEWED BY: JJC	CHECKED BY: JJC
DATE: JUNE 2018	PROJECT NO.: 43654.00	DRAWN BY: LDT	SCALE: AS NOTED
		REVISION NO.: 0	DRAWING NO.: 10
			SHEET NO. 18 OF 28

2018 - GZA GeoEnvironmental, Inc. GZA-33-DNA-1884-USA-1884-PROPOSED CAP LIMITS-2018-1-14-DWG REMEDIAL LAYOUT PLAN - JUNE 14, 2018 3:30 PM LSA\_THERMALT





INTERIOR FENCING WILL BE REMOVED AS NECESSARY TO CONSTRUCT THE REMEDY. ACCESS TO THE SUBSTATION AND TRANSMISSION TOWER WILL BE RESTRICTED DURING THE WORK

APPROXIMATE LAYOUT OF TURBIDITY CURTAIN

ABANDONED HYDRANT TO BE REMOVED

ABANDONED HYDRANTS TO BE REMOVED

REMOVE RETAINING WALL

REMOVE CONCRETE SLABS AS NECESSARY TO INSTALL CAP AND CONTAINMENT WALL. IF SLABS REMAIN IN PLACE, THE SLABS WILL BE PERFORATED TO PROMOTE DRAINAGE.

REMOVE BEDROCK OUTCROPS AS NECESSARY TO CONSTRUCT REMEDY

REMOVE FENCING AND CONCRETE SLABS WITHIN THE FORMER TRANSFORMER AREA

MAINTAIN SITE SECURITY AT ALL TIMES WITH EXISTING FENCE OR TEMPORARY CONSTRUCTION FENCING

REMOVE FENCING

- LEGEND:**
- - - - - 10' - - - - - EXISTING CONTOUR (MAJOR 5 FOOT INTERVAL)
  - - - - - 11' - - - - - EXISTING CONTOUR (MINOR 1 FOOT INTERVAL)
  - - - - - 200-FOOT CRMC BUFFER
  - EXISTING PAVEMENT
  - X X X X EXISTING FENCE
  - SITE BOUNDARY
  - OHV EXISTING OVERHEAD ELECTRIC WIRES
  - HVOHV EXISTING HIGH VOLTAGE ELECTRIC WIRES
  - EXISTING BUILDING
  - EXISTING CONCRETE SURFACE
  - EXISTING COMPACTED GRAVEL/STONE SURFACE
  - ABANDONED HYDRANT
  - SEDIMENTATION AND EROSION CONTROL
  - TURBIDITY CURTAIN
  - FULL AIR MONITORING STATION
  - AIR MONITORING STATION (VOCs & DUST ONLY)
  - TRUCK ROUTE
  - TRACKING PAD

THE INFORMATION SHOWN ON THE DRAWING IS SOLELY FOR USE BY NATIONAL GRID OR THE NATIONAL GRID'S DESIGNATED REPRESENTATIVE FOR THE SPECIFIC PROJECT AND LOCATION IDENTIFIED ON THE DRAWING. THE DRAWING SHALL NOT BE TRANSFERRED, REUSED, COPIED, OR ALTERED IN ANY MANNER FOR USE AT ANY OTHER LOCATION OR FOR ANY OTHER PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF GZA AND NATIONAL GRID. ANY TRANSFER, REUSE, OR MODIFICATION TO THE DRAWING BY OTHERS, WITHOUT THE PRIOR WRITTEN EXPRESS CONSENT OF GZA AND NATIONAL GRID, WILL BE AT THE USER'S SOLE RISK AND WITHOUT ANY RISK OR LIABILITY TO GZA AND NATIONAL GRID.

**REMEDIAL ACTION WORK PLAN  
FORMER TIDEWATER FACILITY  
PAWTUCKET, RHODE ISLAND**

**TEMPORARY FACILITIES & SITE CONTROL PLAN**

PREPARED BY: **GZA** GeoEnvironmental, Inc. Engineers and Scientists  
www.gza.com

PREPARED FOR: **nationalgrid**

PROJ MGR: DR	REVIEWED BY: JJC	CHECKED BY: JJC	DRAWING
DESIGNED BY: SLM	DRAWN BY: LDT	SCALE: AS NOTED	11
DATE: JUNE 2018	PROJECT NO. 43654.00	REVISION NO. 0	SHEET NO. 19 OF 28

TODD R. GREENE  
No. [Signature]  
REGISTERED PROFESSIONAL ENGINEER  
CIVIL

0 30' 60' 120' 180'  
SCALE IN FEET 1" = 60'

2018 - GZA GeoEnvironmental, Inc. GZA-2018-06-13-14-DWG TEMPORARY FACILITIES & SITE CONTROL PLAN JUNE 13, 2018 11:30 AM USA THERMAL









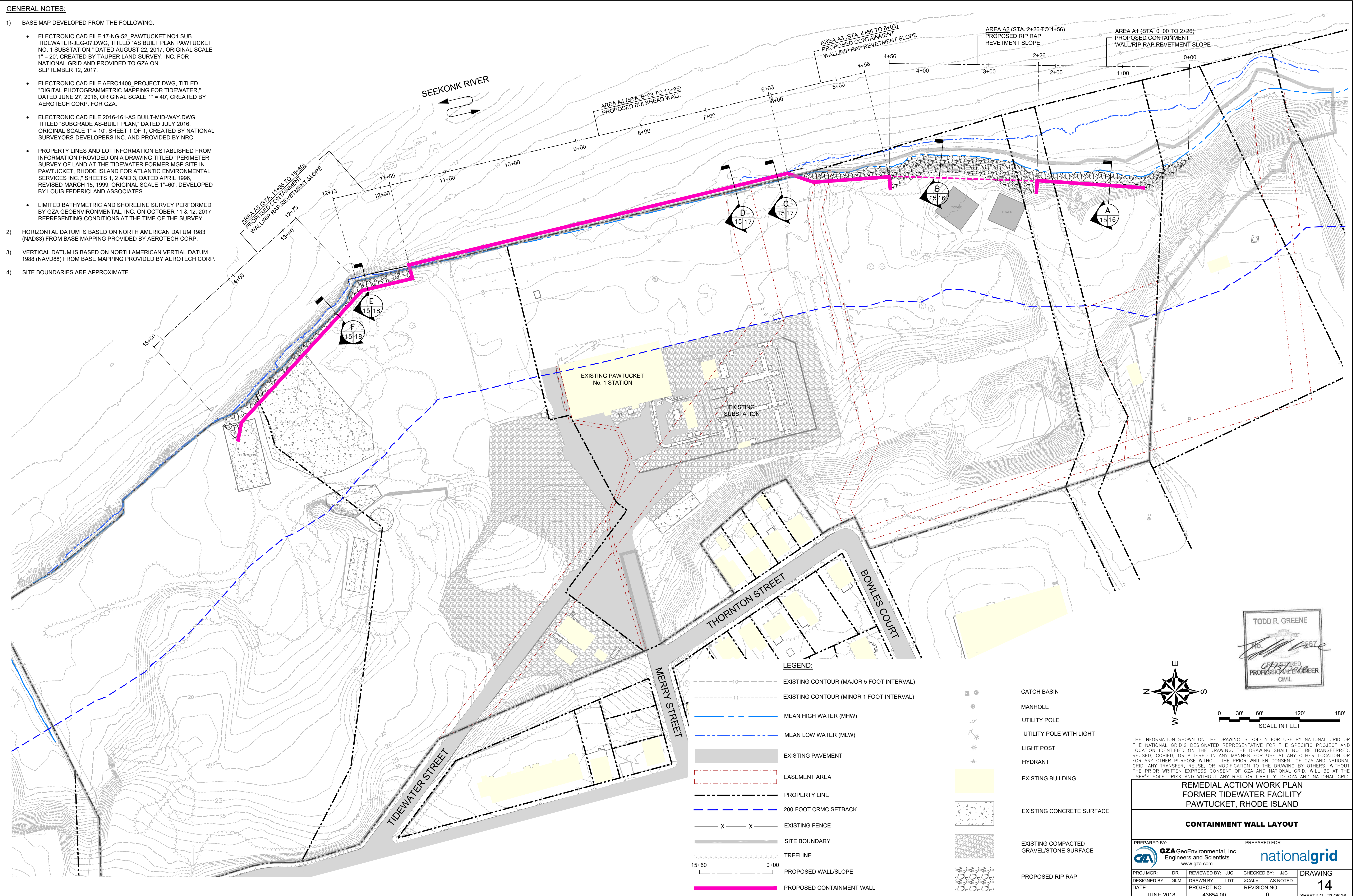


**GENERAL NOTES:**

1) BASE MAP DEVELOPED FROM THE FOLLOWING:

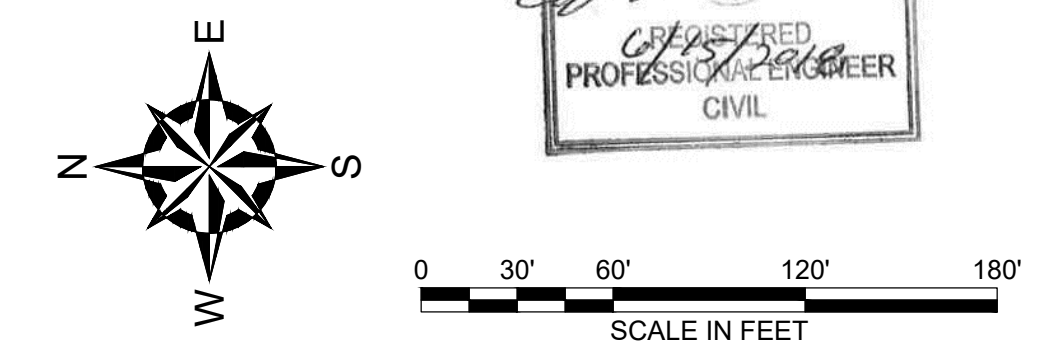
- ELECTRONIC CAD FILE 17-NG-52\_PAWTUCKET NO1 SUB TIDEWATER-JEG-07.DWG, TITLED "AS BUILT PLAN PAWTUCKET NO. 1 SUBSTATION," DATED AUGUST 22, 2017, ORIGINAL SCALE 1" = 20', CREATED BY TAUPER LAND SURVEY, INC. FOR NATIONAL GRID AND PROVIDED TO GZA ON SEPTEMBER 12, 2017.
- ELECTRONIC CAD FILE AERO1408\_PROJECT.DWG, TITLED "DIGITAL PHOTOGRAMMETRIC MAPPING FOR TIDEWATER," DATED JUNE 27, 2016, ORIGINAL SCALE 1" = 40', CREATED BY AEROTECH CORP. FOR GZA.
- ELECTRONIC CAD FILE 2016-161-AS BUILT-MID-WAY.DWG, TITLED "SUBGRADE AS-BUILT PLAN," DATED JULY 2016, ORIGINAL SCALE 1" = 10', SHEET 1 OF 1, CREATED BY NATIONAL SURVEYORS-DEVELOPERS INC. AND PROVIDED BY NRC.
- PROPERTY LINES AND LOT INFORMATION ESTABLISHED FROM INFORMATION PROVIDED ON A DRAWING TITLED "PERIMETER SURVEY OF LAND AT THE TIDEWATER FORMER MGP SITE IN PAWTUCKET, RHODE ISLAND FOR ATLANTIC ENVIRONMENTAL SERVICES INC.," SHEETS 1, 2 AND 3, DATED APRIL 1996, REVISED MARCH 15, 1999, ORIGINAL SCALE 1"=60', DEVELOPED BY LOUIS FEDERICI AND ASSOCIATES.
- LIMITED BATHYMETRIC AND SHORELINE SURVEY PERFORMED BY GZA GEOENVIRONMENTAL, INC. ON OCTOBER 11 & 12, 2017 REPRESENTING CONDITIONS AT THE TIME OF THE SURVEY.

- 2) HORIZONTAL DATUM IS BASED ON NORTH AMERICAN DATUM 1983 (NAD83) FROM BASE MAPPING PROVIDED BY AEROTECH CORP.
- 3) VERTICAL DATUM IS BASED ON NORTH AMERICAN VERTICAL DATUM 1988 (NAVD88) FROM BASE MAPPING PROVIDED BY AEROTECH CORP.
- 4) SITE BOUNDARIES ARE APPROXIMATE.



**LEGEND:**

- EXISTING CONTOUR (MAJOR 5 FOOT INTERVAL)
- EXISTING CONTOUR (MINOR 1 FOOT INTERVAL)
- MEAN HIGH WATER (MHW)
- MEAN LOW WATER (MLW)
- EXISTING PAVEMENT
- EASEMENT AREA
- PROPERTY LINE
- 200-FOOT CRMC SETBACK
- EXISTING FENCE
- SITE BOUNDARY
- TREELINE
- PROPOSED WALL/SLOPE
- PROPOSED CONTAINMENT WALL
- CATCH BASIN
- MANHOLE
- UTILITY POLE
- UTILITY POLE WITH LIGHT
- LIGHT POST
- HYDRANT
- EXISTING BUILDING
- EXISTING CONCRETE SURFACE
- EXISTING COMPACTED GRAVEL/STONE SURFACE
- PROPOSED RIP RAP



TODD R. GREENE  
 No. [Signature]  
 REGISTERED PROFESSIONAL ENGINEER  
 CIVIL

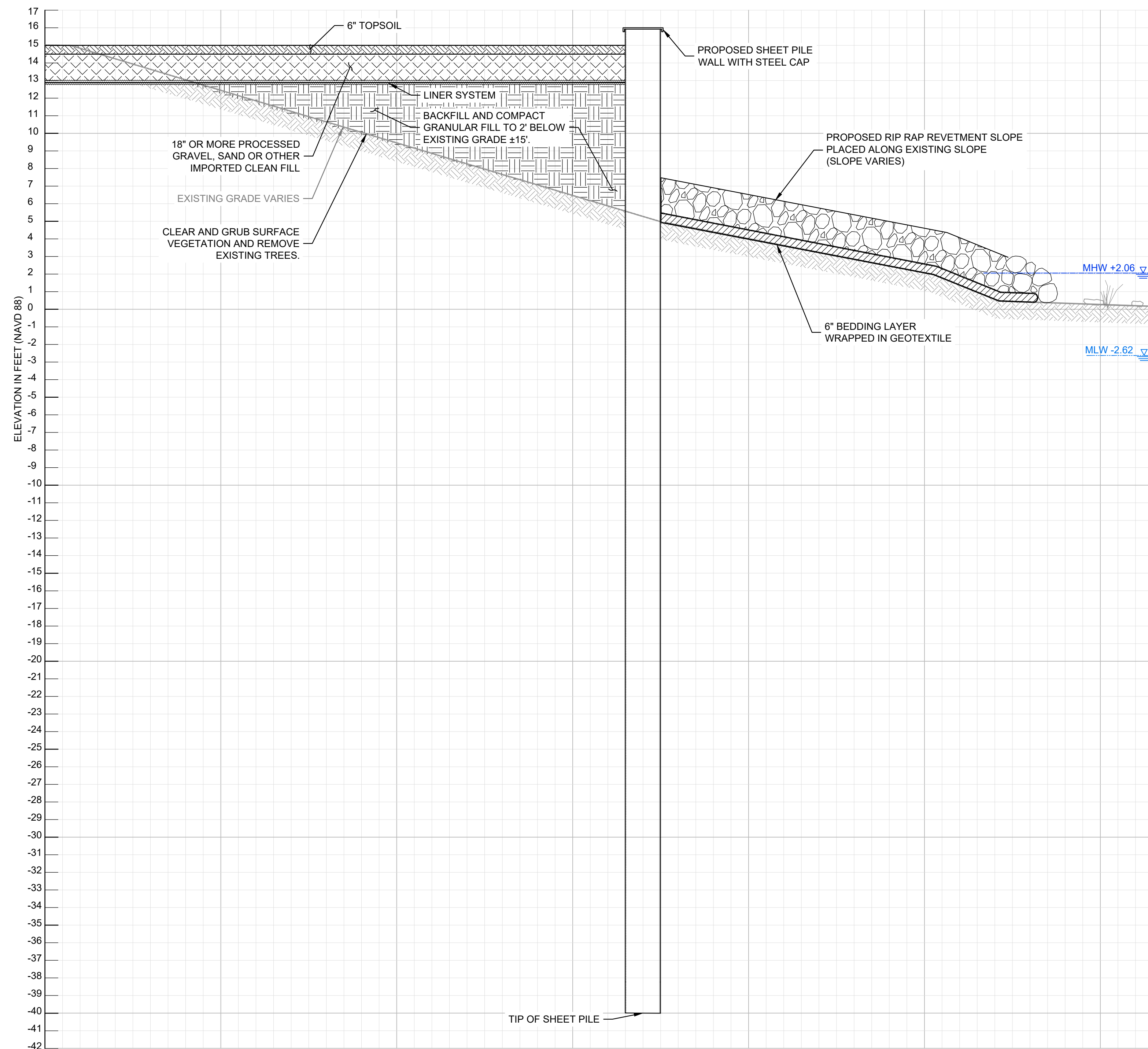
THE INFORMATION SHOWN ON THE DRAWING IS SOLELY FOR USE BY NATIONAL GRID OR THE NATIONAL GRID'S DESIGNATED REPRESENTATIVE FOR THE SPECIFIC PROJECT AND LOCATION IDENTIFIED ON THE DRAWING. THE DRAWING SHALL NOT BE TRANSFERRED, REUSED, COPIED, OR ALTERED IN ANY MANNER FOR USE AT ANY OTHER LOCATION OR FOR ANY OTHER PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF GZA AND NATIONAL GRID. ANY TRANSFER, REUSE, OR MODIFICATION TO THE DRAWING BY OTHERS, WITHOUT THE PRIOR WRITTEN EXPRESS CONSENT OF GZA AND NATIONAL GRID, WILL BE AT THE USER'S SOLE RISK AND WITHOUT ANY RISK OR LIABILITY TO GZA AND NATIONAL GRID.

<b>REMEDIAL ACTION WORK PLAN FORMER TIDEWATER FACILITY PAWTUCKET, RHODE ISLAND</b>			
<b>CONTAINMENT WALL LAYOUT</b>			
PREPARED BY: <b>GZA</b> GeoEnvironmental, Inc. Engineers and Scientists www.gza.com	PREPARED FOR: <b>nationalgrid</b>		
PROJ MGR: DR	DESIGNED BY: SLM	REVIEWED BY: JJC	CHECKED BY: JJC
DATE: JUNE 2018	DRAWN BY: LDT	SCALE: AS NOTED	DRAWING NO. 14
	PROJECT NO. 43654.00	REVISION NO. 0	SHEET NO. 22 OF 28

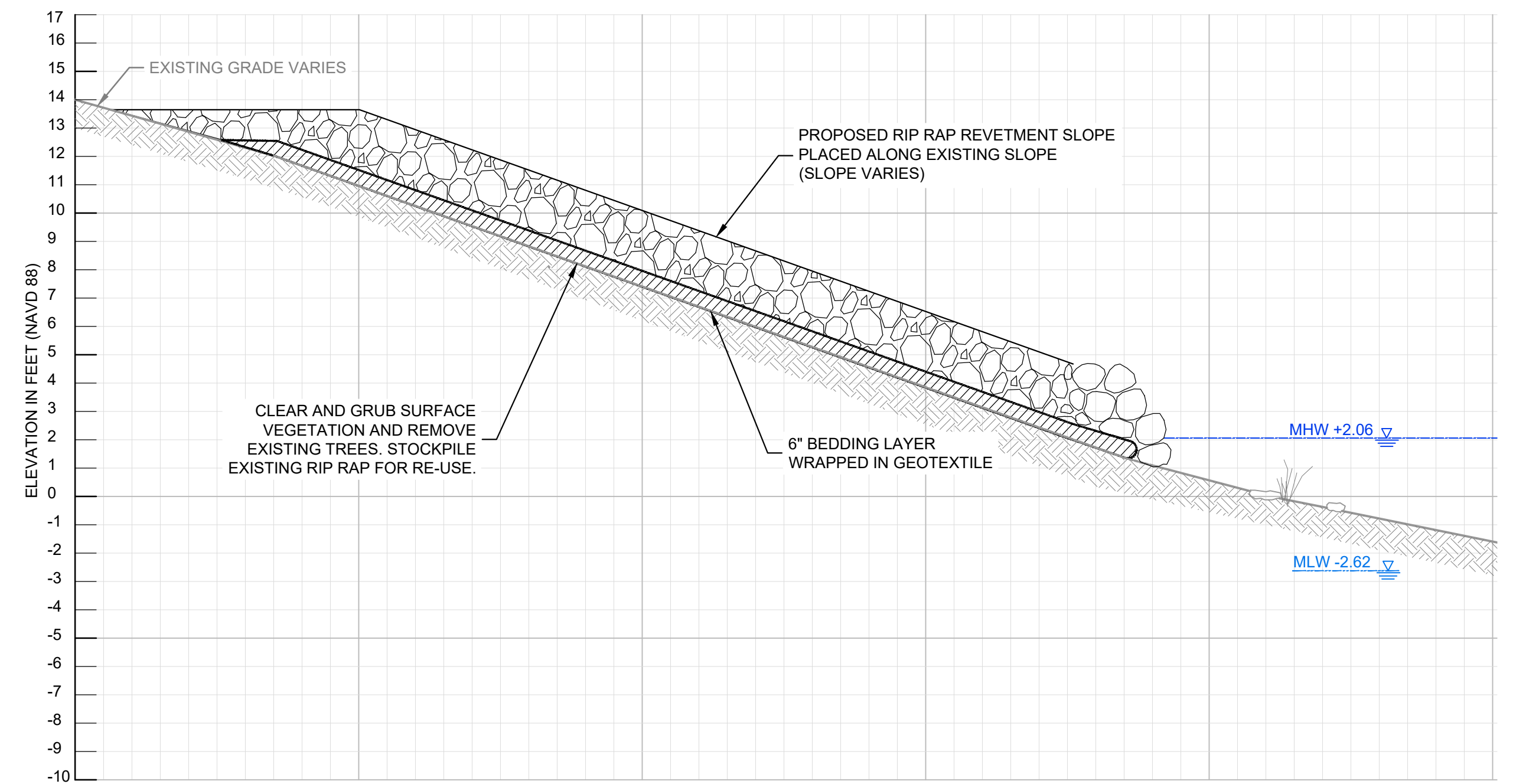
2018 - GZA GeoEnvironmental, Inc. GZA-3-DNA-1484-USA-TIDWATER-CONTOUR WALL LAYOUT JUNE 13, 2018 11:35 AM USA THERMALT



© 2018 - GZA GeoEnvironmental, Inc. GZA-3-DNA-USA-USA-TOURRES-CAD-DWGS-USA-SWP-PROPOSED WALL-SECTIONS LT\_2018-26.DWG CONTAINMENT WALL SECTIONS A & B JUNE 13, 2018 11:37 AM USA THERMALT



**A** AREA A1 (STA. 1+15)  
15/16 SCALE: 1" = 4'-0"



**B** AREA A2 (STA. 3+67)  
15/16 SCALE: 1" = 4'-0"



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REMEDIAL ACTION WORK PLAN  
FORMER TIDEWATER FACILITY  
PAWTUCKET, RHODE ISLAND

CONTAINMENT WALL SECTIONS A & B

TODD R. GREENE  
No. 0567  
REGISTERED PROFESSIONAL ENGINEER  
CIVIL

PREPARED BY: GZA GeoEnvironmental, Inc.  
Engineers and Scientists  
www.gza.com

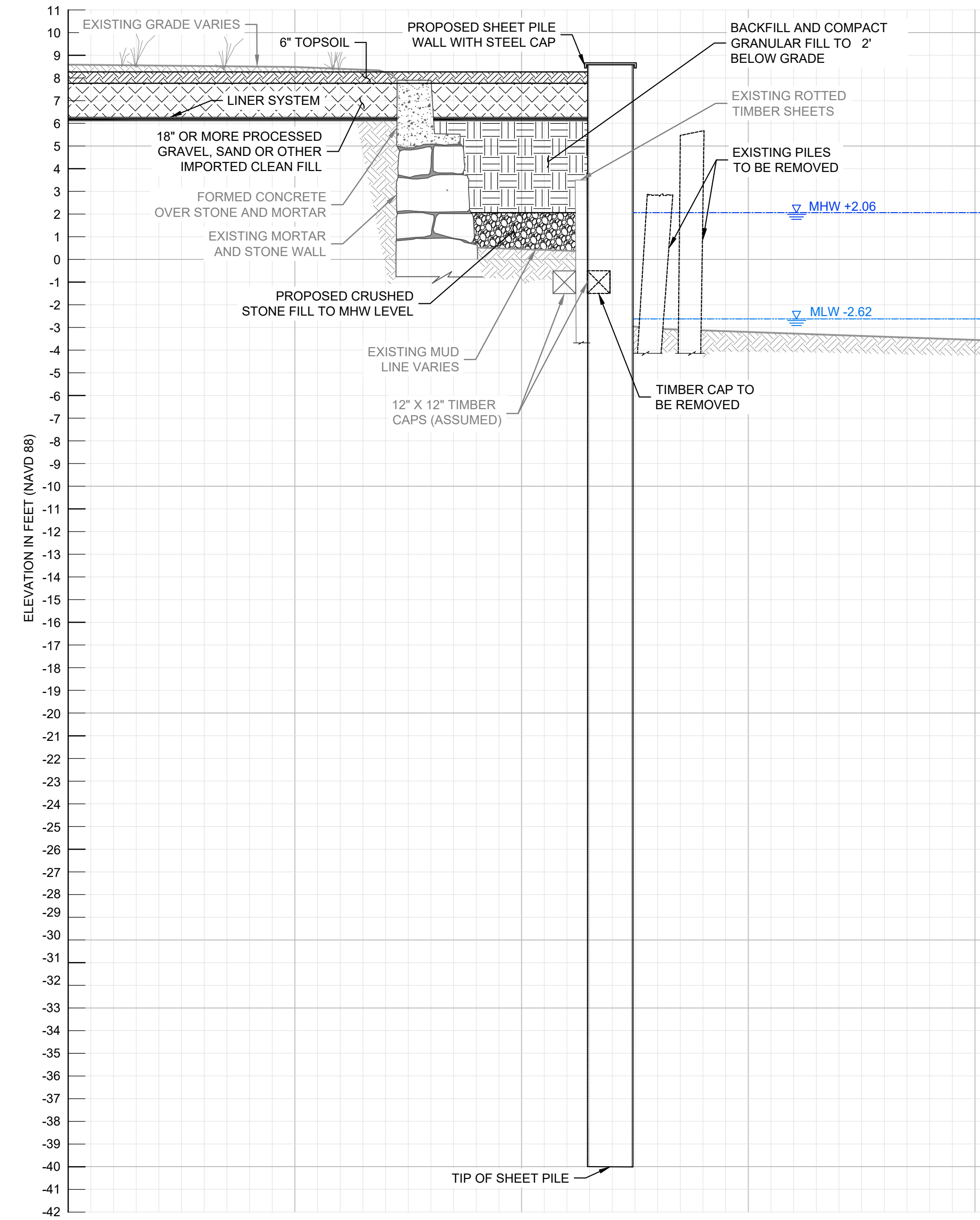
PREPARED FOR: nationalgrid

PROJ MGR: DR DESIGNED BY: SLM  
REVIEWED BY: JJC DRAWN BY: LDT  
DATE: JUNE 2018 PROJECT NO. 43654.00

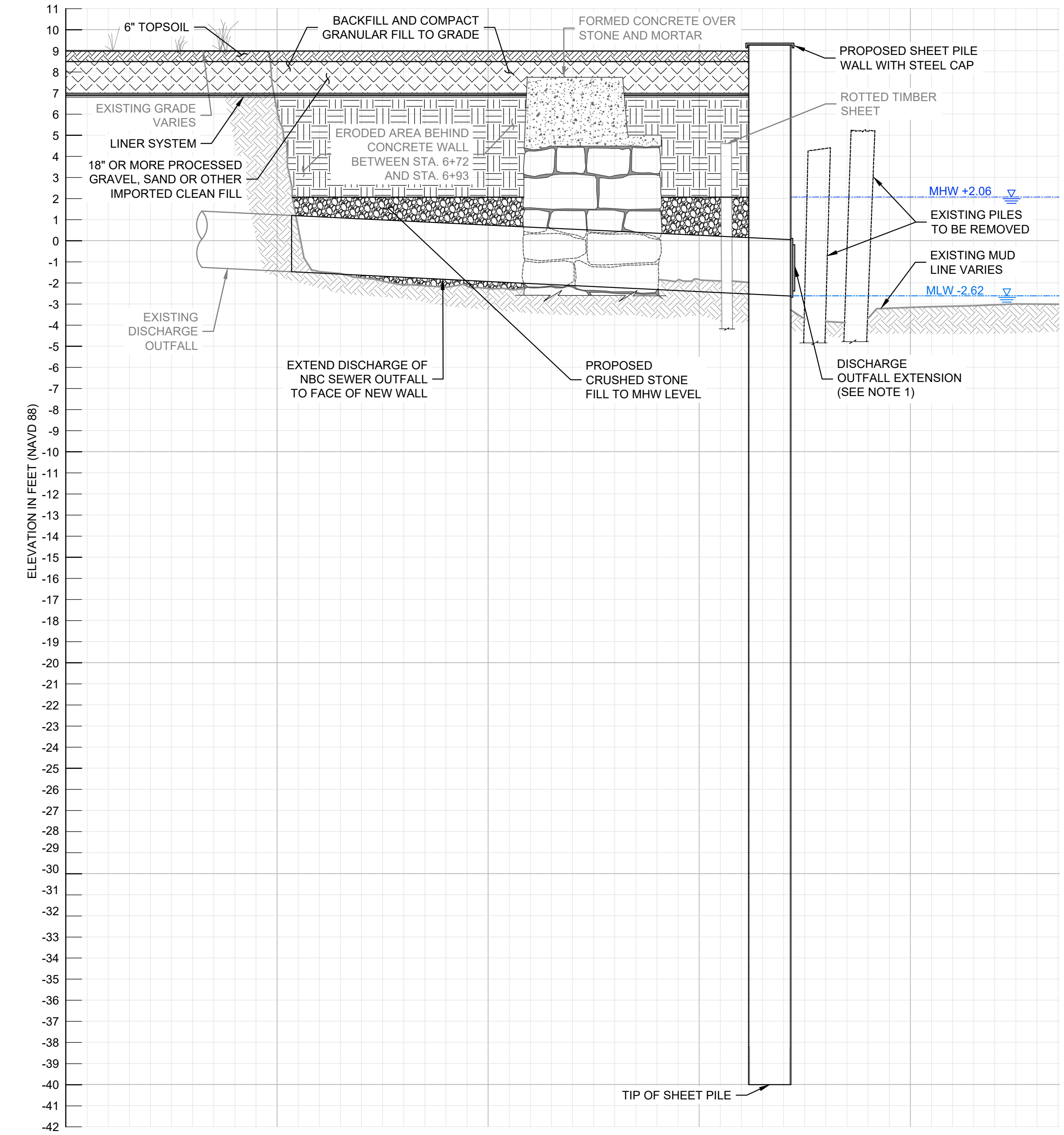
CHECKED BY: JJC SCALE: AS NOTED  
REVISION NO. 0

DRAWING 15  
SHEET NO. 23 OF 26

© 2018 - GZA GeoEnvironmental, Inc. GZA-3-D-ENV-USA-USA-TOURRES-CAUTIONS-SECTION-C-D-1517-2018-06-13-11:39 AM LISA THERIAULT



**C**  
1517  
AREA A4 (STA. 6+20)  
SCALE: 1" = 4'-0"



**D**  
1517  
AREA A4 (STA. 6+79)  
SCALE: 1" = 4'-0"

- NOTES:
- NBC WET WEATHER DISCHARGE, OUTFALL #217 (STA. 6+79)



THE INFORMATION SHOWN ON THE DRAWING IS SOLELY FOR USE BY NATIONAL GRID OR THE NATIONAL GRID'S DESIGNATED REPRESENTATIVE FOR THE SPECIFIC PROJECT AND LOCATION IDENTIFIED ON THE DRAWING. THE DRAWING SHALL NOT BE TRANSFERRED, REUSED, COPIED, OR ALTERED IN ANY MANNER FOR USE AT ANY OTHER LOCATION OR FOR ANY OTHER PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF GZA AND NATIONAL GRID. ANY TRANSFER, REUSE, OR MODIFICATION TO THE DRAWING BY OTHERS, WITHOUT THE PRIOR WRITTEN EXPRESS CONSENT OF GZA AND NATIONAL GRID, WILL BE AT THE USER'S SOLE RISK AND WITHOUT ANY RISK OR LIABILITY TO GZA AND NATIONAL GRID.

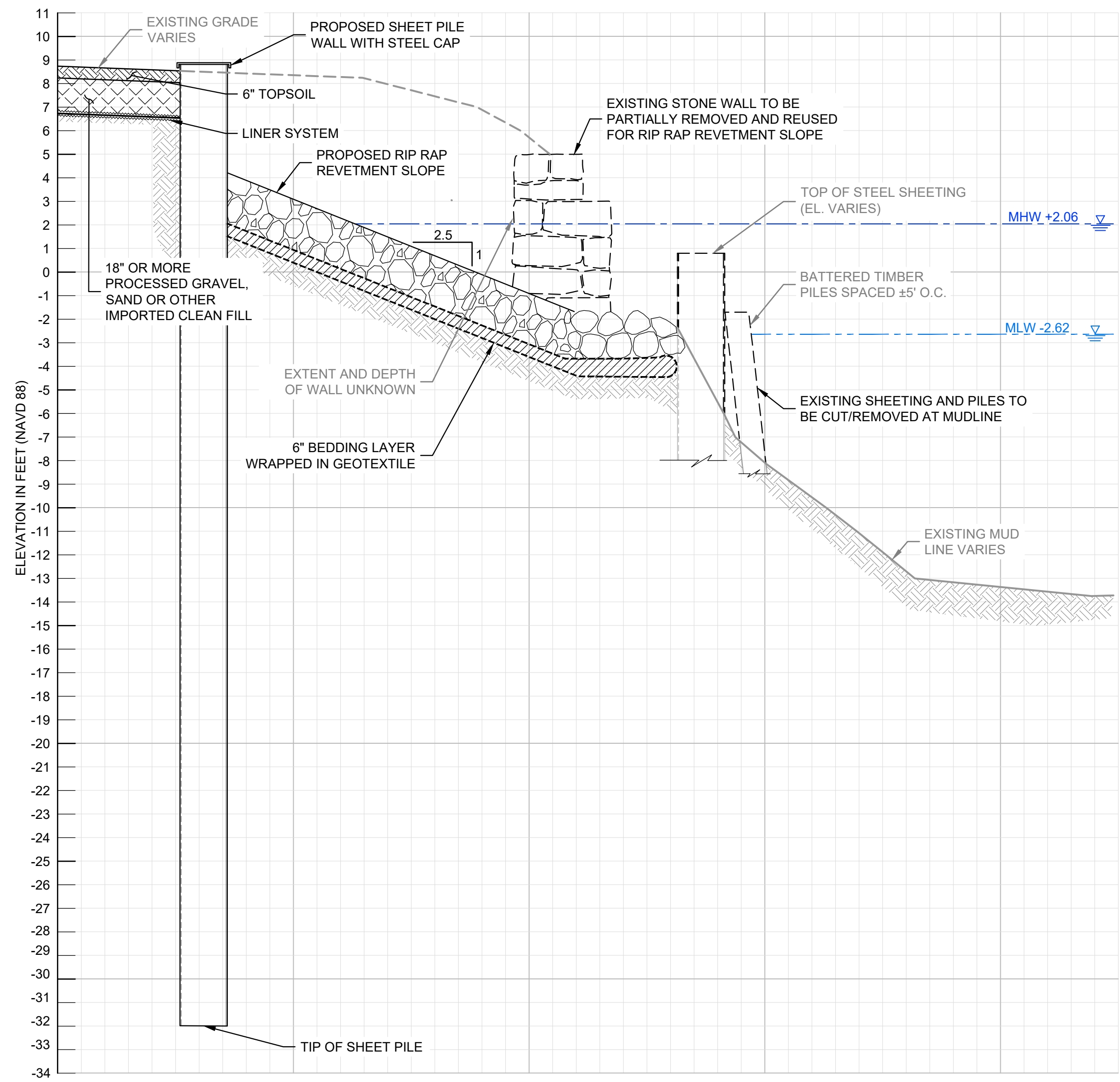
REMEDIAL ACTION WORK PLAN  
FORMER TIDEWATER FACILITY  
PAWTUCKET, RHODE ISLAND

CONTAINMENT WALL SECTIONS C & D

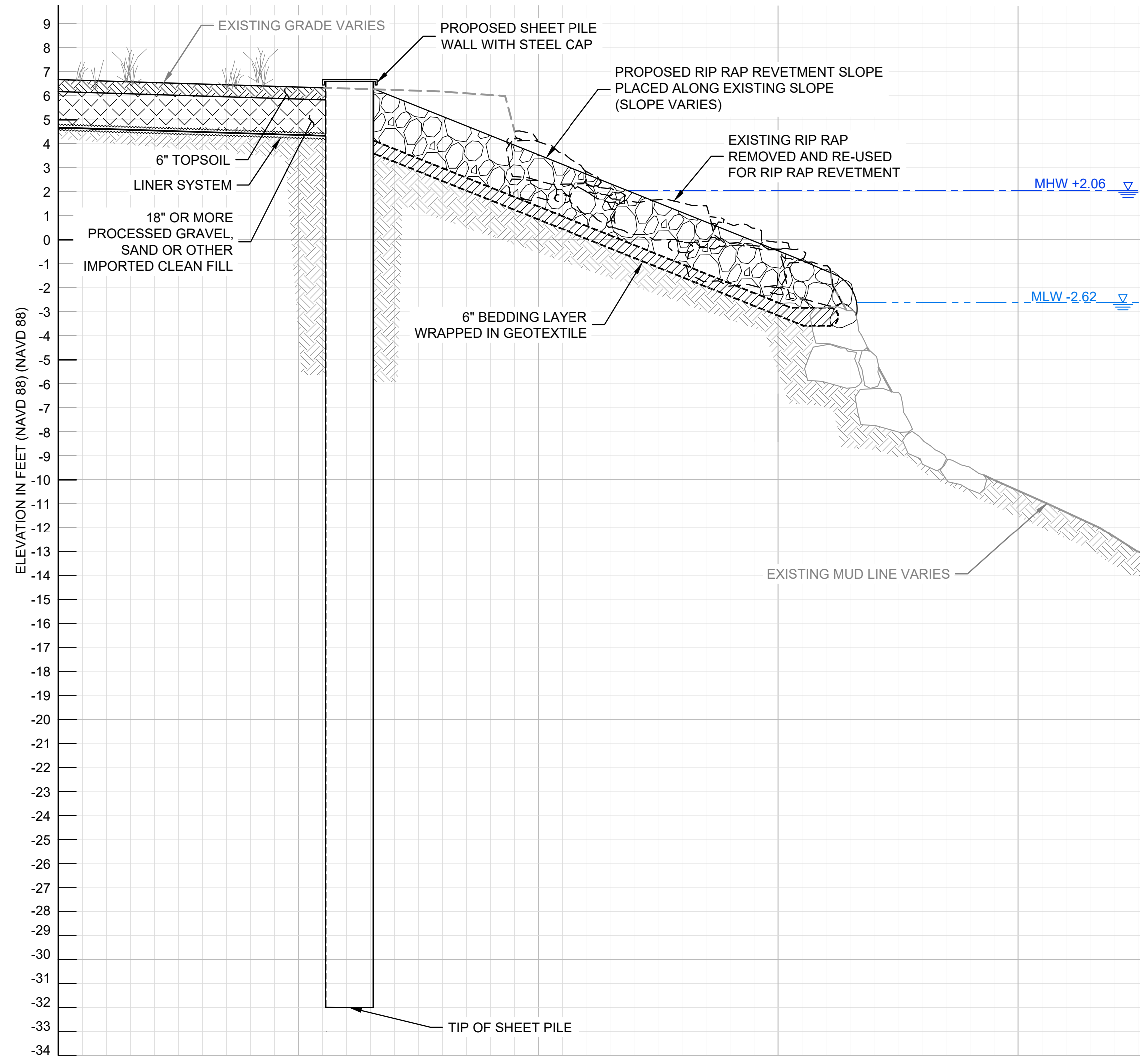
TODD R. GREENE  
No. 1517  
REGISTERED  
PROFESSIONAL ENGINEER  
CIVIL

PREPARED BY: <b>GZA</b> GeoEnvironmental, Inc. Engineers and Scientists www.gza.com	PREPARED FOR: <b>nationalgrid</b>
PROJ MGR: DR DESIGNED BY: SLM DATE: JUNE 2018	REVIEWED BY: JJC DRAWN BY: LDT PROJECT NO. 43654.00
CHECKED BY: JJC SCALE: AS NOTED REVISION NO. 0	DRAWING <b>16</b> REVISION NO. SHEET NO. 24 OF 26





**E** AREA A5 (STA. 12+52)  
 15/18 SCALE: 1" = 4'-0"



**F** AREA A5 (STA. 13+25)  
 15/18 SCALE: 1" = 4'-0"



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**REMEDIAL ACTION WORK PLAN  
 FORMER TIDEWATER FACILITY  
 PAWTUCKET, RHODE ISLAND**

**CONTAINMENT WALL SECTIONS E & F**

TODD R. GREENE  
 No. [Signature]  
 REGISTERED PROFESSIONAL ENGINEER  
 CIVIL

PREPARED BY: <b>GZA</b> GeoEnvironmental, Inc. Engineers and Scientists www.gza.com	PREPARED FOR: <b>nationalgrid</b>		
PROJ MGR: DR DESIGNED BY: SLM	REVIEWED BY: JJC DRAWN BY: LDT	CHECKED BY: JJC SCALE: AS NOTED	DRAWING <b>17</b>
DATE: JUNE 2018	PROJECT NO. 43654.00	REVISION NO. 0	SHEET NO. 25 OF 28









## **APPENDIX A**

### **LIMITATIONS**

## **GEOHYDROLOGICAL LIMITATIONS**

1. This Remedial Action Workplan has been prepared on behalf of and for the exclusive use of The Narragansett Electric Company d/b/a National Grid, solely for the Former Tidewater Facility located at terminus of Merry and Tidewater Streets in Pawtucket, Rhode Island ("Site") to address the requirements of Rule 9.00 of the Rhode Island Department of Environmental Management (RIDEM) Rules and Regulations for the Investigation and Remediation of Hazardous Materials Releases (*Remediation Regulations*) promulgated August 1996 and most recently amended in November 2011. This report and the findings contained herein shall not, in whole or in part, be disseminated or conveyed to any other party, nor used by any other party in whole or in part, without the prior written consent of GZA or National Grid.
2. GZA's work was performed in accordance with generally accepted practices of other consultants undertaking similar studies at the same time and in the same geographical area, and GZA observed that degree of care and skill generally exercised by other consultants under similar circumstances and conditions. GZA's findings and conclusions must be considered not as scientific certainties, but rather as our professional opinion concerning the significance of the limited data gathered during the course of the study. No other warranty, express or implied is made. Specifically, GZA does not and cannot represent that the Site contains no hazardous material, oil, or other latent condition beyond that observed by GZA during the 2012 Site investigation program.
3. The observations described in this report were made under the conditions stated therein. The conclusions presented in the report were based upon services performed and observations made by GZA.
4. In the event that National Grid or others authorized to use this report obtain information on environmental or hazardous waste issues at the Site not contained in this report, such information shall be brought to GZA's attention forthwith. GZA will evaluate such information and, on the basis of this evaluation, may modify the conclusions stated in this report.
5. The conclusions and recommendations contained in this report are based in part upon the data obtained from environmental samples obtained from relatively widely spread subsurface explorations. The nature and extent of variations between these explorations may not become evident until further exploration. If variations or other latent conditions then appear evident, it will be necessary to reevaluate the conclusions and recommendations of this report.



6. The generalized soil profile described in the text is intended to convey trends in subsurface conditions. The boundaries between strata are approximate and idealized and have been developed by interpretations of widely spaced explorations and samples; actual soil transitions are probably more gradual. For specific information, refer to the boring logs.
7. In the event this work included the collection of water level data, these readings have been made in the test pits, borings and/or observation wells at times and under conditions stated on the exploration logs. These data have been reviewed and interpretations have been made in the text of this report. However, it must be noted that fluctuations in the level of the groundwater may occur due to variations in rainfall and other factors different from those prevailing at the time measurements were made.
8. The conclusions contained in this report are based in part upon various types of chemical data and are contingent upon their validity. These data have been reviewed and interpretations made in the report. Moreover, it should be noted that variations in the types and concentrations of contaminants and variations in their flow paths may occur due to seasonal water table fluctuations, past disposal practices, the passage of time, and other factors. Should additional chemical data become available in the future, these data should be reviewed by GZA and the conclusions and recommendations presented herein modified accordingly.



## **APPENDIX B**

DRAFT ELUR AND SMP



~~Appendix G~~  
**APPENDIX B**  
**ENVIRONMENTAL LAND USAGE RESTRICTION**

This Declaration of Environmental Land Usage Restriction (“Restriction”) is made on this \_\_\_\_ day of \_\_\_\_\_, 20\_\_ by ~~[property owner]~~, the City of Pawtucket, and its successors and/or assigns (hereinafter, the “Grantor”).

**WITNESSETH:**

WHEREAS, the Grantor ~~\_\_\_\_\_ (name)~~, the City of Pawtucket is the Owner in fee simple of certain real property identified as ~~[specify the eastern portions of Assessor’s Plat 65B, Lot(s), address 648 and Town or City]~~ the eastern portions of Plat 67B, Lots 11 and 21 located in Pawtucket, Rhode Island (the “Property. These lots along with Assessor’s Plat 54B, Lot 826 and Assessor’s Plat 65B, Lots 645, 647, 649, and 662 owned by The Narragansett Electric Company are collectively identified as the Former Tidewater Facility (the “Site”), more particularly described in Exhibit A (Legal Description) which is attached hereto and made a part hereof; . Separate Environmental Land Usage Restrictions will be recorded on The Narragansett Electric Company owned lots;

WHEREAS, the ~~Property Site~~ (or portion thereof identified in the Class I survey which is attached hereto as Exhibit ~~2AA~~ and is made a part hereof) has been determined to ~~contain soil and/or groundwater which is contaminated with certain Hazardous Materials hazardous materials and/or petroleum in excess of applicable [residential or industrial/commercial Residential Direct Criteria, Industrial/Commercial Direct Exposure Criteria, and/or applicable groundwater the GB Groundwater objective]~~ criteria pursuant to the Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases (“Remediation Regulations”);

WHEREAS, the Grantor and the Department have determined that the environmental land use restrictions set forth below are consistent with the regulations adopted by the Rhode Island Department of Environmental Management (“Department”) pursuant to R.I.G.L. § 23-19.14-1 and that this restriction shall be a Conservation Restriction pursuant to R.I.G.L. § 34-39--1 et. seq. and shall not be subject to the 30--year limitation provided in R.I.G.L. § 34-4-21;

WHEREAS, the Department's written approval of this Restriction is contained in the document entitled: ~~[Remedial Decision Letter/ Settlement Agreement/ Order of Approval/ Remedial Approval Letter]~~ issued on \_\_\_\_\_ pursuant to the Remediation Regulations and attached in Exhibit B;

WHEREAS, to prevent exposure to or migration of ~~Hazardous Substances hazardous substances~~ and to abate hazards to human health and/or the environment, and in accordance with the ~~[Remedial Decision Letter/ Remedial Agreement/ Order of Approval/ Remedial Approval Letter];~~, the Grantor desires to impose certain restrictions upon the use, occupancy, and activities of

and at the ~~{Property/Contaminated-Site}~~;

WHEREAS, the Grantor believes that this Restriction will effectively protect public health and the environment from such contamination; and

WHEREAS, the Grantor intends that such restrictions shall run with the land and be binding upon and enforceable against the Grantor and the Grantor's successors and assigns.

NOW, THEREFORE, Grantor agrees as follows:

A. **Restrictions Applicable to the ~~{Property/Contaminated-Site}~~:** In accordance with the ~~{Remedial Decision Letter/ Remedial Agreement/ Order of Approval/ Remedial Approval Letter}~~, the use, occupancy and activity of and at the ~~{Property/ Contaminated-Site}~~ is restricted as follows:

i. No ~~residential~~ use of the ~~{Property/Contaminated-Site}~~ including no vegetable gardens, licensed daycares, and elementary and secondary schools shall be permitted that is contrary to Department approvals and restrictions contained herein;

ii. No groundwater at the ~~{Property/Contaminated-Site}~~ shall be used as potable water or irrigation;

iii. ~~No~~ Neither the engineered controls nor the underlying soil at the ~~{Property/Contaminated-Site}~~ shall be disturbed in any manner without written permission of the Department's Office of Waste Management, except as permitted in ~~the Remedial Action Work Plan (RAWP) or~~ Section C below and in the Soil Management Plan (SMP) approved by the Department in a written approval letter dated \_\_\_\_\_ (date) \_\_\_\_\_ contained in Exhibit B ~~and~~ attached hereto;

iv. Humans engaged in activities at the ~~{Property/Contaminated-Site}~~ shall not be exposed to soils containing ~~Hazardous Materials~~ hazardous materials and/or petroleum in concentrations exceeding the applicable Department approved Direct Exposure Criteria set forth in the Remediation Regulations;

~~{vi. Water at the {Property/Contaminated-} No subsurface structures shall be constructed on the Site} shall be prohibited from infiltrating soils over groundwater containing Hazardous Materials~~ hazardous materials and/or petroleum in concentrations exceeding the applicable Department approved ~~leachability criteria set forth in the Remediation Regulations~~;

~~viii.v. \_\_\_\_\_ No subsurface structures shall be constructed on the {Property/Contaminated-Site} over groundwater containing Hazardous Materials and/or petroleum in concentrations exceeding the applicable Department approved GA or GB Groundwater Objectives set forth in the Remediation Regulations; without an engineered control to address potential vapor intrusion; and,~~



~~ix.vi.~~ \_\_\_\_ The engineered controls at the ~~[Property/ Contaminated-Site]~~ described in the ~~[RAWP or SMP]~~ contained in Exhibit ~~BD~~ attached hereto shall not be disturbed and shall be properly maintained to prevent humans engaged in ~~[residential or industrial/commercial]~~ activity from being exposed to soils containing ~~Hazardous Materials~~hazardous materials and/or petroleum in concentrations exceeding the applicable Department-approved ~~[residential or industrial/commercial]~~Industrial/Commercial Direct Exposure Criteria in accordance with the Remediation Regulations; ~~and.~~

~~[ii. The engineered controls at the [Property/ Contaminated-Site] described in the [RAWP or Soil Management Plan SMP] contained in Exhibit B attached hereto shall not be disturbed and shall be properly maintained so that water does not infiltrate soils containing Hazardous Materials and/or petroleum in concentrations exceeding the applicable Department approved leachability criteria set forth in the Remediation Regulations.~~

**~~D.B.~~** No action shall be taken, allowed, suffered, or omitted at the ~~[Property/ Contaminated-Site]~~ if such action or omission is reasonably likely to:

- i. Create a risk of migration of ~~Hazardous Materials~~hazardous materials and/or petroleum;
- ii. Create a potential hazard to human health or the environment; or
- iii. Result in the disturbance of any engineering controls utilized at the ~~[Property/Contaminated-Site]~~, except as permitted in the Department-approved ~~[RAWP or SMP]~~ contained in Exhibit ~~BD~~.

C. **Emergencies:** In the event of any emergency which presents a significant risk to human health or to the environment, including but not limited to, maintenance and repair of utility lines and other related appurtenances or a response to emergencies such as fire or flood, the application of Paragraphs A (~~iii. viii. -vi.~~) and B above may be suspended, provided such risk cannot be abated without suspending such Paragraphs and the Grantor complies with the following:

- i. \_\_\_\_ Grantor shall notify the Department's Office of Waste Management in writing of the emergency as soon as possible but no more than three (3) business days after Grantor's having learned of the emergency. (This does not remove Grantor's obligation to notify any other necessary state, local or federal agencies.);
- ii. \_\_\_\_ Grantor shall limit both the extent and duration of the suspension to the minimum period reasonable and necessary to adequately respond to the emergency;
- iii. \_\_\_\_ Grantor shall implement reasonable measures necessary to prevent actual, potential, present and future risk to human health and the environment resulting from such suspension;
- iv. \_\_\_\_ Grantor shall communicate at the time of written notification to the Department its

intention to conduct the Emergency Response Actions and provide a schedule to complete the Emergency Response Actions;

- v. \_\_\_ Grantor shall continue to implement the Emergency Response Actions, on the schedule submitted to the Department, to ensure that the ~~{Property/Contaminated-Site}~~ is remediated in accordance with the Remediation Regulations (or applicable variance) or restored to its condition prior to such emergency. Based upon information submitted to the Department at the time the ELUR was recorded pertaining to known environmental conditions at the ~~{Property/Contaminated-Site}~~, emergency maintenance and repair of utility lines and other related appurtenances shall only require restoration of the ~~{Property/Contaminated-Site}~~ to its condition prior to the maintenance and repair of the utility lines and other related appurtenances; and
- vi. \_\_\_ Grantor shall submit to the Department, within ten (10) days after the completion of the Emergency Response Action, a status report describing the emergency activities that have been completed.

**D. Release of Restriction; Alterations of Subject Area:** The Grantor shall not make, or allow or suffer to be made, any alteration of any kind in, to, or about any portion of the ~~{Property/Contaminated-Site}~~ inconsistent with this Restriction unless the Grantor has received the Department's prior written approval for such alteration. If the Department determines that the proposed alteration is significant, the Department may require the amendment of this Restriction. Alterations deemed insignificant -by the Department will be approved via a letter from the Department. The Department shall not approve any such alteration and shall not release the ~~{Property/Contaminated-Site}~~ from the provisions of this Restriction unless the Grantor demonstrates to the Department's satisfaction that Grantor has managed the ~~{Property/Contaminated-Site}~~ in accordance with applicable regulations.

**E. Notice of Lessees and Other Holders of Interests in the ~~{Property/Contaminated-Site}~~:** The Grantor, or any future holder of any interest in the ~~{Property/Contaminated-Site}~~, shall cause any lease, grant, or other transfer of any interest in the ~~{Property/Contaminated-Site}~~ to include a provision expressly requiring the lessee, grantee, or transferee to comply with this Restriction. The failure to include such provision shall not affect the validity or applicability of this Restriction to the ~~{Property/Contaminated-Site}~~.

**F. Enforceability:** If any court of competent jurisdiction determines that any provision of this Restriction is invalid or unenforceable, the Grantor shall notify the Department in writing within fourteen (14) days of such determination.

**G. Binding Effect:** All of the terms, covenants, and conditions of this Restriction shall run with the land and shall be binding on the Grantor, its successors and assigns, and each Owner and any other party entitled to control, possession or use of the ~~{Property/Contaminated-Site}~~ during such period of Ownership or possession.

**H. Inspection & Non-Compliance:** It shall be the obligation of the Grantor, or any future holder of any interest in the ~~{Property/Contaminated-Site}~~, to provide for annual inspections of the ~~{Property/Contaminated-Site}~~ for compliance with the ELUR in accordance with



Department requirements.

~~[An officer or Director of the company with direct knowledge of past and present conditions of the [Property/Contaminated-Site] (the “Company Representative”), or]~~ A qualified environmental professional will, on behalf of the Grantor or future holder of any interest in the ~~[Property/Contaminated-Site]~~, evaluate the compliance status of the ~~[Property/Contaminated-Site]~~ on an annual basis. Upon completion of the evaluation, the ~~[Company Representative or]~~ environmental professional will prepare and ~~simultaneously~~ submit to the Department and to the Grantor or future holder of any interest in the ~~[Property/Contaminated-Site]~~ an evaluation report detailing the findings of the inspection, and noting any compliance violations at the ~~[Property/Contaminated-Site]~~. If the ~~[Property/Contaminated-Site]~~ is determined to be out of compliance with the terms of the ELUR, the Grantor or future holder of any interest in the ~~[Property/Contaminated-Site]~~ shall submit a corrective action plan in writing to the Department within ten (10) days of receipt of the evaluation report, indicating the plans to bring the ~~[Property/Contaminated-Site]~~ into compliance with the ELUR, including, at a minimum, a schedule for implementation of the plan.

In the event of any violation of the terms of this Restriction, which remains uncured more than ninety (90) days after written notice of violation, all Department approvals and agreements relating to the ~~[Property/Contaminated-Site]~~ may be voided at the sole discretion of the Department.

- I. **Terms Used Herein:** The definitions of terms used herein shall be the same as the definitions contained in Section 3 (DEFINITIONS) of the Remediation Regulations.

### EXHIBITS

Exhibit A: Legal Description and Class I Survey

Exhibit B: Order of Approval

Exhibit C: Figure 1: Extent of Engineered Control

Exhibit D: Soil Management Plan

IN WITNESS WHEREOF, the Grantor has hereunto set (his/her) hand and seal on the day and year set forth above.

~~[Name of Person(s), company, LLC or LLP]~~  
CITY OF PAWTUCKET

By: \_\_\_\_\_

Grantor (signature) \_\_\_\_\_ Grantor (typed name)

STATE OF RHODE ISLAND  
COUNTY OF \_\_\_\_\_

\_\_\_\_\_ In (CITY/TOWN), in said County and State, on the \_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, before me Personally appeared \_\_\_\_\_, to me known and known by me to be the party executing the foregoing instrument and (he/she) acknowledged said instrument by (him/her) executed to be (his/her) free act and deed.

Notary Public: \_\_\_\_\_

\_\_\_\_\_ My Comm. Expires: \_\_\_\_\_

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|



~~Appendix G~~  
**APPENDIX B**  
**ENVIRONMENTAL LAND USAGE RESTRICTION**

This Declaration of Environmental Land Usage Restriction (“Restriction”) is made on this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_ by ~~[property owner]~~The Narragansett Electric Company, and its successors and/or assigns (hereinafter, the “Grantor”).

**WITNESSETH:**

WHEREAS, the Grantor ~~\_\_\_\_\_ (name)~~, The Narragansett Electric Company is the Owner in fee simple of certain real property identified as ~~[specify Assessor’s Plat, Lot(s), address 65B, Lots 645, 647, and Town or City]649~~ located in Pawtucket, Rhode Island ~~(, These lots along with the “Property Assessor’s Plat 54B, Lot 826 and Assessor’s Plat 65B, Lot 662 owned by The Narragansett Electric Company and the eastern portions of Assessor’s Plat 65B, Lot 648 and the eastern portions of Plat 67B, Lots 11 and 21 owned by the City of Pawtucket are collectively identified as the Former Tidewater Facility (the “Site”)~~, more particularly described in Exhibit A (Legal Description) which is attached hereto and made a part hereof. Separate Environmental Land Usage Restrictions will be recorded on Assessor’s Plat 54B, Lot 826 and Assessor’s Plat 65B, Lot 662 owned by The Narragansett Electric Company and the City of Pawtucket owned lots;

WHEREAS, the ~~Property Site~~ (or portion thereof identified in the Class I survey which is attached hereto as Exhibit ~~2AA~~ and is made a part hereof) has been determined to ~~contain soil and/or groundwater which is contaminated with certain Hazardous Materials hazardous materials and/or petroleum in excess of applicable [residential or industrial/commercial Residential Direct Criteria, Industrial/Commercial Direct Exposure Criteria, and/or applicable groundwater the GB Groundwater objective]~~ criteria pursuant to the Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases (“Remediation Regulations”);

WHEREAS, the Grantor and the Department have determined that the environmental land use restrictions set forth below are consistent with the regulations adopted by the Rhode Island Department of Environmental Management (“Department”) pursuant to R.I.G.L. § 23-19.14-1 and that this restriction shall be a Conservation Restriction pursuant to R.I.G.L. § 34-39--1 et. seq. and shall not be subject to the 30-year limitation provided in R.I.G.L. § 34-4-21;

WHEREAS, the Department's written approval of this Restriction is contained in the document entitled: ~~[Remedial Decision Letter/ Settlement Agreement/ Order of Approval/ Remedial Approval Letter]~~ issued on \_\_\_\_\_ pursuant to the Remediation Regulations and attached in Exhibit B;

WHEREAS, to prevent exposure to or migration of ~~Hazardous Substances hazardous substances~~ and to abate hazards to human health and/or the environment, and in accordance with the

~~[Remedial Decision Letter/ Remedial Agreement/ Order of Approval/ Remedial Approval Letter]~~, the Grantor desires to impose certain restrictions upon the use, occupancy, and activities of and at the ~~[Property/Contaminated-Site]~~;

WHEREAS, the Grantor believes that this Restriction will effectively protect public health and the environment from such contamination; and

WHEREAS, the Grantor intends that such restrictions shall run with the land and be binding upon and enforceable against the Grantor and the Grantor's successors and assigns.

NOW, THEREFORE, Grantor agrees as follows:

**A. Restrictions Applicable to the ~~[Property/Contaminated-Site]~~:** In accordance with the ~~[Remedial Decision Letter/ Remedial Agreement/ Order of Approval/ Remedial Approval Letter]~~, the use, occupancy and activity of and at the ~~[Property/Contaminated-Site]~~ is restricted as follows:

- i. No residential use of the ~~[Property/Contaminated-Site]~~ including no vegetable gardens, licensed daycares, and elementary and secondary schools shall be permitted that is contrary to Department approvals and restrictions contained herein;
- ii. No groundwater at the ~~[Property/Contaminated-Site]~~ shall be used as potable water or irrigation;
- iii. ~~No~~ Neither the engineered controls nor the underlying soil at the ~~[Property/Contaminated-Site]~~ shall be disturbed in any manner without written permission of the Department's Office of Waste Management, except as permitted in ~~the Remedial Action Work Plan (RAWP) or~~ Section C below and in the Soil Management Plan (SMP) approved by the Department in a written approval letter dated \_\_\_\_\_ (date) contained in Exhibit B ~~and~~ attached hereto;
- iv. Humans engaged in activities at the ~~[Property/Contaminated-Site]~~ shall not be exposed to soils containing ~~Hazardous Materials~~ hazardous materials and/or petroleum in concentrations exceeding the applicable Department approved Direct Exposure Criteria set forth in the Remediation Regulations;
- ~~v. Water at the [Property/Contaminated-Site] shall be prohibited from infiltrating soils containing Hazardous Materials and/or petroleum in concentrations exceeding the applicable Department approved leachability criteria set forth in the Remediation Regulations;~~
- vii.v. No subsurface structures shall be constructed on the [Property/Contaminated-Site] over groundwater containing Hazardous Materials hazardous materials and/or petroleum in concentrations exceeding the applicable Department approved ~~GA or GB~~ Groundwater Objectives set forth in the Remediation Regulations; without an engineered control to address potential vapor intrusion; and,



~~viii.vi.~~ The engineered controls at the ~~{Property/ Contaminated-Site}~~ described in the ~~{RAWP or SMP}~~ contained in Exhibit ~~BD~~ attached hereto shall not be disturbed and shall be properly maintained to prevent humans engaged in ~~{residential or industrial/commercial}~~Industrial/Commercial activity from being exposed to soils containing ~~Hazardous Materials~~hazardous materials and/or petroleum in concentrations exceeding the applicable Department-approved ~~{residential or industrial/commercial}~~Industrial/Commercial Direct Exposure Criteria in accordance with the Remediation Regulations; ~~and.~~

~~{ii. The engineered controls at the {Property/ Contaminated-Site} described in the {RAWP or Soil Management Plan SMP} contained in Exhibit B attached hereto shall not be disturbed and shall be properly maintained so that water does not infiltrate soils containing Hazardous Materials and/or petroleum in concentrations exceeding the applicable Department approved leachability criteria set forth in the Remediation Regulations.~~

**D.B.** No action shall be taken, allowed, suffered, or omitted at the ~~{Property/ Contaminated-Site}~~ if such action or omission is reasonably likely to:

- i. Create a risk of migration of ~~Hazardous Materials~~hazardous materials and/or petroleum;
- ii. Create a potential hazard to human health or the environment; or
- iii. Result in the disturbance of any engineering controls utilized at the ~~{Property/Contaminated-Site}~~, except as permitted in the Department-approved ~~{RAWP or SMP}~~ contained in Exhibit ~~BD~~.

C. **Emergencies:** In the event of any emergency which presents a significant risk to human health or to the environment, including but not limited to, maintenance and repair of utility lines and other related appurtenances or a response to emergencies such as fire or flood, the application of Paragraphs A (~~iii. -viii. -vi.~~) and B above may be suspended, provided such risk cannot be abated without suspending such Paragraphs and the Grantor complies with the following:

- i. Grantor shall notify the Department's Office of Waste Management in writing of the emergency as soon as possible but no more than three (3) business days after Grantor's having learned of the emergency. (This does not remove Grantor's obligation to notify any other necessary state, local or federal agencies.);
- ii. Grantor shall limit both the extent and duration of the suspension to the minimum period reasonable and necessary to adequately respond to the emergency;
- iii. Grantor shall implement reasonable measures necessary to prevent actual, potential, present and future risk to human health and the environment resulting from such suspension;

- iv. \_\_\_ Grantor shall communicate at the time of written notification to the Department its intention to conduct the Emergency Response Actions and provide a schedule to complete the Emergency Response Actions;
- v. \_\_\_ Grantor shall continue to implement the Emergency Response Actions, on the schedule submitted to the Department, to ensure that the ~~{Property/Contaminated-Site}~~ is remediated in accordance with the Remediation Regulations (or applicable variance) or restored to its condition prior to such emergency. Based upon information submitted to the Department at the time the ELUR was recorded pertaining to known environmental conditions at the ~~{Property/Contaminated-Site}~~,<sup>2</sup> emergency maintenance and repair of utility lines and other related appurtenances shall only require restoration of the ~~{Property/Contaminated-Site}~~ to its condition prior to the maintenance and repair of the utility lines and other related appurtenances; and
- vi. \_\_\_ Grantor shall submit to the Department, within ten (10) days after the completion of the Emergency Response Action, a status report describing the emergency activities that have been completed.

**D. Release of Restriction; Alterations of Subject Area:** The Grantor shall not make, or allow or suffer to be made, any alteration of any kind in, to, or about any portion of the ~~{Property/Contaminated-Site}~~ inconsistent with this Restriction unless the Grantor has received the Department's prior written approval for such alteration. If the Department determines that the proposed alteration is significant, the Department may require the amendment of this Restriction. Alterations deemed insignificant -by the Department will be approved via a letter from the Department. The Department shall not approve any such alteration and shall not release the ~~{Property/Contaminated-Site}~~ from the provisions of this Restriction unless the Grantor demonstrates to the Department's satisfaction that Grantor has managed the ~~{Property/Contaminated-Site}~~ in accordance with applicable regulations.

**E. Notice of Lessees and Other Holders of Interests in the ~~{Property/Contaminated-Site}~~:** The Grantor, or any future holder of any interest in the ~~{Property/Contaminated-Site}~~,<sup>2</sup> shall cause any lease, grant, or other transfer of any interest in the ~~{Property/Contaminated-Site}~~ to include a provision expressly requiring the lessee, grantee, or transferee to comply with this Restriction. The failure to include such provision shall not affect the validity or applicability of this Restriction to the ~~{Property/Contaminated-Site}~~.

**F. Enforceability:** If any court of competent jurisdiction determines that any provision of this Restriction is invalid or unenforceable, the Grantor shall notify the Department in writing within fourteen (14) days of such determination.

**G. Binding Effect:** All of the terms, covenants, and conditions of this Restriction shall run with the land and shall be binding on the Grantor, its successors and assigns, and each Owner and any other party entitled to control, possession or use of the ~~{Property/Contaminated-Site}~~ during such period of Ownership or possession.

**H. Inspection & Non-Compliance:** It shall be the obligation of the Grantor, or any future holder



of any interest in the ~~{Property/Contaminated-Site}~~, to provide for annual inspections of the ~~{Property/Contaminated-Site}~~ for compliance with the ELUR in accordance with Department requirements.

~~[An officer or Director of the company with direct knowledge of past and present conditions of the {Property/Contaminated-Site} (the "Company Representative"), or]~~ A qualified environmental professional will, on behalf of the Grantor or future holder of any interest in the ~~{Property/Contaminated-Site}~~, evaluate the compliance status of the ~~{Property/Contaminated-Site}~~ on an annual basis. Upon completion of the evaluation, the ~~{Company Representative or}~~ environmental professional will prepare and ~~simultaneously~~ submit to the Department and to the Grantor or future holder of any interest in the ~~{Property/Contaminated-Site}~~ an evaluation report detailing the findings of the inspection, and noting any compliance violations at the ~~{Property/Contaminated-Site}~~. If the ~~{Property/Contaminated-Site}~~ is determined to be out of compliance with the terms of the ELUR, the Grantor or future holder of any interest in the ~~{Property/Contaminated-Site}~~ shall submit a corrective action plan in writing to the Department within ten (10) days of receipt of the evaluation report, indicating the plans to bring the ~~{Property/Contaminated-Site}~~ into compliance with the ELUR, including, at a minimum, a schedule for implementation of the plan.

In the event of any violation of the terms of this Restriction, which remains uncured more than ninety (90) days after written notice of violation, all Department approvals and agreements relating to the ~~{Property/Contaminated-Site}~~ may be voided at the sole discretion of the Department.

- I. Terms Used Herein:** The definitions of terms used herein shall be the same as the definitions contained in Section 3 (DEFINITIONS) of the Remediation Regulations.

## EXHIBITS

Exhibit A: Legal Description and Class I Survey

Exhibit B: Order of Approval

Exhibit C: Figure 1: Extent of Engineered Control

Exhibit D: Soil Management Plan

IN WITNESS WHEREOF, the Grantor has hereunto set (his/her) hand and seal on the day and year set forth above.

~~{Name of Person(s), company, LLC or LLP}~~  
THE NARRAGANSETT ELECTRIC COMPANY

By: \_\_\_\_\_  
Grantor (signature) \_\_\_\_\_ Grantor (typed name)

STATE OF RHODE ISLAND  
COUNTY OF \_\_\_\_\_

\_\_\_\_\_In (CITY/TOWN), in said County and State, on the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_,  
before me Personally appeared \_\_\_\_\_, to me known and known by me to be the party  
executing the foregoing instrument and (he/she) acknowledged said instrument by (him/her)  
executed to be (his/her) free act and deed.

Notary Public: \_\_\_\_\_

| \_\_\_\_\_ My Comm. Expires: \_\_\_\_\_  
  
|



~~Appendix G~~  
**APPENDIX B**  
**ENVIRONMENTAL LAND USAGE RESTRICTION**

This Declaration of Environmental Land Usage Restriction (“Restriction”) is made on this \_\_\_\_ day of \_\_\_\_\_, 20\_\_ by ~~[property owner]~~The Narragansett Electric Company, and its successors and/or assigns (hereinafter, the “Grantor”).

**WITNESSETH:**

WHEREAS, the Grantor ~~\_\_\_\_\_ (name)~~, The Narragansett Electric Company is the Owner in fee simple of certain real property identified as ~~[specify Assessor’s Plat 54B, Lot(s), address 826 and Town or City]~~Plat 65B, Lot 662 located in Pawtucket, Rhode Island ( These lots along with the “Property Assessor’s Plat 65B, Lots 645, 647, and 649 owned by The Narragansett Electric Company and the eastern portions of Assessor’s Plat 65B, Lot 648 and the eastern portions of Plat 67B, Lots 11 and 21 owned by the City of Pawtucket are collectively identified as the Former Tidewater Facility (the “Site”), more particularly described in Exhibit A (Legal Description) which is attached hereto and made a part hereof. Separate Environmental Land Usage Restrictions will be recorded on Assessor’s Plat 65B, Lots 645, 647, and 649 owned by The Narragansett Electric Company and the City of Pawtucket owned lots;

WHEREAS, the ~~Property Site~~ (or portion thereof identified in the Class I survey which is attached hereto as Exhibit ~~2AA~~ and is made a part hereof) has been determined to ~~contain soil and/or groundwater which is contaminated with certain Hazardous Materials hazardous materials and/or petroleum in excess of applicable [residential or industrial/commercial Residential Direct Criteria, Industrial/Commercial Direct Exposure Criteria, and/or applicable groundwater the GB Groundwater objective]~~ criteria pursuant to the Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases (“Remediation Regulations”);

WHEREAS, the Grantor and the Department have determined that the environmental land use restrictions set forth below are consistent with the regulations adopted by the Rhode Island Department of Environmental Management (“Department”) pursuant to R.I.G.L. § 23-19.14-1 and that this restriction shall be a Conservation Restriction pursuant to R.I.G.L. § 34-39--1 et. seq. and shall not be subject to the 30-~~year~~ limitation provided in R.I.G.L. § 34-4-21;

WHEREAS, the Department's written approval of this Restriction is contained in the document entitled: ~~[Remedial Decision Letter/ Settlement Agreement/ Order of Approval/ Remedial Approval Letter]~~ issued on \_\_\_\_\_ pursuant to the Remediation Regulations and attached in Exhibit B;

WHEREAS, to prevent exposure to or migration of ~~Hazardous Substances hazardous substances~~ and to abate hazards to human health and/or the environment, and in accordance with the ~~[Remedial Decision Letter/ Remedial Agreement/ Order of Approval/ Remedial Approval~~

~~Letter~~, the Grantor desires to impose certain restrictions upon the use, occupancy, and activities of and at the ~~{Property/Contaminated-Site}~~;

WHEREAS, the Grantor believes that this Restriction will effectively protect public health and the environment from such contamination; and

WHEREAS, the Grantor intends that such restrictions shall run with the land and be binding upon and enforceable against the Grantor and the Grantor's successors and assigns.

NOW, THEREFORE, Grantor agrees as follows:

**A. Restrictions Applicable to the ~~{Property/Contaminated-Site}~~:** In accordance with the ~~{Remedial Decision Letter/ Remedial Agreement/ Order of Approval/ Remedial Approval Letter}~~, the use, occupancy and activity of and at the ~~{Property/ Contaminated-Site}~~ is restricted as follows:

- i. ~~Restricted Residential Activity (as defined herein) is allowed and provides for passive recreational use but prohibits certain uses/activities including occupied residences at grade level, vegetable gardens, licensed daycares, and elementary and secondary schools (collectively, "Restricted Residential Activity").~~ No residential use of the ~~{Property/Contaminated-Site}~~ shall be permitted that is contrary to Department approvals and/or restrictions including Restricted Residential Activity contained herein;
- ii. No groundwater at the ~~{Property/Contaminated-Site}~~ shall be used as potable water or irrigation;
- iii. ~~No~~Neither the engineered controls nor the underlying soil at the ~~{Property/Contaminated-Site}~~ shall be disturbed in any manner without written permission of the Department's Office of Waste Management, except as permitted in ~~the Remedial Action Work Plan (RAWP) or~~ Section C below and in the Soil Management Plan (SMP) approved by the Department in a written approval letter dated \_\_\_\_\_ (date) \_\_\_\_\_ contained in Exhibit B ~~and~~ attached hereto;
- iv. Humans engaged in activities at the ~~{Property/Contaminated-Site}~~ shall not be exposed to soils containing ~~Hazardous Materials~~ hazardous materials and/or petroleum in concentrations exceeding the applicable Department approved Direct Exposure Criteria set forth in the Remediation Regulations;
- ~~v. Water at the {Property/Contaminated-Site} shall be prohibited from infiltrating soils containing Hazardous Materials and/or petroleum in concentrations exceeding the applicable Department approved leachability criteria set forth in the Remediation Regulations;~~
- vii-v. \_\_\_\_\_ No subsurface structures shall be constructed on the ~~{Property/Contaminated-Site}~~ over groundwater containing ~~Hazardous Materials~~ hazardous materials and/or petroleum in concentrations exceeding the applicable Department approved ~~GA or~~ GB Groundwater



Objectives set forth in the Remediation Regulations; ~~without an engineered control to address potential vapor intrusion~~; and,

~~viii.vi.~~ vi. The engineered controls at the ~~{Property/ Contaminated-Site}~~ described in the ~~{RAWP or SMP}~~ contained in Exhibit ~~BD~~ attached hereto shall not be disturbed and shall be properly maintained to prevent humans engaged in ~~{residential}~~ Restricted Residential Activity or ~~industrial/commercial~~ Industrial/Commercial activity from being exposed to soils containing ~~Hazardous Materials~~ hazardous materials and/or petroleum in concentrations exceeding the applicable Department-approved ~~{residential}~~ Residential or ~~industrial/commercial~~ Industrial/Commercial Direct Exposure Criteria in accordance with the Remediation Regulations; ~~and.~~

~~[ii. The engineered controls at the {Property/ Contaminated-Site} described in the {RAWP or Soil Management Plan SMP} contained in Exhibit B attached hereto shall not be disturbed and shall be properly maintained so that water does not infiltrate soils containing Hazardous Materials and/or petroleum in concentrations exceeding the applicable Department-approved leachability criteria set forth in the Remediation Regulations.~~

**D.B.** No action shall be taken, allowed, suffered, or omitted at the ~~{Property/ Contaminated-Site}~~ if such action or omission is reasonably likely to:

- i. Create a risk of migration of ~~Hazardous Materials~~ hazardous materials and/or petroleum;
- ii. Create a potential hazard to human health or the environment; or
- iii. Result in the disturbance of any engineering controls utilized at the ~~{Property/Contaminated-Site}~~, except as permitted in the Department-approved ~~{RAWP or SMP}~~ contained in Exhibit ~~BD~~.

C. **Emergencies:** In the event of any emergency which presents a significant risk to human health or to the environment, including but not limited to, maintenance and repair of utility lines and other related appurtenances or a response to emergencies such as fire or flood, the application of Paragraphs A (~~iii. viii.-vi.~~) and B above may be suspended, provided such risk cannot be abated without suspending such Paragraphs and the Grantor complies with the following:

- i. \_\_\_ Grantor shall notify the Department's Office of Waste Management in writing of the emergency as soon as possible but no more than three (3) business days after Grantor's having learned of the emergency. (This does not remove Grantor's obligation to notify any other necessary state, local or federal agencies.);
- ii. \_\_\_ Grantor shall limit both the extent and duration of the suspension to the minimum period reasonable and necessary to adequately respond to the emergency;
- iii. \_\_\_ Grantor shall implement reasonable measures necessary to prevent actual, potential, present and future risk to human health and the environment resulting from such

suspension;

- iv. \_\_\_ Grantor shall communicate at the time of written notification to the Department its intention to conduct the Emergency Response Actions and provide a schedule to complete the Emergency Response Actions;
- v. \_\_\_ Grantor shall continue to implement the Emergency Response Actions, on the schedule submitted to the Department, to ensure that the ~~{Property/Contaminated-Site}~~ is remediated in accordance with the Remediation Regulations (or applicable variance) or restored to its condition prior to such emergency. Based upon information submitted to the Department at the time the ELUR was recorded pertaining to known environmental conditions at the ~~{Property/Contaminated-Site}~~,<sup>2</sup> emergency maintenance and repair of utility lines and other related appurtenances shall only require restoration of the ~~{Property/Contaminated-Site}~~ to its condition prior to the maintenance and repair of the utility lines and other related appurtenances; and
- vi. \_\_\_ Grantor shall submit to the Department, within ten (10) days after the completion of the Emergency Response Action, a status report describing the emergency activities that have been completed.

**D. Release of Restriction; Alterations of Subject Area:** The Grantor shall not make, or allow or suffer to be made, any alteration of any kind in, to, or about any portion of the ~~{Property/Contaminated-Site}~~ inconsistent with this Restriction unless the Grantor has received the Department's prior written approval for such alteration. If the Department determines that the proposed alteration is significant, the Department may require the amendment of this Restriction. Alterations deemed insignificant -by the Department will be approved via a letter from the Department. The Department shall not approve any such alteration and shall not release the ~~{Property/Contaminated-Site}~~ from the provisions of this Restriction unless the Grantor demonstrates to the Department's satisfaction that Grantor has managed the ~~{Property/Contaminated-Site}~~ in accordance with applicable regulations.

**E. Notice of Lessees and Other Holders of Interests in the ~~{Property/Contaminated-Site}~~:** The Grantor, or any future holder of any interest in the ~~{Property/Contaminated-Site}~~,<sup>2</sup> shall cause any lease, grant, or other transfer of any interest in the ~~{Property/Contaminated-Site}~~ to include a provision expressly requiring the lessee, grantee, or transferee to comply with this Restriction. The failure to include such provision shall not affect the validity or applicability of this Restriction to the ~~{Property/Contaminated-Site}~~.

**F. Enforceability:** If any court of competent jurisdiction determines that any provision of this Restriction is invalid or unenforceable, the Grantor shall notify the Department in writing within fourteen (14) days of such determination.

**G. Binding Effect:** All of the terms, covenants, and conditions of this Restriction shall run with the land and shall be binding on the Grantor, its successors and assigns, and each Owner and any other party entitled to control, possession or use of the ~~{Property/Contaminated-Site}~~ during such period of Ownership or possession.



**H. Inspection & Non-Compliance:** It shall be the obligation of the Grantor, or any future holder of any interest in the ~~[Property/Contaminated-Site]~~,<sub>2</sub> to provide for annual inspections of the ~~[Property/Contaminated-Site]~~ for compliance with the ELUR in accordance with Department requirements.

~~[An officer or Director of the company with direct knowledge of past and present conditions of the [Property/Contaminated-Site] (the “Company Representative”), or]~~ A qualified environmental professional will, on behalf of the Grantor or future holder of any interest in the ~~[Property/Contaminated-Site]~~,<sub>2</sub> evaluate the compliance status of the ~~[Property/Contaminated-Site]~~ on an annual basis. Upon completion of the evaluation, the ~~[Company Representative or]~~ environmental professional will prepare and ~~simultaneously~~ submit to the Department and to the Grantor or future holder of any interest in the ~~[Property/Contaminated-Site]~~ an evaluation report detailing the findings of the inspection, and noting any compliance violations at the ~~[Property/Contaminated-Site]~~. If the ~~[Property/Contaminated-Site]~~ is determined to be out of compliance with the terms of the ELUR, the Grantor or future holder of any interest in the ~~[Property/Contaminated-Site]~~ shall submit a corrective action plan in writing to the Department within ten (10) days of receipt of the evaluation report, indicating the plans to bring the ~~[Property/Contaminated-Site]~~ into compliance with the ELUR, including, at a minimum, a schedule for implementation of the plan.

In the event of any violation of the terms of this Restriction, which remains uncured more than ninety (90) days after written notice of violation, all Department approvals and agreements relating to the ~~[Property/Contaminated-Site]~~ may be voided at the sole discretion of the Department.

**I. Terms Used Herein:** The definitions of terms used herein shall be the same as the definitions contained in Section 3 (DEFINITIONS) of the Remediation Regulations.

**EXHIBITS**

- Exhibit A: Legal Description and Class I Survey
- Exhibit B: Order of Approval
- Exhibit C: Figure 1: Extent of Engineered Control
- Exhibit D: Soil Management Plan

IN WITNESS WHEREOF, the Grantor has hereunto set (his/her) hand and seal on the day and year set forth above.

~~[Name of Person(s), company, LLC or LLP]~~  
THE NARRAGANSETT ELECTRIC COMPANY

By: \_\_\_\_\_  
Grantor (signature) \_\_\_\_\_ Grantor (typed name)

STATE OF RHODE ISLAND  
COUNTY OF \_\_\_\_\_

\_\_\_\_\_In (CITY/TOWN), in said County and State, on the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_,  
before me Personally appeared \_\_\_\_\_, to me known and known by me to be the party  
executing the foregoing instrument and (he/she) acknowledged said instrument by (him/her)  
executed to be (his/her) free act and deed.

Notary Public: \_\_\_\_\_

| \_\_\_\_\_ My Comm. Expires: \_\_\_\_\_  
  
|



**EXHIBIT D**  
**SOIL MANAGEMENT PLAN**  
Former Tidewater Facility  
Pawtucket, Rhode Island

This *Soil Management Plan* (SMP) has been prepared to establish procedures to be followed during future construction and/or maintenance activities that require management of impacted materials (soil and groundwater) at the Former Tidewater Facility located in Pawtucket, Rhode Island (referred to herein as the “Site”). The Former Tidewater Facility is identified as Assessor’s Plat (AP) 54B, Lot 826 and AP 65B, Lots 662, 645, 647 and 649 owned by The Narragansett Electric Company and the eastern portions of AP 65B, Lot 648 and AP 67B Lots 11 and 21 owned by the City of Pawtucket.

A Rhode Island Department of Environmental Management (RIDEM) approved *Public Involvement Plan* (PIP) dated October 2013 has been prepared for this Site consistent with the requirements of the RIDEM *Remediation Regulations*. This PIP establishes procedures regarding how information related to the investigation and clean-up of the Tidewater Site will be shared with the public and how the public will be able to comment on plans for assessment and cleanup of the Site. The PIP is not intended to cover emergency activities or day to day facility operations, including repair and maintenance of the natural gas regulator facility and electrical substation involving minor soil disturbances. This PIP should be reviewed for specific requirements prior to any planned activities where disturbance of the engineered controls is required.

A Site-specific *Air Quality Monitoring Plan* (AQMP) has been prepared for the Tidewater Site. This plan was developed to provide for a consistent approach to air monitoring during certain relatively short duration remediation, construction, and maintenance related activities. This AQMP should be reviewed for specific air monitoring requirements prior to performance of earth disturbing activities.

The restrictions established for the Site are described in Section A of the ELUR. As described in Section A of the ELUR, neither the engineered controls nor the underlying impacted soils at the Site shall be disturbed in any manner without prior written permission from RIDEM’s Office of Waste Management. The “engineered controls” are defined as follows:

- The engineered cap in the paved portions of the Site consists of a minimum 2-inch layer of top course and a minimum 2-inch layer of binder course installed directly over the existing asphalt surface. These paved capped areas are limited to the area to the west and north of the Pawtucket No. 1 substation building;
- In the northern portion of the Site, the engineered cap consists of a permeable cap with a minimum 6-inch layer of topsoil underlain by a minimum 6-inch layer of compacted granular fill underlain by a geotextile fabric that acts as a warning barrier;
- An impermeable cap consisting of a minimum 6-inch layer of topsoil (northern portion) or 6-inch thick layer of gravel (southern portion) underlain by a minimum 18-inch layer of

processed gravel, sand or other clean fill underlain by a liner system which includes a doubled-sided composite drainage net, a 40-mil HDPE liner, and an 8 oz non-woven geotextile;

- A crushed stone permeable cap consisting of a minimum 6-inch layer of crushed stone underlain by a minimum 6-inch layer of compacted granular fill underlain by a geotextile fabric that acts as a warning barrier to the east of the Pawtucket No. 1 substation building and the substation;
- Along portions of the riverfront, in the western portion of the NFA, and west of the natural gas regulating station, the engineered cap consists of a minimum 12-inch layer of RIDOT R-3 rip rap underlain by a geotextile fabric that acts as a warning barrier;
- The access road to the south of the substation and the staging area proximate to the transmission towers consists of a minimum 6-inch layer of compacted granular fill underlain by a minimum 18-inch layer of processed gravel, sand or clean fill underlain by a linear system which includes a doubled-sided composite drainage net, a 40-mil HDPE liner, and an 8 oz non-woven geotextile underlain by existing soil subgrade; and,
- Chain link fencing serves as an engineered control to restrict access to certain portions of the Site. The layout of this engineered control fencing is depicted on Figure 1.

In addition, a network of monitoring and recovery wells and a containment wall are present on the Site. The attached Figure 1 depicts the extent of the engineered controls, as well as the locations of the monitoring and recovery wells and the containment wall.

This SMP is organized as follows:

- Section 1.0 describes notification and reporting required by RIDEM;
- Section 2.0 describes the Site and provides relevant background information;
- Section 3.0 presents a summary of the Site hydrogeologic features;
- Section 4.0 summarizes soil and groundwater quality data;
- Section 5.0 presents soil and groundwater management requirements; and
- Section 6.0 presents health and safety requirements.

## **1.0 NOTIFICATION**

In the event of an activity involving disturbance of impacted soil beneath the engineered caps, disturbance of the engineered control fencing, or the disturbance of surface soils on the steep slopes along the western edges of AP 65B Lots 645, 647, and 649 and the eastern portions of AP 65B, Lot 648, and AP67B Lots 11 and 21, The Narragansett Electric Company shall provide a written description to RIDEM of the anticipated activity (referred to herein as the "Notification"). The Notification must be submitted to RIDEM no later than **60 days** prior to the proposed initiation of activities. At a minimum, the Notification shall include: a description of the activity; an estimate of the areal extent and depth of disturbance; the estimated volume of soil to be excavated/disturbed; a list of the known and anticipated contaminants of concern; a drawing clearly identifying the proposed areas and depths to be excavated/disturbed; impacted



soil (if applicable) management/handling/disposal procedures; description of plans to manage, contain, treat, and discharge or dispose of groundwater (if necessary); restoration procedures (including engineered control replacement/repair); and the anticipated duration of the project. Please note: these notification requirements do not apply to emergencies or routine maintenance or repair activities necessary to maintain operation of the active natural gas regulating station, active electrical substation located on the Site, or other active utilities on the Site.

Work associated with the Notification shall not commence until written RIDEM approval has been issued. As indicated previously, the requirements of the Site-specific PIP established for the Tidewater Site shall also be reviewed and implemented as necessary and as applicable. Once RIDEM approval has been issued, RIDEM shall be notified a minimum of two (2) days prior to the start of activities at the Site. If significant alterations to the RIDEM-approved plan are necessary, a written description of the proposed deviation shall be submitted to RIDEM for review and approval prior to initiation of work.

Following written Notification, RIDEM will determine the post closure reporting requirements. Following written Notification, RIDEM may determine that minor disturbances of impacted soil may be documented through the annual evaluation submitted in accordance with Section H (Inspection & Non-Compliance) of the RIDEM-approved ELUR. RIDEM will also make a determination regarding whether Public Notice to the abutting Site owners/tenants concerning the proposed activities will be required. Significant disturbances of impacted soil may require submission of a *Closure Report* for RIDEM's review and approval documenting that the activities were performed in accordance with this SMP and the RIDEM-approved ELUR.

## **2.0 SITE DESCRIPTION/BACKGROUND**

The following provides a brief description and history of the Site and a summary of relevant past operations. For more detailed information, please refer to the January 2011 *Site Investigation Data Report* (SIDR) prepared by GZA GeoEnvironmental, Inc. (GZA) on behalf of The Narragansett Electric Company which is on file with RIDEM.

The Former Tidewater Facility consists of approximately 23 acres across eight separate lots located between Taft Street, an extension of Tidewater and Thorton Streets to the west, and the Seekonk River to the east. The Site is secured with a locked perimeter chain-link fence. The Site has been subdivided into four areas, as described below.

- North Fill Area (NFA) (northern portions of A.P. 54B Lot 826);
- Former Gas Plant Area (FGPA) (southern portions of A.P. 54B Lot 826 and A.P. 65B Lot 662);
- Former Power Plant Area (FPPA) (A.P. 65B Lot 645); and the
- South Fill Area (SFA) (A.P. 65B Lots 647 and 649, portions of Lot 648, and portions of A.P. 67B Lots 11 and 21).

The Site was the location of a former Manufactured Gas Plant (MGP) which operated from approximately 1880 to 1968. From the 1880s until 1954, the MGP generated gas using the coal carbonization and carbureted water gas processes. In the later years of operation (1954 until the late-1960s), the MGP produced gas for peak shaving purposes. In 1968, the MGP facility was decommissioned. Based on available information, it appears that the majority of the aboveground MGP structures and tanks were razed at that time or before. The last of the two remaining gasholders (Nos. 7 and 8) were decommissioned and removed in 2010. Presently, there is an active natural gas regulating station located in the southwestern corner of the FGPA.

In 1890, the Pawtucket Gas Company commenced building the Pawtucket No. 1 Station for power generation purposes. The No. 1 Station operated from the early-1890s until 1975. Based on a review of aerial photographs, the current transformer yard was part of this electrical generation plant since at least 1939. The station used coal and petroleum-based products for electricity generation. In addition, the plant used residual byproduct tar from the MGP for power generation. Presently, two electrical transmission towers, a substation and the Pawtucket No. 1 substation building are located in the FPPA.

Chain link fencing surrounds the northern, western, and southern edges of the Site (Perimeter Fencing) and the substation area, the Pawtucket No. 1 substation building, the transmission towers, and the natural gas regulator station. In addition, chain link fencing restricts access to certain portions of the Site (Engineered Control Fencing). The layout of this chain link fencing is depicted on Figure 1.

### **3.0 HYDROGEOLOGIC CONDITIONS**

Stratigraphy across the Site generally consists of fill materials underlain by stratified gravel, sands, silt and clay, underlain by glacial till and bedrock. The fill materials were generally identified to consist of varying percentages of sand, coal, ash, slag, and former building/structure debris. The thickness of these fill materials has been observed to range from approximately 1 to 2 feet in the northwestern portion of the Site to over 20 feet in the southern portion. The elevation of the top of the glacial till is inferred to generally slope downward from west to east across the Site as the estuarine and outwash deposits thicken proximate to the river. Along the river, the top of the glacial till was encountered at approximate elevations -16 feet (NAVD88) in the northern portion of the FGPA to approximate elevation -70 feet (NAVD88) in the SFA.

Groundwater on the Site is tidally-influenced and has been observed to fluctuate approximately 5 feet between mean low and high water in shallow monitoring wells adjacent to the Seekonk River. Groundwater was encountered at elevations ranging from approximately 26 feet (NAVD88) in the northwestern portion of the Site to approximately -1 feet (NAVD88) proximate to the Seekonk River. In general, groundwater is encountered within the fill materials across the FPPA and SFA where the fill thicknesses are more significant and within the underlying native materials in the FGPA and NFA.



#### **4.0 SUMMARY OF ENVIRONMENTAL IMPACTS**

Based on the type of chemical constituents present at the Site, the potential routes of exposure to excavation and/or utility workers include inhalation, dermal contact or accidental ingestion of impacted soil, and the possible introduction of contaminants through broken skin. Utilization of the appropriate personal protective equipment and the general safety guidelines provided herein will serve to minimize the potential for worker exposure to impacted media while performing work at the Site.

The following sections present a summary of soil and groundwater quality at the Site. For further detail, please refer to the January 2011 *Site Investigation Data Report*, on file with RIDEM.

In planning activities that may include disturbance of impacted materials, a qualified Environmental Professional shall review this environmental data and develop appropriate procedures for impacted soil disturbance/management/disposal and worker health and safety consistent with this SMP.

##### **4.1 CONSTITUENTS OF CONCERN**

Based on the results of the previous investigations described in the above reports, certain constituents of concern (COCs) were detected in soil and groundwater associated with former operations on the Site. A list of detected COCs and their concentration ranges are provided in the following tables. For comparative purposes, these tables also include the Industrial/Commercial Direct Exposure Criteria, the GB Leachability Criteria, the Upper Concentration Limit (UCL) and the GB Groundwater Objective within RIDEM's Remediation Regulations.

	Units	RIDEM GB Leachability	RIDEM Industrial/ Commercial	RIDEM UCL	Range of Soil Concentrations Detected	
<b>PAHS BY GCMS</b>						
2-Methylnaphthalene	mg/kg	NE	10,000	10,000	0.0558	to 4,520
Acenaphthene	mg/kg	NE	10,000	10,000	0.0800	to 3,590
Acenaphthylene	mg/kg	NE	10,000	10,000	0.0693	to 4,400
Anthracene	mg/kg	NE	10,000	10,000	0.0817	to 2,910
Benzo [a] Anthracene	mg/kg	NE	8	10,000	0.0800	to 1,880
Benzo [a] Pyrene	mg/kg	NE	0.8	10,000	0.0470	to 1,400
Benzo [b] Fluoranthene	mg/kg	NE	8	10,000	0.0930	to 1,200
Benzo [g,h,i] Perylene	mg/kg	NE	10,000	10,000	0.0493	to 1,100
Benzo [k] Fluoranthene	mg/kg	NE	78	10,000	0.1700	to 1,120
Chrysene	mg/kg	NE	780	10,000	0.0900	to 1,500
Dibenzo [a,h] Anthracene	mg/kg	NE	0.8	10,000	0.0653	to 260
Fluoranthene	mg/kg	NE	10,000	10,000	0.1360	to 4,990
Fluorene	mg/kg	NE	10,000	10,000	0.0455	to 3,200
Indeno [1,2,3-cd] Pyrene	mg/kg	NE	7.8	10,000	0.0720	to 1,000
Naphthalene	mg/kg	NE	10,000	10,000	0.0570	to 37,000
Phenanthrene	mg/kg	NE	10,000	10,000	0.0830	to 7,900
Pyrene	mg/kg	NE	10,000	10,000	0.0619	to 4,600
<b>TOTAL PETROLEUM HYDROCARBON</b>						
Hydrocarbon Content	mg/kg	2,500	2,500	30,000	0.170	to 760,000
<b>METALS</b>						
Antimony	mg/kg	NE	820	10,000	1.700	to 100
Arsenic	mg/kg	NE	7	10,000	0.056	to 120
Beryllium	mg/kg	NE	1.3	10,000	0.080	to 8.7
Cadmium	mg/kg	NE	1,000	10,000	0.020	to 19.3
Chromium	mg/kg	NE	10,000	10,000	1.090	to 260
Copper	mg/kg	NE	10,000	10,000	1.200	to 920
Lead	mg/kg	NE	500	10,000	0.050	to 19,000
Mercury	mg/kg	NE	610	10,000	0.0063	to 279
Nickel	mg/kg	NE	10,000	10,000	0.075	to 2,100
Selenium	mg/kg	NE	10,000	10,000	1.900	to 35
Silver	mg/kg	NE	10,000	10,000	0.390	to 20
Thallium	mg/kg	NE	140	10,000	0.200	to 3
Zinc	mg/kg	NE	10,000	10,000	0.054	to 1,100
<b>OTHER ANALYTES</b>						
Total Cyanide	mg/kg	NE	10,000	10,000	0.340	to 17,000



	Units	RIDEM GB Leachability Criteria	RIDEM Industrial/ Commercial DEC	RIDEM UCL	Range of Soil Concentrations Detected		
<b>POLYCHLORINATED BIPHENYLS</b>							
Aroclor 1268	mg/kg	10000	10000	10,000	5.00	to	30
Aroclor 1262	mg/kg	10000	10000	10,000	5.00	to	30
Aroclor 1260	mg/kg	10000	10000	10,000	0.07	to	30
Aroclor 1254	mg/kg	10000	10000	10,000	0.10	to	30
Aroclor 1248	mg/kg	10000	10000	10,000	5.00	to	30
Aroclor 1242/1016	mg/kg	10000	10000	10,000	5.00	to	30
Aroclor 1232	mg/kg	10000	10000	10,000	5.00	to	30
Aroclor 1221	mg/kg	10000	10000	10,000	5.00	to	30
<b>VOLATILE ORGANICS</b>							
1,2,4-Trimethylbenzene	mg/kg	NE	NE	10,000	0.0070	to	480
1,2-Dichlorobenzene	mg/kg	NE	10,000	10,000	0.01870	to	0.0187
1,3,5-Trimethylbenzene	mg/kg	NE	NE	10,000	0.01140	to	150
1,3-Dichlorobenzene	mg/kg	NE	10,000	10,000	0.00680	to	0.0068
1,4-Dichlorobenzene	mg/kg	NE	240	10,000	0.00680	to	0.0068
4-Isopropyltoluene	mg/kg	NE	NE	10,000	0.00360	to	5.5300
Acetone	mg/kg	NE	10,000	10,000	0.02290	to	0.2090
Benzene	mg/kg	4.3	200	10,000	0.00540	to	389
Bromomethane	mg/kg	NE	2,900	10,000	0.02890	to	0.0725
Carbon Disulfide	mg/kg	NE	NE	10,000	0.00480	to	0.0111
Carbon Tetrachloride	mg/kg	5	44	10,000	0.00610	to	0.1300
Chloroform	mg/kg	NE	940	10,000	0.04190	to	0.1510
Ethylbenzene	mg/kg	62	10,000	10,000	0.00540	to	323
Isopropylbenzene	mg/kg	NE	10,000	10,000	0.05500	to	9.3
m&p-Xylene	mg/kg	NE	10,000	10,000	0.00540	to	877
Methyl tert-butyl ether	mg/kg	100	10,000	10,000	0.61000	to	0.6100
Methylene Chloride	mg/kg	NE	760	10,000	0.04910	to	129
Naphthalene	mg/kg	NE	10,000	10,000	0.00480	to	14,300
n-Butylbenzene	mg/kg	NE	NE	10,000	0.07800	to	8.6
n-Propylbenzene	mg/kg	NE	NE	10,000	0.05700	to	19
o-Xylene	mg/kg	NE	10,000	10,000	0.00540	to	877
sec-Butylbenzene	mg/kg	NE	NE	10,000	0.07260	to	4.5
Styrene	mg/kg	64	190	10,000	0.00590	to	1,500
Tetrachloroethene	mg/kg	4.2	110	10,000	0.02150	to	0.1490
Toluene	mg/kg	54	10,000	10,000	0.00540	to	1,190
Total Xylenes	mg/kg	NE	10,000	10,000	0.00540	to	1,309

UCL = Upper Concentration Limit

I/C DEC = Industrial/Commercial Direct Exposure Criteria

NE = Indicates a criterion has not been established  
 All results are reported in mg/kg.

	Units	RIDEM GB Groundwater UCL	RIDEM GB Groundwater Objective	Range of Groundwater Concentrations	
<b>TOTAL PETROLEUM HYDROCARBON</b>					
Hydrocarbon Content	mg/L	NE	NE	0.0028	to 11.6
<b>METALS</b>					
Arsenic	mg/L	NE	NE	0.0027	to 0.0625
Beryllium	mg/L	NE	NE	0.0003	to 0.0074
Chromium	mg/L	NE	NE	0.0250	to 0.0610
Copper	mg/L	NE	NE	0.0730	to 0.120
Lead	mg/L	NE	NE	0.0075	to 0.260
Nickel	mg/L	NE	NE	0.0590	to 0.250
Zinc	mg/L	NE	NE	0.0230	to 0.950
<b>OTHER ANALYTES</b>					
Total Cyanide	mg/L	NE	NE	0.0110	to 2.52
	Units	RIDEM GB Groundwater UCL	RIDEM GB Groundwater Objective	Range of Groundwater Concentrations	
<b>PAHS BY GCMS</b>					
2-Methylnaphthalene	mg/L	NE	NE	0.0002	to 1.83
Acenaphthene	mg/L	NE	NE	0.0002	to 1.85
Acenaphthylene	mg/L	NE	NE	0.0002	to 1.09
Anthracene	mg/L	NE	NE	0.0002	to 0.58
Benzo [a] Anthracene	mg/L	NE	NE	0.0001	to 0.64
Benzo [a] Pyrene	mg/L	NE	NE	0.0001	to 0.430
Benzo [b] Fluoranthene	mg/L	NE	NE	0.0001	to 0.210
Benzo [g,h,i] Perylene	mg/L	NE	NE	0.0002	to 0.310
Benzo [k] Fluoranthene	mg/L	NE	NE	0.0001	to 0.30
Chrysene	mg/L	NE	NE	0.0001	to 0.630
Dibenzo [a,h] Anthracene	mg/L	NE	NE	0.0001	to 0.080
Fluoranthene	mg/L	NE	NE	0.0002	to 1.2
Fluorene	mg/L	NE	NE	0.0002	to 0.450
Indeno [1,2,3-cd] Pyrene	mg/L	NE	NE	0.0001	to 0.210
Naphthalene	mg/L	NE	2.67	0.0002	to 4.870
Phenanthrene	mg/L	NE	NE	0.0002	to 0.510
Pyrene	mg/L	NE	NE	0.0002	to 1.62



	Units	RIDEM GB Groundwater UCL	RIDEM GB Groundwater Objective	Range of Groundwater Concentrations
<b>VOLATILE ORGANICS</b>				
1,2,3-Trichloropropane	mg/L	NE	NE	0.0420 to 0.0500
1,2,4-Trimethylbenzene	mg/L	NE	NE	0.0010 to 0.0876
1,2-Dibromoethane	mg/L	NE	NE	0.0670 to 0.2900
1,2-Dichlorobenzene	mg/L	NE	NE	0.0610 to 0.0610
1,3,5-Trimethylbenzene	mg/L	NE	NE	0.0010 to 0.0806
2-Chlorotoluene	mg/L	NE	NE	0.0035 to 3.9000
4-Isopropyltoluene	mg/L	NE	NE	0.0014 to 0.0138
Benzene	mg/L	18	0.14	0.0012 to 0.0962
Bromobenzene	mg/L	NE	NE	0.0780 to 0.2900
Chloroform	mg/L	NE	NE	0.0013 to 0.0840
Dibromomethane	mg/L	NE	NE	0.0010 to 0.0010
Dichlorodifluoromethane	mg/L	NE	NE	0.0020 to 0.0020
Diethyl Ether	mg/L	NE	NE	0.0010 to 0.0010
Di-isopropyl ether	mg/L	NE	NE	0.0010 to 0.0010
Ethyl tertiary-butyl ether	mg/L	NE	NE	0.0004 to 1.2600
Ethylbenzene	mg/L	16	1.6	0.0010 to 2.1800
Hexachlorobutadiene	mg/L	NE	NE	0.0006 to 0.0006
Hexachloroethane	mg/L	NE	NE	0.0004 to 0.0630
Isopropylbenzene	mg/L	NE	NE	0.0010 to 0.4000
Methyl tert-Butyl Ether	mg/L	NE	5	0.0010 to 0.3200
Methylene Chloride	mg/L	NE	NE	0.0016 to 6.6000
Naphthalene	mg/L	NE	2.67	0.0010 to 9.7500
n-Butylbenzene	mg/L	NE	NE	0.0010 to 0.0220
n-Propylbenzene	mg/L	NE	NE	0.0010 to 0.0438
sec-Butylbenzene	mg/L	NE	NE	0.0010 to 0.0092

	Units	RIDEM GB Groundwater UCL	RIDEM GB Groundwater Objective	Range of Groundwater Concentrations
<b>VOLATILE ORGANICS</b>				
Styrene	mg/L	50	2.2	0.0010 to 0.0235
tert-Butylbenzene	mg/L	NE	NE	0.0004 to 0.3300
Tertiary-amyl methyl ether	mg/L	NE	NE	0.0010 to 0.0010
Tetrachloroethene	mg/L	NE	0.15	0.0002 to 0.0010
Tetrahydrofuran	mg/L	NE	NE	0.0004 to 0.1740
Toluene	mg/L	21	1.7	0.0010 to 0.2130
trans-1,2-Dichloroethene	mg/L	79	2.8	0.0010 to 0.0010
trans-1,3-Dichloropropene	mg/L	NE	NE	0.0003 to 0.0004
Trichloroethene	mg/L	87	0.54	0.0004 to 0.0024
Trichlorofluoromethane	mg/L	NE	NE	0.0010 to 0.0010
Vinyl Acetate	mg/L	NE	NE	0.0050 to 0.0050
Vinyl Chloride	mg/L	NE	0.002	0.0010 to 0.0010
Xylene O	mg/L	NE	NE	0.0006 to 0.6460
Xylene P,M	mg/L	NE	NE	0.0009 to 0.7090
Xylenes (Total)	mg/L	NE	NE	0.0020 to 1.3500

UCL = Upper Concentration Limit  
NE = Indicates a criterion has not been established  
All results are reported in mg/L.

Non-aqueous phase liquid (NAPL) impacts have also been detected predominantly in the eastern portion of the Site proximate to and downgradient of the former MGP structures and petroleum storage tanks in the FPPA. The following table summarizes the ranges of NAPL thicknesses observed. Please refer to the historic reports for more detail on observed NAPL distribution and thicknesses.

	RANGE OF NAPL THICKNESSES OBSERVED (feet)
Light Non-Aqueous Phase Liquids (LNAPLs)	Trace (less than 0.01 feet) to 5.57 feet
Dense Non-Aqueous Phase Liquids (DNAPLs)	Trace (less than 0.01 feet) to 14.52 feet

## 5.0 SOIL AND GROUNDWATER MANAGEMENT REQUIREMENTS

The following management guidelines were developed for activities involving excavation/disturbance of impacted soils and/or groundwater located beneath the engineered caps and within areas along the western and southern Site boundaries which are



controlled via the engineered control fencing. As described in the ELUR and shown on the attached Figure 1, the “engineered controls” for the Site are defined as follows:

- The engineered cap in the paved portions of the Site consists of a minimum 2-inch layer of top course and a minimum 2-inch layer of binder course installed directly over the existing asphalt surface. These paved capped areas are limited to the area to the west and north of the Pawtucket No. 1 substation building;
- In the northern portion of the Site, the engineered cap consists of a permeable cap with a minimum 6-inch layer of topsoil underlain by a minimum 6-inch layer of compacted granular fill underlain by a geotextile fabric that acts as a warning barrier;
- An impermeable cap consisting of a minimum 6-inch layer of topsoil (northern portion) or 6-inch thick layer of gravel (southern portion) underlain by a minimum 18-inch layer of processed gravel, sand or other clean fill underlain by a liner system which includes a doubled-sided composite drainage net, a 40-mil HDPE liner, and an 8 oz non-woven geotextile;
- A crushed stone permeable cap consisting of a minimum 6-inch layer of crushed stone underlain by a minimum 6-inch layer of compacted granular fill underlain by a geotextile fabric that acts as a warning barrier to the east of the Pawtucket No. 1 substation building and the substation;
- Along portions of the riverfront, in the western portion of the NFA, and west of the natural gas regulating station, the engineered cap consists of a minimum 12-inch layer of RIDOT R-3 rip rap underlain by a geotextile fabric that acts as a warning barrier;
- The access road to the south of the substation and the staging area proximate to the transmission towers consists of a minimum 6-inch layer of compacted granular fill underlain by a minimum 18-inch layer of processed gravel, sand or clean fill underlain by a linear system which includes a doubled-sided composite drainage net, a 40-mil HDPE liner, and an 8 oz non-woven geotextile underlain by existing soil subgrade; and,
- Chain link fencing serves as an engineered control to restrict access to certain portions of the Site. The layout of this engineered control fencing is depicted on Figure 1.

These guidelines apply to all “non-emergency<sup>1</sup>” construction and utility maintenance and repair activities that disturb soils and/or groundwater beneath the engineered caps and within the areas restricted by the engineered control fencing. Soils generated from an excavation conducted at the Site may be placed back into its original excavation. However, so as to maintain known exposure scenarios, every attempt shall be made to backfill the excavation so that the corresponding depth and location of the backfilled soil resembles the depth and location at which the soil originally existed. This requirement includes the reinstallation of the geosynthetic barrier or impermeable liner and the re-placement of the engineered control cap. During re-placement of the engineered control cap, new sections of the geosynthetic barrier shall overlap the existing geosynthetic barrier by at least 2-feet and the edges of the new replacement impermeable liner shall be fusion-welded to the existing

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<sup>1</sup> Refer to the “Emergency” provisions of the ELUR. In the event emergency work is necessary, this SMP shall be consulted and the provisions described herein will be followed to the extent practical.

liner to create an impermeable joint. Excess and/or materials deemed unsuitable for use as backfill shall be managed and disposed off-Site consistent with this SMP.

As previously described, groundwater was encountered at elevations ranging from approximately 26 feet (NAVD88) in the northwestern portion of the Site to approximately -1 feet (NAVD88) proximate to the Seekonk River. In addition, NAPL has been observed in certain limited areas of the Site (predominantly in the eastern portion of the Site proximate to and downgradient of the former MGP structures and petroleum storage tanks in the FPPA). Projects involving excavation below the water table and/or disturbance of impacted groundwater will require additional controls and Best Management Practices (BMPs) as described below.

#### *Non-Emergency Preliminary Activities*

- Prior to the initiation of soil excavation, the selected contractor or any other personnel performing subsurface work at the Site shall contact DIGSAFE® and appropriate utility companies to identify and mark the location of below grade utilities.
- Prior to performing the proposed work, the selected contractor and/or responsible party shall obtain all applicable federal, state and local permits. Please note, a portion of the Site is located within the jurisdictional limits of the Coastal Resource Management Council (CRMC). A jurisdictional determination of the requirements of the CRMC shall be made prior to the implementation of proposed construction projects. If applicable, CRMC approval shall be obtained prior to conducting the work.
- As described further herein, prior to conducting any earthwork/construction activities that involves disturbance of materials beneath the engineered caps or within the areas restricted by the engineered control fencing, a qualified Environmental Professional shall be consulted to determine the appropriate level of health and safety training required by personnel involved with the work, the personal protection equipment required, and general health and safety guidelines. A project specific Health and Safety Plan (HASp) shall be prepared by a qualified Certified Industrial Hygienist (CIH) and adhered to during all phases of the work.

#### *Soil and Groundwater Management Guidelines*

- A qualified Environmental Professional shall be on the Site during these activities to observe and document soil conditions, including field screening the soils via a handheld photoionization detector (PID).
- Reuse of excavate from below the engineered caps is allowable provided the material is placed below the same engineered cap type (e.g. impacted soil generated from below the impermeable engineered cap may be re-used as backfill below the impermeable engineered cap). To the extent practical, excavated materials shall be replaced such that



the corresponding depth and location of the backfilled soil resembles the depth and location at which the soil originally existed.

- Grossly impacted materials and/or materials deemed unsuitable for use as backfill shall be segregated and stockpiled separately for subsequent management and disposal.
- Stockpiled soils shall be staged and temporarily stored in a designated area of the Site for no more than 90 days. To the extent practical, the storage location shall be selected to limit unauthorized access to the materials (*i.e.*, away from public roadways/walkways).
- To limit the potential for run-off of soils from excavation areas, adequate erosion controls shall be established around the perimeter of the work area(s) and on the down slope side of disturbed areas susceptible to erosion. Erosion control devices such as staked haybales, silt fencing, and/or straw wattles shall be employed. All erosion controls shall be established and maintained as required by any applicable permits, including CRMC requirements.
- Excavated materials shall be temporarily placed in working stockpiles adjacent to excavations staged on two layers of 10-mil polyethylene sheeting to prevent potential re-contamination of the engineered caps. Depending on the volume of material involved in the project, soils shall be either stockpiled on polyethylene sheeting as described herein, or stored in lined roll-off type containers. NO excavated materials shall be placed directly on the ground surface. In selecting the soil storage location, considerations must be made relative to the requirements of CRMC. At the end of each work day all stockpiles shall be covered with 10-mil polyethylene sheeting to control the generation of wind-blown dusts and potential sediment migration. Stockpile areas shall be equipped with appropriate controls to limit the loss of the cover and protect against storm water erosion. This shall include the installation of hay bales, silt fencing and any other appropriate measures during the entire duration of the project. Stockpiles shall be inspected daily. Should tears or punctures be observed in either the polyethylene sheeting covering or underlying the piles, repairs shall be made immediately. Daily shutdown procedures shall include the covering and securing of all stockpiled material area with polyethylene sheeting.
- Best soil management practices shall be employed at all times and impacted soils shall be segregated into separate piles (or cells or containers) as appropriate.
- During earthwork, odors shall be monitored and controlled as necessary. Odor control measures shall be implemented as necessary, which shall include covering exposed excavated surfaces and stockpiles, limiting the extent of excavation at any one time, and the use of odor suppressing foams.
- During earthwork, dust suppression techniques shall be initiated and maintained at all times. All reasonable precautions shall be taken to prevent the excessive generation of

dust during soil excavation, stockpiling, loading, and other soil handling activities. Methods of stabilization consisting of sprinkling, mulching, or similar methods shall be employed as necessary for dust control. Dust controls shall be employed to ensure the work is conducted consistent with all applicable statutes, regulations, and ordinances. If excessive dust generation occurs and cannot be reasonably controlled, the job shall be shut down until dust control is achieved.

- In the event that unexpected observations or situations involving hazardous materials, hazardous wastes or similar conditions of environmental concern arise during work, earthwork activities shall be immediately ceased. Workers shall not attempt to handle the situation themselves but shall consult with the on-Site Environmental Professional for further evaluation and direction.
- Groundwater and/or NAPL generated during construction dewatering activities at the Site shall be managed, contained, treated (if necessary) and discharged, or disposed off-Site. All appropriate regulatory approvals related to the removal, handling, treatment and discharge of impacted groundwater shall be in-place prior to the initiation of the work. **Impacted, untreated groundwater shall not be discharged directly to the ground surface, collection utilities, or neighboring water body.**
- As shown on the attached Figure 1, a network of groundwater monitoring and recovery wells exist on the Site. When executing work, care shall be exercised to ensure that this well network is protected and maintained. In the event a well is damaged it shall be repaired or replaced. In the event a damaged well requires abandonment, the well abandonment procedures described in Appendix 1 of RIDEM's *Rules and Regulations for Groundwater Quality* shall be adhered to. No monitoring or recovery wells shall be abandoned without prior RIDEM approval.
- As shown on the attached Figure 1, a containment wall exists on the Site. When executing work, care shall be exercised to ensure that this containment wall is protected and maintained. In the event, the wall is damaged it shall be repaired or replaced.

#### *Air Monitoring and Controls*

As described previously, a Site-specific *Air Quality Monitoring Plan* (AQMP) has been prepared for the Tidewater Site. The following presents a summary of this AQMP which shall be reviewed by a qualified Environmental Professional prior to performance of earth disturbing activities where the potential for volatilization exists. The air quality monitoring program consists of a two-tiered approach using real-time air monitoring (Tier I) and time integrated sampling using EPA approved sampling and analytical methods (Tier II).



## Tier I—Real Time Monitoring

Real time monitoring will involve the use of the following hand- held instrumentation or equipment substantially similar thereto.

- Portable Photoionization Detector (PID) – this instrument measures total volatile organic compound (TVOC) concentrations with a detection limit of 10 parts per billion (ppb). TVOC readings will be measured directly upwind and downwind of the work zones and Site perimeter. Perimeter locations will be selected based on wind direction and location of the nearest potential sensitive receptor.
- DustTrak Dust Meter – this instrument uses infrared electromagnetic radiation to sense airborne particles less than 10 microns in size. The detection limit for this instrument is 1 microgram per cubic meter ( $\mu\text{g}/\text{m}^3$ ). Similar to the PID, the readings from this hand-held instrument will be measured directly upwind and downwind of the work zones and Site perimeter. Perimeter locations will be selected based on wind direction and location of the nearest potential sensitive receptor.
- Photovac Voyager Gas Chromatograph (GC) Field Gas Meter—this instrument measures real time benzene concentrations with a detection limit for benzene of 10 ppb. The GC will be calibrated to a known concentration of benzene each day prior to monitoring activities. Similar to the PID and DustTrak, the readings from this hand-held instrument will be measured directly upwind and downwind of the work zones and Site perimeter. Perimeter locations will be selected based on wind direction and location of the nearest potential sensitive receptor.

The use of hand held field equipment allows field personnel to alter monitoring locations based on the activity being performed and changing wind directions. The following table outlines the Action Levels for the Tier I monitoring program.

### Tier I Action Levels – Real Time Monitoring

Compound	Work Zone Perimeter	Site Line
TOTAL VOLATILE ORGANIC COMPOUNDS (TVOC)	1.0 PPM	0.5 PPM
RESPIRABLE PARTICULATE (PM10)	1,000 UG/M <sup>3</sup>	150 UG/M <sup>3</sup>
BENZENE	NOT APPLICABLE	0.35 PPM

In the event these real time action levels are exceeded, the likely cause will be identified and appropriate engineering controls and/or modification of work practices implemented. In addition, on any day when the real time monitoring exceeds these action levels, time integrated samples from upwind and downwind Site line locations will be sent to the laboratory for analysis (Tier II).

## Tier II—Time Integrated Sampling

Time integrated, laboratory samples will be collected at the nearest Site line directly downwind of the Work zone and at an upwind perimeter location. This second-tier monitoring program is designed to assess and document perimeter air quality during these activities. Samples will be collected daily during intrusive activities and submitted for analysis in the event of a Tier I Action Level exceedance. In addition, at least one set of time integrated samples will be analyzed during each work activity. At a minimum, two samples (one upwind and one downwind) will be collected each day using Summa canisters and high volume PUF samplers. In the event of Tier I Action Level exceedance, the Summa canisters will be analyzed for VOCs via USEPA Method TO-15 and the PUF samplers will be analyzed for naphthalene via USEPA Method TO-13. The following action levels were selected for use during the time integrated sample monitoring program.

### Tier II Action Levels – Time Integrated Samples (Site Line)

Compound	Wisconsin Action Level (24 hour average)	RIDEM AAL (24 hour)	Proposed Action Levels (24-hour average) <sup>2</sup>
BENZENE	10 PPB	6.2 PPB	6.2 PPB
TOLUENE	94 PPB	80 PPB <sup>3</sup>	80 PPB
ETHYLBENZENE	230 PPB	692 PPB	230 PPB
XYLENES	23 PPB	692 PPB	23 PPB
NAPHTHALENE	20 PPB	0.6 PPB <sup>4</sup>	20 PPB

These time integrated sampling results will be available 24 to 48 hours after collection. In the event time integrated perimeter sampling results indicate levels in excess of these action levels, work activities will be shutdown and engineered controls and work practices will be re-evaluated prior to restarting activities.

### *Waste Characterization and Disposal*

Soils excavated from the Site shall not be re-used at locations off-Site. All excess soils shall be transported to a facility licensed for recycling or disposal pre-approved by The Narragansett Electric Company. A qualified Environmental Professional shall collect samples of the excavated soils (either during excavation or from stockpiles) for laboratory testing. Soil must be sampled at a frequency adequate to support the data requirements of the selected disposal facility but should consider the following testing program.

<sup>2</sup> Action levels represent the lower of the DHFS and RIDEM AAL with the exception of naphthalene. DHFS action level for naphthalene is based on a subchronic exposure which is more appropriate for these shorter duration efforts than the AAL for naphthalene which is based on chronic exposure assumptions.

<sup>3</sup> RIDEM does not have a 24-hour AAL for toluene. This value based on RIDEM annual AAL for toluene.

<sup>4</sup> The listed 24 hour AAL for naphthalene is based on chronic exposure assumptions.



Analyte/Parameter	Test Method
Petroleum hydrocarbons	EPA Method 8100M
Volatile organic compounds	EPA Method 8260B
Semi-volatile organic compounds	EPA Method 8270
Total RCRA Metals	EPA Method 6010 & 7471A
Flashpoint	EPA Method 1010M
Corrosivity (pH)	EPA Method 9045C
Reactivity	EPA Methods SW-846 7.3.3.2/9014 and SW-846 7.3.4.2/376.2

- Copies of all profiles, manifests, bills of lading, and shipping paperwork shall be maintained by the Owner and included in a *Closure Report* or in the *Annual Inspection Report* prepared consistent with the requirements of Section H of the ELUR.

#### *Decontamination Protocols*

- At the conclusion of the construction activities or whenever heavy equipment or tools leave the Site, they shall be decontaminated as required by the qualified Environmental Professional within a pre-designated area. This area shall include adequate controls (e.g., decontamination pad or liner) to prevent the potential for impact to the surrounding ground surface. At a minimum, soil shall be brushed from the equipment and re-used as backfill or placed in stockpiles to be managed as described herein. Vehicles are not to leave the Site with visible soil residues on the exterior.
- All non-disposable equipment used during the soil disturbance activities shall be properly decontaminated as appropriate prior to removal from the Site. All disposable equipment used during the soil disturbance activities shall be properly containerized and disposed off Site following completion of the work.

#### *Restoration and Backfill*

- Site restoration activities shall, at a minimum, be performed such as to replace, to pre-construction conditions, the existing engineered controls. This includes replacement of the underlying geosynthetic fabric and/or liner. All disturbed areas shall be graded to match pre-existing conditions.
- Any clean fill material brought to the Site is required to meet the Department's Method 1 Residential Direct Exposure Criteria or be designated by a qualified Environmental Professional as Non-Jurisdictional under the Remediation Regulations. All clean fill, including sub-grade material and loam, imported to the Site must be sampled prior to delivery and placement. Laboratory analytical results shall be reviewed by a qualified Environmental Professional prior to acceptance or delivery to the Site. Clean fill and loam shall be sampled for arsenic, VOCs, total metals (RCRA 13), semi-volatile organic

compounds, and total petroleum hydrocarbons at a minimum frequency of one sample per 500 cubic yards. The *Annual Inspection Report* for the Site, or *Closure Report* if applicable, shall include the analytical sampling results from the imported materials demonstrating compliance. Any fill determined to be non-jurisdictional will also require the submission of a written certification by a qualified Environmental Professional designating that the fill is not jurisdictional.

## 6.0 HEALTH AND SAFETY REQUIREMENTS

The basic health and safety procedures outlined below shall be implemented while performing excavation work that includes disturbance of materials beneath the engineered controls at the Site. ***These health and safety procedures are intended as a general guideline only. Contractors and others involved in subsurface excavation work at the Site are responsible for the preparation of their own health and safety procedures and the protection of their own workers. Prior to conducting any earthwork/construction activities that involves disturbance of materials beneath the engineered controls, an Environmental Professional shall be consulted to determine the appropriate level of health and safety training required by personnel involved with the work.***

### *Personal Protective Equipment (PPE)*

In general, the level of protection which shall be used by workers will be determined by the task which the person is performing; however, at a minimum, Level D PPE shall be worn at all times while performing excavation activities within the ELUR area. Level D PPE shall, at a minimum, consist of the following:

- Steel-toe work boots with over-boots as needed;
- Hard hats;
- Safety vest;
- Safety glasses; and
- Rubber or leather gloves.

### *Operating Procedures/Safety Guidelines*

Regardless of the level of PPE necessary to complete work, the following general health and safety guidelines shall be followed during the performance of any excavation activities conducted:

- The location of all utilities in the vicinity of the excavation shall be established prior to beginning work.
- During work, precautions shall be taken to restrict access to the work area to only personnel involved in the work activities. Under no circumstances should the general public be allowed access to the area.



- Practice contamination avoidance: never sit or kneel in an excavation; never lay equipment on the ground; avoid obvious sources of contamination; and avoid unnecessary contact with objects in an excavation.
- Be alert to any unusual changes in your physical condition; never ignore warning signs. Notify the responsible employee as to any changed conditions.
- All equipment used in an excavation shall be properly cleaned and maintained in good working order. Equipment shall be inspected for signs of defect and/or contamination before use.
- Eating, drinking, chewing gum, and smoking shall be prohibited in active excavation areas.
- During working hours, workers who stop to drink or eat should leave the active work area, remove PPE, and wash hands thoroughly with soap and water prior to eating or drinking.
- The discovery of any condition that would suggest the existence of a situation more hazardous than anticipated shall result in the evacuation of personnel from the excavation and the re-evaluation of the hazard and the level of protection.
- At the completion of work, workers shall wash their hands with soap and water before leaving the Site. All workers safety boots are recommended to be brushed with a stiff bristle brush or similar instrument (not by hand) to remove residual soil. Disposable PPE shall be disposed of according to applicable regulations.

*Emergency Phone Numbers*

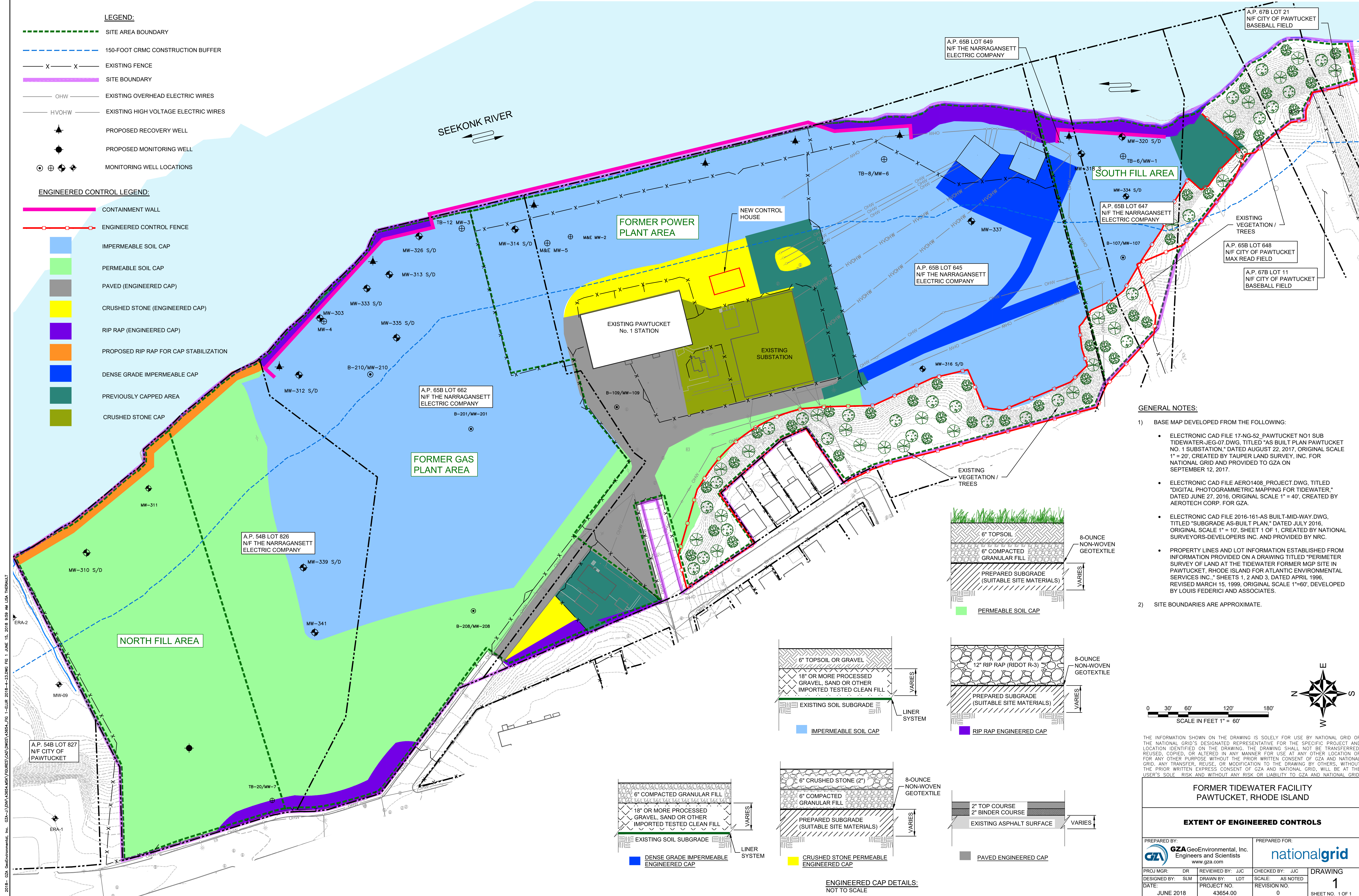
Emergency telephone numbers and the directions to the nearest hospital are included below. This information shall also be included in the Health and Safety Plans developed for the activity and shall be periodically reviewed and updated as needed.

<b>Response Agency</b>	<b>Phone Number</b>
Ambulance	911
Police	911
Fire	911
RIDEM/Office of Compliance & Inspection/Emergency response Program	(401) 222-1360 or (401) 222-3070 (non-business hours)
USEPA/Hazardous Materials Spills	(800) 424-8802
Poison Control Center	(800) 562-8236
DigSafe® (Utility Clearance)	1-888-DIGSAFE

<b>Hospital</b>	
Memorial Hospital 11 Brewster Street Pawtucket, RI	401-729-2000
<b>Route to Hospital</b>	
<ol style="list-style-type: none"> <li>1. Head NORTHWEST on TIDEWATER SREET toward TAFT STREET</li> <li>2. Turn RIGHT onto PLEASANT STREET</li> <li>3. Turn RIGHT onto GRACE STREET</li> <li>4. GRACE STREET becomes DIVISION STREET</li> <li>5. Turn SLIGHT RIGHT onto WATER STREET</li> <li>6. Turn SLIGHT RIGHT onto SCHOOL STREET (114 S)</li> <li>7. Turn SLIGHT LEFT onto POND STREET</li> <li>8. Turn RIGHT onto BREWSTER STREET</li> </ol>	

\\gzaprovidence\Jobs\ENV\43654.msk\Reports\RAWP\Appendix B Draft ELUR and SMP\FINAL ELURS & SMP\FINAL Soil Management Plan\_Tidewater.docx





**LEGEND:**

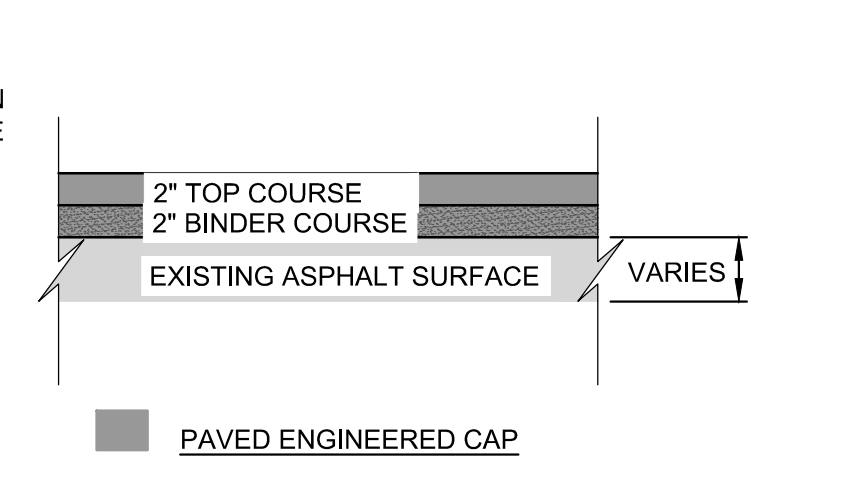
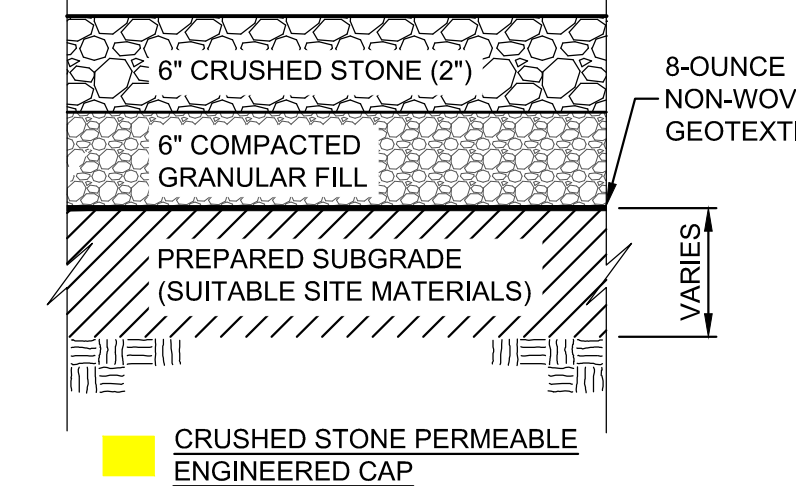
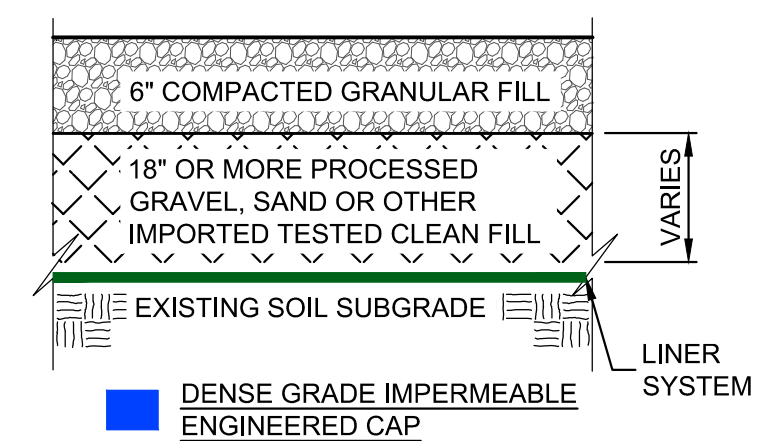
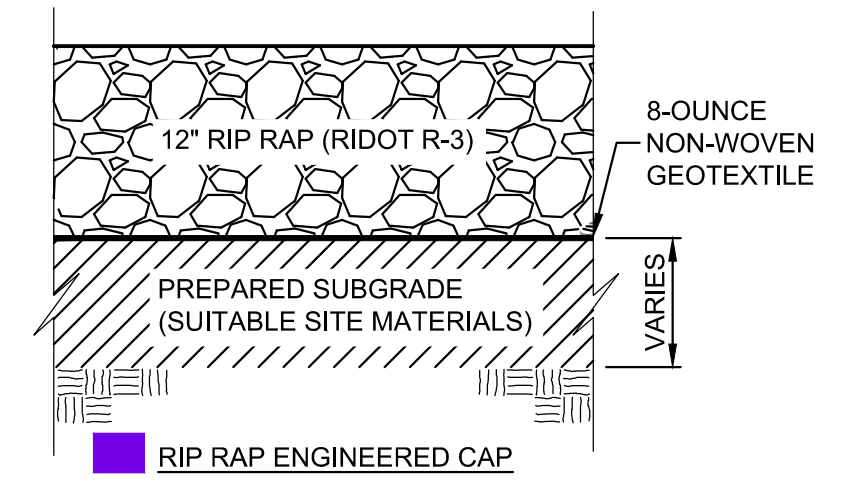
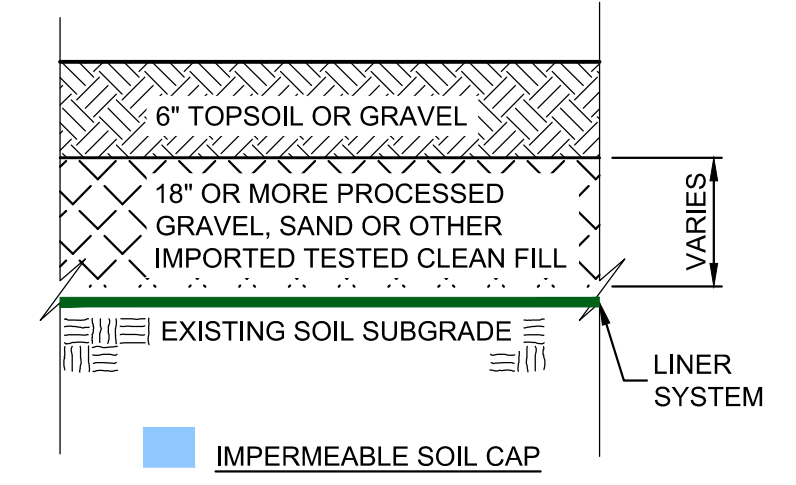
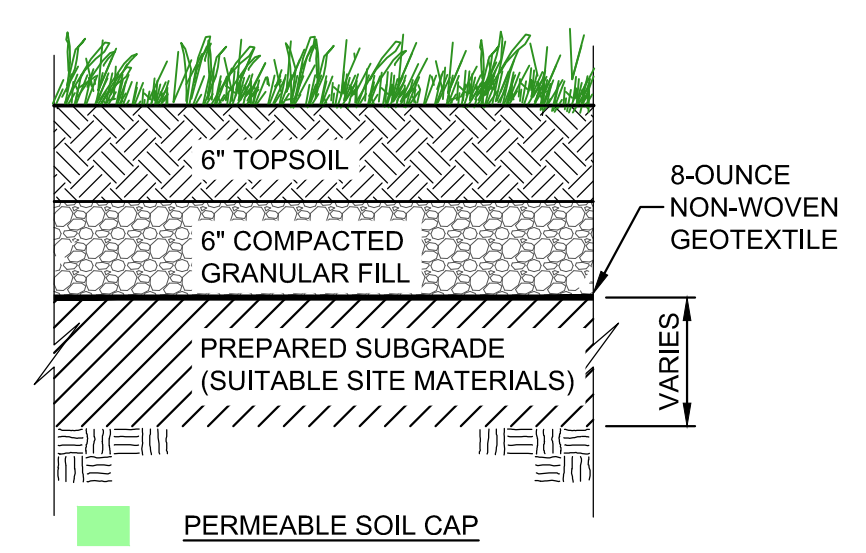
- SITE AREA BOUNDARY
- 150-FOOT CRMC CONSTRUCTION BUFFER
- X X EXISTING FENCE
- SITE BOUNDARY
- OHW EXISTING OVERHEAD ELECTRIC WIRES
- HVOHW EXISTING HIGH VOLTAGE ELECTRIC WIRES
- ▲ PROPOSED RECOVERY WELL
- PROPOSED MONITORING WELL
- ⊕ ⊖ ⊗ MONITORING WELL LOCATIONS

**ENGINEERED CONTROL LEGEND:**

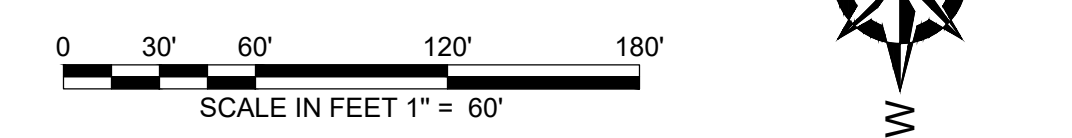
- CONTAINMENT WALL
- ENGINEERED CONTROL FENCE
- IMPERMEABLE SOIL CAP
- PERMEABLE SOIL CAP
- PAVED (ENGINEERED CAP)
- CRUSHED STONE (ENGINEERED CAP)
- RIP RAP (ENGINEERED CAP)
- PROPOSED RIP RAP FOR CAP STABILIZATION
- DENSE GRADE IMPERMEABLE CAP
- PREVIOUSLY CAPPED AREA
- CRUSHED STONE CAP

**GENERAL NOTES:**

- 1) BASE MAP DEVELOPED FROM THE FOLLOWING:
  - ELECTRONIC CAD FILE 17-NG-52\_PAWTUCKET NO1 SUB TIDEWATER-JEG-07.DWG, TITLED "AS BUILT PLAN PAWTUCKET NO. 1 SUBSTATION," DATED AUGUST 22, 2017, ORIGINAL SCALE 1" = 20', CREATED BY TAUPER LAND SURVEY, INC. FOR NATIONAL GRID AND PROVIDED TO GZA ON SEPTEMBER 12, 2017.
  - ELECTRONIC CAD FILE AERO1408\_PROJECT.DWG, TITLED "DIGITAL PHOTOGRAMMETRIC MAPPING FOR TIDEWATER," DATED JUNE 27, 2016, ORIGINAL SCALE 1" = 40', CREATED BY AEROTECH CORP. FOR GZA.
  - ELECTRONIC CAD FILE 2016-161-AS-BUILT-MID-WAY.DWG, TITLED "SUBGRADE AS-BUILT PLAN," DATED JULY 2016, ORIGINAL SCALE 1" = 10', SHEET 1 OF 1, CREATED BY NATIONAL SURVEYORS-DEVELOPERS INC. AND PROVIDED BY NRC.
  - PROPERTY LINES AND LOT INFORMATION ESTABLISHED FROM INFORMATION PROVIDED ON A DRAWING TITLED "PERIMETER SURVEY OF LAND AT THE TIDEWATER FORMER MGP SITE IN PAWTUCKET, RHODE ISLAND FOR ATLANTIC ENVIRONMENTAL SERVICES INC.," SHEETS 1, 2 AND 3, DATED APRIL 1996, REVISED MARCH 15, 1999, ORIGINAL SCALE 1"=60', DEVELOPED BY LOUIS FEDERICI AND ASSOCIATES.
- 2) SITE BOUNDARIES ARE APPROXIMATE.



**ENGINEERED CAP DETAILS:**  
NOT TO SCALE



THE INFORMATION SHOWN ON THE DRAWING IS SOLELY FOR USE BY NATIONAL GRID OR THE NATIONAL GRID'S DESIGNATED REPRESENTATIVE FOR THE SPECIFIC PROJECT AND LOCATION IDENTIFIED ON THE DRAWING. THE DRAWING SHALL NOT BE TRANSFERRED, REUSED, COPIED, OR ALTERED IN ANY MANNER FOR USE AT ANY OTHER LOCATION OR FOR ANY OTHER PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF GZA AND NATIONAL GRID. ANY TRANSFER, REUSE, OR MODIFICATION TO THE DRAWING BY OTHERS, WITHOUT THE PRIOR WRITTEN EXPRESS CONSENT OF GZA AND NATIONAL GRID, WILL BE AT THE USER'S SOLE RISK AND WITHOUT ANY RISK OR LIABILITY TO GZA AND NATIONAL GRID.

<b>FORMER TIDEWATER FACILITY PAWTUCKET, RHODE ISLAND</b>			
<b>EXTENT OF ENGINEERED CONTROLS</b>			
PREPARED BY: <b>GZA</b> GeoEnvironmental, Inc. Engineers and Scientists www.gza.com		PREPARED FOR: <b>nationalgrid</b>	
PROJ MGR: DR	DESIGNED BY: SLM	REVIEWED BY: JJC	CHECKED BY: JJC
DATE: JUNE 2018	PROJECT NO: 43654.00	DRAWN BY: LDT	SCALE: AS NOTED
		REVISION NO: 0	DRAWING NO: 1
			SHEET NO. 1 OF 1

2018 - GZA, GeoEnvironmental, Inc. GZA-2018-06-15-10:59 AM USA THERMAL





## **APPENDIX C**

### CRMC ASSENTS



State of Rhode Island and Providence Plantations  
Coastal Resources Management Council  
Oliver H. Stedman Government Center  
4808 Tower Hill Road, Suite 3  
Wakefield, RI 02879-1900

(401) 783-3370  
Fax (401) 783-3767

## FINDING OF NO SIGNIFICANT IMPACT

September 12, 2017

Narragansett Electric Company d/b/a National Grid  
Att: William Howard  
280 Melrose Street  
Providence, RI 02907

RE: CRMC Assent No. A2017-09-027: perform test borings, test pits and surface soil sampling as per plans submitted to CRMC 9/11/2017. Project Location: 200 Taft Street, Pawtucket; Plat 54B|65|65B|67, Lot 826|645,654|662|11

Dear Applicant:

The Coastal Resources Management Council has reviewed your project proposal and has determined the findings of no significant impact on coastal resources. This project must be completed within three (3) years of the date of this notification, unless written application requesting an extension is received by CRMC sixty (60) days prior to the expiration date. If this project involves excess excavated materials, excess soils, excess construction materials, and debris (including any destructed materials) these materials shall be removed from the site and disposed of at an inland landfill or a suitable and legal upland location. **If the project involves earthwork, appropriate erosion controls shall be utilized.** All applicable policies, prohibitions, and standards of the RICRMP shall be upheld.

CAUTION: The limits of authorized work shall be only for that which was approved by the CRMC. Any activities or alterations in which deviate from this assent or what was detailed on the CRMC approved plans will require a separate application and review. Additionally, if the information provided to the CRMC for this review is inaccurate or did not reveal all necessary information or data, then this permit may be found to be null and void. Plans for any future alteration of the shoreline or construction or alteration within the 200' zone of CRMC jurisdiction or in coastal waters must be submitted for review to the CRMC prior to commencing such activity.

Permits, licenses or easements issued by the Council are valid only with the conditions and stipulation under which they are granted and imply no guarantee of renewal. The initial application or an application for renewal may be subject to denial or modification. If an application is granted, said permit, license and easement may be subject to revocation and/or modification for failure to comply with the conditions and stipulations under which the same was issued or for other good cause.

Applicant agrees that as a condition to the granting of this assent, members of the Coastal Resources Management Council or its staff shall have access to applicant's property to make on-site inspections to insure compliance with the assent.

A copy of this authorization to perform construction related activities shall be kept on site and available for inspection. NOTE: Failure to have this letter on site or work in excess of your proposal constitutes a violation under this program.

Sincerely,

William Mosunic, Administrative Officer  
Coastal Resources Management Council

/bms



State of Rhode Island and Providence Plantations

COASTAL RESOURCES MANAGEMENT COUNCIL

NOTICE OF

ASSENT

CRMC Assent No.: A2017-09-027

Date:

This certifies that Narragansett Electric Company d/b/a National Grid has permission to perform test borings, test pits and surface soil sampling as per plans submitted to CRMC 9/11/2017.

situated at 200 Taft Street

Plat No. 54B|65|65B|67

Lot No. 826|645,654|662|11

Said construction operations to be done in accordance with an approved assent on file in the Offices of the Coastal Resources Management Council and subject further to all the provisions of the building ordinances of the :

City/Town of

Pawtucket

and to all the applicable State, Local and Federal provisions. This assent shall expire three (3) years from the date of this assent.

*Doreen Spolka*

Official Designee

Coastal Resources Management Council

**THIS CARD MUST BE DISPLAYED IN A CONSPICUOUS PLACE ON THE PREMISES. FAILURE TO DISPLAY WILL RESULT IN LEGAL ACTION.**



State of Rhode Island and Providence Plantations  
Coastal Resources Management Council  
Oliver H. Stedman Government Center  
4808 Tower Hill Road, Suite 3  
Wakefield, RI 02879-1900

(401) 783-3370  
Fax (401) 783-3767

## FINDING OF NO SIGNIFICANT IMPACT

September 28, 2017

City of Pawtucket  
137 Roosevelt Avenue  
Pawtucket, RI 02860

RE: CRMC Assent No. 2017-09-082: Perform surface soil sampling as per plan submitted to CRMC 9/28/17.  
Project Location: Pleasant Street, Pawtucket; Plat 67, Lot 0011

Dear Applicant:

The Coastal Resources Management Council has reviewed your project proposal and has determined the findings of no significant impact on coastal resources. This project must be completed within three (3) years of the date of this notification, unless written application requesting an extension is received by CRMC sixty (60) days prior to the expiration date. If this project involves excess excavated materials, excess soils, excess construction materials, and debris (including any destructed materials) these materials shall be removed from the site and disposed of at an inland landfill or a suitable and legal upland location. **If the project involves earthwork, appropriate erosion controls shall be utilized.** All applicable policies, prohibitions, and standards of the RICRMP shall be upheld.

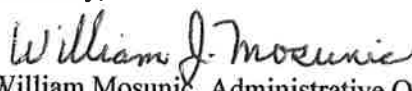
CAUTION: The limits of authorized work shall be only for that which was approved by the CRMC. Any activities or alterations in which deviate from this assent or what was detailed on the CRMC approved plans will require a separate application and review. Additionally, if the information provided to the CRMC for this review is inaccurate or did not reveal all necessary information or data, then this permit may be found to be null and void. Plans for any future alteration of the shoreline or construction or alteration within the 200' zone of CRMC jurisdiction or in coastal waters must be submitted for review to the CRMC prior to commencing such activity.

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Applicant agrees that as a condition to the granting of this assent, members of the Coastal Resources Management Council or its staff shall have access to applicant's property to make on-site inspections to insure compliance with the assent.

A copy of this authorization to perform construction related activities shall be kept on site and available for inspection. NOTE: Failure to have this letter on site or work in excess of your proposal constitutes a violation under this program.

Sincerely,

  
William Mosunic, Administrative Officer  
Coastal Resources Management Council

/bms

State of Rhode Island and Providence Plantations

COASTAL RESOURCES MANAGEMENT COUNCIL

NOTICE OF

ASSENT

CRMC Assent No.: 2017-09-082 Date: September 28, 2017

This certifies that City of Pawtucket has permission to Perform surface soil sampling as per plan submitted to CRMC 9/28/17.

\_\_\_\_\_

situated at Pleasant Street Plat No. 67 Lot No. 0011

Said construction operations to be done in accordance with an approved assent on file in the Offices of the Coastal Resources Management Council and subject further to all the provisions of the building ordinances of the :

City/Town of Pawtucket

and to all the applicable State, Local and Federal provisions. This assent shall expire three (3) years from the date of this assent.

Misty Zolner Official Designee Coastal Resources Management Council

THIS CARD MUST BE DISPLAYED IN A CONSPICUOUS PLACE ON THE PREMISES. FAILURE TO DISPLAY WILL RESULT IN LEGAL ACTION.





State of Rhode Island and Providence Plantations  
**Coastal Resources Management Council**  
Oliver H. Stedman Government Center  
4808 Tower Hill Road, Suite 3  
Wakefield, RI 02879-1900

(401) 783-3370  
Fax (401) 783-3767

## FINDING OF NO SIGNIFICANT IMPACT

September 28, 2017

City of Pawtucket  
137 Roosevelt Avenue  
Pawtucket, RI 02860

RE: CRMC Assent No. A2017-09-081: Perform surface soil sampling as per plans submitted to CRMC 9/28/17.  
Project Location: 486 Pleasant Street, Pawtucket; Plat 65, Lot 648

Dear Applicant:

The Coastal Resources Management Council has reviewed your project proposal and has determined the findings of no significant impact on coastal resources. This project must be completed within three (3) years of the date of this notification, unless written application requesting an extension is received by CRMC sixty (60) days prior to the expiration date. If this project involves excess excavated materials, excess soils, excess construction materials, and debris (including any destructed materials) these materials shall be removed from the site and disposed of at an inland landfill or a suitable and legal upland location. **If the project involves earthwork, appropriate erosion controls shall be utilized.** All applicable policies, prohibitions, and standards of the RICRMP shall be upheld.

**CAUTION:** The limits of authorized work shall be only for that which was approved by the CRMC. Any activities or alterations in which deviate from this assent or what was detailed on the CRMC approved plans will require a separate application and review. Additionally, if the information provided to the CRMC for this review is inaccurate or did not reveal all necessary information or data, then this permit may be found to be null and void. Plans for any future alteration of the shoreline or construction or alteration within the 200' zone of CRMC jurisdiction or in coastal waters must be submitted for review to the CRMC prior to commencing such activity.

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Applicant agrees that as a condition to the granting of this assent, members of the Coastal Resources Management Council or its staff shall have access to applicant's property to make on-site inspections to insure compliance with the assent.

A copy of this authorization to perform construction related activities shall be kept on site and available for inspection. **NOTE:** Failure to have this letter on site or work in excess of your proposal constitutes a violation under this program.

Sincerely,

William Mosunic, Administrative Officer  
Coastal Resources Management Council

/bms

State of Rhode Island and Providence Plantations

COASTAL RESOURCES MANAGEMENT COUNCIL

NOTICE OF

ASSENT

CRMC Assent No.: A2017-09-081

Date: September 28, 2017

This certifies that City of Pawtucket

has permission to Perform surface soil sampling as per plans submitted to CRMC 9/28/17.

situated at 486 Pleasant Street

Plat No. 65

Lot No. 648

Said construction operations to be done in accordance with an approved assent on file in the Offices of the Coastal Resources Management Council and subject further to all the provisions of the building ordinances of the :

City/Town of

Pawtucket

and to all the applicable State, Local and Federal provisions. This assent shall expire three (3) years from the date of this assent.

*William J. Scelzo*

Official Designee

Coastal Resources Management Council

**THIS CARD MUST BE DISPLAYED IN A CONSPICUOUS PLACE ON THE PREMISES. FAILURE TO DISPLAY WILL RESULT IN LEGAL ACTION.**



## **APPENDIX D**

### **LDI EXPLORATION LOGS**



## SHALLOW SOIL SAMPLE FIELD LOG

<b>GZA GeoEnvironmental, Inc.</b> 530 Broadway Providence, RI 02909 Phone: (401) 421-4140		<u>PROJECT</u> Project Name: <u>Former Tidewater Facility</u> Location: <u>Pawtucket, RI</u>				Date: <u>9/21/2017</u> <span style="float: right;">Page 1 of 1</span> File No. <u>05.0043654.00</u> GZA Staff/Sampler: <u>SCC</u>		
		SAMPLING EQUIPMENT				PID: MiniRae 3000 Calibration Standard: 100 ppm Source lamp: 10.6 eV Instrument Reading (start): 100 Instrument Reading (finish):		
Air Temperature (°F): <u>70s</u> Weather Conditions: <u>Mostly Cloudy</u>		Sample Method/Device: _____ Grab <b>Hand Auger</b> Hand Core/Borer Dredge Other						
Sample ID	Time	Sample Depth (FT)	OVM Reading (PPM)	Odor	Ground Cover (asphlt/cnc.gras)	Cover Thickness (ft)	Sample Description	
GZ-SS-501	1045	0-18"	ND	None			Light brown, (7.5, 6/3), fine to medium SAND, little Gravel, trace Silt, trace Organics (roots), dry	
GZ-SS-502	1120	0-18"	ND	None			Light brown (7.5 yr, 6/3), fine to medium SAND, little Gravel, trace Silt, trace Organics (roots), dry	
GZ-SS-503	1155	0-2	7.2	None	Asphalt		Light brown (7.5, 6/3), fine to medium SAND, little Gravel, little Silt, trace Organics (roots), dry	
GZ-SS-504	1220	0-2	ND	None			Light brown (7.5, 6/3), fine to medium SAND, little Gravel, little Silt, trace Organics (roots), trace Porcelain, dry	
GZ-SS-505	1315	0-24"	ND	None			Light brown (7.5, 6/3), fine to medium SAND, little Gravel, little Silt, trace Organics (roots), trace Slag, dry	
GZ-SS-506	1340	0-24"	ND	None	Roots		Tan (10 yr, 6/6), fine to medium SAND, trace fine to coarse Gravel, trace Silt, dry	
GZ-SS-508	1415	0-24"	ND	None			Light brown (7.5, 6/3), fine to coarse SAND and GRAVEL, trace Silt, trace Organics (roots), dry	
GZ-SS-509	1430	0-24"	ND	None	Trash, Debris		Top 18": Brown (10 yr, 4/4), fine to medium SAND, little fine to coarse Gravel, little Silt, Bottom 6": Orange-brown (10 yr, 4/4), fine to medium SAND, little fine to coarse Gravel, little Silt	
GZ-SS-510	1450	0-24"	ND	None			Brown (10 yr, 4/4) fine to medium SAND, little Silt, trace Glass, dry	
<b>SOIL CONDITIONS</b>			<b>DENSITY</b>			<b>ABBREVIATIONS</b>		<b>ORGANIC MATERIALS</b>
Fines (silts & clay)	Too fine to see.	TRACE (TR)	0-10%	Sand	Silt/Clay	V - Very	F - Fine	Organic Silt: Dark gray to black, light weight, often H2S odor.
Fine sand.	Finest visible particles.	LITTLE (L.)	10-20%	V. Loose	V. Soft	GR - Gray	M - Medium	Humus: Decomposed root/twig/leaf litter - forest areas.
Med. Sand	1/64"-1/16" (granular sugar).	SOME (S.)	20-35%	Loose	Soft	BN - Brown	C - Coarse	Root Mat: Living root fiber structures, found in marshes.
C. Sand	1/6"-1/4" (rock salt).	AND	35-50%	M. Dense	M. Stiff	YEL - Yellow	F/M - Fine to Medium	Peat: Fossiliferous root mat - decomposed fiber structure.
Fine gravel	1/4"-3/4" (pea to grape).			Dense	Stiff	RD - Red	F/C - Fine to Coarse	Note: e.g. logs, branches, roots, shells, black streaks, H2S odor.

## SHALLOW SOIL SAMPLE FIELD LOG

<b>GZA GeoEnvironmental, Inc.</b> 530 Broadway Providence, RI 02909 Phone: (401) 421-4140		<b>PROJECT</b> Project Name: <u>Former Tidewater Facility</u> Location: <u>Pawtucket, RI</u>				Date: <u>9/22/2017</u> <span style="float: right;">Page 1 of 1</span> File No. <u>05.0043654.00</u> GZA Staff/Sampler: <u>SCC</u>		
		<b>SAMPLING EQUIPMENT</b>				PID: <u>MiniRae 3000</u> Calibration Standard: <u>100 ppm</u> Source lamp: <u>10.6 eV</u>		
Air Temperature (°F): <u>80s - 90s</u> Weather Conditions: <u>Sunny</u>		Sample Method/Device: _____ Grab <b>Hand Auger</b> Hand Core/Borer Dredge Other				Instrument Reading (start): <u>100</u> Instrument Reading (finish): _____		
Sample ID	Time	Sample Depth (FT)	OVM Reading (PPM)	Odor	Ground Cover (asphlt/cnc.gras)	Cover Thickness (ft)	Sample Description	
GZ-SS-507	0808	0-2'	ND	None			Brown (10 yr, 4/4), fine to medium SAND, little fine to coarse Gravel, little Silt, trace Brick, dry	
GZ-SS-511	0825	0-18"	ND	None			Light brown (7.5, 6/3), fine to medium SAND, some fine to coarse Gravel, little Silt, trace Brick, trace Slag, trace Concrete, dry	
GZ-SS-512	0900	0-2'	ND	None			Top 6": Brown (10 yr, 4/4), fine to medium SAND, little Silt, trace Gravel,, dry Bottom 18": Gray (5 yr, 5/1) fine SAND and SILT, trace Gravel, dry	
GZ-SS-513	0915	0-2'	ND	None			Brown (10 yr, 4/4), fine to medium SAND, little fine to coarse Gravel, trace Silt, trace Slag, dry	
GZ-SS-514	0930	0-2'	ND	None			Light brown (7.5, 6/3), fine to medium SAND, little Silt, little Gravel, trace Organics (roots), trace Ash, dry	
GZ-SS-515	1000	0-2'	ND	None			Top 6": Dark brown (10 yr, 3/3), fine to medium SAND, little Gravel, trace Silt, Bottom 18": Tan, (10 yr, 6/6), fine Sand, trace Gravel, trace Silt, dry	
GZ-SS-516	1030	0-2'	ND	None	Brick, Debris		Brown (10 yr, 4/4), fine to medium SAND, little Silt, trace Gravel, trace Organics (roots), trace Brick, trace Porcelain, trace Glass, trace Ash	
GZ-SS-517	1137	0-2'	ND	None	Trash, Brick, Concrete		Light to medium brown (10 yr, 5/8), fine to medium SAND, little Silt, trace Gravel, trace Slag, trace Glass, trace Seashells, trace Organics (roots)	
SOIL CONDITIONS			DENSITY			ABBREVIATIONS		ORGANIC MATERIALS
Fines (silts & clay)	Too fine to see,	TRACE (TR)	0-10%	Sand	Silt/Clay	V - Very	F - Fine	Organic Silt: Dark gray to black, light weight, often H2S odor.
Fine sand.	Finest visible particles.	LITTLE (L.)	10-20%	V. Loose	V. Soft	GR - Gray	M - Medium	Humus: Decomposed root/twig/leaf litter - forest areas.
Med. Sand	1/64"-1/16" (granular sugar).	SOME (S.)	20-35%	Loose	Soft	BN - Brown	C - Coarse	Root Mat: Living root fiber structures, found in marshes.
C. Sand	1/6"-1/4" (rock salt).	AND	35-50%	M. Dense	M. Stiff	YEL - Yellow	F/M - Fine to Medium	Peat: Fossiliferous root mat - decomposed fiber structure.
Fine gravel	1/4"-3/4" (pea to grape).			Dense	Stiff	RD - Red	F/C - Fine to Coarse	Note: e.g. logs, branches, roots, shells, black streaks, H2S odor.







# SHALLOW SOIL SAMPLE FIELD LOG

<b>GZA GeoEnvironmental, Inc.</b> <b>530 Broadway</b> <b>Providence, RI 02909</b> <b>Phone: (401) 421-4140</b>	<b>PROJECT</b> Project Name: <u>Former Tidewater Facility</u> Location: <u>Pawtucket, RI</u>	Date: <u>9/27/2017</u> <span style="float: right;">Page 1 of 1</span> File No. <u>05.0043654.00</u> GZA Staff/Sampler: <u>SCC</u>
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Air Temperature (°F): <u>80s °F</u> Weather Conditions: <u>Cloudy</u>	<b>SAMPLING EQUIPMENT</b> Sample Method/Device: _____ Grab <b>Hand Auger</b> Hand Core/Borer    Dredge    Other	PID: <u>MiniRae 3000</u> Calibration Standard: <u>100 ppm</u> Source lamp: <u>10.6 eV</u> Instrument Reading (start): <u>99.9</u> Instrument Reading (finish): _____
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Sample ID	Time	Sample Depth (FT)	OVM Reading (PPM)	Odor	Ground Cover (asphlt/cnc.gras)	Cover Thickness (ft)	Sample Description
GZ-SS-535	0820	0-2	ND	None	Slag, Coal, Brick, Glass		Dark brown (10 yr, 3/3), fine to coarse SAND, some fine to coarse Gravel, some Organics (roots), little Silt, trace Slag, trace Brick, MGP odor in general area, dry
GZ-SS-536	0835	0-2	ND	None	Slag, Coal, Brick, Glass		Dark brown (10 yr. 3/3), fine to coarse SAND, some fine to coarse Gravel, some Organics (roots), little Silt, trace Slag, trace Glass, trace Brick, MGP odor in general area, dry
GZ-SS-537	0855	0-2	ND	None	Slag, Coal, Brick, Glass		Grayish-brown (10 yr, 5/2), fine to coarse SAND, some fine to coarse Gravel, some Organics (roots), trace Slag, trace Brick, trace Grass, trace Silt, dry
GZ-SS-538	0910	0-2	ND	None	Slag, Coal, Brick, Glass		Brown (10 yr, 4/3), fine to corase SAND, some fine to coarse Gravel, some Organics (roots), trace Slag, trace Brick, trace Glass, trace Silt, dry
GZ-SS-539	0925	0-2	ND	None	Brick, Slag, Coal		Brown (10 yr. 3/3), fine to corase SAND, some fine to coarse Gravel, some Organics (roots), trace Slag, trace Glass, trace Brick, dry
GZ-SS-556	1000	0-2	ND	None	Brick, Slag, Coal		Dark brown (10 yr, 3/3), fine to coarse SAND, some fine to coarse Gravel, little Silt, trace Organics (roots), trace Slag, dry
GZ-SS-557	1015	0-2	ND	None	Brick, Slag, Coal		Dark brown (10 yr, 3/3), fine to coarse SAND, some Slag, little Silt, little fine to coarse Gravel, trace Organics (roots), dry
GZ-SS-558	1030	0-2	ND	None	Brick, Slag, Coal		Dark brown (10 yr. 3/3) fine to coarse SAND, some Slag, little Silt, little fine to coarse Gravel, trace Brick, trace Organics (roots), dry
GZ-SS-559	1040	0-2	ND	None	Brick, Slag, Coal		Dark brown (10 yr, 3/3) fine to coarse SAND, some Slag, little fine to coarse Gravel, trace Silt, trace Brick, trace Organics (roots), dry
GZ-SS-560	1050	0-2	ND	None	Brick, Slag, Coal		Dark brown ( 10 yr, 3/3), fine to coarse SAND, some Slag, trace fine to coarse Gravel, trace Silt, trace Brick, trace Organics (roots), dry

SOIL CONDITIONS				DENSITY		ABBREVIATIONS		ORGANIC MATERIALS
Fines (silts & clay)	Too fine to see.	TRACE (TR.)	0-10%	Sand	Silt/Clay	V - Very	F - Fine	Organic Silt:    Dark gray to black, light weight, often H2S odor.
Fine sand.	Finest visible particles.	LITTLE (L.)	10-20%	V. Loose	V. Soft	GR - Gray	M - Medium	Humus:        Decomposed root/twig/leaf litter - forest areas.
Med. Sand	1/64"-1/16" (granular sugar).	SOME (S.)	20-35%	Loose	Soft	BN - Brown	C - Coarse	Root Mat:     Living root fiber structures, found in marshes.
C. Sand	1/6"-1/4" (rock salt).	AND	35-50%	M. Dense	M. Stiff	YEL - Yellow	F/M - Fine to Medium	Peat:         Fossiliferous root mat - decomposed fiber structure.
Fine gravel	1/4"-3/4" (pea to grape).			Dense	Stiff	RD - Red	F/C - Fine to Coarse	Note: e.g. logs, branches, roots, shells, black streaks, H2S odor.

## SHALLOW SOIL SAMPLE FIELD LOG

<b>GZA GeoEnvironmental, Inc.</b> 530 Broadway Providence, RI 02909 Phone: (401) 421-4140	PROJECT Project Name: <u>Former Tidewater Facility</u> Location: <u>Pawtucket, RI</u>	Date: <u>9/28/2017</u> <span style="float: right;">Page 1 of 2</span> File No. <u>05.0043654.00</u> GZA Staff/Sampler: <u>SCC</u>
	SAMPLING EQUIPMENT	
	Air Temperature (°F): <u>70s °F</u> Weather Conditions: <u>Sunny</u>	Sample Method/Device: _____ Grab <b>Hand Auger</b> Hand Core/Borer                      Dredge    Other

Sample ID	Time	Sample Depth (FT)	OVM Reading (PPM)	Odor	Ground Cover (asphlt/cnc.gras)	Cover Thickness (ft)	Sample Description
GZ-SS-FT-501	0810	0-0.25	ND	None	Leaves, Roots, Gravel		Brown (10 yr, 5/3), fine to coarse SAND, some fine to coarse Gravel, little Silt, little Organics (roots), trace Slag, trace Brick, dry (FILL)
GZ-SS-FT-501	0820	0.75-1	ND	None	Leaves, Roots, Gravel		Pale to medium brown (10 yr, 4/3), fine to coarse SAND, little fine to coarse Gravel, little Silt, dry (FILL)
GZ-SS-FT-501	0825	1.75-2	ND	None	Leaves, Roots, Gravel		Pale brown (10 yr, 6/3), fine to medium SAND, trace fine Gravel, trace Silt, dry (FILL)
GZ-SS-FT-502	835	0-0.25	0.4	None	Leaves, Roots, Gravel, Slag		Brown (10 yr, 5/3), fine to coarse SAND, some fine Gravel, some Organics (roots), trace Silt, trace Slag, dry (FILL)
GZ-SS-FT-502	0840	0.75-1	ND	None	Leaves, Roots, Gravel, Slag		Dark brown (10 yr, 3/3), fine to coarse SAND, little fine to coarse Gravel, trace Organics (roots), trace Silt, trace Slag, dry (FILL)
GZ-SS-FT-502	0850	1.75-2	ND	None	Leaves, Roots, Gravel, Slag		Brown (10 yr, 5/3), fine to medium SAND, trace fine to coarse Gravel, trace Silt, trace Slag, dry (FILL)
GZ-SS-FT-503	0900	0-0.25	ND	None	Leaves, Roots, Gravel		Brown (10 yr, 5/3), fine to coarse SAND, trace fine Gravel, trace Organics (roots), trace Silt, dry (FILL)
GZ-SS-FT-503	0910	0.75-1	ND	None	Leaves, Roots, Gravel		Brown (10 yr, 5/3), fine to coarse SAND, some fine to coarse Gravel, trace Organics (roots), trace Silt, dry (FILL)
GZ-SS-FT-503	0915	1.75-2	ND	None	Leaves, Roots, Gravel		Pale to medium brown (10 yr, 4/3), fine to coarse SAND, some fine to coarse Gravel, some Silt, dry (FILL)
GZ-SS-FT-504	0925	0-0.25	0.2	None	Leaves, Roots, Gravel		Brown (10 yr, 5/3), fine to coarse SAND, some fine to coarse Gravel, trace Silt, trace Organics, (roots), trace Slag, dry (FILL)
GZ-SS-FT-504	0930	0.75-1	ND	None	Leaves, Roots, Gravel		Brown (10 yr, 5/3), fine to medium SAND, little fine to coarse Gravel, trace Silt (dry) (FILL)
GZ-SS-FT-504	0940	1.75-2	ND	None	Leaves, Roots, Gravel		Dark brown (10 yr, 3/3), fine to medium SAND, little fine to coarse Gravel, trace Silt, dry (FILL)
GZ-SS-FT-505	1015	0-0.25	ND	None	Leaves, Roots, Gravel		Dark brown (10 yr, 5/3), fine to coarse SAND, some fine to coarse Gravel, little Organics (roots), trace Silt, trace Slag, dry (FILL)
GZ-SS-FT-505	1030	0.75-1	ND	None	Leaves, Roots, Gravel		Brown (10 yr, 5/3), fine to medium SAND, trace fine to coarse Gravel, trace Silt, trace Organics (roots), dry (FILL)
GZ-SS-FT-505	1045	1.75-2	ND	None	Leaves, Roots, Gravel		Brown (10 yr, 5/3), fine to medium SAND, trace fine Gravel, trace Silt, dry (FILL)

SOIL CONDITIONS			DENSITY		ABBREVIATIONS		ORGANIC MATERIALS
Fines (silts & clay)	Too fine to see.	TRACE (TR.)	0-10%	Sand	Silt/Clay	V - Very	F - Fine
Fine sand.	Finest visible particles.	LITTLE (L.)	10-20%	V. Loose	V. Soft	GR - Gray	M - Medium
Med. Sand	1/64"-1/16" (granular sugar).	SOME (S.)	20-35%	Loose	Soft	BN - Brown	C - Coarse
C. Sand	1/6"-1/4" (rock salt).	AND	35-50%	M. Dense	M. Stiff	YEL - Yellow	F/M - Fine to Medium
Fine gravel	1/4"-3/4" (pea to grape).			Dense	Stiff	RD - Red	F/C - Fine to Coarse

Organic Silt: Dark gray to black, light weight, often H2S odor.  
 Humus: Decomposed root/twig/leaf litter - forest areas.  
 Root Mat: Living root fiber structures, found in marshes.  
 Peat: Fossiliferous root mat - decomposed fiber structure.  
 Note: e.g. logs, branches, roots, shells, black streaks, H2S odor.





# SHALLOW SOIL SAMPLE FIELD LOG

<b>GZA GeoEnvironmental, Inc.</b> <b>655 Winding Brook Drive, Suite 402</b> <b>Glastonbury, CT 06033</b> <b>Phone: (860) 286-8900</b>	Project Name: <u>PROJECT</u> Location: <u>Former Tidewater Facility</u> <u>Pawtucket, RI</u>	Date: <u>10/2/2017</u> <span style="float: right;">Page 1 of 2</span> File No. <u>05.0043654.00</u> GZA Staff/Sampler: <u>SCC</u>
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Air Temperature (°F): <u>60s - 70s</u> Weather Conditions: <u>Sunny</u>	<b>SAMPLING EQUIPMENT</b>	PID: <u>MiniRae 3000</u> Calibration Standard: <u>100 ppm</u> Source lamp: <u>10.6 eV</u> Instrument Reading (start): <u>100</u> Instrument Reading (finish): _____
Sample Method/Device: Grab <u>Hand Auger</u> Hand Core/Borer _____ Dredge _____ Other _____		

Sample ID	Time	Sample Depth (FT)	OVM Reading (PPM)	Odor	Ground Cover (asphlt/cnc.gras)	Cover Thickness (ft)	Sample Description
GZ-SS-540	1040	0-2	ND	None	Asphalt, Brick, Concrete, Leaves, Sticks		Light medium brown (10 yr, 5/3), fine to coarse SAND, some fine to coarse Gravel, some Organics (roots), trace Silt, trace Brick, dry
GZ-SS-541	1055	0-2	ND	None	Asphalt, Brick, Concrete, Leaves, Sticks		Grayish-brown (10 yr, 5/2), fine to coarse SAND, some fine to coarse Gravel, some Organics (roots & leaves), trace Silt, blue-stained rock observed on surface, dry
GZ-SS-542	1100	0-2	ND	None	Asphalt, Brick, Concrete, Leaves, Sticks		Brown (10 yr, 4/3), fine to coarse SAND, little fine to coarse Gravel, little Organics (roots) trace Concrete, trace Slag, dry
GZ-SS-543	1115	0-2	ND	None	Asphalt, Brick, Concrete, Leaves, Sticks		Light-medium brown (10 yr, 4/3), fine to coarse SAND, little fine to coarse Gravel, little Organics (roots), trace Silt, trace Brick, dry
GZ-SS-544	1125	0-2	ND	None	Asphalt, Brick, Concrete, Leaves, Sticks		Pale brown (10 yr, 6/3), fine to coarse SAND and GRAVEL, some Organics (roots & leaves), trace Silt, dry
GZ-SS-545	1145	0-2	ND	None	Asphalt, Brick, Concrete, Leaves, Sticks		Brown (10 yr, 4/3), fine to coarse SAND, some fine to coarse Gravel, some Organics (roots, leaves), trace Silt, trace Brick, dry
GZ-SS-546	1155	0-2	ND	None	Asphalt, Brick, Concrete, Leaves, Sticks, Metal Debris & Glass		Grayish-brown (10 yr, 5/2), fine to coarse SAND, some fine to coarse Gravel, some Organics (roots) trace Concrete, trace Silt, dry
GZ-SS-547	1215	0-2	ND	None	Asphalt, Brick, Core, Leaves, Sticks, Metal Debris & Glass		Pale brown (10 yr, 6/3), fine to coarse SAND, some fine to coarse Gravel, little Organics (roots), trace Concrete, trace Silt, trace Glass, dry
GZ-SS-548	1230	0-2	0.1	None	Asphalt, Brick, Core, Leaves, Sticks, Metal Debris & Glass		Brown (10 yr, 5/3), fine to coarse SAND, some fine to coarse Gravel, little Organics (roots & leaves), little Silt, trace Concrete, dry
GZ-SS-549	1245	0-2	ND	None	Asphalt, Brick, Core, Leaves, Sticks, Metal Debris & Glass		Brown (10 yr, 4/3), fine to coarse SAND, some fine to coarse Gravel, some Organics (roots & leaves) trace Silt, dry
GZ-SS-550	1255	0-2	ND	None	Asphalt, Brick, Core, Leaves, Sticks, Metal Debris & Glass		Brown (10 yr, 5/3), fine to coarse SAND, some fine to coarse Gravel, little Organics (roots & Leaves), trace Silt, trace Concrete, dry
GZ-SS-551	1310	0-2	ND	None	Asphalt, Brick, Core, Leaves, Sticks, Metal Debris & Glass		Brown (10 yr, 5/3), fine to coarse SAND, some fine to coarse Gravel, little Organics (roots & leaves), trace Concrete, trace Silt, dry
GZ-SS-552	1325	0-2	ND	None	Asphalt, Brick, Core, Leaves, Sticks, Metal Debris & Glass		Brown (10 yr, 5/3), fine to coarse SAND and GRAVEL, little Organics (roots & leaves), trace Concrete, trace Silt, dry
GZ-SS-553	1335	0-2	ND	None	Asphalt, Brick, Core, Leaves, Sticks, Metal Debris & Glass		Pale brown (10 yr, 6/3), fine to coarse SAND and GRAVEL, little Organics (roots), trace Silt, trace Plastic debris, trace Concrete, dry

SOIL CONDITIONS			DENSITY		ABBREVIATIONS		ORGANIC MATERIALS
Fines (silts & clay)	Too fine to see.	TRACE (TR.)	0-10%	Sand	Silt/Clay	V - Very	F - Fine
Fine sand.	Finest visible particles.	LITTLE (L.)	10-20%	V. Loose	V. Soft	GR - Gray	M - Medium
Med. Sand	1/64"-1/16" (granular sugar).	SOME (S.)	20-35%	Loose	Soft	BN - Brown	C - Coarse
C. Sand	1/6"-1/4" (rock salt).	AND	35-50%	M. Dense	M. Stiff	YEL - Yellow	F/M - Fine to Medium
Fine gravel	1/4"-3/4" (pea to grape).			Dense	Stiff	RD - Red	F/C - Fine to Coarse
							Organic Silt: Dark gray to black, light weight, often H2S odor.
							Humus: Decomposed root/twig/leaf litter - forest areas.
							Root Mat: Living root fiber structures, found in marshes.
							Peat: Fossiliferous root mat - decomposed fiber structure.
							Note: e.g. logs, branches, roots, shells, black streaks, H2S odor.





## SHALLOW SOIL SAMPLE FIELD LOG

<b>GZA GeoEnvironmental, Inc.</b> 530 Broadway Providence, RI 02909 Phone: (401) 421-4140			<b>PROJECT</b> Project Name: <u>Former Tidewater Facility</u> Location: <u>Pawtucket, RI</u>				Date: <u>12/8/2017</u> <span style="float: right;">Page 1 of 1</span> File No. <u>05.0043654.00</u> GZA Staff/Sampler: <u>SCC</u>	
			Air Temperature (°F): <u>40°</u> Weather Conditions: <u>Sunny</u>			<b>SAMPLING EQUIPMENT</b> Sample Method/Device: _____ Grab <b>Hand Auger</b> Hand Core/Borer Dredge Other		
Sample ID	Time	Sample Depth (FT)	OVM Reading (PPM)	Odor	Ground Cover (asphlt/cnc.gras)	Cover Thickness (ft)	Sample Description	
GZ-SS-561	0910	0-2	ND	None	Sticks, Leaves, Grass, Roots		Pale brown (10 yr, 6/3) fine to coarse SAND, little fine to coarse Gravel, trace Silt, trace Organic (roots)\, dry	
GZ-SS-562	0920	0-2	ND	None	Leaves, Roots, Slag		Black, (10 yr, 2/1), fine to coarse SAND and SLAG, some fine to coarse Gravel, Organic (roots), dry	
GZ-SS-563	0955	0-2	ND	None	Leaves, Grass, Roots		Top 6": Black (10 yr, 2/1), fine to coarse SAND, some Slag, some Organics (roots), little fine to coarse Gravel, little Brick, dry; Bottom 18": Black (10 yr, 2/1) SLAG, some fine to coarse Sand, some Brick, blue staining, dry	
GZ-SS-564	1020	0-2	ND	None	Leaves, Branches, Grass		Top 12": Brown (10 yr, 4/3) fine to coarse SAND, little fine to coarse Gravel, little Organics (roots), trace Silt, dry (FILL; Bottom 12": Dark grayish-brown (10 yr, 4/2), fine to coarse SAND, some fine to coarse Gravel, little Cobble, little Silt, dry	
GZ-SS-565	1100	0-2	ND	None	Leaves, Sticks, Slag		Black (10 yr, 2/1) SLAG, some fine to coarse Sand, some Brick, little Organics (roots), dry	
GZ-22-566	1145	0-2	ND	None	Leaves, Sticks, Roots, Slag		Black (10 yr, 2/1) SLAG, some fine to coarse SAND, little Brick, little fine to coarse Gravel, little Organics (roots), dry	
GZ-SS-567	1200	0-2	ND	None	Leaves, Twigs, Roots		Brown (10 yr, 4/3), fine to coarse SAND, some Slag, some fine to coarse Gravel, little Organics (roots), dry	
GZ-SS-568	1215	0-2	ND	None	Leaves, Twigs, Roots		Dark brown, (10 yr, 3/2), fine to coarse SAND, some fine to coarse Gravel, little Cobble, little Organics (roots), little Slag, Asphalt Chalk, dry	
GZ-SS-569	1230	0-2	ND	None	Leaves, Twigs, Roots		Top 12": Dark gray (10 yr, 3/3), fine to coarse SAND, some Organics (roots), little Slag, dry; Bottom 12": Grayish-brown (10 yr, 5/2), fine SAND, some Silt, little Organics (roots), dry	
GZ-SS-570	1245	0-2	ND	None	Leaves, Twigs, Metal Debris, Roots		Very dark brown (10 yr, 2/2) SLAG, some fine to coarse Sand, little Brick, little Organics (roots), trace Silt, dry	
<b>SOIL CONDITIONS</b>			<b>DENSITY</b>			<b>ORGANIC MATERIALS</b>		
Fines (silts & clay)	Too fine to see.	TRACE (TR)	0-10%	Sand	Silt/Clay	V - Very	F - Fine	Organic Silt: Dark gray to black, light weight, often H2S odor.
Fine sand.	Finest visible particles.	LITTLE (L.)	10-20%	V. Loose	V. Soft	GR - Gray	M - Medium	Humus: Decomposed root/twig/leaf litter - forest areas.
Med. Sand	1/64"-1/16" (granular sugar).	SOME (S.)	20-35%	Loose	Soft	BN - Brown	C - Coarse	Root Mat: Living root fiber structures, found in marshes.
C. Sand	1/6"-1/4" (rock salt).	AND	35-50%	M. Dense	M. Stiff	YEL - Yellow	F/M - Fine to Medium	Peat: Fossiliferous root mat - decomposed fiber structure.
Fine gravel	1/4"-3/4" (pea to grape).			Dense	Stiff	RD - Red	F/C - Fine to Coarse	Note: e.g. logs, branches, roots, shells, black streaks, H2S odor.

## TEST PIT FIELD LOG

<b>GZA GEOENVIRONMENTAL, INC.</b> 530 BROADWAY PROVIDENCE, RI GEOTECHNICAL CONSULTANTS	<b>PROJECT</b> DESCRIPTION: Former Tidewater Facility  LOCATION: Pawtucket, Rhode Island	<b>TEST PIT NO.:</b> <span style="font-size: 1.2em; font-weight: bold;">SV-1</span>  <b>FILE NO.:</b> 43654.00  <b>DATE:</b> 10/13/17
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GZA ENGINEER: SCC	CONTRACTOR: Cascade	EXCAVATION EQUIPMENT	DATUM: NAVD88
WEATHER: Sunny, 60's	OPERATOR: Greg Rivera	MAKE: Soil Vac	GROUND ELEV.: 26.29
	CAPACITY: -	MODEL: -	TIME STARTED: 0745
	cu. yd.	REACH: 4	TIME COMPLETE: 1030

DEPTH	PID	SOIL DESCRIPTION	EXCAV. EFFORT	BOULDER COUNT QTY. CLASS	REMARK NO.
-1-	ND	Pale brown (10 yr, 6/3), fine to medium SAND, little Silt, little Organics (roots), trace (+) fine to coarse Gravel (dry)	E	0	1 / 2
-2-			E	0	
-3-	ND		E	0	
-4-			E	0	
-5-	ND	Pale brown (10 yr, 6/3), fine to medium SAND, some Silt, trace fine to coarse Gravel (dry)	E	0	
-6-			E	0	
-7-		End of Exploration at 6'			
-8-					
-9-					
-10-					
-11-					
-12-					
-13-					
-14-					

REMARKS:

- Soil samples screened with a MiniRAE 3000 photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. ND = None Detected above background.
- Test pit backfilled in the approximate order the soils were dug.

TEST PIT PLAN 	LEGEND: BOULDER COUNT SIZE RANGE LETTER DESIGNATION CLASSIFICATION 6"-18" A 18"-36" B 36" OR LARGER C	PROPORTIONS USED TRACE (TR) 0-10% LITTLE (LI) 10-20% SOME (SO) 20-35% AND 35-50%	EXCAVATION EFFORT E EASY M MODERATE D DIFFICULT   NOT OBSERVED OBSERVED GROUNDWATER LEVEL
VOLUME= 5.3 cu. yd.			

## TEST PIT FIELD LOG

<b>GZA GEOENVIRONMENTAL, INC.</b> 530 BROADWAY PROVIDENCE, RI GEOTECHNICAL CONSULTANTS	<b>PROJECT</b> DESCRIPTION: Former Tidewater Facility  LOCATION: Pawtucket, Rhode Island	<b>TEST PIT NO.:</b> <span style="font-size: 1.2em; font-weight: bold;">SV-2</span>  <b>FILE NO.:</b> 43654.00  <b>DATE:</b> 10/13/17
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GZA ENGINEER: SCC	CONTRACTOR: Cascade	EXCAVATION EQUIPMENT	DATUM: NAVD88
WEATHER: Sunny, 60's	OPERATOR: Greg Rivera	MAKE: Soil Vac	GROUND ELEV.: 21.56
	CAPACITY: cu. yd.	MODEL:	TIME STARTED: 1110
		REACH:	TIME COMPLETE: 1330

DEPTH	PID	SOIL DESCRIPTION	EXCAV. EFFORT	BOULDER COUNT QTY. CLASS	REMARK NO.
-1-	ND	Gray (10 yr, 5/1), PROCESSED GRAVEL, some fine to coarse Sand, little Organics (roots) (dry)	E	0	1 / 2
-2-		Brown (10 yr.), fine to medium SAND, some Cobble, some Gravel, little Silt (dry)	E	0	
-3-	ND		E	0	
-4-			E	0	
-5-	ND		E	0	
-6-		End of Exploration at 6'	E	0	
-7-					
-8-					
-9-					
-10-					
-11-					
-12-					
-13-					
-14-					

REMARKS:

- Soil samples screened with a MiniRAE 3000 photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. A "\*\*\*" indicates a sample sent to a laboratory for additional analyses or screening. ND = None Detected above background.
- Test pit backfilled in the approximate order the soils were dug.

TEST PIT PLAN 	LEGEND: BOULDER COUNT SIZE RANGE LETTER DESIGNATION CLASSIFICATION 6"-18" A 18"-36" B 36" OR LARGER C	PROPORTIONS USED TRACE (TR) 0-10% LITTLE (LI) 10-20% SOME (SO) 20-35% AND 35-50%	EXCAVATION EFFORT E EASY M MODERATE D DIFFICULT   NOT OBSERVED OBSERVED GROUNDWATER LEVEL
VOLUME= 1.3 cu. yd.			



### TEST PIT FIELD LOG

<b>GZA GEOENVIRONMENTAL, INC.</b> 530 BROADWAY PROVIDENCE, RI GEOTECHNICAL CONSULTANTS	<b>PROJECT</b> DESCRIPTION: Former Tidewater Facility  LOCATION: Pawtucket, Rhode Island	<b>TEST PIT NO.:</b> <span style="font-size: 1.2em; font-weight: bold;">TP-501</span>  <b>FILE NO.:</b> 43654.00  <b>DATE:</b> 9/14/17
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GZA ENGINEER: SCC	CONTRACTOR: Moran Environmental	DATUM: NAVD88	GROUND ELEV.: 28.05
WEATHER: Partly cloudy, 80s	OPERATOR: John Duponte	MAKE: Kobelco	MODEL: SK1405R LC
	CAPACITY: 1 cu. yd.	REACH: ~18'	TIME COMPLETED: 1345

DEPTH	PID (ppm)	SOIL DESCRIPTION	EXCAV. EFFORT	BOULDER COUNT QTY. CLASS	REMARK NO.
-1-	ND	----- HARDENED TAR (dry) ----- Dark brown-black (10 yr, 2/2), fine to coarse SAND, some Slag/Ash/Brick, little fine to coarse Gravel, trace Silt, trace Organics, slight naphthalene/creosote-like odor, (dry)	E	0	1/4
-2-		Yellow-brown (10 yr, 6/3), fine to coarse SAND, little fine to coarse Gravel, trace Silt, dry (dry)	E	0	
-3-	ND		E	0	
-4-		----- ASH ----- Tan (10 yr, 6/3), fine SAND, some Silt, trace Brick, trace fine to coarse Gravel (dry)	E	0	2
-5-	ND	Tan (10 yr, 6/3), fine SAND, some Silt, trace fine to coarse Gravel (dry)	M	0	
-6-			M	0	
-7-			E	0	
-8-	ND	Yellow-brown (10 yr, 6/3), fine to coarse SAND, little Silt, little fine to coarse Gravel (dry)	E	0	
-9-			E	0	
-10-		Brown (10 yr, 4/3), SILT and CLAY (moist)	E	0	
-11-	ND		E	0	
-12-			E	0	3
-13-			E	0	
-14-		End of Exploration ~13' bgs			

**REMARKS:**

- Soil samples screened with a MiniRAE 3000 photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. ND = None Detected above background.
- Pocket of ash in NE side wall from approximately 3.5 to 4 feet below ground surface (gray color).
- Multi-colored SILT and CLAY soil (red-brown, yellow, gray), see photo.
- Soils backfilled in the general order they were excavated. Backfilled soil was compacted via excavator bucket tamping every 12 inch lift.

<b>TEST PIT PLAN</b> 	<b>LEGEND:</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">BOULDER</td> <td style="width: 30%;">COUNT</td> <td style="width: 40%;">PROPORTIONS USED</td> </tr> <tr> <td>SIZE RANGE</td> <td>LETTER DESIGNATION</td> <td>TRACE (TR) 0-10%</td> </tr> <tr> <td>CLASSIFICATION</td> <td>A</td> <td>LITTLE (LI) 10-20%</td> </tr> <tr> <td>6"-18"</td> <td>B</td> <td>SOME (SO) 20-35%</td> </tr> <tr> <td>18"-36"</td> <td>C</td> <td>AND 35-50%</td> </tr> <tr> <td>36" OR LARGER</td> <td></td> <td></td> </tr> </table>	BOULDER	COUNT	PROPORTIONS USED	SIZE RANGE	LETTER DESIGNATION	TRACE (TR) 0-10%	CLASSIFICATION	A	LITTLE (LI) 10-20%	6"-18"	B	SOME (SO) 20-35%	18"-36"	C	AND 35-50%	36" OR LARGER			<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%; text-align: center;">EXCAVATION EFFORT</td> <td style="width: 70%;"></td> </tr> <tr> <td style="text-align: center;">E</td> <td style="text-align: center;">EASY</td> </tr> <tr> <td style="text-align: center;">M</td> <td style="text-align: center;">MODERATE</td> </tr> <tr> <td style="text-align: center;">D</td> <td style="text-align: center;">DIFFICULT</td> </tr> <tr> <td style="text-align: center;"></td> <td style="text-align: center;">NOT OBSERVED</td> </tr> <tr> <td style="text-align: center;">-----</td> <td style="text-align: center;">OBSERVED GROUNDWATER LEVEL</td> </tr> </table>	EXCAVATION EFFORT		E	EASY	M	MODERATE	D	DIFFICULT		NOT OBSERVED	-----	OBSERVED GROUNDWATER LEVEL
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### TEST PIT FIELD LOG

<b>GZA GEOENVIRONMENTAL, INC.</b> 530 BROADWAY PROVIDENCE, RI GEOTECHNICAL CONSULTANTS	<b>PROJECT</b> DESCRIPTION: Former Tidewater Facility  LOCATION: Pawtucket, Rhode Island	<b>TEST PIT NO.:</b> <span style="font-size: 1.2em; font-weight: bold;">TP-502</span>  <b>FILE NO.:</b> 43654.00  <b>DATE:</b> 9/14/17
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GZA ENGINEER: SCC	CONTRACTOR: Moran Environmental	DATUM: NAVD88	GROUND ELEV.: 27.53
WEATHER: Partly cloudy, 80s	OPERATOR: John Duponte	TIME STARTED: 1350	TIME COMPLETED: 1500
	MAKE: Kobelco	MODEL: SK1405R LC	
	CAPACITY: 1 cu. yd.	REACH: ~18'	

DEPTH	PID (ppm)	SOIL DESCRIPTION	EXCAV. EFFORT	BOULDER COUNT QTY. CLASS	REMARK NO.
-1-	ND	Dark brown-black (10 yr 3/1), fine to coarse SAND, some Silt, little fine to coarse Gravel, little Organics (roots), trace Concrete, trace Slag (dry)	E	0	1/3
-2-	ND	Dark brown-gray (10 yr, 3/2), fine to coarse SAND, little Brick and Concrete, little fine to coarse Gravel, trace Silt	E	0	
-3-			E	0	
-4-		Dark brown-gray (10 yr, 3/2), fine to coarse SAND, little Brick and Concrete, little fine to coarse Gravel, trace Silt, large pockets of Ash	E	0	
-5-	ND		E	0	2
-6-			E	0	
-7-			E	0	
-8-		Brownish-yellow (10 yr, 6/6), fine to coarse SAND, little Silt, little fine to coarse Gravel (dry)	E	0	
-9-	ND		E	0	
-10-			E	0	
-11-			E	0	
-12-		Light brown (10 yr, 6/3), fine SAND, little Silt, (dry)	E	0	
-13-	ND		E	0	
-14-		End of Exploration ~13' bgs			

**REMARKS:**

- Soil samples screened with a MiniRAE 3000 photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. ND = None Detected above background.
- Pockets of ash not easily observed however large amounts of ash excavated from 3.5 to 7 feet below ground surface.
- Soils backfilled in the general order they were excavated. Backfilled soil was compacted via excavator bucket tamping every 12 inch lift.

TEST PIT PLAN 	<b>LEGEND:</b> BOULDER COUNT SIZE RANGE LETTER DESIGNATION CLASSIFICATION 6"-18" A 18"-36" B 36" OR LARGER C	<b>PROPORTIONS USED</b> TRACE (TR) 0-10% LITTLE (LI) 10-20% SOME (SO) 20-35% AND 35-50%	<b>EXCAVATION EFFORT</b> E EASY M MODERATE D DIFFICULT  NOT OBSERVED OBSERVED GROUNDWATER LEVEL
VOLUME= 19.2 cu. yd.			

### TEST PIT FIELD LOG

<b>GZA GEOENVIRONMENTAL, INC.</b> 530 BROADWAY PROVIDENCE, RI GEOTECHNICAL CONSULTANTS	<b>PROJECT</b> DESCRIPTION: Former Tidewater Facility  LOCATION: Pawtucket, Rhode Island	<b>TEST PIT NO.:</b> <span style="font-size: 1.2em; font-weight: bold;">TP-503</span>  <b>FILE NO.:</b> 43654.00  <b>DATE:</b> 9/15/17
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GZA ENGINEER: SCC	CONTRACTOR: Moran Environmental	EXCAVATION EQUIPMENT	DATUM: NAVD88
WEATHER: Partly cloudy, 80s	OPERATOR: John Duponte	MAKE: Kobelco	GROUND ELEV.: 75.22
	MODEL: SK1405R LC	CAPACITY: 1 cu. yd.	REACH: ~18'
		TIME STARTED: 0750	TIME COMPLETED: 0850

DEPTH	PID (ppm)	SOIL DESCRIPTION	EXCAV. EFFORT	BOULDER COUNT QTY. CLASS	REMARK NO.
-1-	ND	Dark grayish-brown (10 yr, 4/2), fine to coarse SAND, little Silt, little fine to coarse Gravel, little Organics (Root) (dry)	E	0	1/2
-2-		Dark brown-black (10 yr, 3/2), fine to coarse SAND, some fine to coarse Gravel, little Slag/Brick, little Silt (dry)	E	0	
-3-	ND		E	0	
-4-		Yellow-brown (10 yr, 5/8), fine to coarse SAND, little fine to coarse Gravel, little Silt (dry)	E	0	
-5-	ND		E	0	
-6-		ASH and SLAG (10 yr 3/3) (dry)	E	0	
-7-	ND		E	0	
-8-		Yellow-brown (10 yr, 5/8), fine to coarse SAND, little fine to coarse Gravel, little Silt (dry)	E	0	
-9-	ND		E	0	
-10-		Brown-gray (10 yr, 5/2), SILT and CLAY (moist-wet)	E	0	
-11-	ND		E	0	
-12-		End of Exploration ~12' bgs	E	0	
-13-			E	0	
-14-					

**REMARKS:**

- Soil samples screened with a MiniRAE 3000 photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. ND = None Detected above background.
- Soils backfilled in the general order they were excavated. Backfilled soil was compacted via excavator bucket tamping every 12 inch lift.

<b>TEST PIT PLAN</b> 	<b>LEGEND:</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;">BOULDER</td> <td style="width: 33%;">COUNT</td> <td style="width: 33%;"></td> </tr> <tr> <td>SIZE RANGE</td> <td>LETTER</td> <td>PROPORTIONS USED</td> </tr> <tr> <td>CLASSIFICATION</td> <td>DESIGNATION</td> <td>TRACE (TR) 0-10%</td> </tr> <tr> <td>6"-18"</td> <td>A</td> <td>LITTLE (LI) 10-20%</td> </tr> <tr> <td>18"-36"</td> <td>B</td> <td>SOME (SO) 20-35%</td> </tr> <tr> <td>36" OR LARGER</td> <td>C</td> <td>AND 35-50%</td> </tr> </table>	BOULDER	COUNT		SIZE RANGE	LETTER	PROPORTIONS USED	CLASSIFICATION	DESIGNATION	TRACE (TR) 0-10%	6"-18"	A	LITTLE (LI) 10-20%	18"-36"	B	SOME (SO) 20-35%	36" OR LARGER	C	AND 35-50%	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;">EXCAVATION EFFORT</td> <td style="width: 50%;"></td> </tr> <tr> <td style="text-align: center;">E</td> <td style="text-align: center;">EASY</td> </tr> <tr> <td style="text-align: center;">M</td> <td style="text-align: center;">MODERATE</td> </tr> <tr> <td style="text-align: center;">D</td> <td style="text-align: center;">DIFFICULT</td> </tr> <tr> <td style="text-align: center;">▽</td> <td style="text-align: center;">NOT OBSERVED</td> </tr> <tr> <td style="text-align: center;">—</td> <td style="text-align: center;">OBSERVED GROUNDWATER LEVEL</td> </tr> </table>	EXCAVATION EFFORT		E	EASY	M	MODERATE	D	DIFFICULT	▽	NOT OBSERVED	—	OBSERVED GROUNDWATER LEVEL
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VOLUME= 17.8 cu. yd.																																



### TEST PIT FIELD LOG

<b>GZA GEOENVIRONMENTAL, INC.</b> 530 BROADWAY PROVIDENCE, RI GEOTECHNICAL CONSULTANTS	<b>PROJECT</b> DESCRIPTION: Former Tidewater Facility  LOCATION: Pawtucket, Rhode Island	<b>TEST PIT NO.:</b> <span style="font-size: 1.2em; font-weight: bold;">TP-504</span>  <b>FILE NO.:</b> 43654.00  <b>DATE:</b> 9/15/17
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GZA ENGINEER: SCC	CONTRACTOR: Moran Environmental	DATUM: NAVD88
WEATHER: Partly cloudy, 80s	OPERATOR: John Duponte	GROUND ELEV.: 20.52
	MAKE: Kobelco	TIME STARTED: 0900
	MODEL: SK1405R LC	TIME COMPLETED: 1045
	CAPACITY: 1 cu. yd.	REACH: ~18'

DEPTH	PID (ppm)	SOIL DESCRIPTION	EXCAV. EFFORT	BOULDER COUNT QTY. CLASS	REMARK NO.
-1-	ND	Tan-brown (10 yr, 5/3), fine to coarse SAND, little fine to coarse Gravel, trace Silt (dry)	E		1/2/4
-2-		Dark brown-black (10 yr, 3/3), fine to coarse SAND, some Slag and Hardened Tar or Asphalt,	E		
-3-	ND	some fine to coarse Gravel, little Brick and Glass, little Silt (dry)	M	2A	
-4-		Yellow-brown (10 yr, 5/4), fine to coarse SAND, some Slag and Hardened Tar or Asphalt,	M	2B	
-5-	ND	some fine to coarse Gravel, little Brick and Glass, little Silt, trace Plastic debris (dry)	M	4A	3
-6-			M	4B	
-7-			M	4A/4B	
-8-			M	4A/4B	
-9-			M	4A/4B	
-10-			M	4A/4B	
-11-			M	4A/4B	
-12-			M	4A/4B	
-13-			M	4A/4B	
-14-		End of Exploration ~13' bgs			

**REMARKS:**

1. Soil samples screened with a MiniRAE 3000 photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. ND = None Detected above background.
2. Imported fill over geotextile fabric from previous construction project at approximately 0 to 1.5 feet below ground surface.
3. Plastic debris included remnant plastic pipe.
4. Soils backfilled in the general order they were excavated. Backfilled soil was compacted via excavator bucket tamping every 12 inch lift.

<b>TEST PIT PLAN</b> 	<b>LEGEND:</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">BOULDER</td> <td style="width: 30%;">COUNT</td> <td style="width: 40%;">PROPORTIONS USED</td> </tr> <tr> <td>SIZE RANGE</td> <td>LETTER</td> <td></td> </tr> <tr> <td>CLASSIFICATION</td> <td>DESIGNATION</td> <td>TRACE (TR) 0-10%</td> </tr> <tr> <td>6"-18"</td> <td>A</td> <td>LITTLE (LI) 10-20%</td> </tr> <tr> <td>18"-36"</td> <td>B</td> <td>SOME (SO) 20-35%</td> </tr> <tr> <td>36" OR LARGER</td> <td>C</td> <td>AND 35-50%</td> </tr> </table>	BOULDER	COUNT	PROPORTIONS USED	SIZE RANGE	LETTER		CLASSIFICATION	DESIGNATION	TRACE (TR) 0-10%	6"-18"	A	LITTLE (LI) 10-20%	18"-36"	B	SOME (SO) 20-35%	36" OR LARGER	C	AND 35-50%	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%; text-align: center;">EXCAVATION EFFORT</td> <td style="width: 70%;"></td> </tr> <tr> <td style="text-align: center;">E</td> <td>EASY</td> </tr> <tr> <td style="text-align: center;">M</td> <td>MODERATE</td> </tr> <tr> <td style="text-align: center;">D</td> <td>DIFFICULT</td> </tr> <tr> <td style="text-align: center;"></td> <td>NOT OBSERVED</td> </tr> <tr> <td style="text-align: center;">—</td> <td>OBSERVED GROUNDWATER LEVEL</td> </tr> </table>	EXCAVATION EFFORT		E	EASY	M	MODERATE	D	DIFFICULT		NOT OBSERVED	—	OBSERVED GROUNDWATER LEVEL
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VOLUME= 28.9 cu. yd.

### TEST PIT FIELD LOG

<b>GZA GEOENVIRONMENTAL, INC.</b> 530 BROADWAY PROVIDENCE, RI GEOTECHNICAL CONSULTANTS	<b>PROJECT</b> DESCRIPTION: Former Tidewater Facility  LOCATION: Pawtucket, Rhode Island	<b>TEST PIT NO.:</b> <span style="font-size: 1.2em; font-weight: bold;">TP-505</span>  <b>FILE NO.:</b> 43654.00  <b>DATE:</b> 9/15/17
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GZA ENGINEER: SCC	CONTRACTOR: Moran Environmental	DATUM: NAVD88	GROUND ELEV.: 18.34
WEATHER: Partly cloudy, 80s	OPERATOR: John Duponte	MAKE: Kobelco	MODEL: SK1405R LC
	CAPACITY: 1 cu. yd.	REACH: ~18'	TIME COMPLETED: 1150

DEPTH	PID (ppm)	SOIL DESCRIPTION	EXCAV. EFFORT	BOULDER COUNT QTY. CLASS	REMARK NO.
-1-	ND	Tan-brown (10 yr, 5/3), fine to coarse SAND, little fine to coarse Gravel, little Organics (roots), trace Silt (dry)	E	0	1/2/4
-2-		Brown-dark brown (10 yr, 4/3), fine to coarse SAND, some Asphalt/Brick/Slag, little fine to coarse Gravel, little Plastic debris (pipe), little Wood, trace Silt (dry)	E	0	
-3-			M	2A/2B	
-4-	ND		M	2A/2B	
-5-			M	4A/4B	
-6-			D	4A/4B/4C	3
-7-	ND		D	4A/4B/4C	
-8-			D	4A/4B/4C	
-9-	ND		D	4A/4B/4C	
-10-			M	4A/4B/4C	
-11-	ND		M	4A/4B/4C	
-12-			M	4A/4B/4C	
-13-	ND		M	4A/4B/4C	
-14-		End of Exploration ~13' bgs			

**REMARKS:**

- Soil samples screened with a MiniRAE 3000 photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. ND = None Detected above background.
- Imported fill over geotextile fabric from previous construction project at 0 to 1.5 feet below ground surface in southern portion of test pit only.
- Other debris observed including Tyvek suits and rubber tire.
- Soils backfilled in the general order they were excavated. Backfilled soil was compacted via excavator bucket tamping every 12 inch lift.

<b>TEST PIT PLAN</b> 	<b>LEGEND:</b> <table style="width: 100%;"> <tr> <th>BOULDER SIZE RANGE CLASSIFICATION</th> <th>COUNT LETTER DESIGNATION</th> <th>PROPORTIONS USED</th> </tr> <tr> <td>6"-18"</td> <td>A</td> <td>TRACE (TR) 0-10%</td> </tr> <tr> <td>18"-36"</td> <td>B</td> <td>LITTLE (LI) 10-20%</td> </tr> <tr> <td>36" OR LARGER</td> <td>C</td> <td>SOME (SO) 20-35%</td> </tr> <tr> <td></td> <td></td> <td>AND 35-50%</td> </tr> </table>	BOULDER SIZE RANGE CLASSIFICATION	COUNT LETTER DESIGNATION	PROPORTIONS USED	6"-18"	A	TRACE (TR) 0-10%	18"-36"	B	LITTLE (LI) 10-20%	36" OR LARGER	C	SOME (SO) 20-35%			AND 35-50%	<table style="width: 100%;"> <tr> <th>EXCAVATION EFFORT</th> <th>NOT OBSERVED</th> </tr> <tr> <td>E EASY</td> <td>OBERVED GROUNDWATER LEVEL</td> </tr> <tr> <td>M MODERATE</td> <td></td> </tr> <tr> <td>D DIFFICULT</td> <td></td> </tr> </table>	EXCAVATION EFFORT	NOT OBSERVED	E EASY	OBERVED GROUNDWATER LEVEL	M MODERATE		D DIFFICULT	
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VOLUME= 28.9 cu. yd.

### TEST PIT FIELD LOG

<b>GZA GEOENVIRONMENTAL, INC.</b> 530 BROADWAY PROVIDENCE, RI GEOTECHNICAL CONSULTANTS	<b>PROJECT</b> DESCRIPTION: Former Tidewater Facility  LOCATION: Pawtucket, Rhode Island	<b>TEST PIT NO.:</b> <span style="font-size: 1.2em; font-weight: bold;">TP-506</span>  <b>FILE NO.:</b> 43654.00  <b>DATE:</b> 9/15/17
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GZA ENGINEER: SCC	CONTRACTOR: Moran Environmental	DATUM: NAVD88
WEATHER: Partly cloudy, 80s	OPERATOR: John Duponte	GROUND ELEV.: 18.11
	MAKE: Kobelco	TIME STARTED: 1250
	MODEL: SK1405R LC	TIME COMPLETED: 1400
	CAPACITY: 1 cu. yd.	REACH: ~18'

DEPTH	PID (ppm)	SOIL DESCRIPTION	EXCAV. EFFORT	BOULDER		REMARK NO.
				COUNT	CLASS	
-1-	ND	Tan-brown (10 yr, 5/3), fine to coarse SAND, little fine to coarse Gravel, trace Silt, trace Organics (roots) (dry)	E	0		1/2/4
-2-		Brown (10 yr, 4/3), fine to coarse SAND, some fine to coarse Gravel, some Brick and Asphalt, little Plastic, debris, little Slag, little Silt (dry)	E	0		
-3-	ND		M	2A/2B		
-4-			M	2A/2B		
-5-	ND		M	2A/2B		
-6-			M	2A/2B		3
-7-			M	2A/2B		
-8-	ND		M	2A/2B		
-9-			M	2A/2B		
-10-		10' - - - - -	M	2A/2B		
-11-	10.5	Dark brown-black (10 yr 2/2), fine to coarse SAND, some Slag, little fine to coarse Gravel, little Brick, little Silt, trace Wood, slight sulfur-like odor (moist)	D	0		
-12-			D	0		
-13-	1.3		VD	0		
-14-		End of Exploration ~13' bgs				

**REMARKS:**

- Soil samples screened with a MiniRAE 3000 photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. ND = None Detected above background.
- Imported fill over geotextile fabric from previous construction at 0 to 1.5 feet below ground surface.
- Large chunks of slag at approximately 4 to 6 feet below ground surface.
- Soils backfilled in the general order they were excavated. Backfilled soil was compacted via excavator bucket tamping ever 12 inch lift.

TEST PIT PLAN 	<b>LEGEND:</b>  <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">BOULDER</td> <td style="width: 30%;">COUNT</td> <td style="width: 40%;">PROPORTIONS USED</td> </tr> <tr> <td>SIZE RANGE</td> <td>LETTER</td> <td></td> </tr> <tr> <td>CLASSIFICATION</td> <td>DESIGNATION</td> <td>TRACE (TR) 0-10%</td> </tr> <tr> <td>6"-18"</td> <td>A</td> <td>LITTLE (LI) 10-20%</td> </tr> <tr> <td>18"-36"</td> <td>B</td> <td>SOME (SO) 20-35%</td> </tr> <tr> <td>36" OR LARGER</td> <td>C</td> <td>AND 35-50%</td> </tr> </table>	BOULDER	COUNT	PROPORTIONS USED	SIZE RANGE	LETTER		CLASSIFICATION	DESIGNATION	TRACE (TR) 0-10%	6"-18"	A	LITTLE (LI) 10-20%	18"-36"	B	SOME (SO) 20-35%	36" OR LARGER	C	AND 35-50%	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%; text-align: center;">EXCAVATION EFFORT</td> <td style="width: 70%;"></td> </tr> <tr> <td>E</td> <td>EASY</td> </tr> <tr> <td>M</td> <td>MODERATE</td> </tr> <tr> <td>D</td> <td>DIFFICULT</td> </tr> <tr> <td style="text-align: center;"></td> <td>NOT OBSERVED</td> </tr> <tr> <td style="text-align: center;"></td> <td>OBSERVED GROUNDWATER LEVEL</td> </tr> </table>	EXCAVATION EFFORT		E	EASY	M	MODERATE	D	DIFFICULT		NOT OBSERVED		OBSERVED GROUNDWATER LEVEL
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VOLUME= 19.3 cu. yd.



### TEST PIT FIELD LOG

<b>GZA GEOENVIRONMENTAL, INC.</b> 530 BROADWAY PROVIDENCE, RI GEOTECHNICAL CONSULTANTS	<b>PROJECT</b> DESCRIPTION: Former Tidewater Facility  LOCATION: Pawtucket, Rhode Island	<b>TEST PIT NO.:</b> <span style="font-size: 1.2em; font-weight: bold;">TP-507</span>  <b>FILE NO.:</b> 43654.00  <b>DATE:</b> 9/15/17
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GZA ENGINEER: SCC	CONTRACTOR: Moran Environmental	EXCAVATION EQUIPMENT	DATUM: NAVD88
WEATHER: Partly cloudy, 80s	OPERATOR: John Duponte	MAKE: Kobelco	GROUND ELEV.: 15.60
	MODEL: SK1405R LC	REACH: ~18'	TIME STARTED: 1410
	CAPACITY: 1 cu. yd.		TIME COMPLETED: 1455

DEPTH	PID (ppm)	SOIL DESCRIPTION	EXCAV. EFFORT	BOULDER COUNT QTY. CLASS	REMARK NO.
-1-	ND	Brown (10 yr, 4/3), fine to coarse SAND, little Silt, little Organics (roots), little fine to coarse Gravel (dry)	E		1, 2
-2-		Light brown (10 yr, 4/3), fine to coarse SAND, some Concrete/Asphalt/Brick, some fine to coarse Gravel, little Silt, little Cobble, trace Plastic debris (dry)	M/D	4A/2B	
-3-	ND		M/D	4A/2B	
-4-			M/D	4A/2B	
-5-	ND		M/D	4A/2B	
-6-			M/D	4A/2B	
-7-	ND		M/D	4A/2B	
-8-			M/D	4A/2B	
-9-	ND		M/D	4A/2B	
-10-			M/D	4A/2B	
-11-	ND		M/D	4A/2B	
-12-			M/D	4A/2B	
-13-	ND		M/D	4A/2B	
-14-		End of Exploration ~13' bgs			

**REMARKS:**

- Soil samples screened with a MiniRAE 3000 photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. ND = None Detected above background.
- Soils backfilled in the general order they were excavated. Backfilled soil was compacted via excavator bucket tamping every 12 inch lift.

<b>TEST PIT PLAN</b> 	<b>LEGEND:</b> <table style="width: 100%;"> <tr> <td style="text-align: center;">BOULDER</td> <td style="text-align: center;">COUNT</td> </tr> <tr> <td style="text-align: center;">SIZE RANGE</td> <td style="text-align: center;">LETTER</td> </tr> <tr> <td style="text-align: center;">CLASSIFICATION</td> <td style="text-align: center;">DESIGNATION</td> </tr> <tr> <td style="text-align: center;">6"-18"</td> <td style="text-align: center;">A</td> </tr> <tr> <td style="text-align: center;">18"-36"</td> <td style="text-align: center;">B</td> </tr> <tr> <td style="text-align: center;">36" OR LARGER</td> <td style="text-align: center;">C</td> </tr> </table>	BOULDER	COUNT	SIZE RANGE	LETTER	CLASSIFICATION	DESIGNATION	6"-18"	A	18"-36"	B	36" OR LARGER	C	<b>PROPORTIONS USED</b> TRACE (TR)      0-10% LITTLE (LI)    10-20% SOME (SO)      20-35% AND              35-50%	<b>EXCAVATION EFFORT</b> E                    EASY M                    MODERATE D                    DIFFICULT  NOT OBSERVED OBSERVED GROUNDWATER LEVEL
BOULDER	COUNT														
SIZE RANGE	LETTER														
CLASSIFICATION	DESIGNATION														
6"-18"	A														
18"-36"	B														
36" OR LARGER	C														

VOLUME= 28.9 cu. yd.

### TEST PIT FIELD LOG

<b>GZA GEOENVIRONMENTAL, INC.</b> 530 BROADWAY PROVIDENCE, RI GEOTECHNICAL CONSULTANTS	<b>PROJECT</b> DESCRIPTION: Former Tidewater Facility  LOCATION: Pawtucket, Rhode Island	<b>TEST PIT NO.:</b> <span style="font-size: 1.2em;"><b>TP-508</b></span>  <b>FILE NO.:</b> 43654.00  <b>DATE:</b> 9/18/17
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GZA ENGINEER: SCC	CONTRACTOR: Moran Environmental	EXCAVATION EQUIPMENT	DATUM: NAVD88
WEATHER: Partly cloudy, 80s	OPERATOR: John Duponte	MAKE: Kobelco	GROUND ELEV.: 8.52
	MODEL: SK1405R LC	REACH: ~18'	TIME STARTED: 1050
	CAPACITY: 1 cu. yd.		TIME COMPLETED: 1150

DEPTH	PID (ppm)	SOIL DESCRIPTION	EXCAV. EFFORT	BOULDER COUNT QTY. CLASS	REMARK NO.
-1-	0.8	Dark brown (10 yr, 3/3), fine to coarse SAND, some Silt, some Organics, little Brick, little fine to coarse Gravel (dry)	E	0	1/2/4
-2-		ASH, little Slag and Coal Fragments (dry)	E	0	
-3-		Tan-black (10 yr, 6/3), fine SAND, some Silt, little Organics, trace fine Gravel (moist-wet)	E	0	
-4-			E	0	
-5-			E	0	3
-6-		End of Exploration ~5.5 bgs			
-7-					
-8-					
-9-					
-10-					
-11-					
-12-					
-13-					
-14-					

**REMARKS:**

- Soil samples screened with a MiniRAE 3000 photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. ND = None Detected above background.
- Concrete slab approximately 6 to 9 inches below ground surface along the south side of the test pit along with a remnant 12 inch diameter clay pipe.
- Moderate groundwater weeping from 5 to 5.5 feet below ground surface.
- Soils backfilled in the general order they were excavated. Backfilled soil was compacted via excavator bucket tamping every 12 inch lift.

<b>TEST PIT PLAN</b> 	<b>LEGEND:</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;">BOULDER</td> <td style="width: 33%;">COUNT</td> <td style="width: 33%;">PROPORTIONS USED</td> </tr> <tr> <td>SIZE RANGE</td> <td>LETTER</td> <td></td> </tr> <tr> <td>CLASSIFICATION</td> <td>DESIGNATION</td> <td>TRACE (TR)      0-10%</td> </tr> <tr> <td>6"-18"</td> <td>A</td> <td>LITTLE (LI)     10-20%</td> </tr> <tr> <td>18"-36"</td> <td>B</td> <td>SOME (SO)       20-35%</td> </tr> <tr> <td>36" OR LARGER</td> <td>C</td> <td>AND               35-50%</td> </tr> </table>	BOULDER	COUNT	PROPORTIONS USED	SIZE RANGE	LETTER		CLASSIFICATION	DESIGNATION	TRACE (TR)      0-10%	6"-18"	A	LITTLE (LI)     10-20%	18"-36"	B	SOME (SO)       20-35%	36" OR LARGER	C	AND               35-50%	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;">EXCAVATION EFFORT</td> <td style="width: 50%; text-align: center;">EASY</td> </tr> <tr> <td style="text-align: center;">E</td> <td style="text-align: center;">MODERATE</td> </tr> <tr> <td style="text-align: center;">M</td> <td style="text-align: center;">DIFFICULT</td> </tr> <tr> <td style="text-align: center;">D</td> <td></td> </tr> </table>	EXCAVATION EFFORT	EASY	E	MODERATE	M	DIFFICULT	D		 OBSERVED GROUNDWATER LEVEL
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M	DIFFICULT																												
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VOLUME= 9.8 cu. yd.

### TEST PIT FIELD LOG

<b>GZA GEOENVIRONMENTAL, INC.</b> 530 BROADWAY PROVIDENCE, RI GEOTECHNICAL CONSULTANTS	<b>PROJECT</b> DESCRIPTION: Former Tidewater Facility  LOCATION: Pawtucket, Rhode Island	<b>TEST PIT NO.:</b> <span style="font-size: 1.2em;"><b>TP-509</b></span>  <b>FILE NO.:</b> 43654.00  <b>DATE:</b> 9/18/17
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GZA ENGINEER: SCC	CONTRACTOR: Moran Environmental	EXCAVATION EQUIPMENT	DATUM: NAVD88
WEATHER: Partly cloudy, 80s	OPERATOR: John Duponte	MAKE: Kobelco	GROUND ELEV.: 7.56
	MODEL: SK1405R LC	CAPACITY: 1 cu. yd.	REACH: ~18'
		TIME STARTED: 1400	TIME COMPLETED: 1450

DEPTH	PID (ppm)	SOIL DESCRIPTION	EXCAV. EFFORT	BOULDER COUNT QTY. CLASS	REMARK NO.
-1-	ND	Dark brown (10 yr, 3/3), fine to coarse SAND, some Silt, some Organics, little Brick, little fine to coarse Gravel (dry)	E		1/4/5
-2-		Brown-dark brown (10 yr, 4/3), fine to coarse SAND, little Silt, little fine to coarse Gravel, trace Brick, trace Slag, trace Organics (dry-moist, wet at 9' bgs)	E		
-3-	ND		E		
-4-			E		
-5-	ND		E		3
-6-			E		
-7-	ND		E		
-8-	ND		E		
-9-			E		2
-10-		End of Exploration at ~9' bgs			
-11-					
-12-					
-13-					
-14-					

**REMARKS:**

- Soil samples screened with a MiniRAE 3000 photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. ND = None Detected above background.
- Slow groundwater weep at approximately 9 feet below ground surface.
- Two potential bulk head tie-back rods observed at approximately 5 feet below ground surface at the north and south ends of the test pit.
- Brick foundation wall running east-west adjacent to the south test pit wall.
- Soils backfilled in the general order they were excavated. Backfilled soil was compacted via excavator bucket tamping every 12 inch lift.

<b>TEST PIT PLAN</b> <p style="text-align: center;">NORTH</p> VOLUME= 13 cu. yd.	<b>LEGEND:</b>  <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">BOULDER</td> <td style="width: 20%;">COUNT</td> <td style="width: 50%;">PROPORTIONS USED</td> </tr> <tr> <td>SIZE RANGE</td> <td>LETTER</td> <td></td> </tr> <tr> <td>CLASSIFICATION</td> <td>DESIGNATION</td> <td></td> </tr> <tr> <td>6"-18"</td> <td>A</td> <td>TRACE (TR) 0-10%</td> </tr> <tr> <td>18"-36"</td> <td>B</td> <td>LITTLE (LI) 10-20%</td> </tr> <tr> <td>36" OR LARGER</td> <td>C</td> <td>SOME (SO) 20-35%</td> </tr> <tr> <td></td> <td></td> <td>AND 35-50%</td> </tr> </table>	BOULDER	COUNT	PROPORTIONS USED	SIZE RANGE	LETTER		CLASSIFICATION	DESIGNATION		6"-18"	A	TRACE (TR) 0-10%	18"-36"	B	LITTLE (LI) 10-20%	36" OR LARGER	C	SOME (SO) 20-35%			AND 35-50%	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%; text-align: center;">EXCAVATION EFFORT</td> <td style="width: 70%;"></td> </tr> <tr> <td style="text-align: center;">E</td> <td style="text-align: center;">EASY</td> </tr> <tr> <td style="text-align: center;">M</td> <td style="text-align: center;">MODERATE</td> </tr> <tr> <td style="text-align: center;">D</td> <td style="text-align: center;">DIFFICULT</td> </tr> <tr> <td style="text-align: center;"></td> <td style="text-align: center;">NOT OBSERVED</td> </tr> <tr> <td style="text-align: center;"></td> <td style="text-align: center;">OBSERVED GROUNDWATER LEVEL</td> </tr> </table>	EXCAVATION EFFORT		E	EASY	M	MODERATE	D	DIFFICULT		NOT OBSERVED		OBSERVED GROUNDWATER LEVEL
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## TEST PIT FIELD LOG

<b>GZA GEOENVIRONMENTAL, INC.</b> 530 BROADWAY PROVIDENCE, RI GEOTECHNICAL CONSULTANTS	<b>PROJECT</b> DESCRIPTION: Former Tidewater Facility  LOCATION: Pawtucket, Rhode Island	<b>TEST PIT NO.:</b> <span style="font-size: 1.2em;"><b>TP-509A</b></span>  <b>FILE NO.:</b> 43654.00  <b>DATE:</b> 9/18/17
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ON EQUIPMENT GZA ENGINEER: SCC	CONTRACTOR: Moran Environmental OPERATOR: John Duponte	DATUM: NAVD88 GROUND ELEV.: 7.75 TIME STARTED: 1500 TIME COMPLETED: 1540	
WEATHER: Partly cloudy, 80s	MAKE: Kobelco CAPACITY: 1 cu. yd.	MODEL: SK1405R LC REACH: ~18'	

DEPTH	PID	SOIL DESCRIPTION	EXCAV. EFFORT	BOULDER COUNT QTY. CLASS	REMARK NO.
-1-	ND	Dark brown (10 yr, 3/3), fine to coarse SAND, some Silt, some Organics, little Brick, little fine to coarse Gravel (dry)	E	0	1/4
-2-		Brown-dark brown (10 yr, 4/3), fine to coarse SAND, little Silt, little fine to coarse Gravel, trace Brick, trace Slag, trace Organics, dry-moist, wet at 9' bgs (dry)	E	0	
-3-	ND		E	0	2
-4-			E	0	
-5-	ND		E	0	
-6-			E	0	
-7-		End of Exploration at ~6' bgs			
-8-					
-9-					
-10-					
-11-					
-12-					
-13-					
-14-					

**REMARKS:**

- Soil samples screened with a MiniRAE 3000 photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. ND = None Detected above background.
- Two potential bulk head tie-back rods observed at approximately 5 feet below ground surface at the north and south ends of the test pit.
- Brick foundation wall running east-west adjacent to the south test pit wall.
- Soils backfilled in the general order they were excavated. Backfilled soil was compacted via excavator bucket tamping every 12 inch lift.

TEST PIT PLAN 	<b>LEGEND:</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">BOULDER</td> <td style="text-align: center;">COUNT</td> <td style="text-align: center;">PROPORTIONS USED</td> </tr> <tr> <td style="text-align: center;">SIZE RANGE</td> <td style="text-align: center;">LETTER DESIGNATION</td> <td></td> </tr> <tr> <td style="text-align: center;">CLASSIFICATION</td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">6"-18"</td> <td style="text-align: center;">A</td> <td style="text-align: center;">TRACE (TR) 0-10%</td> </tr> <tr> <td style="text-align: center;">18"-36"</td> <td style="text-align: center;">B</td> <td style="text-align: center;">LITTLE (LI) 10-20%</td> </tr> <tr> <td style="text-align: center;">36" OR LARGER</td> <td style="text-align: center;">C</td> <td style="text-align: center;">SOME (SO) 20-35%</td> </tr> <tr> <td></td> <td></td> <td style="text-align: center;">AND 35-50%</td> </tr> </table>	BOULDER	COUNT	PROPORTIONS USED	SIZE RANGE	LETTER DESIGNATION		CLASSIFICATION			6"-18"	A	TRACE (TR) 0-10%	18"-36"	B	LITTLE (LI) 10-20%	36" OR LARGER	C	SOME (SO) 20-35%			AND 35-50%	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">EXCAVATION EFFORT</td> <td style="text-align: center;">EASY MODERATE DIFFICULT</td> </tr> <tr> <td style="text-align: center;">E</td> <td style="text-align: center;">EASY</td> </tr> <tr> <td style="text-align: center;">M</td> <td style="text-align: center;">MODERATE</td> </tr> <tr> <td style="text-align: center;">D</td> <td style="text-align: center;">DIFFICULT</td> </tr> <tr> <td style="text-align: center;"></td> <td style="text-align: center;">NOT OBSERVED</td> </tr> <tr> <td style="text-align: center;"></td> <td style="text-align: center;">OBSERVED GROUNDWATER LEVEL</td> </tr> </table>	EXCAVATION EFFORT	EASY MODERATE DIFFICULT	E	EASY	M	MODERATE	D	DIFFICULT		NOT OBSERVED		OBSERVED GROUNDWATER LEVEL
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VOLUME= 10 cu. yd.																																			

### TEST PIT FIELD LOG

<b>GZA GEOENVIRONMENTAL, INC.</b> 530 BROADWAY PROVIDENCE, RI GEOTECHNICAL CONSULTANTS	<b>PROJECT</b> DESCRIPTION: Former Tidewater Facility  LOCATION: Pawtucket, Rhode Island	<b>TEST PIT NO.:</b> <b>TP-510</b>  <b>FILE NO.:</b> 43654.00  <b>DATE:</b> 9/18/17
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GZA ENGINEER: SCC	CONTRACTOR: Moran Environmental	DATUM: NAVD88	GROUND ELEV.: 9.20
WEATHER: Partly cloudy, 80s	OPERATOR: John Duponte	MAKE: Kobelco	MODEL: SK1405R LC
	CAPACITY: 1 cu. yd.	REACH: ~18'	TIME STARTED: 1000
			TIME COMPLETED: 1100

DEPTH	PID (ppm)	SOIL DESCRIPTION	EXCAV. EFFORT	BOULDER COUNT QTY. CLASS	REMARK NO.
-1-	ND	Black (10 yr, 2/1), fine to coarse SAND and COAL, 6"x8" Lumber, some Slag (dry-wet)	E	0	1/3
-2-			E	0	
-3-	0.4	Strong brown (7.5 yr, 4/6) SLAG (dry-wet)	E	0	2
-4-		End of Exploration at 3' bgs			
-5-					
-6-					
-7-					
-8-					
-9-					
-10-					
-11-					
-12-					
-13-					
-14-					

**REMARKS:**

- Soil samples screened with a MiniRAE 3000 photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. ND = None Detected above background.
- Heavy groundwater weeping at 3 feet below ground surface.
- Soils backfilled in the general order they were excavated. Backfilled soil was compacted via excavator bucket tamping every 12 inch lift.

<b>TEST PIT PLAN</b> 	<b>LEGEND:</b> <table style="width: 100%;"> <tr> <th>BOULDER SIZE RANGE CLASSIFICATION</th> <th>COUNT LETTER DESIGNATION</th> </tr> <tr> <td>6"-18"</td> <td>A</td> </tr> <tr> <td>18"-36"</td> <td>B</td> </tr> <tr> <td>36" OR LARGER</td> <td>C</td> </tr> </table>	BOULDER SIZE RANGE CLASSIFICATION	COUNT LETTER DESIGNATION	6"-18"	A	18"-36"	B	36" OR LARGER	C	<b>PROPORTIONS USED</b> <table style="width: 100%;"> <tr> <td>TRACE (TR)</td> <td>0-10%</td> </tr> <tr> <td>LITTLE (LI)</td> <td>10-20%</td> </tr> <tr> <td>SOME (SO)</td> <td>20-35%</td> </tr> <tr> <td>AND</td> <td>35-50%</td> </tr> </table>	TRACE (TR)	0-10%	LITTLE (LI)	10-20%	SOME (SO)	20-35%	AND	35-50%	<b>EXCAVATION EFFORT</b> <table style="width: 100%;"> <tr> <td>E</td> <td>EASY</td> </tr> <tr> <td>M</td> <td>MODERATE</td> </tr> <tr> <td>D</td> <td>DIFFICULT</td> </tr> </table>  OBSERVED GROUNDWATER LEVEL	E	EASY	M	MODERATE	D	DIFFICULT
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VOLUME= 5.3 cu. yd.

### TEST PIT FIELD LOG

<b>GZA GEOENVIRONMENTAL, INC.</b> 530 BROADWAY PROVIDENCE, RI GEOTECHNICAL CONSULTANTS	<b>PROJECT</b> DESCRIPTION: Former Tidewater Facility  LOCATION: Pawtucket, Rhode Island	<b>TEST PIT NO.:</b> <span style="font-size: 1.2em; font-weight: bold;">TP-511</span>  <b>FILE NO.:</b> 43654.00  <b>DATE:</b> 9/18/17
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GZA ENGINEER: SCC	CONTRACTOR: Moran Environmental	EXCAVATION EQUIPMENT	DATUM: NAVD88
WEATHER: Partly cloudy, 80s	OPERATOR: John Duponte	MAKE: Kobelco	GROUND ELEV.: 16.40
	MODEL: SK1405R LC	REACH: ~18'	TIME STARTED: 0745
	CAPACITY: 1 cu. yd.		TIME COMPLETED: 0820

DEPTH	PID (ppm)	SOIL DESCRIPTION	EXCAV. EFFORT	BOULDER COUNT QTY. CLASS	REMARK NO.
-1-	ND	Gray-brown (10 yr, 5/2 <sub>1</sub> ), fine to coarse SAND, some fine to coarse Gravel, little Silt (dry)	E	0	1/2/5
-2-	0.1	Yellow/brown-black (10 yr, 5/4), fine to coarse SAND, little fine to coarse Gravel, little Coal and Slag Fragments, little Brick, trace Silt (dry)	E	0	
-3-		Pipe	E	0	4
-4-	ND	Yellow-brown (10 yr, 5/4), fine to coarse SAND, little fine to coarse Gravel, trace Silt, moist (bottom 12" (wet))	E	0	
-5-			E	0	
-6-	ND		E	0	
-7-			E	0	3
-8-		End of Exploration at ~7' bgs			
-9-					
-10-					
-11-					
-12-					
-13-					
-14-					

**REMARKS:**

1. Soil samples screened with a MiniRAE 3000 photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. ND = None Detected above background.
2. 1-foot of imported fill over geotextile fabric at 0 to 1 foot below ground surface from previous construction project.
3. Moderate to heavy groundwater weeping at approximately 6 feet below ground surface.
4. 4-inch diameter iron pipe observed at approximately 2.5 to 3 feet below ground surface running north-south.
5. Soils backfilled in the general order they were excavated. Backfilled soil was compacted via excavator bucket tamping every 12 inch lift.

<b>TEST PIT PLAN</b> 	<b>LEGEND:</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">BOULDER</td> <td style="text-align: center;">COUNT</td> </tr> <tr> <td style="text-align: center;">SIZE RANGE</td> <td style="text-align: center;">LETTER</td> </tr> <tr> <td style="text-align: center;">CLASSIFICATION</td> <td style="text-align: center;">DESIGNATION</td> </tr> <tr> <td style="text-align: center;">6"-18"</td> <td style="text-align: center;">A</td> </tr> <tr> <td style="text-align: center;">18"-36"</td> <td style="text-align: center;">B</td> </tr> <tr> <td style="text-align: center;">36" OR LARGER</td> <td style="text-align: center;">C</td> </tr> </table>	BOULDER	COUNT	SIZE RANGE	LETTER	CLASSIFICATION	DESIGNATION	6"-18"	A	18"-36"	B	36" OR LARGER	C	<b>PROPORTIONS USED</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <td>TRACE (TR)</td> <td style="text-align: right;">0-10%</td> </tr> <tr> <td>LITTLE (LI)</td> <td style="text-align: right;">10-20%</td> </tr> <tr> <td>SOME (SO)</td> <td style="text-align: right;">20-35%</td> </tr> <tr> <td>AND</td> <td style="text-align: right;">35-50%</td> </tr> </table>	TRACE (TR)	0-10%	LITTLE (LI)	10-20%	SOME (SO)	20-35%	AND	35-50%	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">E</td> <td style="text-align: center;">EASY</td> </tr> <tr> <td style="text-align: center;">M</td> <td style="text-align: center;">MODERATE</td> </tr> <tr> <td style="text-align: center;">D</td> <td style="text-align: center;">DIFFICULT</td> </tr> </table> <div style="text-align: center; margin-top: 10px;">                   OBSERVED GROUNDWATER LEVEL             </div>	E	EASY	M	MODERATE	D	DIFFICULT
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## TEST PIT FIELD LOG

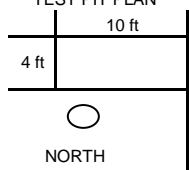



<b>GZA GEOENVIRONMENTAL, INC.</b> 530 BROADWAY PROVIDENCE, RI GEOTECHNICAL CONSULTANTS	<b>PROJECT</b> DESCRIPTION: Former Tidewater Facility  LOCATION: Pawtucket, Rhode Island	<b>TEST PIT NO.:</b> <span style="font-size: 1.2em; font-weight: bold;">TP-512</span>  <b>FILE NO.:</b> 43654.00  <b>DATE:</b> 9/18/17
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GZA ENGINEER: SCC	CONTRACTOR: Moran Environmental	EXCAVATION EQUIPMENT	DATUM: NAVD88
WEATHER: Partly cloudy, 80s	OPERATOR: John Duponte	GROUND ELEV.: 23.34	TIME STARTED: 0830
	MAKE: Kobelco	MODEL: SK1405R LC	TIME COMPLETED: 0930
	CAPACITY: 1 cu. yd.	REACH: ~18'	

DEPTH	PID (ppm)	SOIL DESCRIPTION	EXCAV. EFFORT	BOULDER COUNT QTY. CLASS	REMARK NO.
-1-	ND	Brown (10 yr, 5/3), fine to coarse SAND, little fine to coarse Gravel, little Silt, little Organics (roots) (dry)	E	0	1/2
-2-		Brown (10 yr, 5/3), fine to coarse SAND, little fine to coarse Gravel, little Silt, little Organics (roots) little Slag (dry)	E	0	
-3-	ND		E	0	
-4-		Yellow-brown (10 yr, 5/4), fine to coarse SAND, little Gravel, little Cobble, trace Silt (dry)	E	0	
-5-	ND		E	2A	
-6-			E	2A	
-7-	ND		E	2A	
-8-			E	2A	
-9-	ND		E	2A	
-10-			E	2A	
-11-	ND		E	2A	
-12-			E	2A	
-13-		End of Exploration at ~12' bgs			
-14-					

**REMARKS:**

- Soil samples screened with a MiniRAE 3000 photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. ND = None Detected above background.
- Soils backfilled in the general order they were excavated. Backfilled soil was compacted via excavator bucket tamping every 12 inch lift.

<b>TEST PIT PLAN</b> 	<b>LEGEND:</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;">BOULDER</td> <td style="width: 33%;">COUNT</td> <td style="width: 33%;"></td> </tr> <tr> <td>SIZE RANGE</td> <td>LETTER</td> <td>PROPORTIONS</td> </tr> <tr> <td>CLASSIFICATION</td> <td>DESIGNATION</td> <td>USED</td> </tr> <tr> <td>6"-18"</td> <td>A</td> <td>TRACE (TR) 0-10%</td> </tr> <tr> <td>18"-36"</td> <td>B</td> <td>LITTLE (LI) 10-20%</td> </tr> <tr> <td>36" OR LARGER</td> <td>C</td> <td>SOME (SO) 20-35%</td> </tr> <tr> <td></td> <td></td> <td>AND 35-50%</td> </tr> </table>	BOULDER	COUNT		SIZE RANGE	LETTER	PROPORTIONS	CLASSIFICATION	DESIGNATION	USED	6"-18"	A	TRACE (TR) 0-10%	18"-36"	B	LITTLE (LI) 10-20%	36" OR LARGER	C	SOME (SO) 20-35%			AND 35-50%	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">E</td> <td style="text-align: center;">EASY</td> </tr> <tr> <td style="text-align: center;">M</td> <td style="text-align: center;">MODERATE</td> </tr> <tr> <td style="text-align: center;">D</td> <td style="text-align: center;">DIFFICULT</td> </tr> <tr> <td style="text-align: center;"></td> <td style="text-align: center;">NOT OBSERVED</td> </tr> <tr> <td></td> <td style="text-align: center;">OBSERVED GROUNDWATER LEVEL</td> </tr> </table>	E	EASY	M	MODERATE	D	DIFFICULT		NOT OBSERVED		OBSERVED GROUNDWATER LEVEL
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### TEST PIT FIELD LOG

**GZA GEOENVIRONMENTAL, INC.**  
**530 BROADWAY**  
**PROVIDENCE, RI**  
**GEO TECHNICAL CONSULTANTS**

**PROJECT**  
**DESCRIPTION: Former Tidewater Facility**  
**LOCATION: Pawtucket, Rhode Island**

**TEST PIT NO.: TP-516**  
**FILE NO.: 43654.00**  
**DATE: 9/21/17**

**EXCAVATION EQUIPMENT**

GZA ENGINEER: SCC	CONTRACTOR: Moran Environmental	DATUM: NAVD88
WEATHER: Partly cloudy, 80s	OPERATOR: John Duponte	GROUND ELEV.: 7.88
	MAKE: Kobelco	TIME STARTED: 1020
	MODEL: SK1405R LC	TIME COMPLETED: 1040
	CAPACITY: 1 cu. yd.	REACH: ~18'

DEPTH	PID (ppm)	SOIL DESCRIPTION	EXCAV. EFFORT	BOULDER COUNT QTY. CLASS	REMARK NO.
-1-		Dark grayish brown (10 yr, 3/2), fine to coarse SAND, some fine to coarse Gravel, little Wood debris, little Brick, little Organics (roots)	M	0	1
-2-		little Silt (dry)	M	0	
-3-		Concrete Raceway Vault	M	0	
-4-			M	0	
-5-			M	0	
-6-		End of Exploration ~5' bgs			
-7-					
-8-					
-9-					
-10-					
-11-					
-12-					
-13-					
-14-					

**REMARKS:**  
 1. Soils backfilled in the general order they were excavated. Backfilled soil was compacted via excavator bucket tamping every 12 inch lift.

<p><b>TEST PIT PLAN</b></p> <p style="text-align: center;">6 ft</p> <p style="text-align: center;">5 ft</p> <p style="text-align: center;">NORTH</p> <p>VOLUME= 5.5 cu. yd.</p>	<p><b>LEGEND:</b></p> <table border="0" style="width: 100%;"> <tr> <td style="text-align: center;">BOULDER</td> <td style="text-align: center;">COUNT</td> </tr> <tr> <td style="text-align: center;">SIZE RANGE</td> <td style="text-align: center;">LETTER</td> </tr> <tr> <td style="text-align: center;">CLASSIFICATION</td> <td style="text-align: center;">DESIGNATION</td> </tr> <tr> <td style="text-align: center;">6"-18"</td> <td style="text-align: center;">A</td> </tr> <tr> <td style="text-align: center;">18"-36"</td> <td style="text-align: center;">B</td> </tr> <tr> <td style="text-align: center;">36" OR LARGER</td> <td style="text-align: center;">C</td> </tr> </table>	BOULDER	COUNT	SIZE RANGE	LETTER	CLASSIFICATION	DESIGNATION	6"-18"	A	18"-36"	B	36" OR LARGER	C	<p style="text-align: center;"><b>PROPORTIONS USED</b></p> <table border="0" style="width: 100%;"> <tr> <td>TRACE (TR)</td> <td style="text-align: right;">0-10%</td> </tr> <tr> <td>LITTLE (LI)</td> <td style="text-align: right;">10-20%</td> </tr> <tr> <td>SOME (SO)</td> <td style="text-align: right;">20-35%</td> </tr> <tr> <td>AND</td> <td style="text-align: right;">35-50%</td> </tr> </table>	TRACE (TR)	0-10%	LITTLE (LI)	10-20%	SOME (SO)	20-35%	AND	35-50%	<p style="text-align: center;"><b>EXCAVATION EFFORT</b></p> <table border="0" style="width: 100%;"> <tr> <td style="text-align: center;">E</td> <td style="text-align: right;">EASY</td> </tr> <tr> <td style="text-align: center;">M</td> <td style="text-align: right;">MODERATE</td> </tr> <tr> <td style="text-align: center;">D</td> <td style="text-align: right;">DIFFICULT</td> </tr> <tr> <td style="text-align: center;"></td> <td style="text-align: right;">NOT OBSERVED</td> </tr> <tr> <td style="text-align: center;"></td> <td style="text-align: right;">OBSERVED GROUNDWATER LEVEL</td> </tr> </table>	E	EASY	M	MODERATE	D	DIFFICULT		NOT OBSERVED		OBSERVED GROUNDWATER LEVEL
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### TEST PIT FIELD LOG

<b>GZA GEOENVIRONMENTAL, INC.</b> 530 BROADWAY PROVIDENCE, RI GEOTECHNICAL CONSULTANTS	<b>PROJECT</b> DESCRIPTION: Former Tidewater Facility  LOCATION: Pawtucket, Rhode Island	<b>TEST PIT NO.:</b> <span style="font-size: 1.2em;"><b>TP-516A</b></span>  <b>FILE NO.:</b> 43654.00  <b>DATE:</b> 9/21/17
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GZA ENGINEER: SCC	CONTRACTOR: Moran Environmental	EXCAVATION EQUIPMENT	DATUM: NAVD88
WEATHER: Partly cloudy, 80s	OPERATOR: John Duponte	MAKE: Kobelco	GROUND ELEV.: 7.93
	MODEL: SK1405R LC	REACH: ~18'	TIME STARTED: 1045
	CAPACITY: 1 cu. yd.		TIME COMPLETED: 1100

DEPTH	PID (ppm)	SOIL DESCRIPTION	EXCAV. EFFORT	BOULDER COUNT QTY. CLASS	REMARK NO.
-1-		Dark brown (10 yr, 3/3), fine to coarse SAND, some fine to coarse Gravel, some Concrete/Brick/Wood, little Organics, little Silt (dry)	E	0	1
-2-		18" wide	E	0	
-3-		Wood Raceway	E	0	2
-4-		End of Exploration ~3' bgs			
-5-					
-6-					
-7-					
-8-					
-9-					
-10-					
-11-					
-12-					
-13-					
-14-					

**REMARKS:**

- Soil samples screened with a MiniRAE 3000 photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. ND = None Detected above background.
- Wood raceway containing black petroleum-like liquid observed.

<b>TEST PIT PLAN</b> 	<b>LEGEND:</b> <table style="width: 100%;"> <tr> <th>BOULDER</th> <th>COUNT</th> </tr> <tr> <td>SIZE RANGE</td> <td>LETTER</td> </tr> <tr> <td>CLASSIFICATION</td> <td>DESIGNATION</td> </tr> <tr> <td>6"-18"</td> <td>A</td> </tr> <tr> <td>18"-36"</td> <td>B</td> </tr> <tr> <td>36" OR LARGER</td> <td>C</td> </tr> </table>	BOULDER	COUNT	SIZE RANGE	LETTER	CLASSIFICATION	DESIGNATION	6"-18"	A	18"-36"	B	36" OR LARGER	C	<b>PROPORTIONS USED</b> <table style="width: 100%;"> <tr> <td>TRACE (TR)</td> <td>0-10%</td> </tr> <tr> <td>LITTLE (LI)</td> <td>10-20%</td> </tr> <tr> <td>SOME (SO)</td> <td>20-35%</td> </tr> <tr> <td>AND</td> <td>35-50%</td> </tr> </table>	TRACE (TR)	0-10%	LITTLE (LI)	10-20%	SOME (SO)	20-35%	AND	35-50%	<b>EXCAVATION EFFORT</b> <table style="width: 100%;"> <tr> <td>E</td> <td>EASY</td> </tr> <tr> <td>M</td> <td>MODERATE</td> </tr> <tr> <td>D</td> <td>DIFFICULT</td> </tr> <tr> <td></td> <td>NOT OBSERVED</td> </tr> <tr> <td></td> <td>OBSERVED GROUNDWATER LEVEL</td> </tr> </table>	E	EASY	M	MODERATE	D	DIFFICULT		NOT OBSERVED		OBSERVED GROUNDWATER LEVEL
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VOLUME= 3.5 cu. yd.



### TEST PIT FIELD LOG

<b>GZA GEOENVIRONMENTAL, INC.</b> 530 BROADWAY PROVIDENCE, RI GEOTECHNICAL CONSULTANTS	<b>PROJECT</b> DESCRIPTION: Former Tidewater Facility  LOCATION: Pawtucket, Rhode Island	<b>TEST PIT NO.:</b> <span style="font-size: 1.2em;"><b>TP-516B</b></span>  <b>FILE NO.:</b> 43654.00  <b>DATE:</b> 9/21/17
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GZA ENGINEER: SCC	CONTRACTOR: Moran Environmental	EXCAVATION EQUIPMENT	DATUM: NAVD88
WEATHER: Partly cloudy, 80s	OPERATOR: John Duponte	MAKE: Kobelco	GROUND ELEV.: 8.71
	MODEL: SK1405R LC	CAPACITY: 1 cu. yd.	TIME STARTED: 1045
	REACH: ~18'		TIME COMPLETED: 1135

DEPTH	PID (ppm)	SOIL DESCRIPTION	EXCAV. EFFORT	BOULDER COUNT QTY. CLASS	REMARK NO.
-1-		<p style="text-align: center;">Pocket of blue soil (Grey 2, 4/1)</p> <p style="text-align: center;">Brown-dark brown (10 yr, 4/3), fine to coars SAND, little fine to coarse Gravel, little Brick, little Organics (roots), little Silt, trace Coal/Slag (dry)</p> <p style="text-align: center;">○ 6" diameter pipe 2' bgs      ○ ~14" diameter pipe 2' bgs</p> <p style="text-align: center;">○ ~6" diameter pipe 3' bgs</p> <p style="text-align: center;">Wood debris</p>	E	0	1
-2-			M	2A	
-3-			D	2A	
-4-			D	0	
-5-		End of Exploration ~4' bgs			
-6-					
-7-					
-8-					
-9-					
-10-					
-11-					
-12-					
-13-					
-14-					

**REMARKS:**


1. Soils backfilled in the general order they were excavated. Backfilled soil was compacted via excavator bucket tamping every 12 inch lift.

<b>TEST PIT PLAN</b> <p style="text-align: center;">NORTH</p> VOLUME= 8 cu. yd.	<b>LEGEND:</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">BOULDER</td> <td style="text-align: center;">COUNT</td> </tr> <tr> <td style="text-align: center;">SIZE RANGE</td> <td style="text-align: center;">LETTER</td> </tr> <tr> <td style="text-align: center;">CLASSIFICATION</td> <td style="text-align: center;">DESIGNATION</td> </tr> <tr> <td style="text-align: center;">6"-18"</td> <td style="text-align: center;">A</td> </tr> <tr> <td style="text-align: center;">18"-36"</td> <td style="text-align: center;">B</td> </tr> <tr> <td style="text-align: center;">36" OR LARGER</td> <td style="text-align: center;">C</td> </tr> </table>	BOULDER	COUNT	SIZE RANGE	LETTER	CLASSIFICATION	DESIGNATION	6"-18"	A	18"-36"	B	36" OR LARGER	C	<b>PROPORTIONS USED</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <td>TRACE (TR)</td> <td style="text-align: right;">0-10%</td> </tr> <tr> <td>LITTLE (LI)</td> <td style="text-align: right;">10-20%</td> </tr> <tr> <td>SOME (SO)</td> <td style="text-align: right;">20-35%</td> </tr> <tr> <td>AND</td> <td style="text-align: right;">35-50%</td> </tr> </table>	TRACE (TR)	0-10%	LITTLE (LI)	10-20%	SOME (SO)	20-35%	AND	35-50%	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">E</td> <td style="text-align: center;">EASY</td> </tr> <tr> <td style="text-align: center;">M</td> <td style="text-align: center;">MODERATE</td> </tr> <tr> <td style="text-align: center;">D</td> <td style="text-align: center;">DIFFICULT</td> </tr> <tr> <td style="text-align: center;"></td> <td style="text-align: center;">NOT OBSERVED</td> </tr> <tr> <td style="text-align: center;"></td> <td style="text-align: center;">OBSERVED GROUNDWATER LEVEL</td> </tr> </table>	E	EASY	M	MODERATE	D	DIFFICULT		NOT OBSERVED		OBSERVED GROUNDWATER LEVEL
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### TEST PIT FIELD LOG

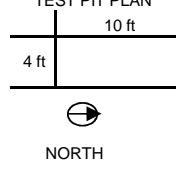



<b>GZA GEOENVIRONMENTAL, INC.</b> 530 BROADWAY PROVIDENCE, RI GEOTECHNICAL CONSULTANTS	<b>PROJECT</b> DESCRIPTION: Former Tidewater Facility  LOCATION: Pawtucket, Rhode Island	<b>TEST PIT NO.:</b> <b>TP-516C</b>  <b>FILE NO.:</b> 43654.00  <b>DATE:</b> 9/22/17
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GZA ENGINEER: SCC	CONTRACTOR: Moran Environmental	EXCAVATION EQUIPMENT	DATUM: NAVD88
WEATHER: Partly cloudy, 80s	OPERATOR: John Duponte	MAKE: Kobelco	GROUND ELEV.: 9.54
	MODEL: SK1405R LC	REACH: ~18'	TIME STARTED: 1045
	CAPACITY: 1 cu. yd.		TIME COMPLETED: 1420

DEPTH	PID (ppm)	SOIL DESCRIPTION	EXCAV. EFFORT	BOULDER COUNT QTY. CLASS	REMARK NO.
-1-	ND	Dark brown (10 yr, 3/3), fine to coarse SAND, some Concrete and Brick, some Organics (roots), little Slag, little Metal Pipe Debris (dry)	M	0	1/3
-2-	ND	 14" diameter pipe ~2' bgs	M	0	
-3-			M	0	2
-4-		----- End of Exploration ~3' bgs			
-5-					
-6-					
-7-					
-8-					
-9-					
-10-					
-11-					
-12-					
-13-					
-14-					

**REMARKS:**

- Soil samples screened with a MiniRAE 3000 photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. ND = None Detected above background.
- 14 inch diameter steel pipe observed with hole in the top. Approximately 1 inch of sludge with slight naphthalene-like odor in the pipe.
- Soils backfilled in the general order they were excavated. Backfilled soil was compacted via excavator bucket tamping every 12 inch lift.

<b>TEST PIT PLAN</b> 	<b>LEGEND:</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">BOULDER</td> <td style="width: 30%;">COUNT</td> <td style="width: 40%;">PROPORTIONS USED</td> </tr> <tr> <td>SIZE RANGE</td> <td>LETTER</td> <td></td> </tr> <tr> <td>CLASSIFICATION</td> <td>DESIGNATION</td> <td>TRACE (TR) 0-10%</td> </tr> <tr> <td>6"-18"</td> <td>A</td> <td>LITTLE (LI) 10-20%</td> </tr> <tr> <td>18"-36"</td> <td>B</td> <td>SOME (SO) 20-35%</td> </tr> <tr> <td>36" OR LARGER</td> <td>C</td> <td>AND 35-50%</td> </tr> </table>	BOULDER	COUNT	PROPORTIONS USED	SIZE RANGE	LETTER		CLASSIFICATION	DESIGNATION	TRACE (TR) 0-10%	6"-18"	A	LITTLE (LI) 10-20%	18"-36"	B	SOME (SO) 20-35%	36" OR LARGER	C	AND 35-50%	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;">EXCAVATION EFFORT</td> <td style="width: 50%; text-align: center;">EASY</td> </tr> <tr> <td style="text-align: center;">E</td> <td style="text-align: center;">MODERATE</td> </tr> <tr> <td style="text-align: center;">M</td> <td style="text-align: center;">DIFFICULT</td> </tr> <tr> <td style="text-align: center;">D</td> <td style="text-align: center;">NOT OBSERVED</td> </tr> <tr> <td style="text-align: center;"></td> <td style="text-align: center;">OBSERVED GROUNDWATER LEVEL</td> </tr> </table>	EXCAVATION EFFORT	EASY	E	MODERATE	M	DIFFICULT	D	NOT OBSERVED		OBSERVED GROUNDWATER LEVEL
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VOLUME= 4.4 cu. yd.

## TEST PIT FIELD LOG

<b>GZA GEOENVIRONMENTAL, INC.</b> 530 BROADWAY PROVIDENCE, RI GEOTECHNICAL CONSULTANTS	<b>PROJECT</b> DESCRIPTION: Former Tidewater Facility LOCATION: Pawtucket, Rhode Island	<b>TEST PIT NO.:</b> <span style="font-size: 1.2em; font-weight: bold;">TP-517</span> <b>FILE NO.:</b> 43654.00 <b>DATE:</b> 9/21/17
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GZA ENGINEER: SCC	CONTRACTOR: Moran Environmental	EXCAVATION EQUIPMENT	DATUM: NAVD85
WEATHER: Partly cloudy, 80s	OPERATOR: John Duponte	MAKE: Kobelco	GROUND ELEV.: 8.27
	MODEL: SK1405R LC	REACH: ~18'	TIME STARTED: 1045
	CAPACITY: 1 cu. yd.		TIME COMPLETED: 1255

DEPTH	PID (ppm)	SOIL DESCRIPTION	EXCAV. EFFORT	BOULDER COUNT QTY. CLASS	REMARK NO.
-1-		Brown-dark brown (10 yr, 4/3), fine to coarse SAND, fine to coarse Gravel, some Cobble/Concrete/ Brick debris (dry)	E	0	1/3
-2-			E	0	2
-3-		Yellow-brown fine to coarse SAND, trace Silt, some Cobble and Concrete (dry)	E	0	
-4-			E	0	
-5-					
-6-					
-7-					
-8-					
-9-					
-10-					
-11-					
-12-					
-13-					
-14-					

**REMARKS:**

- Soil samples screened with a MiniRAE 3000 photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. ND = None Detected above background.
- Raceway depth measured through board crack to approximately 6 inches.
- Soils backfilled in the general order they were excavated. Backfilled soil was compacted via excavator bucket tamping every 12 inch lift.

<b>TEST PIT PLAN</b> 	<b>LEGEND:</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">BOULDER</td> <td style="text-align: center;">COUNT</td> <td></td> </tr> <tr> <td style="text-align: center;">SIZE RANGE</td> <td style="text-align: center;">LETTER</td> <td></td> </tr> <tr> <td style="text-align: center;">CLASSIFICATION</td> <td style="text-align: center;">DESIGNATION</td> <td></td> </tr> <tr> <td style="text-align: center;">6"-18"</td> <td style="text-align: center;">A</td> <td></td> </tr> <tr> <td style="text-align: center;">18"-36"</td> <td style="text-align: center;">B</td> <td></td> </tr> <tr> <td style="text-align: center;">36" OR LARGER</td> <td style="text-align: center;">C</td> <td></td> </tr> </table>	BOULDER	COUNT		SIZE RANGE	LETTER		CLASSIFICATION	DESIGNATION		6"-18"	A		18"-36"	B		36" OR LARGER	C		<b>PROPORTIONS USED</b> TRACE (TR)            0-10% LITTLE (LI)           10-20% SOME (SO)            20-35% AND                      35-50%	<b>EXCAVATION EFFORT</b> E                        EASY M                        MODERATE D                        DIFFICULT  NOT OBSERVED OBSERVED GROUNDWATER LEVEL
BOULDER	COUNT																				
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6"-18"	A																				
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36" OR LARGER	C																				
VOLUME= 7.8 cu. yd.																					



### TEST PIT FIELD LOG

<b>GZA GEOENVIRONMENTAL, INC.</b> 530 BROADWAY PROVIDENCE, RI GEOTECHNICAL CONSULTANTS	<b>PROJECT</b> DESCRIPTION: Former Tidewater Facility  LOCATION: Pawtucket, Rhode Island	<b>TEST PIT NO.:</b> <span style="font-size: 1.2em; font-weight: bold;">TP-518</span>  <b>FILE NO.:</b> 43654.00  <b>DATE:</b> 9/21/17
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GZA ENGINEER: SCC	CONTRACTOR: Moran Environmental	EXCAVATION EQUIPMENT	DATUM: NAVD88
WEATHER: Partly cloudy, 80s	OPERATOR: John Duponte	MAKE: Kobelco	GROUND ELEV.: 7.34
	MODEL: SK1405R LC	REACH: ~18'	TIME STARTED: 1045
	CAPACITY: 1 cu. yd.		TIME COMPLETED: 1500

DEPTH	PID (ppm)	SOIL DESCRIPTION	EXCAV. EFFORT	BOULDER COUNT QTY. CLASS	REMARK NO.
-1-	ND	Tan-brown (10 yr, 6/3), fine to coarse SAND, little fine to coarse Gravel, trace Organics (roots), trace Asphalt (dry)	E	2A	1/2
-2-			E	2A	
-3-	ND	<div style="display: flex; justify-content: space-between;"> <div style="width: 20%;"> <p>Concrete wall below grade</p> <p>~8' dia. Vertical steel pipe observed in the test pit bottom at ~4' bgs</p> <p>End of Exploration ~7' bgs</p> </div> <div style="width: 50%; border-left: 1px dashed black; border-right: 1px dashed black; padding: 0 5px;"> <p>Dark brown-black (10 yr, 2/1), fine to coarse SAND, some Concrete/Brick, little Pipe/Plastic debris, little fine to coarse Gravel, little Silt, dry</p> </div> <div style="width: 20%; border-left: 1px dashed black; border-right: 1px dashed black; padding: 0 5px;"> <p>Concrete Wall Below Grade</p> </div> </div>	E	2A/2B	
-4-			E	2A/2B	
-5-	4.5		E	2A/2B	
-6-			E	2A/2B	
-7-			E	2A/2B	
-8-					
-9-					
-10-					
-11-					
-12-					
-13-					
-14-					

**REMARKS:**

- Soil samples screened with a MiniRAE 3000 photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. ND = None Detected above background.
- Soils backfilled in the general order they were excavated. Backfilled soil was compacted via excavator bucket tamping every 12 inch lift.

<b>TEST PIT PLAN</b> 	<b>LEGEND:</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">BOULDER</td> <td style="width: 30%;">COUNT</td> <td style="width: 40%;">PROPORTIONS USED</td> </tr> <tr> <td>SIZE RANGE CLASSIFICATION</td> <td>LETTER DESIGNATION</td> <td></td> </tr> <tr> <td>6"-18"</td> <td>A</td> <td>TRACE (TR) 0-10%</td> </tr> <tr> <td>18"-36"</td> <td>B</td> <td>LITTLE (LI) 10-20%</td> </tr> <tr> <td>36" OR LARGER</td> <td>C</td> <td>SOME (SO) 20-35%</td> </tr> <tr> <td></td> <td></td> <td>AND 35-50%</td> </tr> </table>	BOULDER	COUNT	PROPORTIONS USED	SIZE RANGE CLASSIFICATION	LETTER DESIGNATION		6"-18"	A	TRACE (TR) 0-10%	18"-36"	B	LITTLE (LI) 10-20%	36" OR LARGER	C	SOME (SO) 20-35%			AND 35-50%	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%; text-align: center;">                     EXCAVATION EFFORT                      E M D   </td> <td style="width: 70%;">                     EASY                      MODERATE                      DIFFICULT                       NOT OBSERVED                      OBSERVED GROUNDWATER LEVEL                 </td> </tr> </table>	EXCAVATION EFFORT E M D  	EASY MODERATE DIFFICULT  NOT OBSERVED OBSERVED GROUNDWATER LEVEL
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EXCAVATION EFFORT E M D  	EASY MODERATE DIFFICULT  NOT OBSERVED OBSERVED GROUNDWATER LEVEL																					

VOLUME= 58.3 cu. yd.

### TEST PIT FIELD LOG

<b>GZA GEOENVIRONMENTAL, INC.</b> 530 BROADWAY PROVIDENCE, RI GEOTECHNICAL CONSULTANTS	<b>PROJECT</b> DESCRIPTION: Former Tidewater Facility  LOCATION: Pawtucket, Rhode Island	<b>TEST PIT NO.:</b> <span style="font-size: 1.2em;"><b>TP-518A</b></span>  <b>FILE NO.:</b> 43654.00  <b>DATE:</b> 9/22/17
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GZA ENGINEER: SCC	CONTRACTOR: Moran Environmental	EXCAVATION EQUIPMENT	DATUM: NAVD88
WEATHER: Partly cloudy, 80s	OPERATOR: John Duponte	MAKE: Kobelco	GROUND ELEV.: 8.58
	MODEL: SK1405R LC	CAPACITY: 1 cu. yd.	REACH: ~18'
			TIME STARTED: 1030
			TIME COMPLETED: 1120

DEPTH	PID (ppm)	SOIL DESCRIPTION	EXCAV. EFFORT	BOULDER COUNT QTY. CLASS	REMARK NO.
-1-	ND	40' from end of raceway	E	0	1/2
-2-		Yellow-brown (10 yr, 6/6), fine to coarse SAND, little fine to coarse Gravel, little Cobble, little Metal debris, little Organics (dry)	E	0	
-3-	ND		E	0	
-4-			E	0	3
-5-					
-6-					
-7-					
-8-					
-9-					
-10-					
-11-					
-12-					
-13-					
-14-					

**REMARKS:**

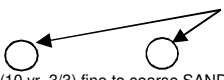
- Soil samples screened with a MiniRAE 3000 photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. ND = None Detected above background.
- Soils backfilled in the general order they were excavated. Backfilled soil was compacted via excavator bucket tamping every 12 inch lift.
- Manhole structure observed at approximately 4' below grade.

<b>TEST PIT PLAN</b> 	<b>LEGEND:</b> BOULDER SIZE RANGE CLASSIFICATION 6"-18" 18"-36" 36" OR LARGER	COUNT LETTER DESIGNATION A B C	PROPORTIONS USED TRACE (TR) 0-10% LITTLE (LI) 10-20% SOME (SO) 20-35% AND 35-50%	EXCAVATION EFFORT E EASY M MODERATE D DIFFICULT   NOT OBSERVED OBSERVED GROUNDWATER LEVEL
VOLUME= 22.2 cu. yd.				

## TEST PIT FIELD LOG

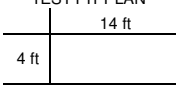



<b>GZA GEOENVIRONMENTAL, INC.</b> 530 Broadway PROVIDENCE, RI GEOTECHNICAL CONSULTANTS	<b>Former Tidewater Facility</b>  <b>Pawtucket, Rhode Island</b>	<b>TEST PIT NO.:</b> <span style="float: right;"><b>TP-519</b></span> <b>FILE NO.:</b> 43654 <b>DATE:</b> 9/22/2017
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GZA ENGINEER: SCC	CONTRACTOR: Moran Environmental	EXCAVATION EQUIPMENT	GROUND ELEV.: 8.62
WEATHER: Cloudy, 70s	OPERATOR: John Duponte	MODEL: SK140SR LC	TIME STARTED: 1300
	MAKE: Kobelco	REACH: ~ 18 ft	TIME COMPLETED: 1345
	CAPACITY: 1 cu. yd.		

DEPTH	PID (ppm)	SOIL DESCRIPTION	EXCAV. EFFORT	BOULDER COUNT QTY. CLASS	REMARK NO.
-1-	ND	Dark gray-black (10 yr, 2/1) fine to coarse SAND, some Organics (root), little fine to coarse Gravel, little brick, little Silt (dry)	E/M	2A/2B	1/3
-2-		 <p style="text-align: center;">pipes, see note 2</p>	E/M	2A/2B	2
-3-	18.4	Dark brown-black (10 yr, 3/3) fine to coarse SAND AND CONCRETE, some Brick little fine to coarse Gravel, trace Organics (root), trace Silt, slight-moderate fuel oil-like odor, (dry)	E/M		
-4-		End of Exploration ~3.5' bgs			
-5-					
-6-					
-7-					
-8-					
-9-					
-10-					
-11-					
-12-					
-13-					
-14-					

**REMARKS:**

- Soil samples screened with a MiniRAE 3000 photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. ND = None Detected above background.
- Two 3-inch diameter steel pipes observed approximately 2 feet below grade. Pipes appeared to be damaged and contain viscous NAPL (possible No. 6 oil).
- Soils backfilled in the general order they were excavated. Backfilled soil was compacted via excavator bucket tamping every 12 inch lift.

<b>TEST PIT PLAN</b>  NORTH VOLUME= 7.3 cu. yd.	<b>LEGEND:</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">BOULDER</td> <td style="text-align: center;">COUNT</td> </tr> <tr> <td style="text-align: center;">SIZE RANGE</td> <td style="text-align: center;">LETTER</td> </tr> <tr> <td style="text-align: center;">CLASSIFICATION</td> <td style="text-align: center;">DESIGNATION</td> </tr> <tr> <td style="text-align: center;">6"-18"</td> <td style="text-align: center;">A</td> </tr> <tr> <td style="text-align: center;">18"-36"</td> <td style="text-align: center;">B</td> </tr> <tr> <td style="text-align: center;">36" OR LARGER</td> <td style="text-align: center;">C</td> </tr> </table>	BOULDER	COUNT	SIZE RANGE	LETTER	CLASSIFICATION	DESIGNATION	6"-18"	A	18"-36"	B	36" OR LARGER	C	<b>PROPORTIONS USED</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <td>TRACE (TR)</td> <td style="text-align: right;">0-10%</td> </tr> <tr> <td>LITTLE (LI)</td> <td style="text-align: right;">10-20%</td> </tr> <tr> <td>SOME (SO)</td> <td style="text-align: right;">20-35%</td> </tr> <tr> <td>AND</td> <td style="text-align: right;">35-50%</td> </tr> </table>	TRACE (TR)	0-10%	LITTLE (LI)	10-20%	SOME (SO)	20-35%	AND	35-50%	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">E M D</td> <td style="text-align: center;">                 EXCAVATION EFFORT                  EASY                  MODERATE                  DIFFICULT             </td> </tr> <tr> <td style="text-align: center;">  </td> <td style="text-align: center;">                 NOT OBSERVED                  OBSERVED GROUNDWATER LEVEL             </td> </tr> </table>	E M D	EXCAVATION EFFORT EASY MODERATE DIFFICULT		NOT OBSERVED OBSERVED GROUNDWATER LEVEL
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### TEST PIT FIELD LOG

<b>GZA GEOENVIRONMENTAL, INC.</b> 530 BROADWAY PROVIDENCE, RI GEOTECHNICAL CONSULTANTS	<b>PROJECT</b> DESCRIPTION: Former Tidewater Facility  LOCATION: Pawtucket, Rhode Island	<b>TEST PIT NO.:</b> <span style="font-size: 1.2em; font-weight: bold;">TP-521</span>  <b>FILE NO.:</b> 43654.00  <b>DATE:</b> 9/25/17
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GZA ENGINEER: SCC	CONTRACTOR: Moran Environmental	DATUM: NAVD88
WEATHER: Partly cloudy, 80s	OPERATOR: John Duponte	GROUND ELEV.: 10.21
	MAKE: Kobelco	TIME STARTED: 0840
	MODEL: SK1405R LC	TIME COMPLETED: 0945
	CAPACITY: 1 cu. yd.	REACH: ~18'

DEPTH	PID (ppm)	SOIL DESCRIPTION	EXCAV. EFFORT	BOULDER COUNT QTY. CLASS	REMARK NO.
-1-	ND	Medium-dark brown (10 yr, 3/3), fine to coarse SAND, some Brick, little fine to coarse Gravel, little Silt, little Organics (roots) (dry) <div style="display: flex; align-items: center; margin-top: 5px;"> <span style="margin-right: 5px;">○</span> <span style="font-size: 0.8em;">← 8" diameter pipe</span> </div>	E	0	1/3
-2-	ND		E	0	2
-3-	ND		E	0	
-4-		End of Exploration ~3.5' bgs			
-5-					
-6-					
-7-					
-8-					
-9-					
-10-					
-11-					
-12-					
-13-					
-14-					

**REMARKS:**

1. Soil samples screened with a MiniRAE 3000 photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. ND = None Detected above background.
2. One 8 inch diameter pipe found similar to TP-522.
3. Soils backfilled in the general order they were excavated. Backfilled soil was compacted via excavator bucket tamping every 12 inch lift.

<b>TEST PIT PLAN</b>  NORTH VOLUME= 7.8 cu. yd.	<b>LEGEND:</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">BOULDER</td> <td style="width: 50%;">COUNT</td> </tr> <tr> <td>SIZE RANGE</td> <td>LETTER</td> </tr> <tr> <td>CLASSIFICATION</td> <td>DESIGNATION</td> </tr> <tr> <td>6"-18"</td> <td>A</td> </tr> <tr> <td>18"-36"</td> <td>B</td> </tr> <tr> <td>36" OR LARGER</td> <td>C</td> </tr> </table>	BOULDER	COUNT	SIZE RANGE	LETTER	CLASSIFICATION	DESIGNATION	6"-18"	A	18"-36"	B	36" OR LARGER	C	<b>PROPORTIONS USED</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <td>TRACE (TR)</td> <td>0-10%</td> </tr> <tr> <td>LITTLE (LI)</td> <td>10-20%</td> </tr> <tr> <td>SOME (SO)</td> <td>20-35%</td> </tr> <tr> <td>AND</td> <td>35-50%</td> </tr> </table>	TRACE (TR)	0-10%	LITTLE (LI)	10-20%	SOME (SO)	20-35%	AND	35-50%	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;">                     EXCAVATION EFFORT                      E M D  </td> <td style="width: 50%; text-align: center;">                     EASY                      MODERATE                      DIFFICULT                      NOT OBSERVED                      OBSERVED GROUNDWATER LEVEL                 </td> </tr> </table>	EXCAVATION EFFORT E M D 	EASY MODERATE DIFFICULT NOT OBSERVED OBSERVED GROUNDWATER LEVEL
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### TEST PIT FIELD LOG

<b>GZA GEOENVIRONMENTAL, INC.</b> 530 BROADWAY PROVIDENCE, RI GEOTECHNICAL CONSULTANTS	<b>PROJECT</b> DESCRIPTION: Former Tidewater Facility  LOCATION: Pawtucket, Rhode Island	<b>TEST PIT NO.:</b> <span style="font-size: 1.2em;"><b>TP-523</b></span>  <b>FILE NO.:</b> 43654.00  <b>DATE:</b> 9/22/17
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GZA ENGINEER: SCC	CONTRACTOR: Moran Environmental	EXCAVATION EQUIPMENT	DATUM: NAVD88
WEATHER: Partly cloudy, 80s	OPERATOR: John Duponte	MAKE: Kobelco	GROUND ELEV.: 9.26
	MODEL: SK1405R LC	REACH: ~18'	TIME STARTED: 1415
	CAPACITY: 1 cu. yd.		TIME COMPLETED: 1510

DEPTH	PID (ppm)	SOIL DESCRIPTION	EXCAV. EFFORT	BOULDER COUNT QTY. CLASS	REMARK NO.
-1-	1.0	Dark brown-black (10 yr, 2/1), fine to coarse SAND, some fine to coarse Gravel, little Brick/ Concrete fragments, little Coal/Slag Fragments, little Silt, slight to moderate petroleum-like odor (dry)	E	0	1/2
-2-	9.1		E	0	
-3-			E	0	
-4-			E	0	
-5-		End of Exploration ~4' bgs			
-6-					
-7-					
-8-					
-9-					
-10-					
-11-					
-12-					
-13-					
-14-					

**REMARKS:**

- Soil samples screened with a MiniRAE 3000 photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. ND = None Detected above background.
- Soils backfilled in the general order they were excavated. Backfilled soil was compacted via excavator bucket tamping every 12 inch lift.

<b>TEST PIT PLAN</b> <p style="text-align: center;">NORTH</p> VOLUME= 8.9 cu. yd.	<b>LEGEND:</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">BOULDER</td> <td style="text-align: center;">COUNT</td> </tr> <tr> <td style="text-align: center;">SIZE RANGE</td> <td style="text-align: center;">LETTER</td> </tr> <tr> <td style="text-align: center;">CLASSIFICATION</td> <td style="text-align: center;">DESIGNATION</td> </tr> <tr> <td style="text-align: center;">6"-18"</td> <td style="text-align: center;">A</td> </tr> <tr> <td style="text-align: center;">18"-36"</td> <td style="text-align: center;">B</td> </tr> <tr> <td style="text-align: center;">36" OR LARGER</td> <td style="text-align: center;">C</td> </tr> </table>	BOULDER	COUNT	SIZE RANGE	LETTER	CLASSIFICATION	DESIGNATION	6"-18"	A	18"-36"	B	36" OR LARGER	C	<b>PROPORTIONS USED</b> TRACE (TR) 0-10% LITTLE (LI) 10-20% SOME (SO) 20-35% AND 35-50%	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">E</td> <td style="text-align: center;">EASY</td> </tr> <tr> <td style="text-align: center;">M</td> <td style="text-align: center;">MODERATE</td> </tr> <tr> <td style="text-align: center;">D</td> <td style="text-align: center;">DIFFICULT</td> </tr> <tr> <td style="text-align: center;"></td> <td style="text-align: center;">NOT OBSERVED</td> </tr> <tr> <td style="text-align: center;"></td> <td style="text-align: center;">OBSERVED GROUNDWATER LEVEL</td> </tr> </table>	E	EASY	M	MODERATE	D	DIFFICULT		NOT OBSERVED		OBSERVED GROUNDWATER LEVEL
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### TEST PIT FIELD LOG

<b>GZA GEOENVIRONMENTAL, INC.</b> 530 BROADWAY PROVIDENCE, RI GEOTECHNICAL CONSULTANTS	<b>PROJECT</b> DESCRIPTION: Former Tidewater Facility  LOCATION: Pawtucket, Rhode Island	<b>TEST PIT NO.:</b> <span style="font-size: 1.2em; font-weight: bold;">TP-524</span>  <b>FILE NO.:</b> 43654.00  <b>DATE:</b> 9/18/17
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GZA ENGINEER: SCC	CONTRACTOR: Moran Environmental	EXCAVATION EQUIPMENT	DATUM: NAVD88
WEATHER: Partly cloudy, 80s	OPERATOR: John Duponte	MAKE: Kobelco	GROUND ELEV.: 8.08
	MODEL: SK1405R LC	CAPACITY: 1 cu. yd.	TIME STARTED: 1248
	REACH: ~18'		TIME COMPLETED: 1350

DEPTH	PID (ppm)	SOIL DESCRIPTION	EXCAV. EFFORT	BOULDER COUNT QTY. CLASS	REMARK NO.
-1-		Dark brown (10 yr, 3/3), fine to coarse SAND, some Silt, some Organics (roots), little Brick, little fine to coarse Gravel (dry)	E	0	1/3/4
-2-		Black ( 10 yr, 2/1) COAL and SLAG, little fine to coarse SAND, little Silt (dry)	E	0	
-3-		Tan (10 yr, 6/3), fine to coarse SAND, some fine to coarse Gravel, little Silt, little Organics (roots), little Metal Debris (dry)	E	0	
-4-			E	0	
-5-			M	0	
-6-		Dark brown (10 yr, 3/3), fine to coarse SAND, some fine to coarse Gravel, little Silt, little Organics (roots), little Metal Debris (dry)	M	2A/2B	
-7-			D	2A/2B	
-8-			D	2A/2B/2C	2
-9-			D	2A/2B/2C	5
-10-		End of Exploration at ~9.5' bgs	D		
-11-					
-12-					
-13-					
-14-					

**REMARKS:**

- Soil samples screened with a MiniRAE 3000 photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. ND = None Detected above background.
- Metal rod at approximately 8 feet below ground surface running east-west. Possible bulkhead tie-back.
- Soils backfilled in the general order they were excavated. Backfilled soil was compacted via excavator bucket tamping every 12 inch lift.
- Potential stone foundation observed parallel with north test pit wall.
- Moderate groundwater weeping at 9 feet below ground surface.

<b>TEST PIT PLAN</b> <p style="text-align: center;">NORTH</p> VOLUME= 12.5 cu. yd.	<b>LEGEND:</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">BOULDER</td> <td style="text-align: center;">COUNT</td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">SIZE RANGE</td> <td style="text-align: center;">LETTER</td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">CLASSIFICATION</td> <td style="text-align: center;">DESIGNATION</td> <td style="text-align: center;">TRACE (TR)</td> <td style="text-align: center;">0-10%</td> </tr> <tr> <td style="text-align: center;">6"-18"</td> <td style="text-align: center;">A</td> <td style="text-align: center;">LITTLE (LI)</td> <td style="text-align: center;">10-20%</td> </tr> <tr> <td style="text-align: center;">18"-36"</td> <td style="text-align: center;">B</td> <td style="text-align: center;">SOME (SO)</td> <td style="text-align: center;">20-35%</td> </tr> <tr> <td style="text-align: center;">36" OR LARGER</td> <td style="text-align: center;">C</td> <td style="text-align: center;">AND</td> <td style="text-align: center;">35-50%</td> </tr> </table>	BOULDER	COUNT			SIZE RANGE	LETTER			CLASSIFICATION	DESIGNATION	TRACE (TR)	0-10%	6"-18"	A	LITTLE (LI)	10-20%	18"-36"	B	SOME (SO)	20-35%	36" OR LARGER	C	AND	35-50%	<b>EXCAVATION EFFORT</b> E EASY M MODERATE D DIFFICULT	 OBSERVED GROUNDWATER LEVEL
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### TEST PIT FIELD LOG

<b>GZA GEOENVIRONMENTAL, INC.</b> 530 BROADWAY PROVIDENCE, RI GEOTECHNICAL CONSULTANTS	<b>PROJECT</b> DESCRIPTION: Former Tidewater Facility  LOCATION: Pawtucket, Rhode Island	<b>TEST PIT NO.:</b> <span style="font-size: 1.2em; font-weight: bold;">TP-525</span>  <b>FILE NO.:</b> 43654.00  <b>DATE:</b> 9/21/17
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GZA ENGINEER: SCC	CONTRACTOR: Moran Environmental	EXCAVATION EQUIPMENT	DATUM: NAVD88
WEATHER: Partly cloudy, 80s	OPERATOR: John Duponte	MAKE: Kobelco	GROUND ELEV.: 8.02
	MODEL: SK1405R LC	CAPACITY: 1 cu. yd.	TIME STARTED: 0730
	REACH: ~18'		TIME COMPLETED: 0920

DEPTH	PID (ppm)	SOIL DESCRIPTION	EXCAV. EFFORT	BOULDER COUNT QTY. CLASS	REMARK NO.
-1-		Dark brown-brown (10 yr, 3/3), fine to coarse SAND, little Organics, little fine to coarse Gravel, little Silt, little Brick/Wood/Concrete Debris (dry)	M	0	1/3
-2-			M	0	2
-3-			M	0	
-4-					
-5-					
-6-					
-7-					
-8-					
-9-					
-10-					
-11-					
-12-					
-13-					
-14-					

**REMARKS:**

- Soil samples screened with a MiniRAE 3000 photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. ND = None Detected above background.
- Wood raceway observed at approximately 1.5 feet below ground surface. Location completed to trace raceway north in attempt to find the northern most extent of the raceway.
- Soils backfilled in the general order they were excavated. Backfilled soil was compacted via excavator bucket tamping every 12 inch lift.

<b>TEST PIT PLAN</b> 	<b>LEGEND:</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">BOULDER</td> <td style="text-align: center;">COUNT</td> </tr> <tr> <td style="text-align: center;">SIZE RANGE</td> <td style="text-align: center;">LETTER</td> </tr> <tr> <td style="text-align: center;">CLASSIFICATION</td> <td style="text-align: center;">DESIGNATION</td> </tr> <tr> <td style="text-align: center;">6"-18"</td> <td style="text-align: center;">A</td> </tr> <tr> <td style="text-align: center;">18"-36"</td> <td style="text-align: center;">B</td> </tr> <tr> <td style="text-align: center;">36" OR LARGER</td> <td style="text-align: center;">C</td> </tr> </table>	BOULDER	COUNT	SIZE RANGE	LETTER	CLASSIFICATION	DESIGNATION	6"-18"	A	18"-36"	B	36" OR LARGER	C	<b>PROPORTIONS USED</b> TRACE (TR)      0-10% LITTLE (LI)     10-20% SOME (SO)        20-35% AND                35-50%	<b>EXCAVATION EFFORT</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">E</td> <td style="text-align: center;">EASY</td> </tr> <tr> <td style="text-align: center;">M</td> <td style="text-align: center;">MODERATE</td> </tr> <tr> <td style="text-align: center;">D</td> <td style="text-align: center;">DIFFICULT</td> </tr> <tr> <td style="text-align: center;"></td> <td style="text-align: center;">NOT OBSERVED</td> </tr> <tr> <td style="text-align: center;"></td> <td style="text-align: center;">OBSERVED GROUNDWATER LEVEL</td> </tr> </table>	E	EASY	M	MODERATE	D	DIFFICULT		NOT OBSERVED		OBSERVED GROUNDWATER LEVEL
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### TEST PIT FIELD LOG

<b>GZA GEOENVIRONMENTAL, INC.</b> 530 BROADWAY PROVIDENCE, RI GEOTECHNICAL CONSULTANTS	<b>PROJECT</b> DESCRIPTION: Former Tidewater Facility  LOCATION: Pawtucket, Rhode Island	<b>TEST PIT NO.:</b> <span style="font-size: 1.2em; font-weight: bold;">TP-526</span>  <b>FILE NO.:</b> 43654.00  <b>DATE:</b> 9/22/17
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GZA ENGINEER: SCC	CONTRACTOR: Moran Environmental	EXCAVATION EQUIPMENT	DATUM: NAVD88
WEATHER: Partly cloudy, 80s	OPERATOR: John Duponte	MAKE: Kobelco	GROUND ELEV.: 8.56
	MODEL: SK1405R LC	REACH: ~18'	TIME STARTED: 0800
	CAPACITY: 1 cu. yd.		TIME COMPLETED: 1008

DEPTH	PID (ppm)	SOIL DESCRIPTION	EXCAV. EFFORT	BOULDER COUNT QTY. CLASS	REMARK NO.
-1-	ND	Dark brown-black (10 yr 2/1), fine to coarse SAND, little fine to coarse Gravel, little Brick/Concrete Debris, little Slag, little Organics (roots), trace Silt (dry)	E	0	1/2/3
-2-		7.5'	E	2A	
-3-	ND	Wood Raceway 2.5' bgs 8" dia. steel pipe	E	2A	
-4-		Concrete vault with black petroleum	E	0	
-5-			E	0	
-6-					
-7-		End of Exploration ~7' bgs			
-8-					
-9-					
-10-					
-11-					
-12-					
-13-					
-14-					

**REMARKS:**

- Soil samples screened with a MiniRAE 3000 photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. ND = None Detected above background.
- Test pit completed to locate raceway structuring.
- Soils backfilled in the general order they were excavated. Backfilled soil was compacted via excavator bucket tamping every 12 inch lift.

<b>TEST PIT PLAN</b> 	<b>LEGEND:</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">BOULDER</td> <td style="text-align: center;">COUNT</td> </tr> <tr> <td style="text-align: center;">SIZE RANGE</td> <td style="text-align: center;">LETTER</td> </tr> <tr> <td style="text-align: center;">CLASSIFICATION</td> <td style="text-align: center;">DESIGNATION</td> </tr> <tr> <td style="text-align: center;">6"-18"</td> <td style="text-align: center;">A</td> </tr> <tr> <td style="text-align: center;">18"-36"</td> <td style="text-align: center;">B</td> </tr> <tr> <td style="text-align: center;">36" OR LARGER</td> <td style="text-align: center;">C</td> </tr> </table>	BOULDER	COUNT	SIZE RANGE	LETTER	CLASSIFICATION	DESIGNATION	6"-18"	A	18"-36"	B	36" OR LARGER	C	<b>PROPORTIONS USED</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <td>TRACE (TR)</td> <td style="text-align: right;">0-10%</td> </tr> <tr> <td>LITTLE (LI)</td> <td style="text-align: right;">10-20%</td> </tr> <tr> <td>SOME (SO)</td> <td style="text-align: right;">20-35%</td> </tr> <tr> <td>AND</td> <td style="text-align: right;">35-50%</td> </tr> </table>	TRACE (TR)	0-10%	LITTLE (LI)	10-20%	SOME (SO)	20-35%	AND	35-50%	<b>EXCAVATION EFFORT</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">E</td> <td style="text-align: center;">EASY</td> </tr> <tr> <td style="text-align: center;">M</td> <td style="text-align: center;">MODERATE</td> </tr> <tr> <td style="text-align: center;">D</td> <td style="text-align: center;">DIFFICULT</td> </tr> <tr> <td style="text-align: center;"></td> <td style="text-align: center;">NOT OBSERVED</td> </tr> <tr> <td style="text-align: center;"></td> <td style="text-align: center;">OBSERVED GROUNDWATER LEVEL</td> </tr> </table>	E	EASY	M	MODERATE	D	DIFFICULT		NOT OBSERVED		OBSERVED GROUNDWATER LEVEL
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VOLUME= 7.4 cu. yd.

### TEST PIT FIELD LOG

<b>GZA GEOENVIRONMENTAL, INC.</b> 530 BROADWAY PROVIDENCE, RI GEOTECHNICAL CONSULTANTS	<b>PROJECT</b> DESCRIPTION: Former Tidewater Facility  LOCATION: Pawtucket, Rhode Island	<b>TEST PIT NO.:</b> <span style="font-size: 1.2em; font-weight: bold;">TP-527</span>  <b>FILE NO.:</b> 43654.00  <b>DATE:</b> 9/25/17
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GZA ENGINEER: SCC	CONTRACTOR: Moran Environmental	EXCAVATION EQUIPMENT	DATUM: NAVD88
WEATHER: Partly cloudy, 80s	OPERATOR: John Duponte	MAKE: Kobelco	GROUND ELEV.: 9.08
	MODEL: SK1405R LC	CAPACITY: 1 cu. yd.	TIME STARTED: 1000
	REACH: ~18'		TIME COMPLETED: 1020

DEPTH	PID (ppm)	SOIL DESCRIPTION	EXCAV. EFFORT	BOULDER COUNT QTY. CLASS	REMARK NO.
-1-	ND	Medium-dark brown (10 yr, 3/3), fine to coarse SAND, little Silt, little fine to coarse Gravel, little Organics (Roots) (dry)	E		1/2
-2-			E		
-3-		Brown (10 yr, 4/3), PULVERIZED ROCK, some fine to coarse Sand, little fine to coarse Gravel, trace Silt (dry)	D		
-4-	ND		D		
-5-			D		
-6-	2.2	Brown (10 yr, 4/3), PULVERIZED ROCK, some fine to coarse Sand, little fine to coarse Gravel, trace Silt, slight petroleum-like odor, NAPL saturation (high viscosity) (wet)	D		
-7-		End of Exploration -6' bgs			
-8-					
-9-					
-10-					
-11-					
-12-					
-13-					
-14-					

**REMARKS:**

- Soil samples screened with a MiniRAE 3000 photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. ND = None Detected above background.
- Soils backfilled in the general order they were excavated. Backfilled soil was compacted via excavator bucket tamping every 12 inch lift.

TEST PIT PLAN 	<b>LEGEND:</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;">BOULDER</td> <td style="width: 33%;">COUNT</td> <td style="width: 33%;">PROPORTIONS USED</td> </tr> <tr> <td>SIZE RANGE CLASSIFICATION</td> <td>LETTER DESIGNATION</td> <td></td> </tr> <tr> <td>6"-18"</td> <td>A</td> <td>TRACE (TR) 0-10%</td> </tr> <tr> <td>18"-36"</td> <td>B</td> <td>LITTLE (LI) 10-20%</td> </tr> <tr> <td>36" OR LARGER</td> <td>C</td> <td>SOME (SO) 20-35%</td> </tr> <tr> <td></td> <td></td> <td>AND 35-50%</td> </tr> </table>	BOULDER	COUNT	PROPORTIONS USED	SIZE RANGE CLASSIFICATION	LETTER DESIGNATION		6"-18"	A	TRACE (TR) 0-10%	18"-36"	B	LITTLE (LI) 10-20%	36" OR LARGER	C	SOME (SO) 20-35%			AND 35-50%	EXCAVATION EFFORT E EASY M MODERATE D DIFFICULT  	OBSERVED GROUNDWATER LEVEL
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VOLUME= 6.7 cu. yd.



### TEST PIT FIELD LOG

<b>GZA GEOENVIRONMENTAL, INC.</b> 530 BROADWAY PROVIDENCE, RI GEOTECHNICAL CONSULTANTS	<b>PROJECT</b> DESCRIPTION: Former Tidewater Facility  LOCATION: Pawtucket, Rhode Island	<b>TEST PIT NO.:</b> <span style="font-size: 1.2em; font-weight: bold;">TP-528</span>  <b>FILE NO.:</b> 43654.00  <b>DATE:</b> 9/25/17
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GZA ENGINEER: SCC  WEATHER: Partly cloudy, 80s	EXCAVATION EQUIPMENT CONTRACTOR: Moran Environmental OPERATOR: John Duponte MAKE: Kobelco CAPACITY: 1 cu. yd.	MODEL: SK1405R LC REACH: ~18'	DATUM: NAVD88 GROUND ELEV.: 8.69 TIME STARTED: 1055 TIME COMPLETED: 1150
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DEPTH	PID (ppm)	SOIL DESCRIPTION	EXCAV. EFFORT	BOULDER COUNT QTY. CLASS	REMARK NO.
-1-	ND	Dark brown-black (10 yr, 3/3), fine to coarse SAND, some Slag, little fine to coarse Gravel, little Silt, little Brick (dry)	E	0	1/2
-2-			E	0	
-3-			ND	----- Brown (10 yr, 4/3), fine to coarse SAND, little fine to coarse Gravel, trace Silt (dry)	E
-4-	E	2A/2B			
-5-	0.9		E	2A/2B	
-6-			E	2A/2B	
-7-	2.4		E	2A/2B	
-8-			E	2A/2B	
-9-			E	2A/2B	
-10-		End of Exploration ~9' bgs			
-11-					
-12-					
-13-					
-14-					

**REMARKS:**

- Soil samples screened with a MiniRAE 3000 photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. ND = None Detected above background.
- Soils backfilled in the general order they were excavated. Backfilled soil was compacted via excavator bucket tamping every 12 inch lift.

<b>TEST PIT PLAN</b> <p style="font-size: 0.8em;">9 ft 3 ft NORTH</p> <p style="font-size: 0.8em;">VOLUME= 9 cu. yd.</p>	<b>LEGEND:</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">BOULDER</td> <td style="width: 50%;">COUNT</td> </tr> <tr> <td>SIZE RANGE</td> <td>LETTER</td> </tr> <tr> <td>CLASSIFICATION</td> <td>DESIGNATION</td> </tr> <tr> <td>6"-18"</td> <td>A</td> </tr> <tr> <td>18"-36"</td> <td>B</td> </tr> <tr> <td>36" OR LARGER</td> <td>C</td> </tr> </table>	BOULDER	COUNT	SIZE RANGE	LETTER	CLASSIFICATION	DESIGNATION	6"-18"	A	18"-36"	B	36" OR LARGER	C	<b>PROPORTIONS USED</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <td>TRACE (TR)</td> <td>0-10%</td> </tr> <tr> <td>LITTLE (LI)</td> <td>10-20%</td> </tr> <tr> <td>SOME (SO)</td> <td>20-35%</td> </tr> <tr> <td>AND</td> <td>35-50%</td> </tr> </table>	TRACE (TR)	0-10%	LITTLE (LI)	10-20%	SOME (SO)	20-35%	AND	35-50%	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;">                     EXCAVATION EFFORT                      E M D  </td> <td style="width: 50%; text-align: center;">                     EASY MODERATE DIFFICULT                       NOT OBSERVED OBSERVED GROUNDWATER LEVEL                 </td> </tr> </table>	EXCAVATION EFFORT E M D 	EASY MODERATE DIFFICULT  NOT OBSERVED OBSERVED GROUNDWATER LEVEL
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### TEST PIT FIELD LOG

<b>GZA GEOENVIRONMENTAL, INC.</b> 530 BROADWAY PROVIDENCE, RI GEOTECHNICAL CONSULTANTS	<b>PROJECT</b> DESCRIPTION: Former Tidewater Facility  LOCATION: Pawtucket, Rhode Island	<b>TEST PIT NO.:</b> <span style="font-size: 1.2em; font-weight: bold;">TP-529</span>  <b>FILE NO.:</b> 43654.00  <b>DATE:</b> 9/25/17
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GZA ENGINEER: SCC	CONTRACTOR: Moran Environmental	EXCAVATION EQUIPMENT	DATUM: NAVD88
WEATHER: Partly cloudy, 80s	OPERATOR: John Duponte	MAKE: Kobelco	GROUND ELEV.: 7.19
	MODEL: SK1405R LC	CAPACITY: 1 cu. yd.	REACH: ~18'
		TIME STARTED: 1415	TIME COMPLETED: 1500

DEPTH	PID (ppm)	SOIL DESCRIPTION	EXCAV. EFFORT	BOULDER COUNT QTY. CLASS	REMARK NO.	
-1-	10.0	Dark brown-black (10 yr, 2/2), fine to coarse SAND and SLAG, little fine to coarse Gravel, little Organics (Roots), little Wood Debris, trace Silt (dry)	E	0	1/2/3	
-2-			D	0		
-3-	407	Black (10 yr, 2/1), SLAG, little fine to coarse Sand and Gravel, little Wood Debris, moderate coal tar-like odor, coated-saturated (high viscosity) (moist)	D	0		
-4-		End of Exploration ~3' bgs				
-5-						
-6-						
-7-						
-8-						
-9-						
-10-						
-11-						
-12-						
-13-						
-14-						

**REMARKS:**

- Soil samples screened with a MiniRAE 3000 photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. ND = None Detected above background.
- Very difficult digging due to very compact slag and wood debris with hardened tar like material. Excavation terminated at approximately 3 feet below ground surface due to difficulty.
- Soils backfilled in the general order they were excavated. Backfilled soil was compacted via excavator bucket tamping every 12 inch lift.

<b>TEST PIT PLAN</b> 	<b>LEGEND:</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">BOULDER</td> <td style="text-align: center;">COUNT</td> </tr> <tr> <td style="text-align: center;">SIZE RANGE</td> <td style="text-align: center;">LETTER</td> </tr> <tr> <td style="text-align: center;">CLASSIFICATION</td> <td style="text-align: center;">DESIGNATION</td> </tr> <tr> <td style="text-align: center;">6"-18"</td> <td style="text-align: center;">A</td> </tr> <tr> <td style="text-align: center;">18"-36"</td> <td style="text-align: center;">B</td> </tr> <tr> <td style="text-align: center;">36" OR LARGER</td> <td style="text-align: center;">C</td> </tr> </table>	BOULDER	COUNT	SIZE RANGE	LETTER	CLASSIFICATION	DESIGNATION	6"-18"	A	18"-36"	B	36" OR LARGER	C	<b>PROPORTIONS USED</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <td>TRACE (TR)</td> <td style="text-align: center;">0-10%</td> </tr> <tr> <td>LITTLE (LI)</td> <td style="text-align: center;">10-20%</td> </tr> <tr> <td>SOME (SO)</td> <td style="text-align: center;">20-35%</td> </tr> <tr> <td>AND</td> <td style="text-align: center;">35-50%</td> </tr> </table>	TRACE (TR)	0-10%	LITTLE (LI)	10-20%	SOME (SO)	20-35%	AND	35-50%	<b>EXCAVATION EFFORT</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">E</td> <td style="text-align: center;">EASY</td> </tr> <tr> <td style="text-align: center;">M</td> <td style="text-align: center;">MODERATE</td> </tr> <tr> <td style="text-align: center;">D</td> <td style="text-align: center;">DIFFICULT</td> </tr> <tr> <td style="text-align: center;"></td> <td style="text-align: center;">NOT OBSERVED</td> </tr> <tr> <td style="text-align: center;"></td> <td style="text-align: center;">OBSERVED GROUNDWATER LEVEL</td> </tr> </table>	E	EASY	M	MODERATE	D	DIFFICULT		NOT OBSERVED		OBSERVED GROUNDWATER LEVEL
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VOLUME= 3.3 cu. yd.

### TEST PIT FIELD LOG

<b>GZA GEOENVIRONMENTAL, INC.</b> 530 BROADWAY PROVIDENCE, RI GEOTECHNICAL CONSULTANTS	<b>PROJECT</b> DESCRIPTION: Former Tidewater Facility  LOCATION: Pawtucket, Rhode Island	<b>TEST PIT NO.:</b> <span style="font-size: 1.2em; font-weight: bold;">TP-530</span>  <b>FILE NO.:</b> 43654.00  <b>DATE:</b> 9/26/17
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GZA ENGINEER: SCC  WEATHER: Partly cloudy, 80s	EXCAVATION EQUIPMENT CONTRACTOR: Moran Environmental OPERATOR: John Duponte MAKE: Kobelco CAPACITY: 1 cu. yd.	MODEL: SK1405R LC REACH: ~18'	DATUM: NAVD88 GROUND ELEV.: 7.08 TIME STARTED: 0800 TIME COMPLETED: 0900
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DEPTH	PID (ppm)	SOIL DESCRIPTION	EXCAV. EFFORT	BOULDER COUNT QTY. CLASS	REMARK NO.
-1-	ND	Dark brown (10 yr, 3/3), fine to coarse SAND, some Organics (Roots), little Silt, little fine to coarse Gravel (dry)	E	0	1/2
-2-		Brown (10 yr, 4/1), fine to coarse SAND, little Cobble, little fine to coarse Gravel, trace Silt (dry)	E	2A/2B	
-3-	0.6	4" wide concrete foundation wall ~0.5' bgs running east-west	E	2A/2B	
-4-			E	2A/2B	
-5-	0.6	Dark brown-black (10 yr, 3/3), SLAG, little fine to coarse Sand, little fine to coarse Gravel, little Cocnrete/Brick, slight petroleum-like odor, black staining (moist-wet)	E	0	
-6-			E	0	
-7-	1.0		E	0	
-8-			E	0	
-9-		End of Exploration ~8' bgs			
-10-					
-11-					
-12-					
-13-					
-14-					

**REMARKS:**

- Soil samples screened with a MiniRAE 3000 photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. ND = None Detected above background.
- Soils backfilled in the general order they were excavated. Backfilled soil was compacted via excavator bucket tamping every 12 inch lift.

<b>TEST PIT PLAN</b> 	<b>LEGEND:</b> BOULDER COUNT LETTER DESIGNATION SIZE RANGE CLASSIFICATION 6"-18" A 18"-36" B 36" OR LARGER C	<b>PROPORTIONS USED</b> TRACE (TR) 0-10% LITTLE (LI) 10-20% SOME (SO) 20-35% AND 35-50%	<b>EXCAVATION EFFORT</b> E EASY M MODERATE D DIFFICULT  NOT OBSERVED OBSERVED GROUNDWATER LEVEL
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VOLUME= 20.7 cu. yd.



### TEST PIT FIELD LOG

<b>GZA GEOENVIRONMENTAL, INC.</b> 530 BROADWAY PROVIDENCE, RI GEOTECHNICAL CONSULTANTS	<b>PROJECT</b> DESCRIPTION: Former Tidewater Facility  LOCATION: Pawtucket, Rhode Island	<b>TEST PIT NO.:</b> <span style="font-size: 1.2em; font-weight: bold;">TP-531</span>  <b>FILE NO.:</b> 43654.00  <b>DATE:</b> 9/26/17
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GZA ENGINEER: SCC	CONTRACTOR: Moran Environmental	EXCAVATION EQUIPMENT	DATUM: NAVD88
WEATHER: Partly cloudy, 80s	OPERATOR: John Duponte	MAKE: Kobelco	GROUND ELEV.: 22.51
	MODEL: SK1405R LC	REACH: ~18'	TIME STARTED: 1140
	CAPACITY: 1 cu. yd.		TIME COMPLETED: 1230

DEPTH	PID (ppm)	SOIL DESCRIPTION	EXCAV. EFFORT	BOULDER COUNT QTY. CLASS	REMARK NO.
-1-	ND	Dark blue-black (Gley 1, 3/1), fine to coarse SAND, little fine to coarse Gravel, little Silt, little Organics (Roots) (dry)	E	0	1/4
-2-		Dark brown (10 yr, 3/3), fine to coarse SAND and CONCRETE, some Brick, some fine to coarse Gavel, some Metal Debris	M	3A	2
-3-			M	0	2
-4-			M	0	
-5-			M	0	
-6-			M	0	
-7-			M	0	
-8-			M	0	
-9-			M	0	
-10-			M	0	
-11-			M	0	
-12-			M	0	
-13-			M	0	3
-14-		End of Exploration ~14' bgs	M	0	

**REMARKS:**

- Soil samples screened with a MiniRAE 3000 photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. ND = None Detected above background.
- Large concrete debris.
- Groundwater observed weeping from pit face at 13 feet below ground surface.
- Soils backfilled in general order they were excavated. Backfilled soil was compacted via excavator bucket tamping every 12" lift.

<b>TEST PIT PLAN</b> <p style="text-align: center;">9 ft</p> <p style="text-align: center;">3 ft</p> <p style="text-align: center;">NORTH</p> <p>VOLUME= 14 cu. yd.</p>	<b>LEGEND:</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;">BOULDER</td> <td style="width: 33%;">COUNT</td> <td style="width: 33%;"></td> </tr> <tr> <td>SIZE RANGE</td> <td>LETTER</td> <td></td> </tr> <tr> <td>CLASSIFICATION</td> <td>DESIGNATION</td> <td></td> </tr> <tr> <td>6"-18"</td> <td>A</td> <td></td> </tr> <tr> <td>18"-36"</td> <td>B</td> <td></td> </tr> <tr> <td>36" OR LARGER</td> <td>C</td> <td></td> </tr> </table>	BOULDER	COUNT		SIZE RANGE	LETTER		CLASSIFICATION	DESIGNATION		6"-18"	A		18"-36"	B		36" OR LARGER	C		<b>PROPORTIONS USED</b> TRACE (TR) 0-10% LITTLE (LI) 10-20% SOME (SO) 20-35% AND 35-50%	<b>EXCAVATION EFFORT</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">E</td> <td style="width: 50%;">EASY</td> </tr> <tr> <td>M</td> <td>MODERATE</td> </tr> <tr> <td>D</td> <td>DIFFICULT</td> </tr> </table> <p style="text-align: center;">OBSERVED GROUNDWATER LEVEL</p>	E	EASY	M	MODERATE	D	DIFFICULT
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### TEST PIT FIELD LOG

<b>GZA GEOENVIRONMENTAL, INC.</b> 530 BROADWAY PROVIDENCE, RI GEOTECHNICAL CONSULTANTS	<b>PROJECT</b> DESCRIPTION: Former Tidewater Facility  LOCATION: Pawtucket, Rhode Island	<b>TEST PIT NO.:</b> <span style="font-size: 1.2em;"><b>TP-532</b></span>  <b>FILE NO.:</b> 43654.00  <b>DATE:</b> 12/19/17
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GZA ENGINEER: SCC  WEATHER: Partly cloudy, 80s	EXCAVATION EQUIPMENT CONTRACTOR: Moran Environmental OPERATOR: John Duponte MAKE: Kobelco CAPACITY: 1 cu. yd.	MODEL: SK1405R LC REACH: ~18'	DATUM: NAVD88 GROUND ELEV.: 7.60 TIME STARTED: 1230 TIME COMPLETE: 1300
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DEPTH	PID (ppm)	SOIL DESCRIPTION	EXCAV. EFFORT	BOULDER COUNT QTY. CLASS	REMARK NO.
-1-	ND	Very dark brown (10 yr, 3/3), fine to coarse SAND, some Organics (roots), some fine to coarse Gravel, little Cobble (dry)	E	0	1/2/3
-2-	ND	Pale brown (10 yr, 7/2), fine to coarse SAND, little fine to coarse Gravel (dry)	E	0	
-3-		Grayish-brown (10 yr, 5/2), fine to coarse SAND, some fine to coarse Gravel, little Cobble, little Silt (moist)	E	0	
-4-		-----	E	0	
-5-		End of Exploration - 4' bgs			
-6-					
-7-					
-8-					
-9-					
-10-					
-11-					
-12-					
-13-					
-14-					

**REMARKS:**

- Soil samples screened with a MiniRAE 3000 photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. ND = None Detected above background.
- On 12/28/17 excavated soils were visually assessed for the presence of blue staining, which would be indicative of purifier waste. No blue staining was observed.
- Soils backfilled in general order they were excavated. Backfilled soil was compacted via excavator bucket tamping every 12" lift.

<b>TEST PIT PLAN</b> 	<b>LEGEND:</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">BOULDER</td> <td style="text-align: center;">COUNT</td> </tr> <tr> <td style="text-align: center;">SIZE RANGE</td> <td style="text-align: center;">LETTER</td> </tr> <tr> <td style="text-align: center;">CLASSIFICATION</td> <td style="text-align: center;">DESIGNATION</td> </tr> <tr> <td style="text-align: center;">6"-18"</td> <td style="text-align: center;">A</td> </tr> <tr> <td style="text-align: center;">18"-36"</td> <td style="text-align: center;">B</td> </tr> <tr> <td style="text-align: center;">36" OR LARGER</td> <td style="text-align: center;">C</td> </tr> </table>	BOULDER	COUNT	SIZE RANGE	LETTER	CLASSIFICATION	DESIGNATION	6"-18"	A	18"-36"	B	36" OR LARGER	C	<b>PROPORTIONS USED</b>  TRACE (TR)      0-10% LITTLE (LI)    10-20% SOME (SO)      20-35% AND              35-50%	<b>EXCAVATION EFFORT</b>  E                    EASY M                    MODERATE D                    DIFFICULT   OBSERVED GROUNDWATER LEVEL
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### TEST PIT FIELD LOG

<b>GZA GEOENVIRONMENTAL, INC.</b> 530 BROADWAY PROVIDENCE, RI GEOTECHNICAL CONSULTANTS	<b>PROJECT</b> DESCRIPTION: Former Tidewater Facility  LOCATION: Pawtucket, Rhode Island	<b>TEST PIT NO.:</b> <span style="font-size: 1.2em;"><b>TP-533</b></span>  <b>FILE NO.:</b> 43654.00  <b>DATE:</b> 12/19/17
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GZA ENGINEER: SCC	CONTRACTOR: Moran Environmental	EXCAVATION EQUIPMENT	DATUM: NAVD88
WEATHER: Partly cloudy, 80s	OPERATOR: John Duponte	MAKE: Kobelco	GROUND ELEV.: 10.03
	MODEL: SK1405R LC	REACH: ~18'	TIME STARTED: 1340
	CAPACITY: 1 cu. yd.		TIME COMPLETED: 1350

DEPTH	PID (ppm)	SOIL DESCRIPTION	EXCAV. EFFORT	BOULDER COUNT QTY. CLASS	REMARK NO.
-1-	ND	Very dark brown (10 yr, 3/3), fine to coarse SAND, some Organics (roots), some fine to coarse Gravel, little Silt, trace Cobble (dry)	E	0	1/3/4
-2-	ND	Very dark gray (10 yr, 3/1) SILT, some fine Sand, little fine to coarse Gravel, little Metal debris, trace Glass (wet)	E	0	
-3-	ND		E	0	
-4-	ND		E	0	2
-5-		----- End of Exploration - 4' bgs			
-6-					
-7-					
-8-					
-9-					
-10-					
-11-					
-12-					
-13-					
-14-					

**REMARKS:**

- Soil samples screened with a MiniRAE 3000 photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. ND = None Detected above background.
- On 12/28/17 excavated soils were visually assessed for the presence of blue staining, which would be indicative of purifier waste. No blue staining was observed.
- Soils backfilled in general order they were excavated. Backfilled soil was compacted via excavator bucket tamping every 12" lift.

<b>TEST PIT PLAN</b> 	<b>LEGEND:</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">BOULDER</td> <td style="text-align: center;">COUNT</td> <td></td> </tr> <tr> <td style="text-align: center;">SIZE RANGE</td> <td style="text-align: center;">LETTER</td> <td></td> </tr> <tr> <td style="text-align: center;">CLASSIFICATION</td> <td style="text-align: center;">DESIGNATION</td> <td></td> </tr> <tr> <td style="text-align: center;">6"-18"</td> <td style="text-align: center;">A</td> <td></td> </tr> <tr> <td style="text-align: center;">18"-36"</td> <td style="text-align: center;">B</td> <td></td> </tr> <tr> <td style="text-align: center;">36" OR LARGER</td> <td style="text-align: center;">C</td> <td></td> </tr> </table>	BOULDER	COUNT		SIZE RANGE	LETTER		CLASSIFICATION	DESIGNATION		6"-18"	A		18"-36"	B		36" OR LARGER	C		<b>PROPORTIONS USED</b> TRACE (TR)      0-10% LITTLE (LI)    10-20% SOME (SO)      20-35% AND              35-50%	<b>EXCAVATION EFFORT</b> E                    EASY M                    MODERATE D                    DIFFICULT  NOT OBSERVED OBSERVED GROUNDWATER LEVEL
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### TEST PIT FIELD LOG

<b>GZA GEOENVIRONMENTAL, INC.</b> 530 BROADWAY PROVIDENCE, RI GEOTECHNICAL CONSULTANTS	<b>PROJECT</b> DESCRIPTION: Former Tidewater Facility  LOCATION: Pawtucket, Rhode Island	<b>TEST PIT NO.:</b> <span style="font-size: 1.2em; font-weight: bold;">TP-534</span>  <b>FILE NO.:</b> 43654.00  <b>DATE:</b> 12/19/17
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GZA ENGINEER: SCC  WEATHER: Partly cloudy, 80s	<b>EXCAVATION EQUIPMENT</b> CONTRACTOR: Moran Environmental OPERATOR: John Duponte MAKE: Kobelco      MODEL: SK1405R LC CAPACITY: 1 cu. yd.      REACH: ~18'	DATUM: NAVD88 GROUND ELEV.: 33.93 TIME STARTED: 0810 TIME COMPLETED: 0830
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DEPTH	PID (ppm)	SOIL DESCRIPTION	EXCAV. EFFORT	BOULDER COUNT QTY. CLASS	REMARK NO.
-1-	ND	Black (10 yr, 2/1) SLAG, little Ash, little Organics (roots) (dry)	E	0	1/2/3
-2-			E	0	
-3-	ND	Brown (10 yr, 5/3), fine SAND, little fine to coarse Gravel, trace Silt (dry)	E	0	
-4-		End of Exploration - 3' bgs			
-5-					
-6-					
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-9-					
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**REMARKS:**

- Soil samples screened with a MiniRAE 3000 photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. ND = None Detected above background.
- On 12/28/17 excavated soils were visually assessed for the presence of blue staining, which would be indicative of purifier waste. No blue staining was observed.
- Soils backfilled in general order they were excavated. Backfilled soil was compacted via excavator bucket tamping every 12" lift.

<b>TEST PIT PLAN</b> 	<b>LEGEND:</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">BOULDER</td> <td style="text-align: center;">COUNT</td> <td></td> </tr> <tr> <td style="text-align: center;">SIZE RANGE</td> <td style="text-align: center;">LETTER</td> <td></td> </tr> <tr> <td style="text-align: center;">CLASSIFICATION</td> <td style="text-align: center;">DESIGNATION</td> <td></td> </tr> <tr> <td style="text-align: center;">6"-18"</td> <td style="text-align: center;">A</td> <td></td> </tr> <tr> <td style="text-align: center;">18"-36"</td> <td style="text-align: center;">B</td> <td></td> </tr> <tr> <td style="text-align: center;">36" OR LARGER</td> <td style="text-align: center;">C</td> <td></td> </tr> </table>	BOULDER	COUNT		SIZE RANGE	LETTER		CLASSIFICATION	DESIGNATION		6"-18"	A		18"-36"	B		36" OR LARGER	C		<b>PROPORTIONS USED</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <td>TRACE (TR)</td> <td style="text-align: right;">0-10%</td> </tr> <tr> <td>LITTLE (LI)</td> <td style="text-align: right;">10-20%</td> </tr> <tr> <td>SOME (SO)</td> <td style="text-align: right;">20-35%</td> </tr> <tr> <td>AND</td> <td style="text-align: right;">35-50%</td> </tr> </table>	TRACE (TR)	0-10%	LITTLE (LI)	10-20%	SOME (SO)	20-35%	AND	35-50%	<b>EXCAVATION EFFORT</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">E</td> <td style="text-align: right;">EASY</td> </tr> <tr> <td style="text-align: center;">M</td> <td style="text-align: right;">MODERATE</td> </tr> <tr> <td style="text-align: center;">D</td> <td style="text-align: right;">DIFFICULT</td> </tr> <tr> <td style="text-align: center;"></td> <td style="text-align: right;">NOT OBSERVED</td> </tr> <tr> <td style="text-align: center;"></td> <td style="text-align: right;">OBSERVED GROUNDWATER LEVEL</td> </tr> </table>	E	EASY	M	MODERATE	D	DIFFICULT		NOT OBSERVED		OBSERVED GROUNDWATER LEVEL
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### TEST PIT FIELD LOG

<b>GZA GEOENVIRONMENTAL, INC.</b> 530 BROADWAY PROVIDENCE, RI GEOTECHNICAL CONSULTANTS	<b>PROJECT</b> DESCRIPTION: Former Tidewater Facility  LOCATION: Pawtucket, Rhode Island	<b>TEST PIT NO.:</b> <span style="font-size: 1.2em;"><b>TP-535A</b></span>  <b>FILE NO.:</b> 43654.00  <b>DATE:</b> 12/19/17
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GZA ENGINEER: SCC  WEATHER: Partly cloudy, 80s	EXCAVATION EQUIPMENT CONTRACTOR: Moran Environmental OPERATOR: John Duponte MAKE: Kobelco CAPACITY: 1 cu. yd.	MODEL: SK1405R LC REACH: -18'	DATUM: NAVD88 GROUND ELEV.: 29.35 TIME STARTED: 0845 TIME COMPLETED: 0900
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DEPTH	PID (ppm)	SOIL DESCRIPTION	EXCAV. EFFORT	BOULDER COUNT QTY. CLASS	REMARK NO.
-1-	ND	0.25' Grayish-brown (10 yr, 5/1), fine to coarse SAND, some Slag, little Ash (dry)			
		----- Dark gray (10 yr, 4/1) SLAG (dry)	E	0	1/2/3
-2-	ND	Brown (10 yr, 5/3), fine to coarse SAND (dry)	E	0	
-3-		----- Dark gray (10 yr, 4/1) Clayey SILT (moist)	E	0	
-4-		End of Exploration - 3' bgs			
-5-					
-6-					
-7-					
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-10-					
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**REMARKS:**

- Soil samples screened with a MiniRAE 3000 photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. ND = None Detected above background.
- On 12/28/17 excavated soils were visually assessed for the presence of blue staining, which would be indicative of purifier waste. No blue staining was observed.
- Soils backfilled in general order they were excavated. Backfilled soil was compacted via excavator bucket tamping every 12" lift.

<b>TEST PIT PLAN</b> 	<b>LEGEND:</b> <table style="width: 100%;"> <tr> <td style="text-align: center;">BOULDER</td> <td style="text-align: center;">COUNT</td> <td></td> </tr> <tr> <td style="text-align: center;">SIZE RANGE</td> <td style="text-align: center;">LETTER</td> <td></td> </tr> <tr> <td style="text-align: center;">CLASSIFICATION</td> <td style="text-align: center;">DESIGNATION</td> <td></td> </tr> <tr> <td style="text-align: center;">6"-18"</td> <td style="text-align: center;">A</td> <td></td> </tr> <tr> <td style="text-align: center;">18"-36"</td> <td style="text-align: center;">B</td> <td></td> </tr> <tr> <td style="text-align: center;">36" OR LARGER</td> <td style="text-align: center;">C</td> <td></td> </tr> </table>	BOULDER	COUNT		SIZE RANGE	LETTER		CLASSIFICATION	DESIGNATION		6"-18"	A		18"-36"	B		36" OR LARGER	C		<b>PROPORTIONS USED</b> TRACE (TR)      0-10% LITTLE (LI)     10-20% SOME (SO)        20-35% AND                35-50%	<b>EXCAVATION EFFORT</b> E                    EASY M                    MODERATE D                    DIFFICULT  NOT OBSERVED OBSERVED GROUNDWATER LEVEL
BOULDER	COUNT																				
SIZE RANGE	LETTER																				
CLASSIFICATION	DESIGNATION																				
6"-18"	A																				
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36" OR LARGER	C																				
VOLUME= 3.3 cu yd.																					

### TEST PIT FIELD LOG

<b>GZA GEOENVIRONMENTAL, INC.</b> 530 BROADWAY PROVIDENCE, RI GEOTECHNICAL CONSULTANTS	<b>PROJECT</b> DESCRIPTION: Former Tidewater Facility  LOCATION: Pawtucket, Rhode Island	<b>TEST PIT NO.:</b> <b>TP-535B</b>  <b>FILE NO.:</b> 43654.00  <b>DATE:</b> 12/19/17
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GZA ENGINEER: SCC	CONTRACTOR: Moran Environmental	EXCAVATION EQUIPMENT	DATUM: NAVD88
WEATHER: Partly cloudy, 80s	OPERATOR: John Duponte	MAKE: Kobelco	GROUND ELEV.: 30.36
	MODEL: SK1405R LC	SK1405R LC	TIME STARTED: 0905
	CAPACITY: 1 cu. yd.	REACH: ~18'    ~18'	IME COMPLETED: 0915

DEPTH	PID (ppm)	SOIL DESCRIPTION	EXCAV. EFFORT	BOULDER COUNT QTY. CLASS	REMARK NO.
-1-	ND	Dark brown to brown (10 yr, 4/3), fine to coarse SAND, little Silt, little fine to coarse Gravel, little Organics (roots), trace Slag (dry)	E	0	1/2/3
-2-			E	0	
-3-			E	0	
-4-			E	0	
-5-		----- End of Exploration - 4' bgs			
-6-					
-7-					
-8-					
-9-					
-10-					
-11-					
-12-					
-13-					
-14-					

**REMARKS:**

- Soil samples screened with a MiniRAE 3000 photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. ND = None Detected above background.
- On 12/28/17 excavated soils were visually assessed for the presence of blue staining, which would be indicative of purifier waste. No blue staining was observed.
- Soils backfilled in general order they were excavated. Backfilled soil was compacted via excavator bucket tamping every 12" lift.

<b>TEST PIT PLAN</b> <p style="font-size: small;">VOLUME= 2.7 cu yd.</p>	<b>LEGEND:</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">BOULDER</td> <td style="text-align: center;">COUNT</td> </tr> <tr> <td style="text-align: center;">SIZE RANGE</td> <td style="text-align: center;">LETTER</td> </tr> <tr> <td style="text-align: center;">CLASSIFICATION</td> <td style="text-align: center;">DESIGNATION</td> </tr> <tr> <td style="text-align: center;">6"-18"</td> <td style="text-align: center;">A</td> </tr> <tr> <td style="text-align: center;">18"-36"</td> <td style="text-align: center;">B</td> </tr> <tr> <td style="text-align: center;">36" OR LARGER</td> <td style="text-align: center;">C</td> </tr> </table>	BOULDER	COUNT	SIZE RANGE	LETTER	CLASSIFICATION	DESIGNATION	6"-18"	A	18"-36"	B	36" OR LARGER	C	<b>PROPORTIONS USED</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">TRACE (TR)</td> <td style="text-align: center;">0-10%</td> </tr> <tr> <td style="text-align: center;">LITTLE (LI)</td> <td style="text-align: center;">10-20%</td> </tr> <tr> <td style="text-align: center;">SOME (SO)</td> <td style="text-align: center;">20-35%</td> </tr> <tr> <td style="text-align: center;">AND</td> <td style="text-align: center;">35-50%</td> </tr> </table>	TRACE (TR)	0-10%	LITTLE (LI)	10-20%	SOME (SO)	20-35%	AND	35-50%	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">E</td> <td style="text-align: center;">EASY</td> </tr> <tr> <td style="text-align: center;">M</td> <td style="text-align: center;">MODERATE</td> </tr> <tr> <td style="text-align: center;">D</td> <td style="text-align: center;">DIFFICULT</td> </tr> <tr> <td style="text-align: center;"></td> <td style="text-align: center;">NOT OBSERVED</td> </tr> <tr> <td style="text-align: center;"></td> <td style="text-align: center;">OBSERVED GROUNDWATER LEVEL</td> </tr> </table>	E	EASY	M	MODERATE	D	DIFFICULT		NOT OBSERVED		OBSERVED GROUNDWATER LEVEL
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### TEST PIT FIELD LOG

<b>GZA GEOENVIRONMENTAL, INC.</b> 530 BROADWAY PROVIDENCE, RI GEOTECHNICAL CONSULTANTS	<b>PROJECT</b> DESCRIPTION: Former Tidewater Facility  LOCATION: Pawtucket, Rhode Island	<b>TEST PIT NO.:</b> <span style="font-size: 1.2em;"><b>TP-536</b></span>  <b>FILE NO.:</b> 43654.00  <b>DATE:</b> 12/19/17
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GZA ENGINEER: SCC  WEATHER: Partly cloudy, 80s	<b>EXCAVATION EQUIPMENT</b> CONTRACTOR: Moran Environmental OPERATOR: John Duponte MAKE: Kobelco      MODEL: SK1405R LC      SK1405R LC CAPACITY: 1 cu. yd.      REACH: ~18'      ~18'	DATUM: NAVD88 GROUND ELEV.: 25.55 TIME STARTED: 0915 TIME COMPLETED: 0925
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DEPTH	PID (ppm)	SOIL DESCRIPTION	EXCAV. EFFORT	BOULDER COUNT QTY. CLASS	REMARK NO.
-1-	ND	Brown (10 yr, 5/3), fine to coarse SAND, some fine to coarse Gravel, little Organics (roots) (dry)	E	0	1/2/4
-2-	ND	Brown (10 yr, 5/3), fine to coarse GRAVEL, little fine to coarse Sand (dry) ----- Gray (10 yr, 5/1), fine to coarse SAND, little Silt, trace fine to coarse Gravel (dry)	E	0	3
-3-		Brown (10 yr, 5/3), fine SAND, trace silt (dry)	E	0	
-4-		End of Exploration - 3' bgs			
-5-					
-6-					
-7-					
-8-					
-9-					
-10-					
-11-					
-12-					
-13-					
-14-					

**REMARKS:**

1. Soil samples screened with a MiniRAE 3000 photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. ND = None Detected above background.
2. On 12/28/17 excavated soils were visually assessed for the presence of blue staining, which would be indicative of purifier waste. No blue staining was observed.
3. Heavy groundwater weeping from pit face at 3 feet below ground surface.
4. Soils backfilled in the general order they were excavated. Backfilled soil was compacted via excavator bucket tamping every 12 inch lift.

<b>TEST PIT PLAN</b> 	<b>LEGEND:</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">BOULDER</td> <td style="width: 30%;">COUNT</td> <td style="width: 40%;">PROPORTIONS USED</td> </tr> <tr> <td>SIZE RANGE</td> <td>LETTER</td> <td>TRACE (TR)      0-10%</td> </tr> <tr> <td>CLASSIFICATION</td> <td>DESIGNATION</td> <td>LITTLE (LI)     10-20%</td> </tr> <tr> <td>6"-18"</td> <td>A</td> <td>SOME (SO)      20-35%</td> </tr> <tr> <td>18"-36"</td> <td>B</td> <td>AND              35-50%</td> </tr> <tr> <td>36" OR LARGER</td> <td>C</td> <td></td> </tr> </table>	BOULDER	COUNT	PROPORTIONS USED	SIZE RANGE	LETTER	TRACE (TR)      0-10%	CLASSIFICATION	DESIGNATION	LITTLE (LI)     10-20%	6"-18"	A	SOME (SO)      20-35%	18"-36"	B	AND              35-50%	36" OR LARGER	C		<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%; text-align: center;">                     EXCAVATION EFFORT                       E M D   </td> <td style="width: 70%; text-align: center;">                     EASY MODERATE DIFFICULT                       NOT OBSERVED OBSERVED GROUNDWATER LEVEL                 </td> </tr> </table>	EXCAVATION EFFORT  E M D  	EASY MODERATE DIFFICULT  NOT OBSERVED OBSERVED GROUNDWATER LEVEL
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VOLUME= 2.5 cu yd.

### TEST PIT FIELD LOG

<b>GZA GEOENVIRONMENTAL, INC.</b> 530 BROADWAY PROVIDENCE, RI GEOTECHNICAL CONSULTANTS	<b>PROJECT</b> DESCRIPTION: Former Tidewater Facility  LOCATION: Pawtucket, Rhode Island	<b>TEST PIT NO.:</b> <span style="font-size: 1.2em; font-weight: bold;">TP-537</span>  <b>FILE NO.:</b> 43654.00  <b>DATE:</b> 12/19/17
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GZA ENGINEER: SCC	CONTRACTOR: Moran Environmental	EXCAVATION EQUIPMENT	DATUM: NAVD88
WEATHER: Partly cloudy, 80s	OPERATOR: John Duponte	MAKE: Kobelco	GROUND ELEV.: 27.54
	MODEL: SK1405R LC	REACH: ~18'	TIME STARTED: 0945
	CAPACITY: 1 cu. yd.		TIME COMPLETED: 1000

DEPTH	PID (ppm)	SOIL DESCRIPTION	EXCAV. EFFORT	BOULDER COUNT QTY. CLASS	REMARK NO.	
-1-	ND	Brown (10 yr, 5/3), fine to coarse SAND, some fine to coarse Gravel, little Organics (roots) (dry)	E	0	1/2/3/4	
-2-		Grayish-brown (10 yr, 5/2), fine to coarse SAND, some fine to coarse Gravel, little Silt, little Slag, trace Cobble (dry)	E	0		
-3-	ND	Gray (10 yr, 5/1), fine SAND, some fine to coarse Gravel, some Silt, trace Cobble (dry)	E	0		
-4-		End of Exploration - 3.5' bgs				
-5-						
-6-						
-7-						
-8-						
-9-						
-10-						
-11-						
-12-						
-13-						
-14-						

**REMARKS:**

- Soil samples screened with a MiniRAE 3000 photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. ND = None Detected above background.
- Geotextile fabric observed at approximately 1 foot below grade.
- On 12/28/17 excavated soils were visually assessed for the presence of blue staining, which would be indicative of purifier waste. No blue staining was observed.
- Soils backfilled in general order they were excavated. Backfilled soil was compacted via excavator bucket tamping every 12" lift.

<b>TEST PIT PLAN</b> <p style="font-size: 0.8em;">VOLUME= 3.1 cu yd.</p>	<b>LEGEND:</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">BOULDER</td> <td style="width: 30%;">COUNT</td> <td style="width: 40%;">PROPORTIONS USED</td> </tr> <tr> <td>SIZE RANGE</td> <td>LETTER</td> <td></td> </tr> <tr> <td>CLASSIFICATION</td> <td>DESIGNATION</td> <td></td> </tr> <tr> <td>6"-18"</td> <td>A</td> <td>TRACE (TR) 0-10%</td> </tr> <tr> <td>18"-36"</td> <td>B</td> <td>LITTLE (LI) 10-20%</td> </tr> <tr> <td>36" OR LARGER</td> <td>C</td> <td>SOME (SO) 20-35%</td> </tr> <tr> <td></td> <td></td> <td>AND 35-50%</td> </tr> </table>	BOULDER	COUNT	PROPORTIONS USED	SIZE RANGE	LETTER		CLASSIFICATION	DESIGNATION		6"-18"	A	TRACE (TR) 0-10%	18"-36"	B	LITTLE (LI) 10-20%	36" OR LARGER	C	SOME (SO) 20-35%			AND 35-50%	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%; text-align: center;">EXCAVATION EFFORT</td> <td style="width: 70%;"></td> </tr> <tr> <td style="text-align: center;">E</td> <td style="text-align: center;">EASY</td> </tr> <tr> <td style="text-align: center;">M</td> <td style="text-align: center;">MODERATE</td> </tr> <tr> <td style="text-align: center;">D</td> <td style="text-align: center;">DIFFICULT</td> </tr> <tr> <td style="text-align: center;"></td> <td style="text-align: center;">NOT OBSERVED</td> </tr> <tr> <td style="text-align: center;">—</td> <td style="text-align: center;">OBSERVED GROUNDWATER LEVEL</td> </tr> </table>	EXCAVATION EFFORT		E	EASY	M	MODERATE	D	DIFFICULT		NOT OBSERVED	—	OBSERVED GROUNDWATER LEVEL
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### TEST PIT FIELD LOG

<b>GZA GEOENVIRONMENTAL, INC.</b> 530 BROADWAY PROVIDENCE, RI GEOTECHNICAL CONSULTANTS	<b>PROJECT</b> DESCRIPTION: Former Tidewater Facility  LOCATION: Pawtucket, Rhode Island	<b>TEST PIT NO.:</b> <span style="font-size: 1.2em; font-weight: bold;">TP-538</span>  <b>FILE NO.:</b> 43654.00  <b>DATE:</b> 12/19/17
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GZA ENGINEER: SCC	CONTRACTOR: Moran Environmental	EXCAVATION EQUIPMENT	DATUM: NAVD88
WEATHER: Partly cloudy, 80s	OPERATOR: John Duponte	MAKE: Kobelco	GROUND ELEV.: 17.87
	MODEL: SK1405R LC	SK1405R LC	TIME STARTED: 0930
	CAPACITY: 1 cu. yd.	REACH: ~18'      ~18'	IME COMPLETED: 0940

DEPTH	PID (ppm)	SOIL DESCRIPTION	EXCAV. EFFORT	BOULDER COUNT QTY. CLASS	REMARK NO.
-1-	ND	Dark brown (10 yr, 3/3), fine to coarse SAND, some Concrete, some Slag, little fine to coarse Gravel, little Cobble, little Organics (roots), little Metal debris (dry)	E	0	1/2/3/4
-2-	ND	Dark brown (10 yr, 3/3) CONCRETE, some Slag, little fine to coarse Sand, little Brick, little fine to coarse Gravel, little Cobble (dry)	M	0	
-3-			M	0	
-4-			M	0	
-5-		End of Exploration - 4' bgs			
-6-					
-7-					
-8-					
-9-					
-10-					
-11-					
-12-					
-13-					
-14-					

**REMARKS:**

1. Soil samples screened with a MiniRAE 3000 photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. ND = None Detected above background.
2. Filter fabric observed ~1' bgs.
3. On 12/28/17 excavated soils were visually assessed for the presence of blue staining, which would be indicative of purifier waste. No blue staining was observed.
4. Soils backfilled in general order they were excavated. Backfilled soil was compacted via excavator bucket tamping every 12" lift.

<b>TEST PIT PLAN</b> 	<b>LEGEND:</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">BOULDER</td> <td style="text-align: center;">COUNT</td> </tr> <tr> <td style="text-align: center;">SIZE RANGE</td> <td style="text-align: center;">LETTER</td> </tr> <tr> <td style="text-align: center;">CLASSIFICATION</td> <td style="text-align: center;">DESIGNATION</td> </tr> <tr> <td style="text-align: center;">6"-18"</td> <td style="text-align: center;">A</td> </tr> <tr> <td style="text-align: center;">18"-36"</td> <td style="text-align: center;">B</td> </tr> <tr> <td style="text-align: center;">36" OR LARGER</td> <td style="text-align: center;">C</td> </tr> </table>	BOULDER	COUNT	SIZE RANGE	LETTER	CLASSIFICATION	DESIGNATION	6"-18"	A	18"-36"	B	36" OR LARGER	C	<table style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="2" style="text-align: center;">PROPORTIONS USED</th> </tr> <tr> <td style="text-align: center;">TRACE (TR)</td> <td style="text-align: center;">0-10%</td> </tr> <tr> <td style="text-align: center;">LITTLE (LI)</td> <td style="text-align: center;">10-20%</td> </tr> <tr> <td style="text-align: center;">SOME (SO)</td> <td style="text-align: center;">20-35%</td> </tr> <tr> <td style="text-align: center;">AND</td> <td style="text-align: center;">35-50%</td> </tr> </table>	PROPORTIONS USED		TRACE (TR)	0-10%	LITTLE (LI)	10-20%	SOME (SO)	20-35%	AND	35-50%	<table style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="2" style="text-align: center;">EXCAVATION EFFORT</th> </tr> <tr> <td style="text-align: center;">E</td> <td style="text-align: center;">EASY</td> </tr> <tr> <td style="text-align: center;">M</td> <td style="text-align: center;">MODERATE</td> </tr> <tr> <td style="text-align: center;">D</td> <td style="text-align: center;">DIFFICULT</td> </tr> <tr> <td colspan="2" style="text-align: center;">NOT OBSERVED</td> </tr> <tr> <td colspan="2" style="text-align: center;">OBSERVED GROUNDWATER LEVEL</td> </tr> </table>	EXCAVATION EFFORT		E	EASY	M	MODERATE	D	DIFFICULT	NOT OBSERVED		OBSERVED GROUNDWATER LEVEL	
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### TEST PIT FIELD LOG

<b>GZA GEOENVIRONMENTAL, INC.</b> 530 BROADWAY PROVIDENCE, RI GEOTECHNICAL CONSULTANTS	<b>PROJECT</b> DESCRIPTION: Former Tidewater Facility  LOCATION: Pawtucket, Rhode Island	<b>TEST PIT NO.:</b> <span style="font-size: 1.2em; font-weight: bold;">TP-539</span>  <b>FILE NO.:</b> 43654.00  <b>DATE:</b> 12/20/17
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GZA ENGINEER: SCC	CONTRACTOR: Moran Environmental	EXCAVATION EQUIPMENT	DATUM: NAVD88
WEATHER: Partly cloudy, 80s	OPERATOR: John Duponte	MAKE: Kobelco	GROUND ELEV.: 20.53
	MODEL: SK1405R LC	REACH: ~18'	TIME STARTED: 1145
	CAPACITY: 1 cu. yd.		TIME COMPLETED: 1210

DEPTH	PID (ppm)	SOIL DESCRIPTION	EXCAV. EFFORT	BOULDER COUNT QTY. CLASS	REMARK NO.
-1-	ND	Black (10 yr, 2/1), fine to coarse SAND and GRAVEL, some Organics (roots), little Slag, surficial blue-green staining (dry)	E	0	1/3/4/5
-2-		Dark gray (10 yr, 5/1), SLAG and ASH, some fine to coarse Sand (dry)	E	0	
-3-		Orange-brown (10 yr, 6/6) ROCK, some Cobble, some Brick (dry)	E	0	
-4-	ND	Black (10 yr, 2/1), fine SAND, little fine to coarse and GRAVEL, little Slag, trace Cobble, trace Brick, sporadic blue staining (dry)	E	0	
-5-		Dark gray (10 yr, 5/1) SLAG and ASH, little fine to coarse Sand, little fine to coarse Gravel, sproadic blue staining (dry)	E	0	2
-6-		End of Exploration at 5' bgs			
-7-					
-8-					
-9-					
-10-					
-11-					
-12-					
-13-					
-14-					

**REMARKS:**

- Soil samples screened with a MiniRAE 3000 photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. ND = None Detected above background.
- Groundwater weeping from pit face at ~5 bgs.
- Filter fabric observed ~1' bgs.
- On 12/28/17 excavated soils were visually assessed for the presence of blue staining, which would be indicative of purifier waste. No blue staining was observed other than the staining originally observed.
- Soils backfilled in general order they were excavated. Backfilled soil was compacted via excavator bucket tamping every 12" lift.

TEST PIT PLAN 	<b>LEGEND:</b> <table style="width: 100%;"> <tr> <td style="width: 33%;">BOULDER</td> <td style="width: 33%;">COUNT</td> <td style="width: 33%;">PROPORTIONS USED</td> </tr> <tr> <td>SIZE RANGE</td> <td>LETTER DESIGNATION</td> <td>TRACE (TR) 0-10%</td> </tr> <tr> <td>CLASSIFICATION</td> <td>A</td> <td>LITTLE (LI) 10-20%</td> </tr> <tr> <td>6"-18"</td> <td>B</td> <td>SOME (SO) 20-35%</td> </tr> <tr> <td>18"-36"</td> <td>C</td> <td>AND 35-50%</td> </tr> <tr> <td>36" OR LARGER</td> <td></td> <td></td> </tr> </table>	BOULDER	COUNT	PROPORTIONS USED	SIZE RANGE	LETTER DESIGNATION	TRACE (TR) 0-10%	CLASSIFICATION	A	LITTLE (LI) 10-20%	6"-18"	B	SOME (SO) 20-35%	18"-36"	C	AND 35-50%	36" OR LARGER			EXCAVATION EFFORT <table style="width: 100%;"> <tr> <td style="width: 33%;">E</td> <td style="width: 33%;">EASY</td> </tr> <tr> <td>M</td> <td>MODERATE</td> </tr> <tr> <td>D</td> <td>DIFFICULT</td> </tr> <tr> <td colspan="2" style="text-align: center;">NOT OBSERVED</td> </tr> <tr> <td colspan="2" style="text-align: center;">OBSERVED GROUNDWATER LEVEL</td> </tr> </table>	E	EASY	M	MODERATE	D	DIFFICULT	NOT OBSERVED		OBSERVED GROUNDWATER LEVEL	
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### TEST PIT FIELD LOG

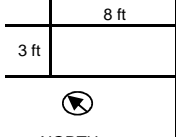

<b>GZA GEOENVIRONMENTAL, INC.</b> 530 BROADWAY PROVIDENCE, RI GEOTECHNICAL CONSULTANTS	<b>PROJECT</b> DESCRIPTION: Former Tidewater Facility  LOCATION: Pawtucket, Rhode Island	<b>TEST PIT NO.:</b> <span style="font-size: 1.2em; font-weight: bold;">TP-540</span>  <b>FILE NO.:</b> 43654.00  <b>DATE:</b> 12/19/17
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GZA ENGINEER: SCC  WEATHER: Partly cloudy, 80s	<b>EXCAVATION EQUIPMENT</b> CONTRACTOR: Moran Environmental OPERATOR: John Duponte MAKE: Kobelco      MODEL: SK1405R LC CAPACITY: 1 cu. yd.      REACH: ~18'	DATUM: NAVD88 GROUND ELEV.: 7.92 TIME STARTED: 1305 TIME COMPLETED: 1230
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DEPTH	PID (ppm)	SOIL DESCRIPTION	EXCAV. EFFORT	BOULDER COUNT QTY. CLASS	REMARK NO.
-1-	ND	Black (10 yr, 2/1), fine to coarse SAND, some Organics (roots), little fine to coarse Gravel (dry)		0	
-2-	ND	Grayish-brown (10 yr, 5/2), fine to coarse SAND, some fine to coarse Gravel, little Silt (dry)	E		1/2/3
-3-			E	0	
-4-			E	0	
-5-		End of Exploration at 4' bgs			
-6-					
-7-					
-8-					
-9-					
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-12-					
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**REMARKS:**

1. Soil samples screened with a MiniRAE 3000 photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. ND = None Detected above background.
2. On 12/28/17 excavated soils were visually assessed for the presence of blue staining, which would be indicative of purifier waste. No blue staining was observed.
3. Soils backfilled in general order they were excavated. Backfilled soil was compacted via excavator bucket tamping every 12" lift.

<b>TEST PIT PLAN</b>  NORTH VOLUME= 3.5 cu yd.	<b>LEGEND:</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">BOULDER</td> <td style="text-align: center;">COUNT</td> </tr> <tr> <td style="text-align: center;">SIZE RANGE</td> <td style="text-align: center;">LETTER</td> </tr> <tr> <td style="text-align: center;">CLASSIFICATION</td> <td style="text-align: center;">DESIGNATION</td> </tr> <tr> <td style="text-align: center;">6"-18"</td> <td style="text-align: center;">A</td> </tr> <tr> <td style="text-align: center;">18"-36"</td> <td style="text-align: center;">B</td> </tr> <tr> <td style="text-align: center;">36" OR LARGER</td> <td style="text-align: center;">C</td> </tr> </table>	BOULDER	COUNT	SIZE RANGE	LETTER	CLASSIFICATION	DESIGNATION	6"-18"	A	18"-36"	B	36" OR LARGER	C	<b>PROPORTIONS USED</b> TRACE (TR)      0-10% LITTLE (LI)      10-20% SOME (SO)      20-35% AND      35-50%	<b>EXCAVATION EFFORT</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">E</td> <td style="text-align: center;">EASY</td> </tr> <tr> <td style="text-align: center;">M</td> <td style="text-align: center;">MODERATE</td> </tr> <tr> <td style="text-align: center;">D</td> <td style="text-align: center;">DIFFICULT</td> </tr> <tr> <td colspan="2" style="text-align: center;">NOT OBSERVED</td> </tr> <tr> <td colspan="2" style="text-align: center;">OBSERVED GROUNDWATER LEVEL</td> </tr> </table> 	E	EASY	M	MODERATE	D	DIFFICULT	NOT OBSERVED		OBSERVED GROUNDWATER LEVEL	
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### TEST PIT FIELD LOG

<b>GZA GEOENVIRONMENTAL, INC.</b> 530 BROADWAY PROVIDENCE, RI GEOTECHNICAL CONSULTANTS	<b>PROJECT</b> DESCRIPTION: Former Tidewater Facility  LOCATION: Pawtucket, Rhode Island	<b>TEST PIT NO.:</b> <span style="font-size: 1.2em;"><b>TP-541</b></span>  <b>FILE NO.:</b> 43654.00  <b>DATE:</b> 12/19/17
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GZA ENGINEER: SCC	CONTRACTOR: Moran Environmental	EXCAVATION EQUIPMENT	DATUM: NAVD88
WEATHER: Partly cloudy, 80s	OPERATOR: John Duponte	GROUND ELEV.: 7.55	TIME STARTED: 1240
	MAKE: Kobelco	MODEL: SK1405R LC	TIME COMPLETED: 1250
	CAPACITY: 1 cu. yd.	REACH: ~18'	

DEPTH	PID (ppm)	SOIL DESCRIPTION	EXCAV. EFFORT	BOULDER COUNT QTY. CLASS	REMARK NO.
-1-	ND	Black (10 yr, 2/1), fine to coarse SAND, some Slag, some Organics (roots), little fine to coarse Gravel, little Cobble (dry)	E	0	1/2/3
-2-	ND	Brown (10 yr, 4/3), fine to medium SAND, little fine to coarse Gravel, trace coarse Sand, trace Silt (dry)	E	0	
-3-	ND		E	0	
-4-	ND		E	0	
-5-	ND	----- End of Exploration at 4' bgs			
-6-	ND				
-7-	ND				
-8-	ND				
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**REMARKS:**

- Soil samples screened with a MiniRAE 3000 photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. ND = None Detected above background.
- On 12/28/17 excavated soils were visually assessed for the presence of blue staining, which would be indicative of purifier waste. No blue staining was observed.
- Soils backfilled in general order they were excavated. Backfilled soil was compacted via excavator bucket tamping every 12" lift.

<b>TEST PIT PLAN</b> <p style="text-align: center;">NORTH</p> VOLUME= 3.7 cu yd.	<b>LEGEND:</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">BOULDER</td> <td style="width: 50%;">COUNT</td> </tr> <tr> <td>SIZE RANGE</td> <td>LETTER</td> </tr> <tr> <td>CLASSIFICATION</td> <td>DESIGNATION</td> </tr> <tr> <td>6"-18"</td> <td>A</td> </tr> <tr> <td>18"-36"</td> <td>B</td> </tr> <tr> <td>36" OR LARGER</td> <td>C</td> </tr> </table>	BOULDER	COUNT	SIZE RANGE	LETTER	CLASSIFICATION	DESIGNATION	6"-18"	A	18"-36"	B	36" OR LARGER	C	<b>PROPORTIONS USED</b> TRACE (TR)      0-10% LITTLE (LI)     10-20% SOME (SO)        20-35% AND                35-50%	<b>EXCAVATION EFFORT</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">E</td> <td style="text-align: center;">EASY</td> </tr> <tr> <td style="text-align: center;">M</td> <td style="text-align: center;">MODERATE</td> </tr> <tr> <td style="text-align: center;">D</td> <td style="text-align: center;">DIFFICULT</td> </tr> <tr> <td style="text-align: center;"></td> <td style="text-align: center;">NOT OBSERVED</td> </tr> <tr> <td style="text-align: center;"></td> <td style="text-align: center;">OBSERVED GROUNDWATER LEVEL</td> </tr> </table>	E	EASY	M	MODERATE	D	DIFFICULT		NOT OBSERVED		OBSERVED GROUNDWATER LEVEL
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### TEST PIT FIELD LOG

<b>GZA GEOENVIRONMENTAL, INC.</b> 530 BROADWAY PROVIDENCE, RI GEOTECHNICAL CONSULTANTS	<b>PROJECT</b> DESCRIPTION: Former Tidewater Facility  LOCATION: Pawtucket, Rhode Island	<b>TEST PIT NO.:</b> <span style="font-size: 1.2em; font-weight: bold;">TP-542</span>  <b>FILE NO.:</b> 43654.00  <b>DATE:</b> 12/19/17
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GZA ENGINEER: SCC	CONTRACTOR: Moran Environmental	EXCAVATION EQUIPMENT	DATUM: NAVD88
WEATHER: Partly cloudy, 80s	OPERATOR: John Duponte	MAKE: Kobelco	GROUND ELEV.: 16.9
	MODEL: SK1405R LC	CAPACITY: 1 cu. yd.	TIME STARTED: 1030
	REACH: ~18'		TIME COMPLETED: 1040

DEPTH	PID (ppm)	SOIL DESCRIPTION	EXCAV. EFFORT	BOULDER COUNT QTY. CLASS	REMARK NO.
-1-	ND	Brown (10 yr, 5/3), fine to medium SAND, some Organics (roots) (dry) 0.25'			
-2-		Pale brown (10 yr, 7/2), fine to medium SAND, some fine to coarse Gravel, trace Silt (dry)	E	0	1/2/3/4
-3-	ND	Pale brown (10 yr, 7/2), fine to coarse SAND, some Slag, some fine to coarse Gravel, little Cobble, trace Metal debris (dry)			
-4-			M	2A, 1B	
-5-		End of Exploration at 4' bgs			
-6-					
-7-					
-8-					
-9-					
-10-					
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-12-					
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**REMARKS:**

- Soil samples screened with a MiniRAE 3000 photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. ND = None Detected above background.
- Geotextile fabric observed at approximately 1 foot below grade.
- On 12/28/17 excavated soils were visually assessed for the presence of blue staining, which would be indicative of purifier waste. No blue staining was observed.
- Soils backfilled in general order they were excavated. Backfilled soil was compacted via excavator bucket tamping every 12" lift.

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### TEST PIT FIELD LOG

<b>GZA GEOENVIRONMENTAL, INC.</b> 530 BROADWAY PROVIDENCE, RI GEOTECHNICAL CONSULTANTS	<b>PROJECT</b> DESCRIPTION: Former Tidewater Facility  LOCATION: Pawtucket, Rhode Island	<b>TEST PIT NO.:</b> <span style="font-size: 1.2em;"><b>TP-543</b></span>  <b>FILE NO.:</b> 43654.00  <b>DATE:</b> 12/19/17
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GZA ENGINEER: SCC	CONTRACTOR: Moran Environmental	EXCAVATION EQUIPMENT	DATUM: NAVD88
WEATHER: Partly cloudy, 80s	OPERATOR: John Duponte	MAKE: Kobelco	GROUND ELEV.: 19.12
	MODEL: SK1405R LC	REACH: ~18'	TIME STARTED: 1020
	CAPACITY: 1 cu. yd.		TIME COMPLETED: 1030

DEPTH	PID (ppm)	SOIL DESCRIPTION	EXCAV. EFFORT	BOULDER COUNT QTY. CLASS	REMARK NO.
-1-	ND	Brown (10 yr, 5/3), fine to medium SAND, little Organics (roots), trace fine to coarse Gravel (dry)		0	
		Pale brown (10 yr, 7/2), fine to coarse SAND, little fine to coarse Gravel (dry)	E	0	1/2/3/4
-2-		Brown (10 yr, 5/3), fine to coarse SAND (dry)			
		Gray (10 yr, 6/1), fine SAND, little Silt, trace Metal debris (moist)	E	0	
-3-	ND	Dark gray (10 yr, 4/1) Clayey SILT, some fine to coarse Sand, slight sulfur-like odor (moist)	E	0	
-4-		End of Exploration at 3.5' bgs	E	0	
-5-					
-6-					
-7-					
-8-					
-9-					
-10-					
-11-					
-12-					
-13-					
-14-					

**REMARKS:**

- Soil samples screened with a MiniRAE 3000 photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. ND = None Detected above background.
- Geotextile fabric observed at approximately 1 foot below grade.
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<b>TEST PIT PLAN</b> <p style="text-align: center;">NORTH</p> <p>VOLUME= 3.9 cu yd.</p>	<b>LEGEND:</b>  <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;">BOULDER</td> <td style="width: 33%;">COUNT</td> <td style="width: 33%;">PROPORTIONS USED</td> </tr> <tr> <td>SIZE RANGE</td> <td>LETTER</td> <td>TRACE (TR) 0-10%</td> </tr> <tr> <td>CLASSIFICATION</td> <td>DESIGNATION</td> <td>LITTLE (LI) 10-20%</td> </tr> <tr> <td>6"-18"</td> <td>A</td> <td>SOME (SO) 20-35%</td> </tr> <tr> <td>18"-36"</td> <td>B</td> <td>AND 35-50%</td> </tr> <tr> <td>36" OR LARGER</td> <td>C</td> <td></td> </tr> </table>	BOULDER	COUNT	PROPORTIONS USED	SIZE RANGE	LETTER	TRACE (TR) 0-10%	CLASSIFICATION	DESIGNATION	LITTLE (LI) 10-20%	6"-18"	A	SOME (SO) 20-35%	18"-36"	B	AND 35-50%	36" OR LARGER	C		<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;">EXCAVATION EFFORT</td> <td style="width: 50%;"></td> </tr> <tr> <td style="text-align: center;">E</td> <td style="text-align: center;">EASY</td> </tr> <tr> <td style="text-align: center;">M</td> <td style="text-align: center;">MODERATE</td> </tr> <tr> <td style="text-align: center;">D</td> <td style="text-align: center;">DIFFICULT</td> </tr> <tr> <td style="text-align: center;"></td> <td style="text-align: center;">NOT OBSERVED</td> </tr> <tr> <td style="text-align: center;"></td> <td style="text-align: center;">OBSERVED GROUNDWATER LEVEL</td> </tr> </table>	EXCAVATION EFFORT		E	EASY	M	MODERATE	D	DIFFICULT		NOT OBSERVED		OBSERVED GROUNDWATER LEVEL
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### TEST PIT FIELD LOG

<b>GZA GEOENVIRONMENTAL, INC.</b> 530 BROADWAY PROVIDENCE, RI GEOTECHNICAL CONSULTANTS	<b>PROJECT</b> DESCRIPTION: Former Tidewater Facility  LOCATION: Pawtucket, Rhode Island	<b>TEST PIT NO.:</b> <span style="font-size: 1.2em; font-weight: bold;">TP-544</span>  <b>FILE NO.:</b> 43654.00  <b>DATE:</b> 12/19/17
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GZA ENGINEER: SCC	EXCAVATION EQUIPMENT	DATUM: NAVD88	
WEATHER: Partly cloudy, 80s	CONTRACTOR: Moran Environmental	GROUND ELEV.: 8.66	
	OPERATOR: John Duponte	TIME STARTED: 12.25	
	MAKE: Kobelco	TIME COMPLETED: 12.35	
	MODEL: SK1405R LC		
	CAPACITY: 1 cu. yd.	REACH: ~18'	

DEPTH	PID (ppm)	SOIL DESCRIPTION	EXCAV. EFFORT	BOULDER COUNT QTY. CLASS	REMARK NO.
-1-	ND	Dark brown (10 yr, 3/3), fine to coarse SAND, little Silt, little fine to coarse Gravel, little Organics (roots), trace Slag (dry)	E	0	1/2/3
-2-	ND	Grayish-brown (10 yr, 5/2), fine to coarse SAND and SLAG, some fine to coarse Gravel, little Ash, little Organics (roots) (dry)	E	0	
-3-		Gray (10 yr, 6/1), fine SAND, little Silt, trace fine to coarse Gravel (dry)	E	0	
-4-		Orange-brown (10 yr, 5/4), fine to coarse SAND, trace fine to coarse Gravel (dry)	E	0	
-5-		Grayish-brown (10 yr, 5/2), fine SAND, some Silt, trace fine to coarse Gravel (moist)	E	0	
-6-		End of Exploration at 3.5' bgs			
-7-					
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**REMARKS:**

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### TEST PIT FIELD LOG

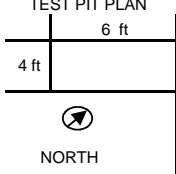

<b>GZA GEOENVIRONMENTAL, INC.</b> 530 BROADWAY PROVIDENCE, RI GEOTECHNICAL CONSULTANTS	<b>PROJECT</b> DESCRIPTION: Former Tidewater Facility  LOCATION: Pawtucket, Rhode Island	<b>TEST PIT NO.:</b> <span style="font-size: 1.2em; font-weight: bold;">TP-545</span>  <b>FILE NO.:</b> 43654.00  <b>DATE:</b> 12/19/17
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GZA ENGINEER: SCC	CONTRACTOR: Moran Environmental	EXCAVATION EQUIPMENT	DATUM: NAVD88
WEATHER: Partly cloudy, 80s	OPERATOR: John Duponte	MAKE: Kobelco	GROUND ELEV.: 9.72
	MODEL: SK1405R LC	REACH: ~18'	TIME STARTED: 1210
	CAPACITY: 1 cu. yd.		TIME COMPLETED: 1220

DEPTH	PID (ppm)	SOIL DESCRIPTION	EXCAV. EFFORT	BOULDER COUNT QTY. CLASS	REMARK NO.
-1-	ND	Black (10 yr, 2/1) SLAG, some fine to coarse Sand, trace fine to coarse Gravel (dry)	E	0	1/2/3/4
-2-	ND	Pale brown (10 yr, 7/2), fine SAND, some Concrete, some fine to coarse Gravel, some Cobble, little Silt, trace Brick (moist)	M	0	
-3-			M	0	
-4-		End of Exploration at 3' bgs			
-5-					
-6-					
-7-					
-8-					
-9-					
-10-					
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-12-					
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**REMARKS:**

1. Soil samples screened with a MiniRAE 3000 photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. ND = None Detected above background.
2. On 12/28/17 excavated soils were visually assessed for the presence of blue staining, which would be indicative of purifier waste. No blue staining was observed.
3. Soils backfilled in general order they were excavated. Backfilled soil was compacted via excavator bucket tamping every 12" left.
4. Groundwater observed at approximately 3 feet below grade.

<b>TEST PIT PLAN</b>  <p style="text-align: center;">NORTH</p> <p>VOLUME= 3.5 cu yd.</p>	<b>LEGEND:</b>  <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">BOULDER</td> <td style="text-align: center;">COUNT</td> </tr> <tr> <td style="text-align: center;">SIZE RANGE</td> <td style="text-align: center;">LETTER</td> </tr> <tr> <td style="text-align: center;">CLASSIFICATION</td> <td style="text-align: center;">DESIGNATION</td> </tr> <tr> <td style="text-align: center;">6"-18"</td> <td style="text-align: center;">A</td> </tr> <tr> <td style="text-align: center;">18"-36"</td> <td style="text-align: center;">B</td> </tr> <tr> <td style="text-align: center;">36" OR LARGER</td> <td style="text-align: center;">C</td> </tr> </table>	BOULDER	COUNT	SIZE RANGE	LETTER	CLASSIFICATION	DESIGNATION	6"-18"	A	18"-36"	B	36" OR LARGER	C	<b>PROPORTIONS USED</b>  <table style="width: 100%; border-collapse: collapse;"> <tr> <td>TRACE (TR)</td> <td style="text-align: right;">0-10%</td> </tr> <tr> <td>LITTLE (LI)</td> <td style="text-align: right;">10-20%</td> </tr> <tr> <td>SOME (SO)</td> <td style="text-align: right;">20-35%</td> </tr> <tr> <td>AND</td> <td style="text-align: right;">35-50%</td> </tr> </table>	TRACE (TR)	0-10%	LITTLE (LI)	10-20%	SOME (SO)	20-35%	AND	35-50%	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">E</td> <td style="text-align: center;">EASY</td> </tr> <tr> <td style="text-align: center;">M</td> <td style="text-align: center;">MODERATE</td> </tr> <tr> <td style="text-align: center;">D</td> <td style="text-align: center;">DIFFICULT</td> </tr> </table> <div style="text-align: center; margin-top: 10px;">                   OBSERVED GROUNDWATER LEVEL             </div>	E	EASY	M	MODERATE	D	DIFFICULT
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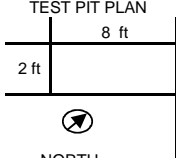

<b>GZA GEOENVIRONMENTAL, INC.</b> 530 BROADWAY PROVIDENCE, RI GEOTECHNICAL CONSULTANTS	<b>PROJECT</b> DESCRIPTION: Former Tidewater Facility  LOCATION: Pawtucket, Rhode Island	<b>TEST PIT NO.:</b> <span style="font-size: 1.2em; font-weight: bold;">TP-546</span>  <b>FILE NO.:</b> 43654.00  <b>DATE:</b> 12/19/17
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GZA ENGINEER: SCC	CONTRACTOR: Moran Environmental	EXCAVATION EQUIPMENT	DATUM: NAVD88
WEATHER: Partly cloudy, 80s	OPERATOR: John Duponte	GROUND ELEV.: 12.74	TIME STARTED: 1200
	MAKE: Kobelco	MODEL: SK1405R LC	TIME COMPLETED: 1210
	CAPACITY: 1 cu. yd.	REACH: ~18'	

DEPTH	PID (ppm)	SOIL DESCRIPTION	EXCAV. EFFORT	BOULDER COUNT QTY. CLASS	REMARK NO.
-1-	ND	Black (10 yr, 2/1), fine to coarse SAND, some Organics (roots), little fine to coarse Gravel, little Cobble, trace Brick, blue staining (dry)	E	0	1/2/3
-2-	ND	Brown (10 yr, 4/3), fine to coarse SAND, some fine to coarse Gravel, little Cobble, trace Silt (moist - wet)	E	0	4
-3-		End of Exploration at 2' bgs			
-4-					
-5-					
-6-					
-7-					
-8-					
-9-					
-10-					
-11-					
-12-					
-13-					
-14-					

**REMARKS:**

- Soil samples screened with a MiniRAE 3000 photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. ND = None Detected above background.
- On 12/28/17 excavated soils were visually assessed for the presence of blue staining, which would be indicative of purifier waste. No blue staining was observed.
- Soils backfilled in general order they were excavated. Backfilled soil was compacted via excavator bucket tamping every 12" lift.
- Groundwater observed at approximately 2 feet below grade.

<b>TEST PIT PLAN</b>  NORTH VOLUME= 1.2 cu yd.	<b>LEGEND:</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">BOULDER</td> <td style="text-align: center;">COUNT</td> </tr> <tr> <td style="text-align: center;">SIZE RANGE</td> <td style="text-align: center;">LETTER</td> </tr> <tr> <td style="text-align: center;">CLASSIFICATION</td> <td style="text-align: center;">DESIGNATION</td> </tr> <tr> <td style="text-align: center;">6"-18"</td> <td style="text-align: center;">A</td> </tr> <tr> <td style="text-align: center;">18"-36"</td> <td style="text-align: center;">B</td> </tr> <tr> <td style="text-align: center;">36" OR LARGER</td> <td style="text-align: center;">C</td> </tr> </table>	BOULDER	COUNT	SIZE RANGE	LETTER	CLASSIFICATION	DESIGNATION	6"-18"	A	18"-36"	B	36" OR LARGER	C	<b>PROPORTIONS USED</b> TRACE (TR) 0-10% LITTLE (LI) 10-20% SOME (SO) 20-35% AND 35-50%	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">E</td> <td style="text-align: center;">EASY</td> </tr> <tr> <td style="text-align: center;">M</td> <td style="text-align: center;">MODERATE</td> </tr> <tr> <td style="text-align: center;">D</td> <td style="text-align: center;">DIFFICULT</td> </tr> </table>  OBSERVED GROUNDWATER LEVEL	E	EASY	M	MODERATE	D	DIFFICULT
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### TEST PIT FIELD LOG

<b>GZA GEOENVIRONMENTAL, INC.</b> 530 BROADWAY PROVIDENCE, RI GEOTECHNICAL CONSULTANTS	<b>PROJECT</b> DESCRIPTION: Former Tidewater Facility  LOCATION: Pawtucket, Rhode Island	<b>TEST PIT NO.:</b> <span style="font-size: 1.2em; font-weight: bold;">TP-547</span>  <b>FILE NO.:</b> 43654.00  <b>DATE:</b> 12/19/17
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GZA ENGINEER: SCC	CONTRACTOR: Moran Environmental	EXCAVATION EQUIPMENT	DATUM: NAVD88
WEATHER: Partly cloudy, 80s	OPERATOR: John Duponte	MAKE: Kobelco	GROUND ELEV.: 23.63
	MODEL: SK1405R LC	REACH: ~18'	TIME STARTED: 1050
	CAPACITY: 1 cu. yd.		TIME COMPLETED: 1100

DEPTH	PID (ppm)	SOIL DESCRIPTION	EXCAV. EFFORT	BOULDER COUNT QTY. CLASS	REMARK NO.
-1-	ND	Brown (10 yr, 4/3), fine to coarse SAND, some Organics (roots), trace fine to coarse Gravel, trace Brick (dry)	E	0	1/2/3/4
-2-	ND	Pale brown (10 yr, 7/2), fine to medium SAND, some fine to coarse Gravel (dry)	E	0	
-3-	ND		E	0	
-4-	ND	Dark gray (10 yr, 4/1), fine to coarse SAND, some fine to coarse Gravel, some Organics (roots), trace, Cobble, trace Metal debris (dry)	E	0	
-5-		End of Exploration at 3.5' bgs			
-6-					
-7-					
-8-					
-9-					
-10-					
-11-					
-12-					
-13-					
-14-					

**REMARKS:**

- Soil samples screened with a MiniRAE 3000 photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. ND = None Detected above background.
- On 12/28/17 excavated soils were visually assessed for the presence of blue staining, which would be indicative of purfier waste. No blue staining was observed.
- Soils backfilled in general order they were excavated. Backfilled soil was compacted via excavator bucket tamping every 12" lift.
- Geotextile fabric observed at approximately 1 foot below grade.

TEST PIT PLAN 	<b>LEGEND:</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">BOULDER</td> <td style="text-align: center;">COUNT</td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">SIZE RANGE</td> <td style="text-align: center;">LETTER</td> <td style="text-align: center;">PROPORTIONS</td> <td style="text-align: center;">USED</td> </tr> <tr> <td style="text-align: center;">CLASSIFICATION</td> <td style="text-align: center;">DESIGNATION</td> <td style="text-align: center;">TRACE (TR)</td> <td style="text-align: center;">0-10%</td> </tr> <tr> <td style="text-align: center;">6"-18"</td> <td style="text-align: center;">A</td> <td style="text-align: center;">LITTLE (LI)</td> <td style="text-align: center;">10-20%</td> </tr> <tr> <td style="text-align: center;">18"-36"</td> <td style="text-align: center;">B</td> <td style="text-align: center;">SOME (SO)</td> <td style="text-align: center;">20-35%</td> </tr> <tr> <td style="text-align: center;">36" OR LARGER</td> <td style="text-align: center;">C</td> <td style="text-align: center;">AND</td> <td style="text-align: center;">35-50%</td> </tr> </table>	BOULDER	COUNT			SIZE RANGE	LETTER	PROPORTIONS	USED	CLASSIFICATION	DESIGNATION	TRACE (TR)	0-10%	6"-18"	A	LITTLE (LI)	10-20%	18"-36"	B	SOME (SO)	20-35%	36" OR LARGER	C	AND	35-50%	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">E</td> <td style="text-align: center;">EASY</td> </tr> <tr> <td style="text-align: center;">M</td> <td style="text-align: center;">MODERATE</td> </tr> <tr> <td style="text-align: center;">D</td> <td style="text-align: center;">DIFFICULT</td> </tr> <tr> <td style="text-align: center;"></td> <td style="text-align: center;">NOT OBSERVED</td> </tr> <tr> <td style="text-align: center;"></td> <td style="text-align: center;">OBSERVED GROUNDWATER LEVEL</td> </tr> </table>	E	EASY	M	MODERATE	D	DIFFICULT		NOT OBSERVED		OBSERVED GROUNDWATER LEVEL	VOLUME= 3.5 cu.yd.
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### TEST PIT FIELD LOG

<b>GZA GEOENVIRONMENTAL, INC.</b> 530 BROADWAY PROVIDENCE, RI GEOTECHNICAL CONSULTANTS	<b>PROJECT</b> DESCRIPTION: Former Tidewater Facility  LOCATION: Pawtucket, Rhode Island	<b>TEST PIT NO.:</b> <span style="font-size: 1.2em; font-weight: bold;">TP-548</span>  <b>FILE NO.:</b> 43654.00  <b>DATE:</b> 12/19/17
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GZA ENGINEER: SCC  WEATHER: Partly cloudy, 80s	EXCAVATION EQUIPMENT CONTRACTOR: Moran Environmental OPERATOR: John Duponte MAKE: Kobelco CAPACITY: 1 cu. yd.	MODEL: SK1405R LC REACH: ~18'	DATUM: NAVD88 GROUND ELEV.: 27.27 TIME STARTED: 0830 TIME COMPLETED: 0845
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DEPTH	PID (ppm)	SOIL DESCRIPTION	EXCAV. EFFORT	BOULDER COUNT QTY. CLASS	REMARK NO.
-1-	ND	Black (10 yr, 2/1), fine to coarse SAND and SLAG, little fine to coarse Gravel, little Organics (roots) (dry)	E	0	1/2/3
-2-		Black (10 yr, 2/1), fine to coarse SAND, some Slag, little Silt (dry)	E	0	4
-3-	ND	Very dark brown (10 yr, 2/2), fine to coarse SAND, little Slag, little Silt, spots of pinkish-red Soil from 3-4' bgs	E	0	
-4-			E	0	
-5-		End of Exploration at 4' bgs			
-6-					
-7-					
-8-					
-9-					
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**REMARKS:**

1. Soil samples screened with a MiniRAE 3000 photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. ND = None Detected above background.
2. On 12/28/17 excavated soils were visually assessed for the presence of blue staining, which would be indicative of purifier waste. No blue staining was observed.
3. Soils backfilled in general order they were excavated. Backfilled soil was compacted via excavator bucket tamping every 12" lift.
4. Pocket of ash observed at approximately 1 to 2 feet below grade in test pit sidewall.

<b>TEST PIT PLAN</b> <p style="font-size: 0.8em;">9 ft 3 ft NORTH VOLUME= 4 cu yd.</p>	<b>LEGEND:</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;">BOULDER</td> <td style="width: 33%;">COUNT</td> <td style="width: 33%;"></td> </tr> <tr> <td>SIZE RANGE</td> <td>LETTER</td> <td></td> </tr> <tr> <td>CLASSIFICATION</td> <td>DESIGNATION</td> <td></td> </tr> <tr> <td>6"-18"</td> <td>A</td> <td></td> </tr> <tr> <td>18"-36"</td> <td>B</td> <td></td> </tr> <tr> <td>36" OR LARGER</td> <td>C</td> <td></td> </tr> </table>	BOULDER	COUNT		SIZE RANGE	LETTER		CLASSIFICATION	DESIGNATION		6"-18"	A		18"-36"	B		36" OR LARGER	C		<b>PROPORTIONS USED</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <td>TRACE (TR)</td> <td>0-10%</td> </tr> <tr> <td>LITTLE (LI)</td> <td>10-20%</td> </tr> <tr> <td>SOME (SO)</td> <td>20-35%</td> </tr> <tr> <td>AND</td> <td>35-50%</td> </tr> </table>	TRACE (TR)	0-10%	LITTLE (LI)	10-20%	SOME (SO)	20-35%	AND	35-50%	<b>EXCAVATION EFFORT</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">E</td> <td>EASY</td> </tr> <tr> <td style="text-align: center;">M</td> <td>MODERATE</td> </tr> <tr> <td style="text-align: center;">D</td> <td>DIFFICULT</td> </tr> <tr> <td style="text-align: center;"></td> <td>NOT OBSERVED</td> </tr> <tr> <td style="text-align: center;"></td> <td>OBSERVED GROUNDWATER LEVEL</td> </tr> </table>	E	EASY	M	MODERATE	D	DIFFICULT		NOT OBSERVED		OBSERVED GROUNDWATER LEVEL
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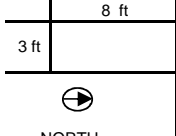
<b>GZA GEOENVIRONMENTAL, INC.</b> 530 BROADWAY PROVIDENCE, RI GEOTECHNICAL CONSULTANTS	<b>PROJECT</b> DESCRIPTION: Former Tidewater Facility  LOCATION: Pawtucket, Rhode Island	<b>TEST PIT NO.:</b> <span style="font-size: 1.2em; font-weight: bold;">TP-549</span>  <b>FILE NO.:</b> 43654.00  <b>DATE:</b> 12/20/17
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GZA ENGINEER: SCC	CONTRACTOR: Moran Environmental	EXCAVATION EQUIPMENT	DATUM: NAVD88
WEATHER: Partly cloudy, 80s	OPERATOR: John Duponte	MAKE: Kobelco	GROUND ELEV.: 21.05
	MODEL: SK1405R LC	REACH: ~18'	TIME STARTED: 0805
	CAPACITY: 1 cu. yd.		TIME COMPLETED: 0815

DEPTH	PID (ppm)	SOIL DESCRIPTION	EXCAV. EFFORT	BOULDER COUNT QTY. CLASS	REMARK NO.	
-1-	ND	Brown (10 yr, 4/3), fine to coarse SAND, little Organics (roots), little fine Gravel (dry)				
-2-		Pale brown (10 yr, 7/2), fine to coarse SAND, some fine to coarse Gravel, little Cobble (dry)	E	0	1/2/3	
-3-		Concrete Slab 3 ft. below grade	D	0	4	
-4-		End of Exploration at 3' bgs				
-5-						
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**REMARKS:**

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2. On 12/28/17 excavated soils were visually assessed for the presence of blue staining, which would be indicative of purifier waste. No blue staining was observed.
3. Soils backfilled in general order they were excavated. Backfilled soil was compacted via excavator bucket tamping every 12" lift.
4. Refusal at approximately 3 feet below grade due to concrete slab.

<b>TEST PIT PLAN</b>  NORTH VOLUME= 2.7 cu yd.	<b>LEGEND:</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;">BOULDER</td> <td style="width: 33%;">COUNT</td> <td style="width: 33%;"></td> </tr> <tr> <td>SIZE RANGE</td> <td>LETTER</td> <td>PROPORTIONS USED</td> </tr> <tr> <td>CLASSIFICATION</td> <td>DESIGNATION</td> <td>TRACE (TR) 0-10%</td> </tr> <tr> <td>6"-18"</td> <td>A</td> <td>LITTLE (LI) 10-20%</td> </tr> <tr> <td>18"-36"</td> <td>B</td> <td>SOME (SO) 20-35%</td> </tr> <tr> <td>36" OR LARGER</td> <td>C</td> <td>AND 35-50%</td> </tr> </table>	BOULDER	COUNT		SIZE RANGE	LETTER	PROPORTIONS USED	CLASSIFICATION	DESIGNATION	TRACE (TR) 0-10%	6"-18"	A	LITTLE (LI) 10-20%	18"-36"	B	SOME (SO) 20-35%	36" OR LARGER	C	AND 35-50%	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">E</td> <td style="text-align: center;">EASY</td> </tr> <tr> <td style="text-align: center;">M</td> <td style="text-align: center;">MODERATE</td> </tr> <tr> <td style="text-align: center;">D</td> <td style="text-align: center;">DIFFICULT</td> </tr> <tr> <td colspan="2" style="text-align: center;">NOT OBSERVED</td> </tr> <tr> <td colspan="2" style="text-align: center;">OBSERVED GROUNDWATER LEVEL</td> </tr> </table>	E	EASY	M	MODERATE	D	DIFFICULT	NOT OBSERVED		OBSERVED GROUNDWATER LEVEL	
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### TEST PIT FIELD LOG

<b>GZA GEOENVIRONMENTAL, INC.</b> 530 BROADWAY PROVIDENCE, RI GEOTECHNICAL CONSULTANTS	<b>PROJECT</b> DESCRIPTION: Former Tidewater Facility  LOCATION: Pawtucket, Rhode Island	<b>TEST PIT NO.:</b> <span style="font-size: 1.2em;"><b>TP-550</b></span>  <b>FILE NO.:</b> 43654.00  <b>DATE:</b> 12/20/17
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GZA ENGINEER: SCC	CONTRACTOR: Moran Environmental	EXCAVATION EQUIPMENT	DATUM: NAVD88
WEATHER: Partly cloudy, 80s	OPERATOR: John Duponte	MAKE: Kobelco	GROUND ELEV.: 20.78
	MODEL: SK1405R LC	REACH: ~18'	TIME STARTED: 0820
	CAPACITY: 1 cu. yd.		TIME COMPLETED: 830

DEPTH	PID (ppm)	SOIL DESCRIPTION	EXCAV. EFFORT	BOULDER COUNT QTY. CLASS	REMARK NO.
-1-	ND	----- Brown (10 yr, 4/3), fine to coarse SAND, little Organics (roots), little fine Gravel (dry) ----- Pale brown (10 yr, 7/2), fine to coarse SAND, some fine to coarse Gravel, little Cobble (dry)	E	0	1/3/4
-2-			E	0	
-3-		Concrete Slab at 3 feet below grade	D	0	2
-4-		End of Exploration at 3' bgs			
-5-					
-6-					
-7-					
-8-					
-9-					
-10-					
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-14-					

**REMARKS:**

- Soil samples screened with a MiniRAE 3000 photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. ND = None Detected above background.
- Refusal at 3' bgs due to concrete.
- On 12/28/17 excavated soils were visually assessed for the presence of blue staining, which would be indicative of purifier waste. No blue staining was observed.
- Soils backfilled in general order they were excavated. Backfilled soil was compacted via excavator bucket tamping every 12" lift.

<b>TEST PIT PLAN</b> 	<b>LEGEND:</b> <table style="width: 100%;"> <tr> <td style="width: 33%;">BOULDER</td> <td style="width: 33%;">COUNT</td> <td style="width: 33%;">PROPORTIONS USED</td> </tr> <tr> <td>SIZE RANGE</td> <td>LETTER DESIGNATION</td> <td>TRACE (TR) 0-10%</td> </tr> <tr> <td>CLASSIFICATION</td> <td></td> <td>LITTLE (LI) 10-20%</td> </tr> <tr> <td>6"-18"</td> <td>A</td> <td>SOME (SO) 20-35%</td> </tr> <tr> <td>18"-36"</td> <td>B</td> <td>AND 35-50%</td> </tr> <tr> <td>36" OR LARGER</td> <td>C</td> <td></td> </tr> </table>	BOULDER	COUNT	PROPORTIONS USED	SIZE RANGE	LETTER DESIGNATION	TRACE (TR) 0-10%	CLASSIFICATION		LITTLE (LI) 10-20%	6"-18"	A	SOME (SO) 20-35%	18"-36"	B	AND 35-50%	36" OR LARGER	C		<table style="width: 100%;"> <tr> <td style="width: 33%; text-align: center;">                     E M D   </td> <td style="width: 33%; text-align: center;">                     EXCAVATION EFFORT                       EASY MODERATE DIFFICULT                       NOT OBSERVED OBSERVED GROUNDWATER LEVEL                 </td> <td style="width: 33%;"></td> </tr> </table>	E M D  	EXCAVATION EFFORT  EASY MODERATE DIFFICULT  NOT OBSERVED OBSERVED GROUNDWATER LEVEL	
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VOLUME= 2.2 cu yd.																							



### TEST PIT FIELD LOG

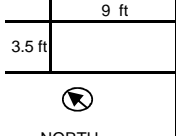
<b>GZA GEOENVIRONMENTAL, INC.</b> 530 BROADWAY PROVIDENCE, RI GEOTECHNICAL CONSULTANTS	<b>PROJECT</b> DESCRIPTION: Former Tidewater Facility  LOCATION: Pawtucket, Rhode Island	<b>TEST PIT NO.:</b> <span style="font-size: 1.2em; font-weight: bold;">TP-551</span>  <b>FILE NO.:</b> 43654.00  <b>DATE:</b> 12/20/17
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GZA ENGINEER: SCC	CONTRACTOR: Moran Environmental	EXCAVATION EQUIPMENT	DATUM: NAVD88
WEATHER: Partly cloudy, 80s	OPERATOR: John Duponte	MAKE: Kobelco	GROUND ELEV.: 16.55
	MODEL: SK1405R LC	CAPACITY: 1 cu. yd.	TIME STARTED: 0840
	REACH: ~18'		TIME COMPLETED: 0855

DEPTH	PID (ppm)	SOIL DESCRIPTION	EXCAV. EFFORT	BOULDER COUNT QTY. CLASS	REMARK NO.
-1-	ND	Brown (10 yr, 4/3), fine to coarse SAND, little Organics (roots), little fine to coarse Gravel (dry)			
		Bluish-gray (Gley 2, 5/1), fine to coarse SAND and GRAVEL (dry)	E	0	1/2/3/4
-2-	ND	Black (10 yr, 2/1), fine SAND, little fine to coarse Gravel, little Organics, little Silt, slight sulfur-like odor (moist)	E	0	
-3-		Dark gray (10 yr, 4/1), fine SAND, some Silt, trace fine to coarse Gravel (moist)	E	0	
-4-		End of Exploration at 3' bgs	E	0	
-5-					
-6-					
-7-					
-8-					
-9-					
-10-					
-11-					
-12-					
-13-					
-14-					

**REMARKS:**

- Soil samples screened with a MiniRAE 3000 photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. ND = None Detected above background.
- Geotextile fabric observed at approximately 1 foot below grade.
- On 12/28/17 excavated soils were visually assessed for the presence of blue staining, which would be indicative of purfier waste. No blue staining was observed.
- Soils backfilled in general order they were excavated. Backfilled soil was compacted via excavator bucket tamping every 12" lift.

<b>TEST PIT PLAN</b>  NORTH VOLUME= 4.1 cu yd.	<b>LEGEND:</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;">BOULDER</td> <td style="width: 33%;">COUNT</td> <td style="width: 33%;">PROPORTIONS USED</td> </tr> <tr> <td>SIZE RANGE</td> <td>LETTER DESIGNATION</td> <td>TRACE (TR) 0-10%</td> </tr> <tr> <td>CLASSIFICATION</td> <td>A</td> <td>LITTLE (LI) 10-20%</td> </tr> <tr> <td>6"-18"</td> <td>B</td> <td>SOME (SO) 20-35%</td> </tr> <tr> <td>18"-36"</td> <td>C</td> <td>AND 35-50%</td> </tr> <tr> <td>36" OR LARGER</td> <td></td> <td></td> </tr> </table>	BOULDER	COUNT	PROPORTIONS USED	SIZE RANGE	LETTER DESIGNATION	TRACE (TR) 0-10%	CLASSIFICATION	A	LITTLE (LI) 10-20%	6"-18"	B	SOME (SO) 20-35%	18"-36"	C	AND 35-50%	36" OR LARGER			<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">E</td> <td style="text-align: center;">EASY</td> </tr> <tr> <td style="text-align: center;">M</td> <td style="text-align: center;">MODERATE</td> </tr> <tr> <td style="text-align: center;">D</td> <td style="text-align: center;">DIFFICULT</td> </tr> <tr> <td colspan="2" style="text-align: center;">NOT OBSERVED</td> </tr> <tr> <td colspan="2" style="text-align: center;">OBSERVED GROUNDWATER LEVEL</td> </tr> </table>	E	EASY	M	MODERATE	D	DIFFICULT	NOT OBSERVED		OBSERVED GROUNDWATER LEVEL	
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### TEST PIT FIELD LOG

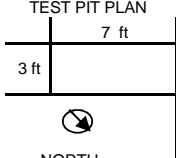

<b>GZA GEOENVIRONMENTAL, INC.</b> 530 BROADWAY PROVIDENCE, RI GEOTECHNICAL CONSULTANTS	<b>PROJECT</b> DESCRIPTION: Former Tidewater Facility  LOCATION: Pawtucket, Rhode Island	<b>TEST PIT NO.:</b> <span style="font-size: 1.2em; font-weight: bold;">TP-552</span>  <b>FILE NO.:</b> 43654.00  <b>DATE:</b> 12/20/18
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GZA ENGINEER: SCC	CONTRACTOR: Moran Environmental	EXCAVATION EQUIPMENT	DATUM: NAVD88
WEATHER: Partly cloudy, 80s	OPERATOR: John Duponte	MAKE: Kobelco	GROUND ELEV.: 13.51
	MODEL: SK1405R LC	CAPACITY: 1 cu. yd.	TIME STARTED: 0900
	REACH: ~18'		TIME COMPLETED: 0910

DEPTH	PID (ppm)	SOIL DESCRIPTION	EXCAV. EFFORT	BOULDER COUNT QTY. CLASS	REMARK NO.
-1-	24.7	Dark brown (10 yr, 3/3), fine to coarse SAND, little fine to coarse Gravel, little Organics (roots), little Wood debris, trace Brick (dry)	E	0	1/2/3
-2-		Black (10 yr, 2/1), HARDENED TAR, moderate coal-tar like odor (dry)	E	0	
-3-	ND	Orange-brown (10 yr, 6/6), fine SAND, some Silt, little coarse Sand (moist)	E	0	
-4-		Black (10 yr, 2/1), fine to coarse SAND and SLAG, little fine to coarse Gravel, trace Silt (moist)	E	0	
-5-		End of Exploration 4' bgs			
-6-					
-7-					
-8-					
-9-					
-10-					
-11-					
-12-					
-13-					
-14-					

**REMARKS:**

- Soil samples screened with a MiniRAE 3000 photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. ND = None Detected above background.
- On 12/28/17 excavated soils were visually assessed for the presence of blue staining, which would be indicative of purifier waste. No blue staining was observed.
- Soils backfilled in general order they were excavated. Backfilled soil was compacted via excavator bucket tamping every 12" lift.

<b>TEST PIT PLAN</b>  VOLUME= 3.1 cu yd.	<b>LEGEND:</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">BOULDER</td> <td style="text-align: center;">COUNT</td> </tr> <tr> <td style="text-align: center;">SIZE RANGE</td> <td style="text-align: center;">LETTER</td> </tr> <tr> <td style="text-align: center;">CLASSIFICATION</td> <td style="text-align: center;">DESIGNATION</td> </tr> <tr> <td style="text-align: center;">6"-18"</td> <td style="text-align: center;">A</td> </tr> <tr> <td style="text-align: center;">18"-36"</td> <td style="text-align: center;">B</td> </tr> <tr> <td style="text-align: center;">36" OR LARGER</td> <td style="text-align: center;">C</td> </tr> </table>	BOULDER	COUNT	SIZE RANGE	LETTER	CLASSIFICATION	DESIGNATION	6"-18"	A	18"-36"	B	36" OR LARGER	C	<b>PROPORTIONS USED</b> TRACE (TR) 0-10% LITTLE (LI) 10-20% SOME (SO) 20-35% AND 35-50%	<b>EXCAVATION EFFORT</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">E</td> <td style="text-align: center;">EASY</td> </tr> <tr> <td style="text-align: center;">M</td> <td style="text-align: center;">MODERATE</td> </tr> <tr> <td style="text-align: center;">D</td> <td style="text-align: center;">DIFFICULT</td> </tr> <tr> <td colspan="2" style="text-align: center;">NOT OBSERVED</td> </tr> <tr> <td colspan="2" style="text-align: center;">OBSERVED GROUNDWATER LEVEL</td> </tr> </table> 	E	EASY	M	MODERATE	D	DIFFICULT	NOT OBSERVED		OBSERVED GROUNDWATER LEVEL	
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### TEST PIT FIELD LOG

<b>GZA GEOENVIRONMENTAL, INC.</b> 530 BROADWAY PROVIDENCE, RI GEOTECHNICAL CONSULTANTS	<b>PROJECT</b> DESCRIPTION: Former Tidewater Facility  LOCATION: Pawtucket, Rhode Island	<b>TEST PIT NO.:</b> <span style="font-size: 1.2em; font-weight: bold;">TP-553</span>  <b>FILE NO.:</b> 43654.00  <b>DATE:</b> 12/20/17
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GZA ENGINEER: SCC	CONTRACTOR: Moran Environmental	EXCAVATION EQUIPMENT	DATUM: NAVD88
WEATHER: Partly cloudy, 80s	OPERATOR: John Duponte	MAKE: Kobelco	GROUND ELEV.: 11.50
	MODEL: SK1405R LC	CAPACITY: 1 cu. yd.	TIME STARTED: 0915
	REACH: ~18'		TIME COMPLETED: 0925

DEPTH	PID (ppm)	SOIL DESCRIPTION	EXCAV. EFFORT	BOULDER COUNT QTY. CLASS	REMARK NO.	
-1-	ND	Dark brown (10 yr, 4/2), fine to coarse SAND, (roots), little Cobble (dry)	E	0	1/4	
-2-		Black (10 yr, 2/1), fine to coarse SAND and SLAG, some fine to coarse Gravel, little Organics, some fine to coarse Gravel (dry)	E	0		
-3-		Brown (10 yr, 4/3), fine SAND, some Silt, trace fine to coarse Gravel (moist - wet)	E	0		
-4-			E	0	2/3	
-5-		End of Exploration 4' bgs				
-6-						
-7-						
-8-						
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Concrete Footing (depth unknown)

**REMARKS:**

- Soil samples screened with a MiniRAE 3000 photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. ND = None Detected above background.
- Groundwater observed at approximately 4 feet below grade.
- On 12/28/17 excavated soils were visually assessed for the presence of blue staining, which would be indicative of purifier waste. Blue staining was observed from 3 to 4 feet below grade.
- Soils backfilled in general order they were excavated. Backfilled soil was compacted via excavator bucket tamping every 12" lift.

TEST PIT PLAN 	<b>LEGEND:</b>  <table style="width: 100%; border: none;"> <tr> <td style="text-align: center;">BOULDER</td> <td style="text-align: center;">COUNT</td> <td></td> </tr> <tr> <td style="text-align: center;">SIZE RANGE</td> <td style="text-align: center;">LETTER</td> <td></td> </tr> <tr> <td style="text-align: center;">CLASSIFICATION</td> <td style="text-align: center;">DESIGNATION</td> <td></td> </tr> <tr> <td style="text-align: center;">6"-18"</td> <td style="text-align: center;">A</td> <td></td> </tr> <tr> <td style="text-align: center;">18"-36"</td> <td style="text-align: center;">B</td> <td></td> </tr> <tr> <td style="text-align: center;">36" OR LARGER</td> <td style="text-align: center;">C</td> <td></td> </tr> </table>	BOULDER	COUNT		SIZE RANGE	LETTER		CLASSIFICATION	DESIGNATION		6"-18"	A		18"-36"	B		36" OR LARGER	C		<b>PROPORTIONS USED</b>  TRACE (TR)      0-10% LITTLE (LI)    10-20% SOME (SO)      20-35% AND              35-50%	<b>EXCAVATION EFFORT</b>  E                    EASY M                    MODERATE D                    DIFFICULT  OBSERVED GROUNDWATER LEVEL
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NORTH VOLUME= 3.16 cu yd.																					



### TEST PIT FIELD LOG

<b>GZA GEOENVIRONMENTAL, INC.</b> 655 WINDING BROOK DRIVE, SUITE 402 GLASTONBURY, CT GEOTECHNICAL CONSULTANTS	<b>PROJECT</b> DESCRIPTION: Former Tidewater Facility  LOCATION: Pawtucket, Rhode Island	<b>TEST PIT NO.:</b> <span style="font-size: 1.2em; font-weight: bold;">TP-554</span>  <b>FILE NO.:</b> 43654.00  <b>DATE:</b> 12/20/17
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GZA ENGINEER: SCC	CONTRACTOR: Moran Environmental	EXCAVATION EQUIPMENT	DATUM: NAVD88
WEATHER: Partly cloudy, 80s	OPERATOR: John Duponte	MAKE: Kobelco	GROUND ELEV.: 10.27
	MODEL: SK1405R LC	REACH: ~18'	TIME STARTED: 0930
	CAPACITY: 1 cu. yd.		TIME COMPLETED: 0940

DEPTH	PID (ppm)	SOIL DESCRIPTION	EXCAV. EFFORT	BOULDER COUNT QTY. CLASS	REMARK NO.
-1-	ND	Very dark brown (10 yr, 3/2), fine to coarse SAND, some fine to coarse Gravel, some Organics (roots), little Brick (dry)	E	0	1/4/5
-2-		Orange-brown (10 yr, 6/6), fine to coarse SAND, some Cobble, some fine to coarse Gravel (dry)			
-2-		Black (10 yr, 7/1) SLAG and ROCK, little fine to coarse Sand (moist)	E	5A, 5B, 5C	2/3
-3-		End of Exploration at 2' bgs (Possible Bedrock)			
-4-					
-5-					
-6-					
-7-					
-8-					
-9-					
-10-					
-11-					
-12-					
-13-					
-14-					

**REMARKS:**

1. Soil samples screened with a MiniRAE 3000 photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. ND = None Detected above background.
2. Groundwater weeping from pit face ~2' bgs.
3. Test pit excavated to refusal at 2' bgs on possible bedrock.
4. On 12/28/17 excavated soils were visually assessed for the presence of blue staining, which would be indicative of purifier waste. No blue staining was observed.
5. Soils backfilled in general order they were excavated. Backfilled soil was compacted via excavator bucket tamping every 12" lift.

<b>TEST PIT PLAN</b> <p style="text-align: center;">NORTH</p> <p>VOLUME= 1.8 cu yd.</p>	<b>LEGEND:</b>  <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">BOULDER</td> <td style="width: 30%;">COUNT</td> <td style="width: 40%;"></td> </tr> <tr> <td>SIZE RANGE</td> <td>LETTER</td> <td>PROPORTIONS USED</td> </tr> <tr> <td>CLASSIFICATION</td> <td>DESIGNATION</td> <td>TRACE (TR) 0-10%</td> </tr> <tr> <td>6"-18"</td> <td>A</td> <td>LITTLE (LI) 10-20%</td> </tr> <tr> <td>18"-36"</td> <td>B</td> <td>SOME (SO) 20-35%</td> </tr> <tr> <td>36" OR LARGER</td> <td>C</td> <td>AND 35-50%</td> </tr> </table>	BOULDER	COUNT		SIZE RANGE	LETTER	PROPORTIONS USED	CLASSIFICATION	DESIGNATION	TRACE (TR) 0-10%	6"-18"	A	LITTLE (LI) 10-20%	18"-36"	B	SOME (SO) 20-35%	36" OR LARGER	C	AND 35-50%	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;">EXCAVATION EFFORT</td> <td style="width: 50%;"></td> </tr> <tr> <td style="text-align: center;">E</td> <td style="text-align: center;">EASY</td> </tr> <tr> <td style="text-align: center;">M</td> <td style="text-align: center;">MODERATE</td> </tr> <tr> <td style="text-align: center;">D</td> <td style="text-align: center;">DIFFICULT</td> </tr> </table>	EXCAVATION EFFORT		E	EASY	M	MODERATE	D	DIFFICULT	<div style="text-align: center;">                   OBSERVED GROUNDWATER LEVEL             </div>
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### TEST PIT FIELD LOG

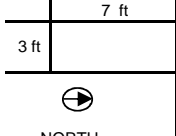



<b>GZA GEOENVIRONMENTAL, INC.</b> 530 BROADWAY PROVIDENCE, RI GEOTECHNICAL CONSULTANTS	<b>PROJECT</b> DESCRIPTION: Former Tidewater Facility  LOCATION: Pawtucket, Rhode Island	<b>TEST PIT NO.:</b> <span style="font-size: 1.2em; font-weight: bold;">TP-555</span>  <b>FILE NO.:</b> 43654.00  <b>DATE:</b> 12/20/17
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GZA ENGINEER: SCC	CONTRACTOR: Moran Environmental	EXCAVATION EQUIPMENT	DATUM: NAVD88
WEATHER: Partly cloudy, 80s	OPERATOR: John Duponte	MAKE: Kobelco	GROUND ELEV.: 9.45
	MODEL: SK1405R LC	REACH: ~18'	TIME STARTED: 0950
	CAPACITY: 1 cu. yd.		TIME COMPLETED: 1000

DEPTH	PID (ppm)	SOIL DESCRIPTION	EXCAV. EFFORT	BOULDER COUNT QTY. CLASS	REMARK NO.	
-1-	ND	Black (10 yr, 2/1), fine to coarse SAND and SLAG, some Organics (roots) (dry)	E	0	1/3/4	
-2-		Black (10 yr, 2/1), SLAG, some fine to coarse Sand, little Metal debris, trace Wood debris (dry)	E	0		
-3-			E	0		
-4-			E	0	2	
-5-		----- End of Exploration at ~4' bgs				
-6-						
-7-						
-8-						
-9-						
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-13-						
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**REMARKS:**

- Soil samples screened with a MiniRAE 3000 photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. ND = None Detected above background.
- Groundwater weeping from pit face ~4' bgs.
- On 12/28/17 excavated soils were visually assessed for the presence of blue staining, which would be indicative of purifier waste. No blue staining was observed.
- Soils backfilled in general order they were excavated. Backfilled soil was compacted via excavator bucket tamping every 12" lift.

<b>TEST PIT PLAN</b>  VOLUME= 3.1 cu yd.	<b>LEGEND:</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">BOULDER</td> <td style="text-align: center;">COUNT</td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">SIZE RANGE</td> <td style="text-align: center;">LETTER</td> <td style="text-align: center;">PROPORTIONS</td> <td style="text-align: center;">USED</td> </tr> <tr> <td style="text-align: center;">CLASSIFICATION</td> <td style="text-align: center;">DESIGNATION</td> <td>TRACE (TR)</td> <td>0-10%</td> </tr> <tr> <td style="text-align: center;">6"-18"</td> <td style="text-align: center;">A</td> <td>LITTLE (LI)</td> <td>10-20%</td> </tr> <tr> <td style="text-align: center;">18"-36"</td> <td style="text-align: center;">B</td> <td>SOME (SO)</td> <td>20-35%</td> </tr> <tr> <td style="text-align: center;">36" OR LARGER</td> <td style="text-align: center;">C</td> <td>AND</td> <td>35-50%</td> </tr> </table>	BOULDER	COUNT			SIZE RANGE	LETTER	PROPORTIONS	USED	CLASSIFICATION	DESIGNATION	TRACE (TR)	0-10%	6"-18"	A	LITTLE (LI)	10-20%	18"-36"	B	SOME (SO)	20-35%	36" OR LARGER	C	AND	35-50%	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">E</td> <td style="text-align: center;">EASY</td> </tr> <tr> <td style="text-align: center;">M</td> <td style="text-align: center;">MODERATE</td> </tr> <tr> <td style="text-align: center;">D</td> <td style="text-align: center;">DIFFICULT</td> </tr> </table>	E	EASY	M	MODERATE	D	DIFFICULT	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center; vertical-align: middle;">                   OBSERVED GROUNDWATER LEVEL             </td> </tr> </table>	 OBSERVED GROUNDWATER LEVEL
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### TEST PIT FIELD LOG

<b>GZA GEOENVIRONMENTAL, INC.</b> 530 BROADWAY PROVIDENCE, RI GEOTECHNICAL CONSULTANTS	<b>PROJECT</b> DESCRIPTION: Former Tidewater Facility  LOCATION: Pawtucket, Rhode Island	<b>TEST PIT NO.:</b> <span style="font-size: 1.2em; font-weight: bold;">TP-556</span>  <b>FILE NO.:</b> 43654.00  <b>DATE:</b> 12/20/17
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GZA ENGINEER: SCC	CONTRACTOR: Moran Environmental	EXCAVATION EQUIPMENT	DATUM: NAVD88
WEATHER: Partly cloudy, 80s	OPERATOR: John Duponte	MAKE: Kobelco	GROUND ELEV.: 7.90
	MODEL: SK1405R LC	REACH: ~18'	TIME STARTED: 1010
	CAPACITY: 1 cu. yd.		TIME COMPLETED: 1020

DEPTH	PID (ppm)	SOIL DESCRIPTION	EXCAV. EFFORT	BOULDER COUNT QTY. CLASS	REMARK NO.
-1-	ND	Very dark brown (10 yr, 3/2), fine to coarse SAND, some Organics (roots), trace fine to coarse Gravel, trace Slag (dry)	E	0	1/2/3
-2-		Gray (10 yr, 6/1) SLAG and ASH, little fine to coarse Sand (dry)	E	0	
-3-		Orange-brown (10 yr, 6/6), fine SAND, little Cobble, trace Silt (dry)	E	0	
-4-		End of Exploration at ~3.5' bgs	E	0	
-5-					
-6-					
-7-					
-8-					
-9-					
-10-					
-11-					
-12-					
-13-					
-14-					

**REMARKS:**

- Soil samples screened with a MiniRAE 3000 photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. ND = None Detected above background.
- On 12/28/17 excavated soils were visually assessed for the presence of blue staining, which would be indicative of purifier waste. No blue staining was observed.
- Soils backfilled in general order they were excavated. Backfilled soil was compacted via excavator bucket tamping every 12" lift.

<b>TEST PIT PLAN</b> <p style="font-size: 0.8em;">7 ft 3 ft NORTH</p> <p>VOLUME= 4 cu yd.</p>	<b>LEGEND:</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;">BOULDER</td> <td style="width: 33%;">COUNT</td> <td style="width: 33%;"></td> </tr> <tr> <td>SIZE RANGE</td> <td>LETTER</td> <td>PROPORTIONS USED</td> </tr> <tr> <td>CLASSIFICATION</td> <td>DESIGNATION</td> <td>TRACE (TR) 0-10%</td> </tr> <tr> <td>6"-18"</td> <td>A</td> <td>LITTLE (LI) 10-20%</td> </tr> <tr> <td>18"-36"</td> <td>B</td> <td>SOME (SO) 20-35%</td> </tr> <tr> <td>36" OR LARGER</td> <td>C</td> <td>AND 35-50%</td> </tr> </table>	BOULDER	COUNT		SIZE RANGE	LETTER	PROPORTIONS USED	CLASSIFICATION	DESIGNATION	TRACE (TR) 0-10%	6"-18"	A	LITTLE (LI) 10-20%	18"-36"	B	SOME (SO) 20-35%	36" OR LARGER	C	AND 35-50%	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">E</td> <td style="text-align: center;">EASY</td> </tr> <tr> <td style="text-align: center;">M</td> <td style="text-align: center;">MODERATE</td> </tr> <tr> <td style="text-align: center;">D</td> <td style="text-align: center;">DIFFICULT</td> </tr> <tr> <td colspan="2" style="text-align: center;">NOT OBSERVED</td> </tr> <tr> <td colspan="2" style="text-align: center;">OBSERVED GROUNDWATER LEVEL</td> </tr> </table>	E	EASY	M	MODERATE	D	DIFFICULT	NOT OBSERVED		OBSERVED GROUNDWATER LEVEL	
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### TEST PIT FIELD LOG

<b>GZA GEOENVIRONMENTAL, INC.</b> 530 BROADWAY PROVIDENCE, RI GEOTECHNICAL CONSULTANTS	<b>PROJECT</b> DESCRIPTION: Former Tidewater Facility  LOCATION: Pawtucket, Rhode Island	<b>TEST PIT NO.:</b> <span style="font-size: 1.2em; font-weight: bold;">TP-557</span>  <b>FILE NO.:</b> 43654.00  <b>DATE:</b> 12/20/17
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GZA ENGINEER: SCC	CONTRACTOR: Moran Environmental	EXCAVATION EQUIPMENT	DATUM: NAVD88
WEATHER: Partly cloudy, 80s	OPERATOR: John Duponte	MAKE: Kobelco	GROUND ELEV.: 7.28
	MODEL: SK1405R LC	REACH: ~18'	TIME STARTED: 1035
	CAPACITY: 1 cu. yd.		TIME COMPLETED: 1050

DEPTH	PID (ppm)	SOIL DESCRIPTION	EXCAV. EFFORT	BOULDER COUNT QTY. CLASS	REMARK NO.
-1-	ND	Black (10 yr, 2/1), fine to coarse SAND, some Slag, little fine to coarse Gravel, little Organics (roots), trace Silt (dry)	E	0	1/2/3
-2-		Light grayish-brown (10 yr, 6/2), SLAG and ASH, trace fine to coarse Sand (dry)	E	0	
-3-		Gray (10 yr, 6/1), fine SAND, little Silt (dry)	E	0	
-4-		Light grayish-brown (10 yr, 6/2), SLAG and ASH, trace fine to coarse Sand (dry)	E	0	
-4-		Dark gray (10 yr, 4/1), fine to coarse GRAVEL, some fine to coarse Sand (dry)	E	0	
-5-		Grayish-brown (10 yr, 5/2), fine SAND, trace fine to coarse Gravel, trace Cobble, trace Silt (dry)	E	0	
-6-		End of Exploration at ~3.5' bgs			
-7-					
-8-					
-9-					
-10-					
-11-					
-12-					
-13-					
-14-					

**REMARKS:**

- Soil samples screened with a MiniRAE 3000 photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. ND = None Detected above background.
- On 12/28/17 excavated soils were visually assessed for the presence of blue staining, which would be indicative of waste. No blue staining was observed.
- Soils backfilled in general order they were excavated. Backfilled soil was compacted via excavator bucket tamping every 12" lift.

<b>TEST PIT PLAN</b> <p style="font-size: 0.8em;">10 ft 4 ft NORTH</p>	<b>LEGEND:</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;">BOULDER</td> <td style="width: 33%;">COUNT</td> <td style="width: 33%;"></td> </tr> <tr> <td>SIZE RANGE</td> <td>LETTER</td> <td>PROPORTIONS USED</td> </tr> <tr> <td>CLASSIFICATION</td> <td>DESIGNATION</td> <td>TRACE (TR) 0-10%</td> </tr> <tr> <td>6"-18"</td> <td>A</td> <td>LITTLE (LI) 10-20%</td> </tr> <tr> <td>18"-36"</td> <td>B</td> <td>SOME (SO) 20-35%</td> </tr> <tr> <td>36" OR LARGER</td> <td>C</td> <td>AND 35-50%</td> </tr> </table>	BOULDER	COUNT		SIZE RANGE	LETTER	PROPORTIONS USED	CLASSIFICATION	DESIGNATION	TRACE (TR) 0-10%	6"-18"	A	LITTLE (LI) 10-20%	18"-36"	B	SOME (SO) 20-35%	36" OR LARGER	C	AND 35-50%	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;"></td> <td style="width: 33%;"></td> <td style="width: 33%;"></td> </tr> <tr> <td style="text-align: center;">E</td> <td style="text-align: center;">M</td> <td style="text-align: center;">D</td> </tr> <tr> <td style="text-align: center;">EASY</td> <td style="text-align: center;">MODERATE</td> <td style="text-align: center;">DIFFICULT</td> </tr> <tr> <td colspan="3" style="text-align: center;">NOT OBSERVED</td> </tr> <tr> <td colspan="3" style="text-align: center;">OBSERVED GROUNDWATER LEVEL</td> </tr> </table>				E	M	D	EASY	MODERATE	DIFFICULT	NOT OBSERVED			OBSERVED GROUNDWATER LEVEL		
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### TEST PIT FIELD LOG

<b>GZA GEOENVIRONMENTAL, INC.</b> 530 BROADWAY PROVIDENCE, RI GEOTECHNICAL CONSULTANTS	<b>PROJECT</b> DESCRIPTION: Former Tidewater Facility  LOCATION: Pawtucket, Rhode Island	<b>TEST PIT NO.:</b> <span style="font-size: 1.2em; font-weight: bold;">TP-558</span>  <b>FILE NO.:</b> 43654.00  <b>DATE:</b> 12/20/17
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GZA ENGINEER: SCC	CONTRACTOR: Moran Environmental	EXCAVATION EQUIPMENT	DATUM: NAVD88
WEATHER: Partly cloudy, 80s	OPERATOR: John Duponte	MAKE: Kobelco	GROUND ELEV.: 7.71
	MODEL: SK1405R LC	CAPACITY: 1 cu. yd.	TIME STARTED: 1055
	REACH: ~18'		TIME COMPLETED: 1110

DEPTH	PID (ppm)	SOIL DESCRIPTION	EXCAV. EFFORT	BOULDER COUNT QTY. CLASS	REMARK NO.
-1-	ND	Black (10 yr, 2/1), fine to coarse SAND, little fine to coarse Gravel, little Organics (roots), trace Slag (dry)	E	0	1/2/3
-2-		Brown (10 yr, 5/3), fine to coarse SAND, some fine to coarse Gravel, little Cobble, trace Brick (dry)	E	0	
-3-		Brown (10 yr, 5/3), fine SAND, some fine to coarse Gravel, little Cobble, little Silt (moist)	E	0	
-4-		End of Exploration at ~4' bgs	E	0	4
-5-					
-6-					
-7-					
-8-					
-9-					
-10-					
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**REMARKS:**

- Soil samples screened with a MiniRAE 3000 photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. ND = None Detected above background.
- On 12/28/17 excavated soils were visually assessed for the presence of blue staining, which would be indicative of purifier waste. No blue staining was observed.
- Soils backfilled in general order they were excavated. Backfilled soil was compacted via excavator bucket tamping every 12" lift.
- Groundwater weeping from test pit sidewall at approximately 4 feet below grade.

<b>TEST PIT PLAN</b> <p style="text-align: center;">NORTH</p> <p>VOLUME= 4.1 cu yd.</p>	<b>LEGEND:</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">BOULDER</td> <td style="text-align: center;">COUNT</td> </tr> <tr> <td style="text-align: center;">SIZE RANGE</td> <td style="text-align: center;">LETTER</td> </tr> <tr> <td style="text-align: center;">CLASSIFICATION</td> <td style="text-align: center;">DESIGNATION</td> </tr> <tr> <td style="text-align: center;">6"-18"</td> <td style="text-align: center;">A</td> </tr> <tr> <td style="text-align: center;">18"-36"</td> <td style="text-align: center;">B</td> </tr> <tr> <td style="text-align: center;">36" OR LARGER</td> <td style="text-align: center;">C</td> </tr> </table>	BOULDER	COUNT	SIZE RANGE	LETTER	CLASSIFICATION	DESIGNATION	6"-18"	A	18"-36"	B	36" OR LARGER	C	<b>PROPORTIONS USED</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <td>TRACE (TR)</td> <td style="text-align: right;">0-10%</td> </tr> <tr> <td>LITTLE (LI)</td> <td style="text-align: right;">10-20%</td> </tr> <tr> <td>SOME (SO)</td> <td style="text-align: right;">20-35%</td> </tr> <tr> <td>AND</td> <td style="text-align: right;">35-50%</td> </tr> </table>	TRACE (TR)	0-10%	LITTLE (LI)	10-20%	SOME (SO)	20-35%	AND	35-50%	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">E</td> <td style="text-align: center;">EASY</td> </tr> <tr> <td style="text-align: center;">M</td> <td style="text-align: center;">MODERATE</td> </tr> <tr> <td style="text-align: center;">D</td> <td style="text-align: center;">DIFFICULT</td> </tr> </table> <div style="text-align: center; margin-top: 10px;"> <p>OBSERVED GROUNDWATER LEVEL</p> </div>	E	EASY	M	MODERATE	D	DIFFICULT
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### TEST PIT FIELD LOG

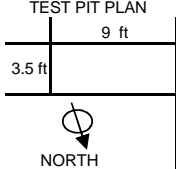



<b>GZA GEOENVIRONMENTAL, INC.</b> 530 BROADWAY PROVIDENCE, RI GEOTECHNICAL CONSULTANTS	<b>PROJECT</b> DESCRIPTION: Former Tidewater Facility  LOCATION: Pawtucket, Rhode Island	<b>TEST PIT NO.:</b> <span style="font-size: 1.2em; font-weight: bold;">TP-559</span>  <b>FILE NO.:</b> 43654.00  <b>DATE:</b> 12/20/17
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GZA ENGINEER: SCC  WEATHER: Partly cloudy, 80s	<b>EXCAVATION EQUIPMENT</b> CONTRACTOR: Moran Environmental OPERATOR: John Duponte MAKE: Kobelco      MODEL: SK1405R LC CAPACITY: 1 cu. yd.      REACH: ~18'	DATUM: NAVD88 GROUND ELEV.: 6.92 TIME STARTED: 1115 TIME COMPLETE: 1125
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DEPTH	PID (ppm)	SOIL DESCRIPTION	EXCAV. EFFORT	BOULDER COUNT QTY. CLASS	REMARK NO.
-1-	ND	Black (10 yr, 2/1), fine to coarse SAND, some Organics (roots), little fine to coarse Gravel, little Slag (dry)	E	0	1/2/3
-2-		Dark grayish-brown (10 yr, 5/2) SLAG and ASH, some fine to coarse Sand (dry)	E	0	
-3-		Brown (10 yr, 5/3), fine SAND, some fine to coarse Gravel, some Cobble, little Silt (moist)	E	0	
-4-		End of Exploration at ~4' bgs		E	0
-5-					
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**REMARKS:**

- Soil samples screened with a MiniRAE 3000 photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. ND = None Detected above background.
- On 12/28/17 excavated soils were visually assessed for the presence of blue staining, which would be indicative of purifier waste. No blue staining was observed.
- Soils backfilled in general order they were excavated. Backfilled soil was compacted via excavator bucket tamping every 12" lift.

<b>TEST PIT PLAN</b>  VOLUME= 4.7 cu yd.	<b>LEGEND:</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">BOULDER</td> <td style="text-align: center;">COUNT</td> </tr> <tr> <td style="text-align: center;">SIZE RANGE</td> <td style="text-align: center;">LETTER</td> </tr> <tr> <td style="text-align: center;">CLASSIFICATION</td> <td style="text-align: center;">DESIGNATION</td> </tr> <tr> <td style="text-align: center;">6"-18"</td> <td style="text-align: center;">A</td> </tr> <tr> <td style="text-align: center;">18"-36"</td> <td style="text-align: center;">B</td> </tr> <tr> <td style="text-align: center;">36" OR LARGER</td> <td style="text-align: center;">C</td> </tr> </table>	BOULDER	COUNT	SIZE RANGE	LETTER	CLASSIFICATION	DESIGNATION	6"-18"	A	18"-36"	B	36" OR LARGER	C	<b>PROPORTIONS USED</b> TRACE (TR)      0-10% LITTLE (LI)      10-20% SOME (SO)      20-35% AND      35-50%	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">E</td> <td style="text-align: center;">EASY</td> </tr> <tr> <td style="text-align: center;">M</td> <td style="text-align: center;">MODERATE</td> </tr> <tr> <td style="text-align: center;">D</td> <td style="text-align: center;">DIFFICULT</td> </tr> <tr> <td colspan="2" style="text-align: center;">  </td> </tr> <tr> <td colspan="2" style="text-align: center;">NOT OBSERVED</td> </tr> <tr> <td colspan="2" style="text-align: center;">OBSERVED GROUNDWATER LEVEL</td> </tr> </table>	E	EASY	M	MODERATE	D	DIFFICULT			NOT OBSERVED		OBSERVED GROUNDWATER LEVEL	
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### TEST PIT FIELD LOG

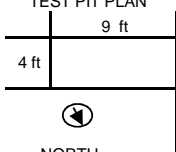

<b>GZA GEOENVIRONMENTAL, INC.</b> 530 BROADWAY PROVIDENCE, RI GEOTECHNICAL CONSULTANTS	<b>PROJECT</b> DESCRIPTION: Former Tidewater Facility  LOCATION: Pawtucket, Rhode Island	<b>TEST PIT NO.:</b> <span style="font-size: 1.2em; font-weight: bold;">TP-560</span>  <b>FILE NO.:</b> 43654.00  <b>DATE:</b> 12/20/17
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GZA ENGINEER: SCC	CONTRACTOR: Moran Environmental	EXCAVATION EQUIPMENT	DATUM: NAVD88
WEATHER: Partly cloudy, 80s	OPERATOR: John Duponte	MAKE: Kobelco	GROUND ELEV.: 7.0
	MODEL: SK1405R LC	CAPACITY: 1 cu. yd.	TIME STARTED: 1130
	REACH: ~18'		TIME COMPLETED: 1145

DEPTH	PID (ppm)	SOIL DESCRIPTION	EXCAV. EFFORT	BOULDER COUNT QTY. CLASS	REMARK NO.
-1-	ND	Grayish-brown (10 yr, 6/1), fine to coarse SAND, some fine to coarse Gravel, some Organics (roots), little Cobble (dry)	E	0	1/3/4
-2-		Brown (10 yr, 5/3), fine to coarse SAND, some fine to coarse Gravel, little Slag, little Cobble, trace Silt (dry)	E	0	
-3-		Dark grayish-brown (10 yr, 4/2), fine SAND, little fine to coarse Gravel, little Cobble, little Silt (wet)	E	0	
-4-		End of Exploration at 4' bgs	E	0	2
-5-					
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**REMARKS:**

1. Soil samples screened with a MiniRAE 3000 photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. ND = None Detected above background.
2. Groundwater observed at approximately 4 feet below grade.
3. On 12/28/17 excavated soils were visually assessed for the presence of blue staining, which would be indicative of purifier waste. No blue staining was observed.
4. Soils backfilled in the general order they were excavated. Backfilled soil was compacted via excavator bucket tamping every 12" lift.

<b>TEST PIT PLAN</b>  NORTH VOLUME= 5.3 cu. yd.	<b>LEGEND:</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">BOULDER</td> <td style="text-align: center;">COUNT</td> </tr> <tr> <td style="text-align: center;">SIZE RANGE</td> <td style="text-align: center;">LETTER</td> </tr> <tr> <td style="text-align: center;">CLASSIFICATION</td> <td style="text-align: center;">DESIGNATION</td> </tr> <tr> <td style="text-align: center;">6"-18"</td> <td style="text-align: center;">A</td> </tr> <tr> <td style="text-align: center;">18"-36"</td> <td style="text-align: center;">B</td> </tr> <tr> <td style="text-align: center;">36" OR LARGER</td> <td style="text-align: center;">C</td> </tr> </table>	BOULDER	COUNT	SIZE RANGE	LETTER	CLASSIFICATION	DESIGNATION	6"-18"	A	18"-36"	B	36" OR LARGER	C	<b>PROPORTIONS USED</b> TRACE (TR) 0-10% LITTLE (LI) 10-20% SOME (SO) 20-35% AND 35-50%	<b>EXCAVATION EFFORT</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">E</td> <td style="text-align: center;">EASY</td> </tr> <tr> <td style="text-align: center;">M</td> <td style="text-align: center;">MODERATE</td> </tr> <tr> <td style="text-align: center;">D</td> <td style="text-align: center;">DIFFICULT</td> </tr> </table>  OBSERVED GROUNDWATER LEVEL	E	EASY	M	MODERATE	D	DIFFICULT
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**TEST BORING LOG**



**GZA**  
**GeoEnvironmental, Inc.**  
*Engineers and Scientists*

**National Grid**  
**Former Tidewater Facility**  
**Pawtucket, Rhode Island**

**EXPLORATION NO.:** GZ-BK-501  
**SHEET:** 2 of 2  
**PROJECT NO:** 43654  
**REVIEWED BY:** SCC

**Logged By:** S. McLeod  
**Drilling Co.:** Cascade  
**Foreman:** Greg Rivera

**Type of Rig:** CME-55  
**Rig Model:** LC Track Rig  
**Drilling Method:**  
Wash & Drive

**Boring Location:** See Plan  
**Ground Surface Elev. (ft.):** 5.17  
**Final Boring Depth (ft.):** 37  
**Date Start - Finish:** 10/24/2017 - 10/24/2017

**H. Datum:**  
**V. Datum:**

**Hammer Type:** Automatic Hammer  
**Hammer Weight (lb.):** 140  
**Hammer Fall (in.):** 30  
**Auger or Casing O.D./I.D Dia (in.):** 4.5"/4.25"

**Sampler Type:** Split Spoon  
**Sampler O.D. (in.):** 2  
**Sampler Length (in.):** 24  
**Rock Core Size:**

**Groundwater Depth (ft.)**

Date	Time	Water Depth	Stab. Time

Depth (ft)	Casing Blows/ Core Rate	Sample						SPT Value	Sample Description and Identification Modified Burmister Procedure (USCS Group Symbol)	Remark	Field Test Data	Depth (ft.)	Stratum Description	Elev. (ft.)
		No.	Depth (ft.)	Pen. (in)	Rec. (in)	Blows (per 6 in.)								
		S-16	35-37	24	12	18 29 36 45	65	S-11 : Top 12": Medium, gray (10 yr, 5/1), fine to coarse SAND, wet Next 2": Medium, gray (10 yr, 5/1), fine to coarse SAND and GRAVEL Bottom 4": Medium, grayish-brown (10 yr, 5/2), fine to medium SAND, wet S-12 : Top 16": Medium, gray (10 yr, 5/1), fine to coarse SAND, slight coal tar-like odor, wet Bottom 5": Medium dark , gray (10 yr, 3/1), fine SAND, slight coal tar-like odor, wet S-13 : Top 13": Medium, dark gray (10 yr, 3/1), fine to coarse SAND, trace fine to coarse Gravel, wet Bottom 11": Medium, grayish-brown (10 yr, 5/2), fine SAND, moderate coal tar-like odor, wet S-14 : Top 16": Dense, dark gray (10 yr, 4/1), fine to coarse SAND, slight coal tar-like odor, wet Bottom 8": Dense, light bluish-gray (Gley 2, 7/1), fine to coarse SAND, some fine to coarse Gravel, some Cobble (wet) S-15 : Top 9": Dense, dark gray (10 yr, 3/1), coarse GRAVEL, trace fine to coarse Sand, slight coal tar-like odor, wet Bototm 5": Dense, very dark gray (10 yr, 3/1), fine to coarse GRAVEL, little fine to coarse Sand, trace Silt, slight coal tar-like odor S-16 : Top 9": Dense, very dark gray (10 yr, 3/1), fine to coarse GRAVEL, little fine to coarse Sand, trace Silt, moderate coal tar-like odor		51.6		GLACIAL TILL	-31.8	
40											37			
45														
50														
55														
60														
65														
70														

**REMARKS**

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

**Exploration No.:**  
**GZ-BK-501**





**TEST BORING LOG**



**GZA**  
**GeoEnvironmental, Inc.**  
*Engineers and Scientists*

**National Grid**  
**Former Tidewater Facility**  
**Pawtucket, Rhode Island**

**EXPLORATION NO.:** GZ-BK-502  
**SHEET:** 2 of 4  
**PROJECT NO:** 43654  
**REVIEWED BY:**

**Logged By:** S. McLeod  
**Drilling Co.:** Cascade  
**Foreman:** Greg Rivera

**Type of Rig:** CME-55  
**Rig Model:** LC Tract Rig  
**Drilling Method:**  
Wash & Drive

**Boring Location:** See Plan  
**Ground Surface Elev. (ft.):**  
**Final Boring Depth (ft.):** 82  
**Date Start - Finish:** 10/30/2017 - 11/2/2017

**H. Datum:**  
**V. Datum:**

**Hammer Type:** Automatic Hammer  
**Hammer Weight (lb.):** 140  
**Hammer Fall (in.):** 30  
**Auger or Casing O.D./I.D Dia (in.):** 4.5"/4.25"

**Sampler Type:** Sonic Core  
**Sampler O.D. (in.):** 2  
**Sampler Length (in.):** 24  
**Rock Core Size:**

**Groundwater Depth (ft.)**

Date	Time	Water Depth	Stab. Time

Depth (ft)	Casing Blows/ Core Rate	Sample						SPT Value	Sample Description and Identification Modified Burmister Procedure (USCS Group Symbol)	Remark	Field Test Data	Depth (ft.)	Stratum Description	Elev. (ft.)
		No.	Depth (ft.)	Pen. (in)	Rec. (in)	Blows (per 6 in.)								
40		S-19	36-38	24	20	13 22 23 26	45	Next 11": Gray (10 yr, 5/1), fine to coarse SAND (wet)		ND				
		S-20	38-40	24	12	3 6 10 8	16	Bottom 7": Gray/brown (10 yr, 4/2), fine to medium SAND, little Silt, little Organics (wet) (stratified Silt and Sand)						
45		S-21	40-42	24	12	12 8 10 9	18	S-14 : Dense, dark gray (10 yr, 4/1), fine to coarse SAND, trace Silt (wet)		ND				
		S-22	42-44	24	19	14 10 12 16	22	S-15 : Medium, gray-brown (10 yr, 5/2), fine to coarse SAND, some fine to coarse Gravel, trace Sit (wet)						
50		S-23	44-46	24	11	3 5 5 7	10	S-16 : Top 13": Dense, brown (10 yr, 5/3), fine to coarse SAND, little fine to coarse Gravel (wet)		ND				
		S-24	46-48	24	19	11 21 15 12	36	Bottom 7": Dense, brown (10 yr, 5/3), fine SAND (wet)						
55		S-25	48-50	24	0	5 9 8 7	17	S-17 : Top 7": Medium, dark gray (10 yr, 4/1), fine to coarse SAND and GRAVEL (wet)		ND				
		S-26	50-52	24	0			Bottom 5": Medium, brown (10 yr, 5/3), fine to coarse SAND (wet)						
60		S-27	52-54	24	10	3 2 4 6	6	S-18 : Top 2": Very dense, brown (10 yr, 5/3), fine SAND (wet)		ND			SAND	
		S-28	54-56	24	12	8 3 3 4	6	Next 10": Very dense, brown (10 yr, 5/3), fine to medium SAND (wet)						
65		S-29	56-58	24	14	8 4 4 6	8	Bottom 8": Very dense, brown (10 yr, 5/3), fine to coarse GRAVEL, little fine to coarse Sand, trace Silt (wet)		ND				
		S-30	58-60	24	12	3 6 6 7	12	S-19 : Top 12": Dense, brown (10 yr, 5/3), fine to medium SAND (wet)						
70		S-31	60-62	24	11	6 4 5 6	9	Next 5": Dense, brown (10 yr, 5/3), fine to coarse SAND (wet)		ND				
		S-32	62-64	24	20	6 6 7 11	13	Bottom 3": Dense, brown (10 yr, 5/3), fine to coarse GRAVEL, little fine to coarse Sand, trace Silt (wet)						
		S-33	64-66	24	15	6 5 10 12	15	S-20 : Medium, brown (10 yr, 5/3), fine to coarse SAND, trace fine Gravel (wet)		ND				
		S-34	66-68	24	24	12 26 157 29	R	S-21 : Top 6": Medium, brown (10 yr, 5/3), fine to coarse GRAVEL, little fine to coarse Sand, trace Silt (wet)						
		S-35	68-70	24	20	31 13 24 22	37	Bottom 6": Medium, brown (10 yr, 5/3), fine to coarse SAND, trace fine Gravel, trace Silt (wet)		ND			67.67 68GLACIAL TILL LENSE	
		S-36	70-72	24	18	15 5 5 10	10	S-22 : Medium, brown (10 yr, 5/3), fine to coarse SAND, little fine to coarse Gravel, trace Silt (wet)						
								S-23 : Medium brown (10 yr, 5/2), fine to coarse SAND (wet)						SAND
								S-24 : Top 10": Dense, brown (10 yr, 5/2), fine to coarse SAND (wet)						
								Bottom 9": Dense, brown (10 yr, 5/8), fine to coarse SAND, little fine to coarse Gravel (wet)						

**REMARKS**

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

**Exploration No.:**  
**GZ-BK-502**

**TEST BORING LOG**



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**National Grid**  
**Former Tidewater Facility**  
**Pawtucket, Rhode Island**

**EXPLORATION NO.:** GZ-BK-502  
**SHEET:** 3 of 4  
**PROJECT NO:** 43654  
**REVIEWED BY:**

**Logged By:** S. McLeod  
**Drilling Co.:** Cascade  
**Foreman:** Greg Rivera

**Type of Rig:** CME-55  
**Rig Model:** LC Tract Rig  
**Drilling Method:**  
Wash & Drive

**Boring Location:** See Plan  
**Ground Surface Elev. (ft.):**  
**Final Boring Depth (ft.):** 82  
**Date Start - Finish:** 10/30/2017 - 11/2/2017

**H. Datum:**  
**V. Datum:**

**Hammer Type:** Automatic Hammer  
**Hammer Weight (lb.):** 140  
**Hammer Fall (in.):** 30  
**Auger or Casing O.D./I.D Dia (in.):** 4.5"/4.25"

**Sampler Type:** Sonic Core  
**Sampler O.D. (in.):** 2  
**Sampler Length (in.):** 24  
**Rock Core Size:**

**Groundwater Depth (ft.)**

Date	Time	Water Depth	Stab. Time

Depth (ft)	Casing Blows/ Core Rate	Sample					SPT Value	Sample Description and Identification Modified Burmister Procedure (USCS Group Symbol)	Remark	Field Test Data	Depth (ft.)	Stratum Description	Elev. (ft.)
		No.	Depth (ft.)	Pen. (in)	Rec. (in)	Blows (per 6 in.)							
75		S-37	75-77	24	14	7 5 18 19	23	S-25 : No Recovery S-26 : No Recovery S-27 : Top 8" : Loose, brown (10 yr, 5/3), fine SAND, trace Silt (wet) Bottom 2" : Loose, brown (10 yr, 5/3), fine to coarse SAND, trace Silt (wet) S-28 : Loose, brown (10 yr, 5/3), fine SAND (wet) S-29 : Top 8" : Loose, brown (10 yr, 5/3), fine SAND (wet) Bottom 4" : Loose, gray (10 yr, 5/1), fine SAND, trace Silt (wet) S-30 : Medium, gray (10 yr, 5/1), fine SAND, trace Silt (wet)		ND	76.67	SAND	
80		S-38	80-82	24	11	4 7 13 27	20	S-31 : Loose, gray/brown (10 yr, 5/1), fine SAND, trace Silt (wet) S-32 : Medium, gray/brown (10 yr, 5/1), fine SAND, trace Silt (wet) S-33 : Top 9" : Medium, grayish-brown (10 yr, 5/2), fine SAND, trace Silt (wet) Bottom 6" : Medium, dark gray (10 yr, 4/1), fine to coarse SAND (wet) S-34 : Top 19" : Very dense, grayish-brown (10 yr, 5/2), fine SAND, trace Silt (wet) Next 1" : Very dense, dark gray (10 yr, 4/1), fine to coarse SAND (wet) Bottom 4" : Very dense, bluish-gray (Gley2 6/1), fine to coarse Gravel, little fine Sand, trace Silt (wet) S-35 : Top 12" : Dense, grayish-brown (10 yr, 5/2), fine to medium SAND, trace Silt (wet) Bottom 12" : Dense, dark gray (10 yr, 4/1), fine to coarse SAND, trace fine Gravel, trace Silt (wet) S-36 : Top 6" : Medium, dark gray (10 yr, 4/1), fine to medium SAND (wet) Bottom 12" : Medium, dark gray (10 yr, 4/1), fine to coarse SAND (wet) S-37 : Top 10" : Medium, dark gray (10 yr, 4/1), fine to coarse SAND, trace fine to coarse Gravel (wet) Bottom 4" : Medium, dark gray (Gley1, 4/N), fine to coarse GRAVEL, little fine to coarse Sand, trace Silt (wet) S-38 : Medium, dark gray (Gley1, 4/N), fine to coarse SAND, little fine to coarse Gravel, trace Silt (wet)		ND	82	GLACIAL TILL	

**REMARKS**

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

**Exploration No.:**  
**GZ-BK-502**

**TEST BORING LOG**



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**National Grid**  
**Former Tidewater Facility**  
**Pawtucket, Rhode Island**

**EXPLORATION NO.:** GZ-BK-502  
**SHEET:** 4 of 4  
**PROJECT NO:** 43654  
**REVIEWED BY:**

**Logged By:** S. McLeod  
**Drilling Co.:** Cascade  
**Foreman:** Greg Rivera

**Type of Rig:** CME-55  
**Rig Model:** LC Tract Rig  
**Drilling Method:**  
 Wash & Drive

**Boring Location:** See Plan  
**Ground Surface Elev. (ft.):**  
**Final Boring Depth (ft.):** 82  
**Date Start - Finish:** 10/30/2017 - 11/2/2017

**H. Datum:**  
**V. Datum:**

**Hammer Type:** Automatic Hammer  
**Hammer Weight (lb.):** 140  
**Hammer Fall (in.):** 30  
**Auger or Casing O.D./I.D Dia (in.):** 4.5"/4.25"

**Sampler Type:** Sonic Core  
**Sampler O.D. (in.):** 2  
**Sampler Length (in.):** 24  
**Rock Core Size:**

**Groundwater Depth (ft.)**

Date	Time	Water Depth	Stab. Time

Depth (ft)	Casing Blows/ Core Rate	Sample					SPT Value	Sample Description and Identification Modified Burmister Procedure (USCS Group Symbol)	Remark	Field Test Data	Depth (ft.)	Stratum Description	Elev. (ft.)
		No.	Depth (ft.)	Pen. (in)	Rec. (in)	Blows (per 6 in.)							
110								End of exploration at 82 feet.					
115													
120													
125													
130													
135													
140													

**REMARKS**

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

**Exploration No.:**  
**GZ-BK-502**



**TEST BORING LOG**



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**National Grid**  
**Former Tidewater Facility**  
**Pawtucket, Rhode Island**

**EXPLORATION NO.:** GZ-BW-501  
**SHEET:** 1 of 2  
**PROJECT NO:** 43654  
**REVIEWED BY:** SCC

**Logged By:** S. McLeod  
**Drilling Co.:** Cascade  
**Foreman:** Greg Rivera

**Type of Rig:** CME-55  
**Rig Model:** LC Track Rig  
**Drilling Method:**  
Wash & Drive

**Boring Location:** See Plan  
**Ground Surface Elev. (ft.):** 6.96  
**Final Boring Depth (ft.):** 36  
**Date Start - Finish:** 10/25/2017 - 10/26/2017

**H. Datum:**  
**V. Datum:**

**Hammer Type:** Automatic Hammer  
**Hammer Weight (lb.):** 140  
**Hammer Fall (in.):** 30  
**Auger or Casing O.D./I.D Dia (in.):** 4.5"/4.25"

**Sampler Type:** Split Spoon  
**Sampler O.D. (in.):** 2  
**Sampler Length (in.):** 24  
**Rock Core Size:**

**Groundwater Depth (ft.)**

Date	Time	Water Depth	Stab. Time

Depth (ft)	Casing Blows/ Core Rate	Sample					SPT Value	Sample Description Modified Burmister	Remark	Field Test Data	Depth (ft.)	Stratum Description	Elev. (ft.)
		No.	Depth (ft.)	Pen. (in)	Rec. (in)	Blows (per 6 in.)							
5		S-1	0-2					S-1 : Top 18": Very dark brown (10 yr, 2/2), fine to coarse SAND, some Slab, some Organics (roots), little fine to coarse Gravel (dry)	1	ND			
		S-2	2-4					Bottom 6": Very dark brown (10 yr, 2/2), fine to coarse SAND, some Slag, little fine to coarse Gravel (dry)	2				
10		S-3	4-6					S-2 : Very dark brown (10 yr, 2/2), fine to coarse SAND, some Slag, little fine to coarse Gravel (dry)	3	ND			
		S-4	6-8	24	22	3 2 2 3	4	S-3 : Very dark brown (10 yr, 2/2), fine to coarse SAND, some Slag, little fine to coarse Gravel (dry)	4				
15		S-5	8-10	24	1	WOH 4 6 4	10	S-4 : Very loose, black (10 yr, 2/1), fine to coarse SAND, little Slag, little Organics (roots), trace Brick (dry)	5	ND			
		S-6	10-12	24	8	7 7 17 5	24	S-5 : Loose, black (10 yr, 2/1), fine to coarse SAND, little fine to coarse Gravel, little Brick (wet)	6				
20		S-7	12-14	24	5	3 3 2 3	5	S-6 : Top 2": Medium, very dark brown (10 yr, 2/2), fine to coarse SAND and GRAVEL, some Slag (wet)	7	70	14		-7.0
		S-8	14-16	24	2	2 1 1 2	2	Bottom 6": WOOD	8				
25		S-9	16-18	24	6	5 6 7 14	13	S-7 : Loose, black (10 yr, 2/1), fine to coarse SAND and GRAVEL, little Brick, sheen/coated, moderate coal tar-like odor (wet)	9	ND			
		S-10	18-20	24	13	9 11 11 14	22	S-8 : Very loose, very dark gray (10 yr, 3/1) Clayey SILT (wet)	10				
30		S-11	20-22	24	18	13 7 9 16	16	S-9 : Medium, dark gray (10 yr, 4/1) SILT, little fine to coarse Sand (wet)	11	8.0	20		-13.0
		S-12	22-24	24	24	14 20 32 29	52	S-10 : Top 9": Medium, dark gray (10 yr, 4/1), fine to coarse SAND, some fine to coarse Gravel, moderate coal tar-like odor (wet)	12				
35		S-13	24-26	24	6	1 1 16 16	17	Bottom 4": Medium dark gray (10 yr, 4/1), fine to coarse SAND, some fine to coarse Gravel, coated, moderate coal tar-like odor (wet)	13	10.9			
		S-14	26-28	24	8	10 9 11 16	20	S-11 : Medium, dark gray (10 yr, 4/1), fine to coarse SAND, some fine to coarse Gravel, blebs, moderate coat tar-like odor (wet)	14				
		S-15	28-30	24	17	14 24 12 23	36	S-12 : Top 5": Dense, gray (10 yr, 5/1), fine to coarse GRAVEL, little fine to coarse Sand, blebs, moderate coal tar-like odor (wet)	15	28			
		S-16	30-32	24	10	4 17 18 29	35	Bottom 19": Dense, gray (10 yr, 5/1), fine to coarse SAND, some fine to coarse Gravel, blebs, moderate coal tar-like odor (wet)	16				
		S-17	32-34	24	12	3 12 24 27	36	S-13 : Medium, dark gray (10 yr, 4/1), fine to coarse SAND and GRAVEL, sheen, moderate coal tar-like odor	17	ND	31.5		-24.5
		S-18	34-36	24	18	26 46			18				

**REMARKS**

1 - Soil samples screened with a 10.6 eV MiniRAE 2000 photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. ND=None Detected above background.  
2 - Borehole backfilled with a portland cement and bentonite grout via tremmie pipe.  
3 - Three locations encountered refusal at 3' bgs due to concrete.

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

**Exploration No.:**  
**GZ-BW-501**

BORING LOGS.GPJ; GZA TEMPLATE TEST BORING; GZA TEMPLATE 0210.GDT; GZA LIBRARY 10-29-10-NGRID MODIFIED.GLB; 1/11/2018; 1:04:21 PM

### TEST BORING LOG



**GZA**  
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National Grid  
 Former Tidewater Facility  
 Pawtucket, Rhode Island

**EXPLORATION NO.:** GZ-BW-501  
**SHEET:** 2 of 2  
**PROJECT NO:** 43654  
**REVIEWED BY:** SCC

**Logged By:** S. McLeod  
**Drilling Co.:** Cascade  
**Foreman:** Greg Rivera

**Type of Rig:** CME-55  
**Rig Model:** LC Track Rig  
**Drilling Method:**  
 Wash & Drive

**Boring Location:** See Plan  
**Ground Surface Elev. (ft.):** 6.96  
**Final Boring Depth (ft.):** 36  
**Date Start - Finish:** 10/25/2017 - 10/26/2017

**H. Datum:**  
**V. Datum:**

**Hammer Type:** Automatic Hammer  
**Hammer Weight (lb.):** 140  
**Hammer Fall (in.):** 30  
**Auger or Casing O.D./I.D Dia (in.):** 4.5"/4.25"

**Sampler Type:** Split Spoon  
**Sampler O.D. (in.):** 2  
**Sampler Length (in.):** 24  
**Rock Core Size:**

**Groundwater Depth (ft.)**

Date	Time	Water Depth	Stab. Time

Depth (ft)	Casing Blows/ Core Rate	Sample					SPT Value	Sample Description Modified Burmister	Remark	Field Test Data	Depth (ft.)	Stratum Description	Elev. (ft.)
		No.	Depth (ft.)	Pen. (in)	Rec. (in)	Blows (per 6 in.)							
						84 33	130	(wet)		ND	36	GLACIAL TILL	-29.0
40								S-14 : Top 5": Medium, dark grayish-brown (10 yr, 4/2), fine SAND, blebs, moderate coal tar-like odor (wet) Bottom 3": Medium, black (10 yr, 2/1), fine to coarse SAND, some fine to coarse Gravel, sheen/coated, moderate coal tar-like odor (wet)					
45								S-15 : Top 7": Dense, dark grayish-brown (10 yr, 4/2), fine to coarse SAND, little fine to coarse Gravel, slight coal tar-like odor (wet) Next 8": Dense, grayish-brown (10 yr, 5/2), fine to medium SAND, trace fine to coarse Gravel, slight coal tar-like odor (wet) Bottom 2": Dense, dark grayish-brown (10 yr, 4/1), fine to medium SAND, little fine to coarse Gravel, sheen, slight coal tar-like odor					
50								S-16 : Top 6": Dense, very dark gray (10 yr, 3/1), fine to coarse SAND, some fine to coarse Gravel (wet) Bottom 4": Dense, greenish-gray (Gley1, 6/1), fine to medium SAND, some fine to coarse Gravel, trace Silt (wet)					
55								S-17 : Dense, dark gray (10 yr, 4/1), fine to coarse SAND and GRAVEL (wet) S-18 : Top 9": Very dense, bluish-gray (Gley2, 6/1), fine to coarse SAND and GRAVEL, little Silt (wet) Bottom 9": Very dense, grayish-brown (10 yr, 5/2), fine to coarse GRAVEL, some fine to coarse Sand (wet)					
60								End of exploration at 36 feet.					
65													
70													

**REMARKS**

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

**Exploration No.:**  
**GZ-BW-501**

BORING LOGS.GPJ; GZA TEMPLATE TEST BORING; GZA TEMPLATE 0210.GDT; GZA LIBRARY 10-29-10-NGRID MODIFIED.GLB; 1/11/2018; 1:04:22 PM



**TEST BORING LOG**



**GZA**  
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*Engineers and Scientists*

**National Grid**  
**Former Tidewater Facility**  
**Pawtucket, Rhode Island**

**EXPLORATION NO.:** GZ-BW-502  
**SHEET:** 2 of 2  
**PROJECT NO:** 43654  
**REVIEWED BY:** SCC

**Logged By:** S. Connolly  
**Drilling Co.:** Cascade  
**Foreman:** Greg Rivera

**Type of Rig:** RotoSonic  
**Rig Model:** Fraste XL Max 250  
**Drilling Method:**  
Sonic

**Boring Location:** See Plan  
**Ground Surface Elev. (ft.):** 5.76  
**Final Boring Depth (ft.):** 50  
**Date Start - Finish:** 10/9/2017 - 10/9/2017

**H. Datum:**  
**V. Datum:**

**Hammer Type:** NA  
**Hammer Weight (lb.):** NA  
**Hammer Fall (in.):** NA  
**Auger or Casing O.D./I.D Dia (in.):** 6.5"/8"

**Sampler Type:** Sonic Core  
**Sampler O.D. (in.):** 4  
**Sampler Length (in.):** 60  
**Rock Core Size:**

**Groundwater Depth (ft.)**

Date	Time	Water Depth	Stab. Time

Depth (ft)	Casing Blows/ Core Rate	Sample				Blows (per 6 in.)	SPT Value	Sample Description and Identification Modified Burmister Procedure (USCS Group Symbol)	Remark	Field Test Data	Depth (ft.)	Stratum Description	Elev. (ft.)										
		No.	Depth (ft.)	Pen. (in)	Rec. (in)																		
40		S-10	35-40	60	48			(wet) Bottom 18": Very dark gray (10 yr, 3/1), fine to medium SAND, trace Silt, moderate coal tar-like odor (wet) S-9 : Top 20": Dark gray (10 yr, 4/1), fine to coarse SAND, some fine to coarse Gravel, trace Silt, 1" coated seam at 31', moderate coal tar-like odor, sheen throughout (wet) Next 16": Grayish brown (10 yr, 5/2), fine SAND and SILT (wet) Bottom 16": Dark gray (10 yr, 4/1), fine to coarse SAND, some fine to coarse Gravel, little Cobble, slight coal tar-like odor (wet)		173	SAND												
		S-11	40-45	60	50			182															
		S-12	45-50	60	52			1393		41.8			-36.0										
45									71	GLACIAL TILL													
									90.4														
50									825.5	49.5	-43.7	POSSIBLE BEDROCK											
55																							
													60										
70																							

**REMARKS**

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

**Exploration No.:**  
**GZ-BW-502**

GZA TEMPLATE TEST BORING: 1/5/2018; 11:25:34 AM





**TEST BORING LOG**



**GZA**  
**GeoEnvironmental, Inc.**  
*Engineers and Scientists*

**National Grid**  
**Former Tidewater Facility**  
**Pawtucket, Rhode Island**

**EXPLORATION NO.:** GZ-BW-503  
**SHEET:** 2 of 2  
**PROJECT NO:** 43654  
**REVIEWED BY:** SCC

**Logged By:** S. Connolly  
**Drilling Co.:** Cascade  
**Foreman:** Greg Rivera

**Type of Rig:** RotoSonic  
**Rig Model:** Fraste XL Max 250  
**Drilling Method:**  
 Sonic

**Boring Location:** See Plan  
**Ground Surface Elev. (ft.):** 6.03  
**Final Boring Depth (ft.):** 50  
**Date Start - Finish:** 10/10/2017 - 10/12/2017

**H. Datum:**  
**V. Datum:**

**Hammer Type:** NA  
**Hammer Weight (lb.):** NA  
**Hammer Fall (in.):** NA  
**Auger or Casing O.D./I.D Dia (in.):** 6.5"/8"

**Sampler Type:** Sonic Core  
**Sampler O.D. (in.):** 4  
**Sampler Length (in.):** 60  
**Rock Core Size:**

**Groundwater Depth (ft.)**

Date	Time	Water Depth	Stab. Time

Depth (ft)	Casing Blows/ Core Rate	Sample				Blows (per 6 in.)	SPT Value	Sample Description Modified Burmister	Remark	Field Test Data	Depth (ft.)	Stratum Description	Elev. (ft.)
		No.	Depth (ft.)	Pen. (in)	Rec. (in)								
40		S-10	35-40	60	50			tar-like odor (wet) Next 24": Gray (10 yr, 5/1), fine to medium SAND, some Silt, slight coal tar-like odor (wet) Bottom 12": Gray (10 yr, 5/1), fine to coarse SAND, some Gravel, slight coal tar-like odor (wet)		5.1	OUTWASH	-31.7	
		S-11	40-45	60	60			S-9 : Top 6": Gray (10 yr, 5/1), fine to coarse SAND, strong coal tar-like odor, saturated (wet) Next 34": Gray (10 yr, 5/1), fine SAND, some Silt, slight coal tar-like odor (wet) Next 3": Gray (10 yr, 5/1), fine to coarse SAND, saturated, strong coal tar-like odor, saturated (wet)		2.4			GLACIAL TILL
		S-12	45-50	60	53			Bottom 17": Gray (10 yr, 5/1), fine to medium SAND, slight coal tar-like odor S-10 : Top 32": Pale brown (10 yr, 6/3), fine SAND, some Silt (wet) Bottom 28": Light gray (10 yr, 7/1), fine to coarse SAND, some Silt, little fine to coarse Gravel, little Cobble (wet)		1.3			
45							Bottom 17": Gray (10 yr, 5/1), fine to medium SAND, slight coal tar-like odor S-10 : Top 32": Pale brown (10 yr, 6/3), fine SAND, some Silt (wet) Bottom 28": Light gray (10 yr, 7/1), fine to coarse SAND, some Silt, little fine to coarse Gravel, little Cobble (wet)		ND				
50							S-11 : Top 16": Light gray (10 yr, 7/1), fine to coarse SAND, some Silt, little fine to coarse Gravel, little Cobble (wet) Bottom 44": Brown (10 yr, 5/3), fine to coarse SAND, some Silt, little fine to coarse Gravel, little Cobble (wet) S-12 : Brown (10 yr, 5/3), fine to coarse SAND, some Silt, little fine to coarse Gravel, little Cobble (wet)		1.6				
55							End of exploration at 50 feet.		1.9	50		-44.0	
60													
65													
70													

**REMARKS**

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

**Exploration No.:**  
**GZ-BW-503**

BORING LOGS.GPJ; GZA TEMPLATE TEST BORING; GZA TEMPLATE 0210.GDT; GZA LIBRARY 10-29-10-NGRID MODIFIED.GLB; 1/11/2018; 1:04:52 PM

**TEST BORING LOG**



**GZA**  
**GeoEnvironmental, Inc.**  
*Engineers and Scientists*

**National Grid**  
**Former Tidewater Facility**  
**Pawtucket, Rhode Island**

**EXPLORATION NO.:** GZ-BW-504A  
**SHEET:** 1 of 2  
**PROJECT NO:** 43654  
**REVIEWED BY:** SCC

**Logged By:** S. Connolly  
**Drilling Co.:** Cascade  
**Foreman:** Greg Rivera

**Type of Rig:** Rotasonic  
**Rig Model:** Fraste XL Max 250  
**Drilling Method:**  
Sonic

**Boring Location:** See Plan  
**Ground Surface Elev. (ft.):** 8.42  
**Final Boring Depth (ft.):** 50  
**Date Start - Finish:** 10/10/2017 - 10/10/2017

**H. Datum:**  
**V. Datum:**

**Hammer Type:** NA  
**Hammer Weight (lb.):** NA  
**Hammer Fall (in.):** NA  
**Auger or Casing O.D./I.D Dia (in.):** 6.5"/8"

**Sampler Type:** Sonic Core  
**Sampler O.D. (in.):** 4  
**Sampler Length (in.):** 60  
**Rock Core Size:**

**Groundwater Depth (ft.)**

Date	Time	Water Depth	Stab. Time

Depth (ft)	Casing Blows/ Core Rate	Sample					SPT Value	Sample Description Modified Burmister	Remark	Field Test Data	Depth (ft.)	Stratum Description	Elev. (ft.)	
		No.	Depth (ft.)	Pen. (in)	Rec. (in)	Blows (per 6 in.)								
5		S-1	0-2					S-1 : Dark brown-gray (10 yr, 3/2), fine to coarse SAND, some Slag, little fine to coarse Gravel, little Organics (Roots), trace Silt (dry)	1	ND	FILL			
		S-2	2-4					S-2 : Black (10 yr, 2/1), fine to coarse SAND, some Slag, little fine to coarse Gravel, trace Silt, trace Organics (roots) (dry)	2	ND				
		S-3	4-6					S-3 : Black (10 yr, 2/1), fine to coarse SAND, some Slag, little fine to coarse Gravel, trace Silt, trace Organics (roots) (dry)		ND				
		S-4	6-10	48	48			S-4 : Top 20": Gray (10 yr, 5/1), coarse GRAVEL, some Cobble, some fine to medium Sand, trace Organics (roots) (dry)		1.1				
10		S-5	10-15	60	60			S-4 : Next 3": Dark brown (10 yr, 3/3), fine to medium SAND, some fine to coarse Gravel, some Cobble, trace Silt (dry) Next 14": Pale brown (10 yr, 6/3), fine to medium SAND, some Silt, trace Gravel (dry) Bottom 11": Dark yellow brown (10 yr, 4/6), fine SAND, some Silt, moderate-strong petroleum like odor, stained (moist)		9.2			-0.8	
								S-5 : Top 8": Dark gray (10 yr, 4/1), fine SAND, some Gravel, some Silt, moderate petroleum-like odor, sheen-staining (wet)		112.7				
15		S-6	15-20	60	30			Bottom 52": Dark gray (10 yr, 4/1), fine to coarse SAND and GRAVEL, slight petroleum-like odor (wet)		73.2	SAND			
								S-6 : Top 15": Very dark gray (10 yr, 3/1), fine to coarse GRAVEL, some Cobble, some fine to medium Sand, little Silt, moderate-strong petroleum-like odor (wet)		44.3				
								Next 4": Dark yellowish-brown (10 yr, 4/4), fine to medium SAND, some Silt, little fine to coarse Gravel (wet)		84.8				
								Bottom 11": Dark gray (10 yr, 4/1) fine SAND, some Silt, trace fine Gravel, slight coal tar-like odor, stained (wet)		160				
20		S-7	20-25	60	52			S-7 : Top 34": Very dark gray (10 yr, 3/1), fine to coarse GRAVEL, some Cobble, some fine to medium Sand, little Silt, moderate-strong (wet) petroleum-like odor		46				
								Bottom 18": Dark brown (10 yr, 3/2), fine to coarse SAND, some fine to coarse Gravel, little Cobble, trace Silt, slight coal tar-like odor (wet)		138.				
25		S-8	25-30	60	44			S-8 : Top 16": Dark brown (10 yr, 3/2), fine to coarse SAND, some fine to coarse Gravel, little Cobble, trace Silt, slight coal tar-like odor (wet)		44.8				
								S-8 : Top 16": Dark brown (10 yr, 3/2), fine to coarse SAND, some fine to coarse Gravel, little Cobble, trace Silt, slight coal tar-like odor (wet)		50.2				
30								S-8 : Top 16": Dark brown (10 yr, 3/2), fine to coarse SAND, some fine to coarse Gravel, little Cobble, trace Silt, slight coal tar-like odor (wet)		96.7				
								S-8 : Top 16": Dark brown (10 yr, 3/2), fine to coarse SAND, some fine to coarse Gravel, little Cobble, trace Silt, slight coal tar-like odor (wet)		46				
35		S-9	30-35	60	42			S-9 : Top 18": Dark brown (10 yr, 3/2), fine to coarse SAND, some fine to coarse Gravel, little Cobble, trace Silt, slight coal tar-like odor (wet)		46				
								S-9 : Top 18": Dark brown (10 yr, 3/2), fine to coarse SAND, some fine to coarse Gravel, little Cobble, trace Silt, slight coal tar-like odor (wet)		46	30			-21.6

**REMARKS**  
1 - Soil samples screened with a 10.6 eV MiniRAE 2000 photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. ND=None Detected above background.  
2 - Borehole backfilled with a portland cement and bentonite grout via tremmie pipe.

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

**Exploration No.:**  
**GZ-BW-504A**

BORING LOGS.GPJ; GZA TEMPLATE TEST BORING; GZA TEMPLATE 0210.GDT; GZA LIBRARY 10-29-10-NGRID MODIFIED.GLB; 1/11/2018; 1:05:13 PM

**TEST BORING LOG**



**GZA**  
**GeoEnvironmental, Inc.**  
*Engineers and Scientists*

**National Grid**  
**Former Tidewater Facility**  
**Pawtucket, Rhode Island**

**EXPLORATION NO.:** GZ-BW-504A  
**SHEET:** 2 of 2  
**PROJECT NO:** 43654  
**REVIEWED BY:** SCC

**Logged By:** S. Connolly  
**Drilling Co.:** Cascade  
**Foreman:** Greg Rivera

**Type of Rig:** Rotasonic  
**Rig Model:** Fraste XL Max 250  
**Drilling Method:**  
 Sonic

**Boring Location:** See Plan  
**Ground Surface Elev. (ft.):** 8.42  
**Final Boring Depth (ft.):** 50  
**Date Start - Finish:** 10/10/2017 - 10/10/2017

**H. Datum:**  
**V. Datum:**

**Hammer Type:** NA  
**Hammer Weight (lb.):** NA  
**Hammer Fall (in.):** NA  
**Auger or Casing O.D./I.D Dia (in.):** 6.5"/8"

**Sampler Type:** Sonic Core  
**Sampler O.D. (in.):** 4  
**Sampler Length (in.):** 60  
**Rock Core Size:**

**Groundwater Depth (ft.)**

Date	Time	Water Depth	Stab. Time

Depth (ft)	Casing Blows/ Core Rate	Sample				Blows (per 6 in.)	SPT Value	Sample Description Modified Burmister	Remark	Field Test Data	Depth (ft.)	Stratum Description	Elev. (ft.)			
		No.	Depth (ft.)	Pen. (in)	Rec. (in)											
40		S-10	35-40	60	50			Bottom 28": Very dark gray (10 yr, 3/1), fine to coarse GRAVEL, some Cobble, some fine to medium Sand, little Silt, mod-strong petroleum-like odor (wet) S-9 : Top 8": Very dark gray (10 yr, 3/1), fine to coarse GRAVEL, some Cobble, some fine to medium Sand, little Silt, moderate-strong petroleum-like odor (wet) Next 28": Brown (10 yr, 4/3), fine to coarse SAND, some fine to coarse Gravel, little Cobble (wet) Bottom 6": Brown (10 yr, 4/3), fine SAND, some Silt (wet) S-10 : Top 10": Dark gray (10 yr, 4/1), fine to medium SAND, little fine Gravel (wet) Bottom 40": Gray (10 yr, 5/1), fine SAND, some Silt (wet) S-11 : Very dark gray (10 yr, 3/1), fine to coarse SAND, some fine to coarse Gravel, some Cobble, trace Silt, slight coal tar-like odor (wet) S-12 : Top 24": Brown (10 yr, 4/3), fine to coarse SAND, some Gravel, little Cobble, trace Silt (wet) Next 6": Gray (10 yr, 5/1), fine SAND, some Silt (wet) Next 4": Gray (10 yr, 5/1), fine to coarse GRAVEL, some Cobble, some fine to medium Sand (wet) Bottom 10": ROCK/BOULDER		9.0 ND						
		S-11	40-45	60	32										36.7	SAND
		S-12	45-50	60	44										7.2	
45										2.5						
50											48.83		-40.4			
											50	GLACIAL TILL	-41.6			
55								End of exploration at 50 feet.								
60																
65																
70																

**REMARKS**

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

**Exploration No.:**  
**GZ-BW-504A**

BORING LOGS.GPJ; GZA TEMPLATE TEST BORING; GZA TEMPLATE 0210.GDT; GZA LIBRARY 10-29-10-NGRID MODIFIED.GLB; 1/11/2018; 1:05:13 PM



**TEST BORING LOG**



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**National Grid**  
**Former Tidewater Facility**  
**Pawtucket, Rhode Island**

**EXPLORATION NO.:** GZ-BW-505  
**SHEET:** 1 of 3  
**PROJECT NO:** 43654  
**REVIEWED BY:** SCC

**Logged By:** S. McLeod  
**Drilling Co.:** Cascade  
**Foreman:** Greg Rivera

**Type of Rig:** CME-55  
**Rig Model:** LC Track Rig  
**Drilling Method:**  
Wash & Drive

**Boring Location:** See Plan  
**Ground Surface Elev. (ft.):** 7.34  
**Final Boring Depth (ft.):** 44  
**Date Start - Finish:** 10/10/2017 - 10/27/2017

**H. Datum:**  
**V. Datum:**

**Hammer Type:** NA  
**Hammer Weight (lb.):** NA  
**Hammer Fall (in.):** NA  
**Auger or Casing O.D./I.D Dia (in.):** 4.5"/4.25"

**Sampler Type:** Split Spoon  
**Sampler O.D. (in.):** 4  
**Sampler Length (in.):** 60  
**Rock Core Size:**

**Groundwater Depth (ft.)**

Date	Time	Water Depth	Stab. Time

Depth (ft)	Casing Blows/ Core Rate	Sample					SPT Value	Sample Description and Identification Modified Burmister Procedure (USCS Group Symbol)	Remark	Field Test Data	Depth (ft.)	Stratum Description	Elev. (ft.)
		No.	Depth (ft.)	Pen. (in)	Rec. (in)	Blows (per 6 in.)							
5		S-1	0-2					S-1 : Very dark gray (10 yr, 3/1), fine to coarse SAND, some fine to coarse Gravel, some Brick, little Slag, little Organics (roots), trace Silt (dry)	1	0.1			
		S-2	2-4										
10		S-3	4-6					S-3 : Very dark grayish-brown (10 yr, 3/2), fine to coarse SAND, some fine to coarse Gravel, some Brick, trace Slag, trace Silt (dry)		ND			
		S-4	6-8	24	17	5 10 11 13	21						
15		S-5	8-10	24	21	15 6 6 5	12	Next 4": Medium, brown (10 yr, 4/3), fine to coarse SAND, little fine to coarse Gravel, moderate petroleum-like odor (wet)		8.7			
		S-6	10-12	24	21	8 6 7 12	13						
20		S-7	12-14	24	15	12 13 18 15	31	S-5 : Medium, dark gray (10 yr, 4/3), fine to coarse SAND, little fine to coarse Gravel, moderate petroleum-like odor (wet)		9.5			
		S-8	14-16	24	5	6 5 10 7	15						
25		S-9	16-18	24	12	7 8 11 17	19	Bottom 12": Medium, brown (10 yr, 5/3), fine to medium SAND, slight petroleum-like odor (wet)		2.1			
		S-10	18-20	24	16	5 11 17 23	28						
30		S-11	20-22	24	24	15 31 26 34	57	Bottom 7": Dense, black (10 yr, 2/1), fine to coarse SAND and GRAVEL, slight petroleum-like odor (wet)		ND			
		S-12	22-24	24	10	19 73 27 20	100						
35		S-13	24-26	24	0	14 15 21 24	36	S-9 : Medium, very dark gray (10 yr, 3/1), fine to medium SAND, some fine to coarse Gravel, trace Silt, slight petroleum-like odor (wet)		ND			
		S-14	26-28	24	12	10 13 13 15	26						
		S-15	28-30	24	9	6 10 13 20	23	Bottom 6": Medium, very dark gray (10 yr, 3/1), fine to coarse SAND, little fine to coarse Gravel, trace Silt (wet)		ND			
		S-16	30-32	24	14	6 16 14 12	30						
		S-17	32-34	24	14	7 7 9 10	16			ND			
		S-18	34-36	24	23	5 8				ND			

**REMARKS**  
1 - Soil samples screened with a 10.6 eV MiniRAE 2000 photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. ND=None Detected above background.  
2 - Borehole backfilled with a portland cement and bentonite grout via tremmie pipe.

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

**Exploration No.:**  
**GZ-BW-505**

BORING LOGS.GPJ; GZA TEMPLATE TEST BORING; GZA TEMPLATE 0210.GDT; GZA LIBRARY 10-29-10-NGRID MODIFIED.GLB; 1/8/2018; 11:40:42 AM

**TEST BORING LOG**



**GZA**  
**GeoEnvironmental, Inc.**  
*Engineers and Scientists*

**National Grid**  
**Former Tidewater Facility**  
**Pawtucket, Rhode Island**

**EXPLORATION NO.:** GZ-BW-505  
**SHEET:** 2 of 3  
**PROJECT NO:** 43654  
**REVIEWED BY:** SCC

**Logged By:** S. McLeod  
**Drilling Co.:** Cascade  
**Foreman:** Greg Rivera

**Type of Rig:** CME-55  
**Rig Model:** LC Track Rig  
**Drilling Method:**  
 Wash & Drive

**Boring Location:** See Plan  
**Ground Surface Elev. (ft.):** 7.34  
**Final Boring Depth (ft.):** 44  
**Date Start - Finish:** 10/10/2017 - 10/27/2017

**H. Datum:**  
**V. Datum:**

**Hammer Type:** NA  
**Hammer Weight (lb.):** NA  
**Hammer Fall (in.):** NA  
**Auger or Casing O.D./I.D Dia (in.):** 4.5"/4.25"

**Sampler Type:** Split Spoon  
**Sampler O.D. (in.):** 4  
**Sampler Length (in.):** 60  
**Rock Core Size:**

**Groundwater Depth (ft.)**

Date	Time	Water Depth	Stab. Time

Depth (ft)	Casing Blows/ Core Rate	Sample					SPT Value	Sample Description and Identification Modified Burmister Procedure (USCS Group Symbol)	Remark	Field Test Data	Depth (ft.)	Stratum Description	Elev. (ft.)
		No.	Depth (ft.)	Pen. (in)	Rec. (in)	Blows (per 6 in.)							
40		S-19	36-38	24	16	11 13 5 6 7 6	19 13	S-11 : Top 14": Dense, very dark gray (10 yr, 3/1), fine to coarse SAND, little fine to coarse Gravel, trace Silt (wet) Bottom 10": Dense, very dark grayish-brown (10 yr, 3/2), fine to coarse GRAVEL, some fine to coarse Sand, trace Silt (wet)	ND	38.83	-31.5	SAND	
		S-20	38-40	24	19	5 4 10 10	14	S-12 : Top 8": Very dense, very dark grayish-brown (10 yr, 3/2), fine to coarse GRAVEL, some fine to coarse Sand, trace Silt (wet)	ND				
		S-21	40-42	24	14	23 27 23 24	50	Bottom 2": Very dense, grayish-brown (10 yr, 3/2), fine to medium SAND, some Silt (wet)	ND	44	-36.7	GLACIAL TILL	
		S-22	42-44	24	17	7 14 18 28	32	S-13 : No Recovery	ND				
45							S-14 : Top 8": Medium, gray (10 yr, 5/1), fine SAND, trace Silt, 1-2" fine to coarse Sand seam at 27.5' (wet) Bottom 4": Medium, yellowish-brown (10 yr, 5/8), fine to coarse SAND (wet)						
50							S-15 : Medium, dark yellowish-brown (10 yr, 4/6), fine to coarse SAND, trace fine to coarse Gravel (wet) S-16 : Top 4: Medium, dark yellowish-brown (10 yr. 4/6). fine to coarse SAND, trace fine to coarse Gravel (wet) Next 6": Medium, dark gray (10 yr. 4/1). fine to coarse SAND, some fine to coarse Gravel (wet) Bottom 4: Medium, dark yellowish-brown (10 yr. 4/6). fine to coarse SAND, trace fine to coarse Gravel (wet)						
55							S-17 : Top 6": Medium, dark gray (10 yr, 4/1), fine to coarse SAND, some fine to coarse Gravel (wet) Bottom 8" Medium, dark yellowish-brown (10 yr, 4/6), fine to coarse SAND, trace fine to coarse Gravel (wet)						
60							S-18 : Top 7": Medium, gray (10 yr, 5/1), fine to coarse SAND, little fine to coarse Gravel (wet) Next 2": Medium, dark yellowish-brown (10 yr, 5/1), fine to coarse SAND, little fine to coarse Gravel (wet) Next 6": Medium, gray (10 yr, 5/1), fine to coarse SAND (wet)						
65							Bottom 8": Medium, gray (10 yr, 5/1), fine SAND, little Silt (wet) S-19 : Medium, gray (10 yr, 5/1), fine SAND, little Silt (wet) S-20 : Top 2": Medium, dark gray (10 yr, 4/1) Clayey SILT (wet)						
70							Next 3": Medium, dark gray (10 yr, 4/1) SILT, some fine Sand, (wet)						

**REMARKS**

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

**Exploration No.:**  
**GZ-BW-505**

BORING LOGS.GPJ; GZA TEMPLATE TEST BORING; GZA TEMPLATE 0210.GDT; GZA LIBRARY 10-29-10-NGRID MODIFIED.GLB; 1/8/2018; 11:40:42 AM

**TEST BORING LOG**



**GZA**  
**GeoEnvironmental, Inc.**  
*Engineers and Scientists*

**National Grid**  
**Former Tidewater Facility**  
**Pawtucket, Rhode Island**

**EXPLORATION NO.:** GZ-BW-505  
**SHEET:** 3 of 3  
**PROJECT NO:** 43654  
**REVIEWED BY:** SCC

**Logged By:** S. McLeod  
**Drilling Co.:** Cascade  
**Foreman:** Greg Rivera

**Type of Rig:** CME-55  
**Rig Model:** LC Track Rig  
**Drilling Method:**  
 Wash & Drive

**Boring Location:** See Plan  
**Ground Surface Elev. (ft.):** 7.34  
**Final Boring Depth (ft.):** 44  
**Date Start - Finish:** 10/10/2017 - 10/27/2017

**H. Datum:**  
**V. Datum:**

**Hammer Type:** NA  
**Hammer Weight (lb.):** NA  
**Hammer Fall (in.):** NA  
**Auger or Casing O.D./I.D Dia (in.):** 4.5"/4.25"

**Sampler Type:** Split Spoon  
**Sampler O.D. (in.):** 4  
**Sampler Length (in.):** 60  
**Rock Core Size:**

**Groundwater Depth (ft.)**

Date	Time	Water Depth	Stab. Time

Depth (ft)	Casing Blows/ Core Rate	Sample No.	Sample				SPT Value	Sample Description and Identification Modified Burmister Procedure (USCS Group Symbol)	Remark	Field Test Data	Depth (ft.)	Stratum Description	Elev. (ft.)
			Depth (ft.)	Pen. (in)	Rec. (in)	Blows (per 6 in.)							
75							Bottom 14": Medium, dark gray (10 yr, 4/1), fine to medium SAND, some fine to coarse Gravel, little Silt (wet) S-21 : Dense, dark gray (10 yr, 4/1), fine to medium SAND, some fine to coarse Gravel, little Silt (wet) S-22 : Top 8": Dense, dark bluish-gray (10 yr, 4/1), fine to medium SAND, some fine to coarse Gravel, little Silt (wet) Bottom 9": Dense, brown (10 yr, 4/3), fine to medium SAND, some fine to coarse Gravel, little Silt (wet)						
80							End of exploration at 44 feet.						
85													
90													
95													
100													
105													

**REMARKS**

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

**Exploration No.:**  
**GZ-BW-505**

BORING LOGS.GPJ; GZA TEMPLATE TEST BORING; GZA TEMPLATE 0210.GDT; GZA LIBRARY 10-29-10-NGRID MODIFIED.GLB; 1/8/2018; 11:40:43 AM

**TEST BORING LOG**



**GZA**  
**GeoEnvironmental, Inc.**  
*Engineers and Scientists*

**National Grid**  
**Former Tidewater Facility**  
**Pawtucket, Rhode Island**

**EXPLORATION NO.:** GZ-BW-506  
**SHEET:** 1 of 2  
**PROJECT NO:** 43654  
**REVIEWED BY:** SCC

**Logged By:** S. McLeod  
**Drilling Co.:** Cascade  
**Foreman:** Greg Rivera

**Type of Rig:** RotoSonic  
**Rig Model:** Fraste XL Max 250  
**Drilling Method:**  
Sonic

**Boring Location:** See Plan  
**Ground Surface Elev. (ft.):** 5.98  
**Final Boring Depth (ft.):** 55  
**Date Start - Finish:** 10/10/2017 - 10/10/2017

**H. Datum:**  
**V. Datum:**

**Hammer Type:** NA  
**Hammer Weight (lb.):** NA  
**Hammer Fall (in.):** NA  
**Auger or Casing O.D./I.D Dia (in.):** 6.5"/8"

**Sampler Type:** Sonic Core  
**Sampler O.D. (in.):** 4  
**Sampler Length (in.):** 60  
**Rock Core Size:**

**Groundwater Depth (ft.)**

Date	Time	Water Depth	Stab. Time

Depth (ft)	Casing Blows/ Core Rate	Sample					SPT Value	Sample Description and Identification Modified Burmister Procedure (USCS Group Symbol)	Remark	Field Test Data	Depth (ft.)	Stratum Description	Elev. (ft.)
		No.	Depth (ft.)	Pen. (in)	Rec. (in)	Blows (per 6 in.)							
5		S-1	0-2					S-1 : Dark brown (10 yr, 3/3), fine to coarse SAND, some Slag, some Brick, little Organics (Roots), trace Silt (dry)	1	ND			
		S-2	2-4					S-2 : Dark brown (10 yr, 3/3), fine to coarse SAND, some Slag, some Brick, little Organics (Roots), trace Silt (dry)	2	ND			
		S-3	4-6					S-3 : Dark brown (10 yr, 3/3), fine to coarse SAND, some Slag, some Brick, trace Silt (dry)		ND			
10		S-4	6-10	48	48			S-4 : Top 20": Dark brown (10 yr, 3/3), fine to coarse SAND, some Slag, some Brick, trace Silt (dry) Next 5": Black (10 yr, 2/1), COAL FRAGMENTS, little Sand (dry)		ND	FILL		
		S-5	10-15	60	46			Next 7": Brown (10 yr, 5/2), fine to coarse GRAVEL, some Cobble, some fine to medium Sand (moist) Bottom 16": Very dark brown (10 yr, 2/2), fine to coarse GRAVEL, some Slag, little fine to coarse Sand (wet)	3	6.7			
		S-6	15-20	60	46			S-5 : Black (10 yr, 2/1), fine to medium SAND and GRAVEL, some Cobble, some Slag, some Brick, little Silt, slight petroleum-like odor, sheen (wet) S-6 : Top 18": Very dark gray (10 yr, 3/1), fine to coarse GRAVEL, some Cobble, little fine to coarse Sand (wet) Bottom 28": Dark gray (10 yr, 4/1), fine to coarse SAND and GRAVEL, some Cobble (wet)		5.4			
15		S-6	15-20	60	46			S-6 : Top 18": Very dark gray (10 yr, 3/1), fine to coarse GRAVEL, some Cobble, little fine to coarse Sand (wet) Bottom 28": Dark gray (10 yr, 4/1), fine to coarse SAND and GRAVEL, some Cobble (wet)		2.1	15		-9.0
		S-7	20-25	60	40			S-7 : Dark gray (10 yr, 4/1), fine to coarse SAND and GRAVEL, some Cobble (wet)		ND	SAND		
		S-8	25-30	60	46			S-8 : Top 24": Dark gray (10 yr, 4/1), fine to coarse SAND and GRAVEL, some Cobble (wet) Bottom 42": Very dark gray (10 yr, 3/1), fine to coarse SAND and GRAVEL, some Cobble (wet)		0.3			
S-9	30-35	60	42			S-9 : Very dark gray (10 yr, 3/1), fine to coarse SAND and GRAVEL, some Cobble (wet)		0.2					
30		S-9	30-35	60	42			S-9 : Very dark gray (10 yr, 3/1), fine to coarse SAND and GRAVEL, some Cobble (wet)		0.6			
										0.2			
35										0.2			

**REMARKS**  
 1 - Soil samples screened with a 10.6 eV MiniRAE 2000 photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. ND=None Detected above background.  
 2 - Borehole backfilled with a portland cement and bentonite grout via tremmie pipe.  
 3 - Very loose material.

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

**Exploration No.:**  
**GZ-BW-506**

GZA TEMPLATE TEST BORING: 1/5/2018; 11:26:10 AM



**TEST BORING LOG**



**GZA**  
**GeoEnvironmental, Inc.**  
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**National Grid**  
**Former Tidewater Facility**  
**Pawtucket, Rhode Island**

**EXPLORATION NO.:** GZ-BW-506  
**SHEET:** 2 of 2  
**PROJECT NO:** 43654  
**REVIEWED BY:** SCC

**Logged By:** S. McLeod  
**Drilling Co.:** Cascade  
**Foreman:** Greg Rivera

**Type of Rig:** RotoSonic  
**Rig Model:** Fraste XL Max 250  
**Drilling Method:**  
Sonic

**Boring Location:** See Plan  
**Ground Surface Elev. (ft.):** 5.98  
**Final Boring Depth (ft.):** 55  
**Date Start - Finish:** 10/10/2017 - 10/10/2017

**H. Datum:**  
**V. Datum:**

**Hammer Type:** NA  
**Hammer Weight (lb.):** NA  
**Hammer Fall (in.):** NA  
**Auger or Casing O.D./I.D Dia (in.):** 6.5"/8"

**Sampler Type:** Sonic Core  
**Sampler O.D. (in.):** 4  
**Sampler Length (in.):** 60  
**Rock Core Size:**

**Groundwater Depth (ft.)**

Date	Time	Water Depth	Stab. Time

Depth (ft)	Casing Blows/ Core Rate	Sample				Blows (per 6 in.)	SPT Value	Sample Description and Identification Modified Burmister Procedure (USCS Group Symbol)	Remark	Field Test Data	Depth (ft.)	Stratum Description	Elev. (ft.)
		No.	Depth (ft.)	Pen. (in)	Rec. (in)								
40		S-10	35-40	60	60			S-10 : Top 12": Very dark gray (10 yr, 3/1), fine to coarse SAND and GRAVEL, some Cobble (wet) Next 4": Light olive-brown (2.5 y, 5/3), SILT, some fine Sand (wet) Next 6": Grayish-brown (10 yr, 5/2), fine SAND, some Silt (wet)			SAND		
		S-11	40-45	60	36			Next 12": Grayish-brown (10 yr, 5/2), fine to medium SAND, little Silt, trace fine Gravel (wet) Bottom 26": Dark gray (10 yr, 4/1), fine to coarse SAND, some fine to coarse Gravel (wet)					
		S-12	45-50	60	42			S-11 : Top 24": Very dark gray (10 yr, 3/1), fine to coarse SAND, some fine to coarse Gravel, little Cobble, trace Silt (wet) Next 4": Pinkish-gray (7.5 yr, 6/2), fine SAND, some Silt (wet)					
		S-13	50-55	60	48			Bottom 8": Brown (10 yr, 5/3), fine to coarse SAND, some Gravel, trace Silt (wet) S-12 : Top 18": Brown (10 yr, 5/3), fine to coarse SAND, some Gravel, trace Silt (wet) Bottom 24": Brown (10 yr, 4/3), fine to coarse SAND, some Gravel, some Cobble, little Silt (wet)					
55								S-13 : Top 10": Brown (10 yr, 4/3), fine to coarse SAND, some Gravel, some Cobble, little Silt (wet) Next 32": Bluish-gray (Gley 2, 5/1), fine SAND, some fine to coarse Gravel, some Cobble, little Silt, slight coal tar-like odor (wet) Bottom 6": Brown (10 yr, 4/3), fine to coarse GRAVEL and COBBLE, some fine to coarse Sand, coated, strong coal tar-like odor (wet)	1481	55	GLACIAL TILL	-49.0	
								End of exploration at 55 feet.					

**REMARKS**

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

**Exploration No.:**  
**GZ-BW-506**



**TEST BORING LOG**



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**Former Tidewater Facility**  
**Pawtucket, Rhode Island**

**EXPLORATION NO.:** GZ-BW-507  
**SHEET:** 2 of 2  
**PROJECT NO:** 43654  
**REVIEWED BY:** SCC

**Logged By:** S. McLeod  
**Drilling Co.:** Cascade  
**Foreman:** Greg Rivera

**Type of Rig:** RotoSonic  
**Rig Model:** Fraste XL Max 250  
**Drilling Method:**  
 Sonic

**Boring Location:** See Plan  
**Ground Surface Elev. (ft.):** 7.16  
**Final Boring Depth (ft.):** 60  
**Date Start - Finish:** 10/11/2017 - 10/17/2017

**H. Datum:**  
**V. Datum:**

**Hammer Type:** NA  
**Hammer Weight (lb.):** NA  
**Hammer Fall (in.):** NA  
**Auger or Casing O.D./I.D Dia (in.):** 6.5"/8"

**Sampler Type:** Sonic Core  
**Sampler O.D. (in.):** 4  
**Sampler Length (in.):** 60  
**Rock Core Size:**

**Groundwater Depth (ft.)**

Date	Time	Water Depth	Stab. Time

Depth (ft)	Casing Blows/ Core Rate	Sample				Blows (per 6 in.)	SPT Value	Sample Description and Identification Modified Burmister Procedure (USCS Group Symbol)	Remark	Field Test Data	Depth (ft.)	Stratum Description	Elev. (ft.)
		No.	Depth (ft.)	Pen. (in)	Rec. (in)								
40		S-10	35-40	60	54			S-10 : Top 18": Dark gray (10 yr, 4/1), fine SAND, little Silt, trace fine to coarse Gravel (wet) Next 16": Grayish-brown (10 yr, 5/2), fine to medium SAND, some fine to coarse Gravel, little Cobble, trace Silt (wet) Bottom 20": Yellowish-brown (10 yr, 5/4), fine to coarse GRAVEL, some Cobble, little fine to medium Sand, little Silt (wet)		ND	SAND		
		S-11	40-45	60	52								
45		S-12	45-50	60	60			S-11 : Top 16": Brown (10 yr, 5/3), fine to coarse GRAVEL, some Cobble, little fine to coarse Sand (wet) Next 10": Grayish-brown (10 yr, 5/2), fine to medium SAND, some fine Gravel, little Silt (wet) Bottom 26": Grayish-brown (10 yr, 5/2), fine to coarse SAND, some fine to coarse Gravel, some Cobble, little Silt (wet)		ND	SAND		
50		S-13	50-55	60	50			S-12 : Top 12": Bluish-gray (Gley 2, 5/1), fine SAND, some Cobble, little Silt (wet) Bottom 48": Dark grayish-brown (10 yr, 5/2), fine SAND, little Silt (wet)		ND	SAND		
55		S-14	55-60	60	56			S-13 : Top 10": Brown (7.5 yr, 4/4), fine SAND, little Silt (wet) Bottom 40": Grayish-brown (10 yr, 5/2), fine to coarse SAND, some fine to coarse Gravel, some Cobble (wet) S-14 : Top 20": Grayish-brown (10 yr, 5/2), fine to coarse SAND, some fine to coarse Gravel, some Cobble (wet) Bottom 36": Gray (10 yr, 5/1), fine to coarse SAND, some fine to coarse Gravel, some Cobble (wet)		ND	GLACIAL TILL		
60								End of exploration at 60 feet.		ND			
65													
70													

**REMARKS**

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

**Exploration No.:**  
**GZ-BW-507**

**TEST BORING LOG**



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**Former Tidewater Facility**  
**Pawtucket, Rhode Island**

**EXPLORATION NO.:** GZ-BW-508  
**SHEET:** 1 of 2  
**PROJECT NO:** 43654  
**REVIEWED BY:** SCC

**Logged By:** S. McLeod  
**Drilling Co.:** Cascade  
**Foreman:** Greg Rivera

**Type of Rig:** RotoSonic  
**Rig Model:** Fraste XL Max 250  
**Drilling Method:**  
Sonic

**Boring Location:** See Plan  
**Ground Surface Elev. (ft.):** 7.19  
**Final Boring Depth (ft.):** 60  
**Date Start - Finish:** 10/18/2017 - 10/18/2017

**H. Datum:**  
**V. Datum:**

**Hammer Type:** NA  
**Hammer Weight (lb.):** NA  
**Hammer Fall (in.):** NA  
**Auger or Casing O.D./I.D Dia (in.):** 6.5"/8"

**Sampler Type:** Sonic Core  
**Sampler O.D. (in.):** 4  
**Sampler Length (in.):** 60  
**Rock Core Size:**

**Groundwater Depth (ft.)**

Date	Time	Water Depth	Stab. Time

Depth (ft)	Casing Blows/ Core Rate	Sample					SPT Value	Sample Description Modified Burmister	Remark	Field Test Data	Depth (ft.)	Stratum Description	Elev. (ft.)
		No.	Depth (ft.)	Pen. (in)	Rec. (in)	Blows (per 6 in.)							
5		S-1	0-2					S-1 : Dark brown (10 yr, 3/2), fine to coarse SAND, some fine to coarse Gravel, some Organics (Roots), some Brick, little Concrete, trace Metal Fragments, slight purifier waste-like odor (dry)	1	ND			
		S-2	2-4					S-2 : Dark brown (10 yr, 3/2), fine to coarse SAND, some fine to coarse Gravel, some Organics (Roots), some Brick, little Concrete, trace Metal Fragments, slight purifier waste-like odor (dry)	2				
		S-3	4-6					S-3 : Dark brown (10 yr, 3/2), fine to coarse SAND, some fine to coarse Gravel, some Organics (Roots), some Brick, little Concrete, little Slag, trace Metal Fragments, slight purifier waste-like odor (dry)	ND				
		S-4	6-10	48	48			S-4 : Top 6": Black (10 yr, 2/1), fine to coarse SAND, little fine to coarse Gravel (dry)	ND				
10		S-5	10-15	60	48			Next 8": Pale brown (10 yr, 6/3), fine to coarse SAND, some fine to coarse Gravel, some Brick, little Cobble (dry)	ND	15.67		-8.5	
		S-6	15-20	60	52			Next 12": Black (10 yr, 2/1), COAL, some fine to coarse Sand, some fine to coarse Gravel, some Brick (dry)	ND				
		S-7	20-25	60	36			Bottom 22": Grayish-brown (10 yr, 5/2), SLAG, some fine to coarse Sand, some fine to coarse Gravel (moist)	ND				
20		S-8	25-30	60	60			S-5 : Top 8": Grayish-brown (10 yr, 5/2) SLAG, some fine to coarse Sand, some fine to coarse Gravel (wet)	ND			SAND	
		S-9	30-35	60	44			Next 10": Dark gray (10 yr, 4/1) SILT, trace fine to medium Sand, trace Organic, organic-like odor (wet)	ND				
								Next 10": Pale brown (10 yr, 6/3), fine to coarse SAND, some fine to coarse Gravel, some Cobble (wet)	ND				
25								Next 8": Gray (10 yr, 5/1), fine to coarse SAND, some Silt (wet)	ND				
								Bottom 12": Pale brown (10 yr, 6/3), fine to coarse SAND, some Gravel, some Cobble (wet)	ND				
								S-6 : Top 12": Brown (10 yr, 4/3), fine to coarse SAND, some fine to coarse Gravel, some Cobble (wet)	ND				
30								Next 4": Gray (10 yr, 5/1) fine to coarse SAND, some Silt (wet)	ND				
								Next 10": Strong brown (7.5 yr, 5/8), fine to coarse SAND, some fine to coarse Gravel, some Cobble (wet)	ND				
								Next 6": Grayish-brown, (10 yr, 5/2), fine to coarse SAND, some Gravel, some Cobble (wet)	ND				
35								Bottom 20": Strong brown (7.5 yr, 5/8), fine to coarse SAND, some fine to coarse Gravel, some Cobble (wet)	ND				

**REMARKS**  
1 - Soil samples screened with a 10.6 eV MiniRAE 2000 photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. ND=None Detected above background.  
2 - Borehole backfilled with a portland cement and bentonite grout via tremmie pipe.

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

**Exploration No.:**  
**GZ-BW-508**

BORING LOGS.GPJ; GZA TEMPLATE TEST BORING; GZA TEMPLATE 0210.GDT; GZA LIBRARY 10-29-10-NGRID MODIFIED.GLB; 1/11/2018; 1:05:38 PM



**TEST BORING LOG**



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**National Grid**  
**Former Tidewater Facility**  
**Pawtucket, Rhode Island**

**EXPLORATION NO.:** GZ-BW-508  
**SHEET:** 2 of 2  
**PROJECT NO:** 43654  
**REVIEWED BY:** SCC

**Logged By:** S. McLeod  
**Drilling Co.:** Cascade  
**Foreman:** Greg Rivera

**Type of Rig:** RotoSonic  
**Rig Model:** Fraste XL Max 250  
**Drilling Method:**  
 Sonic

**Boring Location:** See Plan  
**Ground Surface Elev. (ft.):** 7.19  
**Final Boring Depth (ft.):** 60  
**Date Start - Finish:** 10/18/2017 - 10/18/2017

**H. Datum:**  
**V. Datum:**

**Hammer Type:** NA  
**Hammer Weight (lb.):** NA  
**Hammer Fall (in.):** NA  
**Auger or Casing O.D./I.D Dia (in.):** 6.5"/8"

**Sampler Type:** Sonic Core  
**Sampler O.D. (in.):** 4  
**Sampler Length (in.):** 60  
**Rock Core Size:**

**Groundwater Depth (ft.)**

Date	Time	Water Depth	Stab. Time

Depth (ft)	Casing Blows/ Core Rate	Sample				Blows (per 6 in.)	SPT Value	Sample Description Modified Burmister	Remark	Field Test Data	Depth (ft.)	Stratum Description	Elev. (ft.)
		No.	Depth (ft.)	Pen. (in)	Rec. (in)								
40		S-10	35-40	60	50			S-7 : Top 16": Pale brown (10 yr, 6/3), fine to coarse SAND, little fine to coarse Gravel (wet) Bottom 20": Pale brown (10 yr, 6/3), fine to coarse SAND, some fine to coarse Gravel, some Cobble (wet) S-8 : Pale brown (10 yr, 6/3), fine to coarse SAND, some fine to coarse Gravel, some Cobble (wet) S-9 : Top 32": Brown (10 yr, 4/3), fine to coarse SAND, some fine to coarse Gravel, some Cobble (wet) Bottom 12": Grayish-brown (10 yr, 5/2), fine SAND, little medium to coarse Sand, little medium to coarse Gravel, little Cobble (wet) S-10 : Grayish-brown (10 yr, 5/2), fine SAND, little fine to coarse Sand, little medium to coarse Gravel, little Cobble (wet) S-11 : Brown (10 yr, 5/2), fine SAND, some fine to coarse Gravel, little Cobble (wet) Bottom 36": Grayish-brown (10 yr, 5/2), fine SAND, little fine to coarse Sand, little medium to coarse Gravel, little Cobble (wet) S-12 : Dark grayish-brown (10 yr, 4/2), fine to coarse SAND (wet) S-13 : Top 30": Brown (10 yr, 5/2), fine to medium SAND, some fine to coarse Gravel, little Cobble (wet) Bottom 14": Gray (10 yr, 5/1), fine to coarse SAND, little fine to coarse Gravel, little Cobble (wet) S-14 : Top 6": Gray (10 yr, 5/1), fine to coarse SAND and GRAVEL (wet) Next 26": Gray (10 yr, 5/1), fine to coarse SAND, little Gravel, little Cobble (wet) Bottom 14": Bluish-gray (Gley 2, 5/1), fine to medium SAND, some Cobble (wet)	3	ND			
		S-11	40-45	60	48								
45		S-12	45-50	60	50				ND				
		S-13	50-55	60	44								
55		S-14	55-60	60	46				ND	58.47	GLACIAL TILL	-51.3	
60									ND				
65													
70													

**REMARKS**  
 3 - Soils appear to be very loose from 40 to 41 feet.

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

**Exploration No.:**  
**GZ-BW-508**

BORING LOGS.GPJ; GZA TEMPLATE TEST BORING; GZA TEMPLATE 0210.GDT; GZA LIBRARY 10-29-10-NGRID MODIFIED.GLB; 1/11/2018; 1:05:38 PM



**TEST BORING LOG**



**GZA**  
**GeoEnvironmental, Inc.**  
*Engineers and Scientists*

**National Grid**  
**Former Tidewater Facility**  
**Pawtucket, Rhode Island**

**EXPLORATION NO.:** GZ-BW-509  
**SHEET:** 2 of 2  
**PROJECT NO:** 43654  
**REVIEWED BY:** SCC

**Logged By:** S. McLeod  
**Drilling Co.:** Cascade  
**Foreman:** Greg Rivera

**Type of Rig:** RotoSonic  
**Rig Model:** Fraste XL Plax 25  
**Drilling Method:**  
Sonic

**Boring Location:** See Plan  
**Ground Surface Elev. (ft.):** 7.94  
**Final Boring Depth (ft.):** 60  
**Date Start - Finish:** 10/11/2017 - 10/11/2017

**H. Datum:**  
**V. Datum:**

**Hammer Type:** NA  
**Hammer Weight (lb.):** NA  
**Hammer Fall (in.):** NA  
**Auger or Casing O.D./I.D Dia (in.):** 6.5"/8"

**Sampler Type:** Sonic Core  
**Sampler O.D. (in.):** 4  
**Sampler Length (in.):** 60  
**Rock Core Size:**

**Groundwater Depth (ft.)**

Date	Time	Water Depth	Stab. Time

Depth (ft)	Casing Blows/ Core Rate	Sample				Blows (per 6 in.)	SPT Value	Sample Description and Identification Modified Burmister Procedure (USCS Group Symbol)	Remark	Field Test Data	Depth (ft.)	Stratum Description	Elev. (ft.)
		No.	Depth (ft.)	Pen. (in)	Rec. (in)								
40		S-10	35-40	60	52			some fine to coarse Gravel, little Cobble (wet) Next 3": Gray (10 yr, 5/1), fine to medium SAND, some fine to coarse Gravel, little Cobble, trace Silt (wet) Next 24": Brown (10 yr, 4/3) fine to coarse SAND, some fine to coarse Gravel, little Cobble (wet) Bottom 23": Gray (10 yr, 5/1), fine to medium SAND, some fine to coarse Gravel, little Cobble, trace Silt (wet) S-9 : Top 34": Brown (10 yr, 4/3), fine to coarse SAND, some fine to coarse Gravel, little Cobble (wet) Bottom 22": Gray (10 yr, 5/1), fine to coarse SAND, some Gravel, some Cobble, little Silt (wet) S-10 : Top 26": Gray (10 yr, 5/1), fine to coarse SAND, some fine to coarse Gravel, some Cobble (wet) Bottom 26": Grayish-brown (10 yr, 5/2), fine to medium SAND, little fine Gravel, trace Silt (wet) S-11 : Top 32": Grayish-brown (10 yr, 5/2), fine to medium SAND, little fine Gravel, trace Silt (wet) Bottom 14": Brown (10 yr, 4/3), fine to coarse SAND, some fine to coarse Gravel, little Cobble, trace Silt (wet) S-12 : Top 24": Very dark gray (10 yr, 3/1), fine to medium SAND (wet) Bottom 30": Pale brown (10 yr, 6/3), fine SAND (wet) S-13 : Top 16": Pale brown (10 yr, 5/2), fine to coarse SAND, trace fine to medium Gravel (wet) Bottom 38": Pale brown (10 yr, 6/3), fine SAND, trace Silt (wet) S-14 : Top 6": Grayish-brown (10 yr, 5/2), fine to coarse SAND, trace fine to coarse Gravel (wet) Next 16": Gray (10 yr, 5/1), fine to coarse SAND and GRAVEL, some Cobble (wet) Bottom 28": Gray (10 yr, 5/1), fine to medium SAND, some fine to coarse Gravel, some Cobble (wet)					
		S-11	40-45	60	46								
		S-12	45-50	60	54								
		S-13	50-55	60	54								
45		S-12	45-50	60	54								
50		S-13	50-55	60	54								
55		S-14	55-60	60	50								
60										56.8		-48.9	
											GLACIAL TILL		
60										60		-52.1	
65													
70													

**REMARKS**

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

**Exploration No.:**  
**GZ-BW-509**

**TEST BORING LOG**



**GZA**  
**GeoEnvironmental, Inc.**  
*Engineers and Scientists*

**National Grid**  
**Former Tidewater Facility**  
**Pawtucket, Rhode Island**

**EXPLORATION NO.:** GZ-BW-510  
**SHEET:** 1 of 4  
**PROJECT NO:** 43654 REVIEWED  
**BY:** SCC

**Logged By:** S. McLeod  
**Drilling Co.:** Cascade  
**Foreman:** Greg Rivera

**Type of Rig:** CME-55  
**Rig Model:** LC Track Rig  
**Drilling Method:**  
Wash & Drive

**Boring Location:** See Plan  
**Ground Surface Elev. (ft.):** 8.97  
**Final Boring Depth (ft.):** 64  
**Date Start - Finish:** 10/30/2017 - 11/8/2017

**H. Datum:**  
**V. Datum:**

**Hammer Type:** Automatic Hammer  
**Hammer Weight (lb.):** 140  
**Hammer Fall (in.):** 30  
**Auger or Casing O.D./I.D Dia (in.):** 4.5"/4.25"

**Sampler Type:** Split Spoon  
**Sampler O.D. (in.):** 2  
**Sampler Length (in.):** 24  
**Rock Core Size:**

**Groundwater Depth (ft.)**

Date	Time	Water Depth	Stab. Time

Depth (ft)	Casing Blows/ Core Rate	Sample					SPT Value	Sample Description and Identification Modified Burmister Procedure (USCS Group Symbol)	Remark	Field Test Data	Depth (ft.)	Stratum Description	Elev. (ft.)
		No.	Depth (ft.)	Pen. (in)	Rec. (in)	Blows (per 6 in.)							
5		S-1	0-2					S-1 : Dark brown (10 yr, 3/3), fine to coarse SAND, some fine to coarse Gravel, little Organics (roots), little Cobble, little Slag, trace Brick (dry)	1	ND		FILL	
		S-2	2-4					S-2 : Dark brown (10 yr, 3/3), fine to coarse SAND, some fine to coarse Gravel, some Brick, little Cobble, trace Slag (dry)	2	ND			
10		S-3	4-6					S-3 : Dark brown (10 yr, 3/3), fine to coarse SAND, some fine to coarse Gravel, some Brick, little Cobble, trace Slag (dry)		ND		FILL	
		S-4	6-8	24	10	8 9 11 12	20	S-4 : Medium, grayish-brown (10 yr, 5/2) CONCRETE, little fine to coarse Sand, little fine to coarse Gravel (dry)		ND			
		S-5	8-10	24	14	19 12 12 11	24	S-5 : Top 4": Medium, grayish-brown (10 yr, 5/2) CONCRETE, little fine to coarse Sand, little Brick, little fine to coarse Gravel, trace Organics (roots, leaves) (dry)		87.8			
		S-6	10-12	24	17	40 27 17 20	44	Bottom 10": Medium, black (10 yr, 2/1) COAL and SLAG, little Brick (dry)		193.6			
15		S-7	12-14	24	24	21 9 20 19	29	S-6 : Top 7": Dense, dark gray (10 yr, 4/1), fine to coarse GRAVEL, little fine to coarse Sand, slight petroleum-like odor (wet)		28.1	13.7	-4.7	
		S-8	14-16	24	15	24 16 20 22	36	Next 3": Dense, dark grayish-brown (10 yr, 4/2), fine to medium SAND, some fine to coarse Gravel, trace Silt, slight petroleum-like odor (wet)		1.4	14.6	ORGANIC SILTY SAND -5.6	
20		S-9	16-18	24	22	7 9 22 16	31	Bottom 7": Dense, very dark gray (10 yr, 3/1), fine to coarse SAND and GRAVEL, sheen-stained, moderate petroleum-like odor (wet)		ND		SAND	
		S-10	18-20	24	24	17 16 16 13	32	S-7 : Top 20": Medium, black (10 yr, 2/1) SLAG and fine to coarse GRAVEL, little Concrete, little fine to coarse Sand, sheen-coated, strong petroleum-like odor (wet)		ND			
		S-11	20-22	24	13	5 7 8 11	15	Bottom 4": Medium, black (10 yr, 2/1) Clayey SILT, slight petroleum-like odor (wet)		ND			
25		S-12	22-24	24	14	9 9 34 20	43	S-8 : Top 11": Dense, very dark grayish-brown (10 yr, 3/2), fine to coarse SAND and SILT (stratified Sand and Silt)		ND		SAND	
		S-13	24-26	24	14	19 29 34 30	63	Bottom 4": Dense, gray (10 yr, 5/1), fine to coarse SAND, some fine Gravel, trace Organics, slight sulfur-like odor (wet)		ND			
		S-14	26-28	24	15	29 21 27 44	48	Bottom 4": Dense, gray (10 yr, 5/1), fine to coarse SAND, some fine Gravel, trace Organics, slight sulfur-like odor (wet)		ND			
30		S-15	28-30	24	11	14 21 12 18	33	S-9 : Top 10": Dense, dark gray (10 yr, 4/1), fine to coarse SAND (wet)		ND		SAND	
		S-16	30-32	24	10	12 11 13 9	24	Bottom 12": Dense, dark grayish-brown (10 yr, 4/2), fine to coarse SAND, some fine to coarse Gravel, trace Silt	3	ND			
35		S-17	32-34	24	8	16 11 9 7	20			ND			
		S-18	34-36	24	11	10 4				ND			

**REMARKS**  
 1 - Soil samples screened with a 10.6 eV MiniRAE 2000 photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. ND=None Detected above background.  
 2 - Borehole backfilled with a portland cement and bentonite grout via tremmie pipe.  
 3 - Drill chatter from 26-30 feet.

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

**Exploration No.:**  
**GZ-BK-510**

GZA TEMPLATE TEST BORING: 1/5/2018; 11:26:50 AM



### TEST BORING LOG



**GZA**  
**GeoEnvironmental, Inc.**  
*Engineers and Scientists*

**National Grid**  
**Former Tidewater Facility**  
**Pawtucket, Rhode Island**

**EXPLORATION NO.:** GZ-BK-510  
**SHEET:** 2 of 4  
**PROJECT NO:** 43654  
**REVIEWED BY:** SCC

**Logged By:** S. McLeod  
**Drilling Co.:** Cascade  
**Foreman:** Greg Rivera

**Type of Rig:** CME-55  
**Rig Model:** LC Track Rig  
**Drilling Method:**  
Wash & Drive

**Boring Location:** See Plan  
**Ground Surface Elev. (ft.):** 8.97  
**Final Boring Depth (ft.):** 64  
**Date Start - Finish:** 10/30/2017 - 11/8/2017

**H. Datum:**  
**V. Datum:**

**Hammer Type:** Automatic Hammer  
**Hammer Weight (lb.):** 140  
**Hammer Fall (in.):** 30  
**Auger or Casing O.D./I.D Dia (in.):** 4.5"/4.25"

**Sampler Type:** Split Spoon  
**Sampler O.D. (in.):** 2  
**Sampler Length (in.):** 24  
**Rock Core Size:**

**Groundwater Depth (ft.)**

Date	Time	Water Depth	Stab. Time

Depth (ft)	Casing Blows/ Core Rate	Sample						SPT Value	Sample Description and Identification Modified Burmister Procedure (USCS Group Symbol)	Remark	Field Test Data	Depth (ft.)	Stratum Description	Elev. (ft.)
		No.	Depth (ft.)	Pen. (in)	Rec. (in)	Blows (per 6 in.)								
40		S-19	36-38	24	18	5	5	9	(wet)	ND				
						4	4	9	S-10 : Top 14": Dense, dark gray (10 yr, 4/1), fine to coarse SAND (wet)					
						5	5	18	Next 6": Dense, dark grayish-brown (10 yr, 4/2), fine to coarse SAND, some fine to coarse Gravel (wet)					
						8	8	18	Bottom 4": Dense, very dark brown (10 yr, 2/2), fine to medium SAND and SILT, some fine to coarse Gravel, some Organics, slight sulfur-like odor (wet)					
						3	3	8	S-11 : Top 12": Medium, grayish-brown (10 yr, 5/2), fine to coarse SAND, grain size increases from top to bottom of interval (wet)					
						5	7	19	Bottom 1": Medium, dark grayish-brown (10 yr, 4/2), fine to coarse GRAVEL, little fine to coarse Sand (wet)					
						3	8	19	S-12 : Top 7": Dense, dark grayish-brown (10 yr, 4/2), fine to coarse GRAVEL, little fine to coarse Sand (wet)					
						11	14	6	Bottom 7": Dense, dark gray (10 yr, 4/1), fine to coarse GRAVEL, little fine to coarse Sand (wet)					
						6	11	13	S-13 : Top 6": Dense, very dark grayish-brown (10 yr, 3/2), ROCK (Cobble/Boulder) (wet)					
						12	12	20	Next 6": Dense, very dark grayish-brown (10 yr, 8/2), fine to coarse GRAVEL, some fine to coarse Sand (wet)					
						8	11	9	Bottom 2": Dense, very pale brown (10 yr, 3/2), fine to coarse GRAVEL, some fine to coarse Sand (wet)					
						45		S-23	44-46					24
5	3	16	Bottom 8": Dense, grayish-brown (10 yr, 5/2), fine to coarse SAND, some fine to coarse Gravel (wet)											
3	11	9	S-15 : Dense, grayish-brown (10 yr, 5/2), fine to coarse GRAVEL, some fine to coarse Sand, trace Silt (wet)											
12	12	27	S-16 : Top 7": Medium, grayish-brown (10 yr, 5/2), fine to coarse GRAVEL, some fine to coarse Sand, trace Silt (wet)											
6	11	16	Bottom 3": Medium, grayish-brown (10 yr, 5/2), fine to coarse SAND, some fine to coarse Gravel, trace Silt (wet)											
8	11	21	S-17 : Top 4": Medium, grayish-brown (10 yr, 5/2), fine to coarse GRAVEL, little fine to coarse Sand (wet)											
50		S-24	46-48	24	14	5	11	21	Bottom 4": Medium, gray (10 yr, 5/1), fine to coarse SAND, little fine to coarse Gravel (wet)	ND				
						8	11	27	S-18 : Loose, dark grayish-brown (10 yr, 4/2), fine SAND, little Silt (wet)					
						5	3	6						
						3	11	49						
						13	19	21						
						13	13	21						
55		S-25	48-50	24	5	5	3	6		ND				
						3	11	6						
						13	19	32						
						6	11	20						
						9	13	20						
						3	4	9						
60		S-26	50-52	24	24	13	19	32		ND				
						13	13	32						
						6	11	20						
						9	13	20						
						3	4	9						
						5	13	9						
65		S-27	52-54	24	16	6	11	20		ND				
						9	13	20						
						3	4	9						
						5	13	9						
						8	8	16						
						8	11	16						
70		S-28	54-56	24	18	3	4	9		ND				
						5	13	9						
						8	8	16						
						8	11	16						
						10	9	21						
						12	15	21						
70		S-29	56-58	24	16	8	8	16		ND				
						8	8	16						
						10	9	21						
						12	15	21						
						11	12	27						
						15	20	27						
70		S-30	58-60	24	19	10	9	21		ND				
						12	15	21						
						11	12	27						
						15	20	27						
						10	20	49						
						29	30	49						
70		S-31	60-62	24	8	11	12	27		ND				
						15	20	27						
						10	20	49						
						29	30	49						
						10	20	49						
						29	30	49						
70		S-32	62-64	24	6	10	20	49		ND				
						29	30	49						
						10	20	49						
						29	30	49						
						10	20	49						
						29	30	49						

**REMARKS**  
4 - Drill chatter from 59-60 feet.

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

**Exploration No.:**  
**GZ-BK-510**

### TEST BORING LOG



**GZA**  
**GeoEnvironmental, Inc.**  
*Engineers and Scientists*

**National Grid**  
**Former Tidewater Facility**  
**Pawtucket, Rhode Island**

**EXPLORATION NO.:** GZ-BK-510  
**SHEET:** 3 of 4  
**PROJECT NO:** 43654  
**REVIEWED BY:** SCC

**Logged By:** S. McLeod  
**Drilling Co.:** Cascade  
**Foreman:** Greg Rivera

**Type of Rig:** CME-55  
**Rig Model:** LC Track Rig  
**Drilling Method:**  
 Wash & Drive

**Boring Location:** See Plan  
**Ground Surface Elev. (ft.):** 8.97  
**Final Boring Depth (ft.):** 64  
**Date Start - Finish:** 10/30/2017 - 11/8/2017

**H. Datum:**  
**V. Datum:**

**Hammer Type:** Automatic Hammer  
**Hammer Weight (lb.):** 140  
**Hammer Fall (in.):** 30  
**Auger or Casing O.D./I.D Dia (in.):** 4.5"/4.25"

**Sampler Type:** Split Spoon  
**Sampler O.D. (in.):** 2  
**Sampler Length (in.):** 24  
**Rock Core Size:**

**Groundwater Depth (ft.)**

Date	Time	Water Depth	Stab. Time

Depth (ft)	Casing Blows/ Core Rate	Sample					SPT Value	Sample Description and Identification Modified Burmister Procedure (USCS Group Symbol)	Remark	Field Test Data	Depth (ft.)	Stratum Description	Elev. (ft.)
		No.	Depth (ft.)	Pen. (in)	Rec. (in)	Blows (per 6 in.)							
75							S-19 : Loose, dark grayish-brown (10 yr, 4/2), fine SAND, trace Silt (wet) S-20 : Medium, dark grayish-brown (10 yr, 4/2), fine SAND, trace Silt (wet) S-21 : Loose, dark grayish-brown (10 yr, 4/2), fine SAND, trace Silt, 1-2" seams of dark gray (10 yr. 4/1) fine to coarse Sand (wet) S-22 : Top 8": Medium, dark gray (10 yr, 4/1), fine to coarse SAND (wet) Bottom 15": Medium, dark grayish-brown (10 yr, 4/2), fine to medium SAND, trace Silt (wet) S-23 : Top 17": Medium, dark grayish-brown (10 yr, 4/2), fine to coarse SAND (wet) Bottom 6": Medium, dark grayish -brown (10 yr, 4/2), fine to coarse GRAVEL, little fine to coarse Sand (wet) S-24 : Medium, dark grayish-brown (10 yr, 4/2), fine to coarse SAND, some fine to coarse Gravel (wet) S-25 : Rock stuck in sampler S-26 : Top 9": Dense, dark grayish-brown (10 yr, 4/2), fine to coarse SAND, trace Silt (wet) Next 3": Dense, pale brown (10 yr, 6/3), fine SAND, trace Silt (wet) Bottom 12": Dense, pale brown (10 yr, 6/3), fine to medium SAND, trace Silt (wet) S-27 : Medium, brown (10 yr, 5/3), fine SAND, trace Silt (wet) S-28 : Top 9": Loose, grayish-brown (10 yr, 5/2), fine SAND, little fine to coarse Gravel, trace Silt (wet) Bottom 9": Loose, grayish-brown (10 yr, 5/2), fine SAND, little Silt (wet) S-29 : Top 14": Medium, grayish-brown (10 yr, 5/2), fine SAND, little Silt (wet) Next 1": Medium, dark gray (10 yr, 4/1), fine SAND, trace Silt (wet) Bottom 1": Medium, dark gray (10 yr, 4/1), fine to coarse SAND (wet) S-30 : Top 10": Medium, dark gray (10 yr, 4/1), fine to coarse SAND (wet) Next 5": Medium, light brownish-gray (10 yr, 6/2), fine SAND, little Silt (wet)						
80													
85													
90													
95													
100													
105													

**REMARKS**

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

**Exploration No.:**  
**GZ-BK-510**

### TEST BORING LOG



**GZA**  
**GeoEnvironmental, Inc.**  
*Engineers and Scientists*

National Grid  
 Former Tidewater Facility  
 Pawtucket, Rhode Island

EXPLORATION NO.: GZ-BK-510  
 SHEET: 4 of 4  
 PROJECT NO: 43654  
 REVIEWED BY: SCC

**Logged By:** S. McLeod  
**Drilling Co.:** Cascade  
**Foreman:** Greg Rivera

**Type of Rig:** CME-55  
**Rig Model:** LC Track Rig  
**Drilling Method:**  
 Wash & Drive

**Boring Location:** See Plan  
**Ground Surface Elev. (ft.):** 8.97  
**Final Boring Depth (ft.):** 64  
**Date Start - Finish:** 10/30/2017 - 11/8/2017

**H. Datum:**  
**V. Datum:**

**Hammer Type:** Automatic Hammer  
**Hammer Weight (lb.):** 140  
**Hammer Fall (in.):** 30  
**Auger or Casing O.D./I.D Dia (in.):** 4.5"/4.25"

**Sampler Type:** Split Spoon  
**Sampler O.D. (in.):** 2  
**Sampler Length (in.):** 24  
**Rock Core Size:**

**Groundwater Depth (ft.)**

Date	Time	Water Depth	Stab. Time

Depth (ft)	Casing Blows/ Core Rate	Sample					SPT Value	Sample Description and Identification Modified Burmister Procedure (USCS Group Symbol)	Remark	Field Test Data	Depth (ft.)	Stratum Description	Elev. (ft.)
		No.	Depth (ft.)	Pen. (in)	Rec. (in)	Blows (per 6 in.)							
110							Next 1": Medium, very dark gray (10 yr, 3/1), fine to medium SAND, trace Silt (wet) Bottom 3": Medium, gray (10 yr, 5/1), fine to coarse GRAVEL, some fine to coarse Sand, trace Silt (wet) S-31 : Dense, gray (10 yr, 5/1), fine to coarse GRAVEL, some fine to coarse Sand, trace Silt (rock stuck in bottom of sampler) (wet) S-32 : Dense, gray (Gleyl, 5) fine to coarse GRAVEL, some fine to coarse Sand, trace Silt (wet)						
115							End of exploration at 64 feet.						
120													
125													
130													
135													
140													

**REMARKS**

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

**Exploration No.:**  
**GZ-BK-510**





**TEST BORING LOG**



**GZA**  
**GeoEnvironmental, Inc.**  
*Engineers and Scientists*

**National Grid**  
**Former Tidewater Facility**  
**Pawtucket, Rhode Island**

**EXPLORATION NO.:** GZ-BW-511  
**SHEET:** 2 of 2  
**PROJECT NO:** 43654  
**REVIEWED BY:**

**Logged By:** S. McLeod  
**Drilling Co.:** Cascade  
**Foreman:** Greg Rivera

**Type of Rig:** RotoSonic  
**Rig Model:** Fraste XL Plax 25  
**Drilling Method:**  
Sonic

**Boring Location:** See Plan  
**Ground Surface Elev. (ft.):**  
**Final Boring Depth (ft.):** 60  
**Date Start - Finish:** 10/19/2017 - 10/19/2017

**H. Datum:**  
**V. Datum:**

**Hammer Type:** NA  
**Hammer Weight (lb.):** NA  
**Hammer Fall (in.):** NA  
**Auger or Casing O.D./I.D Dia (in.):** 6.5"/8"

**Sampler Type:** Sonic Core  
**Sampler O.D. (in.):** 4  
**Sampler Length (in.):** 60  
**Rock Core Size:**

**Groundwater Depth (ft.)**

Date	Time	Water Depth	Stab. Time

Depth (ft)	Casing Blows/ Core Rate	Sample					SPT Value	Sample Description and Identification Modified Burmister Procedure (USCS Group Symbol)	Remark	Field Test Data	Depth (ft.)	Stratum Description	Elev. (ft.)
		No.	Depth (ft.)	Pen. (in)	Rec. (in)	Blows (per 6 in.)							
40		S-11	40-45	60	56		S-10 : Top 42": Brown (10 yr, 5/3), fine to coarse SAND and GRAVEL, some Cobble, trace Silt (wet) Bottom 18": Brown (10 yr, 5/3), fine to coarse GRAVEL, some Cobble, some fine to coarse Sand (wet)		ND				
45		S-12	45-50	60	50		S-11 : Top 13": Grayish-brown (10 yr, 5/2), fine to coarse SAND, little fine to coarse Gravel, trace Cobble (wet) Next 25": Brown (10 yr, 5/3), fine to coarse SAND and GRAVEL, some Cobble Bottom 18": Dark gray (10 yr, 4/1), fine SAND, trace Silt (wet)		ND				
50		S-13	50-55	60	60		S-12 : Top 20": Dark gray (10 yr, 4/1), fine SAND, trace Silt (wet) Next 26": Dark grayish-brown (10 yr, 3/2), fine to medium SAND (wet) Bottom 4": Dark gray (10 yr, 4/1), fine to coarse SAND (wet)		ND				
55		S-14	55-60	60	50		S-13 : Top 42": Grayish-brown (10 yr, 5/2), fine to coarse SAND, some fine to coarse Gravel, some Cobble (wet) Bottom 18": Grayish-brown (10 yr, 5/1), fine SAND, trace Silt (wet)	3	ND				
60							S-14 : Top 25": Grayish-brown (10 yr, 5/1), fine SAND, trace Silt (wet) Next 4": Very dark grayish-brown (10 yr, 3/2), fine to coarse SAND, some fine to coarse Gravel, little Cobble (wet) Bottom 21": Dark gray (10 yr, 4/1), fine to medium SAND, some Cobble, little fine to coarse Gravel (wet)		ND	58.25			
							End of exploration at 60 feet.		ND	60		GLACIAL TILL	

**REMARKS**  
3 - Very loose soils from 50.5 to 55 feet.

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

**Exploration No.:**  
**GZ-BW-511**



**TEST BORING LOG**



**GZA**  
**GeoEnvironmental, Inc.**  
*Engineers and Scientists*

**National Grid**  
**Former Tidewater Facility**  
**Pawtucket, Rhode Island**

**EXPLORATION NO.:** GZ-BW-512  
**SHEET:** 2 of 3  
**PROJECT NO:** 43654  
**REVIEWED BY:**

**Logged By:** S. McLeod  
**Drilling Co.:** Cascade  
**Foreman:** Greg Rivera

**Type of Rig:** RotoSonic  
**Rig Model:** Fraste XL Plax 25  
**Drilling Method:**  
Sonic

**Boring Location:** See Plan  
**Ground Surface Elev. (ft.):**  
**Final Boring Depth (ft.):** 70  
**Date Start - Finish:** 10/20/2017 - 10/20/2017

**H. Datum:**  
**V. Datum:**

**Hammer Type:** NA  
**Hammer Weight (lb.):** NA  
**Hammer Fall (in.):** NA  
**Auger or Casing O.D./I.D Dia (in.):** 6.5"/8"

**Sampler Type:** Sonic Core  
**Sampler O.D. (in.):** 4  
**Sampler Length (in.):** 60  
**Rock Core Size:**

**Groundwater Depth (ft.)**

Date	Time	Water Depth	Stab. Time

Depth (ft)	Casing Blows/ Core Rate	Sample					SPT Value	Sample Description and Identification Modified Burmister Procedure (USCS Group Symbol)	Remark	Field Test Data	Depth (ft.)	Stratum Description	Elev. (ft.)
		No.	Depth (ft.)	Pen. (in)	Rec. (in)	Blows (per 6 in.)							
40		S-11	40-45	60	42		S-8 : Very dark gray (10 yr, 3/1), fine to medium SAND, trace Organics, little Silt, slight sulfur-like odor, slight naphthalene-like odor S-9 : Top 38": Very dark gray (10 yr, 3/1), fine to coarse SAND, trace fine to coarse Gravel, slight sulfur-like odor (wet) Next 10": Very dark gray (10 yr, 3/1), fine to coarse Bottom 8": Very dark gray (10 yr, 3/1), fine to coarse SAND, little fine to coarse Gravel, little Cobble, little Silt (wet) S-10 : Top 8": Very dark gray (10 yr, 3/1), fine to coarse SAND, little fine to coarse Gravel, little Cobble, little Silt (wet) Bottom 43": Strong brown (7.5 yr, 5/8), fine to coarse SAND and GRAVEL, some Cobble (wet) S-11 : Top 12": Very dark gray (10 yr, 3/1), fine to coarse SAND and GRAVEL, some Cobble (wet) Next 18": Brown (10 yr, 4/3), fine to coarse SAND and GRAVEL, some Cobble (wet) Next 4": Brown (10 yr, 5/3), fine to medium SAND, some fine to coarse Gravel, little Cobble (wet) Bottom 8": Grayish-brown (10 yr, 5/2), fine SAND, trace Silt (wet) S-12 : Grayish-brown (10 yr, 5/2), fine SAND, trace Silt (wet) S-13 : No Recovery S-14 : No Recovery S-15 : Top 20": Dark gray (10 yr, 4/1), fine SAND, trace fine to coarse Gravel, trace Silt (wet) Middle 8": Grayish-brown (10 yr, 5/2), fine to coarse SAND and GRAVEL, some Cobble (wet) Bottom 12" Gray (10 yr, 5/1), fine SAND, trace fine to coarse Gravel, trace Silt (wet) Middle 8": Grayish-brown (10 yr, 5/2), fine to coarse SAND and GRAVEL, some Cobble (wet) Bottom 12": Gray (10 yr, 5/1), fine SAND, trace Silt (wet) S-16 : Top 8": Gray (10 yr, 5/1), fine SAND, trace Silt (wet) Middle 18": Dark gray (10 yr, 4/1), fine to coarse SAND (wet) Bottom 20": Gray (10 yr, 5/1), fine SAND, trace Silt (wet)	3	1.1 1.8 1.5 ND ND ND	SAND			
45		S-12	45-50	60	60								
50		S-13	50-55	60	0								
55		S-14	55-60	60	0								
60		S-15	60-65	60	40			4	9				
65		S-16	65-70	60	46				ND ND				
70									ND	70			

**REMARKS**  
3 - 40 to 41 feet sample likely to be slough.  
4 - 60 to 61.7 fete very loose soils.

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

**Exploration No.:**  
**GZ-BW-512**

### TEST BORING LOG



**GZA**  
**GeoEnvironmental, Inc.**  
*Engineers and Scientists*

National Grid  
 Former Tidewater Facility  
 Pawtucket, Rhode Island

EXPLORATION NO.: **GZ-BW-512**  
 SHEET: 3 of 3  
 PROJECT NO: 43654  
 REVIEWED BY:

**Logged By:** S. McLeod  
**Drilling Co.:** Cascade  
**Foreman:** Greg Rivera

**Type of Rig:** RotoSonic  
**Rig Model:** Fraste XL Plax 25  
**Drilling Method:**  
 Sonic

**Boring Location:** See Plan  
**Ground Surface Elev. (ft.):**  
**Final Boring Depth (ft.):** 70  
**Date Start - Finish:** 10/20/2017 - 10/20/2017

**H. Datum:**  
**V. Datum:**

**Hammer Type:** NA  
**Hammer Weight (lb.):** NA  
**Hammer Fall (in.):** NA  
**Auger or Casing O.D./I.D Dia (in.):** 6.5"/8"

**Sampler Type:** Sonic Core  
**Sampler O.D. (in.):** 4  
**Sampler Length (in.):** 60  
**Rock Core Size:**

**Groundwater Depth (ft.)**

Date	Time	Water Depth	Stab. Time

Depth (ft)	Casing Blows/ Core Rate	Sample					SPT Value	Sample Description and Identification Modified Burmister Procedure (USCS Group Symbol)	Remark	Field Test Data	Depth (ft.)	Stratum Description	Elev. (ft.)
		No.	Depth (ft.)	Pen. (in)	Rec. (in)	Blows (per 6 in.)							
75							End of exploration at 70 feet.						
80													
85													
90													
95													
100													
105													

**REMARKS**

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

**Exploration No.:**  
**GZ-BW-512**



**TEST BORING LOG**



**GZA**  
**GeoEnvironmental, Inc.**  
*Engineers and Scientists*

**National Grid**  
**Former Tidewater Facility**  
**Pawtucket, Rhode Island**

**EXPLORATION NO.:** GZ-BW-513  
**SHEET:** 1 of 2  
**PROJECT NO:** 43654  
**REVIEWED BY:** SCC

**Logged By:** S. McLeod  
**Drilling Co.:** Cascade  
**Foreman:** Greg Rivera

**Type of Rig:** RotoSonic  
**Rig Model:** Fraste XL Max 250  
**Drilling Method:**  
Sonic

**Boring Location:** See Plan  
**Ground Surface Elev. (ft.):** 17.62  
**Final Boring Depth (ft.):** 70  
**Date Start - Finish:** 10/19/2017 - 10/19/2017

**H. Datum:**  
**V. Datum:**

**Hammer Type:** NA  
**Hammer Weight (lb.):** NA  
**Hammer Fall (in.):** NA  
**Auger or Casing O.D./I.D Dia (in.):** 6.5"/8"

**Sampler Type:** Sonic Core  
**Sampler O.D. (in.):** 4  
**Sampler Length (in.):** 60  
**Rock Core Size:**

**Groundwater Depth (ft.)**

Date	Time	Water Depth	Stab. Time

Depth (ft)	Casing Blows/ Core Rate	Sample					SPT Value	Sample Description Modified Burmister	Remark	Field Test Data	Depth (ft.)	Stratum Description	Elev. (ft.)
		No.	Depth (ft.)	Pen. (in)	Rec. (in)	Blows (per 6 in.)							
5		S-1	0-5	60	60			S-1 : Top 10": Dark brown (10 yr, 3/3), fine to coarse SAND, little fine to coarse Gravel, trace Organics (Roots), trace Cobble (dry) Next 22": Black (10 yr, 2/1) SLAG, little fine to coarse Sand (dry) Next 18": Black (10 yr, 2/1), fine to coarse SAND, some Wood Chips, little fine to coarse Gravel, strong purifier waste-like odor (dry) Bottom 10": Light yellowish-brown (10 yr, 6/4), fine SAND (moist) S-2 : No Recovery	1	0.6			
								2					
5		S-2	5-10	60	0			Next 18": Black (10 yr, 2/1), fine to coarse SAND, some Wood Chips, little fine to coarse Gravel, strong purifier waste-like odor (dry) Bottom 10": Light yellowish-brown (10 yr, 6/4), fine SAND (moist) S-2 : No Recovery		14			
10		S-3	10-15	60	50			S-3 : Top 22": Black (10 yr, 2/1), fine to coarse SAND, some Slag, little fine to coarse Gravel, trace Cobble, moderate coal tar-like odor (dry) Next 8": Light yellowish-brown (10 yr, 6/4), fine to coarse SAND, some Slag, trace Brick (dry) Next 14": Dark gray (10 yr, 4/1), fine SAND, little Brick, little Cobble, trace Silt (moist) Bottom 6": Light yellowish-brown (10 yr, 6/4), fine to coarse SAND, some Slag, trace Brick (dry)	45.8		FILL		
15		S-4	15-20	60	44			S-4 : Top 30": Very dark gray (10 yr, 3/1), fine to coarse SAND, some Slag, little Brick (dry) Bottom 14": Red (2.5 yr, 4/8) BRICK (dry)	6.7				
20		S-5	20-25	60	56			S-5 : Top 8": Very dark gray (10 yr, 3/1) fine to coarse GRAVEL, some fine to coarse Sand, little Cobble (wet) Next 8": Very dark gray (10 yr, 3/1), fine SAND, some Silt, trace fine to coarse Gravel (wet) Next 4": Very dark gray (10 yr, 3/1), fine to coarse Gravel, little fine to coarse Sand (wet) Next 20": Very dark gray (10 yr, 3/1) fine SAND, some fine to coarse Gravel, 1-2" seam Wood Debris (wet) Bottom 16": Grayish-brown (10 yr, 5/2) fine to coarse SAND, some fine to coarse Gravel (wet)	0.3	20		-2.4	
25		S-6	25-30	60	52			S-6 : Very dark gray (10 yr, 3/1), fine to coarse SAND, trace fine to coarse Gravel, trace Silt, slight sulfur-like odor (wet) S-7 : Top 26": Very dark gray (10 yr, 3/1), fine to coarse SAND, little Cobble (wet)	ND				
30		S-7	30-35	60	51			Bottom 16": Grayish-brown (10 yr, 5/2) fine to coarse SAND, some fine to coarse Gravel (wet) S-6 : Very dark gray (10 yr, 3/1), fine to coarse SAND, trace fine to coarse Gravel, trace Silt, slight sulfur-like odor (wet) S-7 : Top 26": Very dark gray (10 yr, 3/1), fine to coarse SAND, little Cobble (wet) Bottom 25": Very dark gray (10 yr, 3/1), fine to coarse	ND				
35									ND				

**REMARKS**  
1 - Soil samples screened with a 10.6 eV MiniRAE 2000 photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. ND=None Detected above background.  
2 - Borehole backfilled with a portland cement and bentonite grout via tremmie pipe.

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

**Exploration No.:**  
**GZ-BW-513**

BORING LOGS.GPJ; GZA TEMPLATE TEST BORING; GZA TEMPLATE 0210.GDT; GZA LIBRARY 10-29-10-NGRID MODIFIED.GLB; 1/8/2018; 1:28:49 PM

**TEST BORING LOG**



**GZA**  
**GeoEnvironmental, Inc.**  
*Engineers and Scientists*

**National Grid**  
**Former Tidewater Facility**  
**Pawtucket, Rhode Island**

**EXPLORATION NO.:** GZ-BW-513  
**SHEET:** 2 of 2  
**PROJECT NO:** 43654  
**REVIEWED BY:** SCC

**Logged By:** S. McLeod  
**Drilling Co.:** Cascade  
**Foreman:** Greg Rivera

**Type of Rig:** RotoSonic  
**Rig Model:** Fraste XL Max 250  
**Drilling Method:**  
Sonic

**Boring Location:** See Plan  
**Ground Surface Elev. (ft.):** 17.62  
**Final Boring Depth (ft.):** 70  
**Date Start - Finish:** 10/19/2017 - 10/19/2017

**H. Datum:**  
**V. Datum:**

**Hammer Type:** NA  
**Hammer Weight (lb.):** NA  
**Hammer Fall (in.):** NA  
**Auger or Casing O.D./I.D Dia (in.):** 6.5"/8"

**Sampler Type:** Sonic Core  
**Sampler O.D. (in.):** 4  
**Sampler Length (in.):** 60  
**Rock Core Size:**

**Groundwater Depth (ft.)**

Date	Time	Water Depth	Stab. Time

Depth (ft)	Casing Blows/ Core Rate	Sample					Blows (per 6 in.)	SPT Value	Sample Description Modified Burmister	Remark	Field Test Data	Depth (ft.)	Stratum Description	Elev. (ft.)
		No.	Depth (ft.)	Pen. (in)	Rec. (in)									
40		S-8	35-40	60	57			SAND, little Silt, little Organics (Wood and Root), slight sulfur-like odor (wet) S-8 : Top 40": Very dark gray (10 yr, 3/1), fine to coarse SAND, little Silt, trace Organics (Wood and Root), slight sulfur-like odor (wet) Bottom 17": Pale brown (10 yr, 6/3), fine SAND (wet) S-9 : Brown (10 yr, 4/3), fine to coarse SAND, some fine to coarse Gravel, little Brick (wet)		ND				
		S-9	40-45	60	36									
45		S-10	45-50	60	50			S-10 : Top 10": Dark yellowish-brown (10 yr, 4/6), fine to coarse SAND, trace fine to coarse Gravel (wet) Middle 16": Dark yellowish-brown (10 yr, 4/6), fine to coarse SAND, some fine to coarse Gravel (wet) Bottom 24": Yellowish-brown (10 yr, 5/8), COBBLE, some fine to coarse Gravel, little fine to coarse Sand (wet) S-11 : Brown (10 yr, 4/3), fine to coarse SAND, some fine to coarse Gravel, little Cobble, 1/2" seam of Silt at 51.5' (wet)		ND				
50		S-11	50-55	60	46			S-11 : Brown (10 yr, 4/3), fine to coarse SAND, some fine to coarse Gravel, little Cobble, 1/2" seam of Silt at 51.5' (wet)		ND		SAND		
55		S-12	55-60	60	42			S-12 : Top 8": Brown (10 yr, 4/3), fine to coarse SAND, some fine to coarse Gravel, little Cobble (wet) Bottom 34": Light brownish-gray (10 yr, 6/2), fine SAND, trace Silt (wet)		ND				
60		S-13	60-65	60	42			S-13 : Top 17": Brown (10 yr, 4/3), fine to coarse SAND, some fine to coarse Gravel, little Cobble (wet) Bottom 25": Light brownish-gray (10 yr, 6/2), fine SAND, trace Silt, trace Organics (Wood) (wet)		ND				
65		S-14	65-70	60	60			S-14 : Top 23": Light brownish-gray (10 yr, 6/2), fine SAND, trace Silt (wet) Bottom 37": Pale brown (10 yr, 6/3), fine to medium SAND, some fine to coarse Gravel, some Cobble, trace Silt (wet)		ND				
70											70	GLACIAL TILL	-52.4	

**REMARKS**  
3 - Sample likely to be slough.  
4 - 60 to 61.4 feet likely to be slough.  
End of exploration at 70 feet.

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

**Exploration No.:**  
**GZ-BW-513**

BORING LOGS.GPJ; GZA TEMPLATE TEST BORING; GZA TEMPLATE 0210.GDT; GZA LIBRARY 10-29-10-NGRID MODIFIED.GLB; 1/8/2018; 1:28:50 PM



**TEST BORING LOG**



**GZA**  
**GeoEnvironmental, Inc.**  
*Engineers and Scientists*

**National Grid**  
**Former Tidewater Facility**  
**Pawtucket, Rhode Island**

**EXPLORATION NO.:** GZ-BW-515  
**SHEET:** 1 of 1  
**PROJECT NO:** 43654  
**REVIEWED BY:**

**Logged By:** S. McLeod  
**Drilling Co.:** Cascade  
**Foreman:** Greg Rivera

**Type of Rig:** RotoSonic  
**Rig Model:** Fraste XL Plax 25  
**Drilling Method:**  
Sonic

**Boring Location:** See Plan  
**Ground Surface Elev. (ft.):**  
**Final Boring Depth (ft.):** 20  
**Date Start - Finish:** 10/18/2017 - 10/18/2017

**H. Datum:**  
**V. Datum:**

**Hammer Type:** NA  
**Hammer Weight (lb.):** NA  
**Hammer Fall (in.):** NA  
**Auger or Casing O.D./I.D Dia (in.):** 6.5"/8"

**Sampler Type:** Sonic Core  
**Sampler O.D. (in.):** 4  
**Sampler Length (in.):** 60  
**Rock Core Size:**

**Groundwater Depth (ft.)**

Date	Time	Water Depth	Stab. Time

Depth (ft)	Casing Blows/ Core Rate	Sample					SPT Value	Sample Description and Identification Modified Burmister Procedure (USCS Group Symbol)	Remark	Field Test Data	Depth (ft.)	Stratum Description	Elev. (ft.)			
		No.	Depth (ft.)	Pen. (in)	Rec. (in)	Blows (per 6 in.)										
5		S-1	0-2					S-1 : Very dark gray (10 yr, 3/1), fine to coarse SAND, some fine to coarse Gravel, little Slag, trace Cobble, trace Brick (dry) S-2 : Black (10 yr, 2/1), fine to coarse SAND, little fine to coarse Gravel (dry) S-3 : Top 12": Light gray (10 yr, 7/1), fine to medium SAND, some Brick, trace Gravel (dry) Bottom 12": Black (10 yr, 2/1), fine to coarse SAND, little fine to coarse Gravel (dry) S-4 : Top 6": Black (10 yr, 2/1), fine to coarse SAND, little fine to coarse Gravel (dry) Bottom 36": Light gray (10 yr, 7/1), fine to medium SAND, some Brick, trace Gravel (dry) S-5 : Top 18": Very dark gray (10 yr, 3/1), fine to coarse SAND, some fine to coarse Gravel, some Cobble, trace Slag, trace Brick (wet) Bottom 36": Very dark gray (10 yr, 3/1), fine to medium SAND, little fine to coarse Gravel, trace Wood (Organics), trace Silt (wet) S-6 : Very dark gray (10 yr, 3/1), fine to medium SAND, little fine to coarse Gravel, trace Wood (Organics), trace Silt, wet with 2" seam (19.17-19.33) brown (10 yr, 4/3), fine to coarse SAND and GRAVEL, some Cobble (wet)								
		S-2	2-4										1	3.7	FILL	
		S-3	4-6										2	ND		
		S-4	6-10	48	42								3	ND		
		S-5	10-15	60	52								ND	ND		
		S-6	15-20	60	60								ND	ND		
10								4	ND	11.5	SAND					
										ND			20			
20																
25																
30																
35																

**REMARKS**

1 - Soil samples screened with a 10.6 eV MiniRAE 2000 photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. A "\*\*\*" indicates a sample sent to a laboratory for additional analyses or screening. ND=None Detected above background.  
2 - Borehole backfilled with a portland cement and bentonite grout via tremmie pipe.  
3 - Possible purifier waste?  
4 - 10 to 11 feet very loose soils.

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

**Exploration No.:**  
**GZ-BW-515**





### TEST BORING LOG



**GZA**  
**GeoEnvironmental, Inc.**  
*Engineers and Scientists*

**National Grid**  
**Former Tidewater Facility**  
**Pawtucket, Rhode Island**

**EXPLORATION NO.:** GZ-SB-515  
**SHEET:** 1 of 1  
**PROJECT NO:** 43654  
**REVIEWED BY:** SCC

**Logged By:** S. McLeod  
**Drilling Co.:** Cascade  
**Foreman:** Greg Rivera

**Type of Rig:** RotoSonic  
**Rig Model:** Fraste XL Max 250  
**Drilling Method:**  
Sonic

**Boring Location:** See Plan  
**Ground Surface Elev. (ft.):** 9.06  
**Final Boring Depth (ft.):** 20  
**Date Start - Finish:** 10/18/2017 - 10/20/2017

**H. Datum:**  
**V. Datum:**

**Hammer Type:** NA  
**Hammer Weight (lb.):** NA  
**Hammer Fall (in.):** NA  
**Auger or Casing O.D./I.D Dia (in.):** 6.5"/8"

**Sampler Type:** Sonic Core  
**Sampler O.D. (in.):** 4  
**Sampler Length (in.):** 60  
**Rock Core Size:**

**Groundwater Depth (ft.)**

Date	Time	Water Depth	Stab. Time

Depth (ft)	Casing Blows/ Core Rate	Sample					SPT Value	Sample Description and Identification Modified Burmister Procedure (USCS Group Symbol)	Remark	Field Test Data	Depth (ft.)	Stratum Description	Elev. (ft.)
		No.	Depth (ft.)	Pen. (in)	Rec. (in)	Blows (per 6 in.)							
5		S-1	0-2					S-1 : Very dark gray (10 yr, 3/1), fine to coarse SAND, some fine to coarse Gravel, little Slag, trace Cobble, trace Brick (dry) S-2 : Black (10 yr. 2/1), fine to coarse SAND, little fine to coarse Gravel (dry) S-3 : Top 12": Light gray (10 yr,7/1), fine to medium SAND, some Brick, little purifier waste (wood chips), dry Bottom 12": Black (10 yr, 2/1), fine to coarse SAND, little fine to coarse Gravel (dry) S-4 : Top 6": Black (10 yr, 2/1), fine to coarse SAND, little fine to coarse Gravel (dry) Bottm 36": Light Gray (10 yr, 7/1), fine to medium SAND, some Brick, little purifier waste (wood chips), dry S-5 : Top 18": Very dark gray (10 yr, 3/1), fine to coarse SAND, some fine to coarse Gravel, some Cobble, trace Slag, trace Brick (wet) Bottom 36": Very dark gray (10 yr, 3/1), fine to medium SAND, little fine to coarse Gravel, trace Wood (organics), trace Silt (wet) S-6 : Top 50": Very dark gray (10 yr, 3/1), fine to medium SAND, little fine to coarse Gravel, trace Wood (organics), trace Silt, wet Next 2": Brown (10 yr, 4/3), fine to coarse SAND and GRAVEL, some Cobble, wet Bottom 8": Very dark gray (10 yr, 3/1), fine to medium SAND, little fine to coarse Gravel, trace Wood (organics), trace Silt, wet End of exploration at 20 feet.	1	FILL			
		S-2	2-4						2		3.7		
		S-3	4-6								ND		
		S-4	6-10	48	42						ND		
		S-5	10-15	60	52						ND		
		S-6	15-20	60	60						ND		
10										11.5		-2.4	
15												SAND	
20										20		-10.9	
25													
30													
35													

**REMARKS**

1 - Soil samples screened with a 10.6 eV MiniRAE 2000 photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. A "\*\*\*" indicates a sample sent to a laboratory for additional analyses or screening. ND=None Detected above background.  
 2 - Borehole backfilled with a portland cement and bentonite grout via tremmie pipe.

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

**Exploration No.:**  
**GZ-SB-515**

GZA TEMPLATE TEST BORING: 1/5/2018; 11:27:24 AM



**TEST BORING LOG**



**GZA**  
**GeoEnvironmental, Inc.**  
*Engineers and Scientists*

National Grid  
 Former Tidewater Facility  
 Pawtucket, Rhode Island

EXPLORATION NO.: GZ-SB-516  
 SHEET: 2 of 2  
 PROJECT NO: 43654  
 REVIEWED BY: SCC

**Logged By:** S. McLeod  
**Drilling Co.:** Cascade  
**Foreman:** Greg Rivera

**Type of Rig:** CME-55  
**Rig Model:** LC Track Rig  
**Drilling Method:**  
 Wash & Drive

**Boring Location:** See Plan  
**Ground Surface Elev. (ft.):** 9.68  
**Final Boring Depth (ft.):** 16  
**Date Start - Finish:** 10/30/2017 - 10/30/2017

**H. Datum:**  
**V. Datum:**

**Hammer Type:** Automatic Hammer  
**Hammer Weight (lb.):** 140  
**Hammer Fall (in.):** 30  
**Auger or Casing O.D./I.D Dia (in.):** 4.5"/4.25"

**Sampler Type:** Split Spoon  
**Sampler O.D. (in.):** 2  
**Sampler Length (in.):** 24  
**Rock Core Size:**

**Groundwater Depth (ft.)**

Date	Time	Water Depth	Stab. Time

Depth (ft)	Casing Blows/ Core Rate	Sample No.	Sample				SPT Value	Sample Description and Identification Modified Burmister Procedure (USCS Group Symbol)	Remark	Field Test Data	Depth (ft.)	Stratum Description	Elev. (ft.)
			Depth (ft.)	Pen. (in)	Rec. (in)	Blows (per 6 in.)							
40							Bottom 6": Dense, very dark brown (10 yr, 2/2), fine to medium SAND, little fine to coarse Gravel, little Silt, wet						
45							End of exploration at 16 feet.						
50													
55													
60													
65													
70													

**REMARKS**

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

**Exploration No.:**  
**GZ-SB-516**





### TEST BORING LOG



**GZA**  
**GeoEnvironmental, Inc.**  
*Engineers and Scientists*

**National Grid**  
**Former Tidewater Facility**  
**Pawtucket, Rhode Island**

**EXPLORATION NO.:** GZ-WB-501  
**SHEET:** 1 of 1  
**PROJECT NO:** 43654  
**REVIEWED BY:**

**Logged By:** S. McLeod  
**Drilling Co.:** Cascade  
**Foreman:** Nick Mavlejo

**Type of Rig:** CME 55  
**Rig Model:** LC Tract Rig  
**Drilling Method:**  
Wash & Drive

**Boring Location:** See Plan  
**Ground Surface Elev. (ft.):**  
**Final Boring Depth (ft.):** 27  
**Date Start - Finish:** 12/7/2017 - 12/7/2017

**H. Datum:**  
**V. Datum:**

**Hammer Type:** NA  
**Hammer Weight (lb.):** 140  
**Hammer Fall (in.):** 30  
**Auger or Casing O.D./I.D Dia (in.):** 4.5"/4.25"

**Sampler Type:** Split Spoon  
**Sampler O.D. (in.):** 2  
**Sampler Length (in.):** 24  
**Rock Core Size:**

**Groundwater Depth (ft.)**

Date	Time	Water Depth	Stab. Time

Depth (ft)	Casing Blows/ Core Rate	Sample					SPT Value	Sample Description and Identification Modified Burmister Procedure (USCS Group Symbol)	Remark	Field Test Data	Depth (ft.)	Stratum Description	Elev. (ft.)
		No.	Depth (ft.)	Pen. (in)	Rec. (in)	Blows (per 6 in.)							
5		S-1	5-7	24	14			S-1 : Shelby Tube	1				
									2				
10		S-2	7.5-9.5	24	10	6 15 15 39	30	S-2 : Top 6": Medium, gray (10 yr, 5/1), coarse SAND, little fine Gravel, trace Silt, sheen, slight coal tar-like odor (wet) Bottom 4": Medium, black (10 yr, 2/1), fine to coarse GRAVEL, some fine to coarse Sand, little Silt, coated, slight coal tar-like odor (wet)	3				
									4			RECENT RIVER SEDIMENT	
15		S-3	12-14	24	1	9 5 5 4	10	S-3 : Medium, very dark gray (10 yr, 3/1), fine SAND, some Silt, little fine to coarse Gravel, slight coal tar-like odor (wet)	5				
									6				
20		S-4	15-17	24	19	3 4 4 5	8	S-4 : Top 2": Loose, grayish-brown (10 yr, 5/2), fine SAND, trace Silt, slight coal tar-like odor (wet) Next 1": Loose, dark grayish-brown (10 yr, 4/2), coarse SAND, slight coal tar-like odor (wet) Bottom 16": Loose, grayish-brown (10 yr, 5/2), fine SAND, trace Silt, slight coal tar-like odor (wet)	7				
									8				
25		S-5	20-22	24	22	3 6 8 8	14	S-5 : Top 10": Medium, grayish-brown (10 yr, 5/2), fine SAND, trace Silt, slight coal tar-like odor (wet) Next 2": Medium, dark grayish-brown (10 yr, 4/2), coarse SAND, slight coal tar-like odor (wet) Bottom 10": Medium, very dark gray (10 yr, 3/1), fine to medium SAND, trace Silt, NAPL saturated from 20-22", moderate coal tar-like odor (wet)	9				
									10				
30		S-6	25-27	24	24	2 3 6 6	9	S-6 : Top 16": Loose, dark gray (10 yr, 4/1), fine to coarse SAND, trace Silt, sheen, slight coal tar-like odor (wet) Next 2": Loose, dark gray (10 yr, 4/1), coarse SAND, trace Silt, sheen, slight coal tar-like odor (wet) Bottom 6": Loose, dark gray (10 yr, 4/1), fine to medium SAND, trace Silt, sheen, slight coal tar-like odor (wet)	11				
									12				
35								End of exploration at 27 feet.	13				
									14				
									15				
									16				
									17				
									18				
									19				
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**REMARKS**

1 - Soil samples screened with a 10.6 eV MiniRAE 2000 photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. A "\*" indicates a sample sent to a laboratory for additional analyses or screening. ND=None Detected above background.  
 2 - Borehole backfilled with a portland cement and bentonite grout via tremmie pipe.  
 3 - Sheen in water when drilling out casing from 5-7'. 4. - Drill rig chatter from 7-7.5'.  
 5 - Drill rig chatter from 9.5-13.92', likely boulder. 6. - Drill chatter @ 27'. 7. - NAPL observed in drill water starting at 28.5'.  
 8 - Unable to collect 30-32' sample due to possible breaking of casing @ 25'. Difficult drilling and drilling chatter indicate possible Glacial Till at 29'.

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

**Exploration No.:**  
**GZ-WB-501**

GZA TEMPLATE TEST BORING: 12/28/2017: 9:25:25 AM

**TEST BORING LOG**



**GZA**  
**GeoEnvironmental, Inc.**  
*Engineers and Scientists*

**National Grid**  
**Former Tidewater Facility**  
**Pawtucket, Rhode Island**

**EXPLORATION NO.:** GZ-WB-502  
**SHEET:** 1 of 2  
**PROJECT NO:** 43654  
**REVIEWED BY:** SCC

**Logged By:** S. McLeod  
**Drilling Co.:** Cascade  
**Foreman:** Nick Mavlejo

**Type of Rig:** CME 45  
**Rig Model:** LC Track Rig  
**Drilling Method:**  
Wash & Drive

**Boring Location:** See Plan  
**Ground Surface Elev. (ft.):**  
**Final Boring Depth (ft.):** 37  
**Date Start - Finish:** 12/11/2017 - 12/11/2017

**H. Datum:**  
**V. Datum:**

**Hammer Type:** NA  
**Hammer Weight (lb.):** 140  
**Hammer Fall (in.):** 30  
**Auger or Casing O.D./I.D Dia (in.):** 4.5"/4.25"

**Sampler Type:** Split Spoon  
**Sampler O.D. (in.):** 2  
**Sampler Length (in.):** 24  
**Rock Core Size:**

**Groundwater Depth (ft.)**

Date	Time	Water Depth	Stab. Time

Depth (ft)	Casing Blows/ Core Rate	Sample					SPT Value	Sample Description Modified Burmister	Remark	Field Test Data	Depth (ft.)	Stratum Description	Elev. (ft.)
		No.	Depth (ft.)	Pen. (in)	Rec. (in)	Blows (per 6 in.)							
5		S-1	5-7	28	28	WOR		S-1 : Shelby Tube	1				
		S-2	7-9	24	6	WOR		S-2 : Very loose, black (10 yr, 2/1) SILT, slight sulfur-like odor (wet)	2				
		S-3	9-11	28	25	WOR		S-3 : Shelby tube	3				
		S-4	11-13	24	0	WOH 1 3 2	4	S-4 : No Recovery					
		S-5	13-15	24	24	WOR/WOH 3 5		S-5 : Top 12": Very loose, black (10 yr, 2/1) SILT, slight sulfur-like odor (wet) Next 3": Very loose, dark grayish-brown (10 yr, 4/2), fine to coarse SAND, trace fine Gravel, trace Silt, slight coal tar-like odor (wet) Bottom 9": Very loose, gray (10 yr, 5/1), fine SAND, little Silt, slight coal tar-like odor (wet)	19.4	14			
		S-6	20-22	24	16	4 8 6 6	14	S-6 : Top 4": Medium, dark gray (10 yr, 4/1), fine to coarse SAND, slight petroleum-like odor (wet) Next 2": Medium, dark gray (10 yr, 4/1), fine to coarse SAND and GRAVEL, slight petroleum-like odor (wet) Bottom 10": Medium, gray (10 yr, 4/1), fine SAND, little fine to coarse Gravel, little Silt, slight petroleum-like odor (wet)	16.2				
		S-7	25-27	24	15	3 4 4 5	8	S-7 : Top 10": Medium, grayish-brown (10 yr, 5/2), fine SAND, some Silt (wet) Bottom 5": Medium, grayish-brown (10 yr, 5/2) Clayey SILT (wet)	4	ND		SAND AND GRAVEL	
		S-8	30-32	24	9	3 7 6 6	13	S-8 : Medium, very dark gray (10 yr, 3/1), coarse GRAVEL, little Silt, trace fine to coarse Sand, slight petroleum-like odor (wet)	5	8.7			
35											35		

**REMARKS**

- Soil samples screened with a 10.6 eV MiniRAE 2000 photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. ND=None Detected above background.
- Drilling completed over the water on the Seekonk River utilizing a barge mounted drill rig.
- Borehole backfilled with a portland cement and bentonite grout via tremmie pipe.
- Drill rig chatter between 27-29'.
- Drill rig changer at 32'.

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

**Exploration No.:**  
**GZ-WB-502**

BORING LOGS.GPJ; GZA TEMPLATE TEST BORING; GZA TEMPLATE 0210.GDT; GZA LIBRARY 10-29-10-NGRID MODIFIED.GLB; 1/11/2018; 1:06:15 PM

**TEST BORING LOG**



**GZA**  
**GeoEnvironmental, Inc.**  
*Engineers and Scientists*

National Grid  
 Former Tidewater Facility  
 Pawtucket, Rhode Island

EXPLORATION NO.: GZ-WB-502  
 SHEET: 2 of 2  
 PROJECT NO: 43654  
 REVIEWED BY: SCC

**Logged By:** S. McLeod  
**Drilling Co.:** Cascade  
**Foreman:** Nick Mavlejo

**Type of Rig:** CME 45  
**Rig Model:** LC Track Rig  
**Drilling Method:**  
 Wash & Drive

**Boring Location:** See Plan  
**Ground Surface Elev. (ft.):**  
**Final Boring Depth (ft.):** 37  
**Date Start - Finish:** 12/11/2017 - 12/11/2017

**H. Datum:**  
**V. Datum:**

**Hammer Type:** NA  
**Hammer Weight (lb.):** 140  
**Hammer Fall (in.):** 30  
**Auger or Casing O.D./I.D Dia (in.):** 4.5"/4.25"

**Sampler Type:** Split Spoon  
**Sampler O.D. (in.):** 2  
**Sampler Length (in.):** 24  
**Rock Core Size:**

**Groundwater Depth (ft.)**

Date	Time	Water Depth	Stab. Time

Depth (ft)	Casing Blows/ Core Rate	Sample					SPT Value	Sample Description Modified Burmister	Remark	Field Test Data	Depth (ft.)	Stratum Description	Elev. (ft.)
		No.	Depth (ft.)	Pen. (in)	Rec. (in)	Blows (per 6 in.)							
		S-9	35-37	24	12	19 25 52/2" -	R	S-9 : Very dense, very dark gray (Gley 1, 3/N), fine to coarse SAND, some fine to coarse Gravel, little Silt (wet)		ND	37	TILL	
40								End of exploration at 37 feet.					
45													
50													
55													
60													
65													
70													

**REMARKS**

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

**Exploration No.:**  
**GZ-WB-502**

BORING LOGS.GPJ; GZA TEMPLATE TEST BORING; GZA TEMPLATE 0210.GDT; GZA LIBRARY 10-29-10-NGRID MODIFIED.GLB; 1/11/2018; 1:06:15 PM



### TEST BORING LOG



**GZA**  
**GeoEnvironmental, Inc.**  
*Engineers and Scientists*

National Grid  
 Former Tidewater Facility  
 Pawtucket, Rhode Island

EXPLORATION NO.: GZ-WB-503  
 SHEET: 1 of 2  
 PROJECT NO: 43654  
 REVIEWED BY: SCC

Logged By: S. McLeod  
 Drilling Co.: Cascade  
 Foreman: Nick Mavlejo

Type of Rig: CME 45  
 Rig Model: LC Track Rig  
 Drilling Method:  
 Wash & Drive

Boring Location: See Plan  
 Ground Surface Elev. (ft.):  
 Final Boring Depth (ft.): 37  
 Date Start - Finish: 12/12/2017 - 12/12/2017

H. Datum:  
 V. Datum:

Hammer Type: NA  
 Hammer Weight (lb.): 140  
 Hammer Fall (in.): 30  
 Auger or Casing O.D./I.D Dia (in.): 4.5"/4.25"

Sampler Type: Split Spoon  
 Sampler O.D. (in.): 2  
 Sampler Length (in.): 24  
 Rock Core Size:

**Groundwater Depth (ft.)**

Date	Time	Water Depth	Stab. Time

Depth (ft)	Casing Blows/ Core Rate	Sample					SPT Value	Sample Description Modified Burmister	Remark	Field Test Data	Depth (ft.)	Stratum Description	Elev. (ft.)
		No.	Depth (ft.)	Pen. (in)	Rec. (in)	Blows (per 6 in.)							
5		S-1	5-7	29	24	WOR		S-1 : Shelby Tube				RECENT RIVER SEDIMENT	
		S-2	7-9	24	0	WOR		S-2 : No Recovery					
10		S-3	9-11	24	12	5 5 7 4	12	S-3 : Top 4": Medium, very dark gray (10 yr, 3/1), fine to coarse SAND and GRAVEL, trace Silt, slight coal tar-like odor (wet) Bottom 8": Medium, dark gray (10 yr, 4/1), fine to coarse SAND, trace Silt, slight coal tar-like odor (wet)	4	33	9.25		
		S-4	15-17	24	10	4 9 7 7		16					
20		S-5	20-22	24	3	1 4 6 9	10	S-5 : Medium, gray (10 yr, 5/1), fine to coarse GRAVEL, little fine to coarse Sand (wet)	5	0.3		SAND AND GRAVEL	
		S-6	25-27	24	12	8 12 22 11		34					
30		S-7	30-32	24	8	40 29 12 24	41	S-7 : Dense, dark gray (10 yr, 4/1), coarse GRAVEL, little fine Sand, trace Silt (wet)	6	2.1			
35											35		

**REMARKS**

- 1 - Soil samples screened with a 10.6 eV MiniRAE 2000 photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. ND=None Detected above background.
- 2 - Drilling completed over the water on the Seekonk River utilizing a barge mounted drill rig.
- 3 - Borehole backfilled with a portland cement and bentonite grout via tremmie pipe.
- 4 - Attempted Shelby Tube - hit refusal.
- 5 - Drill rig chatter from 23-25'.
- 6 - Drill rig chatter from 27-29'.
- 7 - Drill rig chatter from 32-35'.

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

**Exploration No.:**  
**GZ-WB-503**

BORING LOGS.GPJ; GZA TEMPLATE TEST BORING; GZA TEMPLATE 0210.GDT; GZA LIBRARY 10-29-10-NGRID MODIFIED.GLB; 1/8/2018; 1:29:36 PM

### TEST BORING LOG



**GZA**  
**GeoEnvironmental, Inc.**  
*Engineers and Scientists*

National Grid  
 Former Tidewater Facility  
 Pawtucket, Rhode Island

EXPLORATION NO.: GZ-WB-503  
 SHEET: 2 of 2  
 PROJECT NO: 43654  
 REVIEWED BY: SCC

**Logged By:** S. McLeod  
**Drilling Co.:** Cascade  
**Foreman:** Nick Mavlejo

**Type of Rig:** CME 45  
**Rig Model:** LC Track Rig  
**Drilling Method:**  
 Wash & Drive

**Boring Location:** See Plan  
**Ground Surface Elev. (ft.):**  
**Final Boring Depth (ft.):** 37  
**Date Start - Finish:** 12/12/2017 - 12/12/2017

**H. Datum:**  
**V. Datum:**

**Hammer Type:** NA  
**Hammer Weight (lb.):** 140  
**Hammer Fall (in.):** 30  
**Auger or Casing O.D./I.D Dia (in.):** 4.5"/4.25"

**Sampler Type:** Split Spoon  
**Sampler O.D. (in.):** 2  
**Sampler Length (in.):** 24  
**Rock Core Size:**

**Groundwater Depth (ft.)**

Date	Time	Water Depth	Stab. Time

Depth (ft)	Casing Blows/ Core Rate	Sample					SPT Value	Sample Description Modified Burmister	Remark	Field Test Data	Depth (ft.)	Stratum Description	Elev. (ft.)
		No.	Depth (ft.)	Pen. (in)	Rec. (in)	Blows (per 6 in.)							
		S-8	35-37	24		9 26 18 14	44	S-8 : Dense, dark gray (Gley1, 4/N), fine to coarse GRAVEL, some fine Sand, little Silt (wet)		0.9		GLACIAL TILL	
40								End of exploration at 37 feet.					
45													
50													
55													
60													
65													
70													

**REMARKS**

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

**Exploration No.:**  
**GZ-WB-503**

BORING LOGS.GPJ; GZA TEMPLATE TEST BORING; GZA TEMPLATE 0210.GDT; GZA LIBRARY 10-29-10-NGRID MODIFIED.GLB; 1/8/2018; 1:29:36 PM

**TEST BORING LOG**



**GZA**  
**GeoEnvironmental, Inc.**  
*Engineers and Scientists*

**National Grid**  
**Former Tidewater Facility**  
**Pawtucket, Rhode Island**

**EXPLORATION NO.:** GZ-WB-504  
**SHEET:** 1 of 1  
**PROJECT NO:** 43654  
**REVIEWED BY:** SCC

**Logged By:** S. McLeod  
**Drilling Co.:** Cascade  
**Foreman:** Nick Mavlejo

**Type of Rig:** CME-45  
**Rig Model:** LC Track Rig  
**Drilling Method:**  
Wash & Drive

**Boring Location:** See Plan  
**Ground Surface Elev. (ft.):**  
**Final Boring Depth (ft.):** 17  
**Date Start - Finish:** 12/6/2017 - 12/6/2017

**H. Datum:**  
**V. Datum:**

**Hammer Type:** NA  
**Hammer Weight (lb.):** 140  
**Hammer Fall (in.):** 30  
**Auger or Casing O.D./I.D Dia (in.):** 4.5"/4.25"

**Sampler Type:** Split Spoon  
**Sampler O.D. (in.):** 2  
**Sampler Length (in.):** 24  
**Rock Core Size:**

**Groundwater Depth (ft.)**

Date	Time	Water Depth	Stab. Time

Depth (ft)	Casing Blows/ Core Rate	Sample						SPT Value	Sample Description Modified Burmister	Remark	Field Test Data	Depth (ft.)	Stratum Description	Elev. (ft.)			
		No.	Depth (ft.)	Pen. (in)	Rec. (in)	Blows (per 6 in.)											
5		S-1	5-7	24	9	WOH 4 49 16	53	S-1 : Dense, very dark gray (10 yr, 3/1) ROCK, little Silt, trace fine to coarse Sand (wet)	1	ND		RECENT RIVER SEDIMENT					
		S-2	7-9	24	10	16 7 7 6	14	S-2 : Medium, very dark gray (10 yr, 3/1), coarse GRAVEL, some fine to coarse Sand, little Silt, moderate coal-tar-like odor, sheet (wet)	2					27.1			
		S-3	9-11	24	7	WOH 2 3 4	5	S-3 : Loose, grayish-brown (10 yr, 5/2), fine SAND, some Silt, slight sulfur-like odor (wet)	3					ND	9		
		S-4	11-13	24	14	3 3 4 5	7	S-4 : Top 11": Loose, grayish-brown (10 yr, 5/2), fine SAND, some Silt, slight coal tar-like odor (wet)	4					2.7		SAND	
		S-5	13-15	24	13	2 10 10 18	20	Bottom 3": Loose, gray (10 yr, 5/1), fine to coarse SAND, little fine to coarse Gravel, little Silt, slight coal tar-like odor (wet)						3.7	13		
		S-6	15-17	24	11	18 16 14 9	30	S-5 : Top 6": Medium, gray (10 yr, 5/1), fine to coarse SAND, little fine to coarse Gravel, little Silt, slight coal tar-like odor (wet) Bottom 7": Medium, gray (10 yr, 5/1), fine to coarse SAND, little fine to coarse Gravel, little Silt (wet) S-6 : Medium, gray (10 yr, 5/1), fine to coarse SAND, little fine to coarse Gravel, little Silt, moderate coal tar-like odor (wet)						30.9	17		GLACIAL TILL
								End of exploration at 17 feet.									

**REMARKS**

1 - Soil samples screened with a 10.6 eV MiniRAE 2000 photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. ND=None Detected above background.  
 2 - Drilling completed over the water on the Seekonk River utilizing barge mounted drill rig.  
 3 - Borehole backfilled with a portland cement and bentonite grout via tremmie pipe.  
 4 - From 0-5' difficulty pounding casing likely due to difficulty pounding coring.

See Log Key for exploration of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

**Exploration No.:**  
**GZ-WB-504**

BORING LOGS.GPJ; GZA TEMPLATE TEST BORING; GZA TEMPLATE 0210.GDT; GZA LIBRARY 10-29-10-NGRID MODIFIED.GLB; 1/8/2018; 1:29:52 PM



## **APPENDIX E**

### **LDI LABORATORY RESULTS**





## CERTIFICATE OF ANALYSIS

Sarah McLeod  
GZA GeoEnvironmental, Inc.  
530 Broadway  
Providence, RI 02909

**RE: Former Tidwater Facility (05.0043654.00)**  
**ESS Laboratory Work Order Number: 1709470**

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard  
Laboratory Director

**REVIEWED**

**By ESS Laboratory at 3:44 pm, Sep 26, 2017**

### Analytical Summary

The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility

ESS Laboratory Work Order: 1709470

**SAMPLE RECEIPT**

The following samples were received on September 15, 2017 for the analyses specified on the enclosed Chain of Custody Record.

**Low Level VOA vials were frozen by ESS Laboratory on September 15, 2017 at 22:40.**

<u>Lab Number</u>	<u>Sample Name</u>	<u>Matrix</u>	<u>Analysis</u>
1709470-01	TP-501 (0-1.5')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1709470-02	TP-501 (3.5-4')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1709470-03	TP-502 (0-1')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1709470-04	TP-502 (4-5')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1709470-05	TP-503 (0-2')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1709470-06	TP-503 (5-6')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1709470-07	TP-504 (1.5-2')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1709470-08	TP-504 (4-5')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1709470-09	TP-505 (0-2')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1709470-10	TP-505 (4-5')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1709470-11	TP-506 (1-2')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1709470-12	TP-506 (10-11')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1709470-13	TP-507 (0-2')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1709470-14	TP-507 (10-11')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1709470-15	TP-597 (1-2')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1709470-16	TB-091417	Solid	8260B Low



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility

ESS Laboratory Work Order: 1709470

**PROJECT NARRATIVE**

**5035/8260B Volatile Organic Compounds / Low Level**

1709470-03 [Internal Standard\(s\) outside of criteria. Sample was reanalyzed to confirm \(IC\).](#)

1,4-Dichlorobenzene-D4 (47% @ 50-200%)

CI71948-BSD1 [Blank Spike recovery is below lower control limit \(B-\).](#)

Dichlorodifluoromethane (64% @ 70-130%)

**No other observations noted.**

**End of Project Narrative.**

**DATA USABILITY LINKS**

*To ensure you are viewing the most current version of the documents below, please clear your internet cookies for [www.ESSLaboratory.com](http://www.ESSLaboratory.com). Consult your IT Support personnel for information on how to clear your internet cookies.*

[Definitions of Quality Control Parameters](#)

[Semivolatile Organics Internal Standard Information](#)

[Semivolatile Organics Surrogate Information](#)

[Volatile Organics Internal Standard Information](#)

[Volatile Organics Surrogate Information](#)

[EPH and VPH Alkane Lists](#)



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility

ESS Laboratory Work Order: 1709470

**CURRENT SW-846 METHODOLOGY VERSIONS**

**Analytical Methods**

- 1010A - Flashpoint
- 6010C - ICP
- 6020A - ICP MS
- 7010 - Graphite Furnace
- 7196A - Hexavalent Chromium
- 7470A - Aqueous Mercury
- 7471B - Solid Mercury
- 8011 - EDB/DBCP/TCP
- 8015C - GRO/DRO
- 8081B - Pesticides
- 8082A - PCB
- 8100M - TPH
- 8151A - Herbicides
- 8260B - VOA
- 8270D - SVOA
- 8270D SIM - SVOA Low Level
- 9014 - Cyanide
- 9038 - Sulfate
- 9040C - Aqueous pH
- 9045D - Solid pH (Corrosivity)
- 9050A - Specific Conductance
- 9056A - Anions (IC)
- 9060A - TOC
- 9095B - Paint Filter
- MADEP 04-1.1 - EPH / VPH

**Prep Methods**

- 3005A - Aqueous ICP Digestion
- 3020A - Aqueous Graphite Furnace / ICP MS Digestion
- 3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
- 3060A - Solid Hexavalent Chromium Digestion
- 3510C - Separatory Funnel Extraction
- 3520C - Liquid / Liquid Extraction
- 3540C - Manual Soxhlet Extraction
- 3541 - Automated Soxhlet Extraction
- 3546 - Microwave Extraction
- 3580A - Waste Dilution
- 5030B - Aqueous Purge and Trap
- 5030C - Aqueous Purge and Trap
- 5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-501 (0-1.5')  
Date Sampled: 09/14/17 11:05  
Percent Solids: 91

ESS Laboratory Work Order: 1709470  
ESS Laboratory Sample ID: 1709470-01  
Sample Matrix: Soil  
Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (2.09)		6020A		20	NAR	09/21/17 23:16	2.09	100	CI71936
Arsenic	<b>4.21</b> (2.62)		6010C		1	KJK	09/22/17 20:55	2.09	100	CI71936
Beryllium	<b>0.27</b> (0.12)		6010C		1	KJK	09/23/17 18:51	2.09	100	CI71936
Cadmium	ND (0.52)		6010C		1	KJK	09/22/17 20:55	2.09	100	CI71936
Chromium	<b>3.49</b> (1.05)		6010C		1	KJK	09/22/17 20:55	2.09	100	CI71936
Copper	<b>50.4</b> (2.62)		6010C		1	KJK	09/22/17 20:55	2.09	100	CI71936
Lead	<b>31.5</b> (5.23)		6010C		1	KJK	09/22/17 20:55	2.09	100	CI71936
Mercury	<b>0.078</b> (0.033)		7471B		1	MJV	09/22/17 20:37	0.66	40	CI71940
Nickel	<b>7.04</b> (2.62)		6010C		1	KJK	09/22/17 20:55	2.09	100	CI71936
Selenium	ND (2.09)		6020A		20	NAR	09/21/17 23:16	2.09	100	CI71936
Silver	ND (0.52)		6010C		1	KJK	09/22/17 20:55	2.09	100	CI71936
Thallium	ND (2.09)		6020A		20	NAR	09/21/17 23:16	2.09	100	CI71936
Zinc	<b>12.0</b> (2.62)		6010C		1	KJK	09/22/17 20:55	2.09	100	CI71936



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-501 (0-1.5')  
 Date Sampled: 09/14/17 11:05  
 Percent Solids: 91  
 Initial Volume: 5.6  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709470  
 ESS Laboratory Sample ID: 1709470-01  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0049)		8260B Low		1	09/19/17 17:39	C7I0305	CI71948
1,1,1-Trichloroethane	ND (0.0049)		8260B Low		1	09/19/17 17:39	C7I0305	CI71948
1,1,2,2-Tetrachloroethane	ND (0.0049)		8260B Low		1	09/19/17 17:39	C7I0305	CI71948
1,1,2-Trichloroethane	ND (0.0049)		8260B Low		1	09/19/17 17:39	C7I0305	CI71948
1,1-Dichloroethane	ND (0.0049)		8260B Low		1	09/19/17 17:39	C7I0305	CI71948
1,1-Dichloroethene	ND (0.0049)		8260B Low		1	09/19/17 17:39	C7I0305	CI71948
1,1-Dichloropropene	ND (0.0049)		8260B Low		1	09/19/17 17:39	C7I0305	CI71948
1,2,3-Trichlorobenzene	ND (0.0049)		8260B Low		1	09/19/17 17:39	C7I0305	CI71948
1,2,3-Trichloropropane	ND (0.0049)		8260B Low		1	09/19/17 17:39	C7I0305	CI71948
1,2,4-Trichlorobenzene	ND (0.0049)		8260B Low		1	09/19/17 17:39	C7I0305	CI71948
1,2,4-Trimethylbenzene	ND (0.0049)		8260B Low		1	09/19/17 17:39	C7I0305	CI71948
1,2-Dibromo-3-Chloropropane	ND (0.0049)		8260B Low		1	09/19/17 17:39	C7I0305	CI71948
1,2-Dibromoethane	ND (0.0049)		8260B Low		1	09/19/17 17:39	C7I0305	CI71948
1,2-Dichlorobenzene	ND (0.0049)		8260B Low		1	09/19/17 17:39	C7I0305	CI71948
1,2-Dichloroethane	ND (0.0049)		8260B Low		1	09/19/17 17:39	C7I0305	CI71948
1,2-Dichloropropane	ND (0.0049)		8260B Low		1	09/19/17 17:39	C7I0305	CI71948
1,3,5-Trimethylbenzene	ND (0.0049)		8260B Low		1	09/19/17 17:39	C7I0305	CI71948
1,3-Dichlorobenzene	ND (0.0049)		8260B Low		1	09/19/17 17:39	C7I0305	CI71948
1,3-Dichloropropane	ND (0.0049)		8260B Low		1	09/19/17 17:39	C7I0305	CI71948
1,4-Dichlorobenzene	ND (0.0049)		8260B Low		1	09/19/17 17:39	C7I0305	CI71948
1,4-Dioxane	ND (0.0977)		8260B Low		1	09/19/17 17:39	C7I0305	CI71948
1-Chlorohexane	ND (0.0049)		8260B Low		1	09/19/17 17:39	C7I0305	CI71948
2,2-Dichloropropane	ND (0.0049)		8260B Low		1	09/19/17 17:39	C7I0305	CI71948
2-Butanone	ND (0.0488)		8260B Low		1	09/19/17 17:39	C7I0305	CI71948
2-Chlorotoluene	ND (0.0049)		8260B Low		1	09/19/17 17:39	C7I0305	CI71948
2-Hexanone	ND (0.0488)		8260B Low		1	09/19/17 17:39	C7I0305	CI71948
4-Chlorotoluene	ND (0.0049)		8260B Low		1	09/19/17 17:39	C7I0305	CI71948
4-Isopropyltoluene	ND (0.0049)		8260B Low		1	09/19/17 17:39	C7I0305	CI71948
4-Methyl-2-Pentanone	ND (0.0488)		8260B Low		1	09/19/17 17:39	C7I0305	CI71948
Acetone	ND (0.0488)		8260B Low		1	09/19/17 17:39	C7I0305	CI71948
Benzene	ND (0.0049)		8260B Low		1	09/19/17 17:39	C7I0305	CI71948
Bromobenzene	ND (0.0049)		8260B Low		1	09/19/17 17:39	C7I0305	CI71948



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-501 (0-1.5')  
 Date Sampled: 09/14/17 11:05  
 Percent Solids: 91  
 Initial Volume: 5.6  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709470  
 ESS Laboratory Sample ID: 1709470-01  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0049)		8260B Low		1	09/19/17 17:39	C7I0305	CI71948
Bromodichloromethane	ND (0.0049)		8260B Low		1	09/19/17 17:39	C7I0305	CI71948
Bromoform	ND (0.0049)		8260B Low		1	09/19/17 17:39	C7I0305	CI71948
Bromomethane	ND (0.0098)		8260B Low		1	09/19/17 17:39	C7I0305	CI71948
Carbon Disulfide	ND (0.0049)		8260B Low		1	09/19/17 17:39	C7I0305	CI71948
Carbon Tetrachloride	ND (0.0049)		8260B Low		1	09/19/17 17:39	C7I0305	CI71948
Chlorobenzene	ND (0.0049)		8260B Low		1	09/19/17 17:39	C7I0305	CI71948
Chloroethane	ND (0.0098)		8260B Low		1	09/19/17 17:39	C7I0305	CI71948
Chloroform	ND (0.0049)		8260B Low		1	09/19/17 17:39	C7I0305	CI71948
Chloromethane	ND (0.0098)		8260B Low		1	09/19/17 17:39	C7I0305	CI71948
cis-1,2-Dichloroethene	ND (0.0049)		8260B Low		1	09/19/17 17:39	C7I0305	CI71948
cis-1,3-Dichloropropene	ND (0.0049)		8260B Low		1	09/19/17 17:39	C7I0305	CI71948
Dibromochloromethane	ND (0.0049)		8260B Low		1	09/19/17 17:39	C7I0305	CI71948
Dibromomethane	ND (0.0049)		8260B Low		1	09/19/17 17:39	C7I0305	CI71948
Dichlorodifluoromethane	ND (0.0098)		8260B Low		1	09/19/17 17:39	C7I0305	CI71948
Diethyl Ether	ND (0.0049)		8260B Low		1	09/19/17 17:39	C7I0305	CI71948
Di-isopropyl ether	ND (0.0049)		8260B Low		1	09/19/17 17:39	C7I0305	CI71948
Ethyl tertiary-butyl ether	ND (0.0049)		8260B Low		1	09/19/17 17:39	C7I0305	CI71948
Ethylbenzene	ND (0.0049)		8260B Low		1	09/19/17 17:39	C7I0305	CI71948
Hexachlorobutadiene	ND (0.0049)		8260B Low		1	09/19/17 17:39	C7I0305	CI71948
Isopropylbenzene	ND (0.0049)		8260B Low		1	09/19/17 17:39	C7I0305	CI71948
Methyl tert-Butyl Ether	ND (0.0049)		8260B Low		1	09/19/17 17:39	C7I0305	CI71948
Methylene Chloride	ND (0.0244)		8260B Low		1	09/19/17 17:39	C7I0305	CI71948
Naphthalene	ND (0.0049)		8260B Low		1	09/19/17 17:39	C7I0305	CI71948
n-Butylbenzene	ND (0.0049)		8260B Low		1	09/19/17 17:39	C7I0305	CI71948
n-Propylbenzene	ND (0.0049)		8260B Low		1	09/19/17 17:39	C7I0305	CI71948
sec-Butylbenzene	ND (0.0049)		8260B Low		1	09/19/17 17:39	C7I0305	CI71948
Styrene	ND (0.0049)		8260B Low		1	09/19/17 17:39	C7I0305	CI71948
tert-Butylbenzene	ND (0.0049)		8260B Low		1	09/19/17 17:39	C7I0305	CI71948
Tertiary-amyl methyl ether	ND (0.0049)		8260B Low		1	09/19/17 17:39	C7I0305	CI71948
Tetrachloroethene	ND (0.0049)		8260B Low		1	09/19/17 17:39	C7I0305	CI71948
Tetrahydrofuran	ND (0.0049)		8260B Low		1	09/19/17 17:39	C7I0305	CI71948



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-501 (0-1.5')  
 Date Sampled: 09/14/17 11:05  
 Percent Solids: 91  
 Initial Volume: 5.6  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709470  
 ESS Laboratory Sample ID: 1709470-01  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0049)		8260B Low		1	09/19/17 17:39	C7I0305	CI71948
trans-1,2-Dichloroethene	ND (0.0049)		8260B Low		1	09/19/17 17:39	C7I0305	CI71948
trans-1,3-Dichloropropene	ND (0.0049)		8260B Low		1	09/19/17 17:39	C7I0305	CI71948
Trichloroethene	ND (0.0049)		8260B Low		1	09/19/17 17:39	C7I0305	CI71948
Trichlorofluoromethane	ND (0.0049)		8260B Low		1	09/19/17 17:39	C7I0305	CI71948
Vinyl Acetate	ND (0.0049)		8260B Low		1	09/19/17 17:39	C7I0305	CI71948
Vinyl Chloride	ND (0.0098)		8260B Low		1	09/19/17 17:39	C7I0305	CI71948
Xylene O	ND (0.0049)		8260B Low		1	09/19/17 17:39	C7I0305	CI71948
Xylene P,M	ND (0.0098)		8260B Low		1	09/19/17 17:39	C7I0305	CI71948
Xylenes (Total)	ND (0.0098)		8260B Low		1	09/19/17 17:39		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	91 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	101 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	95 %		70-130
<i>Surrogate: Toluene-d8</i>	104 %		70-130





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-501 (0-1.5')  
Date Sampled: 09/14/17 11:05  
Percent Solids: 91  
Initial Volume: 19.4  
Final Volume: 1  
Extraction Method: 3546

ESS Laboratory Work Order: 1709470  
ESS Laboratory Sample ID: 1709470-01  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: SMR  
Prepared: 9/18/17 11:00

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	6000 (423)		8100M		10	09/19/17 17:10	C710275	CI71820

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: O-Terphenyl</i>	69 %		40-140



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-501 (0-1.5')  
Date Sampled: 09/14/17 11:05  
Percent Solids: 91  
Initial Volume: 14.3  
Final Volume: 0.5  
Extraction Method: 3546

ESS Laboratory Work Order: 1709470  
ESS Laboratory Sample ID: 1709470-01  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: TJ  
Prepared: 9/18/17 11:30

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	12.5 (0.764)		8270D		2	09/19/17 7:43	C7I0285	CI71818
Acenaphthene	2.47 (0.764)		8270D		2	09/19/17 7:43	C7I0285	CI71818
Acenaphthylene	16.5 (0.764)		8270D		2	09/19/17 7:43	C7I0285	CI71818
Anthracene	12.2 (0.764)		8270D		2	09/19/17 7:43	C7I0285	CI71818
Benzo(a)anthracene	28.5 (7.64)		8270D		20	09/19/17 20:21	C7I0285	CI71818
Benzo(a)pyrene	18.2 (0.383)		8270D		2	09/19/17 7:43	C7I0285	CI71818
Benzo(b)fluoranthene	28.2 (7.64)		8270D		20	09/19/17 20:21	C7I0285	CI71818
Benzo(g,h,i)perylene	7.75 (0.764)		8270D		2	09/19/17 7:43	C7I0285	CI71818
Benzo(k)fluoranthene	17.5 (0.764)		8270D		2	09/19/17 7:43	C7I0285	CI71818
Chrysene	27.8 (3.83)		8270D		20	09/19/17 20:21	C7I0285	CI71818
Dibenzo(a,h)Anthracene	4.30 (0.383)		8270D		2	09/19/17 7:43	C7I0285	CI71818
Fluoranthene	87.5 (7.64)		8270D		20	09/19/17 20:21	C7I0285	CI71818
Fluorene	6.22 (0.764)		8270D		2	09/19/17 7:43	C7I0285	CI71818
Indeno(1,2,3-cd)Pyrene	7.81 (0.764)		8270D		2	09/19/17 7:43	C7I0285	CI71818
Naphthalene	28.8 (7.64)		8270D		20	09/19/17 20:21	C7I0285	CI71818
Phenanthrene	70.6 (7.64)		8270D		20	09/19/17 20:21	C7I0285	CI71818
Pyrene	52.8 (7.64)		8270D		20	09/19/17 20:21	C7I0285	CI71818

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
Surrogate: 1,2-Dichlorobenzene-d4	52 %		30-130
Surrogate: 2-Fluorobiphenyl	64 %		30-130
Surrogate: Nitrobenzene-d5	47 %		30-130
Surrogate: p-Terphenyl-d14	72 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-501 (0-1.5')  
Date Sampled: 09/14/17 11:05  
Percent Solids: 91

ESS Laboratory Work Order: 1709470  
ESS Laboratory Sample ID: 1709470-01  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	7.48 (1.09)		9014		1	EEM	09/21/17 12:25	mg/kg dry	CI72119



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-501 (3.5-4')  
Date Sampled: 09/14/17 11:30  
Percent Solids: 92

ESS Laboratory Work Order: 1709470  
ESS Laboratory Sample ID: 1709470-02  
Sample Matrix: Soil  
Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (1.98)		6020A		20	NAR	09/21/17 23:41	2.21	100	CI71936
Arsenic	<b>5.91</b> (2.47)		6010C		1	KJK	09/22/17 21:16	2.21	100	CI71936
Beryllium	<b>0.42</b> (0.11)		6010C		1	KJK	09/23/17 19:25	2.21	100	CI71936
Cadmium	ND (0.49)		6010C		1	KJK	09/22/17 21:16	2.21	100	CI71936
Chromium	<b>7.23</b> (0.99)		6010C		1	KJK	09/22/17 21:16	2.21	100	CI71936
Copper	<b>101</b> (2.47)		6010C		1	KJK	09/22/17 21:16	2.21	100	CI71936
Lead	<b>87.5</b> (4.94)		6010C		1	KJK	09/22/17 21:16	2.21	100	CI71936
Mercury	<b>0.139</b> (0.035)		7471B		1	MJV	09/22/17 20:47	0.62	40	CI71940
Nickel	<b>7.40</b> (2.47)		6010C		1	KJK	09/22/17 21:16	2.21	100	CI71936
Selenium	ND (1.98)		6020A		20	NAR	09/21/17 23:41	2.21	100	CI71936
Silver	ND (0.49)		6010C		1	KJK	09/22/17 21:16	2.21	100	CI71936
Thallium	ND (1.98)		6020A		20	NAR	09/21/17 23:41	2.21	100	CI71936
Zinc	<b>92.3</b> (2.47)		6010C		1	KJK	09/22/17 21:16	2.21	100	CI71936





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-501 (3.5-4')  
Date Sampled: 09/14/17 11:30  
Percent Solids: 92  
Initial Volume: 4.6  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1709470  
ESS Laboratory Sample ID: 1709470-02  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0059)		8260B Low		1	09/19/17 18:04	C7I0305	CI71948
1,1,1-Trichloroethane	ND (0.0059)		8260B Low		1	09/19/17 18:04	C7I0305	CI71948
1,1,2,2-Tetrachloroethane	ND (0.0059)		8260B Low		1	09/19/17 18:04	C7I0305	CI71948
1,1,2-Trichloroethane	ND (0.0059)		8260B Low		1	09/19/17 18:04	C7I0305	CI71948
1,1-Dichloroethane	ND (0.0059)		8260B Low		1	09/19/17 18:04	C7I0305	CI71948
1,1-Dichloroethene	ND (0.0059)		8260B Low		1	09/19/17 18:04	C7I0305	CI71948
1,1-Dichloropropene	ND (0.0059)		8260B Low		1	09/19/17 18:04	C7I0305	CI71948
1,2,3-Trichlorobenzene	ND (0.0059)		8260B Low		1	09/19/17 18:04	C7I0305	CI71948
1,2,3-Trichloropropane	ND (0.0059)		8260B Low		1	09/19/17 18:04	C7I0305	CI71948
1,2,4-Trichlorobenzene	ND (0.0059)		8260B Low		1	09/19/17 18:04	C7I0305	CI71948
1,2,4-Trimethylbenzene	ND (0.0059)		8260B Low		1	09/19/17 18:04	C7I0305	CI71948
1,2-Dibromo-3-Chloropropane	ND (0.0059)		8260B Low		1	09/19/17 18:04	C7I0305	CI71948
1,2-Dibromoethane	ND (0.0059)		8260B Low		1	09/19/17 18:04	C7I0305	CI71948
1,2-Dichlorobenzene	ND (0.0059)		8260B Low		1	09/19/17 18:04	C7I0305	CI71948
1,2-Dichloroethane	ND (0.0059)		8260B Low		1	09/19/17 18:04	C7I0305	CI71948
1,2-Dichloropropane	ND (0.0059)		8260B Low		1	09/19/17 18:04	C7I0305	CI71948
1,3,5-Trimethylbenzene	ND (0.0059)		8260B Low		1	09/19/17 18:04	C7I0305	CI71948
1,3-Dichlorobenzene	ND (0.0059)		8260B Low		1	09/19/17 18:04	C7I0305	CI71948
1,3-Dichloropropane	ND (0.0059)		8260B Low		1	09/19/17 18:04	C7I0305	CI71948
1,4-Dichlorobenzene	ND (0.0059)		8260B Low		1	09/19/17 18:04	C7I0305	CI71948
1,4-Dioxane	ND (0.119)		8260B Low		1	09/19/17 18:04	C7I0305	CI71948
1-Chlorohexane	ND (0.0059)		8260B Low		1	09/19/17 18:04	C7I0305	CI71948
2,2-Dichloropropane	ND (0.0059)		8260B Low		1	09/19/17 18:04	C7I0305	CI71948
2-Butanone	ND (0.0594)		8260B Low		1	09/19/17 18:04	C7I0305	CI71948
2-Chlorotoluene	ND (0.0059)		8260B Low		1	09/19/17 18:04	C7I0305	CI71948
2-Hexanone	ND (0.0594)		8260B Low		1	09/19/17 18:04	C7I0305	CI71948
4-Chlorotoluene	ND (0.0059)		8260B Low		1	09/19/17 18:04	C7I0305	CI71948
4-Isopropyltoluene	ND (0.0059)		8260B Low		1	09/19/17 18:04	C7I0305	CI71948
4-Methyl-2-Pentanone	ND (0.0594)		8260B Low		1	09/19/17 18:04	C7I0305	CI71948
Acetone	ND (0.0594)		8260B Low		1	09/19/17 18:04	C7I0305	CI71948
Benzene	ND (0.0059)		8260B Low		1	09/19/17 18:04	C7I0305	CI71948
Bromobenzene	ND (0.0059)		8260B Low		1	09/19/17 18:04	C7I0305	CI71948



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-501 (3.5-4')  
 Date Sampled: 09/14/17 11:30  
 Percent Solids: 92  
 Initial Volume: 4.6  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709470  
 ESS Laboratory Sample ID: 1709470-02  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0059)		8260B Low		1	09/19/17 18:04	C7I0305	CI71948
Bromodichloromethane	ND (0.0059)		8260B Low		1	09/19/17 18:04	C7I0305	CI71948
Bromoform	ND (0.0059)		8260B Low		1	09/19/17 18:04	C7I0305	CI71948
Bromomethane	ND (0.0119)		8260B Low		1	09/19/17 18:04	C7I0305	CI71948
Carbon Disulfide	ND (0.0059)		8260B Low		1	09/19/17 18:04	C7I0305	CI71948
Carbon Tetrachloride	ND (0.0059)		8260B Low		1	09/19/17 18:04	C7I0305	CI71948
Chlorobenzene	ND (0.0059)		8260B Low		1	09/19/17 18:04	C7I0305	CI71948
Chloroethane	ND (0.0119)		8260B Low		1	09/19/17 18:04	C7I0305	CI71948
Chloroform	ND (0.0059)		8260B Low		1	09/19/17 18:04	C7I0305	CI71948
Chloromethane	ND (0.0119)		8260B Low		1	09/19/17 18:04	C7I0305	CI71948
cis-1,2-Dichloroethene	ND (0.0059)		8260B Low		1	09/19/17 18:04	C7I0305	CI71948
cis-1,3-Dichloropropene	ND (0.0059)		8260B Low		1	09/19/17 18:04	C7I0305	CI71948
Dibromochloromethane	ND (0.0059)		8260B Low		1	09/19/17 18:04	C7I0305	CI71948
Dibromomethane	ND (0.0059)		8260B Low		1	09/19/17 18:04	C7I0305	CI71948
Dichlorodifluoromethane	ND (0.0119)		8260B Low		1	09/19/17 18:04	C7I0305	CI71948
Diethyl Ether	ND (0.0059)		8260B Low		1	09/19/17 18:04	C7I0305	CI71948
Di-isopropyl ether	ND (0.0059)		8260B Low		1	09/19/17 18:04	C7I0305	CI71948
Ethyl tertiary-butyl ether	ND (0.0059)		8260B Low		1	09/19/17 18:04	C7I0305	CI71948
Ethylbenzene	ND (0.0059)		8260B Low		1	09/19/17 18:04	C7I0305	CI71948
Hexachlorobutadiene	ND (0.0059)		8260B Low		1	09/19/17 18:04	C7I0305	CI71948
Isopropylbenzene	ND (0.0059)		8260B Low		1	09/19/17 18:04	C7I0305	CI71948
Methyl tert-Butyl Ether	ND (0.0059)		8260B Low		1	09/19/17 18:04	C7I0305	CI71948
Methylene Chloride	ND (0.0297)		8260B Low		1	09/19/17 18:04	C7I0305	CI71948
Naphthalene	ND (0.0059)		8260B Low		1	09/19/17 18:04	C7I0305	CI71948
n-Butylbenzene	ND (0.0059)		8260B Low		1	09/19/17 18:04	C7I0305	CI71948
n-Propylbenzene	ND (0.0059)		8260B Low		1	09/19/17 18:04	C7I0305	CI71948
sec-Butylbenzene	ND (0.0059)		8260B Low		1	09/19/17 18:04	C7I0305	CI71948
Styrene	ND (0.0059)		8260B Low		1	09/19/17 18:04	C7I0305	CI71948
tert-Butylbenzene	ND (0.0059)		8260B Low		1	09/19/17 18:04	C7I0305	CI71948
Tertiary-amyl methyl ether	ND (0.0059)		8260B Low		1	09/19/17 18:04	C7I0305	CI71948
Tetrachloroethene	ND (0.0059)		8260B Low		1	09/19/17 18:04	C7I0305	CI71948
Tetrahydrofuran	ND (0.0059)		8260B Low		1	09/19/17 18:04	C7I0305	CI71948



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-501 (3.5-4')  
 Date Sampled: 09/14/17 11:30  
 Percent Solids: 92  
 Initial Volume: 4.6  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709470  
 ESS Laboratory Sample ID: 1709470-02  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0059)		8260B Low		1	09/19/17 18:04	C7I0305	CI71948
trans-1,2-Dichloroethene	ND (0.0059)		8260B Low		1	09/19/17 18:04	C7I0305	CI71948
trans-1,3-Dichloropropene	ND (0.0059)		8260B Low		1	09/19/17 18:04	C7I0305	CI71948
Trichloroethene	ND (0.0059)		8260B Low		1	09/19/17 18:04	C7I0305	CI71948
Trichlorofluoromethane	ND (0.0059)		8260B Low		1	09/19/17 18:04	C7I0305	CI71948
Vinyl Acetate	ND (0.0059)		8260B Low		1	09/19/17 18:04	C7I0305	CI71948
Vinyl Chloride	ND (0.0119)		8260B Low		1	09/19/17 18:04	C7I0305	CI71948
Xylene O	ND (0.0059)		8260B Low		1	09/19/17 18:04	C7I0305	CI71948
Xylene P,M	ND (0.0119)		8260B Low		1	09/19/17 18:04	C7I0305	CI71948
Xylenes (Total)	ND (0.0119)		8260B Low		1	09/19/17 18:04		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	92 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	104 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	96 %		70-130
<i>Surrogate: Toluene-d8</i>	100 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-501 (3.5-4')  
 Date Sampled: 09/14/17 11:30  
 Percent Solids: 92  
 Initial Volume: 19  
 Final Volume: 1  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709470  
 ESS Laboratory Sample ID: 1709470-02  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: SMR  
 Prepared: 9/18/17 11:00

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	121 (43.1)		8100M		1	09/19/17 15:23	C710275	C171820

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	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: O-Terphenyl</i>	77 %		40-140





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-501 (3.5-4')  
 Date Sampled: 09/14/17 11:30  
 Percent Solids: 92  
 Initial Volume: 14.9  
 Final Volume: 0.5  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709470  
 ESS Laboratory Sample ID: 1709470-02  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: TJ  
 Prepared: 9/18/17 11:30

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.366)		8270D		1	09/19/17 0:33	C7I0262	CI71818
Acenaphthene	ND (0.366)		8270D		1	09/19/17 0:33	C7I0262	CI71818
Acenaphthylene	<b>0.462</b> (0.366)		8270D		1	09/19/17 0:33	C7I0262	CI71818
Anthracene	<b>0.501</b> (0.366)		8270D		1	09/19/17 0:33	C7I0262	CI71818
Benzo(a)anthracene	<b>0.879</b> (0.366)		8270D		1	09/19/17 0:33	C7I0262	CI71818
Benzo(a)pyrene	<b>0.718</b> (0.184)		8270D		1	09/19/17 0:33	C7I0262	CI71818
Benzo(b)fluoranthene	<b>0.923</b> (0.366)		8270D		1	09/19/17 0:33	C7I0262	CI71818
Benzo(g,h,i)perylene	<b>0.442</b> (0.366)		8270D		1	09/19/17 0:33	C7I0262	CI71818
Benzo(k)fluoranthene	ND (0.366)		8270D		1	09/19/17 0:33	C7I0262	CI71818
Chrysene	<b>0.754</b> (0.184)		8270D		1	09/19/17 0:33	C7I0262	CI71818
Dibenzo(a,h)Anthracene	<b>0.185</b> (0.184)		8270D		1	09/19/17 0:33	C7I0262	CI71818
Fluoranthene	<b>1.94</b> (0.366)		8270D		1	09/19/17 0:33	C7I0262	CI71818
Fluorene	ND (0.366)		8270D		1	09/19/17 0:33	C7I0262	CI71818
Indeno(1,2,3-cd)Pyrene	<b>0.414</b> (0.366)		8270D		1	09/19/17 0:33	C7I0262	CI71818
Naphthalene	<b>0.653</b> (0.366)		8270D		1	09/19/17 0:33	C7I0262	CI71818
Phenanthrene	<b>1.93</b> (0.366)		8270D		1	09/19/17 0:33	C7I0262	CI71818
Pyrene	<b>1.92</b> (0.366)		8270D		1	09/19/17 0:33	C7I0262	CI71818

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	54 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	59 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	55 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	81 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-501 (3.5-4')  
Date Sampled: 09/14/17 11:30  
Percent Solids: 92

ESS Laboratory Work Order: 1709470  
ESS Laboratory Sample ID: 1709470-02  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	ND (1.07)		9014		1	EEM	09/21/17 12:25	mg/kg dry	CI72119



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-502 (0-1')  
Date Sampled: 09/14/17 14:05  
Percent Solids: 68

ESS Laboratory Work Order: 1709470  
ESS Laboratory Sample ID: 1709470-03  
Sample Matrix: Soil  
Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (2.94)		6020A		20	NAR	09/21/17 23:46	2	100	CI71936
<b>Arsenic</b>	<b>12.5</b> (3.67)		6010C		1	KJK	09/22/17 21:32	2	100	CI71936
<b>Beryllium</b>	<b>0.71</b> (0.16)		6010C		1	KJK	09/23/17 19:29	2	100	CI71936
Cadmium	ND (0.73)		6010C		1	KJK	09/22/17 21:32	2	100	CI71936
<b>Chromium</b>	<b>3.86</b> (1.47)		6010C		1	KJK	09/22/17 21:32	2	100	CI71936
<b>Copper</b>	<b>22.5</b> (3.67)		6010C		1	KJK	09/22/17 21:32	2	100	CI71936
<b>Lead</b>	<b>26.3</b> (7.35)		6010C		1	KJK	09/22/17 21:32	2	100	CI71936
<b>Mercury</b>	<b>0.060</b> (0.042)		7471B		1	MJV	09/22/17 20:49	0.69	40	CI71940
<b>Nickel</b>	<b>6.10</b> (3.67)		6010C		1	KJK	09/22/17 21:32	2	100	CI71936
Selenium	ND (2.94)		6020A		20	NAR	09/21/17 23:46	2	100	CI71936
Silver	ND (0.73)		6010C		1	KJK	09/22/17 21:32	2	100	CI71936
Thallium	ND (2.94)		6020A		20	NAR	09/21/17 23:46	2	100	CI71936
<b>Zinc</b>	<b>10.5</b> (3.67)		6010C		1	KJK	09/22/17 21:32	2	100	CI71936



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-502 (0-1')  
Date Sampled: 09/14/17 14:05  
Percent Solids: 68  
Initial Volume: 5.1  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1709470  
ESS Laboratory Sample ID: 1709470-03  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0072)		8260B Low		1	09/19/17 18:30	C7I0305	CI71948
1,1,1-Trichloroethane	ND (0.0072)		8260B Low		1	09/19/17 18:30	C7I0305	CI71948
1,1,2,2-Tetrachloroethane	ND (0.0072)		8260B Low		1	09/19/17 18:30	C7I0305	CI71948
1,1,2-Trichloroethane	ND (0.0072)		8260B Low		1	09/19/17 18:30	C7I0305	CI71948
1,1-Dichloroethane	ND (0.0072)		8260B Low		1	09/19/17 18:30	C7I0305	CI71948
1,1-Dichloroethene	ND (0.0072)		8260B Low		1	09/19/17 18:30	C7I0305	CI71948
1,1-Dichloropropene	ND (0.0072)		8260B Low		1	09/19/17 18:30	C7I0305	CI71948
1,2,3-Trichlorobenzene	ND (0.0072)		8260B Low		1	09/19/17 18:30	C7I0305	CI71948
1,2,3-Trichloropropane	ND (0.0072)		8260B Low		1	09/19/17 18:30	C7I0305	CI71948
1,2,4-Trichlorobenzene	ND (0.0072)		8260B Low		1	09/19/17 18:30	C7I0305	CI71948
1,2,4-Trimethylbenzene	ND (0.0072)		8260B Low		1	09/19/17 18:30	C7I0305	CI71948
1,2-Dibromo-3-Chloropropane	ND (0.0072)		8260B Low		1	09/19/17 18:30	C7I0305	CI71948
1,2-Dibromoethane	ND (0.0072)		8260B Low		1	09/19/17 18:30	C7I0305	CI71948
1,2-Dichlorobenzene	ND (0.0072)		8260B Low		1	09/19/17 18:30	C7I0305	CI71948
1,2-Dichloroethane	ND (0.0072)		8260B Low		1	09/19/17 18:30	C7I0305	CI71948
1,2-Dichloropropane	ND (0.0072)		8260B Low		1	09/19/17 18:30	C7I0305	CI71948
1,3,5-Trimethylbenzene	ND (0.0072)		8260B Low		1	09/19/17 18:30	C7I0305	CI71948
1,3-Dichlorobenzene	ND (0.0072)		8260B Low		1	09/19/17 18:30	C7I0305	CI71948
1,3-Dichloropropane	ND (0.0072)		8260B Low		1	09/19/17 18:30	C7I0305	CI71948
1,4-Dichlorobenzene	ND (0.0072)		8260B Low		1	09/19/17 18:30	C7I0305	CI71948
1,4-Dioxane	ND (0.144)		8260B Low		1	09/19/17 18:30	C7I0305	CI71948
1-Chlorohexane	ND (0.0072)		8260B Low		1	09/19/17 18:30	C7I0305	CI71948
2,2-Dichloropropane	ND (0.0072)		8260B Low		1	09/19/17 18:30	C7I0305	CI71948
2-Butanone	ND (0.0720)		8260B Low		1	09/19/17 18:30	C7I0305	CI71948
2-Chlorotoluene	ND (0.0072)		8260B Low		1	09/19/17 18:30	C7I0305	CI71948
2-Hexanone	ND (0.0720)		8260B Low		1	09/19/17 18:30	C7I0305	CI71948
4-Chlorotoluene	ND (0.0072)		8260B Low		1	09/19/17 18:30	C7I0305	CI71948
4-Isopropyltoluene	ND (0.0072)		8260B Low		1	09/19/17 18:30	C7I0305	CI71948
4-Methyl-2-Pentanone	ND (0.0720)		8260B Low		1	09/19/17 18:30	C7I0305	CI71948
Acetone	ND (0.0720)		8260B Low		1	09/19/17 18:30	C7I0305	CI71948
Benzene	ND (0.0072)		8260B Low		1	09/19/17 18:30	C7I0305	CI71948
Bromobenzene	ND (0.0072)		8260B Low		1	09/19/17 18:30	C7I0305	CI71948





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-502 (0-1')  
 Date Sampled: 09/14/17 14:05  
 Percent Solids: 68  
 Initial Volume: 5.1  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709470  
 ESS Laboratory Sample ID: 1709470-03  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0072)		8260B Low		1	09/19/17 18:30	C7I0305	CI71948
Bromodichloromethane	ND (0.0072)		8260B Low		1	09/19/17 18:30	C7I0305	CI71948
Bromoform	ND (0.0072)		8260B Low		1	09/19/17 18:30	C7I0305	CI71948
Bromomethane	ND (0.0144)		8260B Low		1	09/19/17 18:30	C7I0305	CI71948
Carbon Disulfide	ND (0.0072)		8260B Low		1	09/19/17 18:30	C7I0305	CI71948
Carbon Tetrachloride	ND (0.0072)		8260B Low		1	09/19/17 18:30	C7I0305	CI71948
Chlorobenzene	ND (0.0072)		8260B Low		1	09/19/17 18:30	C7I0305	CI71948
Chloroethane	ND (0.0144)		8260B Low		1	09/19/17 18:30	C7I0305	CI71948
Chloroform	ND (0.0072)		8260B Low		1	09/19/17 18:30	C7I0305	CI71948
Chloromethane	ND (0.0144)		8260B Low		1	09/19/17 18:30	C7I0305	CI71948
cis-1,2-Dichloroethene	ND (0.0072)		8260B Low		1	09/19/17 18:30	C7I0305	CI71948
cis-1,3-Dichloropropene	ND (0.0072)		8260B Low		1	09/19/17 18:30	C7I0305	CI71948
Dibromochloromethane	ND (0.0072)		8260B Low		1	09/19/17 18:30	C7I0305	CI71948
Dibromomethane	ND (0.0072)		8260B Low		1	09/19/17 18:30	C7I0305	CI71948
Dichlorodifluoromethane	ND (0.0144)		8260B Low		1	09/19/17 18:30	C7I0305	CI71948
Diethyl Ether	ND (0.0072)		8260B Low		1	09/19/17 18:30	C7I0305	CI71948
Di-isopropyl ether	ND (0.0072)		8260B Low		1	09/19/17 18:30	C7I0305	CI71948
Ethyl tertiary-butyl ether	ND (0.0072)		8260B Low		1	09/19/17 18:30	C7I0305	CI71948
Ethylbenzene	ND (0.0072)		8260B Low		1	09/19/17 18:30	C7I0305	CI71948
Hexachlorobutadiene	ND (0.0072)		8260B Low		1	09/19/17 18:30	C7I0305	CI71948
Isopropylbenzene	ND (0.0072)		8260B Low		1	09/19/17 18:30	C7I0305	CI71948
Methyl tert-Butyl Ether	ND (0.0072)		8260B Low		1	09/19/17 18:30	C7I0305	CI71948
Methylene Chloride	ND (0.0360)		8260B Low		1	09/19/17 18:30	C7I0305	CI71948
Naphthalene	ND (0.0072)		8260B Low		1	09/19/17 18:30	C7I0305	CI71948
n-Butylbenzene	ND (0.0072)		8260B Low		1	09/19/17 18:30	C7I0305	CI71948
n-Propylbenzene	ND (0.0072)		8260B Low		1	09/19/17 18:30	C7I0305	CI71948
sec-Butylbenzene	ND (0.0072)		8260B Low		1	09/19/17 18:30	C7I0305	CI71948
Styrene	ND (0.0072)		8260B Low		1	09/19/17 18:30	C7I0305	CI71948
tert-Butylbenzene	ND (0.0072)		8260B Low		1	09/19/17 18:30	C7I0305	CI71948
Tertiary-amyl methyl ether	ND (0.0072)		8260B Low		1	09/19/17 18:30	C7I0305	CI71948
Tetrachloroethene	ND (0.0072)		8260B Low		1	09/19/17 18:30	C7I0305	CI71948
Tetrahydrofuran	ND (0.0072)		8260B Low		1	09/19/17 18:30	C7I0305	CI71948



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-502 (0-1')  
 Date Sampled: 09/14/17 14:05  
 Percent Solids: 68  
 Initial Volume: 5.1  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709470  
 ESS Laboratory Sample ID: 1709470-03  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0072)		8260B Low		1	09/19/17 18:30	C7I0305	CI71948
trans-1,2-Dichloroethene	ND (0.0072)		8260B Low		1	09/19/17 18:30	C7I0305	CI71948
trans-1,3-Dichloropropene	ND (0.0072)		8260B Low		1	09/19/17 18:30	C7I0305	CI71948
Trichloroethene	ND (0.0072)		8260B Low		1	09/19/17 18:30	C7I0305	CI71948
Trichlorofluoromethane	ND (0.0072)		8260B Low		1	09/19/17 18:30	C7I0305	CI71948
Vinyl Acetate	ND (0.0072)		8260B Low		1	09/19/17 18:30	C7I0305	CI71948
Vinyl Chloride	ND (0.0144)		8260B Low		1	09/19/17 18:30	C7I0305	CI71948
Xylene O	ND (0.0072)		8260B Low		1	09/19/17 18:30	C7I0305	CI71948
Xylene P,M	ND (0.0144)		8260B Low		1	09/19/17 18:30	C7I0305	CI71948
Xylenes (Total)	ND (0.0144)		8260B Low		1	09/19/17 18:30		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	93 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	85 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	97 %		70-130
<i>Surrogate: Toluene-d8</i>	118 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-502 (0-1')  
Date Sampled: 09/14/17 14:05  
Percent Solids: 68  
Initial Volume: 20.3  
Final Volume: 1  
Extraction Method: 3546

ESS Laboratory Work Order: 1709470  
ESS Laboratory Sample ID: 1709470-03  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: SMR  
Prepared: 9/18/17 11:00

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	186 (54.3)		8100M		1	09/19/17 15:59	C710275	C171820

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	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: O-Terphenyl</i>	77 %		40-140



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-502 (0-1')  
 Date Sampled: 09/14/17 14:05  
 Percent Solids: 68  
 Initial Volume: 14.4  
 Final Volume: 0.5  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709470  
 ESS Laboratory Sample ID: 1709470-03  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: TJ  
 Prepared: 9/18/17 11:30

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.510)		8270D		1	09/19/17 1:08	C7I0262	CI71818
Acenaphthene	ND (0.510)		8270D		1	09/19/17 1:08	C7I0262	CI71818
Acenaphthylene	ND (0.510)		8270D		1	09/19/17 1:08	C7I0262	CI71818
Anthracene	ND (0.510)		8270D		1	09/19/17 1:08	C7I0262	CI71818
Benzo(a)anthracene	ND (0.510)		8270D		1	09/19/17 1:08	C7I0262	CI71818
Benzo(a)pyrene	ND (0.256)		8270D		1	09/19/17 1:08	C7I0262	CI71818
Benzo(b)fluoranthene	ND (0.510)		8270D		1	09/19/17 1:08	C7I0262	CI71818
Benzo(g,h,i)perylene	ND (0.510)		8270D		1	09/19/17 1:08	C7I0262	CI71818
Benzo(k)fluoranthene	ND (0.510)		8270D		1	09/19/17 1:08	C7I0262	CI71818
Chrysene	ND (0.256)		8270D		1	09/19/17 1:08	C7I0262	CI71818
Dibenzo(a,h)Anthracene	ND (0.256)		8270D		1	09/19/17 1:08	C7I0262	CI71818
Fluoranthene	ND (0.510)		8270D		1	09/19/17 1:08	C7I0262	CI71818
Fluorene	ND (0.510)		8270D		1	09/19/17 1:08	C7I0262	CI71818
Indeno(1,2,3-cd)Pyrene	ND (0.510)		8270D		1	09/19/17 1:08	C7I0262	CI71818
Naphthalene	ND (0.510)		8270D		1	09/19/17 1:08	C7I0262	CI71818
Phenanthrene	ND (0.510)		8270D		1	09/19/17 1:08	C7I0262	CI71818
Pyrene	ND (0.510)		8270D		1	09/19/17 1:08	C7I0262	CI71818

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: 1,2-Dichlorobenzene-d4	69 %		30-130
Surrogate: 2-Fluorobiphenyl	72 %		30-130
Surrogate: Nitrobenzene-d5	69 %		30-130
Surrogate: p-Terphenyl-d14	84 %		30-130





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-502 (0-1')  
Date Sampled: 09/14/17 14:05  
Percent Solids: 68

ESS Laboratory Work Order: 1709470  
ESS Laboratory Sample ID: 1709470-03  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	1.44 (1.43)		9014		1	EEM	09/21/17 12:25	mg/kg dry	CI72119



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-502 (4-5')  
 Date Sampled: 09/14/17 14:17  
 Percent Solids: 96

ESS Laboratory Work Order: 1709470  
 ESS Laboratory Sample ID: 1709470-04  
 Sample Matrix: Soil  
 Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (1.87)		6020A		20	NAR	09/21/17 23:51	2.22	100	CI71936
Arsenic	<b>4.89</b> (2.34)		6010C		1	KJK	09/22/17 21:36	2.22	100	CI71936
Beryllium	<b>0.51</b> (0.10)		6010C		1	KJK	09/23/17 19:33	2.22	100	CI71936
Cadmium	ND (0.47)		6010C		1	KJK	09/22/17 21:36	2.22	100	CI71936
Chromium	<b>6.08</b> (0.93)		6010C		1	KJK	09/22/17 21:36	2.22	100	CI71936
Copper	<b>29.4</b> (2.34)		6010C		1	KJK	09/22/17 21:36	2.22	100	CI71936
Lead	<b>36.3</b> (4.67)		6010C		1	KJK	09/22/17 21:36	2.22	100	CI71936
Mercury	<b>0.143</b> (0.034)		7471B		1	MJV	09/22/17 20:51	0.61	40	CI71940
Nickel	<b>8.40</b> (2.34)		6010C		1	KJK	09/22/17 21:36	2.22	100	CI71936
Selenium	ND (1.87)		6020A		20	NAR	09/21/17 23:51	2.22	100	CI71936
Silver	ND (0.47)		6010C		1	KJK	09/22/17 21:36	2.22	100	CI71936
Thallium	ND (1.87)		6020A		20	NAR	09/21/17 23:51	2.22	100	CI71936
Zinc	<b>13.3</b> (2.34)		6010C		1	KJK	09/22/17 21:36	2.22	100	CI71936



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-502 (4-5')  
 Date Sampled: 09/14/17 14:17  
 Percent Solids: 96  
 Initial Volume: 5  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709470  
 ESS Laboratory Sample ID: 1709470-04  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0052)		8260B Low		1	09/19/17 18:55	C7I0305	CI71948
1,1,1-Trichloroethane	ND (0.0052)		8260B Low		1	09/19/17 18:55	C7I0305	CI71948
1,1,2,2-Tetrachloroethane	ND (0.0052)		8260B Low		1	09/19/17 18:55	C7I0305	CI71948
1,1,2-Trichloroethane	ND (0.0052)		8260B Low		1	09/19/17 18:55	C7I0305	CI71948
1,1-Dichloroethane	ND (0.0052)		8260B Low		1	09/19/17 18:55	C7I0305	CI71948
1,1-Dichloroethene	ND (0.0052)		8260B Low		1	09/19/17 18:55	C7I0305	CI71948
1,1-Dichloropropene	ND (0.0052)		8260B Low		1	09/19/17 18:55	C7I0305	CI71948
1,2,3-Trichlorobenzene	ND (0.0052)		8260B Low		1	09/19/17 18:55	C7I0305	CI71948
1,2,3-Trichloropropane	ND (0.0052)		8260B Low		1	09/19/17 18:55	C7I0305	CI71948
1,2,4-Trichlorobenzene	ND (0.0052)		8260B Low		1	09/19/17 18:55	C7I0305	CI71948
1,2,4-Trimethylbenzene	ND (0.0052)		8260B Low		1	09/19/17 18:55	C7I0305	CI71948
1,2-Dibromo-3-Chloropropane	ND (0.0052)		8260B Low		1	09/19/17 18:55	C7I0305	CI71948
1,2-Dibromoethane	ND (0.0052)		8260B Low		1	09/19/17 18:55	C7I0305	CI71948
1,2-Dichlorobenzene	ND (0.0052)		8260B Low		1	09/19/17 18:55	C7I0305	CI71948
1,2-Dichloroethane	ND (0.0052)		8260B Low		1	09/19/17 18:55	C7I0305	CI71948
1,2-Dichloropropane	ND (0.0052)		8260B Low		1	09/19/17 18:55	C7I0305	CI71948
1,3,5-Trimethylbenzene	ND (0.0052)		8260B Low		1	09/19/17 18:55	C7I0305	CI71948
1,3-Dichlorobenzene	ND (0.0052)		8260B Low		1	09/19/17 18:55	C7I0305	CI71948
1,3-Dichloropropane	ND (0.0052)		8260B Low		1	09/19/17 18:55	C7I0305	CI71948
1,4-Dichlorobenzene	ND (0.0052)		8260B Low		1	09/19/17 18:55	C7I0305	CI71948
1,4-Dioxane	ND (0.104)		8260B Low		1	09/19/17 18:55	C7I0305	CI71948
1-Chlorohexane	ND (0.0052)		8260B Low		1	09/19/17 18:55	C7I0305	CI71948
2,2-Dichloropropane	ND (0.0052)		8260B Low		1	09/19/17 18:55	C7I0305	CI71948
2-Butanone	ND (0.0519)		8260B Low		1	09/19/17 18:55	C7I0305	CI71948
2-Chlorotoluene	ND (0.0052)		8260B Low		1	09/19/17 18:55	C7I0305	CI71948
2-Hexanone	ND (0.0519)		8260B Low		1	09/19/17 18:55	C7I0305	CI71948
4-Chlorotoluene	ND (0.0052)		8260B Low		1	09/19/17 18:55	C7I0305	CI71948
4-Isopropyltoluene	ND (0.0052)		8260B Low		1	09/19/17 18:55	C7I0305	CI71948
4-Methyl-2-Pentanone	ND (0.0519)		8260B Low		1	09/19/17 18:55	C7I0305	CI71948
Acetone	ND (0.0519)		8260B Low		1	09/19/17 18:55	C7I0305	CI71948
Benzene	ND (0.0052)		8260B Low		1	09/19/17 18:55	C7I0305	CI71948
Bromobenzene	ND (0.0052)		8260B Low		1	09/19/17 18:55	C7I0305	CI71948



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-502 (4-5')  
 Date Sampled: 09/14/17 14:17  
 Percent Solids: 96  
 Initial Volume: 5  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709470  
 ESS Laboratory Sample ID: 1709470-04  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0052)		8260B Low		1	09/19/17 18:55	C7I0305	CI71948
Bromodichloromethane	ND (0.0052)		8260B Low		1	09/19/17 18:55	C7I0305	CI71948
Bromoform	ND (0.0052)		8260B Low		1	09/19/17 18:55	C7I0305	CI71948
Bromomethane	ND (0.0104)		8260B Low		1	09/19/17 18:55	C7I0305	CI71948
Carbon Disulfide	ND (0.0052)		8260B Low		1	09/19/17 18:55	C7I0305	CI71948
Carbon Tetrachloride	ND (0.0052)		8260B Low		1	09/19/17 18:55	C7I0305	CI71948
Chlorobenzene	ND (0.0052)		8260B Low		1	09/19/17 18:55	C7I0305	CI71948
Chloroethane	ND (0.0104)		8260B Low		1	09/19/17 18:55	C7I0305	CI71948
Chloroform	ND (0.0052)		8260B Low		1	09/19/17 18:55	C7I0305	CI71948
Chloromethane	ND (0.0104)		8260B Low		1	09/19/17 18:55	C7I0305	CI71948
cis-1,2-Dichloroethene	ND (0.0052)		8260B Low		1	09/19/17 18:55	C7I0305	CI71948
cis-1,3-Dichloropropene	ND (0.0052)		8260B Low		1	09/19/17 18:55	C7I0305	CI71948
Dibromochloromethane	ND (0.0052)		8260B Low		1	09/19/17 18:55	C7I0305	CI71948
Dibromomethane	ND (0.0052)		8260B Low		1	09/19/17 18:55	C7I0305	CI71948
Dichlorodifluoromethane	ND (0.0104)		8260B Low		1	09/19/17 18:55	C7I0305	CI71948
Diethyl Ether	ND (0.0052)		8260B Low		1	09/19/17 18:55	C7I0305	CI71948
Di-isopropyl ether	ND (0.0052)		8260B Low		1	09/19/17 18:55	C7I0305	CI71948
Ethyl tertiary-butyl ether	ND (0.0052)		8260B Low		1	09/19/17 18:55	C7I0305	CI71948
Ethylbenzene	ND (0.0052)		8260B Low		1	09/19/17 18:55	C7I0305	CI71948
Hexachlorobutadiene	ND (0.0052)		8260B Low		1	09/19/17 18:55	C7I0305	CI71948
Isopropylbenzene	ND (0.0052)		8260B Low		1	09/19/17 18:55	C7I0305	CI71948
Methyl tert-Butyl Ether	ND (0.0052)		8260B Low		1	09/19/17 18:55	C7I0305	CI71948
Methylene Chloride	ND (0.0259)		8260B Low		1	09/19/17 18:55	C7I0305	CI71948
Naphthalene	ND (0.0052)		8260B Low		1	09/19/17 18:55	C7I0305	CI71948
n-Butylbenzene	ND (0.0052)		8260B Low		1	09/19/17 18:55	C7I0305	CI71948
n-Propylbenzene	ND (0.0052)		8260B Low		1	09/19/17 18:55	C7I0305	CI71948
sec-Butylbenzene	ND (0.0052)		8260B Low		1	09/19/17 18:55	C7I0305	CI71948
Styrene	ND (0.0052)		8260B Low		1	09/19/17 18:55	C7I0305	CI71948
tert-Butylbenzene	ND (0.0052)		8260B Low		1	09/19/17 18:55	C7I0305	CI71948
Tertiary-amyl methyl ether	ND (0.0052)		8260B Low		1	09/19/17 18:55	C7I0305	CI71948
Tetrachloroethene	ND (0.0052)		8260B Low		1	09/19/17 18:55	C7I0305	CI71948
Tetrahydrofuran	ND (0.0052)		8260B Low		1	09/19/17 18:55	C7I0305	CI71948





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-502 (4-5')  
 Date Sampled: 09/14/17 14:17  
 Percent Solids: 96  
 Initial Volume: 5  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709470  
 ESS Laboratory Sample ID: 1709470-04  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0052)		8260B Low		1	09/19/17 18:55	C7I0305	CI71948
trans-1,2-Dichloroethene	ND (0.0052)		8260B Low		1	09/19/17 18:55	C7I0305	CI71948
trans-1,3-Dichloropropene	ND (0.0052)		8260B Low		1	09/19/17 18:55	C7I0305	CI71948
Trichloroethene	ND (0.0052)		8260B Low		1	09/19/17 18:55	C7I0305	CI71948
Trichlorofluoromethane	ND (0.0052)		8260B Low		1	09/19/17 18:55	C7I0305	CI71948
Vinyl Acetate	ND (0.0052)		8260B Low		1	09/19/17 18:55	C7I0305	CI71948
Vinyl Chloride	ND (0.0104)		8260B Low		1	09/19/17 18:55	C7I0305	CI71948
Xylene O	ND (0.0052)		8260B Low		1	09/19/17 18:55	C7I0305	CI71948
Xylene P,M	ND (0.0104)		8260B Low		1	09/19/17 18:55	C7I0305	CI71948
Xylenes (Total)	ND (0.0104)		8260B Low		1	09/19/17 18:55		[CALC]

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: 1,2-Dichloroethane-d4	96 %		70-130
Surrogate: 4-Bromofluorobenzene	104 %		70-130
Surrogate: Dibromofluoromethane	98 %		70-130
Surrogate: Toluene-d8	104 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-502 (4-5')  
 Date Sampled: 09/14/17 14:17  
 Percent Solids: 96  
 Initial Volume: 19.3  
 Final Volume: 1  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709470  
 ESS Laboratory Sample ID: 1709470-04  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: SMR  
 Prepared: 9/18/17 11:00

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	ND (40.3)		8100M		1	09/18/17 18:23	C710279	CI71820
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		76 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-502 (4-5')  
 Date Sampled: 09/14/17 14:17  
 Percent Solids: 96  
 Initial Volume: 14.2  
 Final Volume: 0.5  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709470  
 ESS Laboratory Sample ID: 1709470-04  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: TJ  
 Prepared: 9/18/17 11:30

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.365)		8270D		1	09/19/17 1:42	C7I0262	CI71818
Acenaphthene	ND (0.365)		8270D		1	09/19/17 1:42	C7I0262	CI71818
Acenaphthylene	ND (0.365)		8270D		1	09/19/17 1:42	C7I0262	CI71818
Anthracene	ND (0.365)		8270D		1	09/19/17 1:42	C7I0262	CI71818
Benzo(a)anthracene	ND (0.365)		8270D		1	09/19/17 1:42	C7I0262	CI71818
Benzo(a)pyrene	ND (0.183)		8270D		1	09/19/17 1:42	C7I0262	CI71818
Benzo(b)fluoranthene	ND (0.365)		8270D		1	09/19/17 1:42	C7I0262	CI71818
Benzo(g,h,i)perylene	ND (0.365)		8270D		1	09/19/17 1:42	C7I0262	CI71818
Benzo(k)fluoranthene	ND (0.365)		8270D		1	09/19/17 1:42	C7I0262	CI71818
Chrysene	ND (0.183)		8270D		1	09/19/17 1:42	C7I0262	CI71818
Dibenzo(a,h)Anthracene	ND (0.183)		8270D		1	09/19/17 1:42	C7I0262	CI71818
<b>Fluoranthene</b>	<b>0.367</b> (0.365)		8270D		1	09/19/17 1:42	C7I0262	CI71818
Fluorene	ND (0.365)		8270D		1	09/19/17 1:42	C7I0262	CI71818
Indeno(1,2,3-cd)Pyrene	ND (0.365)		8270D		1	09/19/17 1:42	C7I0262	CI71818
Naphthalene	ND (0.365)		8270D		1	09/19/17 1:42	C7I0262	CI71818
<b>Phenanthrene</b>	<b>0.397</b> (0.365)		8270D		1	09/19/17 1:42	C7I0262	CI71818
Pyrene	ND (0.365)		8270D		1	09/19/17 1:42	C7I0262	CI71818

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	54 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	52 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	51 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	60 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-502 (4-5')  
Date Sampled: 09/14/17 14:17  
Percent Solids: 96

ESS Laboratory Work Order: 1709470  
ESS Laboratory Sample ID: 1709470-04  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	ND (1.01)		9014		1	EEM	09/21/17 12:25	mg/kg dry	CI72119





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-503 (0-2')  
 Date Sampled: 09/15/17 08:00  
 Percent Solids: 94

ESS Laboratory Work Order: 1709470  
 ESS Laboratory Sample ID: 1709470-05  
 Sample Matrix: Soil  
 Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (1.73)		6020A		20	NAR	09/21/17 23:56	2.45	100	CI71936
Arsenic	<b>7.91</b> (2.16)		6010C		1	KJK	09/22/17 21:41	2.45	100	CI71936
Beryllium	<b>0.32</b> (0.10)		6010C		1	KJK	09/23/17 19:37	2.45	100	CI71936
Cadmium	ND (0.43)		6010C		1	KJK	09/22/17 21:41	2.45	100	CI71936
Chromium	<b>6.29</b> (0.87)		6010C		1	KJK	09/22/17 21:41	2.45	100	CI71936
Copper	<b>61.8</b> (2.16)		6010C		1	KJK	09/22/17 21:41	2.45	100	CI71936
Lead	<b>93.8</b> (4.33)		6010C		1	KJK	09/22/17 21:41	2.45	100	CI71936
Mercury	<b>0.118</b> (0.032)		7471B		1	MJV	09/22/17 20:57	0.65	40	CI71940
Nickel	<b>7.31</b> (2.16)		6010C		1	KJK	09/22/17 21:41	2.45	100	CI71936
Selenium	ND (1.73)		6020A		20	NAR	09/21/17 23:56	2.45	100	CI71936
Silver	ND (0.43)		6010C		1	KJK	09/22/17 21:41	2.45	100	CI71936
Thallium	ND (1.73)		6020A		20	NAR	09/21/17 23:56	2.45	100	CI71936
Zinc	<b>18.8</b> (2.16)		6010C		1	KJK	09/22/17 21:41	2.45	100	CI71936



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-503 (0-2')  
 Date Sampled: 09/15/17 08:00  
 Percent Solids: 94  
 Initial Volume: 5.1  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709470  
 ESS Laboratory Sample ID: 1709470-05  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0052)		8260B Low		1	09/19/17 19:20	C7I0305	CI71948
1,1,1-Trichloroethane	ND (0.0052)		8260B Low		1	09/19/17 19:20	C7I0305	CI71948
1,1,2,2-Tetrachloroethane	ND (0.0052)		8260B Low		1	09/19/17 19:20	C7I0305	CI71948
1,1,2-Trichloroethane	ND (0.0052)		8260B Low		1	09/19/17 19:20	C7I0305	CI71948
1,1-Dichloroethane	ND (0.0052)		8260B Low		1	09/19/17 19:20	C7I0305	CI71948
1,1-Dichloroethene	ND (0.0052)		8260B Low		1	09/19/17 19:20	C7I0305	CI71948
1,1-Dichloropropene	ND (0.0052)		8260B Low		1	09/19/17 19:20	C7I0305	CI71948
1,2,3-Trichlorobenzene	ND (0.0052)		8260B Low		1	09/19/17 19:20	C7I0305	CI71948
1,2,3-Trichloropropane	ND (0.0052)		8260B Low		1	09/19/17 19:20	C7I0305	CI71948
1,2,4-Trichlorobenzene	ND (0.0052)		8260B Low		1	09/19/17 19:20	C7I0305	CI71948
1,2,4-Trimethylbenzene	ND (0.0052)		8260B Low		1	09/19/17 19:20	C7I0305	CI71948
1,2-Dibromo-3-Chloropropane	ND (0.0052)		8260B Low		1	09/19/17 19:20	C7I0305	CI71948
1,2-Dibromoethane	ND (0.0052)		8260B Low		1	09/19/17 19:20	C7I0305	CI71948
1,2-Dichlorobenzene	ND (0.0052)		8260B Low		1	09/19/17 19:20	C7I0305	CI71948
1,2-Dichloroethane	ND (0.0052)		8260B Low		1	09/19/17 19:20	C7I0305	CI71948
1,2-Dichloropropane	ND (0.0052)		8260B Low		1	09/19/17 19:20	C7I0305	CI71948
1,3,5-Trimethylbenzene	ND (0.0052)		8260B Low		1	09/19/17 19:20	C7I0305	CI71948
1,3-Dichlorobenzene	ND (0.0052)		8260B Low		1	09/19/17 19:20	C7I0305	CI71948
1,3-Dichloropropane	ND (0.0052)		8260B Low		1	09/19/17 19:20	C7I0305	CI71948
1,4-Dichlorobenzene	ND (0.0052)		8260B Low		1	09/19/17 19:20	C7I0305	CI71948
1,4-Dioxane	ND (0.104)		8260B Low		1	09/19/17 19:20	C7I0305	CI71948
1-Chlorohexane	ND (0.0052)		8260B Low		1	09/19/17 19:20	C7I0305	CI71948
2,2-Dichloropropane	ND (0.0052)		8260B Low		1	09/19/17 19:20	C7I0305	CI71948
2-Butanone	ND (0.0519)		8260B Low		1	09/19/17 19:20	C7I0305	CI71948
2-Chlorotoluene	ND (0.0052)		8260B Low		1	09/19/17 19:20	C7I0305	CI71948
2-Hexanone	ND (0.0519)		8260B Low		1	09/19/17 19:20	C7I0305	CI71948
4-Chlorotoluene	ND (0.0052)		8260B Low		1	09/19/17 19:20	C7I0305	CI71948
4-Isopropyltoluene	ND (0.0052)		8260B Low		1	09/19/17 19:20	C7I0305	CI71948
4-Methyl-2-Pentanone	ND (0.0519)		8260B Low		1	09/19/17 19:20	C7I0305	CI71948
<b>Acetone</b>	<b>0.209 (0.0519)</b>		8260B Low		1	09/19/17 19:20	C7I0305	CI71948
Benzene	ND (0.0052)		8260B Low		1	09/19/17 19:20	C7I0305	CI71948
Bromobenzene	ND (0.0052)		8260B Low		1	09/19/17 19:20	C7I0305	CI71948

*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-503 (0-2')  
Date Sampled: 09/15/17 08:00  
Percent Solids: 94  
Initial Volume: 5.1  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1709470  
ESS Laboratory Sample ID: 1709470-05  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0052)		8260B Low		1	09/19/17 19:20	C7I0305	CI71948
Bromodichloromethane	ND (0.0052)		8260B Low		1	09/19/17 19:20	C7I0305	CI71948
Bromoform	ND (0.0052)		8260B Low		1	09/19/17 19:20	C7I0305	CI71948
Bromomethane	ND (0.0104)		8260B Low		1	09/19/17 19:20	C7I0305	CI71948
Carbon Disulfide	ND (0.0052)		8260B Low		1	09/19/17 19:20	C7I0305	CI71948
Carbon Tetrachloride	ND (0.0052)		8260B Low		1	09/19/17 19:20	C7I0305	CI71948
Chlorobenzene	ND (0.0052)		8260B Low		1	09/19/17 19:20	C7I0305	CI71948
Chloroethane	ND (0.0104)		8260B Low		1	09/19/17 19:20	C7I0305	CI71948
Chloroform	ND (0.0052)		8260B Low		1	09/19/17 19:20	C7I0305	CI71948
Chloromethane	ND (0.0104)		8260B Low		1	09/19/17 19:20	C7I0305	CI71948
cis-1,2-Dichloroethene	ND (0.0052)		8260B Low		1	09/19/17 19:20	C7I0305	CI71948
cis-1,3-Dichloropropene	ND (0.0052)		8260B Low		1	09/19/17 19:20	C7I0305	CI71948
Dibromochloromethane	ND (0.0052)		8260B Low		1	09/19/17 19:20	C7I0305	CI71948
Dibromomethane	ND (0.0052)		8260B Low		1	09/19/17 19:20	C7I0305	CI71948
Dichlorodifluoromethane	ND (0.0104)		8260B Low		1	09/19/17 19:20	C7I0305	CI71948
Diethyl Ether	ND (0.0052)		8260B Low		1	09/19/17 19:20	C7I0305	CI71948
Di-isopropyl ether	ND (0.0052)		8260B Low		1	09/19/17 19:20	C7I0305	CI71948
Ethyl tertiary-butyl ether	ND (0.0052)		8260B Low		1	09/19/17 19:20	C7I0305	CI71948
Ethylbenzene	ND (0.0052)		8260B Low		1	09/19/17 19:20	C7I0305	CI71948
Hexachlorobutadiene	ND (0.0052)		8260B Low		1	09/19/17 19:20	C7I0305	CI71948
Isopropylbenzene	ND (0.0052)		8260B Low		1	09/19/17 19:20	C7I0305	CI71948
Methyl tert-Butyl Ether	ND (0.0052)		8260B Low		1	09/19/17 19:20	C7I0305	CI71948
Methylene Chloride	ND (0.0260)		8260B Low		1	09/19/17 19:20	C7I0305	CI71948
Naphthalene	ND (0.0052)		8260B Low		1	09/19/17 19:20	C7I0305	CI71948
n-Butylbenzene	ND (0.0052)		8260B Low		1	09/19/17 19:20	C7I0305	CI71948
n-Propylbenzene	ND (0.0052)		8260B Low		1	09/19/17 19:20	C7I0305	CI71948
sec-Butylbenzene	ND (0.0052)		8260B Low		1	09/19/17 19:20	C7I0305	CI71948
Styrene	ND (0.0052)		8260B Low		1	09/19/17 19:20	C7I0305	CI71948
tert-Butylbenzene	ND (0.0052)		8260B Low		1	09/19/17 19:20	C7I0305	CI71948
Tertiary-amyl methyl ether	ND (0.0052)		8260B Low		1	09/19/17 19:20	C7I0305	CI71948
Tetrachloroethene	ND (0.0052)		8260B Low		1	09/19/17 19:20	C7I0305	CI71948
Tetrahydrofuran	ND (0.0052)		8260B Low		1	09/19/17 19:20	C7I0305	CI71948



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-503 (0-2')  
 Date Sampled: 09/15/17 08:00  
 Percent Solids: 94  
 Initial Volume: 5.1  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709470  
 ESS Laboratory Sample ID: 1709470-05  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0052)		8260B Low		1	09/19/17 19:20	C7I0305	CI71948
trans-1,2-Dichloroethene	ND (0.0052)		8260B Low		1	09/19/17 19:20	C7I0305	CI71948
trans-1,3-Dichloropropene	ND (0.0052)		8260B Low		1	09/19/17 19:20	C7I0305	CI71948
Trichloroethene	ND (0.0052)		8260B Low		1	09/19/17 19:20	C7I0305	CI71948
Trichlorofluoromethane	ND (0.0052)		8260B Low		1	09/19/17 19:20	C7I0305	CI71948
Vinyl Acetate	ND (0.0052)		8260B Low		1	09/19/17 19:20	C7I0305	CI71948
Vinyl Chloride	ND (0.0104)		8260B Low		1	09/19/17 19:20	C7I0305	CI71948
Xylene O	ND (0.0052)		8260B Low		1	09/19/17 19:20	C7I0305	CI71948
Xylene P,M	ND (0.0104)		8260B Low		1	09/19/17 19:20	C7I0305	CI71948
Xylenes (Total)	ND (0.0104)		8260B Low		1	09/19/17 19:20		[CALC]

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: 1,2-Dichloroethane-d4	90 %		70-130
Surrogate: 4-Bromofluorobenzene	85 %		70-130
Surrogate: Dibromofluoromethane	95 %		70-130
Surrogate: Toluene-d8	118 %		70-130





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-503 (0-2')  
 Date Sampled: 09/15/17 08:00  
 Percent Solids: 94  
 Initial Volume: 20.5  
 Final Volume: 1  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709470  
 ESS Laboratory Sample ID: 1709470-05  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: SMR  
 Prepared: 9/18/17 12:50

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	2020 (194)		8100M		5	09/19/17 2:01	C710279	CI71821
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		85 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-503 (0-2')  
Date Sampled: 09/15/17 08:00  
Percent Solids: 94  
Initial Volume: 15.3  
Final Volume: 0.5  
Extraction Method: 3546

ESS Laboratory Work Order: 1709470  
ESS Laboratory Sample ID: 1709470-05  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: TJ  
Prepared: 9/18/17 11:30

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	1.16 (0.346)		8270D		1	09/19/17 2:17	C7I0262	CI71818
Acenaphthene	0.371 (0.346)		8270D		1	09/19/17 2:17	C7I0262	CI71818
Acenaphthylene	6.92 (0.346)		8270D		1	09/19/17 2:17	C7I0262	CI71818
Anthracene	4.39 (0.346)		8270D		1	09/19/17 2:17	C7I0262	CI71818
Benzo(a)anthracene	12.8 (3.46)		8270D		10	09/20/17 4:31	C7I0262	CI71818
Benzo(a)pyrene	11.2 (1.73)		8270D		10	09/20/17 4:31	C7I0262	CI71818
Benzo(b)fluoranthene	13.0 (3.46)		8270D		10	09/20/17 4:31	C7I0262	CI71818
Benzo(g,h,i)perylene	6.26 (0.346)		8270D		1	09/19/17 2:17	C7I0262	CI71818
Benzo(k)fluoranthene	5.78 (3.46)		8270D		10	09/20/17 4:31	C7I0262	CI71818
Chrysene	12.6 (1.73)		8270D		10	09/20/17 4:31	C7I0262	CI71818
Dibenzo(a,h)Anthracene	2.62 (0.173)		8270D		1	09/19/17 2:17	C7I0262	CI71818
Fluoranthene	15.7 (3.46)		8270D		10	09/20/17 4:31	C7I0262	CI71818
Fluorene	0.907 (0.346)		8270D		1	09/19/17 2:17	C7I0262	CI71818
Indeno(1,2,3-cd)Pyrene	5.75 (0.346)		8270D		1	09/19/17 2:17	C7I0262	CI71818
Naphthalene	2.16 (0.346)		8270D		1	09/19/17 2:17	C7I0262	CI71818
Phenanthrene	11.5 (3.46)		8270D		10	09/20/17 4:31	C7I0262	CI71818
Pyrene	30.1 (3.46)		8270D		10	09/20/17 4:31	C7I0262	CI71818

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
Surrogate: 1,2-Dichlorobenzene-d4	52 %		30-130
Surrogate: 2-Fluorobiphenyl	60 %		30-130
Surrogate: Nitrobenzene-d5	55 %		30-130
Surrogate: p-Terphenyl-d14	59 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-503 (0-2')  
Date Sampled: 09/15/17 08:00  
Percent Solids: 94

ESS Laboratory Work Order: 1709470  
ESS Laboratory Sample ID: 1709470-05  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	123 (10.0)		9014		10	EEM	09/21/17 12:25	mg/kg dry	CI72119



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-503 (5-6)  
 Date Sampled: 09/15/17 08:20  
 Percent Solids: 91

ESS Laboratory Work Order: 1709470  
 ESS Laboratory Sample ID: 1709470-06  
 Sample Matrix: Soil  
 Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (2.14)		6020A		20	NAR	09/22/17 0:24	2.05	100	CI71936
Arsenic	<b>3.94</b> (2.67)		6010C		1	KJK	09/23/17 19:41	2.05	100	CI71936
Beryllium	<b>0.40</b> (0.12)		6010C		1	KJK	09/23/17 19:41	2.05	100	CI71936
Cadmium	ND (0.53)		6010C		1	KJK	09/22/17 21:45	2.05	100	CI71936
Chromium	<b>1.86</b> (1.07)		6010C		1	KJK	09/22/17 21:45	2.05	100	CI71936
Copper	<b>83.6</b> (2.67)		6010C		1	KJK	09/22/17 21:45	2.05	100	CI71936
Lead	<b>35.4</b> (5.35)		6010C		1	KJK	09/22/17 21:45	2.05	100	CI71936
Mercury	ND (0.029)		7471B		1	MJV	09/22/17 20:59	0.76	40	CI71940
Nickel	<b>4.99</b> (2.67)		6010C		1	KJK	09/22/17 21:45	2.05	100	CI71936
Selenium	ND (2.14)		6020A		20	NAR	09/22/17 0:24	2.05	100	CI71936
Silver	ND (0.53)		6010C		1	KJK	09/22/17 21:45	2.05	100	CI71936
Thallium	ND (2.14)		6020A		20	NAR	09/22/17 0:24	2.05	100	CI71936
Zinc	<b>6.09</b> (2.67)		6010C		1	KJK	09/22/17 21:45	2.05	100	CI71936





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-503 (5-6)  
 Date Sampled: 09/15/17 08:20  
 Percent Solids: 91  
 Initial Volume: 4.9  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709470  
 ESS Laboratory Sample ID: 1709470-06  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0056)		8260B Low		1	09/19/17 19:45	C7I0305	CI71948
1,1,1-Trichloroethane	ND (0.0056)		8260B Low		1	09/19/17 19:45	C7I0305	CI71948
1,1,2,2-Tetrachloroethane	ND (0.0056)		8260B Low		1	09/19/17 19:45	C7I0305	CI71948
1,1,2-Trichloroethane	ND (0.0056)		8260B Low		1	09/19/17 19:45	C7I0305	CI71948
1,1-Dichloroethane	ND (0.0056)		8260B Low		1	09/19/17 19:45	C7I0305	CI71948
1,1-Dichloroethene	ND (0.0056)		8260B Low		1	09/19/17 19:45	C7I0305	CI71948
1,1-Dichloropropene	ND (0.0056)		8260B Low		1	09/19/17 19:45	C7I0305	CI71948
1,2,3-Trichlorobenzene	ND (0.0056)		8260B Low		1	09/19/17 19:45	C7I0305	CI71948
1,2,3-Trichloropropane	ND (0.0056)		8260B Low		1	09/19/17 19:45	C7I0305	CI71948
1,2,4-Trichlorobenzene	ND (0.0056)		8260B Low		1	09/19/17 19:45	C7I0305	CI71948
1,2,4-Trimethylbenzene	ND (0.0056)		8260B Low		1	09/19/17 19:45	C7I0305	CI71948
1,2-Dibromo-3-Chloropropane	ND (0.0056)		8260B Low		1	09/19/17 19:45	C7I0305	CI71948
1,2-Dibromoethane	ND (0.0056)		8260B Low		1	09/19/17 19:45	C7I0305	CI71948
1,2-Dichlorobenzene	ND (0.0056)		8260B Low		1	09/19/17 19:45	C7I0305	CI71948
1,2-Dichloroethane	ND (0.0056)		8260B Low		1	09/19/17 19:45	C7I0305	CI71948
1,2-Dichloropropane	ND (0.0056)		8260B Low		1	09/19/17 19:45	C7I0305	CI71948
1,3,5-Trimethylbenzene	ND (0.0056)		8260B Low		1	09/19/17 19:45	C7I0305	CI71948
1,3-Dichlorobenzene	ND (0.0056)		8260B Low		1	09/19/17 19:45	C7I0305	CI71948
1,3-Dichloropropane	ND (0.0056)		8260B Low		1	09/19/17 19:45	C7I0305	CI71948
1,4-Dichlorobenzene	ND (0.0056)		8260B Low		1	09/19/17 19:45	C7I0305	CI71948
1,4-Dioxane	ND (0.112)		8260B Low		1	09/19/17 19:45	C7I0305	CI71948
1-Chlorohexane	ND (0.0056)		8260B Low		1	09/19/17 19:45	C7I0305	CI71948
2,2-Dichloropropane	ND (0.0056)		8260B Low		1	09/19/17 19:45	C7I0305	CI71948
2-Butanone	ND (0.0559)		8260B Low		1	09/19/17 19:45	C7I0305	CI71948
2-Chlorotoluene	ND (0.0056)		8260B Low		1	09/19/17 19:45	C7I0305	CI71948
2-Hexanone	ND (0.0559)		8260B Low		1	09/19/17 19:45	C7I0305	CI71948
4-Chlorotoluene	ND (0.0056)		8260B Low		1	09/19/17 19:45	C7I0305	CI71948
4-Isopropyltoluene	ND (0.0056)		8260B Low		1	09/19/17 19:45	C7I0305	CI71948
4-Methyl-2-Pentanone	ND (0.0559)		8260B Low		1	09/19/17 19:45	C7I0305	CI71948
Acetone	ND (0.0559)		8260B Low		1	09/19/17 19:45	C7I0305	CI71948
Benzene	ND (0.0056)		8260B Low		1	09/19/17 19:45	C7I0305	CI71948
Bromobenzene	ND (0.0056)		8260B Low		1	09/19/17 19:45	C7I0305	CI71948



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-503 (5-6)  
 Date Sampled: 09/15/17 08:20  
 Percent Solids: 91  
 Initial Volume: 4.9  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709470  
 ESS Laboratory Sample ID: 1709470-06  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0056)		8260B Low		1	09/19/17 19:45	C7I0305	CI71948
Bromodichloromethane	ND (0.0056)		8260B Low		1	09/19/17 19:45	C7I0305	CI71948
Bromoform	ND (0.0056)		8260B Low		1	09/19/17 19:45	C7I0305	CI71948
Bromomethane	ND (0.0112)		8260B Low		1	09/19/17 19:45	C7I0305	CI71948
Carbon Disulfide	ND (0.0056)		8260B Low		1	09/19/17 19:45	C7I0305	CI71948
Carbon Tetrachloride	ND (0.0056)		8260B Low		1	09/19/17 19:45	C7I0305	CI71948
Chlorobenzene	ND (0.0056)		8260B Low		1	09/19/17 19:45	C7I0305	CI71948
Chloroethane	ND (0.0112)		8260B Low		1	09/19/17 19:45	C7I0305	CI71948
Chloroform	ND (0.0056)		8260B Low		1	09/19/17 19:45	C7I0305	CI71948
Chloromethane	ND (0.0112)		8260B Low		1	09/19/17 19:45	C7I0305	CI71948
cis-1,2-Dichloroethene	ND (0.0056)		8260B Low		1	09/19/17 19:45	C7I0305	CI71948
cis-1,3-Dichloropropene	ND (0.0056)		8260B Low		1	09/19/17 19:45	C7I0305	CI71948
Dibromochloromethane	ND (0.0056)		8260B Low		1	09/19/17 19:45	C7I0305	CI71948
Dibromomethane	ND (0.0056)		8260B Low		1	09/19/17 19:45	C7I0305	CI71948
Dichlorodifluoromethane	ND (0.0112)		8260B Low		1	09/19/17 19:45	C7I0305	CI71948
Diethyl Ether	ND (0.0056)		8260B Low		1	09/19/17 19:45	C7I0305	CI71948
Di-isopropyl ether	ND (0.0056)		8260B Low		1	09/19/17 19:45	C7I0305	CI71948
Ethyl tertiary-butyl ether	ND (0.0056)		8260B Low		1	09/19/17 19:45	C7I0305	CI71948
Ethylbenzene	ND (0.0056)		8260B Low		1	09/19/17 19:45	C7I0305	CI71948
Hexachlorobutadiene	ND (0.0056)		8260B Low		1	09/19/17 19:45	C7I0305	CI71948
Isopropylbenzene	ND (0.0056)		8260B Low		1	09/19/17 19:45	C7I0305	CI71948
Methyl tert-Butyl Ether	ND (0.0056)		8260B Low		1	09/19/17 19:45	C7I0305	CI71948
Methylene Chloride	ND (0.0280)		8260B Low		1	09/19/17 19:45	C7I0305	CI71948
Naphthalene	ND (0.0056)		8260B Low		1	09/19/17 19:45	C7I0305	CI71948
n-Butylbenzene	ND (0.0056)		8260B Low		1	09/19/17 19:45	C7I0305	CI71948
n-Propylbenzene	ND (0.0056)		8260B Low		1	09/19/17 19:45	C7I0305	CI71948
sec-Butylbenzene	ND (0.0056)		8260B Low		1	09/19/17 19:45	C7I0305	CI71948
Styrene	ND (0.0056)		8260B Low		1	09/19/17 19:45	C7I0305	CI71948
tert-Butylbenzene	ND (0.0056)		8260B Low		1	09/19/17 19:45	C7I0305	CI71948
Tertiary-amyl methyl ether	ND (0.0056)		8260B Low		1	09/19/17 19:45	C7I0305	CI71948
Tetrachloroethene	ND (0.0056)		8260B Low		1	09/19/17 19:45	C7I0305	CI71948
Tetrahydrofuran	ND (0.0056)		8260B Low		1	09/19/17 19:45	C7I0305	CI71948



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-503 (5-6)  
Date Sampled: 09/15/17 08:20  
Percent Solids: 91  
Initial Volume: 4.9  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1709470  
ESS Laboratory Sample ID: 1709470-06  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0056)		8260B Low		1	09/19/17 19:45	C7I0305	CI71948
trans-1,2-Dichloroethene	ND (0.0056)		8260B Low		1	09/19/17 19:45	C7I0305	CI71948
trans-1,3-Dichloropropene	ND (0.0056)		8260B Low		1	09/19/17 19:45	C7I0305	CI71948
Trichloroethene	ND (0.0056)		8260B Low		1	09/19/17 19:45	C7I0305	CI71948
Trichlorofluoromethane	ND (0.0056)		8260B Low		1	09/19/17 19:45	C7I0305	CI71948
Vinyl Acetate	ND (0.0056)		8260B Low		1	09/19/17 19:45	C7I0305	CI71948
Vinyl Chloride	ND (0.0112)		8260B Low		1	09/19/17 19:45	C7I0305	CI71948
Xylene O	ND (0.0056)		8260B Low		1	09/19/17 19:45	C7I0305	CI71948
Xylene P,M	ND (0.0112)		8260B Low		1	09/19/17 19:45	C7I0305	CI71948
Xylenes (Total)	ND (0.0112)		8260B Low		1	09/19/17 19:45		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	94 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	104 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	97 %		70-130
<i>Surrogate: Toluene-d8</i>	101 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-503 (5-6)  
 Date Sampled: 09/15/17 08:20  
 Percent Solids: 91  
 Initial Volume: 19  
 Final Volume: 1  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709470  
 ESS Laboratory Sample ID: 1709470-06  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: SMR  
 Prepared: 9/18/17 12:50

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	ND (43.3)		8100M		1	09/18/17 19:01	C710279	CI71821
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		80 %		40-140				





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-503 (5-6)  
Date Sampled: 09/15/17 08:20  
Percent Solids: 91  
Initial Volume: 14.5  
Final Volume: 0.5  
Extraction Method: 3546

ESS Laboratory Work Order: 1709470  
ESS Laboratory Sample ID: 1709470-06  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: TJ  
Prepared: 9/18/17 11:30

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.378)		8270D		1	09/19/17 2:52	C7I0262	CI71818
Acenaphthene	ND (0.378)		8270D		1	09/19/17 2:52	C7I0262	CI71818
Acenaphthylene	ND (0.378)		8270D		1	09/19/17 2:52	C7I0262	CI71818
Anthracene	ND (0.378)		8270D		1	09/19/17 2:52	C7I0262	CI71818
Benzo(a)anthracene	ND (0.378)		8270D		1	09/19/17 2:52	C7I0262	CI71818
Benzo(a)pyrene	ND (0.189)		8270D		1	09/19/17 2:52	C7I0262	CI71818
Benzo(b)fluoranthene	ND (0.378)		8270D		1	09/19/17 2:52	C7I0262	CI71818
Benzo(g,h,i)perylene	ND (0.378)		8270D		1	09/19/17 2:52	C7I0262	CI71818
Benzo(k)fluoranthene	ND (0.378)		8270D		1	09/19/17 2:52	C7I0262	CI71818
Chrysene	ND (0.189)		8270D		1	09/19/17 2:52	C7I0262	CI71818
Dibenzo(a,h)Anthracene	ND (0.189)		8270D		1	09/19/17 2:52	C7I0262	CI71818
Fluoranthene	ND (0.378)		8270D		1	09/19/17 2:52	C7I0262	CI71818
Fluorene	ND (0.378)		8270D		1	09/19/17 2:52	C7I0262	CI71818
Indeno(1,2,3-cd)Pyrene	ND (0.378)		8270D		1	09/19/17 2:52	C7I0262	CI71818
Naphthalene	ND (0.378)		8270D		1	09/19/17 2:52	C7I0262	CI71818
Phenanthrene	ND (0.378)		8270D		1	09/19/17 2:52	C7I0262	CI71818
Pyrene	ND (0.378)		8270D		1	09/19/17 2:52	C7I0262	CI71818

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: 1,2-Dichlorobenzene-d4	68 %		30-130
Surrogate: 2-Fluorobiphenyl	71 %		30-130
Surrogate: Nitrobenzene-d5	68 %		30-130
Surrogate: p-Terphenyl-d14	81 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-503 (5-6)  
Date Sampled: 09/15/17 08:20  
Percent Solids: 91

ESS Laboratory Work Order: 1709470  
ESS Laboratory Sample ID: 1709470-06  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	ND (1.10)		9014		1	EEM	09/21/17 12:25	mg/kg dry	CI72119



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-504 (1.5-2')  
 Date Sampled: 09/15/17 09:10  
 Percent Solids: 94

ESS Laboratory Work Order: 1709470  
 ESS Laboratory Sample ID: 1709470-07  
 Sample Matrix: Soil  
 Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (1.50)		6020A		20	NAR	09/22/17 0:29	2.82	100	CI71936
Arsenic	2.07 (1.88)		6010C		1	KJK	09/23/17 19:45	2.82	100	CI71936
Beryllium	0.18 (0.08)		6010C		1	KJK	09/23/17 19:45	2.82	100	CI71936
Cadmium	ND (0.38)		6010C		1	KJK	09/22/17 21:49	2.82	100	CI71936
Chromium	9.06 (0.75)		6010C		1	KJK	09/22/17 21:49	2.82	100	CI71936
Copper	8.33 (1.88)		6010C		1	KJK	09/22/17 21:49	2.82	100	CI71936
Lead	52.7 (3.76)		6010C		1	KJK	09/22/17 21:49	2.82	100	CI71936
Mercury	0.040 (0.030)		7471B		1	MJV	09/22/17 21:01	0.71	40	CI71940
Nickel	5.73 (1.88)		6010C		1	KJK	09/22/17 21:49	2.82	100	CI71936
Selenium	ND (1.50)		6020A		20	NAR	09/22/17 0:29	2.82	100	CI71936
Silver	ND (0.38)		6010C		1	KJK	09/22/17 21:49	2.82	100	CI71936
Thallium	ND (1.50)		6020A		20	NAR	09/22/17 0:29	2.82	100	CI71936
Zinc	30.7 (1.88)		6010C		1	KJK	09/22/17 21:49	2.82	100	CI71936



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-504 (1.5-2')  
 Date Sampled: 09/15/17 09:10  
 Percent Solids: 94  
 Initial Volume: 6.6  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709470  
 ESS Laboratory Sample ID: 1709470-07  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0040)		8260B Low		1	09/19/17 20:11	C7I0305	CI71948
1,1,1-Trichloroethane	ND (0.0040)		8260B Low		1	09/19/17 20:11	C7I0305	CI71948
1,1,2,2-Tetrachloroethane	ND (0.0040)		8260B Low		1	09/19/17 20:11	C7I0305	CI71948
1,1,2-Trichloroethane	ND (0.0040)		8260B Low		1	09/19/17 20:11	C7I0305	CI71948
1,1-Dichloroethane	ND (0.0040)		8260B Low		1	09/19/17 20:11	C7I0305	CI71948
1,1-Dichloroethene	ND (0.0040)		8260B Low		1	09/19/17 20:11	C7I0305	CI71948
1,1-Dichloropropene	ND (0.0040)		8260B Low		1	09/19/17 20:11	C7I0305	CI71948
1,2,3-Trichlorobenzene	ND (0.0040)		8260B Low		1	09/19/17 20:11	C7I0305	CI71948
1,2,3-Trichloropropane	ND (0.0040)		8260B Low		1	09/19/17 20:11	C7I0305	CI71948
1,2,4-Trichlorobenzene	ND (0.0040)		8260B Low		1	09/19/17 20:11	C7I0305	CI71948
1,2,4-Trimethylbenzene	ND (0.0040)		8260B Low		1	09/19/17 20:11	C7I0305	CI71948
1,2-Dibromo-3-Chloropropane	ND (0.0040)		8260B Low		1	09/19/17 20:11	C7I0305	CI71948
1,2-Dibromoethane	ND (0.0040)		8260B Low		1	09/19/17 20:11	C7I0305	CI71948
1,2-Dichlorobenzene	ND (0.0040)		8260B Low		1	09/19/17 20:11	C7I0305	CI71948
1,2-Dichloroethane	ND (0.0040)		8260B Low		1	09/19/17 20:11	C7I0305	CI71948
1,2-Dichloropropane	ND (0.0040)		8260B Low		1	09/19/17 20:11	C7I0305	CI71948
1,3,5-Trimethylbenzene	ND (0.0040)		8260B Low		1	09/19/17 20:11	C7I0305	CI71948
1,3-Dichlorobenzene	ND (0.0040)		8260B Low		1	09/19/17 20:11	C7I0305	CI71948
1,3-Dichloropropane	ND (0.0040)		8260B Low		1	09/19/17 20:11	C7I0305	CI71948
1,4-Dichlorobenzene	ND (0.0040)		8260B Low		1	09/19/17 20:11	C7I0305	CI71948
1,4-Dioxane	ND (0.0804)		8260B Low		1	09/19/17 20:11	C7I0305	CI71948
1-Chlorohexane	ND (0.0040)		8260B Low		1	09/19/17 20:11	C7I0305	CI71948
2,2-Dichloropropane	ND (0.0040)		8260B Low		1	09/19/17 20:11	C7I0305	CI71948
2-Butanone	ND (0.0402)		8260B Low		1	09/19/17 20:11	C7I0305	CI71948
2-Chlorotoluene	ND (0.0040)		8260B Low		1	09/19/17 20:11	C7I0305	CI71948
2-Hexanone	ND (0.0402)		8260B Low		1	09/19/17 20:11	C7I0305	CI71948
4-Chlorotoluene	ND (0.0040)		8260B Low		1	09/19/17 20:11	C7I0305	CI71948
4-Isopropyltoluene	ND (0.0040)		8260B Low		1	09/19/17 20:11	C7I0305	CI71948
4-Methyl-2-Pentanone	ND (0.0402)		8260B Low		1	09/19/17 20:11	C7I0305	CI71948
Acetone	ND (0.0402)		8260B Low		1	09/19/17 20:11	C7I0305	CI71948
Benzene	ND (0.0040)		8260B Low		1	09/19/17 20:11	C7I0305	CI71948
Bromobenzene	ND (0.0040)		8260B Low		1	09/19/17 20:11	C7I0305	CI71948





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-504 (1.5-2')  
 Date Sampled: 09/15/17 09:10  
 Percent Solids: 94  
 Initial Volume: 6.6  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709470  
 ESS Laboratory Sample ID: 1709470-07  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0040)		8260B Low		1	09/19/17 20:11	C7I0305	CI71948
Bromodichloromethane	ND (0.0040)		8260B Low		1	09/19/17 20:11	C7I0305	CI71948
Bromoform	ND (0.0040)		8260B Low		1	09/19/17 20:11	C7I0305	CI71948
Bromomethane	ND (0.0080)		8260B Low		1	09/19/17 20:11	C7I0305	CI71948
Carbon Disulfide	ND (0.0040)		8260B Low		1	09/19/17 20:11	C7I0305	CI71948
Carbon Tetrachloride	ND (0.0040)		8260B Low		1	09/19/17 20:11	C7I0305	CI71948
Chlorobenzene	ND (0.0040)		8260B Low		1	09/19/17 20:11	C7I0305	CI71948
Chloroethane	ND (0.0080)		8260B Low		1	09/19/17 20:11	C7I0305	CI71948
Chloroform	ND (0.0040)		8260B Low		1	09/19/17 20:11	C7I0305	CI71948
Chloromethane	ND (0.0080)		8260B Low		1	09/19/17 20:11	C7I0305	CI71948
cis-1,2-Dichloroethene	ND (0.0040)		8260B Low		1	09/19/17 20:11	C7I0305	CI71948
cis-1,3-Dichloropropene	ND (0.0040)		8260B Low		1	09/19/17 20:11	C7I0305	CI71948
Dibromochloromethane	ND (0.0040)		8260B Low		1	09/19/17 20:11	C7I0305	CI71948
Dibromomethane	ND (0.0040)		8260B Low		1	09/19/17 20:11	C7I0305	CI71948
Dichlorodifluoromethane	ND (0.0080)		8260B Low		1	09/19/17 20:11	C7I0305	CI71948
Diethyl Ether	ND (0.0040)		8260B Low		1	09/19/17 20:11	C7I0305	CI71948
Di-isopropyl ether	ND (0.0040)		8260B Low		1	09/19/17 20:11	C7I0305	CI71948
Ethyl tertiary-butyl ether	ND (0.0040)		8260B Low		1	09/19/17 20:11	C7I0305	CI71948
Ethylbenzene	ND (0.0040)		8260B Low		1	09/19/17 20:11	C7I0305	CI71948
Hexachlorobutadiene	ND (0.0040)		8260B Low		1	09/19/17 20:11	C7I0305	CI71948
Isopropylbenzene	ND (0.0040)		8260B Low		1	09/19/17 20:11	C7I0305	CI71948
Methyl tert-Butyl Ether	ND (0.0040)		8260B Low		1	09/19/17 20:11	C7I0305	CI71948
Methylene Chloride	ND (0.0201)		8260B Low		1	09/19/17 20:11	C7I0305	CI71948
Naphthalene	ND (0.0040)		8260B Low		1	09/19/17 20:11	C7I0305	CI71948
n-Butylbenzene	ND (0.0040)		8260B Low		1	09/19/17 20:11	C7I0305	CI71948
n-Propylbenzene	ND (0.0040)		8260B Low		1	09/19/17 20:11	C7I0305	CI71948
sec-Butylbenzene	ND (0.0040)		8260B Low		1	09/19/17 20:11	C7I0305	CI71948
Styrene	ND (0.0040)		8260B Low		1	09/19/17 20:11	C7I0305	CI71948
tert-Butylbenzene	ND (0.0040)		8260B Low		1	09/19/17 20:11	C7I0305	CI71948
Tertiary-amyl methyl ether	ND (0.0040)		8260B Low		1	09/19/17 20:11	C7I0305	CI71948
Tetrachloroethene	ND (0.0040)		8260B Low		1	09/19/17 20:11	C7I0305	CI71948
Tetrahydrofuran	ND (0.0040)		8260B Low		1	09/19/17 20:11	C7I0305	CI71948



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-504 (1.5-2')  
 Date Sampled: 09/15/17 09:10  
 Percent Solids: 94  
 Initial Volume: 6.6  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709470  
 ESS Laboratory Sample ID: 1709470-07  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0040)		8260B Low		1	09/19/17 20:11	C7I0305	CI71948
trans-1,2-Dichloroethene	ND (0.0040)		8260B Low		1	09/19/17 20:11	C7I0305	CI71948
trans-1,3-Dichloropropene	ND (0.0040)		8260B Low		1	09/19/17 20:11	C7I0305	CI71948
Trichloroethene	ND (0.0040)		8260B Low		1	09/19/17 20:11	C7I0305	CI71948
Trichlorofluoromethane	ND (0.0040)		8260B Low		1	09/19/17 20:11	C7I0305	CI71948
Vinyl Acetate	ND (0.0040)		8260B Low		1	09/19/17 20:11	C7I0305	CI71948
Vinyl Chloride	ND (0.0080)		8260B Low		1	09/19/17 20:11	C7I0305	CI71948
Xylene O	ND (0.0040)		8260B Low		1	09/19/17 20:11	C7I0305	CI71948
Xylene P,M	ND (0.0080)		8260B Low		1	09/19/17 20:11	C7I0305	CI71948
Xylenes (Total)	ND (0.0080)		8260B Low		1	09/19/17 20:11		[CALC]

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: 1,2-Dichloroethane-d4	95 %		70-130
Surrogate: 4-Bromofluorobenzene	104 %		70-130
Surrogate: Dibromofluoromethane	100 %		70-130
Surrogate: Toluene-d8	100 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-504 (1.5-2')  
Date Sampled: 09/15/17 09:10  
Percent Solids: 94  
Initial Volume: 19.5  
Final Volume: 2  
Extraction Method: 3546

ESS Laboratory Work Order: 1709470  
ESS Laboratory Sample ID: 1709470-07  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: SMR  
Prepared: 9/18/17 12:50

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	1250 (816)		8100M		10	09/19/17 2:39	C710279	CI71821
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		102 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-504 (1.5-2')  
 Date Sampled: 09/15/17 09:10  
 Percent Solids: 94  
 Initial Volume: 15  
 Final Volume: 1  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709470  
 ESS Laboratory Sample ID: 1709470-07  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: TJ  
 Prepared: 9/18/17 11:30

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (1.41)		8270D		2	09/19/17 20:56	C7I0308	CI71818
Acenaphthene	ND (1.41)		8270D		2	09/19/17 20:56	C7I0308	CI71818
Acenaphthylene	ND (1.41)		8270D		2	09/19/17 20:56	C7I0308	CI71818
Anthracene	ND (1.41)		8270D		2	09/19/17 20:56	C7I0308	CI71818
<b>Benzo(a)anthracene</b>	<b>2.76</b> (0.709)		8270D		2	09/19/17 20:56	C7I0308	CI71818
<b>Benzo(a)pyrene</b>	<b>2.30</b> (0.352)		8270D		2	09/19/17 20:56	C7I0308	CI71818
<b>Benzo(b)fluoranthene</b>	<b>2.69</b> (0.709)		8270D		2	09/19/17 20:56	C7I0308	CI71818
<b>Benzo(g,h,i)perylene</b>	<b>1.26</b> (0.709)		8270D		2	09/19/17 20:56	C7I0308	CI71818
<b>Benzo(k)fluoranthene</b>	<b>1.92</b> (0.709)		8270D		2	09/19/17 20:56	C7I0308	CI71818
<b>Chrysene</b>	<b>2.73</b> (0.352)		8270D		2	09/19/17 20:56	C7I0308	CI71818
<b>Dibenzo(a,h)Anthracene</b>	<b>0.646</b> (0.352)		8270D		2	09/19/17 20:56	C7I0308	CI71818
<b>Fluoranthene</b>	<b>7.81</b> (1.41)		8270D		2	09/19/17 20:56	C7I0308	CI71818
Fluorene	ND (1.41)		8270D		2	09/19/17 20:56	C7I0308	CI71818
<b>Indeno(1,2,3-cd)Pyrene</b>	<b>1.01</b> (0.709)		8270D		2	09/19/17 20:56	C7I0308	CI71818
Naphthalene	ND (0.709)		8270D		2	09/19/17 20:56	C7I0308	CI71818
<b>Phenanthrene</b>	<b>2.98</b> (1.41)		8270D		2	09/19/17 20:56	C7I0308	CI71818
<b>Pyrene</b>	<b>5.88</b> (1.41)		8270D		2	09/19/17 20:56	C7I0308	CI71818

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	72 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	78 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	61 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	91 %		30-130





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-504 (1.5-2')  
Date Sampled: 09/15/17 09:10  
Percent Solids: 94

ESS Laboratory Work Order: 1709470  
ESS Laboratory Sample ID: 1709470-07  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	2.44 (1.00)		9014		1	EEM	09/21/17 12:25	mg/kg dry	CI72119



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-504 (4-5')  
Date Sampled: 09/15/17 09:55  
Percent Solids: 98

ESS Laboratory Work Order: 1709470  
ESS Laboratory Sample ID: 1709470-08  
Sample Matrix: Soil  
Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (1.69)		6020A		20	NAR	09/22/17 0:34	2.42	100	CI71936
Arsenic	ND (2.11)		6010C		1	KJK	09/22/17 21:53	2.42	100	CI71936
<b>Beryllium</b>	<b>0.25</b> (0.09)		6010C		1	KJK	09/23/17 19:49	2.42	100	CI71936
Cadmium	ND (0.42)		6010C		1	KJK	09/22/17 21:53	2.42	100	CI71936
<b>Chromium</b>	<b>4.63</b> (0.85)		6010C		1	KJK	09/22/17 21:53	2.42	100	CI71936
<b>Copper</b>	<b>8.68</b> (2.11)		6010C		1	KJK	09/22/17 21:53	2.42	100	CI71936
<b>Lead</b>	<b>21.0</b> (4.23)		6010C		1	KJK	09/22/17 21:53	2.42	100	CI71936
Mercury	ND (0.028)		7471B		1	MJV	09/22/17 21:03	0.72	40	CI71940
<b>Nickel</b>	<b>5.90</b> (2.11)		6010C		1	KJK	09/22/17 21:53	2.42	100	CI71936
Selenium	ND (1.69)		6020A		20	NAR	09/22/17 0:34	2.42	100	CI71936
Silver	ND (0.42)		6010C		1	KJK	09/22/17 21:53	2.42	100	CI71936
Thallium	ND (1.69)		6020A		20	NAR	09/22/17 0:34	2.42	100	CI71936
<b>Zinc</b>	<b>21.3</b> (2.11)		6010C		1	KJK	09/22/17 21:53	2.42	100	CI71936



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-504 (4-5')  
 Date Sampled: 09/15/17 09:55  
 Percent Solids: 98  
 Initial Volume: 5  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709470  
 ESS Laboratory Sample ID: 1709470-08  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0051)		8260B Low		1	09/19/17 20:36	C7I0305	CI71948
1,1,1-Trichloroethane	ND (0.0051)		8260B Low		1	09/19/17 20:36	C7I0305	CI71948
1,1,2,2-Tetrachloroethane	ND (0.0051)		8260B Low		1	09/19/17 20:36	C7I0305	CI71948
1,1,2-Trichloroethane	ND (0.0051)		8260B Low		1	09/19/17 20:36	C7I0305	CI71948
1,1-Dichloroethane	ND (0.0051)		8260B Low		1	09/19/17 20:36	C7I0305	CI71948
1,1-Dichloroethene	ND (0.0051)		8260B Low		1	09/19/17 20:36	C7I0305	CI71948
1,1-Dichloropropene	ND (0.0051)		8260B Low		1	09/19/17 20:36	C7I0305	CI71948
1,2,3-Trichlorobenzene	ND (0.0051)		8260B Low		1	09/19/17 20:36	C7I0305	CI71948
1,2,3-Trichloropropane	ND (0.0051)		8260B Low		1	09/19/17 20:36	C7I0305	CI71948
1,2,4-Trichlorobenzene	ND (0.0051)		8260B Low		1	09/19/17 20:36	C7I0305	CI71948
1,2,4-Trimethylbenzene	ND (0.0051)		8260B Low		1	09/19/17 20:36	C7I0305	CI71948
1,2-Dibromo-3-Chloropropane	ND (0.0051)		8260B Low		1	09/19/17 20:36	C7I0305	CI71948
1,2-Dibromoethane	ND (0.0051)		8260B Low		1	09/19/17 20:36	C7I0305	CI71948
1,2-Dichlorobenzene	ND (0.0051)		8260B Low		1	09/19/17 20:36	C7I0305	CI71948
1,2-Dichloroethane	ND (0.0051)		8260B Low		1	09/19/17 20:36	C7I0305	CI71948
1,2-Dichloropropane	ND (0.0051)		8260B Low		1	09/19/17 20:36	C7I0305	CI71948
1,3,5-Trimethylbenzene	ND (0.0051)		8260B Low		1	09/19/17 20:36	C7I0305	CI71948
1,3-Dichlorobenzene	ND (0.0051)		8260B Low		1	09/19/17 20:36	C7I0305	CI71948
1,3-Dichloropropane	ND (0.0051)		8260B Low		1	09/19/17 20:36	C7I0305	CI71948
1,4-Dichlorobenzene	ND (0.0051)		8260B Low		1	09/19/17 20:36	C7I0305	CI71948
1,4-Dioxane	ND (0.102)		8260B Low		1	09/19/17 20:36	C7I0305	CI71948
1-Chlorohexane	ND (0.0051)		8260B Low		1	09/19/17 20:36	C7I0305	CI71948
2,2-Dichloropropane	ND (0.0051)		8260B Low		1	09/19/17 20:36	C7I0305	CI71948
2-Butanone	ND (0.0512)		8260B Low		1	09/19/17 20:36	C7I0305	CI71948
2-Chlorotoluene	ND (0.0051)		8260B Low		1	09/19/17 20:36	C7I0305	CI71948
2-Hexanone	ND (0.0512)		8260B Low		1	09/19/17 20:36	C7I0305	CI71948
4-Chlorotoluene	ND (0.0051)		8260B Low		1	09/19/17 20:36	C7I0305	CI71948
4-Isopropyltoluene	ND (0.0051)		8260B Low		1	09/19/17 20:36	C7I0305	CI71948
4-Methyl-2-Pentanone	ND (0.0512)		8260B Low		1	09/19/17 20:36	C7I0305	CI71948
Acetone	ND (0.0512)		8260B Low		1	09/19/17 20:36	C7I0305	CI71948
Benzene	ND (0.0051)		8260B Low		1	09/19/17 20:36	C7I0305	CI71948
Bromobenzene	ND (0.0051)		8260B Low		1	09/19/17 20:36	C7I0305	CI71948



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-504 (4-5')  
 Date Sampled: 09/15/17 09:55  
 Percent Solids: 98  
 Initial Volume: 5  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709470  
 ESS Laboratory Sample ID: 1709470-08  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0051)		8260B Low		1	09/19/17 20:36	C7I0305	CI71948
Bromodichloromethane	ND (0.0051)		8260B Low		1	09/19/17 20:36	C7I0305	CI71948
Bromoform	ND (0.0051)		8260B Low		1	09/19/17 20:36	C7I0305	CI71948
Bromomethane	ND (0.0102)		8260B Low		1	09/19/17 20:36	C7I0305	CI71948
Carbon Disulfide	ND (0.0051)		8260B Low		1	09/19/17 20:36	C7I0305	CI71948
Carbon Tetrachloride	ND (0.0051)		8260B Low		1	09/19/17 20:36	C7I0305	CI71948
Chlorobenzene	ND (0.0051)		8260B Low		1	09/19/17 20:36	C7I0305	CI71948
Chloroethane	ND (0.0102)		8260B Low		1	09/19/17 20:36	C7I0305	CI71948
Chloroform	ND (0.0051)		8260B Low		1	09/19/17 20:36	C7I0305	CI71948
Chloromethane	ND (0.0102)		8260B Low		1	09/19/17 20:36	C7I0305	CI71948
cis-1,2-Dichloroethene	ND (0.0051)		8260B Low		1	09/19/17 20:36	C7I0305	CI71948
cis-1,3-Dichloropropene	ND (0.0051)		8260B Low		1	09/19/17 20:36	C7I0305	CI71948
Dibromochloromethane	ND (0.0051)		8260B Low		1	09/19/17 20:36	C7I0305	CI71948
Dibromomethane	ND (0.0051)		8260B Low		1	09/19/17 20:36	C7I0305	CI71948
Dichlorodifluoromethane	ND (0.0102)		8260B Low		1	09/19/17 20:36	C7I0305	CI71948
Diethyl Ether	ND (0.0051)		8260B Low		1	09/19/17 20:36	C7I0305	CI71948
Di-isopropyl ether	ND (0.0051)		8260B Low		1	09/19/17 20:36	C7I0305	CI71948
Ethyl tertiary-butyl ether	ND (0.0051)		8260B Low		1	09/19/17 20:36	C7I0305	CI71948
Ethylbenzene	ND (0.0051)		8260B Low		1	09/19/17 20:36	C7I0305	CI71948
Hexachlorobutadiene	ND (0.0051)		8260B Low		1	09/19/17 20:36	C7I0305	CI71948
Isopropylbenzene	ND (0.0051)		8260B Low		1	09/19/17 20:36	C7I0305	CI71948
Methyl tert-Butyl Ether	ND (0.0051)		8260B Low		1	09/19/17 20:36	C7I0305	CI71948
Methylene Chloride	ND (0.0256)		8260B Low		1	09/19/17 20:36	C7I0305	CI71948
Naphthalene	ND (0.0051)		8260B Low		1	09/19/17 20:36	C7I0305	CI71948
n-Butylbenzene	ND (0.0051)		8260B Low		1	09/19/17 20:36	C7I0305	CI71948
n-Propylbenzene	ND (0.0051)		8260B Low		1	09/19/17 20:36	C7I0305	CI71948
sec-Butylbenzene	ND (0.0051)		8260B Low		1	09/19/17 20:36	C7I0305	CI71948
Styrene	ND (0.0051)		8260B Low		1	09/19/17 20:36	C7I0305	CI71948
tert-Butylbenzene	ND (0.0051)		8260B Low		1	09/19/17 20:36	C7I0305	CI71948
Tertiary-amyl methyl ether	ND (0.0051)		8260B Low		1	09/19/17 20:36	C7I0305	CI71948
Tetrachloroethene	ND (0.0051)		8260B Low		1	09/19/17 20:36	C7I0305	CI71948
Tetrahydrofuran	ND (0.0051)		8260B Low		1	09/19/17 20:36	C7I0305	CI71948





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-504 (4-5')  
 Date Sampled: 09/15/17 09:55  
 Percent Solids: 98  
 Initial Volume: 5  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709470  
 ESS Laboratory Sample ID: 1709470-08  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0051)		8260B Low		1	09/19/17 20:36	C7I0305	CI71948
trans-1,2-Dichloroethene	ND (0.0051)		8260B Low		1	09/19/17 20:36	C7I0305	CI71948
trans-1,3-Dichloropropene	ND (0.0051)		8260B Low		1	09/19/17 20:36	C7I0305	CI71948
Trichloroethene	ND (0.0051)		8260B Low		1	09/19/17 20:36	C7I0305	CI71948
Trichlorofluoromethane	ND (0.0051)		8260B Low		1	09/19/17 20:36	C7I0305	CI71948
Vinyl Acetate	ND (0.0051)		8260B Low		1	09/19/17 20:36	C7I0305	CI71948
Vinyl Chloride	ND (0.0102)		8260B Low		1	09/19/17 20:36	C7I0305	CI71948
Xylene O	ND (0.0051)		8260B Low		1	09/19/17 20:36	C7I0305	CI71948
Xylene P,M	ND (0.0102)		8260B Low		1	09/19/17 20:36	C7I0305	CI71948
Xylenes (Total)	ND (0.0102)		8260B Low		1	09/19/17 20:36		[CALC]

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: 1,2-Dichloroethane-d4	95 %		70-130
Surrogate: 4-Bromofluorobenzene	99 %		70-130
Surrogate: Dibromofluoromethane	99 %		70-130
Surrogate: Toluene-d8	104 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-504 (4-5')  
 Date Sampled: 09/15/17 09:55  
 Percent Solids: 98  
 Initial Volume: 19.8  
 Final Volume: 2  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709470  
 ESS Laboratory Sample ID: 1709470-08  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: SMR  
 Prepared: 9/18/17 12:50

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	1080 (775)		8100M		10	09/19/17 3:17	C710279	CI71821

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: O-Terphenyl</i>	92 %		40-140



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-504 (4-5')  
Date Sampled: 09/15/17 09:55  
Percent Solids: 98  
Initial Volume: 15.1  
Final Volume: 1  
Extraction Method: 3546

ESS Laboratory Work Order: 1709470  
ESS Laboratory Sample ID: 1709470-08  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: TJ  
Prepared: 9/18/17 11:30

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (1.35)		8270D		2	09/19/17 3:26	C7I0262	CI71818
Acenaphthene	ND (1.35)		8270D		2	09/19/17 3:26	C7I0262	CI71818
Acenaphthylene	ND (1.35)		8270D		2	09/19/17 3:26	C7I0262	CI71818
Anthracene	ND (1.35)		8270D		2	09/19/17 3:26	C7I0262	CI71818
<b>Benzo(a)anthracene</b>	<b>2.01</b> (0.679)		8270D		2	09/19/17 3:26	C7I0262	CI71818
<b>Benzo(a)pyrene</b>	<b>2.00</b> (0.338)		8270D		2	09/19/17 3:26	C7I0262	CI71818
<b>Benzo(b)fluoranthene</b>	<b>2.22</b> (0.679)		8270D		2	09/19/17 3:26	C7I0262	CI71818
<b>Benzo(g,h,i)perylene</b>	<b>1.06</b> (0.679)		8270D		2	09/19/17 3:26	C7I0262	CI71818
<b>Benzo(k)fluoranthene</b>	<b>1.08</b> (0.679)		8270D		2	09/19/17 3:26	C7I0262	CI71818
<b>Chrysene</b>	<b>1.78</b> (0.338)		8270D		2	09/19/17 3:26	C7I0262	CI71818
<b>Dibenzo(a,h)Anthracene</b>	<b>0.439</b> (0.338)		8270D		2	09/19/17 3:26	C7I0262	CI71818
<b>Fluoranthene</b>	<b>3.57</b> (1.35)		8270D		2	09/19/17 3:26	C7I0262	CI71818
Fluorene	ND (1.35)		8270D		2	09/19/17 3:26	C7I0262	CI71818
<b>Indeno(1,2,3-cd)Pyrene</b>	<b>0.884</b> (0.679)		8270D		2	09/19/17 3:26	C7I0262	CI71818
Naphthalene	ND (0.679)		8270D		2	09/19/17 3:26	C7I0262	CI71818
<b>Phenanthrene</b>	<b>1.76</b> (1.35)		8270D		2	09/19/17 3:26	C7I0262	CI71818
<b>Pyrene</b>	<b>3.23</b> (1.35)		8270D		2	09/19/17 3:26	C7I0262	CI71818

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	57 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	60 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	54 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	65 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-504 (4-5')  
Date Sampled: 09/15/17 09:55  
Percent Solids: 98

ESS Laboratory Work Order: 1709470  
ESS Laboratory Sample ID: 1709470-08  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	ND (0.96)		9014		1	EEM	09/21/17 12:25	mg/kg dry	CI72119





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-505 (0-2')  
 Date Sampled: 09/15/17 11:10  
 Percent Solids: 98

ESS Laboratory Work Order: 1709470  
 ESS Laboratory Sample ID: 1709470-09  
 Sample Matrix: Soil  
 Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (1.88)		6020A		20	NAR	09/22/17 0:39	2.17	100	CI71936
Arsenic	ND (2.35)		6010C		1	KJK	09/22/17 21:57	2.17	100	CI71936
<b>Beryllium</b>	<b>0.23</b> (0.10)		6010C		1	KJK	09/23/17 19:53	2.17	100	CI71936
Cadmium	ND (0.47)		6010C		1	KJK	09/22/17 21:57	2.17	100	CI71936
<b>Chromium</b>	<b>3.81</b> (0.94)		6010C		1	KJK	09/22/17 21:57	2.17	100	CI71936
<b>Copper</b>	<b>9.06</b> (2.35)		6010C		1	KJK	09/22/17 21:57	2.17	100	CI71936
<b>Lead</b>	<b>17.3</b> (4.71)		6010C		1	KJK	09/22/17 21:57	2.17	100	CI71936
Mercury	ND (0.027)		7471B		1	MJV	09/22/17 21:05	0.76	40	CI71940
<b>Nickel</b>	<b>3.80</b> (2.35)		6010C		1	KJK	09/22/17 21:57	2.17	100	CI71936
Selenium	ND (1.88)		6020A		20	NAR	09/22/17 0:39	2.17	100	CI71936
Silver	ND (0.47)		6010C		1	KJK	09/22/17 21:57	2.17	100	CI71936
Thallium	ND (1.88)		6020A		20	NAR	09/22/17 0:39	2.17	100	CI71936
<b>Zinc</b>	<b>29.7</b> (2.35)		6010C		1	KJK	09/22/17 21:57	2.17	100	CI71936



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-505 (0-2')  
 Date Sampled: 09/15/17 11:10  
 Percent Solids: 98  
 Initial Volume: 8  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709470  
 ESS Laboratory Sample ID: 1709470-09  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0032)		8260B Low		1	09/19/17 21:02	C7I0305	CI71948
1,1,1-Trichloroethane	ND (0.0032)		8260B Low		1	09/19/17 21:02	C7I0305	CI71948
1,1,2,2-Tetrachloroethane	ND (0.0032)		8260B Low		1	09/19/17 21:02	C7I0305	CI71948
1,1,2-Trichloroethane	ND (0.0032)		8260B Low		1	09/19/17 21:02	C7I0305	CI71948
1,1-Dichloroethane	ND (0.0032)		8260B Low		1	09/19/17 21:02	C7I0305	CI71948
1,1-Dichloroethene	ND (0.0032)		8260B Low		1	09/19/17 21:02	C7I0305	CI71948
1,1-Dichloropropene	ND (0.0032)		8260B Low		1	09/19/17 21:02	C7I0305	CI71948
1,2,3-Trichlorobenzene	ND (0.0032)		8260B Low		1	09/19/17 21:02	C7I0305	CI71948
1,2,3-Trichloropropane	ND (0.0032)		8260B Low		1	09/19/17 21:02	C7I0305	CI71948
1,2,4-Trichlorobenzene	ND (0.0032)		8260B Low		1	09/19/17 21:02	C7I0305	CI71948
1,2,4-Trimethylbenzene	ND (0.0032)		8260B Low		1	09/19/17 21:02	C7I0305	CI71948
1,2-Dibromo-3-Chloropropane	ND (0.0032)		8260B Low		1	09/19/17 21:02	C7I0305	CI71948
1,2-Dibromoethane	ND (0.0032)		8260B Low		1	09/19/17 21:02	C7I0305	CI71948
1,2-Dichlorobenzene	ND (0.0032)		8260B Low		1	09/19/17 21:02	C7I0305	CI71948
1,2-Dichloroethane	ND (0.0032)		8260B Low		1	09/19/17 21:02	C7I0305	CI71948
1,2-Dichloropropane	ND (0.0032)		8260B Low		1	09/19/17 21:02	C7I0305	CI71948
1,3,5-Trimethylbenzene	ND (0.0032)		8260B Low		1	09/19/17 21:02	C7I0305	CI71948
1,3-Dichlorobenzene	ND (0.0032)		8260B Low		1	09/19/17 21:02	C7I0305	CI71948
1,3-Dichloropropane	ND (0.0032)		8260B Low		1	09/19/17 21:02	C7I0305	CI71948
1,4-Dichlorobenzene	ND (0.0032)		8260B Low		1	09/19/17 21:02	C7I0305	CI71948
1,4-Dioxane	ND (0.0638)		8260B Low		1	09/19/17 21:02	C7I0305	CI71948
1-Chlorohexane	ND (0.0032)		8260B Low		1	09/19/17 21:02	C7I0305	CI71948
2,2-Dichloropropane	ND (0.0032)		8260B Low		1	09/19/17 21:02	C7I0305	CI71948
2-Butanone	ND (0.0319)		8260B Low		1	09/19/17 21:02	C7I0305	CI71948
2-Chlorotoluene	ND (0.0032)		8260B Low		1	09/19/17 21:02	C7I0305	CI71948
2-Hexanone	ND (0.0319)		8260B Low		1	09/19/17 21:02	C7I0305	CI71948
4-Chlorotoluene	ND (0.0032)		8260B Low		1	09/19/17 21:02	C7I0305	CI71948
4-Isopropyltoluene	ND (0.0032)		8260B Low		1	09/19/17 21:02	C7I0305	CI71948
4-Methyl-2-Pentanone	ND (0.0319)		8260B Low		1	09/19/17 21:02	C7I0305	CI71948
Acetone	ND (0.0319)		8260B Low		1	09/19/17 21:02	C7I0305	CI71948
Benzene	ND (0.0032)		8260B Low		1	09/19/17 21:02	C7I0305	CI71948
Bromobenzene	ND (0.0032)		8260B Low		1	09/19/17 21:02	C7I0305	CI71948



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-505 (0-2')  
 Date Sampled: 09/15/17 11:10  
 Percent Solids: 98  
 Initial Volume: 8  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709470  
 ESS Laboratory Sample ID: 1709470-09  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0032)		8260B Low		1	09/19/17 21:02	C7I0305	CI71948
Bromodichloromethane	ND (0.0032)		8260B Low		1	09/19/17 21:02	C7I0305	CI71948
Bromoform	ND (0.0032)		8260B Low		1	09/19/17 21:02	C7I0305	CI71948
Bromomethane	ND (0.0064)		8260B Low		1	09/19/17 21:02	C7I0305	CI71948
Carbon Disulfide	ND (0.0032)		8260B Low		1	09/19/17 21:02	C7I0305	CI71948
Carbon Tetrachloride	ND (0.0032)		8260B Low		1	09/19/17 21:02	C7I0305	CI71948
Chlorobenzene	ND (0.0032)		8260B Low		1	09/19/17 21:02	C7I0305	CI71948
Chloroethane	ND (0.0064)		8260B Low		1	09/19/17 21:02	C7I0305	CI71948
Chloroform	ND (0.0032)		8260B Low		1	09/19/17 21:02	C7I0305	CI71948
Chloromethane	ND (0.0064)		8260B Low		1	09/19/17 21:02	C7I0305	CI71948
cis-1,2-Dichloroethene	ND (0.0032)		8260B Low		1	09/19/17 21:02	C7I0305	CI71948
cis-1,3-Dichloropropene	ND (0.0032)		8260B Low		1	09/19/17 21:02	C7I0305	CI71948
Dibromochloromethane	ND (0.0032)		8260B Low		1	09/19/17 21:02	C7I0305	CI71948
Dibromomethane	ND (0.0032)		8260B Low		1	09/19/17 21:02	C7I0305	CI71948
Dichlorodifluoromethane	ND (0.0064)		8260B Low		1	09/19/17 21:02	C7I0305	CI71948
Diethyl Ether	ND (0.0032)		8260B Low		1	09/19/17 21:02	C7I0305	CI71948
Di-isopropyl ether	ND (0.0032)		8260B Low		1	09/19/17 21:02	C7I0305	CI71948
Ethyl tertiary-butyl ether	ND (0.0032)		8260B Low		1	09/19/17 21:02	C7I0305	CI71948
Ethylbenzene	ND (0.0032)		8260B Low		1	09/19/17 21:02	C7I0305	CI71948
Hexachlorobutadiene	ND (0.0032)		8260B Low		1	09/19/17 21:02	C7I0305	CI71948
Isopropylbenzene	ND (0.0032)		8260B Low		1	09/19/17 21:02	C7I0305	CI71948
Methyl tert-Butyl Ether	ND (0.0032)		8260B Low		1	09/19/17 21:02	C7I0305	CI71948
Methylene Chloride	ND (0.0160)		8260B Low		1	09/19/17 21:02	C7I0305	CI71948
Naphthalene	ND (0.0032)		8260B Low		1	09/19/17 21:02	C7I0305	CI71948
n-Butylbenzene	ND (0.0032)		8260B Low		1	09/19/17 21:02	C7I0305	CI71948
n-Propylbenzene	ND (0.0032)		8260B Low		1	09/19/17 21:02	C7I0305	CI71948
sec-Butylbenzene	ND (0.0032)		8260B Low		1	09/19/17 21:02	C7I0305	CI71948
Styrene	ND (0.0032)		8260B Low		1	09/19/17 21:02	C7I0305	CI71948
tert-Butylbenzene	ND (0.0032)		8260B Low		1	09/19/17 21:02	C7I0305	CI71948
Tertiary-amyl methyl ether	ND (0.0032)		8260B Low		1	09/19/17 21:02	C7I0305	CI71948
Tetrachloroethene	ND (0.0032)		8260B Low		1	09/19/17 21:02	C7I0305	CI71948
Tetrahydrofuran	ND (0.0032)		8260B Low		1	09/19/17 21:02	C7I0305	CI71948



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-505 (0-2')  
 Date Sampled: 09/15/17 11:10  
 Percent Solids: 98  
 Initial Volume: 8  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709470  
 ESS Laboratory Sample ID: 1709470-09  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0032)		8260B Low		1	09/19/17 21:02	C7I0305	CI71948
trans-1,2-Dichloroethene	ND (0.0032)		8260B Low		1	09/19/17 21:02	C7I0305	CI71948
trans-1,3-Dichloropropene	ND (0.0032)		8260B Low		1	09/19/17 21:02	C7I0305	CI71948
Trichloroethene	ND (0.0032)		8260B Low		1	09/19/17 21:02	C7I0305	CI71948
Trichlorofluoromethane	ND (0.0032)		8260B Low		1	09/19/17 21:02	C7I0305	CI71948
Vinyl Acetate	ND (0.0032)		8260B Low		1	09/19/17 21:02	C7I0305	CI71948
Vinyl Chloride	ND (0.0064)		8260B Low		1	09/19/17 21:02	C7I0305	CI71948
Xylene O	ND (0.0032)		8260B Low		1	09/19/17 21:02	C7I0305	CI71948
Xylene P,M	ND (0.0064)		8260B Low		1	09/19/17 21:02	C7I0305	CI71948
Xylenes (Total)	ND (0.0064)		8260B Low		1	09/19/17 21:02		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	98 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	101 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	100 %		70-130
<i>Surrogate: Toluene-d8</i>	101 %		70-130





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-505 (0-2')  
Date Sampled: 09/15/17 11:10  
Percent Solids: 98  
Initial Volume: 20.9  
Final Volume: 1  
Extraction Method: 3546

ESS Laboratory Work Order: 1709470  
ESS Laboratory Sample ID: 1709470-09  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: SMR  
Prepared: 9/18/17 12:50

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	287 (183)		8100M		5	09/19/17 3:56	C710279	CI71821
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		84 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-505 (0-2')  
Date Sampled: 09/15/17 11:10  
Percent Solids: 98  
Initial Volume: 15.7  
Final Volume: 0.5  
Extraction Method: 3546

ESS Laboratory Work Order: 1709470  
ESS Laboratory Sample ID: 1709470-09  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: TJ  
Prepared: 9/18/17 11:30

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.650)		8270D		2	09/19/17 21:31	C7I0308	CI71818
Acenaphthene	ND (0.650)		8270D		2	09/19/17 21:31	C7I0308	CI71818
Acenaphthylene	ND (0.650)		8270D		2	09/19/17 21:31	C7I0308	CI71818
Anthracene	ND (0.650)		8270D		2	09/19/17 21:31	C7I0308	CI71818
<b>Benzo(a)anthracene</b>	<b>1.36</b> (0.650)		8270D		2	09/19/17 21:31	C7I0308	CI71818
<b>Benzo(a)pyrene</b>	<b>1.33</b> (0.326)		8270D		2	09/19/17 21:31	C7I0308	CI71818
<b>Benzo(b)fluoranthene</b>	<b>1.41</b> (0.650)		8270D		2	09/19/17 21:31	C7I0308	CI71818
Benzo(g,h,i)perylene	ND (0.650)		8270D		2	09/19/17 21:31	C7I0308	CI71818
<b>Benzo(k)fluoranthene</b>	<b>1.34</b> (0.650)		8270D		2	09/19/17 21:31	C7I0308	CI71818
<b>Chrysene</b>	<b>1.39</b> (0.326)		8270D		2	09/19/17 21:31	C7I0308	CI71818
<b>Dibenzo(a,h)Anthracene</b>	<b>0.406</b> (0.326)		8270D		2	09/19/17 21:31	C7I0308	CI71818
<b>Fluoranthene</b>	<b>1.83</b> (0.650)		8270D		2	09/19/17 21:31	C7I0308	CI71818
Fluorene	ND (0.650)		8270D		2	09/19/17 21:31	C7I0308	CI71818
Indeno(1,2,3-cd)Pyrene	ND (0.650)		8270D		2	09/19/17 21:31	C7I0308	CI71818
Naphthalene	ND (0.650)		8270D		2	09/19/17 21:31	C7I0308	CI71818
Phenanthrene	ND (0.650)		8270D		2	09/19/17 21:31	C7I0308	CI71818
<b>Pyrene</b>	<b>1.69</b> (0.650)		8270D		2	09/19/17 21:31	C7I0308	CI71818

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	47 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	60 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	42 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	72 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-505 (0-2')  
Date Sampled: 09/15/17 11:10  
Percent Solids: 98

ESS Laboratory Work Order: 1709470  
ESS Laboratory Sample ID: 1709470-09  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	ND (1.01)		9014		1	EEM	09/21/17 12:25	mg/kg dry	CI72119



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-505 (4-5')  
Date Sampled: 09/15/17 11:35  
Percent Solids: 97

ESS Laboratory Work Order: 1709470  
ESS Laboratory Sample ID: 1709470-10  
Sample Matrix: Soil  
Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (1.94)		6020A		20	NAR	09/22/17 0:44	2.13	100	CI71936
Arsenic	<b>5.23</b> (2.42)		6010C		1	KJK	09/22/17 22:01	2.13	100	CI71936
Beryllium	<b>0.29</b> (0.11)		6010C		1	KJK	09/23/17 19:57	2.13	100	CI71936
Cadmium	ND (0.48)		6010C		1	KJK	09/22/17 22:01	2.13	100	CI71936
Chromium	<b>7.76</b> (0.97)		6010C		1	KJK	09/22/17 22:01	2.13	100	CI71936
Copper	<b>14.6</b> (2.42)		6010C		1	KJK	09/22/17 22:01	2.13	100	CI71936
Lead	<b>24.2</b> (4.84)		6010C		1	KJK	09/22/17 22:01	2.13	100	CI71936
Mercury	<b>0.037</b> (0.031)		7471B		1	MJV	09/22/17 21:07	0.66	40	CI71940
Nickel	<b>8.84</b> (2.42)		6010C		1	KJK	09/22/17 22:01	2.13	100	CI71936
Selenium	ND (1.94)		6020A		20	NAR	09/22/17 0:44	2.13	100	CI71936
Silver	ND (0.48)		6010C		1	KJK	09/22/17 22:01	2.13	100	CI71936
Thallium	ND (1.94)		6020A		20	NAR	09/22/17 0:44	2.13	100	CI71936
Zinc	<b>33.2</b> (2.42)		6010C		1	KJK	09/22/17 22:01	2.13	100	CI71936





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-505 (4-5')  
Date Sampled: 09/15/17 11:35  
Percent Solids: 97  
Initial Volume: 9.1  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1709470  
ESS Laboratory Sample ID: 1709470-10  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0028)		8260B Low		1	09/19/17 21:27	C7I0305	CI71948
1,1,1-Trichloroethane	ND (0.0028)		8260B Low		1	09/19/17 21:27	C7I0305	CI71948
1,1,2,2-Tetrachloroethane	ND (0.0028)		8260B Low		1	09/19/17 21:27	C7I0305	CI71948
1,1,2-Trichloroethane	ND (0.0028)		8260B Low		1	09/19/17 21:27	C7I0305	CI71948
1,1-Dichloroethane	ND (0.0028)		8260B Low		1	09/19/17 21:27	C7I0305	CI71948
1,1-Dichloroethene	ND (0.0028)		8260B Low		1	09/19/17 21:27	C7I0305	CI71948
1,1-Dichloropropene	ND (0.0028)		8260B Low		1	09/19/17 21:27	C7I0305	CI71948
1,2,3-Trichlorobenzene	ND (0.0028)		8260B Low		1	09/19/17 21:27	C7I0305	CI71948
1,2,3-Trichloropropane	ND (0.0028)		8260B Low		1	09/19/17 21:27	C7I0305	CI71948
1,2,4-Trichlorobenzene	ND (0.0028)		8260B Low		1	09/19/17 21:27	C7I0305	CI71948
1,2,4-Trimethylbenzene	ND (0.0028)		8260B Low		1	09/19/17 21:27	C7I0305	CI71948
1,2-Dibromo-3-Chloropropane	ND (0.0028)		8260B Low		1	09/19/17 21:27	C7I0305	CI71948
1,2-Dibromoethane	ND (0.0028)		8260B Low		1	09/19/17 21:27	C7I0305	CI71948
1,2-Dichlorobenzene	ND (0.0028)		8260B Low		1	09/19/17 21:27	C7I0305	CI71948
1,2-Dichloroethane	ND (0.0028)		8260B Low		1	09/19/17 21:27	C7I0305	CI71948
1,2-Dichloropropane	ND (0.0028)		8260B Low		1	09/19/17 21:27	C7I0305	CI71948
1,3,5-Trimethylbenzene	ND (0.0028)		8260B Low		1	09/19/17 21:27	C7I0305	CI71948
1,3-Dichlorobenzene	ND (0.0028)		8260B Low		1	09/19/17 21:27	C7I0305	CI71948
1,3-Dichloropropane	ND (0.0028)		8260B Low		1	09/19/17 21:27	C7I0305	CI71948
1,4-Dichlorobenzene	ND (0.0028)		8260B Low		1	09/19/17 21:27	C7I0305	CI71948
1,4-Dioxane	ND (0.0567)		8260B Low		1	09/19/17 21:27	C7I0305	CI71948
1-Chlorohexane	ND (0.0028)		8260B Low		1	09/19/17 21:27	C7I0305	CI71948
2,2-Dichloropropane	ND (0.0028)		8260B Low		1	09/19/17 21:27	C7I0305	CI71948
2-Butanone	ND (0.0283)		8260B Low		1	09/19/17 21:27	C7I0305	CI71948
2-Chlorotoluene	ND (0.0028)		8260B Low		1	09/19/17 21:27	C7I0305	CI71948
2-Hexanone	ND (0.0283)		8260B Low		1	09/19/17 21:27	C7I0305	CI71948
4-Chlorotoluene	ND (0.0028)		8260B Low		1	09/19/17 21:27	C7I0305	CI71948
4-Isopropyltoluene	ND (0.0028)		8260B Low		1	09/19/17 21:27	C7I0305	CI71948
4-Methyl-2-Pentanone	ND (0.0283)		8260B Low		1	09/19/17 21:27	C7I0305	CI71948
Acetone	ND (0.0283)		8260B Low		1	09/19/17 21:27	C7I0305	CI71948
Benzene	ND (0.0028)		8260B Low		1	09/19/17 21:27	C7I0305	CI71948
Bromobenzene	ND (0.0028)		8260B Low		1	09/19/17 21:27	C7I0305	CI71948



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-505 (4-5')  
Date Sampled: 09/15/17 11:35  
Percent Solids: 97  
Initial Volume: 9.1  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1709470  
ESS Laboratory Sample ID: 1709470-10  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0028)		8260B Low		1	09/19/17 21:27	C7I0305	CI71948
Bromodichloromethane	ND (0.0028)		8260B Low		1	09/19/17 21:27	C7I0305	CI71948
Bromoform	ND (0.0028)		8260B Low		1	09/19/17 21:27	C7I0305	CI71948
Bromomethane	ND (0.0057)		8260B Low		1	09/19/17 21:27	C7I0305	CI71948
Carbon Disulfide	ND (0.0028)		8260B Low		1	09/19/17 21:27	C7I0305	CI71948
Carbon Tetrachloride	ND (0.0028)		8260B Low		1	09/19/17 21:27	C7I0305	CI71948
Chlorobenzene	ND (0.0028)		8260B Low		1	09/19/17 21:27	C7I0305	CI71948
Chloroethane	ND (0.0057)		8260B Low		1	09/19/17 21:27	C7I0305	CI71948
Chloroform	ND (0.0028)		8260B Low		1	09/19/17 21:27	C7I0305	CI71948
Chloromethane	ND (0.0057)		8260B Low		1	09/19/17 21:27	C7I0305	CI71948
cis-1,2-Dichloroethene	ND (0.0028)		8260B Low		1	09/19/17 21:27	C7I0305	CI71948
cis-1,3-Dichloropropene	ND (0.0028)		8260B Low		1	09/19/17 21:27	C7I0305	CI71948
Dibromochloromethane	ND (0.0028)		8260B Low		1	09/19/17 21:27	C7I0305	CI71948
Dibromomethane	ND (0.0028)		8260B Low		1	09/19/17 21:27	C7I0305	CI71948
Dichlorodifluoromethane	ND (0.0057)		8260B Low		1	09/19/17 21:27	C7I0305	CI71948
Diethyl Ether	ND (0.0028)		8260B Low		1	09/19/17 21:27	C7I0305	CI71948
Di-isopropyl ether	ND (0.0028)		8260B Low		1	09/19/17 21:27	C7I0305	CI71948
Ethyl tertiary-butyl ether	ND (0.0028)		8260B Low		1	09/19/17 21:27	C7I0305	CI71948
Ethylbenzene	ND (0.0028)		8260B Low		1	09/19/17 21:27	C7I0305	CI71948
Hexachlorobutadiene	ND (0.0028)		8260B Low		1	09/19/17 21:27	C7I0305	CI71948
Isopropylbenzene	ND (0.0028)		8260B Low		1	09/19/17 21:27	C7I0305	CI71948
Methyl tert-Butyl Ether	ND (0.0028)		8260B Low		1	09/19/17 21:27	C7I0305	CI71948
Methylene Chloride	ND (0.0142)		8260B Low		1	09/19/17 21:27	C7I0305	CI71948
Naphthalene	ND (0.0028)		8260B Low		1	09/19/17 21:27	C7I0305	CI71948
n-Butylbenzene	ND (0.0028)		8260B Low		1	09/19/17 21:27	C7I0305	CI71948
n-Propylbenzene	ND (0.0028)		8260B Low		1	09/19/17 21:27	C7I0305	CI71948
sec-Butylbenzene	ND (0.0028)		8260B Low		1	09/19/17 21:27	C7I0305	CI71948
Styrene	ND (0.0028)		8260B Low		1	09/19/17 21:27	C7I0305	CI71948
tert-Butylbenzene	ND (0.0028)		8260B Low		1	09/19/17 21:27	C7I0305	CI71948
Tertiary-amyl methyl ether	ND (0.0028)		8260B Low		1	09/19/17 21:27	C7I0305	CI71948
Tetrachloroethene	ND (0.0028)		8260B Low		1	09/19/17 21:27	C7I0305	CI71948
Tetrahydrofuran	ND (0.0028)		8260B Low		1	09/19/17 21:27	C7I0305	CI71948



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-505 (4-5')  
 Date Sampled: 09/15/17 11:35  
 Percent Solids: 97  
 Initial Volume: 9.1  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709470  
 ESS Laboratory Sample ID: 1709470-10  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0028)		8260B Low		1	09/19/17 21:27	C7I0305	CI71948
trans-1,2-Dichloroethene	ND (0.0028)		8260B Low		1	09/19/17 21:27	C7I0305	CI71948
trans-1,3-Dichloropropene	ND (0.0028)		8260B Low		1	09/19/17 21:27	C7I0305	CI71948
Trichloroethene	ND (0.0028)		8260B Low		1	09/19/17 21:27	C7I0305	CI71948
Trichlorofluoromethane	ND (0.0028)		8260B Low		1	09/19/17 21:27	C7I0305	CI71948
Vinyl Acetate	ND (0.0028)		8260B Low		1	09/19/17 21:27	C7I0305	CI71948
Vinyl Chloride	ND (0.0057)		8260B Low		1	09/19/17 21:27	C7I0305	CI71948
Xylene O	ND (0.0028)		8260B Low		1	09/19/17 21:27	C7I0305	CI71948
Xylene P,M	ND (0.0057)		8260B Low		1	09/19/17 21:27	C7I0305	CI71948
Xylenes (Total)	ND (0.0057)		8260B Low		1	09/19/17 21:27		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	97 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	104 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	100 %		70-130
<i>Surrogate: Toluene-d8</i>	100 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-505 (4-5')  
 Date Sampled: 09/15/17 11:35  
 Percent Solids: 97  
 Initial Volume: 20.5  
 Final Volume: 1  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709470  
 ESS Laboratory Sample ID: 1709470-10  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: SMR  
 Prepared: 9/18/17 12:50

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	195 (189)		8100M		5	09/19/17 4:34	C710279	CI71821

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: O-Terphenyl</i>	91 %		40-140





CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-505 (4-5')  
Date Sampled: 09/15/17 11:35  
Percent Solids: 97  
Initial Volume: 15.9  
Final Volume: 0.5  
Extraction Method: 3546

ESS Laboratory Work Order: 1709470  
ESS Laboratory Sample ID: 1709470-10  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: TJ  
Prepared: 9/18/17 11:30

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.324)		8270D		1	09/19/17 22:07	C7I0308	CI71818
Acenaphthene	ND (0.324)		8270D		1	09/19/17 22:07	C7I0308	CI71818
Acenaphthylene	ND (0.324)		8270D		1	09/19/17 22:07	C7I0308	CI71818
Anthracene	ND (0.324)		8270D		1	09/19/17 22:07	C7I0308	CI71818
<b>Benzo(a)anthracene</b>	<b>0.952</b> (0.324)		8270D		1	09/19/17 22:07	C7I0308	CI71818
<b>Benzo(a)pyrene</b>	<b>0.964</b> (0.163)		8270D		1	09/19/17 22:07	C7I0308	CI71818
<b>Benzo(b)fluoranthene</b>	<b>1.23</b> (0.324)		8270D		1	09/19/17 22:07	C7I0308	CI71818
<b>Benzo(g,h,i)perylene</b>	<b>0.553</b> (0.324)		8270D		1	09/19/17 22:07	C7I0308	CI71818
<b>Benzo(k)fluoranthene</b>	<b>0.827</b> (0.324)		8270D		1	09/19/17 22:07	C7I0308	CI71818
<b>Chrysene</b>	<b>0.970</b> (0.163)		8270D		1	09/19/17 22:07	C7I0308	CI71818
<b>Dibenzo(a,h)Anthracene</b>	<b>0.278</b> (0.163)		8270D		1	09/19/17 22:07	C7I0308	CI71818
<b>Fluoranthene</b>	<b>1.99</b> (0.324)		8270D		1	09/19/17 22:07	C7I0308	CI71818
Fluorene	ND (0.324)		8270D		1	09/19/17 22:07	C7I0308	CI71818
<b>Indeno(1,2,3-cd)Pyrene</b>	<b>0.459</b> (0.324)		8270D		1	09/19/17 22:07	C7I0308	CI71818
Naphthalene	ND (0.324)		8270D		1	09/19/17 22:07	C7I0308	CI71818
<b>Phenanthrene</b>	<b>0.704</b> (0.324)		8270D		1	09/19/17 22:07	C7I0308	CI71818
<b>Pyrene</b>	<b>1.55</b> (0.324)		8270D		1	09/19/17 22:07	C7I0308	CI71818

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: 1,2-Dichlorobenzene-d4	57 %		30-130
Surrogate: 2-Fluorobiphenyl	71 %		30-130
Surrogate: Nitrobenzene-d5	52 %		30-130
Surrogate: p-Terphenyl-d14	88 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-505 (4-5')  
Date Sampled: 09/15/17 11:35  
Percent Solids: 97

ESS Laboratory Work Order: 1709470  
ESS Laboratory Sample ID: 1709470-10  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	ND (1.02)		9014		1	EEM	09/21/17 12:25	mg/kg dry	CI72119



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-506 (1-2')  
 Date Sampled: 09/15/17 13:00  
 Percent Solids: 94

ESS Laboratory Work Order: 1709470  
 ESS Laboratory Sample ID: 1709470-11  
 Sample Matrix: Soil  
 Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (1.89)		6020A		20	NAR	09/22/17 0:49	2.25	100	CI71936
Arsenic	ND (2.36)		6010C		1	KJK	09/22/17 22:05	2.25	100	CI71936
<b>Beryllium</b>	<b>0.20</b> (0.10)		6010C		1	KJK	09/23/17 20:01	2.25	100	CI71936
Cadmium	ND (0.47)		6010C		1	KJK	09/22/17 22:05	2.25	100	CI71936
<b>Chromium</b>	<b>2.17</b> (0.94)		6010C		1	KJK	09/22/17 22:05	2.25	100	CI71936
<b>Copper</b>	<b>6.77</b> (2.36)		6010C		1	KJK	09/22/17 22:05	2.25	100	CI71936
Lead	ND (4.72)		6010C		1	KJK	09/22/17 22:05	2.25	100	CI71936
Mercury	ND (0.030)		7471B		1	MJV	09/22/17 21:09	0.71	40	CI71940
Nickel	ND (2.36)		6010C		1	KJK	09/22/17 22:05	2.25	100	CI71936
Selenium	ND (1.89)		6020A		20	NAR	09/22/17 0:49	2.25	100	CI71936
Silver	ND (0.47)		6010C		1	KJK	09/22/17 22:05	2.25	100	CI71936
Thallium	ND (1.89)		6020A		20	NAR	09/22/17 0:49	2.25	100	CI71936
<b>Zinc</b>	<b>32.0</b> (2.36)		6010C		1	KJK	09/22/17 22:05	2.25	100	CI71936



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-506 (1-2')  
Date Sampled: 09/15/17 13:00  
Percent Solids: 94  
Initial Volume: 7.5  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1709470  
ESS Laboratory Sample ID: 1709470-11  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0035)		8260B Low		1	09/19/17 21:53	C7I0305	CI71948
1,1,1-Trichloroethane	ND (0.0035)		8260B Low		1	09/19/17 21:53	C7I0305	CI71948
1,1,2,2-Tetrachloroethane	ND (0.0035)		8260B Low		1	09/19/17 21:53	C7I0305	CI71948
1,1,2-Trichloroethane	ND (0.0035)		8260B Low		1	09/19/17 21:53	C7I0305	CI71948
1,1-Dichloroethane	ND (0.0035)		8260B Low		1	09/19/17 21:53	C7I0305	CI71948
1,1-Dichloroethene	ND (0.0035)		8260B Low		1	09/19/17 21:53	C7I0305	CI71948
1,1-Dichloropropene	ND (0.0035)		8260B Low		1	09/19/17 21:53	C7I0305	CI71948
1,2,3-Trichlorobenzene	ND (0.0035)		8260B Low		1	09/19/17 21:53	C7I0305	CI71948
1,2,3-Trichloropropane	ND (0.0035)		8260B Low		1	09/19/17 21:53	C7I0305	CI71948
1,2,4-Trichlorobenzene	ND (0.0035)		8260B Low		1	09/19/17 21:53	C7I0305	CI71948
1,2,4-Trimethylbenzene	ND (0.0035)		8260B Low		1	09/19/17 21:53	C7I0305	CI71948
1,2-Dibromo-3-Chloropropane	ND (0.0035)		8260B Low		1	09/19/17 21:53	C7I0305	CI71948
1,2-Dibromoethane	ND (0.0035)		8260B Low		1	09/19/17 21:53	C7I0305	CI71948
1,2-Dichlorobenzene	ND (0.0035)		8260B Low		1	09/19/17 21:53	C7I0305	CI71948
1,2-Dichloroethane	ND (0.0035)		8260B Low		1	09/19/17 21:53	C7I0305	CI71948
1,2-Dichloropropane	ND (0.0035)		8260B Low		1	09/19/17 21:53	C7I0305	CI71948
1,3,5-Trimethylbenzene	ND (0.0035)		8260B Low		1	09/19/17 21:53	C7I0305	CI71948
1,3-Dichlorobenzene	ND (0.0035)		8260B Low		1	09/19/17 21:53	C7I0305	CI71948
1,3-Dichloropropane	ND (0.0035)		8260B Low		1	09/19/17 21:53	C7I0305	CI71948
1,4-Dichlorobenzene	ND (0.0035)		8260B Low		1	09/19/17 21:53	C7I0305	CI71948
1,4-Dioxane	ND (0.0709)		8260B Low		1	09/19/17 21:53	C7I0305	CI71948
1-Chlorohexane	ND (0.0035)		8260B Low		1	09/19/17 21:53	C7I0305	CI71948
2,2-Dichloropropane	ND (0.0035)		8260B Low		1	09/19/17 21:53	C7I0305	CI71948
2-Butanone	ND (0.0354)		8260B Low		1	09/19/17 21:53	C7I0305	CI71948
2-Chlorotoluene	ND (0.0035)		8260B Low		1	09/19/17 21:53	C7I0305	CI71948
2-Hexanone	ND (0.0354)		8260B Low		1	09/19/17 21:53	C7I0305	CI71948
4-Chlorotoluene	ND (0.0035)		8260B Low		1	09/19/17 21:53	C7I0305	CI71948
4-Isopropyltoluene	ND (0.0035)		8260B Low		1	09/19/17 21:53	C7I0305	CI71948
4-Methyl-2-Pentanone	ND (0.0354)		8260B Low		1	09/19/17 21:53	C7I0305	CI71948
Acetone	ND (0.0354)		8260B Low		1	09/19/17 21:53	C7I0305	CI71948
Benzene	ND (0.0035)		8260B Low		1	09/19/17 21:53	C7I0305	CI71948
Bromobenzene	ND (0.0035)		8260B Low		1	09/19/17 21:53	C7I0305	CI71948





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-506 (1-2')  
 Date Sampled: 09/15/17 13:00  
 Percent Solids: 94  
 Initial Volume: 7.5  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709470  
 ESS Laboratory Sample ID: 1709470-11  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0035)		8260B Low		1	09/19/17 21:53	C7I0305	CI71948
Bromodichloromethane	ND (0.0035)		8260B Low		1	09/19/17 21:53	C7I0305	CI71948
Bromoform	ND (0.0035)		8260B Low		1	09/19/17 21:53	C7I0305	CI71948
Bromomethane	ND (0.0071)		8260B Low		1	09/19/17 21:53	C7I0305	CI71948
Carbon Disulfide	ND (0.0035)		8260B Low		1	09/19/17 21:53	C7I0305	CI71948
Carbon Tetrachloride	ND (0.0035)		8260B Low		1	09/19/17 21:53	C7I0305	CI71948
Chlorobenzene	ND (0.0035)		8260B Low		1	09/19/17 21:53	C7I0305	CI71948
Chloroethane	ND (0.0071)		8260B Low		1	09/19/17 21:53	C7I0305	CI71948
Chloroform	ND (0.0035)		8260B Low		1	09/19/17 21:53	C7I0305	CI71948
Chloromethane	ND (0.0071)		8260B Low		1	09/19/17 21:53	C7I0305	CI71948
cis-1,2-Dichloroethene	ND (0.0035)		8260B Low		1	09/19/17 21:53	C7I0305	CI71948
cis-1,3-Dichloropropene	ND (0.0035)		8260B Low		1	09/19/17 21:53	C7I0305	CI71948
Dibromochloromethane	ND (0.0035)		8260B Low		1	09/19/17 21:53	C7I0305	CI71948
Dibromomethane	ND (0.0035)		8260B Low		1	09/19/17 21:53	C7I0305	CI71948
Dichlorodifluoromethane	ND (0.0071)		8260B Low		1	09/19/17 21:53	C7I0305	CI71948
Diethyl Ether	ND (0.0035)		8260B Low		1	09/19/17 21:53	C7I0305	CI71948
Di-isopropyl ether	ND (0.0035)		8260B Low		1	09/19/17 21:53	C7I0305	CI71948
Ethyl tertiary-butyl ether	ND (0.0035)		8260B Low		1	09/19/17 21:53	C7I0305	CI71948
Ethylbenzene	ND (0.0035)		8260B Low		1	09/19/17 21:53	C7I0305	CI71948
Hexachlorobutadiene	ND (0.0035)		8260B Low		1	09/19/17 21:53	C7I0305	CI71948
Isopropylbenzene	ND (0.0035)		8260B Low		1	09/19/17 21:53	C7I0305	CI71948
Methyl tert-Butyl Ether	ND (0.0035)		8260B Low		1	09/19/17 21:53	C7I0305	CI71948
Methylene Chloride	ND (0.0177)		8260B Low		1	09/19/17 21:53	C7I0305	CI71948
Naphthalene	ND (0.0035)		8260B Low		1	09/19/17 21:53	C7I0305	CI71948
n-Butylbenzene	ND (0.0035)		8260B Low		1	09/19/17 21:53	C7I0305	CI71948
n-Propylbenzene	ND (0.0035)		8260B Low		1	09/19/17 21:53	C7I0305	CI71948
sec-Butylbenzene	ND (0.0035)		8260B Low		1	09/19/17 21:53	C7I0305	CI71948
Styrene	ND (0.0035)		8260B Low		1	09/19/17 21:53	C7I0305	CI71948
tert-Butylbenzene	ND (0.0035)		8260B Low		1	09/19/17 21:53	C7I0305	CI71948
Tertiary-amyl methyl ether	ND (0.0035)		8260B Low		1	09/19/17 21:53	C7I0305	CI71948
Tetrachloroethene	ND (0.0035)		8260B Low		1	09/19/17 21:53	C7I0305	CI71948
Tetrahydrofuran	ND (0.0035)		8260B Low		1	09/19/17 21:53	C7I0305	CI71948



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-506 (1-2')  
 Date Sampled: 09/15/17 13:00  
 Percent Solids: 94  
 Initial Volume: 7.5  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709470  
 ESS Laboratory Sample ID: 1709470-11  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0035)		8260B Low		1	09/19/17 21:53	C7I0305	CI71948
trans-1,2-Dichloroethene	ND (0.0035)		8260B Low		1	09/19/17 21:53	C7I0305	CI71948
trans-1,3-Dichloropropene	ND (0.0035)		8260B Low		1	09/19/17 21:53	C7I0305	CI71948
Trichloroethene	ND (0.0035)		8260B Low		1	09/19/17 21:53	C7I0305	CI71948
Trichlorofluoromethane	ND (0.0035)		8260B Low		1	09/19/17 21:53	C7I0305	CI71948
Vinyl Acetate	ND (0.0035)		8260B Low		1	09/19/17 21:53	C7I0305	CI71948
Vinyl Chloride	ND (0.0071)		8260B Low		1	09/19/17 21:53	C7I0305	CI71948
Xylene O	ND (0.0035)		8260B Low		1	09/19/17 21:53	C7I0305	CI71948
Xylene P,M	ND (0.0071)		8260B Low		1	09/19/17 21:53	C7I0305	CI71948
Xylenes (Total)	ND (0.0071)		8260B Low		1	09/19/17 21:53		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	97 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	105 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	100 %		70-130
<i>Surrogate: Toluene-d8</i>	99 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-506 (1-2')  
 Date Sampled: 09/15/17 13:00  
 Percent Solids: 94  
 Initial Volume: 19.5  
 Final Volume: 1  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709470  
 ESS Laboratory Sample ID: 1709470-11  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: SMR  
 Prepared: 9/18/17 12:50

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	ND (40.9)		8100M		1	09/18/17 19:39	C710279	CI71821
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		88 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-506 (1-2')  
Date Sampled: 09/15/17 13:00  
Percent Solids: 94  
Initial Volume: 14.8  
Final Volume: 0.5  
Extraction Method: 3546

ESS Laboratory Work Order: 1709470  
ESS Laboratory Sample ID: 1709470-11  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: TJ  
Prepared: 9/18/17 11:30

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.359)		8270D		1	09/19/17 22:42	C7I0308	CI71818
Acenaphthene	ND (0.359)		8270D		1	09/19/17 22:42	C7I0308	CI71818
Acenaphthylene	ND (0.359)		8270D		1	09/19/17 22:42	C7I0308	CI71818
Anthracene	ND (0.359)		8270D		1	09/19/17 22:42	C7I0308	CI71818
Benzo(a)anthracene	ND (0.359)		8270D		1	09/19/17 22:42	C7I0308	CI71818
Benzo(a)pyrene	ND (0.180)		8270D		1	09/19/17 22:42	C7I0308	CI71818
Benzo(b)fluoranthene	ND (0.359)		8270D		1	09/19/17 22:42	C7I0308	CI71818
Benzo(g,h,i)perylene	ND (0.359)		8270D		1	09/19/17 22:42	C7I0308	CI71818
Benzo(k)fluoranthene	ND (0.359)		8270D		1	09/19/17 22:42	C7I0308	CI71818
Chrysene	ND (0.180)		8270D		1	09/19/17 22:42	C7I0308	CI71818
Dibenzo(a,h)Anthracene	ND (0.180)		8270D		1	09/19/17 22:42	C7I0308	CI71818
Fluoranthene	ND (0.359)		8270D		1	09/19/17 22:42	C7I0308	CI71818
Fluorene	ND (0.359)		8270D		1	09/19/17 22:42	C7I0308	CI71818
Indeno(1,2,3-cd)Pyrene	ND (0.359)		8270D		1	09/19/17 22:42	C7I0308	CI71818
Naphthalene	ND (0.359)		8270D		1	09/19/17 22:42	C7I0308	CI71818
Phenanthrene	ND (0.359)		8270D		1	09/19/17 22:42	C7I0308	CI71818
Pyrene	ND (0.359)		8270D		1	09/19/17 22:42	C7I0308	CI71818

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: 1,2-Dichlorobenzene-d4	57 %		30-130
Surrogate: 2-Fluorobiphenyl	65 %		30-130
Surrogate: Nitrobenzene-d5	49 %		30-130
Surrogate: p-Terphenyl-d14	83 %		30-130





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-506 (1-2')  
Date Sampled: 09/15/17 13:00  
Percent Solids: 94

ESS Laboratory Work Order: 1709470  
ESS Laboratory Sample ID: 1709470-11  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	ND (0.99)		9014		1	EEM	09/21/17 12:25	mg/kg dry	CI72119



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-506 (10-11')  
 Date Sampled: 09/15/17 13:25  
 Percent Solids: 89

ESS Laboratory Work Order: 1709470  
 ESS Laboratory Sample ID: 1709470-12  
 Sample Matrix: Soil  
 Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (1.66)		6020A		20	NAR	09/22/17 0:54	2.7	100	CI71936
Arsenic	<b>11.0</b> (2.08)		6010C		1	KJK	09/22/17 22:08	2.7	100	CI71936
Beryllium	<b>0.28</b> (0.09)		6010C		1	KJK	09/23/17 20:17	2.7	100	CI71936
Cadmium	ND (0.42)		6010C		1	KJK	09/22/17 22:08	2.7	100	CI71936
Chromium	<b>27.4</b> (0.83)		6010C		1	KJK	09/22/17 22:08	2.7	100	CI71936
Copper	<b>79.3</b> (2.08)		6010C		1	KJK	09/22/17 22:08	2.7	100	CI71936
Lead	<b>32.3</b> (4.16)		6010C		1	KJK	09/22/17 22:08	2.7	100	CI71936
Mercury	<b>0.049</b> (0.034)		7471B		1	MJV	09/22/17 21:11	0.66	40	CI71940
Nickel	<b>12.2</b> (2.08)		6010C		1	KJK	09/22/17 22:08	2.7	100	CI71936
Selenium	ND (1.66)		6020A		20	NAR	09/22/17 0:54	2.7	100	CI71936
Silver	ND (0.42)		6010C		1	KJK	09/22/17 22:08	2.7	100	CI71936
Thallium	ND (1.66)		6020A		20	NAR	09/22/17 0:54	2.7	100	CI71936
Zinc	<b>17.6</b> (2.08)		6010C		1	KJK	09/22/17 22:08	2.7	100	CI71936



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-506 (10-11')  
 Date Sampled: 09/15/17 13:25  
 Percent Solids: 89  
 Initial Volume: 6.5  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709470  
 ESS Laboratory Sample ID: 1709470-12  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0043)		8260B Low		1	09/19/17 22:18	C7I0305	CI71948
1,1,1-Trichloroethane	ND (0.0043)		8260B Low		1	09/19/17 22:18	C7I0305	CI71948
1,1,2,2-Tetrachloroethane	ND (0.0043)		8260B Low		1	09/19/17 22:18	C7I0305	CI71948
1,1,2-Trichloroethane	ND (0.0043)		8260B Low		1	09/19/17 22:18	C7I0305	CI71948
1,1-Dichloroethane	ND (0.0043)		8260B Low		1	09/19/17 22:18	C7I0305	CI71948
1,1-Dichloroethene	ND (0.0043)		8260B Low		1	09/19/17 22:18	C7I0305	CI71948
1,1-Dichloropropene	ND (0.0043)		8260B Low		1	09/19/17 22:18	C7I0305	CI71948
1,2,3-Trichlorobenzene	ND (0.0043)		8260B Low		1	09/19/17 22:18	C7I0305	CI71948
1,2,3-Trichloropropane	ND (0.0043)		8260B Low		1	09/19/17 22:18	C7I0305	CI71948
1,2,4-Trichlorobenzene	ND (0.0043)		8260B Low		1	09/19/17 22:18	C7I0305	CI71948
1,2,4-Trimethylbenzene	ND (0.0043)		8260B Low		1	09/19/17 22:18	C7I0305	CI71948
1,2-Dibromo-3-Chloropropane	ND (0.0043)		8260B Low		1	09/19/17 22:18	C7I0305	CI71948
1,2-Dibromoethane	ND (0.0043)		8260B Low		1	09/19/17 22:18	C7I0305	CI71948
1,2-Dichlorobenzene	ND (0.0043)		8260B Low		1	09/19/17 22:18	C7I0305	CI71948
1,2-Dichloroethane	ND (0.0043)		8260B Low		1	09/19/17 22:18	C7I0305	CI71948
1,2-Dichloropropane	ND (0.0043)		8260B Low		1	09/19/17 22:18	C7I0305	CI71948
1,3,5-Trimethylbenzene	ND (0.0043)		8260B Low		1	09/19/17 22:18	C7I0305	CI71948
1,3-Dichlorobenzene	ND (0.0043)		8260B Low		1	09/19/17 22:18	C7I0305	CI71948
1,3-Dichloropropane	ND (0.0043)		8260B Low		1	09/19/17 22:18	C7I0305	CI71948
1,4-Dichlorobenzene	ND (0.0043)		8260B Low		1	09/19/17 22:18	C7I0305	CI71948
1,4-Dioxane	ND (0.0863)		8260B Low		1	09/19/17 22:18	C7I0305	CI71948
1-Chlorohexane	ND (0.0043)		8260B Low		1	09/19/17 22:18	C7I0305	CI71948
2,2-Dichloropropane	ND (0.0043)		8260B Low		1	09/19/17 22:18	C7I0305	CI71948
2-Butanone	ND (0.0432)		8260B Low		1	09/19/17 22:18	C7I0305	CI71948
2-Chlorotoluene	ND (0.0043)		8260B Low		1	09/19/17 22:18	C7I0305	CI71948
2-Hexanone	ND (0.0432)		8260B Low		1	09/19/17 22:18	C7I0305	CI71948
4-Chlorotoluene	ND (0.0043)		8260B Low		1	09/19/17 22:18	C7I0305	CI71948
4-Isopropyltoluene	ND (0.0043)		8260B Low		1	09/19/17 22:18	C7I0305	CI71948
4-Methyl-2-Pentanone	ND (0.0432)		8260B Low		1	09/19/17 22:18	C7I0305	CI71948
Acetone	ND (0.0432)		8260B Low		1	09/19/17 22:18	C7I0305	CI71948
Benzene	ND (0.0043)		8260B Low		1	09/19/17 22:18	C7I0305	CI71948
Bromobenzene	ND (0.0043)		8260B Low		1	09/19/17 22:18	C7I0305	CI71948

*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-506 (10-11')  
 Date Sampled: 09/15/17 13:25  
 Percent Solids: 89  
 Initial Volume: 6.5  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709470  
 ESS Laboratory Sample ID: 1709470-12  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0043)		8260B Low		1	09/19/17 22:18	C7I0305	CI71948
Bromodichloromethane	ND (0.0043)		8260B Low		1	09/19/17 22:18	C7I0305	CI71948
Bromoform	ND (0.0043)		8260B Low		1	09/19/17 22:18	C7I0305	CI71948
Bromomethane	ND (0.0086)		8260B Low		1	09/19/17 22:18	C7I0305	CI71948
Carbon Disulfide	ND (0.0043)		8260B Low		1	09/19/17 22:18	C7I0305	CI71948
Carbon Tetrachloride	ND (0.0043)		8260B Low		1	09/19/17 22:18	C7I0305	CI71948
Chlorobenzene	ND (0.0043)		8260B Low		1	09/19/17 22:18	C7I0305	CI71948
Chloroethane	ND (0.0086)		8260B Low		1	09/19/17 22:18	C7I0305	CI71948
Chloroform	ND (0.0043)		8260B Low		1	09/19/17 22:18	C7I0305	CI71948
Chloromethane	ND (0.0086)		8260B Low		1	09/19/17 22:18	C7I0305	CI71948
cis-1,2-Dichloroethene	ND (0.0043)		8260B Low		1	09/19/17 22:18	C7I0305	CI71948
cis-1,3-Dichloropropene	ND (0.0043)		8260B Low		1	09/19/17 22:18	C7I0305	CI71948
Dibromochloromethane	ND (0.0043)		8260B Low		1	09/19/17 22:18	C7I0305	CI71948
Dibromomethane	ND (0.0043)		8260B Low		1	09/19/17 22:18	C7I0305	CI71948
Dichlorodifluoromethane	ND (0.0086)		8260B Low		1	09/19/17 22:18	C7I0305	CI71948
Diethyl Ether	ND (0.0043)		8260B Low		1	09/19/17 22:18	C7I0305	CI71948
Di-isopropyl ether	ND (0.0043)		8260B Low		1	09/19/17 22:18	C7I0305	CI71948
Ethyl tertiary-butyl ether	ND (0.0043)		8260B Low		1	09/19/17 22:18	C7I0305	CI71948
Ethylbenzene	ND (0.0043)		8260B Low		1	09/19/17 22:18	C7I0305	CI71948
Hexachlorobutadiene	ND (0.0043)		8260B Low		1	09/19/17 22:18	C7I0305	CI71948
Isopropylbenzene	ND (0.0043)		8260B Low		1	09/19/17 22:18	C7I0305	CI71948
Methyl tert-Butyl Ether	ND (0.0043)		8260B Low		1	09/19/17 22:18	C7I0305	CI71948
Methylene Chloride	ND (0.0216)		8260B Low		1	09/19/17 22:18	C7I0305	CI71948
Naphthalene	ND (0.0043)		8260B Low		1	09/19/17 22:18	C7I0305	CI71948
n-Butylbenzene	ND (0.0043)		8260B Low		1	09/19/17 22:18	C7I0305	CI71948
n-Propylbenzene	ND (0.0043)		8260B Low		1	09/19/17 22:18	C7I0305	CI71948
sec-Butylbenzene	ND (0.0043)		8260B Low		1	09/19/17 22:18	C7I0305	CI71948
Styrene	ND (0.0043)		8260B Low		1	09/19/17 22:18	C7I0305	CI71948
tert-Butylbenzene	ND (0.0043)		8260B Low		1	09/19/17 22:18	C7I0305	CI71948
Tertiary-amyl methyl ether	ND (0.0043)		8260B Low		1	09/19/17 22:18	C7I0305	CI71948
Tetrachloroethene	ND (0.0043)		8260B Low		1	09/19/17 22:18	C7I0305	CI71948
Tetrahydrofuran	ND (0.0043)		8260B Low		1	09/19/17 22:18	C7I0305	CI71948





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-506 (10-11')  
Date Sampled: 09/15/17 13:25  
Percent Solids: 89  
Initial Volume: 6.5  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1709470  
ESS Laboratory Sample ID: 1709470-12  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0043)		8260B Low		1	09/19/17 22:18	C7I0305	CI71948
trans-1,2-Dichloroethene	ND (0.0043)		8260B Low		1	09/19/17 22:18	C7I0305	CI71948
trans-1,3-Dichloropropene	ND (0.0043)		8260B Low		1	09/19/17 22:18	C7I0305	CI71948
Trichloroethene	ND (0.0043)		8260B Low		1	09/19/17 22:18	C7I0305	CI71948
Trichlorofluoromethane	ND (0.0043)		8260B Low		1	09/19/17 22:18	C7I0305	CI71948
Vinyl Acetate	ND (0.0043)		8260B Low		1	09/19/17 22:18	C7I0305	CI71948
Vinyl Chloride	ND (0.0086)		8260B Low		1	09/19/17 22:18	C7I0305	CI71948
Xylene O	ND (0.0043)		8260B Low		1	09/19/17 22:18	C7I0305	CI71948
Xylene P,M	ND (0.0086)		8260B Low		1	09/19/17 22:18	C7I0305	CI71948
Xylenes (Total)	ND (0.0086)		8260B Low		1	09/19/17 22:18		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	94 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	102 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	98 %		70-130
<i>Surrogate: Toluene-d8</i>	103 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-506 (10-11')  
 Date Sampled: 09/15/17 13:25  
 Percent Solids: 89  
 Initial Volume: 19.8  
 Final Volume: 1  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709470  
 ESS Laboratory Sample ID: 1709470-12  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: SMR  
 Prepared: 9/18/17 12:50

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	2370 (213)		8100M		5	09/20/17 22:55	C710332	CI71821

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: O-Terphenyl</i>	90 %		40-140



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-506 (10-11')  
 Date Sampled: 09/15/17 13:25  
 Percent Solids: 89  
 Initial Volume: 15.7  
 Final Volume: 0.5  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709470  
 ESS Laboratory Sample ID: 1709470-12  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: TJ  
 Prepared: 9/18/17 11:30

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	0.397 (0.357)		8270D		1	09/19/17 23:17	C7I0308	CI71818
Acenaphthene	ND (0.357)		8270D		1	09/19/17 23:17	C7I0308	CI71818
Acenaphthylene	ND (0.357)		8270D		1	09/19/17 23:17	C7I0308	CI71818
Anthracene	ND (0.357)		8270D		1	09/19/17 23:17	C7I0308	CI71818
Benzo(a)anthracene	ND (0.357)		8270D		1	09/19/17 23:17	C7I0308	CI71818
Benzo(a)pyrene	ND (0.179)		8270D		1	09/19/17 23:17	C7I0308	CI71818
Benzo(b)fluoranthene	ND (0.357)		8270D		1	09/19/17 23:17	C7I0308	CI71818
Benzo(g,h,i)perylene	ND (0.357)		8270D		1	09/19/17 23:17	C7I0308	CI71818
Benzo(k)fluoranthene	ND (0.357)		8270D		1	09/19/17 23:17	C7I0308	CI71818
Chrysene	ND (0.179)		8270D		1	09/19/17 23:17	C7I0308	CI71818
Dibenzo(a,h)Anthracene	ND (0.179)		8270D		1	09/19/17 23:17	C7I0308	CI71818
Fluoranthene	ND (0.357)		8270D		1	09/19/17 23:17	C7I0308	CI71818
Fluorene	ND (0.357)		8270D		1	09/19/17 23:17	C7I0308	CI71818
Indeno(1,2,3-cd)Pyrene	ND (0.357)		8270D		1	09/19/17 23:17	C7I0308	CI71818
Naphthalene	ND (0.357)		8270D		1	09/19/17 23:17	C7I0308	CI71818
<b>Phenanthrene</b>	<b>0.401 (0.357)</b>		8270D		1	09/19/17 23:17	C7I0308	CI71818
Pyrene	ND (0.357)		8270D		1	09/19/17 23:17	C7I0308	CI71818

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	67 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	72 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	57 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	81 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-506 (10-11')  
Date Sampled: 09/15/17 13:25  
Percent Solids: 89

ESS Laboratory Work Order: 1709470  
ESS Laboratory Sample ID: 1709470-12  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	2.11 (1.13)		9014		1	EEM	09/21/17 12:25	mg/kg dry	CI72119





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-507 (0-2')  
Date Sampled: 09/15/17 14:05  
Percent Solids: 98

ESS Laboratory Work Order: 1709470  
ESS Laboratory Sample ID: 1709470-13  
Sample Matrix: Soil  
Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (1.59)		6020A		20	NAR	09/22/17 0:59	2.56	100	CI71936
<b>Arsenic</b>	<b>2.88</b> (1.99)		6010C		1	KJK	09/22/17 22:25	2.56	100	CI71936
<b>Beryllium</b>	<b>0.27</b> (0.09)		6010C		1	KJK	09/23/17 20:21	2.56	100	CI71936
Cadmium	ND (0.40)		6010C		1	KJK	09/22/17 22:25	2.56	100	CI71936
<b>Chromium</b>	<b>7.61</b> (0.80)		6010C		1	KJK	09/22/17 22:25	2.56	100	CI71936
<b>Copper</b>	<b>15.4</b> (1.99)		6010C		1	KJK	09/22/17 22:25	2.56	100	CI71936
<b>Lead</b>	<b>21.6</b> (3.98)		6010C		1	KJK	09/22/17 22:25	2.56	100	CI71936
Mercury	ND (0.031)		7471B		1	MJV	09/22/17 21:13	0.66	40	CI71940
<b>Nickel</b>	<b>8.08</b> (1.99)		6010C		1	KJK	09/22/17 22:25	2.56	100	CI71936
Selenium	ND (1.59)		6020A		20	NAR	09/22/17 0:59	2.56	100	CI71936
Silver	ND (0.40)		6010C		1	KJK	09/22/17 22:25	2.56	100	CI71936
Thallium	ND (1.59)		6020A		20	NAR	09/22/17 0:59	2.56	100	CI71936
<b>Zinc</b>	<b>26.7</b> (1.99)		6010C		1	KJK	09/22/17 22:25	2.56	100	CI71936



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-507 (0-2')  
 Date Sampled: 09/15/17 14:05  
 Percent Solids: 98  
 Initial Volume: 4.9  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709470  
 ESS Laboratory Sample ID: 1709470-13  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0052)		8260B Low		1	09/19/17 22:44	C7I0305	CI71948
1,1,1-Trichloroethane	ND (0.0052)		8260B Low		1	09/19/17 22:44	C7I0305	CI71948
1,1,2,2-Tetrachloroethane	ND (0.0052)		8260B Low		1	09/19/17 22:44	C7I0305	CI71948
1,1,2-Trichloroethane	ND (0.0052)		8260B Low		1	09/19/17 22:44	C7I0305	CI71948
1,1-Dichloroethane	ND (0.0052)		8260B Low		1	09/19/17 22:44	C7I0305	CI71948
1,1-Dichloroethene	ND (0.0052)		8260B Low		1	09/19/17 22:44	C7I0305	CI71948
1,1-Dichloropropene	ND (0.0052)		8260B Low		1	09/19/17 22:44	C7I0305	CI71948
1,2,3-Trichlorobenzene	ND (0.0052)		8260B Low		1	09/19/17 22:44	C7I0305	CI71948
1,2,3-Trichloropropane	ND (0.0052)		8260B Low		1	09/19/17 22:44	C7I0305	CI71948
1,2,4-Trichlorobenzene	ND (0.0052)		8260B Low		1	09/19/17 22:44	C7I0305	CI71948
1,2,4-Trimethylbenzene	ND (0.0052)		8260B Low		1	09/19/17 22:44	C7I0305	CI71948
1,2-Dibromo-3-Chloropropane	ND (0.0052)		8260B Low		1	09/19/17 22:44	C7I0305	CI71948
1,2-Dibromoethane	ND (0.0052)		8260B Low		1	09/19/17 22:44	C7I0305	CI71948
1,2-Dichlorobenzene	ND (0.0052)		8260B Low		1	09/19/17 22:44	C7I0305	CI71948
1,2-Dichloroethane	ND (0.0052)		8260B Low		1	09/19/17 22:44	C7I0305	CI71948
1,2-Dichloropropane	ND (0.0052)		8260B Low		1	09/19/17 22:44	C7I0305	CI71948
1,3,5-Trimethylbenzene	ND (0.0052)		8260B Low		1	09/19/17 22:44	C7I0305	CI71948
1,3-Dichlorobenzene	ND (0.0052)		8260B Low		1	09/19/17 22:44	C7I0305	CI71948
1,3-Dichloropropane	ND (0.0052)		8260B Low		1	09/19/17 22:44	C7I0305	CI71948
1,4-Dichlorobenzene	ND (0.0052)		8260B Low		1	09/19/17 22:44	C7I0305	CI71948
1,4-Dioxane	ND (0.104)		8260B Low		1	09/19/17 22:44	C7I0305	CI71948
1-Chlorohexane	ND (0.0052)		8260B Low		1	09/19/17 22:44	C7I0305	CI71948
2,2-Dichloropropane	ND (0.0052)		8260B Low		1	09/19/17 22:44	C7I0305	CI71948
2-Butanone	ND (0.0519)		8260B Low		1	09/19/17 22:44	C7I0305	CI71948
2-Chlorotoluene	ND (0.0052)		8260B Low		1	09/19/17 22:44	C7I0305	CI71948
2-Hexanone	ND (0.0519)		8260B Low		1	09/19/17 22:44	C7I0305	CI71948
4-Chlorotoluene	ND (0.0052)		8260B Low		1	09/19/17 22:44	C7I0305	CI71948
4-Isopropyltoluene	ND (0.0052)		8260B Low		1	09/19/17 22:44	C7I0305	CI71948
4-Methyl-2-Pentanone	ND (0.0519)		8260B Low		1	09/19/17 22:44	C7I0305	CI71948
Acetone	ND (0.0519)		8260B Low		1	09/19/17 22:44	C7I0305	CI71948
Benzene	ND (0.0052)		8260B Low		1	09/19/17 22:44	C7I0305	CI71948
Bromobenzene	ND (0.0052)		8260B Low		1	09/19/17 22:44	C7I0305	CI71948



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-507 (0-2')  
 Date Sampled: 09/15/17 14:05  
 Percent Solids: 98  
 Initial Volume: 4.9  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709470  
 ESS Laboratory Sample ID: 1709470-13  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0052)		8260B Low		1	09/19/17 22:44	C7I0305	CI71948
Bromodichloromethane	ND (0.0052)		8260B Low		1	09/19/17 22:44	C7I0305	CI71948
Bromoform	ND (0.0052)		8260B Low		1	09/19/17 22:44	C7I0305	CI71948
Bromomethane	ND (0.0104)		8260B Low		1	09/19/17 22:44	C7I0305	CI71948
Carbon Disulfide	ND (0.0052)		8260B Low		1	09/19/17 22:44	C7I0305	CI71948
Carbon Tetrachloride	ND (0.0052)		8260B Low		1	09/19/17 22:44	C7I0305	CI71948
Chlorobenzene	ND (0.0052)		8260B Low		1	09/19/17 22:44	C7I0305	CI71948
Chloroethane	ND (0.0104)		8260B Low		1	09/19/17 22:44	C7I0305	CI71948
Chloroform	ND (0.0052)		8260B Low		1	09/19/17 22:44	C7I0305	CI71948
Chloromethane	ND (0.0104)		8260B Low		1	09/19/17 22:44	C7I0305	CI71948
cis-1,2-Dichloroethene	ND (0.0052)		8260B Low		1	09/19/17 22:44	C7I0305	CI71948
cis-1,3-Dichloropropene	ND (0.0052)		8260B Low		1	09/19/17 22:44	C7I0305	CI71948
Dibromochloromethane	ND (0.0052)		8260B Low		1	09/19/17 22:44	C7I0305	CI71948
Dibromomethane	ND (0.0052)		8260B Low		1	09/19/17 22:44	C7I0305	CI71948
Dichlorodifluoromethane	ND (0.0104)		8260B Low		1	09/19/17 22:44	C7I0305	CI71948
Diethyl Ether	ND (0.0052)		8260B Low		1	09/19/17 22:44	C7I0305	CI71948
Di-isopropyl ether	ND (0.0052)		8260B Low		1	09/19/17 22:44	C7I0305	CI71948
Ethyl tertiary-butyl ether	ND (0.0052)		8260B Low		1	09/19/17 22:44	C7I0305	CI71948
Ethylbenzene	ND (0.0052)		8260B Low		1	09/19/17 22:44	C7I0305	CI71948
Hexachlorobutadiene	ND (0.0052)		8260B Low		1	09/19/17 22:44	C7I0305	CI71948
Isopropylbenzene	ND (0.0052)		8260B Low		1	09/19/17 22:44	C7I0305	CI71948
Methyl tert-Butyl Ether	ND (0.0052)		8260B Low		1	09/19/17 22:44	C7I0305	CI71948
Methylene Chloride	ND (0.0260)		8260B Low		1	09/19/17 22:44	C7I0305	CI71948
Naphthalene	ND (0.0052)		8260B Low		1	09/19/17 22:44	C7I0305	CI71948
n-Butylbenzene	ND (0.0052)		8260B Low		1	09/19/17 22:44	C7I0305	CI71948
n-Propylbenzene	ND (0.0052)		8260B Low		1	09/19/17 22:44	C7I0305	CI71948
sec-Butylbenzene	ND (0.0052)		8260B Low		1	09/19/17 22:44	C7I0305	CI71948
Styrene	ND (0.0052)		8260B Low		1	09/19/17 22:44	C7I0305	CI71948
tert-Butylbenzene	ND (0.0052)		8260B Low		1	09/19/17 22:44	C7I0305	CI71948
Tertiary-amyl methyl ether	ND (0.0052)		8260B Low		1	09/19/17 22:44	C7I0305	CI71948
Tetrachloroethene	ND (0.0052)		8260B Low		1	09/19/17 22:44	C7I0305	CI71948
Tetrahydrofuran	ND (0.0052)		8260B Low		1	09/19/17 22:44	C7I0305	CI71948



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-507 (0-2')  
 Date Sampled: 09/15/17 14:05  
 Percent Solids: 98  
 Initial Volume: 4.9  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709470  
 ESS Laboratory Sample ID: 1709470-13  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0052)		8260B Low		1	09/19/17 22:44	C7I0305	CI71948
trans-1,2-Dichloroethene	ND (0.0052)		8260B Low		1	09/19/17 22:44	C7I0305	CI71948
trans-1,3-Dichloropropene	ND (0.0052)		8260B Low		1	09/19/17 22:44	C7I0305	CI71948
Trichloroethene	ND (0.0052)		8260B Low		1	09/19/17 22:44	C7I0305	CI71948
Trichlorofluoromethane	ND (0.0052)		8260B Low		1	09/19/17 22:44	C7I0305	CI71948
Vinyl Acetate	ND (0.0052)		8260B Low		1	09/19/17 22:44	C7I0305	CI71948
Vinyl Chloride	ND (0.0104)		8260B Low		1	09/19/17 22:44	C7I0305	CI71948
Xylene O	ND (0.0052)		8260B Low		1	09/19/17 22:44	C7I0305	CI71948
Xylene P,M	ND (0.0104)		8260B Low		1	09/19/17 22:44	C7I0305	CI71948
Xylenes (Total)	ND (0.0104)		8260B Low		1	09/19/17 22:44		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	96 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	104 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	101 %		70-130
<i>Surrogate: Toluene-d8</i>	101 %		70-130





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-507 (0-2')  
 Date Sampled: 09/15/17 14:05  
 Percent Solids: 98  
 Initial Volume: 20  
 Final Volume: 1  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709470  
 ESS Laboratory Sample ID: 1709470-13  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: SMR  
 Prepared: 9/18/17 12:50

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	ND (191)		8100M		5	09/19/17 5:12	C710279	CI71821
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		96 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-507 (0-2')  
Date Sampled: 09/15/17 14:05  
Percent Solids: 98  
Initial Volume: 14.6  
Final Volume: 0.5  
Extraction Method: 3546

ESS Laboratory Work Order: 1709470  
ESS Laboratory Sample ID: 1709470-13  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: TJ  
Prepared: 9/18/17 11:30

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.348)		8270D		1	09/19/17 23:52	C7I0308	CI71818
Acenaphthene	ND (0.348)		8270D		1	09/19/17 23:52	C7I0308	CI71818
Acenaphthylene	ND (0.348)		8270D		1	09/19/17 23:52	C7I0308	CI71818
Anthracene	ND (0.348)		8270D		1	09/19/17 23:52	C7I0308	CI71818
<b>Benzo(a)anthracene</b>	<b>0.890</b> (0.348)		8270D		1	09/19/17 23:52	C7I0308	CI71818
<b>Benzo(a)pyrene</b>	<b>0.795</b> (0.175)		8270D		1	09/19/17 23:52	C7I0308	CI71818
<b>Benzo(b)fluoranthene</b>	<b>0.759</b> (0.348)		8270D		1	09/19/17 23:52	C7I0308	CI71818
<b>Benzo(g,h,i)perylene</b>	<b>0.376</b> (0.348)		8270D		1	09/19/17 23:52	C7I0308	CI71818
<b>Benzo(k)fluoranthene</b>	<b>0.666</b> (0.348)		8270D		1	09/19/17 23:52	C7I0308	CI71818
<b>Chrysene</b>	<b>0.776</b> (0.175)		8270D		1	09/19/17 23:52	C7I0308	CI71818
<b>Dibenzo(a,h)Anthracene</b>	<b>0.207</b> (0.175)		8270D		1	09/19/17 23:52	C7I0308	CI71818
<b>Fluoranthene</b>	<b>2.22</b> (0.348)		8270D		1	09/19/17 23:52	C7I0308	CI71818
Fluorene	ND (0.348)		8270D		1	09/19/17 23:52	C7I0308	CI71818
<b>Indeno(1,2,3-cd)Pyrene</b>	<b>0.351</b> (0.348)		8270D		1	09/19/17 23:52	C7I0308	CI71818
Naphthalene	ND (0.348)		8270D		1	09/19/17 23:52	C7I0308	CI71818
<b>Phenanthrene</b>	<b>0.645</b> (0.348)		8270D		1	09/19/17 23:52	C7I0308	CI71818
<b>Pyrene</b>	<b>1.92</b> (0.348)		8270D		1	09/19/17 23:52	C7I0308	CI71818

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	63 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	70 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	53 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	106 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-507 (0-2')  
Date Sampled: 09/15/17 14:05  
Percent Solids: 98

ESS Laboratory Work Order: 1709470  
ESS Laboratory Sample ID: 1709470-13  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	ND (0.99)		9014		1	EEM	09/21/17 12:25	mg/kg dry	CI72119



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-507 (10-11')  
Date Sampled: 09/15/17 14:30  
Percent Solids: 82

ESS Laboratory Work Order: 1709470  
ESS Laboratory Sample ID: 1709470-14  
Sample Matrix: Soil  
Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (2.44)		6020A		20	NAR	09/22/17 1:04	2	100	CI71936
<b>Arsenic</b>	<b>5.50</b> (3.06)		6010C		1	KJK	09/22/17 22:29	2	100	CI71936
<b>Beryllium</b>	<b>0.34</b> (0.13)		6010C		1	KJK	09/23/17 20:25	2	100	CI71936
Cadmium	ND (0.61)		6010C		1	KJK	09/22/17 22:29	2	100	CI71936
<b>Chromium</b>	<b>10.7</b> (1.22)		6010C		1	KJK	09/22/17 22:29	2	100	CI71936
<b>Copper</b>	<b>21.7</b> (3.06)		6010C		1	KJK	09/22/17 22:29	2	100	CI71936
<b>Lead</b>	<b>7.04</b> (6.11)		6010C		1	KJK	09/22/17 22:29	2	100	CI71936
Mercury	ND (0.039)		7471B		1	MJV	09/22/17 21:15	0.62	40	CI71940
<b>Nickel</b>	<b>8.99</b> (3.06)		6010C		1	KJK	09/22/17 22:29	2	100	CI71936
Selenium	ND (2.44)		6020A		20	NAR	09/22/17 1:04	2	100	CI71936
Silver	ND (0.61)		6010C		1	KJK	09/22/17 22:29	2	100	CI71936
Thallium	ND (2.44)		6020A		20	NAR	09/22/17 1:04	2	100	CI71936
<b>Zinc</b>	<b>22.1</b> (3.06)		6010C		1	KJK	09/22/17 22:29	2	100	CI71936





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-507 (10-11')  
 Date Sampled: 09/15/17 14:30  
 Percent Solids: 82  
 Initial Volume: 6.1  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709470  
 ESS Laboratory Sample ID: 1709470-14  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0050)		8260B Low		1	09/19/17 23:09	C7I0305	CI71948
1,1,1-Trichloroethane	ND (0.0050)		8260B Low		1	09/19/17 23:09	C7I0305	CI71948
1,1,2,2-Tetrachloroethane	ND (0.0050)		8260B Low		1	09/19/17 23:09	C7I0305	CI71948
1,1,2-Trichloroethane	ND (0.0050)		8260B Low		1	09/19/17 23:09	C7I0305	CI71948
1,1-Dichloroethane	ND (0.0050)		8260B Low		1	09/19/17 23:09	C7I0305	CI71948
1,1-Dichloroethene	ND (0.0050)		8260B Low		1	09/19/17 23:09	C7I0305	CI71948
1,1-Dichloropropene	ND (0.0050)		8260B Low		1	09/19/17 23:09	C7I0305	CI71948
1,2,3-Trichlorobenzene	ND (0.0050)		8260B Low		1	09/19/17 23:09	C7I0305	CI71948
1,2,3-Trichloropropane	ND (0.0050)		8260B Low		1	09/19/17 23:09	C7I0305	CI71948
1,2,4-Trichlorobenzene	ND (0.0050)		8260B Low		1	09/19/17 23:09	C7I0305	CI71948
1,2,4-Trimethylbenzene	ND (0.0050)		8260B Low		1	09/19/17 23:09	C7I0305	CI71948
1,2-Dibromo-3-Chloropropane	ND (0.0050)		8260B Low		1	09/19/17 23:09	C7I0305	CI71948
1,2-Dibromoethane	ND (0.0050)		8260B Low		1	09/19/17 23:09	C7I0305	CI71948
1,2-Dichlorobenzene	ND (0.0050)		8260B Low		1	09/19/17 23:09	C7I0305	CI71948
1,2-Dichloroethane	ND (0.0050)		8260B Low		1	09/19/17 23:09	C7I0305	CI71948
1,2-Dichloropropane	ND (0.0050)		8260B Low		1	09/19/17 23:09	C7I0305	CI71948
1,3,5-Trimethylbenzene	ND (0.0050)		8260B Low		1	09/19/17 23:09	C7I0305	CI71948
1,3-Dichlorobenzene	ND (0.0050)		8260B Low		1	09/19/17 23:09	C7I0305	CI71948
1,3-Dichloropropane	ND (0.0050)		8260B Low		1	09/19/17 23:09	C7I0305	CI71948
1,4-Dichlorobenzene	ND (0.0050)		8260B Low		1	09/19/17 23:09	C7I0305	CI71948
1,4-Dioxane	ND (0.100)		8260B Low		1	09/19/17 23:09	C7I0305	CI71948
1-Chlorohexane	ND (0.0050)		8260B Low		1	09/19/17 23:09	C7I0305	CI71948
2,2-Dichloropropane	ND (0.0050)		8260B Low		1	09/19/17 23:09	C7I0305	CI71948
2-Butanone	ND (0.0501)		8260B Low		1	09/19/17 23:09	C7I0305	CI71948
2-Chlorotoluene	ND (0.0050)		8260B Low		1	09/19/17 23:09	C7I0305	CI71948
2-Hexanone	ND (0.0501)		8260B Low		1	09/19/17 23:09	C7I0305	CI71948
4-Chlorotoluene	ND (0.0050)		8260B Low		1	09/19/17 23:09	C7I0305	CI71948
4-Isopropyltoluene	ND (0.0050)		8260B Low		1	09/19/17 23:09	C7I0305	CI71948
4-Methyl-2-Pentanone	ND (0.0501)		8260B Low		1	09/19/17 23:09	C7I0305	CI71948
Acetone	ND (0.0501)		8260B Low		1	09/19/17 23:09	C7I0305	CI71948
Benzene	ND (0.0050)		8260B Low		1	09/19/17 23:09	C7I0305	CI71948
Bromobenzene	ND (0.0050)		8260B Low		1	09/19/17 23:09	C7I0305	CI71948



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-507 (10-11')  
 Date Sampled: 09/15/17 14:30  
 Percent Solids: 82  
 Initial Volume: 6.1  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709470  
 ESS Laboratory Sample ID: 1709470-14  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0050)		8260B Low		1	09/19/17 23:09	C7I0305	CI71948
Bromodichloromethane	ND (0.0050)		8260B Low		1	09/19/17 23:09	C7I0305	CI71948
Bromoform	ND (0.0050)		8260B Low		1	09/19/17 23:09	C7I0305	CI71948
Bromomethane	ND (0.0100)		8260B Low		1	09/19/17 23:09	C7I0305	CI71948
Carbon Disulfide	ND (0.0050)		8260B Low		1	09/19/17 23:09	C7I0305	CI71948
Carbon Tetrachloride	ND (0.0050)		8260B Low		1	09/19/17 23:09	C7I0305	CI71948
Chlorobenzene	ND (0.0050)		8260B Low		1	09/19/17 23:09	C7I0305	CI71948
Chloroethane	ND (0.0100)		8260B Low		1	09/19/17 23:09	C7I0305	CI71948
Chloroform	ND (0.0050)		8260B Low		1	09/19/17 23:09	C7I0305	CI71948
Chloromethane	ND (0.0100)		8260B Low		1	09/19/17 23:09	C7I0305	CI71948
cis-1,2-Dichloroethene	ND (0.0050)		8260B Low		1	09/19/17 23:09	C7I0305	CI71948
cis-1,3-Dichloropropene	ND (0.0050)		8260B Low		1	09/19/17 23:09	C7I0305	CI71948
Dibromochloromethane	ND (0.0050)		8260B Low		1	09/19/17 23:09	C7I0305	CI71948
Dibromomethane	ND (0.0050)		8260B Low		1	09/19/17 23:09	C7I0305	CI71948
Dichlorodifluoromethane	ND (0.0100)		8260B Low		1	09/19/17 23:09	C7I0305	CI71948
Diethyl Ether	ND (0.0050)		8260B Low		1	09/19/17 23:09	C7I0305	CI71948
Di-isopropyl ether	ND (0.0050)		8260B Low		1	09/19/17 23:09	C7I0305	CI71948
Ethyl tertiary-butyl ether	ND (0.0050)		8260B Low		1	09/19/17 23:09	C7I0305	CI71948
Ethylbenzene	ND (0.0050)		8260B Low		1	09/19/17 23:09	C7I0305	CI71948
Hexachlorobutadiene	ND (0.0050)		8260B Low		1	09/19/17 23:09	C7I0305	CI71948
Isopropylbenzene	ND (0.0050)		8260B Low		1	09/19/17 23:09	C7I0305	CI71948
Methyl tert-Butyl Ether	ND (0.0050)		8260B Low		1	09/19/17 23:09	C7I0305	CI71948
Methylene Chloride	ND (0.0250)		8260B Low		1	09/19/17 23:09	C7I0305	CI71948
Naphthalene	ND (0.0050)		8260B Low		1	09/19/17 23:09	C7I0305	CI71948
n-Butylbenzene	ND (0.0050)		8260B Low		1	09/19/17 23:09	C7I0305	CI71948
n-Propylbenzene	ND (0.0050)		8260B Low		1	09/19/17 23:09	C7I0305	CI71948
sec-Butylbenzene	ND (0.0050)		8260B Low		1	09/19/17 23:09	C7I0305	CI71948
Styrene	ND (0.0050)		8260B Low		1	09/19/17 23:09	C7I0305	CI71948
tert-Butylbenzene	ND (0.0050)		8260B Low		1	09/19/17 23:09	C7I0305	CI71948
Tertiary-amyl methyl ether	ND (0.0050)		8260B Low		1	09/19/17 23:09	C7I0305	CI71948
Tetrachloroethene	ND (0.0050)		8260B Low		1	09/19/17 23:09	C7I0305	CI71948
Tetrahydrofuran	ND (0.0050)		8260B Low		1	09/19/17 23:09	C7I0305	CI71948



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-507 (10-11')  
Date Sampled: 09/15/17 14:30  
Percent Solids: 82  
Initial Volume: 6.1  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1709470  
ESS Laboratory Sample ID: 1709470-14  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0050)		8260B Low		1	09/19/17 23:09	C7I0305	CI71948
trans-1,2-Dichloroethene	ND (0.0050)		8260B Low		1	09/19/17 23:09	C7I0305	CI71948
trans-1,3-Dichloropropene	ND (0.0050)		8260B Low		1	09/19/17 23:09	C7I0305	CI71948
Trichloroethene	ND (0.0050)		8260B Low		1	09/19/17 23:09	C7I0305	CI71948
Trichlorofluoromethane	ND (0.0050)		8260B Low		1	09/19/17 23:09	C7I0305	CI71948
Vinyl Acetate	ND (0.0050)		8260B Low		1	09/19/17 23:09	C7I0305	CI71948
Vinyl Chloride	ND (0.0100)		8260B Low		1	09/19/17 23:09	C7I0305	CI71948
Xylene O	ND (0.0050)		8260B Low		1	09/19/17 23:09	C7I0305	CI71948
Xylene P,M	ND (0.0100)		8260B Low		1	09/19/17 23:09	C7I0305	CI71948
Xylenes (Total)	ND (0.0100)		8260B Low		1	09/19/17 23:09		[CALC]

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: 1,2-Dichloroethane-d4	95 %		70-130
Surrogate: 4-Bromofluorobenzene	105 %		70-130
Surrogate: Dibromofluoromethane	99 %		70-130
Surrogate: Toluene-d8	100 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-507 (10-11')  
 Date Sampled: 09/15/17 14:30  
 Percent Solids: 82  
 Initial Volume: 19.4  
 Final Volume: 1  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709470  
 ESS Laboratory Sample ID: 1709470-14  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: SMR  
 Prepared: 9/18/17 12:50

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	ND (47.3)		8100M		1	09/18/17 20:56	C710279	CI71821
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		95 %		40-140				





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-507 (10-11')  
 Date Sampled: 09/15/17 14:30  
 Percent Solids: 82  
 Initial Volume: 14.4  
 Final Volume: 0.5  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709470  
 ESS Laboratory Sample ID: 1709470-14  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: TJ  
 Prepared: 9/18/17 15:15

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.424)		8270D		1	09/20/17 1:38	C7I0308	CI71819
Acenaphthene	ND (0.424)		8270D		1	09/20/17 1:38	C7I0308	CI71819
Acenaphthylene	ND (0.424)		8270D		1	09/20/17 1:38	C7I0308	CI71819
Anthracene	ND (0.424)		8270D		1	09/20/17 1:38	C7I0308	CI71819
Benzo(a)anthracene	ND (0.424)		8270D		1	09/20/17 1:38	C7I0308	CI71819
Benzo(a)pyrene	ND (0.213)		8270D		1	09/20/17 1:38	C7I0308	CI71819
Benzo(b)fluoranthene	ND (0.424)		8270D		1	09/20/17 1:38	C7I0308	CI71819
Benzo(g,h,i)perylene	ND (0.424)		8270D		1	09/20/17 1:38	C7I0308	CI71819
Benzo(k)fluoranthene	ND (0.424)		8270D		1	09/20/17 1:38	C7I0308	CI71819
Chrysene	ND (0.213)		8270D		1	09/20/17 1:38	C7I0308	CI71819
Dibenzo(a,h)Anthracene	ND (0.213)		8270D		1	09/20/17 1:38	C7I0308	CI71819
Fluoranthene	ND (0.424)		8270D		1	09/20/17 1:38	C7I0308	CI71819
Fluorene	ND (0.424)		8270D		1	09/20/17 1:38	C7I0308	CI71819
Indeno(1,2,3-cd)Pyrene	ND (0.424)		8270D		1	09/20/17 1:38	C7I0308	CI71819
Naphthalene	ND (0.424)		8270D		1	09/20/17 1:38	C7I0308	CI71819
Phenanthrene	ND (0.424)		8270D		1	09/20/17 1:38	C7I0308	CI71819
Pyrene	ND (0.424)		8270D		1	09/20/17 1:38	C7I0308	CI71819

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: 1,2-Dichlorobenzene-d4	76 %		30-130
Surrogate: 2-Fluorobiphenyl	81 %		30-130
Surrogate: Nitrobenzene-d5	66 %		30-130
Surrogate: p-Terphenyl-d14	114 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-507 (10-11')  
Date Sampled: 09/15/17 14:30  
Percent Solids: 82

ESS Laboratory Work Order: 1709470  
ESS Laboratory Sample ID: 1709470-14  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	2.35 (1.17)		9014		1	EEM	09/21/17 12:25	mg/kg dry	CI72119



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-597 (1-2')  
 Date Sampled: 09/15/17 00:00  
 Percent Solids: 95

ESS Laboratory Work Order: 1709470  
 ESS Laboratory Sample ID: 1709470-15  
 Sample Matrix: Soil  
 Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (2.01)		6020A		20	NAR	09/22/17 1:09	2.09	100	CI71936
Arsenic	ND (2.51)		6010C		1	KJK	09/22/17 22:33	2.09	100	CI71936
<b>Beryllium</b>	<b>0.19</b> (0.11)		6010C		1	KJK	09/23/17 20:29	2.09	100	CI71936
Cadmium	ND (0.50)		6010C		1	KJK	09/22/17 22:33	2.09	100	CI71936
<b>Chromium</b>	<b>2.24</b> (1.01)		6010C		1	KJK	09/22/17 22:33	2.09	100	CI71936
<b>Copper</b>	<b>5.65</b> (2.51)		6010C		1	KJK	09/22/17 22:33	2.09	100	CI71936
Lead	ND (5.03)		6010C		1	KJK	09/22/17 22:33	2.09	100	CI71936
Mercury	ND (0.035)		7471B		1	HG	09/22/17 22:33	0.6	40	CI71940
Nickel	ND (2.51)		6010C		1	KJK	09/22/17 22:33	2.09	100	CI71936
Selenium	ND (2.01)		6020A		20	NAR	09/22/17 1:09	2.09	100	CI71936
Silver	ND (0.50)		6010C		1	KJK	09/22/17 22:33	2.09	100	CI71936
Thallium	ND (2.01)		6020A		20	NAR	09/22/17 1:09	2.09	100	CI71936
<b>Zinc</b>	<b>23.6</b> (2.51)		6010C		1	KJK	09/22/17 22:33	2.09	100	CI71936



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-597 (1-2')  
 Date Sampled: 09/15/17 00:00  
 Percent Solids: 95  
 Initial Volume: 7.4  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709470  
 ESS Laboratory Sample ID: 1709470-15  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0036)		8260B Low		1	09/19/17 23:34	C7I0305	CI71948
1,1,1-Trichloroethane	ND (0.0036)		8260B Low		1	09/19/17 23:34	C7I0305	CI71948
1,1,2,2-Tetrachloroethane	ND (0.0036)		8260B Low		1	09/19/17 23:34	C7I0305	CI71948
1,1,2-Trichloroethane	ND (0.0036)		8260B Low		1	09/19/17 23:34	C7I0305	CI71948
1,1-Dichloroethane	ND (0.0036)		8260B Low		1	09/19/17 23:34	C7I0305	CI71948
1,1-Dichloroethene	ND (0.0036)		8260B Low		1	09/19/17 23:34	C7I0305	CI71948
1,1-Dichloropropene	ND (0.0036)		8260B Low		1	09/19/17 23:34	C7I0305	CI71948
1,2,3-Trichlorobenzene	ND (0.0036)		8260B Low		1	09/19/17 23:34	C7I0305	CI71948
1,2,3-Trichloropropane	ND (0.0036)		8260B Low		1	09/19/17 23:34	C7I0305	CI71948
1,2,4-Trichlorobenzene	ND (0.0036)		8260B Low		1	09/19/17 23:34	C7I0305	CI71948
1,2,4-Trimethylbenzene	ND (0.0036)		8260B Low		1	09/19/17 23:34	C7I0305	CI71948
1,2-Dibromo-3-Chloropropane	ND (0.0036)		8260B Low		1	09/19/17 23:34	C7I0305	CI71948
1,2-Dibromoethane	ND (0.0036)		8260B Low		1	09/19/17 23:34	C7I0305	CI71948
1,2-Dichlorobenzene	ND (0.0036)		8260B Low		1	09/19/17 23:34	C7I0305	CI71948
1,2-Dichloroethane	ND (0.0036)		8260B Low		1	09/19/17 23:34	C7I0305	CI71948
1,2-Dichloropropane	ND (0.0036)		8260B Low		1	09/19/17 23:34	C7I0305	CI71948
1,3,5-Trimethylbenzene	ND (0.0036)		8260B Low		1	09/19/17 23:34	C7I0305	CI71948
1,3-Dichlorobenzene	ND (0.0036)		8260B Low		1	09/19/17 23:34	C7I0305	CI71948
1,3-Dichloropropane	ND (0.0036)		8260B Low		1	09/19/17 23:34	C7I0305	CI71948
1,4-Dichlorobenzene	ND (0.0036)		8260B Low		1	09/19/17 23:34	C7I0305	CI71948
1,4-Dioxane	ND (0.0710)		8260B Low		1	09/19/17 23:34	C7I0305	CI71948
1-Chlorohexane	ND (0.0036)		8260B Low		1	09/19/17 23:34	C7I0305	CI71948
2,2-Dichloropropane	ND (0.0036)		8260B Low		1	09/19/17 23:34	C7I0305	CI71948
2-Butanone	ND (0.0355)		8260B Low		1	09/19/17 23:34	C7I0305	CI71948
2-Chlorotoluene	ND (0.0036)		8260B Low		1	09/19/17 23:34	C7I0305	CI71948
2-Hexanone	ND (0.0355)		8260B Low		1	09/19/17 23:34	C7I0305	CI71948
4-Chlorotoluene	ND (0.0036)		8260B Low		1	09/19/17 23:34	C7I0305	CI71948
4-Isopropyltoluene	ND (0.0036)		8260B Low		1	09/19/17 23:34	C7I0305	CI71948
4-Methyl-2-Pentanone	ND (0.0355)		8260B Low		1	09/19/17 23:34	C7I0305	CI71948
Acetone	ND (0.0355)		8260B Low		1	09/19/17 23:34	C7I0305	CI71948
Benzene	ND (0.0036)		8260B Low		1	09/19/17 23:34	C7I0305	CI71948
Bromobenzene	ND (0.0036)		8260B Low		1	09/19/17 23:34	C7I0305	CI71948





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-597 (1-2')  
 Date Sampled: 09/15/17 00:00  
 Percent Solids: 95  
 Initial Volume: 7.4  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709470  
 ESS Laboratory Sample ID: 1709470-15  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0036)		8260B Low		1	09/19/17 23:34	C7I0305	CI71948
Bromodichloromethane	ND (0.0036)		8260B Low		1	09/19/17 23:34	C7I0305	CI71948
Bromoform	ND (0.0036)		8260B Low		1	09/19/17 23:34	C7I0305	CI71948
Bromomethane	ND (0.0071)		8260B Low		1	09/19/17 23:34	C7I0305	CI71948
Carbon Disulfide	ND (0.0036)		8260B Low		1	09/19/17 23:34	C7I0305	CI71948
Carbon Tetrachloride	ND (0.0036)		8260B Low		1	09/19/17 23:34	C7I0305	CI71948
Chlorobenzene	ND (0.0036)		8260B Low		1	09/19/17 23:34	C7I0305	CI71948
Chloroethane	ND (0.0071)		8260B Low		1	09/19/17 23:34	C7I0305	CI71948
Chloroform	ND (0.0036)		8260B Low		1	09/19/17 23:34	C7I0305	CI71948
Chloromethane	ND (0.0071)		8260B Low		1	09/19/17 23:34	C7I0305	CI71948
cis-1,2-Dichloroethene	ND (0.0036)		8260B Low		1	09/19/17 23:34	C7I0305	CI71948
cis-1,3-Dichloropropene	ND (0.0036)		8260B Low		1	09/19/17 23:34	C7I0305	CI71948
Dibromochloromethane	ND (0.0036)		8260B Low		1	09/19/17 23:34	C7I0305	CI71948
Dibromomethane	ND (0.0036)		8260B Low		1	09/19/17 23:34	C7I0305	CI71948
Dichlorodifluoromethane	ND (0.0071)		8260B Low		1	09/19/17 23:34	C7I0305	CI71948
Diethyl Ether	ND (0.0036)		8260B Low		1	09/19/17 23:34	C7I0305	CI71948
Di-isopropyl ether	ND (0.0036)		8260B Low		1	09/19/17 23:34	C7I0305	CI71948
Ethyl tertiary-butyl ether	ND (0.0036)		8260B Low		1	09/19/17 23:34	C7I0305	CI71948
Ethylbenzene	ND (0.0036)		8260B Low		1	09/19/17 23:34	C7I0305	CI71948
Hexachlorobutadiene	ND (0.0036)		8260B Low		1	09/19/17 23:34	C7I0305	CI71948
Isopropylbenzene	ND (0.0036)		8260B Low		1	09/19/17 23:34	C7I0305	CI71948
Methyl tert-Butyl Ether	ND (0.0036)		8260B Low		1	09/19/17 23:34	C7I0305	CI71948
Methylene Chloride	ND (0.0178)		8260B Low		1	09/19/17 23:34	C7I0305	CI71948
Naphthalene	ND (0.0036)		8260B Low		1	09/19/17 23:34	C7I0305	CI71948
n-Butylbenzene	ND (0.0036)		8260B Low		1	09/19/17 23:34	C7I0305	CI71948
n-Propylbenzene	ND (0.0036)		8260B Low		1	09/19/17 23:34	C7I0305	CI71948
sec-Butylbenzene	ND (0.0036)		8260B Low		1	09/19/17 23:34	C7I0305	CI71948
Styrene	ND (0.0036)		8260B Low		1	09/19/17 23:34	C7I0305	CI71948
tert-Butylbenzene	ND (0.0036)		8260B Low		1	09/19/17 23:34	C7I0305	CI71948
Tertiary-amyl methyl ether	ND (0.0036)		8260B Low		1	09/19/17 23:34	C7I0305	CI71948
Tetrachloroethene	ND (0.0036)		8260B Low		1	09/19/17 23:34	C7I0305	CI71948
Tetrahydrofuran	ND (0.0036)		8260B Low		1	09/19/17 23:34	C7I0305	CI71948



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-597 (1-2')  
Date Sampled: 09/15/17 00:00  
Percent Solids: 95  
Initial Volume: 7.4  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1709470  
ESS Laboratory Sample ID: 1709470-15  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0036)		8260B Low		1	09/19/17 23:34	C7I0305	CI71948
trans-1,2-Dichloroethene	ND (0.0036)		8260B Low		1	09/19/17 23:34	C7I0305	CI71948
trans-1,3-Dichloropropene	ND (0.0036)		8260B Low		1	09/19/17 23:34	C7I0305	CI71948
Trichloroethene	ND (0.0036)		8260B Low		1	09/19/17 23:34	C7I0305	CI71948
Trichlorofluoromethane	ND (0.0036)		8260B Low		1	09/19/17 23:34	C7I0305	CI71948
Vinyl Acetate	ND (0.0036)		8260B Low		1	09/19/17 23:34	C7I0305	CI71948
Vinyl Chloride	ND (0.0071)		8260B Low		1	09/19/17 23:34	C7I0305	CI71948
Xylene O	ND (0.0036)		8260B Low		1	09/19/17 23:34	C7I0305	CI71948
Xylene P,M	ND (0.0071)		8260B Low		1	09/19/17 23:34	C7I0305	CI71948
Xylenes (Total)	ND (0.0071)		8260B Low		1	09/19/17 23:34		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	97 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	104 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	100 %		70-130
<i>Surrogate: Toluene-d8</i>	101 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-597 (1-2')  
 Date Sampled: 09/15/17 00:00  
 Percent Solids: 95  
 Initial Volume: 19.6  
 Final Volume: 1  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709470  
 ESS Laboratory Sample ID: 1709470-15  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: SMR  
 Prepared: 9/18/17 12:50

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	ND (40.2)		8100M		1	09/18/17 21:34	C710279	CI71821
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		83 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-597 (1-2')  
 Date Sampled: 09/15/17 00:00  
 Percent Solids: 95  
 Initial Volume: 14.2  
 Final Volume: 0.5  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709470  
 ESS Laboratory Sample ID: 1709470-15  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: TJ  
 Prepared: 9/18/17 15:15

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.370)		8270D		1	09/20/17 2:13	C7I0308	CI71819
Acenaphthene	ND (0.370)		8270D		1	09/20/17 2:13	C7I0308	CI71819
Acenaphthylene	ND (0.370)		8270D		1	09/20/17 2:13	C7I0308	CI71819
Anthracene	ND (0.370)		8270D		1	09/20/17 2:13	C7I0308	CI71819
Benzo(a)anthracene	ND (0.370)		8270D		1	09/20/17 2:13	C7I0308	CI71819
Benzo(a)pyrene	ND (0.185)		8270D		1	09/20/17 2:13	C7I0308	CI71819
Benzo(b)fluoranthene	ND (0.370)		8270D		1	09/20/17 2:13	C7I0308	CI71819
Benzo(g,h,i)perylene	ND (0.370)		8270D		1	09/20/17 2:13	C7I0308	CI71819
Benzo(k)fluoranthene	ND (0.370)		8270D		1	09/20/17 2:13	C7I0308	CI71819
Chrysene	ND (0.185)		8270D		1	09/20/17 2:13	C7I0308	CI71819
Dibenzo(a,h)Anthracene	ND (0.185)		8270D		1	09/20/17 2:13	C7I0308	CI71819
Fluoranthene	ND (0.370)		8270D		1	09/20/17 2:13	C7I0308	CI71819
Fluorene	ND (0.370)		8270D		1	09/20/17 2:13	C7I0308	CI71819
Indeno(1,2,3-cd)Pyrene	ND (0.370)		8270D		1	09/20/17 2:13	C7I0308	CI71819
Naphthalene	ND (0.370)		8270D		1	09/20/17 2:13	C7I0308	CI71819
Phenanthrene	ND (0.370)		8270D		1	09/20/17 2:13	C7I0308	CI71819
Pyrene	ND (0.370)		8270D		1	09/20/17 2:13	C7I0308	CI71819

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	75 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	81 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	62 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	105 %		30-130





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-597 (1-2')  
Date Sampled: 09/15/17 00:00  
Percent Solids: 95

ESS Laboratory Work Order: 1709470  
ESS Laboratory Sample ID: 1709470-15  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	ND (1.02)		9014		1	EEM	09/21/17 12:25	mg/kg dry	CI72119



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TB-091417  
Date Sampled: 09/14/17 00:00  
Percent Solids: N/A  
Initial Volume: 5  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1709470  
ESS Laboratory Sample ID: 1709470-16  
Sample Matrix: Solid  
Units: mg/kg wet  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0050)		8260B Low		1	09/19/17 15:32	C7I0305	CI71948
1,1,1-Trichloroethane	ND (0.0050)		8260B Low		1	09/19/17 15:32	C7I0305	CI71948
1,1,2,2-Tetrachloroethane	ND (0.0050)		8260B Low		1	09/19/17 15:32	C7I0305	CI71948
1,1,2-Trichloroethane	ND (0.0050)		8260B Low		1	09/19/17 15:32	C7I0305	CI71948
1,1-Dichloroethane	ND (0.0050)		8260B Low		1	09/19/17 15:32	C7I0305	CI71948
1,1-Dichloroethene	ND (0.0050)		8260B Low		1	09/19/17 15:32	C7I0305	CI71948
1,1-Dichloropropene	ND (0.0050)		8260B Low		1	09/19/17 15:32	C7I0305	CI71948
1,2,3-Trichlorobenzene	ND (0.0050)		8260B Low		1	09/19/17 15:32	C7I0305	CI71948
1,2,3-Trichloropropane	ND (0.0050)		8260B Low		1	09/19/17 15:32	C7I0305	CI71948
1,2,4-Trichlorobenzene	ND (0.0050)		8260B Low		1	09/19/17 15:32	C7I0305	CI71948
1,2,4-Trimethylbenzene	ND (0.0050)		8260B Low		1	09/19/17 15:32	C7I0305	CI71948
1,2-Dibromo-3-Chloropropane	ND (0.0050)		8260B Low		1	09/19/17 15:32	C7I0305	CI71948
1,2-Dibromoethane	ND (0.0050)		8260B Low		1	09/19/17 15:32	C7I0305	CI71948
1,2-Dichlorobenzene	ND (0.0050)		8260B Low		1	09/19/17 15:32	C7I0305	CI71948
1,2-Dichloroethane	ND (0.0050)		8260B Low		1	09/19/17 15:32	C7I0305	CI71948
1,2-Dichloropropane	ND (0.0050)		8260B Low		1	09/19/17 15:32	C7I0305	CI71948
1,3,5-Trimethylbenzene	ND (0.0050)		8260B Low		1	09/19/17 15:32	C7I0305	CI71948
1,3-Dichlorobenzene	ND (0.0050)		8260B Low		1	09/19/17 15:32	C7I0305	CI71948
1,3-Dichloropropane	ND (0.0050)		8260B Low		1	09/19/17 15:32	C7I0305	CI71948
1,4-Dichlorobenzene	ND (0.0050)		8260B Low		1	09/19/17 15:32	C7I0305	CI71948
1,4-Dioxane	ND (0.100)		8260B Low		1	09/19/17 15:32	C7I0305	CI71948
1-Chlorohexane	ND (0.0050)		8260B Low		1	09/19/17 15:32	C7I0305	CI71948
2,2-Dichloropropane	ND (0.0050)		8260B Low		1	09/19/17 15:32	C7I0305	CI71948
2-Butanone	ND (0.0500)		8260B Low		1	09/19/17 15:32	C7I0305	CI71948
2-Chlorotoluene	ND (0.0050)		8260B Low		1	09/19/17 15:32	C7I0305	CI71948
2-Hexanone	ND (0.0500)		8260B Low		1	09/19/17 15:32	C7I0305	CI71948
4-Chlorotoluene	ND (0.0050)		8260B Low		1	09/19/17 15:32	C7I0305	CI71948
4-Isopropyltoluene	ND (0.0050)		8260B Low		1	09/19/17 15:32	C7I0305	CI71948
4-Methyl-2-Pentanone	ND (0.0500)		8260B Low		1	09/19/17 15:32	C7I0305	CI71948
Acetone	ND (0.0500)		8260B Low		1	09/19/17 15:32	C7I0305	CI71948
Benzene	ND (0.0050)		8260B Low		1	09/19/17 15:32	C7I0305	CI71948
Bromobenzene	ND (0.0050)		8260B Low		1	09/19/17 15:32	C7I0305	CI71948



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TB-091417  
 Date Sampled: 09/14/17 00:00  
 Percent Solids: N/A  
 Initial Volume: 5  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709470  
 ESS Laboratory Sample ID: 1709470-16  
 Sample Matrix: Solid  
 Units: mg/kg wet  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0050)		8260B Low		1	09/19/17 15:32	C7I0305	CI71948
Bromodichloromethane	ND (0.0050)		8260B Low		1	09/19/17 15:32	C7I0305	CI71948
Bromoform	ND (0.0050)		8260B Low		1	09/19/17 15:32	C7I0305	CI71948
Bromomethane	ND (0.0100)		8260B Low		1	09/19/17 15:32	C7I0305	CI71948
Carbon Disulfide	ND (0.0050)		8260B Low		1	09/19/17 15:32	C7I0305	CI71948
Carbon Tetrachloride	ND (0.0050)		8260B Low		1	09/19/17 15:32	C7I0305	CI71948
Chlorobenzene	ND (0.0050)		8260B Low		1	09/19/17 15:32	C7I0305	CI71948
Chloroethane	ND (0.0100)		8260B Low		1	09/19/17 15:32	C7I0305	CI71948
Chloroform	ND (0.0050)		8260B Low		1	09/19/17 15:32	C7I0305	CI71948
Chloromethane	ND (0.0100)		8260B Low		1	09/19/17 15:32	C7I0305	CI71948
cis-1,2-Dichloroethene	ND (0.0050)		8260B Low		1	09/19/17 15:32	C7I0305	CI71948
cis-1,3-Dichloropropene	ND (0.0050)		8260B Low		1	09/19/17 15:32	C7I0305	CI71948
Dibromochloromethane	ND (0.0050)		8260B Low		1	09/19/17 15:32	C7I0305	CI71948
Dibromomethane	ND (0.0050)		8260B Low		1	09/19/17 15:32	C7I0305	CI71948
Dichlorodifluoromethane	ND (0.0100)		8260B Low		1	09/19/17 15:32	C7I0305	CI71948
Diethyl Ether	ND (0.0050)		8260B Low		1	09/19/17 15:32	C7I0305	CI71948
Di-isopropyl ether	ND (0.0050)		8260B Low		1	09/19/17 15:32	C7I0305	CI71948
Ethyl tertiary-butyl ether	ND (0.0050)		8260B Low		1	09/19/17 15:32	C7I0305	CI71948
Ethylbenzene	ND (0.0050)		8260B Low		1	09/19/17 15:32	C7I0305	CI71948
Hexachlorobutadiene	ND (0.0050)		8260B Low		1	09/19/17 15:32	C7I0305	CI71948
Isopropylbenzene	ND (0.0050)		8260B Low		1	09/19/17 15:32	C7I0305	CI71948
Methyl tert-Butyl Ether	ND (0.0050)		8260B Low		1	09/19/17 15:32	C7I0305	CI71948
Methylene Chloride	ND (0.0250)		8260B Low		1	09/19/17 15:32	C7I0305	CI71948
Naphthalene	ND (0.0050)		8260B Low		1	09/19/17 15:32	C7I0305	CI71948
n-Butylbenzene	ND (0.0050)		8260B Low		1	09/19/17 15:32	C7I0305	CI71948
n-Propylbenzene	ND (0.0050)		8260B Low		1	09/19/17 15:32	C7I0305	CI71948
sec-Butylbenzene	ND (0.0050)		8260B Low		1	09/19/17 15:32	C7I0305	CI71948
Styrene	ND (0.0050)		8260B Low		1	09/19/17 15:32	C7I0305	CI71948
tert-Butylbenzene	ND (0.0050)		8260B Low		1	09/19/17 15:32	C7I0305	CI71948
Tertiary-amyl methyl ether	ND (0.0050)		8260B Low		1	09/19/17 15:32	C7I0305	CI71948
Tetrachloroethene	ND (0.0050)		8260B Low		1	09/19/17 15:32	C7I0305	CI71948
Tetrahydrofuran	ND (0.0050)		8260B Low		1	09/19/17 15:32	C7I0305	CI71948



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TB-091417  
Date Sampled: 09/14/17 00:00  
Percent Solids: N/A  
Initial Volume: 5  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1709470  
ESS Laboratory Sample ID: 1709470-16  
Sample Matrix: Solid  
Units: mg/kg wet  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0050)		8260B Low		1	09/19/17 15:32	C7I0305	CI71948
trans-1,2-Dichloroethene	ND (0.0050)		8260B Low		1	09/19/17 15:32	C7I0305	CI71948
trans-1,3-Dichloropropene	ND (0.0050)		8260B Low		1	09/19/17 15:32	C7I0305	CI71948
Trichloroethene	ND (0.0050)		8260B Low		1	09/19/17 15:32	C7I0305	CI71948
Trichlorofluoromethane	ND (0.0050)		8260B Low		1	09/19/17 15:32	C7I0305	CI71948
Vinyl Acetate	ND (0.0050)		8260B Low		1	09/19/17 15:32	C7I0305	CI71948
Vinyl Chloride	ND (0.0100)		8260B Low		1	09/19/17 15:32	C7I0305	CI71948
Xylene O	ND (0.0050)		8260B Low		1	09/19/17 15:32	C7I0305	CI71948
Xylene P,M	ND (0.0100)		8260B Low		1	09/19/17 15:32	C7I0305	CI71948
Xylenes (Total)	ND (0.0100)		8260B Low		1	09/19/17 15:32		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	87 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	103 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	93 %		70-130
<i>Surrogate: Toluene-d8</i>	101 %		70-130





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility

ESS Laboratory Work Order: 1709470

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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**Total Metals**

**Batch CI71936 - 3050B**

**Blank**

Antimony	ND	2.00	mg/kg wet
Arsenic	ND	2.50	mg/kg wet
Beryllium	ND	0.11	mg/kg wet
Cadmium	ND	0.50	mg/kg wet
Chromium	ND	1.00	mg/kg wet
Copper	ND	2.50	mg/kg wet
Lead	ND	5.00	mg/kg wet
Nickel	ND	2.50	mg/kg wet
Selenium	ND	2.00	mg/kg wet
Silver	ND	0.50	mg/kg wet
Thallium	ND	2.00	mg/kg wet
Zinc	ND	2.50	mg/kg wet

**LCS**

Antimony	49.1	16.7	mg/kg wet	48.00	102	80-120
Arsenic	105	8.33	mg/kg wet	123.0	85	80-120
Beryllium	168	0.37	mg/kg wet	192.0	87	80-120
Chromium	159	3.33	mg/kg wet	179.0	89	80-120
Copper	73.0	8.33	mg/kg wet	78.90	92	80-120
Lead	124	16.7	mg/kg wet	145.0	86	80-120
Nickel	121	8.33	mg/kg wet	143.0	85	80-120
Selenium	42.3	16.7	mg/kg wet	42.40	100	80-120
Silver	70.2	1.67	mg/kg wet	81.60	86	80-120
Thallium	47.0	16.7	mg/kg wet	52.00	90	80-120

**LCS**

Cadmium	66.0	2.00	mg/kg wet	76.80	86	80-120
Zinc	201	10.0	mg/kg wet	212.0	95	80-120

**LCS Dup**

Antimony	54.4	19.2	mg/kg wet	48.00	113	80-120	10	30
Arsenic	112	9.62	mg/kg wet	123.0	91	80-120	7	20
Beryllium	172	0.42	mg/kg wet	192.0	90	80-120	3	20
Chromium	167	3.85	mg/kg wet	179.0	93	80-120	5	20
Copper	77.8	9.62	mg/kg wet	78.90	99	80-120	6	20
Lead	134	19.2	mg/kg wet	145.0	92	80-120	8	20
Nickel	125	9.62	mg/kg wet	143.0	88	80-120	4	20
Selenium	42.9	19.2	mg/kg wet	42.40	101	80-120	1	30
Silver	73.3	1.92	mg/kg wet	81.60	90	80-120	4	20
Thallium	48.3	19.2	mg/kg wet	52.00	93	80-120	3	30

**LCS Dup**

Cadmium	69.5	1.92	mg/kg wet	76.80	91	80-120	5	20
Zinc	203	9.62	mg/kg wet	212.0	96	80-120	1	20

**Batch CI71940 - 7471B**

**Blank**

Mercury	ND	0.033	mg/kg wet
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CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility

ESS Laboratory Work Order: 1709470

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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Total Metals

**Batch CI71940 - 7471B**

**LCS**

Mercury	6.76	0.776	mg/kg wet	6.650		102	80-120			
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**LCS Dup**

Mercury	6.79	0.707	mg/kg wet	6.650		102	80-120	0.5	20	
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CI71948 - 5035**

**Blank**

1,1,1,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,1-Trichloroethane	ND	0.0050	mg/kg wet							
1,1,2,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,2-Trichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethene	ND	0.0050	mg/kg wet							
1,1-Dichloropropene	ND	0.0050	mg/kg wet							
1,2,3-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,3-Trichloropropane	ND	0.0050	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,4-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,2-Dibromo-3-Chloropropane	ND	0.0050	mg/kg wet							
1,2-Dibromoethane	ND	0.0050	mg/kg wet							
1,2-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,2-Dichloroethane	ND	0.0050	mg/kg wet							
1,2-Dichloropropane	ND	0.0050	mg/kg wet							
1,3,5-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,3-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,3-Dichloropropane	ND	0.0050	mg/kg wet							
1,4-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,4-Dioxane	ND	0.100	mg/kg wet							
1-Chlorohexane	ND	0.0050	mg/kg wet							
2,2-Dichloropropane	ND	0.0050	mg/kg wet							
2-Butanone	ND	0.0500	mg/kg wet							
2-Chlorotoluene	ND	0.0050	mg/kg wet							
2-Hexanone	ND	0.0500	mg/kg wet							
4-Chlorotoluene	ND	0.0050	mg/kg wet							
4-Isopropyltoluene	ND	0.0050	mg/kg wet							
4-Methyl-2-Pentanone	ND	0.0500	mg/kg wet							
Acetone	ND	0.0500	mg/kg wet							
Benzene	ND	0.0050	mg/kg wet							
Bromobenzene	ND	0.0050	mg/kg wet							
Bromochloromethane	ND	0.0050	mg/kg wet							
Bromodichloromethane	ND	0.0050	mg/kg wet							
Bromoform	ND	0.0050	mg/kg wet							
Bromomethane	ND	0.0100	mg/kg wet							



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility

ESS Laboratory Work Order: 1709470

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CI71948 - 5035**

Carbon Disulfide	ND	0.0050	mg/kg wet							
Carbon Tetrachloride	ND	0.0050	mg/kg wet							
Chlorobenzene	ND	0.0050	mg/kg wet							
Chloroethane	ND	0.0100	mg/kg wet							
Chloroform	ND	0.0050	mg/kg wet							
Chloromethane	ND	0.0100	mg/kg wet							
cis-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
cis-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Dibromochloromethane	ND	0.0050	mg/kg wet							
Dibromomethane	ND	0.0050	mg/kg wet							
Dichlorodifluoromethane	ND	0.0100	mg/kg wet							
Diethyl Ether	ND	0.0050	mg/kg wet							
Di-isopropyl ether	ND	0.0050	mg/kg wet							
Ethyl tertiary-butyl ether	ND	0.0050	mg/kg wet							
Ethylbenzene	ND	0.0050	mg/kg wet							
Hexachlorobutadiene	ND	0.0050	mg/kg wet							
Isopropylbenzene	ND	0.0050	mg/kg wet							
Methyl tert-Butyl Ether	ND	0.0050	mg/kg wet							
Methylene Chloride	ND	0.0250	mg/kg wet							
Naphthalene	ND	0.0050	mg/kg wet							
n-Butylbenzene	ND	0.0050	mg/kg wet							
n-Propylbenzene	ND	0.0050	mg/kg wet							
sec-Butylbenzene	ND	0.0050	mg/kg wet							
Styrene	ND	0.0050	mg/kg wet							
tert-Butylbenzene	ND	0.0050	mg/kg wet							
Tertiary-amyl methyl ether	ND	0.0050	mg/kg wet							
Tetrachloroethene	ND	0.0050	mg/kg wet							
Tetrahydrofuran	ND	0.0050	mg/kg wet							
Toluene	ND	0.0050	mg/kg wet							
trans-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
trans-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Trichloroethene	ND	0.0050	mg/kg wet							
Trichlorofluoromethane	ND	0.0050	mg/kg wet							
Vinyl Acetate	ND	0.0050	mg/kg wet							
Vinyl Chloride	ND	0.0100	mg/kg wet							
Xylene O	ND	0.0050	mg/kg wet							
Xylene P,M	ND	0.0100	mg/kg wet							
Xylenes (Total)	ND	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	0.0423		mg/kg wet	0.05000		85	70-130			
Surrogate: 4-Bromofluorobenzene	0.0516		mg/kg wet	0.05000		103	70-130			
Surrogate: Dibromofluoromethane	0.0459		mg/kg wet	0.05000		92	70-130			
Surrogate: Toluene-d8	0.0506		mg/kg wet	0.05000		101	70-130			

**LCS**

1,1,1,2-Tetrachloroethane	0.0528	0.0050	mg/kg wet	0.05000		106	70-130			
1,1,1-Trichloroethane	0.0549	0.0050	mg/kg wet	0.05000		110	70-130			



CERTIFICATE OF ANALYSIS

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ESS Laboratory Work Order: 1709470

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CI71948 - 5035**

1,1,2,2-Tetrachloroethane	0.0562	0.0050	mg/kg wet	0.05000		112	70-130			
1,1,2-Trichloroethane	0.0492	0.0050	mg/kg wet	0.05000		98	70-130			
1,1-Dichloroethane	0.0526	0.0050	mg/kg wet	0.05000		105	70-130			
1,1-Dichloroethene	0.0596	0.0050	mg/kg wet	0.05000		119	70-130			
1,1-Dichloropropene	0.0572	0.0050	mg/kg wet	0.05000		114	70-130			
1,2,3-Trichlorobenzene	0.0532	0.0050	mg/kg wet	0.05000		106	70-130			
1,2,3-Trichloropropane	0.0505	0.0050	mg/kg wet	0.05000		101	70-130			
1,2,4-Trichlorobenzene	0.0530	0.0050	mg/kg wet	0.05000		106	70-130			
1,2,4-Trimethylbenzene	0.0537	0.0050	mg/kg wet	0.05000		107	70-130			
1,2-Dibromo-3-Chloropropane	0.0496	0.0050	mg/kg wet	0.05000		99	70-130			
1,2-Dibromoethane	0.0530	0.0050	mg/kg wet	0.05000		106	70-130			
1,2-Dichlorobenzene	0.0580	0.0050	mg/kg wet	0.05000		116	70-130			
1,2-Dichloroethane	0.0514	0.0050	mg/kg wet	0.05000		103	70-130			
1,2-Dichloropropane	0.0554	0.0050	mg/kg wet	0.05000		111	70-130			
1,3,5-Trimethylbenzene	0.0539	0.0050	mg/kg wet	0.05000		108	70-130			
1,3-Dichlorobenzene	0.0563	0.0050	mg/kg wet	0.05000		113	70-130			
1,3-Dichloropropane	0.0609	0.0050	mg/kg wet	0.05000		122	70-130			
1,4-Dichlorobenzene	0.0580	0.0050	mg/kg wet	0.05000		116	70-130			
1,4-Dioxane	1.04	0.100	mg/kg wet	1.000		104	70-130			
1-Chlorohexane	0.0524	0.0050	mg/kg wet	0.05000		105	70-130			
2,2-Dichloropropane	0.0480	0.0050	mg/kg wet	0.05000		96	70-130			
2-Butanone	0.270	0.0500	mg/kg wet	0.2500		108	70-130			
2-Chlorotoluene	0.0579	0.0050	mg/kg wet	0.05000		116	70-130			
2-Hexanone	0.254	0.0500	mg/kg wet	0.2500		102	70-130			
4-Chlorotoluene	0.0586	0.0050	mg/kg wet	0.05000		117	70-130			
4-Isopropyltoluene	0.0588	0.0050	mg/kg wet	0.05000		118	70-130			
4-Methyl-2-Pentanone	0.243	0.0500	mg/kg wet	0.2500		97	70-130			
Acetone	0.242	0.0500	mg/kg wet	0.2500		97	70-130			
Benzene	0.0542	0.0050	mg/kg wet	0.05000		108	70-130			
Bromobenzene	0.0532	0.0050	mg/kg wet	0.05000		106	70-130			
Bromochloromethane	0.0537	0.0050	mg/kg wet	0.05000		107	70-130			
Bromodichloromethane	0.0467	0.0050	mg/kg wet	0.05000		93	70-130			
Bromoform	0.0568	0.0050	mg/kg wet	0.05000		114	70-130			
Bromomethane	0.0492	0.0100	mg/kg wet	0.05000		98	70-130			
Carbon Disulfide	0.0577	0.0050	mg/kg wet	0.05000		115	70-130			
Carbon Tetrachloride	0.0492	0.0050	mg/kg wet	0.05000		98	70-130			
Chlorobenzene	0.0570	0.0050	mg/kg wet	0.05000		114	70-130			
Chloroethane	0.0508	0.0100	mg/kg wet	0.05000		102	70-130			
Chloroform	0.0521	0.0050	mg/kg wet	0.05000		104	70-130			
Chloromethane	0.0488	0.0100	mg/kg wet	0.05000		98	70-130			
cis-1,2-Dichloroethene	0.0545	0.0050	mg/kg wet	0.05000		109	70-130			
cis-1,3-Dichloropropene	0.0511	0.0050	mg/kg wet	0.05000		102	70-130			
Dibromochloromethane	0.0500	0.0050	mg/kg wet	0.05000		100	70-130			
Dibromomethane	0.0512	0.0050	mg/kg wet	0.05000		102	70-130			
Dichlorodifluoromethane	0.0368	0.0100	mg/kg wet	0.05000		74	70-130			





CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility

ESS Laboratory Work Order: 1709470

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CI71948 - 5035**

Diethyl Ether	0.0526	0.0050	mg/kg wet	0.05000		105	70-130			
Di-isopropyl ether	0.0551	0.0050	mg/kg wet	0.05000		110	70-130			
Ethyl tertiary-butyl ether	0.0495	0.0050	mg/kg wet	0.05000		99	70-130			
Ethylbenzene	0.0590	0.0050	mg/kg wet	0.05000		118	70-130			
Hexachlorobutadiene	0.0531	0.0050	mg/kg wet	0.05000		106	70-130			
Isopropylbenzene	0.0520	0.0050	mg/kg wet	0.05000		104	70-130			
Methyl tert-Butyl Ether	0.0505	0.0050	mg/kg wet	0.05000		101	70-130			
Methylene Chloride	0.0521	0.0250	mg/kg wet	0.05000		104	70-130			
Naphthalene	0.0514	0.0050	mg/kg wet	0.05000		103	70-130			
n-Butylbenzene	0.0524	0.0050	mg/kg wet	0.05000		105	70-130			
n-Propylbenzene	0.0606	0.0050	mg/kg wet	0.05000		121	70-130			
sec-Butylbenzene	0.0593	0.0050	mg/kg wet	0.05000		119	70-130			
Styrene	0.0520	0.0050	mg/kg wet	0.05000		104	70-130			
tert-Butylbenzene	0.0536	0.0050	mg/kg wet	0.05000		107	70-130			
Tertiary-amyl methyl ether	0.0481	0.0050	mg/kg wet	0.05000		96	70-130			
Tetrachloroethene	0.0579	0.0050	mg/kg wet	0.05000		116	70-130			
Tetrahydrofuran	0.0503	0.0050	mg/kg wet	0.05000		101	70-130			
Toluene	0.0477	0.0050	mg/kg wet	0.05000		95	70-130			
trans-1,2-Dichloroethene	0.0576	0.0050	mg/kg wet	0.05000		115	70-130			
trans-1,3-Dichloropropene	0.0484	0.0050	mg/kg wet	0.05000		97	70-130			
Trichloroethene	0.0540	0.0050	mg/kg wet	0.05000		108	70-130			
Trichlorofluoromethane	0.0510	0.0050	mg/kg wet	0.05000		102	70-130			
Vinyl Acetate	0.0515	0.0050	mg/kg wet	0.05000		103	70-130			
Vinyl Chloride	0.0511	0.0100	mg/kg wet	0.05000		102	70-130			
Xylene O	0.0601	0.0050	mg/kg wet	0.05000		120	70-130			
Xylene P,M	0.120	0.0100	mg/kg wet	0.1000		120	70-130			
Xylenes (Total)	0.180	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	0.0460		mg/kg wet	0.05000		92	70-130			
Surrogate: 4-Bromofluorobenzene	0.0515		mg/kg wet	0.05000		103	70-130			
Surrogate: Dibromofluoromethane	0.0483		mg/kg wet	0.05000		97	70-130			
Surrogate: Toluene-d8	0.0534		mg/kg wet	0.05000		107	70-130			

**LCS Dup**

1,1,1,2-Tetrachloroethane	0.0466	0.0050	mg/kg wet	0.05000		93	70-130	12	25	
1,1,1-Trichloroethane	0.0475	0.0050	mg/kg wet	0.05000		95	70-130	15	25	
1,1,2,2-Tetrachloroethane	0.0479	0.0050	mg/kg wet	0.05000		96	70-130	16	25	
1,1,2-Trichloroethane	0.0426	0.0050	mg/kg wet	0.05000		85	70-130	14	25	
1,1-Dichloroethane	0.0460	0.0050	mg/kg wet	0.05000		92	70-130	13	25	
1,1-Dichloroethene	0.0521	0.0050	mg/kg wet	0.05000		104	70-130	13	25	
1,1-Dichloropropene	0.0497	0.0050	mg/kg wet	0.05000		99	70-130	14	25	
1,2,3-Trichlorobenzene	0.0464	0.0050	mg/kg wet	0.05000		93	70-130	14	25	
1,2,3-Trichloropropane	0.0439	0.0050	mg/kg wet	0.05000		88	70-130	14	25	
1,2,4-Trichlorobenzene	0.0459	0.0050	mg/kg wet	0.05000		92	70-130	14	25	
1,2,4-Trimethylbenzene	0.0471	0.0050	mg/kg wet	0.05000		94	70-130	13	25	
1,2-Dibromo-3-Chloropropane	0.0436	0.0050	mg/kg wet	0.05000		87	70-130	13	25	
1,2-Dibromoethane	0.0460	0.0050	mg/kg wet	0.05000		92	70-130	14	25	



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility

ESS Laboratory Work Order: 1709470

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
<b>5035/8260B Volatile Organic Compounds / Low Level</b>										
<b>Batch CI71948 - 5035</b>										
1,2-Dichlorobenzene	0.0503	0.0050	mg/kg wet	0.05000		101	70-130	14	25	
1,2-Dichloroethane	0.0447	0.0050	mg/kg wet	0.05000		89	70-130	14	25	
1,2-Dichloropropane	0.0482	0.0050	mg/kg wet	0.05000		96	70-130	14	25	
1,3,5-Trimethylbenzene	0.0469	0.0050	mg/kg wet	0.05000		94	70-130	14	25	
1,3-Dichlorobenzene	0.0497	0.0050	mg/kg wet	0.05000		99	70-130	12	25	
1,3-Dichloropropane	0.0521	0.0050	mg/kg wet	0.05000		104	70-130	16	25	
1,4-Dichlorobenzene	0.0494	0.0050	mg/kg wet	0.05000		99	70-130	16	25	
1,4-Dioxane	0.873	0.100	mg/kg wet	1.000		87	70-130	17	20	
1-Chlorohexane	0.0456	0.0050	mg/kg wet	0.05000		91	70-130	14	25	
2,2-Dichloropropane	0.0420	0.0050	mg/kg wet	0.05000		84	70-130	13	25	
2-Butanone	0.232	0.0500	mg/kg wet	0.2500		93	70-130	15	25	
2-Chlorotoluene	0.0507	0.0050	mg/kg wet	0.05000		101	70-130	13	25	
2-Hexanone	0.221	0.0500	mg/kg wet	0.2500		88	70-130	14	25	
4-Chlorotoluene	0.0501	0.0050	mg/kg wet	0.05000		100	70-130	16	25	
4-Isopropyltoluene	0.0508	0.0050	mg/kg wet	0.05000		102	70-130	15	25	
4-Methyl-2-Pentanone	0.210	0.0500	mg/kg wet	0.2500		84	70-130	15	25	
Acetone	0.208	0.0500	mg/kg wet	0.2500		83	70-130	15	25	
Benzene	0.0471	0.0050	mg/kg wet	0.05000		94	70-130	14	25	
Bromobenzene	0.0464	0.0050	mg/kg wet	0.05000		93	70-130	14	25	
Bromochloromethane	0.0464	0.0050	mg/kg wet	0.05000		93	70-130	15	25	
Bromodichloromethane	0.0407	0.0050	mg/kg wet	0.05000		81	70-130	14	25	
Bromoform	0.0482	0.0050	mg/kg wet	0.05000		96	70-130	16	25	
Bromomethane	0.0408	0.0100	mg/kg wet	0.05000		82	70-130	19	25	
Carbon Disulfide	0.0501	0.0050	mg/kg wet	0.05000		100	70-130	14	25	
Carbon Tetrachloride	0.0429	0.0050	mg/kg wet	0.05000		86	70-130	14	25	
Chlorobenzene	0.0492	0.0050	mg/kg wet	0.05000		98	70-130	15	25	
Chloroethane	0.0448	0.0100	mg/kg wet	0.05000		90	70-130	13	25	
Chloroform	0.0456	0.0050	mg/kg wet	0.05000		91	70-130	13	25	
Chloromethane	0.0424	0.0100	mg/kg wet	0.05000		85	70-130	14	25	
cis-1,2-Dichloroethene	0.0476	0.0050	mg/kg wet	0.05000		95	70-130	13	25	
cis-1,3-Dichloropropene	0.0447	0.0050	mg/kg wet	0.05000		89	70-130	13	25	
Dibromochloromethane	0.0435	0.0050	mg/kg wet	0.05000		87	70-130	14	25	
Dibromomethane	0.0447	0.0050	mg/kg wet	0.05000		89	70-130	14	25	
Dichlorodifluoromethane	0.0318	0.0100	mg/kg wet	0.05000		64	70-130	15	25	B-
Diethyl Ether	0.0460	0.0050	mg/kg wet	0.05000		92	70-130	13	25	
Di-isopropyl ether	0.0482	0.0050	mg/kg wet	0.05000		96	70-130	13	25	
Ethyl tertiary-butyl ether	0.0434	0.0050	mg/kg wet	0.05000		87	70-130	13	25	
Ethylbenzene	0.0510	0.0050	mg/kg wet	0.05000		102	70-130	14	25	
Hexachlorobutadiene	0.0460	0.0050	mg/kg wet	0.05000		92	70-130	14	25	
Isopropylbenzene	0.0454	0.0050	mg/kg wet	0.05000		91	70-130	14	25	
Methyl tert-Butyl Ether	0.0444	0.0050	mg/kg wet	0.05000		89	70-130	13	25	
Methylene Chloride	0.0457	0.0250	mg/kg wet	0.05000		91	70-130	13	25	
Naphthalene	0.0445	0.0050	mg/kg wet	0.05000		89	70-130	14	25	
n-Butylbenzene	0.0456	0.0050	mg/kg wet	0.05000		91	70-130	14	25	
n-Propylbenzene	0.0525	0.0050	mg/kg wet	0.05000		105	70-130	14	25	

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility

ESS Laboratory Work Order: 1709470

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CI71948 - 5035**

sec-Butylbenzene	0.0511	0.0050	mg/kg wet	0.05000		102	70-130	15	25	
Styrene	0.0447	0.0050	mg/kg wet	0.05000		89	70-130	15	25	
tert-Butylbenzene	0.0471	0.0050	mg/kg wet	0.05000		94	70-130	13	25	
Tertiary-amyl methyl ether	0.0425	0.0050	mg/kg wet	0.05000		85	70-130	12	25	
Tetrachloroethene	0.0489	0.0050	mg/kg wet	0.05000		98	70-130	17	25	
Tetrahydrofuran	0.0439	0.0050	mg/kg wet	0.05000		88	70-130	14	25	
Toluene	0.0414	0.0050	mg/kg wet	0.05000		83	70-130	14	25	
trans-1,2-Dichloroethene	0.0500	0.0050	mg/kg wet	0.05000		100	70-130	14	25	
trans-1,3-Dichloropropene	0.0433	0.0050	mg/kg wet	0.05000		87	70-130	11	25	
Trichloroethene	0.0473	0.0050	mg/kg wet	0.05000		95	70-130	13	25	
Trichlorofluoromethane	0.0445	0.0050	mg/kg wet	0.05000		89	70-130	14	25	
Vinyl Acetate	0.0459	0.0050	mg/kg wet	0.05000		92	70-130	12	25	
Vinyl Chloride	0.0451	0.0100	mg/kg wet	0.05000		90	70-130	12	25	
Xylene O	0.0520	0.0050	mg/kg wet	0.05000		104	70-130	14	25	
Xylene P,M	0.103	0.0100	mg/kg wet	0.1000		103	70-130	15	25	
Xylenes (Total)	0.155	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	0.0462		mg/kg wet	0.05000		92	70-130			
Surrogate: 4-Bromofluorobenzene	0.0508		mg/kg wet	0.05000		102	70-130			
Surrogate: Dibromofluoromethane	0.0490		mg/kg wet	0.05000		98	70-130			
Surrogate: Toluene-d8	0.0530		mg/kg wet	0.05000		106	70-130			

8100M Total Petroleum Hydrocarbons

**Batch CI71820 - 3546**

<b>Blank</b>										
Decane (C10)	ND	0.2	mg/kg wet							
Docosane (C22)	ND	0.2	mg/kg wet							
Dodecane (C12)	ND	0.2	mg/kg wet							
Eicosane (C20)	ND	0.2	mg/kg wet							
Hexacosane (C26)	ND	0.2	mg/kg wet							
Hexadecane (C16)	ND	0.2	mg/kg wet							
Nonadecane (C19)	ND	0.2	mg/kg wet							
Nonane (C9)	ND	0.2	mg/kg wet							
Octacosane (C28)	ND	0.2	mg/kg wet							
Octadecane (C18)	ND	0.2	mg/kg wet							
Tetracosane (C24)	ND	0.2	mg/kg wet							
Tetradecane (C14)	ND	0.2	mg/kg wet							
Total Petroleum Hydrocarbons	ND	37.5	mg/kg wet							
Triacotane (C30)	ND	0.2	mg/kg wet							

Surrogate: O-Terphenyl	4.28		mg/kg wet	5.000		86	40-140			
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<b>LCS</b>										
Decane (C10)	1.7	0.2	mg/kg wet	2.500		68	40-140			
Docosane (C22)	2.2	0.2	mg/kg wet	2.500		89	40-140			
Dodecane (C12)	1.9	0.2	mg/kg wet	2.500		76	40-140			
Eicosane (C20)	2.2	0.2	mg/kg wet	2.500		89	40-140			



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility

ESS Laboratory Work Order: 1709470

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
<b>8100M Total Petroleum Hydrocarbons</b>										
<b>Batch CI71820 - 3546</b>										
Hexacosane (C26)	2.2	0.2	mg/kg wet	2.500		90	40-140			
Hexadecane (C16)	2.1	0.2	mg/kg wet	2.500		85	40-140			
Nonadecane (C19)	2.3	0.2	mg/kg wet	2.500		93	40-140			
Nonane (C9)	1.4	0.2	mg/kg wet	2.500		56	30-140			
Octacosane (C28)	2.2	0.2	mg/kg wet	2.500		90	40-140			
Octadecane (C18)	2.1	0.2	mg/kg wet	2.500		84	40-140			
Tetracosane (C24)	2.2	0.2	mg/kg wet	2.500		89	40-140			
Tetradecane (C14)	2.0	0.2	mg/kg wet	2.500		79	40-140			
Total Petroleum Hydrocarbons	30.7	37.5	mg/kg wet	35.00		88	40-140			
Triacotane (C30)	2.2	0.2	mg/kg wet	2.500		89	40-140			
<i>Surrogate: O-Terphenyl</i>	<i>4.19</i>		<i>mg/kg wet</i>	<i>5.000</i>		<i>84</i>	<i>40-140</i>			
<b>LCS Dup</b>										
Decane (C10)	1.6	0.2	mg/kg wet	2.500		66	40-140	3	25	
Docosane (C22)	2.1	0.2	mg/kg wet	2.500		85	40-140	5	25	
Dodecane (C12)	1.7	0.2	mg/kg wet	2.500		67	40-140	12	25	
Eicosane (C20)	2.1	0.2	mg/kg wet	2.500		83	40-140	6	25	
Hexacosane (C26)	2.1	0.2	mg/kg wet	2.500		85	40-140	5	25	
Hexadecane (C16)	2.0	0.2	mg/kg wet	2.500		80	40-140	6	25	
Nonadecane (C19)	2.2	0.2	mg/kg wet	2.500		88	40-140	5	25	
Nonane (C9)	1.4	0.2	mg/kg wet	2.500		57	30-140	1	25	
Octacosane (C28)	2.1	0.2	mg/kg wet	2.500		85	40-140	5	25	
Octadecane (C18)	2.0	0.2	mg/kg wet	2.500		80	40-140	5	25	
Tetracosane (C24)	2.1	0.2	mg/kg wet	2.500		85	40-140	5	25	
Tetradecane (C14)	1.8	0.2	mg/kg wet	2.500		71	40-140	11	25	
Total Petroleum Hydrocarbons	29.6	37.5	mg/kg wet	35.00		85	40-140	4	25	
Triacotane (C30)	2.1	0.2	mg/kg wet	2.500		85	40-140	5	25	
<i>Surrogate: O-Terphenyl</i>	<i>4.08</i>		<i>mg/kg wet</i>	<i>5.000</i>		<i>82</i>	<i>40-140</i>			
<b>Batch CI71821 - 3546</b>										
<b>Blank</b>										
Decane (C10)	ND	0.2	mg/kg wet							
Docosane (C22)	ND	0.2	mg/kg wet							
Dodecane (C12)	ND	0.2	mg/kg wet							
Eicosane (C20)	ND	0.2	mg/kg wet							
Hexacosane (C26)	ND	0.2	mg/kg wet							
Hexadecane (C16)	ND	0.2	mg/kg wet							
Nonadecane (C19)	ND	0.2	mg/kg wet							
Nonane (C9)	ND	0.2	mg/kg wet							
Octacosane (C28)	ND	0.2	mg/kg wet							
Octadecane (C18)	ND	0.2	mg/kg wet							
Tetracosane (C24)	ND	0.2	mg/kg wet							
Tetradecane (C14)	ND	0.2	mg/kg wet							
Total Petroleum Hydrocarbons	ND	37.5	mg/kg wet							
Triacotane (C30)	ND	0.2	mg/kg wet							



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility

ESS Laboratory Work Order: 1709470

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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8100M Total Petroleum Hydrocarbons

**Batch CI71821 - 3546**

<i>Surrogate: O-Terphenyl</i>	4.50		mg/kg wet	5.000		90	40-140			
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**LCS**

Decane (C10)	2.0	0.2	mg/kg wet	2.500		81	40-140			
Docosane (C22)	2.4	0.2	mg/kg wet	2.500		98	40-140			
Dodecane (C12)	2.2	0.2	mg/kg wet	2.500		87	40-140			
Eicosane (C20)	2.4	0.2	mg/kg wet	2.500		98	40-140			
Hexacosane (C26)	2.5	0.2	mg/kg wet	2.500		99	40-140			
Hexadecane (C16)	2.3	0.2	mg/kg wet	2.500		94	40-140			
Nonadecane (C19)	2.5	0.2	mg/kg wet	2.500		99	40-140			
Nonane (C9)	1.7	0.2	mg/kg wet	2.500		68	30-140			
Octacosane (C28)	2.5	0.2	mg/kg wet	2.500		99	40-140			
Octadecane (C18)	2.3	0.2	mg/kg wet	2.500		93	40-140			
Tetracosane (C24)	2.5	0.2	mg/kg wet	2.500		99	40-140			
Tetradecane (C14)	2.2	0.2	mg/kg wet	2.500		89	40-140			
Total Petroleum Hydrocarbons	32.9	37.5	mg/kg wet	35.00		94	40-140			
Triacontane (C30)	2.5	0.2	mg/kg wet	2.500		101	40-140			

<i>Surrogate: O-Terphenyl</i>	4.47		mg/kg wet	5.000		89	40-140			
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**LCS Dup**

Decane (C10)	2.0	0.2	mg/kg wet	2.500		80	40-140	1	25	
Docosane (C22)	2.5	0.2	mg/kg wet	2.500		101	40-140	3	25	
Dodecane (C12)	2.2	0.2	mg/kg wet	2.500		89	40-140	2	25	
Eicosane (C20)	2.5	0.2	mg/kg wet	2.500		101	40-140	3	25	
Hexacosane (C26)	2.6	0.2	mg/kg wet	2.500		102	40-140	3	25	
Hexadecane (C16)	2.4	0.2	mg/kg wet	2.500		97	40-140	3	25	
Nonadecane (C19)	2.5	0.2	mg/kg wet	2.500		102	40-140	3	25	
Nonane (C9)	1.6	0.2	mg/kg wet	2.500		66	30-140	4	25	
Octacosane (C28)	2.6	0.2	mg/kg wet	2.500		102	40-140	3	25	
Octadecane (C18)	2.4	0.2	mg/kg wet	2.500		96	40-140	3	25	
Tetracosane (C24)	2.5	0.2	mg/kg wet	2.500		102	40-140	3	25	
Tetradecane (C14)	2.3	0.2	mg/kg wet	2.500		92	40-140	3	25	
Total Petroleum Hydrocarbons	33.8	37.5	mg/kg wet	35.00		96	40-140	3	25	
Triacontane (C30)	2.6	0.2	mg/kg wet	2.500		104	40-140	3	25	

<i>Surrogate: O-Terphenyl</i>	4.64		mg/kg wet	5.000		93	40-140			
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8270D Polynuclear Aromatic Hydrocarbons

**Batch CI71818 - 3546**

**Blank**

2-Methylnaphthalene	ND	0.333	mg/kg wet							
Acenaphthene	ND	0.333	mg/kg wet							
Acenaphthylene	ND	0.333	mg/kg wet							
Anthracene	ND	0.333	mg/kg wet							
Benzo(a)anthracene	ND	0.167	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility

ESS Laboratory Work Order: 1709470

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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8270D Polynuclear Aromatic Hydrocarbons

**Batch CI71818 - 3546**

Benzo(a)pyrene	ND	0.083	mg/kg wet							
Benzo(b)fluoranthene	ND	0.167	mg/kg wet							
Benzo(g,h,i)perylene	ND	0.167	mg/kg wet							
Benzo(k)fluoranthene	ND	0.167	mg/kg wet							
Chrysene	ND	0.083	mg/kg wet							
Dibenzo(a,h)Anthracene	ND	0.083	mg/kg wet							
Fluoranthene	ND	0.333	mg/kg wet							
Fluorene	ND	0.333	mg/kg wet							
Indeno(1,2,3-cd)Pyrene	ND	0.167	mg/kg wet							
Naphthalene	ND	0.167	mg/kg wet							
Phenanthrene	ND	0.333	mg/kg wet							
Pyrene	ND	0.333	mg/kg wet							
Surrogate: 1,2-Dichlorobenzene-d4	2.62		mg/kg wet	3.333		79	30-130			
Surrogate: 2-Fluorobiphenyl	2.64		mg/kg wet	3.333		79	30-130			
Surrogate: Nitrobenzene-d5	2.24		mg/kg wet	3.333		67	30-130			
Surrogate: p-Terphenyl-d14	3.06		mg/kg wet	3.333		92	30-130			

**LCS**

2-Methylnaphthalene	2.64	0.333	mg/kg wet	3.333		79	40-140			
Acenaphthene	2.59	0.333	mg/kg wet	3.333		78	40-140			
Acenaphthylene	2.76	0.333	mg/kg wet	3.333		83	40-140			
Anthracene	2.56	0.333	mg/kg wet	3.333		77	40-140			
Benzo(a)anthracene	2.61	0.333	mg/kg wet	3.333		78	40-140			
Benzo(a)pyrene	2.61	0.167	mg/kg wet	3.333		78	40-140			
Benzo(b)fluoranthene	2.74	0.333	mg/kg wet	3.333		82	40-140			
Benzo(g,h,i)perylene	2.70	0.333	mg/kg wet	3.333		81	40-140			
Benzo(k)fluoranthene	2.70	0.333	mg/kg wet	3.333		81	40-140			
Chrysene	2.82	0.167	mg/kg wet	3.333		85	40-140			
Dibenzo(a,h)Anthracene	2.74	0.167	mg/kg wet	3.333		82	40-140			
Fluoranthene	2.88	0.333	mg/kg wet	3.333		86	40-140			
Fluorene	2.81	0.333	mg/kg wet	3.333		84	40-140			
Indeno(1,2,3-cd)Pyrene	2.60	0.333	mg/kg wet	3.333		78	40-140			
Naphthalene	2.60	0.333	mg/kg wet	3.333		78	40-140			
Phenanthrene	2.63	0.333	mg/kg wet	3.333		79	40-140			
Pyrene	2.72	0.333	mg/kg wet	3.333		82	40-140			
Surrogate: 1,2-Dichlorobenzene-d4	2.80		mg/kg wet	3.333		84	30-130			
Surrogate: 2-Fluorobiphenyl	3.07		mg/kg wet	3.333		92	30-130			
Surrogate: Nitrobenzene-d5	2.51		mg/kg wet	3.333		75	30-130			
Surrogate: p-Terphenyl-d14	3.16		mg/kg wet	3.333		95	30-130			

**LCS Dup**

2-Methylnaphthalene	2.54	0.333	mg/kg wet	3.333		76	40-140	4	30	
Acenaphthene	2.45	0.333	mg/kg wet	3.333		74	40-140	5	30	
Acenaphthylene	2.64	0.333	mg/kg wet	3.333		79	40-140	4	30	
Anthracene	2.35	0.333	mg/kg wet	3.333		71	40-140	9	30	
Benzo(a)anthracene	2.50	0.333	mg/kg wet	3.333		75	40-140	4	30	
Benzo(a)pyrene	2.50	0.167	mg/kg wet	3.333		75	40-140	4	30	



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility

ESS Laboratory Work Order: 1709470

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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8270D Polynuclear Aromatic Hydrocarbons

**Batch CI71818 - 3546**

Benzo(b)fluoranthene	2.54	0.333	mg/kg wet	3.333		76	40-140	8	30	
Benzo(g,h,i)perylene	2.67	0.333	mg/kg wet	3.333		80	40-140	1	30	
Benzo(k)fluoranthene	2.66	0.333	mg/kg wet	3.333		80	40-140	2	30	
Chrysene	2.70	0.167	mg/kg wet	3.333		81	40-140	4	30	
Dibenzo(a,h)Anthracene	2.70	0.167	mg/kg wet	3.333		81	40-140	2	30	
Fluoranthene	2.76	0.333	mg/kg wet	3.333		83	40-140	4	30	
Fluorene	2.71	0.333	mg/kg wet	3.333		81	40-140	4	30	
Indeno(1,2,3-cd)Pyrene	2.53	0.333	mg/kg wet	3.333		76	40-140	3	30	
Naphthalene	2.49	0.333	mg/kg wet	3.333		75	40-140	4	30	
Phenanthrene	2.52	0.333	mg/kg wet	3.333		76	40-140	4	30	
Pyrene	2.63	0.333	mg/kg wet	3.333		79	40-140	3	30	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	2.64		mg/kg wet	3.333		79	30-130			
<i>Surrogate: 2-Fluorobiphenyl</i>	2.78		mg/kg wet	3.333		83	30-130			
<i>Surrogate: Nitrobenzene-d5</i>	2.35		mg/kg wet	3.333		71	30-130			
<i>Surrogate: p-Terphenyl-d14</i>	2.93		mg/kg wet	3.333		88	30-130			

**Batch CI71819 - 3546**

<b>Blank</b>										
2-Methylnaphthalene	ND	0.333	mg/kg wet							
Acenaphthene	ND	0.333	mg/kg wet							
Acenaphthylene	ND	0.333	mg/kg wet							
Anthracene	ND	0.333	mg/kg wet							
Benzo(a)anthracene	ND	0.333	mg/kg wet							
Benzo(a)pyrene	ND	0.167	mg/kg wet							
Benzo(b)fluoranthene	ND	0.333	mg/kg wet							
Benzo(g,h,i)perylene	ND	0.333	mg/kg wet							
Benzo(k)fluoranthene	ND	0.333	mg/kg wet							
Chrysene	ND	0.167	mg/kg wet							
Dibenzo(a,h)Anthracene	ND	0.167	mg/kg wet							
Fluoranthene	ND	0.333	mg/kg wet							
Fluorene	ND	0.333	mg/kg wet							
Indeno(1,2,3-cd)Pyrene	ND	0.333	mg/kg wet							
Naphthalene	ND	0.333	mg/kg wet							
Phenanthrene	ND	0.333	mg/kg wet							
Pyrene	ND	0.333	mg/kg wet							
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	2.59		mg/kg wet	3.333		78	30-130			
<i>Surrogate: 2-Fluorobiphenyl</i>	2.76		mg/kg wet	3.333		83	30-130			
<i>Surrogate: Nitrobenzene-d5</i>	2.18		mg/kg wet	3.333		65	30-130			
<i>Surrogate: p-Terphenyl-d14</i>	3.36		mg/kg wet	3.333		101	30-130			

<b>LCS</b>										
2-Methylnaphthalene	2.71	0.333	mg/kg wet	3.333		81	40-140			
Acenaphthene	2.50	0.333	mg/kg wet	3.333		75	40-140			
Acenaphthylene	2.74	0.333	mg/kg wet	3.333		82	40-140			
Anthracene	2.36	0.333	mg/kg wet	3.333		71	40-140			
Benzo(a)anthracene	2.54	0.333	mg/kg wet	3.333		76	40-140			
Benzo(a)pyrene	2.58	0.167	mg/kg wet	3.333		77	40-140			



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility

ESS Laboratory Work Order: 1709470

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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8270D Polynuclear Aromatic Hydrocarbons

**Batch CI71819 - 3546**

Benzo(b)fluoranthene	2.64	0.333	mg/kg wet	3.333		79	40-140			
Benzo(g,h,i)perylene	2.88	0.333	mg/kg wet	3.333		86	40-140			
Benzo(k)fluoranthene	2.62	0.333	mg/kg wet	3.333		79	40-140			
Chrysene	2.74	0.167	mg/kg wet	3.333		82	40-140			
Dibenzo(a,h)Anthracene	2.80	0.167	mg/kg wet	3.333		84	40-140			
Fluoranthene	2.35	0.333	mg/kg wet	3.333		70	40-140			
Fluorene	2.77	0.333	mg/kg wet	3.333		83	40-140			
Indeno(1,2,3-cd)Pyrene	2.63	0.333	mg/kg wet	3.333		79	40-140			
Naphthalene	2.57	0.333	mg/kg wet	3.333		77	40-140			
Phenanthrene	2.53	0.333	mg/kg wet	3.333		76	40-140			
Pyrene	2.98	0.333	mg/kg wet	3.333		89	40-140			
Surrogate: 1,2-Dichlorobenzene-d4	2.79		mg/kg wet	3.333		84	30-130			
Surrogate: 2-Fluorobiphenyl	2.84		mg/kg wet	3.333		85	30-130			
Surrogate: Nitrobenzene-d5	2.37		mg/kg wet	3.333		71	30-130			
Surrogate: p-Terphenyl-d14	3.46		mg/kg wet	3.333		104	30-130			

**LCS Dup**

2-Methylnaphthalene	2.46	0.333	mg/kg wet	3.333		74	40-140	10	30	
Acenaphthene	2.26	0.333	mg/kg wet	3.333		68	40-140	10	30	
Acenaphthylene	2.41	0.333	mg/kg wet	3.333		72	40-140	13	30	
Anthracene	2.12	0.333	mg/kg wet	3.333		64	40-140	11	30	
Benzo(a)anthracene	2.33	0.333	mg/kg wet	3.333		70	40-140	9	30	
Benzo(a)pyrene	2.36	0.167	mg/kg wet	3.333		71	40-140	9	30	
Benzo(b)fluoranthene	2.46	0.333	mg/kg wet	3.333		74	40-140	7	30	
Benzo(g,h,i)perylene	2.66	0.333	mg/kg wet	3.333		80	40-140	8	30	
Benzo(k)fluoranthene	2.44	0.333	mg/kg wet	3.333		73	40-140	7	30	
Chrysene	2.50	0.167	mg/kg wet	3.333		75	40-140	9	30	
Dibenzo(a,h)Anthracene	2.57	0.167	mg/kg wet	3.333		77	40-140	9	30	
Fluoranthene	2.00	0.333	mg/kg wet	3.333		60	40-140	16	30	
Fluorene	2.52	0.333	mg/kg wet	3.333		76	40-140	9	30	
Indeno(1,2,3-cd)Pyrene	2.41	0.333	mg/kg wet	3.333		72	40-140	9	30	
Naphthalene	2.28	0.333	mg/kg wet	3.333		68	40-140	12	30	
Phenanthrene	2.24	0.333	mg/kg wet	3.333		67	40-140	12	30	
Pyrene	3.01	0.333	mg/kg wet	3.333		90	40-140	0.9	30	
Surrogate: 1,2-Dichlorobenzene-d4	2.41		mg/kg wet	3.333		72	30-130			
Surrogate: 2-Fluorobiphenyl	2.56		mg/kg wet	3.333		77	30-130			
Surrogate: Nitrobenzene-d5	2.09		mg/kg wet	3.333		63	30-130			
Surrogate: p-Terphenyl-d14	3.51		mg/kg wet	3.333		105	30-130			

Classical Chemistry

**Batch CI72119 - TCN Prep**

<b>Blank</b>										
Total Cyanide	ND	1.00	mg/kg wet							
<b>LCS</b>										
Total Cyanide	5.07	1.00	mg/kg wet	5.015		101	90-110			





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility

ESS Laboratory Work Order: 1709470

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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Classical Chemistry

**Batch CI72119 - TCN Prep**

**Reference**

Total Cyanide	50.1	4.83	mg/kg wet	48.40		104	36.1577-206.6 12			
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**Reference**

Total Cyanide	49.1	4.86	mg/kg wet	48.40		102	36.1577-206.6 12			
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*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility

ESS Laboratory Work Order: 1709470

**Notes and Definitions**

- U Analyte included in the analysis, but not detected
- IC Internal Standard(s) outside of criteria. Sample was reanalyzed to confirm (IC).
- D Diluted.
- B- Blank Spike recovery is below lower control limit (B-).
- ND Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference
- MDL Method Detection Limit
- MRL Method Reporting Limit
- LOD Limit of Detection
- LOQ Limit of Quantitation
- DL Detection Limit
- I/V Initial Volume
- F/V Final Volume
- § Subcontracted analysis; see attached report
- 1 Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
- 2 Range result excludes concentrations of target analytes eluting in that range.
- 3 Range result excludes the concentration of the C9-C10 aromatic range.
- Avg Results reported as a mathematical average.
- NR No Recovery
- [CALC] Calculated Analyte
- SUB Subcontracted analysis; see attached report
- RL Reporting Limit
- EDL Estimated Detection Limit



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility

ESS Laboratory Work Order: 1709470

**ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS**

**ENVIRONMENTAL**

Rhode Island Potable and Non Potable Water: LAI00179

<http://www.health.ri.gov/find/labs/analytical/ESS.pdf>

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750

[http://www.ct.gov/dph/lib/dph/environmental\\_health/environmental\\_laboratories/pdf/OutofStateCommercialLaboratories.pdf](http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf)

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002

<http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml>

Massachusetts Potable and Non Potable Water: M-RI002

<http://public.dep.state.ma.us/Labcert/Labcert.aspx>

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424

<http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm>

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313

<http://www.wadsworth.org/labcert/elap/comm.html>

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006

[http://datamine2.state.nj.us/DEP\\_OPRA/OpraMain/pi\\_main?mode=pi\\_by\\_site&sort\\_order=PI\\_NAMEA&Select+a+Site:=58715](http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715)

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752

<http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx>

## ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Providence, RI - GZA/HDM

ESS Project ID: 1709470

Date Received: 9/15/2017

Shipped/Delivered Via: ESS Courier

Project Due Date: 9/22/2017

Days for Project: 5 Day

1. Air bill manifest present?  No  
Air No.: NA

6. Does COC match bottles?  Yes

2. Were custody seals present?  No

7. Is COC complete and correct?  Yes

3. Is radiation count <100 CPM?  Yes

8. Were samples received intact?  Yes

4. Is a Cooler Present?  Yes  
Temp: 3.5 Iced with: Ice

9. Were labs informed about **short holds & rushes**? Yes / No /  NA

5. Was COC signed and dated by client?  Yes

10. Were any analyses received outside of hold time? Yes  No

11. Any Subcontracting needed? Yes  No  
ESS Sample IDs: \_\_\_\_\_  
Analysis: \_\_\_\_\_  
TAT: \_\_\_\_\_

12. Were VOAs received?  Yes / No  
a. Air bubbles in aqueous VOAs?  Yes / No  
b. Does methanol cover soil completely?  Yes / No / NA

13. Are the samples properly preserved?  Yes / No  
a. If metals preserved upon receipt: Date: 9/15/17  
b. Low Level VOA vials frozen: Date: 9/15/17

Time: 2240 By: RE

Sample Receiving Notes:

14. Was there a need to contact Project Manager?  Yes / No  
a. Was there a need to contact the client?  Yes / No  
Who was contacted? \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_ By: \_\_\_\_\_

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
01	164300	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
01	164315	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
01	164344	Yes	NA	Yes	VOA Vial - Other	Other	
01	164345	Yes	NA	Yes	VOA Vial - Other	Other	
02	164299	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
02	164314	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
02	164342	Yes	NA	Yes	VOA Vial - Other	Other	
02	164343	Yes	NA	Yes	VOA Vial - Other	Other	
03	164298	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
03	164313	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
03	164340	Yes	NA	Yes	VOA Vial - Other	Other	
03	164341	Yes	NA	Yes	VOA Vial - Other	Other	
04	164297	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
04	164312	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
04	164338	Yes	NA	Yes	VOA Vial - Other	Other	
04	164339	Yes	NA	Yes	VOA Vial - Other	Other	
05	164296	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
05	164311	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
05	164336	Yes	NA	Yes	VOA Vial - Other	Other	
05	164337	Yes	NA	Yes	VOA Vial - Other	Other	
06	164295	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
06	164310	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
06	164334	Yes	NA	Yes	VOA Vial - Other	Other	
06	164335	Yes	NA	Yes	VOA Vial - Other	Other	



## ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Providence, RI - GZA/HDM

ESS Project ID: 1709470  
Date Received: 9/15/2017

07	164294	Yes	NA	Yes	8 oz. Jar - Unpres	NP
07	164309	Yes	NA	Yes	VOA Vial - Methanol	MeOH
07	164332	Yes	NA	Yes	VOA Vial - Other	Other
07	164333	Yes	NA	Yes	VOA Vial - Other	Other
08	164293	Yes	NA	Yes	8 oz. Jar - Unpres	NP
08	164308	Yes	NA	Yes	VOA Vial - Methanol	MeOH
08	164330	Yes	NA	Yes	VOA Vial - Other	Other
08	164331	Yes	NA	Yes	VOA Vial - Other	Other
09	164292	Yes	NA	Yes	8 oz. Jar - Unpres	NP
09	164307	Yes	NA	Yes	VOA Vial - Methanol	MeOH
09	164328	Yes	NA	Yes	VOA Vial - Other	Other
09	164329	Yes	NA	Yes	VOA Vial - Other	Other
10	164291	Yes	NA	Yes	8 oz. Jar - Unpres	NP
10	164306	Yes	NA	Yes	VOA Vial - Methanol	MeOH
10	164326	Yes	NA	Yes	VOA Vial - Other	Other
10	164327	Yes	NA	Yes	VOA Vial - Other	Other
11	164290	Yes	NA	Yes	8 oz. Jar - Unpres	NP
11	164305	Yes	NA	Yes	VOA Vial - Methanol	MeOH
11	164324	Yes	NA	Yes	VOA Vial - Other	Other
11	164325	Yes	NA	Yes	VOA Vial - Other	Other
12	164289	Yes	NA	Yes	8 oz. Jar - Unpres	NP
12	164304	Yes	NA	Yes	VOA Vial - Methanol	MeOH
12	164322	Yes	NA	Yes	VOA Vial - Other	Other
12	164323	Yes	NA	Yes	VOA Vial - Other	Other
13	164288	Yes	NA	Yes	8 oz. Jar - Unpres	NP
13	164303	Yes	NA	Yes	VOA Vial - Methanol	MeOH
13	164320	Yes	NA	Yes	VOA Vial - Other	Other
13	164321	Yes	NA	Yes	VOA Vial - Other	Other
14	164287	Yes	NA	Yes	8 oz. Jar - Unpres	NP
14	164302	Yes	NA	Yes	VOA Vial - Methanol	MeOH
14	164318	Yes	NA	Yes	VOA Vial - Other	Other
14	164319	Yes	NA	Yes	VOA Vial - Other	Other
15	164286	Yes	NA	Yes	8 oz. Jar - Unpres	NP
15	164301	Yes	NA	Yes	VOA Vial - Methanol	MeOH
15	164316	Yes	NA	Yes	VOA Vial - Other	Other
15	164317	Yes	NA	Yes	VOA Vial - Other	Other
16	164346	Yes	NA	Yes	VOA Vial - Other	Other
16	164347	Yes	NA	Yes	VOA Vial - Methanol	MeOH

**2nd Review**

Are barcode labels on correct containers?

Yes / No

Completed

By: 

Date & Time: 9/15/17 2038

Reviewed

By: 

Date & Time: 9/15/17 2240

Delivered

By: 

Date & Time: 9/15/17 2240

ESS Laboratory

Division of Thielsch Engineering, Inc.  
 185 Frances Avenue, Cranston RI 02910  
 Tel. (401) 461-7181 Fax (401) 461-4486  
 www.esslaboratory.com

CHAIN OF CUSTODY

ESS Lab # **1709470**

Turn Time Standard 5-Day Rush  
 Regulatory State Rhode Island  
 Is this project for any of the following?:  
 OCT RCP  MA MCP  ORGP

Reporting Limits RIDEM R-DEC and GB Leachability  
 Electronic Deliverables  Limit Checker  Standard Excel  
 Other (Please Specify →)

Company Name GZA  
 Project # 05.0043654.00  
 Project Name Former Tidewater Facility  
 Contact Person Sean Connelly  
 Address 530 Broadway  
 City Providence State RI Zip Code 02909 PO # 43654  
 Telephone Number 401-421-4140 FAX Number - Email Address sean.connelly@gza.com

Analysis  
 VOCs (8260B)  
 PAHs (8270)  
 TPH  
 PP-13 metals  
 Total Cyanide

ESS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID	VOCs (8260B)	PAHs (8270)	TPH	PP-13 metals	Total Cyanide
10	9/14/17	1000	-	Trip Blank	TB-091417	X				
1	9/14/17	1105	Grab	Soil	TP-501 (0-1.5')	X	X	X	X	X
2	9/14/17	1130	Grab	Soil	TP-501 (3.5-4')	X	X	X	X	X
3	9/14/17	1405	Grab	Soil	TP-502 (0-1')	X	X	X	X	X
4	9/14/17	1417	Grab	Soil	TP-502 (4-5')	X	X	X	X	X
5	9/15/17	0800	Grab	Soil	TP-503 (0-2')	X	X	X	X	X
6	9/15/17	0820	Grab	Soil	TP-503 (5-6')	X	X	X	X	X
7	9/15/17	0910	Grab	Soil	TP-504 (1.5'-2')	X	X	X	X	X
8	9/15/17	0955	Grab	Soil	TP-504 (4-5')	X	X	X	X	X
9	9/15/17	1110	Grab	Soil	TP-505 (0-2')	X	X	X	X	X

Container Type: AC-Air Cassette AG-Amber Glass B-BOD Bottle C-Cubitainer G-Glass O-Other P-Poly S-Sterile V-Vial  
 Container Volume: 1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other\*  
 Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAce, NaOH 9-NH4Cl 10-DI H2O 11-Other\*  
 Number of Containers per Sample: 3

Laboratory Use Only  
 Cooler Present:   
 Seals Intact:   
 Cooler Temperature: Excited 3°C 9/15/17

Sampled by: Sean Connelly, Sarah McLeod, Erik Beloff  
 Comments: Please specify "Other" preservative and containers types in this space  
 NGRID rates apply  
 Please email sarah.mcleod@gza.com also

Relinquished by: (Signature, Date & Time) <i>Sarah McLeod 9-15-2017 1540</i>	Received By: (Signature, Date & Time) <i>[Signature] 9/15/17 15:40</i>	Relinquished By: (Signature, Date & Time) <i>[Signature] 9/15/17 15:40</i>	Received By: (Signature, Date & Time) <i>[Signature] 9/15/17 2016</i>
Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)



ESS Laboratory

Division of Thielsch Engineering, Inc.  
 185 Frances Avenue, Cranston RI 02910  
 Tel. (401) 461-7181 Fax (401) 461-4486  
 www.esslaboratory.com

CHAIN OF CUSTODY

ESS Lab # **1709470**

Reporting Limits **RIDEM R-DEC and GB Leachability**

Electronic  Limit Checker  Standard Excel

Deliverables  Other (Please Specify -->)

Turn Time **5-Day** Rush

Regulatory State **Rhode Island**

Is this project for any of the following?:  
 OCT RCP  OMA MCP  ORGP

Company Name **GZA** Project # **05.0043654.00** Project Name **Former Tidewater Facility**

Contact Person **Sean Connelly** Address **530 Broadway**

City **Providence** State **RI** Zip Code **02909** PO # **43654**

Telephone Number **401-421-4140** FAX Number **-** Email Address **sean.connelly@gza.com**

ESS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID	Analysis														
10	9/15/17	1135	Grab	Soil	TP-505 (2-2') (4-5')	VOCs (8260B)	X	X	X	X	X									
11	9/15/17	1300	Grab	Soil	TP-506 (1-2')	PAHs (8270D)	X	X	X	X	X									
12	9/15/17	1325	Grab	Soil	TP-506 (10-11')	TPH	X	X	X	X	X									
13	9/15/17	1405	Grab	Soil	TP-507 (0-2')	PP-13 Metals	X	X	X	X	X									
14	9/15/17	1430	Grab	Soil	TP-507 (10-11')	Total Cyanide	X	X	X	X	X									
15	9/15/17	-	Grab	Soil	TP-597 (1-2')		X	X	X	X	X									

Container Type: AC-Air Cassette AG-Amber Glass B-BOD Bottle C-Cubitainer G - Glass O-Other P-Poly S-Sterile V-Vial

Container Volume: 1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other\*

Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAce, NaOH 9-NH4Cl 10-DI H2O 11-Other\*

Number of Containers per Sample:

**Laboratory Use Only**

Cooler Present:

Seals Intact:

Cooler Temperature: **Freezer 35C 9/15/17**

Sampled by: Sean Connelly, Sarah McLeod, Erik Beloff

Comments: Please specify "Other" preservative and containers types in this space

NGRID rates apply

Please email sarah.mcleod@gza.com also

Relinquished by: (Signature, Date & Time) <i>Sarah McLeod 9-15-2017 15:40</i>	Received By: (Signature, Date & Time) <i>[Signature] 9/15/17 15:40</i>	Relinquished By: (Signature, Date & Time) <i>[Signature] 9/15/17 16:22</i>	Received By: (Signature, Date & Time) <i>[Signature] 9/15/17 2016</i>
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## CERTIFICATE OF ANALYSIS

Sarah McLeod  
GZA GeoEnvironmental, Inc.  
530 Broadway  
Providence, RI 02909

**RE: Former Tidwater Facility (05.0043654.00)**  
**ESS Laboratory Work Order Number: 1709493**

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.



Laurel Stoddard  
Laboratory Director

**REVIEWED**

*By ESS Laboratory at 5:11 pm, Sep 27, 2017*

**Analytical Summary**

The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility

ESS Laboratory Work Order: 1709493

**SAMPLE RECEIPT**

The following samples were received on September 18, 2017 for the analyses specified on the enclosed Chain of Custody Record.

**Low Level VOA vials were frozen by ESS Laboratory on September 18, 2017 at 17:24.**

<u>Lab Number</u>	<u>Sample Name</u>	<u>Matrix</u>	<u>Analysis</u>
1709493-01	TP-511 (1-2')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1709493-02	TP-511 (3-4')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1709493-03	TP-512 (0-2')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1709493-04	TP-512 (3-4')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1709493-05	TP-510 (0-2')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1709493-06	TP-510 (2-3')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1709493-07	TP-524 (0-2')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1709493-08	TP-524 (5-6')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1709493-09	TP-509 (0-2')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1709493-10	TP-509 (5-6')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1709493-11	TP-598 (0-2')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1709493-12	TB-091817	Solid	8260B Low
1709493-13	TP-508 (0-2')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1709493-14	TP-508 (4-5')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility

ESS Laboratory Work Order: 1709493

PROJECT NARRATIVE

**Total Metals**

CI71937-BS1 [Blank Spike recovery is below lower control limit \(B-\).](#)  
Lead (75% @ 80-120%)

CI71937-BSD1 [Blank Spike recovery is below lower control limit \(B-\).](#)  
Thallium (64% @ 80-120%)

CI71937-BSD1 [Relative percent difference for duplicate is outside of criteria \(D+\).](#)  
Antimony (25% @ 20%)

CI71937-BSD2 [Blank Spike recovery is below lower control limit \(B-\).](#)  
Lead (77% @ 78-112%)

CI71939-BSD1 [Blank Spike recovery is above upper control limit \(B+\).](#)  
Mercury (124% @ 80-120%)

CI71939-BSD1 [Relative percent difference for duplicate is outside of criteria \(D+\).](#)  
Mercury (21% @ 20%)

**No other observations noted.**

**End of Project Narrative.**

DATA USABILITY LINKS

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[Definitions of Quality Control Parameters](#)

[Semivolatile Organics Internal Standard Information](#)

[Semivolatile Organics Surrogate Information](#)

[Volatile Organics Internal Standard Information](#)

[Volatile Organics Surrogate Information](#)

[EPH and VPH Alkane Lists](#)



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility

ESS Laboratory Work Order: 1709493

**CURRENT SW-846 METHODOLOGY VERSIONS**

**Analytical Methods**

- 1010A - Flashpoint
- 6010C - ICP
- 6020A - ICP MS
- 7010 - Graphite Furnace
- 7196A - Hexavalent Chromium
- 7470A - Aqueous Mercury
- 7471B - Solid Mercury
- 8011 - EDB/DBCP/TCP
- 8015C - GRO/DRO
- 8081B - Pesticides
- 8082A - PCB
- 8100M - TPH
- 8151A - Herbicides
- 8260B - VOA
- 8270D - SVOA
- 8270D SIM - SVOA Low Level
- 9014 - Cyanide
- 9038 - Sulfate
- 9040C - Aqueous pH
- 9045D - Solid pH (Corrosivity)
- 9050A - Specific Conductance
- 9056A - Anions (IC)
- 9060A - TOC
- 9095B - Paint Filter
- MADEP 04-1.1 - EPH / VPH

**Prep Methods**

- 3005A - Aqueous ICP Digestion
- 3020A - Aqueous Graphite Furnace / ICP MS Digestion
- 3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
- 3060A - Solid Hexavalent Chromium Digestion
- 3510C - Separatory Funnel Extraction
- 3520C - Liquid / Liquid Extraction
- 3540C - Manual Soxhlet Extraction
- 3541 - Automated Soxhlet Extraction
- 3546 - Microwave Extraction
- 3580A - Waste Dilution
- 5030B - Aqueous Purge and Trap
- 5030C - Aqueous Purge and Trap
- 5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-511 (1-2')  
 Date Sampled: 09/18/17 07:55  
 Percent Solids: 94

ESS Laboratory Work Order: 1709493  
 ESS Laboratory Sample ID: 1709493-01  
 Sample Matrix: Soil  
 Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (4.08)		6010C		1	KJK	09/23/17 5:48	2.62	100	CI71937
Arsenic	<b>5.64</b> (2.04)		6010C		1	KJK	09/23/17 5:48	2.62	100	CI71937
Beryllium	<b>0.11</b> (0.09)		6010C		1	KJK	09/23/17 5:48	2.62	100	CI71937
Cadmium	ND (0.41)		6010C		1	KJK	09/23/17 20:54	2.62	100	CI71937
Chromium	<b>6.67</b> (0.82)		6010C		1	KJK	09/23/17 5:48	2.62	100	CI71937
Copper	<b>11.6</b> (2.04)		6010C		1	KJK	09/23/17 5:48	2.62	100	CI71937
Lead	<b>18.9</b> (4.08)		6010C		1	KJK	09/23/17 5:48	2.62	100	CI71937
Mercury	<b>0.032</b> (0.031)		7471B		1	MJV	09/21/17 21:43	0.69	40	CI71939
Nickel	<b>3.89</b> (2.04)		6010C		1	KJK	09/23/17 5:48	2.62	100	CI71937
Selenium	ND (4.08)		6020A		20	NAR	09/27/17 10:29	2.62	100	CI71937
Silver	ND (0.41)		6010C		1	KJK	09/23/17 20:54	2.62	100	CI71937
Thallium	ND (4.08)		6010C		1	KJK	09/23/17 5:48	2.62	100	CI71937
Zinc	<b>13.6</b> (2.04)		6010C		1	KJK	09/23/17 5:48	2.62	100	CI71937





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-511 (1-2')  
 Date Sampled: 09/18/17 07:55  
 Percent Solids: 94  
 Initial Volume: 5  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709493  
 ESS Laboratory Sample ID: 1709493-01  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0053)		8260B Low		1	09/20/17 18:42	C7I0344	CI72107
1,1,1-Trichloroethane	ND (0.0053)		8260B Low		1	09/20/17 18:42	C7I0344	CI72107
1,1,2,2-Tetrachloroethane	ND (0.0053)		8260B Low		1	09/20/17 18:42	C7I0344	CI72107
1,1,2-Trichloroethane	ND (0.0053)		8260B Low		1	09/20/17 18:42	C7I0344	CI72107
1,1-Dichloroethane	ND (0.0053)		8260B Low		1	09/20/17 18:42	C7I0344	CI72107
1,1-Dichloroethene	ND (0.0053)		8260B Low		1	09/20/17 18:42	C7I0344	CI72107
1,1-Dichloropropene	ND (0.0053)		8260B Low		1	09/20/17 18:42	C7I0344	CI72107
1,2,3-Trichlorobenzene	ND (0.0053)		8260B Low		1	09/20/17 18:42	C7I0344	CI72107
1,2,3-Trichloropropane	ND (0.0053)		8260B Low		1	09/20/17 18:42	C7I0344	CI72107
1,2,4-Trichlorobenzene	ND (0.0053)		8260B Low		1	09/20/17 18:42	C7I0344	CI72107
1,2,4-Trimethylbenzene	ND (0.0053)		8260B Low		1	09/20/17 18:42	C7I0344	CI72107
1,2-Dibromo-3-Chloropropane	ND (0.0053)		8260B Low		1	09/20/17 18:42	C7I0344	CI72107
1,2-Dibromoethane	ND (0.0053)		8260B Low		1	09/20/17 18:42	C7I0344	CI72107
1,2-Dichlorobenzene	ND (0.0053)		8260B Low		1	09/20/17 18:42	C7I0344	CI72107
1,2-Dichloroethane	ND (0.0053)		8260B Low		1	09/20/17 18:42	C7I0344	CI72107
1,2-Dichloropropane	ND (0.0053)		8260B Low		1	09/20/17 18:42	C7I0344	CI72107
1,3,5-Trimethylbenzene	ND (0.0053)		8260B Low		1	09/20/17 18:42	C7I0344	CI72107
1,3-Dichlorobenzene	ND (0.0053)		8260B Low		1	09/20/17 18:42	C7I0344	CI72107
1,3-Dichloropropane	ND (0.0053)		8260B Low		1	09/20/17 18:42	C7I0344	CI72107
1,4-Dichlorobenzene	ND (0.0053)		8260B Low		1	09/20/17 18:42	C7I0344	CI72107
1,4-Dioxane	ND (0.107)		8260B Low		1	09/20/17 18:42	C7I0344	CI72107
1-Chlorohexane	ND (0.0053)		8260B Low		1	09/20/17 18:42	C7I0344	CI72107
2,2-Dichloropropane	ND (0.0053)		8260B Low		1	09/20/17 18:42	C7I0344	CI72107
2-Butanone	ND (0.0534)		8260B Low		1	09/20/17 18:42	C7I0344	CI72107
2-Chlorotoluene	ND (0.0053)		8260B Low		1	09/20/17 18:42	C7I0344	CI72107
2-Hexanone	ND (0.0534)		8260B Low		1	09/20/17 18:42	C7I0344	CI72107
4-Chlorotoluene	ND (0.0053)		8260B Low		1	09/20/17 18:42	C7I0344	CI72107
4-Isopropyltoluene	ND (0.0053)		8260B Low		1	09/20/17 18:42	C7I0344	CI72107
4-Methyl-2-Pentanone	ND (0.0534)		8260B Low		1	09/20/17 18:42	C7I0344	CI72107
Acetone	ND (0.0534)		8260B Low		1	09/20/17 18:42	C7I0344	CI72107
Benzene	ND (0.0053)		8260B Low		1	09/20/17 18:42	C7I0344	CI72107
Bromobenzene	ND (0.0053)		8260B Low		1	09/20/17 18:42	C7I0344	CI72107



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-511 (1-2')  
 Date Sampled: 09/18/17 07:55  
 Percent Solids: 94  
 Initial Volume: 5  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709493  
 ESS Laboratory Sample ID: 1709493-01  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0053)		8260B Low		1	09/20/17 18:42	C7I0344	CI72107
Bromodichloromethane	ND (0.0053)		8260B Low		1	09/20/17 18:42	C7I0344	CI72107
Bromoform	ND (0.0053)		8260B Low		1	09/20/17 18:42	C7I0344	CI72107
Bromomethane	ND (0.0107)		8260B Low		1	09/20/17 18:42	C7I0344	CI72107
Carbon Disulfide	ND (0.0053)		8260B Low		1	09/20/17 18:42	C7I0344	CI72107
Carbon Tetrachloride	ND (0.0053)		8260B Low		1	09/20/17 18:42	C7I0344	CI72107
Chlorobenzene	ND (0.0053)		8260B Low		1	09/20/17 18:42	C7I0344	CI72107
Chloroethane	ND (0.0107)		8260B Low		1	09/20/17 18:42	C7I0344	CI72107
Chloroform	ND (0.0053)		8260B Low		1	09/20/17 18:42	C7I0344	CI72107
Chloromethane	ND (0.0107)		8260B Low		1	09/20/17 18:42	C7I0344	CI72107
cis-1,2-Dichloroethene	ND (0.0053)		8260B Low		1	09/20/17 18:42	C7I0344	CI72107
cis-1,3-Dichloropropene	ND (0.0053)		8260B Low		1	09/20/17 18:42	C7I0344	CI72107
Dibromochloromethane	ND (0.0053)		8260B Low		1	09/20/17 18:42	C7I0344	CI72107
Dibromomethane	ND (0.0053)		8260B Low		1	09/20/17 18:42	C7I0344	CI72107
Dichlorodifluoromethane	ND (0.0107)		8260B Low		1	09/20/17 18:42	C7I0344	CI72107
Diethyl Ether	ND (0.0053)		8260B Low		1	09/20/17 18:42	C7I0344	CI72107
Di-isopropyl ether	ND (0.0053)		8260B Low		1	09/20/17 18:42	C7I0344	CI72107
Ethyl tertiary-butyl ether	ND (0.0053)		8260B Low		1	09/20/17 18:42	C7I0344	CI72107
Ethylbenzene	ND (0.0053)		8260B Low		1	09/20/17 18:42	C7I0344	CI72107
Hexachlorobutadiene	ND (0.0053)		8260B Low		1	09/20/17 18:42	C7I0344	CI72107
Isopropylbenzene	ND (0.0053)		8260B Low		1	09/20/17 18:42	C7I0344	CI72107
Methyl tert-Butyl Ether	ND (0.0053)		8260B Low		1	09/20/17 18:42	C7I0344	CI72107
Methylene Chloride	ND (0.0267)		8260B Low		1	09/20/17 18:42	C7I0344	CI72107
Naphthalene	ND (0.0053)		8260B Low		1	09/20/17 18:42	C7I0344	CI72107
n-Butylbenzene	ND (0.0053)		8260B Low		1	09/20/17 18:42	C7I0344	CI72107
n-Propylbenzene	ND (0.0053)		8260B Low		1	09/20/17 18:42	C7I0344	CI72107
sec-Butylbenzene	ND (0.0053)		8260B Low		1	09/20/17 18:42	C7I0344	CI72107
Styrene	ND (0.0053)		8260B Low		1	09/20/17 18:42	C7I0344	CI72107
tert-Butylbenzene	ND (0.0053)		8260B Low		1	09/20/17 18:42	C7I0344	CI72107
Tertiary-amyl methyl ether	ND (0.0053)		8260B Low		1	09/20/17 18:42	C7I0344	CI72107
Tetrachloroethene	ND (0.0053)		8260B Low		1	09/20/17 18:42	C7I0344	CI72107
Tetrahydrofuran	ND (0.0053)		8260B Low		1	09/20/17 18:42	C7I0344	CI72107



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-511 (1-2')  
 Date Sampled: 09/18/17 07:55  
 Percent Solids: 94  
 Initial Volume: 5  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709493  
 ESS Laboratory Sample ID: 1709493-01  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0053)		8260B Low		1	09/20/17 18:42	C7I0344	CI72107
trans-1,2-Dichloroethene	ND (0.0053)		8260B Low		1	09/20/17 18:42	C7I0344	CI72107
trans-1,3-Dichloropropene	ND (0.0053)		8260B Low		1	09/20/17 18:42	C7I0344	CI72107
Trichloroethene	ND (0.0053)		8260B Low		1	09/20/17 18:42	C7I0344	CI72107
Trichlorofluoromethane	ND (0.0053)		8260B Low		1	09/20/17 18:42	C7I0344	CI72107
Vinyl Acetate	ND (0.0053)		8260B Low		1	09/20/17 18:42	C7I0344	CI72107
Vinyl Chloride	ND (0.0107)		8260B Low		1	09/20/17 18:42	C7I0344	CI72107
Xylene O	ND (0.0053)		8260B Low		1	09/20/17 18:42	C7I0344	CI72107
Xylene P,M	ND (0.0107)		8260B Low		1	09/20/17 18:42	C7I0344	CI72107
Xylenes (Total)	ND (0.0107)		8260B Low		1	09/20/17 18:42		[CALC]

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: 1,2-Dichloroethane-d4	94 %		70-130
Surrogate: 4-Bromofluorobenzene	102 %		70-130
Surrogate: Dibromofluoromethane	96 %		70-130
Surrogate: Toluene-d8	116 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-511 (1-2')  
 Date Sampled: 09/18/17 07:55  
 Percent Solids: 94  
 Initial Volume: 19.3  
 Final Volume: 1  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709493  
 ESS Laboratory Sample ID: 1709493-01  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: SMR  
 Prepared: 9/19/17 13:10

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	ND (41.5)		8100M		1	09/20/17 16:43	C710328	CI71918
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		85 %		40-140				





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-511 (1-2')  
 Date Sampled: 09/18/17 07:55  
 Percent Solids: 94  
 Initial Volume: 14.6  
 Final Volume: 0.5  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709493  
 ESS Laboratory Sample ID: 1709493-01  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: TJ  
 Prepared: 9/19/17 11:55

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.366)		8270D		1	09/21/17 2:55	C7I0309	CI71819
Acenaphthene	ND (0.366)		8270D		1	09/21/17 2:55	C7I0309	CI71819
<b>Acenaphthylene</b>	<b>0.389</b> (0.366)		8270D		1	09/21/17 2:55	C7I0309	CI71819
Anthracene	ND (0.366)		8270D		1	09/21/17 2:55	C7I0309	CI71819
<b>Benzo(a)anthracene</b>	<b>0.551</b> (0.366)		8270D		1	09/21/17 2:55	C7I0309	CI71819
<b>Benzo(a)pyrene</b>	<b>0.423</b> (0.183)		8270D		1	09/21/17 2:55	C7I0309	CI71819
<b>Benzo(b)fluoranthene</b>	<b>0.609</b> (0.366)		8270D		1	09/21/17 2:55	C7I0309	CI71819
Benzo(g,h,i)perylene	ND (0.366)		8270D		1	09/21/17 2:55	C7I0309	CI71819
Benzo(k)fluoranthene	ND (0.366)		8270D		1	09/21/17 2:55	C7I0309	CI71819
<b>Chrysene</b>	<b>0.569</b> (0.183)		8270D		1	09/21/17 2:55	C7I0309	CI71819
Dibenzo(a,h)Anthracene	ND (0.183)		8270D		1	09/21/17 2:55	C7I0309	CI71819
<b>Fluoranthene</b>	<b>0.734</b> (0.366)		8270D		1	09/21/17 2:55	C7I0309	CI71819
Fluorene	ND (0.366)		8270D		1	09/21/17 2:55	C7I0309	CI71819
Indeno(1,2,3-cd)Pyrene	ND (0.366)		8270D		1	09/21/17 2:55	C7I0309	CI71819
Naphthalene	ND (0.366)		8270D		1	09/21/17 2:55	C7I0309	CI71819
<b>Phenanthrene</b>	<b>0.371</b> (0.366)		8270D		1	09/21/17 2:55	C7I0309	CI71819
<b>Pyrene</b>	<b>0.799</b> (0.366)		8270D		1	09/21/17 2:55	C7I0309	CI71819

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	75 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	76 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	77 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	84 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-511 (1-2)  
Date Sampled: 09/18/17 07:55  
Percent Solids: 94

ESS Laboratory Work Order: 1709493  
ESS Laboratory Sample ID: 1709493-01  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	19.1 (1.03)		9014		1	EEM	09/21/17 12:25	mg/kg dry	CI72119



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-511 (3-4')  
 Date Sampled: 09/18/17 08:10  
 Percent Solids: 97

ESS Laboratory Work Order: 1709493  
 ESS Laboratory Sample ID: 1709493-02  
 Sample Matrix: Soil  
 Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (4.16)		6010C		1	KJK	09/23/17 6:08	2.47	100	CI71937
Arsenic	6.75 (2.08)		6010C		1	KJK	09/23/17 21:27	2.47	100	CI71937
Beryllium	0.37 (0.09)		6010C		1	KJK	09/23/17 6:08	2.47	100	CI71937
Cadmium	ND (0.42)		6010C		1	KJK	09/23/17 21:27	2.47	100	CI71937
Chromium	15.2 (0.83)		6010C		1	KJK	09/23/17 6:08	2.47	100	CI71937
Copper	26.3 (2.08)		6010C		1	KJK	09/23/17 6:08	2.47	100	CI71937
Lead	33.1 (4.16)		6010C		1	KJK	09/23/17 6:08	2.47	100	CI71937
Mercury	ND (0.029)		7471B		1	MJV	09/21/17 21:45	0.7	40	CI71939
Nickel	16.7 (2.08)		6010C		1	KJK	09/23/17 6:08	2.47	100	CI71937
Selenium	ND (4.16)		6020A		20	NAR	09/27/17 10:54	2.47	100	CI71937
Silver	ND (0.42)		6010C		1	KJK	09/23/17 21:27	2.47	100	CI71937
Thallium	ND (4.16)		6010C		1	KJK	09/23/17 6:08	2.47	100	CI71937
Zinc	67.6 (2.08)		6010C		1	KJK	09/23/17 6:08	2.47	100	CI71937



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-511 (3-4')  
 Date Sampled: 09/18/17 08:10  
 Percent Solids: 97  
 Initial Volume: 4.7  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709493  
 ESS Laboratory Sample ID: 1709493-02  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0055)		8260B Low		1	09/20/17 19:08	C7I0344	CI72107
1,1,1-Trichloroethane	ND (0.0055)		8260B Low		1	09/20/17 19:08	C7I0344	CI72107
1,1,2,2-Tetrachloroethane	ND (0.0055)		8260B Low		1	09/20/17 19:08	C7I0344	CI72107
1,1,2-Trichloroethane	ND (0.0055)		8260B Low		1	09/20/17 19:08	C7I0344	CI72107
1,1-Dichloroethane	ND (0.0055)		8260B Low		1	09/20/17 19:08	C7I0344	CI72107
1,1-Dichloroethene	ND (0.0055)		8260B Low		1	09/20/17 19:08	C7I0344	CI72107
1,1-Dichloropropene	ND (0.0055)		8260B Low		1	09/20/17 19:08	C7I0344	CI72107
1,2,3-Trichlorobenzene	ND (0.0055)		8260B Low		1	09/20/17 19:08	C7I0344	CI72107
1,2,3-Trichloropropane	ND (0.0055)		8260B Low		1	09/20/17 19:08	C7I0344	CI72107
1,2,4-Trichlorobenzene	ND (0.0055)		8260B Low		1	09/20/17 19:08	C7I0344	CI72107
1,2,4-Trimethylbenzene	ND (0.0055)		8260B Low		1	09/20/17 19:08	C7I0344	CI72107
1,2-Dibromo-3-Chloropropane	ND (0.0055)		8260B Low		1	09/20/17 19:08	C7I0344	CI72107
1,2-Dibromoethane	ND (0.0055)		8260B Low		1	09/20/17 19:08	C7I0344	CI72107
1,2-Dichlorobenzene	ND (0.0055)		8260B Low		1	09/20/17 19:08	C7I0344	CI72107
1,2-Dichloroethane	ND (0.0055)		8260B Low		1	09/20/17 19:08	C7I0344	CI72107
1,2-Dichloropropane	ND (0.0055)		8260B Low		1	09/20/17 19:08	C7I0344	CI72107
1,3,5-Trimethylbenzene	ND (0.0055)		8260B Low		1	09/20/17 19:08	C7I0344	CI72107
1,3-Dichlorobenzene	ND (0.0055)		8260B Low		1	09/20/17 19:08	C7I0344	CI72107
1,3-Dichloropropane	ND (0.0055)		8260B Low		1	09/20/17 19:08	C7I0344	CI72107
1,4-Dichlorobenzene	ND (0.0055)		8260B Low		1	09/20/17 19:08	C7I0344	CI72107
1,4-Dioxane	ND (0.109)		8260B Low		1	09/20/17 19:08	C7I0344	CI72107
1-Chlorohexane	ND (0.0055)		8260B Low		1	09/20/17 19:08	C7I0344	CI72107
2,2-Dichloropropane	ND (0.0055)		8260B Low		1	09/20/17 19:08	C7I0344	CI72107
2-Butanone	ND (0.0547)		8260B Low		1	09/20/17 19:08	C7I0344	CI72107
2-Chlorotoluene	ND (0.0055)		8260B Low		1	09/20/17 19:08	C7I0344	CI72107
2-Hexanone	ND (0.0547)		8260B Low		1	09/20/17 19:08	C7I0344	CI72107
4-Chlorotoluene	ND (0.0055)		8260B Low		1	09/20/17 19:08	C7I0344	CI72107
4-Isopropyltoluene	ND (0.0055)		8260B Low		1	09/20/17 19:08	C7I0344	CI72107
4-Methyl-2-Pentanone	ND (0.0547)		8260B Low		1	09/20/17 19:08	C7I0344	CI72107
Acetone	ND (0.0547)		8260B Low		1	09/20/17 19:08	C7I0344	CI72107
Benzene	ND (0.0055)		8260B Low		1	09/20/17 19:08	C7I0344	CI72107
Bromobenzene	ND (0.0055)		8260B Low		1	09/20/17 19:08	C7I0344	CI72107





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-511 (3-4')  
 Date Sampled: 09/18/17 08:10  
 Percent Solids: 97  
 Initial Volume: 4.7  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709493  
 ESS Laboratory Sample ID: 1709493-02  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0055)		8260B Low		1	09/20/17 19:08	C7I0344	CI72107
Bromodichloromethane	ND (0.0055)		8260B Low		1	09/20/17 19:08	C7I0344	CI72107
Bromoform	ND (0.0055)		8260B Low		1	09/20/17 19:08	C7I0344	CI72107
Bromomethane	ND (0.0109)		8260B Low		1	09/20/17 19:08	C7I0344	CI72107
Carbon Disulfide	ND (0.0055)		8260B Low		1	09/20/17 19:08	C7I0344	CI72107
Carbon Tetrachloride	ND (0.0055)		8260B Low		1	09/20/17 19:08	C7I0344	CI72107
Chlorobenzene	ND (0.0055)		8260B Low		1	09/20/17 19:08	C7I0344	CI72107
Chloroethane	ND (0.0109)		8260B Low		1	09/20/17 19:08	C7I0344	CI72107
Chloroform	ND (0.0055)		8260B Low		1	09/20/17 19:08	C7I0344	CI72107
Chloromethane	ND (0.0109)		8260B Low		1	09/20/17 19:08	C7I0344	CI72107
cis-1,2-Dichloroethene	ND (0.0055)		8260B Low		1	09/20/17 19:08	C7I0344	CI72107
cis-1,3-Dichloropropene	ND (0.0055)		8260B Low		1	09/20/17 19:08	C7I0344	CI72107
Dibromochloromethane	ND (0.0055)		8260B Low		1	09/20/17 19:08	C7I0344	CI72107
Dibromomethane	ND (0.0055)		8260B Low		1	09/20/17 19:08	C7I0344	CI72107
Dichlorodifluoromethane	ND (0.0109)		8260B Low		1	09/20/17 19:08	C7I0344	CI72107
Diethyl Ether	ND (0.0055)		8260B Low		1	09/20/17 19:08	C7I0344	CI72107
Di-isopropyl ether	ND (0.0055)		8260B Low		1	09/20/17 19:08	C7I0344	CI72107
Ethyl tertiary-butyl ether	ND (0.0055)		8260B Low		1	09/20/17 19:08	C7I0344	CI72107
Ethylbenzene	ND (0.0055)		8260B Low		1	09/20/17 19:08	C7I0344	CI72107
Hexachlorobutadiene	ND (0.0055)		8260B Low		1	09/20/17 19:08	C7I0344	CI72107
Isopropylbenzene	ND (0.0055)		8260B Low		1	09/20/17 19:08	C7I0344	CI72107
Methyl tert-Butyl Ether	ND (0.0055)		8260B Low		1	09/20/17 19:08	C7I0344	CI72107
Methylene Chloride	ND (0.0273)		8260B Low		1	09/20/17 19:08	C7I0344	CI72107
Naphthalene	ND (0.0055)		8260B Low		1	09/20/17 19:08	C7I0344	CI72107
n-Butylbenzene	ND (0.0055)		8260B Low		1	09/20/17 19:08	C7I0344	CI72107
n-Propylbenzene	ND (0.0055)		8260B Low		1	09/20/17 19:08	C7I0344	CI72107
sec-Butylbenzene	ND (0.0055)		8260B Low		1	09/20/17 19:08	C7I0344	CI72107
Styrene	ND (0.0055)		8260B Low		1	09/20/17 19:08	C7I0344	CI72107
tert-Butylbenzene	ND (0.0055)		8260B Low		1	09/20/17 19:08	C7I0344	CI72107
Tertiary-amyl methyl ether	ND (0.0055)		8260B Low		1	09/20/17 19:08	C7I0344	CI72107
Tetrachloroethene	ND (0.0055)		8260B Low		1	09/20/17 19:08	C7I0344	CI72107
Tetrahydrofuran	ND (0.0055)		8260B Low		1	09/20/17 19:08	C7I0344	CI72107



## CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-511 (3-4')  
 Date Sampled: 09/18/17 08:10  
 Percent Solids: 97  
 Initial Volume: 4.7  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709493  
 ESS Laboratory Sample ID: 1709493-02  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

### 5035/8260B Volatile Organic Compounds / Low Level

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0055)		8260B Low		1	09/20/17 19:08	C7I0344	CI72107
trans-1,2-Dichloroethene	ND (0.0055)		8260B Low		1	09/20/17 19:08	C7I0344	CI72107
trans-1,3-Dichloropropene	ND (0.0055)		8260B Low		1	09/20/17 19:08	C7I0344	CI72107
Trichloroethene	ND (0.0055)		8260B Low		1	09/20/17 19:08	C7I0344	CI72107
Trichlorofluoromethane	ND (0.0055)		8260B Low		1	09/20/17 19:08	C7I0344	CI72107
Vinyl Acetate	ND (0.0055)		8260B Low		1	09/20/17 19:08	C7I0344	CI72107
Vinyl Chloride	ND (0.0109)		8260B Low		1	09/20/17 19:08	C7I0344	CI72107
Xylene O	ND (0.0055)		8260B Low		1	09/20/17 19:08	C7I0344	CI72107
Xylene P,M	ND (0.0109)		8260B Low		1	09/20/17 19:08	C7I0344	CI72107
Xylenes (Total)	ND (0.0109)		8260B Low		1	09/20/17 19:08		[CALC]

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: 1,2-Dichloroethane-d4	93 %		70-130
Surrogate: 4-Bromofluorobenzene	106 %		70-130
Surrogate: Dibromofluoromethane	95 %		70-130
Surrogate: Toluene-d8	113 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-511 (3-4')  
Date Sampled: 09/18/17 08:10  
Percent Solids: 97  
Initial Volume: 19  
Final Volume: 1  
Extraction Method: 3546

ESS Laboratory Work Order: 1709493  
ESS Laboratory Sample ID: 1709493-02  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: SMR  
Prepared: 9/19/17 13:10

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	ND (40.6)		8100M		1	09/20/17 18:30	C710328	CI71918
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		79 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-511 (3-4')  
 Date Sampled: 09/18/17 08:10  
 Percent Solids: 97  
 Initial Volume: 14.7  
 Final Volume: 0.5  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709493  
 ESS Laboratory Sample ID: 1709493-02  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: TJ  
 Prepared: 9/19/17 11:55

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.349)		8270D		1	09/22/17 3:18	C7I0363	CI71920
Acenaphthene	ND (0.349)		8270D		1	09/22/17 3:18	C7I0363	CI71920
Acenaphthylene	ND (0.349)		8270D		1	09/22/17 3:18	C7I0363	CI71920
Anthracene	ND (0.349)		8270D		1	09/22/17 3:18	C7I0363	CI71920
Benzo(a)anthracene	ND (0.349)		8270D		1	09/22/17 3:18	C7I0363	CI71920
Benzo(a)pyrene	ND (0.175)		8270D		1	09/22/17 3:18	C7I0363	CI71920
Benzo(b)fluoranthene	ND (0.349)		8270D		1	09/22/17 3:18	C7I0363	CI71920
Benzo(g,h,i)perylene	ND (0.349)		8270D		1	09/22/17 3:18	C7I0363	CI71920
Benzo(k)fluoranthene	ND (0.349)		8270D		1	09/22/17 3:18	C7I0363	CI71920
Chrysene	ND (0.175)		8270D		1	09/22/17 3:18	C7I0363	CI71920
Dibenzo(a,h)Anthracene	ND (0.175)		8270D		1	09/22/17 3:18	C7I0363	CI71920
Fluoranthene	ND (0.349)		8270D		1	09/22/17 3:18	C7I0363	CI71920
Fluorene	ND (0.349)		8270D		1	09/22/17 3:18	C7I0363	CI71920
Indeno(1,2,3-cd)Pyrene	ND (0.349)		8270D		1	09/22/17 3:18	C7I0363	CI71920
Naphthalene	ND (0.349)		8270D		1	09/22/17 3:18	C7I0363	CI71920
Phenanthrene	ND (0.349)		8270D		1	09/22/17 3:18	C7I0363	CI71920
Pyrene	ND (0.349)		8270D		1	09/22/17 3:18	C7I0363	CI71920

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: 1,2-Dichlorobenzene-d4	67 %		30-130
Surrogate: 2-Fluorobiphenyl	66 %		30-130
Surrogate: Nitrobenzene-d5	53 %		30-130
Surrogate: p-Terphenyl-d14	67 %		30-130





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-511 (3-4')  
Date Sampled: 09/18/17 08:10  
Percent Solids: 97

ESS Laboratory Work Order: 1709493  
ESS Laboratory Sample ID: 1709493-02  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	6.27 (0.94)		9014		1	EEM	09/21/17 12:25	mg/kg dry	CI72119



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-512 (0-2')  
 Date Sampled: 09/18/17 08:40  
 Percent Solids: 98

ESS Laboratory Work Order: 1709493  
 ESS Laboratory Sample ID: 1709493-03  
 Sample Matrix: Soil  
 Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (5.08)		6010C		1	KJK	09/23/17 6:13	2.01	100	CI71937
Arsenic	2.73 (2.54)		6010C		1	KJK	09/23/17 6:13	2.01	100	CI71937
Beryllium	0.21 (0.11)		6010C		1	KJK	09/23/17 6:13	2.01	100	CI71937
Cadmium	ND (0.51)		6010C		1	KJK	09/23/17 21:32	2.01	100	CI71937
Chromium	5.15 (1.02)		6010C		1	KJK	09/23/17 6:13	2.01	100	CI71937
Copper	11.4 (2.54)		6010C		1	KJK	09/23/17 6:13	2.01	100	CI71937
Lead	27.7 (5.08)		6010C		1	KJK	09/23/17 6:13	2.01	100	CI71937
Mercury	ND (0.030)		7471B		1	MJV	09/21/17 21:47	0.67	40	CI71939
Nickel	6.12 (2.54)		6010C		1	KJK	09/23/17 6:13	2.01	100	CI71937
Selenium	ND (5.08)		6020A		20	NAR	09/27/17 10:59	2.01	100	CI71937
Silver	ND (0.51)		6010C		1	KJK	09/23/17 21:32	2.01	100	CI71937
Thallium	ND (5.08)		6010C		1	KJK	09/23/17 6:13	2.01	100	CI71937
Zinc	48.4 (2.54)		6010C		1	KJK	09/23/17 6:13	2.01	100	CI71937



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-512 (0-2')  
 Date Sampled: 09/18/17 08:40  
 Percent Solids: 98  
 Initial Volume: 6.3  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709493  
 ESS Laboratory Sample ID: 1709493-03  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0041)		8260B Low		1	09/20/17 19:33	C7I0344	CI72107
1,1,1-Trichloroethane	ND (0.0041)		8260B Low		1	09/20/17 19:33	C7I0344	CI72107
1,1,2,2-Tetrachloroethane	ND (0.0041)		8260B Low		1	09/20/17 19:33	C7I0344	CI72107
1,1,2-Trichloroethane	ND (0.0041)		8260B Low		1	09/20/17 19:33	C7I0344	CI72107
1,1-Dichloroethane	ND (0.0041)		8260B Low		1	09/20/17 19:33	C7I0344	CI72107
1,1-Dichloroethene	ND (0.0041)		8260B Low		1	09/20/17 19:33	C7I0344	CI72107
1,1-Dichloropropene	ND (0.0041)		8260B Low		1	09/20/17 19:33	C7I0344	CI72107
1,2,3-Trichlorobenzene	ND (0.0041)		8260B Low		1	09/20/17 19:33	C7I0344	CI72107
1,2,3-Trichloropropane	ND (0.0041)		8260B Low		1	09/20/17 19:33	C7I0344	CI72107
1,2,4-Trichlorobenzene	ND (0.0041)		8260B Low		1	09/20/17 19:33	C7I0344	CI72107
1,2,4-Trimethylbenzene	ND (0.0041)		8260B Low		1	09/20/17 19:33	C7I0344	CI72107
1,2-Dibromo-3-Chloropropane	ND (0.0041)		8260B Low		1	09/20/17 19:33	C7I0344	CI72107
1,2-Dibromoethane	ND (0.0041)		8260B Low		1	09/20/17 19:33	C7I0344	CI72107
1,2-Dichlorobenzene	ND (0.0041)		8260B Low		1	09/20/17 19:33	C7I0344	CI72107
1,2-Dichloroethane	ND (0.0041)		8260B Low		1	09/20/17 19:33	C7I0344	CI72107
1,2-Dichloropropane	ND (0.0041)		8260B Low		1	09/20/17 19:33	C7I0344	CI72107
1,3,5-Trimethylbenzene	ND (0.0041)		8260B Low		1	09/20/17 19:33	C7I0344	CI72107
1,3-Dichlorobenzene	ND (0.0041)		8260B Low		1	09/20/17 19:33	C7I0344	CI72107
1,3-Dichloropropane	ND (0.0041)		8260B Low		1	09/20/17 19:33	C7I0344	CI72107
1,4-Dichlorobenzene	ND (0.0041)		8260B Low		1	09/20/17 19:33	C7I0344	CI72107
1,4-Dioxane	ND (0.0810)		8260B Low		1	09/20/17 19:33	C7I0344	CI72107
1-Chlorohexane	ND (0.0041)		8260B Low		1	09/20/17 19:33	C7I0344	CI72107
2,2-Dichloropropane	ND (0.0041)		8260B Low		1	09/20/17 19:33	C7I0344	CI72107
2-Butanone	ND (0.0405)		8260B Low		1	09/20/17 19:33	C7I0344	CI72107
2-Chlorotoluene	ND (0.0041)		8260B Low		1	09/20/17 19:33	C7I0344	CI72107
2-Hexanone	ND (0.0405)		8260B Low		1	09/20/17 19:33	C7I0344	CI72107
4-Chlorotoluene	ND (0.0041)		8260B Low		1	09/20/17 19:33	C7I0344	CI72107
4-Isopropyltoluene	ND (0.0041)		8260B Low		1	09/20/17 19:33	C7I0344	CI72107
4-Methyl-2-Pentanone	ND (0.0405)		8260B Low		1	09/20/17 19:33	C7I0344	CI72107
Acetone	ND (0.0405)		8260B Low		1	09/20/17 19:33	C7I0344	CI72107
Benzene	ND (0.0041)		8260B Low		1	09/20/17 19:33	C7I0344	CI72107
Bromobenzene	ND (0.0041)		8260B Low		1	09/20/17 19:33	C7I0344	CI72107



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-512 (0-2')  
 Date Sampled: 09/18/17 08:40  
 Percent Solids: 98  
 Initial Volume: 6.3  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709493  
 ESS Laboratory Sample ID: 1709493-03  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0041)		8260B Low		1	09/20/17 19:33	C7I0344	CI72107
Bromodichloromethane	ND (0.0041)		8260B Low		1	09/20/17 19:33	C7I0344	CI72107
Bromoform	ND (0.0041)		8260B Low		1	09/20/17 19:33	C7I0344	CI72107
Bromomethane	ND (0.0081)		8260B Low		1	09/20/17 19:33	C7I0344	CI72107
Carbon Disulfide	ND (0.0041)		8260B Low		1	09/20/17 19:33	C7I0344	CI72107
Carbon Tetrachloride	ND (0.0041)		8260B Low		1	09/20/17 19:33	C7I0344	CI72107
Chlorobenzene	ND (0.0041)		8260B Low		1	09/20/17 19:33	C7I0344	CI72107
Chloroethane	ND (0.0081)		8260B Low		1	09/20/17 19:33	C7I0344	CI72107
Chloroform	ND (0.0041)		8260B Low		1	09/20/17 19:33	C7I0344	CI72107
Chloromethane	ND (0.0081)		8260B Low		1	09/20/17 19:33	C7I0344	CI72107
cis-1,2-Dichloroethene	ND (0.0041)		8260B Low		1	09/20/17 19:33	C7I0344	CI72107
cis-1,3-Dichloropropene	ND (0.0041)		8260B Low		1	09/20/17 19:33	C7I0344	CI72107
Dibromochloromethane	ND (0.0041)		8260B Low		1	09/20/17 19:33	C7I0344	CI72107
Dibromomethane	ND (0.0041)		8260B Low		1	09/20/17 19:33	C7I0344	CI72107
Dichlorodifluoromethane	ND (0.0081)		8260B Low		1	09/20/17 19:33	C7I0344	CI72107
Diethyl Ether	ND (0.0041)		8260B Low		1	09/20/17 19:33	C7I0344	CI72107
Di-isopropyl ether	ND (0.0041)		8260B Low		1	09/20/17 19:33	C7I0344	CI72107
Ethyl tertiary-butyl ether	ND (0.0041)		8260B Low		1	09/20/17 19:33	C7I0344	CI72107
Ethylbenzene	ND (0.0041)		8260B Low		1	09/20/17 19:33	C7I0344	CI72107
Hexachlorobutadiene	ND (0.0041)		8260B Low		1	09/20/17 19:33	C7I0344	CI72107
Isopropylbenzene	ND (0.0041)		8260B Low		1	09/20/17 19:33	C7I0344	CI72107
Methyl tert-Butyl Ether	ND (0.0041)		8260B Low		1	09/20/17 19:33	C7I0344	CI72107
Methylene Chloride	ND (0.0203)		8260B Low		1	09/20/17 19:33	C7I0344	CI72107
Naphthalene	ND (0.0041)		8260B Low		1	09/20/17 19:33	C7I0344	CI72107
n-Butylbenzene	ND (0.0041)		8260B Low		1	09/20/17 19:33	C7I0344	CI72107
n-Propylbenzene	ND (0.0041)		8260B Low		1	09/20/17 19:33	C7I0344	CI72107
sec-Butylbenzene	ND (0.0041)		8260B Low		1	09/20/17 19:33	C7I0344	CI72107
Styrene	ND (0.0041)		8260B Low		1	09/20/17 19:33	C7I0344	CI72107
tert-Butylbenzene	ND (0.0041)		8260B Low		1	09/20/17 19:33	C7I0344	CI72107
Tertiary-amyl methyl ether	ND (0.0041)		8260B Low		1	09/20/17 19:33	C7I0344	CI72107
Tetrachloroethene	ND (0.0041)		8260B Low		1	09/20/17 19:33	C7I0344	CI72107
Tetrahydrofuran	ND (0.0041)		8260B Low		1	09/20/17 19:33	C7I0344	CI72107





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-512 (0-2')  
 Date Sampled: 09/18/17 08:40  
 Percent Solids: 98  
 Initial Volume: 6.3  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709493  
 ESS Laboratory Sample ID: 1709493-03  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0041)		8260B Low		1	09/20/17 19:33	C7I0344	CI72107
trans-1,2-Dichloroethene	ND (0.0041)		8260B Low		1	09/20/17 19:33	C7I0344	CI72107
trans-1,3-Dichloropropene	ND (0.0041)		8260B Low		1	09/20/17 19:33	C7I0344	CI72107
Trichloroethene	ND (0.0041)		8260B Low		1	09/20/17 19:33	C7I0344	CI72107
Trichlorofluoromethane	ND (0.0041)		8260B Low		1	09/20/17 19:33	C7I0344	CI72107
Vinyl Acetate	ND (0.0041)		8260B Low		1	09/20/17 19:33	C7I0344	CI72107
Vinyl Chloride	ND (0.0081)		8260B Low		1	09/20/17 19:33	C7I0344	CI72107
Xylene O	ND (0.0041)		8260B Low		1	09/20/17 19:33	C7I0344	CI72107
Xylene P,M	ND (0.0081)		8260B Low		1	09/20/17 19:33	C7I0344	CI72107
Xylenes (Total)	ND (0.0081)		8260B Low		1	09/20/17 19:33		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	94 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	106 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	96 %		70-130
<i>Surrogate: Toluene-d8</i>	113 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-512 (0-2')  
 Date Sampled: 09/18/17 08:40  
 Percent Solids: 98  
 Initial Volume: 19.5  
 Final Volume: 1  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709493  
 ESS Laboratory Sample ID: 1709493-03  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: SMR  
 Prepared: 9/19/17 13:10

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	296 (196)		8100M		5	09/21/17 12:38	C710328	CI71918
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		85 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-512 (0-2')  
Date Sampled: 09/18/17 08:40  
Percent Solids: 98  
Initial Volume: 15.1  
Final Volume: 0.5  
Extraction Method: 3546

ESS Laboratory Work Order: 1709493  
ESS Laboratory Sample ID: 1709493-03  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: TJ  
Prepared: 9/19/17 11:55

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.338)		8270D		1	09/22/17 3:53	C7I0363	CI71920
Acenaphthene	ND (0.338)		8270D		1	09/22/17 3:53	C7I0363	CI71920
Acenaphthylene	ND (0.338)		8270D		1	09/22/17 3:53	C7I0363	CI71920
Anthracene	ND (0.338)		8270D		1	09/22/17 3:53	C7I0363	CI71920
<b>Benzo(a)anthracene</b>	<b>1.02</b> (0.338)		8270D		1	09/22/17 3:53	C7I0363	CI71920
<b>Benzo(a)pyrene</b>	<b>0.992</b> (0.169)		8270D		1	09/22/17 3:53	C7I0363	CI71920
<b>Benzo(b)fluoranthene</b>	<b>1.18</b> (0.338)		8270D		1	09/22/17 3:53	C7I0363	CI71920
<b>Benzo(g,h,i)perylene</b>	<b>0.552</b> (0.338)		8270D		1	09/22/17 3:53	C7I0363	CI71920
<b>Benzo(k)fluoranthene</b>	<b>0.966</b> (0.338)		8270D		1	09/22/17 3:53	C7I0363	CI71920
<b>Chrysene</b>	<b>1.01</b> (0.169)		8270D		1	09/22/17 3:53	C7I0363	CI71920
<b>Dibenzo(a,h)Anthracene</b>	<b>0.262</b> (0.169)		8270D		1	09/22/17 3:53	C7I0363	CI71920
<b>Fluoranthene</b>	<b>1.89</b> (0.338)		8270D		1	09/22/17 3:53	C7I0363	CI71920
Fluorene	ND (0.338)		8270D		1	09/22/17 3:53	C7I0363	CI71920
<b>Indeno(1,2,3-cd)Pyrene</b>	<b>0.485</b> (0.338)		8270D		1	09/22/17 3:53	C7I0363	CI71920
Naphthalene	ND (0.338)		8270D		1	09/22/17 3:53	C7I0363	CI71920
<b>Phenanthrene</b>	<b>0.483</b> (0.338)		8270D		1	09/22/17 3:53	C7I0363	CI71920
<b>Pyrene</b>	<b>1.59</b> (0.338)		8270D		1	09/22/17 3:53	C7I0363	CI71920

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	61 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	67 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	49 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	67 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-512 (0-2')  
Date Sampled: 09/18/17 08:40  
Percent Solids: 98

ESS Laboratory Work Order: 1709493  
ESS Laboratory Sample ID: 1709493-03  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	5.50 (1.00)		9014		1	EEM	09/21/17 12:25	mg/kg dry	CI72119





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-512 (3-4')  
Date Sampled: 09/18/17 08:50  
Percent Solids: 95

ESS Laboratory Work Order: 1709493  
ESS Laboratory Sample ID: 1709493-04  
Sample Matrix: Soil  
Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (4.19)		6010C		1	KJK	09/23/17 6:18	2.52	100	CI71937
Arsenic	<b>3.42</b> (2.10)		6010C		1	KJK	09/23/17 6:18	2.52	100	CI71937
Beryllium	<b>0.26</b> (0.09)		6010C		1	KJK	09/23/17 6:18	2.52	100	CI71937
Cadmium	ND (0.42)		6010C		1	KJK	09/23/17 21:36	2.52	100	CI71937
Chromium	<b>3.77</b> (0.84)		6010C		1	KJK	09/23/17 6:18	2.52	100	CI71937
Copper	<b>19.2</b> (2.10)		6010C		1	KJK	09/23/17 6:18	2.52	100	CI71937
Lead	<b>26.1</b> (4.19)		6010C		1	KJK	09/23/17 6:18	2.52	100	CI71937
Mercury	<b>0.088</b> (0.026)		7471B		1	MJV	09/21/17 21:49	0.81	40	CI71939
Nickel	<b>7.13</b> (2.10)		6010C		1	KJK	09/23/17 6:18	2.52	100	CI71937
Selenium	ND (4.19)		6020A		20	NAR	09/27/17 11:04	2.52	100	CI71937
Silver	ND (0.42)		6010C		1	KJK	09/23/17 21:36	2.52	100	CI71937
Thallium	ND (4.19)		6010C		1	KJK	09/23/17 6:18	2.52	100	CI71937
Zinc	<b>8.93</b> (2.10)		6010C		1	KJK	09/23/17 6:18	2.52	100	CI71937



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-512 (3-4')  
 Date Sampled: 09/18/17 08:50  
 Percent Solids: 95  
 Initial Volume: 5.5  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709493  
 ESS Laboratory Sample ID: 1709493-04  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0048)		8260B Low		1	09/20/17 19:58	C7I0344	CI72107
1,1,1-Trichloroethane	ND (0.0048)		8260B Low		1	09/20/17 19:58	C7I0344	CI72107
1,1,2,2-Tetrachloroethane	ND (0.0048)		8260B Low		1	09/20/17 19:58	C7I0344	CI72107
1,1,2-Trichloroethane	ND (0.0048)		8260B Low		1	09/20/17 19:58	C7I0344	CI72107
1,1-Dichloroethane	ND (0.0048)		8260B Low		1	09/20/17 19:58	C7I0344	CI72107
1,1-Dichloroethene	ND (0.0048)		8260B Low		1	09/20/17 19:58	C7I0344	CI72107
1,1-Dichloropropene	ND (0.0048)		8260B Low		1	09/20/17 19:58	C7I0344	CI72107
1,2,3-Trichlorobenzene	ND (0.0048)		8260B Low		1	09/20/17 19:58	C7I0344	CI72107
1,2,3-Trichloropropane	ND (0.0048)		8260B Low		1	09/20/17 19:58	C7I0344	CI72107
1,2,4-Trichlorobenzene	ND (0.0048)		8260B Low		1	09/20/17 19:58	C7I0344	CI72107
1,2,4-Trimethylbenzene	ND (0.0048)		8260B Low		1	09/20/17 19:58	C7I0344	CI72107
1,2-Dibromo-3-Chloropropane	ND (0.0048)		8260B Low		1	09/20/17 19:58	C7I0344	CI72107
1,2-Dibromoethane	ND (0.0048)		8260B Low		1	09/20/17 19:58	C7I0344	CI72107
1,2-Dichlorobenzene	ND (0.0048)		8260B Low		1	09/20/17 19:58	C7I0344	CI72107
1,2-Dichloroethane	ND (0.0048)		8260B Low		1	09/20/17 19:58	C7I0344	CI72107
1,2-Dichloropropane	ND (0.0048)		8260B Low		1	09/20/17 19:58	C7I0344	CI72107
1,3,5-Trimethylbenzene	ND (0.0048)		8260B Low		1	09/20/17 19:58	C7I0344	CI72107
1,3-Dichlorobenzene	ND (0.0048)		8260B Low		1	09/20/17 19:58	C7I0344	CI72107
1,3-Dichloropropane	ND (0.0048)		8260B Low		1	09/20/17 19:58	C7I0344	CI72107
1,4-Dichlorobenzene	ND (0.0048)		8260B Low		1	09/20/17 19:58	C7I0344	CI72107
1,4-Dioxane	ND (0.0960)		8260B Low		1	09/20/17 19:58	C7I0344	CI72107
1-Chlorohexane	ND (0.0048)		8260B Low		1	09/20/17 19:58	C7I0344	CI72107
2,2-Dichloropropane	ND (0.0048)		8260B Low		1	09/20/17 19:58	C7I0344	CI72107
2-Butanone	ND (0.0480)		8260B Low		1	09/20/17 19:58	C7I0344	CI72107
2-Chlorotoluene	ND (0.0048)		8260B Low		1	09/20/17 19:58	C7I0344	CI72107
2-Hexanone	ND (0.0480)		8260B Low		1	09/20/17 19:58	C7I0344	CI72107
4-Chlorotoluene	ND (0.0048)		8260B Low		1	09/20/17 19:58	C7I0344	CI72107
4-Isopropyltoluene	ND (0.0048)		8260B Low		1	09/20/17 19:58	C7I0344	CI72107
4-Methyl-2-Pentanone	ND (0.0480)		8260B Low		1	09/20/17 19:58	C7I0344	CI72107
Acetone	ND (0.0480)		8260B Low		1	09/20/17 19:58	C7I0344	CI72107
Benzene	ND (0.0048)		8260B Low		1	09/20/17 19:58	C7I0344	CI72107
Bromobenzene	ND (0.0048)		8260B Low		1	09/20/17 19:58	C7I0344	CI72107



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-512 (3-4')  
 Date Sampled: 09/18/17 08:50  
 Percent Solids: 95  
 Initial Volume: 5.5  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709493  
 ESS Laboratory Sample ID: 1709493-04  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0048)		8260B Low		1	09/20/17 19:58	C7I0344	CI72107
Bromodichloromethane	ND (0.0048)		8260B Low		1	09/20/17 19:58	C7I0344	CI72107
Bromoform	ND (0.0048)		8260B Low		1	09/20/17 19:58	C7I0344	CI72107
Bromomethane	ND (0.0096)		8260B Low		1	09/20/17 19:58	C7I0344	CI72107
Carbon Disulfide	ND (0.0048)		8260B Low		1	09/20/17 19:58	C7I0344	CI72107
Carbon Tetrachloride	ND (0.0048)		8260B Low		1	09/20/17 19:58	C7I0344	CI72107
Chlorobenzene	ND (0.0048)		8260B Low		1	09/20/17 19:58	C7I0344	CI72107
Chloroethane	ND (0.0096)		8260B Low		1	09/20/17 19:58	C7I0344	CI72107
Chloroform	ND (0.0048)		8260B Low		1	09/20/17 19:58	C7I0344	CI72107
Chloromethane	ND (0.0096)		8260B Low		1	09/20/17 19:58	C7I0344	CI72107
cis-1,2-Dichloroethene	ND (0.0048)		8260B Low		1	09/20/17 19:58	C7I0344	CI72107
cis-1,3-Dichloropropene	ND (0.0048)		8260B Low		1	09/20/17 19:58	C7I0344	CI72107
Dibromochloromethane	ND (0.0048)		8260B Low		1	09/20/17 19:58	C7I0344	CI72107
Dibromomethane	ND (0.0048)		8260B Low		1	09/20/17 19:58	C7I0344	CI72107
Dichlorodifluoromethane	ND (0.0096)		8260B Low		1	09/20/17 19:58	C7I0344	CI72107
Diethyl Ether	ND (0.0048)		8260B Low		1	09/20/17 19:58	C7I0344	CI72107
Di-isopropyl ether	ND (0.0048)		8260B Low		1	09/20/17 19:58	C7I0344	CI72107
Ethyl tertiary-butyl ether	ND (0.0048)		8260B Low		1	09/20/17 19:58	C7I0344	CI72107
Ethylbenzene	ND (0.0048)		8260B Low		1	09/20/17 19:58	C7I0344	CI72107
Hexachlorobutadiene	ND (0.0048)		8260B Low		1	09/20/17 19:58	C7I0344	CI72107
Isopropylbenzene	ND (0.0048)		8260B Low		1	09/20/17 19:58	C7I0344	CI72107
Methyl tert-Butyl Ether	ND (0.0048)		8260B Low		1	09/20/17 19:58	C7I0344	CI72107
Methylene Chloride	ND (0.0240)		8260B Low		1	09/20/17 19:58	C7I0344	CI72107
Naphthalene	ND (0.0048)		8260B Low		1	09/20/17 19:58	C7I0344	CI72107
n-Butylbenzene	ND (0.0048)		8260B Low		1	09/20/17 19:58	C7I0344	CI72107
n-Propylbenzene	ND (0.0048)		8260B Low		1	09/20/17 19:58	C7I0344	CI72107
sec-Butylbenzene	ND (0.0048)		8260B Low		1	09/20/17 19:58	C7I0344	CI72107
Styrene	ND (0.0048)		8260B Low		1	09/20/17 19:58	C7I0344	CI72107
tert-Butylbenzene	ND (0.0048)		8260B Low		1	09/20/17 19:58	C7I0344	CI72107
Tertiary-amyl methyl ether	ND (0.0048)		8260B Low		1	09/20/17 19:58	C7I0344	CI72107
Tetrachloroethene	ND (0.0048)		8260B Low		1	09/20/17 19:58	C7I0344	CI72107
Tetrahydrofuran	ND (0.0048)		8260B Low		1	09/20/17 19:58	C7I0344	CI72107



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-512 (3-4)  
Date Sampled: 09/18/17 08:50  
Percent Solids: 95  
Initial Volume: 5.5  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1709493  
ESS Laboratory Sample ID: 1709493-04  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0048)		8260B Low		1	09/20/17 19:58	C7I0344	CI72107
trans-1,2-Dichloroethene	ND (0.0048)		8260B Low		1	09/20/17 19:58	C7I0344	CI72107
trans-1,3-Dichloropropene	ND (0.0048)		8260B Low		1	09/20/17 19:58	C7I0344	CI72107
Trichloroethene	ND (0.0048)		8260B Low		1	09/20/17 19:58	C7I0344	CI72107
Trichlorofluoromethane	ND (0.0048)		8260B Low		1	09/20/17 19:58	C7I0344	CI72107
Vinyl Acetate	ND (0.0048)		8260B Low		1	09/20/17 19:58	C7I0344	CI72107
Vinyl Chloride	ND (0.0096)		8260B Low		1	09/20/17 19:58	C7I0344	CI72107
Xylene O	ND (0.0048)		8260B Low		1	09/20/17 19:58	C7I0344	CI72107
Xylene P,M	ND (0.0096)		8260B Low		1	09/20/17 19:58	C7I0344	CI72107
Xylenes (Total)	ND (0.0096)		8260B Low		1	09/20/17 19:58		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	96 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	102 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	98 %		70-130
<i>Surrogate: Toluene-d8</i>	116 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-512 (3-4)  
 Date Sampled: 09/18/17 08:50  
 Percent Solids: 95  
 Initial Volume: 19.4  
 Final Volume: 1  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709493  
 ESS Laboratory Sample ID: 1709493-04  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: SMR  
 Prepared: 9/19/17 13:10

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	162 (40.8)		8100M		1	09/20/17 19:06	C710328	CI71918
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		84 %		40-140				





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-512 (3-4)  
Date Sampled: 09/18/17 08:50  
Percent Solids: 95  
Initial Volume: 14  
Final Volume: 0.5  
Extraction Method: 3546

ESS Laboratory Work Order: 1709493  
ESS Laboratory Sample ID: 1709493-04  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: TJ  
Prepared: 9/19/17 14:13

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
<b>2-Methylnaphthalene</b>	<b>0.552</b> (0.377)		8270D		1	09/21/17 3:30	C7I0309	CI71919
Acenaphthene	ND (0.377)		8270D		1	09/21/17 3:30	C7I0309	CI71919
Acenaphthylene	ND (0.377)		8270D		1	09/21/17 3:30	C7I0309	CI71919
Anthracene	ND (0.377)		8270D		1	09/21/17 3:30	C7I0309	CI71919
<b>Benzo(a)anthracene</b>	<b>1.33</b> (0.377)		8270D		1	09/21/17 3:30	C7I0309	CI71919
<b>Benzo(a)pyrene</b>	<b>1.88</b> (0.189)		8270D		1	09/21/17 3:30	C7I0309	CI71919
<b>Benzo(b)fluoranthene</b>	<b>2.53</b> (0.377)		8270D		1	09/21/17 3:30	C7I0309	CI71919
<b>Benzo(g,h,i)perylene</b>	<b>2.38</b> (0.377)		8270D		1	09/21/17 3:30	C7I0309	CI71919
<b>Benzo(k)fluoranthene</b>	<b>0.778</b> (0.377)		8270D		1	09/21/17 3:30	C7I0309	CI71919
<b>Chrysene</b>	<b>1.65</b> (0.189)		8270D		1	09/21/17 3:30	C7I0309	CI71919
<b>Dibenzo(a,h)Anthracene</b>	<b>0.805</b> (0.189)		8270D		1	09/21/17 3:30	C7I0309	CI71919
<b>Fluoranthene</b>	<b>1.63</b> (0.377)		8270D		1	09/21/17 3:30	C7I0309	CI71919
Fluorene	ND (0.377)		8270D		1	09/21/17 3:30	C7I0309	CI71919
<b>Indeno(1,2,3-cd)Pyrene</b>	<b>1.85</b> (0.377)		8270D		1	09/21/17 3:30	C7I0309	CI71919
<b>Naphthalene</b>	<b>1.90</b> (0.377)		8270D		1	09/21/17 3:30	C7I0309	CI71919
<b>Phenanthrene</b>	<b>1.11</b> (0.377)		8270D		1	09/21/17 3:30	C7I0309	CI71919
<b>Pyrene</b>	<b>1.76</b> (0.377)		8270D		1	09/21/17 3:30	C7I0309	CI71919

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	70 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	72 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	69 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	75 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-512 (3-4)  
Date Sampled: 09/18/17 08:50  
Percent Solids: 95

ESS Laboratory Work Order: 1709493  
ESS Laboratory Sample ID: 1709493-04  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	18.4 (1.02)		9014		1	EEM	09/21/17 12:25	mg/kg dry	CI72119



## CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-510 (0-2')  
Date Sampled: 09/18/17 10:25  
Percent Solids: 88

ESS Laboratory Work Order: 1709493  
ESS Laboratory Sample ID: 1709493-05  
Sample Matrix: Soil  
Units: mg/kg dry

Extraction Method: 3050B

### Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (4.92)		6010C		1	KJK	09/23/17 6:22	2.3	100	CI71937
<b>Arsenic</b>	<b>10.0</b> (2.46)		6010C		1	KJK	09/23/17 6:22	2.3	100	CI71937
Beryllium	ND (0.11)		6010C		1	KJK	09/23/17 6:22	2.3	100	CI71937
Cadmium	ND (0.49)		6010C		1	KJK	09/23/17 21:41	2.3	100	CI71937
<b>Chromium</b>	<b>1.09</b> (0.98)		6010C		1	KJK	09/23/17 6:22	2.3	100	CI71937
<b>Copper</b>	<b>26.1</b> (2.46)		6010C		1	KJK	09/23/17 6:22	2.3	100	CI71937
<b>Lead</b>	<b>295</b> (4.92)		6010C		1	KJK	09/23/17 6:22	2.3	100	CI71937
<b>Mercury</b>	<b>0.097</b> (0.033)		7471B		1	MJV	09/21/17 21:51	0.67	40	CI71939
<b>Nickel</b>	<b>11.6</b> (2.46)		6010C		1	KJK	09/23/17 6:22	2.3	100	CI71937
Selenium	ND (4.92)		6020A		20	NAR	09/27/17 11:23	2.3	100	CI71937
Silver	ND (0.49)		6010C		1	KJK	09/23/17 21:41	2.3	100	CI71937
Thallium	ND (4.92)		6010C		1	KJK	09/23/17 6:22	2.3	100	CI71937
<b>Zinc</b>	<b>27.0</b> (2.46)		6010C		1	KJK	09/23/17 6:22	2.3	100	CI71937



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-510 (0-2')  
 Date Sampled: 09/18/17 10:25  
 Percent Solids: 88  
 Initial Volume: 5.1  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709493  
 ESS Laboratory Sample ID: 1709493-05  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0055)		8260B Low		1	09/20/17 20:24	C7I0344	CI72107
1,1,1-Trichloroethane	ND (0.0055)		8260B Low		1	09/20/17 20:24	C7I0344	CI72107
1,1,2,2-Tetrachloroethane	ND (0.0055)		8260B Low		1	09/20/17 20:24	C7I0344	CI72107
1,1,2-Trichloroethane	ND (0.0055)		8260B Low		1	09/20/17 20:24	C7I0344	CI72107
1,1-Dichloroethane	ND (0.0055)		8260B Low		1	09/20/17 20:24	C7I0344	CI72107
1,1-Dichloroethene	ND (0.0055)		8260B Low		1	09/20/17 20:24	C7I0344	CI72107
1,1-Dichloropropene	ND (0.0055)		8260B Low		1	09/20/17 20:24	C7I0344	CI72107
1,2,3-Trichlorobenzene	ND (0.0055)		8260B Low		1	09/20/17 20:24	C7I0344	CI72107
1,2,3-Trichloropropane	ND (0.0055)		8260B Low		1	09/20/17 20:24	C7I0344	CI72107
1,2,4-Trichlorobenzene	ND (0.0055)		8260B Low		1	09/20/17 20:24	C7I0344	CI72107
1,2,4-Trimethylbenzene	ND (0.0055)		8260B Low		1	09/20/17 20:24	C7I0344	CI72107
1,2-Dibromo-3-Chloropropane	ND (0.0055)		8260B Low		1	09/20/17 20:24	C7I0344	CI72107
1,2-Dibromoethane	ND (0.0055)		8260B Low		1	09/20/17 20:24	C7I0344	CI72107
1,2-Dichlorobenzene	ND (0.0055)		8260B Low		1	09/20/17 20:24	C7I0344	CI72107
1,2-Dichloroethane	ND (0.0055)		8260B Low		1	09/20/17 20:24	C7I0344	CI72107
1,2-Dichloropropane	ND (0.0055)		8260B Low		1	09/20/17 20:24	C7I0344	CI72107
1,3,5-Trimethylbenzene	ND (0.0055)		8260B Low		1	09/20/17 20:24	C7I0344	CI72107
1,3-Dichlorobenzene	ND (0.0055)		8260B Low		1	09/20/17 20:24	C7I0344	CI72107
1,3-Dichloropropane	ND (0.0055)		8260B Low		1	09/20/17 20:24	C7I0344	CI72107
1,4-Dichlorobenzene	ND (0.0055)		8260B Low		1	09/20/17 20:24	C7I0344	CI72107
1,4-Dioxane	ND (0.111)		8260B Low		1	09/20/17 20:24	C7I0344	CI72107
1-Chlorohexane	ND (0.0055)		8260B Low		1	09/20/17 20:24	C7I0344	CI72107
2,2-Dichloropropane	ND (0.0055)		8260B Low		1	09/20/17 20:24	C7I0344	CI72107
2-Butanone	ND (0.0554)		8260B Low		1	09/20/17 20:24	C7I0344	CI72107
2-Chlorotoluene	ND (0.0055)		8260B Low		1	09/20/17 20:24	C7I0344	CI72107
2-Hexanone	ND (0.0554)		8260B Low		1	09/20/17 20:24	C7I0344	CI72107
4-Chlorotoluene	ND (0.0055)		8260B Low		1	09/20/17 20:24	C7I0344	CI72107
4-Isopropyltoluene	ND (0.0055)		8260B Low		1	09/20/17 20:24	C7I0344	CI72107
4-Methyl-2-Pentanone	ND (0.0554)		8260B Low		1	09/20/17 20:24	C7I0344	CI72107
Acetone	ND (0.0554)		8260B Low		1	09/20/17 20:24	C7I0344	CI72107
Benzene	ND (0.0055)		8260B Low		1	09/20/17 20:24	C7I0344	CI72107
Bromobenzene	ND (0.0055)		8260B Low		1	09/20/17 20:24	C7I0344	CI72107



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-510 (0-2')  
 Date Sampled: 09/18/17 10:25  
 Percent Solids: 88  
 Initial Volume: 5.1  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709493  
 ESS Laboratory Sample ID: 1709493-05  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0055)		8260B Low		1	09/20/17 20:24	C7I0344	CI72107
Bromodichloromethane	ND (0.0055)		8260B Low		1	09/20/17 20:24	C7I0344	CI72107
Bromoform	ND (0.0055)		8260B Low		1	09/20/17 20:24	C7I0344	CI72107
Bromomethane	ND (0.0111)		8260B Low		1	09/20/17 20:24	C7I0344	CI72107
Carbon Disulfide	ND (0.0055)		8260B Low		1	09/20/17 20:24	C7I0344	CI72107
Carbon Tetrachloride	ND (0.0055)		8260B Low		1	09/20/17 20:24	C7I0344	CI72107
Chlorobenzene	ND (0.0055)		8260B Low		1	09/20/17 20:24	C7I0344	CI72107
Chloroethane	ND (0.0111)		8260B Low		1	09/20/17 20:24	C7I0344	CI72107
Chloroform	ND (0.0055)		8260B Low		1	09/20/17 20:24	C7I0344	CI72107
Chloromethane	ND (0.0111)		8260B Low		1	09/20/17 20:24	C7I0344	CI72107
cis-1,2-Dichloroethene	ND (0.0055)		8260B Low		1	09/20/17 20:24	C7I0344	CI72107
cis-1,3-Dichloropropene	ND (0.0055)		8260B Low		1	09/20/17 20:24	C7I0344	CI72107
Dibromochloromethane	ND (0.0055)		8260B Low		1	09/20/17 20:24	C7I0344	CI72107
Dibromomethane	ND (0.0055)		8260B Low		1	09/20/17 20:24	C7I0344	CI72107
Dichlorodifluoromethane	ND (0.0111)		8260B Low		1	09/20/17 20:24	C7I0344	CI72107
Diethyl Ether	ND (0.0055)		8260B Low		1	09/20/17 20:24	C7I0344	CI72107
Di-isopropyl ether	ND (0.0055)		8260B Low		1	09/20/17 20:24	C7I0344	CI72107
Ethyl tertiary-butyl ether	ND (0.0055)		8260B Low		1	09/20/17 20:24	C7I0344	CI72107
Ethylbenzene	ND (0.0055)		8260B Low		1	09/20/17 20:24	C7I0344	CI72107
Hexachlorobutadiene	ND (0.0055)		8260B Low		1	09/20/17 20:24	C7I0344	CI72107
Isopropylbenzene	ND (0.0055)		8260B Low		1	09/20/17 20:24	C7I0344	CI72107
Methyl tert-Butyl Ether	ND (0.0055)		8260B Low		1	09/20/17 20:24	C7I0344	CI72107
Methylene Chloride	ND (0.0277)		8260B Low		1	09/20/17 20:24	C7I0344	CI72107
Naphthalene	ND (0.0055)		8260B Low		1	09/20/17 20:24	C7I0344	CI72107
n-Butylbenzene	ND (0.0055)		8260B Low		1	09/20/17 20:24	C7I0344	CI72107
n-Propylbenzene	ND (0.0055)		8260B Low		1	09/20/17 20:24	C7I0344	CI72107
sec-Butylbenzene	ND (0.0055)		8260B Low		1	09/20/17 20:24	C7I0344	CI72107
Styrene	ND (0.0055)		8260B Low		1	09/20/17 20:24	C7I0344	CI72107
tert-Butylbenzene	ND (0.0055)		8260B Low		1	09/20/17 20:24	C7I0344	CI72107
Tertiary-amyl methyl ether	ND (0.0055)		8260B Low		1	09/20/17 20:24	C7I0344	CI72107
Tetrachloroethene	ND (0.0055)		8260B Low		1	09/20/17 20:24	C7I0344	CI72107
Tetrahydrofuran	ND (0.0055)		8260B Low		1	09/20/17 20:24	C7I0344	CI72107





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-510 (0-2')  
Date Sampled: 09/18/17 10:25  
Percent Solids: 88  
Initial Volume: 5.1  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1709493  
ESS Laboratory Sample ID: 1709493-05  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0055)		8260B Low		1	09/20/17 20:24	C7I0344	CI72107
trans-1,2-Dichloroethene	ND (0.0055)		8260B Low		1	09/20/17 20:24	C7I0344	CI72107
trans-1,3-Dichloropropene	ND (0.0055)		8260B Low		1	09/20/17 20:24	C7I0344	CI72107
Trichloroethene	ND (0.0055)		8260B Low		1	09/20/17 20:24	C7I0344	CI72107
Trichlorofluoromethane	ND (0.0055)		8260B Low		1	09/20/17 20:24	C7I0344	CI72107
Vinyl Acetate	ND (0.0055)		8260B Low		1	09/20/17 20:24	C7I0344	CI72107
Vinyl Chloride	ND (0.0111)		8260B Low		1	09/20/17 20:24	C7I0344	CI72107
Xylene O	ND (0.0055)		8260B Low		1	09/20/17 20:24	C7I0344	CI72107
Xylene P,M	ND (0.0111)		8260B Low		1	09/20/17 20:24	C7I0344	CI72107
Xylenes (Total)	ND (0.0111)		8260B Low		1	09/20/17 20:24		[CALC]

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: 1,2-Dichloroethane-d4	94 %		70-130
Surrogate: 4-Bromofluorobenzene	101 %		70-130
Surrogate: Dibromofluoromethane	97 %		70-130
Surrogate: Toluene-d8	118 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-510 (0-2')  
Date Sampled: 09/18/17 10:25  
Percent Solids: 88  
Initial Volume: 19.4  
Final Volume: 1  
Extraction Method: 3546

ESS Laboratory Work Order: 1709493  
ESS Laboratory Sample ID: 1709493-05  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: SMR  
Prepared: 9/19/17 13:10

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	1240 (219)		8100M		5	09/21/17 13:14	C710328	CI71918

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: O-Terphenyl</i>	82 %		40-140



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-510 (0-2')  
 Date Sampled: 09/18/17 10:25  
 Percent Solids: 88  
 Initial Volume: 14.3  
 Final Volume: 1  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709493  
 ESS Laboratory Sample ID: 1709493-05  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: TJ  
 Prepared: 9/22/17 14:30

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	4.01 (1.58)		8270D		2	09/22/17 22:43	C7I0365	CI72209
Acenaphthene	8.45 (1.58)		8270D		2	09/22/17 22:43	C7I0365	CI72209
Acenaphthylene	ND (1.58)		8270D		2	09/22/17 22:43	C7I0365	CI72209
Anthracene	19.6 (1.58)		8270D		2	09/22/17 22:43	C7I0365	CI72209
Benzo(a)anthracene	32.4 (0.792)		8270D		2	09/22/17 22:43	C7I0365	CI72209
Benzo(a)pyrene	24.3 (0.394)		8270D		2	09/22/17 22:43	C7I0365	CI72209
Benzo(b)fluoranthene	27.5 (0.792)		8270D		2	09/22/17 22:43	C7I0365	CI72209
Benzo(g,h,i)perylene	7.72 (0.792)		8270D		2	09/22/17 22:43	C7I0365	CI72209
Benzo(k)fluoranthene	22.4 (0.792)		8270D		2	09/22/17 22:43	C7I0365	CI72209
Chrysene	32.2 (0.394)		8270D		2	09/22/17 22:43	C7I0365	CI72209
Dibenzo(a,h)Anthracene	5.25 (0.394)		8270D		2	09/22/17 22:43	C7I0365	CI72209
Fluoranthene	85.7 (15.8)		8270D		20	09/22/17 23:18	C7I0365	CI72209
Fluorene	9.29 (1.58)		8270D		2	09/22/17 22:43	C7I0365	CI72209
Indeno(1,2,3-cd)Pyrene	8.18 (0.792)		8270D		2	09/22/17 22:43	C7I0365	CI72209
Naphthalene	7.31 (0.792)		8270D		2	09/22/17 22:43	C7I0365	CI72209
Phenanthrene	72.7 (15.8)		8270D		20	09/22/17 23:18	C7I0365	CI72209
Pyrene	59.3 (15.8)		8270D		20	09/22/17 23:18	C7I0365	CI72209

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	72 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	81 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	56 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	77 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-510 (0-2')  
Date Sampled: 09/18/17 10:25  
Percent Solids: 88

ESS Laboratory Work Order: 1709493  
ESS Laboratory Sample ID: 1709493-05  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	3.16 (1.10)		9014		1	EEM	09/21/17 12:25	mg/kg dry	CI72119



## CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-510 (2-3')  
Date Sampled: 09/18/17 10:35  
Percent Solids: 75

ESS Laboratory Work Order: 1709493  
ESS Laboratory Sample ID: 1709493-06  
Sample Matrix: Soil  
Units: mg/kg dry

Extraction Method: 3050B

### Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (6.47)		6010C		1	KJK	09/23/17 6:40	2.06	100	CI71937
<b>Arsenic</b>	<b>6.79</b> (3.24)		6010C		1	KJK	09/23/17 6:40	2.06	100	CI71937
Beryllium	ND (0.14)		6010C		1	KJK	09/23/17 6:40	2.06	100	CI71937
Cadmium	ND (0.65)		6010C		1	KJK	09/23/17 21:46	2.06	100	CI71937
<b>Chromium</b>	<b>2.14</b> (1.29)		6010C		1	KJK	09/23/17 21:46	2.06	100	CI71937
<b>Copper</b>	<b>19.9</b> (3.24)		6010C		1	KJK	09/23/17 6:40	2.06	100	CI71937
<b>Lead</b>	<b>45.7</b> (6.47)		6010C		1	KJK	09/23/17 6:40	2.06	100	CI71937
<b>Mercury</b>	<b>0.063</b> (0.037)		7471B		1	MJV	09/21/17 21:57	0.72	40	CI71939
<b>Nickel</b>	<b>6.41</b> (3.24)		6010C		1	KJK	09/23/17 6:40	2.06	100	CI71937
Selenium	ND (6.47)		6020A		20	NAR	09/27/17 11:38	2.06	100	CI71937
Silver	ND (0.65)		6010C		1	KJK	09/23/17 21:46	2.06	100	CI71937
Thallium	ND (6.47)		6010C		1	KJK	09/23/17 6:40	2.06	100	CI71937
<b>Zinc</b>	<b>35.0</b> (3.24)		6010C		1	KJK	09/23/17 6:40	2.06	100	CI71937





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-510 (2-3')  
 Date Sampled: 09/18/17 10:35  
 Percent Solids: 75  
 Initial Volume: 7.2  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709493  
 ESS Laboratory Sample ID: 1709493-06  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0046)		8260B Low		1	09/20/17 20:49	C7I0344	CI72107
1,1,1-Trichloroethane	ND (0.0046)		8260B Low		1	09/20/17 20:49	C7I0344	CI72107
1,1,2,2-Tetrachloroethane	ND (0.0046)		8260B Low		1	09/20/17 20:49	C7I0344	CI72107
1,1,2-Trichloroethane	ND (0.0046)		8260B Low		1	09/20/17 20:49	C7I0344	CI72107
1,1-Dichloroethane	ND (0.0046)		8260B Low		1	09/20/17 20:49	C7I0344	CI72107
1,1-Dichloroethene	ND (0.0046)		8260B Low		1	09/20/17 20:49	C7I0344	CI72107
1,1-Dichloropropene	ND (0.0046)		8260B Low		1	09/20/17 20:49	C7I0344	CI72107
1,2,3-Trichlorobenzene	ND (0.0046)		8260B Low		1	09/20/17 20:49	C7I0344	CI72107
1,2,3-Trichloropropane	ND (0.0046)		8260B Low		1	09/20/17 20:49	C7I0344	CI72107
1,2,4-Trichlorobenzene	ND (0.0046)		8260B Low		1	09/20/17 20:49	C7I0344	CI72107
1,2,4-Trimethylbenzene	ND (0.0046)		8260B Low		1	09/20/17 20:49	C7I0344	CI72107
1,2-Dibromo-3-Chloropropane	ND (0.0046)		8260B Low		1	09/20/17 20:49	C7I0344	CI72107
1,2-Dibromoethane	ND (0.0046)		8260B Low		1	09/20/17 20:49	C7I0344	CI72107
1,2-Dichlorobenzene	ND (0.0046)		8260B Low		1	09/20/17 20:49	C7I0344	CI72107
1,2-Dichloroethane	ND (0.0046)		8260B Low		1	09/20/17 20:49	C7I0344	CI72107
1,2-Dichloropropane	ND (0.0046)		8260B Low		1	09/20/17 20:49	C7I0344	CI72107
1,3,5-Trimethylbenzene	ND (0.0046)		8260B Low		1	09/20/17 20:49	C7I0344	CI72107
1,3-Dichlorobenzene	ND (0.0046)		8260B Low		1	09/20/17 20:49	C7I0344	CI72107
1,3-Dichloropropane	ND (0.0046)		8260B Low		1	09/20/17 20:49	C7I0344	CI72107
1,4-Dichlorobenzene	ND (0.0046)		8260B Low		1	09/20/17 20:49	C7I0344	CI72107
1,4-Dioxane	ND (0.0926)		8260B Low		1	09/20/17 20:49	C7I0344	CI72107
1-Chlorohexane	ND (0.0046)		8260B Low		1	09/20/17 20:49	C7I0344	CI72107
2,2-Dichloropropane	ND (0.0046)		8260B Low		1	09/20/17 20:49	C7I0344	CI72107
2-Butanone	ND (0.0463)		8260B Low		1	09/20/17 20:49	C7I0344	CI72107
2-Chlorotoluene	ND (0.0046)		8260B Low		1	09/20/17 20:49	C7I0344	CI72107
2-Hexanone	ND (0.0463)		8260B Low		1	09/20/17 20:49	C7I0344	CI72107
4-Chlorotoluene	ND (0.0046)		8260B Low		1	09/20/17 20:49	C7I0344	CI72107
4-Isopropyltoluene	ND (0.0046)		8260B Low		1	09/20/17 20:49	C7I0344	CI72107
4-Methyl-2-Pentanone	ND (0.0463)		8260B Low		1	09/20/17 20:49	C7I0344	CI72107
Acetone	ND (0.0463)		8260B Low		1	09/20/17 20:49	C7I0344	CI72107
Benzene	ND (0.0046)		8260B Low		1	09/20/17 20:49	C7I0344	CI72107
Bromobenzene	ND (0.0046)		8260B Low		1	09/20/17 20:49	C7I0344	CI72107



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-510 (2-3')  
 Date Sampled: 09/18/17 10:35  
 Percent Solids: 75  
 Initial Volume: 7.2  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709493  
 ESS Laboratory Sample ID: 1709493-06  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0046)		8260B Low		1	09/20/17 20:49	C7I0344	CI72107
Bromodichloromethane	ND (0.0046)		8260B Low		1	09/20/17 20:49	C7I0344	CI72107
Bromoform	ND (0.0046)		8260B Low		1	09/20/17 20:49	C7I0344	CI72107
Bromomethane	ND (0.0093)		8260B Low		1	09/20/17 20:49	C7I0344	CI72107
Carbon Disulfide	ND (0.0046)		8260B Low		1	09/20/17 20:49	C7I0344	CI72107
Carbon Tetrachloride	ND (0.0046)		8260B Low		1	09/20/17 20:49	C7I0344	CI72107
Chlorobenzene	ND (0.0046)		8260B Low		1	09/20/17 20:49	C7I0344	CI72107
Chloroethane	ND (0.0093)		8260B Low		1	09/20/17 20:49	C7I0344	CI72107
Chloroform	ND (0.0046)		8260B Low		1	09/20/17 20:49	C7I0344	CI72107
Chloromethane	ND (0.0093)		8260B Low		1	09/20/17 20:49	C7I0344	CI72107
cis-1,2-Dichloroethene	ND (0.0046)		8260B Low		1	09/20/17 20:49	C7I0344	CI72107
cis-1,3-Dichloropropene	ND (0.0046)		8260B Low		1	09/20/17 20:49	C7I0344	CI72107
Dibromochloromethane	ND (0.0046)		8260B Low		1	09/20/17 20:49	C7I0344	CI72107
Dibromomethane	ND (0.0046)		8260B Low		1	09/20/17 20:49	C7I0344	CI72107
Dichlorodifluoromethane	ND (0.0093)		8260B Low		1	09/20/17 20:49	C7I0344	CI72107
Diethyl Ether	ND (0.0046)		8260B Low		1	09/20/17 20:49	C7I0344	CI72107
Di-isopropyl ether	ND (0.0046)		8260B Low		1	09/20/17 20:49	C7I0344	CI72107
Ethyl tertiary-butyl ether	ND (0.0046)		8260B Low		1	09/20/17 20:49	C7I0344	CI72107
Ethylbenzene	ND (0.0046)		8260B Low		1	09/20/17 20:49	C7I0344	CI72107
Hexachlorobutadiene	ND (0.0046)		8260B Low		1	09/20/17 20:49	C7I0344	CI72107
Isopropylbenzene	ND (0.0046)		8260B Low		1	09/20/17 20:49	C7I0344	CI72107
Methyl tert-Butyl Ether	ND (0.0046)		8260B Low		1	09/20/17 20:49	C7I0344	CI72107
Methylene Chloride	ND (0.0231)		8260B Low		1	09/20/17 20:49	C7I0344	CI72107
Naphthalene	ND (0.0046)		8260B Low		1	09/20/17 20:49	C7I0344	CI72107
n-Butylbenzene	ND (0.0046)		8260B Low		1	09/20/17 20:49	C7I0344	CI72107
n-Propylbenzene	ND (0.0046)		8260B Low		1	09/20/17 20:49	C7I0344	CI72107
sec-Butylbenzene	ND (0.0046)		8260B Low		1	09/20/17 20:49	C7I0344	CI72107
Styrene	ND (0.0046)		8260B Low		1	09/20/17 20:49	C7I0344	CI72107
tert-Butylbenzene	ND (0.0046)		8260B Low		1	09/20/17 20:49	C7I0344	CI72107
Tertiary-amyl methyl ether	ND (0.0046)		8260B Low		1	09/20/17 20:49	C7I0344	CI72107
Tetrachloroethene	ND (0.0046)		8260B Low		1	09/20/17 20:49	C7I0344	CI72107
Tetrahydrofuran	ND (0.0046)		8260B Low		1	09/20/17 20:49	C7I0344	CI72107



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-510 (2-3')  
 Date Sampled: 09/18/17 10:35  
 Percent Solids: 75  
 Initial Volume: 7.2  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709493  
 ESS Laboratory Sample ID: 1709493-06  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0046)		8260B Low		1	09/20/17 20:49	C7I0344	CI72107
trans-1,2-Dichloroethene	ND (0.0046)		8260B Low		1	09/20/17 20:49	C7I0344	CI72107
trans-1,3-Dichloropropene	ND (0.0046)		8260B Low		1	09/20/17 20:49	C7I0344	CI72107
Trichloroethene	ND (0.0046)		8260B Low		1	09/20/17 20:49	C7I0344	CI72107
Trichlorofluoromethane	ND (0.0046)		8260B Low		1	09/20/17 20:49	C7I0344	CI72107
Vinyl Acetate	ND (0.0046)		8260B Low		1	09/20/17 20:49	C7I0344	CI72107
Vinyl Chloride	ND (0.0093)		8260B Low		1	09/20/17 20:49	C7I0344	CI72107
Xylene O	ND (0.0046)		8260B Low		1	09/20/17 20:49	C7I0344	CI72107
Xylene P,M	ND (0.0093)		8260B Low		1	09/20/17 20:49	C7I0344	CI72107
Xylenes (Total)	ND (0.0093)		8260B Low		1	09/20/17 20:49		[CALC]

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: 1,2-Dichloroethane-d4	97 %		70-130
Surrogate: 4-Bromofluorobenzene	105 %		70-130
Surrogate: Dibromofluoromethane	98 %		70-130
Surrogate: Toluene-d8	114 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-510 (2-3')  
 Date Sampled: 09/18/17 10:35  
 Percent Solids: 75  
 Initial Volume: 19.4  
 Final Volume: 1  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709493  
 ESS Laboratory Sample ID: 1709493-06  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: SMR  
 Prepared: 9/19/17 13:10

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	1640 (515)		8100M		10	09/21/17 13:50	C710328	CI71918
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		92 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-510 (2-3')  
Date Sampled: 09/18/17 10:35  
Percent Solids: 75  
Initial Volume: 14.7  
Final Volume: 0.5  
Extraction Method: 3546

ESS Laboratory Work Order: 1709493  
ESS Laboratory Sample ID: 1709493-06  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: TJ  
Prepared: 9/19/17 14:13

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	3.18 (0.453)		8270D		1	09/21/17 0:15	C7I0326	CI71919
Acenaphthene	2.18 (0.453)		8270D		1	09/21/17 0:15	C7I0326	CI71919
Acenaphthylene	1.05 (0.453)		8270D		1	09/21/17 0:15	C7I0326	CI71919
Anthracene	7.21 (0.453)		8270D		1	09/21/17 0:15	C7I0326	CI71919
Benzo(a)anthracene	25.2 (4.53)		8270D		10	09/21/17 19:40	C7I0326	CI71919
Benzo(a)pyrene	19.6 (2.27)		8270D		10	09/21/17 19:40	C7I0326	CI71919
Benzo(b)fluoranthene	19.1 (4.53)		8270D		10	09/21/17 19:40	C7I0326	CI71919
Benzo(g,h,i)perylene	4.38 (0.453)		8270D		1	09/21/17 0:15	C7I0326	CI71919
Benzo(k)fluoranthene	9.05 (0.453)		8270D		1	09/21/17 0:15	C7I0326	CI71919
Chrysene	24.5 (2.27)		8270D		10	09/21/17 19:40	C7I0326	CI71919
Dibenzo(a,h)Anthracene	3.01 (0.227)		8270D		1	09/21/17 0:15	C7I0326	CI71919
Fluoranthene	58.0 (4.53)		8270D		10	09/21/17 19:40	C7I0326	CI71919
Fluorene	3.00 (0.453)		8270D		1	09/21/17 0:15	C7I0326	CI71919
Indeno(1,2,3-cd)Pyrene	4.63 (0.453)		8270D		1	09/21/17 0:15	C7I0326	CI71919
Naphthalene	32.4 (4.53)		8270D		10	09/21/17 19:40	C7I0326	CI71919
Phenanthrene	42.1 (4.53)		8270D		10	09/21/17 19:40	C7I0326	CI71919
Pyrene	35.3 (4.53)		8270D		10	09/21/17 19:40	C7I0326	CI71919

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	62 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	68 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	50 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	65 %		30-130





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-510 (2-3')  
Date Sampled: 09/18/17 10:35  
Percent Solids: 75

ESS Laboratory Work Order: 1709493  
ESS Laboratory Sample ID: 1709493-06  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	23.2 (1.30)		9014		1	EEM	09/22/17 11:20	mg/kg dry	CI72210



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-524 (0-2')  
Date Sampled: 09/18/17 13:05  
Percent Solids: 94

ESS Laboratory Work Order: 1709493  
ESS Laboratory Sample ID: 1709493-07  
Sample Matrix: Soil  
Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	8.54 (4.54)		6010C		1	KJK	09/23/17 6:46	2.34	100	CI71937
Arsenic	9.40 (2.27)		6010C		1	KJK	09/23/17 6:46	2.34	100	CI71937
Beryllium	0.11 (0.10)		6010C		1	KJK	09/23/17 6:46	2.34	100	CI71937
Cadmium	ND (0.45)		6010C		1	KJK	09/23/17 21:52	2.34	100	CI71937
Chromium	2.73 (0.91)		6010C		1	KJK	09/23/17 6:46	2.34	100	CI71937
Copper	43.6 (2.27)		6010C		1	KJK	09/23/17 6:46	2.34	100	CI71937
Lead	200 (4.54)		6010C		1	KJK	09/23/17 6:46	2.34	100	CI71937
Mercury	0.090 (0.030)		7471B		1	MJV	09/21/17 21:59	0.69	40	CI71939
Nickel	10.0 (2.27)		6010C		1	KJK	09/23/17 6:46	2.34	100	CI71937
Selenium	ND (4.54)		6020A		20	NAR	09/27/17 11:43	2.34	100	CI71937
Silver	ND (0.45)		6010C		1	KJK	09/23/17 21:52	2.34	100	CI71937
Thallium	ND (4.54)		6010C		1	KJK	09/23/17 6:46	2.34	100	CI71937
Zinc	23.5 (2.27)		6010C		1	KJK	09/23/17 6:46	2.34	100	CI71937



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-524 (0-2')  
Date Sampled: 09/18/17 13:05  
Percent Solids: 94  
Initial Volume: 9.8  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1709493  
ESS Laboratory Sample ID: 1709493-07  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0027)		8260B Low		1	09/20/17 21:15	C7I0344	CI72107
1,1,1-Trichloroethane	ND (0.0027)		8260B Low		1	09/20/17 21:15	C7I0344	CI72107
1,1,2,2-Tetrachloroethane	ND (0.0027)		8260B Low		1	09/20/17 21:15	C7I0344	CI72107
1,1,2-Trichloroethane	ND (0.0027)		8260B Low		1	09/20/17 21:15	C7I0344	CI72107
1,1-Dichloroethane	ND (0.0027)		8260B Low		1	09/20/17 21:15	C7I0344	CI72107
1,1-Dichloroethene	ND (0.0027)		8260B Low		1	09/20/17 21:15	C7I0344	CI72107
1,1-Dichloropropene	ND (0.0027)		8260B Low		1	09/20/17 21:15	C7I0344	CI72107
1,2,3-Trichlorobenzene	ND (0.0027)		8260B Low		1	09/20/17 21:15	C7I0344	CI72107
1,2,3-Trichloropropane	ND (0.0027)		8260B Low		1	09/20/17 21:15	C7I0344	CI72107
1,2,4-Trichlorobenzene	ND (0.0027)		8260B Low		1	09/20/17 21:15	C7I0344	CI72107
1,2,4-Trimethylbenzene	ND (0.0027)		8260B Low		1	09/20/17 21:15	C7I0344	CI72107
1,2-Dibromo-3-Chloropropane	ND (0.0027)		8260B Low		1	09/20/17 21:15	C7I0344	CI72107
1,2-Dibromoethane	ND (0.0027)		8260B Low		1	09/20/17 21:15	C7I0344	CI72107
1,2-Dichlorobenzene	ND (0.0027)		8260B Low		1	09/20/17 21:15	C7I0344	CI72107
1,2-Dichloroethane	ND (0.0027)		8260B Low		1	09/20/17 21:15	C7I0344	CI72107
1,2-Dichloropropane	ND (0.0027)		8260B Low		1	09/20/17 21:15	C7I0344	CI72107
1,3,5-Trimethylbenzene	ND (0.0027)		8260B Low		1	09/20/17 21:15	C7I0344	CI72107
1,3-Dichlorobenzene	ND (0.0027)		8260B Low		1	09/20/17 21:15	C7I0344	CI72107
1,3-Dichloropropane	ND (0.0027)		8260B Low		1	09/20/17 21:15	C7I0344	CI72107
1,4-Dichlorobenzene	ND (0.0027)		8260B Low		1	09/20/17 21:15	C7I0344	CI72107
1,4-Dioxane	ND (0.0542)		8260B Low		1	09/20/17 21:15	C7I0344	CI72107
1-Chlorohexane	ND (0.0027)		8260B Low		1	09/20/17 21:15	C7I0344	CI72107
2,2-Dichloropropane	ND (0.0027)		8260B Low		1	09/20/17 21:15	C7I0344	CI72107
2-Butanone	ND (0.0271)		8260B Low		1	09/20/17 21:15	C7I0344	CI72107
2-Chlorotoluene	ND (0.0027)		8260B Low		1	09/20/17 21:15	C7I0344	CI72107
2-Hexanone	ND (0.0271)		8260B Low		1	09/20/17 21:15	C7I0344	CI72107
4-Chlorotoluene	ND (0.0027)		8260B Low		1	09/20/17 21:15	C7I0344	CI72107
4-Isopropyltoluene	ND (0.0027)		8260B Low		1	09/20/17 21:15	C7I0344	CI72107
4-Methyl-2-Pentanone	ND (0.0271)		8260B Low		1	09/20/17 21:15	C7I0344	CI72107
Acetone	ND (0.0271)		8260B Low		1	09/20/17 21:15	C7I0344	CI72107
Benzene	ND (0.0027)		8260B Low		1	09/20/17 21:15	C7I0344	CI72107
Bromobenzene	ND (0.0027)		8260B Low		1	09/20/17 21:15	C7I0344	CI72107



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-524 (0-2')  
 Date Sampled: 09/18/17 13:05  
 Percent Solids: 94  
 Initial Volume: 9.8  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709493  
 ESS Laboratory Sample ID: 1709493-07  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0027)		8260B Low		1	09/20/17 21:15	C7I0344	CI72107
Bromodichloromethane	ND (0.0027)		8260B Low		1	09/20/17 21:15	C7I0344	CI72107
Bromoform	ND (0.0027)		8260B Low		1	09/20/17 21:15	C7I0344	CI72107
Bromomethane	ND (0.0054)		8260B Low		1	09/20/17 21:15	C7I0344	CI72107
Carbon Disulfide	ND (0.0027)		8260B Low		1	09/20/17 21:15	C7I0344	CI72107
Carbon Tetrachloride	ND (0.0027)		8260B Low		1	09/20/17 21:15	C7I0344	CI72107
Chlorobenzene	ND (0.0027)		8260B Low		1	09/20/17 21:15	C7I0344	CI72107
Chloroethane	ND (0.0054)		8260B Low		1	09/20/17 21:15	C7I0344	CI72107
Chloroform	ND (0.0027)		8260B Low		1	09/20/17 21:15	C7I0344	CI72107
Chloromethane	ND (0.0054)		8260B Low		1	09/20/17 21:15	C7I0344	CI72107
cis-1,2-Dichloroethene	ND (0.0027)		8260B Low		1	09/20/17 21:15	C7I0344	CI72107
cis-1,3-Dichloropropene	ND (0.0027)		8260B Low		1	09/20/17 21:15	C7I0344	CI72107
Dibromochloromethane	ND (0.0027)		8260B Low		1	09/20/17 21:15	C7I0344	CI72107
Dibromomethane	ND (0.0027)		8260B Low		1	09/20/17 21:15	C7I0344	CI72107
Dichlorodifluoromethane	ND (0.0054)		8260B Low		1	09/20/17 21:15	C7I0344	CI72107
Diethyl Ether	ND (0.0027)		8260B Low		1	09/20/17 21:15	C7I0344	CI72107
Di-isopropyl ether	ND (0.0027)		8260B Low		1	09/20/17 21:15	C7I0344	CI72107
Ethyl tertiary-butyl ether	ND (0.0027)		8260B Low		1	09/20/17 21:15	C7I0344	CI72107
Ethylbenzene	ND (0.0027)		8260B Low		1	09/20/17 21:15	C7I0344	CI72107
Hexachlorobutadiene	ND (0.0027)		8260B Low		1	09/20/17 21:15	C7I0344	CI72107
Isopropylbenzene	ND (0.0027)		8260B Low		1	09/20/17 21:15	C7I0344	CI72107
Methyl tert-Butyl Ether	ND (0.0027)		8260B Low		1	09/20/17 21:15	C7I0344	CI72107
Methylene Chloride	ND (0.0135)		8260B Low		1	09/20/17 21:15	C7I0344	CI72107
Naphthalene	ND (0.0027)		8260B Low		1	09/20/17 21:15	C7I0344	CI72107
n-Butylbenzene	ND (0.0027)		8260B Low		1	09/20/17 21:15	C7I0344	CI72107
n-Propylbenzene	ND (0.0027)		8260B Low		1	09/20/17 21:15	C7I0344	CI72107
sec-Butylbenzene	ND (0.0027)		8260B Low		1	09/20/17 21:15	C7I0344	CI72107
Styrene	ND (0.0027)		8260B Low		1	09/20/17 21:15	C7I0344	CI72107
tert-Butylbenzene	ND (0.0027)		8260B Low		1	09/20/17 21:15	C7I0344	CI72107
Tertiary-amyl methyl ether	ND (0.0027)		8260B Low		1	09/20/17 21:15	C7I0344	CI72107
Tetrachloroethene	ND (0.0027)		8260B Low		1	09/20/17 21:15	C7I0344	CI72107
Tetrahydrofuran	ND (0.0027)		8260B Low		1	09/20/17 21:15	C7I0344	CI72107



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-524 (0-2')  
 Date Sampled: 09/18/17 13:05  
 Percent Solids: 94  
 Initial Volume: 9.8  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709493  
 ESS Laboratory Sample ID: 1709493-07  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0027)		8260B Low		1	09/20/17 21:15	C7I0344	CI72107
trans-1,2-Dichloroethene	ND (0.0027)		8260B Low		1	09/20/17 21:15	C7I0344	CI72107
trans-1,3-Dichloropropene	ND (0.0027)		8260B Low		1	09/20/17 21:15	C7I0344	CI72107
Trichloroethene	ND (0.0027)		8260B Low		1	09/20/17 21:15	C7I0344	CI72107
Trichlorofluoromethane	ND (0.0027)		8260B Low		1	09/20/17 21:15	C7I0344	CI72107
Vinyl Acetate	ND (0.0027)		8260B Low		1	09/20/17 21:15	C7I0344	CI72107
Vinyl Chloride	ND (0.0054)		8260B Low		1	09/20/17 21:15	C7I0344	CI72107
Xylene O	ND (0.0027)		8260B Low		1	09/20/17 21:15	C7I0344	CI72107
Xylene P,M	ND (0.0054)		8260B Low		1	09/20/17 21:15	C7I0344	CI72107
Xylenes (Total)	ND (0.0054)		8260B Low		1	09/20/17 21:15		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	95 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	94 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	97 %		70-130
<i>Surrogate: Toluene-d8</i>	128 %		70-130





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-524 (0-2')  
 Date Sampled: 09/18/17 13:05  
 Percent Solids: 94  
 Initial Volume: 19.2  
 Final Volume: 1  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709493  
 ESS Laboratory Sample ID: 1709493-07  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: SMR  
 Prepared: 9/19/17 13:10

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	785 (41.5)		8100M		1	09/20/17 22:02	C710328	CI71918
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		76 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-524 (0-2')  
Date Sampled: 09/18/17 13:05  
Percent Solids: 94  
Initial Volume: 14.4  
Final Volume: 0.5  
Extraction Method: 3546

ESS Laboratory Work Order: 1709493  
ESS Laboratory Sample ID: 1709493-07  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: TJ  
Prepared: 9/22/17 16:54

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
<b>2-Methylnaphthalene</b>	<b>1.06</b> (0.368)		8270D		1	09/22/17 23:53	C7I0365	CI72209
Acenaphthene	ND (0.368)		8270D		1	09/22/17 23:53	C7I0365	CI72209
Acenaphthylene	ND (0.368)		8270D		1	09/22/17 23:53	C7I0365	CI72209
Anthracene	ND (0.368)		8270D		1	09/22/17 23:53	C7I0365	CI72209
<b>Benzo(a)anthracene</b>	<b>1.07</b> (0.368)		8270D		1	09/22/17 23:53	C7I0365	CI72209
<b>Benzo(a)pyrene</b>	<b>0.652</b> (0.185)		8270D		1	09/22/17 23:53	C7I0365	CI72209
<b>Benzo(b)fluoranthene</b>	<b>1.21</b> (0.368)		8270D		1	09/22/17 23:53	C7I0365	CI72209
Benzo(g,h,i)perylene	ND (0.368)		8270D		1	09/22/17 23:53	C7I0365	CI72209
<b>Benzo(k)fluoranthene</b>	<b>0.848</b> (0.368)		8270D		1	09/22/17 23:53	C7I0365	CI72209
<b>Chrysene</b>	<b>1.41</b> (0.185)		8270D		1	09/22/17 23:53	C7I0365	CI72209
Dibenzo(a,h)Anthracene	ND (0.185)		8270D		1	09/22/17 23:53	C7I0365	CI72209
<b>Fluoranthene</b>	<b>2.55</b> (0.368)		8270D		1	09/22/17 23:53	C7I0365	CI72209
Fluorene	ND (0.368)		8270D		1	09/22/17 23:53	C7I0365	CI72209
Indeno(1,2,3-cd)Pyrene	ND (0.368)		8270D		1	09/22/17 23:53	C7I0365	CI72209
<b>Naphthalene</b>	<b>3.81</b> (0.368)		8270D		1	09/22/17 23:53	C7I0365	CI72209
<b>Phenanthrene</b>	<b>1.97</b> (0.368)		8270D		1	09/22/17 23:53	C7I0365	CI72209
<b>Pyrene</b>	<b>1.41</b> (0.368)		8270D		1	09/22/17 23:53	C7I0365	CI72209

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	56 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	56 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	40 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	51 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-524 (0-2')  
Date Sampled: 09/18/17 13:05  
Percent Solids: 94

ESS Laboratory Work Order: 1709493  
ESS Laboratory Sample ID: 1709493-07  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	ND (1.05)		9014		1	EEM	09/22/17 11:20	mg/kg dry	CI72210



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-524 (5-6)  
 Date Sampled: 09/18/17 13:35  
 Percent Solids: 92

ESS Laboratory Work Order: 1709493  
 ESS Laboratory Sample ID: 1709493-08  
 Sample Matrix: Soil  
 Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (5.45)		6010C		1	KJK	09/23/17 6:51	2	100	CI71937
<b>Arsenic</b>	<b>4.29</b> (2.73)		6010C		1	KJK	09/23/17 6:51	2	100	CI71937
<b>Beryllium</b>	<b>0.54</b> (0.12)		6010C		1	KJK	09/23/17 6:51	2	100	CI71937
Cadmium	ND (0.55)		6010C		1	KJK	09/23/17 22:10	2	100	CI71937
<b>Chromium</b>	<b>13.9</b> (1.09)		6010C		1	KJK	09/23/17 6:51	2	100	CI71937
<b>Copper</b>	<b>10.4</b> (2.73)		6010C		1	KJK	09/23/17 6:51	2	100	CI71937
<b>Lead</b>	<b>8.12</b> (5.45)		6010C		1	KJK	09/23/17 6:51	2	100	CI71937
Mercury	ND (0.032)		7471B		1	MJV	09/21/17 22:01	0.67	40	CI71939
<b>Nickel</b>	<b>8.27</b> (2.73)		6010C		1	KJK	09/23/17 6:51	2	100	CI71937
Selenium	ND (5.45)		6020A		20	NAR	09/27/17 11:48	2	100	CI71937
Silver	ND (0.55)		6010C		1	KJK	09/23/17 22:10	2	100	CI71937
Thallium	ND (5.45)		6010C		1	KJK	09/23/17 6:51	2	100	CI71937
<b>Zinc</b>	<b>30.1</b> (2.73)		6010C		1	KJK	09/23/17 6:51	2	100	CI71937



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-524 (5-6)  
Date Sampled: 09/18/17 13:35  
Percent Solids: 92  
Initial Volume: 6.1  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1709493  
ESS Laboratory Sample ID: 1709493-08  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0045)		8260B Low		1	09/20/17 21:40	C7I0344	CI72107
1,1,1-Trichloroethane	ND (0.0045)		8260B Low		1	09/20/17 21:40	C7I0344	CI72107
1,1,2,2-Tetrachloroethane	ND (0.0045)		8260B Low		1	09/20/17 21:40	C7I0344	CI72107
1,1,2-Trichloroethane	ND (0.0045)		8260B Low		1	09/20/17 21:40	C7I0344	CI72107
1,1-Dichloroethane	ND (0.0045)		8260B Low		1	09/20/17 21:40	C7I0344	CI72107
1,1-Dichloroethene	ND (0.0045)		8260B Low		1	09/20/17 21:40	C7I0344	CI72107
1,1-Dichloropropene	ND (0.0045)		8260B Low		1	09/20/17 21:40	C7I0344	CI72107
1,2,3-Trichlorobenzene	ND (0.0045)		8260B Low		1	09/20/17 21:40	C7I0344	CI72107
1,2,3-Trichloropropane	ND (0.0045)		8260B Low		1	09/20/17 21:40	C7I0344	CI72107
1,2,4-Trichlorobenzene	ND (0.0045)		8260B Low		1	09/20/17 21:40	C7I0344	CI72107
1,2,4-Trimethylbenzene	ND (0.0045)		8260B Low		1	09/20/17 21:40	C7I0344	CI72107
1,2-Dibromo-3-Chloropropane	ND (0.0045)		8260B Low		1	09/20/17 21:40	C7I0344	CI72107
1,2-Dibromoethane	ND (0.0045)		8260B Low		1	09/20/17 21:40	C7I0344	CI72107
1,2-Dichlorobenzene	ND (0.0045)		8260B Low		1	09/20/17 21:40	C7I0344	CI72107
1,2-Dichloroethane	ND (0.0045)		8260B Low		1	09/20/17 21:40	C7I0344	CI72107
1,2-Dichloropropane	ND (0.0045)		8260B Low		1	09/20/17 21:40	C7I0344	CI72107
1,3,5-Trimethylbenzene	ND (0.0045)		8260B Low		1	09/20/17 21:40	C7I0344	CI72107
1,3-Dichlorobenzene	ND (0.0045)		8260B Low		1	09/20/17 21:40	C7I0344	CI72107
1,3-Dichloropropane	ND (0.0045)		8260B Low		1	09/20/17 21:40	C7I0344	CI72107
1,4-Dichlorobenzene	ND (0.0045)		8260B Low		1	09/20/17 21:40	C7I0344	CI72107
1,4-Dioxane	ND (0.0894)		8260B Low		1	09/20/17 21:40	C7I0344	CI72107
1-Chlorohexane	ND (0.0045)		8260B Low		1	09/20/17 21:40	C7I0344	CI72107
2,2-Dichloropropane	ND (0.0045)		8260B Low		1	09/20/17 21:40	C7I0344	CI72107
2-Butanone	ND (0.0447)		8260B Low		1	09/20/17 21:40	C7I0344	CI72107
2-Chlorotoluene	ND (0.0045)		8260B Low		1	09/20/17 21:40	C7I0344	CI72107
2-Hexanone	ND (0.0447)		8260B Low		1	09/20/17 21:40	C7I0344	CI72107
4-Chlorotoluene	ND (0.0045)		8260B Low		1	09/20/17 21:40	C7I0344	CI72107
4-Isopropyltoluene	ND (0.0045)		8260B Low		1	09/20/17 21:40	C7I0344	CI72107
4-Methyl-2-Pentanone	ND (0.0447)		8260B Low		1	09/20/17 21:40	C7I0344	CI72107
Acetone	ND (0.0447)		8260B Low		1	09/20/17 21:40	C7I0344	CI72107
Benzene	ND (0.0045)		8260B Low		1	09/20/17 21:40	C7I0344	CI72107
Bromobenzene	ND (0.0045)		8260B Low		1	09/20/17 21:40	C7I0344	CI72107





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-524 (5-6)  
 Date Sampled: 09/18/17 13:35  
 Percent Solids: 92  
 Initial Volume: 6.1  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709493  
 ESS Laboratory Sample ID: 1709493-08  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0045)		8260B Low		1	09/20/17 21:40	C7I0344	CI72107
Bromodichloromethane	ND (0.0045)		8260B Low		1	09/20/17 21:40	C7I0344	CI72107
Bromoform	ND (0.0045)		8260B Low		1	09/20/17 21:40	C7I0344	CI72107
Bromomethane	ND (0.0089)		8260B Low		1	09/20/17 21:40	C7I0344	CI72107
Carbon Disulfide	ND (0.0045)		8260B Low		1	09/20/17 21:40	C7I0344	CI72107
Carbon Tetrachloride	ND (0.0045)		8260B Low		1	09/20/17 21:40	C7I0344	CI72107
Chlorobenzene	ND (0.0045)		8260B Low		1	09/20/17 21:40	C7I0344	CI72107
Chloroethane	ND (0.0089)		8260B Low		1	09/20/17 21:40	C7I0344	CI72107
Chloroform	ND (0.0045)		8260B Low		1	09/20/17 21:40	C7I0344	CI72107
Chloromethane	ND (0.0089)		8260B Low		1	09/20/17 21:40	C7I0344	CI72107
cis-1,2-Dichloroethene	ND (0.0045)		8260B Low		1	09/20/17 21:40	C7I0344	CI72107
cis-1,3-Dichloropropene	ND (0.0045)		8260B Low		1	09/20/17 21:40	C7I0344	CI72107
Dibromochloromethane	ND (0.0045)		8260B Low		1	09/20/17 21:40	C7I0344	CI72107
Dibromomethane	ND (0.0045)		8260B Low		1	09/20/17 21:40	C7I0344	CI72107
Dichlorodifluoromethane	ND (0.0089)		8260B Low		1	09/20/17 21:40	C7I0344	CI72107
Diethyl Ether	ND (0.0045)		8260B Low		1	09/20/17 21:40	C7I0344	CI72107
Di-isopropyl ether	ND (0.0045)		8260B Low		1	09/20/17 21:40	C7I0344	CI72107
Ethyl tertiary-butyl ether	ND (0.0045)		8260B Low		1	09/20/17 21:40	C7I0344	CI72107
Ethylbenzene	ND (0.0045)		8260B Low		1	09/20/17 21:40	C7I0344	CI72107
Hexachlorobutadiene	ND (0.0045)		8260B Low		1	09/20/17 21:40	C7I0344	CI72107
Isopropylbenzene	ND (0.0045)		8260B Low		1	09/20/17 21:40	C7I0344	CI72107
Methyl tert-Butyl Ether	ND (0.0045)		8260B Low		1	09/20/17 21:40	C7I0344	CI72107
Methylene Chloride	ND (0.0224)		8260B Low		1	09/20/17 21:40	C7I0344	CI72107
Naphthalene	ND (0.0045)		8260B Low		1	09/20/17 21:40	C7I0344	CI72107
n-Butylbenzene	ND (0.0045)		8260B Low		1	09/20/17 21:40	C7I0344	CI72107
n-Propylbenzene	ND (0.0045)		8260B Low		1	09/20/17 21:40	C7I0344	CI72107
sec-Butylbenzene	ND (0.0045)		8260B Low		1	09/20/17 21:40	C7I0344	CI72107
Styrene	ND (0.0045)		8260B Low		1	09/20/17 21:40	C7I0344	CI72107
tert-Butylbenzene	ND (0.0045)		8260B Low		1	09/20/17 21:40	C7I0344	CI72107
Tertiary-amyl methyl ether	ND (0.0045)		8260B Low		1	09/20/17 21:40	C7I0344	CI72107
Tetrachloroethene	ND (0.0045)		8260B Low		1	09/20/17 21:40	C7I0344	CI72107
Tetrahydrofuran	ND (0.0045)		8260B Low		1	09/20/17 21:40	C7I0344	CI72107



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-524 (5-6)  
 Date Sampled: 09/18/17 13:35  
 Percent Solids: 92  
 Initial Volume: 6.1  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709493  
 ESS Laboratory Sample ID: 1709493-08  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0045)		8260B Low		1	09/20/17 21:40	C7I0344	CI72107
trans-1,2-Dichloroethene	ND (0.0045)		8260B Low		1	09/20/17 21:40	C7I0344	CI72107
trans-1,3-Dichloropropene	ND (0.0045)		8260B Low		1	09/20/17 21:40	C7I0344	CI72107
Trichloroethene	ND (0.0045)		8260B Low		1	09/20/17 21:40	C7I0344	CI72107
Trichlorofluoromethane	ND (0.0045)		8260B Low		1	09/20/17 21:40	C7I0344	CI72107
Vinyl Acetate	ND (0.0045)		8260B Low		1	09/20/17 21:40	C7I0344	CI72107
Vinyl Chloride	ND (0.0089)		8260B Low		1	09/20/17 21:40	C7I0344	CI72107
Xylene O	ND (0.0045)		8260B Low		1	09/20/17 21:40	C7I0344	CI72107
Xylene P,M	ND (0.0089)		8260B Low		1	09/20/17 21:40	C7I0344	CI72107
Xylenes (Total)	ND (0.0089)		8260B Low		1	09/20/17 21:40		[CALC]

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: 1,2-Dichloroethane-d4	97 %		70-130
Surrogate: 4-Bromofluorobenzene	105 %		70-130
Surrogate: Dibromofluoromethane	99 %		70-130
Surrogate: Toluene-d8	114 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-524 (5-6)  
Date Sampled: 09/18/17 13:35  
Percent Solids: 92  
Initial Volume: 20.3  
Final Volume: 1  
Extraction Method: 3546

ESS Laboratory Work Order: 1709493  
ESS Laboratory Sample ID: 1709493-08  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: SMR  
Prepared: 9/19/17 13:10

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	ND (40.3)		8100M		1	09/20/17 22:37	C710328	CI71918
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		81 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-524 (5-6)  
Date Sampled: 09/18/17 13:35  
Percent Solids: 92  
Initial Volume: 14.3  
Final Volume: 0.5  
Extraction Method: 3546

ESS Laboratory Work Order: 1709493  
ESS Laboratory Sample ID: 1709493-08  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: TJ  
Prepared: 9/19/17 14:13

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.381)		8270D		1	09/21/17 1:25	C7I0326	CI71919
Acenaphthene	ND (0.381)		8270D		1	09/21/17 1:25	C7I0326	CI71919
Acenaphthylene	ND (0.381)		8270D		1	09/21/17 1:25	C7I0326	CI71919
Anthracene	ND (0.381)		8270D		1	09/21/17 1:25	C7I0326	CI71919
Benzo(a)anthracene	ND (0.381)		8270D		1	09/21/17 1:25	C7I0326	CI71919
<b>Benzo(a)pyrene</b>	<b>0.202</b> (0.191)		8270D		1	09/21/17 1:25	C7I0326	CI71919
Benzo(b)fluoranthene	ND (0.381)		8270D		1	09/21/17 1:25	C7I0326	CI71919
Benzo(g,h,i)perylene	ND (0.381)		8270D		1	09/21/17 1:25	C7I0326	CI71919
Benzo(k)fluoranthene	ND (0.381)		8270D		1	09/21/17 1:25	C7I0326	CI71919
<b>Chrysene</b>	<b>0.259</b> (0.191)		8270D		1	09/21/17 1:25	C7I0326	CI71919
Dibenzo(a,h)Anthracene	ND (0.191)		8270D		1	09/21/17 1:25	C7I0326	CI71919
<b>Fluoranthene</b>	<b>0.501</b> (0.381)		8270D		1	09/21/17 1:25	C7I0326	CI71919
Fluorene	ND (0.381)		8270D		1	09/21/17 1:25	C7I0326	CI71919
Indeno(1,2,3-cd)Pyrene	ND (0.381)		8270D		1	09/21/17 1:25	C7I0326	CI71919
Naphthalene	ND (0.381)		8270D		1	09/21/17 1:25	C7I0326	CI71919
Phenanthrene	ND (0.381)		8270D		1	09/21/17 1:25	C7I0326	CI71919
<b>Pyrene</b>	<b>0.386</b> (0.381)		8270D		1	09/21/17 1:25	C7I0326	CI71919

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	72 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	76 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	57 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	85 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-524 (5-6)  
Date Sampled: 09/18/17 13:35  
Percent Solids: 92

ESS Laboratory Work Order: 1709493  
ESS Laboratory Sample ID: 1709493-08  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	ND (1.04)		9014		1	EEM	09/22/17 11:20	mg/kg dry	CI72210





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-509 (0-2')  
Date Sampled: 09/18/17 14:15  
Percent Solids: 89

ESS Laboratory Work Order: 1709493  
ESS Laboratory Sample ID: 1709493-09  
Sample Matrix: Soil  
Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (5.41)		6010C		1	KJK	09/23/17 6:55	2.07	100	CI71937
<b>Arsenic</b>	<b>5.03</b> (2.70)		6010C		1	KJK	09/23/17 6:55	2.07	100	CI71937
<b>Beryllium</b>	<b>0.34</b> (0.12)		6010C		1	KJK	09/23/17 6:55	2.07	100	CI71937
Cadmium	ND (0.54)		6010C		1	KJK	09/23/17 22:14	2.07	100	CI71937
<b>Chromium</b>	<b>8.06</b> (1.08)		6010C		1	KJK	09/23/17 6:55	2.07	100	CI71937
<b>Copper</b>	<b>13.0</b> (2.70)		6010C		1	KJK	09/23/17 6:55	2.07	100	CI71937
<b>Lead</b>	<b>15.7</b> (5.41)		6010C		1	KJK	09/23/17 6:55	2.07	100	CI71937
Mercury	ND (0.031)		7471B		1	MJV	09/21/17 22:03	0.71	40	CI71939
<b>Nickel</b>	<b>8.83</b> (2.70)		6010C		1	KJK	09/23/17 6:55	2.07	100	CI71937
Selenium	ND (5.41)		6020A		20	NAR	09/27/17 11:53	2.07	100	CI71937
Silver	ND (0.54)		6010C		1	KJK	09/23/17 22:14	2.07	100	CI71937
Thallium	ND (5.41)		6010C		1	KJK	09/23/17 6:55	2.07	100	CI71937
<b>Zinc</b>	<b>28.8</b> (2.70)		6010C		1	KJK	09/23/17 6:55	2.07	100	CI71937



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-509 (0-2')  
Date Sampled: 09/18/17 14:15  
Percent Solids: 89  
Initial Volume: 11.9  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1709493  
ESS Laboratory Sample ID: 1709493-09  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0024)		8260B Low		1	09/20/17 22:05	C7I0344	CI72107
1,1,1-Trichloroethane	ND (0.0024)		8260B Low		1	09/20/17 22:05	C7I0344	CI72107
1,1,2,2-Tetrachloroethane	ND (0.0024)		8260B Low		1	09/20/17 22:05	C7I0344	CI72107
1,1,2-Trichloroethane	ND (0.0024)		8260B Low		1	09/20/17 22:05	C7I0344	CI72107
1,1-Dichloroethane	ND (0.0024)		8260B Low		1	09/20/17 22:05	C7I0344	CI72107
1,1-Dichloroethene	ND (0.0024)		8260B Low		1	09/20/17 22:05	C7I0344	CI72107
1,1-Dichloropropene	ND (0.0024)		8260B Low		1	09/20/17 22:05	C7I0344	CI72107
1,2,3-Trichlorobenzene	ND (0.0024)		8260B Low		1	09/20/17 22:05	C7I0344	CI72107
1,2,3-Trichloropropane	ND (0.0024)		8260B Low		1	09/20/17 22:05	C7I0344	CI72107
1,2,4-Trichlorobenzene	ND (0.0024)		8260B Low		1	09/20/17 22:05	C7I0344	CI72107
1,2,4-Trimethylbenzene	ND (0.0024)		8260B Low		1	09/20/17 22:05	C7I0344	CI72107
1,2-Dibromo-3-Chloropropane	ND (0.0024)		8260B Low		1	09/20/17 22:05	C7I0344	CI72107
1,2-Dibromoethane	ND (0.0024)		8260B Low		1	09/20/17 22:05	C7I0344	CI72107
1,2-Dichlorobenzene	ND (0.0024)		8260B Low		1	09/20/17 22:05	C7I0344	CI72107
1,2-Dichloroethane	ND (0.0024)		8260B Low		1	09/20/17 22:05	C7I0344	CI72107
1,2-Dichloropropane	ND (0.0024)		8260B Low		1	09/20/17 22:05	C7I0344	CI72107
1,3,5-Trimethylbenzene	ND (0.0024)		8260B Low		1	09/20/17 22:05	C7I0344	CI72107
1,3-Dichlorobenzene	ND (0.0024)		8260B Low		1	09/20/17 22:05	C7I0344	CI72107
1,3-Dichloropropane	ND (0.0024)		8260B Low		1	09/20/17 22:05	C7I0344	CI72107
1,4-Dichlorobenzene	ND (0.0024)		8260B Low		1	09/20/17 22:05	C7I0344	CI72107
1,4-Dioxane	ND (0.0470)		8260B Low		1	09/20/17 22:05	C7I0344	CI72107
1-Chlorohexane	ND (0.0024)		8260B Low		1	09/20/17 22:05	C7I0344	CI72107
2,2-Dichloropropane	ND (0.0024)		8260B Low		1	09/20/17 22:05	C7I0344	CI72107
2-Butanone	ND (0.0235)		8260B Low		1	09/20/17 22:05	C7I0344	CI72107
2-Chlorotoluene	ND (0.0024)		8260B Low		1	09/20/17 22:05	C7I0344	CI72107
2-Hexanone	ND (0.0235)		8260B Low		1	09/20/17 22:05	C7I0344	CI72107
4-Chlorotoluene	ND (0.0024)		8260B Low		1	09/20/17 22:05	C7I0344	CI72107
4-Isopropyltoluene	ND (0.0024)		8260B Low		1	09/20/17 22:05	C7I0344	CI72107
4-Methyl-2-Pentanone	ND (0.0235)		8260B Low		1	09/20/17 22:05	C7I0344	CI72107
Acetone	ND (0.0235)		8260B Low		1	09/20/17 22:05	C7I0344	CI72107
Benzene	ND (0.0024)		8260B Low		1	09/20/17 22:05	C7I0344	CI72107
Bromobenzene	ND (0.0024)		8260B Low		1	09/20/17 22:05	C7I0344	CI72107



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-509 (0-2')  
Date Sampled: 09/18/17 14:15  
Percent Solids: 89  
Initial Volume: 11.9  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1709493  
ESS Laboratory Sample ID: 1709493-09  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0024)		8260B Low		1	09/20/17 22:05	C7I0344	CI72107
Bromodichloromethane	ND (0.0024)		8260B Low		1	09/20/17 22:05	C7I0344	CI72107
Bromoform	ND (0.0024)		8260B Low		1	09/20/17 22:05	C7I0344	CI72107
Bromomethane	ND (0.0047)		8260B Low		1	09/20/17 22:05	C7I0344	CI72107
Carbon Disulfide	ND (0.0024)		8260B Low		1	09/20/17 22:05	C7I0344	CI72107
Carbon Tetrachloride	ND (0.0024)		8260B Low		1	09/20/17 22:05	C7I0344	CI72107
Chlorobenzene	ND (0.0024)		8260B Low		1	09/20/17 22:05	C7I0344	CI72107
Chloroethane	ND (0.0047)		8260B Low		1	09/20/17 22:05	C7I0344	CI72107
Chloroform	ND (0.0024)		8260B Low		1	09/20/17 22:05	C7I0344	CI72107
Chloromethane	ND (0.0047)		8260B Low		1	09/20/17 22:05	C7I0344	CI72107
cis-1,2-Dichloroethene	ND (0.0024)		8260B Low		1	09/20/17 22:05	C7I0344	CI72107
cis-1,3-Dichloropropene	ND (0.0024)		8260B Low		1	09/20/17 22:05	C7I0344	CI72107
Dibromochloromethane	ND (0.0024)		8260B Low		1	09/20/17 22:05	C7I0344	CI72107
Dibromomethane	ND (0.0024)		8260B Low		1	09/20/17 22:05	C7I0344	CI72107
Dichlorodifluoromethane	ND (0.0047)		8260B Low		1	09/20/17 22:05	C7I0344	CI72107
Diethyl Ether	ND (0.0024)		8260B Low		1	09/20/17 22:05	C7I0344	CI72107
Di-isopropyl ether	ND (0.0024)		8260B Low		1	09/20/17 22:05	C7I0344	CI72107
Ethyl tertiary-butyl ether	ND (0.0024)		8260B Low		1	09/20/17 22:05	C7I0344	CI72107
Ethylbenzene	ND (0.0024)		8260B Low		1	09/20/17 22:05	C7I0344	CI72107
Hexachlorobutadiene	ND (0.0024)		8260B Low		1	09/20/17 22:05	C7I0344	CI72107
Isopropylbenzene	ND (0.0024)		8260B Low		1	09/20/17 22:05	C7I0344	CI72107
Methyl tert-Butyl Ether	ND (0.0024)		8260B Low		1	09/20/17 22:05	C7I0344	CI72107
Methylene Chloride	ND (0.0118)		8260B Low		1	09/20/17 22:05	C7I0344	CI72107
Naphthalene	ND (0.0024)		8260B Low		1	09/20/17 22:05	C7I0344	CI72107
n-Butylbenzene	ND (0.0024)		8260B Low		1	09/20/17 22:05	C7I0344	CI72107
n-Propylbenzene	ND (0.0024)		8260B Low		1	09/20/17 22:05	C7I0344	CI72107
sec-Butylbenzene	ND (0.0024)		8260B Low		1	09/20/17 22:05	C7I0344	CI72107
Styrene	ND (0.0024)		8260B Low		1	09/20/17 22:05	C7I0344	CI72107
tert-Butylbenzene	ND (0.0024)		8260B Low		1	09/20/17 22:05	C7I0344	CI72107
Tertiary-amyl methyl ether	ND (0.0024)		8260B Low		1	09/20/17 22:05	C7I0344	CI72107
Tetrachloroethene	ND (0.0024)		8260B Low		1	09/20/17 22:05	C7I0344	CI72107
Tetrahydrofuran	ND (0.0024)		8260B Low		1	09/20/17 22:05	C7I0344	CI72107



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-509 (0-2')  
 Date Sampled: 09/18/17 14:15  
 Percent Solids: 89  
 Initial Volume: 11.9  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709493  
 ESS Laboratory Sample ID: 1709493-09  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0024)		8260B Low		1	09/20/17 22:05	C7I0344	CI72107
trans-1,2-Dichloroethene	ND (0.0024)		8260B Low		1	09/20/17 22:05	C7I0344	CI72107
trans-1,3-Dichloropropene	ND (0.0024)		8260B Low		1	09/20/17 22:05	C7I0344	CI72107
Trichloroethene	ND (0.0024)		8260B Low		1	09/20/17 22:05	C7I0344	CI72107
Trichlorofluoromethane	ND (0.0024)		8260B Low		1	09/20/17 22:05	C7I0344	CI72107
Vinyl Acetate	ND (0.0024)		8260B Low		1	09/20/17 22:05	C7I0344	CI72107
Vinyl Chloride	ND (0.0047)		8260B Low		1	09/20/17 22:05	C7I0344	CI72107
Xylene O	ND (0.0024)		8260B Low		1	09/20/17 22:05	C7I0344	CI72107
Xylene P,M	ND (0.0047)		8260B Low		1	09/20/17 22:05	C7I0344	CI72107
Xylenes (Total)	ND (0.0047)		8260B Low		1	09/20/17 22:05		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	103 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	104 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	100 %		70-130
<i>Surrogate: Toluene-d8</i>	112 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-509 (0-2')  
 Date Sampled: 09/18/17 14:15  
 Percent Solids: 89  
 Initial Volume: 20.2  
 Final Volume: 1  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709493  
 ESS Laboratory Sample ID: 1709493-09  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: SMR  
 Prepared: 9/22/17 13:15

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	ND (41.6)		8100M		1	09/22/17 16:12	C710358	C172208
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		78 %		40-140				





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-509 (0-2')  
 Date Sampled: 09/18/17 14:15  
 Percent Solids: 89  
 Initial Volume: 15.8  
 Final Volume: 0.5  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709493  
 ESS Laboratory Sample ID: 1709493-09  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: TJ  
 Prepared: 9/22/17 12:50

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.354)		8270D		1	09/24/17 15:49	C7I0385	CI72209
Acenaphthene	ND (0.354)		8270D		1	09/24/17 15:49	C7I0385	CI72209
Acenaphthylene	ND (0.354)		8270D		1	09/24/17 15:49	C7I0385	CI72209
Anthracene	ND (0.354)		8270D		1	09/24/17 15:49	C7I0385	CI72209
Benzo(a)anthracene	ND (0.354)		8270D		1	09/24/17 15:49	C7I0385	CI72209
Benzo(a)pyrene	ND (0.177)		8270D		1	09/24/17 15:49	C7I0385	CI72209
Benzo(b)fluoranthene	ND (0.354)		8270D		1	09/24/17 15:49	C7I0385	CI72209
Benzo(g,h,i)perylene	ND (0.354)		8270D		1	09/24/17 15:49	C7I0385	CI72209
Benzo(k)fluoranthene	ND (0.354)		8270D		1	09/24/17 15:49	C7I0385	CI72209
Chrysene	ND (0.177)		8270D		1	09/24/17 15:49	C7I0385	CI72209
Dibenzo(a,h)Anthracene	ND (0.177)		8270D		1	09/24/17 15:49	C7I0385	CI72209
Fluoranthene	ND (0.354)		8270D		1	09/24/17 15:49	C7I0385	CI72209
Fluorene	ND (0.354)		8270D		1	09/24/17 15:49	C7I0385	CI72209
Indeno(1,2,3-cd)Pyrene	ND (0.354)		8270D		1	09/24/17 15:49	C7I0385	CI72209
Naphthalene	ND (0.354)		8270D		1	09/24/17 15:49	C7I0385	CI72209
Phenanthrene	ND (0.354)		8270D		1	09/24/17 15:49	C7I0385	CI72209
Pyrene	ND (0.354)		8270D		1	09/24/17 15:49	C7I0385	CI72209

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: 1,2-Dichlorobenzene-d4	58 %		30-130
Surrogate: 2-Fluorobiphenyl	67 %		30-130
Surrogate: Nitrobenzene-d5	63 %		30-130
Surrogate: p-Terphenyl-d14	93 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-509 (0-2')  
Date Sampled: 09/18/17 14:15  
Percent Solids: 89

ESS Laboratory Work Order: 1709493  
ESS Laboratory Sample ID: 1709493-09  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	ND (1.10)		9014		1	EEM	09/22/17 11:20	mg/kg dry	CI72210



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-509 (5-6)  
 Date Sampled: 09/18/17 14:30  
 Percent Solids: 89

ESS Laboratory Work Order: 1709493  
 ESS Laboratory Sample ID: 1709493-10  
 Sample Matrix: Soil  
 Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (5.24)		6010C		1	KJK	09/23/17 6:59	2.15	100	CI71937
<b>Arsenic</b>	<b>3.99</b> (2.62)		6010C		1	KJK	09/23/17 6:59	2.15	100	CI71937
<b>Beryllium</b>	<b>0.25</b> (0.12)		6010C		1	KJK	09/23/17 6:59	2.15	100	CI71937
Cadmium	ND (0.52)		6010C		1	KJK	09/23/17 22:18	2.15	100	CI71937
<b>Chromium</b>	<b>5.93</b> (1.05)		6010C		1	KJK	09/23/17 6:59	2.15	100	CI71937
<b>Copper</b>	<b>16.5</b> (2.62)		6010C		1	KJK	09/23/17 6:59	2.15	100	CI71937
<b>Lead</b>	<b>16.6</b> (5.24)		6010C		1	KJK	09/23/17 6:59	2.15	100	CI71937
Mercury	ND (0.033)		7471B		1	MJV	09/21/17 22:21	0.67	40	CI71939
<b>Nickel</b>	<b>8.08</b> (2.62)		6010C		1	KJK	09/23/17 6:59	2.15	100	CI71937
Selenium	ND (5.24)		6020A		20	NAR	09/27/17 11:57	2.15	100	CI71937
Silver	ND (0.52)		6010C		1	KJK	09/23/17 22:18	2.15	100	CI71937
Thallium	ND (5.24)		6010C		1	KJK	09/23/17 6:59	2.15	100	CI71937
<b>Zinc</b>	<b>28.5</b> (2.62)		6010C		1	KJK	09/23/17 6:59	2.15	100	CI71937



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-509 (5-6)  
 Date Sampled: 09/18/17 14:30  
 Percent Solids: 89  
 Initial Volume: 7  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709493  
 ESS Laboratory Sample ID: 1709493-10  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0040)		8260B Low		1	09/20/17 22:31	C7I0344	CI72107
1,1,1-Trichloroethane	ND (0.0040)		8260B Low		1	09/20/17 22:31	C7I0344	CI72107
1,1,2,2-Tetrachloroethane	ND (0.0040)		8260B Low		1	09/20/17 22:31	C7I0344	CI72107
1,1,2-Trichloroethane	ND (0.0040)		8260B Low		1	09/20/17 22:31	C7I0344	CI72107
1,1-Dichloroethane	ND (0.0040)		8260B Low		1	09/20/17 22:31	C7I0344	CI72107
1,1-Dichloroethene	ND (0.0040)		8260B Low		1	09/20/17 22:31	C7I0344	CI72107
1,1-Dichloropropene	ND (0.0040)		8260B Low		1	09/20/17 22:31	C7I0344	CI72107
1,2,3-Trichlorobenzene	ND (0.0040)		8260B Low		1	09/20/17 22:31	C7I0344	CI72107
1,2,3-Trichloropropane	ND (0.0040)		8260B Low		1	09/20/17 22:31	C7I0344	CI72107
1,2,4-Trichlorobenzene	ND (0.0040)		8260B Low		1	09/20/17 22:31	C7I0344	CI72107
1,2,4-Trimethylbenzene	ND (0.0040)		8260B Low		1	09/20/17 22:31	C7I0344	CI72107
1,2-Dibromo-3-Chloropropane	ND (0.0040)		8260B Low		1	09/20/17 22:31	C7I0344	CI72107
1,2-Dibromoethane	ND (0.0040)		8260B Low		1	09/20/17 22:31	C7I0344	CI72107
1,2-Dichlorobenzene	ND (0.0040)		8260B Low		1	09/20/17 22:31	C7I0344	CI72107
1,2-Dichloroethane	ND (0.0040)		8260B Low		1	09/20/17 22:31	C7I0344	CI72107
1,2-Dichloropropane	ND (0.0040)		8260B Low		1	09/20/17 22:31	C7I0344	CI72107
1,3,5-Trimethylbenzene	ND (0.0040)		8260B Low		1	09/20/17 22:31	C7I0344	CI72107
1,3-Dichlorobenzene	ND (0.0040)		8260B Low		1	09/20/17 22:31	C7I0344	CI72107
1,3-Dichloropropane	ND (0.0040)		8260B Low		1	09/20/17 22:31	C7I0344	CI72107
1,4-Dichlorobenzene	ND (0.0040)		8260B Low		1	09/20/17 22:31	C7I0344	CI72107
1,4-Dioxane	ND (0.0804)		8260B Low		1	09/20/17 22:31	C7I0344	CI72107
1-Chlorohexane	ND (0.0040)		8260B Low		1	09/20/17 22:31	C7I0344	CI72107
2,2-Dichloropropane	ND (0.0040)		8260B Low		1	09/20/17 22:31	C7I0344	CI72107
2-Butanone	ND (0.0402)		8260B Low		1	09/20/17 22:31	C7I0344	CI72107
2-Chlorotoluene	ND (0.0040)		8260B Low		1	09/20/17 22:31	C7I0344	CI72107
2-Hexanone	ND (0.0402)		8260B Low		1	09/20/17 22:31	C7I0344	CI72107
4-Chlorotoluene	ND (0.0040)		8260B Low		1	09/20/17 22:31	C7I0344	CI72107
4-Isopropyltoluene	ND (0.0040)		8260B Low		1	09/20/17 22:31	C7I0344	CI72107
4-Methyl-2-Pentanone	ND (0.0402)		8260B Low		1	09/20/17 22:31	C7I0344	CI72107
Acetone	ND (0.0402)		8260B Low		1	09/20/17 22:31	C7I0344	CI72107
Benzene	ND (0.0040)		8260B Low		1	09/20/17 22:31	C7I0344	CI72107
Bromobenzene	ND (0.0040)		8260B Low		1	09/20/17 22:31	C7I0344	CI72107



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-509 (5-6')  
Date Sampled: 09/18/17 14:30  
Percent Solids: 89  
Initial Volume: 7  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1709493  
ESS Laboratory Sample ID: 1709493-10  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0040)		8260B Low		1	09/20/17 22:31	C7I0344	CI72107
Bromodichloromethane	ND (0.0040)		8260B Low		1	09/20/17 22:31	C7I0344	CI72107
Bromoform	ND (0.0040)		8260B Low		1	09/20/17 22:31	C7I0344	CI72107
Bromomethane	ND (0.0080)		8260B Low		1	09/20/17 22:31	C7I0344	CI72107
Carbon Disulfide	ND (0.0040)		8260B Low		1	09/20/17 22:31	C7I0344	CI72107
Carbon Tetrachloride	ND (0.0040)		8260B Low		1	09/20/17 22:31	C7I0344	CI72107
Chlorobenzene	ND (0.0040)		8260B Low		1	09/20/17 22:31	C7I0344	CI72107
Chloroethane	ND (0.0080)		8260B Low		1	09/20/17 22:31	C7I0344	CI72107
Chloroform	ND (0.0040)		8260B Low		1	09/20/17 22:31	C7I0344	CI72107
Chloromethane	ND (0.0080)		8260B Low		1	09/20/17 22:31	C7I0344	CI72107
cis-1,2-Dichloroethene	ND (0.0040)		8260B Low		1	09/20/17 22:31	C7I0344	CI72107
cis-1,3-Dichloropropene	ND (0.0040)		8260B Low		1	09/20/17 22:31	C7I0344	CI72107
Dibromochloromethane	ND (0.0040)		8260B Low		1	09/20/17 22:31	C7I0344	CI72107
Dibromomethane	ND (0.0040)		8260B Low		1	09/20/17 22:31	C7I0344	CI72107
Dichlorodifluoromethane	ND (0.0080)		8260B Low		1	09/20/17 22:31	C7I0344	CI72107
Diethyl Ether	ND (0.0040)		8260B Low		1	09/20/17 22:31	C7I0344	CI72107
Di-isopropyl ether	ND (0.0040)		8260B Low		1	09/20/17 22:31	C7I0344	CI72107
Ethyl tertiary-butyl ether	ND (0.0040)		8260B Low		1	09/20/17 22:31	C7I0344	CI72107
Ethylbenzene	ND (0.0040)		8260B Low		1	09/20/17 22:31	C7I0344	CI72107
Hexachlorobutadiene	ND (0.0040)		8260B Low		1	09/20/17 22:31	C7I0344	CI72107
Isopropylbenzene	ND (0.0040)		8260B Low		1	09/20/17 22:31	C7I0344	CI72107
Methyl tert-Butyl Ether	ND (0.0040)		8260B Low		1	09/20/17 22:31	C7I0344	CI72107
Methylene Chloride	ND (0.0201)		8260B Low		1	09/20/17 22:31	C7I0344	CI72107
Naphthalene	ND (0.0040)		8260B Low		1	09/20/17 22:31	C7I0344	CI72107
n-Butylbenzene	ND (0.0040)		8260B Low		1	09/20/17 22:31	C7I0344	CI72107
n-Propylbenzene	ND (0.0040)		8260B Low		1	09/20/17 22:31	C7I0344	CI72107
sec-Butylbenzene	ND (0.0040)		8260B Low		1	09/20/17 22:31	C7I0344	CI72107
Styrene	ND (0.0040)		8260B Low		1	09/20/17 22:31	C7I0344	CI72107
tert-Butylbenzene	ND (0.0040)		8260B Low		1	09/20/17 22:31	C7I0344	CI72107
Tertiary-amyl methyl ether	ND (0.0040)		8260B Low		1	09/20/17 22:31	C7I0344	CI72107
Tetrachloroethene	ND (0.0040)		8260B Low		1	09/20/17 22:31	C7I0344	CI72107
Tetrahydrofuran	ND (0.0040)		8260B Low		1	09/20/17 22:31	C7I0344	CI72107





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-509 (5-6)  
 Date Sampled: 09/18/17 14:30  
 Percent Solids: 89  
 Initial Volume: 7  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709493  
 ESS Laboratory Sample ID: 1709493-10  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0040)		8260B Low		1	09/20/17 22:31	C7I0344	CI72107
trans-1,2-Dichloroethene	ND (0.0040)		8260B Low		1	09/20/17 22:31	C7I0344	CI72107
trans-1,3-Dichloropropene	ND (0.0040)		8260B Low		1	09/20/17 22:31	C7I0344	CI72107
Trichloroethene	ND (0.0040)		8260B Low		1	09/20/17 22:31	C7I0344	CI72107
Trichlorofluoromethane	ND (0.0040)		8260B Low		1	09/20/17 22:31	C7I0344	CI72107
Vinyl Acetate	ND (0.0040)		8260B Low		1	09/20/17 22:31	C7I0344	CI72107
Vinyl Chloride	ND (0.0080)		8260B Low		1	09/20/17 22:31	C7I0344	CI72107
Xylene O	ND (0.0040)		8260B Low		1	09/20/17 22:31	C7I0344	CI72107
Xylene P,M	ND (0.0080)		8260B Low		1	09/20/17 22:31	C7I0344	CI72107
Xylenes (Total)	ND (0.0080)		8260B Low		1	09/20/17 22:31		[CALC]

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: 1,2-Dichloroethane-d4	97 %		70-130
Surrogate: 4-Bromofluorobenzene	104 %		70-130
Surrogate: Dibromofluoromethane	100 %		70-130
Surrogate: Toluene-d8	114 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-509 (5-6')  
Date Sampled: 09/18/17 14:30  
Percent Solids: 89  
Initial Volume: 20.4  
Final Volume: 1  
Extraction Method: 3546

ESS Laboratory Work Order: 1709493  
ESS Laboratory Sample ID: 1709493-10  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: SMR  
Prepared: 9/19/17 13:10

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	ND (41.4)		8100M		1	09/20/17 23:13	C710328	CI71918
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		82 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-509 (5-6)  
 Date Sampled: 09/18/17 14:30  
 Percent Solids: 89  
 Initial Volume: 15  
 Final Volume: 0.5  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709493  
 ESS Laboratory Sample ID: 1709493-10  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: TJ  
 Prepared: 9/19/17 14:13

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.375)		8270D		1	09/21/17 2:01	C7I0326	CI71919
Acenaphthene	ND (0.375)		8270D		1	09/21/17 2:01	C7I0326	CI71919
Acenaphthylene	ND (0.375)		8270D		1	09/21/17 2:01	C7I0326	CI71919
Anthracene	ND (0.375)		8270D		1	09/21/17 2:01	C7I0326	CI71919
Benzo(a)anthracene	ND (0.375)		8270D		1	09/21/17 2:01	C7I0326	CI71919
Benzo(a)pyrene	ND (0.188)		8270D		1	09/21/17 2:01	C7I0326	CI71919
Benzo(b)fluoranthene	ND (0.375)		8270D		1	09/21/17 2:01	C7I0326	CI71919
Benzo(g,h,i)perylene	ND (0.375)		8270D		1	09/21/17 2:01	C7I0326	CI71919
Benzo(k)fluoranthene	ND (0.375)		8270D		1	09/21/17 2:01	C7I0326	CI71919
Chrysene	ND (0.188)		8270D		1	09/21/17 2:01	C7I0326	CI71919
Dibenzo(a,h)Anthracene	ND (0.188)		8270D		1	09/21/17 2:01	C7I0326	CI71919
Fluoranthene	ND (0.375)		8270D		1	09/21/17 2:01	C7I0326	CI71919
Fluorene	ND (0.375)		8270D		1	09/21/17 2:01	C7I0326	CI71919
Indeno(1,2,3-cd)Pyrene	ND (0.375)		8270D		1	09/21/17 2:01	C7I0326	CI71919
Naphthalene	ND (0.375)		8270D		1	09/21/17 2:01	C7I0326	CI71919
Phenanthrene	ND (0.375)		8270D		1	09/21/17 2:01	C7I0326	CI71919
Pyrene	ND (0.375)		8270D		1	09/21/17 2:01	C7I0326	CI71919

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: 1,2-Dichlorobenzene-d4	78 %		30-130
Surrogate: 2-Fluorobiphenyl	82 %		30-130
Surrogate: Nitrobenzene-d5	61 %		30-130
Surrogate: p-Terphenyl-d14	98 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-509 (5-6)  
Date Sampled: 09/18/17 14:30  
Percent Solids: 89

ESS Laboratory Work Order: 1709493  
ESS Laboratory Sample ID: 1709493-10  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	ND (1.10)		9014		1	EEM	09/22/17 11:20	mg/kg dry	CI72210



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-598 (0-2')  
 Date Sampled: 09/18/17 00:00  
 Percent Solids: 89

ESS Laboratory Work Order: 1709493  
 ESS Laboratory Sample ID: 1709493-11  
 Sample Matrix: Soil  
 Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (5.17)		6010C		1	KJK	09/23/17 7:03	2.16	100	CI71937
<b>Arsenic</b>	<b>3.44</b> (2.59)		6010C		1	KJK	09/23/17 7:03	2.16	100	CI71937
<b>Beryllium</b>	<b>0.24</b> (0.11)		6010C		1	KJK	09/23/17 7:03	2.16	100	CI71937
Cadmium	ND (0.52)		6010C		1	KJK	09/23/17 22:22	2.16	100	CI71937
<b>Chromium</b>	<b>6.84</b> (1.03)		6010C		1	KJK	09/23/17 7:03	2.16	100	CI71937
<b>Copper</b>	<b>8.57</b> (2.59)		6010C		1	KJK	09/23/17 7:03	2.16	100	CI71937
<b>Lead</b>	<b>7.35</b> (5.17)		6010C		1	KJK	09/23/17 7:03	2.16	100	CI71937
Mercury	ND (0.036)		7471B		1	MJV	09/21/17 22:23	0.61	40	CI71939
<b>Nickel</b>	<b>6.39</b> (2.59)		6010C		1	KJK	09/23/17 7:03	2.16	100	CI71937
Selenium	ND (5.17)		6020A		20	NAR	09/27/17 12:02	2.16	100	CI71937
Silver	ND (0.52)		6010C		1	KJK	09/23/17 22:22	2.16	100	CI71937
Thallium	ND (5.17)		6010C		1	KJK	09/23/17 7:03	2.16	100	CI71937
<b>Zinc</b>	<b>19.3</b> (2.59)		6010C		1	KJK	09/23/17 7:03	2.16	100	CI71937





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-598 (0-2')  
 Date Sampled: 09/18/17 00:00  
 Percent Solids: 89  
 Initial Volume: 6.1  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709493  
 ESS Laboratory Sample ID: 1709493-11  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0046)		8260B Low		1	09/20/17 22:56	C7I0344	CI72107
1,1,1-Trichloroethane	ND (0.0046)		8260B Low		1	09/20/17 22:56	C7I0344	CI72107
1,1,2,2-Tetrachloroethane	ND (0.0046)		8260B Low		1	09/20/17 22:56	C7I0344	CI72107
1,1,2-Trichloroethane	ND (0.0046)		8260B Low		1	09/20/17 22:56	C7I0344	CI72107
1,1-Dichloroethane	ND (0.0046)		8260B Low		1	09/20/17 22:56	C7I0344	CI72107
1,1-Dichloroethene	ND (0.0046)		8260B Low		1	09/20/17 22:56	C7I0344	CI72107
1,1-Dichloropropene	ND (0.0046)		8260B Low		1	09/20/17 22:56	C7I0344	CI72107
1,2,3-Trichlorobenzene	ND (0.0046)		8260B Low		1	09/20/17 22:56	C7I0344	CI72107
1,2,3-Trichloropropane	ND (0.0046)		8260B Low		1	09/20/17 22:56	C7I0344	CI72107
1,2,4-Trichlorobenzene	ND (0.0046)		8260B Low		1	09/20/17 22:56	C7I0344	CI72107
1,2,4-Trimethylbenzene	ND (0.0046)		8260B Low		1	09/20/17 22:56	C7I0344	CI72107
1,2-Dibromo-3-Chloropropane	ND (0.0046)		8260B Low		1	09/20/17 22:56	C7I0344	CI72107
1,2-Dibromoethane	ND (0.0046)		8260B Low		1	09/20/17 22:56	C7I0344	CI72107
1,2-Dichlorobenzene	ND (0.0046)		8260B Low		1	09/20/17 22:56	C7I0344	CI72107
1,2-Dichloroethane	ND (0.0046)		8260B Low		1	09/20/17 22:56	C7I0344	CI72107
1,2-Dichloropropane	ND (0.0046)		8260B Low		1	09/20/17 22:56	C7I0344	CI72107
1,3,5-Trimethylbenzene	ND (0.0046)		8260B Low		1	09/20/17 22:56	C7I0344	CI72107
1,3-Dichlorobenzene	ND (0.0046)		8260B Low		1	09/20/17 22:56	C7I0344	CI72107
1,3-Dichloropropane	ND (0.0046)		8260B Low		1	09/20/17 22:56	C7I0344	CI72107
1,4-Dichlorobenzene	ND (0.0046)		8260B Low		1	09/20/17 22:56	C7I0344	CI72107
1,4-Dioxane	ND (0.0916)		8260B Low		1	09/20/17 22:56	C7I0344	CI72107
1-Chlorohexane	ND (0.0046)		8260B Low		1	09/20/17 22:56	C7I0344	CI72107
2,2-Dichloropropane	ND (0.0046)		8260B Low		1	09/20/17 22:56	C7I0344	CI72107
2-Butanone	ND (0.0458)		8260B Low		1	09/20/17 22:56	C7I0344	CI72107
2-Chlorotoluene	ND (0.0046)		8260B Low		1	09/20/17 22:56	C7I0344	CI72107
2-Hexanone	ND (0.0458)		8260B Low		1	09/20/17 22:56	C7I0344	CI72107
4-Chlorotoluene	ND (0.0046)		8260B Low		1	09/20/17 22:56	C7I0344	CI72107
4-Isopropyltoluene	ND (0.0046)		8260B Low		1	09/20/17 22:56	C7I0344	CI72107
4-Methyl-2-Pentanone	ND (0.0458)		8260B Low		1	09/20/17 22:56	C7I0344	CI72107
Acetone	ND (0.0458)		8260B Low		1	09/20/17 22:56	C7I0344	CI72107
Benzene	ND (0.0046)		8260B Low		1	09/20/17 22:56	C7I0344	CI72107
Bromobenzene	ND (0.0046)		8260B Low		1	09/20/17 22:56	C7I0344	CI72107



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-598 (0-2')  
 Date Sampled: 09/18/17 00:00  
 Percent Solids: 89  
 Initial Volume: 6.1  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709493  
 ESS Laboratory Sample ID: 1709493-11  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0046)		8260B Low		1	09/20/17 22:56	C7I0344	CI72107
Bromodichloromethane	ND (0.0046)		8260B Low		1	09/20/17 22:56	C7I0344	CI72107
Bromoform	ND (0.0046)		8260B Low		1	09/20/17 22:56	C7I0344	CI72107
Bromomethane	ND (0.0092)		8260B Low		1	09/20/17 22:56	C7I0344	CI72107
Carbon Disulfide	ND (0.0046)		8260B Low		1	09/20/17 22:56	C7I0344	CI72107
Carbon Tetrachloride	ND (0.0046)		8260B Low		1	09/20/17 22:56	C7I0344	CI72107
Chlorobenzene	ND (0.0046)		8260B Low		1	09/20/17 22:56	C7I0344	CI72107
Chloroethane	ND (0.0092)		8260B Low		1	09/20/17 22:56	C7I0344	CI72107
Chloroform	ND (0.0046)		8260B Low		1	09/20/17 22:56	C7I0344	CI72107
Chloromethane	ND (0.0092)		8260B Low		1	09/20/17 22:56	C7I0344	CI72107
cis-1,2-Dichloroethene	ND (0.0046)		8260B Low		1	09/20/17 22:56	C7I0344	CI72107
cis-1,3-Dichloropropene	ND (0.0046)		8260B Low		1	09/20/17 22:56	C7I0344	CI72107
Dibromochloromethane	ND (0.0046)		8260B Low		1	09/20/17 22:56	C7I0344	CI72107
Dibromomethane	ND (0.0046)		8260B Low		1	09/20/17 22:56	C7I0344	CI72107
Dichlorodifluoromethane	ND (0.0092)		8260B Low		1	09/20/17 22:56	C7I0344	CI72107
Diethyl Ether	ND (0.0046)		8260B Low		1	09/20/17 22:56	C7I0344	CI72107
Di-isopropyl ether	ND (0.0046)		8260B Low		1	09/20/17 22:56	C7I0344	CI72107
Ethyl tertiary-butyl ether	ND (0.0046)		8260B Low		1	09/20/17 22:56	C7I0344	CI72107
Ethylbenzene	ND (0.0046)		8260B Low		1	09/20/17 22:56	C7I0344	CI72107
Hexachlorobutadiene	ND (0.0046)		8260B Low		1	09/20/17 22:56	C7I0344	CI72107
Isopropylbenzene	ND (0.0046)		8260B Low		1	09/20/17 22:56	C7I0344	CI72107
Methyl tert-Butyl Ether	ND (0.0046)		8260B Low		1	09/20/17 22:56	C7I0344	CI72107
Methylene Chloride	ND (0.0229)		8260B Low		1	09/20/17 22:56	C7I0344	CI72107
Naphthalene	ND (0.0046)		8260B Low		1	09/20/17 22:56	C7I0344	CI72107
n-Butylbenzene	ND (0.0046)		8260B Low		1	09/20/17 22:56	C7I0344	CI72107
n-Propylbenzene	ND (0.0046)		8260B Low		1	09/20/17 22:56	C7I0344	CI72107
sec-Butylbenzene	ND (0.0046)		8260B Low		1	09/20/17 22:56	C7I0344	CI72107
Styrene	ND (0.0046)		8260B Low		1	09/20/17 22:56	C7I0344	CI72107
tert-Butylbenzene	ND (0.0046)		8260B Low		1	09/20/17 22:56	C7I0344	CI72107
Tertiary-amyl methyl ether	ND (0.0046)		8260B Low		1	09/20/17 22:56	C7I0344	CI72107
Tetrachloroethene	ND (0.0046)		8260B Low		1	09/20/17 22:56	C7I0344	CI72107
Tetrahydrofuran	ND (0.0046)		8260B Low		1	09/20/17 22:56	C7I0344	CI72107



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-598 (0-2')  
 Date Sampled: 09/18/17 00:00  
 Percent Solids: 89  
 Initial Volume: 6.1  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709493  
 ESS Laboratory Sample ID: 1709493-11  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0046)		8260B Low		1	09/20/17 22:56	C7I0344	CI72107
trans-1,2-Dichloroethene	ND (0.0046)		8260B Low		1	09/20/17 22:56	C7I0344	CI72107
trans-1,3-Dichloropropene	ND (0.0046)		8260B Low		1	09/20/17 22:56	C7I0344	CI72107
Trichloroethene	ND (0.0046)		8260B Low		1	09/20/17 22:56	C7I0344	CI72107
Trichlorofluoromethane	ND (0.0046)		8260B Low		1	09/20/17 22:56	C7I0344	CI72107
Vinyl Acetate	ND (0.0046)		8260B Low		1	09/20/17 22:56	C7I0344	CI72107
Vinyl Chloride	ND (0.0092)		8260B Low		1	09/20/17 22:56	C7I0344	CI72107
Xylene O	ND (0.0046)		8260B Low		1	09/20/17 22:56	C7I0344	CI72107
Xylene P,M	ND (0.0092)		8260B Low		1	09/20/17 22:56	C7I0344	CI72107
Xylenes (Total)	ND (0.0092)		8260B Low		1	09/20/17 22:56		[CALC]

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: 1,2-Dichloroethane-d4	98 %		70-130
Surrogate: 4-Bromofluorobenzene	105 %		70-130
Surrogate: Dibromofluoromethane	100 %		70-130
Surrogate: Toluene-d8	113 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-598 (0-2')  
 Date Sampled: 09/18/17 00:00  
 Percent Solids: 89  
 Initial Volume: 20.5  
 Final Volume: 1  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709493  
 ESS Laboratory Sample ID: 1709493-11  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: SMR  
 Prepared: 9/19/17 13:10

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	ND (40.9)		8100M		1	09/20/17 23:48	C710328	CI71918
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		82 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-598 (0-2')  
 Date Sampled: 09/18/17 00:00  
 Percent Solids: 89  
 Initial Volume: 15  
 Final Volume: 0.5  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709493  
 ESS Laboratory Sample ID: 1709493-11  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: TJ  
 Prepared: 9/19/17 14:13

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.372)		8270D		1	09/21/17 2:36	C7I0326	CI71919
Acenaphthene	ND (0.372)		8270D		1	09/21/17 2:36	C7I0326	CI71919
Acenaphthylene	ND (0.372)		8270D		1	09/21/17 2:36	C7I0326	CI71919
Anthracene	ND (0.372)		8270D		1	09/21/17 2:36	C7I0326	CI71919
Benzo(a)anthracene	ND (0.372)		8270D		1	09/21/17 2:36	C7I0326	CI71919
Benzo(a)pyrene	ND (0.187)		8270D		1	09/21/17 2:36	C7I0326	CI71919
Benzo(b)fluoranthene	ND (0.372)		8270D		1	09/21/17 2:36	C7I0326	CI71919
Benzo(g,h,i)perylene	ND (0.372)		8270D		1	09/21/17 2:36	C7I0326	CI71919
Benzo(k)fluoranthene	ND (0.372)		8270D		1	09/21/17 2:36	C7I0326	CI71919
Chrysene	ND (0.187)		8270D		1	09/21/17 2:36	C7I0326	CI71919
Dibenzo(a,h)Anthracene	ND (0.187)		8270D		1	09/21/17 2:36	C7I0326	CI71919
Fluoranthene	ND (0.372)		8270D		1	09/21/17 2:36	C7I0326	CI71919
Fluorene	ND (0.372)		8270D		1	09/21/17 2:36	C7I0326	CI71919
Indeno(1,2,3-cd)Pyrene	ND (0.372)		8270D		1	09/21/17 2:36	C7I0326	CI71919
Naphthalene	ND (0.372)		8270D		1	09/21/17 2:36	C7I0326	CI71919
Phenanthrene	ND (0.372)		8270D		1	09/21/17 2:36	C7I0326	CI71919
Pyrene	ND (0.372)		8270D		1	09/21/17 2:36	C7I0326	CI71919

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: 1,2-Dichlorobenzene-d4	67 %		30-130
Surrogate: 2-Fluorobiphenyl	73 %		30-130
Surrogate: Nitrobenzene-d5	53 %		30-130
Surrogate: p-Terphenyl-d14	79 %		30-130





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-598 (0-2')  
Date Sampled: 09/18/17 00:00  
Percent Solids: 89

ESS Laboratory Work Order: 1709493  
ESS Laboratory Sample ID: 1709493-11  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	ND (1.06)		9014		1	EEM	09/22/17 11:20	mg/kg dry	C172210



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TB-091817  
 Date Sampled: 09/18/17 00:00  
 Percent Solids: N/A  
 Initial Volume: 5  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709493  
 ESS Laboratory Sample ID: 1709493-12  
 Sample Matrix: Solid  
 Units: mg/kg wet  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0050)		8260B Low		1	09/20/17 15:45	C7I0344	CI72107
1,1,1-Trichloroethane	ND (0.0050)		8260B Low		1	09/20/17 15:45	C7I0344	CI72107
1,1,2,2-Tetrachloroethane	ND (0.0050)		8260B Low		1	09/20/17 15:45	C7I0344	CI72107
1,1,2-Trichloroethane	ND (0.0050)		8260B Low		1	09/20/17 15:45	C7I0344	CI72107
1,1-Dichloroethane	ND (0.0050)		8260B Low		1	09/20/17 15:45	C7I0344	CI72107
1,1-Dichloroethene	ND (0.0050)		8260B Low		1	09/20/17 15:45	C7I0344	CI72107
1,1-Dichloropropene	ND (0.0050)		8260B Low		1	09/20/17 15:45	C7I0344	CI72107
1,2,3-Trichlorobenzene	ND (0.0050)		8260B Low		1	09/20/17 15:45	C7I0344	CI72107
1,2,3-Trichloropropane	ND (0.0050)		8260B Low		1	09/20/17 15:45	C7I0344	CI72107
1,2,4-Trichlorobenzene	ND (0.0050)		8260B Low		1	09/20/17 15:45	C7I0344	CI72107
1,2,4-Trimethylbenzene	ND (0.0050)		8260B Low		1	09/20/17 15:45	C7I0344	CI72107
1,2-Dibromo-3-Chloropropane	ND (0.0050)		8260B Low		1	09/20/17 15:45	C7I0344	CI72107
1,2-Dibromoethane	ND (0.0050)		8260B Low		1	09/20/17 15:45	C7I0344	CI72107
1,2-Dichlorobenzene	ND (0.0050)		8260B Low		1	09/20/17 15:45	C7I0344	CI72107
1,2-Dichloroethane	ND (0.0050)		8260B Low		1	09/20/17 15:45	C7I0344	CI72107
1,2-Dichloropropane	ND (0.0050)		8260B Low		1	09/20/17 15:45	C7I0344	CI72107
1,3,5-Trimethylbenzene	ND (0.0050)		8260B Low		1	09/20/17 15:45	C7I0344	CI72107
1,3-Dichlorobenzene	ND (0.0050)		8260B Low		1	09/20/17 15:45	C7I0344	CI72107
1,3-Dichloropropane	ND (0.0050)		8260B Low		1	09/20/17 15:45	C7I0344	CI72107
1,4-Dichlorobenzene	ND (0.0050)		8260B Low		1	09/20/17 15:45	C7I0344	CI72107
1,4-Dioxane	ND (0.100)		8260B Low		1	09/20/17 15:45	C7I0344	CI72107
1-Chlorohexane	ND (0.0050)		8260B Low		1	09/20/17 15:45	C7I0344	CI72107
2,2-Dichloropropane	ND (0.0050)		8260B Low		1	09/20/17 15:45	C7I0344	CI72107
2-Butanone	ND (0.0500)		8260B Low		1	09/20/17 15:45	C7I0344	CI72107
2-Chlorotoluene	ND (0.0050)		8260B Low		1	09/20/17 15:45	C7I0344	CI72107
2-Hexanone	ND (0.0500)		8260B Low		1	09/20/17 15:45	C7I0344	CI72107
4-Chlorotoluene	ND (0.0050)		8260B Low		1	09/20/17 15:45	C7I0344	CI72107
4-Isopropyltoluene	ND (0.0050)		8260B Low		1	09/20/17 15:45	C7I0344	CI72107
4-Methyl-2-Pentanone	ND (0.0500)		8260B Low		1	09/20/17 15:45	C7I0344	CI72107
Acetone	ND (0.0500)		8260B Low		1	09/20/17 15:45	C7I0344	CI72107
Benzene	ND (0.0050)		8260B Low		1	09/20/17 15:45	C7I0344	CI72107
Bromobenzene	ND (0.0050)		8260B Low		1	09/20/17 15:45	C7I0344	CI72107



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TB-091817  
Date Sampled: 09/18/17 00:00  
Percent Solids: N/A  
Initial Volume: 5  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1709493  
ESS Laboratory Sample ID: 1709493-12  
Sample Matrix: Solid  
Units: mg/kg wet  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0050)		8260B Low		1	09/20/17 15:45	C7I0344	CI72107
Bromodichloromethane	ND (0.0050)		8260B Low		1	09/20/17 15:45	C7I0344	CI72107
Bromoform	ND (0.0050)		8260B Low		1	09/20/17 15:45	C7I0344	CI72107
Bromomethane	ND (0.0100)		8260B Low		1	09/20/17 15:45	C7I0344	CI72107
Carbon Disulfide	ND (0.0050)		8260B Low		1	09/20/17 15:45	C7I0344	CI72107
Carbon Tetrachloride	ND (0.0050)		8260B Low		1	09/20/17 15:45	C7I0344	CI72107
Chlorobenzene	ND (0.0050)		8260B Low		1	09/20/17 15:45	C7I0344	CI72107
Chloroethane	ND (0.0100)		8260B Low		1	09/20/17 15:45	C7I0344	CI72107
Chloroform	ND (0.0050)		8260B Low		1	09/20/17 15:45	C7I0344	CI72107
Chloromethane	ND (0.0100)		8260B Low		1	09/20/17 15:45	C7I0344	CI72107
cis-1,2-Dichloroethene	ND (0.0050)		8260B Low		1	09/20/17 15:45	C7I0344	CI72107
cis-1,3-Dichloropropene	ND (0.0050)		8260B Low		1	09/20/17 15:45	C7I0344	CI72107
Dibromochloromethane	ND (0.0050)		8260B Low		1	09/20/17 15:45	C7I0344	CI72107
Dibromomethane	ND (0.0050)		8260B Low		1	09/20/17 15:45	C7I0344	CI72107
Dichlorodifluoromethane	ND (0.0100)		8260B Low		1	09/20/17 15:45	C7I0344	CI72107
Diethyl Ether	ND (0.0050)		8260B Low		1	09/20/17 15:45	C7I0344	CI72107
Di-isopropyl ether	ND (0.0050)		8260B Low		1	09/20/17 15:45	C7I0344	CI72107
Ethyl tertiary-butyl ether	ND (0.0050)		8260B Low		1	09/20/17 15:45	C7I0344	CI72107
Ethylbenzene	ND (0.0050)		8260B Low		1	09/20/17 15:45	C7I0344	CI72107
Hexachlorobutadiene	ND (0.0050)		8260B Low		1	09/20/17 15:45	C7I0344	CI72107
Isopropylbenzene	ND (0.0050)		8260B Low		1	09/20/17 15:45	C7I0344	CI72107
Methyl tert-Butyl Ether	ND (0.0050)		8260B Low		1	09/20/17 15:45	C7I0344	CI72107
Methylene Chloride	ND (0.0250)		8260B Low		1	09/20/17 15:45	C7I0344	CI72107
Naphthalene	ND (0.0050)		8260B Low		1	09/20/17 15:45	C7I0344	CI72107
n-Butylbenzene	ND (0.0050)		8260B Low		1	09/20/17 15:45	C7I0344	CI72107
n-Propylbenzene	ND (0.0050)		8260B Low		1	09/20/17 15:45	C7I0344	CI72107
sec-Butylbenzene	ND (0.0050)		8260B Low		1	09/20/17 15:45	C7I0344	CI72107
Styrene	ND (0.0050)		8260B Low		1	09/20/17 15:45	C7I0344	CI72107
tert-Butylbenzene	ND (0.0050)		8260B Low		1	09/20/17 15:45	C7I0344	CI72107
Tertiary-amyl methyl ether	ND (0.0050)		8260B Low		1	09/20/17 15:45	C7I0344	CI72107
Tetrachloroethene	ND (0.0050)		8260B Low		1	09/20/17 15:45	C7I0344	CI72107
Tetrahydrofuran	ND (0.0050)		8260B Low		1	09/20/17 15:45	C7I0344	CI72107



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TB-091817  
Date Sampled: 09/18/17 00:00  
Percent Solids: N/A  
Initial Volume: 5  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1709493  
ESS Laboratory Sample ID: 1709493-12  
Sample Matrix: Solid  
Units: mg/kg wet  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0050)		8260B Low		1	09/20/17 15:45	C7I0344	CI72107
trans-1,2-Dichloroethene	ND (0.0050)		8260B Low		1	09/20/17 15:45	C7I0344	CI72107
trans-1,3-Dichloropropene	ND (0.0050)		8260B Low		1	09/20/17 15:45	C7I0344	CI72107
Trichloroethene	ND (0.0050)		8260B Low		1	09/20/17 15:45	C7I0344	CI72107
Trichlorofluoromethane	ND (0.0050)		8260B Low		1	09/20/17 15:45	C7I0344	CI72107
Vinyl Acetate	ND (0.0050)		8260B Low		1	09/20/17 15:45	C7I0344	CI72107
Vinyl Chloride	ND (0.0100)		8260B Low		1	09/20/17 15:45	C7I0344	CI72107
Xylene O	ND (0.0050)		8260B Low		1	09/20/17 15:45	C7I0344	CI72107
Xylene P,M	ND (0.0100)		8260B Low		1	09/20/17 15:45	C7I0344	CI72107
Xylenes (Total)	ND (0.0100)		8260B Low		1	09/20/17 15:45		[CALC]

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: 1,2-Dichloroethane-d4	98 %		70-130
Surrogate: 4-Bromofluorobenzene	104 %		70-130
Surrogate: Dibromofluoromethane	100 %		70-130
Surrogate: Toluene-d8	114 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-508 (0-2')  
Date Sampled: 09/18/17 11:15  
Percent Solids: 96

ESS Laboratory Work Order: 1709493  
ESS Laboratory Sample ID: 1709493-13  
Sample Matrix: Soil  
Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (4.64)		6010C		1	KJK	09/23/17 7:07	2.24	100	CI71937
<b>Arsenic</b>	<b>6.87</b> (2.32)		6010C		1	KJK	09/23/17 7:07	2.24	100	CI71937
<b>Beryllium</b>	<b>0.27</b> (0.10)		6010C		1	KJK	09/23/17 7:07	2.24	100	CI71937
Cadmium	ND (0.46)		6010C		1	KJK	09/23/17 22:26	2.24	100	CI71937
<b>Chromium</b>	<b>4.74</b> (0.93)		6010C		1	KJK	09/23/17 7:07	2.24	100	CI71937
<b>Copper</b>	<b>29.0</b> (2.32)		6010C		1	KJK	09/23/17 7:07	2.24	100	CI71937
<b>Lead</b>	<b>35.3</b> (4.64)		6010C		1	KJK	09/23/17 7:07	2.24	100	CI71937
<b>Mercury</b>	<b>0.179</b> (0.034)		7471B		1	MJV	09/21/17 22:05	0.6	40	CI71939
<b>Nickel</b>	<b>7.40</b> (2.32)		6010C		1	KJK	09/23/17 7:07	2.24	100	CI71937
Selenium	ND (4.64)		6020A		20	NAR	09/27/17 12:30	2.24	100	CI71937
Silver	ND (0.46)		6010C		1	KJK	09/23/17 22:26	2.24	100	CI71937
Thallium	ND (4.64)		6010C		1	KJK	09/23/17 7:07	2.24	100	CI71937
<b>Zinc</b>	<b>20.1</b> (2.32)		6010C		1	KJK	09/23/17 7:07	2.24	100	CI71937





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-508 (0-2')  
 Date Sampled: 09/18/17 11:15  
 Percent Solids: 96  
 Initial Volume: 4.7  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709493  
 ESS Laboratory Sample ID: 1709493-13  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0055)		8260B Low		1	09/20/17 23:21	C7I0344	CI72107
1,1,1-Trichloroethane	ND (0.0055)		8260B Low		1	09/20/17 23:21	C7I0344	CI72107
1,1,2,2-Tetrachloroethane	ND (0.0055)		8260B Low		1	09/20/17 23:21	C7I0344	CI72107
1,1,2-Trichloroethane	ND (0.0055)		8260B Low		1	09/20/17 23:21	C7I0344	CI72107
1,1-Dichloroethane	ND (0.0055)		8260B Low		1	09/20/17 23:21	C7I0344	CI72107
1,1-Dichloroethene	ND (0.0055)		8260B Low		1	09/20/17 23:21	C7I0344	CI72107
1,1-Dichloropropene	ND (0.0055)		8260B Low		1	09/20/17 23:21	C7I0344	CI72107
1,2,3-Trichlorobenzene	ND (0.0055)		8260B Low		1	09/20/17 23:21	C7I0344	CI72107
1,2,3-Trichloropropane	ND (0.0055)		8260B Low		1	09/20/17 23:21	C7I0344	CI72107
1,2,4-Trichlorobenzene	ND (0.0055)		8260B Low		1	09/20/17 23:21	C7I0344	CI72107
1,2,4-Trimethylbenzene	ND (0.0055)		8260B Low		1	09/20/17 23:21	C7I0344	CI72107
1,2-Dibromo-3-Chloropropane	ND (0.0055)		8260B Low		1	09/20/17 23:21	C7I0344	CI72107
1,2-Dibromoethane	ND (0.0055)		8260B Low		1	09/20/17 23:21	C7I0344	CI72107
1,2-Dichlorobenzene	ND (0.0055)		8260B Low		1	09/20/17 23:21	C7I0344	CI72107
1,2-Dichloroethane	ND (0.0055)		8260B Low		1	09/20/17 23:21	C7I0344	CI72107
1,2-Dichloropropane	ND (0.0055)		8260B Low		1	09/20/17 23:21	C7I0344	CI72107
1,3,5-Trimethylbenzene	ND (0.0055)		8260B Low		1	09/20/17 23:21	C7I0344	CI72107
1,3-Dichlorobenzene	ND (0.0055)		8260B Low		1	09/20/17 23:21	C7I0344	CI72107
1,3-Dichloropropane	ND (0.0055)		8260B Low		1	09/20/17 23:21	C7I0344	CI72107
1,4-Dichlorobenzene	ND (0.0055)		8260B Low		1	09/20/17 23:21	C7I0344	CI72107
1,4-Dioxane	ND (0.110)		8260B Low		1	09/20/17 23:21	C7I0344	CI72107
1-Chlorohexane	ND (0.0055)		8260B Low		1	09/20/17 23:21	C7I0344	CI72107
2,2-Dichloropropane	ND (0.0055)		8260B Low		1	09/20/17 23:21	C7I0344	CI72107
2-Butanone	ND (0.0552)		8260B Low		1	09/20/17 23:21	C7I0344	CI72107
2-Chlorotoluene	ND (0.0055)		8260B Low		1	09/20/17 23:21	C7I0344	CI72107
2-Hexanone	ND (0.0552)		8260B Low		1	09/20/17 23:21	C7I0344	CI72107
4-Chlorotoluene	ND (0.0055)		8260B Low		1	09/20/17 23:21	C7I0344	CI72107
4-Isopropyltoluene	ND (0.0055)		8260B Low		1	09/20/17 23:21	C7I0344	CI72107
4-Methyl-2-Pentanone	ND (0.0552)		8260B Low		1	09/20/17 23:21	C7I0344	CI72107
<b>Acetone</b>	<b>0.160 (0.0552)</b>		8260B Low		1	09/20/17 23:21	C7I0344	CI72107
Benzene	ND (0.0055)		8260B Low		1	09/20/17 23:21	C7I0344	CI72107
Bromobenzene	ND (0.0055)		8260B Low		1	09/20/17 23:21	C7I0344	CI72107



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-508 (0-2')  
 Date Sampled: 09/18/17 11:15  
 Percent Solids: 96  
 Initial Volume: 4.7  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709493  
 ESS Laboratory Sample ID: 1709493-13  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0055)		8260B Low		1	09/20/17 23:21	C7I0344	CI72107
Bromodichloromethane	ND (0.0055)		8260B Low		1	09/20/17 23:21	C7I0344	CI72107
Bromoform	ND (0.0055)		8260B Low		1	09/20/17 23:21	C7I0344	CI72107
Bromomethane	ND (0.0110)		8260B Low		1	09/20/17 23:21	C7I0344	CI72107
Carbon Disulfide	ND (0.0055)		8260B Low		1	09/20/17 23:21	C7I0344	CI72107
Carbon Tetrachloride	ND (0.0055)		8260B Low		1	09/20/17 23:21	C7I0344	CI72107
Chlorobenzene	ND (0.0055)		8260B Low		1	09/20/17 23:21	C7I0344	CI72107
Chloroethane	ND (0.0110)		8260B Low		1	09/20/17 23:21	C7I0344	CI72107
Chloroform	ND (0.0055)		8260B Low		1	09/20/17 23:21	C7I0344	CI72107
Chloromethane	ND (0.0110)		8260B Low		1	09/20/17 23:21	C7I0344	CI72107
cis-1,2-Dichloroethene	ND (0.0055)		8260B Low		1	09/20/17 23:21	C7I0344	CI72107
cis-1,3-Dichloropropene	ND (0.0055)		8260B Low		1	09/20/17 23:21	C7I0344	CI72107
Dibromochloromethane	ND (0.0055)		8260B Low		1	09/20/17 23:21	C7I0344	CI72107
Dibromomethane	ND (0.0055)		8260B Low		1	09/20/17 23:21	C7I0344	CI72107
Dichlorodifluoromethane	ND (0.0110)		8260B Low		1	09/20/17 23:21	C7I0344	CI72107
Diethyl Ether	ND (0.0055)		8260B Low		1	09/20/17 23:21	C7I0344	CI72107
Di-isopropyl ether	ND (0.0055)		8260B Low		1	09/20/17 23:21	C7I0344	CI72107
Ethyl tertiary-butyl ether	ND (0.0055)		8260B Low		1	09/20/17 23:21	C7I0344	CI72107
Ethylbenzene	ND (0.0055)		8260B Low		1	09/20/17 23:21	C7I0344	CI72107
Hexachlorobutadiene	ND (0.0055)		8260B Low		1	09/20/17 23:21	C7I0344	CI72107
Isopropylbenzene	ND (0.0055)		8260B Low		1	09/20/17 23:21	C7I0344	CI72107
Methyl tert-Butyl Ether	ND (0.0055)		8260B Low		1	09/20/17 23:21	C7I0344	CI72107
Methylene Chloride	ND (0.0276)		8260B Low		1	09/20/17 23:21	C7I0344	CI72107
Naphthalene	ND (0.0055)		8260B Low		1	09/20/17 23:21	C7I0344	CI72107
n-Butylbenzene	ND (0.0055)		8260B Low		1	09/20/17 23:21	C7I0344	CI72107
n-Propylbenzene	ND (0.0055)		8260B Low		1	09/20/17 23:21	C7I0344	CI72107
sec-Butylbenzene	ND (0.0055)		8260B Low		1	09/20/17 23:21	C7I0344	CI72107
Styrene	ND (0.0055)		8260B Low		1	09/20/17 23:21	C7I0344	CI72107
tert-Butylbenzene	ND (0.0055)		8260B Low		1	09/20/17 23:21	C7I0344	CI72107
Tertiary-amyl methyl ether	ND (0.0055)		8260B Low		1	09/20/17 23:21	C7I0344	CI72107
Tetrachloroethene	ND (0.0055)		8260B Low		1	09/20/17 23:21	C7I0344	CI72107
Tetrahydrofuran	ND (0.0055)		8260B Low		1	09/20/17 23:21	C7I0344	CI72107



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-508 (0-2')  
 Date Sampled: 09/18/17 11:15  
 Percent Solids: 96  
 Initial Volume: 4.7  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709493  
 ESS Laboratory Sample ID: 1709493-13  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0055)		8260B Low		1	09/20/17 23:21	C7I0344	CI72107
trans-1,2-Dichloroethene	ND (0.0055)		8260B Low		1	09/20/17 23:21	C7I0344	CI72107
trans-1,3-Dichloropropene	ND (0.0055)		8260B Low		1	09/20/17 23:21	C7I0344	CI72107
Trichloroethene	ND (0.0055)		8260B Low		1	09/20/17 23:21	C7I0344	CI72107
Trichlorofluoromethane	ND (0.0055)		8260B Low		1	09/20/17 23:21	C7I0344	CI72107
Vinyl Acetate	ND (0.0055)		8260B Low		1	09/20/17 23:21	C7I0344	CI72107
Vinyl Chloride	ND (0.0110)		8260B Low		1	09/20/17 23:21	C7I0344	CI72107
Xylene O	ND (0.0055)		8260B Low		1	09/20/17 23:21	C7I0344	CI72107
Xylene P,M	ND (0.0110)		8260B Low		1	09/20/17 23:21	C7I0344	CI72107
Xylenes (Total)	ND (0.0110)		8260B Low		1	09/20/17 23:21		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	98 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	98 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	100 %		70-130
<i>Surrogate: Toluene-d8</i>	121 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-508 (0-2')  
 Date Sampled: 09/18/17 11:15  
 Percent Solids: 96  
 Initial Volume: 19  
 Final Volume: 1  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709493  
 ESS Laboratory Sample ID: 1709493-13  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: SMR  
 Prepared: 9/20/17 14:15

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	ND (41.0)		8100M		1	09/22/17 3:47	C710356	CI72018
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		66 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-508 (0-2')  
Date Sampled: 09/18/17 11:15  
Percent Solids: 96  
Initial Volume: 14  
Final Volume: 0.5  
Extraction Method: 3546

ESS Laboratory Work Order: 1709493  
ESS Laboratory Sample ID: 1709493-13  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: TJ  
Prepared: 9/20/17 13:17

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.371)		8270D		1	09/22/17 18:36	C7I0365	CI72016
Acenaphthene	ND (0.371)		8270D		1	09/22/17 18:36	C7I0365	CI72016
Acenaphthylene	ND (0.371)		8270D		1	09/22/17 18:36	C7I0365	CI72016
Anthracene	ND (0.371)		8270D		1	09/22/17 18:36	C7I0365	CI72016
Benzo(a)anthracene	ND (0.371)		8270D		1	09/22/17 18:36	C7I0365	CI72016
Benzo(a)pyrene	ND (0.186)		8270D		1	09/22/17 18:36	C7I0365	CI72016
Benzo(b)fluoranthene	ND (0.371)		8270D		1	09/22/17 18:36	C7I0365	CI72016
Benzo(g,h,i)perylene	ND (0.371)		8270D		1	09/22/17 18:36	C7I0365	CI72016
Benzo(k)fluoranthene	ND (0.371)		8270D		1	09/22/17 18:36	C7I0365	CI72016
Chrysene	ND (0.186)		8270D		1	09/22/17 18:36	C7I0365	CI72016
Dibenzo(a,h)Anthracene	ND (0.186)		8270D		1	09/22/17 18:36	C7I0365	CI72016
Fluoranthene	ND (0.371)		8270D		1	09/22/17 18:36	C7I0365	CI72016
Fluorene	ND (0.371)		8270D		1	09/22/17 18:36	C7I0365	CI72016
Indeno(1,2,3-cd)Pyrene	ND (0.371)		8270D		1	09/22/17 18:36	C7I0365	CI72016
Naphthalene	ND (0.371)		8270D		1	09/22/17 18:36	C7I0365	CI72016
Phenanthrene	ND (0.371)		8270D		1	09/22/17 18:36	C7I0365	CI72016
Pyrene	ND (0.371)		8270D		1	09/22/17 18:36	C7I0365	CI72016

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	77 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	87 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	64 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	93 %		30-130





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-508 (0-2')  
Date Sampled: 09/18/17 11:15  
Percent Solids: 96

ESS Laboratory Work Order: 1709493  
ESS Laboratory Sample ID: 1709493-13  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	ND (0.95)		9014		1	EEM	09/22/17 11:20	mg/kg dry	C172210



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-508 (4-5')  
 Date Sampled: 09/18/17 11:30  
 Percent Solids: 89

ESS Laboratory Work Order: 1709493  
 ESS Laboratory Sample ID: 1709493-14  
 Sample Matrix: Soil  
 Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (5.17)		6010C		1	KJK	09/23/17 7:11	2.18	100	CI71937
Arsenic	<b>27.8</b> (2.59)		6010C		1	KJK	09/23/17 7:11	2.18	100	CI71937
Beryllium	<b>0.23</b> (0.11)		6010C		1	KJK	09/23/17 7:11	2.18	100	CI71937
Cadmium	ND (0.52)		6010C		1	KJK	09/23/17 22:30	2.18	100	CI71937
Chromium	<b>6.38</b> (1.03)		6010C		1	KJK	09/23/17 7:11	2.18	100	CI71937
Copper	<b>10.8</b> (2.59)		6010C		1	KJK	09/23/17 7:11	2.18	100	CI71937
Lead	<b>23.0</b> (5.17)		6010C		1	KJK	09/23/17 7:11	2.18	100	CI71937
Mercury	<b>0.103</b> (0.029)		7471B		1	MJV	09/21/17 22:07	0.78	40	CI71939
Nickel	<b>6.03</b> (2.59)		6010C		1	KJK	09/23/17 7:11	2.18	100	CI71937
Selenium	ND (5.17)		6020A		20	NAR	09/27/17 12:35	2.18	100	CI71937
Silver	ND (0.52)		6010C		1	KJK	09/23/17 22:30	2.18	100	CI71937
Thallium	ND (5.17)		6010C		1	KJK	09/23/17 7:11	2.18	100	CI71937
Zinc	<b>21.9</b> (2.59)		6010C		1	KJK	09/23/17 7:11	2.18	100	CI71937



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-508 (4-5')  
 Date Sampled: 09/18/17 11:30  
 Percent Solids: 89  
 Initial Volume: 4.9  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709493  
 ESS Laboratory Sample ID: 1709493-14  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0058)		8260B Low		1	09/20/17 23:47	C7I0344	CI72107
1,1,1-Trichloroethane	ND (0.0058)		8260B Low		1	09/20/17 23:47	C7I0344	CI72107
1,1,2,2-Tetrachloroethane	ND (0.0058)		8260B Low		1	09/20/17 23:47	C7I0344	CI72107
1,1,2-Trichloroethane	ND (0.0058)		8260B Low		1	09/20/17 23:47	C7I0344	CI72107
1,1-Dichloroethane	ND (0.0058)		8260B Low		1	09/20/17 23:47	C7I0344	CI72107
1,1-Dichloroethene	ND (0.0058)		8260B Low		1	09/20/17 23:47	C7I0344	CI72107
1,1-Dichloropropene	ND (0.0058)		8260B Low		1	09/20/17 23:47	C7I0344	CI72107
1,2,3-Trichlorobenzene	ND (0.0058)		8260B Low		1	09/20/17 23:47	C7I0344	CI72107
1,2,3-Trichloropropane	ND (0.0058)		8260B Low		1	09/20/17 23:47	C7I0344	CI72107
1,2,4-Trichlorobenzene	ND (0.0058)		8260B Low		1	09/20/17 23:47	C7I0344	CI72107
1,2,4-Trimethylbenzene	ND (0.0058)		8260B Low		1	09/20/17 23:47	C7I0344	CI72107
1,2-Dibromo-3-Chloropropane	ND (0.0058)		8260B Low		1	09/20/17 23:47	C7I0344	CI72107
1,2-Dibromoethane	ND (0.0058)		8260B Low		1	09/20/17 23:47	C7I0344	CI72107
1,2-Dichlorobenzene	ND (0.0058)		8260B Low		1	09/20/17 23:47	C7I0344	CI72107
1,2-Dichloroethane	ND (0.0058)		8260B Low		1	09/20/17 23:47	C7I0344	CI72107
1,2-Dichloropropane	ND (0.0058)		8260B Low		1	09/20/17 23:47	C7I0344	CI72107
1,3,5-Trimethylbenzene	ND (0.0058)		8260B Low		1	09/20/17 23:47	C7I0344	CI72107
1,3-Dichlorobenzene	ND (0.0058)		8260B Low		1	09/20/17 23:47	C7I0344	CI72107
1,3-Dichloropropane	ND (0.0058)		8260B Low		1	09/20/17 23:47	C7I0344	CI72107
1,4-Dichlorobenzene	ND (0.0058)		8260B Low		1	09/20/17 23:47	C7I0344	CI72107
1,4-Dioxane	ND (0.115)		8260B Low		1	09/20/17 23:47	C7I0344	CI72107
1-Chlorohexane	ND (0.0058)		8260B Low		1	09/20/17 23:47	C7I0344	CI72107
2,2-Dichloropropane	ND (0.0058)		8260B Low		1	09/20/17 23:47	C7I0344	CI72107
2-Butanone	ND (0.0575)		8260B Low		1	09/20/17 23:47	C7I0344	CI72107
2-Chlorotoluene	ND (0.0058)		8260B Low		1	09/20/17 23:47	C7I0344	CI72107
2-Hexanone	ND (0.0575)		8260B Low		1	09/20/17 23:47	C7I0344	CI72107
4-Chlorotoluene	ND (0.0058)		8260B Low		1	09/20/17 23:47	C7I0344	CI72107
4-Isopropyltoluene	ND (0.0058)		8260B Low		1	09/20/17 23:47	C7I0344	CI72107
4-Methyl-2-Pentanone	ND (0.0575)		8260B Low		1	09/20/17 23:47	C7I0344	CI72107
Acetone	ND (0.0575)		8260B Low		1	09/20/17 23:47	C7I0344	CI72107
Benzene	ND (0.0058)		8260B Low		1	09/20/17 23:47	C7I0344	CI72107
Bromobenzene	ND (0.0058)		8260B Low		1	09/20/17 23:47	C7I0344	CI72107



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-508 (4-5')  
 Date Sampled: 09/18/17 11:30  
 Percent Solids: 89  
 Initial Volume: 4.9  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709493  
 ESS Laboratory Sample ID: 1709493-14  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0058)		8260B Low		1	09/20/17 23:47	C7I0344	CI72107
Bromodichloromethane	ND (0.0058)		8260B Low		1	09/20/17 23:47	C7I0344	CI72107
Bromoform	ND (0.0058)		8260B Low		1	09/20/17 23:47	C7I0344	CI72107
Bromomethane	ND (0.0115)		8260B Low		1	09/20/17 23:47	C7I0344	CI72107
Carbon Disulfide	ND (0.0058)		8260B Low		1	09/20/17 23:47	C7I0344	CI72107
Carbon Tetrachloride	ND (0.0058)		8260B Low		1	09/20/17 23:47	C7I0344	CI72107
Chlorobenzene	ND (0.0058)		8260B Low		1	09/20/17 23:47	C7I0344	CI72107
Chloroethane	ND (0.0115)		8260B Low		1	09/20/17 23:47	C7I0344	CI72107
Chloroform	ND (0.0058)		8260B Low		1	09/20/17 23:47	C7I0344	CI72107
Chloromethane	ND (0.0115)		8260B Low		1	09/20/17 23:47	C7I0344	CI72107
cis-1,2-Dichloroethene	ND (0.0058)		8260B Low		1	09/20/17 23:47	C7I0344	CI72107
cis-1,3-Dichloropropene	ND (0.0058)		8260B Low		1	09/20/17 23:47	C7I0344	CI72107
Dibromochloromethane	ND (0.0058)		8260B Low		1	09/20/17 23:47	C7I0344	CI72107
Dibromomethane	ND (0.0058)		8260B Low		1	09/20/17 23:47	C7I0344	CI72107
Dichlorodifluoromethane	ND (0.0115)		8260B Low		1	09/20/17 23:47	C7I0344	CI72107
Diethyl Ether	ND (0.0058)		8260B Low		1	09/20/17 23:47	C7I0344	CI72107
Di-isopropyl ether	ND (0.0058)		8260B Low		1	09/20/17 23:47	C7I0344	CI72107
Ethyl tertiary-butyl ether	ND (0.0058)		8260B Low		1	09/20/17 23:47	C7I0344	CI72107
Ethylbenzene	ND (0.0058)		8260B Low		1	09/20/17 23:47	C7I0344	CI72107
Hexachlorobutadiene	ND (0.0058)		8260B Low		1	09/20/17 23:47	C7I0344	CI72107
Isopropylbenzene	ND (0.0058)		8260B Low		1	09/20/17 23:47	C7I0344	CI72107
Methyl tert-Butyl Ether	ND (0.0058)		8260B Low		1	09/20/17 23:47	C7I0344	CI72107
Methylene Chloride	ND (0.0288)		8260B Low		1	09/20/17 23:47	C7I0344	CI72107
Naphthalene	ND (0.0058)		8260B Low		1	09/20/17 23:47	C7I0344	CI72107
n-Butylbenzene	ND (0.0058)		8260B Low		1	09/20/17 23:47	C7I0344	CI72107
n-Propylbenzene	ND (0.0058)		8260B Low		1	09/20/17 23:47	C7I0344	CI72107
sec-Butylbenzene	ND (0.0058)		8260B Low		1	09/20/17 23:47	C7I0344	CI72107
Styrene	ND (0.0058)		8260B Low		1	09/20/17 23:47	C7I0344	CI72107
tert-Butylbenzene	ND (0.0058)		8260B Low		1	09/20/17 23:47	C7I0344	CI72107
Tertiary-amyl methyl ether	ND (0.0058)		8260B Low		1	09/20/17 23:47	C7I0344	CI72107
Tetrachloroethene	ND (0.0058)		8260B Low		1	09/20/17 23:47	C7I0344	CI72107
Tetrahydrofuran	ND (0.0058)		8260B Low		1	09/20/17 23:47	C7I0344	CI72107



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-508 (4-5')  
 Date Sampled: 09/18/17 11:30  
 Percent Solids: 89  
 Initial Volume: 4.9  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709493  
 ESS Laboratory Sample ID: 1709493-14  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0058)		8260B Low		1	09/20/17 23:47	C7I0344	CI72107
trans-1,2-Dichloroethene	ND (0.0058)		8260B Low		1	09/20/17 23:47	C7I0344	CI72107
trans-1,3-Dichloropropene	ND (0.0058)		8260B Low		1	09/20/17 23:47	C7I0344	CI72107
Trichloroethene	ND (0.0058)		8260B Low		1	09/20/17 23:47	C7I0344	CI72107
Trichlorofluoromethane	ND (0.0058)		8260B Low		1	09/20/17 23:47	C7I0344	CI72107
Vinyl Acetate	ND (0.0058)		8260B Low		1	09/20/17 23:47	C7I0344	CI72107
Vinyl Chloride	ND (0.0115)		8260B Low		1	09/20/17 23:47	C7I0344	CI72107
Xylene O	ND (0.0058)		8260B Low		1	09/20/17 23:47	C7I0344	CI72107
Xylene P,M	ND (0.0115)		8260B Low		1	09/20/17 23:47	C7I0344	CI72107
Xylenes (Total)	ND (0.0115)		8260B Low		1	09/20/17 23:47		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	98 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	107 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	100 %		70-130
<i>Surrogate: Toluene-d8</i>	115 %		70-130





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: TP-508 (4-5')  
 Date Sampled: 09/18/17 11:30  
 Percent Solids: 89  
 Initial Volume: 19.3  
 Final Volume: 1  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709493  
 ESS Laboratory Sample ID: 1709493-14  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: SMR  
 Prepared: 9/20/17 14:15

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	77.6 (43.8)		8100M		1	09/22/17 4:25	C710356	CI72018
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		83 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-508 (4-5')  
Date Sampled: 09/18/17 11:30  
Percent Solids: 89  
Initial Volume: 14.6  
Final Volume: 0.5  
Extraction Method: 3546

ESS Laboratory Work Order: 1709493  
ESS Laboratory Sample ID: 1709493-14  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: TJ  
Prepared: 9/20/17 13:17

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.386)		8270D		1	09/22/17 18:01	C7I0365	CI72016
Acenaphthene	ND (0.386)		8270D		1	09/22/17 18:01	C7I0365	CI72016
Acenaphthylene	ND (0.386)		8270D		1	09/22/17 18:01	C7I0365	CI72016
Anthracene	ND (0.386)		8270D		1	09/22/17 18:01	C7I0365	CI72016
<b>Benzo(a)anthracene</b>	<b>1.09</b> (0.386)		8270D		1	09/22/17 18:01	C7I0365	CI72016
<b>Benzo(a)pyrene</b>	<b>0.797</b> (0.193)		8270D		1	09/22/17 18:01	C7I0365	CI72016
<b>Benzo(b)fluoranthene</b>	<b>0.662</b> (0.386)		8270D		1	09/22/17 18:01	C7I0365	CI72016
<b>Benzo(g,h,i)perylene</b>	<b>0.488</b> (0.386)		8270D		1	09/22/17 18:01	C7I0365	CI72016
<b>Benzo(k)fluoranthene</b>	<b>0.657</b> (0.386)		8270D		1	09/22/17 18:01	C7I0365	CI72016
<b>Chrysene</b>	<b>1.05</b> (0.193)		8270D		1	09/22/17 18:01	C7I0365	CI72016
<b>Dibenzo(a,h)Anthracene</b>	<b>0.263</b> (0.193)		8270D		1	09/22/17 18:01	C7I0365	CI72016
<b>Fluoranthene</b>	<b>2.20</b> (0.386)		8270D		1	09/22/17 18:01	C7I0365	CI72016
Fluorene	ND (0.386)		8270D		1	09/22/17 18:01	C7I0365	CI72016
<b>Indeno(1,2,3-cd)Pyrene</b>	<b>0.438</b> (0.386)		8270D		1	09/22/17 18:01	C7I0365	CI72016
Naphthalene	ND (0.386)		8270D		1	09/22/17 18:01	C7I0365	CI72016
<b>Phenanthrene</b>	<b>0.885</b> (0.386)		8270D		1	09/22/17 18:01	C7I0365	CI72016
<b>Pyrene</b>	<b>1.93</b> (0.386)		8270D		1	09/22/17 18:01	C7I0365	CI72016

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	54 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	58 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	45 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	63 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: TP-508 (4-5')  
Date Sampled: 09/18/17 11:30  
Percent Solids: 89

ESS Laboratory Work Order: 1709493  
ESS Laboratory Sample ID: 1709493-14  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	2.71 (1.10)		9014		1	EEM	09/22/17 11:20	mg/kg dry	CI72210



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility

ESS Laboratory Work Order: 1709493

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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**Total Metals**

**Batch CI71937 - 3050B**

**Blank**

Antimony	ND	5.00	mg/kg wet
Arsenic	ND	2.50	mg/kg wet
Beryllium	ND	0.11	mg/kg wet
Cadmium	ND	0.50	mg/kg wet
Chromium	ND	1.00	mg/kg wet
Copper	ND	2.50	mg/kg wet
Lead	ND	5.00	mg/kg wet
Nickel	ND	2.50	mg/kg wet
Selenium	ND	0.50	mg/kg wet
Silver	ND	0.50	mg/kg wet
Thallium	ND	5.00	mg/kg wet
Zinc	ND	2.50	mg/kg wet

**LCS**

Antimony	36.3	18.2	mg/kg wet	48.00	76	0-238			
Copper	63.2	9.09	mg/kg wet	78.90	80	80-120			
Lead	109	18.2	mg/kg wet	145.0	75	80-120			B-
Selenium	40.6	4.55	mg/kg wet	42.40	96	80-120			
Silver	73.6	1.82	mg/kg wet	81.60	90	80-120			
Thallium	43.0	18.2	mg/kg wet	52.00	83	80-120			

**LCS**

Arsenic	28.1	9.43	mg/kg wet	52.60	53	40-73			
Beryllium	78.3	0.42	mg/kg wet	96.40	81	80-120			
Cadmium	62.3	1.89	mg/kg wet	76.80	81	80-120			
Chromium	86.2	3.77	mg/kg wet	111.0	78	74-110			
Lead	114	18.9	mg/kg wet	146.0	78	78-112			
Nickel	109	9.43	mg/kg wet	141.0	78	76-107			
Zinc	175	9.43	mg/kg wet	212.0	83	80-120			

**LCS Dup**

Antimony	46.6	17.5	mg/kg wet	48.00	97	0-238	25	20	D+
Copper	70.5	8.77	mg/kg wet	78.90	89	80-120	11	20	
Lead	124	17.5	mg/kg wet	145.0	85	80-120	13	20	
Selenium	42.0	4.39	mg/kg wet	42.40	99	80-120	3	30	
Silver	73.2	1.75	mg/kg wet	81.60	90	80-120	0.6	20	
Thallium	33.3	17.5	mg/kg wet	52.00	64	80-120	25	20	B-

**LCS Dup**

Arsenic	27.5	9.09	mg/kg wet	52.60	52	40-73	2	20	
Beryllium	82.9	0.40	mg/kg wet	96.40	86	80-120	6	20	
Cadmium	64.1	1.82	mg/kg wet	76.80	83	80-120	3	20	
Chromium	87.5	3.64	mg/kg wet	111.0	79	74-110	1	20	
Lead	112	18.2	mg/kg wet	146.0	77	78-112	2	20	B-
Nickel	112	9.09	mg/kg wet	141.0	79	76-107	2	20	
Zinc	176	9.09	mg/kg wet	212.0	83	80-120	0.9	20	

**Batch CI71939 - 7471B**



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility

ESS Laboratory Work Order: 1709493

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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Total Metals

**Batch CI71939 - 7471B**

<b>Blank</b>										
Mercury	ND	0.033	mg/kg wet							
<b>LCS</b>										
Mercury	6.68	0.733	mg/kg wet	6.650		100	80-120			
<b>LCS Dup</b>										
Mercury	8.22	0.671	mg/kg wet	6.650		124	80-120	21	20	B++

5035/8260B Volatile Organic Compounds / Low Level

**Batch CI72107 - 5035**

<b>Blank</b>			
1,1,1,2-Tetrachloroethane	ND	0.0050	mg/kg wet
1,1,1-Trichloroethane	ND	0.0050	mg/kg wet
1,1,2,2-Tetrachloroethane	ND	0.0050	mg/kg wet
1,1,2-Trichloroethane	ND	0.0050	mg/kg wet
1,1-Dichloroethane	ND	0.0050	mg/kg wet
1,1-Dichloroethene	ND	0.0050	mg/kg wet
1,1-Dichloropropene	ND	0.0050	mg/kg wet
1,2,3-Trichlorobenzene	ND	0.0050	mg/kg wet
1,2,3-Trichloropropane	ND	0.0050	mg/kg wet
1,2,4-Trichlorobenzene	ND	0.0050	mg/kg wet
1,2,4-Trimethylbenzene	ND	0.0050	mg/kg wet
1,2-Dibromo-3-Chloropropane	ND	0.0050	mg/kg wet
1,2-Dibromoethane	ND	0.0050	mg/kg wet
1,2-Dichlorobenzene	ND	0.0050	mg/kg wet
1,2-Dichloroethane	ND	0.0050	mg/kg wet
1,2-Dichloropropane	ND	0.0050	mg/kg wet
1,3,5-Trimethylbenzene	ND	0.0050	mg/kg wet
1,3-Dichlorobenzene	ND	0.0050	mg/kg wet
1,3-Dichloropropane	ND	0.0050	mg/kg wet
1,4-Dichlorobenzene	ND	0.0050	mg/kg wet
1,4-Dioxane	ND	0.100	mg/kg wet
1-Chlorohexane	ND	0.0050	mg/kg wet
2,2-Dichloropropane	ND	0.0050	mg/kg wet
2-Butanone	ND	0.0500	mg/kg wet
2-Chlorotoluene	ND	0.0050	mg/kg wet
2-Hexanone	ND	0.0500	mg/kg wet
4-Chlorotoluene	ND	0.0050	mg/kg wet
4-Isopropyltoluene	ND	0.0050	mg/kg wet
4-Methyl-2-Pentanone	ND	0.0500	mg/kg wet
Acetone	ND	0.0500	mg/kg wet
Benzene	ND	0.0050	mg/kg wet
Bromobenzene	ND	0.0050	mg/kg wet
Bromochloromethane	ND	0.0050	mg/kg wet
Bromodichloromethane	ND	0.0050	mg/kg wet





CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility

ESS Laboratory Work Order: 1709493

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CI72107 - 5035**

Bromoform	ND	0.0050	mg/kg wet							
Bromomethane	ND	0.0100	mg/kg wet							
Carbon Disulfide	ND	0.0050	mg/kg wet							
Carbon Tetrachloride	ND	0.0050	mg/kg wet							
Chlorobenzene	ND	0.0050	mg/kg wet							
Chloroethane	ND	0.0100	mg/kg wet							
Chloroform	ND	0.0050	mg/kg wet							
Chloromethane	ND	0.0100	mg/kg wet							
cis-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
cis-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Dibromochloromethane	ND	0.0050	mg/kg wet							
Dibromomethane	ND	0.0050	mg/kg wet							
Dichlorodifluoromethane	ND	0.0100	mg/kg wet							
Diethyl Ether	ND	0.0050	mg/kg wet							
Di-isopropyl ether	ND	0.0050	mg/kg wet							
Ethyl tertiary-butyl ether	ND	0.0050	mg/kg wet							
Ethylbenzene	ND	0.0050	mg/kg wet							
Hexachlorobutadiene	ND	0.0050	mg/kg wet							
Isopropylbenzene	ND	0.0050	mg/kg wet							
Methyl tert-Butyl Ether	ND	0.0050	mg/kg wet							
Methylene Chloride	ND	0.0250	mg/kg wet							
Naphthalene	ND	0.0050	mg/kg wet							
n-Butylbenzene	ND	0.0050	mg/kg wet							
n-Propylbenzene	ND	0.0050	mg/kg wet							
sec-Butylbenzene	ND	0.0050	mg/kg wet							
Styrene	ND	0.0050	mg/kg wet							
tert-Butylbenzene	ND	0.0050	mg/kg wet							
Tertiary-amyl methyl ether	ND	0.0050	mg/kg wet							
Tetrachloroethene	ND	0.0050	mg/kg wet							
Tetrahydrofuran	ND	0.0050	mg/kg wet							
Toluene	ND	0.0050	mg/kg wet							
trans-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
trans-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Trichloroethene	ND	0.0050	mg/kg wet							
Trichlorofluoromethane	ND	0.0050	mg/kg wet							
Vinyl Acetate	ND	0.0050	mg/kg wet							
Vinyl Chloride	ND	0.0100	mg/kg wet							
Xylene O	ND	0.0050	mg/kg wet							
Xylene P,M	ND	0.0100	mg/kg wet							
Xylenes (Total)	ND	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	0.0489		mg/kg wet	0.05000		98	70-130			
Surrogate: 4-Bromofluorobenzene	0.0516		mg/kg wet	0.05000		103	70-130			
Surrogate: Dibromofluoromethane	0.0504		mg/kg wet	0.05000		101	70-130			
Surrogate: Toluene-d8	0.0569		mg/kg wet	0.05000		114	70-130			

**LCS**



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility

ESS Laboratory Work Order: 1709493

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CI72107 - 5035**

1,1,1,2-Tetrachloroethane	0.0518	0.0050	mg/kg wet	0.05000		104	70-130			
1,1,1-Trichloroethane	0.0548	0.0050	mg/kg wet	0.05000		110	70-130			
1,1,2,2-Tetrachloroethane	0.0519	0.0050	mg/kg wet	0.05000		104	70-130			
1,1,2-Trichloroethane	0.0465	0.0050	mg/kg wet	0.05000		93	70-130			
1,1-Dichloroethane	0.0502	0.0050	mg/kg wet	0.05000		100	70-130			
1,1-Dichloroethene	0.0562	0.0050	mg/kg wet	0.05000		112	70-130			
1,1-Dichloropropene	0.0553	0.0050	mg/kg wet	0.05000		111	70-130			
1,2,3-Trichlorobenzene	0.0487	0.0050	mg/kg wet	0.05000		97	70-130			
1,2,3-Trichloropropane	0.0478	0.0050	mg/kg wet	0.05000		96	70-130			
1,2,4-Trichlorobenzene	0.0491	0.0050	mg/kg wet	0.05000		98	70-130			
1,2,4-Trimethylbenzene	0.0499	0.0050	mg/kg wet	0.05000		100	70-130			
1,2-Dibromo-3-Chloropropane	0.0475	0.0050	mg/kg wet	0.05000		95	70-130			
1,2-Dibromoethane	0.0503	0.0050	mg/kg wet	0.05000		101	70-130			
1,2-Dichlorobenzene	0.0532	0.0050	mg/kg wet	0.05000		106	70-130			
1,2-Dichloroethane	0.0507	0.0050	mg/kg wet	0.05000		101	70-130			
1,2-Dichloropropane	0.0520	0.0050	mg/kg wet	0.05000		104	70-130			
1,3,5-Trimethylbenzene	0.0500	0.0050	mg/kg wet	0.05000		100	70-130			
1,3-Dichlorobenzene	0.0520	0.0050	mg/kg wet	0.05000		104	70-130			
1,3-Dichloropropane	0.0576	0.0050	mg/kg wet	0.05000		115	70-130			
1,4-Dichlorobenzene	0.0540	0.0050	mg/kg wet	0.05000		108	70-130			
1,4-Dioxane	0.953	0.100	mg/kg wet	1.000		95	70-130			
1-Chlorohexane	0.0490	0.0050	mg/kg wet	0.05000		98	70-130			
2,2-Dichloropropane	0.0486	0.0050	mg/kg wet	0.05000		97	70-130			
2-Butanone	0.258	0.0500	mg/kg wet	0.2500		103	70-130			
2-Chlorotoluene	0.0533	0.0050	mg/kg wet	0.05000		107	70-130			
2-Hexanone	0.245	0.0500	mg/kg wet	0.2500		98	70-130			
4-Chlorotoluene	0.0542	0.0050	mg/kg wet	0.05000		108	70-130			
4-Isopropyltoluene	0.0545	0.0050	mg/kg wet	0.05000		109	70-130			
4-Methyl-2-Pentanone	0.231	0.0500	mg/kg wet	0.2500		92	70-130			
Acetone	0.237	0.0500	mg/kg wet	0.2500		95	70-130			
Benzene	0.0516	0.0050	mg/kg wet	0.05000		103	70-130			
Bromobenzene	0.0484	0.0050	mg/kg wet	0.05000		97	70-130			
Bromochloromethane	0.0507	0.0050	mg/kg wet	0.05000		101	70-130			
Bromodichloromethane	0.0460	0.0050	mg/kg wet	0.05000		92	70-130			
Bromoform	0.0556	0.0050	mg/kg wet	0.05000		111	70-130			
Bromomethane	0.0442	0.0100	mg/kg wet	0.05000		88	70-130			
Carbon Disulfide	0.0555	0.0050	mg/kg wet	0.05000		111	70-130			
Carbon Tetrachloride	0.0497	0.0050	mg/kg wet	0.05000		99	70-130			
Chlorobenzene	0.0544	0.0050	mg/kg wet	0.05000		109	70-130			
Chloroethane	0.0489	0.0100	mg/kg wet	0.05000		98	70-130			
Chloroform	0.0509	0.0050	mg/kg wet	0.05000		102	70-130			
Chloromethane	0.0466	0.0100	mg/kg wet	0.05000		93	70-130			
cis-1,2-Dichloroethene	0.0514	0.0050	mg/kg wet	0.05000		103	70-130			
cis-1,3-Dichloropropene	0.0485	0.0050	mg/kg wet	0.05000		97	70-130			
Dibromochloromethane	0.0484	0.0050	mg/kg wet	0.05000		97	70-130			



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility

ESS Laboratory Work Order: 1709493

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CI72107 - 5035**

Dibromomethane	0.0497	0.0050	mg/kg wet	0.05000		99	70-130			
Dichlorodifluoromethane	0.0377	0.0100	mg/kg wet	0.05000		75	70-130			
Diethyl Ether	0.0488	0.0050	mg/kg wet	0.05000		98	70-130			
Di-isopropyl ether	0.0512	0.0050	mg/kg wet	0.05000		102	70-130			
Ethyl tertiary-butyl ether	0.0464	0.0050	mg/kg wet	0.05000		93	70-130			
Ethylbenzene	0.0567	0.0050	mg/kg wet	0.05000		113	70-130			
Hexachlorobutadiene	0.0490	0.0050	mg/kg wet	0.05000		98	70-130			
Isopropylbenzene	0.0482	0.0050	mg/kg wet	0.05000		96	70-130			
Methyl tert-Butyl Ether	0.0474	0.0050	mg/kg wet	0.05000		95	70-130			
Methylene Chloride	0.0496	0.0250	mg/kg wet	0.05000		99	70-130			
Naphthalene	0.0472	0.0050	mg/kg wet	0.05000		94	70-130			
n-Butylbenzene	0.0497	0.0050	mg/kg wet	0.05000		99	70-130			
n-Propylbenzene	0.0563	0.0050	mg/kg wet	0.05000		113	70-130			
sec-Butylbenzene	0.0553	0.0050	mg/kg wet	0.05000		111	70-130			
Styrene	0.0482	0.0050	mg/kg wet	0.05000		96	70-130			
tert-Butylbenzene	0.0498	0.0050	mg/kg wet	0.05000		100	70-130			
Tertiary-amyl methyl ether	0.0450	0.0050	mg/kg wet	0.05000		90	70-130			
Tetrachloroethene	0.0550	0.0050	mg/kg wet	0.05000		110	70-130			
Tetrahydrofuran	0.0463	0.0050	mg/kg wet	0.05000		93	70-130			
Toluene	0.0450	0.0050	mg/kg wet	0.05000		90	70-130			
trans-1,2-Dichloroethene	0.0543	0.0050	mg/kg wet	0.05000		109	70-130			
trans-1,3-Dichloropropene	0.0476	0.0050	mg/kg wet	0.05000		95	70-130			
Trichloroethene	0.0522	0.0050	mg/kg wet	0.05000		104	70-130			
Trichlorofluoromethane	0.0514	0.0050	mg/kg wet	0.05000		103	70-130			
Vinyl Acetate	0.0485	0.0050	mg/kg wet	0.05000		97	70-130			
Vinyl Chloride	0.0498	0.0100	mg/kg wet	0.05000		100	70-130			
Xylene O	0.0572	0.0050	mg/kg wet	0.05000		114	70-130			
Xylene P,M	0.113	0.0100	mg/kg wet	0.1000		113	70-130			
Xylenes (Total)	0.170	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	0.0492		mg/kg wet	0.05000		98	70-130			
Surrogate: 4-Bromofluorobenzene	0.0532		mg/kg wet	0.05000		106	70-130			
Surrogate: Dibromofluoromethane	0.0507		mg/kg wet	0.05000		101	70-130			
Surrogate: Toluene-d8	0.0541		mg/kg wet	0.05000		108	70-130			

**LCS Dup**

1,1,1,2-Tetrachloroethane	0.0505	0.0050	mg/kg wet	0.05000		101	70-130	2	25	
1,1,1-Trichloroethane	0.0525	0.0050	mg/kg wet	0.05000		105	70-130	4	25	
1,1,2,2-Tetrachloroethane	0.0511	0.0050	mg/kg wet	0.05000		102	70-130	2	25	
1,1,2-Trichloroethane	0.0439	0.0050	mg/kg wet	0.05000		88	70-130	6	25	
1,1-Dichloroethane	0.0481	0.0050	mg/kg wet	0.05000		96	70-130	4	25	
1,1-Dichloroethene	0.0550	0.0050	mg/kg wet	0.05000		110	70-130	2	25	
1,1-Dichloropropene	0.0533	0.0050	mg/kg wet	0.05000		107	70-130	4	25	
1,2,3-Trichlorobenzene	0.0496	0.0050	mg/kg wet	0.05000		99	70-130	2	25	
1,2,3-Trichloropropane	0.0472	0.0050	mg/kg wet	0.05000		94	70-130	1	25	
1,2,4-Trichlorobenzene	0.0498	0.0050	mg/kg wet	0.05000		100	70-130	2	25	
1,2,4-Trimethylbenzene	0.0502	0.0050	mg/kg wet	0.05000		100	70-130	0.7	25	



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility

ESS Laboratory Work Order: 1709493

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CI72107 - 5035**

1,2-Dibromo-3-Chloropropane	0.0477	0.0050	mg/kg wet	0.05000		95	70-130	0.4	25	
1,2-Dibromoethane	0.0494	0.0050	mg/kg wet	0.05000		99	70-130	2	25	
1,2-Dichlorobenzene	0.0528	0.0050	mg/kg wet	0.05000		106	70-130	0.6	25	
1,2-Dichloroethane	0.0475	0.0050	mg/kg wet	0.05000		95	70-130	7	25	
1,2-Dichloropropane	0.0493	0.0050	mg/kg wet	0.05000		99	70-130	5	25	
1,3,5-Trimethylbenzene	0.0501	0.0050	mg/kg wet	0.05000		100	70-130	0.2	25	
1,3-Dichlorobenzene	0.0532	0.0050	mg/kg wet	0.05000		106	70-130	2	25	
1,3-Dichloropropane	0.0560	0.0050	mg/kg wet	0.05000		112	70-130	3	25	
1,4-Dichlorobenzene	0.0520	0.0050	mg/kg wet	0.05000		104	70-130	4	25	
1,4-Dioxane	0.928	0.100	mg/kg wet	1.000		93	70-130	3	20	
1-Chlorohexane	0.0497	0.0050	mg/kg wet	0.05000		99	70-130	1	25	
2,2-Dichloropropane	0.0462	0.0050	mg/kg wet	0.05000		92	70-130	5	25	
2-Butanone	0.245	0.0500	mg/kg wet	0.2500		98	70-130	5	25	
2-Chlorotoluene	0.0531	0.0050	mg/kg wet	0.05000		106	70-130	0.4	25	
2-Hexanone	0.241	0.0500	mg/kg wet	0.2500		96	70-130	2	25	
4-Chlorotoluene	0.0539	0.0050	mg/kg wet	0.05000		108	70-130	0.6	25	
4-Isopropyltoluene	0.0547	0.0050	mg/kg wet	0.05000		109	70-130	0.3	25	
4-Methyl-2-Pentanone	0.219	0.0500	mg/kg wet	0.2500		88	70-130	5	25	
Acetone	0.225	0.0500	mg/kg wet	0.2500		90	70-130	5	25	
Benzene	0.0494	0.0050	mg/kg wet	0.05000		99	70-130	4	25	
Bromobenzene	0.0483	0.0050	mg/kg wet	0.05000		97	70-130	0.3	25	
Bromochloromethane	0.0480	0.0050	mg/kg wet	0.05000		96	70-130	5	25	
Bromodichloromethane	0.0433	0.0050	mg/kg wet	0.05000		87	70-130	6	25	
Bromoform	0.0538	0.0050	mg/kg wet	0.05000		108	70-130	3	25	
Bromomethane	0.0423	0.0100	mg/kg wet	0.05000		85	70-130	4	25	
Carbon Disulfide	0.0534	0.0050	mg/kg wet	0.05000		107	70-130	4	25	
Carbon Tetrachloride	0.0482	0.0050	mg/kg wet	0.05000		96	70-130	3	25	
Chlorobenzene	0.0534	0.0050	mg/kg wet	0.05000		107	70-130	2	25	
Chloroethane	0.0469	0.0100	mg/kg wet	0.05000		94	70-130	4	25	
Chloroform	0.0481	0.0050	mg/kg wet	0.05000		96	70-130	6	25	
Chloromethane	0.0443	0.0100	mg/kg wet	0.05000		89	70-130	5	25	
cis-1,2-Dichloroethene	0.0494	0.0050	mg/kg wet	0.05000		99	70-130	4	25	
cis-1,3-Dichloropropene	0.0462	0.0050	mg/kg wet	0.05000		92	70-130	5	25	
Dibromochloromethane	0.0476	0.0050	mg/kg wet	0.05000		95	70-130	2	25	
Dibromomethane	0.0468	0.0050	mg/kg wet	0.05000		94	70-130	6	25	
Dichlorodifluoromethane	0.0359	0.0100	mg/kg wet	0.05000		72	70-130	5	25	
Diethyl Ether	0.0463	0.0050	mg/kg wet	0.05000		93	70-130	5	25	
Di-isopropyl ether	0.0488	0.0050	mg/kg wet	0.05000		98	70-130	5	25	
Ethyl tertiary-butyl ether	0.0439	0.0050	mg/kg wet	0.05000		88	70-130	6	25	
Ethylbenzene	0.0559	0.0050	mg/kg wet	0.05000		112	70-130	1	25	
Hexachlorobutadiene	0.0498	0.0050	mg/kg wet	0.05000		100	70-130	2	25	
Isopropylbenzene	0.0482	0.0050	mg/kg wet	0.05000		96	70-130	0	25	
Methyl tert-Butyl Ether	0.0448	0.0050	mg/kg wet	0.05000		90	70-130	6	25	
Methylene Chloride	0.0476	0.0250	mg/kg wet	0.05000		95	70-130	4	25	
Naphthalene	0.0482	0.0050	mg/kg wet	0.05000		96	70-130	2	25	

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility

ESS Laboratory Work Order: 1709493

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CI72107 - 5035**

n-Butylbenzene	0.0500	0.0050	mg/kg wet	0.05000		100	70-130	0.6	25	
n-Propylbenzene	0.0564	0.0050	mg/kg wet	0.05000		113	70-130	0.2	25	
sec-Butylbenzene	0.0550	0.0050	mg/kg wet	0.05000		110	70-130	0.5	25	
Styrene	0.0479	0.0050	mg/kg wet	0.05000		96	70-130	0.5	25	
tert-Butylbenzene	0.0500	0.0050	mg/kg wet	0.05000		100	70-130	0.3	25	
Tertiary-amyl methyl ether	0.0430	0.0050	mg/kg wet	0.05000		86	70-130	5	25	
Tetrachloroethene	0.0544	0.0050	mg/kg wet	0.05000		109	70-130	1	25	
Tetrahydrofuran	0.0454	0.0050	mg/kg wet	0.05000		91	70-130	2	25	
Toluene	0.0430	0.0050	mg/kg wet	0.05000		86	70-130	5	25	
trans-1,2-Dichloroethene	0.0523	0.0050	mg/kg wet	0.05000		105	70-130	4	25	
trans-1,3-Dichloropropene	0.0452	0.0050	mg/kg wet	0.05000		90	70-130	5	25	
Trichloroethene	0.0502	0.0050	mg/kg wet	0.05000		100	70-130	4	25	
Trichlorofluoromethane	0.0497	0.0050	mg/kg wet	0.05000		99	70-130	3	25	
Vinyl Acetate	0.0466	0.0050	mg/kg wet	0.05000		93	70-130	4	25	
Vinyl Chloride	0.0480	0.0100	mg/kg wet	0.05000		96	70-130	4	25	
Xylene O	0.0560	0.0050	mg/kg wet	0.05000		112	70-130	2	25	
Xylene P,M	0.112	0.0100	mg/kg wet	0.1000		112	70-130	0.7	25	
Xylenes (Total)	0.168	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	0.0456		mg/kg wet	0.05000		91	70-130			
Surrogate: 4-Bromofluorobenzene	0.0522		mg/kg wet	0.05000		104	70-130			
Surrogate: Dibromofluoromethane	0.0482		mg/kg wet	0.05000		96	70-130			
Surrogate: Toluene-d8	0.0542		mg/kg wet	0.05000		108	70-130			

8100M Total Petroleum Hydrocarbons

**Batch CI71918 - 3546**

<b>Blank</b>										
Decane (C10)	ND	0.2	mg/kg wet							
Docosane (C22)	ND	0.2	mg/kg wet							
Dodecane (C12)	ND	0.2	mg/kg wet							
Eicosane (C20)	ND	0.2	mg/kg wet							
Hexacosane (C26)	ND	0.2	mg/kg wet							
Hexadecane (C16)	ND	0.2	mg/kg wet							
Nonadecane (C19)	ND	0.2	mg/kg wet							
Nonane (C9)	ND	0.2	mg/kg wet							
Octacosane (C28)	ND	0.2	mg/kg wet							
Octadecane (C18)	ND	0.2	mg/kg wet							
Tetracosane (C24)	ND	0.2	mg/kg wet							
Tetradecane (C14)	ND	0.2	mg/kg wet							
Total Petroleum Hydrocarbons	ND	37.5	mg/kg wet							
Triacontane (C30)	ND	0.2	mg/kg wet							

Surrogate: O-Terphenyl	4.19		mg/kg wet	5.000		84	40-140			
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<b>LCS</b>										
Decane (C10)	1.8	0.2	mg/kg wet	2.500		71	40-140			
Docosane (C22)	2.2	0.2	mg/kg wet	2.500		87	40-140			





CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility

ESS Laboratory Work Order: 1709493

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
<b>8100M Total Petroleum Hydrocarbons</b>										
<b>Batch CI71918 - 3546</b>										
Dodecane (C12)	1.9	0.2	mg/kg wet	2.500		76	40-140			
Eicosane (C20)	2.2	0.2	mg/kg wet	2.500		86	40-140			
Hexacosane (C26)	2.2	0.2	mg/kg wet	2.500		88	40-140			
Hexadecane (C16)	2.0	0.2	mg/kg wet	2.500		82	40-140			
Nonadecane (C19)	2.3	0.2	mg/kg wet	2.500		91	40-140			
Nonane (C9)	1.5	0.2	mg/kg wet	2.500		62	30-140			
Octacosane (C28)	2.2	0.2	mg/kg wet	2.500		88	40-140			
Octadecane (C18)	2.1	0.2	mg/kg wet	2.500		82	40-140			
Tetracosane (C24)	2.2	0.2	mg/kg wet	2.500		87	40-140			
Tetradecane (C14)	1.9	0.2	mg/kg wet	2.500		76	40-140			
Total Petroleum Hydrocarbons	28.0	37.5	mg/kg wet	35.00		80	40-140			
Triacontane (C30)	2.2	0.2	mg/kg wet	2.500		87	40-140			
<i>Surrogate: O-Terphenyl</i>	<i>4.17</i>		mg/kg wet	<i>5.000</i>		<i>83</i>	<i>40-140</i>			
<b>LCS Dup</b>										
Decane (C10)	1.8	0.2	mg/kg wet	2.500		70	40-140	1	25	
Docosane (C22)	2.1	0.2	mg/kg wet	2.500		85	40-140	2	25	
Dodecane (C12)	1.7	0.2	mg/kg wet	2.500		70	40-140	9	25	
Eicosane (C20)	2.1	0.2	mg/kg wet	2.500		85	40-140	0.8	25	
Hexacosane (C26)	2.1	0.2	mg/kg wet	2.500		86	40-140	2	25	
Hexadecane (C16)	2.0	0.2	mg/kg wet	2.500		81	40-140	0.6	25	
Nonadecane (C19)	2.2	0.2	mg/kg wet	2.500		89	40-140	2	25	
Nonane (C9)	1.5	0.2	mg/kg wet	2.500		61	30-140	2	25	
Octacosane (C28)	2.2	0.2	mg/kg wet	2.500		86	40-140	1	25	
Octadecane (C18)	2.0	0.2	mg/kg wet	2.500		81	40-140	2	25	
Tetracosane (C24)	2.1	0.2	mg/kg wet	2.500		85	40-140	2	25	
Tetradecane (C14)	1.8	0.2	mg/kg wet	2.500		72	40-140	5	25	
Total Petroleum Hydrocarbons	27.4	37.5	mg/kg wet	35.00		78	40-140	2	25	
Triacontane (C30)	2.1	0.2	mg/kg wet	2.500		85	40-140	3	25	
<i>Surrogate: O-Terphenyl</i>	<i>4.00</i>		mg/kg wet	<i>5.000</i>		<i>80</i>	<i>40-140</i>			
<b>Batch CI72018 - 3546</b>										
<b>Blank</b>										
Decane (C10)	ND	0.2	mg/kg wet							
Docosane (C22)	ND	0.2	mg/kg wet							
Dodecane (C12)	ND	0.2	mg/kg wet							
Eicosane (C20)	ND	0.2	mg/kg wet							
Hexacosane (C26)	ND	0.2	mg/kg wet							
Hexadecane (C16)	ND	0.2	mg/kg wet							
Nonadecane (C19)	ND	0.2	mg/kg wet							
Nonane (C9)	ND	0.2	mg/kg wet							
Octacosane (C28)	ND	0.2	mg/kg wet							
Octadecane (C18)	ND	0.2	mg/kg wet							
Tetracosane (C24)	ND	0.2	mg/kg wet							
Tetradecane (C14)	ND	0.2	mg/kg wet							



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility

ESS Laboratory Work Order: 1709493

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
<b>8100M Total Petroleum Hydrocarbons</b>										
<b>Batch CI72018 - 3546</b>										
Total Petroleum Hydrocarbons	ND	37.5	mg/kg wet							
Triacontane (C30)	ND	0.2	mg/kg wet							
<i>Surrogate: O-Terphenyl</i>	4.66		mg/kg wet	5.000		93	40-140			
<b>LCS</b>										
Decane (C10)	2.3	0.2	mg/kg wet	2.500		94	40-140			
Docosane (C22)	2.8	0.2	mg/kg wet	2.500		113	40-140			
Dodecane (C12)	2.5	0.2	mg/kg wet	2.500		100	40-140			
Eicosane (C20)	2.8	0.2	mg/kg wet	2.500		112	40-140			
Hexacosane (C26)	2.9	0.2	mg/kg wet	2.500		114	40-140			
Hexadecane (C16)	2.7	0.2	mg/kg wet	2.500		108	40-140			
Nonadecane (C19)	2.8	0.2	mg/kg wet	2.500		113	40-140			
Nonane (C9)	2.0	0.2	mg/kg wet	2.500		80	30-140			
Octacosane (C28)	2.8	0.2	mg/kg wet	2.500		114	40-140			
Octadecane (C18)	2.7	0.2	mg/kg wet	2.500		107	40-140			
Tetracosane (C24)	2.8	0.2	mg/kg wet	2.500		114	40-140			
Tetradecane (C14)	2.6	0.2	mg/kg wet	2.500		102	40-140			
Total Petroleum Hydrocarbons	38.0	37.5	mg/kg wet	35.00		109	40-140			
Triacontane (C30)	2.9	0.2	mg/kg wet	2.500		115	40-140			
<i>Surrogate: O-Terphenyl</i>	4.80		mg/kg wet	5.000		96	40-140			
<b>LCS Dup</b>										
Decane (C10)	2.4	0.2	mg/kg wet	2.500		94	40-140	0.5	25	
Docosane (C22)	2.9	0.2	mg/kg wet	2.500		116	40-140	3	25	
Dodecane (C12)	2.5	0.2	mg/kg wet	2.500		101	40-140	1	25	
Eicosane (C20)	2.9	0.2	mg/kg wet	2.500		115	40-140	3	25	
Hexacosane (C26)	2.9	0.2	mg/kg wet	2.500		117	40-140	3	25	
Hexadecane (C16)	2.8	0.2	mg/kg wet	2.500		111	40-140	2	25	
Nonadecane (C19)	2.9	0.2	mg/kg wet	2.500		116	40-140	3	25	
Nonane (C9)	2.0	0.2	mg/kg wet	2.500		81	30-140	0.8	25	
Octacosane (C28)	2.9	0.2	mg/kg wet	2.500		117	40-140	3	25	
Octadecane (C18)	2.7	0.2	mg/kg wet	2.500		110	40-140	3	25	
Tetracosane (C24)	2.9	0.2	mg/kg wet	2.500		117	40-140	3	25	
Tetradecane (C14)	2.6	0.2	mg/kg wet	2.500		104	40-140	2	25	
Total Petroleum Hydrocarbons	39.0	37.5	mg/kg wet	35.00		111	40-140	3	25	
Triacontane (C30)	3.0	0.2	mg/kg wet	2.500		119	40-140	3	25	
<i>Surrogate: O-Terphenyl</i>	4.86		mg/kg wet	5.000		97	40-140			
<b>Batch CI72208 - 3546</b>										
<b>Blank</b>										
Decane (C10)	ND	0.2	mg/kg wet							
Docosane (C22)	ND	0.2	mg/kg wet							
Dodecane (C12)	ND	0.2	mg/kg wet							
Eicosane (C20)	ND	0.2	mg/kg wet							
Hexacosane (C26)	ND	0.2	mg/kg wet							



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility

ESS Laboratory Work Order: 1709493

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
<b>8100M Total Petroleum Hydrocarbons</b>										
<b>Batch CI72208 - 3546</b>										
Hexadecane (C16)	ND	0.2	mg/kg wet							
Nonadecane (C19)	ND	0.2	mg/kg wet							
Nonane (C9)	ND	0.2	mg/kg wet							
Octacosane (C28)	ND	0.2	mg/kg wet							
Octadecane (C18)	ND	0.2	mg/kg wet							
Tetracosane (C24)	ND	0.2	mg/kg wet							
Tetradecane (C14)	ND	0.2	mg/kg wet							
Total Petroleum Hydrocarbons	ND	37.5	mg/kg wet							
Triacotane (C30)	ND	0.2	mg/kg wet							
<i>Surrogate: O-Terphenyl</i>	<i>4.19</i>		mg/kg wet	<i>5.000</i>		<i>84</i>	<i>40-140</i>			
<b>LCS</b>										
Decane (C10)	1.5	0.2	mg/kg wet	2.500		61	40-140			
Docosane (C22)	1.9	0.2	mg/kg wet	2.500		76	40-140			
Dodecane (C12)	1.5	0.2	mg/kg wet	2.500		58	40-140			
Eicosane (C20)	1.9	0.2	mg/kg wet	2.500		74	40-140			
Hexacosane (C26)	1.9	0.2	mg/kg wet	2.500		77	40-140			
Hexadecane (C16)	1.7	0.2	mg/kg wet	2.500		70	40-140			
Nonadecane (C19)	1.9	0.2	mg/kg wet	2.500		77	40-140			
Nonane (C9)	1.3	0.2	mg/kg wet	2.500		53	30-140			
Octacosane (C28)	1.9	0.2	mg/kg wet	2.500		77	40-140			
Octadecane (C18)	1.7	0.2	mg/kg wet	2.500		69	40-140			
Tetracosane (C24)	1.9	0.2	mg/kg wet	2.500		76	40-140			
Tetradecane (C14)	1.6	0.2	mg/kg wet	2.500		65	40-140			
Total Petroleum Hydrocarbons	24.5	37.5	mg/kg wet	35.00		70	40-140			
Triacotane (C30)	1.9	0.2	mg/kg wet	2.500		77	40-140			
<i>Surrogate: O-Terphenyl</i>	<i>4.04</i>		mg/kg wet	<i>5.000</i>		<i>81</i>	<i>40-140</i>			
<b>LCS Dup</b>										
Decane (C10)	1.6	0.2	mg/kg wet	2.500		62	40-140	3	25	
Docosane (C22)	2.0	0.2	mg/kg wet	2.500		78	40-140	3	25	
Dodecane (C12)	1.7	0.2	mg/kg wet	2.500		67	40-140	14	25	
Eicosane (C20)	1.9	0.2	mg/kg wet	2.500		77	40-140	3	25	
Hexacosane (C26)	2.0	0.2	mg/kg wet	2.500		79	40-140	3	25	
Hexadecane (C16)	1.8	0.2	mg/kg wet	2.500		73	40-140	4	25	
Nonadecane (C19)	2.1	0.2	mg/kg wet	2.500		84	40-140	8	25	
Nonane (C9)	1.4	0.2	mg/kg wet	2.500		54	30-140	2	25	
Octacosane (C28)	2.0	0.2	mg/kg wet	2.500		79	40-140	3	25	
Octadecane (C18)	1.8	0.2	mg/kg wet	2.500		71	40-140	4	25	
Tetracosane (C24)	2.0	0.2	mg/kg wet	2.500		78	40-140	3	25	
Tetradecane (C14)	1.6	0.2	mg/kg wet	2.500		63	40-140	4	25	
Total Petroleum Hydrocarbons	25.3	37.5	mg/kg wet	35.00		72	40-140	3	25	
Triacotane (C30)	2.0	0.2	mg/kg wet	2.500		79	40-140	3	25	
<i>Surrogate: O-Terphenyl</i>	<i>4.08</i>		mg/kg wet	<i>5.000</i>		<i>82</i>	<i>40-140</i>			



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility

ESS Laboratory Work Order: 1709493

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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8270D Polynuclear Aromatic Hydrocarbons

**Batch CI71819 - 3546**

**Blank**

2-Methylnaphthalene	ND	0.333	mg/kg wet							
Acenaphthene	ND	0.333	mg/kg wet							
Acenaphthylene	ND	0.333	mg/kg wet							
Anthracene	ND	0.333	mg/kg wet							
Benzo(a)anthracene	ND	0.333	mg/kg wet							
Benzo(a)pyrene	ND	0.167	mg/kg wet							
Benzo(b)fluoranthene	ND	0.333	mg/kg wet							
Benzo(g,h,i)perylene	ND	0.333	mg/kg wet							
Benzo(k)fluoranthene	ND	0.333	mg/kg wet							
Chrysene	ND	0.167	mg/kg wet							
Dibenzo(a,h)Anthracene	ND	0.167	mg/kg wet							
Fluoranthene	ND	0.333	mg/kg wet							
Fluorene	ND	0.333	mg/kg wet							
Indeno(1,2,3-cd)Pyrene	ND	0.333	mg/kg wet							
Naphthalene	ND	0.333	mg/kg wet							
Phenanthrene	ND	0.333	mg/kg wet							
Pyrene	ND	0.333	mg/kg wet							
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	2.59		mg/kg wet	3.333		78	30-130			
<i>Surrogate: 2-Fluorobiphenyl</i>	2.76		mg/kg wet	3.333		83	30-130			
<i>Surrogate: Nitrobenzene-d5</i>	2.18		mg/kg wet	3.333		65	30-130			
<i>Surrogate: p-Terphenyl-d14</i>	3.36		mg/kg wet	3.333		101	30-130			

**LCS**

2-Methylnaphthalene	2.71	0.333	mg/kg wet	3.333		81	40-140			
Acenaphthene	2.50	0.333	mg/kg wet	3.333		75	40-140			
Acenaphthylene	2.74	0.333	mg/kg wet	3.333		82	40-140			
Anthracene	2.36	0.333	mg/kg wet	3.333		71	40-140			
Benzo(a)anthracene	2.54	0.333	mg/kg wet	3.333		76	40-140			
Benzo(a)pyrene	2.58	0.167	mg/kg wet	3.333		77	40-140			
Benzo(b)fluoranthene	2.64	0.333	mg/kg wet	3.333		79	40-140			
Benzo(g,h,i)perylene	2.88	0.333	mg/kg wet	3.333		86	40-140			
Benzo(k)fluoranthene	2.62	0.333	mg/kg wet	3.333		79	40-140			
Chrysene	2.74	0.167	mg/kg wet	3.333		82	40-140			
Dibenzo(a,h)Anthracene	2.80	0.167	mg/kg wet	3.333		84	40-140			
Fluoranthene	2.35	0.333	mg/kg wet	3.333		70	40-140			
Fluorene	2.77	0.333	mg/kg wet	3.333		83	40-140			
Indeno(1,2,3-cd)Pyrene	2.63	0.333	mg/kg wet	3.333		79	40-140			
Naphthalene	2.57	0.333	mg/kg wet	3.333		77	40-140			
Phenanthrene	2.53	0.333	mg/kg wet	3.333		76	40-140			
Pyrene	2.98	0.333	mg/kg wet	3.333		89	40-140			
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	2.79		mg/kg wet	3.333		84	30-130			
<i>Surrogate: 2-Fluorobiphenyl</i>	2.84		mg/kg wet	3.333		85	30-130			
<i>Surrogate: Nitrobenzene-d5</i>	2.37		mg/kg wet	3.333		71	30-130			
<i>Surrogate: p-Terphenyl-d14</i>	3.46		mg/kg wet	3.333		104	30-130			

**LCS Dup**



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility

ESS Laboratory Work Order: 1709493

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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8270D Polynuclear Aromatic Hydrocarbons

**Batch CI71819 - 3546**

2-Methylnaphthalene	2.46	0.333	mg/kg wet	3.333		74	40-140	10	30	
Acenaphthene	2.26	0.333	mg/kg wet	3.333		68	40-140	10	30	
Acenaphthylene	2.41	0.333	mg/kg wet	3.333		72	40-140	13	30	
Anthracene	2.12	0.333	mg/kg wet	3.333		64	40-140	11	30	
Benzo(a)anthracene	2.33	0.333	mg/kg wet	3.333		70	40-140	9	30	
Benzo(a)pyrene	2.36	0.167	mg/kg wet	3.333		71	40-140	9	30	
Benzo(b)fluoranthene	2.46	0.333	mg/kg wet	3.333		74	40-140	7	30	
Benzo(g,h,i)perylene	2.66	0.333	mg/kg wet	3.333		80	40-140	8	30	
Benzo(k)fluoranthene	2.44	0.333	mg/kg wet	3.333		73	40-140	7	30	
Chrysene	2.50	0.167	mg/kg wet	3.333		75	40-140	9	30	
Dibenzo(a,h)Anthracene	2.57	0.167	mg/kg wet	3.333		77	40-140	9	30	
Fluoranthene	2.00	0.333	mg/kg wet	3.333		60	40-140	16	30	
Fluorene	2.52	0.333	mg/kg wet	3.333		76	40-140	9	30	
Indeno(1,2,3-cd)Pyrene	2.41	0.333	mg/kg wet	3.333		72	40-140	9	30	
Naphthalene	2.28	0.333	mg/kg wet	3.333		68	40-140	12	30	
Phenanthrene	2.24	0.333	mg/kg wet	3.333		67	40-140	12	30	
Pyrene	3.01	0.333	mg/kg wet	3.333		90	40-140	0.9	30	
Surrogate: 1,2-Dichlorobenzene-d4	2.41		mg/kg wet	3.333		72	30-130			
Surrogate: 2-Fluorobiphenyl	2.56		mg/kg wet	3.333		77	30-130			
Surrogate: Nitrobenzene-d5	2.09		mg/kg wet	3.333		63	30-130			
Surrogate: p-Terphenyl-d14	3.51		mg/kg wet	3.333		105	30-130			

**Batch CI71919 - 3546**

<b>Blank</b>										
2-Methylnaphthalene	ND	0.333	mg/kg wet							
Acenaphthene	ND	0.333	mg/kg wet							
Acenaphthylene	ND	0.333	mg/kg wet							
Anthracene	ND	0.333	mg/kg wet							
Benzo(a)anthracene	ND	0.333	mg/kg wet							
Benzo(a)pyrene	ND	0.167	mg/kg wet							
Benzo(b)fluoranthene	ND	0.333	mg/kg wet							
Benzo(g,h,i)perylene	ND	0.333	mg/kg wet							
Benzo(k)fluoranthene	ND	0.333	mg/kg wet							
Chrysene	ND	0.167	mg/kg wet							
Dibenzo(a,h)Anthracene	ND	0.167	mg/kg wet							
Fluoranthene	ND	0.333	mg/kg wet							
Fluorene	ND	0.333	mg/kg wet							
Indeno(1,2,3-cd)Pyrene	ND	0.333	mg/kg wet							
Naphthalene	ND	0.333	mg/kg wet							
Phenanthrene	ND	0.333	mg/kg wet							
Pyrene	ND	0.333	mg/kg wet							
Surrogate: 1,2-Dichlorobenzene-d4	2.38		mg/kg wet	3.333		71	30-130			
Surrogate: 2-Fluorobiphenyl	2.39		mg/kg wet	3.333		72	30-130			
Surrogate: Nitrobenzene-d5	1.99		mg/kg wet	3.333		60	30-130			
Surrogate: p-Terphenyl-d14	3.01		mg/kg wet	3.333		90	30-130			

**LCS**





CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility

ESS Laboratory Work Order: 1709493

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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8270D Polynuclear Aromatic Hydrocarbons

**Batch CI71919 - 3546**

2-Methylnaphthalene	2.45	0.333	mg/kg wet	3.333		74	40-140			
Acenaphthene	2.38	0.333	mg/kg wet	3.333		71	40-140			
Acenaphthylene	2.51	0.333	mg/kg wet	3.333		75	40-140			
Anthracene	2.29	0.333	mg/kg wet	3.333		69	40-140			
Benzo(a)anthracene	2.54	0.333	mg/kg wet	3.333		76	40-140			
Benzo(a)pyrene	2.53	0.167	mg/kg wet	3.333		76	40-140			
Benzo(b)fluoranthene	2.59	0.333	mg/kg wet	3.333		78	40-140			
Benzo(g,h,i)perylene	2.70	0.333	mg/kg wet	3.333		81	40-140			
Benzo(k)fluoranthene	2.53	0.333	mg/kg wet	3.333		76	40-140			
Chrysene	2.71	0.167	mg/kg wet	3.333		81	40-140			
Dibenzo(a,h)Anthracene	2.76	0.167	mg/kg wet	3.333		83	40-140			
Fluoranthene	2.69	0.333	mg/kg wet	3.333		81	40-140			
Fluorene	2.55	0.333	mg/kg wet	3.333		77	40-140			
Indeno(1,2,3-cd)Pyrene	2.55	0.333	mg/kg wet	3.333		77	40-140			
Naphthalene	2.40	0.333	mg/kg wet	3.333		72	40-140			
Phenanthrene	2.44	0.333	mg/kg wet	3.333		73	40-140			
Pyrene	2.62	0.333	mg/kg wet	3.333		79	40-140			
Surrogate: 1,2-Dichlorobenzene-d4	2.72		mg/kg wet	3.333		82	30-130			
Surrogate: 2-Fluorobiphenyl	2.97		mg/kg wet	3.333		89	30-130			
Surrogate: Nitrobenzene-d5	2.36		mg/kg wet	3.333		71	30-130			
Surrogate: p-Terphenyl-d14	3.23		mg/kg wet	3.333		97	30-130			

**LCS Dup**

2-Methylnaphthalene	2.36	0.333	mg/kg wet	3.333		71	40-140	4	30	
Acenaphthene	2.28	0.333	mg/kg wet	3.333		68	40-140	4	30	
Acenaphthylene	2.46	0.333	mg/kg wet	3.333		74	40-140	2	30	
Anthracene	2.26	0.333	mg/kg wet	3.333		68	40-140	1	30	
Benzo(a)anthracene	2.48	0.333	mg/kg wet	3.333		74	40-140	2	30	
Benzo(a)pyrene	2.47	0.167	mg/kg wet	3.333		74	40-140	2	30	
Benzo(b)fluoranthene	2.57	0.333	mg/kg wet	3.333		77	40-140	0.5	30	
Benzo(g,h,i)perylene	2.51	0.333	mg/kg wet	3.333		75	40-140	7	30	
Benzo(k)fluoranthene	2.50	0.333	mg/kg wet	3.333		75	40-140	1	30	
Chrysene	2.66	0.167	mg/kg wet	3.333		80	40-140	2	30	
Dibenzo(a,h)Anthracene	2.62	0.167	mg/kg wet	3.333		79	40-140	5	30	
Fluoranthene	2.70	0.333	mg/kg wet	3.333		81	40-140	0.4	30	
Fluorene	2.55	0.333	mg/kg wet	3.333		76	40-140	0.2	30	
Indeno(1,2,3-cd)Pyrene	2.45	0.333	mg/kg wet	3.333		73	40-140	4	30	
Naphthalene	2.31	0.333	mg/kg wet	3.333		69	40-140	4	30	
Phenanthrene	2.40	0.333	mg/kg wet	3.333		72	40-140	2	30	
Pyrene	2.59	0.333	mg/kg wet	3.333		78	40-140	1	30	
Surrogate: 1,2-Dichlorobenzene-d4	2.52		mg/kg wet	3.333		76	30-130			
Surrogate: 2-Fluorobiphenyl	2.76		mg/kg wet	3.333		83	30-130			
Surrogate: Nitrobenzene-d5	2.19		mg/kg wet	3.333		66	30-130			
Surrogate: p-Terphenyl-d14	3.09		mg/kg wet	3.333		93	30-130			

**Batch CI71920 - 3546**

**Blank**



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility

ESS Laboratory Work Order: 1709493

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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8270D Polynuclear Aromatic Hydrocarbons

**Batch CI71920 - 3546**

2-Methylnaphthalene	ND	0.333	mg/kg wet							
Acenaphthene	ND	0.333	mg/kg wet							
Acenaphthylene	ND	0.333	mg/kg wet							
Anthracene	ND	0.333	mg/kg wet							
Benzo(a)anthracene	ND	0.333	mg/kg wet							
Benzo(a)pyrene	ND	0.167	mg/kg wet							
Benzo(b)fluoranthene	ND	0.333	mg/kg wet							
Benzo(g,h,i)perylene	ND	0.333	mg/kg wet							
Benzo(k)fluoranthene	ND	0.333	mg/kg wet							
Chrysene	ND	0.167	mg/kg wet							
Dibenzo(a,h)Anthracene	ND	0.167	mg/kg wet							
Fluoranthene	ND	0.333	mg/kg wet							
Fluorene	ND	0.333	mg/kg wet							
Indeno(1,2,3-cd)Pyrene	ND	0.333	mg/kg wet							
Naphthalene	ND	0.333	mg/kg wet							
Phenanthrene	ND	0.333	mg/kg wet							
Pyrene	ND	0.333	mg/kg wet							
Surrogate: 1,2-Dichlorobenzene-d4	2.54		mg/kg wet	3.333		76	30-130			
Surrogate: 2-Fluorobiphenyl	2.56		mg/kg wet	3.333		77	30-130			
Surrogate: Nitrobenzene-d5	2.59		mg/kg wet	3.333		78	30-130			
Surrogate: p-Terphenyl-d14	3.23		mg/kg wet	3.333		97	30-130			

**LCS**

2-Methylnaphthalene	2.26	0.333	mg/kg wet	3.333		68	40-140			
Acenaphthene	2.33	0.333	mg/kg wet	3.333		70	40-140			
Acenaphthylene	2.46	0.333	mg/kg wet	3.333		74	40-140			
Anthracene	2.42	0.333	mg/kg wet	3.333		73	40-140			
Benzo(a)anthracene	2.45	0.333	mg/kg wet	3.333		73	40-140			
Benzo(a)pyrene	2.42	0.167	mg/kg wet	3.333		73	40-140			
Benzo(b)fluoranthene	2.46	0.333	mg/kg wet	3.333		74	40-140			
Benzo(g,h,i)perylene	2.35	0.333	mg/kg wet	3.333		70	40-140			
Benzo(k)fluoranthene	2.57	0.333	mg/kg wet	3.333		77	40-140			
Chrysene	2.40	0.167	mg/kg wet	3.333		72	40-140			
Dibenzo(a,h)Anthracene	2.39	0.167	mg/kg wet	3.333		72	40-140			
Fluoranthene	2.18	0.333	mg/kg wet	3.333		65	40-140			
Fluorene	2.45	0.333	mg/kg wet	3.333		73	40-140			
Indeno(1,2,3-cd)Pyrene	2.39	0.333	mg/kg wet	3.333		72	40-140			
Naphthalene	2.32	0.333	mg/kg wet	3.333		70	40-140			
Phenanthrene	2.39	0.333	mg/kg wet	3.333		72	40-140			
Pyrene	2.40	0.333	mg/kg wet	3.333		72	40-140			
Surrogate: 1,2-Dichlorobenzene-d4	2.51		mg/kg wet	3.333		75	30-130			
Surrogate: 2-Fluorobiphenyl	2.56		mg/kg wet	3.333		77	30-130			
Surrogate: Nitrobenzene-d5	2.59		mg/kg wet	3.333		78	30-130			
Surrogate: p-Terphenyl-d14	2.74		mg/kg wet	3.333		82	30-130			

**LCS Dup**

2-Methylnaphthalene	2.43	0.333	mg/kg wet	3.333		73	40-140	7	30	
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CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility

ESS Laboratory Work Order: 1709493

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
<b>8270D Polynuclear Aromatic Hydrocarbons</b>										
<b>Batch CI71920 - 3546</b>										
Acenaphthene	2.47	0.333	mg/kg wet	3.333		74	40-140	6	30	
Acenaphthylene	2.61	0.333	mg/kg wet	3.333		78	40-140	6	30	
Anthracene	2.61	0.333	mg/kg wet	3.333		78	40-140	8	30	
Benzo(a)anthracene	2.56	0.333	mg/kg wet	3.333		77	40-140	4	30	
Benzo(a)pyrene	2.68	0.167	mg/kg wet	3.333		80	40-140	10	30	
Benzo(b)fluoranthene	2.66	0.333	mg/kg wet	3.333		80	40-140	8	30	
Benzo(g,h,i)perylene	2.47	0.333	mg/kg wet	3.333		74	40-140	5	30	
Benzo(k)fluoranthene	2.76	0.333	mg/kg wet	3.333		83	40-140	7	30	
Chrysene	2.54	0.167	mg/kg wet	3.333		76	40-140	6	30	
Dibenzo(a,h)Anthracene	2.57	0.167	mg/kg wet	3.333		77	40-140	7	30	
Fluoranthene	2.63	0.333	mg/kg wet	3.333		79	40-140	19	30	
Fluorene	2.75	0.333	mg/kg wet	3.333		82	40-140	12	30	
Indeno(1,2,3-cd)Pyrene	2.54	0.333	mg/kg wet	3.333		76	40-140	6	30	
Naphthalene	2.49	0.333	mg/kg wet	3.333		75	40-140	7	30	
Phenanthrene	2.57	0.333	mg/kg wet	3.333		77	40-140	7	30	
Pyrene	2.61	0.333	mg/kg wet	3.333		78	40-140	8	30	
Surrogate: 1,2-Dichlorobenzene-d4	2.58		mg/kg wet	3.333		77	30-130			
Surrogate: 2-Fluorobiphenyl	2.64		mg/kg wet	3.333		79	30-130			
Surrogate: Nitrobenzene-d5	2.73		mg/kg wet	3.333		82	30-130			
Surrogate: p-Terphenyl-d14	2.94		mg/kg wet	3.333		88	30-130			
<b>Batch CI72016 - 3546</b>										
<b>Blank</b>										
2-Methylnaphthalene	ND	0.333	mg/kg wet							
Acenaphthene	ND	0.333	mg/kg wet							
Acenaphthylene	ND	0.333	mg/kg wet							
Anthracene	ND	0.333	mg/kg wet							
Benzo(a)anthracene	ND	0.333	mg/kg wet							
Benzo(a)pyrene	ND	0.167	mg/kg wet							
Benzo(b)fluoranthene	ND	0.333	mg/kg wet							
Benzo(g,h,i)perylene	ND	0.333	mg/kg wet							
Benzo(k)fluoranthene	ND	0.333	mg/kg wet							
Chrysene	ND	0.167	mg/kg wet							
Dibenzo(a,h)Anthracene	ND	0.167	mg/kg wet							
Fluoranthene	ND	0.333	mg/kg wet							
Fluorene	ND	0.333	mg/kg wet							
Indeno(1,2,3-cd)Pyrene	ND	0.333	mg/kg wet							
Naphthalene	ND	0.333	mg/kg wet							
Phenanthrene	ND	0.333	mg/kg wet							
Pyrene	ND	0.333	mg/kg wet							
Surrogate: 1,2-Dichlorobenzene-d4	2.76		mg/kg wet	3.333		83	30-130			
Surrogate: 2-Fluorobiphenyl	2.66		mg/kg wet	3.333		80	30-130			
Surrogate: Nitrobenzene-d5	2.75		mg/kg wet	3.333		82	30-130			
Surrogate: p-Terphenyl-d14	3.51		mg/kg wet	3.333		105	30-130			
<b>LCS</b>										
2-Methylnaphthalene	2.54	0.333	mg/kg wet	3.333		76	40-140			

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility

ESS Laboratory Work Order: 1709493

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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8270D Polynuclear Aromatic Hydrocarbons

**Batch CI72016 - 3546**

Acenaphthene	2.56	0.333	mg/kg wet	3.333		77	40-140			
Acenaphthylene	2.75	0.333	mg/kg wet	3.333		82	40-140			
Anthracene	2.63	0.333	mg/kg wet	3.333		79	40-140			
Benzo(a)anthracene	2.74	0.333	mg/kg wet	3.333		82	40-140			
Benzo(a)pyrene	2.70	0.167	mg/kg wet	3.333		81	40-140			
Benzo(b)fluoranthene	2.80	0.333	mg/kg wet	3.333		84	40-140			
Benzo(g,h,i)perylene	2.71	0.333	mg/kg wet	3.333		81	40-140			
Benzo(k)fluoranthene	2.82	0.333	mg/kg wet	3.333		85	40-140			
Chrysene	2.71	0.167	mg/kg wet	3.333		81	40-140			
Dibenzo(a,h)Anthracene	2.74	0.167	mg/kg wet	3.333		82	40-140			
Fluoranthene	2.15	0.333	mg/kg wet	3.333		65	40-140			
Fluorene	2.73	0.333	mg/kg wet	3.333		82	40-140			
Indeno(1,2,3-cd)Pyrene	2.75	0.333	mg/kg wet	3.333		82	40-140			
Naphthalene	2.54	0.333	mg/kg wet	3.333		76	40-140			
Phenanthrene	2.66	0.333	mg/kg wet	3.333		80	40-140			
Pyrene	3.32	0.333	mg/kg wet	3.333		99	40-140			
Surrogate: 1,2-Dichlorobenzene-d4	2.78		mg/kg wet	3.333		84	30-130			
Surrogate: 2-Fluorobiphenyl	2.91		mg/kg wet	3.333		87	30-130			
Surrogate: Nitrobenzene-d5	2.88		mg/kg wet	3.333		87	30-130			
Surrogate: p-Terphenyl-d14	3.93		mg/kg wet	3.333		118	30-130			

**LCS Dup**

2-Methylnaphthalene	2.46	0.333	mg/kg wet	3.333		74	40-140	3	30	
Acenaphthene	2.50	0.333	mg/kg wet	3.333		75	40-140	2	30	
Acenaphthylene	2.70	0.333	mg/kg wet	3.333		81	40-140	2	30	
Anthracene	2.65	0.333	mg/kg wet	3.333		79	40-140	0.5	30	
Benzo(a)anthracene	2.59	0.333	mg/kg wet	3.333		78	40-140	6	30	
Benzo(a)pyrene	2.74	0.167	mg/kg wet	3.333		82	40-140	1	30	
Benzo(b)fluoranthene	2.79	0.333	mg/kg wet	3.333		84	40-140	0.1	30	
Benzo(g,h,i)perylene	2.63	0.333	mg/kg wet	3.333		79	40-140	3	30	
Benzo(k)fluoranthene	2.69	0.333	mg/kg wet	3.333		81	40-140	5	30	
Chrysene	2.63	0.167	mg/kg wet	3.333		79	40-140	3	30	
Dibenzo(a,h)Anthracene	2.67	0.167	mg/kg wet	3.333		80	40-140	3	30	
Fluoranthene	2.53	0.333	mg/kg wet	3.333		76	40-140	16	30	
Fluorene	2.70	0.333	mg/kg wet	3.333		81	40-140	1	30	
Indeno(1,2,3-cd)Pyrene	2.70	0.333	mg/kg wet	3.333		81	40-140	2	30	
Naphthalene	2.48	0.333	mg/kg wet	3.333		74	40-140	2	30	
Phenanthrene	2.59	0.333	mg/kg wet	3.333		78	40-140	3	30	
Pyrene	2.56	0.333	mg/kg wet	3.333		77	40-140	26	30	
Surrogate: 1,2-Dichlorobenzene-d4	2.52		mg/kg wet	3.333		76	30-130			
Surrogate: 2-Fluorobiphenyl	2.67		mg/kg wet	3.333		80	30-130			
Surrogate: Nitrobenzene-d5	2.71		mg/kg wet	3.333		81	30-130			
Surrogate: p-Terphenyl-d14	2.89		mg/kg wet	3.333		87	30-130			

**Batch CI72209 - 3546**

<b>Blank</b>										
2-Methylnaphthalene	ND	0.333	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility

ESS Laboratory Work Order: 1709493

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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8270D Polynuclear Aromatic Hydrocarbons

**Batch CI72209 - 3546**

Acenaphthene	ND	0.333	mg/kg wet							
Acenaphthylene	ND	0.333	mg/kg wet							
Anthracene	ND	0.333	mg/kg wet							
Benzo(a)anthracene	ND	0.167	mg/kg wet							
Benzo(a)pyrene	ND	0.083	mg/kg wet							
Benzo(b)fluoranthene	ND	0.167	mg/kg wet							
Benzo(g,h,i)perylene	ND	0.167	mg/kg wet							
Benzo(k)fluoranthene	ND	0.167	mg/kg wet							
Chrysene	ND	0.083	mg/kg wet							
Dibenzo(a,h)Anthracene	ND	0.083	mg/kg wet							
Fluoranthene	ND	0.333	mg/kg wet							
Fluorene	ND	0.333	mg/kg wet							
Indeno(1,2,3-cd)Pyrene	ND	0.167	mg/kg wet							
Naphthalene	ND	0.167	mg/kg wet							
Phenanthrene	ND	0.333	mg/kg wet							
Pyrene	ND	0.333	mg/kg wet							
Surrogate: 1,2-Dichlorobenzene-d4	2.58		mg/kg wet	3.333		77	30-130			
Surrogate: 2-Fluorobiphenyl	2.63		mg/kg wet	3.333		79	30-130			
Surrogate: Nitrobenzene-d5	2.64		mg/kg wet	3.333		79	30-130			
Surrogate: p-Terphenyl-d14	3.16		mg/kg wet	3.333		95	30-130			

**LCS**

2-Methylnaphthalene	2.68	0.333	mg/kg wet	3.333		81	40-140			
Acenaphthene	2.79	0.333	mg/kg wet	3.333		84	40-140			
Acenaphthylene	3.05	0.333	mg/kg wet	3.333		92	40-140			
Anthracene	2.97	0.333	mg/kg wet	3.333		89	40-140			
Benzo(a)anthracene	2.92	0.333	mg/kg wet	3.333		88	40-140			
Benzo(a)pyrene	3.16	0.167	mg/kg wet	3.333		95	40-140			
Benzo(b)fluoranthene	3.01	0.333	mg/kg wet	3.333		90	40-140			
Benzo(g,h,i)perylene	3.02	0.333	mg/kg wet	3.333		91	40-140			
Benzo(k)fluoranthene	3.04	0.333	mg/kg wet	3.333		91	40-140			
Chrysene	2.95	0.167	mg/kg wet	3.333		88	40-140			
Dibenzo(a,h)Anthracene	3.15	0.167	mg/kg wet	3.333		94	40-140			
Fluoranthene	2.77	0.333	mg/kg wet	3.333		83	40-140			
Fluorene	2.92	0.333	mg/kg wet	3.333		88	40-140			
Indeno(1,2,3-cd)Pyrene	3.14	0.333	mg/kg wet	3.333		94	40-140			
Naphthalene	2.82	0.333	mg/kg wet	3.333		84	40-140			
Phenanthrene	2.89	0.333	mg/kg wet	3.333		87	40-140			
Pyrene	2.71	0.333	mg/kg wet	3.333		81	40-140			
Surrogate: 1,2-Dichlorobenzene-d4	3.13		mg/kg wet	3.333		94	30-130			
Surrogate: 2-Fluorobiphenyl	3.31		mg/kg wet	3.333		99	30-130			
Surrogate: Nitrobenzene-d5	3.28		mg/kg wet	3.333		99	30-130			
Surrogate: p-Terphenyl-d14	3.21		mg/kg wet	3.333		96	30-130			

**LCS Dup**

2-Methylnaphthalene	2.51	0.333	mg/kg wet	3.333		75	40-140	7	30	
Acenaphthene	2.64	0.333	mg/kg wet	3.333		79	40-140	6	30	





CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility

ESS Laboratory Work Order: 1709493

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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8270D Polynuclear Aromatic Hydrocarbons

**Batch CI72209 - 3546**

Acenaphthylene	2.84	0.333	mg/kg wet	3.333		85	40-140	7	30	
Anthracene	2.95	0.333	mg/kg wet	3.333		89	40-140	0.6	30	
Benzo(a)anthracene	2.88	0.333	mg/kg wet	3.333		86	40-140	1	30	
Benzo(a)pyrene	3.00	0.167	mg/kg wet	3.333		90	40-140	5	30	
Benzo(b)fluoranthene	2.99	0.333	mg/kg wet	3.333		90	40-140	0.8	30	
Benzo(g,h,i)perylene	3.14	0.333	mg/kg wet	3.333		94	40-140	4	30	
Benzo(k)fluoranthene	3.04	0.333	mg/kg wet	3.333		91	40-140	0.2	30	
Chrysene	2.97	0.167	mg/kg wet	3.333		89	40-140	0.9	30	
Dibenzo(a,h)Anthracene	3.16	0.167	mg/kg wet	3.333		95	40-140	0.3	30	
Fluoranthene	2.78	0.333	mg/kg wet	3.333		84	40-140	0.5	30	
Fluorene	2.88	0.333	mg/kg wet	3.333		86	40-140	1	30	
Indeno(1,2,3-cd)Pyrene	3.19	0.333	mg/kg wet	3.333		96	40-140	1	30	
Naphthalene	2.56	0.333	mg/kg wet	3.333		77	40-140	10	30	
Phenanthrene	2.92	0.333	mg/kg wet	3.333		88	40-140	1	30	
Pyrene	2.92	0.333	mg/kg wet	3.333		88	40-140	8	30	
Surrogate: 1,2-Dichlorobenzene-d4	2.77		mg/kg wet	3.333		83	30-130			
Surrogate: 2-Fluorobiphenyl	2.88		mg/kg wet	3.333		86	30-130			
Surrogate: Nitrobenzene-d5	2.89		mg/kg wet	3.333		87	30-130			
Surrogate: p-Terphenyl-d14	3.36		mg/kg wet	3.333		101	30-130			

Classical Chemistry

**Batch CI72119 - TCN Prep**

<b>Blank</b>										
Total Cyanide	ND	1.00	mg/kg wet							
<b>LCS</b>										
Total Cyanide	5.07	1.00	mg/kg wet	5.015		101	90-110			
<b>Reference</b>										
Total Cyanide	50.1	4.83	mg/kg wet	48.40		104	36.1577-206.6 12			
<b>Reference</b>										
Total Cyanide	49.1	4.86	mg/kg wet	48.40		102	36.1577-206.6 12			

**Batch CI72210 - TCN Prep**

<b>Blank</b>										
Total Cyanide	ND	1.00	mg/kg wet							
<b>LCS</b>										
Total Cyanide	4.94	1.00	mg/kg wet	5.015		98	90-110			
<b>Reference</b>										
Total Cyanide	48.7	4.89	mg/kg wet	48.40		101	36.1577-206.6 12			
<b>Reference</b>										
Total Cyanide	47.8	4.88	mg/kg wet	48.40		99	36.1577-206.6 12			



## CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.

Client Project ID: Former Tidwater Facility

ESS Laboratory Work Order: 1709493

### Notes and Definitions

- U Analyte included in the analysis, but not detected
- D+ Relative percent difference for duplicate is outside of criteria (D+).
- D Diluted.
- B+ Blank Spike recovery is above upper control limit (B+).
- B- Blank Spike recovery is below lower control limit (B-).
- ND Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference
- MDL Method Detection Limit
- MRL Method Reporting Limit
- LOD Limit of Detection
- LOQ Limit of Quantitation
- DL Detection Limit
- I/V Initial Volume
- F/V Final Volume
- § Subcontracted analysis; see attached report
- 1 Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
- 2 Range result excludes concentrations of target analytes eluting in that range.
- 3 Range result excludes the concentration of the C9-C10 aromatic range.
- Avg Results reported as a mathematical average.
- NR No Recovery
- [CALC] Calculated Analyte
- SUB Subcontracted analysis; see attached report
- RL Reporting Limit
- EDL Estimated Detection Limit



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility

ESS Laboratory Work Order: 1709493

**ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS**

**ENVIRONMENTAL**

Rhode Island Potable and Non Potable Water: LAI00179

<http://www.health.ri.gov/find/labs/analytical/ESS.pdf>

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750

[http://www.ct.gov/dph/lib/dph/environmental\\_health/environmental\\_laboratories/pdf/OutofStateCommercialLaboratories.pdf](http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf)

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002

<http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml>

Massachusetts Potable and Non Potable Water: M-RI002

<http://public.dep.state.ma.us/Labcert/Labcert.aspx>

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424

<http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm>

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313

<http://www.wadsworth.org/labcert/elap/comm.html>

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006

[http://datamine2.state.nj.us/DEP\\_OPRA/OpraMain/pi\\_main?mode=pi\\_by\\_site&sort\\_order=PI\\_NAMEA&Select+a+Site:=58715](http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715)

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752

<http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx>

## ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Providence, RI - GZA/HDM  
 Shipped/Delivered Via: Client

ESS Project ID: 1709493  
 Date Received: 9/18/2017  
 Project Due Date: 9/25/2017  
 Days for Project: 5 Day

- |  |  |
|--|--|
| 1. Air bill manifest present? <input type="checkbox"/> No<br>Air No.: <u>NA</u><br>2. Were custody seals present? <input type="checkbox"/> No<br>3. Is radiation count <100 CPM? <input type="checkbox"/> Yes<br>4. Is a Cooler Present? <input type="checkbox"/> Yes<br>Temp: <u>5.2</u> Iced with: <u>Ice</u><br>5. Was COC signed and dated by client? <input type="checkbox"/> Yes | 6. Does COC match bottles? <input type="checkbox"/> No<br>7. Is COC complete and correct? <input type="checkbox"/> Yes<br>8. Were samples received intact? <input type="checkbox"/> Yes<br>9. Were labs informed about <b>short holds &amp; rushes</b> ? Yes / No / NA<br>10. Were any analyses received outside of hold time? Yes / <del>No</del> |
|--|--|

- |   |   |
|---|---|
| 11. Any Subcontracting needed? Yes / <input checked="" type="checkbox"/> No<br>ESS Sample IDs: _____<br>Analysis: _____<br>TAT: _____ | 12. Were VOAs received? <input checked="" type="checkbox"/> Yes / No<br>a. Air bubbles in aqueous VOAs? Yes / No<br>b. Does methanol cover soil completely? <input checked="" type="checkbox"/> Yes / No / NA |
|---|---|

13. Are the samples properly preserved?  Yes / No
- a. If metals preserved upon receipt: Date: \_\_\_\_\_ Time: \_\_\_\_\_ By: \_\_\_\_\_
- b. Low Level VOA vials frozen: Date: 9/18/17 Time: 1724 By: RL

Sample Receiving Notes:

Added containers as per HDM

W 9/19/17  
W 9/19/17

14. Was there a need to contact Project Manager? Yes /  No
- a. Was there a need to contact the client? Yes / No
- Who was contacted? \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_ By: \_\_\_\_\_

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
01	164543	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
01	164564	Yes	NA	Yes	VOA Vial - Other	Other	
01	164565	Yes	NA	Yes	VOA Vial - Other	Other	
01	164576	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
02	164542	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
02	164562	Yes	NA	Yes	VOA Vial - Other	Other	
02	164563	Yes	NA	Yes	VOA Vial - Other	Other	
02	164575	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
03	164541	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
03	164560	Yes	NA	Yes	VOA Vial - Other	Other	
03	164561	Yes	NA	Yes	VOA Vial - Other	Other	
03	164574	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
04	164540	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
04	164558	Yes	NA	Yes	VOA Vial - Other	Other	
04	164559	Yes	NA	Yes	VOA Vial - Other	Other	
04	164573	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
05	164539	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
05	164556	Yes	NA	Yes	VOA Vial - Other	Other	
05	164557	Yes	NA	Yes	VOA Vial - Other	Other	
05	164572	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
06	164538	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
06	164554	Yes	NA	Yes	VOA Vial - Other	Other	
06	164555	Yes	NA	Yes	VOA Vial - Other	Other	
06	164571	Yes	NA	Yes	8 oz. Jar - Unpres	NP	

## ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Providence, RI - GZA/HDM

ESS Project ID: 1709493

Date Received: 9/18/2017

07	164537	Yes	NA	Yes	VOA Vial - Methanol	MeOH
07	164552	Yes	NA	Yes	VOA Vial - Other	Other
07	164553	Yes	NA	Yes	VOA Vial - Other	Other
07	164570	Yes	NA	Yes	8 oz. Jar - Unpres	NP
08	164536	Yes	NA	Yes	VOA Vial - Methanol	MeOH
08	164550	Yes	NA	Yes	VOA Vial - Other	Other
08	164551	Yes	NA	Yes	VOA Vial - Other	Other
08	164569	Yes	NA	Yes	8 oz. Jar - Unpres	NP
09	164535	Yes	NA	Yes	VOA Vial - Methanol	MeOH
09	164548	Yes	NA	Yes	VOA Vial - Other	Other
09	164549	Yes	NA	Yes	VOA Vial - Other	Other
09	164878	Yes	NA	Yes	8 oz. Jar - Unpres	NP
10	164534	Yes	NA	Yes	VOA Vial - Methanol	MeOH
10	164546	Yes	NA	Yes	VOA Vial - Other	Other
10	164547	Yes	NA	Yes	VOA Vial - Other	Other
10	164568	Yes	NA	Yes	8 oz. Jar - Unpres	NP
11	164533	Yes	NA	Yes	VOA Vial - Methanol	MeOH
11	164544	Yes	NA	Yes	VOA Vial - Other	Other
11	164545	Yes	NA	Yes	VOA Vial - Other	Other
11	164567	Yes	NA	Yes	8 oz. Jar - Unpres	NP
11	164577	Yes	NA	Yes	8 oz. Jar - Unpres	NP
12	164532	Yes	NA	Yes	VOA Vial - Methanol	MeOH
12	164566	Yes	NA	Yes	VOA Vial - Other	Other
12	164872	Yes	NA	Yes	VOA Vial - Methanol	MeOH
13	164870	Yes	NA	Yes	8 oz. Jar - Unpres	NP
13	164871	Yes	NA	Yes	VOA Vial - Methanol	MeOH
13	164876	Yes	NA	Yes	VOA Vial - Other	Other
13	164877	Yes	NA	Yes	VOA Vial - Other	Other
14	164869	Yes	NA	Yes	8 oz. Jar - Unpres	NP
14	164873	Yes	NA	Yes	VOA Vial - Methanol	MeOH
14	164874	Yes	NA	Yes	VOA Vial - Other	Other
14	164875	Yes	NA	Yes	VOA Vial - Other	Other

**2nd Review**

Are barcode labels on correct containers?

(Yes) No

Completed

By: 

Date & Time: 9/19/17 1133

Reviewed

By: 

Date & Time: 9/19/17 454

Delivered

By: 

Date & Time: 9/19/17 1204



## ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Providence, RI - GZA/HDM

ESS Project ID: 1709493

Shipped/Delivered Via: Client

Date Received: 9/18/2017

Project Due Date: 9/25/2017

Days for Project: 5 Day

1. Air bill manifest present?  No

Air No.: NA

6. Does COC match bottles?  No

2. Were custody seals present?  No

7. Is COC complete and correct?  Yes

3. Is radiation count <100 CPM?  Yes

8. Were samples received intact?  Yes

4. Is a Cooler Present?  Yes

Temp: 5.2 Iced with: Ice

9. Were labs informed about **short holds & rushes**? Yes / No / NA

5. Was COC signed and dated by client?  Yes

10. Were any analyses received outside of hold time? Yes / No

11. Any Subcontracting needed? Yes  No

ESS Sample IDs:

Analysis: \_\_\_\_\_

TAT: \_\_\_\_\_

12. Were VOAs received?  Yes / No

a. Air bubbles in aqueous VOAs? Yes / No

b. Does methanol cover soil completely? Yes / No / NA

13. Are the samples properly preserved?  Yes / No

a. If metals preserved upon receipt:

Date: \_\_\_\_\_

Time: \_\_\_\_\_

By: \_\_\_\_\_

b. Low Level VOA vials frozen:

Date: 9/18/17

Time: 1724

By: AL

Sample Receiving Notes:

Did not receive soil jar for TP-509(0-2'), Rec'd 1vial MeOH, 2vials DI water and amber soil jar labeled TP-508(0-2') and 1vial MeOH, 2vials DI water

and amber soil jar labeled TP-508(4-5') not listed on COC 9/18/17 *Added temp blank as stated 9/18/17*

14. Was there a need to contact Project Manager?  Yes / No

a. Was there a need to contact the client?  Yes / No

Who was contacted? \_\_\_\_\_

Date: \_\_\_\_\_

Time: \_\_\_\_\_

By: \_\_\_\_\_

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
01	164543	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
01	164564	Yes	NA	Yes	VOA Vial - Other	Other	
01	164565	Yes	NA	Yes	VOA Vial - Other	Other	
01	164576	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
02	164542	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
02	164562	Yes	NA	Yes	VOA Vial - Other	Other	
02	164563	Yes	NA	Yes	VOA Vial - Other	Other	
02	164575	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
03	164541	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
03	164560	Yes	NA	Yes	VOA Vial - Other	Other	
03	164561	Yes	NA	Yes	VOA Vial - Other	Other	
03	164574	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
04	164540	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
04	164558	Yes	NA	Yes	VOA Vial - Other	Other	
04	164559	Yes	NA	Yes	VOA Vial - Other	Other	
04	164573	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
05	164539	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
05	164556	Yes	NA	Yes	VOA Vial - Other	Other	
05	164557	Yes	NA	Yes	VOA Vial - Other	Other	
05	164572	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
06	164538	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
06	164554	Yes	NA	Yes	VOA Vial - Other	Other	
06	164555	Yes	NA	Yes	VOA Vial - Other	Other	
06	164571	Yes	NA	Yes	8 oz. Jar - Unpres	NP	

## ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Providence, RI - GZA/HDM

ESS Project ID: 1709493

Date Received: 9/18/2017

07	164537	Yes	NA	Yes	VOA Vial - Methanol	MeOH
07	164552	Yes	NA	Yes	VOA Vial - Other	Other
07	164553	Yes	NA	Yes	VOA Vial - Other	Other
07	164570	Yes	NA	Yes	8 oz. Jar - Unpres	NP
08	164536	Yes	NA	Yes	VOA Vial - Methanol	MeOH
08	164550	Yes	NA	Yes	VOA Vial - Other	Other
08	164551	Yes	NA	Yes	VOA Vial - Other	Other
08	164569	Yes	NA	Yes	8 oz. Jar - Unpres	NP
09	164535	Yes	NA	Yes	VOA Vial - Methanol	MeOH
09	164548	Yes	NA	Yes	VOA Vial - Other	Other
09	164549	Yes	NA	Yes	VOA Vial - Other	Other
10	164534	Yes	NA	Yes	VOA Vial - Methanol	MeOH
10	164546	Yes	NA	Yes	VOA Vial - Other	Other
10	164547	Yes	NA	Yes	VOA Vial - Other	Other
10	164568	Yes	NA	Yes	8 oz. Jar - Unpres	NP
11	164533	Yes	NA	Yes	VOA Vial - Methanol	MeOH
11	164544	Yes	NA	Yes	VOA Vial - Other	Other
11	164545	Yes	NA	Yes	VOA Vial - Other	Other
11	164567	Yes	NA	Yes	8 oz. Jar - Unpres	NP
11	164577	Yes	NA	Yes	8 oz. Jar - Unpres	NP
12	164532	Yes	NA	Yes	VOA Vial - Methanol	MeOH
12	164566	Yes	NA	Yes	VOA Vial - Other	Other

2nd Review

Are barcode labels on correct containers?

Yes  No

Completed

By: [Signature]

Date & Time: 9/18/17 1705

Reviewed

By: [Signature]

Date & Time: 9/18/17 1724

Delivered

By: [Signature]

Date & Time: 9/18/17 1724





ESS Laboratory

Division of Thielsch Engineering, Inc.  
 185 Frances Avenue, Cranston RI 02910  
 Tel. (401) 461-7181 Fax (401) 461-4486  
 www.esslaboratory.com

**CHAIN OF CUSTODY**

Turn Time Standard 5-Day Rush  
 Regulatory State Rhode Island  
 Is this project for any of the following?:  
 CT RCP  MA MCP  RGP

ESS Lab # 1709493  
 Reporting Limits RIDEM R-DEC and GB Leachability  
 Electronic  Limit Checker  Standard Excel  
 Deliverables  Other (Please Specify →)

Company Name GZA Project # 05.0043654.00 Project Name Former Tidewater Facility  
 Contact Person Sean Connelly Address 530 Broadway  
 City Providence State RI Zip Code 02909 PO # 43654  
 Telephone Number 401-421-4140 FAX Number - Email Address sean.connelly@gza.com

ESS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID	Analysis					
10	9/18/17	1430	Grab	Soil	TP-509 (5-6')	X	X	X	X	X	
11	9/18/17	14:00	Grab	Soil	TP-598 (0-2')	X	X	X	X	X	
<del>12</del>					<del>TP blank at site</del>						
13	9/18/17	11:15	Grab	Soil	TP - 508 (0-2')	X	X	X	X	X	HDM 9/19/17
14	9/18/17	11:30	Grab	Soil	TP - 508 (4-5')	X	X	X	X	X	

Container Type: AC-Air Cassette AG-Amber Glass B-BOD Bottle C-Cubitainer G - Glass O-Other P-Poly S-Sterile V-Vial  AGAG-10-10  
 Container Volume: 1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other\* 7 10  
 Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAce, NaOH 9-NH4Cl 10-DI H2O 11-Other\* 4/0 1  
 Number of Containers per Sample: 3 1

**Laboratory Use Only**  
 Sampled by: Sean Connelly, Sarah McLeod, Erik Beloff  
 Cooler Present: Y  
 Seals Intact: NA  
 Cooler Temperature: 5.2 °C 100  
 Comments: Please specify "Other" preservative and containers types in this space  
 NGRID rates apply  
 Please email sarah.mcleod@gza.com also

Relinquished by: (Signature, Date & Time) <u>Sarah McLeod 9/18/17 1607</u>	Received By: (Signature, Date & Time) <u>[Signature] 9/18/17 1607</u>	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)
Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)









## CERTIFICATE OF ANALYSIS

Sarah McLeod  
GZA GeoEnvironmental, Inc.  
530 Broadway  
Providence, RI 02909

**RE: Former Tidwater Facility (05.0043654.00)**  
**ESS Laboratory Work Order Number: 1709662**

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.



Laurel Stoddard  
Laboratory Director

**REVIEWED***By ESS Laboratory at 5:47 pm, Sep 29, 2017***Analytical Summary**

The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility

ESS Laboratory Work Order: 1709662

**SAMPLE RECEIPT**

The following samples were received on September 22, 2017 for the analyses specified on the enclosed Chain of Custody Record.

**Low Level VOA vials were frozen by ESS Laboratory on September 22, 2017 at 15:51.**

<u>Lab Number</u>	<u>Sample Name</u>	<u>Matrix</u>	<u>Analysis</u>
1709662-01	GZ-SS-501 (0-2')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1709662-02	GZ-SS-502 (0-2')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1709662-03	GZ-SS-503 (0-2')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1709662-04	GZ-SS-504 (0-2')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1709662-05	GZ-SS-505 (0-2')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1709662-06	GZ-SS-506 (0-2')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1709662-07	GZ-SS-507 (0-2')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1709662-08	GZ-SS-508 (0-2')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1709662-09	GZ-SS-509 (0-2')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1709662-10	GZ-SS-510 (0-2')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1709662-11	GZ-SS-511 (0-2')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1709662-12	GZ-SS-512 (0-2')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1709662-13	GZ-SS-513 (0-2')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1709662-14	GZ-SS-514 (0-2')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1709662-15	GZ-SS-515 (0-2')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1709662-16	GZ-SS-516 (0-2')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.

Client Project ID: Former Tidwater Facility

1709662-17

GZ-SS-517 (0-2')

Soil

ESS Laboratory Work Order: 1709662

6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D,  
9014



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility

ESS Laboratory Work Order: 1709662

**PROJECT NARRATIVE**

**5035/8260B Volatile Organic Compounds / Low Level**

- CI72535-BS1 [Blank Spike recovery is below lower control limit \(B-\).](#)  
 Dichlorodifluoromethane (69% @ 70-130%)
- CI72557-BS1 [Blank Spike recovery is below lower control limit \(B-\).](#)  
 Dichlorodifluoromethane (65% @ 70-130%)
- CI72557-BSD1 [Blank Spike recovery is below lower control limit \(B-\).](#)  
 Dichlorodifluoromethane (64% @ 70-130%)

**Total Metals**

- CI72737-SRM1 [Standard Reference Material is biased low \(R-\).](#)  
 Silver (65% @ 70-130%)

No other observations noted.

End of Project Narrative.

**DATA USABILITY LINKS**

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- [Definitions of Quality Control Parameters](#)
- [Semivolatile Organics Internal Standard Information](#)
- [Semivolatile Organics Surrogate Information](#)
- [Volatile Organics Internal Standard Information](#)
- [Volatile Organics Surrogate Information](#)
- [EPH and VPH Alkane Lists](#)





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility

ESS Laboratory Work Order: 1709662

**CURRENT SW-846 METHODOLOGY VERSIONS**

**Analytical Methods**

- 1010A - Flashpoint
- 6010C - ICP
- 6020A - ICP MS
- 7010 - Graphite Furnace
- 7196A - Hexavalent Chromium
- 7470A - Aqueous Mercury
- 7471B - Solid Mercury
- 8011 - EDB/DBCP/TCP
- 8015C - GRO/DRO
- 8081B - Pesticides
- 8082A - PCB
- 8100M - TPH
- 8151A - Herbicides
- 8260B - VOA
- 8270D - SVOA
- 8270D SIM - SVOA Low Level
- 9014 - Cyanide
- 9038 - Sulfate
- 9040C - Aqueous pH
- 9045D - Solid pH (Corrosivity)
- 9050A - Specific Conductance
- 9056A - Anions (IC)
- 9060A - TOC
- 9095B - Paint Filter
- MADEP 04-1.1 - EPH / VPH

**Prep Methods**

- 3005A - Aqueous ICP Digestion
- 3020A - Aqueous Graphite Furnace / ICP MS Digestion
- 3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
- 3060A - Solid Hexavalent Chromium Digestion
- 3510C - Separatory Funnel Extraction
- 3520C - Liquid / Liquid Extraction
- 3540C - Manual Soxhlet Extraction
- 3541 - Automated Soxhlet Extraction
- 3546 - Microwave Extraction
- 3580A - Waste Dilution
- 5030B - Aqueous Purge and Trap
- 5030C - Aqueous Purge and Trap
- 5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: GZ-SS-501 (0-2')  
Date Sampled: 09/21/17 10:45  
Percent Solids: 96

ESS Laboratory Work Order: 1709662  
ESS Laboratory Sample ID: 1709662-01  
Sample Matrix: Soil  
Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (1.97)		6020A		20	NAR	09/29/17 4:21	2.12	100	CI72737
Arsenic	<b>4.46</b> (2.46)		6010C		1	KJK	09/28/17 3:57	2.12	100	CI72737
Beryllium	<b>0.23</b> (0.11)		6010C		1	KJK	09/28/17 3:57	2.12	100	CI72737
Cadmium	ND (0.49)		6010C		1	KJK	09/28/17 3:57	2.12	100	CI72737
Chromium	<b>7.33</b> (0.98)		6010C		1	KJK	09/28/17 3:57	2.12	100	CI72737
Copper	<b>19.2</b> (2.46)		6010C		1	KJK	09/28/17 3:57	2.12	100	CI72737
Lead	<b>79.8</b> (4.92)		6010C		1	KJK	09/28/17 3:57	2.12	100	CI72737
Mercury	<b>0.107</b> (0.031)		7471B		1	MJV	09/27/17 21:10	0.67	40	CI72736
Nickel	<b>6.60</b> (2.46)		6010C		1	KJK	09/28/17 3:57	2.12	100	CI72737
Selenium	ND (1.97)		6020A		20	NAR	09/29/17 4:21	2.12	100	CI72737
Silver	ND (0.49)		6010C		1	KJK	09/28/17 3:57	2.12	100	CI72737
Thallium	ND (1.97)		6020A		20	NAR	09/29/17 4:21	2.12	100	CI72737
Zinc	<b>49.5</b> (2.46)		6010C		1	KJK	09/28/17 3:57	2.12	100	CI72737



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: GZ-SS-501 (0-2')  
 Date Sampled: 09/21/17 10:45  
 Percent Solids: 96  
 Initial Volume: 5.5  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709662  
 ESS Laboratory Sample ID: 1709662-01  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0047)		8260B Low		1	09/26/17 17:46	C7I0420	CI72621
1,1,1-Trichloroethane	ND (0.0047)		8260B Low		1	09/26/17 17:46	C7I0420	CI72621
1,1,2,2-Tetrachloroethane	ND (0.0047)		8260B Low		1	09/26/17 17:46	C7I0420	CI72621
1,1,2-Trichloroethane	ND (0.0047)		8260B Low		1	09/26/17 17:46	C7I0420	CI72621
1,1-Dichloroethane	ND (0.0047)		8260B Low		1	09/26/17 17:46	C7I0420	CI72621
1,1-Dichloroethene	ND (0.0047)		8260B Low		1	09/26/17 17:46	C7I0420	CI72621
1,1-Dichloropropene	ND (0.0047)		8260B Low		1	09/26/17 17:46	C7I0420	CI72621
1,2,3-Trichlorobenzene	ND (0.0047)		8260B Low		1	09/26/17 17:46	C7I0420	CI72621
1,2,3-Trichloropropane	ND (0.0047)		8260B Low		1	09/26/17 17:46	C7I0420	CI72621
1,2,4-Trichlorobenzene	ND (0.0047)		8260B Low		1	09/26/17 17:46	C7I0420	CI72621
1,2,4-Trimethylbenzene	ND (0.0047)		8260B Low		1	09/26/17 17:46	C7I0420	CI72621
1,2-Dibromo-3-Chloropropane	ND (0.0047)		8260B Low		1	09/26/17 17:46	C7I0420	CI72621
1,2-Dibromoethane	ND (0.0047)		8260B Low		1	09/26/17 17:46	C7I0420	CI72621
1,2-Dichlorobenzene	ND (0.0047)		8260B Low		1	09/26/17 17:46	C7I0420	CI72621
1,2-Dichloroethane	ND (0.0047)		8260B Low		1	09/26/17 17:46	C7I0420	CI72621
1,2-Dichloropropane	ND (0.0047)		8260B Low		1	09/26/17 17:46	C7I0420	CI72621
1,3,5-Trimethylbenzene	ND (0.0047)		8260B Low		1	09/26/17 17:46	C7I0420	CI72621
1,3-Dichlorobenzene	ND (0.0047)		8260B Low		1	09/26/17 17:46	C7I0420	CI72621
1,3-Dichloropropane	ND (0.0047)		8260B Low		1	09/26/17 17:46	C7I0420	CI72621
1,4-Dichlorobenzene	ND (0.0047)		8260B Low		1	09/26/17 17:46	C7I0420	CI72621
1,4-Dioxane	ND (0.0949)		8260B Low		1	09/26/17 17:46	C7I0420	CI72621
1-Chlorohexane	ND (0.0047)		8260B Low		1	09/26/17 17:46	C7I0420	CI72621
2,2-Dichloropropane	ND (0.0047)		8260B Low		1	09/26/17 17:46	C7I0420	CI72621
2-Butanone	ND (0.0474)		8260B Low		1	09/26/17 17:46	C7I0420	CI72621
2-Chlorotoluene	ND (0.0047)		8260B Low		1	09/26/17 17:46	C7I0420	CI72621
2-Hexanone	ND (0.0474)		8260B Low		1	09/26/17 17:46	C7I0420	CI72621
4-Chlorotoluene	ND (0.0047)		8260B Low		1	09/26/17 17:46	C7I0420	CI72621
4-Isopropyltoluene	ND (0.0047)		8260B Low		1	09/26/17 17:46	C7I0420	CI72621
4-Methyl-2-Pentanone	ND (0.0474)		8260B Low		1	09/26/17 17:46	C7I0420	CI72621
Acetone	ND (0.0474)		8260B Low		1	09/26/17 17:46	C7I0420	CI72621
Benzene	ND (0.0047)		8260B Low		1	09/26/17 17:46	C7I0420	CI72621
Bromobenzene	ND (0.0047)		8260B Low		1	09/26/17 17:46	C7I0420	CI72621



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: GZ-SS-501 (0-2')  
 Date Sampled: 09/21/17 10:45  
 Percent Solids: 96  
 Initial Volume: 5.5  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709662  
 ESS Laboratory Sample ID: 1709662-01  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0047)		8260B Low		1	09/26/17 17:46	C7I0420	CI72621
Bromodichloromethane	ND (0.0047)		8260B Low		1	09/26/17 17:46	C7I0420	CI72621
Bromoform	ND (0.0047)		8260B Low		1	09/26/17 17:46	C7I0420	CI72621
Bromomethane	ND (0.0095)		8260B Low		1	09/26/17 17:46	C7I0420	CI72621
Carbon Disulfide	ND (0.0047)		8260B Low		1	09/26/17 17:46	C7I0420	CI72621
Carbon Tetrachloride	ND (0.0047)		8260B Low		1	09/26/17 17:46	C7I0420	CI72621
Chlorobenzene	ND (0.0047)		8260B Low		1	09/26/17 17:46	C7I0420	CI72621
Chloroethane	ND (0.0095)		8260B Low		1	09/26/17 17:46	C7I0420	CI72621
Chloroform	ND (0.0047)		8260B Low		1	09/26/17 17:46	C7I0420	CI72621
Chloromethane	ND (0.0095)		8260B Low		1	09/26/17 17:46	C7I0420	CI72621
cis-1,2-Dichloroethene	ND (0.0047)		8260B Low		1	09/26/17 17:46	C7I0420	CI72621
cis-1,3-Dichloropropene	ND (0.0047)		8260B Low		1	09/26/17 17:46	C7I0420	CI72621
Dibromochloromethane	ND (0.0047)		8260B Low		1	09/26/17 17:46	C7I0420	CI72621
Dibromomethane	ND (0.0047)		8260B Low		1	09/26/17 17:46	C7I0420	CI72621
Dichlorodifluoromethane	ND (0.0095)		8260B Low		1	09/26/17 17:46	C7I0420	CI72621
Diethyl Ether	ND (0.0047)		8260B Low		1	09/26/17 17:46	C7I0420	CI72621
Di-isopropyl ether	ND (0.0047)		8260B Low		1	09/26/17 17:46	C7I0420	CI72621
Ethyl tertiary-butyl ether	ND (0.0047)		8260B Low		1	09/26/17 17:46	C7I0420	CI72621
Ethylbenzene	ND (0.0047)		8260B Low		1	09/26/17 17:46	C7I0420	CI72621
Hexachlorobutadiene	ND (0.0047)		8260B Low		1	09/26/17 17:46	C7I0420	CI72621
Isopropylbenzene	ND (0.0047)		8260B Low		1	09/26/17 17:46	C7I0420	CI72621
Methyl tert-Butyl Ether	ND (0.0047)		8260B Low		1	09/26/17 17:46	C7I0420	CI72621
Methylene Chloride	ND (0.0237)		8260B Low		1	09/26/17 17:46	C7I0420	CI72621
Naphthalene	ND (0.0047)		8260B Low		1	09/26/17 17:46	C7I0420	CI72621
n-Butylbenzene	ND (0.0047)		8260B Low		1	09/26/17 17:46	C7I0420	CI72621
n-Propylbenzene	ND (0.0047)		8260B Low		1	09/26/17 17:46	C7I0420	CI72621
sec-Butylbenzene	ND (0.0047)		8260B Low		1	09/26/17 17:46	C7I0420	CI72621
Styrene	ND (0.0047)		8260B Low		1	09/26/17 17:46	C7I0420	CI72621
tert-Butylbenzene	ND (0.0047)		8260B Low		1	09/26/17 17:46	C7I0420	CI72621
Tertiary-amyl methyl ether	ND (0.0047)		8260B Low		1	09/26/17 17:46	C7I0420	CI72621
Tetrachloroethene	ND (0.0047)		8260B Low		1	09/26/17 17:46	C7I0420	CI72621
Tetrahydrofuran	ND (0.0047)		8260B Low		1	09/26/17 17:46	C7I0420	CI72621



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: GZ-SS-501 (0-2')  
 Date Sampled: 09/21/17 10:45  
 Percent Solids: 96  
 Initial Volume: 5.5  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709662  
 ESS Laboratory Sample ID: 1709662-01  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0047)		8260B Low		1	09/26/17 17:46	C7I0420	C172621
trans-1,2-Dichloroethene	ND (0.0047)		8260B Low		1	09/26/17 17:46	C7I0420	C172621
trans-1,3-Dichloropropene	ND (0.0047)		8260B Low		1	09/26/17 17:46	C7I0420	C172621
Trichloroethene	ND (0.0047)		8260B Low		1	09/26/17 17:46	C7I0420	C172621
Trichlorofluoromethane	ND (0.0047)		8260B Low		1	09/26/17 17:46	C7I0420	C172621
Vinyl Acetate	ND (0.0047)		8260B Low		1	09/26/17 17:46	C7I0420	C172621
Vinyl Chloride	ND (0.0095)		8260B Low		1	09/26/17 17:46	C7I0420	C172621
Xylene O	ND (0.0047)		8260B Low		1	09/26/17 17:46	C7I0420	C172621
Xylene P,M	ND (0.0095)		8260B Low		1	09/26/17 17:46	C7I0420	C172621
Xylenes (Total)	ND (0.0095)		8260B Low		1	09/26/17 17:46		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	97 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	105 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	98 %		70-130
<i>Surrogate: Toluene-d8</i>	112 %		70-130





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: GZ-SS-501 (0-2')  
 Date Sampled: 09/21/17 10:45  
 Percent Solids: 96  
 Initial Volume: 19.2  
 Final Volume: 1  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709662  
 ESS Laboratory Sample ID: 1709662-01  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: SMR  
 Prepared: 9/25/17 11:30

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	87.1 (40.8)		8100M		1	09/26/17 3:30	C710397	C172519
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		75 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: GZ-SS-501 (0-2')  
Date Sampled: 09/21/17 10:45  
Percent Solids: 96  
Initial Volume: 15.2  
Final Volume: 0.5  
Extraction Method: 3546

ESS Laboratory Work Order: 1709662  
ESS Laboratory Sample ID: 1709662-01  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: TJ  
Prepared: 9/25/17 12:35

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.343)		8270D		1	09/25/17 19:24	C7I0391	CI72521
Acenaphthene	ND (0.343)		8270D		1	09/25/17 19:24	C7I0391	CI72521
Acenaphthylene	ND (0.343)		8270D		1	09/25/17 19:24	C7I0391	CI72521
<b>Anthracene</b>	<b>0.424</b> (0.343)		8270D		1	09/25/17 19:24	C7I0391	CI72521
<b>Benzo(a)anthracene</b>	<b>1.21</b> (0.343)		8270D		1	09/25/17 19:24	C7I0391	CI72521
<b>Benzo(a)pyrene</b>	<b>1.00</b> (0.172)		8270D		1	09/25/17 19:24	C7I0391	CI72521
<b>Benzo(b)fluoranthene</b>	<b>1.12</b> (0.343)		8270D		1	09/25/17 19:24	C7I0391	CI72521
Benzo(g,h,i)perylene	ND (0.343)		8270D		1	09/25/17 19:24	C7I0391	CI72521
<b>Benzo(k)fluoranthene</b>	<b>0.920</b> (0.343)		8270D		1	09/25/17 19:24	C7I0391	CI72521
<b>Chrysene</b>	<b>1.22</b> (0.172)		8270D		1	09/25/17 19:24	C7I0391	CI72521
<b>Dibenzo(a,h)Anthracene</b>	<b>0.193</b> (0.172)		8270D		1	09/25/17 19:24	C7I0391	CI72521
<b>Fluoranthene</b>	<b>2.56</b> (0.343)		8270D		1	09/25/17 19:24	C7I0391	CI72521
Fluorene	ND (0.343)		8270D		1	09/25/17 19:24	C7I0391	CI72521
<b>Indeno(1,2,3-cd)Pyrene</b>	<b>0.351</b> (0.343)		8270D		1	09/25/17 19:24	C7I0391	CI72521
Naphthalene	ND (0.343)		8270D		1	09/25/17 19:24	C7I0391	CI72521
<b>Phenanthrene</b>	<b>1.65</b> (0.343)		8270D		1	09/25/17 19:24	C7I0391	CI72521
<b>Pyrene</b>	<b>1.70</b> (0.343)		8270D		1	09/25/17 19:24	C7I0391	CI72521

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	58 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	68 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	64 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	66 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: GZ-SS-501 (0-2')  
Date Sampled: 09/21/17 10:45  
Percent Solids: 96

ESS Laboratory Work Order: 1709662  
ESS Laboratory Sample ID: 1709662-01  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	ND (1.02)		9014		1	EEM	09/28/17 11:50	mg/kg dry	CI72818



## CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: GZ-SS-502 (0-2')  
Date Sampled: 09/21/17 11:20  
Percent Solids: 97

ESS Laboratory Work Order: 1709662  
ESS Laboratory Sample ID: 1709662-02  
Sample Matrix: Soil  
Units: mg/kg dry

Extraction Method: 3050B

### Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (1.92)		6020A		20	NAR	09/29/17 4:26	2.15	100	CI72737
Arsenic	7.33 (2.40)		6010C		1	KJK	09/28/17 4:01	2.15	100	CI72737
Beryllium	0.26 (0.11)		6010C		1	KJK	09/28/17 4:01	2.15	100	CI72737
Cadmium	ND (0.48)		6010C		1	KJK	09/28/17 4:01	2.15	100	CI72737
Chromium	14.9 (0.96)		6010C		1	KJK	09/28/17 4:01	2.15	100	CI72737
Copper	22.1 (2.40)		6010C		1	KJK	09/28/17 4:01	2.15	100	CI72737
Lead	52.5 (4.81)		6010C		1	KJK	09/28/17 4:01	2.15	100	CI72737
Mercury	0.065 (0.027)		7471B		1	MJV	09/27/17 21:24	0.75	40	CI72736
Nickel	9.58 (2.40)		6010C		1	KJK	09/28/17 4:01	2.15	100	CI72737
Selenium	ND (1.92)		6020A		20	NAR	09/29/17 4:26	2.15	100	CI72737
Silver	ND (0.48)		6010C		1	KJK	09/28/17 4:01	2.15	100	CI72737
Thallium	ND (1.92)		6020A		20	NAR	09/29/17 4:26	2.15	100	CI72737
Zinc	43.9 (2.40)		6010C		1	KJK	09/28/17 4:01	2.15	100	CI72737



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: GZ-SS-502 (0-2')  
 Date Sampled: 09/21/17 11:20  
 Percent Solids: 97  
 Initial Volume: 6.2  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709662  
 ESS Laboratory Sample ID: 1709662-02  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0042)		8260B Low		1	09/26/17 18:12	C7I0420	CI72621
1,1,1-Trichloroethane	ND (0.0042)		8260B Low		1	09/26/17 18:12	C7I0420	CI72621
1,1,2,2-Tetrachloroethane	ND (0.0042)		8260B Low		1	09/26/17 18:12	C7I0420	CI72621
1,1,2-Trichloroethane	ND (0.0042)		8260B Low		1	09/26/17 18:12	C7I0420	CI72621
1,1-Dichloroethane	ND (0.0042)		8260B Low		1	09/26/17 18:12	C7I0420	CI72621
1,1-Dichloroethene	ND (0.0042)		8260B Low		1	09/26/17 18:12	C7I0420	CI72621
1,1-Dichloropropene	ND (0.0042)		8260B Low		1	09/26/17 18:12	C7I0420	CI72621
1,2,3-Trichlorobenzene	ND (0.0042)		8260B Low		1	09/26/17 18:12	C7I0420	CI72621
1,2,3-Trichloropropane	ND (0.0042)		8260B Low		1	09/26/17 18:12	C7I0420	CI72621
1,2,4-Trichlorobenzene	ND (0.0042)		8260B Low		1	09/26/17 18:12	C7I0420	CI72621
1,2,4-Trimethylbenzene	ND (0.0042)		8260B Low		1	09/26/17 18:12	C7I0420	CI72621
1,2-Dibromo-3-Chloropropane	ND (0.0042)		8260B Low		1	09/26/17 18:12	C7I0420	CI72621
1,2-Dibromoethane	ND (0.0042)		8260B Low		1	09/26/17 18:12	C7I0420	CI72621
1,2-Dichlorobenzene	ND (0.0042)		8260B Low		1	09/26/17 18:12	C7I0420	CI72621
1,2-Dichloroethane	ND (0.0042)		8260B Low		1	09/26/17 18:12	C7I0420	CI72621
1,2-Dichloropropane	ND (0.0042)		8260B Low		1	09/26/17 18:12	C7I0420	CI72621
1,3,5-Trimethylbenzene	ND (0.0042)		8260B Low		1	09/26/17 18:12	C7I0420	CI72621
1,3-Dichlorobenzene	ND (0.0042)		8260B Low		1	09/26/17 18:12	C7I0420	CI72621
1,3-Dichloropropane	ND (0.0042)		8260B Low		1	09/26/17 18:12	C7I0420	CI72621
1,4-Dichlorobenzene	ND (0.0042)		8260B Low		1	09/26/17 18:12	C7I0420	CI72621
1,4-Dioxane	ND (0.0833)		8260B Low		1	09/26/17 18:12	C7I0420	CI72621
1-Chlorohexane	ND (0.0042)		8260B Low		1	09/26/17 18:12	C7I0420	CI72621
2,2-Dichloropropane	ND (0.0042)		8260B Low		1	09/26/17 18:12	C7I0420	CI72621
2-Butanone	ND (0.0417)		8260B Low		1	09/26/17 18:12	C7I0420	CI72621
2-Chlorotoluene	ND (0.0042)		8260B Low		1	09/26/17 18:12	C7I0420	CI72621
2-Hexanone	ND (0.0417)		8260B Low		1	09/26/17 18:12	C7I0420	CI72621
4-Chlorotoluene	ND (0.0042)		8260B Low		1	09/26/17 18:12	C7I0420	CI72621
4-Isopropyltoluene	ND (0.0042)		8260B Low		1	09/26/17 18:12	C7I0420	CI72621
4-Methyl-2-Pentanone	ND (0.0417)		8260B Low		1	09/26/17 18:12	C7I0420	CI72621
Acetone	ND (0.0417)		8260B Low		1	09/26/17 18:12	C7I0420	CI72621
Benzene	ND (0.0042)		8260B Low		1	09/26/17 18:12	C7I0420	CI72621
Bromobenzene	ND (0.0042)		8260B Low		1	09/26/17 18:12	C7I0420	CI72621





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: GZ-SS-502 (0-2')  
Date Sampled: 09/21/17 11:20  
Percent Solids: 97  
Initial Volume: 6.2  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1709662  
ESS Laboratory Sample ID: 1709662-02  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0042)		8260B Low		1	09/26/17 18:12	C7I0420	CI72621
Bromodichloromethane	ND (0.0042)		8260B Low		1	09/26/17 18:12	C7I0420	CI72621
Bromoform	ND (0.0042)		8260B Low		1	09/26/17 18:12	C7I0420	CI72621
Bromomethane	ND (0.0083)		8260B Low		1	09/26/17 18:12	C7I0420	CI72621
Carbon Disulfide	ND (0.0042)		8260B Low		1	09/26/17 18:12	C7I0420	CI72621
Carbon Tetrachloride	ND (0.0042)		8260B Low		1	09/26/17 18:12	C7I0420	CI72621
Chlorobenzene	ND (0.0042)		8260B Low		1	09/26/17 18:12	C7I0420	CI72621
Chloroethane	ND (0.0083)		8260B Low		1	09/26/17 18:12	C7I0420	CI72621
Chloroform	ND (0.0042)		8260B Low		1	09/26/17 18:12	C7I0420	CI72621
Chloromethane	ND (0.0083)		8260B Low		1	09/26/17 18:12	C7I0420	CI72621
cis-1,2-Dichloroethene	ND (0.0042)		8260B Low		1	09/26/17 18:12	C7I0420	CI72621
cis-1,3-Dichloropropene	ND (0.0042)		8260B Low		1	09/26/17 18:12	C7I0420	CI72621
Dibromochloromethane	ND (0.0042)		8260B Low		1	09/26/17 18:12	C7I0420	CI72621
Dibromomethane	ND (0.0042)		8260B Low		1	09/26/17 18:12	C7I0420	CI72621
Dichlorodifluoromethane	ND (0.0083)		8260B Low		1	09/26/17 18:12	C7I0420	CI72621
Diethyl Ether	ND (0.0042)		8260B Low		1	09/26/17 18:12	C7I0420	CI72621
Di-isopropyl ether	ND (0.0042)		8260B Low		1	09/26/17 18:12	C7I0420	CI72621
Ethyl tertiary-butyl ether	ND (0.0042)		8260B Low		1	09/26/17 18:12	C7I0420	CI72621
Ethylbenzene	ND (0.0042)		8260B Low		1	09/26/17 18:12	C7I0420	CI72621
Hexachlorobutadiene	ND (0.0042)		8260B Low		1	09/26/17 18:12	C7I0420	CI72621
Isopropylbenzene	ND (0.0042)		8260B Low		1	09/26/17 18:12	C7I0420	CI72621
Methyl tert-Butyl Ether	ND (0.0042)		8260B Low		1	09/26/17 18:12	C7I0420	CI72621
Methylene Chloride	ND (0.0208)		8260B Low		1	09/26/17 18:12	C7I0420	CI72621
Naphthalene	ND (0.0042)		8260B Low		1	09/26/17 18:12	C7I0420	CI72621
n-Butylbenzene	ND (0.0042)		8260B Low		1	09/26/17 18:12	C7I0420	CI72621
n-Propylbenzene	ND (0.0042)		8260B Low		1	09/26/17 18:12	C7I0420	CI72621
sec-Butylbenzene	ND (0.0042)		8260B Low		1	09/26/17 18:12	C7I0420	CI72621
Styrene	ND (0.0042)		8260B Low		1	09/26/17 18:12	C7I0420	CI72621
tert-Butylbenzene	ND (0.0042)		8260B Low		1	09/26/17 18:12	C7I0420	CI72621
Tertiary-amyl methyl ether	ND (0.0042)		8260B Low		1	09/26/17 18:12	C7I0420	CI72621
Tetrachloroethene	ND (0.0042)		8260B Low		1	09/26/17 18:12	C7I0420	CI72621
Tetrahydrofuran	ND (0.0042)		8260B Low		1	09/26/17 18:12	C7I0420	CI72621



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: GZ-SS-502 (0-2')  
Date Sampled: 09/21/17 11:20  
Percent Solids: 97  
Initial Volume: 6.2  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1709662  
ESS Laboratory Sample ID: 1709662-02  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0042)		8260B Low		1	09/26/17 18:12	C7I0420	CI72621
trans-1,2-Dichloroethene	ND (0.0042)		8260B Low		1	09/26/17 18:12	C7I0420	CI72621
trans-1,3-Dichloropropene	ND (0.0042)		8260B Low		1	09/26/17 18:12	C7I0420	CI72621
Trichloroethene	ND (0.0042)		8260B Low		1	09/26/17 18:12	C7I0420	CI72621
Trichlorofluoromethane	ND (0.0042)		8260B Low		1	09/26/17 18:12	C7I0420	CI72621
Vinyl Acetate	ND (0.0042)		8260B Low		1	09/26/17 18:12	C7I0420	CI72621
Vinyl Chloride	ND (0.0083)		8260B Low		1	09/26/17 18:12	C7I0420	CI72621
Xylene O	ND (0.0042)		8260B Low		1	09/26/17 18:12	C7I0420	CI72621
Xylene P,M	ND (0.0083)		8260B Low		1	09/26/17 18:12	C7I0420	CI72621
Xylenes (Total)	ND (0.0083)		8260B Low		1	09/26/17 18:12		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	97 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	105 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	100 %		70-130
<i>Surrogate: Toluene-d8</i>	113 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: GZ-SS-502 (0-2')  
Date Sampled: 09/21/17 11:20  
Percent Solids: 97  
Initial Volume: 19.1  
Final Volume: 1  
Extraction Method: 3546

ESS Laboratory Work Order: 1709662  
ESS Laboratory Sample ID: 1709662-02  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: SMR  
Prepared: 9/25/17 11:30

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	ND (40.6)		8100M		1	09/26/17 7:36	C710397	C172519
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		84 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: GZ-SS-502 (0-2')  
Date Sampled: 09/21/17 11:20  
Percent Solids: 97  
Initial Volume: 15.3  
Final Volume: 0.5  
Extraction Method: 3546

ESS Laboratory Work Order: 1709662  
ESS Laboratory Sample ID: 1709662-02  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: TJ  
Prepared: 9/25/17 12:35

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.337)		8270D		1	09/25/17 19:59	C7I0391	CI72521
Acenaphthene	ND (0.337)		8270D		1	09/25/17 19:59	C7I0391	CI72521
Acenaphthylene	ND (0.337)		8270D		1	09/25/17 19:59	C7I0391	CI72521
Anthracene	ND (0.337)		8270D		1	09/25/17 19:59	C7I0391	CI72521
<b>Benzo(a)anthracene</b>	<b>0.343</b> (0.337)		8270D		1	09/25/17 19:59	C7I0391	CI72521
<b>Benzo(a)pyrene</b>	<b>0.354</b> (0.169)		8270D		1	09/25/17 19:59	C7I0391	CI72521
<b>Benzo(b)fluoranthene</b>	<b>0.396</b> (0.337)		8270D		1	09/25/17 19:59	C7I0391	CI72521
Benzo(g,h,i)perylene	ND (0.337)		8270D		1	09/25/17 19:59	C7I0391	CI72521
Benzo(k)fluoranthene	ND (0.337)		8270D		1	09/25/17 19:59	C7I0391	CI72521
<b>Chrysene</b>	<b>0.358</b> (0.169)		8270D		1	09/25/17 19:59	C7I0391	CI72521
Dibenzo(a,h)Anthracene	ND (0.169)		8270D		1	09/25/17 19:59	C7I0391	CI72521
<b>Fluoranthene</b>	<b>0.660</b> (0.337)		8270D		1	09/25/17 19:59	C7I0391	CI72521
Fluorene	ND (0.337)		8270D		1	09/25/17 19:59	C7I0391	CI72521
Indeno(1,2,3-cd)Pyrene	ND (0.337)		8270D		1	09/25/17 19:59	C7I0391	CI72521
Naphthalene	ND (0.337)		8270D		1	09/25/17 19:59	C7I0391	CI72521
Phenanthrene	ND (0.337)		8270D		1	09/25/17 19:59	C7I0391	CI72521
<b>Pyrene</b>	<b>0.510</b> (0.337)		8270D		1	09/25/17 19:59	C7I0391	CI72521

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	70 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	73 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	72 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	68 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: GZ-SS-502 (0-2')  
Date Sampled: 09/21/17 11:20  
Percent Solids: 97

ESS Laboratory Work Order: 1709662  
ESS Laboratory Sample ID: 1709662-02  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	ND (1.02)		9014		1	EEM	09/28/17 11:50	mg/kg dry	CI72818





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: GZ-SS-503 (0-2')  
Date Sampled: 09/21/17 11:55  
Percent Solids: 96

ESS Laboratory Work Order: 1709662  
ESS Laboratory Sample ID: 1709662-03  
Sample Matrix: Soil  
Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (2.08)		6020A		20	NAR	09/29/17 4:32	2	100	CI72737
Arsenic	<b>4.37</b> (2.61)		6010C		1	KJK	09/28/17 4:05	2	100	CI72737
Beryllium	<b>0.28</b> (0.11)		6010C		1	KJK	09/28/17 4:05	2	100	CI72737
Cadmium	ND (0.52)		6010C		1	KJK	09/28/17 4:05	2	100	CI72737
Chromium	<b>6.85</b> (1.04)		6010C		1	KJK	09/28/17 4:05	2	100	CI72737
Copper	<b>16.6</b> (2.61)		6010C		1	KJK	09/28/17 4:05	2	100	CI72737
Lead	<b>70.2</b> (5.21)		6010C		1	KJK	09/28/17 4:05	2	100	CI72737
Mercury	<b>0.171</b> (0.027)		7471B		1	MJV	09/27/17 21:26	0.77	40	CI72736
Nickel	<b>7.60</b> (2.61)		6010C		1	KJK	09/28/17 4:05	2	100	CI72737
Selenium	ND (2.08)		6020A		20	NAR	09/29/17 4:32	2	100	CI72737
Silver	ND (0.52)		6010C		1	KJK	09/28/17 4:05	2	100	CI72737
Thallium	ND (2.08)		6020A		20	NAR	09/29/17 4:32	2	100	CI72737
Zinc	<b>65.3</b> (2.61)		6010C		1	KJK	09/28/17 4:05	2	100	CI72737



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: GZ-SS-503 (0-2')  
 Date Sampled: 09/21/17 11:55  
 Percent Solids: 96  
 Initial Volume: 8.9  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709662  
 ESS Laboratory Sample ID: 1709662-03  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0029)		8260B Low		1	09/25/17 18:32	C7I0405	CI72557
1,1,1-Trichloroethane	ND (0.0029)		8260B Low		1	09/25/17 18:32	C7I0405	CI72557
1,1,2,2-Tetrachloroethane	ND (0.0029)		8260B Low		1	09/25/17 18:32	C7I0405	CI72557
1,1,2-Trichloroethane	ND (0.0029)		8260B Low		1	09/25/17 18:32	C7I0405	CI72557
1,1-Dichloroethane	ND (0.0029)		8260B Low		1	09/25/17 18:32	C7I0405	CI72557
1,1-Dichloroethene	ND (0.0029)		8260B Low		1	09/25/17 18:32	C7I0405	CI72557
1,1-Dichloropropene	ND (0.0029)		8260B Low		1	09/25/17 18:32	C7I0405	CI72557
1,2,3-Trichlorobenzene	ND (0.0029)		8260B Low		1	09/25/17 18:32	C7I0405	CI72557
1,2,3-Trichloropropane	ND (0.0029)		8260B Low		1	09/25/17 18:32	C7I0405	CI72557
1,2,4-Trichlorobenzene	ND (0.0029)		8260B Low		1	09/25/17 18:32	C7I0405	CI72557
1,2,4-Trimethylbenzene	ND (0.0029)		8260B Low		1	09/25/17 18:32	C7I0405	CI72557
1,2-Dibromo-3-Chloropropane	ND (0.0029)		8260B Low		1	09/25/17 18:32	C7I0405	CI72557
1,2-Dibromoethane	ND (0.0029)		8260B Low		1	09/25/17 18:32	C7I0405	CI72557
1,2-Dichlorobenzene	ND (0.0029)		8260B Low		1	09/25/17 18:32	C7I0405	CI72557
1,2-Dichloroethane	ND (0.0029)		8260B Low		1	09/25/17 18:32	C7I0405	CI72557
1,2-Dichloropropane	ND (0.0029)		8260B Low		1	09/25/17 18:32	C7I0405	CI72557
1,3,5-Trimethylbenzene	ND (0.0029)		8260B Low		1	09/25/17 18:32	C7I0405	CI72557
1,3-Dichlorobenzene	ND (0.0029)		8260B Low		1	09/25/17 18:32	C7I0405	CI72557
1,3-Dichloropropane	ND (0.0029)		8260B Low		1	09/25/17 18:32	C7I0405	CI72557
1,4-Dichlorobenzene	ND (0.0029)		8260B Low		1	09/25/17 18:32	C7I0405	CI72557
1,4-Dioxane	ND (0.0586)		8260B Low		1	09/25/17 18:32	C7I0405	CI72557
1-Chlorohexane	ND (0.0029)		8260B Low		1	09/25/17 18:32	C7I0405	CI72557
2,2-Dichloropropane	ND (0.0029)		8260B Low		1	09/25/17 18:32	C7I0405	CI72557
2-Butanone	ND (0.0293)		8260B Low		1	09/25/17 18:32	C7I0405	CI72557
2-Chlorotoluene	ND (0.0029)		8260B Low		1	09/25/17 18:32	C7I0405	CI72557
2-Hexanone	ND (0.0293)		8260B Low		1	09/25/17 18:32	C7I0405	CI72557
4-Chlorotoluene	ND (0.0029)		8260B Low		1	09/25/17 18:32	C7I0405	CI72557
<b>4-Isopropyltoluene</b>	<b>0.0036</b> (0.0029)		8260B Low		1	09/25/17 18:32	C7I0405	CI72557
4-Methyl-2-Pentanone	ND (0.0293)		8260B Low		1	09/25/17 18:32	C7I0405	CI72557
<b>Acetone</b>	<b>0.0585</b> (0.0293)		8260B Low		1	09/25/17 18:32	C7I0405	CI72557
Benzene	ND (0.0029)		8260B Low		1	09/25/17 18:32	C7I0405	CI72557
Bromobenzene	ND (0.0029)		8260B Low		1	09/25/17 18:32	C7I0405	CI72557



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: GZ-SS-503 (0-2')  
 Date Sampled: 09/21/17 11:55  
 Percent Solids: 96  
 Initial Volume: 8.9  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709662  
 ESS Laboratory Sample ID: 1709662-03  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0029)		8260B Low		1	09/25/17 18:32	C7I0405	CI72557
Bromodichloromethane	ND (0.0029)		8260B Low		1	09/25/17 18:32	C7I0405	CI72557
Bromoform	ND (0.0029)		8260B Low		1	09/25/17 18:32	C7I0405	CI72557
Bromomethane	ND (0.0059)		8260B Low		1	09/25/17 18:32	C7I0405	CI72557
Carbon Disulfide	ND (0.0029)		8260B Low		1	09/25/17 18:32	C7I0405	CI72557
Carbon Tetrachloride	ND (0.0029)		8260B Low		1	09/25/17 18:32	C7I0405	CI72557
Chlorobenzene	ND (0.0029)		8260B Low		1	09/25/17 18:32	C7I0405	CI72557
Chloroethane	ND (0.0059)		8260B Low		1	09/25/17 18:32	C7I0405	CI72557
Chloroform	ND (0.0029)		8260B Low		1	09/25/17 18:32	C7I0405	CI72557
Chloromethane	ND (0.0059)		8260B Low		1	09/25/17 18:32	C7I0405	CI72557
cis-1,2-Dichloroethene	ND (0.0029)		8260B Low		1	09/25/17 18:32	C7I0405	CI72557
cis-1,3-Dichloropropene	ND (0.0029)		8260B Low		1	09/25/17 18:32	C7I0405	CI72557
Dibromochloromethane	ND (0.0029)		8260B Low		1	09/25/17 18:32	C7I0405	CI72557
Dibromomethane	ND (0.0029)		8260B Low		1	09/25/17 18:32	C7I0405	CI72557
Dichlorodifluoromethane	ND (0.0059)		8260B Low		1	09/25/17 18:32	C7I0405	CI72557
Diethyl Ether	ND (0.0029)		8260B Low		1	09/25/17 18:32	C7I0405	CI72557
Di-isopropyl ether	ND (0.0029)		8260B Low		1	09/25/17 18:32	C7I0405	CI72557
Ethyl tertiary-butyl ether	ND (0.0029)		8260B Low		1	09/25/17 18:32	C7I0405	CI72557
Ethylbenzene	ND (0.0029)		8260B Low		1	09/25/17 18:32	C7I0405	CI72557
Hexachlorobutadiene	ND (0.0029)		8260B Low		1	09/25/17 18:32	C7I0405	CI72557
Isopropylbenzene	ND (0.0029)		8260B Low		1	09/25/17 18:32	C7I0405	CI72557
Methyl tert-Butyl Ether	ND (0.0029)		8260B Low		1	09/25/17 18:32	C7I0405	CI72557
Methylene Chloride	ND (0.0146)		8260B Low		1	09/25/17 18:32	C7I0405	CI72557
Naphthalene	ND (0.0029)		8260B Low		1	09/25/17 18:32	C7I0405	CI72557
n-Butylbenzene	ND (0.0029)		8260B Low		1	09/25/17 18:32	C7I0405	CI72557
n-Propylbenzene	ND (0.0029)		8260B Low		1	09/25/17 18:32	C7I0405	CI72557
sec-Butylbenzene	ND (0.0029)		8260B Low		1	09/25/17 18:32	C7I0405	CI72557
Styrene	ND (0.0029)		8260B Low		1	09/25/17 18:32	C7I0405	CI72557
tert-Butylbenzene	ND (0.0029)		8260B Low		1	09/25/17 18:32	C7I0405	CI72557
Tertiary-amyl methyl ether	ND (0.0029)		8260B Low		1	09/25/17 18:32	C7I0405	CI72557
Tetrachloroethene	ND (0.0029)		8260B Low		1	09/25/17 18:32	C7I0405	CI72557
Tetrahydrofuran	ND (0.0029)		8260B Low		1	09/25/17 18:32	C7I0405	CI72557



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: GZ-SS-503 (0-2')  
 Date Sampled: 09/21/17 11:55  
 Percent Solids: 96  
 Initial Volume: 8.9  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709662  
 ESS Laboratory Sample ID: 1709662-03  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0029)		8260B Low		1	09/25/17 18:32	C7I0405	CI72557
trans-1,2-Dichloroethene	ND (0.0029)		8260B Low		1	09/25/17 18:32	C7I0405	CI72557
trans-1,3-Dichloropropene	ND (0.0029)		8260B Low		1	09/25/17 18:32	C7I0405	CI72557
Trichloroethene	ND (0.0029)		8260B Low		1	09/25/17 18:32	C7I0405	CI72557
Trichlorofluoromethane	ND (0.0029)		8260B Low		1	09/25/17 18:32	C7I0405	CI72557
Vinyl Acetate	ND (0.0029)		8260B Low		1	09/25/17 18:32	C7I0405	CI72557
Vinyl Chloride	ND (0.0059)		8260B Low		1	09/25/17 18:32	C7I0405	CI72557
Xylene O	ND (0.0029)		8260B Low		1	09/25/17 18:32	C7I0405	CI72557
Xylene P,M	ND (0.0059)		8260B Low		1	09/25/17 18:32	C7I0405	CI72557
Xylenes (Total)	ND (0.0059)		8260B Low		1	09/25/17 18:32		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	90 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	104 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	93 %		70-130
<i>Surrogate: Toluene-d8</i>	113 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: GZ-SS-503 (0-2')  
 Date Sampled: 09/21/17 11:55  
 Percent Solids: 96  
 Initial Volume: 19  
 Final Volume: 1  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709662  
 ESS Laboratory Sample ID: 1709662-03  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: SMR  
 Prepared: 9/25/17 11:30

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	268 (41.1)		8100M		1	09/26/17 8:10	C710397	C172519

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	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: O-Terphenyl</i>	82 %		40-140





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: GZ-SS-503 (0-2')  
 Date Sampled: 09/21/17 11:55  
 Percent Solids: 96  
 Initial Volume: 14.3  
 Final Volume: 0.5  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709662  
 ESS Laboratory Sample ID: 1709662-03  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: TJ  
 Prepared: 9/25/17 12:35

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.364)		8270D		1	09/25/17 20:34	C7I0391	CI72521
Acenaphthene	ND (0.364)		8270D		1	09/25/17 20:34	C7I0391	CI72521
Acenaphthylene	ND (0.364)		8270D		1	09/25/17 20:34	C7I0391	CI72521
Anthracene	ND (0.364)		8270D		1	09/25/17 20:34	C7I0391	CI72521
<b>Benzo(a)anthracene</b>	<b>0.453</b> (0.364)		8270D		1	09/25/17 20:34	C7I0391	CI72521
<b>Benzo(a)pyrene</b>	<b>0.473</b> (0.183)		8270D		1	09/25/17 20:34	C7I0391	CI72521
<b>Benzo(b)fluoranthene</b>	<b>0.628</b> (0.364)		8270D		1	09/25/17 20:34	C7I0391	CI72521
Benzo(g,h,i)perylene	ND (0.364)		8270D		1	09/25/17 20:34	C7I0391	CI72521
<b>Benzo(k)fluoranthene</b>	<b>0.399</b> (0.364)		8270D		1	09/25/17 20:34	C7I0391	CI72521
<b>Chrysene</b>	<b>0.483</b> (0.183)		8270D		1	09/25/17 20:34	C7I0391	CI72521
Dibenzo(a,h)Anthracene	ND (0.183)		8270D		1	09/25/17 20:34	C7I0391	CI72521
<b>Fluoranthene</b>	<b>0.833</b> (0.364)		8270D		1	09/25/17 20:34	C7I0391	CI72521
Fluorene	ND (0.364)		8270D		1	09/25/17 20:34	C7I0391	CI72521
Indeno(1,2,3-cd)Pyrene	ND (0.364)		8270D		1	09/25/17 20:34	C7I0391	CI72521
Naphthalene	ND (0.364)		8270D		1	09/25/17 20:34	C7I0391	CI72521
Phenanthrene	ND (0.364)		8270D		1	09/25/17 20:34	C7I0391	CI72521
<b>Pyrene</b>	<b>0.599</b> (0.364)		8270D		1	09/25/17 20:34	C7I0391	CI72521

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	77 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	85 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	81 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	75 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: GZ-SS-503 (0-2')  
Date Sampled: 09/21/17 11:55  
Percent Solids: 96

ESS Laboratory Work Order: 1709662  
ESS Laboratory Sample ID: 1709662-03  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	ND (1.03)		9014		1	EEM	09/28/17 11:50	mg/kg dry	CI72818



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: GZ-SS-504 (0-2')  
 Date Sampled: 09/21/17 12:20  
 Percent Solids: 98

ESS Laboratory Work Order: 1709662  
 ESS Laboratory Sample ID: 1709662-04  
 Sample Matrix: Soil  
 Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (2.01)		6020A		20	NAR	09/29/17 4:38	2.04	100	CI72737
Arsenic	ND (2.51)		6010C		1	KJK	09/28/17 4:22	2.04	100	CI72737
<b>Beryllium</b>	<b>0.12</b> (0.11)		6010C		1	KJK	09/28/17 4:22	2.04	100	CI72737
Cadmium	ND (0.50)		6010C		1	KJK	09/28/17 4:22	2.04	100	CI72737
<b>Chromium</b>	<b>2.53</b> (1.00)		6010C		1	KJK	09/28/17 4:22	2.04	100	CI72737
<b>Copper</b>	<b>7.64</b> (2.51)		6010C		1	KJK	09/28/17 4:22	2.04	100	CI72737
<b>Lead</b>	<b>35.9</b> (5.01)		6010C		1	KJK	09/28/17 4:22	2.04	100	CI72737
<b>Mercury</b>	<b>0.281</b> (0.034)		7471B		1	MJV	09/27/17 21:28	0.6	40	CI72736
<b>Nickel</b>	<b>2.53</b> (2.51)		6010C		1	KJK	09/28/17 4:22	2.04	100	CI72737
Selenium	ND (2.01)		6020A		20	NAR	09/29/17 4:38	2.04	100	CI72737
Silver	ND (0.50)		6010C		1	KJK	09/28/17 4:22	2.04	100	CI72737
Thallium	ND (2.01)		6020A		20	NAR	09/29/17 4:38	2.04	100	CI72737
<b>Zinc</b>	<b>16.6</b> (2.51)		6010C		1	KJK	09/28/17 4:22	2.04	100	CI72737



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: GZ-SS-504 (0-2')  
 Date Sampled: 09/21/17 12:20  
 Percent Solids: 98  
 Initial Volume: 6.2  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709662  
 ESS Laboratory Sample ID: 1709662-04  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0041)		8260B Low		1	09/25/17 18:57	C7I0405	CI72557
1,1,1-Trichloroethane	ND (0.0041)		8260B Low		1	09/25/17 18:57	C7I0405	CI72557
1,1,2,2-Tetrachloroethane	ND (0.0041)		8260B Low		1	09/25/17 18:57	C7I0405	CI72557
1,1,2-Trichloroethane	ND (0.0041)		8260B Low		1	09/25/17 18:57	C7I0405	CI72557
1,1-Dichloroethane	ND (0.0041)		8260B Low		1	09/25/17 18:57	C7I0405	CI72557
1,1-Dichloroethene	ND (0.0041)		8260B Low		1	09/25/17 18:57	C7I0405	CI72557
1,1-Dichloropropene	ND (0.0041)		8260B Low		1	09/25/17 18:57	C7I0405	CI72557
1,2,3-Trichlorobenzene	ND (0.0041)		8260B Low		1	09/25/17 18:57	C7I0405	CI72557
1,2,3-Trichloropropane	ND (0.0041)		8260B Low		1	09/25/17 18:57	C7I0405	CI72557
1,2,4-Trichlorobenzene	ND (0.0041)		8260B Low		1	09/25/17 18:57	C7I0405	CI72557
1,2,4-Trimethylbenzene	ND (0.0041)		8260B Low		1	09/25/17 18:57	C7I0405	CI72557
1,2-Dibromo-3-Chloropropane	ND (0.0041)		8260B Low		1	09/25/17 18:57	C7I0405	CI72557
1,2-Dibromoethane	ND (0.0041)		8260B Low		1	09/25/17 18:57	C7I0405	CI72557
1,2-Dichlorobenzene	ND (0.0041)		8260B Low		1	09/25/17 18:57	C7I0405	CI72557
1,2-Dichloroethane	ND (0.0041)		8260B Low		1	09/25/17 18:57	C7I0405	CI72557
1,2-Dichloropropane	ND (0.0041)		8260B Low		1	09/25/17 18:57	C7I0405	CI72557
1,3,5-Trimethylbenzene	ND (0.0041)		8260B Low		1	09/25/17 18:57	C7I0405	CI72557
1,3-Dichlorobenzene	ND (0.0041)		8260B Low		1	09/25/17 18:57	C7I0405	CI72557
1,3-Dichloropropane	ND (0.0041)		8260B Low		1	09/25/17 18:57	C7I0405	CI72557
1,4-Dichlorobenzene	ND (0.0041)		8260B Low		1	09/25/17 18:57	C7I0405	CI72557
1,4-Dioxane	ND (0.0825)		8260B Low		1	09/25/17 18:57	C7I0405	CI72557
1-Chlorohexane	ND (0.0041)		8260B Low		1	09/25/17 18:57	C7I0405	CI72557
2,2-Dichloropropane	ND (0.0041)		8260B Low		1	09/25/17 18:57	C7I0405	CI72557
2-Butanone	ND (0.0412)		8260B Low		1	09/25/17 18:57	C7I0405	CI72557
2-Chlorotoluene	ND (0.0041)		8260B Low		1	09/25/17 18:57	C7I0405	CI72557
2-Hexanone	ND (0.0412)		8260B Low		1	09/25/17 18:57	C7I0405	CI72557
4-Chlorotoluene	ND (0.0041)		8260B Low		1	09/25/17 18:57	C7I0405	CI72557
4-Isopropyltoluene	ND (0.0041)		8260B Low		1	09/25/17 18:57	C7I0405	CI72557
4-Methyl-2-Pentanone	ND (0.0412)		8260B Low		1	09/25/17 18:57	C7I0405	CI72557
Acetone	ND (0.0412)		8260B Low		1	09/25/17 18:57	C7I0405	CI72557
Benzene	ND (0.0041)		8260B Low		1	09/25/17 18:57	C7I0405	CI72557
Bromobenzene	ND (0.0041)		8260B Low		1	09/25/17 18:57	C7I0405	CI72557



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: GZ-SS-504 (0-2')  
 Date Sampled: 09/21/17 12:20  
 Percent Solids: 98  
 Initial Volume: 6.2  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709662  
 ESS Laboratory Sample ID: 1709662-04  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0041)		8260B Low		1	09/25/17 18:57	C7I0405	CI72557
Bromodichloromethane	ND (0.0041)		8260B Low		1	09/25/17 18:57	C7I0405	CI72557
Bromoform	ND (0.0041)		8260B Low		1	09/25/17 18:57	C7I0405	CI72557
Bromomethane	ND (0.0082)		8260B Low		1	09/25/17 18:57	C7I0405	CI72557
Carbon Disulfide	ND (0.0041)		8260B Low		1	09/25/17 18:57	C7I0405	CI72557
Carbon Tetrachloride	ND (0.0041)		8260B Low		1	09/25/17 18:57	C7I0405	CI72557
Chlorobenzene	ND (0.0041)		8260B Low		1	09/25/17 18:57	C7I0405	CI72557
Chloroethane	ND (0.0082)		8260B Low		1	09/25/17 18:57	C7I0405	CI72557
Chloroform	ND (0.0041)		8260B Low		1	09/25/17 18:57	C7I0405	CI72557
Chloromethane	ND (0.0082)		8260B Low		1	09/25/17 18:57	C7I0405	CI72557
cis-1,2-Dichloroethene	ND (0.0041)		8260B Low		1	09/25/17 18:57	C7I0405	CI72557
cis-1,3-Dichloropropene	ND (0.0041)		8260B Low		1	09/25/17 18:57	C7I0405	CI72557
Dibromochloromethane	ND (0.0041)		8260B Low		1	09/25/17 18:57	C7I0405	CI72557
Dibromomethane	ND (0.0041)		8260B Low		1	09/25/17 18:57	C7I0405	CI72557
Dichlorodifluoromethane	ND (0.0082)		8260B Low		1	09/25/17 18:57	C7I0405	CI72557
Diethyl Ether	ND (0.0041)		8260B Low		1	09/25/17 18:57	C7I0405	CI72557
Di-isopropyl ether	ND (0.0041)		8260B Low		1	09/25/17 18:57	C7I0405	CI72557
Ethyl tertiary-butyl ether	ND (0.0041)		8260B Low		1	09/25/17 18:57	C7I0405	CI72557
Ethylbenzene	ND (0.0041)		8260B Low		1	09/25/17 18:57	C7I0405	CI72557
Hexachlorobutadiene	ND (0.0041)		8260B Low		1	09/25/17 18:57	C7I0405	CI72557
Isopropylbenzene	ND (0.0041)		8260B Low		1	09/25/17 18:57	C7I0405	CI72557
Methyl tert-Butyl Ether	ND (0.0041)		8260B Low		1	09/25/17 18:57	C7I0405	CI72557
Methylene Chloride	ND (0.0206)		8260B Low		1	09/25/17 18:57	C7I0405	CI72557
Naphthalene	ND (0.0041)		8260B Low		1	09/25/17 18:57	C7I0405	CI72557
n-Butylbenzene	ND (0.0041)		8260B Low		1	09/25/17 18:57	C7I0405	CI72557
n-Propylbenzene	ND (0.0041)		8260B Low		1	09/25/17 18:57	C7I0405	CI72557
sec-Butylbenzene	ND (0.0041)		8260B Low		1	09/25/17 18:57	C7I0405	CI72557
Styrene	ND (0.0041)		8260B Low		1	09/25/17 18:57	C7I0405	CI72557
tert-Butylbenzene	ND (0.0041)		8260B Low		1	09/25/17 18:57	C7I0405	CI72557
Tertiary-amyl methyl ether	ND (0.0041)		8260B Low		1	09/25/17 18:57	C7I0405	CI72557
Tetrachloroethene	ND (0.0041)		8260B Low		1	09/25/17 18:57	C7I0405	CI72557
Tetrahydrofuran	ND (0.0041)		8260B Low		1	09/25/17 18:57	C7I0405	CI72557





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: GZ-SS-504 (0-2')  
 Date Sampled: 09/21/17 12:20  
 Percent Solids: 98  
 Initial Volume: 6.2  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709662  
 ESS Laboratory Sample ID: 1709662-04  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0041)		8260B Low		1	09/25/17 18:57	C7I0405	CI72557
trans-1,2-Dichloroethene	ND (0.0041)		8260B Low		1	09/25/17 18:57	C7I0405	CI72557
trans-1,3-Dichloropropene	ND (0.0041)		8260B Low		1	09/25/17 18:57	C7I0405	CI72557
Trichloroethene	ND (0.0041)		8260B Low		1	09/25/17 18:57	C7I0405	CI72557
Trichlorofluoromethane	ND (0.0041)		8260B Low		1	09/25/17 18:57	C7I0405	CI72557
Vinyl Acetate	ND (0.0041)		8260B Low		1	09/25/17 18:57	C7I0405	CI72557
Vinyl Chloride	ND (0.0082)		8260B Low		1	09/25/17 18:57	C7I0405	CI72557
Xylene O	ND (0.0041)		8260B Low		1	09/25/17 18:57	C7I0405	CI72557
Xylene P,M	ND (0.0082)		8260B Low		1	09/25/17 18:57	C7I0405	CI72557
Xylenes (Total)	ND (0.0082)		8260B Low		1	09/25/17 18:57		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	87 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	103 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	93 %		70-130
<i>Surrogate: Toluene-d8</i>	113 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: GZ-SS-504 (0-2')  
 Date Sampled: 09/21/17 12:20  
 Percent Solids: 98  
 Initial Volume: 19.2  
 Final Volume: 1  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709662  
 ESS Laboratory Sample ID: 1709662-04  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: SMR  
 Prepared: 9/25/17 11:30

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	54.9 (40.0)		8100M		1	09/26/17 8:45	C710397	C172519
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		82 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: GZ-SS-504 (0-2')  
 Date Sampled: 09/21/17 12:20  
 Percent Solids: 98  
 Initial Volume: 14.7  
 Final Volume: 0.5  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709662  
 ESS Laboratory Sample ID: 1709662-04  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: TJ  
 Prepared: 9/25/17 12:35

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.348)		8270D		1	09/25/17 21:09	C7I0391	CI72521
Acenaphthene	ND (0.348)		8270D		1	09/25/17 21:09	C7I0391	CI72521
Acenaphthylene	ND (0.348)		8270D		1	09/25/17 21:09	C7I0391	CI72521
Anthracene	ND (0.348)		8270D		1	09/25/17 21:09	C7I0391	CI72521
<b>Benzo(a)anthracene</b>	<b>0.381</b> (0.348)		8270D		1	09/25/17 21:09	C7I0391	CI72521
<b>Benzo(a)pyrene</b>	<b>0.502</b> (0.174)		8270D		1	09/25/17 21:09	C7I0391	CI72521
<b>Benzo(b)fluoranthene</b>	<b>0.657</b> (0.348)		8270D		1	09/25/17 21:09	C7I0391	CI72521
Benzo(g,h,i)perylene	ND (0.348)		8270D		1	09/25/17 21:09	C7I0391	CI72521
<b>Benzo(k)fluoranthene</b>	<b>0.439</b> (0.348)		8270D		1	09/25/17 21:09	C7I0391	CI72521
<b>Chrysene</b>	<b>0.475</b> (0.174)		8270D		1	09/25/17 21:09	C7I0391	CI72521
Dibenzo(a,h)Anthracene	ND (0.174)		8270D		1	09/25/17 21:09	C7I0391	CI72521
<b>Fluoranthene</b>	<b>0.599</b> (0.348)		8270D		1	09/25/17 21:09	C7I0391	CI72521
Fluorene	ND (0.348)		8270D		1	09/25/17 21:09	C7I0391	CI72521
Indeno(1,2,3-cd)Pyrene	ND (0.348)		8270D		1	09/25/17 21:09	C7I0391	CI72521
Naphthalene	ND (0.348)		8270D		1	09/25/17 21:09	C7I0391	CI72521
Phenanthrene	ND (0.348)		8270D		1	09/25/17 21:09	C7I0391	CI72521
<b>Pyrene</b>	<b>0.466</b> (0.348)		8270D		1	09/25/17 21:09	C7I0391	CI72521

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	73 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	81 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	77 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	72 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: GZ-SS-504 (0-2')  
Date Sampled: 09/21/17 12:20  
Percent Solids: 98

ESS Laboratory Work Order: 1709662  
ESS Laboratory Sample ID: 1709662-04  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	ND (1.00)		9014		1	EEM	09/28/17 11:50	mg/kg dry	CI72818



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: GZ-SS-505 (0-2')  
 Date Sampled: 09/21/17 13:15  
 Percent Solids: 95

ESS Laboratory Work Order: 1709662  
 ESS Laboratory Sample ID: 1709662-05  
 Sample Matrix: Soil  
 Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (2.10)		6020A		20	NAR	09/29/17 4:44	2	100	CI72737
Arsenic	ND (2.63)		6010C		1	KJK	09/28/17 4:26	2	100	CI72737
Beryllium	ND (0.12)		6010C		1	KJK	09/28/17 4:26	2	100	CI72737
Cadmium	ND (0.53)		6010C		1	KJK	09/28/17 4:26	2	100	CI72737
<b>Chromium</b>	<b>2.74</b> (1.05)		6010C		1	KJK	09/28/17 4:26	2	100	CI72737
<b>Copper</b>	<b>5.99</b> (2.63)		6010C		1	KJK	09/28/17 4:26	2	100	CI72737
<b>Lead</b>	<b>93.3</b> (5.26)		6010C		1	KJK	09/28/17 4:26	2	100	CI72737
<b>Mercury</b>	<b>0.358</b> (0.030)		7471B		1	MJV	09/27/17 21:30	0.7	40	CI72736
<b>Nickel</b>	<b>2.74</b> (2.63)		6010C		1	KJK	09/28/17 4:26	2	100	CI72737
Selenium	ND (2.10)		6020A		20	NAR	09/29/17 4:44	2	100	CI72737
Silver	ND (0.53)		6010C		1	KJK	09/28/17 4:26	2	100	CI72737
Thallium	ND (2.10)		6020A		20	NAR	09/29/17 4:44	2	100	CI72737
<b>Zinc</b>	<b>23.0</b> (2.63)		6010C		1	KJK	09/28/17 4:26	2	100	CI72737





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: GZ-SS-505 (0-2')  
Date Sampled: 09/21/17 13:15  
Percent Solids: 95  
Initial Volume: 7.8  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1709662  
ESS Laboratory Sample ID: 1709662-05  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0034)		8260B Low		1	09/25/17 19:23	C7I0405	CI72557
1,1,1-Trichloroethane	ND (0.0034)		8260B Low		1	09/25/17 19:23	C7I0405	CI72557
1,1,2,2-Tetrachloroethane	ND (0.0034)		8260B Low		1	09/25/17 19:23	C7I0405	CI72557
1,1,2-Trichloroethane	ND (0.0034)		8260B Low		1	09/25/17 19:23	C7I0405	CI72557
1,1-Dichloroethane	ND (0.0034)		8260B Low		1	09/25/17 19:23	C7I0405	CI72557
1,1-Dichloroethene	ND (0.0034)		8260B Low		1	09/25/17 19:23	C7I0405	CI72557
1,1-Dichloropropene	ND (0.0034)		8260B Low		1	09/25/17 19:23	C7I0405	CI72557
1,2,3-Trichlorobenzene	ND (0.0034)		8260B Low		1	09/25/17 19:23	C7I0405	CI72557
1,2,3-Trichloropropane	ND (0.0034)		8260B Low		1	09/25/17 19:23	C7I0405	CI72557
1,2,4-Trichlorobenzene	ND (0.0034)		8260B Low		1	09/25/17 19:23	C7I0405	CI72557
1,2,4-Trimethylbenzene	ND (0.0034)		8260B Low		1	09/25/17 19:23	C7I0405	CI72557
1,2-Dibromo-3-Chloropropane	ND (0.0034)		8260B Low		1	09/25/17 19:23	C7I0405	CI72557
1,2-Dibromoethane	ND (0.0034)		8260B Low		1	09/25/17 19:23	C7I0405	CI72557
1,2-Dichlorobenzene	ND (0.0034)		8260B Low		1	09/25/17 19:23	C7I0405	CI72557
1,2-Dichloroethane	ND (0.0034)		8260B Low		1	09/25/17 19:23	C7I0405	CI72557
1,2-Dichloropropane	ND (0.0034)		8260B Low		1	09/25/17 19:23	C7I0405	CI72557
1,3,5-Trimethylbenzene	ND (0.0034)		8260B Low		1	09/25/17 19:23	C7I0405	CI72557
1,3-Dichlorobenzene	ND (0.0034)		8260B Low		1	09/25/17 19:23	C7I0405	CI72557
1,3-Dichloropropane	ND (0.0034)		8260B Low		1	09/25/17 19:23	C7I0405	CI72557
1,4-Dichlorobenzene	ND (0.0034)		8260B Low		1	09/25/17 19:23	C7I0405	CI72557
1,4-Dioxane	ND (0.0674)		8260B Low		1	09/25/17 19:23	C7I0405	CI72557
1-Chlorohexane	ND (0.0034)		8260B Low		1	09/25/17 19:23	C7I0405	CI72557
2,2-Dichloropropane	ND (0.0034)		8260B Low		1	09/25/17 19:23	C7I0405	CI72557
2-Butanone	ND (0.0337)		8260B Low		1	09/25/17 19:23	C7I0405	CI72557
2-Chlorotoluene	ND (0.0034)		8260B Low		1	09/25/17 19:23	C7I0405	CI72557
2-Hexanone	ND (0.0337)		8260B Low		1	09/25/17 19:23	C7I0405	CI72557
4-Chlorotoluene	ND (0.0034)		8260B Low		1	09/25/17 19:23	C7I0405	CI72557
4-Isopropyltoluene	ND (0.0034)		8260B Low		1	09/25/17 19:23	C7I0405	CI72557
4-Methyl-2-Pentanone	ND (0.0337)		8260B Low		1	09/25/17 19:23	C7I0405	CI72557
Acetone	ND (0.0337)		8260B Low		1	09/25/17 19:23	C7I0405	CI72557
Benzene	ND (0.0034)		8260B Low		1	09/25/17 19:23	C7I0405	CI72557
Bromobenzene	ND (0.0034)		8260B Low		1	09/25/17 19:23	C7I0405	CI72557



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: GZ-SS-505 (0-2')  
Date Sampled: 09/21/17 13:15  
Percent Solids: 95  
Initial Volume: 7.8  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1709662  
ESS Laboratory Sample ID: 1709662-05  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0034)		8260B Low		1	09/25/17 19:23	C7I0405	CI72557
Bromodichloromethane	ND (0.0034)		8260B Low		1	09/25/17 19:23	C7I0405	CI72557
Bromoform	ND (0.0034)		8260B Low		1	09/25/17 19:23	C7I0405	CI72557
Bromomethane	ND (0.0067)		8260B Low		1	09/25/17 19:23	C7I0405	CI72557
Carbon Disulfide	ND (0.0034)		8260B Low		1	09/25/17 19:23	C7I0405	CI72557
Carbon Tetrachloride	ND (0.0034)		8260B Low		1	09/25/17 19:23	C7I0405	CI72557
Chlorobenzene	ND (0.0034)		8260B Low		1	09/25/17 19:23	C7I0405	CI72557
Chloroethane	ND (0.0067)		8260B Low		1	09/25/17 19:23	C7I0405	CI72557
Chloroform	ND (0.0034)		8260B Low		1	09/25/17 19:23	C7I0405	CI72557
Chloromethane	ND (0.0067)		8260B Low		1	09/25/17 19:23	C7I0405	CI72557
cis-1,2-Dichloroethene	ND (0.0034)		8260B Low		1	09/25/17 19:23	C7I0405	CI72557
cis-1,3-Dichloropropene	ND (0.0034)		8260B Low		1	09/25/17 19:23	C7I0405	CI72557
Dibromochloromethane	ND (0.0034)		8260B Low		1	09/25/17 19:23	C7I0405	CI72557
Dibromomethane	ND (0.0034)		8260B Low		1	09/25/17 19:23	C7I0405	CI72557
Dichlorodifluoromethane	ND (0.0067)		8260B Low		1	09/25/17 19:23	C7I0405	CI72557
Diethyl Ether	ND (0.0034)		8260B Low		1	09/25/17 19:23	C7I0405	CI72557
Di-isopropyl ether	ND (0.0034)		8260B Low		1	09/25/17 19:23	C7I0405	CI72557
Ethyl tertiary-butyl ether	ND (0.0034)		8260B Low		1	09/25/17 19:23	C7I0405	CI72557
Ethylbenzene	ND (0.0034)		8260B Low		1	09/25/17 19:23	C7I0405	CI72557
Hexachlorobutadiene	ND (0.0034)		8260B Low		1	09/25/17 19:23	C7I0405	CI72557
Isopropylbenzene	ND (0.0034)		8260B Low		1	09/25/17 19:23	C7I0405	CI72557
Methyl tert-Butyl Ether	ND (0.0034)		8260B Low		1	09/25/17 19:23	C7I0405	CI72557
Methylene Chloride	ND (0.0168)		8260B Low		1	09/25/17 19:23	C7I0405	CI72557
Naphthalene	ND (0.0034)		8260B Low		1	09/25/17 19:23	C7I0405	CI72557
n-Butylbenzene	ND (0.0034)		8260B Low		1	09/25/17 19:23	C7I0405	CI72557
n-Propylbenzene	ND (0.0034)		8260B Low		1	09/25/17 19:23	C7I0405	CI72557
sec-Butylbenzene	ND (0.0034)		8260B Low		1	09/25/17 19:23	C7I0405	CI72557
Styrene	ND (0.0034)		8260B Low		1	09/25/17 19:23	C7I0405	CI72557
tert-Butylbenzene	ND (0.0034)		8260B Low		1	09/25/17 19:23	C7I0405	CI72557
Tertiary-amyl methyl ether	ND (0.0034)		8260B Low		1	09/25/17 19:23	C7I0405	CI72557
Tetrachloroethene	ND (0.0034)		8260B Low		1	09/25/17 19:23	C7I0405	CI72557
Tetrahydrofuran	ND (0.0034)		8260B Low		1	09/25/17 19:23	C7I0405	CI72557



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: GZ-SS-505 (0-2')  
 Date Sampled: 09/21/17 13:15  
 Percent Solids: 95  
 Initial Volume: 7.8  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709662  
 ESS Laboratory Sample ID: 1709662-05  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0034)		8260B Low		1	09/25/17 19:23	C7I0405	CI72557
trans-1,2-Dichloroethene	ND (0.0034)		8260B Low		1	09/25/17 19:23	C7I0405	CI72557
trans-1,3-Dichloropropene	ND (0.0034)		8260B Low		1	09/25/17 19:23	C7I0405	CI72557
Trichloroethene	ND (0.0034)		8260B Low		1	09/25/17 19:23	C7I0405	CI72557
Trichlorofluoromethane	ND (0.0034)		8260B Low		1	09/25/17 19:23	C7I0405	CI72557
Vinyl Acetate	ND (0.0034)		8260B Low		1	09/25/17 19:23	C7I0405	CI72557
Vinyl Chloride	ND (0.0067)		8260B Low		1	09/25/17 19:23	C7I0405	CI72557
Xylene O	ND (0.0034)		8260B Low		1	09/25/17 19:23	C7I0405	CI72557
Xylene P,M	ND (0.0067)		8260B Low		1	09/25/17 19:23	C7I0405	CI72557
Xylenes (Total)	ND (0.0067)		8260B Low		1	09/25/17 19:23		[CALC]

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: 1,2-Dichloroethane-d4	93 %		70-130
Surrogate: 4-Bromofluorobenzene	102 %		70-130
Surrogate: Dibromofluoromethane	95 %		70-130
Surrogate: Toluene-d8	114 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: GZ-SS-505 (0-2')  
 Date Sampled: 09/21/17 13:15  
 Percent Solids: 95  
 Initial Volume: 19.3  
 Final Volume: 1  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709662  
 ESS Laboratory Sample ID: 1709662-05  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: SMR  
 Prepared: 9/25/17 11:30

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	114 (40.8)		8100M		1	09/26/17 9:20	C710397	C172519
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		80 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: GZ-SS-505 (0-2')  
 Date Sampled: 09/21/17 13:15  
 Percent Solids: 95  
 Initial Volume: 14.5  
 Final Volume: 0.5  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709662  
 ESS Laboratory Sample ID: 1709662-05  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: TJ  
 Prepared: 9/25/17 12:35

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.362)		8270D		1	09/25/17 21:45	C7I0391	CI72521
Acenaphthene	ND (0.362)		8270D		1	09/25/17 21:45	C7I0391	CI72521
Acenaphthylene	ND (0.362)		8270D		1	09/25/17 21:45	C7I0391	CI72521
Anthracene	ND (0.362)		8270D		1	09/25/17 21:45	C7I0391	CI72521
<b>Benzo(a)anthracene</b>	<b>0.456</b> (0.362)		8270D		1	09/25/17 21:45	C7I0391	CI72521
<b>Benzo(a)pyrene</b>	<b>0.477</b> (0.182)		8270D		1	09/25/17 21:45	C7I0391	CI72521
<b>Benzo(b)fluoranthene</b>	<b>0.695</b> (0.362)		8270D		1	09/25/17 21:45	C7I0391	CI72521
Benzo(g,h,i)perylene	ND (0.362)		8270D		1	09/25/17 21:45	C7I0391	CI72521
<b>Benzo(k)fluoranthene</b>	<b>0.450</b> (0.362)		8270D		1	09/25/17 21:45	C7I0391	CI72521
<b>Chrysene</b>	<b>0.539</b> (0.182)		8270D		1	09/25/17 21:45	C7I0391	CI72521
Dibenzo(a,h)Anthracene	ND (0.182)		8270D		1	09/25/17 21:45	C7I0391	CI72521
<b>Fluoranthene</b>	<b>0.826</b> (0.362)		8270D		1	09/25/17 21:45	C7I0391	CI72521
Fluorene	ND (0.362)		8270D		1	09/25/17 21:45	C7I0391	CI72521
Indeno(1,2,3-cd)Pyrene	ND (0.362)		8270D		1	09/25/17 21:45	C7I0391	CI72521
Naphthalene	ND (0.362)		8270D		1	09/25/17 21:45	C7I0391	CI72521
Phenanthrene	ND (0.362)		8270D		1	09/25/17 21:45	C7I0391	CI72521
<b>Pyrene</b>	<b>0.601</b> (0.362)		8270D		1	09/25/17 21:45	C7I0391	CI72521

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	70 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	77 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	76 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	67 %		30-130





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: GZ-SS-505 (0-2')  
Date Sampled: 09/21/17 13:15  
Percent Solids: 95

ESS Laboratory Work Order: 1709662  
ESS Laboratory Sample ID: 1709662-05  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	2.97 (1.03)		9014		1	EEM	09/28/17 11:50	mg/kg dry	CI72818



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: GZ-SS-506 (0-2')  
 Date Sampled: 09/21/17 13:40  
 Percent Solids: 95

ESS Laboratory Work Order: 1709662  
 ESS Laboratory Sample ID: 1709662-06  
 Sample Matrix: Soil  
 Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (1.99)		6020A		20	NAR	09/29/17 5:16	2.12	100	CI72737
Arsenic	ND (2.49)		6010C		1	KJK	09/28/17 4:31	2.12	100	CI72737
<b>Beryllium</b>	<b>0.14</b> (0.11)		6010C		1	KJK	09/28/17 4:31	2.12	100	CI72737
Cadmium	ND (0.50)		6010C		1	KJK	09/28/17 4:31	2.12	100	CI72737
<b>Chromium</b>	<b>1.81</b> (0.99)		6010C		1	KJK	09/28/17 4:31	2.12	100	CI72737
<b>Copper</b>	<b>5.25</b> (2.49)		6010C		1	KJK	09/28/17 4:31	2.12	100	CI72737
Lead	ND (4.97)		6010C		1	KJK	09/28/17 4:31	2.12	100	CI72737
Mercury	ND (0.030)		7471B		1	MJV	09/27/17 21:32	0.7	40	CI72736
Nickel	ND (2.49)		6010C		1	KJK	09/28/17 4:31	2.12	100	CI72737
Selenium	ND (1.99)		6020A		20	NAR	09/29/17 5:16	2.12	100	CI72737
Silver	ND (0.50)		6010C		1	KJK	09/28/17 4:31	2.12	100	CI72737
Thallium	ND (1.99)		6020A		20	NAR	09/29/17 5:16	2.12	100	CI72737
<b>Zinc</b>	<b>32.1</b> (2.49)		6010C		1	KJK	09/28/17 4:31	2.12	100	CI72737



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: GZ-SS-506 (0-2')  
Date Sampled: 09/21/17 13:40  
Percent Solids: 95  
Initial Volume: 5.3  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1709662  
ESS Laboratory Sample ID: 1709662-06  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0050)		8260B Low		1	09/25/17 19:48	C7I0405	CI72557
1,1,1-Trichloroethane	ND (0.0050)		8260B Low		1	09/25/17 19:48	C7I0405	CI72557
1,1,2,2-Tetrachloroethane	ND (0.0050)		8260B Low		1	09/25/17 19:48	C7I0405	CI72557
1,1,2-Trichloroethane	ND (0.0050)		8260B Low		1	09/25/17 19:48	C7I0405	CI72557
1,1-Dichloroethane	ND (0.0050)		8260B Low		1	09/25/17 19:48	C7I0405	CI72557
1,1-Dichloroethene	ND (0.0050)		8260B Low		1	09/25/17 19:48	C7I0405	CI72557
1,1-Dichloropropene	ND (0.0050)		8260B Low		1	09/25/17 19:48	C7I0405	CI72557
1,2,3-Trichlorobenzene	ND (0.0050)		8260B Low		1	09/25/17 19:48	C7I0405	CI72557
1,2,3-Trichloropropane	ND (0.0050)		8260B Low		1	09/25/17 19:48	C7I0405	CI72557
1,2,4-Trichlorobenzene	ND (0.0050)		8260B Low		1	09/25/17 19:48	C7I0405	CI72557
1,2,4-Trimethylbenzene	ND (0.0050)		8260B Low		1	09/25/17 19:48	C7I0405	CI72557
1,2-Dibromo-3-Chloropropane	ND (0.0050)		8260B Low		1	09/25/17 19:48	C7I0405	CI72557
1,2-Dibromoethane	ND (0.0050)		8260B Low		1	09/25/17 19:48	C7I0405	CI72557
1,2-Dichlorobenzene	ND (0.0050)		8260B Low		1	09/25/17 19:48	C7I0405	CI72557
1,2-Dichloroethane	ND (0.0050)		8260B Low		1	09/25/17 19:48	C7I0405	CI72557
1,2-Dichloropropane	ND (0.0050)		8260B Low		1	09/25/17 19:48	C7I0405	CI72557
1,3,5-Trimethylbenzene	ND (0.0050)		8260B Low		1	09/25/17 19:48	C7I0405	CI72557
1,3-Dichlorobenzene	ND (0.0050)		8260B Low		1	09/25/17 19:48	C7I0405	CI72557
1,3-Dichloropropane	ND (0.0050)		8260B Low		1	09/25/17 19:48	C7I0405	CI72557
1,4-Dichlorobenzene	ND (0.0050)		8260B Low		1	09/25/17 19:48	C7I0405	CI72557
1,4-Dioxane	ND (0.0994)		8260B Low		1	09/25/17 19:48	C7I0405	CI72557
1-Chlorohexane	ND (0.0050)		8260B Low		1	09/25/17 19:48	C7I0405	CI72557
2,2-Dichloropropane	ND (0.0050)		8260B Low		1	09/25/17 19:48	C7I0405	CI72557
2-Butanone	ND (0.0497)		8260B Low		1	09/25/17 19:48	C7I0405	CI72557
2-Chlorotoluene	ND (0.0050)		8260B Low		1	09/25/17 19:48	C7I0405	CI72557
2-Hexanone	ND (0.0497)		8260B Low		1	09/25/17 19:48	C7I0405	CI72557
4-Chlorotoluene	ND (0.0050)		8260B Low		1	09/25/17 19:48	C7I0405	CI72557
4-Isopropyltoluene	ND (0.0050)		8260B Low		1	09/25/17 19:48	C7I0405	CI72557
4-Methyl-2-Pentanone	ND (0.0497)		8260B Low		1	09/25/17 19:48	C7I0405	CI72557
Acetone	ND (0.0497)		8260B Low		1	09/25/17 19:48	C7I0405	CI72557
Benzene	ND (0.0050)		8260B Low		1	09/25/17 19:48	C7I0405	CI72557
Bromobenzene	ND (0.0050)		8260B Low		1	09/25/17 19:48	C7I0405	CI72557



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: GZ-SS-506 (0-2')  
 Date Sampled: 09/21/17 13:40  
 Percent Solids: 95  
 Initial Volume: 5.3  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709662  
 ESS Laboratory Sample ID: 1709662-06  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0050)		8260B Low		1	09/25/17 19:48	C7I0405	CI72557
Bromodichloromethane	ND (0.0050)		8260B Low		1	09/25/17 19:48	C7I0405	CI72557
Bromoform	ND (0.0050)		8260B Low		1	09/25/17 19:48	C7I0405	CI72557
Bromomethane	ND (0.0099)		8260B Low		1	09/25/17 19:48	C7I0405	CI72557
Carbon Disulfide	ND (0.0050)		8260B Low		1	09/25/17 19:48	C7I0405	CI72557
Carbon Tetrachloride	ND (0.0050)		8260B Low		1	09/25/17 19:48	C7I0405	CI72557
Chlorobenzene	ND (0.0050)		8260B Low		1	09/25/17 19:48	C7I0405	CI72557
Chloroethane	ND (0.0099)		8260B Low		1	09/25/17 19:48	C7I0405	CI72557
Chloroform	ND (0.0050)		8260B Low		1	09/25/17 19:48	C7I0405	CI72557
Chloromethane	ND (0.0099)		8260B Low		1	09/25/17 19:48	C7I0405	CI72557
cis-1,2-Dichloroethene	ND (0.0050)		8260B Low		1	09/25/17 19:48	C7I0405	CI72557
cis-1,3-Dichloropropene	ND (0.0050)		8260B Low		1	09/25/17 19:48	C7I0405	CI72557
Dibromochloromethane	ND (0.0050)		8260B Low		1	09/25/17 19:48	C7I0405	CI72557
Dibromomethane	ND (0.0050)		8260B Low		1	09/25/17 19:48	C7I0405	CI72557
Dichlorodifluoromethane	ND (0.0099)		8260B Low		1	09/25/17 19:48	C7I0405	CI72557
Diethyl Ether	ND (0.0050)		8260B Low		1	09/25/17 19:48	C7I0405	CI72557
Di-isopropyl ether	ND (0.0050)		8260B Low		1	09/25/17 19:48	C7I0405	CI72557
Ethyl tertiary-butyl ether	ND (0.0050)		8260B Low		1	09/25/17 19:48	C7I0405	CI72557
Ethylbenzene	ND (0.0050)		8260B Low		1	09/25/17 19:48	C7I0405	CI72557
Hexachlorobutadiene	ND (0.0050)		8260B Low		1	09/25/17 19:48	C7I0405	CI72557
Isopropylbenzene	ND (0.0050)		8260B Low		1	09/25/17 19:48	C7I0405	CI72557
Methyl tert-Butyl Ether	ND (0.0050)		8260B Low		1	09/25/17 19:48	C7I0405	CI72557
Methylene Chloride	ND (0.0249)		8260B Low		1	09/25/17 19:48	C7I0405	CI72557
Naphthalene	ND (0.0050)		8260B Low		1	09/25/17 19:48	C7I0405	CI72557
n-Butylbenzene	ND (0.0050)		8260B Low		1	09/25/17 19:48	C7I0405	CI72557
n-Propylbenzene	ND (0.0050)		8260B Low		1	09/25/17 19:48	C7I0405	CI72557
sec-Butylbenzene	ND (0.0050)		8260B Low		1	09/25/17 19:48	C7I0405	CI72557
Styrene	ND (0.0050)		8260B Low		1	09/25/17 19:48	C7I0405	CI72557
tert-Butylbenzene	ND (0.0050)		8260B Low		1	09/25/17 19:48	C7I0405	CI72557
Tertiary-amyl methyl ether	ND (0.0050)		8260B Low		1	09/25/17 19:48	C7I0405	CI72557
Tetrachloroethene	ND (0.0050)		8260B Low		1	09/25/17 19:48	C7I0405	CI72557
Tetrahydrofuran	ND (0.0050)		8260B Low		1	09/25/17 19:48	C7I0405	CI72557



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: GZ-SS-506 (0-2')  
 Date Sampled: 09/21/17 13:40  
 Percent Solids: 95  
 Initial Volume: 5.3  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709662  
 ESS Laboratory Sample ID: 1709662-06  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0050)		8260B Low		1	09/25/17 19:48	C7I0405	CI72557
trans-1,2-Dichloroethene	ND (0.0050)		8260B Low		1	09/25/17 19:48	C7I0405	CI72557
trans-1,3-Dichloropropene	ND (0.0050)		8260B Low		1	09/25/17 19:48	C7I0405	CI72557
Trichloroethene	ND (0.0050)		8260B Low		1	09/25/17 19:48	C7I0405	CI72557
Trichlorofluoromethane	ND (0.0050)		8260B Low		1	09/25/17 19:48	C7I0405	CI72557
Vinyl Acetate	ND (0.0050)		8260B Low		1	09/25/17 19:48	C7I0405	CI72557
Vinyl Chloride	ND (0.0099)		8260B Low		1	09/25/17 19:48	C7I0405	CI72557
Xylene O	ND (0.0050)		8260B Low		1	09/25/17 19:48	C7I0405	CI72557
Xylene P,M	ND (0.0099)		8260B Low		1	09/25/17 19:48	C7I0405	CI72557
Xylenes (Total)	ND (0.0099)		8260B Low		1	09/25/17 19:48		[CALC]

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: 1,2-Dichloroethane-d4	88 %		70-130
Surrogate: 4-Bromofluorobenzene	106 %		70-130
Surrogate: Dibromofluoromethane	94 %		70-130
Surrogate: Toluene-d8	112 %		70-130





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: GZ-SS-506 (0-2')  
 Date Sampled: 09/21/17 13:40  
 Percent Solids: 95  
 Initial Volume: 19.4  
 Final Volume: 1  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709662  
 ESS Laboratory Sample ID: 1709662-06  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: SMR  
 Prepared: 9/25/17 11:30

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	ND (40.7)		8100M		1	09/26/17 9:55	C710397	C172519
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		87 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: GZ-SS-506 (0-2')  
 Date Sampled: 09/21/17 13:40  
 Percent Solids: 95  
 Initial Volume: 14.6  
 Final Volume: 0.5  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709662  
 ESS Laboratory Sample ID: 1709662-06  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: TJ  
 Prepared: 9/25/17 12:35

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.361)		8270D		1	09/25/17 22:20	C7I0391	CI72521
Acenaphthene	ND (0.361)		8270D		1	09/25/17 22:20	C7I0391	CI72521
Acenaphthylene	ND (0.361)		8270D		1	09/25/17 22:20	C7I0391	CI72521
Anthracene	ND (0.361)		8270D		1	09/25/17 22:20	C7I0391	CI72521
Benzo(a)anthracene	ND (0.361)		8270D		1	09/25/17 22:20	C7I0391	CI72521
Benzo(a)pyrene	ND (0.181)		8270D		1	09/25/17 22:20	C7I0391	CI72521
Benzo(b)fluoranthene	ND (0.361)		8270D		1	09/25/17 22:20	C7I0391	CI72521
Benzo(g,h,i)perylene	ND (0.361)		8270D		1	09/25/17 22:20	C7I0391	CI72521
Benzo(k)fluoranthene	ND (0.361)		8270D		1	09/25/17 22:20	C7I0391	CI72521
Chrysene	ND (0.181)		8270D		1	09/25/17 22:20	C7I0391	CI72521
Dibenzo(a,h)Anthracene	ND (0.181)		8270D		1	09/25/17 22:20	C7I0391	CI72521
Fluoranthene	ND (0.361)		8270D		1	09/25/17 22:20	C7I0391	CI72521
Fluorene	ND (0.361)		8270D		1	09/25/17 22:20	C7I0391	CI72521
Indeno(1,2,3-cd)Pyrene	ND (0.361)		8270D		1	09/25/17 22:20	C7I0391	CI72521
Naphthalene	ND (0.361)		8270D		1	09/25/17 22:20	C7I0391	CI72521
Phenanthrene	ND (0.361)		8270D		1	09/25/17 22:20	C7I0391	CI72521
Pyrene	ND (0.361)		8270D		1	09/25/17 22:20	C7I0391	CI72521

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: 1,2-Dichlorobenzene-d4	88 %		30-130
Surrogate: 2-Fluorobiphenyl	93 %		30-130
Surrogate: Nitrobenzene-d5	91 %		30-130
Surrogate: p-Terphenyl-d14	86 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: GZ-SS-506 (0-2')  
Date Sampled: 09/21/17 13:40  
Percent Solids: 95

ESS Laboratory Work Order: 1709662  
ESS Laboratory Sample ID: 1709662-06  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	ND (1.02)		9014		1	EEM	09/28/17 11:50	mg/kg dry	CI72818



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: GZ-SS-507 (0-2')  
 Date Sampled: 09/22/17 08:08  
 Percent Solids: 97

ESS Laboratory Work Order: 1709662  
 ESS Laboratory Sample ID: 1709662-07  
 Sample Matrix: Soil  
 Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (2.00)		6020A		20	NAR	09/29/17 5:22	2.07	100	CI72737
Arsenic	<b>4.91</b> (2.50)		6010C		1	KJK	09/28/17 4:35	2.07	100	CI72737
Beryllium	<b>0.28</b> (0.11)		6010C		1	KJK	09/28/17 4:35	2.07	100	CI72737
Cadmium	ND (0.50)		6010C		1	KJK	09/28/17 4:35	2.07	100	CI72737
Chromium	<b>8.94</b> (1.00)		6010C		1	KJK	09/28/17 4:35	2.07	100	CI72737
Copper	<b>16.8</b> (2.50)		6010C		1	KJK	09/28/17 4:35	2.07	100	CI72737
Lead	<b>73.8</b> (4.99)		6010C		1	KJK	09/28/17 4:35	2.07	100	CI72737
Mercury	<b>0.044</b> (0.030)		7471B		1	MJV	09/27/17 21:34	0.68	40	CI72736
Nickel	<b>10.5</b> (2.50)		6010C		1	KJK	09/28/17 4:35	2.07	100	CI72737
Selenium	ND (2.00)		6020A		20	NAR	09/29/17 5:22	2.07	100	CI72737
Silver	ND (0.50)		6010C		1	KJK	09/28/17 4:35	2.07	100	CI72737
Thallium	ND (2.00)		6020A		20	NAR	09/29/17 5:22	2.07	100	CI72737
Zinc	<b>94.9</b> (2.50)		6010C		1	KJK	09/28/17 4:35	2.07	100	CI72737



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: GZ-SS-507 (0-2')  
 Date Sampled: 09/22/17 08:08  
 Percent Solids: 97  
 Initial Volume: 6.5  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709662  
 ESS Laboratory Sample ID: 1709662-07  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0040)		8260B Low		1	09/25/17 20:13	C7I0405	CI72557
1,1,1-Trichloroethane	ND (0.0040)		8260B Low		1	09/25/17 20:13	C7I0405	CI72557
1,1,2,2-Tetrachloroethane	ND (0.0040)		8260B Low		1	09/25/17 20:13	C7I0405	CI72557
1,1,2-Trichloroethane	ND (0.0040)		8260B Low		1	09/25/17 20:13	C7I0405	CI72557
1,1-Dichloroethane	ND (0.0040)		8260B Low		1	09/25/17 20:13	C7I0405	CI72557
1,1-Dichloroethene	ND (0.0040)		8260B Low		1	09/25/17 20:13	C7I0405	CI72557
1,1-Dichloropropene	ND (0.0040)		8260B Low		1	09/25/17 20:13	C7I0405	CI72557
1,2,3-Trichlorobenzene	ND (0.0040)		8260B Low		1	09/25/17 20:13	C7I0405	CI72557
1,2,3-Trichloropropane	ND (0.0040)		8260B Low		1	09/25/17 20:13	C7I0405	CI72557
1,2,4-Trichlorobenzene	ND (0.0040)		8260B Low		1	09/25/17 20:13	C7I0405	CI72557
1,2,4-Trimethylbenzene	ND (0.0040)		8260B Low		1	09/25/17 20:13	C7I0405	CI72557
1,2-Dibromo-3-Chloropropane	ND (0.0040)		8260B Low		1	09/25/17 20:13	C7I0405	CI72557
1,2-Dibromoethane	ND (0.0040)		8260B Low		1	09/25/17 20:13	C7I0405	CI72557
1,2-Dichlorobenzene	ND (0.0040)		8260B Low		1	09/25/17 20:13	C7I0405	CI72557
1,2-Dichloroethane	ND (0.0040)		8260B Low		1	09/25/17 20:13	C7I0405	CI72557
1,2-Dichloropropane	ND (0.0040)		8260B Low		1	09/25/17 20:13	C7I0405	CI72557
1,3,5-Trimethylbenzene	ND (0.0040)		8260B Low		1	09/25/17 20:13	C7I0405	CI72557
1,3-Dichlorobenzene	ND (0.0040)		8260B Low		1	09/25/17 20:13	C7I0405	CI72557
1,3-Dichloropropane	ND (0.0040)		8260B Low		1	09/25/17 20:13	C7I0405	CI72557
1,4-Dichlorobenzene	ND (0.0040)		8260B Low		1	09/25/17 20:13	C7I0405	CI72557
1,4-Dioxane	ND (0.0795)		8260B Low		1	09/25/17 20:13	C7I0405	CI72557
1-Chlorohexane	ND (0.0040)		8260B Low		1	09/25/17 20:13	C7I0405	CI72557
2,2-Dichloropropane	ND (0.0040)		8260B Low		1	09/25/17 20:13	C7I0405	CI72557
2-Butanone	ND (0.0397)		8260B Low		1	09/25/17 20:13	C7I0405	CI72557
2-Chlorotoluene	ND (0.0040)		8260B Low		1	09/25/17 20:13	C7I0405	CI72557
2-Hexanone	ND (0.0397)		8260B Low		1	09/25/17 20:13	C7I0405	CI72557
4-Chlorotoluene	ND (0.0040)		8260B Low		1	09/25/17 20:13	C7I0405	CI72557
4-Isopropyltoluene	ND (0.0040)		8260B Low		1	09/25/17 20:13	C7I0405	CI72557
4-Methyl-2-Pentanone	ND (0.0397)		8260B Low		1	09/25/17 20:13	C7I0405	CI72557
Acetone	ND (0.0397)		8260B Low		1	09/25/17 20:13	C7I0405	CI72557
Benzene	ND (0.0040)		8260B Low		1	09/25/17 20:13	C7I0405	CI72557
Bromobenzene	ND (0.0040)		8260B Low		1	09/25/17 20:13	C7I0405	CI72557





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: GZ-SS-507 (0-2')  
 Date Sampled: 09/22/17 08:08  
 Percent Solids: 97  
 Initial Volume: 6.5  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709662  
 ESS Laboratory Sample ID: 1709662-07  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0040)		8260B Low		1	09/25/17 20:13	C7I0405	CI72557
Bromodichloromethane	ND (0.0040)		8260B Low		1	09/25/17 20:13	C7I0405	CI72557
Bromoform	ND (0.0040)		8260B Low		1	09/25/17 20:13	C7I0405	CI72557
Bromomethane	ND (0.0079)		8260B Low		1	09/25/17 20:13	C7I0405	CI72557
Carbon Disulfide	ND (0.0040)		8260B Low		1	09/25/17 20:13	C7I0405	CI72557
Carbon Tetrachloride	ND (0.0040)		8260B Low		1	09/25/17 20:13	C7I0405	CI72557
Chlorobenzene	ND (0.0040)		8260B Low		1	09/25/17 20:13	C7I0405	CI72557
Chloroethane	ND (0.0079)		8260B Low		1	09/25/17 20:13	C7I0405	CI72557
Chloroform	ND (0.0040)		8260B Low		1	09/25/17 20:13	C7I0405	CI72557
Chloromethane	ND (0.0079)		8260B Low		1	09/25/17 20:13	C7I0405	CI72557
cis-1,2-Dichloroethene	ND (0.0040)		8260B Low		1	09/25/17 20:13	C7I0405	CI72557
cis-1,3-Dichloropropene	ND (0.0040)		8260B Low		1	09/25/17 20:13	C7I0405	CI72557
Dibromochloromethane	ND (0.0040)		8260B Low		1	09/25/17 20:13	C7I0405	CI72557
Dibromomethane	ND (0.0040)		8260B Low		1	09/25/17 20:13	C7I0405	CI72557
Dichlorodifluoromethane	ND (0.0079)		8260B Low		1	09/25/17 20:13	C7I0405	CI72557
Diethyl Ether	ND (0.0040)		8260B Low		1	09/25/17 20:13	C7I0405	CI72557
Di-isopropyl ether	ND (0.0040)		8260B Low		1	09/25/17 20:13	C7I0405	CI72557
Ethyl tertiary-butyl ether	ND (0.0040)		8260B Low		1	09/25/17 20:13	C7I0405	CI72557
Ethylbenzene	ND (0.0040)		8260B Low		1	09/25/17 20:13	C7I0405	CI72557
Hexachlorobutadiene	ND (0.0040)		8260B Low		1	09/25/17 20:13	C7I0405	CI72557
Isopropylbenzene	ND (0.0040)		8260B Low		1	09/25/17 20:13	C7I0405	CI72557
Methyl tert-Butyl Ether	ND (0.0040)		8260B Low		1	09/25/17 20:13	C7I0405	CI72557
Methylene Chloride	ND (0.0199)		8260B Low		1	09/25/17 20:13	C7I0405	CI72557
Naphthalene	ND (0.0040)		8260B Low		1	09/25/17 20:13	C7I0405	CI72557
n-Butylbenzene	ND (0.0040)		8260B Low		1	09/25/17 20:13	C7I0405	CI72557
n-Propylbenzene	ND (0.0040)		8260B Low		1	09/25/17 20:13	C7I0405	CI72557
sec-Butylbenzene	ND (0.0040)		8260B Low		1	09/25/17 20:13	C7I0405	CI72557
Styrene	ND (0.0040)		8260B Low		1	09/25/17 20:13	C7I0405	CI72557
tert-Butylbenzene	ND (0.0040)		8260B Low		1	09/25/17 20:13	C7I0405	CI72557
Tertiary-amyl methyl ether	ND (0.0040)		8260B Low		1	09/25/17 20:13	C7I0405	CI72557
Tetrachloroethene	ND (0.0040)		8260B Low		1	09/25/17 20:13	C7I0405	CI72557
Tetrahydrofuran	ND (0.0040)		8260B Low		1	09/25/17 20:13	C7I0405	CI72557



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: GZ-SS-507 (0-2')  
 Date Sampled: 09/22/17 08:08  
 Percent Solids: 97  
 Initial Volume: 6.5  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709662  
 ESS Laboratory Sample ID: 1709662-07  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0040)		8260B Low		1	09/25/17 20:13	C7I0405	CI72557
trans-1,2-Dichloroethene	ND (0.0040)		8260B Low		1	09/25/17 20:13	C7I0405	CI72557
trans-1,3-Dichloropropene	ND (0.0040)		8260B Low		1	09/25/17 20:13	C7I0405	CI72557
Trichloroethene	ND (0.0040)		8260B Low		1	09/25/17 20:13	C7I0405	CI72557
Trichlorofluoromethane	ND (0.0040)		8260B Low		1	09/25/17 20:13	C7I0405	CI72557
Vinyl Acetate	ND (0.0040)		8260B Low		1	09/25/17 20:13	C7I0405	CI72557
Vinyl Chloride	ND (0.0079)		8260B Low		1	09/25/17 20:13	C7I0405	CI72557
Xylene O	ND (0.0040)		8260B Low		1	09/25/17 20:13	C7I0405	CI72557
Xylene P,M	ND (0.0079)		8260B Low		1	09/25/17 20:13	C7I0405	CI72557
Xylenes (Total)	ND (0.0079)		8260B Low		1	09/25/17 20:13		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	90 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	103 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	94 %		70-130
<i>Surrogate: Toluene-d8</i>	113 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: GZ-SS-507 (0-2')  
 Date Sampled: 09/22/17 08:08  
 Percent Solids: 97  
 Initial Volume: 19.8  
 Final Volume: 1  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709662  
 ESS Laboratory Sample ID: 1709662-07  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: SMR  
 Prepared: 9/25/17 11:30

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	521 (196)		8100M		5	09/26/17 14:37	C710397	C172519
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		81 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: GZ-SS-507 (0-2')  
Date Sampled: 09/22/17 08:08  
Percent Solids: 97  
Initial Volume: 14.3  
Final Volume: 0.5  
Extraction Method: 3546

ESS Laboratory Work Order: 1709662  
ESS Laboratory Sample ID: 1709662-07  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: TJ  
Prepared: 9/25/17 12:35

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.361)		8270D		1	09/25/17 22:55	C7I0391	CI72521
Acenaphthene	ND (0.361)		8270D		1	09/25/17 22:55	C7I0391	CI72521
<b>Acenaphthylene</b>	<b>0.409</b> (0.361)		8270D		1	09/25/17 22:55	C7I0391	CI72521
Anthracene	ND (0.361)		8270D		1	09/25/17 22:55	C7I0391	CI72521
<b>Benzo(a)anthracene</b>	<b>1.67</b> (0.361)		8270D		1	09/25/17 22:55	C7I0391	CI72521
<b>Benzo(a)pyrene</b>	<b>1.71</b> (0.181)		8270D		1	09/25/17 22:55	C7I0391	CI72521
<b>Benzo(b)fluoranthene</b>	<b>2.63</b> (0.361)		8270D		1	09/25/17 22:55	C7I0391	CI72521
<b>Benzo(g,h,i)perylene</b>	<b>0.698</b> (0.361)		8270D		1	09/25/17 22:55	C7I0391	CI72521
<b>Benzo(k)fluoranthene</b>	<b>1.82</b> (0.361)		8270D		1	09/25/17 22:55	C7I0391	CI72521
<b>Chrysene</b>	<b>1.54</b> (0.181)		8270D		1	09/25/17 22:55	C7I0391	CI72521
<b>Dibenzo(a,h)Anthracene</b>	<b>0.342</b> (0.181)		8270D		1	09/25/17 22:55	C7I0391	CI72521
<b>Fluoranthene</b>	<b>3.00</b> (0.361)		8270D		1	09/25/17 22:55	C7I0391	CI72521
Fluorene	ND (0.361)		8270D		1	09/25/17 22:55	C7I0391	CI72521
<b>Indeno(1,2,3-cd)Pyrene</b>	<b>0.712</b> (0.361)		8270D		1	09/25/17 22:55	C7I0391	CI72521
Naphthalene	ND (0.361)		8270D		1	09/25/17 22:55	C7I0391	CI72521
<b>Phenanthrene</b>	<b>0.507</b> (0.361)		8270D		1	09/25/17 22:55	C7I0391	CI72521
<b>Pyrene</b>	<b>1.83</b> (0.361)		8270D		1	09/25/17 22:55	C7I0391	CI72521

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	63 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	76 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	71 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	67 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: GZ-SS-507 (0-2')  
Date Sampled: 09/22/17 08:08  
Percent Solids: 97

ESS Laboratory Work Order: 1709662  
ESS Laboratory Sample ID: 1709662-07  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	333 (20.2)		9014		20	EEM	09/28/17 11:50	mg/kg dry	CI72818





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: GZ-SS-508 (0-2')  
 Date Sampled: 09/21/17 14:15  
 Percent Solids: 99

ESS Laboratory Work Order: 1709662  
 ESS Laboratory Sample ID: 1709662-08  
 Sample Matrix: Soil  
 Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (1.68)		6020A		20	NAR	09/29/17 5:28	2.42	100	CI72737
Arsenic	<b>5.61</b> (2.10)		6010C		1	KJK	09/28/17 4:39	2.42	100	CI72737
Beryllium	<b>0.26</b> (0.09)		6010C		1	KJK	09/28/17 4:39	2.42	100	CI72737
Cadmium	ND (0.42)		6010C		1	KJK	09/28/17 4:39	2.42	100	CI72737
Chromium	<b>8.72</b> (0.84)		6010C		1	KJK	09/28/17 4:39	2.42	100	CI72737
Copper	<b>13.7</b> (2.10)		6010C		1	KJK	09/28/17 4:39	2.42	100	CI72737
Lead	<b>72.6</b> (4.19)		6010C		1	KJK	09/28/17 4:39	2.42	100	CI72737
Mercury	<b>0.061</b> (0.031)		7471B		1	MJV	09/27/17 21:36	0.65	40	CI72736
Nickel	<b>10.1</b> (2.10)		6010C		1	KJK	09/28/17 4:39	2.42	100	CI72737
Selenium	ND (1.68)		6020A		20	NAR	09/29/17 5:28	2.42	100	CI72737
Silver	ND (0.42)		6010C		1	KJK	09/28/17 4:39	2.42	100	CI72737
Thallium	ND (1.68)		6020A		20	NAR	09/29/17 5:28	2.42	100	CI72737
Zinc	<b>86.0</b> (2.10)		6010C		1	KJK	09/28/17 4:39	2.42	100	CI72737



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: GZ-SS-508 (0-2')  
Date Sampled: 09/21/17 14:15  
Percent Solids: 99  
Initial Volume: 6.3  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1709662  
ESS Laboratory Sample ID: 1709662-08  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0040)		8260B Low		1	09/25/17 20:38	C7I0405	CI72557
1,1,1-Trichloroethane	ND (0.0040)		8260B Low		1	09/25/17 20:38	C7I0405	CI72557
1,1,2,2-Tetrachloroethane	ND (0.0040)		8260B Low		1	09/25/17 20:38	C7I0405	CI72557
1,1,2-Trichloroethane	ND (0.0040)		8260B Low		1	09/25/17 20:38	C7I0405	CI72557
1,1-Dichloroethane	ND (0.0040)		8260B Low		1	09/25/17 20:38	C7I0405	CI72557
1,1-Dichloroethene	ND (0.0040)		8260B Low		1	09/25/17 20:38	C7I0405	CI72557
1,1-Dichloropropene	ND (0.0040)		8260B Low		1	09/25/17 20:38	C7I0405	CI72557
1,2,3-Trichlorobenzene	ND (0.0040)		8260B Low		1	09/25/17 20:38	C7I0405	CI72557
1,2,3-Trichloropropane	ND (0.0040)		8260B Low		1	09/25/17 20:38	C7I0405	CI72557
1,2,4-Trichlorobenzene	ND (0.0040)		8260B Low		1	09/25/17 20:38	C7I0405	CI72557
1,2,4-Trimethylbenzene	ND (0.0040)		8260B Low		1	09/25/17 20:38	C7I0405	CI72557
1,2-Dibromo-3-Chloropropane	ND (0.0040)		8260B Low		1	09/25/17 20:38	C7I0405	CI72557
1,2-Dibromoethane	ND (0.0040)		8260B Low		1	09/25/17 20:38	C7I0405	CI72557
1,2-Dichlorobenzene	ND (0.0040)		8260B Low		1	09/25/17 20:38	C7I0405	CI72557
1,2-Dichloroethane	ND (0.0040)		8260B Low		1	09/25/17 20:38	C7I0405	CI72557
1,2-Dichloropropane	ND (0.0040)		8260B Low		1	09/25/17 20:38	C7I0405	CI72557
1,3,5-Trimethylbenzene	ND (0.0040)		8260B Low		1	09/25/17 20:38	C7I0405	CI72557
1,3-Dichlorobenzene	ND (0.0040)		8260B Low		1	09/25/17 20:38	C7I0405	CI72557
1,3-Dichloropropane	ND (0.0040)		8260B Low		1	09/25/17 20:38	C7I0405	CI72557
1,4-Dichlorobenzene	ND (0.0040)		8260B Low		1	09/25/17 20:38	C7I0405	CI72557
1,4-Dioxane	ND (0.0805)		8260B Low		1	09/25/17 20:38	C7I0405	CI72557
1-Chlorohexane	ND (0.0040)		8260B Low		1	09/25/17 20:38	C7I0405	CI72557
2,2-Dichloropropane	ND (0.0040)		8260B Low		1	09/25/17 20:38	C7I0405	CI72557
2-Butanone	ND (0.0403)		8260B Low		1	09/25/17 20:38	C7I0405	CI72557
2-Chlorotoluene	ND (0.0040)		8260B Low		1	09/25/17 20:38	C7I0405	CI72557
2-Hexanone	ND (0.0403)		8260B Low		1	09/25/17 20:38	C7I0405	CI72557
4-Chlorotoluene	ND (0.0040)		8260B Low		1	09/25/17 20:38	C7I0405	CI72557
4-Isopropyltoluene	ND (0.0040)		8260B Low		1	09/25/17 20:38	C7I0405	CI72557
4-Methyl-2-Pentanone	ND (0.0403)		8260B Low		1	09/25/17 20:38	C7I0405	CI72557
<b>Acetone</b>	<b>0.0598 (0.0403)</b>		8260B Low		1	09/25/17 20:38	C7I0405	CI72557
Benzene	ND (0.0040)		8260B Low		1	09/25/17 20:38	C7I0405	CI72557
Bromobenzene	ND (0.0040)		8260B Low		1	09/25/17 20:38	C7I0405	CI72557



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: GZ-SS-508 (0-2')  
 Date Sampled: 09/21/17 14:15  
 Percent Solids: 99  
 Initial Volume: 6.3  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709662  
 ESS Laboratory Sample ID: 1709662-08  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0040)		8260B Low		1	09/25/17 20:38	C7I0405	CI72557
Bromodichloromethane	ND (0.0040)		8260B Low		1	09/25/17 20:38	C7I0405	CI72557
Bromoform	ND (0.0040)		8260B Low		1	09/25/17 20:38	C7I0405	CI72557
Bromomethane	ND (0.0081)		8260B Low		1	09/25/17 20:38	C7I0405	CI72557
Carbon Disulfide	ND (0.0040)		8260B Low		1	09/25/17 20:38	C7I0405	CI72557
Carbon Tetrachloride	ND (0.0040)		8260B Low		1	09/25/17 20:38	C7I0405	CI72557
Chlorobenzene	ND (0.0040)		8260B Low		1	09/25/17 20:38	C7I0405	CI72557
Chloroethane	ND (0.0081)		8260B Low		1	09/25/17 20:38	C7I0405	CI72557
Chloroform	ND (0.0040)		8260B Low		1	09/25/17 20:38	C7I0405	CI72557
Chloromethane	ND (0.0081)		8260B Low		1	09/25/17 20:38	C7I0405	CI72557
cis-1,2-Dichloroethene	ND (0.0040)		8260B Low		1	09/25/17 20:38	C7I0405	CI72557
cis-1,3-Dichloropropene	ND (0.0040)		8260B Low		1	09/25/17 20:38	C7I0405	CI72557
Dibromochloromethane	ND (0.0040)		8260B Low		1	09/25/17 20:38	C7I0405	CI72557
Dibromomethane	ND (0.0040)		8260B Low		1	09/25/17 20:38	C7I0405	CI72557
Dichlorodifluoromethane	ND (0.0081)		8260B Low		1	09/25/17 20:38	C7I0405	CI72557
Diethyl Ether	ND (0.0040)		8260B Low		1	09/25/17 20:38	C7I0405	CI72557
Di-isopropyl ether	ND (0.0040)		8260B Low		1	09/25/17 20:38	C7I0405	CI72557
Ethyl tertiary-butyl ether	ND (0.0040)		8260B Low		1	09/25/17 20:38	C7I0405	CI72557
Ethylbenzene	ND (0.0040)		8260B Low		1	09/25/17 20:38	C7I0405	CI72557
Hexachlorobutadiene	ND (0.0040)		8260B Low		1	09/25/17 20:38	C7I0405	CI72557
Isopropylbenzene	ND (0.0040)		8260B Low		1	09/25/17 20:38	C7I0405	CI72557
Methyl tert-Butyl Ether	ND (0.0040)		8260B Low		1	09/25/17 20:38	C7I0405	CI72557
Methylene Chloride	ND (0.0201)		8260B Low		1	09/25/17 20:38	C7I0405	CI72557
Naphthalene	ND (0.0040)		8260B Low		1	09/25/17 20:38	C7I0405	CI72557
n-Butylbenzene	ND (0.0040)		8260B Low		1	09/25/17 20:38	C7I0405	CI72557
n-Propylbenzene	ND (0.0040)		8260B Low		1	09/25/17 20:38	C7I0405	CI72557
sec-Butylbenzene	ND (0.0040)		8260B Low		1	09/25/17 20:38	C7I0405	CI72557
Styrene	ND (0.0040)		8260B Low		1	09/25/17 20:38	C7I0405	CI72557
tert-Butylbenzene	ND (0.0040)		8260B Low		1	09/25/17 20:38	C7I0405	CI72557
Tertiary-amyl methyl ether	ND (0.0040)		8260B Low		1	09/25/17 20:38	C7I0405	CI72557
Tetrachloroethene	ND (0.0040)		8260B Low		1	09/25/17 20:38	C7I0405	CI72557
Tetrahydrofuran	ND (0.0040)		8260B Low		1	09/25/17 20:38	C7I0405	CI72557



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: GZ-SS-508 (0-2')  
 Date Sampled: 09/21/17 14:15  
 Percent Solids: 99  
 Initial Volume: 6.3  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709662  
 ESS Laboratory Sample ID: 1709662-08  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0040)		8260B Low		1	09/25/17 20:38	C7I0405	CI72557
trans-1,2-Dichloroethene	ND (0.0040)		8260B Low		1	09/25/17 20:38	C7I0405	CI72557
trans-1,3-Dichloropropene	ND (0.0040)		8260B Low		1	09/25/17 20:38	C7I0405	CI72557
Trichloroethene	ND (0.0040)		8260B Low		1	09/25/17 20:38	C7I0405	CI72557
Trichlorofluoromethane	ND (0.0040)		8260B Low		1	09/25/17 20:38	C7I0405	CI72557
Vinyl Acetate	ND (0.0040)		8260B Low		1	09/25/17 20:38	C7I0405	CI72557
Vinyl Chloride	ND (0.0081)		8260B Low		1	09/25/17 20:38	C7I0405	CI72557
Xylene O	ND (0.0040)		8260B Low		1	09/25/17 20:38	C7I0405	CI72557
Xylene P,M	ND (0.0081)		8260B Low		1	09/25/17 20:38	C7I0405	CI72557
Xylenes (Total)	ND (0.0081)		8260B Low		1	09/25/17 20:38		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	92 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	104 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	96 %		70-130
<i>Surrogate: Toluene-d8</i>	112 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: GZ-SS-508 (0-2')  
 Date Sampled: 09/21/17 14:15  
 Percent Solids: 99  
 Initial Volume: 19.3  
 Final Volume: 1  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709662  
 ESS Laboratory Sample ID: 1709662-08  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: SMR  
 Prepared: 9/25/17 11:30

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	ND (39.4)		8100M		1	09/26/17 10:31	C710397	C172519
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		87 %		40-140				





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: GZ-SS-508 (0-2')  
Date Sampled: 09/21/17 14:15  
Percent Solids: 99  
Initial Volume: 14.8  
Final Volume: 0.5  
Extraction Method: 3546

ESS Laboratory Work Order: 1709662  
ESS Laboratory Sample ID: 1709662-08  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: TJ  
Prepared: 9/25/17 12:35

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.343)		8270D		1	09/25/17 23:30	C7I0391	CI72521
Acenaphthene	ND (0.343)		8270D		1	09/25/17 23:30	C7I0391	CI72521
Acenaphthylene	ND (0.343)		8270D		1	09/25/17 23:30	C7I0391	CI72521
Anthracene	ND (0.343)		8270D		1	09/25/17 23:30	C7I0391	CI72521
Benzo(a)anthracene	ND (0.343)		8270D		1	09/25/17 23:30	C7I0391	CI72521
Benzo(a)pyrene	ND (0.172)		8270D		1	09/25/17 23:30	C7I0391	CI72521
Benzo(b)fluoranthene	ND (0.343)		8270D		1	09/25/17 23:30	C7I0391	CI72521
Benzo(g,h,i)perylene	ND (0.343)		8270D		1	09/25/17 23:30	C7I0391	CI72521
Benzo(k)fluoranthene	ND (0.343)		8270D		1	09/25/17 23:30	C7I0391	CI72521
Chrysene	ND (0.172)		8270D		1	09/25/17 23:30	C7I0391	CI72521
Dibenzo(a,h)Anthracene	ND (0.172)		8270D		1	09/25/17 23:30	C7I0391	CI72521
Fluoranthene	ND (0.343)		8270D		1	09/25/17 23:30	C7I0391	CI72521
Fluorene	ND (0.343)		8270D		1	09/25/17 23:30	C7I0391	CI72521
Indeno(1,2,3-cd)Pyrene	ND (0.343)		8270D		1	09/25/17 23:30	C7I0391	CI72521
Naphthalene	ND (0.343)		8270D		1	09/25/17 23:30	C7I0391	CI72521
Phenanthrene	ND (0.343)		8270D		1	09/25/17 23:30	C7I0391	CI72521
Pyrene	ND (0.343)		8270D		1	09/25/17 23:30	C7I0391	CI72521

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: 1,2-Dichlorobenzene-d4	69 %		30-130
Surrogate: 2-Fluorobiphenyl	77 %		30-130
Surrogate: Nitrobenzene-d5	73 %		30-130
Surrogate: p-Terphenyl-d14	71 %		30-130



**ESS Laboratory**

*Division of Thielsch Engineering, Inc.*

**BAL Laboratory**

*The Microbiology Division  
of Thielsch Engineering, Inc.*



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: GZ-SS-508 (0-2')  
Date Sampled: 09/21/17 14:15  
Percent Solids: 99

ESS Laboratory Work Order: 1709662  
ESS Laboratory Sample ID: 1709662-08  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	ND (0.97)		9014		1	EEM	09/28/17 11:50	mg/kg dry	CI72818



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: GZ-SS-509 (0-2')  
 Date Sampled: 09/21/17 14:30  
 Percent Solids: 92

ESS Laboratory Work Order: 1709662  
 ESS Laboratory Sample ID: 1709662-09  
 Sample Matrix: Soil  
 Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (2.14)		6020A		20	NAR	09/29/17 5:34	2.03	100	CI72737
Arsenic	<b>6.41</b> (2.67)		6010C		1	KJK	09/28/17 4:43	2.03	100	CI72737
Beryllium	<b>0.30</b> (0.12)		6010C		1	KJK	09/28/17 4:43	2.03	100	CI72737
Cadmium	ND (0.53)		6010C		1	KJK	09/28/17 4:43	2.03	100	CI72737
Chromium	<b>9.30</b> (1.07)		6010C		1	KJK	09/28/17 4:43	2.03	100	CI72737
Copper	<b>17.3</b> (2.67)		6010C		1	KJK	09/28/17 4:43	2.03	100	CI72737
Lead	<b>71.8</b> (5.34)		6010C		1	KJK	09/28/17 4:43	2.03	100	CI72737
Mercury	<b>0.065</b> (0.028)		7471B		1	MJV	09/27/17 21:42	0.78	40	CI72736
Nickel	<b>10.1</b> (2.67)		6010C		1	KJK	09/28/17 4:43	2.03	100	CI72737
Selenium	ND (2.14)		6020A		20	NAR	09/29/17 5:34	2.03	100	CI72737
Silver	ND (0.53)		6010C		1	KJK	09/28/17 4:43	2.03	100	CI72737
Thallium	ND (2.14)		6020A		20	NAR	09/29/17 5:34	2.03	100	CI72737
Zinc	<b>89.9</b> (2.67)		6010C		1	KJK	09/28/17 4:43	2.03	100	CI72737



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: GZ-SS-509 (0-2')  
 Date Sampled: 09/21/17 14:30  
 Percent Solids: 92  
 Initial Volume: 5.7  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709662  
 ESS Laboratory Sample ID: 1709662-09  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0048)		8260B Low		1	09/25/17 21:03	C7I0405	CI72557
1,1,1-Trichloroethane	ND (0.0048)		8260B Low		1	09/25/17 21:03	C7I0405	CI72557
1,1,2,2-Tetrachloroethane	ND (0.0048)		8260B Low		1	09/25/17 21:03	C7I0405	CI72557
1,1,2-Trichloroethane	ND (0.0048)		8260B Low		1	09/25/17 21:03	C7I0405	CI72557
1,1-Dichloroethane	ND (0.0048)		8260B Low		1	09/25/17 21:03	C7I0405	CI72557
1,1-Dichloroethene	ND (0.0048)		8260B Low		1	09/25/17 21:03	C7I0405	CI72557
1,1-Dichloropropene	ND (0.0048)		8260B Low		1	09/25/17 21:03	C7I0405	CI72557
1,2,3-Trichlorobenzene	ND (0.0048)		8260B Low		1	09/25/17 21:03	C7I0405	CI72557
1,2,3-Trichloropropane	ND (0.0048)		8260B Low		1	09/25/17 21:03	C7I0405	CI72557
1,2,4-Trichlorobenzene	ND (0.0048)		8260B Low		1	09/25/17 21:03	C7I0405	CI72557
1,2,4-Trimethylbenzene	ND (0.0048)		8260B Low		1	09/25/17 21:03	C7I0405	CI72557
1,2-Dibromo-3-Chloropropane	ND (0.0048)		8260B Low		1	09/25/17 21:03	C7I0405	CI72557
1,2-Dibromoethane	ND (0.0048)		8260B Low		1	09/25/17 21:03	C7I0405	CI72557
1,2-Dichlorobenzene	ND (0.0048)		8260B Low		1	09/25/17 21:03	C7I0405	CI72557
1,2-Dichloroethane	ND (0.0048)		8260B Low		1	09/25/17 21:03	C7I0405	CI72557
1,2-Dichloropropane	ND (0.0048)		8260B Low		1	09/25/17 21:03	C7I0405	CI72557
1,3,5-Trimethylbenzene	ND (0.0048)		8260B Low		1	09/25/17 21:03	C7I0405	CI72557
1,3-Dichlorobenzene	ND (0.0048)		8260B Low		1	09/25/17 21:03	C7I0405	CI72557
1,3-Dichloropropane	ND (0.0048)		8260B Low		1	09/25/17 21:03	C7I0405	CI72557
1,4-Dichlorobenzene	ND (0.0048)		8260B Low		1	09/25/17 21:03	C7I0405	CI72557
1,4-Dioxane	ND (0.0950)		8260B Low		1	09/25/17 21:03	C7I0405	CI72557
1-Chlorohexane	ND (0.0048)		8260B Low		1	09/25/17 21:03	C7I0405	CI72557
2,2-Dichloropropane	ND (0.0048)		8260B Low		1	09/25/17 21:03	C7I0405	CI72557
2-Butanone	ND (0.0475)		8260B Low		1	09/25/17 21:03	C7I0405	CI72557
2-Chlorotoluene	ND (0.0048)		8260B Low		1	09/25/17 21:03	C7I0405	CI72557
2-Hexanone	ND (0.0475)		8260B Low		1	09/25/17 21:03	C7I0405	CI72557
4-Chlorotoluene	ND (0.0048)		8260B Low		1	09/25/17 21:03	C7I0405	CI72557
4-Isopropyltoluene	ND (0.0048)		8260B Low		1	09/25/17 21:03	C7I0405	CI72557
4-Methyl-2-Pentanone	ND (0.0475)		8260B Low		1	09/25/17 21:03	C7I0405	CI72557
Acetone	ND (0.0475)		8260B Low		1	09/25/17 21:03	C7I0405	CI72557
Benzene	ND (0.0048)		8260B Low		1	09/25/17 21:03	C7I0405	CI72557
Bromobenzene	ND (0.0048)		8260B Low		1	09/25/17 21:03	C7I0405	CI72557



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: GZ-SS-509 (0-2')  
Date Sampled: 09/21/17 14:30  
Percent Solids: 92  
Initial Volume: 5.7  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1709662  
ESS Laboratory Sample ID: 1709662-09  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0048)		8260B Low		1	09/25/17 21:03	C7I0405	CI72557
Bromodichloromethane	ND (0.0048)		8260B Low		1	09/25/17 21:03	C7I0405	CI72557
Bromoform	ND (0.0048)		8260B Low		1	09/25/17 21:03	C7I0405	CI72557
Bromomethane	ND (0.0095)		8260B Low		1	09/25/17 21:03	C7I0405	CI72557
Carbon Disulfide	ND (0.0048)		8260B Low		1	09/25/17 21:03	C7I0405	CI72557
Carbon Tetrachloride	ND (0.0048)		8260B Low		1	09/25/17 21:03	C7I0405	CI72557
Chlorobenzene	ND (0.0048)		8260B Low		1	09/25/17 21:03	C7I0405	CI72557
Chloroethane	ND (0.0095)		8260B Low		1	09/25/17 21:03	C7I0405	CI72557
Chloroform	ND (0.0048)		8260B Low		1	09/25/17 21:03	C7I0405	CI72557
Chloromethane	ND (0.0095)		8260B Low		1	09/25/17 21:03	C7I0405	CI72557
cis-1,2-Dichloroethene	ND (0.0048)		8260B Low		1	09/25/17 21:03	C7I0405	CI72557
cis-1,3-Dichloropropene	ND (0.0048)		8260B Low		1	09/25/17 21:03	C7I0405	CI72557
Dibromochloromethane	ND (0.0048)		8260B Low		1	09/25/17 21:03	C7I0405	CI72557
Dibromomethane	ND (0.0048)		8260B Low		1	09/25/17 21:03	C7I0405	CI72557
Dichlorodifluoromethane	ND (0.0095)		8260B Low		1	09/25/17 21:03	C7I0405	CI72557
Diethyl Ether	ND (0.0048)		8260B Low		1	09/25/17 21:03	C7I0405	CI72557
Di-isopropyl ether	ND (0.0048)		8260B Low		1	09/25/17 21:03	C7I0405	CI72557
Ethyl tertiary-butyl ether	ND (0.0048)		8260B Low		1	09/25/17 21:03	C7I0405	CI72557
Ethylbenzene	ND (0.0048)		8260B Low		1	09/25/17 21:03	C7I0405	CI72557
Hexachlorobutadiene	ND (0.0048)		8260B Low		1	09/25/17 21:03	C7I0405	CI72557
Isopropylbenzene	ND (0.0048)		8260B Low		1	09/25/17 21:03	C7I0405	CI72557
Methyl tert-Butyl Ether	ND (0.0048)		8260B Low		1	09/25/17 21:03	C7I0405	CI72557
Methylene Chloride	ND (0.0238)		8260B Low		1	09/25/17 21:03	C7I0405	CI72557
Naphthalene	ND (0.0048)		8260B Low		1	09/25/17 21:03	C7I0405	CI72557
n-Butylbenzene	ND (0.0048)		8260B Low		1	09/25/17 21:03	C7I0405	CI72557
n-Propylbenzene	ND (0.0048)		8260B Low		1	09/25/17 21:03	C7I0405	CI72557
sec-Butylbenzene	ND (0.0048)		8260B Low		1	09/25/17 21:03	C7I0405	CI72557
Styrene	ND (0.0048)		8260B Low		1	09/25/17 21:03	C7I0405	CI72557
tert-Butylbenzene	ND (0.0048)		8260B Low		1	09/25/17 21:03	C7I0405	CI72557
Tertiary-amyl methyl ether	ND (0.0048)		8260B Low		1	09/25/17 21:03	C7I0405	CI72557
Tetrachloroethene	ND (0.0048)		8260B Low		1	09/25/17 21:03	C7I0405	CI72557
Tetrahydrofuran	ND (0.0048)		8260B Low		1	09/25/17 21:03	C7I0405	CI72557





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: GZ-SS-509 (0-2')  
 Date Sampled: 09/21/17 14:30  
 Percent Solids: 92  
 Initial Volume: 5.7  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709662  
 ESS Laboratory Sample ID: 1709662-09  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0048)		8260B Low		1	09/25/17 21:03	C7I0405	CI72557
trans-1,2-Dichloroethene	ND (0.0048)		8260B Low		1	09/25/17 21:03	C7I0405	CI72557
trans-1,3-Dichloropropene	ND (0.0048)		8260B Low		1	09/25/17 21:03	C7I0405	CI72557
Trichloroethene	ND (0.0048)		8260B Low		1	09/25/17 21:03	C7I0405	CI72557
Trichlorofluoromethane	ND (0.0048)		8260B Low		1	09/25/17 21:03	C7I0405	CI72557
Vinyl Acetate	ND (0.0048)		8260B Low		1	09/25/17 21:03	C7I0405	CI72557
Vinyl Chloride	ND (0.0095)		8260B Low		1	09/25/17 21:03	C7I0405	CI72557
Xylene O	ND (0.0048)		8260B Low		1	09/25/17 21:03	C7I0405	CI72557
Xylene P,M	ND (0.0095)		8260B Low		1	09/25/17 21:03	C7I0405	CI72557
Xylenes (Total)	ND (0.0095)		8260B Low		1	09/25/17 21:03		[CALC]

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: 1,2-Dichloroethane-d4	93 %		70-130
Surrogate: 4-Bromofluorobenzene	103 %		70-130
Surrogate: Dibromofluoromethane	95 %		70-130
Surrogate: Toluene-d8	115 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: GZ-SS-509 (0-2')  
 Date Sampled: 09/21/17 14:30  
 Percent Solids: 92  
 Initial Volume: 19.3  
 Final Volume: 1  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709662  
 ESS Laboratory Sample ID: 1709662-09  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: SMR  
 Prepared: 9/25/17 11:30

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	77.2 (42.1)		8100M		1	09/26/17 11:06	C710397	C172519
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		89 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: GZ-SS-509 (0-2')  
 Date Sampled: 09/21/17 14:30  
 Percent Solids: 92  
 Initial Volume: 14.7  
 Final Volume: 0.5  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709662  
 ESS Laboratory Sample ID: 1709662-09  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: TJ  
 Prepared: 9/25/17 12:35

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.368)		8270D		1	09/26/17 0:05	C7I0391	CI72521
Acenaphthene	<b>0.986</b> (0.368)		8270D		1	09/26/17 0:05	C7I0391	CI72521
Acenaphthylene	<b>1.75</b> (0.368)		8270D		1	09/26/17 0:05	C7I0391	CI72521
Anthracene	<b>6.35</b> (0.368)		8270D		1	09/26/17 0:05	C7I0391	CI72521
Benzo(a)anthracene	<b>24.2</b> (3.68)		8270D		10	09/26/17 22:13	C7I0391	CI72521
Benzo(a)pyrene	<b>20.9</b> (1.85)		8270D		10	09/26/17 22:13	C7I0391	CI72521
Benzo(b)fluoranthene	<b>18.6</b> (3.68)		8270D		10	09/26/17 22:13	C7I0391	CI72521
Benzo(g,h,i)perylene	<b>6.33</b> (0.368)		8270D		1	09/26/17 0:05	C7I0391	CI72521
Benzo(k)fluoranthene	<b>17.6</b> (3.68)		8270D		10	09/26/17 22:13	C7I0391	CI72521
Chrysene	<b>21.8</b> (1.85)		8270D		10	09/26/17 22:13	C7I0391	CI72521
Dibenzo(a,h)Anthracene	<b>3.36</b> (0.185)		8270D		1	09/26/17 0:05	C7I0391	CI72521
Fluoranthene	<b>55.4</b> (3.68)		8270D		10	09/26/17 22:13	C7I0391	CI72521
Fluorene	<b>1.42</b> (0.368)		8270D		1	09/26/17 0:05	C7I0391	CI72521
Indeno(1,2,3-cd)Pyrene	<b>6.19</b> (0.368)		8270D		1	09/26/17 0:05	C7I0391	CI72521
Naphthalene	<b>0.655</b> (0.368)		8270D		1	09/26/17 0:05	C7I0391	CI72521
Phenanthrene	<b>30.2</b> (3.68)		8270D		10	09/26/17 22:13	C7I0391	CI72521
Pyrene	<b>42.0</b> (3.68)		8270D		10	09/26/17 22:13	C7I0391	CI72521

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	68 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	75 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	73 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	75 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: GZ-SS-509 (0-2')  
Date Sampled: 09/21/17 14:30  
Percent Solids: 92

ESS Laboratory Work Order: 1709662  
ESS Laboratory Sample ID: 1709662-09  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	2.48 (1.06)		9014		1	EEM	09/28/17 11:50	mg/kg dry	CI72818



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: GZ-SS-510 (0-2')  
Date Sampled: 09/21/17 14:50  
Percent Solids: 96

ESS Laboratory Work Order: 1709662  
ESS Laboratory Sample ID: 1709662-10  
Sample Matrix: Soil  
Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (1.80)		6020A		20	NAR	09/29/17 5:40	2.32	100	CI72737
Arsenic	<b>6.60</b> (2.25)		6010C		1	KJK	09/28/17 18:07	2.32	100	CI72737
Beryllium	<b>0.31</b> (0.10)		6010C		1	KJK	09/28/17 4:47	2.32	100	CI72737
Cadmium	ND (0.45)		6010C		1	KJK	09/28/17 4:47	2.32	100	CI72737
Chromium	<b>6.01</b> (0.90)		6010C		1	KJK	09/28/17 4:47	2.32	100	CI72737
Copper	<b>11.9</b> (2.25)		6010C		1	KJK	09/28/17 4:47	2.32	100	CI72737
Lead	<b>140</b> (4.51)		6010C		1	KJK	09/28/17 4:47	2.32	100	CI72737
Mercury	<b>0.131</b> (0.030)		7471B		1	MJV	09/27/17 21:44	0.7	40	CI72736
Nickel	<b>6.50</b> (2.25)		6010C		1	KJK	09/28/17 4:47	2.32	100	CI72737
Selenium	ND (1.80)		6020A		20	NAR	09/29/17 5:40	2.32	100	CI72737
Silver	ND (0.45)		6010C		1	KJK	09/28/17 4:47	2.32	100	CI72737
Thallium	ND (1.80)		6020A		20	NAR	09/29/17 5:40	2.32	100	CI72737
Zinc	<b>41.4</b> (2.25)		6010C		1	KJK	09/28/17 4:47	2.32	100	CI72737





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: GZ-SS-510 (0-2')  
 Date Sampled: 09/21/17 14:50  
 Percent Solids: 96  
 Initial Volume: 5.8  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709662  
 ESS Laboratory Sample ID: 1709662-10  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0045)		8260B Low		1	09/25/17 21:29	C7I0405	CI72557
1,1,1-Trichloroethane	ND (0.0045)		8260B Low		1	09/25/17 21:29	C7I0405	CI72557
1,1,2,2-Tetrachloroethane	ND (0.0045)		8260B Low		1	09/25/17 21:29	C7I0405	CI72557
1,1,2-Trichloroethane	ND (0.0045)		8260B Low		1	09/25/17 21:29	C7I0405	CI72557
1,1-Dichloroethane	ND (0.0045)		8260B Low		1	09/25/17 21:29	C7I0405	CI72557
1,1-Dichloroethene	ND (0.0045)		8260B Low		1	09/25/17 21:29	C7I0405	CI72557
1,1-Dichloropropene	ND (0.0045)		8260B Low		1	09/25/17 21:29	C7I0405	CI72557
1,2,3-Trichlorobenzene	ND (0.0045)		8260B Low		1	09/25/17 21:29	C7I0405	CI72557
1,2,3-Trichloropropane	ND (0.0045)		8260B Low		1	09/25/17 21:29	C7I0405	CI72557
1,2,4-Trichlorobenzene	ND (0.0045)		8260B Low		1	09/25/17 21:29	C7I0405	CI72557
1,2,4-Trimethylbenzene	ND (0.0045)		8260B Low		1	09/25/17 21:29	C7I0405	CI72557
1,2-Dibromo-3-Chloropropane	ND (0.0045)		8260B Low		1	09/25/17 21:29	C7I0405	CI72557
1,2-Dibromoethane	ND (0.0045)		8260B Low		1	09/25/17 21:29	C7I0405	CI72557
1,2-Dichlorobenzene	ND (0.0045)		8260B Low		1	09/25/17 21:29	C7I0405	CI72557
1,2-Dichloroethane	ND (0.0045)		8260B Low		1	09/25/17 21:29	C7I0405	CI72557
1,2-Dichloropropane	ND (0.0045)		8260B Low		1	09/25/17 21:29	C7I0405	CI72557
1,3,5-Trimethylbenzene	ND (0.0045)		8260B Low		1	09/25/17 21:29	C7I0405	CI72557
1,3-Dichlorobenzene	ND (0.0045)		8260B Low		1	09/25/17 21:29	C7I0405	CI72557
1,3-Dichloropropane	ND (0.0045)		8260B Low		1	09/25/17 21:29	C7I0405	CI72557
1,4-Dichlorobenzene	ND (0.0045)		8260B Low		1	09/25/17 21:29	C7I0405	CI72557
1,4-Dioxane	ND (0.0902)		8260B Low		1	09/25/17 21:29	C7I0405	CI72557
1-Chlorohexane	ND (0.0045)		8260B Low		1	09/25/17 21:29	C7I0405	CI72557
2,2-Dichloropropane	ND (0.0045)		8260B Low		1	09/25/17 21:29	C7I0405	CI72557
2-Butanone	ND (0.0451)		8260B Low		1	09/25/17 21:29	C7I0405	CI72557
2-Chlorotoluene	ND (0.0045)		8260B Low		1	09/25/17 21:29	C7I0405	CI72557
2-Hexanone	ND (0.0451)		8260B Low		1	09/25/17 21:29	C7I0405	CI72557
4-Chlorotoluene	ND (0.0045)		8260B Low		1	09/25/17 21:29	C7I0405	CI72557
4-Isopropyltoluene	ND (0.0045)		8260B Low		1	09/25/17 21:29	C7I0405	CI72557
4-Methyl-2-Pentanone	ND (0.0451)		8260B Low		1	09/25/17 21:29	C7I0405	CI72557
Acetone	ND (0.0451)		8260B Low		1	09/25/17 21:29	C7I0405	CI72557
Benzene	ND (0.0045)		8260B Low		1	09/25/17 21:29	C7I0405	CI72557
Bromobenzene	ND (0.0045)		8260B Low		1	09/25/17 21:29	C7I0405	CI72557



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: GZ-SS-510 (0-2')  
Date Sampled: 09/21/17 14:50  
Percent Solids: 96  
Initial Volume: 5.8  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1709662  
ESS Laboratory Sample ID: 1709662-10  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0045)		8260B Low		1	09/25/17 21:29	C7I0405	CI72557
Bromodichloromethane	ND (0.0045)		8260B Low		1	09/25/17 21:29	C7I0405	CI72557
Bromoform	ND (0.0045)		8260B Low		1	09/25/17 21:29	C7I0405	CI72557
Bromomethane	ND (0.0090)		8260B Low		1	09/25/17 21:29	C7I0405	CI72557
Carbon Disulfide	ND (0.0045)		8260B Low		1	09/25/17 21:29	C7I0405	CI72557
Carbon Tetrachloride	ND (0.0045)		8260B Low		1	09/25/17 21:29	C7I0405	CI72557
Chlorobenzene	ND (0.0045)		8260B Low		1	09/25/17 21:29	C7I0405	CI72557
Chloroethane	ND (0.0090)		8260B Low		1	09/25/17 21:29	C7I0405	CI72557
Chloroform	ND (0.0045)		8260B Low		1	09/25/17 21:29	C7I0405	CI72557
Chloromethane	ND (0.0090)		8260B Low		1	09/25/17 21:29	C7I0405	CI72557
cis-1,2-Dichloroethene	ND (0.0045)		8260B Low		1	09/25/17 21:29	C7I0405	CI72557
cis-1,3-Dichloropropene	ND (0.0045)		8260B Low		1	09/25/17 21:29	C7I0405	CI72557
Dibromochloromethane	ND (0.0045)		8260B Low		1	09/25/17 21:29	C7I0405	CI72557
Dibromomethane	ND (0.0045)		8260B Low		1	09/25/17 21:29	C7I0405	CI72557
Dichlorodifluoromethane	ND (0.0090)		8260B Low		1	09/25/17 21:29	C7I0405	CI72557
Diethyl Ether	ND (0.0045)		8260B Low		1	09/25/17 21:29	C7I0405	CI72557
Di-isopropyl ether	ND (0.0045)		8260B Low		1	09/25/17 21:29	C7I0405	CI72557
Ethyl tertiary-butyl ether	ND (0.0045)		8260B Low		1	09/25/17 21:29	C7I0405	CI72557
Ethylbenzene	ND (0.0045)		8260B Low		1	09/25/17 21:29	C7I0405	CI72557
Hexachlorobutadiene	ND (0.0045)		8260B Low		1	09/25/17 21:29	C7I0405	CI72557
Isopropylbenzene	ND (0.0045)		8260B Low		1	09/25/17 21:29	C7I0405	CI72557
Methyl tert-Butyl Ether	ND (0.0045)		8260B Low		1	09/25/17 21:29	C7I0405	CI72557
Methylene Chloride	ND (0.0225)		8260B Low		1	09/25/17 21:29	C7I0405	CI72557
Naphthalene	ND (0.0045)		8260B Low		1	09/25/17 21:29	C7I0405	CI72557
n-Butylbenzene	ND (0.0045)		8260B Low		1	09/25/17 21:29	C7I0405	CI72557
n-Propylbenzene	ND (0.0045)		8260B Low		1	09/25/17 21:29	C7I0405	CI72557
sec-Butylbenzene	ND (0.0045)		8260B Low		1	09/25/17 21:29	C7I0405	CI72557
Styrene	ND (0.0045)		8260B Low		1	09/25/17 21:29	C7I0405	CI72557
tert-Butylbenzene	ND (0.0045)		8260B Low		1	09/25/17 21:29	C7I0405	CI72557
Tertiary-amyl methyl ether	ND (0.0045)		8260B Low		1	09/25/17 21:29	C7I0405	CI72557
Tetrachloroethene	ND (0.0045)		8260B Low		1	09/25/17 21:29	C7I0405	CI72557
Tetrahydrofuran	ND (0.0045)		8260B Low		1	09/25/17 21:29	C7I0405	CI72557



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: GZ-SS-510 (0-2')  
 Date Sampled: 09/21/17 14:50  
 Percent Solids: 96  
 Initial Volume: 5.8  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709662  
 ESS Laboratory Sample ID: 1709662-10  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0045)		8260B Low		1	09/25/17 21:29	C7I0405	CI72557
trans-1,2-Dichloroethene	ND (0.0045)		8260B Low		1	09/25/17 21:29	C7I0405	CI72557
trans-1,3-Dichloropropene	ND (0.0045)		8260B Low		1	09/25/17 21:29	C7I0405	CI72557
Trichloroethene	ND (0.0045)		8260B Low		1	09/25/17 21:29	C7I0405	CI72557
Trichlorofluoromethane	ND (0.0045)		8260B Low		1	09/25/17 21:29	C7I0405	CI72557
Vinyl Acetate	ND (0.0045)		8260B Low		1	09/25/17 21:29	C7I0405	CI72557
Vinyl Chloride	ND (0.0090)		8260B Low		1	09/25/17 21:29	C7I0405	CI72557
Xylene O	ND (0.0045)		8260B Low		1	09/25/17 21:29	C7I0405	CI72557
Xylene P,M	ND (0.0090)		8260B Low		1	09/25/17 21:29	C7I0405	CI72557
Xylenes (Total)	ND (0.0090)		8260B Low		1	09/25/17 21:29		[CALC]

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: 1,2-Dichloroethane-d4	94 %		70-130
Surrogate: 4-Bromofluorobenzene	92 %		70-130
Surrogate: Dibromofluoromethane	95 %		70-130
Surrogate: Toluene-d8	121 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: GZ-SS-510 (0-2')  
Date Sampled: 09/21/17 14:50  
Percent Solids: 96  
Initial Volume: 19.4  
Final Volume: 1  
Extraction Method: 3546

ESS Laboratory Work Order: 1709662  
ESS Laboratory Sample ID: 1709662-10  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: SMR  
Prepared: 9/25/17 11:30

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	90.6 (40.4)		8100M		1	09/26/17 11:41	C710397	C172519
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		74 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: GZ-SS-510 (0-2')  
Date Sampled: 09/21/17 14:50  
Percent Solids: 96  
Initial Volume: 14  
Final Volume: 0.5  
Extraction Method: 3546

ESS Laboratory Work Order: 1709662  
ESS Laboratory Sample ID: 1709662-10  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: TJ  
Prepared: 9/25/17 12:35

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.373)		8270D		1	09/26/17 0:40	C7I0391	CI72521
Acenaphthene	ND (0.373)		8270D		1	09/26/17 0:40	C7I0391	CI72521
Acenaphthylene	ND (0.373)		8270D		1	09/26/17 0:40	C7I0391	CI72521
Anthracene	ND (0.373)		8270D		1	09/26/17 0:40	C7I0391	CI72521
Benzo(a)anthracene	ND (0.373)		8270D		1	09/26/17 0:40	C7I0391	CI72521
<b>Benzo(a)pyrene</b>	<b>0.317</b> (0.187)		8270D		1	09/26/17 0:40	C7I0391	CI72521
<b>Benzo(b)fluoranthene</b>	<b>0.456</b> (0.373)		8270D		1	09/26/17 0:40	C7I0391	CI72521
Benzo(g,h,i)perylene	ND (0.373)		8270D		1	09/26/17 0:40	C7I0391	CI72521
Benzo(k)fluoranthene	ND (0.373)		8270D		1	09/26/17 0:40	C7I0391	CI72521
<b>Chrysene</b>	<b>0.390</b> (0.187)		8270D		1	09/26/17 0:40	C7I0391	CI72521
Dibenzo(a,h)Anthracene	ND (0.187)		8270D		1	09/26/17 0:40	C7I0391	CI72521
<b>Fluoranthene</b>	<b>0.726</b> (0.373)		8270D		1	09/26/17 0:40	C7I0391	CI72521
Fluorene	ND (0.373)		8270D		1	09/26/17 0:40	C7I0391	CI72521
Indeno(1,2,3-cd)Pyrene	ND (0.373)		8270D		1	09/26/17 0:40	C7I0391	CI72521
Naphthalene	ND (0.373)		8270D		1	09/26/17 0:40	C7I0391	CI72521
Phenanthrene	ND (0.373)		8270D		1	09/26/17 0:40	C7I0391	CI72521
<b>Pyrene</b>	<b>0.483</b> (0.373)		8270D		1	09/26/17 0:40	C7I0391	CI72521

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	67 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	74 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	71 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	66 %		30-130





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: GZ-SS-510 (0-2')  
Date Sampled: 09/21/17 14:50  
Percent Solids: 96

ESS Laboratory Work Order: 1709662  
ESS Laboratory Sample ID: 1709662-10  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	3.49 (1.02)		9014		1	EEM	09/28/17 11:50	mg/kg dry	CI72818



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: GZ-SS-511 (0-2')  
 Date Sampled: 09/22/17 08:25  
 Percent Solids: 96

ESS Laboratory Work Order: 1709662  
 ESS Laboratory Sample ID: 1709662-11  
 Sample Matrix: Soil  
 Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (1.91)		6020A		20	NAR	09/29/17 5:46	2.18	100	CI72737
Arsenic	<b>5.65</b> (2.39)		6010C		1	KJK	09/28/17 4:51	2.18	100	CI72737
Beryllium	<b>0.33</b> (0.11)		6010C		1	KJK	09/28/17 4:51	2.18	100	CI72737
Cadmium	ND (0.48)		6010C		1	KJK	09/28/17 4:51	2.18	100	CI72737
Chromium	<b>9.32</b> (0.95)		6010C		1	KJK	09/28/17 4:51	2.18	100	CI72737
Copper	<b>18.4</b> (2.39)		6010C		1	KJK	09/28/17 4:51	2.18	100	CI72737
Lead	<b>80.4</b> (4.77)		6010C		1	KJK	09/28/17 4:51	2.18	100	CI72737
Mercury	<b>0.083</b> (0.028)		7471B		1	MJV	09/27/17 21:46	0.74	40	CI72736
Nickel	<b>13.9</b> (2.39)		6010C		1	KJK	09/28/17 4:51	2.18	100	CI72737
Selenium	ND (1.91)		6020A		20	NAR	09/29/17 5:46	2.18	100	CI72737
Silver	ND (0.48)		6010C		1	KJK	09/28/17 4:51	2.18	100	CI72737
Thallium	ND (1.91)		6020A		20	NAR	09/29/17 5:46	2.18	100	CI72737
Zinc	<b>63.1</b> (2.39)		6010C		1	KJK	09/28/17 4:51	2.18	100	CI72737



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: GZ-SS-511 (0-2')  
 Date Sampled: 09/22/17 08:25  
 Percent Solids: 96  
 Initial Volume: 6.2  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709662  
 ESS Laboratory Sample ID: 1709662-11  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0042)		8260B Low		1	09/25/17 21:54	C7I0405	CI72557
1,1,1-Trichloroethane	ND (0.0042)		8260B Low		1	09/25/17 21:54	C7I0405	CI72557
1,1,2,2-Tetrachloroethane	ND (0.0042)		8260B Low		1	09/25/17 21:54	C7I0405	CI72557
1,1,2-Trichloroethane	ND (0.0042)		8260B Low		1	09/25/17 21:54	C7I0405	CI72557
1,1-Dichloroethane	ND (0.0042)		8260B Low		1	09/25/17 21:54	C7I0405	CI72557
1,1-Dichloroethene	ND (0.0042)		8260B Low		1	09/25/17 21:54	C7I0405	CI72557
1,1-Dichloropropene	ND (0.0042)		8260B Low		1	09/25/17 21:54	C7I0405	CI72557
1,2,3-Trichlorobenzene	ND (0.0042)		8260B Low		1	09/25/17 21:54	C7I0405	CI72557
1,2,3-Trichloropropane	ND (0.0042)		8260B Low		1	09/25/17 21:54	C7I0405	CI72557
1,2,4-Trichlorobenzene	ND (0.0042)		8260B Low		1	09/25/17 21:54	C7I0405	CI72557
1,2,4-Trimethylbenzene	ND (0.0042)		8260B Low		1	09/25/17 21:54	C7I0405	CI72557
1,2-Dibromo-3-Chloropropane	ND (0.0042)		8260B Low		1	09/25/17 21:54	C7I0405	CI72557
1,2-Dibromoethane	ND (0.0042)		8260B Low		1	09/25/17 21:54	C7I0405	CI72557
1,2-Dichlorobenzene	ND (0.0042)		8260B Low		1	09/25/17 21:54	C7I0405	CI72557
1,2-Dichloroethane	ND (0.0042)		8260B Low		1	09/25/17 21:54	C7I0405	CI72557
1,2-Dichloropropane	ND (0.0042)		8260B Low		1	09/25/17 21:54	C7I0405	CI72557
1,3,5-Trimethylbenzene	ND (0.0042)		8260B Low		1	09/25/17 21:54	C7I0405	CI72557
1,3-Dichlorobenzene	ND (0.0042)		8260B Low		1	09/25/17 21:54	C7I0405	CI72557
1,3-Dichloropropane	ND (0.0042)		8260B Low		1	09/25/17 21:54	C7I0405	CI72557
1,4-Dichlorobenzene	ND (0.0042)		8260B Low		1	09/25/17 21:54	C7I0405	CI72557
1,4-Dioxane	ND (0.0839)		8260B Low		1	09/25/17 21:54	C7I0405	CI72557
1-Chlorohexane	ND (0.0042)		8260B Low		1	09/25/17 21:54	C7I0405	CI72557
2,2-Dichloropropane	ND (0.0042)		8260B Low		1	09/25/17 21:54	C7I0405	CI72557
2-Butanone	ND (0.0420)		8260B Low		1	09/25/17 21:54	C7I0405	CI72557
2-Chlorotoluene	ND (0.0042)		8260B Low		1	09/25/17 21:54	C7I0405	CI72557
2-Hexanone	ND (0.0420)		8260B Low		1	09/25/17 21:54	C7I0405	CI72557
4-Chlorotoluene	ND (0.0042)		8260B Low		1	09/25/17 21:54	C7I0405	CI72557
4-Isopropyltoluene	ND (0.0042)		8260B Low		1	09/25/17 21:54	C7I0405	CI72557
4-Methyl-2-Pentanone	ND (0.0420)		8260B Low		1	09/25/17 21:54	C7I0405	CI72557
Acetone	ND (0.0420)		8260B Low		1	09/25/17 21:54	C7I0405	CI72557
Benzene	ND (0.0042)		8260B Low		1	09/25/17 21:54	C7I0405	CI72557
Bromobenzene	ND (0.0042)		8260B Low		1	09/25/17 21:54	C7I0405	CI72557



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: GZ-SS-511 (0-2')  
 Date Sampled: 09/22/17 08:25  
 Percent Solids: 96  
 Initial Volume: 6.2  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709662  
 ESS Laboratory Sample ID: 1709662-11  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0042)		8260B Low		1	09/25/17 21:54	C7I0405	CI72557
Bromodichloromethane	ND (0.0042)		8260B Low		1	09/25/17 21:54	C7I0405	CI72557
Bromoform	ND (0.0042)		8260B Low		1	09/25/17 21:54	C7I0405	CI72557
Bromomethane	ND (0.0084)		8260B Low		1	09/25/17 21:54	C7I0405	CI72557
Carbon Disulfide	ND (0.0042)		8260B Low		1	09/25/17 21:54	C7I0405	CI72557
Carbon Tetrachloride	ND (0.0042)		8260B Low		1	09/25/17 21:54	C7I0405	CI72557
Chlorobenzene	ND (0.0042)		8260B Low		1	09/25/17 21:54	C7I0405	CI72557
Chloroethane	ND (0.0084)		8260B Low		1	09/25/17 21:54	C7I0405	CI72557
Chloroform	ND (0.0042)		8260B Low		1	09/25/17 21:54	C7I0405	CI72557
Chloromethane	ND (0.0084)		8260B Low		1	09/25/17 21:54	C7I0405	CI72557
cis-1,2-Dichloroethene	ND (0.0042)		8260B Low		1	09/25/17 21:54	C7I0405	CI72557
cis-1,3-Dichloropropene	ND (0.0042)		8260B Low		1	09/25/17 21:54	C7I0405	CI72557
Dibromochloromethane	ND (0.0042)		8260B Low		1	09/25/17 21:54	C7I0405	CI72557
Dibromomethane	ND (0.0042)		8260B Low		1	09/25/17 21:54	C7I0405	CI72557
Dichlorodifluoromethane	ND (0.0084)		8260B Low		1	09/25/17 21:54	C7I0405	CI72557
Diethyl Ether	ND (0.0042)		8260B Low		1	09/25/17 21:54	C7I0405	CI72557
Di-isopropyl ether	ND (0.0042)		8260B Low		1	09/25/17 21:54	C7I0405	CI72557
Ethyl tertiary-butyl ether	ND (0.0042)		8260B Low		1	09/25/17 21:54	C7I0405	CI72557
Ethylbenzene	ND (0.0042)		8260B Low		1	09/25/17 21:54	C7I0405	CI72557
Hexachlorobutadiene	ND (0.0042)		8260B Low		1	09/25/17 21:54	C7I0405	CI72557
Isopropylbenzene	ND (0.0042)		8260B Low		1	09/25/17 21:54	C7I0405	CI72557
Methyl tert-Butyl Ether	ND (0.0042)		8260B Low		1	09/25/17 21:54	C7I0405	CI72557
Methylene Chloride	ND (0.0210)		8260B Low		1	09/25/17 21:54	C7I0405	CI72557
Naphthalene	ND (0.0042)		8260B Low		1	09/25/17 21:54	C7I0405	CI72557
n-Butylbenzene	ND (0.0042)		8260B Low		1	09/25/17 21:54	C7I0405	CI72557
n-Propylbenzene	ND (0.0042)		8260B Low		1	09/25/17 21:54	C7I0405	CI72557
sec-Butylbenzene	ND (0.0042)		8260B Low		1	09/25/17 21:54	C7I0405	CI72557
Styrene	ND (0.0042)		8260B Low		1	09/25/17 21:54	C7I0405	CI72557
tert-Butylbenzene	ND (0.0042)		8260B Low		1	09/25/17 21:54	C7I0405	CI72557
Tertiary-amyl methyl ether	ND (0.0042)		8260B Low		1	09/25/17 21:54	C7I0405	CI72557
Tetrachloroethene	ND (0.0042)		8260B Low		1	09/25/17 21:54	C7I0405	CI72557
Tetrahydrofuran	ND (0.0042)		8260B Low		1	09/25/17 21:54	C7I0405	CI72557



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: GZ-SS-511 (0-2')  
Date Sampled: 09/22/17 08:25  
Percent Solids: 96  
Initial Volume: 6.2  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1709662  
ESS Laboratory Sample ID: 1709662-11  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0042)		8260B Low		1	09/25/17 21:54	C7I0405	CI72557
trans-1,2-Dichloroethene	ND (0.0042)		8260B Low		1	09/25/17 21:54	C7I0405	CI72557
trans-1,3-Dichloropropene	ND (0.0042)		8260B Low		1	09/25/17 21:54	C7I0405	CI72557
Trichloroethene	ND (0.0042)		8260B Low		1	09/25/17 21:54	C7I0405	CI72557
Trichlorofluoromethane	ND (0.0042)		8260B Low		1	09/25/17 21:54	C7I0405	CI72557
Vinyl Acetate	ND (0.0042)		8260B Low		1	09/25/17 21:54	C7I0405	CI72557
Vinyl Chloride	ND (0.0084)		8260B Low		1	09/25/17 21:54	C7I0405	CI72557
Xylene O	ND (0.0042)		8260B Low		1	09/25/17 21:54	C7I0405	CI72557
Xylene P,M	ND (0.0084)		8260B Low		1	09/25/17 21:54	C7I0405	CI72557
Xylenes (Total)	ND (0.0084)		8260B Low		1	09/25/17 21:54		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	93 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	105 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	96 %		70-130
<i>Surrogate: Toluene-d8</i>	112 %		70-130





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: GZ-SS-511 (0-2')  
Date Sampled: 09/22/17 08:25  
Percent Solids: 96  
Initial Volume: 19.7  
Final Volume: 1  
Extraction Method: 3546

ESS Laboratory Work Order: 1709662  
ESS Laboratory Sample ID: 1709662-11  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: SMR  
Prepared: 9/25/17 11:30

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	169 (39.6)		8100M		1	09/26/17 12:16	C710397	C172519
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		78 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: GZ-SS-511 (0-2')  
Date Sampled: 09/22/17 08:25  
Percent Solids: 96  
Initial Volume: 14.7  
Final Volume: 0.5  
Extraction Method: 3546

ESS Laboratory Work Order: 1709662  
ESS Laboratory Sample ID: 1709662-11  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: TJ  
Prepared: 9/25/17 12:35

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.354)		8270D		1	09/26/17 1:15	C7I0391	CI72521
Acenaphthene	ND (0.354)		8270D		1	09/26/17 1:15	C7I0391	CI72521
Acenaphthylene	1.19 (0.354)		8270D		1	09/26/17 1:15	C7I0391	CI72521
Anthracene	0.664 (0.354)		8270D		1	09/26/17 1:15	C7I0391	CI72521
Benzo(a)anthracene	4.99 (0.354)		8270D		1	09/26/17 1:15	C7I0391	CI72521
Benzo(a)pyrene	4.78 (0.177)		8270D		1	09/26/17 1:15	C7I0391	CI72521
Benzo(b)fluoranthene	5.27 (0.354)		8270D		1	09/26/17 1:15	C7I0391	CI72521
Benzo(g,h,i)perylene	1.88 (0.354)		8270D		1	09/26/17 1:15	C7I0391	CI72521
Benzo(k)fluoranthene	5.06 (0.354)		8270D		1	09/26/17 1:15	C7I0391	CI72521
Chrysene	4.26 (0.177)		8270D		1	09/26/17 1:15	C7I0391	CI72521
Dibenzo(a,h)Anthracene	0.947 (0.177)		8270D		1	09/26/17 1:15	C7I0391	CI72521
Fluoranthene	11.9 (3.54)		8270D		10	09/26/17 22:48	C7I0391	CI72521
Fluorene	ND (0.354)		8270D		1	09/26/17 1:15	C7I0391	CI72521
Indeno(1,2,3-cd)Pyrene	1.91 (0.354)		8270D		1	09/26/17 1:15	C7I0391	CI72521
Naphthalene	ND (0.354)		8270D		1	09/26/17 1:15	C7I0391	CI72521
Phenanthrene	1.89 (0.354)		8270D		1	09/26/17 1:15	C7I0391	CI72521
Pyrene	6.91 (0.354)		8270D		1	09/26/17 1:15	C7I0391	CI72521

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	72 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	79 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	76 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	66 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: GZ-SS-511 (0-2')  
Date Sampled: 09/22/17 08:25  
Percent Solids: 96

ESS Laboratory Work Order: 1709662  
ESS Laboratory Sample ID: 1709662-11  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	1.97 (0.97)		9014		1	EEM	09/28/17 11:50	mg/kg dry	CI72818



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: GZ-SS-512 (0-2')  
 Date Sampled: 09/22/17 09:00  
 Percent Solids: 92

ESS Laboratory Work Order: 1709662  
 ESS Laboratory Sample ID: 1709662-12  
 Sample Matrix: Soil  
 Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (2.14)		6020A		20	NAR	09/29/17 5:51	2.03	100	CI72737
<b>Arsenic</b>	<b>3.16</b> (2.67)		6010C		1	KJK	09/28/17 4:55	2.03	100	CI72737
<b>Beryllium</b>	<b>0.30</b> (0.12)		6010C		1	KJK	09/28/17 4:55	2.03	100	CI72737
Cadmium	ND (0.53)		6010C		1	KJK	09/28/17 4:55	2.03	100	CI72737
<b>Chromium</b>	<b>12.1</b> (1.07)		6010C		1	KJK	09/28/17 4:55	2.03	100	CI72737
<b>Copper</b>	<b>7.25</b> (2.67)		6010C		1	KJK	09/28/17 4:55	2.03	100	CI72737
<b>Lead</b>	<b>15.7</b> (5.34)		6010C		1	KJK	09/28/17 4:55	2.03	100	CI72737
<b>Mercury</b>	<b>0.057</b> (0.029)		7471B		1	MJV	09/27/17 21:48	0.75	40	CI72736
<b>Nickel</b>	<b>7.01</b> (2.67)		6010C		1	KJK	09/28/17 4:55	2.03	100	CI72737
Selenium	ND (2.14)		6020A		20	NAR	09/29/17 5:51	2.03	100	CI72737
Silver	ND (0.53)		6010C		1	KJK	09/28/17 4:55	2.03	100	CI72737
Thallium	ND (2.14)		6020A		20	NAR	09/29/17 5:51	2.03	100	CI72737
<b>Zinc</b>	<b>25.6</b> (2.67)		6010C		1	KJK	09/28/17 4:55	2.03	100	CI72737



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: GZ-SS-512 (0-2')  
Date Sampled: 09/22/17 09:00  
Percent Solids: 92  
Initial Volume: 7.9  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1709662  
ESS Laboratory Sample ID: 1709662-12  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0034)		8260B Low		1	09/25/17 22:19	C7I0405	CI72557
1,1,1-Trichloroethane	ND (0.0034)		8260B Low		1	09/25/17 22:19	C7I0405	CI72557
1,1,2,2-Tetrachloroethane	ND (0.0034)		8260B Low		1	09/25/17 22:19	C7I0405	CI72557
1,1,2-Trichloroethane	ND (0.0034)		8260B Low		1	09/25/17 22:19	C7I0405	CI72557
1,1-Dichloroethane	ND (0.0034)		8260B Low		1	09/25/17 22:19	C7I0405	CI72557
1,1-Dichloroethene	ND (0.0034)		8260B Low		1	09/25/17 22:19	C7I0405	CI72557
1,1-Dichloropropene	ND (0.0034)		8260B Low		1	09/25/17 22:19	C7I0405	CI72557
1,2,3-Trichlorobenzene	ND (0.0034)		8260B Low		1	09/25/17 22:19	C7I0405	CI72557
1,2,3-Trichloropropane	ND (0.0034)		8260B Low		1	09/25/17 22:19	C7I0405	CI72557
1,2,4-Trichlorobenzene	ND (0.0034)		8260B Low		1	09/25/17 22:19	C7I0405	CI72557
1,2,4-Trimethylbenzene	ND (0.0034)		8260B Low		1	09/25/17 22:19	C7I0405	CI72557
1,2-Dibromo-3-Chloropropane	ND (0.0034)		8260B Low		1	09/25/17 22:19	C7I0405	CI72557
1,2-Dibromoethane	ND (0.0034)		8260B Low		1	09/25/17 22:19	C7I0405	CI72557
1,2-Dichlorobenzene	ND (0.0034)		8260B Low		1	09/25/17 22:19	C7I0405	CI72557
1,2-Dichloroethane	ND (0.0034)		8260B Low		1	09/25/17 22:19	C7I0405	CI72557
1,2-Dichloropropane	ND (0.0034)		8260B Low		1	09/25/17 22:19	C7I0405	CI72557
1,3,5-Trimethylbenzene	ND (0.0034)		8260B Low		1	09/25/17 22:19	C7I0405	CI72557
1,3-Dichlorobenzene	ND (0.0034)		8260B Low		1	09/25/17 22:19	C7I0405	CI72557
1,3-Dichloropropane	ND (0.0034)		8260B Low		1	09/25/17 22:19	C7I0405	CI72557
1,4-Dichlorobenzene	ND (0.0034)		8260B Low		1	09/25/17 22:19	C7I0405	CI72557
1,4-Dioxane	ND (0.0686)		8260B Low		1	09/25/17 22:19	C7I0405	CI72557
1-Chlorohexane	ND (0.0034)		8260B Low		1	09/25/17 22:19	C7I0405	CI72557
2,2-Dichloropropane	ND (0.0034)		8260B Low		1	09/25/17 22:19	C7I0405	CI72557
2-Butanone	ND (0.0343)		8260B Low		1	09/25/17 22:19	C7I0405	CI72557
2-Chlorotoluene	ND (0.0034)		8260B Low		1	09/25/17 22:19	C7I0405	CI72557
2-Hexanone	ND (0.0343)		8260B Low		1	09/25/17 22:19	C7I0405	CI72557
4-Chlorotoluene	ND (0.0034)		8260B Low		1	09/25/17 22:19	C7I0405	CI72557
4-Isopropyltoluene	ND (0.0034)		8260B Low		1	09/25/17 22:19	C7I0405	CI72557
4-Methyl-2-Pentanone	ND (0.0343)		8260B Low		1	09/25/17 22:19	C7I0405	CI72557
Acetone	ND (0.0343)		8260B Low		1	09/25/17 22:19	C7I0405	CI72557
Benzene	ND (0.0034)		8260B Low		1	09/25/17 22:19	C7I0405	CI72557
Bromobenzene	ND (0.0034)		8260B Low		1	09/25/17 22:19	C7I0405	CI72557





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: GZ-SS-512 (0-2')  
Date Sampled: 09/22/17 09:00  
Percent Solids: 92  
Initial Volume: 7.9  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1709662  
ESS Laboratory Sample ID: 1709662-12  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0034)		8260B Low		1	09/25/17 22:19	C7I0405	CI72557
Bromodichloromethane	ND (0.0034)		8260B Low		1	09/25/17 22:19	C7I0405	CI72557
Bromoform	ND (0.0034)		8260B Low		1	09/25/17 22:19	C7I0405	CI72557
Bromomethane	ND (0.0069)		8260B Low		1	09/25/17 22:19	C7I0405	CI72557
Carbon Disulfide	ND (0.0034)		8260B Low		1	09/25/17 22:19	C7I0405	CI72557
Carbon Tetrachloride	ND (0.0034)		8260B Low		1	09/25/17 22:19	C7I0405	CI72557
Chlorobenzene	ND (0.0034)		8260B Low		1	09/25/17 22:19	C7I0405	CI72557
Chloroethane	ND (0.0069)		8260B Low		1	09/25/17 22:19	C7I0405	CI72557
Chloroform	ND (0.0034)		8260B Low		1	09/25/17 22:19	C7I0405	CI72557
Chloromethane	ND (0.0069)		8260B Low		1	09/25/17 22:19	C7I0405	CI72557
cis-1,2-Dichloroethene	ND (0.0034)		8260B Low		1	09/25/17 22:19	C7I0405	CI72557
cis-1,3-Dichloropropene	ND (0.0034)		8260B Low		1	09/25/17 22:19	C7I0405	CI72557
Dibromochloromethane	ND (0.0034)		8260B Low		1	09/25/17 22:19	C7I0405	CI72557
Dibromomethane	ND (0.0034)		8260B Low		1	09/25/17 22:19	C7I0405	CI72557
Dichlorodifluoromethane	ND (0.0069)		8260B Low		1	09/25/17 22:19	C7I0405	CI72557
Diethyl Ether	ND (0.0034)		8260B Low		1	09/25/17 22:19	C7I0405	CI72557
Di-isopropyl ether	ND (0.0034)		8260B Low		1	09/25/17 22:19	C7I0405	CI72557
Ethyl tertiary-butyl ether	ND (0.0034)		8260B Low		1	09/25/17 22:19	C7I0405	CI72557
Ethylbenzene	ND (0.0034)		8260B Low		1	09/25/17 22:19	C7I0405	CI72557
Hexachlorobutadiene	ND (0.0034)		8260B Low		1	09/25/17 22:19	C7I0405	CI72557
Isopropylbenzene	ND (0.0034)		8260B Low		1	09/25/17 22:19	C7I0405	CI72557
Methyl tert-Butyl Ether	ND (0.0034)		8260B Low		1	09/25/17 22:19	C7I0405	CI72557
Methylene Chloride	ND (0.0172)		8260B Low		1	09/25/17 22:19	C7I0405	CI72557
Naphthalene	ND (0.0034)		8260B Low		1	09/25/17 22:19	C7I0405	CI72557
n-Butylbenzene	ND (0.0034)		8260B Low		1	09/25/17 22:19	C7I0405	CI72557
n-Propylbenzene	ND (0.0034)		8260B Low		1	09/25/17 22:19	C7I0405	CI72557
sec-Butylbenzene	ND (0.0034)		8260B Low		1	09/25/17 22:19	C7I0405	CI72557
Styrene	ND (0.0034)		8260B Low		1	09/25/17 22:19	C7I0405	CI72557
tert-Butylbenzene	ND (0.0034)		8260B Low		1	09/25/17 22:19	C7I0405	CI72557
Tertiary-amyl methyl ether	ND (0.0034)		8260B Low		1	09/25/17 22:19	C7I0405	CI72557
Tetrachloroethene	ND (0.0034)		8260B Low		1	09/25/17 22:19	C7I0405	CI72557
Tetrahydrofuran	ND (0.0034)		8260B Low		1	09/25/17 22:19	C7I0405	CI72557



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: GZ-SS-512 (0-2')  
 Date Sampled: 09/22/17 09:00  
 Percent Solids: 92  
 Initial Volume: 7.9  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709662  
 ESS Laboratory Sample ID: 1709662-12  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0034)		8260B Low		1	09/25/17 22:19	C7I0405	CI72557
trans-1,2-Dichloroethene	ND (0.0034)		8260B Low		1	09/25/17 22:19	C7I0405	CI72557
trans-1,3-Dichloropropene	ND (0.0034)		8260B Low		1	09/25/17 22:19	C7I0405	CI72557
Trichloroethene	ND (0.0034)		8260B Low		1	09/25/17 22:19	C7I0405	CI72557
Trichlorofluoromethane	ND (0.0034)		8260B Low		1	09/25/17 22:19	C7I0405	CI72557
Vinyl Acetate	ND (0.0034)		8260B Low		1	09/25/17 22:19	C7I0405	CI72557
Vinyl Chloride	ND (0.0069)		8260B Low		1	09/25/17 22:19	C7I0405	CI72557
Xylene O	ND (0.0034)		8260B Low		1	09/25/17 22:19	C7I0405	CI72557
Xylene P,M	ND (0.0069)		8260B Low		1	09/25/17 22:19	C7I0405	CI72557
Xylenes (Total)	ND (0.0069)		8260B Low		1	09/25/17 22:19		[CALC]

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: 1,2-Dichloroethane-d4	97 %		70-130
Surrogate: 4-Bromofluorobenzene	107 %		70-130
Surrogate: Dibromofluoromethane	97 %		70-130
Surrogate: Toluene-d8	111 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: GZ-SS-512 (0-2')  
 Date Sampled: 09/22/17 09:00  
 Percent Solids: 92  
 Initial Volume: 19.4  
 Final Volume: 1  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709662  
 ESS Laboratory Sample ID: 1709662-12  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: SMR  
 Prepared: 9/25/17 11:30

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	ND (41.9)		8100M		1	09/26/17 12:51	C710397	C172519
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		79 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: GZ-SS-512 (0-2')  
Date Sampled: 09/22/17 09:00  
Percent Solids: 92  
Initial Volume: 14.5  
Final Volume: 0.5  
Extraction Method: 3546

ESS Laboratory Work Order: 1709662  
ESS Laboratory Sample ID: 1709662-12  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: TJ  
Prepared: 9/25/17 12:35

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.373)		8270D		1	09/26/17 23:23	C7I0426	CI72521
Acenaphthene	ND (0.373)		8270D		1	09/26/17 23:23	C7I0426	CI72521
Acenaphthylene	ND (0.373)		8270D		1	09/26/17 23:23	C7I0426	CI72521
Anthracene	ND (0.373)		8270D		1	09/26/17 23:23	C7I0426	CI72521
<b>Benzo(a)anthracene</b>	<b>0.557</b> (0.373)		8270D		1	09/26/17 23:23	C7I0426	CI72521
<b>Benzo(a)pyrene</b>	<b>0.939</b> (0.187)		8270D		1	09/26/17 23:23	C7I0426	CI72521
<b>Benzo(b)fluoranthene</b>	<b>0.697</b> (0.373)		8270D		1	09/26/17 23:23	C7I0426	CI72521
<b>Benzo(g,h,i)perylene</b>	<b>0.594</b> (0.373)		8270D		1	09/26/17 23:23	C7I0426	CI72521
<b>Benzo(k)fluoranthene</b>	<b>0.669</b> (0.373)		8270D		1	09/26/17 23:23	C7I0426	CI72521
<b>Chrysene</b>	<b>0.549</b> (0.187)		8270D		1	09/26/17 23:23	C7I0426	CI72521
<b>Dibenzo(a,h)Anthracene</b>	<b>0.303</b> (0.187)		8270D		1	09/26/17 23:23	C7I0426	CI72521
<b>Fluoranthene</b>	<b>0.639</b> (0.373)		8270D		1	09/26/17 23:23	C7I0426	CI72521
Fluorene	ND (0.373)		8270D		1	09/26/17 23:23	C7I0426	CI72521
<b>Indeno(1,2,3-cd)Pyrene</b>	<b>0.554</b> (0.373)		8270D		1	09/26/17 23:23	C7I0426	CI72521
Naphthalene	ND (0.373)		8270D		1	09/26/17 23:23	C7I0426	CI72521
Phenanthrene	ND (0.373)		8270D		1	09/26/17 23:23	C7I0426	CI72521
<b>Pyrene</b>	<b>0.589</b> (0.373)		8270D		1	09/26/17 23:23	C7I0426	CI72521

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	79 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	89 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	82 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	85 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: GZ-SS-512 (0-2')  
Date Sampled: 09/22/17 09:00  
Percent Solids: 92

ESS Laboratory Work Order: 1709662  
ESS Laboratory Sample ID: 1709662-12  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	50.7 (10.6)		9014		10	EEM	09/28/17 11:50	mg/kg dry	CI72818





## CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: GZ-SS-513 (0-2')  
Date Sampled: 09/22/17 09:15  
Percent Solids: 95

ESS Laboratory Work Order: 1709662  
ESS Laboratory Sample ID: 1709662-13  
Sample Matrix: Soil  
Units: mg/kg dry

Extraction Method: 3050B

### Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (1.81)		6020A		20	NAR	09/29/17 5:57	2.34	100	CI72737
Arsenic	3.07 (2.26)		6010C		1	KJK	09/28/17 4:59	2.34	100	CI72737
Beryllium	0.17 (0.10)		6010C		1	KJK	09/28/17 4:59	2.34	100	CI72737
Cadmium	ND (0.45)		6010C		1	KJK	09/28/17 4:59	2.34	100	CI72737
Chromium	7.95 (0.90)		6010C		1	KJK	09/28/17 4:59	2.34	100	CI72737
Copper	12.3 (2.26)		6010C		1	KJK	09/28/17 4:59	2.34	100	CI72737
Lead	30.7 (4.52)		6010C		1	KJK	09/28/17 4:59	2.34	100	CI72737
Mercury	0.041 (0.034)		7471B		1	MJV	09/27/17 21:50	0.61	40	CI72736
Nickel	7.47 (2.26)		6010C		1	KJK	09/28/17 4:59	2.34	100	CI72737
Selenium	ND (1.81)		6020A		20	NAR	09/29/17 5:57	2.34	100	CI72737
Silver	ND (0.45)		6010C		1	KJK	09/28/17 4:59	2.34	100	CI72737
Thallium	ND (1.81)		6020A		20	NAR	09/29/17 5:57	2.34	100	CI72737
Zinc	30.5 (2.26)		6010C		1	KJK	09/28/17 4:59	2.34	100	CI72737



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: GZ-SS-513 (0-2')  
 Date Sampled: 09/22/17 09:15  
 Percent Solids: 95  
 Initial Volume: 7.5  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709662  
 ESS Laboratory Sample ID: 1709662-13  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0035)		8260B Low		1	09/25/17 22:44	C7I0405	CI72557
1,1,1-Trichloroethane	ND (0.0035)		8260B Low		1	09/25/17 22:44	C7I0405	CI72557
1,1,2,2-Tetrachloroethane	ND (0.0035)		8260B Low		1	09/25/17 22:44	C7I0405	CI72557
1,1,2-Trichloroethane	ND (0.0035)		8260B Low		1	09/25/17 22:44	C7I0405	CI72557
1,1-Dichloroethane	ND (0.0035)		8260B Low		1	09/25/17 22:44	C7I0405	CI72557
1,1-Dichloroethene	ND (0.0035)		8260B Low		1	09/25/17 22:44	C7I0405	CI72557
1,1-Dichloropropene	ND (0.0035)		8260B Low		1	09/25/17 22:44	C7I0405	CI72557
1,2,3-Trichlorobenzene	ND (0.0035)		8260B Low		1	09/25/17 22:44	C7I0405	CI72557
1,2,3-Trichloropropane	ND (0.0035)		8260B Low		1	09/25/17 22:44	C7I0405	CI72557
1,2,4-Trichlorobenzene	ND (0.0035)		8260B Low		1	09/25/17 22:44	C7I0405	CI72557
1,2,4-Trimethylbenzene	ND (0.0035)		8260B Low		1	09/25/17 22:44	C7I0405	CI72557
1,2-Dibromo-3-Chloropropane	ND (0.0035)		8260B Low		1	09/25/17 22:44	C7I0405	CI72557
1,2-Dibromoethane	ND (0.0035)		8260B Low		1	09/25/17 22:44	C7I0405	CI72557
1,2-Dichlorobenzene	ND (0.0035)		8260B Low		1	09/25/17 22:44	C7I0405	CI72557
1,2-Dichloroethane	ND (0.0035)		8260B Low		1	09/25/17 22:44	C7I0405	CI72557
1,2-Dichloropropane	ND (0.0035)		8260B Low		1	09/25/17 22:44	C7I0405	CI72557
1,3,5-Trimethylbenzene	ND (0.0035)		8260B Low		1	09/25/17 22:44	C7I0405	CI72557
1,3-Dichlorobenzene	ND (0.0035)		8260B Low		1	09/25/17 22:44	C7I0405	CI72557
1,3-Dichloropropane	ND (0.0035)		8260B Low		1	09/25/17 22:44	C7I0405	CI72557
1,4-Dichlorobenzene	ND (0.0035)		8260B Low		1	09/25/17 22:44	C7I0405	CI72557
1,4-Dioxane	ND (0.0705)		8260B Low		1	09/25/17 22:44	C7I0405	CI72557
1-Chlorohexane	ND (0.0035)		8260B Low		1	09/25/17 22:44	C7I0405	CI72557
2,2-Dichloropropane	ND (0.0035)		8260B Low		1	09/25/17 22:44	C7I0405	CI72557
2-Butanone	ND (0.0353)		8260B Low		1	09/25/17 22:44	C7I0405	CI72557
2-Chlorotoluene	ND (0.0035)		8260B Low		1	09/25/17 22:44	C7I0405	CI72557
2-Hexanone	ND (0.0353)		8260B Low		1	09/25/17 22:44	C7I0405	CI72557
4-Chlorotoluene	ND (0.0035)		8260B Low		1	09/25/17 22:44	C7I0405	CI72557
4-Isopropyltoluene	ND (0.0035)		8260B Low		1	09/25/17 22:44	C7I0405	CI72557
4-Methyl-2-Pentanone	ND (0.0353)		8260B Low		1	09/25/17 22:44	C7I0405	CI72557
Acetone	ND (0.0353)		8260B Low		1	09/25/17 22:44	C7I0405	CI72557
Benzene	ND (0.0035)		8260B Low		1	09/25/17 22:44	C7I0405	CI72557
Bromobenzene	ND (0.0035)		8260B Low		1	09/25/17 22:44	C7I0405	CI72557



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: GZ-SS-513 (0-2')  
 Date Sampled: 09/22/17 09:15  
 Percent Solids: 95  
 Initial Volume: 7.5  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709662  
 ESS Laboratory Sample ID: 1709662-13  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0035)		8260B Low		1	09/25/17 22:44	C7I0405	CI72557
Bromodichloromethane	ND (0.0035)		8260B Low		1	09/25/17 22:44	C7I0405	CI72557
Bromoform	ND (0.0035)		8260B Low		1	09/25/17 22:44	C7I0405	CI72557
Bromomethane	ND (0.0071)		8260B Low		1	09/25/17 22:44	C7I0405	CI72557
Carbon Disulfide	ND (0.0035)		8260B Low		1	09/25/17 22:44	C7I0405	CI72557
Carbon Tetrachloride	ND (0.0035)		8260B Low		1	09/25/17 22:44	C7I0405	CI72557
Chlorobenzene	ND (0.0035)		8260B Low		1	09/25/17 22:44	C7I0405	CI72557
Chloroethane	ND (0.0071)		8260B Low		1	09/25/17 22:44	C7I0405	CI72557
Chloroform	ND (0.0035)		8260B Low		1	09/25/17 22:44	C7I0405	CI72557
Chloromethane	ND (0.0071)		8260B Low		1	09/25/17 22:44	C7I0405	CI72557
cis-1,2-Dichloroethene	ND (0.0035)		8260B Low		1	09/25/17 22:44	C7I0405	CI72557
cis-1,3-Dichloropropene	ND (0.0035)		8260B Low		1	09/25/17 22:44	C7I0405	CI72557
Dibromochloromethane	ND (0.0035)		8260B Low		1	09/25/17 22:44	C7I0405	CI72557
Dibromomethane	ND (0.0035)		8260B Low		1	09/25/17 22:44	C7I0405	CI72557
Dichlorodifluoromethane	ND (0.0071)		8260B Low		1	09/25/17 22:44	C7I0405	CI72557
Diethyl Ether	ND (0.0035)		8260B Low		1	09/25/17 22:44	C7I0405	CI72557
Di-isopropyl ether	ND (0.0035)		8260B Low		1	09/25/17 22:44	C7I0405	CI72557
Ethyl tertiary-butyl ether	ND (0.0035)		8260B Low		1	09/25/17 22:44	C7I0405	CI72557
Ethylbenzene	ND (0.0035)		8260B Low		1	09/25/17 22:44	C7I0405	CI72557
Hexachlorobutadiene	ND (0.0035)		8260B Low		1	09/25/17 22:44	C7I0405	CI72557
Isopropylbenzene	ND (0.0035)		8260B Low		1	09/25/17 22:44	C7I0405	CI72557
Methyl tert-Butyl Ether	ND (0.0035)		8260B Low		1	09/25/17 22:44	C7I0405	CI72557
Methylene Chloride	ND (0.0176)		8260B Low		1	09/25/17 22:44	C7I0405	CI72557
Naphthalene	ND (0.0035)		8260B Low		1	09/25/17 22:44	C7I0405	CI72557
n-Butylbenzene	ND (0.0035)		8260B Low		1	09/25/17 22:44	C7I0405	CI72557
n-Propylbenzene	ND (0.0035)		8260B Low		1	09/25/17 22:44	C7I0405	CI72557
sec-Butylbenzene	ND (0.0035)		8260B Low		1	09/25/17 22:44	C7I0405	CI72557
Styrene	ND (0.0035)		8260B Low		1	09/25/17 22:44	C7I0405	CI72557
tert-Butylbenzene	ND (0.0035)		8260B Low		1	09/25/17 22:44	C7I0405	CI72557
Tertiary-amyl methyl ether	ND (0.0035)		8260B Low		1	09/25/17 22:44	C7I0405	CI72557
Tetrachloroethene	ND (0.0035)		8260B Low		1	09/25/17 22:44	C7I0405	CI72557
Tetrahydrofuran	ND (0.0035)		8260B Low		1	09/25/17 22:44	C7I0405	CI72557



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: GZ-SS-513 (0-2')  
 Date Sampled: 09/22/17 09:15  
 Percent Solids: 95  
 Initial Volume: 7.5  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709662  
 ESS Laboratory Sample ID: 1709662-13  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0035)		8260B Low		1	09/25/17 22:44	C7I0405	CI72557
trans-1,2-Dichloroethene	ND (0.0035)		8260B Low		1	09/25/17 22:44	C7I0405	CI72557
trans-1,3-Dichloropropene	ND (0.0035)		8260B Low		1	09/25/17 22:44	C7I0405	CI72557
Trichloroethene	ND (0.0035)		8260B Low		1	09/25/17 22:44	C7I0405	CI72557
Trichlorofluoromethane	ND (0.0035)		8260B Low		1	09/25/17 22:44	C7I0405	CI72557
Vinyl Acetate	ND (0.0035)		8260B Low		1	09/25/17 22:44	C7I0405	CI72557
Vinyl Chloride	ND (0.0071)		8260B Low		1	09/25/17 22:44	C7I0405	CI72557
Xylene O	ND (0.0035)		8260B Low		1	09/25/17 22:44	C7I0405	CI72557
Xylene P,M	ND (0.0071)		8260B Low		1	09/25/17 22:44	C7I0405	CI72557
Xylenes (Total)	ND (0.0071)		8260B Low		1	09/25/17 22:44		[CALC]

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: 1,2-Dichloroethane-d4	95 %		70-130
Surrogate: 4-Bromofluorobenzene	105 %		70-130
Surrogate: Dibromofluoromethane	97 %		70-130
Surrogate: Toluene-d8	113 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: GZ-SS-513 (0-2')  
Date Sampled: 09/22/17 09:15  
Percent Solids: 95  
Initial Volume: 20.1  
Final Volume: 1  
Extraction Method: 3546

ESS Laboratory Work Order: 1709662  
ESS Laboratory Sample ID: 1709662-13  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: SMR  
Prepared: 9/25/17 11:30

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	481 (197)		8100M		5	09/26/17 15:12	C710397	C172519
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		83 %		40-140				





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: GZ-SS-513 (0-2')  
Date Sampled: 09/22/17 09:15  
Percent Solids: 95  
Initial Volume: 15.2  
Final Volume: 0.5  
Extraction Method: 3546

ESS Laboratory Work Order: 1709662  
ESS Laboratory Sample ID: 1709662-13  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: TJ  
Prepared: 9/25/17 12:35

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.348)		8270D		1	09/26/17 23:58	C7I0426	CI72521
Acenaphthene	ND (0.348)		8270D		1	09/26/17 23:58	C7I0426	CI72521
Acenaphthylene	<b>1.18</b> (0.348)		8270D		1	09/26/17 23:58	C7I0426	CI72521
Anthracene	<b>0.598</b> (0.348)		8270D		1	09/26/17 23:58	C7I0426	CI72521
Benzo(a)anthracene	<b>3.01</b> (0.348)		8270D		1	09/26/17 23:58	C7I0426	CI72521
Benzo(a)pyrene	<b>3.09</b> (0.174)		8270D		1	09/26/17 23:58	C7I0426	CI72521
Benzo(b)fluoranthene	<b>3.16</b> (0.348)		8270D		1	09/26/17 23:58	C7I0426	CI72521
Benzo(g,h,i)perylene	<b>1.62</b> (0.348)		8270D		1	09/26/17 23:58	C7I0426	CI72521
Benzo(k)fluoranthene	<b>2.91</b> (0.348)		8270D		1	09/26/17 23:58	C7I0426	CI72521
Chrysene	<b>3.24</b> (0.174)		8270D		1	09/26/17 23:58	C7I0426	CI72521
Dibenzo(a,h)Anthracene	<b>0.780</b> (0.174)		8270D		1	09/26/17 23:58	C7I0426	CI72521
Fluoranthene	<b>3.95</b> (0.348)		8270D		1	09/26/17 23:58	C7I0426	CI72521
Fluorene	ND (0.348)		8270D		1	09/26/17 23:58	C7I0426	CI72521
Indeno(1,2,3-cd)Pyrene	<b>1.51</b> (0.348)		8270D		1	09/26/17 23:58	C7I0426	CI72521
Naphthalene	<b>0.402</b> (0.348)		8270D		1	09/26/17 23:58	C7I0426	CI72521
Phenanthrene	<b>2.25</b> (0.348)		8270D		1	09/26/17 23:58	C7I0426	CI72521
Pyrene	<b>4.11</b> (0.348)		8270D		1	09/26/17 23:58	C7I0426	CI72521

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	71 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	85 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	74 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	70 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: GZ-SS-513 (0-2')  
Date Sampled: 09/22/17 09:15  
Percent Solids: 95

ESS Laboratory Work Order: 1709662  
ESS Laboratory Sample ID: 1709662-13  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	12.0 (0.99)		9014		1	EEM	09/28/17 11:50	mg/kg dry	CI72818



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: GZ-SS-514 (0-2')  
 Date Sampled: 09/22/17 09:30  
 Percent Solids: 97

ESS Laboratory Work Order: 1709662  
 ESS Laboratory Sample ID: 1709662-14  
 Sample Matrix: Soil  
 Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (1.57)		6020A		20	NAR	09/29/17 6:03	2.63	100	CI72737
Arsenic	<b>3.66</b> (1.97)		6010C		1	KJK	09/28/17 5:16	2.63	100	CI72737
Beryllium	<b>0.22</b> (0.09)		6010C		1	KJK	09/28/17 5:16	2.63	100	CI72737
Cadmium	ND (0.39)		6010C		1	KJK	09/28/17 5:16	2.63	100	CI72737
Chromium	<b>6.51</b> (0.79)		6010C		1	KJK	09/28/17 5:16	2.63	100	CI72737
Copper	<b>10.2</b> (1.97)		6010C		1	KJK	09/28/17 5:16	2.63	100	CI72737
Lead	<b>80.0</b> (3.94)		6010C		1	KJK	09/28/17 5:16	2.63	100	CI72737
Mercury	<b>0.601</b> (0.131)		7471B		5	MJV	09/27/17 22:12	0.78	40	CI72736
Nickel	<b>6.20</b> (1.97)		6010C		1	KJK	09/28/17 5:16	2.63	100	CI72737
Selenium	ND (1.57)		6020A		20	NAR	09/29/17 6:03	2.63	100	CI72737
Silver	ND (0.39)		6010C		1	KJK	09/28/17 5:16	2.63	100	CI72737
Thallium	ND (1.57)		6020A		20	NAR	09/29/17 6:03	2.63	100	CI72737
Zinc	<b>28.1</b> (1.97)		6010C		1	KJK	09/28/17 5:16	2.63	100	CI72737



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: GZ-SS-514 (0-2')  
 Date Sampled: 09/22/17 09:30  
 Percent Solids: 97  
 Initial Volume: 8.4  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709662  
 ESS Laboratory Sample ID: 1709662-14  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0031)		8260B Low		1	09/25/17 23:10	C7I0405	CI72557
1,1,1-Trichloroethane	ND (0.0031)		8260B Low		1	09/25/17 23:10	C7I0405	CI72557
1,1,2,2-Tetrachloroethane	ND (0.0031)		8260B Low		1	09/25/17 23:10	C7I0405	CI72557
1,1,2-Trichloroethane	ND (0.0031)		8260B Low		1	09/25/17 23:10	C7I0405	CI72557
1,1-Dichloroethane	ND (0.0031)		8260B Low		1	09/25/17 23:10	C7I0405	CI72557
1,1-Dichloroethene	ND (0.0031)		8260B Low		1	09/25/17 23:10	C7I0405	CI72557
1,1-Dichloropropene	ND (0.0031)		8260B Low		1	09/25/17 23:10	C7I0405	CI72557
1,2,3-Trichlorobenzene	ND (0.0031)		8260B Low		1	09/25/17 23:10	C7I0405	CI72557
1,2,3-Trichloropropane	ND (0.0031)		8260B Low		1	09/25/17 23:10	C7I0405	CI72557
1,2,4-Trichlorobenzene	ND (0.0031)		8260B Low		1	09/25/17 23:10	C7I0405	CI72557
1,2,4-Trimethylbenzene	ND (0.0031)		8260B Low		1	09/25/17 23:10	C7I0405	CI72557
1,2-Dibromo-3-Chloropropane	ND (0.0031)		8260B Low		1	09/25/17 23:10	C7I0405	CI72557
1,2-Dibromoethane	ND (0.0031)		8260B Low		1	09/25/17 23:10	C7I0405	CI72557
1,2-Dichlorobenzene	ND (0.0031)		8260B Low		1	09/25/17 23:10	C7I0405	CI72557
1,2-Dichloroethane	ND (0.0031)		8260B Low		1	09/25/17 23:10	C7I0405	CI72557
1,2-Dichloropropane	ND (0.0031)		8260B Low		1	09/25/17 23:10	C7I0405	CI72557
1,3,5-Trimethylbenzene	ND (0.0031)		8260B Low		1	09/25/17 23:10	C7I0405	CI72557
1,3-Dichlorobenzene	ND (0.0031)		8260B Low		1	09/25/17 23:10	C7I0405	CI72557
1,3-Dichloropropane	ND (0.0031)		8260B Low		1	09/25/17 23:10	C7I0405	CI72557
1,4-Dichlorobenzene	ND (0.0031)		8260B Low		1	09/25/17 23:10	C7I0405	CI72557
1,4-Dioxane	ND (0.0616)		8260B Low		1	09/25/17 23:10	C7I0405	CI72557
1-Chlorohexane	ND (0.0031)		8260B Low		1	09/25/17 23:10	C7I0405	CI72557
2,2-Dichloropropane	ND (0.0031)		8260B Low		1	09/25/17 23:10	C7I0405	CI72557
2-Butanone	ND (0.0308)		8260B Low		1	09/25/17 23:10	C7I0405	CI72557
2-Chlorotoluene	ND (0.0031)		8260B Low		1	09/25/17 23:10	C7I0405	CI72557
2-Hexanone	ND (0.0308)		8260B Low		1	09/25/17 23:10	C7I0405	CI72557
4-Chlorotoluene	ND (0.0031)		8260B Low		1	09/25/17 23:10	C7I0405	CI72557
4-Isopropyltoluene	ND (0.0031)		8260B Low		1	09/25/17 23:10	C7I0405	CI72557
4-Methyl-2-Pentanone	ND (0.0308)		8260B Low		1	09/25/17 23:10	C7I0405	CI72557
Acetone	ND (0.0308)		8260B Low		1	09/25/17 23:10	C7I0405	CI72557
Benzene	ND (0.0031)		8260B Low		1	09/25/17 23:10	C7I0405	CI72557
Bromobenzene	ND (0.0031)		8260B Low		1	09/25/17 23:10	C7I0405	CI72557



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: GZ-SS-514 (0-2')  
 Date Sampled: 09/22/17 09:30  
 Percent Solids: 97  
 Initial Volume: 8.4  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709662  
 ESS Laboratory Sample ID: 1709662-14  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0031)		8260B Low		1	09/25/17 23:10	C7I0405	CI72557
Bromodichloromethane	ND (0.0031)		8260B Low		1	09/25/17 23:10	C7I0405	CI72557
Bromoform	ND (0.0031)		8260B Low		1	09/25/17 23:10	C7I0405	CI72557
Bromomethane	ND (0.0062)		8260B Low		1	09/25/17 23:10	C7I0405	CI72557
Carbon Disulfide	ND (0.0031)		8260B Low		1	09/25/17 23:10	C7I0405	CI72557
Carbon Tetrachloride	ND (0.0031)		8260B Low		1	09/25/17 23:10	C7I0405	CI72557
Chlorobenzene	ND (0.0031)		8260B Low		1	09/25/17 23:10	C7I0405	CI72557
Chloroethane	ND (0.0062)		8260B Low		1	09/25/17 23:10	C7I0405	CI72557
Chloroform	ND (0.0031)		8260B Low		1	09/25/17 23:10	C7I0405	CI72557
Chloromethane	ND (0.0062)		8260B Low		1	09/25/17 23:10	C7I0405	CI72557
cis-1,2-Dichloroethene	ND (0.0031)		8260B Low		1	09/25/17 23:10	C7I0405	CI72557
cis-1,3-Dichloropropene	ND (0.0031)		8260B Low		1	09/25/17 23:10	C7I0405	CI72557
Dibromochloromethane	ND (0.0031)		8260B Low		1	09/25/17 23:10	C7I0405	CI72557
Dibromomethane	ND (0.0031)		8260B Low		1	09/25/17 23:10	C7I0405	CI72557
Dichlorodifluoromethane	ND (0.0062)		8260B Low		1	09/25/17 23:10	C7I0405	CI72557
Diethyl Ether	ND (0.0031)		8260B Low		1	09/25/17 23:10	C7I0405	CI72557
Di-isopropyl ether	ND (0.0031)		8260B Low		1	09/25/17 23:10	C7I0405	CI72557
Ethyl tertiary-butyl ether	ND (0.0031)		8260B Low		1	09/25/17 23:10	C7I0405	CI72557
Ethylbenzene	ND (0.0031)		8260B Low		1	09/25/17 23:10	C7I0405	CI72557
Hexachlorobutadiene	ND (0.0031)		8260B Low		1	09/25/17 23:10	C7I0405	CI72557
Isopropylbenzene	ND (0.0031)		8260B Low		1	09/25/17 23:10	C7I0405	CI72557
Methyl tert-Butyl Ether	ND (0.0031)		8260B Low		1	09/25/17 23:10	C7I0405	CI72557
Methylene Chloride	ND (0.0154)		8260B Low		1	09/25/17 23:10	C7I0405	CI72557
Naphthalene	ND (0.0031)		8260B Low		1	09/25/17 23:10	C7I0405	CI72557
n-Butylbenzene	ND (0.0031)		8260B Low		1	09/25/17 23:10	C7I0405	CI72557
n-Propylbenzene	ND (0.0031)		8260B Low		1	09/25/17 23:10	C7I0405	CI72557
sec-Butylbenzene	ND (0.0031)		8260B Low		1	09/25/17 23:10	C7I0405	CI72557
Styrene	ND (0.0031)		8260B Low		1	09/25/17 23:10	C7I0405	CI72557
tert-Butylbenzene	ND (0.0031)		8260B Low		1	09/25/17 23:10	C7I0405	CI72557
Tertiary-amyl methyl ether	ND (0.0031)		8260B Low		1	09/25/17 23:10	C7I0405	CI72557
Tetrachloroethene	ND (0.0031)		8260B Low		1	09/25/17 23:10	C7I0405	CI72557
Tetrahydrofuran	ND (0.0031)		8260B Low		1	09/25/17 23:10	C7I0405	CI72557





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: GZ-SS-514 (0-2')  
 Date Sampled: 09/22/17 09:30  
 Percent Solids: 97  
 Initial Volume: 8.4  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709662  
 ESS Laboratory Sample ID: 1709662-14  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0031)		8260B Low		1	09/25/17 23:10	C7I0405	CI72557
trans-1,2-Dichloroethene	ND (0.0031)		8260B Low		1	09/25/17 23:10	C7I0405	CI72557
trans-1,3-Dichloropropene	ND (0.0031)		8260B Low		1	09/25/17 23:10	C7I0405	CI72557
Trichloroethene	ND (0.0031)		8260B Low		1	09/25/17 23:10	C7I0405	CI72557
Trichlorofluoromethane	ND (0.0031)		8260B Low		1	09/25/17 23:10	C7I0405	CI72557
Vinyl Acetate	ND (0.0031)		8260B Low		1	09/25/17 23:10	C7I0405	CI72557
Vinyl Chloride	ND (0.0062)		8260B Low		1	09/25/17 23:10	C7I0405	CI72557
Xylene O	ND (0.0031)		8260B Low		1	09/25/17 23:10	C7I0405	CI72557
Xylene P,M	ND (0.0062)		8260B Low		1	09/25/17 23:10	C7I0405	CI72557
Xylenes (Total)	ND (0.0062)		8260B Low		1	09/25/17 23:10		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	98 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	105 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	98 %		70-130
<i>Surrogate: Toluene-d8</i>	112 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: GZ-SS-514 (0-2')  
 Date Sampled: 09/22/17 09:30  
 Percent Solids: 97  
 Initial Volume: 20  
 Final Volume: 1  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709662  
 ESS Laboratory Sample ID: 1709662-14  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: SMR  
 Prepared: 9/25/17 11:30

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	311 (194)		8100M		5	09/26/17 15:47	C710397	C172519
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		79 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: GZ-SS-514 (0-2')  
Date Sampled: 09/22/17 09:30  
Percent Solids: 97  
Initial Volume: 15.4  
Final Volume: 0.5  
Extraction Method: 3546

ESS Laboratory Work Order: 1709662  
ESS Laboratory Sample ID: 1709662-14  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: TJ  
Prepared: 9/25/17 12:35

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.336)		8270D		1	09/27/17 0:33	C7I0426	CI72521
Acenaphthene	ND (0.336)		8270D		1	09/27/17 0:33	C7I0426	CI72521
Acenaphthylene	1.61 (0.336)		8270D		1	09/27/17 0:33	C7I0426	CI72521
Anthracene	0.657 (0.336)		8270D		1	09/27/17 0:33	C7I0426	CI72521
Benzo(a)anthracene	3.81 (0.336)		8270D		1	09/27/17 0:33	C7I0426	CI72521
Benzo(a)pyrene	3.65 (0.168)		8270D		1	09/27/17 0:33	C7I0426	CI72521
Benzo(b)fluoranthene	3.03 (0.336)		8270D		1	09/27/17 0:33	C7I0426	CI72521
Benzo(g,h,i)perylene	1.42 (0.336)		8270D		1	09/27/17 0:33	C7I0426	CI72521
Benzo(k)fluoranthene	3.59 (0.336)		8270D		1	09/27/17 0:33	C7I0426	CI72521
Chrysene	4.22 (0.168)		8270D		1	09/27/17 0:33	C7I0426	CI72521
Dibenzo(a,h)Anthracene	0.780 (0.168)		8270D		1	09/27/17 0:33	C7I0426	CI72521
Fluoranthene	5.42 (0.336)		8270D		1	09/27/17 0:33	C7I0426	CI72521
Fluorene	ND (0.336)		8270D		1	09/27/17 0:33	C7I0426	CI72521
Indeno(1,2,3-cd)Pyrene	1.40 (0.336)		8270D		1	09/27/17 0:33	C7I0426	CI72521
Naphthalene	0.337 (0.336)		8270D		1	09/27/17 0:33	C7I0426	CI72521
Phenanthrene	2.58 (0.336)		8270D		1	09/27/17 0:33	C7I0426	CI72521
Pyrene	5.84 (0.336)		8270D		1	09/27/17 0:33	C7I0426	CI72521

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	70 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	80 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	74 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	71 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: GZ-SS-514 (0-2')  
Date Sampled: 09/22/17 09:30  
Percent Solids: 97

ESS Laboratory Work Order: 1709662  
ESS Laboratory Sample ID: 1709662-14  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	7.32 (1.01)		9014		1	EEM	09/28/17 11:50	mg/kg dry	CI72818



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: GZ-SS-515 (0-2')  
Date Sampled: 09/22/17 10:00  
Percent Solids: 96

ESS Laboratory Work Order: 1709662  
ESS Laboratory Sample ID: 1709662-15  
Sample Matrix: Soil  
Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (1.44)		6020A		20	NAR	09/29/17 6:09	2.88	100	CI72737
<b>Arsenic</b>	<b>3.64</b> (3.60)		6010C		2	KJK	09/29/17 15:51	2.88	100	CI72737
<b>Beryllium</b>	<b>0.21</b> (0.08)		6010C		1	KJK	09/28/17 5:20	2.88	100	CI72737
Cadmium	ND (0.36)		6010C		1	KJK	09/28/17 5:20	2.88	100	CI72737
<b>Chromium</b>	<b>5.12</b> (0.72)		6010C		1	KJK	09/28/17 5:20	2.88	100	CI72737
<b>Copper</b>	<b>8.30</b> (1.80)		6010C		1	KJK	09/28/17 5:20	2.88	100	CI72737
<b>Lead</b>	<b>22.4</b> (3.60)		6010C		1	KJK	09/28/17 5:20	2.88	100	CI72737
Mercury	ND (0.029)		7471B		1	MJV	09/27/17 21:54	0.7	40	CI72736
<b>Nickel</b>	<b>5.63</b> (1.80)		6010C		1	KJK	09/28/17 5:20	2.88	100	CI72737
Selenium	ND (1.44)		6020A		20	NAR	09/29/17 6:09	2.88	100	CI72737
Silver	ND (0.36)		6010C		1	KJK	09/28/17 5:20	2.88	100	CI72737
Thallium	ND (1.44)		6020A		20	NAR	09/29/17 6:09	2.88	100	CI72737
<b>Zinc</b>	<b>23.8</b> (1.80)		6010C		1	KJK	09/28/17 5:20	2.88	100	CI72737





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: GZ-SS-515 (0-2')  
 Date Sampled: 09/22/17 10:00  
 Percent Solids: 96  
 Initial Volume: 7.9  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709662  
 ESS Laboratory Sample ID: 1709662-15  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0033)		8260B Low		1	09/25/17 23:35	C7I0405	CI72557
1,1,1-Trichloroethane	ND (0.0033)		8260B Low		1	09/25/17 23:35	C7I0405	CI72557
1,1,2,2-Tetrachloroethane	ND (0.0033)		8260B Low		1	09/25/17 23:35	C7I0405	CI72557
1,1,2-Trichloroethane	ND (0.0033)		8260B Low		1	09/25/17 23:35	C7I0405	CI72557
1,1-Dichloroethane	ND (0.0033)		8260B Low		1	09/25/17 23:35	C7I0405	CI72557
1,1-Dichloroethene	ND (0.0033)		8260B Low		1	09/25/17 23:35	C7I0405	CI72557
1,1-Dichloropropene	ND (0.0033)		8260B Low		1	09/25/17 23:35	C7I0405	CI72557
1,2,3-Trichlorobenzene	ND (0.0033)		8260B Low		1	09/25/17 23:35	C7I0405	CI72557
1,2,3-Trichloropropane	ND (0.0033)		8260B Low		1	09/25/17 23:35	C7I0405	CI72557
1,2,4-Trichlorobenzene	ND (0.0033)		8260B Low		1	09/25/17 23:35	C7I0405	CI72557
1,2,4-Trimethylbenzene	ND (0.0033)		8260B Low		1	09/25/17 23:35	C7I0405	CI72557
1,2-Dibromo-3-Chloropropane	ND (0.0033)		8260B Low		1	09/25/17 23:35	C7I0405	CI72557
1,2-Dibromoethane	ND (0.0033)		8260B Low		1	09/25/17 23:35	C7I0405	CI72557
1,2-Dichlorobenzene	ND (0.0033)		8260B Low		1	09/25/17 23:35	C7I0405	CI72557
1,2-Dichloroethane	ND (0.0033)		8260B Low		1	09/25/17 23:35	C7I0405	CI72557
1,2-Dichloropropane	ND (0.0033)		8260B Low		1	09/25/17 23:35	C7I0405	CI72557
1,3,5-Trimethylbenzene	ND (0.0033)		8260B Low		1	09/25/17 23:35	C7I0405	CI72557
1,3-Dichlorobenzene	ND (0.0033)		8260B Low		1	09/25/17 23:35	C7I0405	CI72557
1,3-Dichloropropane	ND (0.0033)		8260B Low		1	09/25/17 23:35	C7I0405	CI72557
1,4-Dichlorobenzene	ND (0.0033)		8260B Low		1	09/25/17 23:35	C7I0405	CI72557
1,4-Dioxane	ND (0.0656)		8260B Low		1	09/25/17 23:35	C7I0405	CI72557
1-Chlorohexane	ND (0.0033)		8260B Low		1	09/25/17 23:35	C7I0405	CI72557
2,2-Dichloropropane	ND (0.0033)		8260B Low		1	09/25/17 23:35	C7I0405	CI72557
2-Butanone	ND (0.0328)		8260B Low		1	09/25/17 23:35	C7I0405	CI72557
2-Chlorotoluene	ND (0.0033)		8260B Low		1	09/25/17 23:35	C7I0405	CI72557
2-Hexanone	ND (0.0328)		8260B Low		1	09/25/17 23:35	C7I0405	CI72557
4-Chlorotoluene	ND (0.0033)		8260B Low		1	09/25/17 23:35	C7I0405	CI72557
4-Isopropyltoluene	ND (0.0033)		8260B Low		1	09/25/17 23:35	C7I0405	CI72557
4-Methyl-2-Pentanone	ND (0.0328)		8260B Low		1	09/25/17 23:35	C7I0405	CI72557
Acetone	ND (0.0328)		8260B Low		1	09/25/17 23:35	C7I0405	CI72557
Benzene	ND (0.0033)		8260B Low		1	09/25/17 23:35	C7I0405	CI72557
Bromobenzene	ND (0.0033)		8260B Low		1	09/25/17 23:35	C7I0405	CI72557



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: GZ-SS-515 (0-2')  
Date Sampled: 09/22/17 10:00  
Percent Solids: 96  
Initial Volume: 7.9  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1709662  
ESS Laboratory Sample ID: 1709662-15  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0033)		8260B Low		1	09/25/17 23:35	C7I0405	CI72557
Bromodichloromethane	ND (0.0033)		8260B Low		1	09/25/17 23:35	C7I0405	CI72557
Bromoform	ND (0.0033)		8260B Low		1	09/25/17 23:35	C7I0405	CI72557
Bromomethane	ND (0.0066)		8260B Low		1	09/25/17 23:35	C7I0405	CI72557
Carbon Disulfide	ND (0.0033)		8260B Low		1	09/25/17 23:35	C7I0405	CI72557
Carbon Tetrachloride	ND (0.0033)		8260B Low		1	09/25/17 23:35	C7I0405	CI72557
Chlorobenzene	ND (0.0033)		8260B Low		1	09/25/17 23:35	C7I0405	CI72557
Chloroethane	ND (0.0066)		8260B Low		1	09/25/17 23:35	C7I0405	CI72557
Chloroform	ND (0.0033)		8260B Low		1	09/25/17 23:35	C7I0405	CI72557
Chloromethane	ND (0.0066)		8260B Low		1	09/25/17 23:35	C7I0405	CI72557
cis-1,2-Dichloroethene	ND (0.0033)		8260B Low		1	09/25/17 23:35	C7I0405	CI72557
cis-1,3-Dichloropropene	ND (0.0033)		8260B Low		1	09/25/17 23:35	C7I0405	CI72557
Dibromochloromethane	ND (0.0033)		8260B Low		1	09/25/17 23:35	C7I0405	CI72557
Dibromomethane	ND (0.0033)		8260B Low		1	09/25/17 23:35	C7I0405	CI72557
Dichlorodifluoromethane	ND (0.0066)		8260B Low		1	09/25/17 23:35	C7I0405	CI72557
Diethyl Ether	ND (0.0033)		8260B Low		1	09/25/17 23:35	C7I0405	CI72557
Di-isopropyl ether	ND (0.0033)		8260B Low		1	09/25/17 23:35	C7I0405	CI72557
Ethyl tertiary-butyl ether	ND (0.0033)		8260B Low		1	09/25/17 23:35	C7I0405	CI72557
Ethylbenzene	ND (0.0033)		8260B Low		1	09/25/17 23:35	C7I0405	CI72557
Hexachlorobutadiene	ND (0.0033)		8260B Low		1	09/25/17 23:35	C7I0405	CI72557
Isopropylbenzene	ND (0.0033)		8260B Low		1	09/25/17 23:35	C7I0405	CI72557
Methyl tert-Butyl Ether	ND (0.0033)		8260B Low		1	09/25/17 23:35	C7I0405	CI72557
Methylene Chloride	ND (0.0164)		8260B Low		1	09/25/17 23:35	C7I0405	CI72557
Naphthalene	ND (0.0033)		8260B Low		1	09/25/17 23:35	C7I0405	CI72557
n-Butylbenzene	ND (0.0033)		8260B Low		1	09/25/17 23:35	C7I0405	CI72557
n-Propylbenzene	ND (0.0033)		8260B Low		1	09/25/17 23:35	C7I0405	CI72557
sec-Butylbenzene	ND (0.0033)		8260B Low		1	09/25/17 23:35	C7I0405	CI72557
Styrene	ND (0.0033)		8260B Low		1	09/25/17 23:35	C7I0405	CI72557
tert-Butylbenzene	ND (0.0033)		8260B Low		1	09/25/17 23:35	C7I0405	CI72557
Tertiary-amyl methyl ether	ND (0.0033)		8260B Low		1	09/25/17 23:35	C7I0405	CI72557
Tetrachloroethene	ND (0.0033)		8260B Low		1	09/25/17 23:35	C7I0405	CI72557
Tetrahydrofuran	ND (0.0033)		8260B Low		1	09/25/17 23:35	C7I0405	CI72557



### CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: GZ-SS-515 (0-2')  
 Date Sampled: 09/22/17 10:00  
 Percent Solids: 96  
 Initial Volume: 7.9  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709662  
 ESS Laboratory Sample ID: 1709662-15  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

### 5035/8260B Volatile Organic Compounds / Low Level

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0033)		8260B Low		1	09/25/17 23:35	C7I0405	CI72557
trans-1,2-Dichloroethene	ND (0.0033)		8260B Low		1	09/25/17 23:35	C7I0405	CI72557
trans-1,3-Dichloropropene	ND (0.0033)		8260B Low		1	09/25/17 23:35	C7I0405	CI72557
Trichloroethene	ND (0.0033)		8260B Low		1	09/25/17 23:35	C7I0405	CI72557
Trichlorofluoromethane	ND (0.0033)		8260B Low		1	09/25/17 23:35	C7I0405	CI72557
Vinyl Acetate	ND (0.0033)		8260B Low		1	09/25/17 23:35	C7I0405	CI72557
Vinyl Chloride	ND (0.0066)		8260B Low		1	09/25/17 23:35	C7I0405	CI72557
Xylene O	ND (0.0033)		8260B Low		1	09/25/17 23:35	C7I0405	CI72557
Xylene P,M	ND (0.0066)		8260B Low		1	09/25/17 23:35	C7I0405	CI72557
Xylenes (Total)	ND (0.0066)		8260B Low		1	09/25/17 23:35		[CALC]

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: 1,2-Dichloroethane-d4	98 %		70-130
Surrogate: 4-Bromofluorobenzene	103 %		70-130
Surrogate: Dibromofluoromethane	98 %		70-130
Surrogate: Toluene-d8	113 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: GZ-SS-515 (0-2')  
Date Sampled: 09/22/17 10:00  
Percent Solids: 96  
Initial Volume: 19.2  
Final Volume: 1  
Extraction Method: 3546

ESS Laboratory Work Order: 1709662  
ESS Laboratory Sample ID: 1709662-15  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: SMR  
Prepared: 9/25/17 11:30

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	ND (40.5)		8100M		1	09/26/17 13:27	C710397	C172519
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		79 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: GZ-SS-515 (0-2')  
 Date Sampled: 09/22/17 10:00  
 Percent Solids: 96  
 Initial Volume: 14.2  
 Final Volume: 0.5  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709662  
 ESS Laboratory Sample ID: 1709662-15  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: TJ  
 Prepared: 9/25/17 12:35

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.365)		8270D		1	09/27/17 1:08	C7I0426	CI72521
Acenaphthene	ND (0.365)		8270D		1	09/27/17 1:08	C7I0426	CI72521
Acenaphthylene	ND (0.365)		8270D		1	09/27/17 1:08	C7I0426	CI72521
Anthracene	ND (0.365)		8270D		1	09/27/17 1:08	C7I0426	CI72521
Benzo(a)anthracene	ND (0.365)		8270D		1	09/27/17 1:08	C7I0426	CI72521
Benzo(a)pyrene	ND (0.183)		8270D		1	09/27/17 1:08	C7I0426	CI72521
Benzo(b)fluoranthene	ND (0.365)		8270D		1	09/27/17 1:08	C7I0426	CI72521
Benzo(g,h,i)perylene	ND (0.365)		8270D		1	09/27/17 1:08	C7I0426	CI72521
Benzo(k)fluoranthene	ND (0.365)		8270D		1	09/27/17 1:08	C7I0426	CI72521
<b>Chrysene</b>	<b>0.191</b> (0.183)		8270D		1	09/27/17 1:08	C7I0426	CI72521
Dibenzo(a,h)Anthracene	ND (0.183)		8270D		1	09/27/17 1:08	C7I0426	CI72521
Fluoranthene	ND (0.365)		8270D		1	09/27/17 1:08	C7I0426	CI72521
Fluorene	ND (0.365)		8270D		1	09/27/17 1:08	C7I0426	CI72521
Indeno(1,2,3-cd)Pyrene	ND (0.365)		8270D		1	09/27/17 1:08	C7I0426	CI72521
Naphthalene	ND (0.365)		8270D		1	09/27/17 1:08	C7I0426	CI72521
Phenanthrene	ND (0.365)		8270D		1	09/27/17 1:08	C7I0426	CI72521
Pyrene	ND (0.365)		8270D		1	09/27/17 1:08	C7I0426	CI72521

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	82 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	96 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	85 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	94 %		30-130





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: GZ-SS-515 (0-2')  
Date Sampled: 09/22/17 10:00  
Percent Solids: 96

ESS Laboratory Work Order: 1709662  
ESS Laboratory Sample ID: 1709662-15  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	2.85 (1.00)		9014		1	EEM	09/28/17 11:50	mg/kg dry	CI72818



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: GZ-SS-516 (0-2')  
 Date Sampled: 09/22/17 10:30  
 Percent Solids: 94

ESS Laboratory Work Order: 1709662  
 ESS Laboratory Sample ID: 1709662-16  
 Sample Matrix: Soil  
 Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (2.13)		6020A		20	NAR	09/29/17 11:04	2	100	CI72737
Arsenic	ND (5.32)		6010C		2	KJK	09/29/17 16:15	2	100	CI72737
<b>Beryllium</b>	<b>0.14</b> (0.12)		6010C		1	KJK	09/28/17 18:34	2	100	CI72737
Cadmium	ND (0.53)		6010C		1	KJK	09/28/17 18:34	2	100	CI72737
<b>Chromium</b>	<b>3.57</b> (1.06)		6010C		1	KJK	09/28/17 18:34	2	100	CI72737
<b>Copper</b>	<b>10.3</b> (2.66)		6010C		1	KJK	09/28/17 18:34	2	100	CI72737
<b>Lead</b>	<b>56.8</b> (5.32)		6010C		1	KJK	09/28/17 18:34	2	100	CI72737
<b>Mercury</b>	<b>0.319</b> (0.028)		7471B		1	MJV	09/27/17 21:56	0.76	40	CI72736
<b>Nickel</b>	<b>4.18</b> (2.66)		6010C		1	KJK	09/28/17 18:34	2	100	CI72737
Selenium	ND (2.13)		6020A		20	NAR	09/29/17 11:04	2	100	CI72737
Silver	ND (0.53)		6010C		1	KJK	09/28/17 18:34	2	100	CI72737
Thallium	ND (2.13)		6020A		20	NAR	09/29/17 11:04	2	100	CI72737
<b>Zinc</b>	<b>26.5</b> (2.66)		6010C		1	KJK	09/28/17 18:34	2	100	CI72737



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: GZ-SS-516 (0-2')  
 Date Sampled: 09/22/17 10:30  
 Percent Solids: 94  
 Initial Volume: 5.6  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709662  
 ESS Laboratory Sample ID: 1709662-16  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MD

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0047)		8260B Low		1	09/25/17 12:42	C7I0399	CI72535
1,1,1-Trichloroethane	ND (0.0047)		8260B Low		1	09/25/17 12:42	C7I0399	CI72535
1,1,2,2-Tetrachloroethane	ND (0.0047)		8260B Low		1	09/25/17 12:42	C7I0399	CI72535
1,1,2-Trichloroethane	ND (0.0047)		8260B Low		1	09/25/17 12:42	C7I0399	CI72535
1,1-Dichloroethane	ND (0.0047)		8260B Low		1	09/25/17 12:42	C7I0399	CI72535
1,1-Dichloroethene	ND (0.0047)		8260B Low		1	09/25/17 12:42	C7I0399	CI72535
1,1-Dichloropropene	ND (0.0047)		8260B Low		1	09/25/17 12:42	C7I0399	CI72535
1,2,3-Trichlorobenzene	ND (0.0047)		8260B Low		1	09/25/17 12:42	C7I0399	CI72535
1,2,3-Trichloropropane	ND (0.0047)		8260B Low		1	09/25/17 12:42	C7I0399	CI72535
1,2,4-Trichlorobenzene	ND (0.0047)		8260B Low		1	09/25/17 12:42	C7I0399	CI72535
1,2,4-Trimethylbenzene	ND (0.0047)		8260B Low		1	09/25/17 12:42	C7I0399	CI72535
1,2-Dibromo-3-Chloropropane	ND (0.0047)		8260B Low		1	09/25/17 12:42	C7I0399	CI72535
1,2-Dibromoethane	ND (0.0047)		8260B Low		1	09/25/17 12:42	C7I0399	CI72535
1,2-Dichlorobenzene	ND (0.0047)		8260B Low		1	09/25/17 12:42	C7I0399	CI72535
1,2-Dichloroethane	ND (0.0047)		8260B Low		1	09/25/17 12:42	C7I0399	CI72535
1,2-Dichloropropane	ND (0.0047)		8260B Low		1	09/25/17 12:42	C7I0399	CI72535
1,3,5-Trimethylbenzene	ND (0.0047)		8260B Low		1	09/25/17 12:42	C7I0399	CI72535
1,3-Dichlorobenzene	ND (0.0047)		8260B Low		1	09/25/17 12:42	C7I0399	CI72535
1,3-Dichloropropane	ND (0.0047)		8260B Low		1	09/25/17 12:42	C7I0399	CI72535
1,4-Dichlorobenzene	ND (0.0047)		8260B Low		1	09/25/17 12:42	C7I0399	CI72535
1,4-Dioxane	ND (0.0950)		8260B Low		1	09/25/17 12:42	C7I0399	CI72535
1-Chlorohexane	ND (0.0047)		8260B Low		1	09/25/17 12:42	C7I0399	CI72535
2,2-Dichloropropane	ND (0.0047)		8260B Low		1	09/25/17 12:42	C7I0399	CI72535
2-Butanone	ND (0.0475)		8260B Low		1	09/25/17 12:42	C7I0399	CI72535
2-Chlorotoluene	ND (0.0047)		8260B Low		1	09/25/17 12:42	C7I0399	CI72535
2-Hexanone	ND (0.0475)		8260B Low		1	09/25/17 12:42	C7I0399	CI72535
4-Chlorotoluene	ND (0.0047)		8260B Low		1	09/25/17 12:42	C7I0399	CI72535
4-Isopropyltoluene	ND (0.0047)		8260B Low		1	09/25/17 12:42	C7I0399	CI72535
4-Methyl-2-Pentanone	ND (0.0475)		8260B Low		1	09/25/17 12:42	C7I0399	CI72535
Acetone	ND (0.0475)		8260B Low		1	09/25/17 12:42	C7I0399	CI72535
Benzene	ND (0.0047)		8260B Low		1	09/25/17 12:42	C7I0399	CI72535
Bromobenzene	ND (0.0047)		8260B Low		1	09/25/17 12:42	C7I0399	CI72535



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: GZ-SS-516 (0-2')  
 Date Sampled: 09/22/17 10:30  
 Percent Solids: 94  
 Initial Volume: 5.6  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709662  
 ESS Laboratory Sample ID: 1709662-16  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MD

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0047)		8260B Low		1	09/25/17 12:42	C7I0399	CI72535
Bromodichloromethane	ND (0.0047)		8260B Low		1	09/25/17 12:42	C7I0399	CI72535
Bromoform	ND (0.0047)		8260B Low		1	09/25/17 12:42	C7I0399	CI72535
Bromomethane	ND (0.0095)		8260B Low		1	09/25/17 12:42	C7I0399	CI72535
Carbon Disulfide	ND (0.0047)		8260B Low		1	09/25/17 12:42	C7I0399	CI72535
Carbon Tetrachloride	ND (0.0047)		8260B Low		1	09/25/17 12:42	C7I0399	CI72535
Chlorobenzene	ND (0.0047)		8260B Low		1	09/25/17 12:42	C7I0399	CI72535
Chloroethane	ND (0.0095)		8260B Low		1	09/25/17 12:42	C7I0399	CI72535
Chloroform	ND (0.0047)		8260B Low		1	09/25/17 12:42	C7I0399	CI72535
Chloromethane	ND (0.0095)		8260B Low		1	09/25/17 12:42	C7I0399	CI72535
cis-1,2-Dichloroethene	ND (0.0047)		8260B Low		1	09/25/17 12:42	C7I0399	CI72535
cis-1,3-Dichloropropene	ND (0.0047)		8260B Low		1	09/25/17 12:42	C7I0399	CI72535
Dibromochloromethane	ND (0.0047)		8260B Low		1	09/25/17 12:42	C7I0399	CI72535
Dibromomethane	ND (0.0047)		8260B Low		1	09/25/17 12:42	C7I0399	CI72535
Dichlorodifluoromethane	ND (0.0095)		8260B Low		1	09/25/17 12:42	C7I0399	CI72535
Diethyl Ether	ND (0.0047)		8260B Low		1	09/25/17 12:42	C7I0399	CI72535
Di-isopropyl ether	ND (0.0047)		8260B Low		1	09/25/17 12:42	C7I0399	CI72535
Ethyl tertiary-butyl ether	ND (0.0047)		8260B Low		1	09/25/17 12:42	C7I0399	CI72535
Ethylbenzene	ND (0.0047)		8260B Low		1	09/25/17 12:42	C7I0399	CI72535
Hexachlorobutadiene	ND (0.0047)		8260B Low		1	09/25/17 12:42	C7I0399	CI72535
Isopropylbenzene	ND (0.0047)		8260B Low		1	09/25/17 12:42	C7I0399	CI72535
Methyl tert-Butyl Ether	ND (0.0047)		8260B Low		1	09/25/17 12:42	C7I0399	CI72535
Methylene Chloride	ND (0.0237)		8260B Low		1	09/25/17 12:42	C7I0399	CI72535
Naphthalene	ND (0.0047)		8260B Low		1	09/25/17 12:42	C7I0399	CI72535
n-Butylbenzene	ND (0.0047)		8260B Low		1	09/25/17 12:42	C7I0399	CI72535
n-Propylbenzene	ND (0.0047)		8260B Low		1	09/25/17 12:42	C7I0399	CI72535
sec-Butylbenzene	ND (0.0047)		8260B Low		1	09/25/17 12:42	C7I0399	CI72535
Styrene	ND (0.0047)		8260B Low		1	09/25/17 12:42	C7I0399	CI72535
tert-Butylbenzene	ND (0.0047)		8260B Low		1	09/25/17 12:42	C7I0399	CI72535
Tertiary-amyl methyl ether	ND (0.0047)		8260B Low		1	09/25/17 12:42	C7I0399	CI72535
Tetrachloroethene	ND (0.0047)		8260B Low		1	09/25/17 12:42	C7I0399	CI72535
Tetrahydrofuran	ND (0.0047)		8260B Low		1	09/25/17 12:42	C7I0399	CI72535



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: GZ-SS-516 (0-2')  
 Date Sampled: 09/22/17 10:30  
 Percent Solids: 94  
 Initial Volume: 5.6  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709662  
 ESS Laboratory Sample ID: 1709662-16  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MD

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0047)		8260B Low		1	09/25/17 12:42	C7I0399	CI72535
trans-1,2-Dichloroethene	ND (0.0047)		8260B Low		1	09/25/17 12:42	C7I0399	CI72535
trans-1,3-Dichloropropene	ND (0.0047)		8260B Low		1	09/25/17 12:42	C7I0399	CI72535
Trichloroethene	ND (0.0047)		8260B Low		1	09/25/17 12:42	C7I0399	CI72535
Trichlorofluoromethane	ND (0.0047)		8260B Low		1	09/25/17 12:42	C7I0399	CI72535
Vinyl Acetate	ND (0.0047)		8260B Low		1	09/25/17 12:42	C7I0399	CI72535
Vinyl Chloride	ND (0.0095)		8260B Low		1	09/25/17 12:42	C7I0399	CI72535
Xylene O	ND (0.0047)		8260B Low		1	09/25/17 12:42	C7I0399	CI72535
Xylene P,M	ND (0.0095)		8260B Low		1	09/25/17 12:42	C7I0399	CI72535
Xylenes (Total)	ND (0.0095)		8260B Low		1	09/25/17 12:42		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	91 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	84 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	91 %		70-130
<i>Surrogate: Toluene-d8</i>	102 %		70-130





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: GZ-SS-516 (0-2')  
 Date Sampled: 09/22/17 10:30  
 Percent Solids: 94  
 Initial Volume: 19.9  
 Final Volume: 1  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709662  
 ESS Laboratory Sample ID: 1709662-16  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: SMR  
 Prepared: 9/25/17 11:30

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	179 (40.1)		8100M		1	09/26/17 14:02	C710397	C172519

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: O-Terphenyl</i>	74 %		40-140



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: GZ-SS-516 (0-2')  
 Date Sampled: 09/22/17 10:30  
 Percent Solids: 94  
 Initial Volume: 14.3  
 Final Volume: 0.5  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709662  
 ESS Laboratory Sample ID: 1709662-16  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: TJ  
 Prepared: 9/25/17 12:35

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.372)		8270D		1	09/27/17 1:43	C7I0426	CI72521
Acenaphthene	ND (0.372)		8270D		1	09/27/17 1:43	C7I0426	CI72521
Acenaphthylene	ND (0.372)		8270D		1	09/27/17 1:43	C7I0426	CI72521
Anthracene	ND (0.372)		8270D		1	09/27/17 1:43	C7I0426	CI72521
<b>Benzo(a)anthracene</b>	<b>0.580</b> (0.372)		8270D		1	09/27/17 1:43	C7I0426	CI72521
<b>Benzo(a)pyrene</b>	<b>0.607</b> (0.186)		8270D		1	09/27/17 1:43	C7I0426	CI72521
<b>Benzo(b)fluoranthene</b>	<b>0.787</b> (0.372)		8270D		1	09/27/17 1:43	C7I0426	CI72521
Benzo(g,h,i)perylene	ND (0.372)		8270D		1	09/27/17 1:43	C7I0426	CI72521
<b>Benzo(k)fluoranthene</b>	<b>0.461</b> (0.372)		8270D		1	09/27/17 1:43	C7I0426	CI72521
<b>Chrysene</b>	<b>0.644</b> (0.186)		8270D		1	09/27/17 1:43	C7I0426	CI72521
Dibenzo(a,h)Anthracene	ND (0.186)		8270D		1	09/27/17 1:43	C7I0426	CI72521
<b>Fluoranthene</b>	<b>0.970</b> (0.372)		8270D		1	09/27/17 1:43	C7I0426	CI72521
Fluorene	ND (0.372)		8270D		1	09/27/17 1:43	C7I0426	CI72521
Indeno(1,2,3-cd)Pyrene	ND (0.372)		8270D		1	09/27/17 1:43	C7I0426	CI72521
Naphthalene	ND (0.372)		8270D		1	09/27/17 1:43	C7I0426	CI72521
Phenanthrene	ND (0.372)		8270D		1	09/27/17 1:43	C7I0426	CI72521
<b>Pyrene</b>	<b>0.840</b> (0.372)		8270D		1	09/27/17 1:43	C7I0426	CI72521

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	70 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	83 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	74 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	80 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: GZ-SS-516 (0-2')  
Date Sampled: 09/22/17 10:30  
Percent Solids: 94

ESS Laboratory Work Order: 1709662  
ESS Laboratory Sample ID: 1709662-16  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	6.99 (1.05)		9014		1	EEM	09/28/17 11:50	mg/kg dry	CI72818



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: GZ-SS-517 (0-2')  
Date Sampled: 09/22/17 11:37  
Percent Solids: 95

ESS Laboratory Work Order: 1709662  
ESS Laboratory Sample ID: 1709662-17  
Sample Matrix: Soil  
Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (1.94)		6020A		20	NAR	09/29/17 11:10	2.17	100	CI72737
Arsenic	7.79 (2.42)		6010C		1	KJK	09/28/17 5:29	2.17	100	CI72737
Beryllium	0.25 (0.11)		6010C		1	KJK	09/28/17 5:29	2.17	100	CI72737
Cadmium	0.70 (0.48)		6010C		1	KJK	09/28/17 5:29	2.17	100	CI72737
Chromium	10.5 (0.97)		6010C		1	KJK	09/28/17 5:29	2.17	100	CI72737
Copper	26.1 (2.42)		6010C		1	KJK	09/28/17 5:29	2.17	100	CI72737
Lead	262 (4.84)		6010C		1	KJK	09/28/17 5:29	2.17	100	CI72737
Mercury	0.223 (0.032)		7471B		1	MJV	09/27/17 21:58	0.64	40	CI72736
Nickel	9.39 (2.42)		6010C		1	KJK	09/28/17 5:29	2.17	100	CI72737
Selenium	ND (1.94)		6020A		20	NAR	09/29/17 11:10	2.17	100	CI72737
Silver	ND (0.48)		6010C		1	KJK	09/28/17 5:29	2.17	100	CI72737
Thallium	ND (1.94)		6020A		20	NAR	09/29/17 11:10	2.17	100	CI72737
Zinc	181 (2.42)		6010C		1	KJK	09/28/17 5:29	2.17	100	CI72737



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: GZ-SS-517 (0-2')  
 Date Sampled: 09/22/17 11:37  
 Percent Solids: 95  
 Initial Volume: 10.1  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709662  
 ESS Laboratory Sample ID: 1709662-17  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0026)		8260B Low		1	09/26/17 21:09	C7I0420	CI72621
1,1,1-Trichloroethane	ND (0.0026)		8260B Low		1	09/26/17 21:09	C7I0420	CI72621
1,1,2,2-Tetrachloroethane	ND (0.0026)		8260B Low		1	09/26/17 21:09	C7I0420	CI72621
1,1,2-Trichloroethane	ND (0.0026)		8260B Low		1	09/26/17 21:09	C7I0420	CI72621
1,1-Dichloroethane	ND (0.0026)		8260B Low		1	09/26/17 21:09	C7I0420	CI72621
1,1-Dichloroethene	ND (0.0026)		8260B Low		1	09/26/17 21:09	C7I0420	CI72621
1,1-Dichloropropene	ND (0.0026)		8260B Low		1	09/26/17 21:09	C7I0420	CI72621
1,2,3-Trichlorobenzene	ND (0.0026)		8260B Low		1	09/26/17 21:09	C7I0420	CI72621
1,2,3-Trichloropropane	ND (0.0026)		8260B Low		1	09/26/17 21:09	C7I0420	CI72621
1,2,4-Trichlorobenzene	ND (0.0026)		8260B Low		1	09/26/17 21:09	C7I0420	CI72621
1,2,4-Trimethylbenzene	ND (0.0026)		8260B Low		1	09/26/17 21:09	C7I0420	CI72621
1,2-Dibromo-3-Chloropropane	ND (0.0026)		8260B Low		1	09/26/17 21:09	C7I0420	CI72621
1,2-Dibromoethane	ND (0.0026)		8260B Low		1	09/26/17 21:09	C7I0420	CI72621
1,2-Dichlorobenzene	ND (0.0026)		8260B Low		1	09/26/17 21:09	C7I0420	CI72621
1,2-Dichloroethane	ND (0.0026)		8260B Low		1	09/26/17 21:09	C7I0420	CI72621
1,2-Dichloropropane	ND (0.0026)		8260B Low		1	09/26/17 21:09	C7I0420	CI72621
1,3,5-Trimethylbenzene	ND (0.0026)		8260B Low		1	09/26/17 21:09	C7I0420	CI72621
1,3-Dichlorobenzene	ND (0.0026)		8260B Low		1	09/26/17 21:09	C7I0420	CI72621
1,3-Dichloropropane	ND (0.0026)		8260B Low		1	09/26/17 21:09	C7I0420	CI72621
1,4-Dichlorobenzene	ND (0.0026)		8260B Low		1	09/26/17 21:09	C7I0420	CI72621
1,4-Dioxane	ND (0.0520)		8260B Low		1	09/26/17 21:09	C7I0420	CI72621
1-Chlorohexane	ND (0.0026)		8260B Low		1	09/26/17 21:09	C7I0420	CI72621
2,2-Dichloropropane	ND (0.0026)		8260B Low		1	09/26/17 21:09	C7I0420	CI72621
2-Butanone	ND (0.0260)		8260B Low		1	09/26/17 21:09	C7I0420	CI72621
2-Chlorotoluene	ND (0.0026)		8260B Low		1	09/26/17 21:09	C7I0420	CI72621
2-Hexanone	ND (0.0260)		8260B Low		1	09/26/17 21:09	C7I0420	CI72621
4-Chlorotoluene	ND (0.0026)		8260B Low		1	09/26/17 21:09	C7I0420	CI72621
4-Isopropyltoluene	ND (0.0026)		8260B Low		1	09/26/17 21:09	C7I0420	CI72621
4-Methyl-2-Pentanone	ND (0.0260)		8260B Low		1	09/26/17 21:09	C7I0420	CI72621
Acetone	ND (0.0260)		8260B Low		1	09/26/17 21:09	C7I0420	CI72621
Benzene	ND (0.0026)		8260B Low		1	09/26/17 21:09	C7I0420	CI72621
Bromobenzene	ND (0.0026)		8260B Low		1	09/26/17 21:09	C7I0420	CI72621





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: GZ-SS-517 (0-2')  
 Date Sampled: 09/22/17 11:37  
 Percent Solids: 95  
 Initial Volume: 10.1  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709662  
 ESS Laboratory Sample ID: 1709662-17  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0026)		8260B Low		1	09/26/17 21:09	C7I0420	CI72621
Bromodichloromethane	ND (0.0026)		8260B Low		1	09/26/17 21:09	C7I0420	CI72621
Bromoform	ND (0.0026)		8260B Low		1	09/26/17 21:09	C7I0420	CI72621
Bromomethane	ND (0.0052)		8260B Low		1	09/26/17 21:09	C7I0420	CI72621
Carbon Disulfide	ND (0.0026)		8260B Low		1	09/26/17 21:09	C7I0420	CI72621
Carbon Tetrachloride	ND (0.0026)		8260B Low		1	09/26/17 21:09	C7I0420	CI72621
Chlorobenzene	ND (0.0026)		8260B Low		1	09/26/17 21:09	C7I0420	CI72621
Chloroethane	ND (0.0052)		8260B Low		1	09/26/17 21:09	C7I0420	CI72621
Chloroform	ND (0.0026)		8260B Low		1	09/26/17 21:09	C7I0420	CI72621
Chloromethane	ND (0.0052)		8260B Low		1	09/26/17 21:09	C7I0420	CI72621
cis-1,2-Dichloroethene	ND (0.0026)		8260B Low		1	09/26/17 21:09	C7I0420	CI72621
cis-1,3-Dichloropropene	ND (0.0026)		8260B Low		1	09/26/17 21:09	C7I0420	CI72621
Dibromochloromethane	ND (0.0026)		8260B Low		1	09/26/17 21:09	C7I0420	CI72621
Dibromomethane	ND (0.0026)		8260B Low		1	09/26/17 21:09	C7I0420	CI72621
Dichlorodifluoromethane	ND (0.0052)		8260B Low		1	09/26/17 21:09	C7I0420	CI72621
Diethyl Ether	ND (0.0026)		8260B Low		1	09/26/17 21:09	C7I0420	CI72621
Di-isopropyl ether	ND (0.0026)		8260B Low		1	09/26/17 21:09	C7I0420	CI72621
Ethyl tertiary-butyl ether	ND (0.0026)		8260B Low		1	09/26/17 21:09	C7I0420	CI72621
Ethylbenzene	ND (0.0026)		8260B Low		1	09/26/17 21:09	C7I0420	CI72621
Hexachlorobutadiene	ND (0.0026)		8260B Low		1	09/26/17 21:09	C7I0420	CI72621
Isopropylbenzene	ND (0.0026)		8260B Low		1	09/26/17 21:09	C7I0420	CI72621
Methyl tert-Butyl Ether	ND (0.0026)		8260B Low		1	09/26/17 21:09	C7I0420	CI72621
Methylene Chloride	ND (0.0130)		8260B Low		1	09/26/17 21:09	C7I0420	CI72621
Naphthalene	ND (0.0026)		8260B Low		1	09/26/17 21:09	C7I0420	CI72621
n-Butylbenzene	ND (0.0026)		8260B Low		1	09/26/17 21:09	C7I0420	CI72621
n-Propylbenzene	ND (0.0026)		8260B Low		1	09/26/17 21:09	C7I0420	CI72621
sec-Butylbenzene	ND (0.0026)		8260B Low		1	09/26/17 21:09	C7I0420	CI72621
Styrene	ND (0.0026)		8260B Low		1	09/26/17 21:09	C7I0420	CI72621
tert-Butylbenzene	ND (0.0026)		8260B Low		1	09/26/17 21:09	C7I0420	CI72621
Tertiary-amyl methyl ether	ND (0.0026)		8260B Low		1	09/26/17 21:09	C7I0420	CI72621
Tetrachloroethene	ND (0.0026)		8260B Low		1	09/26/17 21:09	C7I0420	CI72621
Tetrahydrofuran	ND (0.0026)		8260B Low		1	09/26/17 21:09	C7I0420	CI72621



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: GZ-SS-517 (0-2')  
 Date Sampled: 09/22/17 11:37  
 Percent Solids: 95  
 Initial Volume: 10.1  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709662  
 ESS Laboratory Sample ID: 1709662-17  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0026)		8260B Low		1	09/26/17 21:09	C7I0420	CI72621
trans-1,2-Dichloroethene	ND (0.0026)		8260B Low		1	09/26/17 21:09	C7I0420	CI72621
trans-1,3-Dichloropropene	ND (0.0026)		8260B Low		1	09/26/17 21:09	C7I0420	CI72621
Trichloroethene	ND (0.0026)		8260B Low		1	09/26/17 21:09	C7I0420	CI72621
Trichlorofluoromethane	ND (0.0026)		8260B Low		1	09/26/17 21:09	C7I0420	CI72621
Vinyl Acetate	ND (0.0026)		8260B Low		1	09/26/17 21:09	C7I0420	CI72621
Vinyl Chloride	ND (0.0052)		8260B Low		1	09/26/17 21:09	C7I0420	CI72621
Xylene O	ND (0.0026)		8260B Low		1	09/26/17 21:09	C7I0420	CI72621
Xylene P,M	ND (0.0052)		8260B Low		1	09/26/17 21:09	C7I0420	CI72621
Xylenes (Total)	ND (0.0052)		8260B Low		1	09/26/17 21:09		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	111 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	94 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	106 %		70-130
<i>Surrogate: Toluene-d8</i>	122 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility  
 Client Sample ID: GZ-SS-517 (0-2')  
 Date Sampled: 09/22/17 11:37  
 Percent Solids: 95  
 Initial Volume: 19.9  
 Final Volume: 1  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709662  
 ESS Laboratory Sample ID: 1709662-17  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: SMR  
 Prepared: 9/25/17 11:30

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	642 (198)		8100M		5	09/26/17 16:23	C710397	C172519
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		56 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: GZ-SS-517 (0-2')  
Date Sampled: 09/22/17 11:37  
Percent Solids: 95  
Initial Volume: 14.3  
Final Volume: 0.5  
Extraction Method: 3546

ESS Laboratory Work Order: 1709662  
ESS Laboratory Sample ID: 1709662-17  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: TJ  
Prepared: 9/25/17 12:35

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.367)		8270D		1	09/27/17 2:19	C7I0426	CI72521
Acenaphthene	ND (0.367)		8270D		1	09/27/17 2:19	C7I0426	CI72521
Acenaphthylene	1.22 (0.367)		8270D		1	09/27/17 2:19	C7I0426	CI72521
Anthracene	0.704 (0.367)		8270D		1	09/27/17 2:19	C7I0426	CI72521
Benzo(a)anthracene	6.61 (0.367)		8270D		1	09/27/17 2:19	C7I0426	CI72521
Benzo(a)pyrene	7.58 (0.184)		8270D		1	09/27/17 2:19	C7I0426	CI72521
Benzo(b)fluoranthene	8.34 (3.67)		8270D		10	09/27/17 21:24	C7I0426	CI72521
Benzo(g,h,i)perylene	3.25 (0.367)		8270D		1	09/27/17 2:19	C7I0426	CI72521
Benzo(k)fluoranthene	5.97 (0.367)		8270D		1	09/27/17 2:19	C7I0426	CI72521
Chrysene	5.70 (0.184)		8270D		1	09/27/17 2:19	C7I0426	CI72521
Dibenzo(a,h)Anthracene	1.64 (0.184)		8270D		1	09/27/17 2:19	C7I0426	CI72521
Fluoranthene	10.1 (3.67)		8270D		10	09/27/17 21:24	C7I0426	CI72521
Fluorene	ND (0.367)		8270D		1	09/27/17 2:19	C7I0426	CI72521
Indeno(1,2,3-cd)Pyrene	3.30 (0.367)		8270D		1	09/27/17 2:19	C7I0426	CI72521
Naphthalene	ND (0.367)		8270D		1	09/27/17 2:19	C7I0426	CI72521
Phenanthrene	1.72 (0.367)		8270D		1	09/27/17 2:19	C7I0426	CI72521
Pyrene	6.62 (0.367)		8270D		1	09/27/17 2:19	C7I0426	CI72521

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: 1,2-Dichlorobenzene-d4	63 %		30-130
Surrogate: 2-Fluorobiphenyl	86 %		30-130
Surrogate: Nitrobenzene-d5	68 %		30-130
Surrogate: p-Terphenyl-d14	69 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility  
Client Sample ID: GZ-SS-517 (0-2')  
Date Sampled: 09/22/17 11:37  
Percent Solids: 95

ESS Laboratory Work Order: 1709662  
ESS Laboratory Sample ID: 1709662-17  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	11.5 (1.04)		9014		1	EEM	09/28/17 11:50	mg/kg dry	CI72818





CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility

ESS Laboratory Work Order: 1709662

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
<b>Total Metals</b>										
<b>Batch CI72736 - 7471B</b>										
<b>Blank</b>										
Mercury	ND	0.033	mg/kg wet							
<b>LCS</b>										
Mercury	2.58	0.720	mg/kg wet	2.900		89	80-120			
<b>LCS Dup</b>										
Mercury	2.55	0.671	mg/kg wet	2.900		88	80-120	1	20	
<b>Reference</b>										
Mercury	0.837	0.187	mg/kg wet	1000		0.08	0-200			
<b>Batch CI72737 - 3050B</b>										
<b>Blank</b>										
Antimony	ND	2.00	mg/kg wet							
Arsenic	ND	2.50	mg/kg wet							
Beryllium	ND	0.11	mg/kg wet							
Cadmium	ND	0.50	mg/kg wet							
Chromium	ND	1.00	mg/kg wet							
Copper	ND	2.50	mg/kg wet							
Lead	ND	5.00	mg/kg wet							
Nickel	ND	2.50	mg/kg wet							
Selenium	ND	2.00	mg/kg wet							
Silver	ND	0.50	mg/kg wet							
Thallium	ND	2.00	mg/kg wet							
Zinc	ND	2.50	mg/kg wet							
<b>LCS</b>										
Antimony	50.2	19.6	mg/kg wet	48.00		105	80-120			
Arsenic	106	9.80	mg/kg wet	123.0		86	80-120			
Beryllium	173	0.43	mg/kg wet	192.0		90	80-120			
Cadmium	194	1.96	mg/kg wet	224.0		86	80-120			
Chromium	171	3.92	mg/kg wet	179.0		95	80-120			
Copper	69.1	9.80	mg/kg wet	78.90		88	80-120			
Lead	135	19.6	mg/kg wet	145.0		93	80-120			
Nickel	136	9.80	mg/kg wet	143.0		95	80-120			
Selenium	40.0	19.6	mg/kg wet	42.40		94	80-120			
Silver	78.9	1.96	mg/kg wet	81.60		97	80-120			
Thallium	46.2	19.6	mg/kg wet	52.00		89	80-120			
Zinc	679	9.80	mg/kg wet	770.0		88	80-120			
<b>LCS Dup</b>										
Antimony	56.5	18.9	mg/kg wet	48.00		118	80-120	12	30	
Arsenic	111	9.43	mg/kg wet	123.0		90	80-120	4	20	
Beryllium	179	0.42	mg/kg wet	192.0		93	80-120	3	20	
Cadmium	201	1.89	mg/kg wet	224.0		90	80-120	4	20	
Chromium	174	3.77	mg/kg wet	179.0		97	80-120	2	20	
Copper	69.8	9.43	mg/kg wet	78.90		89	80-120	1	20	
Lead	138	18.9	mg/kg wet	145.0		95	80-120	2	20	
Nickel	137	9.43	mg/kg wet	143.0		95	80-120	0.3	20	



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility

ESS Laboratory Work Order: 1709662

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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Total Metals

**Batch CI72737 - 3050B**

Selenium	40.6	18.9	mg/kg wet	42.40		96	80-120	1	30	
Silver	81.0	1.89	mg/kg wet	81.60		99	80-120	3	20	
Thallium	47.3	18.9	mg/kg wet	52.00		91	80-120	2	30	
Zinc	706	9.43	mg/kg wet	770.0		92	80-120	4	20	

**Reference**

Cadmium	401	1.82	mg/kg wet	500.0		80	70-130			
Chromium	452	3.64	mg/kg wet	500.0		90	70-130			
Lead	470	18.2	mg/kg wet	500.0		94	70-130			
Silver	325	1.82	mg/kg wet	500.0		65	70-130			R-

5035/8260B Volatile Organic Compounds / Low Level

**Batch CI72535 - 5035**

**Blank**

1,1,1,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,1-Trichloroethane	ND	0.0050	mg/kg wet							
1,1,2,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,2-Trichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethene	ND	0.0050	mg/kg wet							
1,1-Dichloropropene	ND	0.0050	mg/kg wet							
1,2,3-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,3-Trichloropropane	ND	0.0050	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,4-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,2-Dibromo-3-Chloropropane	ND	0.0050	mg/kg wet							
1,2-Dibromoethane	ND	0.0050	mg/kg wet							
1,2-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,2-Dichloroethane	ND	0.0050	mg/kg wet							
1,2-Dichloropropane	ND	0.0050	mg/kg wet							
1,3,5-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,3-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,3-Dichloropropane	ND	0.0050	mg/kg wet							
1,4-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,4-Dioxane	ND	0.100	mg/kg wet							
1-Chlorohexane	ND	0.0050	mg/kg wet							
2,2-Dichloropropane	ND	0.0050	mg/kg wet							
2-Butanone	ND	0.0500	mg/kg wet							
2-Chlorotoluene	ND	0.0050	mg/kg wet							
2-Hexanone	ND	0.0500	mg/kg wet							
4-Chlorotoluene	ND	0.0050	mg/kg wet							
4-Isopropyltoluene	ND	0.0050	mg/kg wet							
4-Methyl-2-Pentanone	ND	0.0500	mg/kg wet							
Acetone	ND	0.0500	mg/kg wet							
Benzene	ND	0.0050	mg/kg wet							
Bromobenzene	ND	0.0050	mg/kg wet							



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility

ESS Laboratory Work Order: 1709662

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CI72535 - 5035**

Bromochloromethane	ND	0.0050	mg/kg wet							
Bromodichloromethane	ND	0.0050	mg/kg wet							
Bromoform	ND	0.0050	mg/kg wet							
Bromomethane	ND	0.0100	mg/kg wet							
Carbon Disulfide	ND	0.0050	mg/kg wet							
Carbon Tetrachloride	ND	0.0050	mg/kg wet							
Chlorobenzene	ND	0.0050	mg/kg wet							
Chloroethane	ND	0.0100	mg/kg wet							
Chloroform	ND	0.0050	mg/kg wet							
Chloromethane	ND	0.0100	mg/kg wet							
cis-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
cis-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Dibromochloromethane	ND	0.0050	mg/kg wet							
Dibromomethane	ND	0.0050	mg/kg wet							
Dichlorodifluoromethane	ND	0.0100	mg/kg wet							
Diethyl Ether	ND	0.0050	mg/kg wet							
Di-isopropyl ether	ND	0.0050	mg/kg wet							
Ethyl tertiary-butyl ether	ND	0.0050	mg/kg wet							
Ethylbenzene	ND	0.0050	mg/kg wet							
Hexachlorobutadiene	ND	0.0050	mg/kg wet							
Isopropylbenzene	ND	0.0050	mg/kg wet							
Methyl tert-Butyl Ether	ND	0.0050	mg/kg wet							
Methylene Chloride	ND	0.0250	mg/kg wet							
Naphthalene	ND	0.0050	mg/kg wet							
n-Butylbenzene	ND	0.0050	mg/kg wet							
n-Propylbenzene	ND	0.0050	mg/kg wet							
sec-Butylbenzene	ND	0.0050	mg/kg wet							
Styrene	ND	0.0050	mg/kg wet							
tert-Butylbenzene	ND	0.0050	mg/kg wet							
Tertiary-amyl methyl ether	ND	0.0050	mg/kg wet							
Tetrachloroethene	ND	0.0050	mg/kg wet							
Tetrahydrofuran	ND	0.0050	mg/kg wet							
Toluene	ND	0.0050	mg/kg wet							
trans-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
trans-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Trichloroethene	ND	0.0050	mg/kg wet							
Trichlorofluoromethane	ND	0.0050	mg/kg wet							
Vinyl Acetate	ND	0.0050	mg/kg wet							
Vinyl Chloride	ND	0.0100	mg/kg wet							
Xylene O	ND	0.0050	mg/kg wet							
Xylene P,M	ND	0.0100	mg/kg wet							
Xylenes (Total)	ND	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	0.0449		mg/kg wet	0.05000		90	70-130			
Surrogate: 4-Bromofluorobenzene	0.0453		mg/kg wet	0.05000		91	70-130			
Surrogate: Dibromofluoromethane	0.0437		mg/kg wet	0.05000		87	70-130			



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility

ESS Laboratory Work Order: 1709662

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

Batch CI72535 - 5035

<i>Surrogate: Toluene-d8</i>	0.0463		mg/kg wet	0.05000		93	70-130			
<b>LCS</b>										
1,1,1,2-Tetrachloroethane	0.0469	0.0050	mg/kg wet	0.05000		94	70-130			
1,1,1-Trichloroethane	0.0459	0.0050	mg/kg wet	0.05000		92	70-130			
1,1,2,2-Tetrachloroethane	0.0475	0.0050	mg/kg wet	0.05000		95	70-130			
1,1,2-Trichloroethane	0.0457	0.0050	mg/kg wet	0.05000		91	70-130			
1,1-Dichloroethane	0.0443	0.0050	mg/kg wet	0.05000		89	70-130			
1,1-Dichloroethene	0.0481	0.0050	mg/kg wet	0.05000		96	70-130			
1,1-Dichloropropene	0.0463	0.0050	mg/kg wet	0.05000		93	70-130			
1,2,3-Trichlorobenzene	0.0506	0.0050	mg/kg wet	0.05000		101	70-130			
1,2,3-Trichloropropane	0.0439	0.0050	mg/kg wet	0.05000		88	70-130			
1,2,4-Trichlorobenzene	0.0510	0.0050	mg/kg wet	0.05000		102	70-130			
1,2,4-Trimethylbenzene	0.0469	0.0050	mg/kg wet	0.05000		94	70-130			
1,2-Dibromo-3-Chloropropane	0.0488	0.0050	mg/kg wet	0.05000		98	70-130			
1,2-Dibromoethane	0.0474	0.0050	mg/kg wet	0.05000		95	70-130			
1,2-Dichlorobenzene	0.0484	0.0050	mg/kg wet	0.05000		97	70-130			
1,2-Dichloroethane	0.0463	0.0050	mg/kg wet	0.05000		93	70-130			
1,2-Dichloropropane	0.0450	0.0050	mg/kg wet	0.05000		90	70-130			
1,3,5-Trimethylbenzene	0.0459	0.0050	mg/kg wet	0.05000		92	70-130			
1,3-Dichlorobenzene	0.0480	0.0050	mg/kg wet	0.05000		96	70-130			
1,3-Dichloropropane	0.0486	0.0050	mg/kg wet	0.05000		97	70-130			
1,4-Dichlorobenzene	0.0482	0.0050	mg/kg wet	0.05000		96	70-130			
1,4-Dioxane	0.966	0.100	mg/kg wet	1.000		97	70-130			
1-Chlorohexane	0.0464	0.0050	mg/kg wet	0.05000		93	70-130			
2,2-Dichloropropane	0.0444	0.0050	mg/kg wet	0.05000		89	70-130			
2-Butanone	0.221	0.0500	mg/kg wet	0.2500		89	70-130			
2-Chlorotoluene	0.0456	0.0050	mg/kg wet	0.05000		91	70-130			
2-Hexanone	0.240	0.0500	mg/kg wet	0.2500		96	70-130			
4-Chlorotoluene	0.0458	0.0050	mg/kg wet	0.05000		92	70-130			
4-Isopropyltoluene	0.0473	0.0050	mg/kg wet	0.05000		95	70-130			
4-Methyl-2-Pentanone	0.231	0.0500	mg/kg wet	0.2500		92	70-130			
Acetone	0.224	0.0500	mg/kg wet	0.2500		90	70-130			
Benzene	0.0455	0.0050	mg/kg wet	0.05000		91	70-130			
Bromobenzene	0.0474	0.0050	mg/kg wet	0.05000		95	70-130			
Bromochloromethane	0.0462	0.0050	mg/kg wet	0.05000		92	70-130			
Bromodichloromethane	0.0453	0.0050	mg/kg wet	0.05000		91	70-130			
Bromoform	0.0435	0.0050	mg/kg wet	0.05000		87	70-130			
Bromomethane	0.0532	0.0100	mg/kg wet	0.05000		106	70-130			
Carbon Disulfide	0.0488	0.0050	mg/kg wet	0.05000		98	70-130			
Carbon Tetrachloride	0.0465	0.0050	mg/kg wet	0.05000		93	70-130			
Chlorobenzene	0.0477	0.0050	mg/kg wet	0.05000		95	70-130			
Chloroethane	0.0448	0.0100	mg/kg wet	0.05000		90	70-130			
Chloroform	0.0455	0.0050	mg/kg wet	0.05000		91	70-130			
Chloromethane	0.0402	0.0100	mg/kg wet	0.05000		80	70-130			

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility

ESS Laboratory Work Order: 1709662

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CI72535 - 5035**

cis-1,2-Dichloroethene	0.0450	0.0050	mg/kg wet	0.05000		90	70-130			
cis-1,3-Dichloropropene	0.0479	0.0050	mg/kg wet	0.05000		96	70-130			
Dibromochloromethane	0.0484	0.0050	mg/kg wet	0.05000		97	70-130			
Dibromomethane	0.0451	0.0050	mg/kg wet	0.05000		90	70-130			
Dichlorodifluoromethane	0.0346	0.0100	mg/kg wet	0.05000		69	70-130			B-
Diethyl Ether	0.0465	0.0050	mg/kg wet	0.05000		93	70-130			
Di-isopropyl ether	0.0453	0.0050	mg/kg wet	0.05000		91	70-130			
Ethyl tertiary-butyl ether	0.0447	0.0050	mg/kg wet	0.05000		89	70-130			
Ethylbenzene	0.0474	0.0050	mg/kg wet	0.05000		95	70-130			
Hexachlorobutadiene	0.0498	0.0050	mg/kg wet	0.05000		100	70-130			
Isopropylbenzene	0.0443	0.0050	mg/kg wet	0.05000		89	70-130			
Methyl tert-Butyl Ether	0.0455	0.0050	mg/kg wet	0.05000		91	70-130			
Methylene Chloride	0.0466	0.0250	mg/kg wet	0.05000		93	70-130			
Naphthalene	0.0492	0.0050	mg/kg wet	0.05000		98	70-130			
n-Butylbenzene	0.0469	0.0050	mg/kg wet	0.05000		94	70-130			
n-Propylbenzene	0.0469	0.0050	mg/kg wet	0.05000		94	70-130			
sec-Butylbenzene	0.0462	0.0050	mg/kg wet	0.05000		92	70-130			
Styrene	0.0467	0.0050	mg/kg wet	0.05000		93	70-130			
tert-Butylbenzene	0.0465	0.0050	mg/kg wet	0.05000		93	70-130			
Tertiary-amyl methyl ether	0.0437	0.0050	mg/kg wet	0.05000		87	70-130			
Tetrachloroethene	0.0466	0.0050	mg/kg wet	0.05000		93	70-130			
Tetrahydrofuran	0.0481	0.0050	mg/kg wet	0.05000		96	70-130			
Toluene	0.0447	0.0050	mg/kg wet	0.05000		89	70-130			
trans-1,2-Dichloroethene	0.0483	0.0050	mg/kg wet	0.05000		97	70-130			
trans-1,3-Dichloropropene	0.0463	0.0050	mg/kg wet	0.05000		93	70-130			
Trichloroethene	0.0458	0.0050	mg/kg wet	0.05000		92	70-130			
Trichlorofluoromethane	0.0468	0.0050	mg/kg wet	0.05000		94	70-130			
Vinyl Acetate	0.0455	0.0050	mg/kg wet	0.05000		91	70-130			
Vinyl Chloride	0.0424	0.0100	mg/kg wet	0.05000		85	70-130			
Xylene O	0.0470	0.0050	mg/kg wet	0.05000		94	70-130			
Xylene P,M	0.0940	0.0100	mg/kg wet	0.1000		94	70-130			
Xylenes (Total)	0.141	0.0100	mg/kg wet							
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0451</i>		mg/kg wet	<i>0.05000</i>		<i>90</i>	<i>70-130</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0462</i>		mg/kg wet	<i>0.05000</i>		<i>92</i>	<i>70-130</i>			
<i>Surrogate: Dibromofluoromethane</i>	<i>0.0456</i>		mg/kg wet	<i>0.05000</i>		<i>91</i>	<i>70-130</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0459</i>		mg/kg wet	<i>0.05000</i>		<i>92</i>	<i>70-130</i>			

**LCS Dup**

1,1,1,2-Tetrachloroethane	0.0479	0.0050	mg/kg wet	0.05000		96	70-130	2	25	
1,1,1-Trichloroethane	0.0466	0.0050	mg/kg wet	0.05000		93	70-130	1	25	
1,1,2,2-Tetrachloroethane	0.0482	0.0050	mg/kg wet	0.05000		96	70-130	2	25	
1,1,2-Trichloroethane	0.0462	0.0050	mg/kg wet	0.05000		92	70-130	1	25	
1,1-Dichloroethane	0.0445	0.0050	mg/kg wet	0.05000		89	70-130	0.5	25	
1,1-Dichloroethene	0.0485	0.0050	mg/kg wet	0.05000		97	70-130	0.8	25	
1,1-Dichloropropene	0.0465	0.0050	mg/kg wet	0.05000		93	70-130	0.5	25	
1,2,3-Trichlorobenzene	0.0506	0.0050	mg/kg wet	0.05000		101	70-130	0.08	25	





CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility

ESS Laboratory Work Order: 1709662

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CI72535 - 5035**

1,2,3-Trichloropropane	0.0445	0.0050	mg/kg wet	0.05000		89	70-130	1	25	
1,2,4-Trichlorobenzene	0.0509	0.0050	mg/kg wet	0.05000		102	70-130	0.2	25	
1,2,4-Trimethylbenzene	0.0482	0.0050	mg/kg wet	0.05000		96	70-130	3	25	
1,2-Dibromo-3-Chloropropane	0.0464	0.0050	mg/kg wet	0.05000		93	70-130	5	25	
1,2-Dibromoethane	0.0481	0.0050	mg/kg wet	0.05000		96	70-130	1	25	
1,2-Dichlorobenzene	0.0493	0.0050	mg/kg wet	0.05000		99	70-130	2	25	
1,2-Dichloroethane	0.0466	0.0050	mg/kg wet	0.05000		93	70-130	0.5	25	
1,2-Dichloropropane	0.0457	0.0050	mg/kg wet	0.05000		91	70-130	2	25	
1,3,5-Trimethylbenzene	0.0478	0.0050	mg/kg wet	0.05000		96	70-130	4	25	
1,3-Dichlorobenzene	0.0493	0.0050	mg/kg wet	0.05000		99	70-130	3	25	
1,3-Dichloropropane	0.0492	0.0050	mg/kg wet	0.05000		98	70-130	1	25	
1,4-Dichlorobenzene	0.0493	0.0050	mg/kg wet	0.05000		99	70-130	2	25	
1,4-Dioxane	0.901	0.100	mg/kg wet	1.000		90	70-130	7	20	
1-Chlorohexane	0.0474	0.0050	mg/kg wet	0.05000		95	70-130	2	25	
2,2-Dichloropropane	0.0445	0.0050	mg/kg wet	0.05000		89	70-130	0.1	25	
2-Butanone	0.218	0.0500	mg/kg wet	0.2500		87	70-130	2	25	
2-Chlorotoluene	0.0474	0.0050	mg/kg wet	0.05000		95	70-130	4	25	
2-Hexanone	0.239	0.0500	mg/kg wet	0.2500		96	70-130	0.6	25	
4-Chlorotoluene	0.0472	0.0050	mg/kg wet	0.05000		94	70-130	3	25	
4-Isopropyltoluene	0.0486	0.0050	mg/kg wet	0.05000		97	70-130	3	25	
4-Methyl-2-Pentanone	0.227	0.0500	mg/kg wet	0.2500		91	70-130	1	25	
Acetone	0.218	0.0500	mg/kg wet	0.2500		87	70-130	3	25	
Benzene	0.0460	0.0050	mg/kg wet	0.05000		92	70-130	1	25	
Bromobenzene	0.0488	0.0050	mg/kg wet	0.05000		98	70-130	3	25	
Bromochloromethane	0.0463	0.0050	mg/kg wet	0.05000		93	70-130	0.2	25	
Bromodichloromethane	0.0458	0.0050	mg/kg wet	0.05000		92	70-130	1	25	
Bromoform	0.0449	0.0050	mg/kg wet	0.05000		90	70-130	3	25	
Bromomethane	0.0537	0.0100	mg/kg wet	0.05000		107	70-130	1	25	
Carbon Disulfide	0.0489	0.0050	mg/kg wet	0.05000		98	70-130	0.3	25	
Carbon Tetrachloride	0.0466	0.0050	mg/kg wet	0.05000		93	70-130	0.2	25	
Chlorobenzene	0.0488	0.0050	mg/kg wet	0.05000		98	70-130	2	25	
Chloroethane	0.0469	0.0100	mg/kg wet	0.05000		94	70-130	5	25	
Chloroform	0.0461	0.0050	mg/kg wet	0.05000		92	70-130	1	25	
Chloromethane	0.0412	0.0100	mg/kg wet	0.05000		82	70-130	2	25	
cis-1,2-Dichloroethene	0.0453	0.0050	mg/kg wet	0.05000		91	70-130	0.6	25	
cis-1,3-Dichloropropene	0.0476	0.0050	mg/kg wet	0.05000		95	70-130	0.6	25	
Dibromochloromethane	0.0497	0.0050	mg/kg wet	0.05000		99	70-130	2	25	
Dibromomethane	0.0451	0.0050	mg/kg wet	0.05000		90	70-130	0.04	25	
Dichlorodifluoromethane	0.0353	0.0100	mg/kg wet	0.05000		71	70-130	2	25	
Diethyl Ether	0.0463	0.0050	mg/kg wet	0.05000		93	70-130	0.5	25	
Di-isopropyl ether	0.0453	0.0050	mg/kg wet	0.05000		91	70-130	0.04	25	
Ethyl tertiary-butyl ether	0.0447	0.0050	mg/kg wet	0.05000		89	70-130	0.04	25	
Ethylbenzene	0.0485	0.0050	mg/kg wet	0.05000		97	70-130	2	25	
Hexachlorobutadiene	0.0502	0.0050	mg/kg wet	0.05000		100	70-130	0.8	25	
Isopropylbenzene	0.0458	0.0050	mg/kg wet	0.05000		92	70-130	3	25	

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility

ESS Laboratory Work Order: 1709662

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CI72535 - 5035**

Methyl tert-Butyl Ether	0.0451	0.0050	mg/kg wet	0.05000		90	70-130	0.8	25	
Methylene Chloride	0.0470	0.0250	mg/kg wet	0.05000		94	70-130	0.8	25	
Naphthalene	0.0491	0.0050	mg/kg wet	0.05000		98	70-130	0.2	25	
n-Butylbenzene	0.0478	0.0050	mg/kg wet	0.05000		96	70-130	2	25	
n-Propylbenzene	0.0484	0.0050	mg/kg wet	0.05000		97	70-130	3	25	
sec-Butylbenzene	0.0476	0.0050	mg/kg wet	0.05000		95	70-130	3	25	
Styrene	0.0484	0.0050	mg/kg wet	0.05000		97	70-130	4	25	
tert-Butylbenzene	0.0480	0.0050	mg/kg wet	0.05000		96	70-130	3	25	
Tertiary-amyl methyl ether	0.0438	0.0050	mg/kg wet	0.05000		88	70-130	0.09	25	
Tetrachloroethene	0.0479	0.0050	mg/kg wet	0.05000		96	70-130	3	25	
Tetrahydrofuran	0.0475	0.0050	mg/kg wet	0.05000		95	70-130	1	25	
Toluene	0.0455	0.0050	mg/kg wet	0.05000		91	70-130	2	25	
trans-1,2-Dichloroethene	0.0479	0.0050	mg/kg wet	0.05000		96	70-130	0.9	25	
trans-1,3-Dichloropropene	0.0462	0.0050	mg/kg wet	0.05000		92	70-130	0.3	25	
Trichloroethene	0.0457	0.0050	mg/kg wet	0.05000		91	70-130	0.2	25	
Trichlorofluoromethane	0.0474	0.0050	mg/kg wet	0.05000		95	70-130	1	25	
Vinyl Acetate	0.0457	0.0050	mg/kg wet	0.05000		91	70-130	0.4	25	
Vinyl Chloride	0.0431	0.0100	mg/kg wet	0.05000		86	70-130	2	25	
Xylene O	0.0486	0.0050	mg/kg wet	0.05000		97	70-130	3	25	
Xylene P,M	0.0962	0.0100	mg/kg wet	0.1000		96	70-130	2	25	
Xylenes (Total)	0.145	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	0.0449		mg/kg wet	0.05000		90	70-130			
Surrogate: 4-Bromofluorobenzene	0.0473		mg/kg wet	0.05000		95	70-130			
Surrogate: Dibromofluoromethane	0.0453		mg/kg wet	0.05000		91	70-130			
Surrogate: Toluene-d8	0.0466		mg/kg wet	0.05000		93	70-130			

**Batch CI72557 - 5035**

<b>Blank</b>										
1,1,1,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,1-Trichloroethane	ND	0.0050	mg/kg wet							
1,1,2,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,2-Trichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethene	ND	0.0050	mg/kg wet							
1,1-Dichloropropene	ND	0.0050	mg/kg wet							
1,2,3-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,3-Trichloropropane	ND	0.0050	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,4-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,2-Dibromo-3-Chloropropane	ND	0.0050	mg/kg wet							
1,2-Dibromoethane	ND	0.0050	mg/kg wet							
1,2-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,2-Dichloroethane	ND	0.0050	mg/kg wet							
1,2-Dichloropropane	ND	0.0050	mg/kg wet							
1,3,5-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,3-Dichlorobenzene	ND	0.0050	mg/kg wet							



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ESS Laboratory Work Order: 1709662

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CI72557 - 5035**

1,3-Dichloropropane	ND	0.0050	mg/kg wet							
1,4-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,4-Dioxane	ND	0.100	mg/kg wet							
1-Chlorohexane	ND	0.0050	mg/kg wet							
2,2-Dichloropropane	ND	0.0050	mg/kg wet							
2-Butanone	ND	0.0500	mg/kg wet							
2-Chlorotoluene	ND	0.0050	mg/kg wet							
2-Hexanone	ND	0.0500	mg/kg wet							
4-Chlorotoluene	ND	0.0050	mg/kg wet							
4-Isopropyltoluene	ND	0.0050	mg/kg wet							
4-Methyl-2-Pentanone	ND	0.0500	mg/kg wet							
Acetone	ND	0.0500	mg/kg wet							
Benzene	ND	0.0050	mg/kg wet							
Bromobenzene	ND	0.0050	mg/kg wet							
Bromochloromethane	ND	0.0050	mg/kg wet							
Bromodichloromethane	ND	0.0050	mg/kg wet							
Bromoform	ND	0.0050	mg/kg wet							
Bromomethane	ND	0.0100	mg/kg wet							
Carbon Disulfide	ND	0.0050	mg/kg wet							
Carbon Tetrachloride	ND	0.0050	mg/kg wet							
Chlorobenzene	ND	0.0050	mg/kg wet							
Chloroethane	ND	0.0100	mg/kg wet							
Chloroform	ND	0.0050	mg/kg wet							
Chloromethane	ND	0.0100	mg/kg wet							
cis-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
cis-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Dibromochloromethane	ND	0.0050	mg/kg wet							
Dibromomethane	ND	0.0050	mg/kg wet							
Dichlorodifluoromethane	ND	0.0100	mg/kg wet							
Diethyl Ether	ND	0.0050	mg/kg wet							
Di-isopropyl ether	ND	0.0050	mg/kg wet							
Ethyl tertiary-butyl ether	ND	0.0050	mg/kg wet							
Ethylbenzene	ND	0.0050	mg/kg wet							
Hexachlorobutadiene	ND	0.0050	mg/kg wet							
Isopropylbenzene	ND	0.0050	mg/kg wet							
Methyl tert-Butyl Ether	ND	0.0050	mg/kg wet							
Methylene Chloride	ND	0.0250	mg/kg wet							
Naphthalene	ND	0.0050	mg/kg wet							
n-Butylbenzene	ND	0.0050	mg/kg wet							
n-Propylbenzene	ND	0.0050	mg/kg wet							
sec-Butylbenzene	ND	0.0050	mg/kg wet							
Styrene	ND	0.0050	mg/kg wet							
tert-Butylbenzene	ND	0.0050	mg/kg wet							
Tertiary-amyl methyl ether	ND	0.0050	mg/kg wet							
Tetrachloroethene	ND	0.0050	mg/kg wet							



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ESS Laboratory Work Order: 1709662

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CI72557 - 5035**

Tetrahydrofuran	ND	0.0050	mg/kg wet							
Toluene	ND	0.0050	mg/kg wet							
trans-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
trans-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Trichloroethene	ND	0.0050	mg/kg wet							
Trichlorofluoromethane	ND	0.0050	mg/kg wet							
Vinyl Acetate	ND	0.0050	mg/kg wet							
Vinyl Chloride	ND	0.0100	mg/kg wet							
Xylene O	ND	0.0050	mg/kg wet							
Xylene P,M	ND	0.0100	mg/kg wet							
Xylenes (Total)	ND	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	0.0449		mg/kg wet	0.05000		90	70-130			
Surrogate: 4-Bromofluorobenzene	0.0530		mg/kg wet	0.05000		106	70-130			
Surrogate: Dibromofluoromethane	0.0474		mg/kg wet	0.05000		95	70-130			
Surrogate: Toluene-d8	0.0565		mg/kg wet	0.05000		113	70-130			

**LCS**

1,1,1,2-Tetrachloroethane	0.0518	0.0050	mg/kg wet	0.05000		104	70-130			
1,1,1-Trichloroethane	0.0525	0.0050	mg/kg wet	0.05000		105	70-130			
1,1,1,2-Tetrachloroethane	0.0521	0.0050	mg/kg wet	0.05000		104	70-130			
1,1,2-Trichloroethane	0.0469	0.0050	mg/kg wet	0.05000		94	70-130			
1,1-Dichloroethane	0.0500	0.0050	mg/kg wet	0.05000		100	70-130			
1,1-Dichloroethene	0.0565	0.0050	mg/kg wet	0.05000		113	70-130			
1,1-Dichloropropene	0.0540	0.0050	mg/kg wet	0.05000		108	70-130			
1,2,3-Trichlorobenzene	0.0511	0.0050	mg/kg wet	0.05000		102	70-130			
1,2,3-Trichloropropane	0.0477	0.0050	mg/kg wet	0.05000		95	70-130			
1,2,4-Trichlorobenzene	0.0517	0.0050	mg/kg wet	0.05000		103	70-130			
1,2,4-Trimethylbenzene	0.0518	0.0050	mg/kg wet	0.05000		104	70-130			
1,2-Dibromo-3-Chloropropane	0.0471	0.0050	mg/kg wet	0.05000		94	70-130			
1,2-Dibromoethane	0.0502	0.0050	mg/kg wet	0.05000		100	70-130			
1,2-Dichlorobenzene	0.0562	0.0050	mg/kg wet	0.05000		112	70-130			
1,2-Dichloroethane	0.0489	0.0050	mg/kg wet	0.05000		98	70-130			
1,2-Dichloropropane	0.0526	0.0050	mg/kg wet	0.05000		105	70-130			
1,3,5-Trimethylbenzene	0.0516	0.0050	mg/kg wet	0.05000		103	70-130			
1,3-Dichlorobenzene	0.0548	0.0050	mg/kg wet	0.05000		110	70-130			
1,3-Dichloropropane	0.0570	0.0050	mg/kg wet	0.05000		114	70-130			
1,4-Dichlorobenzene	0.0560	0.0050	mg/kg wet	0.05000		112	70-130			
1,4-Dioxane	0.849	0.100	mg/kg wet	1.000		85	70-130			
1-Chlorohexane	0.0490	0.0050	mg/kg wet	0.05000		98	70-130			
2,2-Dichloropropane	0.0472	0.0050	mg/kg wet	0.05000		94	70-130			
2-Butanone	0.249	0.0500	mg/kg wet	0.2500		99	70-130			
2-Chlorotoluene	0.0553	0.0050	mg/kg wet	0.05000		111	70-130			
2-Hexanone	0.229	0.0500	mg/kg wet	0.2500		92	70-130			
4-Chlorotoluene	0.0561	0.0050	mg/kg wet	0.05000		112	70-130			
4-Isopropyltoluene	0.0561	0.0050	mg/kg wet	0.05000		112	70-130			
4-Methyl-2-Pentanone	0.223	0.0500	mg/kg wet	0.2500		89	70-130			



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ESS Laboratory Work Order: 1709662

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Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
<b>5035/8260B Volatile Organic Compounds / Low Level</b>										
<b>Batch CI72557 - 5035</b>										
Acetone	0.223	0.0500	mg/kg wet	0.2500		89	70-130			
Benzene	0.0517	0.0050	mg/kg wet	0.05000		103	70-130			
Bromobenzene	0.0519	0.0050	mg/kg wet	0.05000		104	70-130			
Bromochloromethane	0.0517	0.0050	mg/kg wet	0.05000		103	70-130			
Bromodichloromethane	0.0454	0.0050	mg/kg wet	0.05000		91	70-130			
Bromoform	0.0552	0.0050	mg/kg wet	0.05000		110	70-130			
Bromomethane	0.0414	0.0100	mg/kg wet	0.05000		83	70-130			
Carbon Disulfide	0.0545	0.0050	mg/kg wet	0.05000		109	70-130			
Carbon Tetrachloride	0.0478	0.0050	mg/kg wet	0.05000		96	70-130			
Chlorobenzene	0.0544	0.0050	mg/kg wet	0.05000		109	70-130			
Chloroethane	0.0486	0.0100	mg/kg wet	0.05000		97	70-130			
Chloroform	0.0501	0.0050	mg/kg wet	0.05000		100	70-130			
Chloromethane	0.0442	0.0100	mg/kg wet	0.05000		88	70-130			
cis-1,2-Dichloroethene	0.0525	0.0050	mg/kg wet	0.05000		105	70-130			
cis-1,3-Dichloropropene	0.0498	0.0050	mg/kg wet	0.05000		100	70-130			
Dibromochloromethane	0.0487	0.0050	mg/kg wet	0.05000		97	70-130			
Dibromomethane	0.0490	0.0050	mg/kg wet	0.05000		98	70-130			
Dichlorodifluoromethane	0.0327	0.0100	mg/kg wet	0.05000		65	70-130			B-
Diethyl Ether	0.0497	0.0050	mg/kg wet	0.05000		99	70-130			
Di-isopropyl ether	0.0526	0.0050	mg/kg wet	0.05000		105	70-130			
Ethyl tertiary-butyl ether	0.0472	0.0050	mg/kg wet	0.05000		94	70-130			
Ethylbenzene	0.0559	0.0050	mg/kg wet	0.05000		112	70-130			
Hexachlorobutadiene	0.0523	0.0050	mg/kg wet	0.05000		105	70-130			
Isopropylbenzene	0.0497	0.0050	mg/kg wet	0.05000		99	70-130			
Methyl tert-Butyl Ether	0.0481	0.0050	mg/kg wet	0.05000		96	70-130			
Methylene Chloride	0.0492	0.0250	mg/kg wet	0.05000		98	70-130			
Naphthalene	0.0475	0.0050	mg/kg wet	0.05000		95	70-130			
n-Butylbenzene	0.0500	0.0050	mg/kg wet	0.05000		100	70-130			
n-Propylbenzene	0.0576	0.0050	mg/kg wet	0.05000		115	70-130			
sec-Butylbenzene	0.0563	0.0050	mg/kg wet	0.05000		113	70-130			
Styrene	0.0489	0.0050	mg/kg wet	0.05000		98	70-130			
tert-Butylbenzene	0.0515	0.0050	mg/kg wet	0.05000		103	70-130			
Tertiary-amyl methyl ether	0.0461	0.0050	mg/kg wet	0.05000		92	70-130			
Tetrachloroethene	0.0540	0.0050	mg/kg wet	0.05000		108	70-130			
Tetrahydrofuran	0.0453	0.0050	mg/kg wet	0.05000		91	70-130			
Toluene	0.0446	0.0050	mg/kg wet	0.05000		89	70-130			
trans-1,2-Dichloroethene	0.0548	0.0050	mg/kg wet	0.05000		110	70-130			
trans-1,3-Dichloropropene	0.0479	0.0050	mg/kg wet	0.05000		96	70-130			
Trichloroethene	0.0522	0.0050	mg/kg wet	0.05000		104	70-130			
Trichlorofluoromethane	0.0483	0.0050	mg/kg wet	0.05000		97	70-130			
Vinyl Acetate	0.0489	0.0050	mg/kg wet	0.05000		98	70-130			
Vinyl Chloride	0.0480	0.0100	mg/kg wet	0.05000		96	70-130			
Xylene O	0.0571	0.0050	mg/kg wet	0.05000		114	70-130			
Xylene P,M	0.113	0.0100	mg/kg wet	0.1000		113	70-130			
Xylenes (Total)	0.170	0.0100	mg/kg wet							





CERTIFICATE OF ANALYSIS

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**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CI72557 - 5035**

Surrogate: 1,2-Dichloroethane-d4	0.0459		mg/kg wet	0.05000		92	70-130			
Surrogate: 4-Bromofluorobenzene	0.0507		mg/kg wet	0.05000		101	70-130			
Surrogate: Dibromofluoromethane	0.0488		mg/kg wet	0.05000		98	70-130			
Surrogate: Toluene-d8	0.0522		mg/kg wet	0.05000		104	70-130			

**LCS Dup**

1,1,1,2-Tetrachloroethane	0.0506	0.0050	mg/kg wet	0.05000		101	70-130	2	25	
1,1,1-Trichloroethane	0.0514	0.0050	mg/kg wet	0.05000		103	70-130	2	25	
1,1,2,2-Tetrachloroethane	0.0522	0.0050	mg/kg wet	0.05000		104	70-130	0.2	25	
1,1,2-Trichloroethane	0.0463	0.0050	mg/kg wet	0.05000		93	70-130	1	25	
1,1-Dichloroethane	0.0490	0.0050	mg/kg wet	0.05000		98	70-130	2	25	
1,1-Dichloroethene	0.0550	0.0050	mg/kg wet	0.05000		110	70-130	3	25	
1,1-Dichloropropene	0.0524	0.0050	mg/kg wet	0.05000		105	70-130	3	25	
1,2,3-Trichlorobenzene	0.0497	0.0050	mg/kg wet	0.05000		99	70-130	3	25	
1,2,3-Trichloropropane	0.0480	0.0050	mg/kg wet	0.05000		96	70-130	0.6	25	
1,2,4-Trichlorobenzene	0.0491	0.0050	mg/kg wet	0.05000		98	70-130	5	25	
1,2,4-Trimethylbenzene	0.0497	0.0050	mg/kg wet	0.05000		99	70-130	4	25	
1,2-Dibromo-3-Chloropropane	0.0484	0.0050	mg/kg wet	0.05000		97	70-130	3	25	
1,2-Dibromoethane	0.0499	0.0050	mg/kg wet	0.05000		100	70-130	0.5	25	
1,2-Dichlorobenzene	0.0546	0.0050	mg/kg wet	0.05000		109	70-130	3	25	
1,2-Dichloroethane	0.0486	0.0050	mg/kg wet	0.05000		97	70-130	0.5	25	
1,2-Dichloropropane	0.0522	0.0050	mg/kg wet	0.05000		104	70-130	0.8	25	
1,3,5-Trimethylbenzene	0.0497	0.0050	mg/kg wet	0.05000		99	70-130	4	25	
1,3-Dichlorobenzene	0.0526	0.0050	mg/kg wet	0.05000		105	70-130	4	25	
1,3-Dichloropropane	0.0563	0.0050	mg/kg wet	0.05000		113	70-130	1	25	
1,4-Dichlorobenzene	0.0542	0.0050	mg/kg wet	0.05000		108	70-130	3	25	
1,4-Dioxane	0.860	0.100	mg/kg wet	1.000		86	70-130	1	20	
1-Chlorohexane	0.0475	0.0050	mg/kg wet	0.05000		95	70-130	3	25	
2,2-Dichloropropane	0.0462	0.0050	mg/kg wet	0.05000		92	70-130	2	25	
2-Butanone	0.252	0.0500	mg/kg wet	0.2500		101	70-130	2	25	
2-Chlorotoluene	0.0535	0.0050	mg/kg wet	0.05000		107	70-130	3	25	
2-Hexanone	0.233	0.0500	mg/kg wet	0.2500		93	70-130	1	25	
4-Chlorotoluene	0.0541	0.0050	mg/kg wet	0.05000		108	70-130	4	25	
4-Isopropyltoluene	0.0539	0.0050	mg/kg wet	0.05000		108	70-130	4	25	
4-Methyl-2-Pentanone	0.229	0.0500	mg/kg wet	0.2500		92	70-130	3	25	
Acetone	0.225	0.0500	mg/kg wet	0.2500		90	70-130	1	25	
Benzene	0.0506	0.0050	mg/kg wet	0.05000		101	70-130	2	25	
Bromobenzene	0.0509	0.0050	mg/kg wet	0.05000		102	70-130	2	25	
Bromochloromethane	0.0511	0.0050	mg/kg wet	0.05000		102	70-130	1	25	
Bromodichloromethane	0.0451	0.0050	mg/kg wet	0.05000		90	70-130	0.6	25	
Bromoform	0.0555	0.0050	mg/kg wet	0.05000		111	70-130	0.5	25	
Bromomethane	0.0411	0.0100	mg/kg wet	0.05000		82	70-130	0.7	25	
Carbon Disulfide	0.0535	0.0050	mg/kg wet	0.05000		107	70-130	2	25	
Carbon Tetrachloride	0.0468	0.0050	mg/kg wet	0.05000		94	70-130	2	25	
Chlorobenzene	0.0528	0.0050	mg/kg wet	0.05000		106	70-130	3	25	

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility

ESS Laboratory Work Order: 1709662

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
<b>5035/8260B Volatile Organic Compounds / Low Level</b>										
<b>Batch CI72557 - 5035</b>										
Chloroethane	0.0472	0.0100	mg/kg wet	0.05000		94	70-130	3	25	
Chloroform	0.0490	0.0050	mg/kg wet	0.05000		98	70-130	2	25	
Chloromethane	0.0433	0.0100	mg/kg wet	0.05000		87	70-130	2	25	
cis-1,2-Dichloroethene	0.0514	0.0050	mg/kg wet	0.05000		103	70-130	2	25	
cis-1,3-Dichloropropene	0.0491	0.0050	mg/kg wet	0.05000		98	70-130	1	25	
Dibromochloromethane	0.0483	0.0050	mg/kg wet	0.05000		97	70-130	0.9	25	
Dibromomethane	0.0490	0.0050	mg/kg wet	0.05000		98	70-130	0	25	
Dichlorodifluoromethane	0.0318	0.0100	mg/kg wet	0.05000		64	70-130	3	25	B-
Diethyl Ether	0.0500	0.0050	mg/kg wet	0.05000		100	70-130	0.7	25	
Di-isopropyl ether	0.0521	0.0050	mg/kg wet	0.05000		104	70-130	0.9	25	
Ethyl tertiary-butyl ether	0.0472	0.0050	mg/kg wet	0.05000		94	70-130	0.08	25	
Ethylbenzene	0.0540	0.0050	mg/kg wet	0.05000		108	70-130	3	25	
Hexachlorobutadiene	0.0491	0.0050	mg/kg wet	0.05000		98	70-130	6	25	
Isopropylbenzene	0.0480	0.0050	mg/kg wet	0.05000		96	70-130	3	25	
Methyl tert-Butyl Ether	0.0485	0.0050	mg/kg wet	0.05000		97	70-130	0.8	25	
Methylene Chloride	0.0484	0.0250	mg/kg wet	0.05000		97	70-130	2	25	
Naphthalene	0.0471	0.0050	mg/kg wet	0.05000		94	70-130	0.9	25	
n-Butylbenzene	0.0475	0.0050	mg/kg wet	0.05000		95	70-130	5	25	
n-Propylbenzene	0.0553	0.0050	mg/kg wet	0.05000		111	70-130	4	25	
sec-Butylbenzene	0.0542	0.0050	mg/kg wet	0.05000		108	70-130	4	25	
Styrene	0.0476	0.0050	mg/kg wet	0.05000		95	70-130	3	25	
tert-Butylbenzene	0.0499	0.0050	mg/kg wet	0.05000		100	70-130	3	25	
Tertiary-amyl methyl ether	0.0463	0.0050	mg/kg wet	0.05000		93	70-130	0.3	25	
Tetrachloroethene	0.0517	0.0050	mg/kg wet	0.05000		103	70-130	4	25	
Tetrahydrofuran	0.0468	0.0050	mg/kg wet	0.05000		94	70-130	3	25	
Toluene	0.0441	0.0050	mg/kg wet	0.05000		88	70-130	1	25	
trans-1,2-Dichloroethene	0.0535	0.0050	mg/kg wet	0.05000		107	70-130	2	25	
trans-1,3-Dichloropropene	0.0479	0.0050	mg/kg wet	0.05000		96	70-130	0.1	25	
Trichloroethene	0.0501	0.0050	mg/kg wet	0.05000		100	70-130	4	25	
Trichlorofluoromethane	0.0468	0.0050	mg/kg wet	0.05000		94	70-130	3	25	
Vinyl Acetate	0.0496	0.0050	mg/kg wet	0.05000		99	70-130	1	25	
Vinyl Chloride	0.0470	0.0100	mg/kg wet	0.05000		94	70-130	2	25	
Xylene O	0.0549	0.0050	mg/kg wet	0.05000		110	70-130	4	25	
Xylene P,M	0.108	0.0100	mg/kg wet	0.1000		108	70-130	5	25	
Xylenes (Total)	0.163	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	0.0472		mg/kg wet	0.05000		94	70-130			
Surrogate: 4-Bromofluorobenzene	0.0507		mg/kg wet	0.05000		101	70-130			
Surrogate: Dibromofluoromethane	0.0497		mg/kg wet	0.05000		99	70-130			
Surrogate: Toluene-d8	0.0521		mg/kg wet	0.05000		104	70-130			

<b>Batch CI72621 - 5035</b>										
<b>Blank</b>										
1,1,1,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,1-Trichloroethane	ND	0.0050	mg/kg wet							
1,1,2,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,2-Trichloroethane	ND	0.0050	mg/kg wet							



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidwater Facility

ESS Laboratory Work Order: 1709662

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CI72621 - 5035**

1,1-Dichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethene	ND	0.0050	mg/kg wet							
1,1-Dichloropropene	ND	0.0050	mg/kg wet							
1,2,3-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,3-Trichloropropane	ND	0.0050	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,4-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,2-Dibromo-3-Chloropropane	ND	0.0050	mg/kg wet							
1,2-Dibromoethane	ND	0.0050	mg/kg wet							
1,2-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,2-Dichloroethane	ND	0.0050	mg/kg wet							
1,2-Dichloropropane	ND	0.0050	mg/kg wet							
1,3,5-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,3-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,3-Dichloropropane	ND	0.0050	mg/kg wet							
1,4-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,4-Dioxane	ND	0.100	mg/kg wet							
1-Chlorohexane	ND	0.0050	mg/kg wet							
2,2-Dichloropropane	ND	0.0050	mg/kg wet							
2-Butanone	ND	0.0500	mg/kg wet							
2-Chlorotoluene	ND	0.0050	mg/kg wet							
2-Hexanone	ND	0.0500	mg/kg wet							
4-Chlorotoluene	ND	0.0050	mg/kg wet							
4-Isopropyltoluene	ND	0.0050	mg/kg wet							
4-Methyl-2-Pentanone	ND	0.0500	mg/kg wet							
Acetone	ND	0.0500	mg/kg wet							
Benzene	ND	0.0050	mg/kg wet							
Bromobenzene	ND	0.0050	mg/kg wet							
Bromochloromethane	ND	0.0050	mg/kg wet							
Bromodichloromethane	ND	0.0050	mg/kg wet							
Bromoform	ND	0.0050	mg/kg wet							
Bromomethane	ND	0.0100	mg/kg wet							
Carbon Disulfide	ND	0.0050	mg/kg wet							
Carbon Tetrachloride	ND	0.0050	mg/kg wet							
Chlorobenzene	ND	0.0050	mg/kg wet							
Chloroethane	ND	0.0100	mg/kg wet							
Chloroform	ND	0.0050	mg/kg wet							
Chloromethane	ND	0.0100	mg/kg wet							
cis-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
cis-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Dibromochloromethane	ND	0.0050	mg/kg wet							
Dibromomethane	ND	0.0050	mg/kg wet							
Dichlorodifluoromethane	ND	0.0100	mg/kg wet							
Diethyl Ether	ND	0.0050	mg/kg wet							
Di-isopropyl ether	ND	0.0050	mg/kg wet							



CERTIFICATE OF ANALYSIS

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ESS Laboratory Work Order: 1709662

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CI72621 - 5035**

Ethyl tertiary-butyl ether	ND	0.0050	mg/kg wet							
Ethylbenzene	ND	0.0050	mg/kg wet							
Hexachlorobutadiene	ND	0.0050	mg/kg wet							
Isopropylbenzene	ND	0.0050	mg/kg wet							
Methyl tert-Butyl Ether	ND	0.0050	mg/kg wet							
Methylene Chloride	ND	0.0250	mg/kg wet							
Naphthalene	ND	0.0050	mg/kg wet							
n-Butylbenzene	ND	0.0050	mg/kg wet							
n-Propylbenzene	ND	0.0050	mg/kg wet							
sec-Butylbenzene	ND	0.0050	mg/kg wet							
Styrene	ND	0.0050	mg/kg wet							
tert-Butylbenzene	ND	0.0050	mg/kg wet							
Tertiary-amyl methyl ether	ND	0.0050	mg/kg wet							
Tetrachloroethene	ND	0.0050	mg/kg wet							
Tetrahydrofuran	ND	0.0050	mg/kg wet							
Toluene	ND	0.0050	mg/kg wet							
trans-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
trans-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Trichloroethene	ND	0.0050	mg/kg wet							
Trichlorofluoromethane	ND	0.0050	mg/kg wet							
Vinyl Acetate	ND	0.0050	mg/kg wet							
Vinyl Chloride	ND	0.0100	mg/kg wet							
Xylene O	ND	0.0050	mg/kg wet							
Xylene P,M	ND	0.0100	mg/kg wet							
Xylenes (Total)	ND	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	0.0498		mg/kg wet	0.05000		100	70-130			
Surrogate: 4-Bromofluorobenzene	0.0530		mg/kg wet	0.05000		106	70-130			
Surrogate: Dibromofluoromethane	0.0500		mg/kg wet	0.05000		100	70-130			
Surrogate: Toluene-d8	0.0563		mg/kg wet	0.05000		113	70-130			

**LCS**

1,1,1,2-Tetrachloroethane	0.0476	0.0050	mg/kg wet	0.05000		95	70-130			
1,1,1-Trichloroethane	0.0477	0.0050	mg/kg wet	0.05000		95	70-130			
1,1,2,2-Tetrachloroethane	0.0453	0.0050	mg/kg wet	0.05000		91	70-130			
1,1,2-Trichloroethane	0.0387	0.0050	mg/kg wet	0.05000		77	70-130			
1,1-Dichloroethane	0.0427	0.0050	mg/kg wet	0.05000		85	70-130			
1,1-Dichloroethene	0.0486	0.0050	mg/kg wet	0.05000		97	70-130			
1,1-Dichloropropene	0.0475	0.0050	mg/kg wet	0.05000		95	70-130			
1,2,3-Trichlorobenzene	0.0449	0.0050	mg/kg wet	0.05000		90	70-130			
1,2,3-Trichloropropane	0.0422	0.0050	mg/kg wet	0.05000		84	70-130			
1,2,4-Trichlorobenzene	0.0449	0.0050	mg/kg wet	0.05000		90	70-130			
1,2,4-Trimethylbenzene	0.0458	0.0050	mg/kg wet	0.05000		92	70-130			
1,2-Dibromo-3-Chloropropane	0.0440	0.0050	mg/kg wet	0.05000		88	70-130			
1,2-Dibromoethane	0.0443	0.0050	mg/kg wet	0.05000		89	70-130			
1,2-Dichlorobenzene	0.0489	0.0050	mg/kg wet	0.05000		98	70-130			
1,2-Dichloroethane	0.0430	0.0050	mg/kg wet	0.05000		86	70-130			



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
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ESS Laboratory Work Order: 1709662

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CI72621 - 5035**

1,2-Dichloropropane	0.0432	0.0050	mg/kg wet	0.05000		86	70-130			
1,3,5-Trimethylbenzene	0.0459	0.0050	mg/kg wet	0.05000		92	70-130			
1,3-Dichlorobenzene	0.0479	0.0050	mg/kg wet	0.05000		96	70-130			
1,3-Dichloropropane	0.0503	0.0050	mg/kg wet	0.05000		101	70-130			
1,4-Dichlorobenzene	0.0486	0.0050	mg/kg wet	0.05000		97	70-130			
1,4-Dioxane	0.800	0.100	mg/kg wet	1.000		80	70-130			
1-Chlorohexane	0.0442	0.0050	mg/kg wet	0.05000		88	70-130			
2,2-Dichloropropane	0.0430	0.0050	mg/kg wet	0.05000		86	70-130			
2-Butanone	0.209	0.0500	mg/kg wet	0.2500		83	70-130			
2-Chlorotoluene	0.0486	0.0050	mg/kg wet	0.05000		97	70-130			
2-Hexanone	0.207	0.0500	mg/kg wet	0.2500		83	70-130			
4-Chlorotoluene	0.0496	0.0050	mg/kg wet	0.05000		99	70-130			
4-Isopropyltoluene	0.0502	0.0050	mg/kg wet	0.05000		100	70-130			
4-Methyl-2-Pentanone	0.183	0.0500	mg/kg wet	0.2500		73	70-130			
Acetone	0.186	0.0500	mg/kg wet	0.2500		75	70-130			
Benzene	0.0436	0.0050	mg/kg wet	0.05000		87	70-130			
Bromobenzene	0.0439	0.0050	mg/kg wet	0.05000		88	70-130			
Bromochloromethane	0.0427	0.0050	mg/kg wet	0.05000		85	70-130			
Bromodichloromethane	0.0388	0.0050	mg/kg wet	0.05000		78	70-130			
Bromoform	0.0495	0.0050	mg/kg wet	0.05000		99	70-130			
Bromomethane	0.0375	0.0100	mg/kg wet	0.05000		75	70-130			
Carbon Disulfide	0.0473	0.0050	mg/kg wet	0.05000		95	70-130			
Carbon Tetrachloride	0.0445	0.0050	mg/kg wet	0.05000		89	70-130			
Chlorobenzene	0.0487	0.0050	mg/kg wet	0.05000		97	70-130			
Chloroethane	0.0426	0.0100	mg/kg wet	0.05000		85	70-130			
Chloroform	0.0435	0.0050	mg/kg wet	0.05000		87	70-130			
Chloromethane	0.0418	0.0100	mg/kg wet	0.05000		84	70-130			
cis-1,2-Dichloroethene	0.0434	0.0050	mg/kg wet	0.05000		87	70-130			
cis-1,3-Dichloropropene	0.0412	0.0050	mg/kg wet	0.05000		82	70-130			
Dibromochloromethane	0.0440	0.0050	mg/kg wet	0.05000		88	70-130			
Dibromomethane	0.0413	0.0050	mg/kg wet	0.05000		83	70-130			
Dichlorodifluoromethane	0.0409	0.0100	mg/kg wet	0.05000		82	70-130			
Diethyl Ether	0.0402	0.0050	mg/kg wet	0.05000		80	70-130			
Di-isopropyl ether	0.0423	0.0050	mg/kg wet	0.05000		85	70-130			
Ethyl tertiary-butyl ether	0.0387	0.0050	mg/kg wet	0.05000		77	70-130			
Ethylbenzene	0.0511	0.0050	mg/kg wet	0.05000		102	70-130			
Hexachlorobutadiene	0.0442	0.0050	mg/kg wet	0.05000		88	70-130			
Isopropylbenzene	0.0442	0.0050	mg/kg wet	0.05000		88	70-130			
Methyl tert-Butyl Ether	0.0393	0.0050	mg/kg wet	0.05000		79	70-130			
Methylene Chloride	0.0408	0.0250	mg/kg wet	0.05000		82	70-130			
Naphthalene	0.0417	0.0050	mg/kg wet	0.05000		83	70-130			
n-Butylbenzene	0.0451	0.0050	mg/kg wet	0.05000		90	70-130			
n-Propylbenzene	0.0512	0.0050	mg/kg wet	0.05000		102	70-130			
sec-Butylbenzene	0.0502	0.0050	mg/kg wet	0.05000		100	70-130			
Styrene	0.0434	0.0050	mg/kg wet	0.05000		87	70-130			





CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
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ESS Laboratory Work Order: 1709662

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
<b>5035/8260B Volatile Organic Compounds / Low Level</b>										
<b>Batch CI72621 - 5035</b>										
tert-Butylbenzene	0.0458	0.0050	mg/kg wet	0.05000		92	70-130			
Tertiary-amyl methyl ether	0.0372	0.0050	mg/kg wet	0.05000		74	70-130			
Tetrachloroethene	0.0498	0.0050	mg/kg wet	0.05000		100	70-130			
Tetrahydrofuran	0.0366	0.0050	mg/kg wet	0.05000		73	70-130			
Toluene	0.0379	0.0050	mg/kg wet	0.05000		76	70-130			
trans-1,2-Dichloroethene	0.0464	0.0050	mg/kg wet	0.05000		93	70-130			
trans-1,3-Dichloropropene	0.0410	0.0050	mg/kg wet	0.05000		82	70-130			
Trichloroethene	0.0453	0.0050	mg/kg wet	0.05000		91	70-130			
Trichlorofluoromethane	0.0461	0.0050	mg/kg wet	0.05000		92	70-130			
Vinyl Acetate	0.0404	0.0050	mg/kg wet	0.05000		81	70-130			
Vinyl Chloride	0.0453	0.0100	mg/kg wet	0.05000		91	70-130			
Xylene O	0.0517	0.0050	mg/kg wet	0.05000		103	70-130			
Xylene P,M	0.103	0.0100	mg/kg wet	0.1000		103	70-130			
Xylenes (Total)	0.155	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	0.0460		mg/kg wet	0.05000		92	70-130			
Surrogate: 4-Bromofluorobenzene	0.0536		mg/kg wet	0.05000		107	70-130			
Surrogate: Dibromofluoromethane	0.0483		mg/kg wet	0.05000		97	70-130			
Surrogate: Toluene-d8	0.0549		mg/kg wet	0.05000		110	70-130			
<b>LCS Dup</b>										
1,1,1,2-Tetrachloroethane	0.0493	0.0050	mg/kg wet	0.05000		99	70-130	4	25	
1,1,1-Trichloroethane	0.0490	0.0050	mg/kg wet	0.05000		98	70-130	3	25	
1,1,2,2-Tetrachloroethane	0.0476	0.0050	mg/kg wet	0.05000		95	70-130	5	25	
1,1,2-Trichloroethane	0.0421	0.0050	mg/kg wet	0.05000		84	70-130	8	25	
1,1-Dichloroethane	0.0448	0.0050	mg/kg wet	0.05000		90	70-130	5	25	
1,1-Dichloroethene	0.0500	0.0050	mg/kg wet	0.05000		100	70-130	3	25	
1,1-Dichloropropene	0.0488	0.0050	mg/kg wet	0.05000		98	70-130	3	25	
1,2,3-Trichlorobenzene	0.0476	0.0050	mg/kg wet	0.05000		95	70-130	6	25	
1,2,3-Trichloropropane	0.0443	0.0050	mg/kg wet	0.05000		89	70-130	5	25	
1,2,4-Trichlorobenzene	0.0477	0.0050	mg/kg wet	0.05000		95	70-130	6	25	
1,2,4-Trimethylbenzene	0.0469	0.0050	mg/kg wet	0.05000		94	70-130	3	25	
1,2-Dibromo-3-Chloropropane	0.0459	0.0050	mg/kg wet	0.05000		92	70-130	4	25	
1,2-Dibromoethane	0.0475	0.0050	mg/kg wet	0.05000		95	70-130	7	25	
1,2-Dichlorobenzene	0.0510	0.0050	mg/kg wet	0.05000		102	70-130	4	25	
1,2-Dichloroethane	0.0468	0.0050	mg/kg wet	0.05000		94	70-130	8	25	
1,2-Dichloropropane	0.0465	0.0050	mg/kg wet	0.05000		93	70-130	7	25	
1,3,5-Trimethylbenzene	0.0464	0.0050	mg/kg wet	0.05000		93	70-130	1	25	
1,3-Dichlorobenzene	0.0493	0.0050	mg/kg wet	0.05000		99	70-130	3	25	
1,3-Dichloropropane	0.0536	0.0050	mg/kg wet	0.05000		107	70-130	6	25	
1,4-Dichlorobenzene	0.0509	0.0050	mg/kg wet	0.05000		102	70-130	5	25	
1,4-Dioxane	0.867	0.100	mg/kg wet	1.000		87	70-130	8	20	
1-Chlorohexane	0.0449	0.0050	mg/kg wet	0.05000		90	70-130	2	25	
2,2-Dichloropropane	0.0436	0.0050	mg/kg wet	0.05000		87	70-130	1	25	
2-Butanone	0.230	0.0500	mg/kg wet	0.2500		92	70-130	10	25	
2-Chlorotoluene	0.0494	0.0050	mg/kg wet	0.05000		99	70-130	2	25	
2-Hexanone	0.222	0.0500	mg/kg wet	0.2500		89	70-130	7	25	



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility

ESS Laboratory Work Order: 1709662

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
<b>5035/8260B Volatile Organic Compounds / Low Level</b>										
<b>Batch CI72621 - 5035</b>										
4-Chlorotoluene	0.0505	0.0050	mg/kg wet	0.05000		101	70-130	2	25	
4-Isopropyltoluene	0.0503	0.0050	mg/kg wet	0.05000		101	70-130	0.2	25	
4-Methyl-2-Pentanone	0.203	0.0500	mg/kg wet	0.2500		81	70-130	11	25	
Acetone	0.209	0.0500	mg/kg wet	0.2500		84	70-130	11	25	
Benzene	0.0458	0.0050	mg/kg wet	0.05000		92	70-130	5	25	
Bromobenzene	0.0463	0.0050	mg/kg wet	0.05000		93	70-130	5	25	
Bromochloromethane	0.0457	0.0050	mg/kg wet	0.05000		91	70-130	7	25	
Bromodichloromethane	0.0419	0.0050	mg/kg wet	0.05000		84	70-130	8	25	
Bromoform	0.0533	0.0050	mg/kg wet	0.05000		107	70-130	7	25	
Bromomethane	0.0428	0.0100	mg/kg wet	0.05000		86	70-130	13	25	
Carbon Disulfide	0.0483	0.0050	mg/kg wet	0.05000		97	70-130	2	25	
Carbon Tetrachloride	0.0454	0.0050	mg/kg wet	0.05000		91	70-130	2	25	
Chlorobenzene	0.0507	0.0050	mg/kg wet	0.05000		101	70-130	4	25	
Chloroethane	0.0435	0.0100	mg/kg wet	0.05000		87	70-130	2	25	
Chloroform	0.0458	0.0050	mg/kg wet	0.05000		92	70-130	5	25	
Chloromethane	0.0434	0.0100	mg/kg wet	0.05000		87	70-130	4	25	
cis-1,2-Dichloroethene	0.0462	0.0050	mg/kg wet	0.05000		92	70-130	6	25	
cis-1,3-Dichloropropene	0.0447	0.0050	mg/kg wet	0.05000		89	70-130	8	25	
Dibromochloromethane	0.0467	0.0050	mg/kg wet	0.05000		93	70-130	6	25	
Dibromomethane	0.0456	0.0050	mg/kg wet	0.05000		91	70-130	10	25	
Dichlorodifluoromethane	0.0415	0.0100	mg/kg wet	0.05000		83	70-130	2	25	
Diethyl Ether	0.0441	0.0050	mg/kg wet	0.05000		88	70-130	9	25	
Di-isopropyl ether	0.0463	0.0050	mg/kg wet	0.05000		93	70-130	9	25	
Ethyl tertiary-butyl ether	0.0424	0.0050	mg/kg wet	0.05000		85	70-130	9	25	
Ethylbenzene	0.0522	0.0050	mg/kg wet	0.05000		104	70-130	2	25	
Hexachlorobutadiene	0.0478	0.0050	mg/kg wet	0.05000		96	70-130	8	25	
Isopropylbenzene	0.0441	0.0050	mg/kg wet	0.05000		88	70-130	0.3	25	
Methyl tert-Butyl Ether	0.0432	0.0050	mg/kg wet	0.05000		86	70-130	9	25	
Methylene Chloride	0.0445	0.0250	mg/kg wet	0.05000		89	70-130	9	25	
Naphthalene	0.0449	0.0050	mg/kg wet	0.05000		90	70-130	7	25	
n-Butylbenzene	0.0456	0.0050	mg/kg wet	0.05000		91	70-130	0.9	25	
n-Propylbenzene	0.0513	0.0050	mg/kg wet	0.05000		103	70-130	0.2	25	
sec-Butylbenzene	0.0502	0.0050	mg/kg wet	0.05000		100	70-130	0.08	25	
Styrene	0.0456	0.0050	mg/kg wet	0.05000		91	70-130	5	25	
tert-Butylbenzene	0.0457	0.0050	mg/kg wet	0.05000		91	70-130	0.09	25	
Tertiary-amyl methyl ether	0.0412	0.0050	mg/kg wet	0.05000		82	70-130	10	25	
Tetrachloroethene	0.0499	0.0050	mg/kg wet	0.05000		100	70-130	0.2	25	
Tetrahydrofuran	0.0407	0.0050	mg/kg wet	0.05000		81	70-130	11	25	
Toluene	0.0396	0.0050	mg/kg wet	0.05000		79	70-130	4	25	
trans-1,2-Dichloroethene	0.0479	0.0050	mg/kg wet	0.05000		96	70-130	3	25	
trans-1,3-Dichloropropene	0.0446	0.0050	mg/kg wet	0.05000		89	70-130	8	25	
Trichloroethene	0.0467	0.0050	mg/kg wet	0.05000		93	70-130	3	25	
Trichlorofluoromethane	0.0462	0.0050	mg/kg wet	0.05000		92	70-130	0.3	25	
Vinyl Acetate	0.0448	0.0050	mg/kg wet	0.05000		90	70-130	10	25	
Vinyl Chloride	0.0461	0.0100	mg/kg wet	0.05000		92	70-130	2	25	



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility

ESS Laboratory Work Order: 1709662

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CI72621 - 5035**

Xylene O	0.0533	0.0050	mg/kg wet	0.05000		107	70-130	3	25	
Xylene P,M	0.104	0.0100	mg/kg wet	0.1000		104	70-130	1	25	
Xylenes (Total)	0.157	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	0.0469		mg/kg wet	0.05000		94	70-130			
Surrogate: 4-Bromofluorobenzene	0.0538		mg/kg wet	0.05000		108	70-130			
Surrogate: Dibromofluoromethane	0.0492		mg/kg wet	0.05000		98	70-130			
Surrogate: Toluene-d8	0.0545		mg/kg wet	0.05000		109	70-130			

8100M Total Petroleum Hydrocarbons

**Batch CI72519 - 3546**

<b>Blank</b>										
Decane (C10)	ND	0.2	mg/kg wet							
Docosane (C22)	ND	0.2	mg/kg wet							
Dodecane (C12)	ND	0.2	mg/kg wet							
Eicosane (C20)	ND	0.2	mg/kg wet							
Hexacosane (C26)	ND	0.2	mg/kg wet							
Hexadecane (C16)	ND	0.2	mg/kg wet							
Nonadecane (C19)	ND	0.2	mg/kg wet							
Nonane (C9)	ND	0.2	mg/kg wet							
Octacosane (C28)	ND	0.2	mg/kg wet							
Octadecane (C18)	ND	0.2	mg/kg wet							
Tetracosane (C24)	ND	0.2	mg/kg wet							
Tetradecane (C14)	ND	0.2	mg/kg wet							
Total Petroleum Hydrocarbons	ND	37.5	mg/kg wet							
Triacontane (C30)	ND	0.2	mg/kg wet							

Surrogate: O-Terphenyl	4.36		mg/kg wet	5.000		87	40-140			
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**LCS**

Decane (C10)	1.7	0.2	mg/kg wet	2.500		66	40-140			
Docosane (C22)	2.0	0.2	mg/kg wet	2.500		78	40-140			
Dodecane (C12)	1.6	0.2	mg/kg wet	2.500		64	40-140			
Eicosane (C20)	2.0	0.2	mg/kg wet	2.500		79	40-140			
Hexacosane (C26)	2.0	0.2	mg/kg wet	2.500		79	40-140			
Hexadecane (C16)	1.9	0.2	mg/kg wet	2.500		76	40-140			
Nonadecane (C19)	2.2	0.2	mg/kg wet	2.500		86	40-140			
Nonane (C9)	1.4	0.2	mg/kg wet	2.500		58	30-140			
Octacosane (C28)	2.0	0.2	mg/kg wet	2.500		79	40-140			
Octadecane (C18)	1.8	0.2	mg/kg wet	2.500		74	40-140			
Tetracosane (C24)	2.0	0.2	mg/kg wet	2.500		79	40-140			
Tetradecane (C14)	1.8	0.2	mg/kg wet	2.500		72	40-140			
Total Petroleum Hydrocarbons	25.9	37.5	mg/kg wet	35.00		74	40-140			
Triacontane (C30)	2.0	0.2	mg/kg wet	2.500		79	40-140			

Surrogate: O-Terphenyl	4.29		mg/kg wet	5.000		86	40-140			
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**LCS Dup**

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility

ESS Laboratory Work Order: 1709662

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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8100M Total Petroleum Hydrocarbons

**Batch CI72519 - 3546**

Decane (C10)	1.5	0.2	mg/kg wet	2.500		61	40-140	8	25	
Docosane (C22)	2.0	0.2	mg/kg wet	2.500		79	40-140	0.9	25	
Dodecane (C12)	1.5	0.2	mg/kg wet	2.500		60	40-140	6	25	
Eicosane (C20)	2.0	0.2	mg/kg wet	2.500		79	40-140	1	25	
Hexacosane (C26)	2.0	0.2	mg/kg wet	2.500		79	40-140	0.9	25	
Hexadecane (C16)	1.9	0.2	mg/kg wet	2.500		75	40-140	1	25	
Nonadecane (C19)	2.1	0.2	mg/kg wet	2.500		83	40-140	4	25	
Nonane (C9)	1.3	0.2	mg/kg wet	2.500		52	30-140	9	25	
Octacosane (C28)	2.0	0.2	mg/kg wet	2.500		80	40-140	0.5	25	
Octadecane (C18)	1.8	0.2	mg/kg wet	2.500		74	40-140	0.3	25	
Tetracosane (C24)	2.0	0.2	mg/kg wet	2.500		79	40-140	0.5	25	
Tetradecane (C14)	1.7	0.2	mg/kg wet	2.500		69	40-140	3	25	
Total Petroleum Hydrocarbons	25.5	37.5	mg/kg wet	35.00		73	40-140	1	25	
Triacotane (C30)	2.0	0.2	mg/kg wet	2.500		79	40-140	1	25	

Surrogate: *O*-Terphenyl 4.24 mg/kg wet 5.000 85 40-140

8270D Polynuclear Aromatic Hydrocarbons

**Batch CI72521 - 3546**

**Blank**

2-Methylnaphthalene	ND	0.333	mg/kg wet							
Acenaphthene	ND	0.333	mg/kg wet							
Acenaphthylene	ND	0.333	mg/kg wet							
Anthracene	ND	0.333	mg/kg wet							
Benzo(a)anthracene	ND	0.333	mg/kg wet							
Benzo(a)pyrene	ND	0.167	mg/kg wet							
Benzo(b)fluoranthene	ND	0.333	mg/kg wet							
Benzo(g,h,i)perylene	ND	0.333	mg/kg wet							
Benzo(k)fluoranthene	ND	0.333	mg/kg wet							
Chrysene	ND	0.167	mg/kg wet							
Dibenzo(a,h)Anthracene	ND	0.167	mg/kg wet							
Fluoranthene	ND	0.333	mg/kg wet							
Fluorene	ND	0.333	mg/kg wet							
Indeno(1,2,3-cd)Pyrene	ND	0.333	mg/kg wet							
Naphthalene	ND	0.333	mg/kg wet							
Phenanthrene	ND	0.333	mg/kg wet							
Pyrene	ND	0.333	mg/kg wet							
Surrogate: 1,2-Dichlorobenzene-d4	2.74		mg/kg wet	3.333		82	30-130			
Surrogate: 2-Fluorobiphenyl	2.94		mg/kg wet	3.333		88	30-130			
Surrogate: Nitrobenzene-d5	2.89		mg/kg wet	3.333		87	30-130			
Surrogate: p-Terphenyl-d14	3.19		mg/kg wet	3.333		96	30-130			

**LCS**

2-Methylnaphthalene	2.51	0.333	mg/kg wet	3.333		75	40-140			
Acenaphthene	2.50	0.333	mg/kg wet	3.333		75	40-140			
Acenaphthylene	2.71	0.333	mg/kg wet	3.333		81	40-140			



CERTIFICATE OF ANALYSIS

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ESS Laboratory Work Order: 1709662

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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8270D Polynuclear Aromatic Hydrocarbons

**Batch CI72521 - 3546**

Anthracene	2.79	0.333	mg/kg wet	3.333		84	40-140			
Benzo(a)anthracene	2.83	0.333	mg/kg wet	3.333		85	40-140			
Benzo(a)pyrene	2.82	0.167	mg/kg wet	3.333		85	40-140			
Benzo(b)fluoranthene	2.74	0.333	mg/kg wet	3.333		82	40-140			
Benzo(g,h,i)perylene	2.84	0.333	mg/kg wet	3.333		85	40-140			
Benzo(k)fluoranthene	3.06	0.333	mg/kg wet	3.333		92	40-140			
Chrysene	2.86	0.167	mg/kg wet	3.333		86	40-140			
Dibenzo(a,h)Anthracene	2.87	0.167	mg/kg wet	3.333		86	40-140			
Fluoranthene	2.63	0.333	mg/kg wet	3.333		79	40-140			
Fluorene	2.75	0.333	mg/kg wet	3.333		82	40-140			
Indeno(1,2,3-cd)Pyrene	2.85	0.333	mg/kg wet	3.333		86	40-140			
Naphthalene	2.57	0.333	mg/kg wet	3.333		77	40-140			
Phenanthrene	2.76	0.333	mg/kg wet	3.333		83	40-140			
Pyrene	2.91	0.333	mg/kg wet	3.333		87	40-140			
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	2.76		mg/kg wet	3.333		83	30-130			
<i>Surrogate: 2-Fluorobiphenyl</i>	2.94		mg/kg wet	3.333		88	30-130			
<i>Surrogate: Nitrobenzene-d5</i>	3.07		mg/kg wet	3.333		92	30-130			
<i>Surrogate: p-Terphenyl-d14</i>	3.61		mg/kg wet	3.333		108	30-130			

**LCS Dup**

2-Methylnaphthalene	2.01	0.333	mg/kg wet	3.333		60	40-140	22	30	
Acenaphthene	2.19	0.333	mg/kg wet	3.333		66	40-140	14	30	
Acenaphthylene	2.33	0.333	mg/kg wet	3.333		70	40-140	15	30	
Anthracene	2.51	0.333	mg/kg wet	3.333		75	40-140	10	30	
Benzo(a)anthracene	2.41	0.333	mg/kg wet	3.333		72	40-140	16	30	
Benzo(a)pyrene	2.67	0.167	mg/kg wet	3.333		80	40-140	6	30	
Benzo(b)fluoranthene	2.52	0.333	mg/kg wet	3.333		76	40-140	8	30	
Benzo(g,h,i)perylene	2.66	0.333	mg/kg wet	3.333		80	40-140	7	30	
Benzo(k)fluoranthene	2.68	0.333	mg/kg wet	3.333		80	40-140	13	30	
Chrysene	2.59	0.167	mg/kg wet	3.333		78	40-140	10	30	
Dibenzo(a,h)Anthracene	2.68	0.167	mg/kg wet	3.333		81	40-140	7	30	
Fluoranthene	2.54	0.333	mg/kg wet	3.333		76	40-140	3	30	
Fluorene	2.36	0.333	mg/kg wet	3.333		71	40-140	15	30	
Indeno(1,2,3-cd)Pyrene	2.63	0.333	mg/kg wet	3.333		79	40-140	8	30	
Naphthalene	2.11	0.333	mg/kg wet	3.333		63	40-140	20	30	
Phenanthrene	2.43	0.333	mg/kg wet	3.333		73	40-140	13	30	
Pyrene	2.62	0.333	mg/kg wet	3.333		79	40-140	10	30	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	2.33		mg/kg wet	3.333		70	30-130			
<i>Surrogate: 2-Fluorobiphenyl</i>	2.50		mg/kg wet	3.333		75	30-130			
<i>Surrogate: Nitrobenzene-d5</i>	2.44		mg/kg wet	3.333		73	30-130			
<i>Surrogate: p-Terphenyl-d14</i>	3.07		mg/kg wet	3.333		92	30-130			

Classical Chemistry

**Batch CI72818 - TCN Prep**

<b>Blank</b>										
Total Cyanide	ND	1.00	mg/kg wet							





*CERTIFICATE OF ANALYSIS*

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ESS Laboratory Work Order: 1709662

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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Classical Chemistry

**Batch CI72818 - TCN Prep**

**LCS**

Total Cyanide	4.96	1.00	mg/kg wet	5.015		99	90-110			
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**Reference**

Total Cyanide	50.7	4.97	mg/kg wet	48.40		105	36.1577-206.6 12			
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**Reference**

Total Cyanide	49.4	4.94	mg/kg wet	48.40		102	36.1577-206.6 12			
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## CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.

Client Project ID: Former Tidwater Facility

ESS Laboratory Work Order: 1709662

### Notes and Definitions

- U Analyte included in the analysis, but not detected
- R- Standard Reference Material is biased low (R-).
- D Diluted.
- B- Blank Spike recovery is below lower control limit (B-).
- ND Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference
- MDL Method Detection Limit
- MRL Method Reporting Limit
- LOD Limit of Detection
- LOQ Limit of Quantitation
- DL Detection Limit
- I/V Initial Volume
- F/V Final Volume
- § Subcontracted analysis; see attached report
- 1 Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
- 2 Range result excludes concentrations of target analytes eluting in that range.
- 3 Range result excludes the concentration of the C9-C10 aromatic range.
- Avg Results reported as a mathematical average.
- NR No Recovery
- [CALC] Calculated Analyte
- SUB Subcontracted analysis; see attached report
- RL Reporting Limit
- EDL Estimated Detection Limit



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidwater Facility

ESS Laboratory Work Order: 1709662

**ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS**

**ENVIRONMENTAL**

Rhode Island Potable and Non Potable Water: LAI00179

<http://www.health.ri.gov/find/labs/analytical/ESS.pdf>

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750

[http://www.ct.gov/dph/lib/dph/environmental\\_health/environmental\\_laboratories/pdf/OutofStateCommercialLaboratories.pdf](http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf)

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002

<http://www.maine.gov/dhhs/meecd/environmental-health/dwp/partners/labCert.shtml>

Massachusetts Potable and Non Potable Water: M-RI002

<http://public.dep.state.ma.us/Labcert/Labcert.aspx>

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424

<http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm>

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313

<http://www.wadsworth.org/labcert/elap/comm.html>

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006

[http://datamine2.state.nj.us/DEP\\_OPRA/OpraMain/pi\\_main?mode=pi\\_by\\_site&sort\\_order=PI\\_NAMEA&Select+a+Site:=58715](http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715)

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752

<http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx>

## ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Providence, RI - GZA/HDM  
 Shipped/Delivered Via: Client

ESS Project ID: 1709662  
 Date Received: 9/22/2017  
 Project Due Date: 9/29/2017  
 Days for Project: 5 Day

- |   |   |
|---|---|
| 1. Air bill manifest present? <input type="checkbox"/> No           | 6. Does COC match bottles? <input type="checkbox"/> Yes   |
| Air No.: <u>NA</u>  |   |
| 2. Were custody seals present? <input type="checkbox"/> No          | 7. Is COC complete and correct? <input type="checkbox"/> Yes                                      |
| 3. Is radiation count <100 CPM? <input type="checkbox"/> Yes        | 8. Were samples received intact? <input type="checkbox"/> Yes                                     |
| 4. Is a Cooler Present? <input type="checkbox"/> Yes                | 9. Were labs informed about <b>short holds &amp; rushes</b> ? Yes / No / NA                       |
| Temp: <u>5.6</u> Iced with: <u>Ice</u>                              |   |
| 5. Was COC signed and dated by client? <input type="checkbox"/> Yes | 10. Were any analyses received outside of hold time? Yes / <input checked="" type="checkbox"/> No |

- |   |   |
|---|---|
| 11. Any Subcontracting needed? Yes / <input checked="" type="checkbox"/> No | 12. Were VOAs received? <input checked="" type="checkbox"/> Yes / No                      |
| ESS Sample IDs: _____   | a. Air bubbles in aqueous VOAs? Yes / No  |
| Analysis: _____   | b. Does methanol cover soil completely? <input checked="" type="checkbox"/> Yes / No / NA |
| TAT: _____  |   |

13. Are the samples properly preserved?  Yes / No  
 a. If metals preserved upon receipt: Date: 9/20/17 Time: 1531 By: GA  
 b. Low Level VOA vials frozen: Date: \_\_\_\_\_ Time: \_\_\_\_\_ By: \_\_\_\_\_

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes /  No  
 a. Was there a need to contact the client? Yes / No  
 Who was contacted? \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_ By: \_\_\_\_\_

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
01	166458	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
01	166459	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
01	166476	Yes	NA	Yes	2 oz. Jar - Unpres	NP	
01	166493	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
01	166526	Yes	NA	Yes	VOA Vial - Other	Other	
01	166527	Yes	NA	Yes	VOA Vial - Other	Other	
02	166456	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
02	166457	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
02	166475	Yes	NA	Yes	2 oz. Jar - Unpres	NP	
02	166492	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
02	166524	Yes	NA	Yes	VOA Vial - Other	Other	
02	166525	Yes	NA	Yes	VOA Vial - Other	Other	
03	166454	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
03	166455	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
03	166474	Yes	NA	Yes	2 oz. Jar - Unpres	NP	
03	166491	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
03	166522	Yes	NA	Yes	VOA Vial - Other	Other	
03	166523	Yes	NA	Yes	VOA Vial - Other	Other	
04	166452	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
04	166453	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
04	166473	Yes	NA	Yes	2 oz. Jar - Unpres	NP	
04	166490	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
04	166520	Yes	NA	Yes	VOA Vial - Other	Other	
04	166521	Yes	NA	Yes	VOA Vial - Other	Other	

## ESS Laboratory Sample and Cooler Receipt Checklist

Client: <u>GZA - Providence, RI - GZA/HDM</u>					ESS Project ID: <u>1709662</u>	
					Date Received: <u>9/22/2017</u>	
05	166450	Yes	NA	Yes	4 oz. Jar - Unpres	NP
05	166451	Yes	NA	Yes	4 oz. Jar - Unpres	NP
05	166472	Yes	NA	Yes	2 oz. Jar - Unpres	NP
05	166489	Yes	NA	Yes	VOA Vial - Methanol	MeOH
05	166518	Yes	NA	Yes	VOA Vial - Other	Other
05	166519	Yes	NA	Yes	VOA Vial - Other	Other
06	166448	Yes	NA	Yes	4 oz. Jar - Unpres	NP
06	166449	Yes	NA	Yes	4 oz. Jar - Unpres	NP
06	166471	Yes	NA	Yes	2 oz. Jar - Unpres	NP
06	166488	Yes	NA	Yes	VOA Vial - Methanol	MeOH
06	166516	Yes	NA	Yes	VOA Vial - Other	Other
06	166517	Yes	NA	Yes	VOA Vial - Other	Other
07	166446	Yes	NA	Yes	4 oz. Jar - Unpres	NP
07	166447	Yes	NA	Yes	4 oz. Jar - Unpres	NP
07	166470	Yes	NA	Yes	2 oz. Jar - Unpres	NP
07	166487	Yes	NA	Yes	VOA Vial - Methanol	MeOH
07	166514	Yes	NA	Yes	VOA Vial - Other	Other
07	166515	Yes	NA	Yes	VOA Vial - Other	Other
08	166444	Yes	NA	Yes	4 oz. Jar - Unpres	NP
08	166445	Yes	NA	Yes	4 oz. Jar - Unpres	NP
08	166469	Yes	NA	Yes	2 oz. Jar - Unpres	NP
08	166486	Yes	NA	Yes	VOA Vial - Methanol	MeOH
08	166512	Yes	NA	Yes	VOA Vial - Other	Other
08	166513	Yes	NA	Yes	VOA Vial - Other	Other
09	166442	Yes	NA	Yes	4 oz. Jar - Unpres	NP
09	166443	Yes	NA	Yes	4 oz. Jar - Unpres	NP
09	166468	Yes	NA	Yes	2 oz. Jar - Unpres	NP
09	166485	Yes	NA	Yes	VOA Vial - Methanol	MeOH
09	166510	Yes	NA	Yes	VOA Vial - Other	Other
09	166511	Yes	NA	Yes	VOA Vial - Other	Other
10	166440	Yes	NA	Yes	4 oz. Jar - Unpres	NP
10	166441	Yes	NA	Yes	4 oz. Jar - Unpres	NP
10	166467	Yes	NA	Yes	2 oz. Jar - Unpres	NP
10	166484	Yes	NA	Yes	VOA Vial - Methanol	MeOH
10	166508	Yes	NA	Yes	VOA Vial - Other	Other
10	166509	Yes	NA	Yes	VOA Vial - Other	Other
11	166438	Yes	NA	Yes	4 oz. Jar - Unpres	NP
11	166439	Yes	NA	Yes	4 oz. Jar - Unpres	NP
11	166466	Yes	NA	Yes	2 oz. Jar - Unpres	NP
11	166483	Yes	NA	Yes	VOA Vial - Methanol	MeOH
11	166506	Yes	NA	Yes	VOA Vial - Other	Other
11	166507	Yes	NA	Yes	VOA Vial - Other	Other
12	166436	Yes	NA	Yes	4 oz. Jar - Unpres	NP
12	166437	Yes	NA	Yes	4 oz. Jar - Unpres	NP
12	166465	Yes	NA	Yes	2 oz. Jar - Unpres	NP
12	166482	Yes	NA	Yes	VOA Vial - Methanol	MeOH
12	166504	Yes	NA	Yes	VOA Vial - Other	Other
12	166505	Yes	NA	Yes	VOA Vial - Other	Other
13	166434	Yes	NA	Yes	4 oz. Jar - Unpres	NP
13	166435	Yes	NA	Yes	4 oz. Jar - Unpres	NP
13	166464	Yes	NA	Yes	2 oz. Jar - Unpres	NP
13	166481	Yes	NA	Yes	VOA Vial - Methanol	MeOH
13	166502	Yes	NA	Yes	VOA Vial - Other	Other
13	166503	Yes	NA	Yes	VOA Vial - Other	Other
14	166432	Yes	NA	Yes	4 oz. Jar - Unpres	NP
14	166433	Yes	NA	Yes	4 oz. Jar - Unpres	NP
14	166463	Yes	NA	Yes	2 oz. Jar - Unpres	NP
14	166480	Yes	NA	Yes	VOA Vial - Methanol	MeOH
14	166500	Yes	NA	Yes	VOA Vial - Other	Other
14	166501	Yes	NA	Yes	VOA Vial - Other	Other
15	166430	Yes	NA	Yes	4 oz. Jar - Unpres	NP
15	166431	Yes	NA	Yes	4 oz. Jar - Unpres	NP
15	166462	Yes	NA	Yes	2 oz. Jar - Unpres	NP
15	166479	Yes	NA	Yes	VOA Vial - Methanol	MeOH
15	166498	Yes	NA	Yes	VOA Vial - Other	Other
15	166499	Yes	NA	Yes	VOA Vial - Other	Other
16	166428	Yes	NA	Yes	4 oz. Jar - Unpres	NP
16	166429	Yes	NA	Yes	4 oz. Jar - Unpres	NP
16	166461	Yes	NA	Yes	2 oz. Jar - Unpres	NP
16	166478	Yes	NA	Yes	VOA Vial - Methanol	MeOH



## ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Providence, RI - GZA/HDM

ESS Project ID: 1709662

Date Received: 9/22/2017

16	166496	Yes	NA	Yes	VOA Vial - Other	Other
16	166497	Yes	NA	Yes	VOA Vial - Other	Other
17	166426	Yes	NA	Yes	4 oz. Jar - Unpres	NP
17	166427	Yes	NA	Yes	4 oz. Jar - Unpres	NP
17	166460	Yes	NA	Yes	2 oz. Jar - Unpres	NP
17	166477	Yes	NA	Yes	VOA Vial - Methanol	MeOH
17	166494	Yes	NA	Yes	VOA Vial - Other	Other
17	166495	Yes	NA	Yes	VOA Vial - Other	Other

2nd Review

Are barcode labels on correct containers?

(Yes / No)

Completed

By: 

Date & Time: 9/22/17 1511

Reviewed

By: 

Date & Time: 9/20/17 1549

Delivered

By: 

Date & Time: 9/22/17 1549







## CERTIFICATE OF ANALYSIS

Sarah McLeod  
GZA GeoEnvironmental, Inc.  
530 Broadway  
Providence, RI 02909

**RE: Former Tidewater Facility (05.0043654.00)**  
**ESS Laboratory Work Order Number: 1709754**

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.



Laurel Stoddard  
Laboratory Director

**REVIEWED**

By ESS Laboratory at 2:32 pm, Oct 05, 2017

**Analytical Summary**

The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1709754

**SAMPLE RECEIPT**

The following samples were received on September 26, 2017 for the analyses specified on the enclosed Chain of Custody Record.

**Low Level VOA vials were frozen by ESS Laboratory on September 26, 2107 at 1959.**

<u>Lab Number</u>	<u>Sample Name</u>	<u>Matrix</u>	<u>Analysis</u>
1709754-01	GZ-SS-518 (0-2')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1709754-02	GZ-SS-519 (0-2')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1709754-03	GZ-SS-520 (0-2')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1709754-04	GZ-SS-521 (0-2')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1709754-05	GZ-SS-522 (0-2')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1709754-06	GZ-SS-523 (0-2')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1709754-07	GZ-SS-524 (0-2')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1709754-08	GZ-SS-525 (0-2')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1709754-09	GZ-SS-526 (0-2')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1709754-10	GZ-SS-527 (0-2')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1709754-11	bd092617 (0-2')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1709754-12	GZ-SS-528 (0-2')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1709754-13	GZ-SS-529 (0-2')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1709754-14	GZ-SS-530 (0-2')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1709754-15	GZ-SS-531 (0-2')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1709754-16	GZ-SS-532 (0-2')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1709754-17	GZ-SS-533 (0-2')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014





# ESS Laboratory

*Division of Thielsch Engineering, Inc.*

# BAL Laboratory

*The Microbiology Division  
of Thielsch Engineering, Inc.*



## CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.

Client Project ID: Former Tidewater Facility

1709754-18

GZ-SS-534 (0-2')

Soil

ESS Laboratory Work Order: 1709754

6010C, 6020A, 7471B, 8100M, 8260B, 8260B Low,  
8270D, 9014

1709754-19

Trip Blank

Solid

8260B Low



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1709754

**PROJECT NARRATIVE**

**5035/8260B Volatile Organic Compounds / Low Level**  
 1709754-18 [Reported above the quantitation limit; Estimated value \(E\).](#)  
 Naphthalene

**5035/8260B Volatile Organic Compounds / Methanol**  
 C7J0036-CCV1 [Continuing Calibration %Diff/Drift is below control limit \(CD-\).](#)  
 1,4-Dioxane - Screen (39% @ 30%)

**8100M Total Petroleum Hydrocarbons**  
 1709754-18 [Surrogate recovery\(ies\) diluted below the MRL \(SD\).](#)  
 O-Terphenyl (% @ 40-140%)

**No other observations noted.**

**End of Project Narrative.**

**DATA USABILITY LINKS**

*To ensure you are viewing the most current version of the documents below, please clear your internet cookies for [www.ESSLaboratory.com](http://www.ESSLaboratory.com). Consult your IT Support personnel for information on how to clear your internet cookies.*

- [Definitions of Quality Control Parameters](#)
- [Semivolatile Organics Internal Standard Information](#)
- [Semivolatile Organics Surrogate Information](#)
- [Volatile Organics Internal Standard Information](#)
- [Volatile Organics Surrogate Information](#)
- [EPH and VPH Alkane Lists](#)



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1709754

**CURRENT SW-846 METHODOLOGY VERSIONS**

**Analytical Methods**

- 1010A - Flashpoint
- 6010C - ICP
- 6020A - ICP MS
- 7010 - Graphite Furnace
- 7196A - Hexavalent Chromium
- 7470A - Aqueous Mercury
- 7471B - Solid Mercury
- 8011 - EDB/DBCP/TCP
- 8015C - GRO/DRO
- 8081B - Pesticides
- 8082A - PCB
- 8100M - TPH
- 8151A - Herbicides
- 8260B - VOA
- 8270D - SVOA
- 8270D SIM - SVOA Low Level
- 9014 - Cyanide
- 9038 - Sulfate
- 9040C - Aqueous pH
- 9045D - Solid pH (Corrosivity)
- 9050A - Specific Conductance
- 9056A - Anions (IC)
- 9060A - TOC
- 9095B - Paint Filter
- MADEP 04-1.1 - EPH / VPH

**Prep Methods**

- 3005A - Aqueous ICP Digestion
- 3020A - Aqueous Graphite Furnace / ICP MS Digestion
- 3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
- 3060A - Solid Hexavalent Chromium Digestion
- 3510C - Separatory Funnel Extraction
- 3520C - Liquid / Liquid Extraction
- 3540C - Manual Soxhlet Extraction
- 3541 - Automated Soxhlet Extraction
- 3546 - Microwave Extraction
- 3580A - Waste Dilution
- 5030B - Aqueous Purge and Trap
- 5030C - Aqueous Purge and Trap
- 5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-518 (0-2')  
 Date Sampled: 09/26/17 08:15  
 Percent Solids: 73

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-01  
 Sample Matrix: Soil  
 Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	24.0 (2.52)		6020A		20	NAR	09/29/17 12:49	2.17	100	CI72838
Arsenic	4.11 (3.15)		6010C		1	KJK	09/30/17 0:34	2.17	100	CI72838
Beryllium	0.24 (0.14)		6010C		1	KJK	09/30/17 0:34	2.17	100	CI72838
Cadmium	1.06 (0.63)		6010C		1	KJK	09/30/17 0:34	2.17	100	CI72838
Chromium	26.1 (1.26)		6010C		1	KJK	09/30/17 0:34	2.17	100	CI72838
Copper	76.5 (3.15)		6010C		1	KJK	09/30/17 0:34	2.17	100	CI72838
Lead	4130 (62.9)		6010C		10	KJK	09/30/17 20:11	2.17	100	CI72838
Mercury	0.704 (0.043)		7471B		1	MJV	09/29/17 12:12	0.63	40	CI72839
Nickel	14.1 (3.15)		6010C		1	KJK	09/30/17 0:34	2.17	100	CI72838
Selenium	ND (2.52)		6020A		20	NAR	09/29/17 12:49	2.17	100	CI72838
Silver	ND (0.63)		6010C		1	KJK	09/30/17 0:34	2.17	100	CI72838
Thallium	ND (2.52)		6020A		20	NAR	09/29/17 12:49	2.17	100	CI72838
Zinc	348 (3.15)		6010C		1	KJK	09/30/17 0:34	2.17	100	CI72838



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-518 (0-2')  
Date Sampled: 09/26/17 08:15  
Percent Solids: 73  
Initial Volume: 6  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1709754  
ESS Laboratory Sample ID: 1709754-01  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0057)		8260B Low		1	09/27/17 16:08	C7I0440	CI72730
1,1,1-Trichloroethane	ND (0.0057)		8260B Low		1	09/27/17 16:08	C7I0440	CI72730
1,1,2,2-Tetrachloroethane	ND (0.0057)		8260B Low		1	09/27/17 16:08	C7I0440	CI72730
1,1,2-Trichloroethane	ND (0.0057)		8260B Low		1	09/27/17 16:08	C7I0440	CI72730
1,1-Dichloroethane	ND (0.0057)		8260B Low		1	09/27/17 16:08	C7I0440	CI72730
1,1-Dichloroethene	ND (0.0057)		8260B Low		1	09/27/17 16:08	C7I0440	CI72730
1,1-Dichloropropene	ND (0.0057)		8260B Low		1	09/27/17 16:08	C7I0440	CI72730
1,2,3-Trichlorobenzene	ND (0.0057)		8260B Low		1	09/27/17 16:08	C7I0440	CI72730
1,2,3-Trichloropropane	ND (0.0057)		8260B Low		1	09/27/17 16:08	C7I0440	CI72730
1,2,4-Trichlorobenzene	ND (0.0057)		8260B Low		1	09/27/17 16:08	C7I0440	CI72730
1,2,4-Trimethylbenzene	ND (0.0057)		8260B Low		1	09/27/17 16:08	C7I0440	CI72730
1,2-Dibromo-3-Chloropropane	ND (0.0057)		8260B Low		1	09/27/17 16:08	C7I0440	CI72730
1,2-Dibromoethane	ND (0.0057)		8260B Low		1	09/27/17 16:08	C7I0440	CI72730
1,2-Dichlorobenzene	ND (0.0057)		8260B Low		1	09/27/17 16:08	C7I0440	CI72730
1,2-Dichloroethane	ND (0.0057)		8260B Low		1	09/27/17 16:08	C7I0440	CI72730
1,2-Dichloropropane	ND (0.0057)		8260B Low		1	09/27/17 16:08	C7I0440	CI72730
1,3,5-Trimethylbenzene	ND (0.0057)		8260B Low		1	09/27/17 16:08	C7I0440	CI72730
1,3-Dichlorobenzene	ND (0.0057)		8260B Low		1	09/27/17 16:08	C7I0440	CI72730
1,3-Dichloropropane	ND (0.0057)		8260B Low		1	09/27/17 16:08	C7I0440	CI72730
1,4-Dichlorobenzene	ND (0.0057)		8260B Low		1	09/27/17 16:08	C7I0440	CI72730
1,4-Dioxane	ND (0.114)		8260B Low		1	09/27/17 16:08	C7I0440	CI72730
1-Chlorohexane	ND (0.0057)		8260B Low		1	09/27/17 16:08	C7I0440	CI72730
2,2-Dichloropropane	ND (0.0057)		8260B Low		1	09/27/17 16:08	C7I0440	CI72730
2-Butanone	ND (0.0569)		8260B Low		1	09/27/17 16:08	C7I0440	CI72730
2-Chlorotoluene	ND (0.0057)		8260B Low		1	09/27/17 16:08	C7I0440	CI72730
2-Hexanone	ND (0.0569)		8260B Low		1	09/27/17 16:08	C7I0440	CI72730
4-Chlorotoluene	ND (0.0057)		8260B Low		1	09/27/17 16:08	C7I0440	CI72730
4-Isopropyltoluene	ND (0.0057)		8260B Low		1	09/27/17 16:08	C7I0440	CI72730
4-Methyl-2-Pentanone	ND (0.0569)		8260B Low		1	09/27/17 16:08	C7I0440	CI72730
Acetone	ND (0.0569)		8260B Low		1	09/27/17 16:08	C7I0440	CI72730
Benzene	ND (0.0057)		8260B Low		1	09/27/17 16:08	C7I0440	CI72730
Bromobenzene	ND (0.0057)		8260B Low		1	09/27/17 16:08	C7I0440	CI72730





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-518 (0-2')  
Date Sampled: 09/26/17 08:15  
Percent Solids: 73  
Initial Volume: 6  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1709754  
ESS Laboratory Sample ID: 1709754-01  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0057)		8260B Low		1	09/27/17 16:08	C7I0440	CI72730
Bromodichloromethane	ND (0.0057)		8260B Low		1	09/27/17 16:08	C7I0440	CI72730
Bromoform	ND (0.0057)		8260B Low		1	09/27/17 16:08	C7I0440	CI72730
Bromomethane	ND (0.0114)		8260B Low		1	09/27/17 16:08	C7I0440	CI72730
Carbon Disulfide	ND (0.0057)		8260B Low		1	09/27/17 16:08	C7I0440	CI72730
Carbon Tetrachloride	ND (0.0057)		8260B Low		1	09/27/17 16:08	C7I0440	CI72730
Chlorobenzene	ND (0.0057)		8260B Low		1	09/27/17 16:08	C7I0440	CI72730
Chloroethane	ND (0.0114)		8260B Low		1	09/27/17 16:08	C7I0440	CI72730
Chloroform	ND (0.0057)		8260B Low		1	09/27/17 16:08	C7I0440	CI72730
Chloromethane	ND (0.0114)		8260B Low		1	09/27/17 16:08	C7I0440	CI72730
cis-1,2-Dichloroethene	ND (0.0057)		8260B Low		1	09/27/17 16:08	C7I0440	CI72730
cis-1,3-Dichloropropene	ND (0.0057)		8260B Low		1	09/27/17 16:08	C7I0440	CI72730
Dibromochloromethane	ND (0.0057)		8260B Low		1	09/27/17 16:08	C7I0440	CI72730
Dibromomethane	ND (0.0057)		8260B Low		1	09/27/17 16:08	C7I0440	CI72730
Dichlorodifluoromethane	ND (0.0114)		8260B Low		1	09/27/17 16:08	C7I0440	CI72730
Diethyl Ether	ND (0.0057)		8260B Low		1	09/27/17 16:08	C7I0440	CI72730
Di-isopropyl ether	ND (0.0057)		8260B Low		1	09/27/17 16:08	C7I0440	CI72730
Ethyl tertiary-butyl ether	ND (0.0057)		8260B Low		1	09/27/17 16:08	C7I0440	CI72730
Ethylbenzene	ND (0.0057)		8260B Low		1	09/27/17 16:08	C7I0440	CI72730
Hexachlorobutadiene	ND (0.0057)		8260B Low		1	09/27/17 16:08	C7I0440	CI72730
Isopropylbenzene	ND (0.0057)		8260B Low		1	09/27/17 16:08	C7I0440	CI72730
Methyl tert-Butyl Ether	ND (0.0057)		8260B Low		1	09/27/17 16:08	C7I0440	CI72730
Methylene Chloride	ND (0.0284)		8260B Low		1	09/27/17 16:08	C7I0440	CI72730
Naphthalene	ND (0.0057)		8260B Low		1	09/27/17 16:08	C7I0440	CI72730
n-Butylbenzene	ND (0.0057)		8260B Low		1	09/27/17 16:08	C7I0440	CI72730
n-Propylbenzene	ND (0.0057)		8260B Low		1	09/27/17 16:08	C7I0440	CI72730
sec-Butylbenzene	ND (0.0057)		8260B Low		1	09/27/17 16:08	C7I0440	CI72730
Styrene	ND (0.0057)		8260B Low		1	09/27/17 16:08	C7I0440	CI72730
tert-Butylbenzene	ND (0.0057)		8260B Low		1	09/27/17 16:08	C7I0440	CI72730
Tertiary-amyl methyl ether	ND (0.0057)		8260B Low		1	09/27/17 16:08	C7I0440	CI72730
Tetrachloroethene	ND (0.0057)		8260B Low		1	09/27/17 16:08	C7I0440	CI72730
Tetrahydrofuran	ND (0.0057)		8260B Low		1	09/27/17 16:08	C7I0440	CI72730



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-518 (0-2')  
 Date Sampled: 09/26/17 08:15  
 Percent Solids: 73  
 Initial Volume: 6  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-01  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0057)		8260B Low		1	09/27/17 16:08	C7I0440	CI72730
trans-1,2-Dichloroethene	ND (0.0057)		8260B Low		1	09/27/17 16:08	C7I0440	CI72730
trans-1,3-Dichloropropene	ND (0.0057)		8260B Low		1	09/27/17 16:08	C7I0440	CI72730
Trichloroethene	ND (0.0057)		8260B Low		1	09/27/17 16:08	C7I0440	CI72730
Trichlorofluoromethane	ND (0.0057)		8260B Low		1	09/27/17 16:08	C7I0440	CI72730
Vinyl Acetate	ND (0.0057)		8260B Low		1	09/27/17 16:08	C7I0440	CI72730
Vinyl Chloride	ND (0.0114)		8260B Low		1	09/27/17 16:08	C7I0440	CI72730
Xylene O	ND (0.0057)		8260B Low		1	09/27/17 16:08	C7I0440	CI72730
Xylene P,M	ND (0.0114)		8260B Low		1	09/27/17 16:08	C7I0440	CI72730
Xylenes (Total)	ND (0.0114)		8260B Low		1	09/27/17 16:08		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	111 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	101 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	105 %		70-130
<i>Surrogate: Toluene-d8</i>	117 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-518 (0-2')  
 Date Sampled: 09/26/17 08:15  
 Percent Solids: 73  
 Initial Volume: 20.3  
 Final Volume: 1  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-01  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: SMR  
 Prepared: 9/27/17 12:54

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	1520 (252)		8100M		5	09/28/17 16:27	C710445	C172712
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		68 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-518 (0-2')  
Date Sampled: 09/26/17 08:15  
Percent Solids: 73  
Initial Volume: 14  
Final Volume: 0.5  
Extraction Method: 3546

ESS Laboratory Work Order: 1709754  
ESS Laboratory Sample ID: 1709754-01  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: TJ  
Prepared: 9/27/17 10:25

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.974)		8270D		2	09/28/17 21:15	C7I0459	CI72609
Acenaphthene	ND (0.974)		8270D		2	09/28/17 21:15	C7I0459	CI72609
Acenaphthylene	<b>2.06</b> (0.974)		8270D		2	09/28/17 21:15	C7I0459	CI72609
Anthracene	<b>1.43</b> (0.974)		8270D		2	09/28/17 21:15	C7I0459	CI72609
Benzo(a)anthracene	<b>6.99</b> (0.489)		8270D		2	09/28/17 21:15	C7I0459	CI72609
Benzo(a)pyrene	<b>6.89</b> (0.243)		8270D		2	09/28/17 21:15	C7I0459	CI72609
Benzo(b)fluoranthene	<b>8.30</b> (0.489)		8270D		2	09/28/17 21:15	C7I0459	CI72609
Benzo(g,h,i)perylene	<b>5.36</b> (0.489)		8270D		2	09/28/17 21:15	C7I0459	CI72609
Benzo(k)fluoranthene	<b>3.85</b> (0.489)		8270D		2	09/28/17 21:15	C7I0459	CI72609
Chrysene	<b>6.20</b> (0.243)		8270D		2	09/28/17 21:15	C7I0459	CI72609
Dibenzo(a,h)Anthracene	<b>2.24</b> (0.243)		8270D		2	09/28/17 21:15	C7I0459	CI72609
Fluoranthene	<b>10.1</b> (0.974)		8270D		2	09/28/17 21:15	C7I0459	CI72609
Fluorene	ND (0.974)		8270D		2	09/28/17 21:15	C7I0459	CI72609
Indeno(1,2,3-cd)Pyrene	<b>4.79</b> (0.489)		8270D		2	09/28/17 21:15	C7I0459	CI72609
Naphthalene	ND (0.489)		8270D		2	09/28/17 21:15	C7I0459	CI72609
Phenanthrene	<b>3.66</b> (0.974)		8270D		2	09/28/17 21:15	C7I0459	CI72609
Pyrene	<b>9.99</b> (0.974)		8270D		2	09/28/17 21:15	C7I0459	CI72609

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	49 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	52 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	48 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	60 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-518 (0-2')  
Date Sampled: 09/26/17 08:15  
Percent Solids: 73

ESS Laboratory Work Order: 1709754  
ESS Laboratory Sample ID: 1709754-01  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	61.7 (13.2)		9014		10	EEM	09/29/17 13:00	mg/kg dry	CI72918





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-519 (0-2')  
 Date Sampled: 09/26/17 08:25  
 Percent Solids: 93

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-02  
 Sample Matrix: Soil  
 Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (2.14)		6020A		20	NAR	09/29/17 12:55	2.02	100	CI72838
<b>Arsenic</b>	<b>4.26</b> (2.67)		6010C		1	KJK	09/30/17 0:38	2.02	100	CI72838
<b>Beryllium</b>	<b>0.27</b> (0.12)		6010C		1	KJK	09/30/17 0:38	2.02	100	CI72838
Cadmium	ND (0.53)		6010C		1	KJK	09/30/17 0:38	2.02	100	CI72838
<b>Chromium</b>	<b>4.29</b> (1.07)		6010C		1	KJK	09/30/17 0:38	2.02	100	CI72838
<b>Copper</b>	<b>22.2</b> (2.67)		6010C		1	KJK	09/30/17 0:38	2.02	100	CI72838
<b>Lead</b>	<b>49.8</b> (5.35)		6010C		1	KJK	09/30/17 0:38	2.02	100	CI72838
<b>Mercury</b>	<b>0.040</b> (0.030)		7471B		1	MJV	09/29/17 12:26	0.72	40	CI72839
<b>Nickel</b>	<b>6.91</b> (2.67)		6010C		1	KJK	09/30/17 0:38	2.02	100	CI72838
Selenium	ND (2.14)		6020A		20	NAR	09/29/17 12:55	2.02	100	CI72838
Silver	ND (0.53)		6010C		1	KJK	09/30/17 0:38	2.02	100	CI72838
Thallium	ND (2.14)		6020A		20	NAR	09/29/17 12:55	2.02	100	CI72838
<b>Zinc</b>	<b>41.9</b> (2.67)		6010C		1	KJK	09/30/17 0:38	2.02	100	CI72838



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-519 (0-2')  
 Date Sampled: 09/26/17 08:25  
 Percent Solids: 93  
 Initial Volume: 8.7  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-02  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0031)		8260B Low		1	09/27/17 16:33	C7I0440	CI72730
1,1,1-Trichloroethane	ND (0.0031)		8260B Low		1	09/27/17 16:33	C7I0440	CI72730
1,1,2,2-Tetrachloroethane	ND (0.0031)		8260B Low		1	09/27/17 16:33	C7I0440	CI72730
1,1,2-Trichloroethane	ND (0.0031)		8260B Low		1	09/27/17 16:33	C7I0440	CI72730
1,1-Dichloroethane	ND (0.0031)		8260B Low		1	09/27/17 16:33	C7I0440	CI72730
1,1-Dichloroethene	ND (0.0031)		8260B Low		1	09/27/17 16:33	C7I0440	CI72730
1,1-Dichloropropene	ND (0.0031)		8260B Low		1	09/27/17 16:33	C7I0440	CI72730
1,2,3-Trichlorobenzene	ND (0.0031)		8260B Low		1	09/27/17 16:33	C7I0440	CI72730
1,2,3-Trichloropropane	ND (0.0031)		8260B Low		1	09/27/17 16:33	C7I0440	CI72730
1,2,4-Trichlorobenzene	ND (0.0031)		8260B Low		1	09/27/17 16:33	C7I0440	CI72730
1,2,4-Trimethylbenzene	ND (0.0031)		8260B Low		1	09/27/17 16:33	C7I0440	CI72730
1,2-Dibromo-3-Chloropropane	ND (0.0031)		8260B Low		1	09/27/17 16:33	C7I0440	CI72730
1,2-Dibromoethane	ND (0.0031)		8260B Low		1	09/27/17 16:33	C7I0440	CI72730
1,2-Dichlorobenzene	ND (0.0031)		8260B Low		1	09/27/17 16:33	C7I0440	CI72730
1,2-Dichloroethane	ND (0.0031)		8260B Low		1	09/27/17 16:33	C7I0440	CI72730
1,2-Dichloropropane	ND (0.0031)		8260B Low		1	09/27/17 16:33	C7I0440	CI72730
1,3,5-Trimethylbenzene	ND (0.0031)		8260B Low		1	09/27/17 16:33	C7I0440	CI72730
1,3-Dichlorobenzene	ND (0.0031)		8260B Low		1	09/27/17 16:33	C7I0440	CI72730
1,3-Dichloropropane	ND (0.0031)		8260B Low		1	09/27/17 16:33	C7I0440	CI72730
1,4-Dichlorobenzene	ND (0.0031)		8260B Low		1	09/27/17 16:33	C7I0440	CI72730
1,4-Dioxane	ND (0.0621)		8260B Low		1	09/27/17 16:33	C7I0440	CI72730
1-Chlorohexane	ND (0.0031)		8260B Low		1	09/27/17 16:33	C7I0440	CI72730
2,2-Dichloropropane	ND (0.0031)		8260B Low		1	09/27/17 16:33	C7I0440	CI72730
2-Butanone	ND (0.0311)		8260B Low		1	09/27/17 16:33	C7I0440	CI72730
2-Chlorotoluene	ND (0.0031)		8260B Low		1	09/27/17 16:33	C7I0440	CI72730
2-Hexanone	ND (0.0311)		8260B Low		1	09/27/17 16:33	C7I0440	CI72730
4-Chlorotoluene	ND (0.0031)		8260B Low		1	09/27/17 16:33	C7I0440	CI72730
4-Isopropyltoluene	ND (0.0031)		8260B Low		1	09/27/17 16:33	C7I0440	CI72730
4-Methyl-2-Pentanone	ND (0.0311)		8260B Low		1	09/27/17 16:33	C7I0440	CI72730
Acetone	ND (0.0311)		8260B Low		1	09/27/17 16:33	C7I0440	CI72730
Benzene	ND (0.0031)		8260B Low		1	09/27/17 16:33	C7I0440	CI72730
Bromobenzene	ND (0.0031)		8260B Low		1	09/27/17 16:33	C7I0440	CI72730



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-519 (0-2')  
 Date Sampled: 09/26/17 08:25  
 Percent Solids: 93  
 Initial Volume: 8.7  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-02  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0031)		8260B Low		1	09/27/17 16:33	C7I0440	CI72730
Bromodichloromethane	ND (0.0031)		8260B Low		1	09/27/17 16:33	C7I0440	CI72730
Bromoform	ND (0.0031)		8260B Low		1	09/27/17 16:33	C7I0440	CI72730
Bromomethane	ND (0.0062)		8260B Low		1	09/27/17 16:33	C7I0440	CI72730
Carbon Disulfide	ND (0.0031)		8260B Low		1	09/27/17 16:33	C7I0440	CI72730
Carbon Tetrachloride	ND (0.0031)		8260B Low		1	09/27/17 16:33	C7I0440	CI72730
Chlorobenzene	ND (0.0031)		8260B Low		1	09/27/17 16:33	C7I0440	CI72730
Chloroethane	ND (0.0062)		8260B Low		1	09/27/17 16:33	C7I0440	CI72730
Chloroform	ND (0.0031)		8260B Low		1	09/27/17 16:33	C7I0440	CI72730
Chloromethane	ND (0.0062)		8260B Low		1	09/27/17 16:33	C7I0440	CI72730
cis-1,2-Dichloroethene	ND (0.0031)		8260B Low		1	09/27/17 16:33	C7I0440	CI72730
cis-1,3-Dichloropropene	ND (0.0031)		8260B Low		1	09/27/17 16:33	C7I0440	CI72730
Dibromochloromethane	ND (0.0031)		8260B Low		1	09/27/17 16:33	C7I0440	CI72730
Dibromomethane	ND (0.0031)		8260B Low		1	09/27/17 16:33	C7I0440	CI72730
Dichlorodifluoromethane	ND (0.0062)		8260B Low		1	09/27/17 16:33	C7I0440	CI72730
Diethyl Ether	ND (0.0031)		8260B Low		1	09/27/17 16:33	C7I0440	CI72730
Di-isopropyl ether	ND (0.0031)		8260B Low		1	09/27/17 16:33	C7I0440	CI72730
Ethyl tertiary-butyl ether	ND (0.0031)		8260B Low		1	09/27/17 16:33	C7I0440	CI72730
Ethylbenzene	ND (0.0031)		8260B Low		1	09/27/17 16:33	C7I0440	CI72730
Hexachlorobutadiene	ND (0.0031)		8260B Low		1	09/27/17 16:33	C7I0440	CI72730
Isopropylbenzene	ND (0.0031)		8260B Low		1	09/27/17 16:33	C7I0440	CI72730
Methyl tert-Butyl Ether	ND (0.0031)		8260B Low		1	09/27/17 16:33	C7I0440	CI72730
Methylene Chloride	ND (0.0155)		8260B Low		1	09/27/17 16:33	C7I0440	CI72730
Naphthalene	ND (0.0031)		8260B Low		1	09/27/17 16:33	C7I0440	CI72730
n-Butylbenzene	ND (0.0031)		8260B Low		1	09/27/17 16:33	C7I0440	CI72730
n-Propylbenzene	ND (0.0031)		8260B Low		1	09/27/17 16:33	C7I0440	CI72730
sec-Butylbenzene	ND (0.0031)		8260B Low		1	09/27/17 16:33	C7I0440	CI72730
Styrene	ND (0.0031)		8260B Low		1	09/27/17 16:33	C7I0440	CI72730
tert-Butylbenzene	ND (0.0031)		8260B Low		1	09/27/17 16:33	C7I0440	CI72730
Tertiary-amyl methyl ether	ND (0.0031)		8260B Low		1	09/27/17 16:33	C7I0440	CI72730
Tetrachloroethene	ND (0.0031)		8260B Low		1	09/27/17 16:33	C7I0440	CI72730
Tetrahydrofuran	ND (0.0031)		8260B Low		1	09/27/17 16:33	C7I0440	CI72730



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-519 (0-2')  
 Date Sampled: 09/26/17 08:25  
 Percent Solids: 93  
 Initial Volume: 8.7  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-02  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0031)		8260B Low		1	09/27/17 16:33	C7I0440	CI72730
trans-1,2-Dichloroethene	ND (0.0031)		8260B Low		1	09/27/17 16:33	C7I0440	CI72730
trans-1,3-Dichloropropene	ND (0.0031)		8260B Low		1	09/27/17 16:33	C7I0440	CI72730
Trichloroethene	ND (0.0031)		8260B Low		1	09/27/17 16:33	C7I0440	CI72730
Trichlorofluoromethane	ND (0.0031)		8260B Low		1	09/27/17 16:33	C7I0440	CI72730
Vinyl Acetate	ND (0.0031)		8260B Low		1	09/27/17 16:33	C7I0440	CI72730
Vinyl Chloride	ND (0.0062)		8260B Low		1	09/27/17 16:33	C7I0440	CI72730
Xylene O	ND (0.0031)		8260B Low		1	09/27/17 16:33	C7I0440	CI72730
Xylene P,M	ND (0.0062)		8260B Low		1	09/27/17 16:33	C7I0440	CI72730
Xylenes (Total)	ND (0.0062)		8260B Low		1	09/27/17 16:33		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	112 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	103 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	107 %		70-130
<i>Surrogate: Toluene-d8</i>	115 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-519 (0-2')  
 Date Sampled: 09/26/17 08:25  
 Percent Solids: 93  
 Initial Volume: 19.5  
 Final Volume: 1  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-02  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: SMR  
 Prepared: 9/27/17 12:54

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	178 (41.6)		8100M		1	09/27/17 22:48	C710445	C172712
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		70 %		40-140				





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-519 (0-2')  
 Date Sampled: 09/26/17 08:25  
 Percent Solids: 93  
 Initial Volume: 14.3  
 Final Volume: 0.5  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-02  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: TJ  
 Prepared: 9/27/17 10:25

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.377)		8270D		1	09/28/17 21:49	C7I0459	CI72609
Acenaphthene	ND (0.377)		8270D		1	09/28/17 21:49	C7I0459	CI72609
<b>Acenaphthylene</b>	<b>0.492</b> (0.377)		8270D		1	09/28/17 21:49	C7I0459	CI72609
Anthracene	ND (0.377)		8270D		1	09/28/17 21:49	C7I0459	CI72609
<b>Benzo(a)anthracene</b>	<b>1.87</b> (0.377)		8270D		1	09/28/17 21:49	C7I0459	CI72609
<b>Benzo(a)pyrene</b>	<b>1.73</b> (0.189)		8270D		1	09/28/17 21:49	C7I0459	CI72609
<b>Benzo(b)fluoranthene</b>	<b>2.10</b> (0.377)		8270D		1	09/28/17 21:49	C7I0459	CI72609
<b>Benzo(g,h,i)perylene</b>	<b>1.49</b> (0.377)		8270D		1	09/28/17 21:49	C7I0459	CI72609
<b>Benzo(k)fluoranthene</b>	<b>1.11</b> (0.377)		8270D		1	09/28/17 21:49	C7I0459	CI72609
<b>Chrysene</b>	<b>1.50</b> (0.189)		8270D		1	09/28/17 21:49	C7I0459	CI72609
<b>Dibenzo(a,h)Anthracene</b>	<b>0.492</b> (0.189)		8270D		1	09/28/17 21:49	C7I0459	CI72609
<b>Fluoranthene</b>	<b>2.43</b> (0.377)		8270D		1	09/28/17 21:49	C7I0459	CI72609
Fluorene	ND (0.377)		8270D		1	09/28/17 21:49	C7I0459	CI72609
<b>Indeno(1,2,3-cd)Pyrene</b>	<b>1.34</b> (0.377)		8270D		1	09/28/17 21:49	C7I0459	CI72609
Naphthalene	ND (0.377)		8270D		1	09/28/17 21:49	C7I0459	CI72609
<b>Phenanthrene</b>	<b>0.579</b> (0.377)		8270D		1	09/28/17 21:49	C7I0459	CI72609
<b>Pyrene</b>	<b>2.62</b> (0.377)		8270D		1	09/28/17 21:49	C7I0459	CI72609

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	68 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	72 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	69 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	89 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-519 (0-2')  
Date Sampled: 09/26/17 08:25  
Percent Solids: 93

ESS Laboratory Work Order: 1709754  
ESS Laboratory Sample ID: 1709754-02  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	2.56 (1.02)		9014		1	EEM	09/29/17 13:00	mg/kg dry	C172918



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-520 (0-2')  
 Date Sampled: 09/26/17 08:40  
 Percent Solids: 92

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-03  
 Sample Matrix: Soil  
 Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (1.99)		6020A		20	NAR	09/29/17 13:01	2.17	100	CI72838
Arsenic	6.44 (2.49)		6010C		1	KJK	09/30/17 0:54	2.17	100	CI72838
Beryllium	0.32 (0.11)		6010C		1	KJK	09/30/17 0:54	2.17	100	CI72838
Cadmium	0.73 (0.50)		6010C		1	KJK	09/30/17 0:54	2.17	100	CI72838
Chromium	7.84 (1.00)		6010C		1	KJK	09/30/17 0:54	2.17	100	CI72838
Copper	55.2 (2.49)		6010C		1	KJK	09/30/17 0:54	2.17	100	CI72838
Lead	294 (4.98)		6010C		1	KJK	09/30/17 0:54	2.17	100	CI72838
Mercury	0.274 (0.034)		7471B		1	MJV	09/29/17 12:28	0.63	40	CI72839
Nickel	14.7 (2.49)		6010C		1	KJK	09/30/17 0:54	2.17	100	CI72838
Selenium	ND (1.99)		6020A		20	NAR	09/29/17 13:01	2.17	100	CI72838
Silver	ND (0.50)		6010C		1	KJK	09/30/17 0:54	2.17	100	CI72838
Thallium	ND (1.99)		6020A		20	NAR	09/29/17 13:01	2.17	100	CI72838
Zinc	325 (2.49)		6010C		1	KJK	09/30/17 0:54	2.17	100	CI72838



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-520 (0-2')  
 Date Sampled: 09/26/17 08:40  
 Percent Solids: 92  
 Initial Volume: 6.8  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-03  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0040)		8260B Low		1	09/27/17 16:59	C7I0440	CI72730
1,1,1-Trichloroethane	ND (0.0040)		8260B Low		1	09/27/17 16:59	C7I0440	CI72730
1,1,2,2-Tetrachloroethane	ND (0.0040)		8260B Low		1	09/27/17 16:59	C7I0440	CI72730
1,1,2-Trichloroethane	ND (0.0040)		8260B Low		1	09/27/17 16:59	C7I0440	CI72730
1,1-Dichloroethane	ND (0.0040)		8260B Low		1	09/27/17 16:59	C7I0440	CI72730
1,1-Dichloroethene	ND (0.0040)		8260B Low		1	09/27/17 16:59	C7I0440	CI72730
1,1-Dichloropropene	ND (0.0040)		8260B Low		1	09/27/17 16:59	C7I0440	CI72730
1,2,3-Trichlorobenzene	ND (0.0040)		8260B Low		1	09/27/17 16:59	C7I0440	CI72730
1,2,3-Trichloropropane	ND (0.0040)		8260B Low		1	09/27/17 16:59	C7I0440	CI72730
1,2,4-Trichlorobenzene	ND (0.0040)		8260B Low		1	09/27/17 16:59	C7I0440	CI72730
1,2,4-Trimethylbenzene	ND (0.0040)		8260B Low		1	09/27/17 16:59	C7I0440	CI72730
1,2-Dibromo-3-Chloropropane	ND (0.0040)		8260B Low		1	09/27/17 16:59	C7I0440	CI72730
1,2-Dibromoethane	ND (0.0040)		8260B Low		1	09/27/17 16:59	C7I0440	CI72730
1,2-Dichlorobenzene	ND (0.0040)		8260B Low		1	09/27/17 16:59	C7I0440	CI72730
1,2-Dichloroethane	ND (0.0040)		8260B Low		1	09/27/17 16:59	C7I0440	CI72730
1,2-Dichloropropane	ND (0.0040)		8260B Low		1	09/27/17 16:59	C7I0440	CI72730
1,3,5-Trimethylbenzene	ND (0.0040)		8260B Low		1	09/27/17 16:59	C7I0440	CI72730
1,3-Dichlorobenzene	ND (0.0040)		8260B Low		1	09/27/17 16:59	C7I0440	CI72730
1,3-Dichloropropane	ND (0.0040)		8260B Low		1	09/27/17 16:59	C7I0440	CI72730
1,4-Dichlorobenzene	ND (0.0040)		8260B Low		1	09/27/17 16:59	C7I0440	CI72730
1,4-Dioxane	ND (0.0795)		8260B Low		1	09/27/17 16:59	C7I0440	CI72730
1-Chlorohexane	ND (0.0040)		8260B Low		1	09/27/17 16:59	C7I0440	CI72730
2,2-Dichloropropane	ND (0.0040)		8260B Low		1	09/27/17 16:59	C7I0440	CI72730
2-Butanone	ND (0.0397)		8260B Low		1	09/27/17 16:59	C7I0440	CI72730
2-Chlorotoluene	ND (0.0040)		8260B Low		1	09/27/17 16:59	C7I0440	CI72730
2-Hexanone	ND (0.0397)		8260B Low		1	09/27/17 16:59	C7I0440	CI72730
4-Chlorotoluene	ND (0.0040)		8260B Low		1	09/27/17 16:59	C7I0440	CI72730
<b>4-Isopropyltoluene</b>	<b>0.0042 (0.0040)</b>		8260B Low		1	09/27/17 16:59	C7I0440	CI72730
4-Methyl-2-Pentanone	ND (0.0397)		8260B Low		1	09/27/17 16:59	C7I0440	CI72730
Acetone	ND (0.0397)		8260B Low		1	09/27/17 16:59	C7I0440	CI72730
Benzene	ND (0.0040)		8260B Low		1	09/27/17 16:59	C7I0440	CI72730
Bromobenzene	ND (0.0040)		8260B Low		1	09/27/17 16:59	C7I0440	CI72730



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-520 (0-2')  
 Date Sampled: 09/26/17 08:40  
 Percent Solids: 92  
 Initial Volume: 6.8  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-03  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0040)		8260B Low		1	09/27/17 16:59	C7I0440	CI72730
Bromodichloromethane	ND (0.0040)		8260B Low		1	09/27/17 16:59	C7I0440	CI72730
Bromoform	ND (0.0040)		8260B Low		1	09/27/17 16:59	C7I0440	CI72730
Bromomethane	ND (0.0079)		8260B Low		1	09/27/17 16:59	C7I0440	CI72730
Carbon Disulfide	ND (0.0040)		8260B Low		1	09/27/17 16:59	C7I0440	CI72730
Carbon Tetrachloride	ND (0.0040)		8260B Low		1	09/27/17 16:59	C7I0440	CI72730
Chlorobenzene	ND (0.0040)		8260B Low		1	09/27/17 16:59	C7I0440	CI72730
Chloroethane	ND (0.0079)		8260B Low		1	09/27/17 16:59	C7I0440	CI72730
Chloroform	ND (0.0040)		8260B Low		1	09/27/17 16:59	C7I0440	CI72730
Chloromethane	ND (0.0079)		8260B Low		1	09/27/17 16:59	C7I0440	CI72730
cis-1,2-Dichloroethene	ND (0.0040)		8260B Low		1	09/27/17 16:59	C7I0440	CI72730
cis-1,3-Dichloropropene	ND (0.0040)		8260B Low		1	09/27/17 16:59	C7I0440	CI72730
Dibromochloromethane	ND (0.0040)		8260B Low		1	09/27/17 16:59	C7I0440	CI72730
Dibromomethane	ND (0.0040)		8260B Low		1	09/27/17 16:59	C7I0440	CI72730
Dichlorodifluoromethane	ND (0.0079)		8260B Low		1	09/27/17 16:59	C7I0440	CI72730
Diethyl Ether	ND (0.0040)		8260B Low		1	09/27/17 16:59	C7I0440	CI72730
Di-isopropyl ether	ND (0.0040)		8260B Low		1	09/27/17 16:59	C7I0440	CI72730
Ethyl tertiary-butyl ether	ND (0.0040)		8260B Low		1	09/27/17 16:59	C7I0440	CI72730
Ethylbenzene	ND (0.0040)		8260B Low		1	09/27/17 16:59	C7I0440	CI72730
Hexachlorobutadiene	ND (0.0040)		8260B Low		1	09/27/17 16:59	C7I0440	CI72730
Isopropylbenzene	ND (0.0040)		8260B Low		1	09/27/17 16:59	C7I0440	CI72730
Methyl tert-Butyl Ether	ND (0.0040)		8260B Low		1	09/27/17 16:59	C7I0440	CI72730
Methylene Chloride	ND (0.0199)		8260B Low		1	09/27/17 16:59	C7I0440	CI72730
Naphthalene	ND (0.0040)		8260B Low		1	09/27/17 16:59	C7I0440	CI72730
n-Butylbenzene	ND (0.0040)		8260B Low		1	09/27/17 16:59	C7I0440	CI72730
n-Propylbenzene	ND (0.0040)		8260B Low		1	09/27/17 16:59	C7I0440	CI72730
sec-Butylbenzene	ND (0.0040)		8260B Low		1	09/27/17 16:59	C7I0440	CI72730
Styrene	ND (0.0040)		8260B Low		1	09/27/17 16:59	C7I0440	CI72730
tert-Butylbenzene	ND (0.0040)		8260B Low		1	09/27/17 16:59	C7I0440	CI72730
Tertiary-amyl methyl ether	ND (0.0040)		8260B Low		1	09/27/17 16:59	C7I0440	CI72730
Tetrachloroethene	ND (0.0040)		8260B Low		1	09/27/17 16:59	C7I0440	CI72730
Tetrahydrofuran	ND (0.0040)		8260B Low		1	09/27/17 16:59	C7I0440	CI72730





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-520 (0-2')  
 Date Sampled: 09/26/17 08:40  
 Percent Solids: 92  
 Initial Volume: 6.8  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-03  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0040)		8260B Low		1	09/27/17 16:59	C7I0440	CI72730
trans-1,2-Dichloroethene	ND (0.0040)		8260B Low		1	09/27/17 16:59	C7I0440	CI72730
trans-1,3-Dichloropropene	ND (0.0040)		8260B Low		1	09/27/17 16:59	C7I0440	CI72730
Trichloroethene	ND (0.0040)		8260B Low		1	09/27/17 16:59	C7I0440	CI72730
Trichlorofluoromethane	ND (0.0040)		8260B Low		1	09/27/17 16:59	C7I0440	CI72730
Vinyl Acetate	ND (0.0040)		8260B Low		1	09/27/17 16:59	C7I0440	CI72730
Vinyl Chloride	ND (0.0079)		8260B Low		1	09/27/17 16:59	C7I0440	CI72730
Xylene O	ND (0.0040)		8260B Low		1	09/27/17 16:59	C7I0440	CI72730
Xylene P,M	ND (0.0079)		8260B Low		1	09/27/17 16:59	C7I0440	CI72730
Xylenes (Total)	ND (0.0079)		8260B Low		1	09/27/17 16:59		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	109 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	100 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	107 %		70-130
<i>Surrogate: Toluene-d8</i>	118 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-520 (0-2')  
 Date Sampled: 09/26/17 08:40  
 Percent Solids: 92  
 Initial Volume: 19.9  
 Final Volume: 1  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-03  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: SMR  
 Prepared: 9/27/17 12:54

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	785 (204)		8100M		5	09/28/17 17:02	C710445	C172712
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		64 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-520 (0-2')  
Date Sampled: 09/26/17 08:40  
Percent Solids: 92  
Initial Volume: 14.5  
Final Volume: 0.5  
Extraction Method: 3546

ESS Laboratory Work Order: 1709754  
ESS Laboratory Sample ID: 1709754-03  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: TJ  
Prepared: 9/27/17 10:25

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.372)		8270D		1	09/28/17 22:24	C7I0459	CI72609
Acenaphthene	ND (0.372)		8270D		1	09/28/17 22:24	C7I0459	CI72609
Acenaphthylene	3.68 (0.372)		8270D		1	09/28/17 22:24	C7I0459	CI72609
Anthracene	2.02 (0.372)		8270D		1	09/28/17 22:24	C7I0459	CI72609
Benzo(a)anthracene	9.89 (3.72)		8270D		10	09/29/17 23:19	C7I0459	CI72609
Benzo(a)pyrene	10.1 (1.87)		8270D		10	09/29/17 23:19	C7I0459	CI72609
Benzo(b)fluoranthene	14.5 (3.72)		8270D		10	09/29/17 23:19	C7I0459	CI72609
Benzo(g,h,i)perylene	7.01 (0.372)		8270D		1	09/28/17 22:24	C7I0459	CI72609
Benzo(k)fluoranthene	5.46 (3.72)		8270D		10	09/29/17 23:19	C7I0459	CI72609
Chrysene	8.08 (0.187)		8270D		1	09/28/17 22:24	C7I0459	CI72609
Dibenzo(a,h)Anthracene	3.45 (0.187)		8270D		1	09/28/17 22:24	C7I0459	CI72609
Fluoranthene	11.5 (3.72)		8270D		10	09/29/17 23:19	C7I0459	CI72609
Fluorene	ND (0.372)		8270D		1	09/28/17 22:24	C7I0459	CI72609
Indeno(1,2,3-cd)Pyrene	6.82 (0.372)		8270D		1	09/28/17 22:24	C7I0459	CI72609
Naphthalene	ND (0.372)		8270D		1	09/28/17 22:24	C7I0459	CI72609
Phenanthrene	3.12 (0.372)		8270D		1	09/28/17 22:24	C7I0459	CI72609
Pyrene	13.9 (3.72)		8270D		10	09/29/17 23:19	C7I0459	CI72609

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	57 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	63 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	59 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	68 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-520 (0-2')  
Date Sampled: 09/26/17 08:40  
Percent Solids: 92

ESS Laboratory Work Order: 1709754  
ESS Laboratory Sample ID: 1709754-03  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	8.96 (1.08)		9014		1	EEM	09/29/17 13:00	mg/kg dry	C172918



## CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-521 (0-2')  
Date Sampled: 09/26/17 08:50  
Percent Solids: 95

ESS Laboratory Work Order: 1709754  
ESS Laboratory Sample ID: 1709754-04  
Sample Matrix: Soil  
Units: mg/kg dry

Extraction Method: 3050B

### Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (1.95)		6020A		20	NAR	09/29/17 13:07	2.17	100	CI72838
Arsenic	6.12 (2.44)		6010C		1	KJK	09/30/17 0:59	2.17	100	CI72838
Beryllium	0.22 (0.11)		6010C		1	KJK	09/30/17 0:59	2.17	100	CI72838
Cadmium	ND (0.49)		6010C		1	KJK	09/30/17 0:59	2.17	100	CI72838
Chromium	5.63 (0.98)		6010C		1	KJK	09/30/17 0:59	2.17	100	CI72838
Copper	32.6 (2.44)		6010C		1	KJK	09/30/17 0:59	2.17	100	CI72838
Lead	41.0 (4.88)		6010C		1	KJK	09/30/17 0:59	2.17	100	CI72838
Mercury	0.129 (0.033)		7471B		1	MJV	09/29/17 12:30	0.64	40	CI72839
Nickel	6.44 (2.44)		6010C		1	KJK	09/30/17 0:59	2.17	100	CI72838
Selenium	ND (1.95)		6020A		20	NAR	09/29/17 13:07	2.17	100	CI72838
Silver	ND (0.49)		6010C		1	KJK	09/30/17 0:59	2.17	100	CI72838
Thallium	ND (1.95)		6020A		20	NAR	09/29/17 13:07	2.17	100	CI72838
Zinc	27.3 (2.44)		6010C		1	KJK	09/30/17 0:59	2.17	100	CI72838





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-521 (0-2')  
 Date Sampled: 09/26/17 08:50  
 Percent Solids: 95  
 Initial Volume: 7.8  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-04  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0034)		8260B Low		1	09/27/17 17:24	C7I0440	CI72730
1,1,1-Trichloroethane	ND (0.0034)		8260B Low		1	09/27/17 17:24	C7I0440	CI72730
1,1,2,2-Tetrachloroethane	ND (0.0034)		8260B Low		1	09/27/17 17:24	C7I0440	CI72730
1,1,2-Trichloroethane	ND (0.0034)		8260B Low		1	09/27/17 17:24	C7I0440	CI72730
1,1-Dichloroethane	ND (0.0034)		8260B Low		1	09/27/17 17:24	C7I0440	CI72730
1,1-Dichloroethene	ND (0.0034)		8260B Low		1	09/27/17 17:24	C7I0440	CI72730
1,1-Dichloropropene	ND (0.0034)		8260B Low		1	09/27/17 17:24	C7I0440	CI72730
1,2,3-Trichlorobenzene	ND (0.0034)		8260B Low		1	09/27/17 17:24	C7I0440	CI72730
1,2,3-Trichloropropane	ND (0.0034)		8260B Low		1	09/27/17 17:24	C7I0440	CI72730
1,2,4-Trichlorobenzene	ND (0.0034)		8260B Low		1	09/27/17 17:24	C7I0440	CI72730
1,2,4-Trimethylbenzene	ND (0.0034)		8260B Low		1	09/27/17 17:24	C7I0440	CI72730
1,2-Dibromo-3-Chloropropane	ND (0.0034)		8260B Low		1	09/27/17 17:24	C7I0440	CI72730
1,2-Dibromoethane	ND (0.0034)		8260B Low		1	09/27/17 17:24	C7I0440	CI72730
1,2-Dichlorobenzene	ND (0.0034)		8260B Low		1	09/27/17 17:24	C7I0440	CI72730
1,2-Dichloroethane	ND (0.0034)		8260B Low		1	09/27/17 17:24	C7I0440	CI72730
1,2-Dichloropropane	ND (0.0034)		8260B Low		1	09/27/17 17:24	C7I0440	CI72730
1,3,5-Trimethylbenzene	ND (0.0034)		8260B Low		1	09/27/17 17:24	C7I0440	CI72730
1,3-Dichlorobenzene	ND (0.0034)		8260B Low		1	09/27/17 17:24	C7I0440	CI72730
1,3-Dichloropropane	ND (0.0034)		8260B Low		1	09/27/17 17:24	C7I0440	CI72730
1,4-Dichlorobenzene	ND (0.0034)		8260B Low		1	09/27/17 17:24	C7I0440	CI72730
1,4-Dioxane	ND (0.0678)		8260B Low		1	09/27/17 17:24	C7I0440	CI72730
1-Chlorohexane	ND (0.0034)		8260B Low		1	09/27/17 17:24	C7I0440	CI72730
2,2-Dichloropropane	ND (0.0034)		8260B Low		1	09/27/17 17:24	C7I0440	CI72730
2-Butanone	ND (0.0339)		8260B Low		1	09/27/17 17:24	C7I0440	CI72730
2-Chlorotoluene	ND (0.0034)		8260B Low		1	09/27/17 17:24	C7I0440	CI72730
2-Hexanone	ND (0.0339)		8260B Low		1	09/27/17 17:24	C7I0440	CI72730
4-Chlorotoluene	ND (0.0034)		8260B Low		1	09/27/17 17:24	C7I0440	CI72730
4-Isopropyltoluene	ND (0.0034)		8260B Low		1	09/27/17 17:24	C7I0440	CI72730
4-Methyl-2-Pentanone	ND (0.0339)		8260B Low		1	09/27/17 17:24	C7I0440	CI72730
Acetone	ND (0.0339)		8260B Low		1	09/27/17 17:24	C7I0440	CI72730
Benzene	ND (0.0034)		8260B Low		1	09/27/17 17:24	C7I0440	CI72730
Bromobenzene	ND (0.0034)		8260B Low		1	09/27/17 17:24	C7I0440	CI72730



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-521 (0-2')  
Date Sampled: 09/26/17 08:50  
Percent Solids: 95  
Initial Volume: 7.8  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1709754  
ESS Laboratory Sample ID: 1709754-04  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0034)		8260B Low		1	09/27/17 17:24	C7I0440	CI72730
Bromodichloromethane	ND (0.0034)		8260B Low		1	09/27/17 17:24	C7I0440	CI72730
Bromoform	ND (0.0034)		8260B Low		1	09/27/17 17:24	C7I0440	CI72730
Bromomethane	ND (0.0068)		8260B Low		1	09/27/17 17:24	C7I0440	CI72730
Carbon Disulfide	ND (0.0034)		8260B Low		1	09/27/17 17:24	C7I0440	CI72730
Carbon Tetrachloride	ND (0.0034)		8260B Low		1	09/27/17 17:24	C7I0440	CI72730
Chlorobenzene	ND (0.0034)		8260B Low		1	09/27/17 17:24	C7I0440	CI72730
Chloroethane	ND (0.0068)		8260B Low		1	09/27/17 17:24	C7I0440	CI72730
Chloroform	ND (0.0034)		8260B Low		1	09/27/17 17:24	C7I0440	CI72730
Chloromethane	ND (0.0068)		8260B Low		1	09/27/17 17:24	C7I0440	CI72730
cis-1,2-Dichloroethene	ND (0.0034)		8260B Low		1	09/27/17 17:24	C7I0440	CI72730
cis-1,3-Dichloropropene	ND (0.0034)		8260B Low		1	09/27/17 17:24	C7I0440	CI72730
Dibromochloromethane	ND (0.0034)		8260B Low		1	09/27/17 17:24	C7I0440	CI72730
Dibromomethane	ND (0.0034)		8260B Low		1	09/27/17 17:24	C7I0440	CI72730
Dichlorodifluoromethane	ND (0.0068)		8260B Low		1	09/27/17 17:24	C7I0440	CI72730
Diethyl Ether	ND (0.0034)		8260B Low		1	09/27/17 17:24	C7I0440	CI72730
Di-isopropyl ether	ND (0.0034)		8260B Low		1	09/27/17 17:24	C7I0440	CI72730
Ethyl tertiary-butyl ether	ND (0.0034)		8260B Low		1	09/27/17 17:24	C7I0440	CI72730
Ethylbenzene	ND (0.0034)		8260B Low		1	09/27/17 17:24	C7I0440	CI72730
Hexachlorobutadiene	ND (0.0034)		8260B Low		1	09/27/17 17:24	C7I0440	CI72730
Isopropylbenzene	ND (0.0034)		8260B Low		1	09/27/17 17:24	C7I0440	CI72730
Methyl tert-Butyl Ether	ND (0.0034)		8260B Low		1	09/27/17 17:24	C7I0440	CI72730
Methylene Chloride	ND (0.0170)		8260B Low		1	09/27/17 17:24	C7I0440	CI72730
Naphthalene	ND (0.0034)		8260B Low		1	09/27/17 17:24	C7I0440	CI72730
n-Butylbenzene	ND (0.0034)		8260B Low		1	09/27/17 17:24	C7I0440	CI72730
n-Propylbenzene	ND (0.0034)		8260B Low		1	09/27/17 17:24	C7I0440	CI72730
sec-Butylbenzene	ND (0.0034)		8260B Low		1	09/27/17 17:24	C7I0440	CI72730
Styrene	ND (0.0034)		8260B Low		1	09/27/17 17:24	C7I0440	CI72730
tert-Butylbenzene	ND (0.0034)		8260B Low		1	09/27/17 17:24	C7I0440	CI72730
Tertiary-amyl methyl ether	ND (0.0034)		8260B Low		1	09/27/17 17:24	C7I0440	CI72730
Tetrachloroethene	ND (0.0034)		8260B Low		1	09/27/17 17:24	C7I0440	CI72730
Tetrahydrofuran	ND (0.0034)		8260B Low		1	09/27/17 17:24	C7I0440	CI72730



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-521 (0-2')  
Date Sampled: 09/26/17 08:50  
Percent Solids: 95  
Initial Volume: 7.8  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1709754  
ESS Laboratory Sample ID: 1709754-04  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0034)		8260B Low		1	09/27/17 17:24	C7I0440	CI72730
trans-1,2-Dichloroethene	ND (0.0034)		8260B Low		1	09/27/17 17:24	C7I0440	CI72730
trans-1,3-Dichloropropene	ND (0.0034)		8260B Low		1	09/27/17 17:24	C7I0440	CI72730
Trichloroethene	ND (0.0034)		8260B Low		1	09/27/17 17:24	C7I0440	CI72730
Trichlorofluoromethane	ND (0.0034)		8260B Low		1	09/27/17 17:24	C7I0440	CI72730
Vinyl Acetate	ND (0.0034)		8260B Low		1	09/27/17 17:24	C7I0440	CI72730
Vinyl Chloride	ND (0.0068)		8260B Low		1	09/27/17 17:24	C7I0440	CI72730
Xylene O	ND (0.0034)		8260B Low		1	09/27/17 17:24	C7I0440	CI72730
Xylene P,M	ND (0.0068)		8260B Low		1	09/27/17 17:24	C7I0440	CI72730
Xylenes (Total)	ND (0.0068)		8260B Low		1	09/27/17 17:24		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	110 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	105 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	106 %		70-130
<i>Surrogate: Toluene-d8</i>	111 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-521 (0-2')  
 Date Sampled: 09/26/17 08:50  
 Percent Solids: 95  
 Initial Volume: 19.6  
 Final Volume: 1  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-04  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: SMR  
 Prepared: 9/27/17 12:54

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	ND (40.5)		8100M		1	09/27/17 23:24	C710445	C172712
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		75 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-521 (0-2')  
 Date Sampled: 09/26/17 08:50  
 Percent Solids: 95  
 Initial Volume: 15.2  
 Final Volume: 0.5  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-04  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: TJ  
 Prepared: 9/27/17 10:25

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.348)		8270D		1	09/28/17 22:59	C7I0459	CI72609
Acenaphthene	ND (0.348)		8270D		1	09/28/17 22:59	C7I0459	CI72609
Acenaphthylene	ND (0.348)		8270D		1	09/28/17 22:59	C7I0459	CI72609
Anthracene	ND (0.348)		8270D		1	09/28/17 22:59	C7I0459	CI72609
Benzo(a)anthracene	ND (0.348)		8270D		1	09/28/17 22:59	C7I0459	CI72609
Benzo(a)pyrene	ND (0.174)		8270D		1	09/28/17 22:59	C7I0459	CI72609
Benzo(b)fluoranthene	ND (0.348)		8270D		1	09/28/17 22:59	C7I0459	CI72609
Benzo(g,h,i)perylene	ND (0.348)		8270D		1	09/28/17 22:59	C7I0459	CI72609
Benzo(k)fluoranthene	ND (0.348)		8270D		1	09/28/17 22:59	C7I0459	CI72609
Chrysene	ND (0.174)		8270D		1	09/28/17 22:59	C7I0459	CI72609
Dibenzo(a,h)Anthracene	ND (0.174)		8270D		1	09/28/17 22:59	C7I0459	CI72609
Fluoranthene	ND (0.348)		8270D		1	09/28/17 22:59	C7I0459	CI72609
Fluorene	ND (0.348)		8270D		1	09/28/17 22:59	C7I0459	CI72609
Indeno(1,2,3-cd)Pyrene	ND (0.348)		8270D		1	09/28/17 22:59	C7I0459	CI72609
Naphthalene	ND (0.348)		8270D		1	09/28/17 22:59	C7I0459	CI72609
Phenanthrene	ND (0.348)		8270D		1	09/28/17 22:59	C7I0459	CI72609
Pyrene	ND (0.348)		8270D		1	09/28/17 22:59	C7I0459	CI72609

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: 1,2-Dichlorobenzene-d4	81 %		30-130
Surrogate: 2-Fluorobiphenyl	80 %		30-130
Surrogate: Nitrobenzene-d5	81 %		30-130
Surrogate: p-Terphenyl-d14	94 %		30-130





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-521 (0-2')  
Date Sampled: 09/26/17 08:50  
Percent Solids: 95

ESS Laboratory Work Order: 1709754  
ESS Laboratory Sample ID: 1709754-04  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	1.54 (1.03)		9014		1	EEM	09/29/17 13:00	mg/kg dry	CI72918



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-522 (0-2')  
Date Sampled: 09/26/17 09:05  
Percent Solids: 92

ESS Laboratory Work Order: 1709754  
ESS Laboratory Sample ID: 1709754-05  
Sample Matrix: Soil  
Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (1.68)		6020A		20	NAR	09/29/17 13:24	2.58	100	CI72838
Arsenic	<b>6.16</b> (2.10)		6010C		1	KJK	09/30/17 1:03	2.58	100	CI72838
Beryllium	<b>0.57</b> (0.09)		6010C		1	KJK	09/30/17 1:03	2.58	100	CI72838
Cadmium	ND (0.42)		6010C		1	KJK	09/30/17 1:03	2.58	100	CI72838
Chromium	<b>8.69</b> (0.84)		6010C		1	KJK	09/30/17 1:03	2.58	100	CI72838
Copper	<b>140</b> (2.10)		6010C		1	KJK	09/30/17 1:03	2.58	100	CI72838
Lead	<b>514</b> (4.19)		6010C		1	KJK	09/30/17 1:03	2.58	100	CI72838
Mercury	<b>0.520</b> (0.032)		7471B		1	MJV	09/29/17 12:32	0.68	40	CI72839
Nickel	<b>14.1</b> (2.10)		6010C		1	KJK	09/30/17 1:03	2.58	100	CI72838
Selenium	ND (1.68)		6020A		20	NAR	09/29/17 13:24	2.58	100	CI72838
Silver	ND (0.42)		6010C		1	KJK	09/30/17 1:03	2.58	100	CI72838
Thallium	ND (1.68)		6020A		20	NAR	09/29/17 13:24	2.58	100	CI72838
Zinc	<b>277</b> (2.10)		6010C		1	KJK	09/30/17 1:03	2.58	100	CI72838



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-522 (0-2')  
 Date Sampled: 09/26/17 09:05  
 Percent Solids: 92  
 Initial Volume: 6.7  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-05  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0040)		8260B Low		1	09/27/17 17:49	C7I0440	CI72730
1,1,1-Trichloroethane	ND (0.0040)		8260B Low		1	09/27/17 17:49	C7I0440	CI72730
1,1,2,2-Tetrachloroethane	ND (0.0040)		8260B Low		1	09/27/17 17:49	C7I0440	CI72730
1,1,2-Trichloroethane	ND (0.0040)		8260B Low		1	09/27/17 17:49	C7I0440	CI72730
1,1-Dichloroethane	ND (0.0040)		8260B Low		1	09/27/17 17:49	C7I0440	CI72730
1,1-Dichloroethene	ND (0.0040)		8260B Low		1	09/27/17 17:49	C7I0440	CI72730
1,1-Dichloropropene	ND (0.0040)		8260B Low		1	09/27/17 17:49	C7I0440	CI72730
1,2,3-Trichlorobenzene	ND (0.0040)		8260B Low		1	09/27/17 17:49	C7I0440	CI72730
1,2,3-Trichloropropane	ND (0.0040)		8260B Low		1	09/27/17 17:49	C7I0440	CI72730
1,2,4-Trichlorobenzene	ND (0.0040)		8260B Low		1	09/27/17 17:49	C7I0440	CI72730
1,2,4-Trimethylbenzene	ND (0.0040)		8260B Low		1	09/27/17 17:49	C7I0440	CI72730
1,2-Dibromo-3-Chloropropane	ND (0.0040)		8260B Low		1	09/27/17 17:49	C7I0440	CI72730
1,2-Dibromoethane	ND (0.0040)		8260B Low		1	09/27/17 17:49	C7I0440	CI72730
1,2-Dichlorobenzene	ND (0.0040)		8260B Low		1	09/27/17 17:49	C7I0440	CI72730
1,2-Dichloroethane	ND (0.0040)		8260B Low		1	09/27/17 17:49	C7I0440	CI72730
1,2-Dichloropropane	ND (0.0040)		8260B Low		1	09/27/17 17:49	C7I0440	CI72730
1,3,5-Trimethylbenzene	ND (0.0040)		8260B Low		1	09/27/17 17:49	C7I0440	CI72730
1,3-Dichlorobenzene	ND (0.0040)		8260B Low		1	09/27/17 17:49	C7I0440	CI72730
1,3-Dichloropropane	ND (0.0040)		8260B Low		1	09/27/17 17:49	C7I0440	CI72730
1,4-Dichlorobenzene	ND (0.0040)		8260B Low		1	09/27/17 17:49	C7I0440	CI72730
1,4-Dioxane	ND (0.0807)		8260B Low		1	09/27/17 17:49	C7I0440	CI72730
1-Chlorohexane	ND (0.0040)		8260B Low		1	09/27/17 17:49	C7I0440	CI72730
2,2-Dichloropropane	ND (0.0040)		8260B Low		1	09/27/17 17:49	C7I0440	CI72730
2-Butanone	ND (0.0404)		8260B Low		1	09/27/17 17:49	C7I0440	CI72730
2-Chlorotoluene	ND (0.0040)		8260B Low		1	09/27/17 17:49	C7I0440	CI72730
2-Hexanone	ND (0.0404)		8260B Low		1	09/27/17 17:49	C7I0440	CI72730
4-Chlorotoluene	ND (0.0040)		8260B Low		1	09/27/17 17:49	C7I0440	CI72730
<b>4-Isopropyltoluene</b>	<b>0.0060</b> (0.0040)		8260B Low		1	09/27/17 17:49	C7I0440	CI72730
4-Methyl-2-Pentanone	ND (0.0404)		8260B Low		1	09/27/17 17:49	C7I0440	CI72730
Acetone	ND (0.0404)		8260B Low		1	09/27/17 17:49	C7I0440	CI72730
Benzene	ND (0.0040)		8260B Low		1	09/27/17 17:49	C7I0440	CI72730
Bromobenzene	ND (0.0040)		8260B Low		1	09/27/17 17:49	C7I0440	CI72730



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-522 (0-2')  
 Date Sampled: 09/26/17 09:05  
 Percent Solids: 92  
 Initial Volume: 6.7  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-05  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0040)		8260B Low		1	09/27/17 17:49	C7I0440	CI72730
Bromodichloromethane	ND (0.0040)		8260B Low		1	09/27/17 17:49	C7I0440	CI72730
Bromoform	ND (0.0040)		8260B Low		1	09/27/17 17:49	C7I0440	CI72730
Bromomethane	ND (0.0081)		8260B Low		1	09/27/17 17:49	C7I0440	CI72730
Carbon Disulfide	ND (0.0040)		8260B Low		1	09/27/17 17:49	C7I0440	CI72730
Carbon Tetrachloride	ND (0.0040)		8260B Low		1	09/27/17 17:49	C7I0440	CI72730
Chlorobenzene	ND (0.0040)		8260B Low		1	09/27/17 17:49	C7I0440	CI72730
Chloroethane	ND (0.0081)		8260B Low		1	09/27/17 17:49	C7I0440	CI72730
Chloroform	ND (0.0040)		8260B Low		1	09/27/17 17:49	C7I0440	CI72730
Chloromethane	ND (0.0081)		8260B Low		1	09/27/17 17:49	C7I0440	CI72730
cis-1,2-Dichloroethene	ND (0.0040)		8260B Low		1	09/27/17 17:49	C7I0440	CI72730
cis-1,3-Dichloropropene	ND (0.0040)		8260B Low		1	09/27/17 17:49	C7I0440	CI72730
Dibromochloromethane	ND (0.0040)		8260B Low		1	09/27/17 17:49	C7I0440	CI72730
Dibromomethane	ND (0.0040)		8260B Low		1	09/27/17 17:49	C7I0440	CI72730
Dichlorodifluoromethane	ND (0.0081)		8260B Low		1	09/27/17 17:49	C7I0440	CI72730
Diethyl Ether	ND (0.0040)		8260B Low		1	09/27/17 17:49	C7I0440	CI72730
Di-isopropyl ether	ND (0.0040)		8260B Low		1	09/27/17 17:49	C7I0440	CI72730
Ethyl tertiary-butyl ether	ND (0.0040)		8260B Low		1	09/27/17 17:49	C7I0440	CI72730
Ethylbenzene	ND (0.0040)		8260B Low		1	09/27/17 17:49	C7I0440	CI72730
Hexachlorobutadiene	ND (0.0040)		8260B Low		1	09/27/17 17:49	C7I0440	CI72730
Isopropylbenzene	ND (0.0040)		8260B Low		1	09/27/17 17:49	C7I0440	CI72730
Methyl tert-Butyl Ether	ND (0.0040)		8260B Low		1	09/27/17 17:49	C7I0440	CI72730
Methylene Chloride	ND (0.0202)		8260B Low		1	09/27/17 17:49	C7I0440	CI72730
Naphthalene	ND (0.0040)		8260B Low		1	09/27/17 17:49	C7I0440	CI72730
n-Butylbenzene	ND (0.0040)		8260B Low		1	09/27/17 17:49	C7I0440	CI72730
n-Propylbenzene	ND (0.0040)		8260B Low		1	09/27/17 17:49	C7I0440	CI72730
sec-Butylbenzene	ND (0.0040)		8260B Low		1	09/27/17 17:49	C7I0440	CI72730
Styrene	ND (0.0040)		8260B Low		1	09/27/17 17:49	C7I0440	CI72730
tert-Butylbenzene	ND (0.0040)		8260B Low		1	09/27/17 17:49	C7I0440	CI72730
Tertiary-amyl methyl ether	ND (0.0040)		8260B Low		1	09/27/17 17:49	C7I0440	CI72730
Tetrachloroethene	ND (0.0040)		8260B Low		1	09/27/17 17:49	C7I0440	CI72730
Tetrahydrofuran	ND (0.0040)		8260B Low		1	09/27/17 17:49	C7I0440	CI72730



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-522 (0-2')  
 Date Sampled: 09/26/17 09:05  
 Percent Solids: 92  
 Initial Volume: 6.7  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-05  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0040)		8260B Low		1	09/27/17 17:49	C7I0440	CI72730
trans-1,2-Dichloroethene	ND (0.0040)		8260B Low		1	09/27/17 17:49	C7I0440	CI72730
trans-1,3-Dichloropropene	ND (0.0040)		8260B Low		1	09/27/17 17:49	C7I0440	CI72730
Trichloroethene	ND (0.0040)		8260B Low		1	09/27/17 17:49	C7I0440	CI72730
Trichlorofluoromethane	ND (0.0040)		8260B Low		1	09/27/17 17:49	C7I0440	CI72730
Vinyl Acetate	ND (0.0040)		8260B Low		1	09/27/17 17:49	C7I0440	CI72730
Vinyl Chloride	ND (0.0081)		8260B Low		1	09/27/17 17:49	C7I0440	CI72730
Xylene O	ND (0.0040)		8260B Low		1	09/27/17 17:49	C7I0440	CI72730
Xylene P,M	ND (0.0081)		8260B Low		1	09/27/17 17:49	C7I0440	CI72730
Xylenes (Total)	ND (0.0081)		8260B Low		1	09/27/17 17:49		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	113 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	96 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	107 %		70-130
<i>Surrogate: Toluene-d8</i>	117 %		70-130





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-522 (0-2')  
 Date Sampled: 09/26/17 09:05  
 Percent Solids: 92  
 Initial Volume: 20.3  
 Final Volume: 1  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-05  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: SMR  
 Prepared: 9/27/17 12:54

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	1190 (200)		8100M		5	09/28/17 17:38	C710445	C172712
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		70 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-522 (0-2')  
Date Sampled: 09/26/17 09:05  
Percent Solids: 92  
Initial Volume: 14.9  
Final Volume: 0.5  
Extraction Method: 3546

ESS Laboratory Work Order: 1709754  
ESS Laboratory Sample ID: 1709754-05  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: TJ  
Prepared: 9/27/17 10:25

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	1.68 (0.725)		8270D		2	09/28/17 23:33	C7I0459	CI72609
Acenaphthene	ND (0.725)		8270D		2	09/28/17 23:33	C7I0459	CI72609
Acenaphthylene	6.28 (0.725)		8270D		2	09/28/17 23:33	C7I0459	CI72609
Anthracene	2.58 (0.725)		8270D		2	09/28/17 23:33	C7I0459	CI72609
Benzo(a)anthracene	11.7 (0.725)		8270D		2	09/28/17 23:33	C7I0459	CI72609
Benzo(a)pyrene	10.3 (0.364)		8270D		2	09/28/17 23:33	C7I0459	CI72609
Benzo(b)fluoranthene	12.5 (0.725)		8270D		2	09/28/17 23:33	C7I0459	CI72609
Benzo(g,h,i)perylene	7.19 (0.725)		8270D		2	09/28/17 23:33	C7I0459	CI72609
Benzo(k)fluoranthene	4.23 (0.725)		8270D		2	09/28/17 23:33	C7I0459	CI72609
Chrysene	12.0 (0.364)		8270D		2	09/28/17 23:33	C7I0459	CI72609
Dibenzo(a,h)Anthracene	2.81 (0.364)		8270D		2	09/28/17 23:33	C7I0459	CI72609
Fluoranthene	12.3 (0.725)		8270D		2	09/28/17 23:33	C7I0459	CI72609
Fluorene	1.03 (0.725)		8270D		2	09/28/17 23:33	C7I0459	CI72609
Indeno(1,2,3-cd)Pyrene	6.75 (0.725)		8270D		2	09/28/17 23:33	C7I0459	CI72609
Naphthalene	2.43 (0.725)		8270D		2	09/28/17 23:33	C7I0459	CI72609
Phenanthrene	5.99 (0.725)		8270D		2	09/28/17 23:33	C7I0459	CI72609
Pyrene	16.4 (0.725)		8270D		2	09/28/17 23:33	C7I0459	CI72609

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
Surrogate: 1,2-Dichlorobenzene-d4	62 %		30-130
Surrogate: 2-Fluorobiphenyl	70 %		30-130
Surrogate: Nitrobenzene-d5	63 %		30-130
Surrogate: p-Terphenyl-d14	76 %		30-130



# ESS Laboratory

Division of Thielsch Engineering, Inc.

# BAL Laboratory

The Microbiology Division  
of Thielsch Engineering, Inc.



## CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-522 (0-2')  
Date Sampled: 09/26/17 09:05  
Percent Solids: 92

ESS Laboratory Work Order: 1709754  
ESS Laboratory Sample ID: 1709754-05  
Sample Matrix: Soil

### Classical Chemistry

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	21.6 (1.07)		9014		1	EEM	09/29/17 13:00	mg/kg dry	C172918



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-523 (0-2')  
 Date Sampled: 09/26/17 09:20  
 Percent Solids: 96

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-06  
 Sample Matrix: Soil  
 Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (2.06)		6020A		20	NAR	09/29/17 13:30	2.01	100	CI72838
Arsenic	5.75 (2.58)		6010C		1	KJK	09/30/17 1:07	2.01	100	CI72838
Beryllium	0.35 (0.11)		6010C		1	KJK	09/30/17 1:07	2.01	100	CI72838
Cadmium	ND (0.52)		6010C		1	KJK	09/30/17 1:07	2.01	100	CI72838
Chromium	8.27 (1.03)		6010C		1	KJK	09/30/17 1:07	2.01	100	CI72838
Copper	15.2 (2.58)		6010C		1	KJK	09/30/17 1:07	2.01	100	CI72838
Lead	45.9 (5.16)		6010C		1	KJK	09/30/17 1:07	2.01	100	CI72838
Mercury	0.049 (0.029)		7471B		1	MJV	09/29/17 12:34	0.71	40	CI72839
Nickel	11.5 (2.58)		6010C		1	KJK	09/30/17 1:07	2.01	100	CI72838
Selenium	ND (2.06)		6020A		20	NAR	09/29/17 13:30	2.01	100	CI72838
Silver	ND (0.52)		6010C		1	KJK	09/30/17 1:07	2.01	100	CI72838
Thallium	ND (2.06)		6020A		20	NAR	09/29/17 13:30	2.01	100	CI72838
Zinc	33.7 (2.58)		6010C		1	KJK	09/30/17 1:07	2.01	100	CI72838



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-523 (0-2')  
 Date Sampled: 09/26/17 09:20  
 Percent Solids: 96  
 Initial Volume: 7.3  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-06  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0036)		8260B Low		1	09/27/17 18:15	C7I0440	CI72730
1,1,1-Trichloroethane	ND (0.0036)		8260B Low		1	09/27/17 18:15	C7I0440	CI72730
1,1,2,2-Tetrachloroethane	ND (0.0036)		8260B Low		1	09/27/17 18:15	C7I0440	CI72730
1,1,2-Trichloroethane	ND (0.0036)		8260B Low		1	09/27/17 18:15	C7I0440	CI72730
1,1-Dichloroethane	ND (0.0036)		8260B Low		1	09/27/17 18:15	C7I0440	CI72730
1,1-Dichloroethene	ND (0.0036)		8260B Low		1	09/27/17 18:15	C7I0440	CI72730
1,1-Dichloropropene	ND (0.0036)		8260B Low		1	09/27/17 18:15	C7I0440	CI72730
1,2,3-Trichlorobenzene	ND (0.0036)		8260B Low		1	09/27/17 18:15	C7I0440	CI72730
1,2,3-Trichloropropane	ND (0.0036)		8260B Low		1	09/27/17 18:15	C7I0440	CI72730
1,2,4-Trichlorobenzene	ND (0.0036)		8260B Low		1	09/27/17 18:15	C7I0440	CI72730
1,2,4-Trimethylbenzene	ND (0.0036)		8260B Low		1	09/27/17 18:15	C7I0440	CI72730
1,2-Dibromo-3-Chloropropane	ND (0.0036)		8260B Low		1	09/27/17 18:15	C7I0440	CI72730
1,2-Dibromoethane	ND (0.0036)		8260B Low		1	09/27/17 18:15	C7I0440	CI72730
1,2-Dichlorobenzene	ND (0.0036)		8260B Low		1	09/27/17 18:15	C7I0440	CI72730
1,2-Dichloroethane	ND (0.0036)		8260B Low		1	09/27/17 18:15	C7I0440	CI72730
1,2-Dichloropropane	ND (0.0036)		8260B Low		1	09/27/17 18:15	C7I0440	CI72730
1,3,5-Trimethylbenzene	ND (0.0036)		8260B Low		1	09/27/17 18:15	C7I0440	CI72730
1,3-Dichlorobenzene	ND (0.0036)		8260B Low		1	09/27/17 18:15	C7I0440	CI72730
1,3-Dichloropropane	ND (0.0036)		8260B Low		1	09/27/17 18:15	C7I0440	CI72730
1,4-Dichlorobenzene	ND (0.0036)		8260B Low		1	09/27/17 18:15	C7I0440	CI72730
1,4-Dioxane	ND (0.0710)		8260B Low		1	09/27/17 18:15	C7I0440	CI72730
1-Chlorohexane	ND (0.0036)		8260B Low		1	09/27/17 18:15	C7I0440	CI72730
2,2-Dichloropropane	ND (0.0036)		8260B Low		1	09/27/17 18:15	C7I0440	CI72730
2-Butanone	ND (0.0355)		8260B Low		1	09/27/17 18:15	C7I0440	CI72730
2-Chlorotoluene	ND (0.0036)		8260B Low		1	09/27/17 18:15	C7I0440	CI72730
2-Hexanone	ND (0.0355)		8260B Low		1	09/27/17 18:15	C7I0440	CI72730
4-Chlorotoluene	ND (0.0036)		8260B Low		1	09/27/17 18:15	C7I0440	CI72730
<b>4-Isopropyltoluene</b>	<b>0.0080</b> (0.0036)		8260B Low		1	09/27/17 18:15	C7I0440	CI72730
4-Methyl-2-Pentanone	ND (0.0355)		8260B Low		1	09/27/17 18:15	C7I0440	CI72730
Acetone	ND (0.0355)		8260B Low		1	09/27/17 18:15	C7I0440	CI72730
Benzene	ND (0.0036)		8260B Low		1	09/27/17 18:15	C7I0440	CI72730
Bromobenzene	ND (0.0036)		8260B Low		1	09/27/17 18:15	C7I0440	CI72730





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-523 (0-2')  
Date Sampled: 09/26/17 09:20  
Percent Solids: 96  
Initial Volume: 7.3  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1709754  
ESS Laboratory Sample ID: 1709754-06  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0036)		8260B Low		1	09/27/17 18:15	C7I0440	CI72730
Bromodichloromethane	ND (0.0036)		8260B Low		1	09/27/17 18:15	C7I0440	CI72730
Bromoform	ND (0.0036)		8260B Low		1	09/27/17 18:15	C7I0440	CI72730
Bromomethane	ND (0.0071)		8260B Low		1	09/27/17 18:15	C7I0440	CI72730
Carbon Disulfide	ND (0.0036)		8260B Low		1	09/27/17 18:15	C7I0440	CI72730
Carbon Tetrachloride	ND (0.0036)		8260B Low		1	09/27/17 18:15	C7I0440	CI72730
Chlorobenzene	ND (0.0036)		8260B Low		1	09/27/17 18:15	C7I0440	CI72730
Chloroethane	ND (0.0071)		8260B Low		1	09/27/17 18:15	C7I0440	CI72730
Chloroform	ND (0.0036)		8260B Low		1	09/27/17 18:15	C7I0440	CI72730
Chloromethane	ND (0.0071)		8260B Low		1	09/27/17 18:15	C7I0440	CI72730
cis-1,2-Dichloroethene	ND (0.0036)		8260B Low		1	09/27/17 18:15	C7I0440	CI72730
cis-1,3-Dichloropropene	ND (0.0036)		8260B Low		1	09/27/17 18:15	C7I0440	CI72730
Dibromochloromethane	ND (0.0036)		8260B Low		1	09/27/17 18:15	C7I0440	CI72730
Dibromomethane	ND (0.0036)		8260B Low		1	09/27/17 18:15	C7I0440	CI72730
Dichlorodifluoromethane	ND (0.0071)		8260B Low		1	09/27/17 18:15	C7I0440	CI72730
Diethyl Ether	ND (0.0036)		8260B Low		1	09/27/17 18:15	C7I0440	CI72730
Di-isopropyl ether	ND (0.0036)		8260B Low		1	09/27/17 18:15	C7I0440	CI72730
Ethyl tertiary-butyl ether	ND (0.0036)		8260B Low		1	09/27/17 18:15	C7I0440	CI72730
Ethylbenzene	ND (0.0036)		8260B Low		1	09/27/17 18:15	C7I0440	CI72730
Hexachlorobutadiene	ND (0.0036)		8260B Low		1	09/27/17 18:15	C7I0440	CI72730
Isopropylbenzene	ND (0.0036)		8260B Low		1	09/27/17 18:15	C7I0440	CI72730
Methyl tert-Butyl Ether	ND (0.0036)		8260B Low		1	09/27/17 18:15	C7I0440	CI72730
Methylene Chloride	ND (0.0178)		8260B Low		1	09/27/17 18:15	C7I0440	CI72730
Naphthalene	ND (0.0036)		8260B Low		1	09/27/17 18:15	C7I0440	CI72730
n-Butylbenzene	ND (0.0036)		8260B Low		1	09/27/17 18:15	C7I0440	CI72730
n-Propylbenzene	ND (0.0036)		8260B Low		1	09/27/17 18:15	C7I0440	CI72730
sec-Butylbenzene	ND (0.0036)		8260B Low		1	09/27/17 18:15	C7I0440	CI72730
Styrene	ND (0.0036)		8260B Low		1	09/27/17 18:15	C7I0440	CI72730
tert-Butylbenzene	ND (0.0036)		8260B Low		1	09/27/17 18:15	C7I0440	CI72730
Tertiary-amyl methyl ether	ND (0.0036)		8260B Low		1	09/27/17 18:15	C7I0440	CI72730
Tetrachloroethene	ND (0.0036)		8260B Low		1	09/27/17 18:15	C7I0440	CI72730
Tetrahydrofuran	ND (0.0036)		8260B Low		1	09/27/17 18:15	C7I0440	CI72730



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-523 (0-2')  
 Date Sampled: 09/26/17 09:20  
 Percent Solids: 96  
 Initial Volume: 7.3  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-06  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0036)		8260B Low		1	09/27/17 18:15	C7I0440	CI72730
trans-1,2-Dichloroethene	ND (0.0036)		8260B Low		1	09/27/17 18:15	C7I0440	CI72730
trans-1,3-Dichloropropene	ND (0.0036)		8260B Low		1	09/27/17 18:15	C7I0440	CI72730
Trichloroethene	ND (0.0036)		8260B Low		1	09/27/17 18:15	C7I0440	CI72730
Trichlorofluoromethane	ND (0.0036)		8260B Low		1	09/27/17 18:15	C7I0440	CI72730
Vinyl Acetate	ND (0.0036)		8260B Low		1	09/27/17 18:15	C7I0440	CI72730
Vinyl Chloride	ND (0.0071)		8260B Low		1	09/27/17 18:15	C7I0440	CI72730
Xylene O	ND (0.0036)		8260B Low		1	09/27/17 18:15	C7I0440	CI72730
Xylene P,M	ND (0.0071)		8260B Low		1	09/27/17 18:15	C7I0440	CI72730
Xylenes (Total)	ND (0.0071)		8260B Low		1	09/27/17 18:15		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	111 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	107 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	107 %		70-130
<i>Surrogate: Toluene-d8</i>	111 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-523 (0-2')  
 Date Sampled: 09/26/17 09:20  
 Percent Solids: 96  
 Initial Volume: 20.3  
 Final Volume: 1  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-06  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: SMR  
 Prepared: 9/27/17 12:54

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	54.5 (38.3)		8100M		1	09/27/17 23:59	C710445	C172712
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		62 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-523 (0-2')  
Date Sampled: 09/26/17 09:20  
Percent Solids: 96  
Initial Volume: 14.8  
Final Volume: 0.5  
Extraction Method: 3546

ESS Laboratory Work Order: 1709754  
ESS Laboratory Sample ID: 1709754-06  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: TJ  
Prepared: 9/27/17 10:25

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.350)		8270D		1	09/29/17 0:08	C7I0459	CI72609
Acenaphthene	ND (0.350)		8270D		1	09/29/17 0:08	C7I0459	CI72609
Acenaphthylene	ND (0.350)		8270D		1	09/29/17 0:08	C7I0459	CI72609
Anthracene	ND (0.350)		8270D		1	09/29/17 0:08	C7I0459	CI72609
<b>Benzo(a)anthracene</b>	<b>0.526</b> (0.350)		8270D		1	09/29/17 0:08	C7I0459	CI72609
<b>Benzo(a)pyrene</b>	<b>0.483</b> (0.175)		8270D		1	09/29/17 0:08	C7I0459	CI72609
<b>Benzo(b)fluoranthene</b>	<b>0.558</b> (0.350)		8270D		1	09/29/17 0:08	C7I0459	CI72609
<b>Benzo(g,h,i)perylene</b>	<b>0.383</b> (0.350)		8270D		1	09/29/17 0:08	C7I0459	CI72609
Benzo(k)fluoranthene	ND (0.350)		8270D		1	09/29/17 0:08	C7I0459	CI72609
<b>Chrysene</b>	<b>0.565</b> (0.175)		8270D		1	09/29/17 0:08	C7I0459	CI72609
Dibenzo(a,h)Anthracene	ND (0.175)		8270D		1	09/29/17 0:08	C7I0459	CI72609
<b>Fluoranthene</b>	<b>0.733</b> (0.350)		8270D		1	09/29/17 0:08	C7I0459	CI72609
Fluorene	ND (0.350)		8270D		1	09/29/17 0:08	C7I0459	CI72609
Indeno(1,2,3-cd)Pyrene	ND (0.350)		8270D		1	09/29/17 0:08	C7I0459	CI72609
Naphthalene	ND (0.350)		8270D		1	09/29/17 0:08	C7I0459	CI72609
<b>Phenanthrene</b>	<b>0.474</b> (0.350)		8270D		1	09/29/17 0:08	C7I0459	CI72609
<b>Pyrene</b>	<b>1.07</b> (0.350)		8270D		1	09/29/17 0:08	C7I0459	CI72609

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	75 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	75 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	75 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	104 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-523 (0-2')  
Date Sampled: 09/26/17 09:20  
Percent Solids: 96

ESS Laboratory Work Order: 1709754  
ESS Laboratory Sample ID: 1709754-06  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	1.75 (1.03)		9014		1	EEM	09/29/17 13:00	mg/kg dry	CI72918





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-524 (0-2')  
 Date Sampled: 09/26/17 10:00  
 Percent Solids: 94

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-07  
 Sample Matrix: Soil  
 Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	13.6 (1.99)		6020A		20	NAR	09/29/17 13:36	2.14	100	CI72838
Arsenic	5.80 (2.49)		6010C		1	KJK	09/30/17 1:11	2.14	100	CI72838
Beryllium	0.22 (0.11)		6010C		1	KJK	09/30/17 1:11	2.14	100	CI72838
Cadmium	ND (0.50)		6010C		1	KJK	09/30/17 1:11	2.14	100	CI72838
Chromium	34.1 (1.00)		6010C		1	KJK	09/30/17 1:11	2.14	100	CI72838
Copper	46.0 (2.49)		6010C		1	KJK	09/30/17 1:11	2.14	100	CI72838
Lead	1210 (4.98)		6010C		1	KJK	09/30/17 1:11	2.14	100	CI72838
Mercury	0.391 (0.034)		7471B		1	MJV	09/29/17 12:36	0.63	40	CI72839
Nickel	27.0 (2.49)		6010C		1	KJK	09/30/17 1:11	2.14	100	CI72838
Selenium	ND (1.99)		6020A		20	NAR	09/29/17 13:36	2.14	100	CI72838
Silver	0.64 (0.50)		6010C		1	KJK	09/30/17 1:11	2.14	100	CI72838
Thallium	ND (1.99)		6020A		20	NAR	09/29/17 13:36	2.14	100	CI72838
Zinc	100 (2.49)		6010C		1	KJK	09/30/17 1:11	2.14	100	CI72838



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-524 (0-2')  
 Date Sampled: 09/26/17 10:00  
 Percent Solids: 94  
 Initial Volume: 7  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-07  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0038)		8260B Low		1	09/27/17 18:40	C7I0440	CI72730
1,1,1-Trichloroethane	ND (0.0038)		8260B Low		1	09/27/17 18:40	C7I0440	CI72730
1,1,2,2-Tetrachloroethane	ND (0.0038)		8260B Low		1	09/27/17 18:40	C7I0440	CI72730
1,1,2-Trichloroethane	ND (0.0038)		8260B Low		1	09/27/17 18:40	C7I0440	CI72730
1,1-Dichloroethane	ND (0.0038)		8260B Low		1	09/27/17 18:40	C7I0440	CI72730
1,1-Dichloroethene	ND (0.0038)		8260B Low		1	09/27/17 18:40	C7I0440	CI72730
1,1-Dichloropropene	ND (0.0038)		8260B Low		1	09/27/17 18:40	C7I0440	CI72730
1,2,3-Trichlorobenzene	ND (0.0038)		8260B Low		1	09/27/17 18:40	C7I0440	CI72730
1,2,3-Trichloropropane	ND (0.0038)		8260B Low		1	09/27/17 18:40	C7I0440	CI72730
1,2,4-Trichlorobenzene	ND (0.0038)		8260B Low		1	09/27/17 18:40	C7I0440	CI72730
1,2,4-Trimethylbenzene	ND (0.0038)		8260B Low		1	09/27/17 18:40	C7I0440	CI72730
1,2-Dibromo-3-Chloropropane	ND (0.0038)		8260B Low		1	09/27/17 18:40	C7I0440	CI72730
1,2-Dibromoethane	ND (0.0038)		8260B Low		1	09/27/17 18:40	C7I0440	CI72730
1,2-Dichlorobenzene	ND (0.0038)		8260B Low		1	09/27/17 18:40	C7I0440	CI72730
1,2-Dichloroethane	ND (0.0038)		8260B Low		1	09/27/17 18:40	C7I0440	CI72730
1,2-Dichloropropane	ND (0.0038)		8260B Low		1	09/27/17 18:40	C7I0440	CI72730
1,3,5-Trimethylbenzene	ND (0.0038)		8260B Low		1	09/27/17 18:40	C7I0440	CI72730
1,3-Dichlorobenzene	ND (0.0038)		8260B Low		1	09/27/17 18:40	C7I0440	CI72730
1,3-Dichloropropane	ND (0.0038)		8260B Low		1	09/27/17 18:40	C7I0440	CI72730
1,4-Dichlorobenzene	ND (0.0038)		8260B Low		1	09/27/17 18:40	C7I0440	CI72730
1,4-Dioxane	ND (0.0762)		8260B Low		1	09/27/17 18:40	C7I0440	CI72730
1-Chlorohexane	ND (0.0038)		8260B Low		1	09/27/17 18:40	C7I0440	CI72730
2,2-Dichloropropane	ND (0.0038)		8260B Low		1	09/27/17 18:40	C7I0440	CI72730
2-Butanone	ND (0.0381)		8260B Low		1	09/27/17 18:40	C7I0440	CI72730
2-Chlorotoluene	ND (0.0038)		8260B Low		1	09/27/17 18:40	C7I0440	CI72730
2-Hexanone	ND (0.0381)		8260B Low		1	09/27/17 18:40	C7I0440	CI72730
4-Chlorotoluene	ND (0.0038)		8260B Low		1	09/27/17 18:40	C7I0440	CI72730
4-Isopropyltoluene	ND (0.0038)		8260B Low		1	09/27/17 18:40	C7I0440	CI72730
4-Methyl-2-Pentanone	ND (0.0381)		8260B Low		1	09/27/17 18:40	C7I0440	CI72730
<b>Acetone</b>	<b>0.0940 (0.0381)</b>		8260B Low		1	09/27/17 18:40	C7I0440	CI72730
Benzene	ND (0.0038)		8260B Low		1	09/27/17 18:40	C7I0440	CI72730
Bromobenzene	ND (0.0038)		8260B Low		1	09/27/17 18:40	C7I0440	CI72730



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-524 (0-2')  
Date Sampled: 09/26/17 10:00  
Percent Solids: 94  
Initial Volume: 7  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1709754  
ESS Laboratory Sample ID: 1709754-07  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0038)		8260B Low		1	09/27/17 18:40	C7I0440	CI72730
Bromodichloromethane	ND (0.0038)		8260B Low		1	09/27/17 18:40	C7I0440	CI72730
Bromoform	ND (0.0038)		8260B Low		1	09/27/17 18:40	C7I0440	CI72730
Bromomethane	ND (0.0076)		8260B Low		1	09/27/17 18:40	C7I0440	CI72730
Carbon Disulfide	ND (0.0038)		8260B Low		1	09/27/17 18:40	C7I0440	CI72730
Carbon Tetrachloride	ND (0.0038)		8260B Low		1	09/27/17 18:40	C7I0440	CI72730
Chlorobenzene	ND (0.0038)		8260B Low		1	09/27/17 18:40	C7I0440	CI72730
Chloroethane	ND (0.0076)		8260B Low		1	09/27/17 18:40	C7I0440	CI72730
Chloroform	ND (0.0038)		8260B Low		1	09/27/17 18:40	C7I0440	CI72730
Chloromethane	ND (0.0076)		8260B Low		1	09/27/17 18:40	C7I0440	CI72730
cis-1,2-Dichloroethene	ND (0.0038)		8260B Low		1	09/27/17 18:40	C7I0440	CI72730
cis-1,3-Dichloropropene	ND (0.0038)		8260B Low		1	09/27/17 18:40	C7I0440	CI72730
Dibromochloromethane	ND (0.0038)		8260B Low		1	09/27/17 18:40	C7I0440	CI72730
Dibromomethane	ND (0.0038)		8260B Low		1	09/27/17 18:40	C7I0440	CI72730
Dichlorodifluoromethane	ND (0.0076)		8260B Low		1	09/27/17 18:40	C7I0440	CI72730
Diethyl Ether	ND (0.0038)		8260B Low		1	09/27/17 18:40	C7I0440	CI72730
Di-isopropyl ether	ND (0.0038)		8260B Low		1	09/27/17 18:40	C7I0440	CI72730
Ethyl tertiary-butyl ether	ND (0.0038)		8260B Low		1	09/27/17 18:40	C7I0440	CI72730
Ethylbenzene	ND (0.0038)		8260B Low		1	09/27/17 18:40	C7I0440	CI72730
Hexachlorobutadiene	ND (0.0038)		8260B Low		1	09/27/17 18:40	C7I0440	CI72730
Isopropylbenzene	ND (0.0038)		8260B Low		1	09/27/17 18:40	C7I0440	CI72730
Methyl tert-Butyl Ether	ND (0.0038)		8260B Low		1	09/27/17 18:40	C7I0440	CI72730
Methylene Chloride	ND (0.0190)		8260B Low		1	09/27/17 18:40	C7I0440	CI72730
Naphthalene	ND (0.0038)		8260B Low		1	09/27/17 18:40	C7I0440	CI72730
n-Butylbenzene	ND (0.0038)		8260B Low		1	09/27/17 18:40	C7I0440	CI72730
n-Propylbenzene	ND (0.0038)		8260B Low		1	09/27/17 18:40	C7I0440	CI72730
sec-Butylbenzene	ND (0.0038)		8260B Low		1	09/27/17 18:40	C7I0440	CI72730
Styrene	ND (0.0038)		8260B Low		1	09/27/17 18:40	C7I0440	CI72730
tert-Butylbenzene	ND (0.0038)		8260B Low		1	09/27/17 18:40	C7I0440	CI72730
Tertiary-amyl methyl ether	ND (0.0038)		8260B Low		1	09/27/17 18:40	C7I0440	CI72730
Tetrachloroethene	ND (0.0038)		8260B Low		1	09/27/17 18:40	C7I0440	CI72730
Tetrahydrofuran	ND (0.0038)		8260B Low		1	09/27/17 18:40	C7I0440	CI72730



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-524 (0-2')  
 Date Sampled: 09/26/17 10:00  
 Percent Solids: 94  
 Initial Volume: 7  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-07  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0038)		8260B Low		1	09/27/17 18:40	C7I0440	CI72730
trans-1,2-Dichloroethene	ND (0.0038)		8260B Low		1	09/27/17 18:40	C7I0440	CI72730
trans-1,3-Dichloropropene	ND (0.0038)		8260B Low		1	09/27/17 18:40	C7I0440	CI72730
Trichloroethene	ND (0.0038)		8260B Low		1	09/27/17 18:40	C7I0440	CI72730
Trichlorofluoromethane	ND (0.0038)		8260B Low		1	09/27/17 18:40	C7I0440	CI72730
Vinyl Acetate	ND (0.0038)		8260B Low		1	09/27/17 18:40	C7I0440	CI72730
Vinyl Chloride	ND (0.0076)		8260B Low		1	09/27/17 18:40	C7I0440	CI72730
Xylene O	ND (0.0038)		8260B Low		1	09/27/17 18:40	C7I0440	CI72730
Xylene P,M	ND (0.0076)		8260B Low		1	09/27/17 18:40	C7I0440	CI72730
Xylenes (Total)	ND (0.0076)		8260B Low		1	09/27/17 18:40		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	111 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	99 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	105 %		70-130
<i>Surrogate: Toluene-d8</i>	119 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-524 (0-2')  
Date Sampled: 09/26/17 10:00  
Percent Solids: 94  
Initial Volume: 19.7  
Final Volume: 1  
Extraction Method: 3546

ESS Laboratory Work Order: 1709754  
ESS Laboratory Sample ID: 1709754-07  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: SMR  
Prepared: 9/27/17 12:54

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	364 (40.6)		8100M		1	09/28/17 0:34	C710445	C172712
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		53 %		40-140				





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-524 (0-2')  
Date Sampled: 09/26/17 10:00  
Percent Solids: 94  
Initial Volume: 15.2  
Final Volume: 0.5  
Extraction Method: 3546

ESS Laboratory Work Order: 1709754  
ESS Laboratory Sample ID: 1709754-07  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: TJ  
Prepared: 9/27/17 11:30

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	0.964 (0.351)		8270D		1	09/29/17 0:43	C7I0459	CI72716
Acenaphthene	ND (0.351)		8270D		1	09/29/17 0:43	C7I0459	CI72716
Acenaphthylene	1.76 (0.351)		8270D		1	09/29/17 0:43	C7I0459	CI72716
Anthracene	1.14 (0.351)		8270D		1	09/29/17 0:43	C7I0459	CI72716
Benzo(a)anthracene	3.89 (0.351)		8270D		1	09/29/17 0:43	C7I0459	CI72716
Benzo(a)pyrene	3.49 (0.176)		8270D		1	09/29/17 0:43	C7I0459	CI72716
Benzo(b)fluoranthene	4.12 (0.351)		8270D		1	09/29/17 0:43	C7I0459	CI72716
Benzo(g,h,i)perylene	2.53 (0.351)		8270D		1	09/29/17 0:43	C7I0459	CI72716
Benzo(k)fluoranthene	1.90 (0.351)		8270D		1	09/29/17 0:43	C7I0459	CI72716
Chrysene	3.75 (0.176)		8270D		1	09/29/17 0:43	C7I0459	CI72716
Dibenzo(a,h)Anthracene	1.06 (0.176)		8270D		1	09/29/17 0:43	C7I0459	CI72716
Fluoranthene	4.16 (0.351)		8270D		1	09/29/17 0:43	C7I0459	CI72716
Fluorene	ND (0.351)		8270D		1	09/29/17 0:43	C7I0459	CI72716
Indeno(1,2,3-cd)Pyrene	2.45 (0.351)		8270D		1	09/29/17 0:43	C7I0459	CI72716
Naphthalene	1.17 (0.351)		8270D		1	09/29/17 0:43	C7I0459	CI72716
Phenanthrene	2.53 (0.351)		8270D		1	09/29/17 0:43	C7I0459	CI72716
Pyrene	4.78 (0.351)		8270D		1	09/29/17 0:43	C7I0459	CI72716

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
Surrogate: 1,2-Dichlorobenzene-d4	61 %		30-130
Surrogate: 2-Fluorobiphenyl	64 %		30-130
Surrogate: Nitrobenzene-d5	61 %		30-130
Surrogate: p-Terphenyl-d14	73 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-524 (0-2')  
Date Sampled: 09/26/17 10:00  
Percent Solids: 94

ESS Laboratory Work Order: 1709754  
ESS Laboratory Sample ID: 1709754-07  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	3.03 (1.06)		9014		1	EEM	09/29/17 13:00	mg/kg dry	CI72918



## CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-525 (0-2')  
Date Sampled: 09/26/17 10:30  
Percent Solids: 95

ESS Laboratory Work Order: 1709754  
ESS Laboratory Sample ID: 1709754-08  
Sample Matrix: Soil  
Units: mg/kg dry

Extraction Method: 3050B

### Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	15.3 (2.09)		6020A		20	NAR	09/29/17 13:42	2.02	100	CI72838
Arsenic	6.95 (2.61)		6010C		1	KJK	09/30/17 1:15	2.02	100	CI72838
Beryllium	0.26 (0.11)		6010C		1	KJK	09/30/17 1:15	2.02	100	CI72838
Cadmium	ND (0.52)		6010C		1	KJK	09/30/17 1:15	2.02	100	CI72838
Chromium	22.2 (1.04)		6010C		1	KJK	09/30/17 1:15	2.02	100	CI72838
Copper	45.7 (2.61)		6010C		1	KJK	09/30/17 1:15	2.02	100	CI72838
Lead	1270 (5.22)		6010C		1	KJK	09/30/17 1:15	2.02	100	CI72838
Mercury	0.327 (0.031)		7471B		1	MJV	09/29/17 12:38	0.68	40	CI72839
Nickel	30.3 (2.61)		6010C		1	KJK	09/30/17 1:15	2.02	100	CI72838
Selenium	ND (2.09)		6020A		20	NAR	09/29/17 13:42	2.02	100	CI72838
Silver	ND (0.52)		6010C		1	KJK	09/30/17 1:15	2.02	100	CI72838
Thallium	ND (2.09)		6020A		20	NAR	09/29/17 13:42	2.02	100	CI72838
Zinc	120 (2.61)		6010C		1	KJK	09/30/17 1:15	2.02	100	CI72838



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-525 (0-2')  
 Date Sampled: 09/26/17 10:30  
 Percent Solids: 95  
 Initial Volume: 8  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-08  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0033)		8260B Low		1	09/27/17 19:05	C7I0440	CI72730
1,1,1-Trichloroethane	ND (0.0033)		8260B Low		1	09/27/17 19:05	C7I0440	CI72730
1,1,2,2-Tetrachloroethane	ND (0.0033)		8260B Low		1	09/27/17 19:05	C7I0440	CI72730
1,1,2-Trichloroethane	ND (0.0033)		8260B Low		1	09/27/17 19:05	C7I0440	CI72730
1,1-Dichloroethane	ND (0.0033)		8260B Low		1	09/27/17 19:05	C7I0440	CI72730
1,1-Dichloroethene	ND (0.0033)		8260B Low		1	09/27/17 19:05	C7I0440	CI72730
1,1-Dichloropropene	ND (0.0033)		8260B Low		1	09/27/17 19:05	C7I0440	CI72730
1,2,3-Trichlorobenzene	ND (0.0033)		8260B Low		1	09/27/17 19:05	C7I0440	CI72730
1,2,3-Trichloropropane	ND (0.0033)		8260B Low		1	09/27/17 19:05	C7I0440	CI72730
1,2,4-Trichlorobenzene	ND (0.0033)		8260B Low		1	09/27/17 19:05	C7I0440	CI72730
1,2,4-Trimethylbenzene	ND (0.0033)		8260B Low		1	09/27/17 19:05	C7I0440	CI72730
1,2-Dibromo-3-Chloropropane	ND (0.0033)		8260B Low		1	09/27/17 19:05	C7I0440	CI72730
1,2-Dibromoethane	ND (0.0033)		8260B Low		1	09/27/17 19:05	C7I0440	CI72730
1,2-Dichlorobenzene	ND (0.0033)		8260B Low		1	09/27/17 19:05	C7I0440	CI72730
1,2-Dichloroethane	ND (0.0033)		8260B Low		1	09/27/17 19:05	C7I0440	CI72730
1,2-Dichloropropane	ND (0.0033)		8260B Low		1	09/27/17 19:05	C7I0440	CI72730
1,3,5-Trimethylbenzene	ND (0.0033)		8260B Low		1	09/27/17 19:05	C7I0440	CI72730
1,3-Dichlorobenzene	ND (0.0033)		8260B Low		1	09/27/17 19:05	C7I0440	CI72730
1,3-Dichloropropane	ND (0.0033)		8260B Low		1	09/27/17 19:05	C7I0440	CI72730
1,4-Dichlorobenzene	ND (0.0033)		8260B Low		1	09/27/17 19:05	C7I0440	CI72730
1,4-Dioxane	ND (0.0659)		8260B Low		1	09/27/17 19:05	C7I0440	CI72730
1-Chlorohexane	ND (0.0033)		8260B Low		1	09/27/17 19:05	C7I0440	CI72730
2,2-Dichloropropane	ND (0.0033)		8260B Low		1	09/27/17 19:05	C7I0440	CI72730
2-Butanone	ND (0.0329)		8260B Low		1	09/27/17 19:05	C7I0440	CI72730
2-Chlorotoluene	ND (0.0033)		8260B Low		1	09/27/17 19:05	C7I0440	CI72730
2-Hexanone	ND (0.0329)		8260B Low		1	09/27/17 19:05	C7I0440	CI72730
4-Chlorotoluene	ND (0.0033)		8260B Low		1	09/27/17 19:05	C7I0440	CI72730
4-Isopropyltoluene	ND (0.0033)		8260B Low		1	09/27/17 19:05	C7I0440	CI72730
4-Methyl-2-Pentanone	ND (0.0329)		8260B Low		1	09/27/17 19:05	C7I0440	CI72730
Acetone	ND (0.0329)		8260B Low		1	09/27/17 19:05	C7I0440	CI72730
Benzene	ND (0.0033)		8260B Low		1	09/27/17 19:05	C7I0440	CI72730
Bromobenzene	ND (0.0033)		8260B Low		1	09/27/17 19:05	C7I0440	CI72730



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-525 (0-2')  
 Date Sampled: 09/26/17 10:30  
 Percent Solids: 95  
 Initial Volume: 8  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-08  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0033)		8260B Low		1	09/27/17 19:05	C7I0440	CI72730
Bromodichloromethane	ND (0.0033)		8260B Low		1	09/27/17 19:05	C7I0440	CI72730
Bromoform	ND (0.0033)		8260B Low		1	09/27/17 19:05	C7I0440	CI72730
Bromomethane	ND (0.0066)		8260B Low		1	09/27/17 19:05	C7I0440	CI72730
Carbon Disulfide	ND (0.0033)		8260B Low		1	09/27/17 19:05	C7I0440	CI72730
Carbon Tetrachloride	ND (0.0033)		8260B Low		1	09/27/17 19:05	C7I0440	CI72730
Chlorobenzene	ND (0.0033)		8260B Low		1	09/27/17 19:05	C7I0440	CI72730
Chloroethane	ND (0.0066)		8260B Low		1	09/27/17 19:05	C7I0440	CI72730
Chloroform	ND (0.0033)		8260B Low		1	09/27/17 19:05	C7I0440	CI72730
Chloromethane	ND (0.0066)		8260B Low		1	09/27/17 19:05	C7I0440	CI72730
cis-1,2-Dichloroethene	ND (0.0033)		8260B Low		1	09/27/17 19:05	C7I0440	CI72730
cis-1,3-Dichloropropene	ND (0.0033)		8260B Low		1	09/27/17 19:05	C7I0440	CI72730
Dibromochloromethane	ND (0.0033)		8260B Low		1	09/27/17 19:05	C7I0440	CI72730
Dibromomethane	ND (0.0033)		8260B Low		1	09/27/17 19:05	C7I0440	CI72730
Dichlorodifluoromethane	ND (0.0066)		8260B Low		1	09/27/17 19:05	C7I0440	CI72730
Diethyl Ether	ND (0.0033)		8260B Low		1	09/27/17 19:05	C7I0440	CI72730
Di-isopropyl ether	ND (0.0033)		8260B Low		1	09/27/17 19:05	C7I0440	CI72730
Ethyl tertiary-butyl ether	ND (0.0033)		8260B Low		1	09/27/17 19:05	C7I0440	CI72730
Ethylbenzene	ND (0.0033)		8260B Low		1	09/27/17 19:05	C7I0440	CI72730
Hexachlorobutadiene	ND (0.0033)		8260B Low		1	09/27/17 19:05	C7I0440	CI72730
Isopropylbenzene	ND (0.0033)		8260B Low		1	09/27/17 19:05	C7I0440	CI72730
Methyl tert-Butyl Ether	ND (0.0033)		8260B Low		1	09/27/17 19:05	C7I0440	CI72730
Methylene Chloride	ND (0.0165)		8260B Low		1	09/27/17 19:05	C7I0440	CI72730
Naphthalene	ND (0.0033)		8260B Low		1	09/27/17 19:05	C7I0440	CI72730
n-Butylbenzene	ND (0.0033)		8260B Low		1	09/27/17 19:05	C7I0440	CI72730
n-Propylbenzene	ND (0.0033)		8260B Low		1	09/27/17 19:05	C7I0440	CI72730
sec-Butylbenzene	ND (0.0033)		8260B Low		1	09/27/17 19:05	C7I0440	CI72730
Styrene	ND (0.0033)		8260B Low		1	09/27/17 19:05	C7I0440	CI72730
tert-Butylbenzene	ND (0.0033)		8260B Low		1	09/27/17 19:05	C7I0440	CI72730
Tertiary-amyl methyl ether	ND (0.0033)		8260B Low		1	09/27/17 19:05	C7I0440	CI72730
Tetrachloroethene	ND (0.0033)		8260B Low		1	09/27/17 19:05	C7I0440	CI72730
Tetrahydrofuran	ND (0.0033)		8260B Low		1	09/27/17 19:05	C7I0440	CI72730





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-525 (0-2')  
 Date Sampled: 09/26/17 10:30  
 Percent Solids: 95  
 Initial Volume: 8  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-08  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0033)		8260B Low		1	09/27/17 19:05	C7I0440	CI72730
trans-1,2-Dichloroethene	ND (0.0033)		8260B Low		1	09/27/17 19:05	C7I0440	CI72730
trans-1,3-Dichloropropene	ND (0.0033)		8260B Low		1	09/27/17 19:05	C7I0440	CI72730
Trichloroethene	ND (0.0033)		8260B Low		1	09/27/17 19:05	C7I0440	CI72730
Trichlorofluoromethane	ND (0.0033)		8260B Low		1	09/27/17 19:05	C7I0440	CI72730
Vinyl Acetate	ND (0.0033)		8260B Low		1	09/27/17 19:05	C7I0440	CI72730
Vinyl Chloride	ND (0.0066)		8260B Low		1	09/27/17 19:05	C7I0440	CI72730
Xylene O	ND (0.0033)		8260B Low		1	09/27/17 19:05	C7I0440	CI72730
Xylene P,M	ND (0.0066)		8260B Low		1	09/27/17 19:05	C7I0440	CI72730
Xylenes (Total)	ND (0.0066)		8260B Low		1	09/27/17 19:05		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	113 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	103 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	108 %		70-130
<i>Surrogate: Toluene-d8</i>	113 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-525 (0-2')  
 Date Sampled: 09/26/17 10:30  
 Percent Solids: 95  
 Initial Volume: 20.4  
 Final Volume: 1  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-08  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: SMR  
 Prepared: 9/27/17 12:54

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	82.2 (38.8)		8100M		1	09/28/17 1:10	C710445	C172712
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		66 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-525 (0-2')  
Date Sampled: 09/26/17 10:30  
Percent Solids: 95  
Initial Volume: 15.6  
Final Volume: 0.5  
Extraction Method: 3546

ESS Laboratory Work Order: 1709754  
ESS Laboratory Sample ID: 1709754-08  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: TJ  
Prepared: 9/27/17 11:30

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.337)		8270D		1	09/28/17 23:10	C7I0472	CI72716
Acenaphthene	ND (0.337)		8270D		1	09/28/17 23:10	C7I0472	CI72716
Acenaphthylene	ND (0.337)		8270D		1	09/28/17 23:10	C7I0472	CI72716
Anthracene	ND (0.337)		8270D		1	09/28/17 23:10	C7I0472	CI72716
<b>Benzo(a)anthracene</b>	<b>0.672</b> (0.337)		8270D		1	09/28/17 23:10	C7I0472	CI72716
<b>Benzo(a)pyrene</b>	<b>0.660</b> (0.169)		8270D		1	09/28/17 23:10	C7I0472	CI72716
<b>Benzo(b)fluoranthene</b>	<b>0.657</b> (0.337)		8270D		1	09/28/17 23:10	C7I0472	CI72716
Benzo(g,h,i)perylene	ND (0.337)		8270D		1	09/28/17 23:10	C7I0472	CI72716
<b>Benzo(k)fluoranthene</b>	<b>0.607</b> (0.337)		8270D		1	09/28/17 23:10	C7I0472	CI72716
<b>Chrysene</b>	<b>0.670</b> (0.169)		8270D		1	09/28/17 23:10	C7I0472	CI72716
Dibenzo(a,h)Anthracene	ND (0.169)		8270D		1	09/28/17 23:10	C7I0472	CI72716
<b>Fluoranthene</b>	<b>1.26</b> (0.337)		8270D		1	09/28/17 23:10	C7I0472	CI72716
Fluorene	ND (0.337)		8270D		1	09/28/17 23:10	C7I0472	CI72716
Indeno(1,2,3-cd)Pyrene	ND (0.337)		8270D		1	09/28/17 23:10	C7I0472	CI72716
Naphthalene	ND (0.337)		8270D		1	09/28/17 23:10	C7I0472	CI72716
<b>Phenanthrene</b>	<b>0.458</b> (0.337)		8270D		1	09/28/17 23:10	C7I0472	CI72716
<b>Pyrene</b>	<b>0.990</b> (0.337)		8270D		1	09/28/17 23:10	C7I0472	CI72716

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	70 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	74 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	70 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	75 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-525 (0-2')  
Date Sampled: 09/26/17 10:30  
Percent Solids: 95

ESS Laboratory Work Order: 1709754  
ESS Laboratory Sample ID: 1709754-08  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	3.13 (1.05)		9014		1	EEM	09/29/17 13:00	mg/kg dry	C172918



## CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-526 (0-2')  
 Date Sampled: 09/26/17 12:35  
 Percent Solids: 95

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-09  
 Sample Matrix: Soil  
 Units: mg/kg dry

Extraction Method: 3050B

### Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (1.88)		6020A		20	NAR	09/29/17 13:48	2.24	100	CI72838
Arsenic	5.00 (2.35)		6010C		1	KJK	09/30/17 1:21	2.24	100	CI72838
Beryllium	0.28 (0.10)		6010C		1	KJK	09/30/17 1:21	2.24	100	CI72838
Cadmium	ND (0.47)		6010C		1	KJK	09/30/17 1:21	2.24	100	CI72838
Chromium	8.28 (0.94)		6010C		1	KJK	09/30/17 1:21	2.24	100	CI72838
Copper	42.4 (2.35)		6010C		1	KJK	09/30/17 1:21	2.24	100	CI72838
Lead	403 (4.69)		6010C		1	KJK	09/30/17 1:21	2.24	100	CI72838
Mercury	0.273 (0.030)		7471B		1	MJV	09/29/17 12:40	0.69	40	CI72839
Nickel	15.6 (2.35)		6010C		1	KJK	09/30/17 1:21	2.24	100	CI72838
Selenium	ND (1.88)		6020A		20	NAR	09/29/17 13:48	2.24	100	CI72838
Silver	ND (0.47)		6010C		1	KJK	09/30/17 1:21	2.24	100	CI72838
Thallium	ND (1.88)		6020A		20	NAR	09/29/17 13:48	2.24	100	CI72838
Zinc	127 (2.35)		6010C		1	KJK	09/30/17 1:21	2.24	100	CI72838





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-526 (0-2')  
Date Sampled: 09/26/17 12:35  
Percent Solids: 95  
Initial Volume: 6.2  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1709754  
ESS Laboratory Sample ID: 1709754-09  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0042)		8260B Low		1	09/27/17 19:31	C7I0440	CI72730
1,1,1-Trichloroethane	ND (0.0042)		8260B Low		1	09/27/17 19:31	C7I0440	CI72730
1,1,2,2-Tetrachloroethane	ND (0.0042)		8260B Low		1	09/27/17 19:31	C7I0440	CI72730
1,1,2-Trichloroethane	ND (0.0042)		8260B Low		1	09/27/17 19:31	C7I0440	CI72730
1,1-Dichloroethane	ND (0.0042)		8260B Low		1	09/27/17 19:31	C7I0440	CI72730
1,1-Dichloroethene	ND (0.0042)		8260B Low		1	09/27/17 19:31	C7I0440	CI72730
1,1-Dichloropropene	ND (0.0042)		8260B Low		1	09/27/17 19:31	C7I0440	CI72730
1,2,3-Trichlorobenzene	ND (0.0042)		8260B Low		1	09/27/17 19:31	C7I0440	CI72730
1,2,3-Trichloropropane	ND (0.0042)		8260B Low		1	09/27/17 19:31	C7I0440	CI72730
1,2,4-Trichlorobenzene	ND (0.0042)		8260B Low		1	09/27/17 19:31	C7I0440	CI72730
1,2,4-Trimethylbenzene	ND (0.0042)		8260B Low		1	09/27/17 19:31	C7I0440	CI72730
1,2-Dibromo-3-Chloropropane	ND (0.0042)		8260B Low		1	09/27/17 19:31	C7I0440	CI72730
1,2-Dibromoethane	ND (0.0042)		8260B Low		1	09/27/17 19:31	C7I0440	CI72730
1,2-Dichlorobenzene	ND (0.0042)		8260B Low		1	09/27/17 19:31	C7I0440	CI72730
1,2-Dichloroethane	ND (0.0042)		8260B Low		1	09/27/17 19:31	C7I0440	CI72730
1,2-Dichloropropane	ND (0.0042)		8260B Low		1	09/27/17 19:31	C7I0440	CI72730
1,3,5-Trimethylbenzene	ND (0.0042)		8260B Low		1	09/27/17 19:31	C7I0440	CI72730
1,3-Dichlorobenzene	ND (0.0042)		8260B Low		1	09/27/17 19:31	C7I0440	CI72730
1,3-Dichloropropane	ND (0.0042)		8260B Low		1	09/27/17 19:31	C7I0440	CI72730
1,4-Dichlorobenzene	ND (0.0042)		8260B Low		1	09/27/17 19:31	C7I0440	CI72730
1,4-Dioxane	ND (0.0847)		8260B Low		1	09/27/17 19:31	C7I0440	CI72730
1-Chlorohexane	ND (0.0042)		8260B Low		1	09/27/17 19:31	C7I0440	CI72730
2,2-Dichloropropane	ND (0.0042)		8260B Low		1	09/27/17 19:31	C7I0440	CI72730
2-Butanone	ND (0.0424)		8260B Low		1	09/27/17 19:31	C7I0440	CI72730
2-Chlorotoluene	ND (0.0042)		8260B Low		1	09/27/17 19:31	C7I0440	CI72730
2-Hexanone	ND (0.0424)		8260B Low		1	09/27/17 19:31	C7I0440	CI72730
4-Chlorotoluene	ND (0.0042)		8260B Low		1	09/27/17 19:31	C7I0440	CI72730
4-Isopropyltoluene	ND (0.0042)		8260B Low		1	09/27/17 19:31	C7I0440	CI72730
4-Methyl-2-Pentanone	ND (0.0424)		8260B Low		1	09/27/17 19:31	C7I0440	CI72730
Acetone	ND (0.0424)		8260B Low		1	09/27/17 19:31	C7I0440	CI72730
Benzene	ND (0.0042)		8260B Low		1	09/27/17 19:31	C7I0440	CI72730
Bromobenzene	ND (0.0042)		8260B Low		1	09/27/17 19:31	C7I0440	CI72730



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-526 (0-2')  
 Date Sampled: 09/26/17 12:35  
 Percent Solids: 95  
 Initial Volume: 6.2  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-09  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0042)		8260B Low		1	09/27/17 19:31	C7I0440	CI72730
Bromodichloromethane	ND (0.0042)		8260B Low		1	09/27/17 19:31	C7I0440	CI72730
Bromoform	ND (0.0042)		8260B Low		1	09/27/17 19:31	C7I0440	CI72730
Bromomethane	ND (0.0085)		8260B Low		1	09/27/17 19:31	C7I0440	CI72730
Carbon Disulfide	ND (0.0042)		8260B Low		1	09/27/17 19:31	C7I0440	CI72730
Carbon Tetrachloride	ND (0.0042)		8260B Low		1	09/27/17 19:31	C7I0440	CI72730
Chlorobenzene	ND (0.0042)		8260B Low		1	09/27/17 19:31	C7I0440	CI72730
Chloroethane	ND (0.0085)		8260B Low		1	09/27/17 19:31	C7I0440	CI72730
Chloroform	ND (0.0042)		8260B Low		1	09/27/17 19:31	C7I0440	CI72730
Chloromethane	ND (0.0085)		8260B Low		1	09/27/17 19:31	C7I0440	CI72730
cis-1,2-Dichloroethene	ND (0.0042)		8260B Low		1	09/27/17 19:31	C7I0440	CI72730
cis-1,3-Dichloropropene	ND (0.0042)		8260B Low		1	09/27/17 19:31	C7I0440	CI72730
Dibromochloromethane	ND (0.0042)		8260B Low		1	09/27/17 19:31	C7I0440	CI72730
Dibromomethane	ND (0.0042)		8260B Low		1	09/27/17 19:31	C7I0440	CI72730
Dichlorodifluoromethane	ND (0.0085)		8260B Low		1	09/27/17 19:31	C7I0440	CI72730
Diethyl Ether	ND (0.0042)		8260B Low		1	09/27/17 19:31	C7I0440	CI72730
Di-isopropyl ether	ND (0.0042)		8260B Low		1	09/27/17 19:31	C7I0440	CI72730
Ethyl tertiary-butyl ether	ND (0.0042)		8260B Low		1	09/27/17 19:31	C7I0440	CI72730
Ethylbenzene	ND (0.0042)		8260B Low		1	09/27/17 19:31	C7I0440	CI72730
Hexachlorobutadiene	ND (0.0042)		8260B Low		1	09/27/17 19:31	C7I0440	CI72730
Isopropylbenzene	ND (0.0042)		8260B Low		1	09/27/17 19:31	C7I0440	CI72730
Methyl tert-Butyl Ether	ND (0.0042)		8260B Low		1	09/27/17 19:31	C7I0440	CI72730
Methylene Chloride	ND (0.0212)		8260B Low		1	09/27/17 19:31	C7I0440	CI72730
Naphthalene	ND (0.0042)		8260B Low		1	09/27/17 19:31	C7I0440	CI72730
n-Butylbenzene	ND (0.0042)		8260B Low		1	09/27/17 19:31	C7I0440	CI72730
n-Propylbenzene	ND (0.0042)		8260B Low		1	09/27/17 19:31	C7I0440	CI72730
sec-Butylbenzene	ND (0.0042)		8260B Low		1	09/27/17 19:31	C7I0440	CI72730
Styrene	ND (0.0042)		8260B Low		1	09/27/17 19:31	C7I0440	CI72730
tert-Butylbenzene	ND (0.0042)		8260B Low		1	09/27/17 19:31	C7I0440	CI72730
Tertiary-amyl methyl ether	ND (0.0042)		8260B Low		1	09/27/17 19:31	C7I0440	CI72730
Tetrachloroethene	ND (0.0042)		8260B Low		1	09/27/17 19:31	C7I0440	CI72730
Tetrahydrofuran	ND (0.0042)		8260B Low		1	09/27/17 19:31	C7I0440	CI72730



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-526 (0-2')  
 Date Sampled: 09/26/17 12:35  
 Percent Solids: 95  
 Initial Volume: 6.2  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-09  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0042)		8260B Low		1	09/27/17 19:31	C7I0440	CI72730
trans-1,2-Dichloroethene	ND (0.0042)		8260B Low		1	09/27/17 19:31	C7I0440	CI72730
trans-1,3-Dichloropropene	ND (0.0042)		8260B Low		1	09/27/17 19:31	C7I0440	CI72730
Trichloroethene	ND (0.0042)		8260B Low		1	09/27/17 19:31	C7I0440	CI72730
Trichlorofluoromethane	ND (0.0042)		8260B Low		1	09/27/17 19:31	C7I0440	CI72730
Vinyl Acetate	ND (0.0042)		8260B Low		1	09/27/17 19:31	C7I0440	CI72730
Vinyl Chloride	ND (0.0085)		8260B Low		1	09/27/17 19:31	C7I0440	CI72730
Xylene O	ND (0.0042)		8260B Low		1	09/27/17 19:31	C7I0440	CI72730
Xylene P,M	ND (0.0085)		8260B Low		1	09/27/17 19:31	C7I0440	CI72730
Xylenes (Total)	ND (0.0085)		8260B Low		1	09/27/17 19:31		[CALC]

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: 1,2-Dichloroethane-d4	117 %		70-130
Surrogate: 4-Bromofluorobenzene	105 %		70-130
Surrogate: Dibromofluoromethane	108 %		70-130
Surrogate: Toluene-d8	112 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-526 (0-2')  
 Date Sampled: 09/26/17 12:35  
 Percent Solids: 95  
 Initial Volume: 19.1  
 Final Volume: 1  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-09  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: SMR  
 Prepared: 9/27/17 12:54

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	255 (41.3)		8100M		1	09/28/17 1:45	C710445	C172712
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		68 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-526 (0-2')  
Date Sampled: 09/26/17 12:35  
Percent Solids: 95  
Initial Volume: 14.8  
Final Volume: 0.5  
Extraction Method: 3546

ESS Laboratory Work Order: 1709754  
ESS Laboratory Sample ID: 1709754-09  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: TJ  
Prepared: 9/27/17 11:30

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.355)		8270D		1	09/28/17 23:45	C7I0472	CI72716
Acenaphthene	ND (0.355)		8270D		1	09/28/17 23:45	C7I0472	CI72716
Acenaphthylene	<b>0.429</b> (0.355)		8270D		1	09/28/17 23:45	C7I0472	CI72716
Anthracene	<b>0.578</b> (0.355)		8270D		1	09/28/17 23:45	C7I0472	CI72716
Benzo(a)anthracene	<b>4.17</b> (0.355)		8270D		1	09/28/17 23:45	C7I0472	CI72716
Benzo(a)pyrene	<b>4.01</b> (0.178)		8270D		1	09/28/17 23:45	C7I0472	CI72716
Benzo(b)fluoranthene	<b>4.28</b> (0.355)		8270D		1	09/28/17 23:45	C7I0472	CI72716
Benzo(g,h,i)perylene	<b>1.55</b> (0.355)		8270D		1	09/28/17 23:45	C7I0472	CI72716
Benzo(k)fluoranthene	<b>3.91</b> (0.355)		8270D		1	09/28/17 23:45	C7I0472	CI72716
Chrysene	<b>4.17</b> (0.178)		8270D		1	09/28/17 23:45	C7I0472	CI72716
Dibenzo(a,h)Anthracene	<b>0.817</b> (0.178)		8270D		1	09/28/17 23:45	C7I0472	CI72716
Fluoranthene	<b>8.24</b> (0.355)		8270D		1	09/28/17 23:45	C7I0472	CI72716
Fluorene	ND (0.355)		8270D		1	09/28/17 23:45	C7I0472	CI72716
Indeno(1,2,3-cd)Pyrene	<b>1.54</b> (0.355)		8270D		1	09/28/17 23:45	C7I0472	CI72716
Naphthalene	ND (0.355)		8270D		1	09/28/17 23:45	C7I0472	CI72716
Phenanthrene	<b>2.64</b> (0.355)		8270D		1	09/28/17 23:45	C7I0472	CI72716
Pyrene	<b>5.39</b> (0.355)		8270D		1	09/28/17 23:45	C7I0472	CI72716

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	62 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	73 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	65 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	66 %		30-130





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-526 (0-2')  
Date Sampled: 09/26/17 12:35  
Percent Solids: 95

ESS Laboratory Work Order: 1709754  
ESS Laboratory Sample ID: 1709754-09  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	16.8 (1.03)		9014		1	EEM	09/29/17 13:00	mg/kg dry	CI72918



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-527 (0-2')  
 Date Sampled: 09/26/17 13:00  
 Percent Solids: 96

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-10  
 Sample Matrix: Soil  
 Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (2.06)		6020A		20	NAR	09/29/17 13:53	2.03	100	CI72838
<b>Arsenic</b>	<b>3.64</b> (2.57)		6010C		1	KJK	09/30/17 1:25	2.03	100	CI72838
Beryllium	ND (0.11)		6010C		1	KJK	09/30/17 1:25	2.03	100	CI72838
Cadmium	ND (0.51)		6010C		1	KJK	09/30/17 1:25	2.03	100	CI72838
Chromium	ND (1.03)		6010C		1	KJK	09/30/17 1:25	2.03	100	CI72838
<b>Copper</b>	<b>14.0</b> (2.57)		6010C		1	KJK	09/30/17 1:25	2.03	100	CI72838
<b>Lead</b>	<b>44.3</b> (5.15)		6010C		1	KJK	09/30/17 1:25	2.03	100	CI72838
<b>Mercury</b>	<b>0.413</b> (0.029)		7471B		1	MJV	09/29/17 12:42	0.71	40	CI72839
<b>Nickel</b>	<b>2.61</b> (2.57)		6010C		1	KJK	09/30/17 1:25	2.03	100	CI72838
Selenium	ND (2.06)		6020A		20	NAR	09/29/17 13:53	2.03	100	CI72838
Silver	ND (0.51)		6010C		1	KJK	09/30/17 1:25	2.03	100	CI72838
Thallium	ND (2.06)		6020A		20	NAR	09/29/17 13:53	2.03	100	CI72838
<b>Zinc</b>	<b>3.89</b> (2.57)		6010C		1	KJK	09/30/17 1:25	2.03	100	CI72838



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-527 (0-2')  
Date Sampled: 09/26/17 13:00  
Percent Solids: 96  
Initial Volume: 5.3  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1709754  
ESS Laboratory Sample ID: 1709754-10  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0049)		8260B Low		1	09/28/17 15:48	C7I0473	CI72836
1,1,1-Trichloroethane	ND (0.0049)		8260B Low		1	09/28/17 15:48	C7I0473	CI72836
1,1,2,2-Tetrachloroethane	ND (0.0049)		8260B Low		1	09/28/17 15:48	C7I0473	CI72836
1,1,2-Trichloroethane	ND (0.0049)		8260B Low		1	09/28/17 15:48	C7I0473	CI72836
1,1-Dichloroethane	ND (0.0049)		8260B Low		1	09/28/17 15:48	C7I0473	CI72836
1,1-Dichloroethene	ND (0.0049)		8260B Low		1	09/28/17 15:48	C7I0473	CI72836
1,1-Dichloropropene	ND (0.0049)		8260B Low		1	09/28/17 15:48	C7I0473	CI72836
1,2,3-Trichlorobenzene	ND (0.0049)		8260B Low		1	09/28/17 15:48	C7I0473	CI72836
1,2,3-Trichloropropane	ND (0.0049)		8260B Low		1	09/28/17 15:48	C7I0473	CI72836
1,2,4-Trichlorobenzene	ND (0.0049)		8260B Low		1	09/28/17 15:48	C7I0473	CI72836
1,2,4-Trimethylbenzene	ND (0.0049)		8260B Low		1	09/28/17 15:48	C7I0473	CI72836
1,2-Dibromo-3-Chloropropane	ND (0.0049)		8260B Low		1	09/28/17 15:48	C7I0473	CI72836
1,2-Dibromoethane	ND (0.0049)		8260B Low		1	09/28/17 15:48	C7I0473	CI72836
1,2-Dichlorobenzene	ND (0.0049)		8260B Low		1	09/28/17 15:48	C7I0473	CI72836
1,2-Dichloroethane	ND (0.0049)		8260B Low		1	09/28/17 15:48	C7I0473	CI72836
1,2-Dichloropropane	ND (0.0049)		8260B Low		1	09/28/17 15:48	C7I0473	CI72836
1,3,5-Trimethylbenzene	ND (0.0049)		8260B Low		1	09/28/17 15:48	C7I0473	CI72836
1,3-Dichlorobenzene	ND (0.0049)		8260B Low		1	09/28/17 15:48	C7I0473	CI72836
1,3-Dichloropropane	ND (0.0049)		8260B Low		1	09/28/17 15:48	C7I0473	CI72836
1,4-Dichlorobenzene	ND (0.0049)		8260B Low		1	09/28/17 15:48	C7I0473	CI72836
1,4-Dioxane	ND (0.0986)		8260B Low		1	09/28/17 15:48	C7I0473	CI72836
1-Chlorohexane	ND (0.0049)		8260B Low		1	09/28/17 15:48	C7I0473	CI72836
2,2-Dichloropropane	ND (0.0049)		8260B Low		1	09/28/17 15:48	C7I0473	CI72836
2-Butanone	ND (0.0493)		8260B Low		1	09/28/17 15:48	C7I0473	CI72836
2-Chlorotoluene	ND (0.0049)		8260B Low		1	09/28/17 15:48	C7I0473	CI72836
2-Hexanone	ND (0.0493)		8260B Low		1	09/28/17 15:48	C7I0473	CI72836
4-Chlorotoluene	ND (0.0049)		8260B Low		1	09/28/17 15:48	C7I0473	CI72836
4-Isopropyltoluene	ND (0.0049)		8260B Low		1	09/28/17 15:48	C7I0473	CI72836
4-Methyl-2-Pentanone	ND (0.0493)		8260B Low		1	09/28/17 15:48	C7I0473	CI72836
Acetone	ND (0.0493)		8260B Low		1	09/28/17 15:48	C7I0473	CI72836
Benzene	ND (0.0049)		8260B Low		1	09/28/17 15:48	C7I0473	CI72836
Bromobenzene	ND (0.0049)		8260B Low		1	09/28/17 15:48	C7I0473	CI72836



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-527 (0-2')  
Date Sampled: 09/26/17 13:00  
Percent Solids: 96  
Initial Volume: 5.3  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1709754  
ESS Laboratory Sample ID: 1709754-10  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0049)		8260B Low		1	09/28/17 15:48	C7I0473	CI72836
Bromodichloromethane	ND (0.0049)		8260B Low		1	09/28/17 15:48	C7I0473	CI72836
Bromoform	ND (0.0049)		8260B Low		1	09/28/17 15:48	C7I0473	CI72836
Bromomethane	ND (0.0099)		8260B Low		1	09/28/17 15:48	C7I0473	CI72836
Carbon Disulfide	ND (0.0049)		8260B Low		1	09/28/17 15:48	C7I0473	CI72836
Carbon Tetrachloride	ND (0.0049)		8260B Low		1	09/28/17 15:48	C7I0473	CI72836
Chlorobenzene	ND (0.0049)		8260B Low		1	09/28/17 15:48	C7I0473	CI72836
Chloroethane	ND (0.0099)		8260B Low		1	09/28/17 15:48	C7I0473	CI72836
Chloroform	ND (0.0049)		8260B Low		1	09/28/17 15:48	C7I0473	CI72836
Chloromethane	ND (0.0099)		8260B Low		1	09/28/17 15:48	C7I0473	CI72836
cis-1,2-Dichloroethene	ND (0.0049)		8260B Low		1	09/28/17 15:48	C7I0473	CI72836
cis-1,3-Dichloropropene	ND (0.0049)		8260B Low		1	09/28/17 15:48	C7I0473	CI72836
Dibromochloromethane	ND (0.0049)		8260B Low		1	09/28/17 15:48	C7I0473	CI72836
Dibromomethane	ND (0.0049)		8260B Low		1	09/28/17 15:48	C7I0473	CI72836
Dichlorodifluoromethane	ND (0.0099)		8260B Low		1	09/28/17 15:48	C7I0473	CI72836
Diethyl Ether	ND (0.0049)		8260B Low		1	09/28/17 15:48	C7I0473	CI72836
Di-isopropyl ether	ND (0.0049)		8260B Low		1	09/28/17 15:48	C7I0473	CI72836
Ethyl tertiary-butyl ether	ND (0.0049)		8260B Low		1	09/28/17 15:48	C7I0473	CI72836
Ethylbenzene	ND (0.0049)		8260B Low		1	09/28/17 15:48	C7I0473	CI72836
Hexachlorobutadiene	ND (0.0049)		8260B Low		1	09/28/17 15:48	C7I0473	CI72836
Isopropylbenzene	ND (0.0049)		8260B Low		1	09/28/17 15:48	C7I0473	CI72836
Methyl tert-Butyl Ether	ND (0.0049)		8260B Low		1	09/28/17 15:48	C7I0473	CI72836
Methylene Chloride	ND (0.0247)		8260B Low		1	09/28/17 15:48	C7I0473	CI72836
Naphthalene	ND (0.0049)		8260B Low		1	09/28/17 15:48	C7I0473	CI72836
n-Butylbenzene	ND (0.0049)		8260B Low		1	09/28/17 15:48	C7I0473	CI72836
n-Propylbenzene	ND (0.0049)		8260B Low		1	09/28/17 15:48	C7I0473	CI72836
sec-Butylbenzene	ND (0.0049)		8260B Low		1	09/28/17 15:48	C7I0473	CI72836
Styrene	ND (0.0049)		8260B Low		1	09/28/17 15:48	C7I0473	CI72836
tert-Butylbenzene	ND (0.0049)		8260B Low		1	09/28/17 15:48	C7I0473	CI72836
Tertiary-amyl methyl ether	ND (0.0049)		8260B Low		1	09/28/17 15:48	C7I0473	CI72836
Tetrachloroethene	ND (0.0049)		8260B Low		1	09/28/17 15:48	C7I0473	CI72836
Tetrahydrofuran	ND (0.0049)		8260B Low		1	09/28/17 15:48	C7I0473	CI72836



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-527 (0-2')  
 Date Sampled: 09/26/17 13:00  
 Percent Solids: 96  
 Initial Volume: 5.3  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-10  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0049)		8260B Low		1	09/28/17 15:48	C7I0473	CI72836
trans-1,2-Dichloroethene	ND (0.0049)		8260B Low		1	09/28/17 15:48	C7I0473	CI72836
trans-1,3-Dichloropropene	ND (0.0049)		8260B Low		1	09/28/17 15:48	C7I0473	CI72836
Trichloroethene	ND (0.0049)		8260B Low		1	09/28/17 15:48	C7I0473	CI72836
Trichlorofluoromethane	ND (0.0049)		8260B Low		1	09/28/17 15:48	C7I0473	CI72836
Vinyl Acetate	ND (0.0049)		8260B Low		1	09/28/17 15:48	C7I0473	CI72836
Vinyl Chloride	ND (0.0099)		8260B Low		1	09/28/17 15:48	C7I0473	CI72836
Xylene O	ND (0.0049)		8260B Low		1	09/28/17 15:48	C7I0473	CI72836
Xylene P,M	ND (0.0099)		8260B Low		1	09/28/17 15:48	C7I0473	CI72836
Xylenes (Total)	ND (0.0099)		8260B Low		1	09/28/17 15:48		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	113 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	101 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	105 %		70-130
<i>Surrogate: Toluene-d8</i>	116 %		70-130





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-527 (0-2')  
 Date Sampled: 09/26/17 13:00  
 Percent Solids: 96  
 Initial Volume: 19.8  
 Final Volume: 1  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-10  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: SMR  
 Prepared: 9/27/17 12:54

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	2110 (198)		8100M		5	09/28/17 18:13	C710445	C172712
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		61 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-527 (0-2')  
Date Sampled: 09/26/17 13:00  
Percent Solids: 96  
Initial Volume: 14.2  
Final Volume: 0.5  
Extraction Method: 3546

ESS Laboratory Work Order: 1709754  
ESS Laboratory Sample ID: 1709754-10  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: TJ  
Prepared: 9/27/17 11:30

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	2.44 (0.368)		8270D		1	09/29/17 0:20	C7I0472	CI72716
Acenaphthene	ND (0.368)		8270D		1	09/29/17 0:20	C7I0472	CI72716
Acenaphthylene	5.70 (0.368)		8270D		1	09/29/17 0:20	C7I0472	CI72716
Anthracene	2.50 (0.368)		8270D		1	09/29/17 0:20	C7I0472	CI72716
Benzo(a)anthracene	11.2 (3.68)		8270D		10	09/29/17 22:56	C7I0472	CI72716
Benzo(a)pyrene	6.55 (0.184)		8270D		1	09/29/17 0:20	C7I0472	CI72716
Benzo(b)fluoranthene	10.5 (3.68)		8270D		10	09/29/17 22:56	C7I0472	CI72716
Benzo(g,h,i)perylene	3.61 (0.368)		8270D		1	09/29/17 0:20	C7I0472	CI72716
Benzo(k)fluoranthene	10.1 (3.68)		8270D		10	09/29/17 22:56	C7I0472	CI72716
Chrysene	12.8 (1.84)		8270D		10	09/29/17 22:56	C7I0472	CI72716
Dibenzo(a,h)Anthracene	2.43 (0.184)		8270D		1	09/29/17 0:20	C7I0472	CI72716
Fluoranthene	22.3 (3.68)		8270D		10	09/29/17 22:56	C7I0472	CI72716
Fluorene	ND (0.368)		8270D		1	09/29/17 0:20	C7I0472	CI72716
Indeno(1,2,3-cd)Pyrene	4.11 (0.368)		8270D		1	09/29/17 0:20	C7I0472	CI72716
Naphthalene	5.06 (0.368)		8270D		1	09/29/17 0:20	C7I0472	CI72716
Phenanthrene	8.12 (0.368)		8270D		1	09/29/17 0:20	C7I0472	CI72716
Pyrene	18.8 (3.68)		8270D		10	09/29/17 22:56	C7I0472	CI72716

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
Surrogate: 1,2-Dichlorobenzene-d4	58 %		30-130
Surrogate: 2-Fluorobiphenyl	55 %		30-130
Surrogate: Nitrobenzene-d5	55 %		30-130
Surrogate: p-Terphenyl-d14	96 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-527 (0-2')  
Date Sampled: 09/26/17 13:00  
Percent Solids: 96

ESS Laboratory Work Order: 1709754  
ESS Laboratory Sample ID: 1709754-10  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	195 (51.7)		9014		50	EEM	10/02/17 14:30	mg/kg dry	CJ70215



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: bd092617 (0-2')  
Date Sampled: 09/26/17 12:00  
Percent Solids: 95

ESS Laboratory Work Order: 1709754  
ESS Laboratory Sample ID: 1709754-11  
Sample Matrix: Soil  
Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (1.89)		6020A		20	NAR	09/29/17 13:59	2.22	100	CI72838
Arsenic	4.77 (2.36)		6010C		1	KJK	09/30/17 1:29	2.22	100	CI72838
Beryllium	0.21 (0.10)		6010C		1	KJK	09/30/17 1:29	2.22	100	CI72838
Cadmium	ND (0.47)		6010C		1	KJK	09/30/17 1:29	2.22	100	CI72838
Chromium	5.36 (0.94)		6010C		1	KJK	09/30/17 1:29	2.22	100	CI72838
Copper	30.5 (2.36)		6010C		1	KJK	09/30/17 1:29	2.22	100	CI72838
Lead	151 (4.72)		6010C		1	KJK	09/30/17 1:29	2.22	100	CI72838
Mercury	0.178 (0.028)		7471B		1	MJV	09/29/17 12:44	0.73	40	CI72839
Nickel	8.55 (2.36)		6010C		1	KJK	09/30/17 1:29	2.22	100	CI72838
Selenium	ND (1.89)		6020A		20	NAR	09/29/17 13:59	2.22	100	CI72838
Silver	ND (0.47)		6010C		1	KJK	09/30/17 1:29	2.22	100	CI72838
Thallium	ND (1.89)		6020A		20	NAR	09/29/17 13:59	2.22	100	CI72838
Zinc	171 (2.36)		6010C		1	KJK	09/30/17 1:29	2.22	100	CI72838



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: bd092617 (0-2')  
 Date Sampled: 09/26/17 12:00  
 Percent Solids: 95  
 Initial Volume: 6.6  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-11  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0040)		8260B Low		1	09/27/17 20:22	C7I0440	CI72730
1,1,1-Trichloroethane	ND (0.0040)		8260B Low		1	09/27/17 20:22	C7I0440	CI72730
1,1,2,2-Tetrachloroethane	ND (0.0040)		8260B Low		1	09/27/17 20:22	C7I0440	CI72730
1,1,2-Trichloroethane	ND (0.0040)		8260B Low		1	09/27/17 20:22	C7I0440	CI72730
1,1-Dichloroethane	ND (0.0040)		8260B Low		1	09/27/17 20:22	C7I0440	CI72730
1,1-Dichloroethene	ND (0.0040)		8260B Low		1	09/27/17 20:22	C7I0440	CI72730
1,1-Dichloropropene	ND (0.0040)		8260B Low		1	09/27/17 20:22	C7I0440	CI72730
1,2,3-Trichlorobenzene	ND (0.0040)		8260B Low		1	09/27/17 20:22	C7I0440	CI72730
1,2,3-Trichloropropane	ND (0.0040)		8260B Low		1	09/27/17 20:22	C7I0440	CI72730
1,2,4-Trichlorobenzene	ND (0.0040)		8260B Low		1	09/27/17 20:22	C7I0440	CI72730
1,2,4-Trimethylbenzene	ND (0.0040)		8260B Low		1	09/27/17 20:22	C7I0440	CI72730
1,2-Dibromo-3-Chloropropane	ND (0.0040)		8260B Low		1	09/27/17 20:22	C7I0440	CI72730
1,2-Dibromoethane	ND (0.0040)		8260B Low		1	09/27/17 20:22	C7I0440	CI72730
1,2-Dichlorobenzene	ND (0.0040)		8260B Low		1	09/27/17 20:22	C7I0440	CI72730
1,2-Dichloroethane	ND (0.0040)		8260B Low		1	09/27/17 20:22	C7I0440	CI72730
1,2-Dichloropropane	ND (0.0040)		8260B Low		1	09/27/17 20:22	C7I0440	CI72730
1,3,5-Trimethylbenzene	ND (0.0040)		8260B Low		1	09/27/17 20:22	C7I0440	CI72730
1,3-Dichlorobenzene	ND (0.0040)		8260B Low		1	09/27/17 20:22	C7I0440	CI72730
1,3-Dichloropropane	ND (0.0040)		8260B Low		1	09/27/17 20:22	C7I0440	CI72730
1,4-Dichlorobenzene	ND (0.0040)		8260B Low		1	09/27/17 20:22	C7I0440	CI72730
1,4-Dioxane	ND (0.0794)		8260B Low		1	09/27/17 20:22	C7I0440	CI72730
1-Chlorohexane	ND (0.0040)		8260B Low		1	09/27/17 20:22	C7I0440	CI72730
2,2-Dichloropropane	ND (0.0040)		8260B Low		1	09/27/17 20:22	C7I0440	CI72730
2-Butanone	ND (0.0397)		8260B Low		1	09/27/17 20:22	C7I0440	CI72730
2-Chlorotoluene	ND (0.0040)		8260B Low		1	09/27/17 20:22	C7I0440	CI72730
2-Hexanone	ND (0.0397)		8260B Low		1	09/27/17 20:22	C7I0440	CI72730
4-Chlorotoluene	ND (0.0040)		8260B Low		1	09/27/17 20:22	C7I0440	CI72730
4-Isopropyltoluene	ND (0.0040)		8260B Low		1	09/27/17 20:22	C7I0440	CI72730
4-Methyl-2-Pentanone	ND (0.0397)		8260B Low		1	09/27/17 20:22	C7I0440	CI72730
Acetone	ND (0.0397)		8260B Low		1	09/27/17 20:22	C7I0440	CI72730
Benzene	ND (0.0040)		8260B Low		1	09/27/17 20:22	C7I0440	CI72730
Bromobenzene	ND (0.0040)		8260B Low		1	09/27/17 20:22	C7I0440	CI72730





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: bd092617 (0-2')  
Date Sampled: 09/26/17 12:00  
Percent Solids: 95  
Initial Volume: 6.6  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1709754  
ESS Laboratory Sample ID: 1709754-11  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0040)		8260B Low		1	09/27/17 20:22	C7I0440	CI72730
Bromodichloromethane	ND (0.0040)		8260B Low		1	09/27/17 20:22	C7I0440	CI72730
Bromoform	ND (0.0040)		8260B Low		1	09/27/17 20:22	C7I0440	CI72730
Bromomethane	ND (0.0079)		8260B Low		1	09/27/17 20:22	C7I0440	CI72730
Carbon Disulfide	ND (0.0040)		8260B Low		1	09/27/17 20:22	C7I0440	CI72730
Carbon Tetrachloride	ND (0.0040)		8260B Low		1	09/27/17 20:22	C7I0440	CI72730
Chlorobenzene	ND (0.0040)		8260B Low		1	09/27/17 20:22	C7I0440	CI72730
Chloroethane	ND (0.0079)		8260B Low		1	09/27/17 20:22	C7I0440	CI72730
Chloroform	ND (0.0040)		8260B Low		1	09/27/17 20:22	C7I0440	CI72730
Chloromethane	ND (0.0079)		8260B Low		1	09/27/17 20:22	C7I0440	CI72730
cis-1,2-Dichloroethene	ND (0.0040)		8260B Low		1	09/27/17 20:22	C7I0440	CI72730
cis-1,3-Dichloropropene	ND (0.0040)		8260B Low		1	09/27/17 20:22	C7I0440	CI72730
Dibromochloromethane	ND (0.0040)		8260B Low		1	09/27/17 20:22	C7I0440	CI72730
Dibromomethane	ND (0.0040)		8260B Low		1	09/27/17 20:22	C7I0440	CI72730
Dichlorodifluoromethane	ND (0.0079)		8260B Low		1	09/27/17 20:22	C7I0440	CI72730
Diethyl Ether	ND (0.0040)		8260B Low		1	09/27/17 20:22	C7I0440	CI72730
Di-isopropyl ether	ND (0.0040)		8260B Low		1	09/27/17 20:22	C7I0440	CI72730
Ethyl tertiary-butyl ether	ND (0.0040)		8260B Low		1	09/27/17 20:22	C7I0440	CI72730
Ethylbenzene	ND (0.0040)		8260B Low		1	09/27/17 20:22	C7I0440	CI72730
Hexachlorobutadiene	ND (0.0040)		8260B Low		1	09/27/17 20:22	C7I0440	CI72730
Isopropylbenzene	ND (0.0040)		8260B Low		1	09/27/17 20:22	C7I0440	CI72730
Methyl tert-Butyl Ether	ND (0.0040)		8260B Low		1	09/27/17 20:22	C7I0440	CI72730
Methylene Chloride	ND (0.0199)		8260B Low		1	09/27/17 20:22	C7I0440	CI72730
Naphthalene	ND (0.0040)		8260B Low		1	09/27/17 20:22	C7I0440	CI72730
n-Butylbenzene	ND (0.0040)		8260B Low		1	09/27/17 20:22	C7I0440	CI72730
n-Propylbenzene	ND (0.0040)		8260B Low		1	09/27/17 20:22	C7I0440	CI72730
sec-Butylbenzene	ND (0.0040)		8260B Low		1	09/27/17 20:22	C7I0440	CI72730
Styrene	ND (0.0040)		8260B Low		1	09/27/17 20:22	C7I0440	CI72730
tert-Butylbenzene	ND (0.0040)		8260B Low		1	09/27/17 20:22	C7I0440	CI72730
Tertiary-amyl methyl ether	ND (0.0040)		8260B Low		1	09/27/17 20:22	C7I0440	CI72730
Tetrachloroethene	ND (0.0040)		8260B Low		1	09/27/17 20:22	C7I0440	CI72730
Tetrahydrofuran	ND (0.0040)		8260B Low		1	09/27/17 20:22	C7I0440	CI72730



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: bd092617 (0-2')  
 Date Sampled: 09/26/17 12:00  
 Percent Solids: 95  
 Initial Volume: 6.6  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-11  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0040)		8260B Low		1	09/27/17 20:22	C7I0440	CI72730
trans-1,2-Dichloroethene	ND (0.0040)		8260B Low		1	09/27/17 20:22	C7I0440	CI72730
trans-1,3-Dichloropropene	ND (0.0040)		8260B Low		1	09/27/17 20:22	C7I0440	CI72730
Trichloroethene	ND (0.0040)		8260B Low		1	09/27/17 20:22	C7I0440	CI72730
Trichlorofluoromethane	ND (0.0040)		8260B Low		1	09/27/17 20:22	C7I0440	CI72730
Vinyl Acetate	ND (0.0040)		8260B Low		1	09/27/17 20:22	C7I0440	CI72730
Vinyl Chloride	ND (0.0079)		8260B Low		1	09/27/17 20:22	C7I0440	CI72730
Xylene O	ND (0.0040)		8260B Low		1	09/27/17 20:22	C7I0440	CI72730
Xylene P,M	ND (0.0079)		8260B Low		1	09/27/17 20:22	C7I0440	CI72730
Xylenes (Total)	ND (0.0079)		8260B Low		1	09/27/17 20:22		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	113 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	98 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	108 %		70-130
<i>Surrogate: Toluene-d8</i>	119 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: bd092617 (0-2')  
 Date Sampled: 09/26/17 12:00  
 Percent Solids: 95  
 Initial Volume: 19.2  
 Final Volume: 1  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-11  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: SMR  
 Prepared: 9/27/17 12:54

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	690 (205)		8100M		5	09/28/17 18:49	C710445	C172712
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		70 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: bd092617 (0-2')  
Date Sampled: 09/26/17 12:00  
Percent Solids: 95  
Initial Volume: 14.8  
Final Volume: 0.5  
Extraction Method: 3546

ESS Laboratory Work Order: 1709754  
ESS Laboratory Sample ID: 1709754-11  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: TJ  
Prepared: 9/27/17 11:30

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.354)		8270D		1	09/29/17 0:55	C7I0472	CI72716
Acenaphthene	ND (0.354)		8270D		1	09/29/17 0:55	C7I0472	CI72716
Acenaphthylene	2.16 (0.354)		8270D		1	09/29/17 0:55	C7I0472	CI72716
Anthracene	1.47 (0.354)		8270D		1	09/29/17 0:55	C7I0472	CI72716
Benzo(a)anthracene	7.35 (0.354)		8270D		1	09/29/17 0:55	C7I0472	CI72716
Benzo(a)pyrene	7.07 (0.177)		8270D		1	09/29/17 0:55	C7I0472	CI72716
Benzo(b)fluoranthene	8.07 (3.54)		8270D		10	09/29/17 23:31	C7I0472	CI72716
Benzo(g,h,i)perylene	3.41 (0.354)		8270D		1	09/29/17 0:55	C7I0472	CI72716
Benzo(k)fluoranthene	7.55 (3.54)		8270D		10	09/29/17 23:31	C7I0472	CI72716
Chrysene	6.34 (0.177)		8270D		1	09/29/17 0:55	C7I0472	CI72716
Dibenzo(a,h)Anthracene	1.67 (0.177)		8270D		1	09/29/17 0:55	C7I0472	CI72716
Fluoranthene	13.8 (3.54)		8270D		10	09/29/17 23:31	C7I0472	CI72716
Fluorene	ND (0.354)		8270D		1	09/29/17 0:55	C7I0472	CI72716
Indeno(1,2,3-cd)Pyrene	3.42 (0.354)		8270D		1	09/29/17 0:55	C7I0472	CI72716
Naphthalene	ND (0.354)		8270D		1	09/29/17 0:55	C7I0472	CI72716
Phenanthrene	4.64 (0.354)		8270D		1	09/29/17 0:55	C7I0472	CI72716
Pyrene	10.4 (3.54)		8270D		10	09/29/17 23:31	C7I0472	CI72716

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	72 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	83 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	78 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	84 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: bd092617 (0-2')  
Date Sampled: 09/26/17 12:00  
Percent Solids: 95

ESS Laboratory Work Order: 1709754  
ESS Laboratory Sample ID: 1709754-11  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	4.22 (1.02)		9014		1	EEM	10/02/17 14:30	mg/kg dry	CJ70215





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-528 (0-2')  
Date Sampled: 09/26/17 13:20  
Percent Solids: 98

ESS Laboratory Work Order: 1709754  
ESS Laboratory Sample ID: 1709754-12  
Sample Matrix: Soil  
Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (1.63)		6020A		20	NAR	09/29/17 14:05	2.5	100	CI72838
<b>Arsenic</b>	<b>3.40</b> (2.03)		6010C		1	KJK	09/30/17 1:33	2.5	100	CI72838
Beryllium	ND (0.09)		6010C		1	KJK	09/30/17 1:33	2.5	100	CI72838
Cadmium	ND (0.41)		6010C		1	KJK	09/30/17 1:33	2.5	100	CI72838
<b>Chromium</b>	<b>4.49</b> (0.81)		6010C		1	KJK	09/30/17 1:33	2.5	100	CI72838
<b>Copper</b>	<b>10.0</b> (2.03)		6010C		1	KJK	09/30/17 1:33	2.5	100	CI72838
<b>Lead</b>	<b>16.7</b> (4.06)		6010C		1	KJK	09/30/17 1:33	2.5	100	CI72838
<b>Mercury</b>	<b>0.056</b> (0.030)		7471B		1	MJV	09/29/17 12:50	0.68	40	CI72839
<b>Nickel</b>	<b>4.34</b> (2.03)		6010C		1	KJK	09/30/17 1:33	2.5	100	CI72838
Selenium	ND (1.63)		6020A		20	NAR	09/29/17 14:05	2.5	100	CI72838
Silver	ND (0.41)		6010C		1	KJK	09/30/17 1:33	2.5	100	CI72838
Thallium	ND (1.63)		6020A		20	NAR	09/29/17 14:05	2.5	100	CI72838
<b>Zinc</b>	<b>13.1</b> (2.03)		6010C		1	KJK	09/30/17 1:33	2.5	100	CI72838



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-528 (0-2')  
 Date Sampled: 09/26/17 13:20  
 Percent Solids: 98  
 Initial Volume: 6.4  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-12  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0040)		8260B Low		1	09/27/17 20:47	C7I0440	CI72730
1,1,1-Trichloroethane	ND (0.0040)		8260B Low		1	09/27/17 20:47	C7I0440	CI72730
1,1,2,2-Tetrachloroethane	ND (0.0040)		8260B Low		1	09/27/17 20:47	C7I0440	CI72730
1,1,2-Trichloroethane	ND (0.0040)		8260B Low		1	09/27/17 20:47	C7I0440	CI72730
1,1-Dichloroethane	ND (0.0040)		8260B Low		1	09/27/17 20:47	C7I0440	CI72730
1,1-Dichloroethene	ND (0.0040)		8260B Low		1	09/27/17 20:47	C7I0440	CI72730
1,1-Dichloropropene	ND (0.0040)		8260B Low		1	09/27/17 20:47	C7I0440	CI72730
1,2,3-Trichlorobenzene	ND (0.0040)		8260B Low		1	09/27/17 20:47	C7I0440	CI72730
1,2,3-Trichloropropane	ND (0.0040)		8260B Low		1	09/27/17 20:47	C7I0440	CI72730
1,2,4-Trichlorobenzene	ND (0.0040)		8260B Low		1	09/27/17 20:47	C7I0440	CI72730
1,2,4-Trimethylbenzene	ND (0.0040)		8260B Low		1	09/27/17 20:47	C7I0440	CI72730
1,2-Dibromo-3-Chloropropane	ND (0.0040)		8260B Low		1	09/27/17 20:47	C7I0440	CI72730
1,2-Dibromoethane	ND (0.0040)		8260B Low		1	09/27/17 20:47	C7I0440	CI72730
1,2-Dichlorobenzene	ND (0.0040)		8260B Low		1	09/27/17 20:47	C7I0440	CI72730
1,2-Dichloroethane	ND (0.0040)		8260B Low		1	09/27/17 20:47	C7I0440	CI72730
1,2-Dichloropropane	ND (0.0040)		8260B Low		1	09/27/17 20:47	C7I0440	CI72730
1,3,5-Trimethylbenzene	ND (0.0040)		8260B Low		1	09/27/17 20:47	C7I0440	CI72730
1,3-Dichlorobenzene	ND (0.0040)		8260B Low		1	09/27/17 20:47	C7I0440	CI72730
1,3-Dichloropropane	ND (0.0040)		8260B Low		1	09/27/17 20:47	C7I0440	CI72730
1,4-Dichlorobenzene	ND (0.0040)		8260B Low		1	09/27/17 20:47	C7I0440	CI72730
1,4-Dioxane	ND (0.0794)		8260B Low		1	09/27/17 20:47	C7I0440	CI72730
1-Chlorohexane	ND (0.0040)		8260B Low		1	09/27/17 20:47	C7I0440	CI72730
2,2-Dichloropropane	ND (0.0040)		8260B Low		1	09/27/17 20:47	C7I0440	CI72730
2-Butanone	ND (0.0397)		8260B Low		1	09/27/17 20:47	C7I0440	CI72730
2-Chlorotoluene	ND (0.0040)		8260B Low		1	09/27/17 20:47	C7I0440	CI72730
2-Hexanone	ND (0.0397)		8260B Low		1	09/27/17 20:47	C7I0440	CI72730
4-Chlorotoluene	ND (0.0040)		8260B Low		1	09/27/17 20:47	C7I0440	CI72730
4-Isopropyltoluene	ND (0.0040)		8260B Low		1	09/27/17 20:47	C7I0440	CI72730
4-Methyl-2-Pentanone	ND (0.0397)		8260B Low		1	09/27/17 20:47	C7I0440	CI72730
Acetone	ND (0.0397)		8260B Low		1	09/27/17 20:47	C7I0440	CI72730
Benzene	ND (0.0040)		8260B Low		1	09/27/17 20:47	C7I0440	CI72730
Bromobenzene	ND (0.0040)		8260B Low		1	09/27/17 20:47	C7I0440	CI72730



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-528 (0-2')  
 Date Sampled: 09/26/17 13:20  
 Percent Solids: 98  
 Initial Volume: 6.4  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-12  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0040)		8260B Low		1	09/27/17 20:47	C7I0440	CI72730
Bromodichloromethane	ND (0.0040)		8260B Low		1	09/27/17 20:47	C7I0440	CI72730
Bromoform	ND (0.0040)		8260B Low		1	09/27/17 20:47	C7I0440	CI72730
Bromomethane	ND (0.0079)		8260B Low		1	09/27/17 20:47	C7I0440	CI72730
Carbon Disulfide	ND (0.0040)		8260B Low		1	09/27/17 20:47	C7I0440	CI72730
Carbon Tetrachloride	ND (0.0040)		8260B Low		1	09/27/17 20:47	C7I0440	CI72730
Chlorobenzene	ND (0.0040)		8260B Low		1	09/27/17 20:47	C7I0440	CI72730
Chloroethane	ND (0.0079)		8260B Low		1	09/27/17 20:47	C7I0440	CI72730
Chloroform	ND (0.0040)		8260B Low		1	09/27/17 20:47	C7I0440	CI72730
Chloromethane	ND (0.0079)		8260B Low		1	09/27/17 20:47	C7I0440	CI72730
cis-1,2-Dichloroethene	ND (0.0040)		8260B Low		1	09/27/17 20:47	C7I0440	CI72730
cis-1,3-Dichloropropene	ND (0.0040)		8260B Low		1	09/27/17 20:47	C7I0440	CI72730
Dibromochloromethane	ND (0.0040)		8260B Low		1	09/27/17 20:47	C7I0440	CI72730
Dibromomethane	ND (0.0040)		8260B Low		1	09/27/17 20:47	C7I0440	CI72730
Dichlorodifluoromethane	ND (0.0079)		8260B Low		1	09/27/17 20:47	C7I0440	CI72730
Diethyl Ether	ND (0.0040)		8260B Low		1	09/27/17 20:47	C7I0440	CI72730
Di-isopropyl ether	ND (0.0040)		8260B Low		1	09/27/17 20:47	C7I0440	CI72730
Ethyl tertiary-butyl ether	ND (0.0040)		8260B Low		1	09/27/17 20:47	C7I0440	CI72730
Ethylbenzene	ND (0.0040)		8260B Low		1	09/27/17 20:47	C7I0440	CI72730
Hexachlorobutadiene	ND (0.0040)		8260B Low		1	09/27/17 20:47	C7I0440	CI72730
Isopropylbenzene	ND (0.0040)		8260B Low		1	09/27/17 20:47	C7I0440	CI72730
Methyl tert-Butyl Ether	ND (0.0040)		8260B Low		1	09/27/17 20:47	C7I0440	CI72730
Methylene Chloride	ND (0.0198)		8260B Low		1	09/27/17 20:47	C7I0440	CI72730
Naphthalene	ND (0.0040)		8260B Low		1	09/27/17 20:47	C7I0440	CI72730
n-Butylbenzene	ND (0.0040)		8260B Low		1	09/27/17 20:47	C7I0440	CI72730
n-Propylbenzene	ND (0.0040)		8260B Low		1	09/27/17 20:47	C7I0440	CI72730
sec-Butylbenzene	ND (0.0040)		8260B Low		1	09/27/17 20:47	C7I0440	CI72730
Styrene	ND (0.0040)		8260B Low		1	09/27/17 20:47	C7I0440	CI72730
tert-Butylbenzene	ND (0.0040)		8260B Low		1	09/27/17 20:47	C7I0440	CI72730
Tertiary-amyl methyl ether	ND (0.0040)		8260B Low		1	09/27/17 20:47	C7I0440	CI72730
Tetrachloroethene	ND (0.0040)		8260B Low		1	09/27/17 20:47	C7I0440	CI72730
Tetrahydrofuran	ND (0.0040)		8260B Low		1	09/27/17 20:47	C7I0440	CI72730



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-528 (0-2')  
 Date Sampled: 09/26/17 13:20  
 Percent Solids: 98  
 Initial Volume: 6.4  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-12  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0040)		8260B Low		1	09/27/17 20:47	C7I0440	CI72730
trans-1,2-Dichloroethene	ND (0.0040)		8260B Low		1	09/27/17 20:47	C7I0440	CI72730
trans-1,3-Dichloropropene	ND (0.0040)		8260B Low		1	09/27/17 20:47	C7I0440	CI72730
Trichloroethene	ND (0.0040)		8260B Low		1	09/27/17 20:47	C7I0440	CI72730
Trichlorofluoromethane	ND (0.0040)		8260B Low		1	09/27/17 20:47	C7I0440	CI72730
Vinyl Acetate	ND (0.0040)		8260B Low		1	09/27/17 20:47	C7I0440	CI72730
Vinyl Chloride	ND (0.0079)		8260B Low		1	09/27/17 20:47	C7I0440	CI72730
Xylene O	ND (0.0040)		8260B Low		1	09/27/17 20:47	C7I0440	CI72730
Xylene P,M	ND (0.0079)		8260B Low		1	09/27/17 20:47	C7I0440	CI72730
Xylenes (Total)	ND (0.0079)		8260B Low		1	09/27/17 20:47		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	111 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	104 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	108 %		70-130
<i>Surrogate: Toluene-d8</i>	112 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-528 (0-2')  
 Date Sampled: 09/26/17 13:20  
 Percent Solids: 98  
 Initial Volume: 20.5  
 Final Volume: 1  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-12  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: SMR  
 Prepared: 9/27/17 12:54

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	173 (37.2)		8100M		1	09/28/17 2:20	C710445	C172712
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		73 %		40-140				





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-528 (0-2')  
Date Sampled: 09/26/17 13:20  
Percent Solids: 98  
Initial Volume: 14.2  
Final Volume: 0.5  
Extraction Method: 3546

ESS Laboratory Work Order: 1709754  
ESS Laboratory Sample ID: 1709754-12  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: TJ  
Prepared: 9/27/17 11:30

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.357)		8270D		1	09/29/17 1:30	C7I0472	CI72716
Acenaphthene	ND (0.357)		8270D		1	09/29/17 1:30	C7I0472	CI72716
<b>Acenaphthylene</b>	<b>0.359</b> (0.357)		8270D		1	09/29/17 1:30	C7I0472	CI72716
Anthracene	ND (0.357)		8270D		1	09/29/17 1:30	C7I0472	CI72716
<b>Benzo(a)anthracene</b>	<b>0.754</b> (0.357)		8270D		1	09/29/17 1:30	C7I0472	CI72716
<b>Benzo(a)pyrene</b>	<b>0.666</b> (0.179)		8270D		1	09/29/17 1:30	C7I0472	CI72716
<b>Benzo(b)fluoranthene</b>	<b>1.61</b> (0.357)		8270D		1	09/29/17 1:30	C7I0472	CI72716
<b>Benzo(g,h,i)perylene</b>	<b>0.544</b> (0.357)		8270D		1	09/29/17 1:30	C7I0472	CI72716
<b>Benzo(k)fluoranthene</b>	<b>1.21</b> (0.357)		8270D		1	09/29/17 1:30	C7I0472	CI72716
<b>Chrysene</b>	<b>0.960</b> (0.179)		8270D		1	09/29/17 1:30	C7I0472	CI72716
<b>Dibenzo(a,h)Anthracene</b>	<b>0.259</b> (0.179)		8270D		1	09/29/17 1:30	C7I0472	CI72716
<b>Fluoranthene</b>	<b>1.42</b> (0.357)		8270D		1	09/29/17 1:30	C7I0472	CI72716
Fluorene	ND (0.357)		8270D		1	09/29/17 1:30	C7I0472	CI72716
<b>Indeno(1,2,3-cd)Pyrene</b>	<b>0.534</b> (0.357)		8270D		1	09/29/17 1:30	C7I0472	CI72716
Naphthalene	ND (0.357)		8270D		1	09/29/17 1:30	C7I0472	CI72716
Phenanthrene	ND (0.357)		8270D		1	09/29/17 1:30	C7I0472	CI72716
<b>Pyrene</b>	<b>0.943</b> (0.357)		8270D		1	09/29/17 1:30	C7I0472	CI72716

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	68 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	75 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	73 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	69 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-528 (0-2')  
Date Sampled: 09/26/17 13:20  
Percent Solids: 98

ESS Laboratory Work Order: 1709754  
ESS Laboratory Sample ID: 1709754-12  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	81.5 (9.95)		9014		10	EEM	10/02/17 14:30	mg/kg dry	CJ70215



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-529 (0-2')  
 Date Sampled: 09/26/17 13:35  
 Percent Solids: 97

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-13  
 Sample Matrix: Soil  
 Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (1.70)		6020A		20	NAR	09/29/17 14:11	2.42	100	CI72838
Arsenic	4.13 (2.13)		6010C		1	KJK	09/30/17 1:50	2.42	100	CI72838
Beryllium	0.12 (0.09)		6010C		1	KJK	09/30/17 1:50	2.42	100	CI72838
Cadmium	ND (0.43)		6010C		1	KJK	09/30/17 20:15	2.42	100	CI72838
Chromium	5.92 (0.85)		6010C		1	KJK	09/30/17 1:50	2.42	100	CI72838
Copper	10.9 (2.13)		6010C		1	KJK	09/30/17 1:50	2.42	100	CI72838
Lead	18.4 (4.25)		6010C		1	KJK	09/30/17 1:50	2.42	100	CI72838
Mercury	0.065 (0.029)		7471B		1	MJV	09/29/17 12:52	0.7	40	CI72839
Nickel	6.05 (2.13)		6010C		1	KJK	09/30/17 1:50	2.42	100	CI72838
Selenium	ND (1.70)		6020A		20	NAR	09/29/17 14:11	2.42	100	CI72838
Silver	ND (0.43)		6010C		1	KJK	09/30/17 1:50	2.42	100	CI72838
Thallium	ND (1.70)		6020A		20	NAR	09/29/17 14:11	2.42	100	CI72838
Zinc	17.5 (2.13)		6010C		1	KJK	09/30/17 1:50	2.42	100	CI72838



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-529 (0-2')  
 Date Sampled: 09/26/17 13:35  
 Percent Solids: 97  
 Initial Volume: 6.1  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-13  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0042)		8260B Low		1	09/27/17 21:12	C7I0440	CI72730
1,1,1-Trichloroethane	ND (0.0042)		8260B Low		1	09/27/17 21:12	C7I0440	CI72730
1,1,2,2-Tetrachloroethane	ND (0.0042)		8260B Low		1	09/27/17 21:12	C7I0440	CI72730
1,1,2-Trichloroethane	ND (0.0042)		8260B Low		1	09/27/17 21:12	C7I0440	CI72730
1,1-Dichloroethane	ND (0.0042)		8260B Low		1	09/27/17 21:12	C7I0440	CI72730
1,1-Dichloroethene	ND (0.0042)		8260B Low		1	09/27/17 21:12	C7I0440	CI72730
1,1-Dichloropropene	ND (0.0042)		8260B Low		1	09/27/17 21:12	C7I0440	CI72730
1,2,3-Trichlorobenzene	ND (0.0042)		8260B Low		1	09/27/17 21:12	C7I0440	CI72730
1,2,3-Trichloropropane	ND (0.0042)		8260B Low		1	09/27/17 21:12	C7I0440	CI72730
1,2,4-Trichlorobenzene	ND (0.0042)		8260B Low		1	09/27/17 21:12	C7I0440	CI72730
1,2,4-Trimethylbenzene	ND (0.0042)		8260B Low		1	09/27/17 21:12	C7I0440	CI72730
1,2-Dibromo-3-Chloropropane	ND (0.0042)		8260B Low		1	09/27/17 21:12	C7I0440	CI72730
1,2-Dibromoethane	ND (0.0042)		8260B Low		1	09/27/17 21:12	C7I0440	CI72730
1,2-Dichlorobenzene	ND (0.0042)		8260B Low		1	09/27/17 21:12	C7I0440	CI72730
1,2-Dichloroethane	ND (0.0042)		8260B Low		1	09/27/17 21:12	C7I0440	CI72730
1,2-Dichloropropane	ND (0.0042)		8260B Low		1	09/27/17 21:12	C7I0440	CI72730
1,3,5-Trimethylbenzene	ND (0.0042)		8260B Low		1	09/27/17 21:12	C7I0440	CI72730
1,3-Dichlorobenzene	ND (0.0042)		8260B Low		1	09/27/17 21:12	C7I0440	CI72730
1,3-Dichloropropane	ND (0.0042)		8260B Low		1	09/27/17 21:12	C7I0440	CI72730
1,4-Dichlorobenzene	ND (0.0042)		8260B Low		1	09/27/17 21:12	C7I0440	CI72730
1,4-Dioxane	ND (0.0843)		8260B Low		1	09/27/17 21:12	C7I0440	CI72730
1-Chlorohexane	ND (0.0042)		8260B Low		1	09/27/17 21:12	C7I0440	CI72730
2,2-Dichloropropane	ND (0.0042)		8260B Low		1	09/27/17 21:12	C7I0440	CI72730
2-Butanone	ND (0.0422)		8260B Low		1	09/27/17 21:12	C7I0440	CI72730
2-Chlorotoluene	ND (0.0042)		8260B Low		1	09/27/17 21:12	C7I0440	CI72730
2-Hexanone	ND (0.0422)		8260B Low		1	09/27/17 21:12	C7I0440	CI72730
4-Chlorotoluene	ND (0.0042)		8260B Low		1	09/27/17 21:12	C7I0440	CI72730
4-Isopropyltoluene	ND (0.0042)		8260B Low		1	09/27/17 21:12	C7I0440	CI72730
4-Methyl-2-Pentanone	ND (0.0422)		8260B Low		1	09/27/17 21:12	C7I0440	CI72730
Acetone	ND (0.0422)		8260B Low		1	09/27/17 21:12	C7I0440	CI72730
Benzene	ND (0.0042)		8260B Low		1	09/27/17 21:12	C7I0440	CI72730
Bromobenzene	ND (0.0042)		8260B Low		1	09/27/17 21:12	C7I0440	CI72730



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-529 (0-2')  
Date Sampled: 09/26/17 13:35  
Percent Solids: 97  
Initial Volume: 6.1  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1709754  
ESS Laboratory Sample ID: 1709754-13  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0042)		8260B Low		1	09/27/17 21:12	C7I0440	CI72730
Bromodichloromethane	ND (0.0042)		8260B Low		1	09/27/17 21:12	C7I0440	CI72730
Bromoform	ND (0.0042)		8260B Low		1	09/27/17 21:12	C7I0440	CI72730
Bromomethane	ND (0.0084)		8260B Low		1	09/27/17 21:12	C7I0440	CI72730
Carbon Disulfide	ND (0.0042)		8260B Low		1	09/27/17 21:12	C7I0440	CI72730
Carbon Tetrachloride	ND (0.0042)		8260B Low		1	09/27/17 21:12	C7I0440	CI72730
Chlorobenzene	ND (0.0042)		8260B Low		1	09/27/17 21:12	C7I0440	CI72730
Chloroethane	ND (0.0084)		8260B Low		1	09/27/17 21:12	C7I0440	CI72730
Chloroform	ND (0.0042)		8260B Low		1	09/27/17 21:12	C7I0440	CI72730
Chloromethane	ND (0.0084)		8260B Low		1	09/27/17 21:12	C7I0440	CI72730
cis-1,2-Dichloroethene	ND (0.0042)		8260B Low		1	09/27/17 21:12	C7I0440	CI72730
cis-1,3-Dichloropropene	ND (0.0042)		8260B Low		1	09/27/17 21:12	C7I0440	CI72730
Dibromochloromethane	ND (0.0042)		8260B Low		1	09/27/17 21:12	C7I0440	CI72730
Dibromomethane	ND (0.0042)		8260B Low		1	09/27/17 21:12	C7I0440	CI72730
Dichlorodifluoromethane	ND (0.0084)		8260B Low		1	09/27/17 21:12	C7I0440	CI72730
Diethyl Ether	ND (0.0042)		8260B Low		1	09/27/17 21:12	C7I0440	CI72730
Di-isopropyl ether	ND (0.0042)		8260B Low		1	09/27/17 21:12	C7I0440	CI72730
Ethyl tertiary-butyl ether	ND (0.0042)		8260B Low		1	09/27/17 21:12	C7I0440	CI72730
Ethylbenzene	ND (0.0042)		8260B Low		1	09/27/17 21:12	C7I0440	CI72730
Hexachlorobutadiene	ND (0.0042)		8260B Low		1	09/27/17 21:12	C7I0440	CI72730
Isopropylbenzene	ND (0.0042)		8260B Low		1	09/27/17 21:12	C7I0440	CI72730
Methyl tert-Butyl Ether	ND (0.0042)		8260B Low		1	09/27/17 21:12	C7I0440	CI72730
Methylene Chloride	ND (0.0211)		8260B Low		1	09/27/17 21:12	C7I0440	CI72730
Naphthalene	ND (0.0042)		8260B Low		1	09/27/17 21:12	C7I0440	CI72730
n-Butylbenzene	ND (0.0042)		8260B Low		1	09/27/17 21:12	C7I0440	CI72730
n-Propylbenzene	ND (0.0042)		8260B Low		1	09/27/17 21:12	C7I0440	CI72730
sec-Butylbenzene	ND (0.0042)		8260B Low		1	09/27/17 21:12	C7I0440	CI72730
Styrene	ND (0.0042)		8260B Low		1	09/27/17 21:12	C7I0440	CI72730
tert-Butylbenzene	ND (0.0042)		8260B Low		1	09/27/17 21:12	C7I0440	CI72730
Tertiary-amyl methyl ether	ND (0.0042)		8260B Low		1	09/27/17 21:12	C7I0440	CI72730
Tetrachloroethene	ND (0.0042)		8260B Low		1	09/27/17 21:12	C7I0440	CI72730
Tetrahydrofuran	ND (0.0042)		8260B Low		1	09/27/17 21:12	C7I0440	CI72730





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-529 (0-2')  
 Date Sampled: 09/26/17 13:35  
 Percent Solids: 97  
 Initial Volume: 6.1  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-13  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0042)		8260B Low		1	09/27/17 21:12	C7I0440	CI72730
trans-1,2-Dichloroethene	ND (0.0042)		8260B Low		1	09/27/17 21:12	C7I0440	CI72730
trans-1,3-Dichloropropene	ND (0.0042)		8260B Low		1	09/27/17 21:12	C7I0440	CI72730
Trichloroethene	ND (0.0042)		8260B Low		1	09/27/17 21:12	C7I0440	CI72730
Trichlorofluoromethane	ND (0.0042)		8260B Low		1	09/27/17 21:12	C7I0440	CI72730
Vinyl Acetate	ND (0.0042)		8260B Low		1	09/27/17 21:12	C7I0440	CI72730
Vinyl Chloride	ND (0.0084)		8260B Low		1	09/27/17 21:12	C7I0440	CI72730
Xylene O	ND (0.0042)		8260B Low		1	09/27/17 21:12	C7I0440	CI72730
Xylene P,M	ND (0.0084)		8260B Low		1	09/27/17 21:12	C7I0440	CI72730
Xylenes (Total)	ND (0.0084)		8260B Low		1	09/27/17 21:12		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	115 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	106 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	109 %		70-130
<i>Surrogate: Toluene-d8</i>	113 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-529 (0-2')  
Date Sampled: 09/26/17 13:35  
Percent Solids: 97  
Initial Volume: 19.4  
Final Volume: 1  
Extraction Method: 3546

ESS Laboratory Work Order: 1709754  
ESS Laboratory Sample ID: 1709754-13  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: SMR  
Prepared: 9/27/17 12:54

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	2020 (199)		8100M		5	09/28/17 19:24	C710445	C172712
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		96 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-529 (0-2')  
 Date Sampled: 09/26/17 13:35  
 Percent Solids: 97  
 Initial Volume: 14.3  
 Final Volume: 0.5  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-13  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: TJ  
 Prepared: 9/27/17 11:30

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	0.955 (0.359)		8270D		1	09/29/17 2:05	C7I0472	CI72716
Acenaphthene	ND (0.359)		8270D		1	09/29/17 2:05	C7I0472	CI72716
Acenaphthylene	3.88 (0.359)		8270D		1	09/29/17 2:05	C7I0472	CI72716
Anthracene	1.68 (0.359)		8270D		1	09/29/17 2:05	C7I0472	CI72716
Benzo(a)anthracene	6.58 (0.359)		8270D		1	09/29/17 2:05	C7I0472	CI72716
Benzo(a)pyrene	6.90 (0.180)		8270D		1	09/29/17 2:05	C7I0472	CI72716
Benzo(b)fluoranthene	6.96 (0.359)		8270D		1	09/29/17 2:05	C7I0472	CI72716
Benzo(g,h,i)perylene	4.34 (0.359)		8270D		1	09/29/17 2:05	C7I0472	CI72716
Benzo(k)fluoranthene	6.96 (0.359)		8270D		1	09/29/17 2:05	C7I0472	CI72716
Chrysene	7.49 (0.180)		8270D		1	09/29/17 2:05	C7I0472	CI72716
Dibenzo(a,h)Anthracene	1.77 (0.180)		8270D		1	09/29/17 2:05	C7I0472	CI72716
Fluoranthene	9.70 (3.59)		8270D		10	09/30/17 0:06	C7I0472	CI72716
Fluorene	ND (0.359)		8270D		1	09/29/17 2:05	C7I0472	CI72716
Indeno(1,2,3-cd)Pyrene	3.53 (0.359)		8270D		1	09/29/17 2:05	C7I0472	CI72716
Naphthalene	1.51 (0.359)		8270D		1	09/29/17 2:05	C7I0472	CI72716
Phenanthrene	5.42 (0.359)		8270D		1	09/29/17 2:05	C7I0472	CI72716
Pyrene	13.7 (3.59)		8270D		10	09/30/17 0:06	C7I0472	CI72716

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	55 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	65 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	59 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	63 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-529 (0-2')  
Date Sampled: 09/26/17 13:35  
Percent Solids: 97

ESS Laboratory Work Order: 1709754  
ESS Laboratory Sample ID: 1709754-13  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	86.0 (9.67)		9014		10	EEM	10/02/17 14:30	mg/kg dry	CJ70215



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-530 (0-2')  
 Date Sampled: 09/26/17 13:50  
 Percent Solids: 96

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-14  
 Sample Matrix: Soil  
 Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (1.96)		6020A		20	NAR	09/29/17 14:17	2.12	100	CI72838
Arsenic	<b>5.56</b> (2.45)		6010C		1	KJK	09/30/17 1:54	2.12	100	CI72838
Beryllium	<b>0.11</b> (0.11)		6010C		1	KJK	09/30/17 1:54	2.12	100	CI72838
Cadmium	<b>0.69</b> (0.49)		6010C		1	KJK	09/30/17 20:19	2.12	100	CI72838
Chromium	<b>8.39</b> (0.98)		6010C		1	KJK	09/30/17 1:54	2.12	100	CI72838
Copper	<b>27.6</b> (2.45)		6010C		1	KJK	09/30/17 1:54	2.12	100	CI72838
Lead	<b>42.3</b> (4.89)		6010C		1	KJK	09/30/17 1:54	2.12	100	CI72838
Mercury	<b>0.225</b> (0.030)		7471B		1	MJV	09/29/17 12:54	0.68	40	CI72839
Nickel	<b>11.2</b> (2.45)		6010C		1	KJK	09/30/17 1:54	2.12	100	CI72838
Selenium	ND (1.96)		6020A		20	NAR	09/29/17 14:17	2.12	100	CI72838
Silver	ND (0.49)		6010C		1	KJK	09/30/17 1:54	2.12	100	CI72838
Thallium	ND (1.96)		6020A		20	NAR	09/29/17 14:17	2.12	100	CI72838
Zinc	<b>27.6</b> (2.45)		6010C		1	KJK	09/30/17 1:54	2.12	100	CI72838





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-530 (0-2')  
 Date Sampled: 09/26/17 13:50  
 Percent Solids: 96  
 Initial Volume: 6.1  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-14  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0042)		8260B Low		1	09/27/17 21:38	C7I0440	CI72730
1,1,1-Trichloroethane	ND (0.0042)		8260B Low		1	09/27/17 21:38	C7I0440	CI72730
1,1,2,2-Tetrachloroethane	ND (0.0042)		8260B Low		1	09/27/17 21:38	C7I0440	CI72730
1,1,2-Trichloroethane	ND (0.0042)		8260B Low		1	09/27/17 21:38	C7I0440	CI72730
1,1-Dichloroethane	ND (0.0042)		8260B Low		1	09/27/17 21:38	C7I0440	CI72730
1,1-Dichloroethene	ND (0.0042)		8260B Low		1	09/27/17 21:38	C7I0440	CI72730
1,1-Dichloropropene	ND (0.0042)		8260B Low		1	09/27/17 21:38	C7I0440	CI72730
1,2,3-Trichlorobenzene	ND (0.0042)		8260B Low		1	09/27/17 21:38	C7I0440	CI72730
1,2,3-Trichloropropane	ND (0.0042)		8260B Low		1	09/27/17 21:38	C7I0440	CI72730
1,2,4-Trichlorobenzene	ND (0.0042)		8260B Low		1	09/27/17 21:38	C7I0440	CI72730
1,2,4-Trimethylbenzene	ND (0.0042)		8260B Low		1	09/27/17 21:38	C7I0440	CI72730
1,2-Dibromo-3-Chloropropane	ND (0.0042)		8260B Low		1	09/27/17 21:38	C7I0440	CI72730
1,2-Dibromoethane	ND (0.0042)		8260B Low		1	09/27/17 21:38	C7I0440	CI72730
1,2-Dichlorobenzene	ND (0.0042)		8260B Low		1	09/27/17 21:38	C7I0440	CI72730
1,2-Dichloroethane	ND (0.0042)		8260B Low		1	09/27/17 21:38	C7I0440	CI72730
1,2-Dichloropropane	ND (0.0042)		8260B Low		1	09/27/17 21:38	C7I0440	CI72730
1,3,5-Trimethylbenzene	ND (0.0042)		8260B Low		1	09/27/17 21:38	C7I0440	CI72730
1,3-Dichlorobenzene	ND (0.0042)		8260B Low		1	09/27/17 21:38	C7I0440	CI72730
1,3-Dichloropropane	ND (0.0042)		8260B Low		1	09/27/17 21:38	C7I0440	CI72730
1,4-Dichlorobenzene	ND (0.0042)		8260B Low		1	09/27/17 21:38	C7I0440	CI72730
1,4-Dioxane	ND (0.0850)		8260B Low		1	09/27/17 21:38	C7I0440	CI72730
1-Chlorohexane	ND (0.0042)		8260B Low		1	09/27/17 21:38	C7I0440	CI72730
2,2-Dichloropropane	ND (0.0042)		8260B Low		1	09/27/17 21:38	C7I0440	CI72730
2-Butanone	ND (0.0425)		8260B Low		1	09/27/17 21:38	C7I0440	CI72730
2-Chlorotoluene	ND (0.0042)		8260B Low		1	09/27/17 21:38	C7I0440	CI72730
2-Hexanone	ND (0.0425)		8260B Low		1	09/27/17 21:38	C7I0440	CI72730
4-Chlorotoluene	ND (0.0042)		8260B Low		1	09/27/17 21:38	C7I0440	CI72730
4-Isopropyltoluene	ND (0.0042)		8260B Low		1	09/27/17 21:38	C7I0440	CI72730
4-Methyl-2-Pentanone	ND (0.0425)		8260B Low		1	09/27/17 21:38	C7I0440	CI72730
<b>Acetone</b>	<b>0.122 (0.0425)</b>		8260B Low		1	09/27/17 21:38	C7I0440	CI72730
Benzene	ND (0.0042)		8260B Low		1	09/27/17 21:38	C7I0440	CI72730
Bromobenzene	ND (0.0042)		8260B Low		1	09/27/17 21:38	C7I0440	CI72730



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-530 (0-2')  
 Date Sampled: 09/26/17 13:50  
 Percent Solids: 96  
 Initial Volume: 6.1  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-14  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0042)		8260B Low		1	09/27/17 21:38	C7I0440	CI72730
Bromodichloromethane	ND (0.0042)		8260B Low		1	09/27/17 21:38	C7I0440	CI72730
Bromoform	ND (0.0042)		8260B Low		1	09/27/17 21:38	C7I0440	CI72730
Bromomethane	ND (0.0085)		8260B Low		1	09/27/17 21:38	C7I0440	CI72730
Carbon Disulfide	ND (0.0042)		8260B Low		1	09/27/17 21:38	C7I0440	CI72730
Carbon Tetrachloride	ND (0.0042)		8260B Low		1	09/27/17 21:38	C7I0440	CI72730
Chlorobenzene	ND (0.0042)		8260B Low		1	09/27/17 21:38	C7I0440	CI72730
Chloroethane	ND (0.0085)		8260B Low		1	09/27/17 21:38	C7I0440	CI72730
Chloroform	ND (0.0042)		8260B Low		1	09/27/17 21:38	C7I0440	CI72730
Chloromethane	ND (0.0085)		8260B Low		1	09/27/17 21:38	C7I0440	CI72730
cis-1,2-Dichloroethene	ND (0.0042)		8260B Low		1	09/27/17 21:38	C7I0440	CI72730
cis-1,3-Dichloropropene	ND (0.0042)		8260B Low		1	09/27/17 21:38	C7I0440	CI72730
Dibromochloromethane	ND (0.0042)		8260B Low		1	09/27/17 21:38	C7I0440	CI72730
Dibromomethane	ND (0.0042)		8260B Low		1	09/27/17 21:38	C7I0440	CI72730
Dichlorodifluoromethane	ND (0.0085)		8260B Low		1	09/27/17 21:38	C7I0440	CI72730
Diethyl Ether	ND (0.0042)		8260B Low		1	09/27/17 21:38	C7I0440	CI72730
Di-isopropyl ether	ND (0.0042)		8260B Low		1	09/27/17 21:38	C7I0440	CI72730
Ethyl tertiary-butyl ether	ND (0.0042)		8260B Low		1	09/27/17 21:38	C7I0440	CI72730
Ethylbenzene	ND (0.0042)		8260B Low		1	09/27/17 21:38	C7I0440	CI72730
Hexachlorobutadiene	ND (0.0042)		8260B Low		1	09/27/17 21:38	C7I0440	CI72730
Isopropylbenzene	ND (0.0042)		8260B Low		1	09/27/17 21:38	C7I0440	CI72730
Methyl tert-Butyl Ether	ND (0.0042)		8260B Low		1	09/27/17 21:38	C7I0440	CI72730
Methylene Chloride	ND (0.0212)		8260B Low		1	09/27/17 21:38	C7I0440	CI72730
Naphthalene	ND (0.0042)		8260B Low		1	09/27/17 21:38	C7I0440	CI72730
n-Butylbenzene	ND (0.0042)		8260B Low		1	09/27/17 21:38	C7I0440	CI72730
n-Propylbenzene	ND (0.0042)		8260B Low		1	09/27/17 21:38	C7I0440	CI72730
sec-Butylbenzene	ND (0.0042)		8260B Low		1	09/27/17 21:38	C7I0440	CI72730
Styrene	ND (0.0042)		8260B Low		1	09/27/17 21:38	C7I0440	CI72730
tert-Butylbenzene	ND (0.0042)		8260B Low		1	09/27/17 21:38	C7I0440	CI72730
Tertiary-amyl methyl ether	ND (0.0042)		8260B Low		1	09/27/17 21:38	C7I0440	CI72730
Tetrachloroethene	ND (0.0042)		8260B Low		1	09/27/17 21:38	C7I0440	CI72730
Tetrahydrofuran	ND (0.0042)		8260B Low		1	09/27/17 21:38	C7I0440	CI72730



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-530 (0-2')  
 Date Sampled: 09/26/17 13:50  
 Percent Solids: 96  
 Initial Volume: 6.1  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-14  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0042)		8260B Low		1	09/27/17 21:38	C7I0440	CI72730
trans-1,2-Dichloroethene	ND (0.0042)		8260B Low		1	09/27/17 21:38	C7I0440	CI72730
trans-1,3-Dichloropropene	ND (0.0042)		8260B Low		1	09/27/17 21:38	C7I0440	CI72730
Trichloroethene	ND (0.0042)		8260B Low		1	09/27/17 21:38	C7I0440	CI72730
Trichlorofluoromethane	ND (0.0042)		8260B Low		1	09/27/17 21:38	C7I0440	CI72730
Vinyl Acetate	ND (0.0042)		8260B Low		1	09/27/17 21:38	C7I0440	CI72730
Vinyl Chloride	ND (0.0085)		8260B Low		1	09/27/17 21:38	C7I0440	CI72730
Xylene O	ND (0.0042)		8260B Low		1	09/27/17 21:38	C7I0440	CI72730
Xylene P,M	ND (0.0085)		8260B Low		1	09/27/17 21:38	C7I0440	CI72730
Xylenes (Total)	ND (0.0085)		8260B Low		1	09/27/17 21:38		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	113 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	95 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	108 %		70-130
<i>Surrogate: Toluene-d8</i>	120 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-530 (0-2')  
 Date Sampled: 09/26/17 13:50  
 Percent Solids: 96  
 Initial Volume: 20.1  
 Final Volume: 1  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-14  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: SMR  
 Prepared: 9/27/17 12:54

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	478 (193)		8100M		5	09/28/17 19:59	C710445	C172712
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		65 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-530 (0-2')  
Date Sampled: 09/26/17 13:50  
Percent Solids: 96  
Initial Volume: 14.5  
Final Volume: 0.5  
Extraction Method: 3546

ESS Laboratory Work Order: 1709754  
ESS Laboratory Sample ID: 1709754-14  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: TJ  
Prepared: 9/27/17 11:30

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.357)		8270D		1	09/29/17 2:41	C7I0472	CI72716
Acenaphthene	ND (0.357)		8270D		1	09/29/17 2:41	C7I0472	CI72716
Acenaphthylene	<b>0.606</b> (0.357)		8270D		1	09/29/17 2:41	C7I0472	CI72716
Anthracene	<b>0.732</b> (0.357)		8270D		1	09/29/17 2:41	C7I0472	CI72716
Benzo(a)anthracene	<b>2.07</b> (0.357)		8270D		1	09/29/17 2:41	C7I0472	CI72716
Benzo(a)pyrene	<b>1.48</b> (0.179)		8270D		1	09/29/17 2:41	C7I0472	CI72716
Benzo(b)fluoranthene	<b>3.70</b> (0.357)		8270D		1	09/29/17 2:41	C7I0472	CI72716
Benzo(g,h,i)perylene	<b>1.08</b> (0.357)		8270D		1	09/29/17 2:41	C7I0472	CI72716
Benzo(k)fluoranthene	<b>2.60</b> (0.357)		8270D		1	09/29/17 2:41	C7I0472	CI72716
Chrysene	<b>2.18</b> (0.179)		8270D		1	09/29/17 2:41	C7I0472	CI72716
Dibenzo(a,h)Anthracene	<b>0.571</b> (0.179)		8270D		1	09/29/17 2:41	C7I0472	CI72716
Fluoranthene	<b>4.83</b> (0.357)		8270D		1	09/29/17 2:41	C7I0472	CI72716
Fluorene	ND (0.357)		8270D		1	09/29/17 2:41	C7I0472	CI72716
Indeno(1,2,3-cd)Pyrene	<b>1.18</b> (0.357)		8270D		1	09/29/17 2:41	C7I0472	CI72716
Naphthalene	<b>0.367</b> (0.357)		8270D		1	09/29/17 2:41	C7I0472	CI72716
Phenanthrene	<b>2.17</b> (0.357)		8270D		1	09/29/17 2:41	C7I0472	CI72716
Pyrene	<b>3.38</b> (0.357)		8270D		1	09/29/17 2:41	C7I0472	CI72716

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	55 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	62 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	60 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	73 %		30-130





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-530 (0-2')  
Date Sampled: 09/26/17 13:50  
Percent Solids: 96

ESS Laboratory Work Order: 1709754  
ESS Laboratory Sample ID: 1709754-14  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	258 (51.1)		9014		50	EEM	10/02/17 14:30	mg/kg dry	CJ70215



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-531 (0-2')  
 Date Sampled: 09/26/17 13:55  
 Percent Solids: 95

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-15  
 Sample Matrix: Soil  
 Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (2.01)		6020A		20	NAR	09/29/17 14:34	2.09	100	CI72838
<b>Arsenic</b>	<b>6.01</b> (2.52)		6010C		1	KJK	09/30/17 1:58	2.09	100	CI72838
Beryllium	ND (0.11)		6010C		1	KJK	09/30/17 1:58	2.09	100	CI72838
Cadmium	ND (0.50)		6010C		1	KJK	09/30/17 20:25	2.09	100	CI72838
<b>Chromium</b>	<b>5.17</b> (1.01)		6010C		1	KJK	09/30/17 1:58	2.09	100	CI72838
<b>Copper</b>	<b>15.5</b> (2.52)		6010C		1	KJK	09/30/17 1:58	2.09	100	CI72838
<b>Lead</b>	<b>85.7</b> (5.04)		6010C		1	KJK	09/30/17 1:58	2.09	100	CI72838
<b>Mercury</b>	<b>0.532</b> (0.034)		7471B		1	MJV	09/29/17 12:56	0.61	40	CI72839
Nickel	ND (2.52)		6010C		1	KJK	09/30/17 1:58	2.09	100	CI72838
<b>Selenium</b>	<b>2.94</b> (2.01)		6020A		20	NAR	09/29/17 14:34	2.09	100	CI72838
Silver	ND (0.50)		6010C		1	KJK	09/30/17 1:58	2.09	100	CI72838
Thallium	ND (2.01)		6020A		20	NAR	09/29/17 14:34	2.09	100	CI72838
<b>Zinc</b>	<b>13.0</b> (2.52)		6010C		1	KJK	09/30/17 1:58	2.09	100	CI72838



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-531 (0-2')  
 Date Sampled: 09/26/17 13:55  
 Percent Solids: 95  
 Initial Volume: 4.8  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-15  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0055)		8260B Low		1	09/27/17 22:03	C7I0440	CI72730
1,1,1-Trichloroethane	ND (0.0055)		8260B Low		1	09/27/17 22:03	C7I0440	CI72730
1,1,2,2-Tetrachloroethane	ND (0.0055)		8260B Low		1	09/27/17 22:03	C7I0440	CI72730
1,1,2-Trichloroethane	ND (0.0055)		8260B Low		1	09/27/17 22:03	C7I0440	CI72730
1,1-Dichloroethane	ND (0.0055)		8260B Low		1	09/27/17 22:03	C7I0440	CI72730
1,1-Dichloroethene	ND (0.0055)		8260B Low		1	09/27/17 22:03	C7I0440	CI72730
1,1-Dichloropropene	ND (0.0055)		8260B Low		1	09/27/17 22:03	C7I0440	CI72730
1,2,3-Trichlorobenzene	ND (0.0055)		8260B Low		1	09/27/17 22:03	C7I0440	CI72730
1,2,3-Trichloropropane	ND (0.0055)		8260B Low		1	09/27/17 22:03	C7I0440	CI72730
1,2,4-Trichlorobenzene	ND (0.0055)		8260B Low		1	09/27/17 22:03	C7I0440	CI72730
1,2,4-Trimethylbenzene	ND (0.0055)		8260B Low		1	09/27/17 22:03	C7I0440	CI72730
1,2-Dibromo-3-Chloropropane	ND (0.0055)		8260B Low		1	09/27/17 22:03	C7I0440	CI72730
1,2-Dibromoethane	ND (0.0055)		8260B Low		1	09/27/17 22:03	C7I0440	CI72730
1,2-Dichlorobenzene	ND (0.0055)		8260B Low		1	09/27/17 22:03	C7I0440	CI72730
1,2-Dichloroethane	ND (0.0055)		8260B Low		1	09/27/17 22:03	C7I0440	CI72730
1,2-Dichloropropane	ND (0.0055)		8260B Low		1	09/27/17 22:03	C7I0440	CI72730
1,3,5-Trimethylbenzene	ND (0.0055)		8260B Low		1	09/27/17 22:03	C7I0440	CI72730
1,3-Dichlorobenzene	ND (0.0055)		8260B Low		1	09/27/17 22:03	C7I0440	CI72730
1,3-Dichloropropane	ND (0.0055)		8260B Low		1	09/27/17 22:03	C7I0440	CI72730
1,4-Dichlorobenzene	ND (0.0055)		8260B Low		1	09/27/17 22:03	C7I0440	CI72730
1,4-Dioxane	ND (0.110)		8260B Low		1	09/27/17 22:03	C7I0440	CI72730
1-Chlorohexane	ND (0.0055)		8260B Low		1	09/27/17 22:03	C7I0440	CI72730
2,2-Dichloropropane	ND (0.0055)		8260B Low		1	09/27/17 22:03	C7I0440	CI72730
2-Butanone	ND (0.0548)		8260B Low		1	09/27/17 22:03	C7I0440	CI72730
2-Chlorotoluene	ND (0.0055)		8260B Low		1	09/27/17 22:03	C7I0440	CI72730
2-Hexanone	ND (0.0548)		8260B Low		1	09/27/17 22:03	C7I0440	CI72730
4-Chlorotoluene	ND (0.0055)		8260B Low		1	09/27/17 22:03	C7I0440	CI72730
4-Isopropyltoluene	ND (0.0055)		8260B Low		1	09/27/17 22:03	C7I0440	CI72730
4-Methyl-2-Pentanone	ND (0.0548)		8260B Low		1	09/27/17 22:03	C7I0440	CI72730
Acetone	ND (0.0548)		8260B Low		1	09/27/17 22:03	C7I0440	CI72730
Benzene	ND (0.0055)		8260B Low		1	09/27/17 22:03	C7I0440	CI72730
Bromobenzene	ND (0.0055)		8260B Low		1	09/27/17 22:03	C7I0440	CI72730



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-531 (0-2')  
 Date Sampled: 09/26/17 13:55  
 Percent Solids: 95  
 Initial Volume: 4.8  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-15  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0055)		8260B Low		1	09/27/17 22:03	C7I0440	CI72730
Bromodichloromethane	ND (0.0055)		8260B Low		1	09/27/17 22:03	C7I0440	CI72730
Bromoform	ND (0.0055)		8260B Low		1	09/27/17 22:03	C7I0440	CI72730
Bromomethane	ND (0.0110)		8260B Low		1	09/27/17 22:03	C7I0440	CI72730
Carbon Disulfide	ND (0.0055)		8260B Low		1	09/27/17 22:03	C7I0440	CI72730
Carbon Tetrachloride	ND (0.0055)		8260B Low		1	09/27/17 22:03	C7I0440	CI72730
Chlorobenzene	ND (0.0055)		8260B Low		1	09/27/17 22:03	C7I0440	CI72730
Chloroethane	ND (0.0110)		8260B Low		1	09/27/17 22:03	C7I0440	CI72730
Chloroform	ND (0.0055)		8260B Low		1	09/27/17 22:03	C7I0440	CI72730
Chloromethane	ND (0.0110)		8260B Low		1	09/27/17 22:03	C7I0440	CI72730
cis-1,2-Dichloroethene	ND (0.0055)		8260B Low		1	09/27/17 22:03	C7I0440	CI72730
cis-1,3-Dichloropropene	ND (0.0055)		8260B Low		1	09/27/17 22:03	C7I0440	CI72730
Dibromochloromethane	ND (0.0055)		8260B Low		1	09/27/17 22:03	C7I0440	CI72730
Dibromomethane	ND (0.0055)		8260B Low		1	09/27/17 22:03	C7I0440	CI72730
Dichlorodifluoromethane	ND (0.0110)		8260B Low		1	09/27/17 22:03	C7I0440	CI72730
Diethyl Ether	ND (0.0055)		8260B Low		1	09/27/17 22:03	C7I0440	CI72730
Di-isopropyl ether	ND (0.0055)		8260B Low		1	09/27/17 22:03	C7I0440	CI72730
Ethyl tertiary-butyl ether	ND (0.0055)		8260B Low		1	09/27/17 22:03	C7I0440	CI72730
Ethylbenzene	ND (0.0055)		8260B Low		1	09/27/17 22:03	C7I0440	CI72730
Hexachlorobutadiene	ND (0.0055)		8260B Low		1	09/27/17 22:03	C7I0440	CI72730
Isopropylbenzene	ND (0.0055)		8260B Low		1	09/27/17 22:03	C7I0440	CI72730
Methyl tert-Butyl Ether	ND (0.0055)		8260B Low		1	09/27/17 22:03	C7I0440	CI72730
Methylene Chloride	ND (0.0274)		8260B Low		1	09/27/17 22:03	C7I0440	CI72730
Naphthalene	ND (0.0055)		8260B Low		1	09/27/17 22:03	C7I0440	CI72730
n-Butylbenzene	ND (0.0055)		8260B Low		1	09/27/17 22:03	C7I0440	CI72730
n-Propylbenzene	ND (0.0055)		8260B Low		1	09/27/17 22:03	C7I0440	CI72730
sec-Butylbenzene	ND (0.0055)		8260B Low		1	09/27/17 22:03	C7I0440	CI72730
<b>Styrene</b>	<b>0.0059</b> (0.0055)		8260B Low		1	09/27/17 22:03	C7I0440	CI72730
tert-Butylbenzene	ND (0.0055)		8260B Low		1	09/27/17 22:03	C7I0440	CI72730
Tertiary-amyl methyl ether	ND (0.0055)		8260B Low		1	09/27/17 22:03	C7I0440	CI72730
Tetrachloroethene	ND (0.0055)		8260B Low		1	09/27/17 22:03	C7I0440	CI72730
Tetrahydrofuran	ND (0.0055)		8260B Low		1	09/27/17 22:03	C7I0440	CI72730



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-531 (0-2')  
 Date Sampled: 09/26/17 13:55  
 Percent Solids: 95  
 Initial Volume: 4.8  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-15  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0055)		8260B Low		1	09/27/17 22:03	C7I0440	CI72730
trans-1,2-Dichloroethene	ND (0.0055)		8260B Low		1	09/27/17 22:03	C7I0440	CI72730
trans-1,3-Dichloropropene	ND (0.0055)		8260B Low		1	09/27/17 22:03	C7I0440	CI72730
Trichloroethene	ND (0.0055)		8260B Low		1	09/27/17 22:03	C7I0440	CI72730
Trichlorofluoromethane	ND (0.0055)		8260B Low		1	09/27/17 22:03	C7I0440	CI72730
Vinyl Acetate	ND (0.0055)		8260B Low		1	09/27/17 22:03	C7I0440	CI72730
Vinyl Chloride	ND (0.0110)		8260B Low		1	09/27/17 22:03	C7I0440	CI72730
Xylene O	ND (0.0055)		8260B Low		1	09/27/17 22:03	C7I0440	CI72730
Xylene P,M	ND (0.0110)		8260B Low		1	09/27/17 22:03	C7I0440	CI72730
Xylenes (Total)	ND (0.0110)		8260B Low		1	09/27/17 22:03		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	112 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	104 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	108 %		70-130
<i>Surrogate: Toluene-d8</i>	114 %		70-130





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-531 (0-2')  
Date Sampled: 09/26/17 13:55  
Percent Solids: 95  
Initial Volume: 19.2  
Final Volume: 1  
Extraction Method: 3546

ESS Laboratory Work Order: 1709754  
ESS Laboratory Sample ID: 1709754-15  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: SMR  
Prepared: 9/27/17 12:54

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	2170 (206)		8100M		5	09/28/17 20:34	C710445	C172712
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		56 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-531 (0-2')  
 Date Sampled: 09/26/17 13:55  
 Percent Solids: 95  
 Initial Volume: 14  
 Final Volume: 1  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-15  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: TJ  
 Prepared: 9/27/17 11:30

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.751)		8270D		1	09/29/17 3:16	C7I0472	CI72716
Acenaphthene	ND (0.751)		8270D		1	09/29/17 3:16	C7I0472	CI72716
Acenaphthylene	2.52 (0.751)		8270D		1	09/29/17 3:16	C7I0472	CI72716
Anthracene	1.04 (0.751)		8270D		1	09/29/17 3:16	C7I0472	CI72716
Benzo(a)anthracene	2.87 (0.751)		8270D		1	09/29/17 3:16	C7I0472	CI72716
Benzo(a)pyrene	1.63 (0.377)		8270D		1	09/29/17 3:16	C7I0472	CI72716
Benzo(b)fluoranthene	10.1 (0.751)		8270D		1	09/29/17 3:16	C7I0472	CI72716
Benzo(g,h,i)perylene	2.27 (0.751)		8270D		1	09/29/17 3:16	C7I0472	CI72716
Benzo(k)fluoranthene	7.68 (0.751)		8270D		1	09/29/17 3:16	C7I0472	CI72716
Chrysene	4.68 (0.377)		8270D		1	09/29/17 3:16	C7I0472	CI72716
Dibenzo(a,h)Anthracene	1.26 (0.377)		8270D		1	09/29/17 3:16	C7I0472	CI72716
Fluoranthene	3.07 (0.751)		8270D		1	09/29/17 3:16	C7I0472	CI72716
Fluorene	ND (0.751)		8270D		1	09/29/17 3:16	C7I0472	CI72716
Indeno(1,2,3-cd)Pyrene	2.74 (0.751)		8270D		1	09/29/17 3:16	C7I0472	CI72716
Naphthalene	1.13 (0.751)		8270D		1	09/29/17 3:16	C7I0472	CI72716
Phenanthrene	0.953 (0.751)		8270D		1	09/29/17 3:16	C7I0472	CI72716
Pyrene	2.48 (0.751)		8270D		1	09/29/17 3:16	C7I0472	CI72716

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	69 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	74 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	73 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	77 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-531 (0-2')  
Date Sampled: 09/26/17 13:55  
Percent Solids: 95

ESS Laboratory Work Order: 1709754  
ESS Laboratory Sample ID: 1709754-15  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	407 (51.1)		9014		50	EEM	10/02/17 14:30	mg/kg dry	CJ70215



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-532 (0-2')  
 Date Sampled: 09/26/17 14:15  
 Percent Solids: 98

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-16  
 Sample Matrix: Soil  
 Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (1.92)		6020A		20	NAR	09/29/17 14:40	2.13	100	CI72838
<b>Arsenic</b>	<b>4.46</b> (2.39)		6010C		1	KJK	09/30/17 2:03	2.13	100	CI72838
Beryllium	ND (0.11)		6010C		1	KJK	09/30/17 2:03	2.13	100	CI72838
Cadmium	ND (0.48)		6010C		1	KJK	09/30/17 20:29	2.13	100	CI72838
<b>Chromium</b>	<b>5.54</b> (0.96)		6010C		1	KJK	09/30/17 2:03	2.13	100	CI72838
<b>Copper</b>	<b>12.5</b> (2.39)		6010C		1	KJK	09/30/17 2:03	2.13	100	CI72838
<b>Lead</b>	<b>46.0</b> (4.79)		6010C		1	KJK	09/30/17 2:03	2.13	100	CI72838
<b>Mercury</b>	<b>0.183</b> (0.028)		7471B		1	MJV	09/29/17 12:58	0.71	40	CI72839
<b>Nickel</b>	<b>2.76</b> (2.39)		6010C		1	KJK	09/30/17 2:03	2.13	100	CI72838
Selenium	ND (1.92)		6020A		20	NAR	09/29/17 14:40	2.13	100	CI72838
Silver	ND (0.48)		6010C		1	KJK	09/30/17 2:03	2.13	100	CI72838
Thallium	ND (1.92)		6020A		20	NAR	09/29/17 14:40	2.13	100	CI72838
<b>Zinc</b>	<b>10.2</b> (2.39)		6010C		1	KJK	09/30/17 2:03	2.13	100	CI72838



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-532 (0-2')  
 Date Sampled: 09/26/17 14:15  
 Percent Solids: 98  
 Initial Volume: 8.2  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-16  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0031)		8260B Low		1	09/27/17 22:29	C7I0440	CI72730
1,1,1-Trichloroethane	ND (0.0031)		8260B Low		1	09/27/17 22:29	C7I0440	CI72730
1,1,2,2-Tetrachloroethane	ND (0.0031)		8260B Low		1	09/27/17 22:29	C7I0440	CI72730
1,1,2-Trichloroethane	ND (0.0031)		8260B Low		1	09/27/17 22:29	C7I0440	CI72730
1,1-Dichloroethane	ND (0.0031)		8260B Low		1	09/27/17 22:29	C7I0440	CI72730
1,1-Dichloroethene	ND (0.0031)		8260B Low		1	09/27/17 22:29	C7I0440	CI72730
1,1-Dichloropropene	ND (0.0031)		8260B Low		1	09/27/17 22:29	C7I0440	CI72730
1,2,3-Trichlorobenzene	ND (0.0031)		8260B Low		1	09/27/17 22:29	C7I0440	CI72730
1,2,3-Trichloropropane	ND (0.0031)		8260B Low		1	09/27/17 22:29	C7I0440	CI72730
1,2,4-Trichlorobenzene	ND (0.0031)		8260B Low		1	09/27/17 22:29	C7I0440	CI72730
1,2,4-Trimethylbenzene	ND (0.0031)		8260B Low		1	09/27/17 22:29	C7I0440	CI72730
1,2-Dibromo-3-Chloropropane	ND (0.0031)		8260B Low		1	09/27/17 22:29	C7I0440	CI72730
1,2-Dibromoethane	ND (0.0031)		8260B Low		1	09/27/17 22:29	C7I0440	CI72730
1,2-Dichlorobenzene	ND (0.0031)		8260B Low		1	09/27/17 22:29	C7I0440	CI72730
1,2-Dichloroethane	ND (0.0031)		8260B Low		1	09/27/17 22:29	C7I0440	CI72730
1,2-Dichloropropane	ND (0.0031)		8260B Low		1	09/27/17 22:29	C7I0440	CI72730
1,3,5-Trimethylbenzene	ND (0.0031)		8260B Low		1	09/27/17 22:29	C7I0440	CI72730
1,3-Dichlorobenzene	ND (0.0031)		8260B Low		1	09/27/17 22:29	C7I0440	CI72730
1,3-Dichloropropane	ND (0.0031)		8260B Low		1	09/27/17 22:29	C7I0440	CI72730
1,4-Dichlorobenzene	ND (0.0031)		8260B Low		1	09/27/17 22:29	C7I0440	CI72730
1,4-Dioxane	ND (0.0622)		8260B Low		1	09/27/17 22:29	C7I0440	CI72730
1-Chlorohexane	ND (0.0031)		8260B Low		1	09/27/17 22:29	C7I0440	CI72730
2,2-Dichloropropane	ND (0.0031)		8260B Low		1	09/27/17 22:29	C7I0440	CI72730
2-Butanone	ND (0.0311)		8260B Low		1	09/27/17 22:29	C7I0440	CI72730
2-Chlorotoluene	ND (0.0031)		8260B Low		1	09/27/17 22:29	C7I0440	CI72730
2-Hexanone	ND (0.0311)		8260B Low		1	09/27/17 22:29	C7I0440	CI72730
4-Chlorotoluene	ND (0.0031)		8260B Low		1	09/27/17 22:29	C7I0440	CI72730
4-Isopropyltoluene	ND (0.0031)		8260B Low		1	09/27/17 22:29	C7I0440	CI72730
4-Methyl-2-Pentanone	ND (0.0311)		8260B Low		1	09/27/17 22:29	C7I0440	CI72730
Acetone	ND (0.0311)		8260B Low		1	09/27/17 22:29	C7I0440	CI72730
Benzene	ND (0.0031)		8260B Low		1	09/27/17 22:29	C7I0440	CI72730
Bromobenzene	ND (0.0031)		8260B Low		1	09/27/17 22:29	C7I0440	CI72730





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-532 (0-2')  
Date Sampled: 09/26/17 14:15  
Percent Solids: 98  
Initial Volume: 8.2  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1709754  
ESS Laboratory Sample ID: 1709754-16  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0031)		8260B Low		1	09/27/17 22:29	C7I0440	CI72730
Bromodichloromethane	ND (0.0031)		8260B Low		1	09/27/17 22:29	C7I0440	CI72730
Bromoform	ND (0.0031)		8260B Low		1	09/27/17 22:29	C7I0440	CI72730
Bromomethane	ND (0.0062)		8260B Low		1	09/27/17 22:29	C7I0440	CI72730
Carbon Disulfide	ND (0.0031)		8260B Low		1	09/27/17 22:29	C7I0440	CI72730
Carbon Tetrachloride	ND (0.0031)		8260B Low		1	09/27/17 22:29	C7I0440	CI72730
Chlorobenzene	ND (0.0031)		8260B Low		1	09/27/17 22:29	C7I0440	CI72730
Chloroethane	ND (0.0062)		8260B Low		1	09/27/17 22:29	C7I0440	CI72730
Chloroform	ND (0.0031)		8260B Low		1	09/27/17 22:29	C7I0440	CI72730
Chloromethane	ND (0.0062)		8260B Low		1	09/27/17 22:29	C7I0440	CI72730
cis-1,2-Dichloroethene	ND (0.0031)		8260B Low		1	09/27/17 22:29	C7I0440	CI72730
cis-1,3-Dichloropropene	ND (0.0031)		8260B Low		1	09/27/17 22:29	C7I0440	CI72730
Dibromochloromethane	ND (0.0031)		8260B Low		1	09/27/17 22:29	C7I0440	CI72730
Dibromomethane	ND (0.0031)		8260B Low		1	09/27/17 22:29	C7I0440	CI72730
Dichlorodifluoromethane	ND (0.0062)		8260B Low		1	09/27/17 22:29	C7I0440	CI72730
Diethyl Ether	ND (0.0031)		8260B Low		1	09/27/17 22:29	C7I0440	CI72730
Di-isopropyl ether	ND (0.0031)		8260B Low		1	09/27/17 22:29	C7I0440	CI72730
Ethyl tertiary-butyl ether	ND (0.0031)		8260B Low		1	09/27/17 22:29	C7I0440	CI72730
Ethylbenzene	ND (0.0031)		8260B Low		1	09/27/17 22:29	C7I0440	CI72730
Hexachlorobutadiene	ND (0.0031)		8260B Low		1	09/27/17 22:29	C7I0440	CI72730
Isopropylbenzene	ND (0.0031)		8260B Low		1	09/27/17 22:29	C7I0440	CI72730
Methyl tert-Butyl Ether	ND (0.0031)		8260B Low		1	09/27/17 22:29	C7I0440	CI72730
Methylene Chloride	ND (0.0155)		8260B Low		1	09/27/17 22:29	C7I0440	CI72730
Naphthalene	ND (0.0031)		8260B Low		1	09/27/17 22:29	C7I0440	CI72730
n-Butylbenzene	ND (0.0031)		8260B Low		1	09/27/17 22:29	C7I0440	CI72730
n-Propylbenzene	ND (0.0031)		8260B Low		1	09/27/17 22:29	C7I0440	CI72730
sec-Butylbenzene	ND (0.0031)		8260B Low		1	09/27/17 22:29	C7I0440	CI72730
Styrene	ND (0.0031)		8260B Low		1	09/27/17 22:29	C7I0440	CI72730
tert-Butylbenzene	ND (0.0031)		8260B Low		1	09/27/17 22:29	C7I0440	CI72730
Tertiary-amyl methyl ether	ND (0.0031)		8260B Low		1	09/27/17 22:29	C7I0440	CI72730
Tetrachloroethene	ND (0.0031)		8260B Low		1	09/27/17 22:29	C7I0440	CI72730
Tetrahydrofuran	ND (0.0031)		8260B Low		1	09/27/17 22:29	C7I0440	CI72730



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-532 (0-2')  
Date Sampled: 09/26/17 14:15  
Percent Solids: 98  
Initial Volume: 8.2  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1709754  
ESS Laboratory Sample ID: 1709754-16  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0031)		8260B Low		1	09/27/17 22:29	C7I0440	CI72730
trans-1,2-Dichloroethene	ND (0.0031)		8260B Low		1	09/27/17 22:29	C7I0440	CI72730
trans-1,3-Dichloropropene	ND (0.0031)		8260B Low		1	09/27/17 22:29	C7I0440	CI72730
Trichloroethene	ND (0.0031)		8260B Low		1	09/27/17 22:29	C7I0440	CI72730
Trichlorofluoromethane	ND (0.0031)		8260B Low		1	09/27/17 22:29	C7I0440	CI72730
Vinyl Acetate	ND (0.0031)		8260B Low		1	09/27/17 22:29	C7I0440	CI72730
Vinyl Chloride	ND (0.0062)		8260B Low		1	09/27/17 22:29	C7I0440	CI72730
Xylene O	ND (0.0031)		8260B Low		1	09/27/17 22:29	C7I0440	CI72730
Xylene P,M	ND (0.0062)		8260B Low		1	09/27/17 22:29	C7I0440	CI72730
Xylenes (Total)	ND (0.0062)		8260B Low		1	09/27/17 22:29		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	110 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	98 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	106 %		70-130
<i>Surrogate: Toluene-d8</i>	119 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-532 (0-2')  
 Date Sampled: 09/26/17 14:15  
 Percent Solids: 98  
 Initial Volume: 19.8  
 Final Volume: 1  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-16  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: SMR  
 Prepared: 9/27/17 12:54

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	1520 (193)		8100M		5	09/28/17 21:09	C710445	C172712
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		66 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-532 (0-2')  
Date Sampled: 09/26/17 14:15  
Percent Solids: 98  
Initial Volume: 15  
Final Volume: 1  
Extraction Method: 3546

ESS Laboratory Work Order: 1709754  
ESS Laboratory Sample ID: 1709754-16  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: TJ  
Prepared: 9/27/17 11:30

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.679)		8270D		1	10/02/17 15:37	C7J0002	CI72716
Acenaphthene	ND (0.679)		8270D		1	10/02/17 15:37	C7J0002	CI72716
Acenaphthylene	10.8 (0.679)		8270D		1	10/02/17 15:37	C7J0002	CI72716
Anthracene	6.04 (0.679)		8270D		1	10/02/17 15:37	C7J0002	CI72716
Benzo(a)anthracene	10.0 (0.679)		8270D		1	10/02/17 15:37	C7J0002	CI72716
Benzo(a)pyrene	9.79 (0.341)		8270D		1	10/02/17 15:37	C7J0002	CI72716
Benzo(b)fluoranthene	31.5 (6.79)		8270D		10	10/02/17 16:12	C7J0002	CI72716
Benzo(g,h,i)perylene	12.6 (0.679)		8270D		1	10/02/17 15:37	C7J0002	CI72716
Benzo(k)fluoranthene	13.7 (6.79)		8270D		10	10/02/17 16:12	C7J0002	CI72716
Chrysene	10.3 (0.341)		8270D		1	10/02/17 15:37	C7J0002	CI72716
Dibenzo(a,h)Anthracene	6.13 (0.341)		8270D		1	10/02/17 15:37	C7J0002	CI72716
Fluoranthene	7.68 (0.679)		8270D		1	10/02/17 15:37	C7J0002	CI72716
Fluorene	ND (0.679)		8270D		1	10/02/17 15:37	C7J0002	CI72716
Indeno(1,2,3-cd)Pyrene	12.8 (0.679)		8270D		1	10/02/17 15:37	C7J0002	CI72716
Naphthalene	ND (0.679)		8270D		1	10/02/17 15:37	C7J0002	CI72716
Phenanthrene	2.09 (0.679)		8270D		1	10/02/17 15:37	C7J0002	CI72716
Pyrene	7.10 (0.679)		8270D		1	10/02/17 15:37	C7J0002	CI72716

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	68 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	79 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	74 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	77 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-532 (0-2')  
Date Sampled: 09/26/17 14:15  
Percent Solids: 98

ESS Laboratory Work Order: 1709754  
ESS Laboratory Sample ID: 1709754-16  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	587 (50.6)		9014		50	EEM	10/02/17 14:30	mg/kg dry	CJ70215





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-533 (0-2')  
 Date Sampled: 09/26/17 14:30  
 Percent Solids: 95

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-17  
 Sample Matrix: Soil  
 Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (2.05)		6020A		20	NAR	09/29/17 14:46	2.06	100	CI72838
Arsenic	ND (2.56)		6010C		1	KJK	09/30/17 2:07	2.06	100	CI72838
Beryllium	ND (0.11)		6010C		1	KJK	09/30/17 2:07	2.06	100	CI72838
Cadmium	ND (0.51)		6010C		1	KJK	09/30/17 20:33	2.06	100	CI72838
<b>Chromium</b>	<b>1.91</b> (1.02)		6010C		1	KJK	09/30/17 2:07	2.06	100	CI72838
Copper	ND (2.56)		6010C		1	KJK	09/30/17 2:07	2.06	100	CI72838
Lead	ND (5.12)		6010C		1	KJK	09/30/17 2:07	2.06	100	CI72838
<b>Mercury</b>	<b>0.053</b> (0.034)		7471B		1	MJV	09/29/17 13:00	0.61	40	CI72839
Nickel	ND (2.56)		6010C		1	KJK	09/30/17 2:07	2.06	100	CI72838
Selenium	ND (2.05)		6020A		20	NAR	09/29/17 14:46	2.06	100	CI72838
Silver	ND (0.51)		6010C		1	KJK	09/30/17 2:07	2.06	100	CI72838
Thallium	ND (2.05)		6020A		20	NAR	09/29/17 14:46	2.06	100	CI72838
<b>Zinc</b>	<b>3.78</b> (2.56)		6010C		1	KJK	09/30/17 2:07	2.06	100	CI72838



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-533 (0-2')  
 Date Sampled: 09/26/17 14:30  
 Percent Solids: 95  
 Initial Volume: 5.9  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-17  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0045)		8260B Low		1	09/28/17 16:14	C7I0473	CI72836
1,1,1-Trichloroethane	ND (0.0045)		8260B Low		1	09/28/17 16:14	C7I0473	CI72836
1,1,2,2-Tetrachloroethane	ND (0.0045)		8260B Low		1	09/28/17 16:14	C7I0473	CI72836
1,1,2-Trichloroethane	ND (0.0045)		8260B Low		1	09/28/17 16:14	C7I0473	CI72836
1,1-Dichloroethane	ND (0.0045)		8260B Low		1	09/28/17 16:14	C7I0473	CI72836
1,1-Dichloroethene	ND (0.0045)		8260B Low		1	09/28/17 16:14	C7I0473	CI72836
1,1-Dichloropropene	ND (0.0045)		8260B Low		1	09/28/17 16:14	C7I0473	CI72836
1,2,3-Trichlorobenzene	ND (0.0045)		8260B Low		1	09/28/17 16:14	C7I0473	CI72836
1,2,3-Trichloropropane	ND (0.0045)		8260B Low		1	09/28/17 16:14	C7I0473	CI72836
1,2,4-Trichlorobenzene	ND (0.0045)		8260B Low		1	09/28/17 16:14	C7I0473	CI72836
1,2,4-Trimethylbenzene	ND (0.0045)		8260B Low		1	09/28/17 16:14	C7I0473	CI72836
1,2-Dibromo-3-Chloropropane	ND (0.0045)		8260B Low		1	09/28/17 16:14	C7I0473	CI72836
1,2-Dibromoethane	ND (0.0045)		8260B Low		1	09/28/17 16:14	C7I0473	CI72836
1,2-Dichlorobenzene	ND (0.0045)		8260B Low		1	09/28/17 16:14	C7I0473	CI72836
1,2-Dichloroethane	ND (0.0045)		8260B Low		1	09/28/17 16:14	C7I0473	CI72836
1,2-Dichloropropane	ND (0.0045)		8260B Low		1	09/28/17 16:14	C7I0473	CI72836
1,3,5-Trimethylbenzene	ND (0.0045)		8260B Low		1	09/28/17 16:14	C7I0473	CI72836
1,3-Dichlorobenzene	ND (0.0045)		8260B Low		1	09/28/17 16:14	C7I0473	CI72836
1,3-Dichloropropane	ND (0.0045)		8260B Low		1	09/28/17 16:14	C7I0473	CI72836
1,4-Dichlorobenzene	ND (0.0045)		8260B Low		1	09/28/17 16:14	C7I0473	CI72836
1,4-Dioxane	ND (0.0894)		8260B Low		1	09/28/17 16:14	C7I0473	CI72836
1-Chlorohexane	ND (0.0045)		8260B Low		1	09/28/17 16:14	C7I0473	CI72836
2,2-Dichloropropane	ND (0.0045)		8260B Low		1	09/28/17 16:14	C7I0473	CI72836
2-Butanone	ND (0.0447)		8260B Low		1	09/28/17 16:14	C7I0473	CI72836
2-Chlorotoluene	ND (0.0045)		8260B Low		1	09/28/17 16:14	C7I0473	CI72836
2-Hexanone	ND (0.0447)		8260B Low		1	09/28/17 16:14	C7I0473	CI72836
4-Chlorotoluene	ND (0.0045)		8260B Low		1	09/28/17 16:14	C7I0473	CI72836
4-Isopropyltoluene	ND (0.0045)		8260B Low		1	09/28/17 16:14	C7I0473	CI72836
4-Methyl-2-Pentanone	ND (0.0447)		8260B Low		1	09/28/17 16:14	C7I0473	CI72836
Acetone	ND (0.0447)		8260B Low		1	09/28/17 16:14	C7I0473	CI72836
Benzene	ND (0.0045)		8260B Low		1	09/28/17 16:14	C7I0473	CI72836
Bromobenzene	ND (0.0045)		8260B Low		1	09/28/17 16:14	C7I0473	CI72836



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-533 (0-2')  
 Date Sampled: 09/26/17 14:30  
 Percent Solids: 95  
 Initial Volume: 5.9  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-17  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0045)		8260B Low		1	09/28/17 16:14	C7I0473	CI72836
Bromodichloromethane	ND (0.0045)		8260B Low		1	09/28/17 16:14	C7I0473	CI72836
Bromoform	ND (0.0045)		8260B Low		1	09/28/17 16:14	C7I0473	CI72836
Bromomethane	ND (0.0089)		8260B Low		1	09/28/17 16:14	C7I0473	CI72836
Carbon Disulfide	ND (0.0045)		8260B Low		1	09/28/17 16:14	C7I0473	CI72836
Carbon Tetrachloride	ND (0.0045)		8260B Low		1	09/28/17 16:14	C7I0473	CI72836
Chlorobenzene	ND (0.0045)		8260B Low		1	09/28/17 16:14	C7I0473	CI72836
Chloroethane	ND (0.0089)		8260B Low		1	09/28/17 16:14	C7I0473	CI72836
Chloroform	ND (0.0045)		8260B Low		1	09/28/17 16:14	C7I0473	CI72836
Chloromethane	ND (0.0089)		8260B Low		1	09/28/17 16:14	C7I0473	CI72836
cis-1,2-Dichloroethene	ND (0.0045)		8260B Low		1	09/28/17 16:14	C7I0473	CI72836
cis-1,3-Dichloropropene	ND (0.0045)		8260B Low		1	09/28/17 16:14	C7I0473	CI72836
Dibromochloromethane	ND (0.0045)		8260B Low		1	09/28/17 16:14	C7I0473	CI72836
Dibromomethane	ND (0.0045)		8260B Low		1	09/28/17 16:14	C7I0473	CI72836
Dichlorodifluoromethane	ND (0.0089)		8260B Low		1	09/28/17 16:14	C7I0473	CI72836
Diethyl Ether	ND (0.0045)		8260B Low		1	09/28/17 16:14	C7I0473	CI72836
Di-isopropyl ether	ND (0.0045)		8260B Low		1	09/28/17 16:14	C7I0473	CI72836
Ethyl tertiary-butyl ether	ND (0.0045)		8260B Low		1	09/28/17 16:14	C7I0473	CI72836
Ethylbenzene	ND (0.0045)		8260B Low		1	09/28/17 16:14	C7I0473	CI72836
Hexachlorobutadiene	ND (0.0045)		8260B Low		1	09/28/17 16:14	C7I0473	CI72836
Isopropylbenzene	ND (0.0045)		8260B Low		1	09/28/17 16:14	C7I0473	CI72836
Methyl tert-Butyl Ether	ND (0.0045)		8260B Low		1	09/28/17 16:14	C7I0473	CI72836
Methylene Chloride	ND (0.0224)		8260B Low		1	09/28/17 16:14	C7I0473	CI72836
Naphthalene	ND (0.0045)		8260B Low		1	09/28/17 16:14	C7I0473	CI72836
n-Butylbenzene	ND (0.0045)		8260B Low		1	09/28/17 16:14	C7I0473	CI72836
n-Propylbenzene	ND (0.0045)		8260B Low		1	09/28/17 16:14	C7I0473	CI72836
sec-Butylbenzene	ND (0.0045)		8260B Low		1	09/28/17 16:14	C7I0473	CI72836
Styrene	ND (0.0045)		8260B Low		1	09/28/17 16:14	C7I0473	CI72836
tert-Butylbenzene	ND (0.0045)		8260B Low		1	09/28/17 16:14	C7I0473	CI72836
Tertiary-amyl methyl ether	ND (0.0045)		8260B Low		1	09/28/17 16:14	C7I0473	CI72836
Tetrachloroethene	ND (0.0045)		8260B Low		1	09/28/17 16:14	C7I0473	CI72836
Tetrahydrofuran	ND (0.0045)		8260B Low		1	09/28/17 16:14	C7I0473	CI72836



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-533 (0-2')  
Date Sampled: 09/26/17 14:30  
Percent Solids: 95  
Initial Volume: 5.9  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1709754  
ESS Laboratory Sample ID: 1709754-17  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0045)		8260B Low		1	09/28/17 16:14	C7I0473	CI72836
trans-1,2-Dichloroethene	ND (0.0045)		8260B Low		1	09/28/17 16:14	C7I0473	CI72836
trans-1,3-Dichloropropene	ND (0.0045)		8260B Low		1	09/28/17 16:14	C7I0473	CI72836
Trichloroethene	ND (0.0045)		8260B Low		1	09/28/17 16:14	C7I0473	CI72836
Trichlorofluoromethane	ND (0.0045)		8260B Low		1	09/28/17 16:14	C7I0473	CI72836
Vinyl Acetate	ND (0.0045)		8260B Low		1	09/28/17 16:14	C7I0473	CI72836
Vinyl Chloride	ND (0.0089)		8260B Low		1	09/28/17 16:14	C7I0473	CI72836
Xylene O	ND (0.0045)		8260B Low		1	09/28/17 16:14	C7I0473	CI72836
Xylene P,M	ND (0.0089)		8260B Low		1	09/28/17 16:14	C7I0473	CI72836
Xylenes (Total)	ND (0.0089)		8260B Low		1	09/28/17 16:14		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	109 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	104 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	107 %		70-130
<i>Surrogate: Toluene-d8</i>	111 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-533 (0-2')  
 Date Sampled: 09/26/17 14:30  
 Percent Solids: 95  
 Initial Volume: 20  
 Final Volume: 1  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-17  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: SMR  
 Prepared: 9/27/17 12:54

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	524 (198)		8100M		5	09/28/17 21:44	C710445	C172712
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		73 %		40-140				





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-533 (0-2')  
Date Sampled: 09/26/17 14:30  
Percent Solids: 95  
Initial Volume: 15.4  
Final Volume: 0.5  
Extraction Method: 3546

ESS Laboratory Work Order: 1709754  
ESS Laboratory Sample ID: 1709754-17  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: TJ  
Prepared: 9/27/17 11:30

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.342)		8270D		1	09/30/17 0:28	C7I0480	CI72716
Acenaphthene	ND (0.342)		8270D		1	09/30/17 0:28	C7I0480	CI72716
Acenaphthylene	<b>2.15</b> (0.342)		8270D		1	09/30/17 0:28	C7I0480	CI72716
Anthracene	<b>1.52</b> (0.342)		8270D		1	09/30/17 0:28	C7I0480	CI72716
Benzo(a)anthracene	<b>5.64</b> (0.342)		8270D		1	09/30/17 0:28	C7I0480	CI72716
Benzo(a)pyrene	<b>4.68</b> (0.172)		8270D		1	09/30/17 0:28	C7I0480	CI72716
Benzo(b)fluoranthene	<b>6.20</b> (0.342)		8270D		1	09/30/17 0:28	C7I0480	CI72716
Benzo(g,h,i)perylene	<b>3.54</b> (0.342)		8270D		1	09/30/17 0:28	C7I0480	CI72716
Benzo(k)fluoranthene	<b>2.39</b> (0.342)		8270D		1	09/30/17 0:28	C7I0480	CI72716
Chrysene	<b>4.63</b> (0.172)		8270D		1	09/30/17 0:28	C7I0480	CI72716
Dibenzo(a,h)Anthracene	<b>1.44</b> (0.172)		8270D		1	09/30/17 0:28	C7I0480	CI72716
Fluoranthene	<b>9.79</b> (3.42)		8270D		10	10/02/17 16:47	C7I0480	CI72716
Fluorene	ND (0.342)		8270D		1	09/30/17 0:28	C7I0480	CI72716
Indeno(1,2,3-cd)Pyrene	<b>3.33</b> (0.342)		8270D		1	09/30/17 0:28	C7I0480	CI72716
Naphthalene	ND (0.342)		8270D		1	09/30/17 0:28	C7I0480	CI72716
Phenanthrene	<b>1.97</b> (0.342)		8270D		1	09/30/17 0:28	C7I0480	CI72716
Pyrene	<b>9.67</b> (3.42)		8270D		10	10/02/17 16:47	C7I0480	CI72716

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	57 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	66 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	61 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	70 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-533 (0-2')  
Date Sampled: 09/26/17 14:30  
Percent Solids: 95

ESS Laboratory Work Order: 1709754  
ESS Laboratory Sample ID: 1709754-17  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	14.4 (1.02)		9014		1	EEM	10/02/17 14:30	mg/kg dry	CJ70215



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-534 (0-2')  
Date Sampled: 09/26/17 14:40  
Percent Solids: 92

ESS Laboratory Work Order: 1709754  
ESS Laboratory Sample ID: 1709754-18  
Sample Matrix: Soil  
Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (2.08)		6020A		20	NAR	09/29/17 14:52	2.1	100	CI72838
Arsenic	4.27 (2.60)		6010C		1	KJK	09/30/17 2:11	2.1	100	CI72838
Beryllium	0.22 (0.11)		6010C		1	KJK	09/30/17 2:11	2.1	100	CI72838
Cadmium	ND (0.52)		6010C		1	KJK	09/30/17 20:38	2.1	100	CI72838
Chromium	7.00 (1.04)		6010C		1	KJK	09/30/17 2:11	2.1	100	CI72838
Copper	22.9 (2.60)		6010C		1	KJK	09/30/17 2:11	2.1	100	CI72838
Lead	170 (5.19)		6010C		1	KJK	09/30/17 2:11	2.1	100	CI72838
Mercury	0.422 (0.031)		7471B		1	MJV	09/29/17 13:02	0.7	40	CI72839
Nickel	12.5 (2.60)		6010C		1	KJK	09/30/17 2:11	2.1	100	CI72838
Selenium	ND (2.08)		6020A		20	NAR	09/29/17 14:52	2.1	100	CI72838
Silver	ND (0.52)		6010C		1	KJK	09/30/17 2:11	2.1	100	CI72838
Thallium	ND (2.08)		6020A		20	NAR	09/29/17 14:52	2.1	100	CI72838
Zinc	67.2 (2.60)		6010C		1	KJK	09/30/17 2:11	2.1	100	CI72838



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-534 (0-2')  
Date Sampled: 09/26/17 14:40  
Percent Solids: 92  
Initial Volume: 5.9  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1709754  
ESS Laboratory Sample ID: 1709754-18  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0046)		8260B Low		1	09/27/17 23:19	C7I0440	CI72730
1,1,1-Trichloroethane	ND (0.0046)		8260B Low		1	09/27/17 23:19	C7I0440	CI72730
1,1,2,2-Tetrachloroethane	ND (0.0046)		8260B Low		1	09/27/17 23:19	C7I0440	CI72730
1,1,2-Trichloroethane	ND (0.0046)		8260B Low		1	09/27/17 23:19	C7I0440	CI72730
1,1-Dichloroethane	ND (0.0046)		8260B Low		1	09/27/17 23:19	C7I0440	CI72730
1,1-Dichloroethene	ND (0.0046)		8260B Low		1	09/27/17 23:19	C7I0440	CI72730
1,1-Dichloropropene	ND (0.0046)		8260B Low		1	09/27/17 23:19	C7I0440	CI72730
1,2,3-Trichlorobenzene	ND (0.0046)		8260B Low		1	09/27/17 23:19	C7I0440	CI72730
1,2,3-Trichloropropane	ND (0.0046)		8260B Low		1	09/27/17 23:19	C7I0440	CI72730
1,2,4-Trichlorobenzene	ND (0.0046)		8260B Low		1	09/27/17 23:19	C7I0440	CI72730
<b>1,2,4-Trimethylbenzene</b>	<b>0.0313</b> (0.0046)		8260B Low		1	09/27/17 23:19	C7I0440	CI72730
1,2-Dibromo-3-Chloropropane	ND (0.0046)		8260B Low		1	09/27/17 23:19	C7I0440	CI72730
1,2-Dibromoethane	ND (0.0046)		8260B Low		1	09/27/17 23:19	C7I0440	CI72730
<b>1,2-Dichlorobenzene</b>	<b>0.0187</b> (0.0046)		8260B Low		1	09/27/17 23:19	C7I0440	CI72730
1,2-Dichloroethane	ND (0.0046)		8260B Low		1	09/27/17 23:19	C7I0440	CI72730
1,2-Dichloropropane	ND (0.0046)		8260B Low		1	09/27/17 23:19	C7I0440	CI72730
<b>1,3,5-Trimethylbenzene</b>	<b>0.0114</b> (0.0046)		8260B Low		1	09/27/17 23:19	C7I0440	CI72730
<b>1,3-Dichlorobenzene</b>	<b>0.0068</b> (0.0046)		8260B Low		1	09/27/17 23:19	C7I0440	CI72730
1,3-Dichloropropane	ND (0.0046)		8260B Low		1	09/27/17 23:19	C7I0440	CI72730
<b>1,4-Dichlorobenzene</b>	<b>0.0068</b> (0.0046)		8260B Low		1	09/27/17 23:19	C7I0440	CI72730
1,4-Dioxane	ND (0.0924)		8260B Low		1	09/27/17 23:19	C7I0440	CI72730
1-Chlorohexane	ND (0.0046)		8260B Low		1	09/27/17 23:19	C7I0440	CI72730
2,2-Dichloropropane	ND (0.0046)		8260B Low		1	09/27/17 23:19	C7I0440	CI72730
2-Butanone	ND (0.0462)		8260B Low		1	09/27/17 23:19	C7I0440	CI72730
2-Chlorotoluene	ND (0.0046)		8260B Low		1	09/27/17 23:19	C7I0440	CI72730
2-Hexanone	ND (0.0462)		8260B Low		1	09/27/17 23:19	C7I0440	CI72730
4-Chlorotoluene	ND (0.0046)		8260B Low		1	09/27/17 23:19	C7I0440	CI72730
4-Isopropyltoluene	ND (0.0046)		8260B Low		1	09/27/17 23:19	C7I0440	CI72730
4-Methyl-2-Pentanone	ND (0.0462)		8260B Low		1	09/27/17 23:19	C7I0440	CI72730
Acetone	ND (0.0462)		8260B Low		1	09/27/17 23:19	C7I0440	CI72730
<b>Benzene</b>	<b>0.0399</b> (0.0046)		8260B Low		1	09/27/17 23:19	C7I0440	CI72730
Bromobenzene	ND (0.0046)		8260B Low		1	09/27/17 23:19	C7I0440	CI72730



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-534 (0-2')  
 Date Sampled: 09/26/17 14:40  
 Percent Solids: 92  
 Initial Volume: 5.9  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-18  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0046)		8260B Low		1	09/27/17 23:19	C7I0440	CI72730
Bromodichloromethane	ND (0.0046)		8260B Low		1	09/27/17 23:19	C7I0440	CI72730
Bromoform	ND (0.0046)		8260B Low		1	09/27/17 23:19	C7I0440	CI72730
Bromomethane	ND (0.0092)		8260B Low		1	09/27/17 23:19	C7I0440	CI72730
Carbon Disulfide	ND (0.0046)		8260B Low		1	09/27/17 23:19	C7I0440	CI72730
Carbon Tetrachloride	ND (0.0046)		8260B Low		1	09/27/17 23:19	C7I0440	CI72730
Chlorobenzene	ND (0.0046)		8260B Low		1	09/27/17 23:19	C7I0440	CI72730
Chloroethane	ND (0.0092)		8260B Low		1	09/27/17 23:19	C7I0440	CI72730
Chloroform	ND (0.0046)		8260B Low		1	09/27/17 23:19	C7I0440	CI72730
Chloromethane	ND (0.0092)		8260B Low		1	09/27/17 23:19	C7I0440	CI72730
cis-1,2-Dichloroethene	ND (0.0046)		8260B Low		1	09/27/17 23:19	C7I0440	CI72730
cis-1,3-Dichloropropene	ND (0.0046)		8260B Low		1	09/27/17 23:19	C7I0440	CI72730
Dibromochloromethane	ND (0.0046)		8260B Low		1	09/27/17 23:19	C7I0440	CI72730
Dibromomethane	ND (0.0046)		8260B Low		1	09/27/17 23:19	C7I0440	CI72730
Dichlorodifluoromethane	ND (0.0092)		8260B Low		1	09/27/17 23:19	C7I0440	CI72730
Diethyl Ether	ND (0.0046)		8260B Low		1	09/27/17 23:19	C7I0440	CI72730
Di-isopropyl ether	ND (0.0046)		8260B Low		1	09/27/17 23:19	C7I0440	CI72730
Ethyl tertiary-butyl ether	ND (0.0046)		8260B Low		1	09/27/17 23:19	C7I0440	CI72730
<b>Ethylbenzene</b>	<b>0.0088</b> (0.0046)		8260B Low		1	09/27/17 23:19	C7I0440	CI72730
Hexachlorobutadiene	ND (0.0046)		8260B Low		1	09/27/17 23:19	C7I0440	CI72730
Isopropylbenzene	ND (0.0046)		8260B Low		1	09/27/17 23:19	C7I0440	CI72730
Methyl tert-Butyl Ether	ND (0.0046)		8260B Low		1	09/27/17 23:19	C7I0440	CI72730
Methylene Chloride	ND (0.0231)		8260B Low		1	09/27/17 23:19	C7I0440	CI72730
<b>Naphthalene</b>	<b>E 0.693</b> (0.0046)		8260B Low		1	09/27/17 23:19	C7I0440	CI72730
n-Butylbenzene	ND (0.0046)		8260B Low		1	09/27/17 23:19	C7I0440	CI72730
n-Propylbenzene	ND (0.0046)		8260B Low		1	09/27/17 23:19	C7I0440	CI72730
sec-Butylbenzene	ND (0.0046)		8260B Low		1	09/27/17 23:19	C7I0440	CI72730
<b>Styrene</b>	<b>0.0252</b> (0.0046)		8260B Low		1	09/27/17 23:19	C7I0440	CI72730
tert-Butylbenzene	ND (0.0046)		8260B Low		1	09/27/17 23:19	C7I0440	CI72730
Tertiary-amyl methyl ether	ND (0.0046)		8260B Low		1	09/27/17 23:19	C7I0440	CI72730
Tetrachloroethene	ND (0.0046)		8260B Low		1	09/27/17 23:19	C7I0440	CI72730
Tetrahydrofuran	ND (0.0046)		8260B Low		1	09/27/17 23:19	C7I0440	CI72730





### CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-534 (0-2')  
 Date Sampled: 09/26/17 14:40  
 Percent Solids: 92  
 Initial Volume: 5.9  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-18  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

### 5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
<b>Toluene</b>	<b>0.0798</b> (0.0046)		8260B Low		1	09/27/17 23:19	C7I0440	CI72730
trans-1,2-Dichloroethene	ND (0.0046)		8260B Low		1	09/27/17 23:19	C7I0440	CI72730
trans-1,3-Dichloropropene	ND (0.0046)		8260B Low		1	09/27/17 23:19	C7I0440	CI72730
Trichloroethene	ND (0.0046)		8260B Low		1	09/27/17 23:19	C7I0440	CI72730
Trichlorofluoromethane	ND (0.0046)		8260B Low		1	09/27/17 23:19	C7I0440	CI72730
Vinyl Acetate	ND (0.0046)		8260B Low		1	09/27/17 23:19	C7I0440	CI72730
Vinyl Chloride	ND (0.0092)		8260B Low		1	09/27/17 23:19	C7I0440	CI72730
<b>Xylene O</b>	<b>0.0378</b> (0.0046)		8260B Low		1	09/27/17 23:19	C7I0440	CI72730
<b>Xylene P,M</b>	<b>0.0741</b> (0.0092)		8260B Low		1	09/27/17 23:19	C7I0440	CI72730
<b>Xylenes (Total)</b>	<b>0.112</b> (0.0092)		8260B Low		1	09/27/17 23:19		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	117 %		70-130
Surrogate: 4-Bromofluorobenzene	106 %		70-130
Surrogate: Dibromofluoromethane	111 %		70-130
Surrogate: Toluene-d8	113 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-534 (0-2')  
 Date Sampled: 09/26/17 14:40  
 Percent Solids: 92  
 Initial Volume: 15.8  
 Final Volume: 15  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-18  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MD

**5035/8260B Volatile Organic Compounds / Methanol**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.225)	0.0225	8260B		1	10/03/17 15:39	C7J0036	CJ70325
1,1,1-Trichloroethane	ND (0.225)	0.0451	8260B		1	10/03/17 15:39	C7J0036	CJ70325
1,1,2,2-Tetrachloroethane	ND (0.225)	0.0225	8260B		1	10/03/17 15:39	C7J0036	CJ70325
1,1,2-Trichloroethane	ND (0.225)	0.0451	8260B		1	10/03/17 15:39	C7J0036	CJ70325
1,1-Dichloroethane	ND (0.225)	0.0451	8260B		1	10/03/17 15:39	C7J0036	CJ70325
1,1-Dichloroethene	ND (0.225)	0.0676	8260B		1	10/03/17 15:39	C7J0036	CJ70325
1,1-Dichloropropene	ND (0.225)	0.0451	8260B		1	10/03/17 15:39	C7J0036	CJ70325
1,2,3-Trichlorobenzene	ND (0.225)	0.0451	8260B		1	10/03/17 15:39	C7J0036	CJ70325
1,2,3-Trichloropropane	ND (0.225)	0.0676	8260B		1	10/03/17 15:39	C7J0036	CJ70325
<b>1,2,4-Trichlorobenzene</b>	<b>J 0.108</b> (0.225)	0.0451	8260B		1	10/03/17 15:39	C7J0036	CJ70325
<b>1,2,4-Trimethylbenzene</b>	<b>0.642</b> (0.225)	0.0225	8260B		1	10/03/17 15:39	C7J0036	CJ70325
1,2-Dibromo-3-Chloropropane	ND (1.13)	0.225	8260B		1	10/03/17 15:39	C7J0036	CJ70325
1,2-Dibromoethane	ND (0.225)	0.0451	8260B		1	10/03/17 15:39	C7J0036	CJ70325
<b>1,2-Dichlorobenzene</b>	<b>0.482</b> (0.225)	0.0225	8260B		1	10/03/17 15:39	C7J0036	CJ70325
1,2-Dichloroethane	ND (0.225)	0.0451	8260B		1	10/03/17 15:39	C7J0036	CJ70325
1,2-Dichloropropane	ND (0.225)	0.0451	8260B		1	10/03/17 15:39	C7J0036	CJ70325
<b>1,3,5-Trimethylbenzene</b>	<b>0.230</b> (0.225)	0.0225	8260B		1	10/03/17 15:39	C7J0036	CJ70325
1,3-Dichlorobenzene	ND (0.225)	0.0451	8260B		1	10/03/17 15:39	C7J0036	CJ70325
1,3-Dichloropropane	ND (0.225)	0.0225	8260B		1	10/03/17 15:39	C7J0036	CJ70325
<b>1,4-Dichlorobenzene</b>	<b>0.342</b> (0.225)	0.0225	8260B		1	10/03/17 15:39	C7J0036	CJ70325
1,4-Dioxane - Screen	ND (45.1)	42.8	8260B		1	10/03/17 15:39	C7J0036	CJ70325
1-Chlorohexane	ND (0.225)	0.0901	8260B		1	10/03/17 15:39	C7J0036	CJ70325
2,2-Dichloropropane	ND (0.225)	0.0676	8260B		1	10/03/17 15:39	C7J0036	CJ70325
2-Butanone	ND (1.13)	0.766	8260B		1	10/03/17 15:39	C7J0036	CJ70325
2-Chlorotoluene	ND (0.225)	0.0225	8260B		1	10/03/17 15:39	C7J0036	CJ70325
2-Hexanone	ND (1.13)	0.338	8260B		1	10/03/17 15:39	C7J0036	CJ70325
4-Chlorotoluene	ND (0.225)	0.0225	8260B		1	10/03/17 15:39	C7J0036	CJ70325
4-Isopropyltoluene	ND (0.225)	0.0225	8260B		1	10/03/17 15:39	C7J0036	CJ70325
4-Methyl-2-Pentanone	ND (1.13)	0.360	8260B		1	10/03/17 15:39	C7J0036	CJ70325
Acetone	ND (1.13)	0.608	8260B		1	10/03/17 15:39	C7J0036	CJ70325
<b>Benzene</b>	<b>1.13</b> (0.225)	0.0225	8260B		1	10/03/17 15:39	C7J0036	CJ70325
Bromobenzene	ND (0.225)	0.0451	8260B		1	10/03/17 15:39	C7J0036	CJ70325



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-534 (0-2')  
Date Sampled: 09/26/17 14:40  
Percent Solids: 92  
Initial Volume: 15.8  
Final Volume: 15  
Extraction Method: 5035

ESS Laboratory Work Order: 1709754  
ESS Laboratory Sample ID: 1709754-18  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MD

**5035/8260B Volatile Organic Compounds / Methanol**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.225)	0.0676	8260B		1	10/03/17 15:39	C7J0036	CJ70325
Bromodichloromethane	ND (0.225)	0.0225	8260B		1	10/03/17 15:39	C7J0036	CJ70325
Bromoform	ND (0.225)	0.0451	8260B		1	10/03/17 15:39	C7J0036	CJ70325
Bromomethane	ND (0.225)	0.0901	8260B		1	10/03/17 15:39	C7J0036	CJ70325
Carbon Disulfide	ND (0.225)	0.0225	8260B		1	10/03/17 15:39	C7J0036	CJ70325
Carbon Tetrachloride	ND (0.225)	0.0225	8260B		1	10/03/17 15:39	C7J0036	CJ70325
<b>Chlorobenzene</b>	<b>J 0.0338</b> (0.225)	0.0225	8260B		1	10/03/17 15:39	C7J0036	CJ70325
Chloroethane	ND (0.225)	0.0901	8260B		1	10/03/17 15:39	C7J0036	CJ70325
Chloroform	ND (0.225)	0.0451	8260B		1	10/03/17 15:39	C7J0036	CJ70325
Chloromethane	ND (0.225)	0.0225	8260B		1	10/03/17 15:39	C7J0036	CJ70325
cis-1,2-Dichloroethene	ND (0.225)	0.0451	8260B		1	10/03/17 15:39	C7J0036	CJ70325
cis-1,3-Dichloropropene	ND (0.225)	0.0676	8260B		1	10/03/17 15:39	C7J0036	CJ70325
Dibromochloromethane	ND (0.225)	0.0451	8260B		1	10/03/17 15:39	C7J0036	CJ70325
Dibromomethane	ND (0.225)	0.0676	8260B		1	10/03/17 15:39	C7J0036	CJ70325
Dichlorodifluoromethane	ND (0.225)	0.0676	8260B		1	10/03/17 15:39	C7J0036	CJ70325
Diethyl Ether	ND (0.225)	0.0676	8260B		1	10/03/17 15:39	C7J0036	CJ70325
Di-isopropyl ether	ND (0.225)	0.0451	8260B		1	10/03/17 15:39	C7J0036	CJ70325
Ethyl tertiary-butyl ether	ND (0.225)	0.0225	8260B		1	10/03/17 15:39	C7J0036	CJ70325
<b>Ethylbenzene</b>	<b>0.237</b> (0.225)	0.0225	8260B		1	10/03/17 15:39	C7J0036	CJ70325
Hexachlorobutadiene	ND (0.225)	0.0451	8260B		1	10/03/17 15:39	C7J0036	CJ70325
<b>Isopropylbenzene</b>	<b>J 0.0338</b> (0.225)	0.0225	8260B		1	10/03/17 15:39	C7J0036	CJ70325
Methyl tert-Butyl Ether	ND (0.225)	0.0676	8260B		1	10/03/17 15:39	C7J0036	CJ70325
<b>Methylene Chloride</b>	<b>J 0.0473</b> (0.451)	0.0451	8260B		1	10/03/17 15:39	C7J0036	CJ70325
<b>Naphthalene</b>	<b>15.8</b> (0.225)	0.0451	8260B		1	10/03/17 15:39	C7J0036	CJ70325
<b>n-Butylbenzene</b>	<b>J 0.0766</b> (0.225)	0.0225	8260B		1	10/03/17 15:39	C7J0036	CJ70325
<b>n-Propylbenzene</b>	<b>J 0.0721</b> (0.225)	0.0451	8260B		1	10/03/17 15:39	C7J0036	CJ70325
sec-Butylbenzene	ND (0.225)	0.0225	8260B		1	10/03/17 15:39	C7J0036	CJ70325
<b>Styrene</b>	<b>0.275</b> (0.225)	0.0225	8260B		1	10/03/17 15:39	C7J0036	CJ70325
tert-Butylbenzene	ND (0.225)	0.0225	8260B		1	10/03/17 15:39	C7J0036	CJ70325
Tertiary-amyl methyl ether	ND (0.225)	0.0451	8260B		1	10/03/17 15:39	C7J0036	CJ70325
Tetrachloroethene	ND (0.225)	0.0451	8260B		1	10/03/17 15:39	C7J0036	CJ70325
Tetrahydrofuran	ND (1.13)	0.360	8260B		1	10/03/17 15:39	C7J0036	CJ70325



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-534 (0-2')  
 Date Sampled: 09/26/17 14:40  
 Percent Solids: 92  
 Initial Volume: 15.8  
 Final Volume: 15  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-18  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MD

**5035/8260B Volatile Organic Compounds / Methanol**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
<b>Toluene</b>	<b>2.39</b> (0.225)	0.0225	8260B		1	10/03/17 15:39	C7J0036	CJ70325
trans-1,2-Dichloroethene	ND (0.225)	0.0676	8260B		1	10/03/17 15:39	C7J0036	CJ70325
trans-1,3-Dichloropropene	ND (0.225)	0.0451	8260B		1	10/03/17 15:39	C7J0036	CJ70325
Trichloroethene	ND (0.225)	0.0451	8260B		1	10/03/17 15:39	C7J0036	CJ70325
Trichlorofluoromethane	ND (0.225)	0.0901	8260B		1	10/03/17 15:39	C7J0036	CJ70325
Vinyl Acetate	ND (0.225)	0.113	8260B		1	10/03/17 15:39	C7J0036	CJ70325
Vinyl Chloride	ND (0.225)	0.0451	8260B		1	10/03/17 15:39	C7J0036	CJ70325
<b>Xylene O</b>	<b>0.775</b> (0.225)	0.0225	8260B		1	10/03/17 15:39	C7J0036	CJ70325
<b>Xylene P,M</b>	<b>1.89</b> (0.451)	0.0451	8260B		1	10/03/17 15:39	C7J0036	CJ70325
<b>Xylenes (Total)</b>	<b>2.67</b> (0.451)		8260B		1	10/03/17 15:39		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	120 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	102 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	110 %		70-130
<i>Surrogate: Toluene-d8</i>	107 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-534 (0-2')  
 Date Sampled: 09/26/17 14:40  
 Percent Solids: 92  
 Initial Volume: 10.2  
 Final Volume: 3  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-18  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: SMR  
 Prepared: 9/27/17 12:55

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	26600 (4810)		8100M		20	09/28/17 22:19	C710445	C172713
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		<i>%</i>	<i>SD</i>	<i>40-140</i>				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-534 (0-2')  
Date Sampled: 09/26/17 14:40  
Percent Solids: 92  
Initial Volume: 14.1  
Final Volume: 5  
Extraction Method: 3546

ESS Laboratory Work Order: 1709754  
ESS Laboratory Sample ID: 1709754-18  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: TJ  
Prepared: 9/27/17 11:30

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	252 (77.3)		8270D		20	09/30/17 0:41	C7I0472	CI72716
Acenaphthene	28.4 (7.73)		8270D		2	09/29/17 3:51	C7I0472	CI72716
Acenaphthylene	274 (77.3)		8270D		20	09/30/17 0:41	C7I0472	CI72716
Anthracene	249 (77.3)		8270D		20	09/30/17 0:41	C7I0472	CI72716
Benzo(a)anthracene	605 (77.3)		8270D		20	09/30/17 0:41	C7I0472	CI72716
Benzo(a)pyrene	416 (38.8)		8270D		20	09/30/17 0:41	C7I0472	CI72716
Benzo(b)fluoranthene	270 (77.3)		8270D		20	09/30/17 0:41	C7I0472	CI72716
Benzo(g,h,i)perylene	121 (7.73)		8270D		2	09/29/17 3:51	C7I0472	CI72716
Benzo(k)fluoranthene	314 (77.3)		8270D		20	09/30/17 0:41	C7I0472	CI72716
Chrysene	613 (38.8)		8270D		20	09/30/17 0:41	C7I0472	CI72716
Dibenzo(a,h)Anthracene	68.5 (3.88)		8270D		2	09/29/17 3:51	C7I0472	CI72716
Fluoranthene	880 (77.3)		8270D		20	09/30/17 0:41	C7I0472	CI72716
Fluorene	259 (77.3)		8270D		20	09/30/17 0:41	C7I0472	CI72716
Indeno(1,2,3-cd)Pyrene	116 (7.73)		8270D		2	09/29/17 3:51	C7I0472	CI72716
Naphthalene	188 (7.73)		8270D		2	09/29/17 3:51	C7I0472	CI72716
Phenanthrene	1420 (77.3)		8270D		20	09/30/17 0:41	C7I0472	CI72716
Pyrene	1150 (77.3)		8270D		20	09/30/17 0:41	C7I0472	CI72716

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
Surrogate: 1,2-Dichlorobenzene-d4	89 %		30-130
Surrogate: 2-Fluorobiphenyl	72 %		30-130
Surrogate: Nitrobenzene-d5	83 %		30-130
Surrogate: p-Terphenyl-d14	125 %		30-130





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-534 (0-2')  
Date Sampled: 09/26/17 14:40  
Percent Solids: 92

ESS Laboratory Work Order: 1709754  
ESS Laboratory Sample ID: 1709754-18  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	111 (10.7)		9014		10	EEM	10/02/17 14:30	mg/kg dry	CJ70215



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: Trip Blank  
 Date Sampled: 09/26/17 00:00  
 Percent Solids: N/A  
 Initial Volume: 5  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-19  
 Sample Matrix: Solid  
 Units: mg/kg wet  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0050)		8260B Low		1	09/27/17 15:43	C7I0440	CI72730
1,1,1-Trichloroethane	ND (0.0050)		8260B Low		1	09/27/17 15:43	C7I0440	CI72730
1,1,2,2-Tetrachloroethane	ND (0.0050)		8260B Low		1	09/27/17 15:43	C7I0440	CI72730
1,1,2-Trichloroethane	ND (0.0050)		8260B Low		1	09/27/17 15:43	C7I0440	CI72730
1,1-Dichloroethane	ND (0.0050)		8260B Low		1	09/27/17 15:43	C7I0440	CI72730
1,1-Dichloroethene	ND (0.0050)		8260B Low		1	09/27/17 15:43	C7I0440	CI72730
1,1-Dichloropropene	ND (0.0050)		8260B Low		1	09/27/17 15:43	C7I0440	CI72730
1,2,3-Trichlorobenzene	ND (0.0050)		8260B Low		1	09/27/17 15:43	C7I0440	CI72730
1,2,3-Trichloropropane	ND (0.0050)		8260B Low		1	09/27/17 15:43	C7I0440	CI72730
1,2,4-Trichlorobenzene	ND (0.0050)		8260B Low		1	09/27/17 15:43	C7I0440	CI72730
1,2,4-Trimethylbenzene	ND (0.0050)		8260B Low		1	09/27/17 15:43	C7I0440	CI72730
1,2-Dibromo-3-Chloropropane	ND (0.0050)		8260B Low		1	09/27/17 15:43	C7I0440	CI72730
1,2-Dibromoethane	ND (0.0050)		8260B Low		1	09/27/17 15:43	C7I0440	CI72730
1,2-Dichlorobenzene	ND (0.0050)		8260B Low		1	09/27/17 15:43	C7I0440	CI72730
1,2-Dichloroethane	ND (0.0050)		8260B Low		1	09/27/17 15:43	C7I0440	CI72730
1,2-Dichloropropane	ND (0.0050)		8260B Low		1	09/27/17 15:43	C7I0440	CI72730
1,3,5-Trimethylbenzene	ND (0.0050)		8260B Low		1	09/27/17 15:43	C7I0440	CI72730
1,3-Dichlorobenzene	ND (0.0050)		8260B Low		1	09/27/17 15:43	C7I0440	CI72730
1,3-Dichloropropane	ND (0.0050)		8260B Low		1	09/27/17 15:43	C7I0440	CI72730
1,4-Dichlorobenzene	ND (0.0050)		8260B Low		1	09/27/17 15:43	C7I0440	CI72730
1,4-Dioxane	ND (0.100)		8260B Low		1	09/27/17 15:43	C7I0440	CI72730
1-Chlorohexane	ND (0.0050)		8260B Low		1	09/27/17 15:43	C7I0440	CI72730
2,2-Dichloropropane	ND (0.0050)		8260B Low		1	09/27/17 15:43	C7I0440	CI72730
2-Butanone	ND (0.0500)		8260B Low		1	09/27/17 15:43	C7I0440	CI72730
2-Chlorotoluene	ND (0.0050)		8260B Low		1	09/27/17 15:43	C7I0440	CI72730
2-Hexanone	ND (0.0500)		8260B Low		1	09/27/17 15:43	C7I0440	CI72730
4-Chlorotoluene	ND (0.0050)		8260B Low		1	09/27/17 15:43	C7I0440	CI72730
4-Isopropyltoluene	ND (0.0050)		8260B Low		1	09/27/17 15:43	C7I0440	CI72730
4-Methyl-2-Pentanone	ND (0.0500)		8260B Low		1	09/27/17 15:43	C7I0440	CI72730
Acetone	ND (0.0500)		8260B Low		1	09/27/17 15:43	C7I0440	CI72730
Benzene	ND (0.0050)		8260B Low		1	09/27/17 15:43	C7I0440	CI72730
Bromobenzene	ND (0.0050)		8260B Low		1	09/27/17 15:43	C7I0440	CI72730



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: Trip Blank  
 Date Sampled: 09/26/17 00:00  
 Percent Solids: N/A  
 Initial Volume: 5  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-19  
 Sample Matrix: Solid  
 Units: mg/kg wet  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0050)		8260B Low		1	09/27/17 15:43	C7I0440	CI72730
Bromodichloromethane	ND (0.0050)		8260B Low		1	09/27/17 15:43	C7I0440	CI72730
Bromoform	ND (0.0050)		8260B Low		1	09/27/17 15:43	C7I0440	CI72730
Bromomethane	ND (0.0100)		8260B Low		1	09/27/17 15:43	C7I0440	CI72730
Carbon Disulfide	ND (0.0050)		8260B Low		1	09/27/17 15:43	C7I0440	CI72730
Carbon Tetrachloride	ND (0.0050)		8260B Low		1	09/27/17 15:43	C7I0440	CI72730
Chlorobenzene	ND (0.0050)		8260B Low		1	09/27/17 15:43	C7I0440	CI72730
Chloroethane	ND (0.0100)		8260B Low		1	09/27/17 15:43	C7I0440	CI72730
Chloroform	ND (0.0050)		8260B Low		1	09/27/17 15:43	C7I0440	CI72730
Chloromethane	ND (0.0100)		8260B Low		1	09/27/17 15:43	C7I0440	CI72730
cis-1,2-Dichloroethene	ND (0.0050)		8260B Low		1	09/27/17 15:43	C7I0440	CI72730
cis-1,3-Dichloropropene	ND (0.0050)		8260B Low		1	09/27/17 15:43	C7I0440	CI72730
Dibromochloromethane	ND (0.0050)		8260B Low		1	09/27/17 15:43	C7I0440	CI72730
Dibromomethane	ND (0.0050)		8260B Low		1	09/27/17 15:43	C7I0440	CI72730
Dichlorodifluoromethane	ND (0.0100)		8260B Low		1	09/27/17 15:43	C7I0440	CI72730
Diethyl Ether	ND (0.0050)		8260B Low		1	09/27/17 15:43	C7I0440	CI72730
Di-isopropyl ether	ND (0.0050)		8260B Low		1	09/27/17 15:43	C7I0440	CI72730
Ethyl tertiary-butyl ether	ND (0.0050)		8260B Low		1	09/27/17 15:43	C7I0440	CI72730
Ethylbenzene	ND (0.0050)		8260B Low		1	09/27/17 15:43	C7I0440	CI72730
Hexachlorobutadiene	ND (0.0050)		8260B Low		1	09/27/17 15:43	C7I0440	CI72730
Isopropylbenzene	ND (0.0050)		8260B Low		1	09/27/17 15:43	C7I0440	CI72730
Methyl tert-Butyl Ether	ND (0.0050)		8260B Low		1	09/27/17 15:43	C7I0440	CI72730
Methylene Chloride	ND (0.0250)		8260B Low		1	09/27/17 15:43	C7I0440	CI72730
Naphthalene	ND (0.0050)		8260B Low		1	09/27/17 15:43	C7I0440	CI72730
n-Butylbenzene	ND (0.0050)		8260B Low		1	09/27/17 15:43	C7I0440	CI72730
n-Propylbenzene	ND (0.0050)		8260B Low		1	09/27/17 15:43	C7I0440	CI72730
sec-Butylbenzene	ND (0.0050)		8260B Low		1	09/27/17 15:43	C7I0440	CI72730
Styrene	ND (0.0050)		8260B Low		1	09/27/17 15:43	C7I0440	CI72730
tert-Butylbenzene	ND (0.0050)		8260B Low		1	09/27/17 15:43	C7I0440	CI72730
Tertiary-amyl methyl ether	ND (0.0050)		8260B Low		1	09/27/17 15:43	C7I0440	CI72730
Tetrachloroethene	ND (0.0050)		8260B Low		1	09/27/17 15:43	C7I0440	CI72730
Tetrahydrofuran	ND (0.0050)		8260B Low		1	09/27/17 15:43	C7I0440	CI72730



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: Trip Blank  
 Date Sampled: 09/26/17 00:00  
 Percent Solids: N/A  
 Initial Volume: 5  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709754  
 ESS Laboratory Sample ID: 1709754-19  
 Sample Matrix: Solid  
 Units: mg/kg wet  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0050)		8260B Low		1	09/27/17 15:43	C7I0440	CI72730
trans-1,2-Dichloroethene	ND (0.0050)		8260B Low		1	09/27/17 15:43	C7I0440	CI72730
trans-1,3-Dichloropropene	ND (0.0050)		8260B Low		1	09/27/17 15:43	C7I0440	CI72730
Trichloroethene	ND (0.0050)		8260B Low		1	09/27/17 15:43	C7I0440	CI72730
Trichlorofluoromethane	ND (0.0050)		8260B Low		1	09/27/17 15:43	C7I0440	CI72730
Vinyl Acetate	ND (0.0050)		8260B Low		1	09/27/17 15:43	C7I0440	CI72730
Vinyl Chloride	ND (0.0100)		8260B Low		1	09/27/17 15:43	C7I0440	CI72730
Xylene O	ND (0.0050)		8260B Low		1	09/27/17 15:43	C7I0440	CI72730
Xylene P,M	ND (0.0100)		8260B Low		1	09/27/17 15:43	C7I0440	CI72730
Xylenes (Total)	ND (0.0100)		8260B Low		1	09/27/17 15:43		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	101 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	106 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	101 %		70-130
<i>Surrogate: Toluene-d8</i>	112 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1709754

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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**Total Metals**

**Batch CI72838 - 3050B**

**Blank**

Antimony	ND	2.00	mg/kg wet
Arsenic	ND	2.50	mg/kg wet
Beryllium	ND	0.11	mg/kg wet
Cadmium	ND	0.50	mg/kg wet
Chromium	ND	1.00	mg/kg wet
Copper	ND	2.50	mg/kg wet
Lead	ND	5.00	mg/kg wet
Nickel	ND	2.50	mg/kg wet
Selenium	ND	2.00	mg/kg wet
Silver	ND	0.50	mg/kg wet
Thallium	ND	2.00	mg/kg wet
Zinc	ND	2.50	mg/kg wet

**LCS**

Antimony	60.9	19.2	mg/kg wet	48.00	127	0-238
Arsenic	111	9.62	mg/kg wet	123.0	90	80-120
Beryllium	178	0.42	mg/kg wet	192.0	92	80-120
Cadmium	192	1.92	mg/kg wet	224.0	86	80-120
Chromium	169	3.85	mg/kg wet	179.0	94	80-120
Copper	75.3	9.62	mg/kg wet	78.90	95	80-120
Lead	132	19.2	mg/kg wet	145.0	91	80-120
Nickel	136	9.62	mg/kg wet	143.0	95	80-120
Selenium	43.3	19.2	mg/kg wet	42.40	102	80-120
Silver	75.2	1.92	mg/kg wet	81.60	92	80-120
Thallium	48.3	19.2	mg/kg wet	52.00	93	80-120
Zinc	672	9.62	mg/kg wet	770.0	87	80-120

**LCS Dup**

Antimony	59.3	18.9	mg/kg wet	48.00	124	0-238	3	30
Arsenic	105	9.43	mg/kg wet	123.0	85	80-120	6	20
Beryllium	169	0.42	mg/kg wet	192.0	88	80-120	5	20
Cadmium	181	1.89	mg/kg wet	224.0	81	80-120	6	20
Chromium	160	3.77	mg/kg wet	179.0	89	80-120	5	20
Copper	72.1	9.43	mg/kg wet	78.90	91	80-120	4	20
Lead	127	18.9	mg/kg wet	145.0	88	80-120	3	20
Nickel	131	9.43	mg/kg wet	143.0	91	80-120	4	20
Selenium	42.2	18.9	mg/kg wet	42.40	100	80-120	3	30
Silver	71.3	1.89	mg/kg wet	81.60	87	80-120	5	20
Thallium	48.1	18.9	mg/kg wet	52.00	92	80-120	0.4	30
Zinc	625	9.43	mg/kg wet	770.0	81	80-120	7	20

**Batch CI72839 - 7471B**

**Blank**

Mercury	ND	0.033	mg/kg wet
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**LCS**

Mercury	2.71	0.762	mg/kg wet	2.900	93	80-120
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*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1709754

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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**Total Metals**

**Batch CI72839 - 7471B**

**LCS Dup**

Mercury	2.63	0.747	mg/kg wet	2.900		91	80-120	3	20	
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**5035/8260B Volatile Organic Compounds / Low Level**

**Batch CI72730 - 5035**

**Blank**

1,1,1,2-Tetrachloroethane	ND	0.0050	mg/kg wet
1,1,1-Trichloroethane	ND	0.0050	mg/kg wet
1,1,2,2-Tetrachloroethane	ND	0.0050	mg/kg wet
1,1,2-Trichloroethane	ND	0.0050	mg/kg wet
1,1-Dichloroethane	ND	0.0050	mg/kg wet
1,1-Dichloroethene	ND	0.0050	mg/kg wet
1,1-Dichloropropene	ND	0.0050	mg/kg wet
1,2,3-Trichlorobenzene	ND	0.0050	mg/kg wet
1,2,3-Trichloropropane	ND	0.0050	mg/kg wet
1,2,4-Trichlorobenzene	ND	0.0050	mg/kg wet
1,2,4-Trimethylbenzene	ND	0.0050	mg/kg wet
1,2-Dibromo-3-Chloropropane	ND	0.0050	mg/kg wet
1,2-Dibromoethane	ND	0.0050	mg/kg wet
1,2-Dichlorobenzene	ND	0.0050	mg/kg wet
1,2-Dichloroethane	ND	0.0050	mg/kg wet
1,2-Dichloropropane	ND	0.0050	mg/kg wet
1,3,5-Trimethylbenzene	ND	0.0050	mg/kg wet
1,3-Dichlorobenzene	ND	0.0050	mg/kg wet
1,3-Dichloropropane	ND	0.0050	mg/kg wet
1,4-Dichlorobenzene	ND	0.0050	mg/kg wet
1,4-Dioxane	ND	0.100	mg/kg wet
1-Chlorohexane	ND	0.0050	mg/kg wet
2,2-Dichloropropane	ND	0.0050	mg/kg wet
2-Butanone	ND	0.0500	mg/kg wet
2-Chlorotoluene	ND	0.0050	mg/kg wet
2-Hexanone	ND	0.0500	mg/kg wet
4-Chlorotoluene	ND	0.0050	mg/kg wet
4-Isopropyltoluene	ND	0.0050	mg/kg wet
4-Methyl-2-Pentanone	ND	0.0500	mg/kg wet
Acetone	ND	0.0500	mg/kg wet
Benzene	ND	0.0050	mg/kg wet
Bromobenzene	ND	0.0050	mg/kg wet
Bromochloromethane	ND	0.0050	mg/kg wet
Bromodichloromethane	ND	0.0050	mg/kg wet
Bromoform	ND	0.0050	mg/kg wet
Bromomethane	ND	0.0100	mg/kg wet
Carbon Disulfide	ND	0.0050	mg/kg wet
Carbon Tetrachloride	ND	0.0050	mg/kg wet
Chlorobenzene	ND	0.0050	mg/kg wet





CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1709754

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CI72730 - 5035**

Chloroethane	ND	0.0100	mg/kg wet							
Chloroform	ND	0.0050	mg/kg wet							
Chloromethane	ND	0.0100	mg/kg wet							
cis-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
cis-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Dibromochloromethane	ND	0.0050	mg/kg wet							
Dibromomethane	ND	0.0050	mg/kg wet							
Dichlorodifluoromethane	ND	0.0100	mg/kg wet							
Diethyl Ether	ND	0.0050	mg/kg wet							
Di-isopropyl ether	ND	0.0050	mg/kg wet							
Ethyl tertiary-butyl ether	ND	0.0050	mg/kg wet							
Ethylbenzene	ND	0.0050	mg/kg wet							
Hexachlorobutadiene	ND	0.0050	mg/kg wet							
Isopropylbenzene	ND	0.0050	mg/kg wet							
Methyl tert-Butyl Ether	ND	0.0050	mg/kg wet							
Methylene Chloride	ND	0.0250	mg/kg wet							
Naphthalene	ND	0.0050	mg/kg wet							
n-Butylbenzene	ND	0.0050	mg/kg wet							
n-Propylbenzene	ND	0.0050	mg/kg wet							
sec-Butylbenzene	ND	0.0050	mg/kg wet							
Styrene	ND	0.0050	mg/kg wet							
tert-Butylbenzene	ND	0.0050	mg/kg wet							
Tertiary-amyl methyl ether	ND	0.0050	mg/kg wet							
Tetrachloroethene	ND	0.0050	mg/kg wet							
Tetrahydrofuran	ND	0.0050	mg/kg wet							
Toluene	ND	0.0050	mg/kg wet							
trans-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
trans-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Trichloroethene	ND	0.0050	mg/kg wet							
Trichlorofluoromethane	ND	0.0050	mg/kg wet							
Vinyl Acetate	ND	0.0050	mg/kg wet							
Vinyl Chloride	ND	0.0100	mg/kg wet							
Xylene O	ND	0.0050	mg/kg wet							
Xylene P,M	ND	0.0100	mg/kg wet							
Xylenes (Total)	ND	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	0.0499		mg/kg wet	0.05000		100	70-130			
Surrogate: 4-Bromofluorobenzene	0.0532		mg/kg wet	0.05000		106	70-130			
Surrogate: Dibromofluoromethane	0.0502		mg/kg wet	0.05000		100	70-130			
Surrogate: Toluene-d8	0.0560		mg/kg wet	0.05000		112	70-130			

**LCS**

1,1,1,2-Tetrachloroethane	0.0535	0.0050	mg/kg wet	0.05000		107	70-130			
1,1,1-Trichloroethane	0.0553	0.0050	mg/kg wet	0.05000		111	70-130			
1,1,2,2-Tetrachloroethane	0.0515	0.0050	mg/kg wet	0.05000		103	70-130			
1,1,2-Trichloroethane	0.0483	0.0050	mg/kg wet	0.05000		97	70-130			
1,1-Dichloroethane	0.0507	0.0050	mg/kg wet	0.05000		101	70-130			



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**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CI72730 - 5035**

1,1-Dichloroethene	0.0559	0.0050	mg/kg wet	0.05000		112	70-130			
1,1-Dichloropropene	0.0548	0.0050	mg/kg wet	0.05000		110	70-130			
1,2,3-Trichlorobenzene	0.0511	0.0050	mg/kg wet	0.05000		102	70-130			
1,2,3-Trichloropropane	0.0475	0.0050	mg/kg wet	0.05000		95	70-130			
1,2,4-Trichlorobenzene	0.0511	0.0050	mg/kg wet	0.05000		102	70-130			
1,2,4-Trimethylbenzene	0.0498	0.0050	mg/kg wet	0.05000		100	70-130			
1,2-Dibromo-3-Chloropropane	0.0489	0.0050	mg/kg wet	0.05000		98	70-130			
1,2-Dibromoethane	0.0523	0.0050	mg/kg wet	0.05000		105	70-130			
1,2-Dichlorobenzene	0.0549	0.0050	mg/kg wet	0.05000		110	70-130			
1,2-Dichloroethane	0.0530	0.0050	mg/kg wet	0.05000		106	70-130			
1,2-Dichloropropane	0.0528	0.0050	mg/kg wet	0.05000		106	70-130			
1,3,5-Trimethylbenzene	0.0494	0.0050	mg/kg wet	0.05000		99	70-130			
1,3-Dichlorobenzene	0.0530	0.0050	mg/kg wet	0.05000		106	70-130			
1,3-Dichloropropane	0.0587	0.0050	mg/kg wet	0.05000		117	70-130			
1,4-Dichlorobenzene	0.0545	0.0050	mg/kg wet	0.05000		109	70-130			
1,4-Dioxane	0.948	0.100	mg/kg wet	1.000		95	70-130			
1-Chlorohexane	0.0470	0.0050	mg/kg wet	0.05000		94	70-130			
2,2-Dichloropropane	0.0491	0.0050	mg/kg wet	0.05000		98	70-130			
2-Butanone	0.260	0.0500	mg/kg wet	0.2500		104	70-130			
2-Chlorotoluene	0.0530	0.0050	mg/kg wet	0.05000		106	70-130			
2-Hexanone	0.237	0.0500	mg/kg wet	0.2500		95	70-130			
4-Chlorotoluene	0.0539	0.0050	mg/kg wet	0.05000		108	70-130			
4-Isopropyltoluene	0.0536	0.0050	mg/kg wet	0.05000		107	70-130			
4-Methyl-2-Pentanone	0.229	0.0500	mg/kg wet	0.2500		92	70-130			
Acetone	0.236	0.0500	mg/kg wet	0.2500		94	70-130			
Benzene	0.0515	0.0050	mg/kg wet	0.05000		103	70-130			
Bromobenzene	0.0497	0.0050	mg/kg wet	0.05000		99	70-130			
Bromochloromethane	0.0527	0.0050	mg/kg wet	0.05000		105	70-130			
Bromodichloromethane	0.0478	0.0050	mg/kg wet	0.05000		96	70-130			
Bromoform	0.0584	0.0050	mg/kg wet	0.05000		117	70-130			
Bromomethane	0.0407	0.0100	mg/kg wet	0.05000		81	70-130			
Carbon Disulfide	0.0545	0.0050	mg/kg wet	0.05000		109	70-130			
Carbon Tetrachloride	0.0508	0.0050	mg/kg wet	0.05000		102	70-130			
Chlorobenzene	0.0551	0.0050	mg/kg wet	0.05000		110	70-130			
Chloroethane	0.0495	0.0100	mg/kg wet	0.05000		99	70-130			
Chloroform	0.0524	0.0050	mg/kg wet	0.05000		105	70-130			
Chloromethane	0.0481	0.0100	mg/kg wet	0.05000		96	70-130			
cis-1,2-Dichloroethene	0.0523	0.0050	mg/kg wet	0.05000		105	70-130			
cis-1,3-Dichloropropene	0.0504	0.0050	mg/kg wet	0.05000		101	70-130			
Dibromochloromethane	0.0505	0.0050	mg/kg wet	0.05000		101	70-130			
Dibromomethane	0.0519	0.0050	mg/kg wet	0.05000		104	70-130			
Dichlorodifluoromethane	0.0454	0.0100	mg/kg wet	0.05000		91	70-130			
Diethyl Ether	0.0501	0.0050	mg/kg wet	0.05000		100	70-130			
Di-isopropyl ether	0.0524	0.0050	mg/kg wet	0.05000		105	70-130			
Ethyl tertiary-butyl ether	0.0476	0.0050	mg/kg wet	0.05000		95	70-130			



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1709754

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CI72730 - 5035**

Ethylbenzene	0.0561	0.0050	mg/kg wet	0.05000		112	70-130			
Hexachlorobutadiene	0.0504	0.0050	mg/kg wet	0.05000		101	70-130			
Isopropylbenzene	0.0466	0.0050	mg/kg wet	0.05000		93	70-130			
Methyl tert-Butyl Ether	0.0488	0.0050	mg/kg wet	0.05000		98	70-130			
Methylene Chloride	0.0508	0.0250	mg/kg wet	0.05000		102	70-130			
Naphthalene	0.0474	0.0050	mg/kg wet	0.05000		95	70-130			
n-Butylbenzene	0.0480	0.0050	mg/kg wet	0.05000		96	70-130			
n-Propylbenzene	0.0546	0.0050	mg/kg wet	0.05000		109	70-130			
sec-Butylbenzene	0.0533	0.0050	mg/kg wet	0.05000		107	70-130			
Styrene	0.0490	0.0050	mg/kg wet	0.05000		98	70-130			
tert-Butylbenzene	0.0487	0.0050	mg/kg wet	0.05000		97	70-130			
Tertiary-amyl methyl ether	0.0463	0.0050	mg/kg wet	0.05000		93	70-130			
Tetrachloroethene	0.0536	0.0050	mg/kg wet	0.05000		107	70-130			
Tetrahydrofuran	0.0455	0.0050	mg/kg wet	0.05000		91	70-130			
Toluene	0.0448	0.0050	mg/kg wet	0.05000		90	70-130			
trans-1,2-Dichloroethene	0.0539	0.0050	mg/kg wet	0.05000		108	70-130			
trans-1,3-Dichloropropene	0.0499	0.0050	mg/kg wet	0.05000		100	70-130			
Trichloroethene	0.0520	0.0050	mg/kg wet	0.05000		104	70-130			
Trichlorofluoromethane	0.0520	0.0050	mg/kg wet	0.05000		104	70-130			
Vinyl Acetate	0.0496	0.0050	mg/kg wet	0.05000		99	70-130			
Vinyl Chloride	0.0515	0.0100	mg/kg wet	0.05000		103	70-130			
Xylene O	0.0571	0.0050	mg/kg wet	0.05000		114	70-130			
Xylene P,M	0.113	0.0100	mg/kg wet	0.1000		113	70-130			
Xylenes (Total)	0.170	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	0.0509		mg/kg wet	0.05000		102	70-130			
Surrogate: 4-Bromofluorobenzene	0.0541		mg/kg wet	0.05000		108	70-130			
Surrogate: Dibromofluoromethane	0.0512		mg/kg wet	0.05000		102	70-130			
Surrogate: Toluene-d8	0.0528		mg/kg wet	0.05000		106	70-130			

**LCS Dup**

1,1,1,2-Tetrachloroethane	0.0486	0.0050	mg/kg wet	0.05000		97	70-130	10	25	
1,1,1-Trichloroethane	0.0510	0.0050	mg/kg wet	0.05000		102	70-130	8	25	
1,1,2,2-Tetrachloroethane	0.0480	0.0050	mg/kg wet	0.05000		96	70-130	7	25	
1,1,2-Trichloroethane	0.0432	0.0050	mg/kg wet	0.05000		86	70-130	11	25	
1,1-Dichloroethane	0.0465	0.0050	mg/kg wet	0.05000		93	70-130	9	25	
1,1-Dichloroethene	0.0515	0.0050	mg/kg wet	0.05000		103	70-130	8	25	
1,1-Dichloropropene	0.0504	0.0050	mg/kg wet	0.05000		101	70-130	9	25	
1,2,3-Trichlorobenzene	0.0467	0.0050	mg/kg wet	0.05000		93	70-130	9	25	
1,2,3-Trichloropropane	0.0441	0.0050	mg/kg wet	0.05000		88	70-130	7	25	
1,2,4-Trichlorobenzene	0.0461	0.0050	mg/kg wet	0.05000		92	70-130	10	25	
1,2,4-Trimethylbenzene	0.0465	0.0050	mg/kg wet	0.05000		93	70-130	7	25	
1,2-Dibromo-3-Chloropropane	0.0457	0.0050	mg/kg wet	0.05000		91	70-130	7	25	
1,2-Dibromoethane	0.0467	0.0050	mg/kg wet	0.05000		93	70-130	11	25	
1,2-Dichlorobenzene	0.0504	0.0050	mg/kg wet	0.05000		101	70-130	8	25	
1,2-Dichloroethane	0.0485	0.0050	mg/kg wet	0.05000		97	70-130	9	25	
1,2-Dichloropropane	0.0481	0.0050	mg/kg wet	0.05000		96	70-130	9	25	



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1709754

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CI72730 - 5035**

1,3,5-Trimethylbenzene	0.0462	0.0050	mg/kg wet	0.05000		92	70-130	7	25	
1,3-Dichlorobenzene	0.0492	0.0050	mg/kg wet	0.05000		98	70-130	7	25	
1,3-Dichloropropane	0.0524	0.0050	mg/kg wet	0.05000		105	70-130	11	25	
1,4-Dichlorobenzene	0.0499	0.0050	mg/kg wet	0.05000		100	70-130	9	25	
1,4-Dioxane	0.834	0.100	mg/kg wet	1.000		83	70-130	13	20	
1-Chlorohexane	0.0434	0.0050	mg/kg wet	0.05000		87	70-130	8	25	
2,2-Dichloropropane	0.0450	0.0050	mg/kg wet	0.05000		90	70-130	9	25	
2-Butanone	0.234	0.0500	mg/kg wet	0.2500		93	70-130	11	25	
2-Chlorotoluene	0.0499	0.0050	mg/kg wet	0.05000		100	70-130	6	25	
2-Hexanone	0.217	0.0500	mg/kg wet	0.2500		87	70-130	9	25	
4-Chlorotoluene	0.0497	0.0050	mg/kg wet	0.05000		99	70-130	8	25	
4-Isopropyltoluene	0.0504	0.0050	mg/kg wet	0.05000		101	70-130	6	25	
4-Methyl-2-Pentanone	0.209	0.0500	mg/kg wet	0.2500		84	70-130	9	25	
Acetone	0.213	0.0500	mg/kg wet	0.2500		85	70-130	10	25	
Benzene	0.0471	0.0050	mg/kg wet	0.05000		94	70-130	9	25	
Bromobenzene	0.0463	0.0050	mg/kg wet	0.05000		93	70-130	7	25	
Bromochloromethane	0.0474	0.0050	mg/kg wet	0.05000		95	70-130	11	25	
Bromodichloromethane	0.0431	0.0050	mg/kg wet	0.05000		86	70-130	10	25	
Bromoform	0.0527	0.0050	mg/kg wet	0.05000		105	70-130	10	25	
Bromomethane	0.0385	0.0100	mg/kg wet	0.05000		77	70-130	5	25	
Carbon Disulfide	0.0501	0.0050	mg/kg wet	0.05000		100	70-130	8	25	
Carbon Tetrachloride	0.0470	0.0050	mg/kg wet	0.05000		94	70-130	8	25	
Chlorobenzene	0.0495	0.0050	mg/kg wet	0.05000		99	70-130	11	25	
Chloroethane	0.0452	0.0100	mg/kg wet	0.05000		90	70-130	9	25	
Chloroform	0.0475	0.0050	mg/kg wet	0.05000		95	70-130	10	25	
Chloromethane	0.0443	0.0100	mg/kg wet	0.05000		89	70-130	8	25	
cis-1,2-Dichloroethene	0.0477	0.0050	mg/kg wet	0.05000		95	70-130	9	25	
cis-1,3-Dichloropropene	0.0459	0.0050	mg/kg wet	0.05000		92	70-130	9	25	
Dibromochloromethane	0.0459	0.0050	mg/kg wet	0.05000		92	70-130	10	25	
Dibromomethane	0.0468	0.0050	mg/kg wet	0.05000		94	70-130	10	25	
Dichlorodifluoromethane	0.0420	0.0100	mg/kg wet	0.05000		84	70-130	8	25	
Diethyl Ether	0.0450	0.0050	mg/kg wet	0.05000		90	70-130	11	25	
Di-isopropyl ether	0.0473	0.0050	mg/kg wet	0.05000		95	70-130	10	25	
Ethyl tertiary-butyl ether	0.0435	0.0050	mg/kg wet	0.05000		87	70-130	9	25	
Ethylbenzene	0.0508	0.0050	mg/kg wet	0.05000		102	70-130	10	25	
Hexachlorobutadiene	0.0475	0.0050	mg/kg wet	0.05000		95	70-130	6	25	
Isopropylbenzene	0.0441	0.0050	mg/kg wet	0.05000		88	70-130	6	25	
Methyl tert-Butyl Ether	0.0445	0.0050	mg/kg wet	0.05000		89	70-130	9	25	
Methylene Chloride	0.0460	0.0250	mg/kg wet	0.05000		92	70-130	10	25	
Naphthalene	0.0443	0.0050	mg/kg wet	0.05000		89	70-130	7	25	
n-Butylbenzene	0.0451	0.0050	mg/kg wet	0.05000		90	70-130	6	25	
n-Propylbenzene	0.0512	0.0050	mg/kg wet	0.05000		102	70-130	6	25	
sec-Butylbenzene	0.0503	0.0050	mg/kg wet	0.05000		101	70-130	6	25	
Styrene	0.0447	0.0050	mg/kg wet	0.05000		89	70-130	9	25	
tert-Butylbenzene	0.0463	0.0050	mg/kg wet	0.05000		93	70-130	5	25	



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1709754

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CI72730 - 5035**

Tertiary-amyl methyl ether	0.0422	0.0050	mg/kg wet	0.05000		84	70-130	9	25	
Tetrachloroethene	0.0488	0.0050	mg/kg wet	0.05000		98	70-130	9	25	
Tetrahydrofuran	0.0422	0.0050	mg/kg wet	0.05000		84	70-130	8	25	
Toluene	0.0405	0.0050	mg/kg wet	0.05000		81	70-130	10	25	
trans-1,2-Dichloroethene	0.0499	0.0050	mg/kg wet	0.05000		100	70-130	8	25	
trans-1,3-Dichloropropene	0.0456	0.0050	mg/kg wet	0.05000		91	70-130	9	25	
Trichloroethene	0.0481	0.0050	mg/kg wet	0.05000		96	70-130	8	25	
Trichlorofluoromethane	0.0479	0.0050	mg/kg wet	0.05000		96	70-130	8	25	
Vinyl Acetate	0.0461	0.0050	mg/kg wet	0.05000		92	70-130	7	25	
Vinyl Chloride	0.0475	0.0100	mg/kg wet	0.05000		95	70-130	8	25	
Xylene O	0.0518	0.0050	mg/kg wet	0.05000		104	70-130	10	25	
Xylene P,M	0.102	0.0100	mg/kg wet	0.1000		102	70-130	10	25	
Xylenes (Total)	0.154	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	0.0504		mg/kg wet	0.05000		101	70-130			
Surrogate: 4-Bromofluorobenzene	0.0531		mg/kg wet	0.05000		106	70-130			
Surrogate: Dibromofluoromethane	0.0514		mg/kg wet	0.05000		103	70-130			
Surrogate: Toluene-d8	0.0524		mg/kg wet	0.05000		105	70-130			

**Batch CI72836 - 5035**

<b>Blank</b>										
1,1,1,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,1-Trichloroethane	ND	0.0050	mg/kg wet							
1,1,2,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,2-Trichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethene	ND	0.0050	mg/kg wet							
1,1-Dichloropropene	ND	0.0050	mg/kg wet							
1,2,3-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,3-Trichloropropane	ND	0.0050	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,4-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,2-Dibromo-3-Chloropropane	ND	0.0050	mg/kg wet							
1,2-Dibromoethane	ND	0.0050	mg/kg wet							
1,2-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,2-Dichloroethane	ND	0.0050	mg/kg wet							
1,2-Dichloropropane	ND	0.0050	mg/kg wet							
1,3,5-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,3-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,3-Dichloropropane	ND	0.0050	mg/kg wet							
1,4-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,4-Dioxane	ND	0.100	mg/kg wet							
1-Chlorohexane	ND	0.0050	mg/kg wet							
2,2-Dichloropropane	ND	0.0050	mg/kg wet							
2-Butanone	ND	0.0500	mg/kg wet							
2-Chlorotoluene	ND	0.0050	mg/kg wet							
2-Hexanone	ND	0.0500	mg/kg wet							



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1709754

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CI72836 - 5035**

4-Chlorotoluene	ND	0.0050	mg/kg wet							
4-Isopropyltoluene	ND	0.0050	mg/kg wet							
4-Methyl-2-Pentanone	ND	0.0500	mg/kg wet							
Acetone	ND	0.0500	mg/kg wet							
Benzene	ND	0.0050	mg/kg wet							
Bromobenzene	ND	0.0050	mg/kg wet							
Bromochloromethane	ND	0.0050	mg/kg wet							
Bromodichloromethane	ND	0.0050	mg/kg wet							
Bromoform	ND	0.0050	mg/kg wet							
Bromomethane	ND	0.0100	mg/kg wet							
Carbon Disulfide	ND	0.0050	mg/kg wet							
Carbon Tetrachloride	ND	0.0050	mg/kg wet							
Chlorobenzene	ND	0.0050	mg/kg wet							
Chloroethane	ND	0.0100	mg/kg wet							
Chloroform	ND	0.0050	mg/kg wet							
Chloromethane	ND	0.0100	mg/kg wet							
cis-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
cis-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Dibromochloromethane	ND	0.0050	mg/kg wet							
Dibromomethane	ND	0.0050	mg/kg wet							
Dichlorodifluoromethane	ND	0.0100	mg/kg wet							
Diethyl Ether	ND	0.0050	mg/kg wet							
Di-isopropyl ether	ND	0.0050	mg/kg wet							
Ethyl tertiary-butyl ether	ND	0.0050	mg/kg wet							
Ethylbenzene	ND	0.0050	mg/kg wet							
Hexachlorobutadiene	ND	0.0050	mg/kg wet							
Isopropylbenzene	ND	0.0050	mg/kg wet							
Methyl tert-Butyl Ether	ND	0.0050	mg/kg wet							
Methylene Chloride	ND	0.0250	mg/kg wet							
Naphthalene	ND	0.0050	mg/kg wet							
n-Butylbenzene	ND	0.0050	mg/kg wet							
n-Propylbenzene	ND	0.0050	mg/kg wet							
sec-Butylbenzene	ND	0.0050	mg/kg wet							
Styrene	ND	0.0050	mg/kg wet							
tert-Butylbenzene	ND	0.0050	mg/kg wet							
Tertiary-amyl methyl ether	ND	0.0050	mg/kg wet							
Tetrachloroethene	ND	0.0050	mg/kg wet							
Tetrahydrofuran	ND	0.0050	mg/kg wet							
Toluene	ND	0.0050	mg/kg wet							
trans-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
trans-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Trichloroethene	ND	0.0050	mg/kg wet							
Trichlorofluoromethane	ND	0.0050	mg/kg wet							
Vinyl Acetate	ND	0.0050	mg/kg wet							
Vinyl Chloride	ND	0.0100	mg/kg wet							





CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1709754

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CI72836 - 5035**

Xylene O	ND	0.0050	mg/kg wet							
Xylene P,M	ND	0.0100	mg/kg wet							
Xylenes (Total)	ND	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	0.0510		mg/kg wet	0.05000		102	70-130			
Surrogate: 4-Bromofluorobenzene	0.0536		mg/kg wet	0.05000		107	70-130			
Surrogate: Dibromofluoromethane	0.0506		mg/kg wet	0.05000		101	70-130			
Surrogate: Toluene-d8	0.0557		mg/kg wet	0.05000		111	70-130			

**LCS**

1,1,1,2-Tetrachloroethane	0.0508	0.0050	mg/kg wet	0.05000		102	70-130			
1,1,1-Trichloroethane	0.0541	0.0050	mg/kg wet	0.05000		108	70-130			
1,1,2,2-Tetrachloroethane	0.0508	0.0050	mg/kg wet	0.05000		102	70-130			
1,1,2-Trichloroethane	0.0462	0.0050	mg/kg wet	0.05000		92	70-130			
1,1-Dichloroethane	0.0494	0.0050	mg/kg wet	0.05000		99	70-130			
1,1-Dichloroethene	0.0551	0.0050	mg/kg wet	0.05000		110	70-130			
1,1-Dichloropropene	0.0537	0.0050	mg/kg wet	0.05000		107	70-130			
1,2,3-Trichlorobenzene	0.0493	0.0050	mg/kg wet	0.05000		99	70-130			
1,2,3-Trichloropropane	0.0468	0.0050	mg/kg wet	0.05000		94	70-130			
1,2,4-Trichlorobenzene	0.0491	0.0050	mg/kg wet	0.05000		98	70-130			
1,2,4-Trimethylbenzene	0.0498	0.0050	mg/kg wet	0.05000		100	70-130			
1,2-Dibromo-3-Chloropropane	0.0486	0.0050	mg/kg wet	0.05000		97	70-130			
1,2-Dibromoethane	0.0493	0.0050	mg/kg wet	0.05000		99	70-130			
1,2-Dichlorobenzene	0.0544	0.0050	mg/kg wet	0.05000		109	70-130			
1,2-Dichloroethane	0.0513	0.0050	mg/kg wet	0.05000		103	70-130			
1,2-Dichloropropane	0.0509	0.0050	mg/kg wet	0.05000		102	70-130			
1,3,5-Trimethylbenzene	0.0497	0.0050	mg/kg wet	0.05000		99	70-130			
1,3-Dichlorobenzene	0.0527	0.0050	mg/kg wet	0.05000		105	70-130			
1,3-Dichloropropane	0.0555	0.0050	mg/kg wet	0.05000		111	70-130			
1,4-Dichlorobenzene	0.0539	0.0050	mg/kg wet	0.05000		108	70-130			
1,4-Dioxane	0.897	0.100	mg/kg wet	1.000		90	70-130			
1-Chlorohexane	0.0460	0.0050	mg/kg wet	0.05000		92	70-130			
2,2-Dichloropropane	0.0473	0.0050	mg/kg wet	0.05000		95	70-130			
2-Butanone	0.247	0.0500	mg/kg wet	0.2500		99	70-130			
2-Chlorotoluene	0.0534	0.0050	mg/kg wet	0.05000		107	70-130			
2-Hexanone	0.227	0.0500	mg/kg wet	0.2500		91	70-130			
4-Chlorotoluene	0.0539	0.0050	mg/kg wet	0.05000		108	70-130			
4-Isopropyltoluene	0.0539	0.0050	mg/kg wet	0.05000		108	70-130			
4-Methyl-2-Pentanone	0.222	0.0500	mg/kg wet	0.2500		89	70-130			
Acetone	0.225	0.0500	mg/kg wet	0.2500		90	70-130			
Benzene	0.0499	0.0050	mg/kg wet	0.05000		100	70-130			
Bromobenzene	0.0491	0.0050	mg/kg wet	0.05000		98	70-130			
Bromochloromethane	0.0507	0.0050	mg/kg wet	0.05000		101	70-130			
Bromodichloromethane	0.0457	0.0050	mg/kg wet	0.05000		91	70-130			
Bromoform	0.0547	0.0050	mg/kg wet	0.05000		109	70-130			
Bromomethane	0.0463	0.0100	mg/kg wet	0.05000		93	70-130			
Carbon Disulfide	0.0526	0.0050	mg/kg wet	0.05000		105	70-130			

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1709754

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
<b>5035/8260B Volatile Organic Compounds / Low Level</b>										
<b>Batch CI72836 - 5035</b>										
Carbon Tetrachloride	0.0495	0.0050	mg/kg wet	0.05000		99	70-130			
Chlorobenzene	0.0524	0.0050	mg/kg wet	0.05000		105	70-130			
Chloroethane	0.0486	0.0100	mg/kg wet	0.05000		97	70-130			
Chloroform	0.0504	0.0050	mg/kg wet	0.05000		101	70-130			
Chloromethane	0.0482	0.0100	mg/kg wet	0.05000		96	70-130			
cis-1,2-Dichloroethene	0.0507	0.0050	mg/kg wet	0.05000		101	70-130			
cis-1,3-Dichloropropene	0.0485	0.0050	mg/kg wet	0.05000		97	70-130			
Dibromochloromethane	0.0478	0.0050	mg/kg wet	0.05000		96	70-130			
Dibromomethane	0.0492	0.0050	mg/kg wet	0.05000		98	70-130			
Dichlorodifluoromethane	0.0454	0.0100	mg/kg wet	0.05000		91	70-130			
Diethyl Ether	0.0486	0.0050	mg/kg wet	0.05000		97	70-130			
Di-isopropyl ether	0.0505	0.0050	mg/kg wet	0.05000		101	70-130			
Ethyl tertiary-butyl ether	0.0460	0.0050	mg/kg wet	0.05000		92	70-130			
Ethylbenzene	0.0539	0.0050	mg/kg wet	0.05000		108	70-130			
Hexachlorobutadiene	0.0499	0.0050	mg/kg wet	0.05000		100	70-130			
Isopropylbenzene	0.0474	0.0050	mg/kg wet	0.05000		95	70-130			
Methyl tert-Butyl Ether	0.0473	0.0050	mg/kg wet	0.05000		95	70-130			
Methylene Chloride	0.0480	0.0250	mg/kg wet	0.05000		96	70-130			
Naphthalene	0.0463	0.0050	mg/kg wet	0.05000		93	70-130			
n-Butylbenzene	0.0482	0.0050	mg/kg wet	0.05000		96	70-130			
n-Propylbenzene	0.0551	0.0050	mg/kg wet	0.05000		110	70-130			
sec-Butylbenzene	0.0543	0.0050	mg/kg wet	0.05000		109	70-130			
Styrene	0.0472	0.0050	mg/kg wet	0.05000		94	70-130			
tert-Butylbenzene	0.0490	0.0050	mg/kg wet	0.05000		98	70-130			
Tertiary-amyl methyl ether	0.0444	0.0050	mg/kg wet	0.05000		89	70-130			
Tetrachloroethene	0.0525	0.0050	mg/kg wet	0.05000		105	70-130			
Tetrahydrofuran	0.0442	0.0050	mg/kg wet	0.05000		88	70-130			
Toluene	0.0436	0.0050	mg/kg wet	0.05000		87	70-130			
trans-1,2-Dichloroethene	0.0526	0.0050	mg/kg wet	0.05000		105	70-130			
trans-1,3-Dichloropropene	0.0475	0.0050	mg/kg wet	0.05000		95	70-130			
Trichloroethene	0.0512	0.0050	mg/kg wet	0.05000		102	70-130			
Trichlorofluoromethane	0.0514	0.0050	mg/kg wet	0.05000		103	70-130			
Vinyl Acetate	0.0482	0.0050	mg/kg wet	0.05000		96	70-130			
Vinyl Chloride	0.0510	0.0100	mg/kg wet	0.05000		102	70-130			
Xylene O	0.0551	0.0050	mg/kg wet	0.05000		110	70-130			
Xylene P,M	0.109	0.0100	mg/kg wet	0.1000		109	70-130			
Xylenes (Total)	0.164	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	0.0492		mg/kg wet	0.05000		98	70-130			
Surrogate: 4-Bromofluorobenzene	0.0517		mg/kg wet	0.05000		103	70-130			
Surrogate: Dibromofluoromethane	0.0504		mg/kg wet	0.05000		101	70-130			
Surrogate: Toluene-d8	0.0518		mg/kg wet	0.05000		104	70-130			
<b>LCS Dup</b>										
1,1,1,2-Tetrachloroethane	0.0516	0.0050	mg/kg wet	0.05000		103	70-130	2	25	
1,1,1-Trichloroethane	0.0542	0.0050	mg/kg wet	0.05000		108	70-130	0.2	25	
1,1,2,2-Tetrachloroethane	0.0520	0.0050	mg/kg wet	0.05000		104	70-130	2	25	



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1709754

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CI72836 - 5035**

1,1,2-Trichloroethane	0.0464	0.0050	mg/kg wet	0.05000		93	70-130	0.4	25	
1,1-Dichloroethane	0.0498	0.0050	mg/kg wet	0.05000		100	70-130	0.8	25	
1,1-Dichloroethene	0.0549	0.0050	mg/kg wet	0.05000		110	70-130	0.4	25	
1,1-Dichloropropene	0.0538	0.0050	mg/kg wet	0.05000		108	70-130	0.1	25	
1,2,3-Trichlorobenzene	0.0502	0.0050	mg/kg wet	0.05000		100	70-130	2	25	
1,2,3-Trichloropropane	0.0478	0.0050	mg/kg wet	0.05000		96	70-130	2	25	
1,2,4-Trichlorobenzene	0.0492	0.0050	mg/kg wet	0.05000		98	70-130	0.4	25	
1,2,4-Trimethylbenzene	0.0498	0.0050	mg/kg wet	0.05000		100	70-130	0.04	25	
1,2-Dibromo-3-Chloropropane	0.0488	0.0050	mg/kg wet	0.05000		98	70-130	0.4	25	
1,2-Dibromoethane	0.0496	0.0050	mg/kg wet	0.05000		99	70-130	0.6	25	
1,2-Dichlorobenzene	0.0546	0.0050	mg/kg wet	0.05000		109	70-130	0.4	25	
1,2-Dichloroethane	0.0518	0.0050	mg/kg wet	0.05000		104	70-130	1	25	
1,2-Dichloropropane	0.0516	0.0050	mg/kg wet	0.05000		103	70-130	1	25	
1,3,5-Trimethylbenzene	0.0496	0.0050	mg/kg wet	0.05000		99	70-130	0.4	25	
1,3-Dichlorobenzene	0.0529	0.0050	mg/kg wet	0.05000		106	70-130	0.5	25	
1,3-Dichloropropane	0.0563	0.0050	mg/kg wet	0.05000		113	70-130	1	25	
1,4-Dichlorobenzene	0.0538	0.0050	mg/kg wet	0.05000		108	70-130	0.3	25	
1,4-Dioxane	0.919	0.100	mg/kg wet	1.000		92	70-130	2	20	
1-Chlorohexane	0.0460	0.0050	mg/kg wet	0.05000		92	70-130	0.1	25	
2,2-Dichloropropane	0.0474	0.0050	mg/kg wet	0.05000		95	70-130	0.2	25	
2-Butanone	0.253	0.0500	mg/kg wet	0.2500		101	70-130	2	25	
2-Chlorotoluene	0.0534	0.0050	mg/kg wet	0.05000		107	70-130	0.1	25	
2-Hexanone	0.235	0.0500	mg/kg wet	0.2500		94	70-130	3	25	
4-Chlorotoluene	0.0538	0.0050	mg/kg wet	0.05000		108	70-130	0.2	25	
4-Isopropyltoluene	0.0536	0.0050	mg/kg wet	0.05000		107	70-130	0.6	25	
4-Methyl-2-Pentanone	0.228	0.0500	mg/kg wet	0.2500		91	70-130	3	25	
Acetone	0.230	0.0500	mg/kg wet	0.2500		92	70-130	2	25	
Benzene	0.0501	0.0050	mg/kg wet	0.05000		100	70-130	0.3	25	
Bromobenzene	0.0497	0.0050	mg/kg wet	0.05000		99	70-130	1	25	
Bromochloromethane	0.0511	0.0050	mg/kg wet	0.05000		102	70-130	0.9	25	
Bromodichloromethane	0.0464	0.0050	mg/kg wet	0.05000		93	70-130	2	25	
Bromoform	0.0557	0.0050	mg/kg wet	0.05000		111	70-130	2	25	
Bromomethane	0.0425	0.0100	mg/kg wet	0.05000		85	70-130	9	25	
Carbon Disulfide	0.0528	0.0050	mg/kg wet	0.05000		106	70-130	0.4	25	
Carbon Tetrachloride	0.0494	0.0050	mg/kg wet	0.05000		99	70-130	0.2	25	
Chlorobenzene	0.0528	0.0050	mg/kg wet	0.05000		106	70-130	0.9	25	
Chloroethane	0.0480	0.0100	mg/kg wet	0.05000		96	70-130	1	25	
Chloroform	0.0503	0.0050	mg/kg wet	0.05000		101	70-130	0.2	25	
Chloromethane	0.0481	0.0100	mg/kg wet	0.05000		96	70-130	0.2	25	
cis-1,2-Dichloroethene	0.0511	0.0050	mg/kg wet	0.05000		102	70-130	0.7	25	
cis-1,3-Dichloropropene	0.0490	0.0050	mg/kg wet	0.05000		98	70-130	1	25	
Dibromochloromethane	0.0485	0.0050	mg/kg wet	0.05000		97	70-130	2	25	
Dibromomethane	0.0501	0.0050	mg/kg wet	0.05000		100	70-130	2	25	
Dichlorodifluoromethane	0.0442	0.0100	mg/kg wet	0.05000		88	70-130	3	25	
Diethyl Ether	0.0496	0.0050	mg/kg wet	0.05000		99	70-130	2	25	



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1709754

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CI72836 - 5035**

Di-isopropyl ether	0.0512	0.0050	mg/kg wet	0.05000		102	70-130	1	25	
Ethyl tertiary-butyl ether	0.0469	0.0050	mg/kg wet	0.05000		94	70-130	2	25	
Ethylbenzene	0.0542	0.0050	mg/kg wet	0.05000		108	70-130	0.4	25	
Hexachlorobutadiene	0.0492	0.0050	mg/kg wet	0.05000		98	70-130	1	25	
Isopropylbenzene	0.0474	0.0050	mg/kg wet	0.05000		95	70-130	0	25	
Methyl tert-Butyl Ether	0.0483	0.0050	mg/kg wet	0.05000		97	70-130	2	25	
Methylene Chloride	0.0477	0.0250	mg/kg wet	0.05000		95	70-130	0.8	25	
Naphthalene	0.0480	0.0050	mg/kg wet	0.05000		96	70-130	4	25	
n-Butylbenzene	0.0478	0.0050	mg/kg wet	0.05000		96	70-130	1	25	
n-Propylbenzene	0.0550	0.0050	mg/kg wet	0.05000		110	70-130	0.3	25	
sec-Butylbenzene	0.0538	0.0050	mg/kg wet	0.05000		108	70-130	1	25	
Styrene	0.0475	0.0050	mg/kg wet	0.05000		95	70-130	0.6	25	
tert-Butylbenzene	0.0491	0.0050	mg/kg wet	0.05000		98	70-130	0.3	25	
Tertiary-amyl methyl ether	0.0452	0.0050	mg/kg wet	0.05000		90	70-130	2	25	
Tetrachloroethene	0.0517	0.0050	mg/kg wet	0.05000		103	70-130	2	25	
Tetrahydrofuran	0.0455	0.0050	mg/kg wet	0.05000		91	70-130	3	25	
Toluene	0.0437	0.0050	mg/kg wet	0.05000		87	70-130	0.1	25	
trans-1,2-Dichloroethene	0.0532	0.0050	mg/kg wet	0.05000		106	70-130	1	25	
trans-1,3-Dichloropropene	0.0481	0.0050	mg/kg wet	0.05000		96	70-130	1	25	
Trichloroethene	0.0505	0.0050	mg/kg wet	0.05000		101	70-130	1	25	
Trichlorofluoromethane	0.0508	0.0050	mg/kg wet	0.05000		102	70-130	1	25	
Vinyl Acetate	0.0494	0.0050	mg/kg wet	0.05000		99	70-130	3	25	
Vinyl Chloride	0.0507	0.0100	mg/kg wet	0.05000		101	70-130	0.6	25	
Xylene O	0.0554	0.0050	mg/kg wet	0.05000		111	70-130	0.5	25	
Xylene P,M	0.108	0.0100	mg/kg wet	0.1000		108	70-130	1	25	
Xylenes (Total)	0.164	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	0.0495		mg/kg wet	0.05000		99	70-130			
Surrogate: 4-Bromofluorobenzene	0.0522		mg/kg wet	0.05000		104	70-130			
Surrogate: Dibromofluoromethane	0.0510		mg/kg wet	0.05000		102	70-130			
Surrogate: Toluene-d8	0.0519		mg/kg wet	0.05000		104	70-130			

5035/8260B Volatile Organic Compounds / Methanol

**Batch CJ70325 - 5035**

**Blank**

1,1,1,2-Tetrachloroethane	ND	0.200	mg/kg wet							
1,1,1-Trichloroethane	ND	0.200	mg/kg wet							
1,1,2,2-Tetrachloroethane	ND	0.200	mg/kg wet							
1,1,2-Trichloroethane	ND	0.200	mg/kg wet							
1,1-Dichloroethane	ND	0.200	mg/kg wet							
1,1-Dichloroethene	ND	0.200	mg/kg wet							
1,1-Dichloropropene	ND	0.200	mg/kg wet							
1,2,3-Trichlorobenzene	ND	0.200	mg/kg wet							
1,2,3-Trichloropropane	ND	0.200	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.200	mg/kg wet							
1,2,4-Trimethylbenzene	ND	0.200	mg/kg wet							



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1709754

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Methanol

**Batch CJ70325 - 5035**

1,2-Dibromo-3-Chloropropane	ND	1.00	mg/kg wet							
1,2-Dibromoethane	ND	0.200	mg/kg wet							
1,2-Dichlorobenzene	ND	0.200	mg/kg wet							
1,2-Dichloroethane	ND	0.200	mg/kg wet							
1,2-Dichloropropane	ND	0.200	mg/kg wet							
1,3,5-Trimethylbenzene	ND	0.200	mg/kg wet							
1,3-Dichlorobenzene	ND	0.200	mg/kg wet							
1,3-Dichloropropane	ND	0.200	mg/kg wet							
1,4-Dichlorobenzene	ND	0.200	mg/kg wet							
1,4-Dioxane - Screen	ND	40.0	mg/kg wet							
1-Chlorohexane	ND	0.200	mg/kg wet							
2,2-Dichloropropane	ND	0.200	mg/kg wet							
2-Butanone	ND	1.00	mg/kg wet							
2-Chlorotoluene	ND	0.200	mg/kg wet							
2-Hexanone	ND	1.00	mg/kg wet							
4-Chlorotoluene	ND	0.200	mg/kg wet							
4-Isopropyltoluene	ND	0.200	mg/kg wet							
4-Methyl-2-Pentanone	ND	1.00	mg/kg wet							
Acetone	ND	1.00	mg/kg wet							
Benzene	ND	0.200	mg/kg wet							
Bromobenzene	ND	0.200	mg/kg wet							
Bromochloromethane	ND	0.200	mg/kg wet							
Bromodichloromethane	ND	0.200	mg/kg wet							
Bromoform	ND	0.200	mg/kg wet							
Bromomethane	ND	0.200	mg/kg wet							
Carbon Disulfide	ND	0.200	mg/kg wet							
Carbon Tetrachloride	ND	0.200	mg/kg wet							
Chlorobenzene	ND	0.200	mg/kg wet							
Chloroethane	ND	0.200	mg/kg wet							
Chloroform	ND	0.200	mg/kg wet							
Chloromethane	ND	0.200	mg/kg wet							
cis-1,2-Dichloroethene	ND	0.200	mg/kg wet							
cis-1,3-Dichloropropene	ND	0.200	mg/kg wet							
Dibromochloromethane	ND	0.200	mg/kg wet							
Dibromomethane	ND	0.200	mg/kg wet							
Dichlorodifluoromethane	ND	0.200	mg/kg wet							
Diethyl Ether	ND	0.200	mg/kg wet							
Di-isopropyl ether	ND	0.200	mg/kg wet							
Ethyl tertiary-butyl ether	ND	0.200	mg/kg wet							
Ethylbenzene	ND	0.200	mg/kg wet							
Hexachlorobutadiene	ND	0.200	mg/kg wet							
Isopropylbenzene	ND	0.200	mg/kg wet							
Methyl tert-Butyl Ether	ND	0.200	mg/kg wet							
Methylene Chloride	ND	0.400	mg/kg wet							
Naphthalene	ND	0.200	mg/kg wet							



CERTIFICATE OF ANALYSIS

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Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1709754

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Methanol

**Batch CJ70325 - 5035**

n-Butylbenzene	ND	0.200	mg/kg wet							
n-Propylbenzene	ND	0.200	mg/kg wet							
sec-Butylbenzene	ND	0.200	mg/kg wet							
Styrene	ND	0.200	mg/kg wet							
tert-Butylbenzene	ND	0.200	mg/kg wet							
Tertiary-amyl methyl ether	ND	0.200	mg/kg wet							
Tetrachloroethene	ND	0.200	mg/kg wet							
Tetrahydrofuran	ND	1.00	mg/kg wet							
Toluene	ND	0.200	mg/kg wet							
trans-1,2-Dichloroethene	ND	0.200	mg/kg wet							
trans-1,3-Dichloropropene	ND	0.200	mg/kg wet							
Trichloroethene	ND	0.200	mg/kg wet							
Vinyl Acetate	ND	0.200	mg/kg wet							
Vinyl Chloride	ND	0.200	mg/kg wet							
Xylene O	ND	0.200	mg/kg wet							
Xylene P,M	ND	0.400	mg/kg wet							
Xylenes (Total)	ND	0.400	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	4.99		mg/kg wet	5.000		100	70-130			
Surrogate: 4-Bromofluorobenzene	4.22		mg/kg wet	5.000		84	70-130			
Surrogate: Dibromofluoromethane	4.58		mg/kg wet	5.000		92	70-130			
Surrogate: Toluene-d8	4.23		mg/kg wet	5.000		85	70-130			

**LCS**

1,1,1,2-Tetrachloroethane	1.83	0.200	mg/kg wet	2.000		92	70-130			
1,1,1-Trichloroethane	2.14	0.200	mg/kg wet	2.000		107	70-130			
1,1,2,2-Tetrachloroethane	1.95	0.200	mg/kg wet	2.000		98	70-130			
1,1,2-Trichloroethane	2.05	0.200	mg/kg wet	2.000		102	70-130			
1,1-Dichloroethane	2.08	0.200	mg/kg wet	2.000		104	70-130			
1,1-Dichloroethene	2.07	0.200	mg/kg wet	2.000		104	70-130			
1,1-Dichloropropene	2.23	0.200	mg/kg wet	2.000		111	70-130			
1,2,3-Trichlorobenzene	2.36	0.200	mg/kg wet	2.000		118	70-130			
1,2,3-Trichloropropane	1.95	0.200	mg/kg wet	2.000		97	70-130			
1,2,4-Trichlorobenzene	2.30	0.200	mg/kg wet	2.000		115	70-130			
1,2,4-Trimethylbenzene	2.18	0.200	mg/kg wet	2.000		109	70-130			
1,2-Dibromo-3-Chloropropane	1.82	1.00	mg/kg wet	2.000		91	70-130			
1,2-Dibromoethane	2.07	0.200	mg/kg wet	2.000		104	70-130			
1,2-Dichlorobenzene	2.11	0.200	mg/kg wet	2.000		106	70-130			
1,2-Dichloroethane	2.20	0.200	mg/kg wet	2.000		110	70-130			
1,2-Dichloropropane	2.18	0.200	mg/kg wet	2.000		109	70-130			
1,3,5-Trimethylbenzene	2.17	0.200	mg/kg wet	2.000		108	70-130			
1,3-Dichlorobenzene	2.15	0.200	mg/kg wet	2.000		107	70-130			
1,3-Dichloropropane	2.20	0.200	mg/kg wet	2.000		110	70-130			
1,4-Dichlorobenzene	2.09	0.200	mg/kg wet	2.000		104	70-130			
1,4-Dioxane - Screen	73.0	40.0	mg/kg wet	40.00		183	44-241			
1-Chlorohexane	2.06	0.200	mg/kg wet	2.000		103	70-130			
2,2-Dichloropropane	2.14	0.200	mg/kg wet	2.000		107	70-130			





CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1709754

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Methanol

**Batch CJ70325 - 5035**

2-Butanone	10.4	1.00	mg/kg wet	10.00		104	70-130			
2-Chlorotoluene	2.08	0.200	mg/kg wet	2.000		104	70-130			
2-Hexanone	10.2	1.00	mg/kg wet	10.00		102	70-130			
4-Chlorotoluene	2.13	0.200	mg/kg wet	2.000		107	70-130			
4-Isopropyltoluene	2.09	0.200	mg/kg wet	2.000		104	70-130			
4-Methyl-2-Pentanone	10.4	1.00	mg/kg wet	10.00		104	70-130			
Acetone	10.6	1.00	mg/kg wet	10.00		106	70-130			
Benzene	2.10	0.200	mg/kg wet	2.000		105	70-130			
Bromobenzene	2.16	0.200	mg/kg wet	2.000		108	70-130			
Bromochloromethane	1.94	0.200	mg/kg wet	2.000		97	70-130			
Bromodichloromethane	1.80	0.200	mg/kg wet	2.000		90	70-130			
Bromoform	1.56	0.200	mg/kg wet	2.000		78	70-130			
Bromomethane	2.17	0.200	mg/kg wet	2.000		108	70-130			
Carbon Disulfide	2.12	0.200	mg/kg wet	2.000		106	70-130			
Carbon Tetrachloride	2.13	0.200	mg/kg wet	2.000		107	70-130			
Chlorobenzene	2.06	0.200	mg/kg wet	2.000		103	70-130			
Chloroethane	2.13	0.200	mg/kg wet	2.000		106	70-130			
Chloroform	2.07	0.200	mg/kg wet	2.000		103	70-130			
Chloromethane	2.08	0.200	mg/kg wet	2.000		104	70-130			
cis-1,2-Dichloroethene	2.00	0.200	mg/kg wet	2.000		100	70-130			
cis-1,3-Dichloropropene	2.16	0.200	mg/kg wet	2.000		108	70-130			
Dibromochloromethane	1.66	0.200	mg/kg wet	2.000		83	70-130			
Dibromomethane	1.90	0.200	mg/kg wet	2.000		95	70-130			
Dichlorodifluoromethane	1.99	0.200	mg/kg wet	2.000		100	70-130			
Diethyl Ether	2.17	0.200	mg/kg wet	2.000		108	70-130			
Di-isopropyl ether	2.27	0.200	mg/kg wet	2.000		114	70-130			
Ethyl tertiary-butyl ether	2.21	0.200	mg/kg wet	2.000		110	70-130			
Ethylbenzene	2.16	0.200	mg/kg wet	2.000		108	70-130			
Hexachlorobutadiene	2.42	0.200	mg/kg wet	2.000		121	70-130			
Isopropylbenzene	2.05	0.200	mg/kg wet	2.000		102	70-130			
Methyl tert-Butyl Ether	2.11	0.200	mg/kg wet	2.000		106	70-130			
Methylene Chloride	2.04	0.400	mg/kg wet	2.000		102	70-130			
Naphthalene	2.22	0.200	mg/kg wet	2.000		111	70-130			
n-Butylbenzene	2.20	0.200	mg/kg wet	2.000		110	70-130			
n-Propylbenzene	2.15	0.200	mg/kg wet	2.000		108	70-130			
sec-Butylbenzene	2.13	0.200	mg/kg wet	2.000		107	70-130			
Styrene	2.00	0.200	mg/kg wet	2.000		100	70-130			
tert-Butylbenzene	2.20	0.200	mg/kg wet	2.000		110	70-130			
Tertiary-amyl methyl ether	2.12	0.200	mg/kg wet	2.000		106	70-130			
Tetrachloroethene	1.92	0.200	mg/kg wet	2.000		96	70-130			
Tetrahydrofuran	2.13	1.00	mg/kg wet	2.000		106	70-130			
Toluene	1.86	0.200	mg/kg wet	2.000		93	70-130			
trans-1,2-Dichloroethene	2.02	0.200	mg/kg wet	2.000		101	70-130			
trans-1,3-Dichloropropene	1.85	0.200	mg/kg wet	2.000		92	70-130			
Trichloroethene	2.08	0.200	mg/kg wet	2.000		104	70-130			



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1709754

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
<b>5035/8260B Volatile Organic Compounds / Methanol</b>										
<b>Batch CJ70325 - 5035</b>										
Vinyl Acetate	2.12	0.200	mg/kg wet	2.000		106	70-130			
Vinyl Chloride	2.05	0.200	mg/kg wet	2.000		102	70-130			
Xylene O	2.08	0.200	mg/kg wet	2.000		104	70-130			
Xylene P,M	4.11	0.400	mg/kg wet	4.000		103	70-130			
Xylenes (Total)	6.18	0.400	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	5.32		mg/kg wet	5.000		106	70-130			
Surrogate: 4-Bromofluorobenzene	5.39		mg/kg wet	5.000		108	70-130			
Surrogate: Dibromofluoromethane	5.10		mg/kg wet	5.000		102	70-130			
Surrogate: Toluene-d8	5.10		mg/kg wet	5.000		102	70-130			
<b>LCS Dup</b>										
1,1,1,2-Tetrachloroethane	1.84	0.200	mg/kg wet	2.000		92	70-130	0.4	25	
1,1,1-Trichloroethane	2.18	0.200	mg/kg wet	2.000		109	70-130	2	25	
1,1,2,2-Tetrachloroethane	1.80	0.200	mg/kg wet	2.000		90	70-130	8	25	
1,1,2-Trichloroethane	1.95	0.200	mg/kg wet	2.000		97	70-130	5	25	
1,1-Dichloroethane	2.05	0.200	mg/kg wet	2.000		102	70-130	2	25	
1,1-Dichloroethene	2.04	0.200	mg/kg wet	2.000		102	70-130	2	25	
1,1-Dichloropropene	2.14	0.200	mg/kg wet	2.000		107	70-130	4	25	
1,2,3-Trichlorobenzene	2.11	0.200	mg/kg wet	2.000		105	70-130	11	25	
1,2,3-Trichloropropane	1.76	0.200	mg/kg wet	2.000		88	70-130	10	25	
1,2,4-Trichlorobenzene	2.12	0.200	mg/kg wet	2.000		106	70-130	8	25	
1,2,4-Trimethylbenzene	2.08	0.200	mg/kg wet	2.000		104	70-130	5	25	
1,2-Dibromo-3-Chloropropane	1.87	1.00	mg/kg wet	2.000		94	70-130	3	25	
1,2-Dibromoethane	2.15	0.200	mg/kg wet	2.000		108	70-130	4	25	
1,2-Dichlorobenzene	2.04	0.200	mg/kg wet	2.000		102	70-130	4	25	
1,2-Dichloroethane	2.16	0.200	mg/kg wet	2.000		108	70-130	2	25	
1,2-Dichloropropane	2.17	0.200	mg/kg wet	2.000		109	70-130	0.2	25	
1,3,5-Trimethylbenzene	2.06	0.200	mg/kg wet	2.000		103	70-130	5	25	
1,3-Dichlorobenzene	2.05	0.200	mg/kg wet	2.000		102	70-130	5	25	
1,3-Dichloropropane	2.17	0.200	mg/kg wet	2.000		109	70-130	1	25	
1,4-Dichlorobenzene	1.98	0.200	mg/kg wet	2.000		99	70-130	5	25	
1,4-Dioxane - Screen	50.7	40.0	mg/kg wet	40.00		127	44-241	36	200	
1-Chlorohexane	2.14	0.200	mg/kg wet	2.000		107	70-130	4	25	
2,2-Dichloropropane	2.08	0.200	mg/kg wet	2.000		104	70-130	3	25	
2-Butanone	9.96	1.00	mg/kg wet	10.00		100	70-130	4	25	
2-Chlorotoluene	2.04	0.200	mg/kg wet	2.000		102	70-130	2	25	
2-Hexanone	9.81	1.00	mg/kg wet	10.00		98	70-130	4	25	
4-Chlorotoluene	2.02	0.200	mg/kg wet	2.000		101	70-130	6	25	
4-Isopropyltoluene	2.01	0.200	mg/kg wet	2.000		100	70-130	4	25	
4-Methyl-2-Pentanone	10.0	1.00	mg/kg wet	10.00		100	70-130	4	25	
Acetone	9.80	1.00	mg/kg wet	10.00		98	70-130	8	25	
Benzene	2.07	0.200	mg/kg wet	2.000		104	70-130	1	25	
Bromobenzene	2.05	0.200	mg/kg wet	2.000		103	70-130	5	25	
Bromochloromethane	1.96	0.200	mg/kg wet	2.000		98	70-130	0.9	25	
Bromodichloromethane	1.76	0.200	mg/kg wet	2.000		88	70-130	2	25	
Bromoform	1.58	0.200	mg/kg wet	2.000		79	70-130	1	25	



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1709754

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Methanol

**Batch CJ70325 - 5035**

Bromomethane	2.15	0.200	mg/kg wet	2.000		108	70-130	0.7	25	
Carbon Disulfide	2.12	0.200	mg/kg wet	2.000		106	70-130	0.2	25	
Carbon Tetrachloride	2.12	0.200	mg/kg wet	2.000		106	70-130	0.5	25	
Chlorobenzene	2.07	0.200	mg/kg wet	2.000		103	70-130	0.3	25	
Chloroethane	1.94	0.200	mg/kg wet	2.000		97	70-130	9	25	
Chloroform	2.07	0.200	mg/kg wet	2.000		104	70-130	0.1	25	
Chloromethane	2.15	0.200	mg/kg wet	2.000		108	70-130	3	25	
cis-1,2-Dichloroethene	1.86	0.200	mg/kg wet	2.000		93	70-130	7	25	
cis-1,3-Dichloropropene	2.19	0.200	mg/kg wet	2.000		109	70-130	1	25	
Dibromochloromethane	1.63	0.200	mg/kg wet	2.000		82	70-130	2	25	
Dibromomethane	1.94	0.200	mg/kg wet	2.000		97	70-130	2	25	
Dichlorodifluoromethane	1.96	0.200	mg/kg wet	2.000		98	70-130	1	25	
Diethyl Ether	2.20	0.200	mg/kg wet	2.000		110	70-130	1	25	
Di-isopropyl ether	2.18	0.200	mg/kg wet	2.000		109	70-130	4	25	
Ethyl tertiary-butyl ether	2.17	0.200	mg/kg wet	2.000		108	70-130	2	25	
Ethylbenzene	2.14	0.200	mg/kg wet	2.000		107	70-130	0.8	25	
Hexachlorobutadiene	2.12	0.200	mg/kg wet	2.000		106	70-130	13	25	
Isopropylbenzene	2.03	0.200	mg/kg wet	2.000		102	70-130	0.6	25	
Methyl tert-Butyl Ether	2.12	0.200	mg/kg wet	2.000		106	70-130	0.5	25	
Methylene Chloride	1.94	0.400	mg/kg wet	2.000		97	70-130	5	25	
Naphthalene	2.03	0.200	mg/kg wet	2.000		102	70-130	9	25	
n-Butylbenzene	2.07	0.200	mg/kg wet	2.000		103	70-130	6	25	
n-Propylbenzene	2.13	0.200	mg/kg wet	2.000		106	70-130	1	25	
sec-Butylbenzene	2.05	0.200	mg/kg wet	2.000		102	70-130	4	25	
Styrene	2.06	0.200	mg/kg wet	2.000		103	70-130	3	25	
tert-Butylbenzene	2.06	0.200	mg/kg wet	2.000		103	70-130	6	25	
Tertiary-amyl methyl ether	2.03	0.200	mg/kg wet	2.000		102	70-130	4	25	
Tetrachloroethene	1.91	0.200	mg/kg wet	2.000		96	70-130	0.3	25	
Tetrahydrofuran	1.86	1.00	mg/kg wet	2.000		93	70-130	13	25	
Toluene	1.89	0.200	mg/kg wet	2.000		94	70-130	2	25	
trans-1,2-Dichloroethene	1.96	0.200	mg/kg wet	2.000		98	70-130	3	25	
trans-1,3-Dichloropropene	1.80	0.200	mg/kg wet	2.000		90	70-130	2	25	
Trichloroethene	2.02	0.200	mg/kg wet	2.000		101	70-130	3	25	
Vinyl Acetate	2.06	0.200	mg/kg wet	2.000		103	70-130	3	25	
Vinyl Chloride	2.14	0.200	mg/kg wet	2.000		107	70-130	4	25	
Xylene O	2.09	0.200	mg/kg wet	2.000		105	70-130	0.9	25	
Xylene P,M	4.23	0.400	mg/kg wet	4.000		106	70-130	3	25	
Xylenes (Total)	6.33	0.400	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	5.32		mg/kg wet	5.000		106	70-130			
Surrogate: 4-Bromofluorobenzene	5.30		mg/kg wet	5.000		106	70-130			
Surrogate: Dibromofluoromethane	5.09		mg/kg wet	5.000		102	70-130			
Surrogate: Toluene-d8	5.26		mg/kg wet	5.000		105	70-130			

8100M Total Petroleum Hydrocarbons

**Batch CI72712 - 3546**

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1709754

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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8100M Total Petroleum Hydrocarbons

**Batch CI72712 - 3546**

**Blank**

Decane (C10)	ND	0.2	mg/kg wet
Docosane (C22)	ND	0.2	mg/kg wet
Dodecane (C12)	ND	0.2	mg/kg wet
Eicosane (C20)	ND	0.2	mg/kg wet
Hexacosane (C26)	ND	0.2	mg/kg wet
Hexadecane (C16)	ND	0.2	mg/kg wet
Nonadecane (C19)	ND	0.2	mg/kg wet
Nonane (C9)	ND	0.2	mg/kg wet
Octacosane (C28)	ND	0.2	mg/kg wet
Octadecane (C18)	ND	0.2	mg/kg wet
Tetracosane (C24)	ND	0.2	mg/kg wet
Tetradecane (C14)	ND	0.2	mg/kg wet
Total Petroleum Hydrocarbons	ND	37.5	mg/kg wet
Triacontane (C30)	ND	0.2	mg/kg wet

Surrogate: O-Terphenyl 3.80 mg/kg wet 5.000 76 40-140

**LCS**

Decane (C10)	1.6	0.2	mg/kg wet	2.500	64	40-140
Docosane (C22)	2.0	0.2	mg/kg wet	2.500	78	40-140
Dodecane (C12)	1.7	0.2	mg/kg wet	2.500	68	40-140
Eicosane (C20)	1.9	0.2	mg/kg wet	2.500	75	40-140
Hexacosane (C26)	2.0	0.2	mg/kg wet	2.500	79	40-140
Hexadecane (C16)	1.8	0.2	mg/kg wet	2.500	72	40-140
Nonadecane (C19)	2.0	0.2	mg/kg wet	2.500	79	40-140
Nonane (C9)	1.4	0.2	mg/kg wet	2.500	56	30-140
Octacosane (C28)	2.0	0.2	mg/kg wet	2.500	79	40-140
Octadecane (C18)	1.8	0.2	mg/kg wet	2.500	71	40-140
Tetracosane (C24)	2.0	0.2	mg/kg wet	2.500	79	40-140
Tetradecane (C14)	1.7	0.2	mg/kg wet	2.500	68	40-140
Total Petroleum Hydrocarbons	25.1	37.5	mg/kg wet	35.00	72	40-140
Triacontane (C30)	2.0	0.2	mg/kg wet	2.500	79	40-140

Surrogate: O-Terphenyl 3.92 mg/kg wet 5.000 78 40-140

**LCS Dup**

Decane (C10)	1.6	0.2	mg/kg wet	2.500	65	40-140	1	25
Docosane (C22)	2.0	0.2	mg/kg wet	2.500	79	40-140	0.8	25
Dodecane (C12)	1.6	0.2	mg/kg wet	2.500	62	40-140	9	25
Eicosane (C20)	1.9	0.2	mg/kg wet	2.500	77	40-140	2	25
Hexacosane (C26)	2.0	0.2	mg/kg wet	2.500	80	40-140	0.8	25
Hexadecane (C16)	1.8	0.2	mg/kg wet	2.500	73	40-140	1	25
Nonadecane (C19)	2.0	0.2	mg/kg wet	2.500	80	40-140	1	25
Nonane (C9)	1.4	0.2	mg/kg wet	2.500	56	30-140	1	25
Octacosane (C28)	2.0	0.2	mg/kg wet	2.500	79	40-140	0.08	25
Octadecane (C18)	1.8	0.2	mg/kg wet	2.500	71	40-140	0.8	25



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1709754

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
<b>8100M Total Petroleum Hydrocarbons</b>										
<b>Batch CI72712 - 3546</b>										
Tetracosane (C24)	2.0	0.2	mg/kg wet	2.500		79	40-140	0.6	25	
Tetradecane (C14)	1.7	0.2	mg/kg wet	2.500		69	40-140	1	25	
Total Petroleum Hydrocarbons	25.4	37.5	mg/kg wet	35.00		73	40-140	0.9	25	
Triacontane (C30)	2.0	0.2	mg/kg wet	2.500		79	40-140	0.4	25	
<i>Surrogate: O-Terphenyl</i>	<i>3.87</i>		mg/kg wet	<i>5.000</i>		<i>77</i>	<i>40-140</i>			
<b>Batch CI72713 - 3546</b>										
<b>Blank</b>										
Decane (C10)	ND	0.2	mg/kg wet							
Docosane (C22)	ND	0.2	mg/kg wet							
Dodecane (C12)	ND	0.2	mg/kg wet							
Eicosane (C20)	ND	0.2	mg/kg wet							
Hexacosane (C26)	ND	0.2	mg/kg wet							
Hexadecane (C16)	ND	0.2	mg/kg wet							
Nonadecane (C19)	ND	0.2	mg/kg wet							
Nonane (C9)	ND	0.2	mg/kg wet							
Octacosane (C28)	ND	0.2	mg/kg wet							
Octadecane (C18)	ND	0.2	mg/kg wet							
Tetracosane (C24)	ND	0.2	mg/kg wet							
Tetradecane (C14)	ND	0.2	mg/kg wet							
Total Petroleum Hydrocarbons	ND	37.5	mg/kg wet							
Triacontane (C30)	ND	0.2	mg/kg wet							
<i>Surrogate: O-Terphenyl</i>	<i>3.70</i>		mg/kg wet	<i>5.000</i>		<i>74</i>	<i>40-140</i>			
<b>LCS</b>										
Decane (C10)	1.7	0.2	mg/kg wet	2.500		66	40-140			
Docosane (C22)	2.0	0.2	mg/kg wet	2.500		78	40-140			
Dodecane (C12)	1.7	0.2	mg/kg wet	2.500		69	40-140			
Eicosane (C20)	1.9	0.2	mg/kg wet	2.500		76	40-140			
Hexacosane (C26)	2.0	0.2	mg/kg wet	2.500		79	40-140			
Hexadecane (C16)	1.8	0.2	mg/kg wet	2.500		72	40-140			
Nonadecane (C19)	2.0	0.2	mg/kg wet	2.500		80	40-140			
Nonane (C9)	1.4	0.2	mg/kg wet	2.500		57	30-140			
Octacosane (C28)	2.0	0.2	mg/kg wet	2.500		78	40-140			
Octadecane (C18)	1.8	0.2	mg/kg wet	2.500		71	40-140			
Tetracosane (C24)	2.0	0.2	mg/kg wet	2.500		78	40-140			
Tetradecane (C14)	1.7	0.2	mg/kg wet	2.500		69	40-140			
Total Petroleum Hydrocarbons	25.4	37.5	mg/kg wet	35.00		73	40-140			
Triacontane (C30)	2.0	0.2	mg/kg wet	2.500		79	40-140			
<i>Surrogate: O-Terphenyl</i>	<i>3.87</i>		mg/kg wet	<i>5.000</i>		<i>77</i>	<i>40-140</i>			
<b>LCS Dup</b>										
Decane (C10)	1.6	0.2	mg/kg wet	2.500		65	40-140	1	25	
Docosane (C22)	2.0	0.2	mg/kg wet	2.500		79	40-140	1	25	
Dodecane (C12)	1.7	0.2	mg/kg wet	2.500		69	40-140	0.8	25	



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1709754

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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8100M Total Petroleum Hydrocarbons

**Batch CI72713 - 3546**

Eicosane (C20)	1.9	0.2	mg/kg wet	2.500		77	40-140	0.7	25	
Hexacosane (C26)	2.0	0.2	mg/kg wet	2.500		80	40-140	1	25	
Hexadecane (C16)	1.8	0.2	mg/kg wet	2.500		73	40-140	0.6	25	
Nonadecane (C19)	2.0	0.2	mg/kg wet	2.500		81	40-140	0.9	25	
Nonane (C9)	1.4	0.2	mg/kg wet	2.500		56	30-140	1	25	
Octacosane (C28)	2.0	0.2	mg/kg wet	2.500		80	40-140	2	25	
Octadecane (C18)	1.8	0.2	mg/kg wet	2.500		72	40-140	1	25	
Tetracosane (C24)	2.0	0.2	mg/kg wet	2.500		79	40-140	1	25	
Tetradecane (C14)	1.7	0.2	mg/kg wet	2.500		69	40-140	0.3	25	
Total Petroleum Hydrocarbons	25.5	37.5	mg/kg wet	35.00		73	40-140	0.4	25	
Triacontane (C30)	2.0	0.2	mg/kg wet	2.500		79	40-140	1	25	

Surrogate: *O-Terphenyl* 3.90 mg/kg wet 5.000 78 40-140

8270D Polynuclear Aromatic Hydrocarbons

**Batch CI72609 - 3546**

**Blank**

2-Methylnaphthalene	ND	0.333	mg/kg wet							
Acenaphthene	ND	0.333	mg/kg wet							
Acenaphthylene	ND	0.333	mg/kg wet							
Anthracene	ND	0.333	mg/kg wet							
Benzo(a)anthracene	ND	0.167	mg/kg wet							
Benzo(a)pyrene	ND	0.083	mg/kg wet							
Benzo(b)fluoranthene	ND	0.167	mg/kg wet							
Benzo(g,h,i)perylene	ND	0.167	mg/kg wet							
Benzo(k)fluoranthene	ND	0.167	mg/kg wet							
Chrysene	ND	0.083	mg/kg wet							
Dibenzo(a,h)Anthracene	ND	0.083	mg/kg wet							
Fluoranthene	ND	0.333	mg/kg wet							
Fluorene	ND	0.333	mg/kg wet							
Indeno(1,2,3-cd)Pyrene	ND	0.167	mg/kg wet							
Naphthalene	ND	0.167	mg/kg wet							
Phenanthrene	ND	0.333	mg/kg wet							
Pyrene	ND	0.333	mg/kg wet							
Surrogate: 1,2-Dichlorobenzene-d4	2.41		mg/kg wet	3.333		72	30-130			
Surrogate: 2-Fluorobiphenyl	2.37		mg/kg wet	3.333		71	30-130			
Surrogate: Nitrobenzene-d5	2.40		mg/kg wet	3.333		72	30-130			
Surrogate: p-Terphenyl-d14	3.04		mg/kg wet	3.333		91	30-130			

**LCS**

2-Methylnaphthalene	2.31	0.333	mg/kg wet	3.333		69	40-140			
Acenaphthene	2.37	0.333	mg/kg wet	3.333		71	40-140			
Acenaphthylene	2.56	0.333	mg/kg wet	3.333		77	40-140			
Anthracene	2.80	0.333	mg/kg wet	3.333		84	40-140			
Benzo(a)anthracene	2.82	0.333	mg/kg wet	3.333		85	40-140			
Benzo(a)pyrene	2.95	0.167	mg/kg wet	3.333		89	40-140			





CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1709754

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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8270D Polynuclear Aromatic Hydrocarbons

**Batch CI72609 - 3546**

Benzo(b)fluoranthene	2.81	0.333	mg/kg wet	3.333		84	40-140			
Benzo(g,h,i)perylene	2.97	0.333	mg/kg wet	3.333		89	40-140			
Benzo(k)fluoranthene	3.25	0.333	mg/kg wet	3.333		97	40-140			
Chrysene	2.96	0.167	mg/kg wet	3.333		89	40-140			
Dibenzo(a,h)Anthracene	2.98	0.167	mg/kg wet	3.333		89	40-140			
Fluoranthene	2.52	0.333	mg/kg wet	3.333		76	40-140			
Fluorene	2.53	0.333	mg/kg wet	3.333		76	40-140			
Indeno(1,2,3-cd)Pyrene	3.04	0.333	mg/kg wet	3.333		91	40-140			
Naphthalene	2.37	0.333	mg/kg wet	3.333		71	40-140			
Phenanthrene	2.72	0.333	mg/kg wet	3.333		82	40-140			
Pyrene	2.39	0.333	mg/kg wet	3.333		72	40-140			
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	2.45		mg/kg wet	3.333		73	30-130			
<i>Surrogate: 2-Fluorobiphenyl</i>	2.59		mg/kg wet	3.333		78	30-130			
<i>Surrogate: Nitrobenzene-d5</i>	2.58		mg/kg wet	3.333		77	30-130			
<i>Surrogate: p-Terphenyl-d14</i>	2.62		mg/kg wet	3.333		78	30-130			

**LCS Dup**

2-Methylnaphthalene	2.22	0.333	mg/kg wet	3.333		67	40-140	4	30	
Acenaphthene	2.38	0.333	mg/kg wet	3.333		71	40-140	0.4	30	
Acenaphthylene	2.57	0.333	mg/kg wet	3.333		77	40-140	0.4	30	
Anthracene	2.88	0.333	mg/kg wet	3.333		86	40-140	3	30	
Benzo(a)anthracene	2.93	0.333	mg/kg wet	3.333		88	40-140	4	30	
Benzo(a)pyrene	3.03	0.167	mg/kg wet	3.333		91	40-140	2	30	
Benzo(b)fluoranthene	2.99	0.333	mg/kg wet	3.333		90	40-140	6	30	
Benzo(g,h,i)perylene	2.99	0.333	mg/kg wet	3.333		90	40-140	0.7	30	
Benzo(k)fluoranthene	3.14	0.333	mg/kg wet	3.333		94	40-140	4	30	
Chrysene	2.93	0.167	mg/kg wet	3.333		88	40-140	1	30	
Dibenzo(a,h)Anthracene	3.04	0.167	mg/kg wet	3.333		91	40-140	2	30	
Fluoranthene	3.06	0.333	mg/kg wet	3.333		92	40-140	19	30	
Fluorene	2.61	0.333	mg/kg wet	3.333		78	40-140	3	30	
Indeno(1,2,3-cd)Pyrene	3.07	0.333	mg/kg wet	3.333		92	40-140	1	30	
Naphthalene	2.35	0.333	mg/kg wet	3.333		70	40-140	0.8	30	
Phenanthrene	2.80	0.333	mg/kg wet	3.333		84	40-140	3	30	
Pyrene	2.57	0.333	mg/kg wet	3.333		77	40-140	7	30	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	2.35		mg/kg wet	3.333		70	30-130			
<i>Surrogate: 2-Fluorobiphenyl</i>	2.49		mg/kg wet	3.333		75	30-130			
<i>Surrogate: Nitrobenzene-d5</i>	2.44		mg/kg wet	3.333		73	30-130			
<i>Surrogate: p-Terphenyl-d14</i>	2.75		mg/kg wet	3.333		83	30-130			

**Batch CI72716 - 3546**

**Blank**

2-Methylnaphthalene	ND	0.333	mg/kg wet							
Acenaphthene	ND	0.333	mg/kg wet							
Acenaphthylene	ND	0.333	mg/kg wet							
Anthracene	ND	0.333	mg/kg wet							
Benzo(a)anthracene	ND	0.333	mg/kg wet							
Benzo(a)pyrene	ND	0.167	mg/kg wet							



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1709754

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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8270D Polynuclear Aromatic Hydrocarbons

**Batch CI72716 - 3546**

Benzo(b)fluoranthene	ND	0.333	mg/kg wet							
Benzo(g,h,i)perylene	ND	0.333	mg/kg wet							
Benzo(k)fluoranthene	ND	0.333	mg/kg wet							
Chrysene	ND	0.167	mg/kg wet							
Dibenzo(a,h)Anthracene	ND	0.167	mg/kg wet							
Fluoranthene	ND	0.333	mg/kg wet							
Fluorene	ND	0.333	mg/kg wet							
Indeno(1,2,3-cd)Pyrene	ND	0.333	mg/kg wet							
Naphthalene	ND	0.333	mg/kg wet							
Phenanthrene	ND	0.333	mg/kg wet							
Pyrene	ND	0.333	mg/kg wet							
Surrogate: 1,2-Dichlorobenzene-d4	2.64		mg/kg wet	3.333		79	30-130			
Surrogate: 2-Fluorobiphenyl	2.78		mg/kg wet	3.333		83	30-130			
Surrogate: Nitrobenzene-d5	2.60		mg/kg wet	3.333		78	30-130			
Surrogate: p-Terphenyl-d14	3.30		mg/kg wet	3.333		99	30-130			

**LCS**

2-Methylnaphthalene	2.77	0.333	mg/kg wet	3.333		83	40-140			
Acenaphthene	2.77	0.333	mg/kg wet	3.333		83	40-140			
Acenaphthylene	2.97	0.333	mg/kg wet	3.333		89	40-140			
Anthracene	2.89	0.333	mg/kg wet	3.333		87	40-140			
Benzo(a)anthracene	2.98	0.333	mg/kg wet	3.333		89	40-140			
Benzo(a)pyrene	3.02	0.167	mg/kg wet	3.333		91	40-140			
Benzo(b)fluoranthene	2.99	0.333	mg/kg wet	3.333		90	40-140			
Benzo(g,h,i)perylene	2.91	0.333	mg/kg wet	3.333		87	40-140			
Benzo(k)fluoranthene	3.16	0.333	mg/kg wet	3.333		95	40-140			
Chrysene	2.96	0.167	mg/kg wet	3.333		89	40-140			
Dibenzo(a,h)Anthracene	2.96	0.167	mg/kg wet	3.333		89	40-140			
Fluoranthene	3.15	0.333	mg/kg wet	3.333		95	40-140			
Fluorene	3.08	0.333	mg/kg wet	3.333		92	40-140			
Indeno(1,2,3-cd)Pyrene	2.93	0.333	mg/kg wet	3.333		88	40-140			
Naphthalene	2.79	0.333	mg/kg wet	3.333		84	40-140			
Phenanthrene	2.78	0.333	mg/kg wet	3.333		83	40-140			
Pyrene	2.89	0.333	mg/kg wet	3.333		87	40-140			
Surrogate: 1,2-Dichlorobenzene-d4	2.70		mg/kg wet	3.333		81	30-130			
Surrogate: 2-Fluorobiphenyl	3.00		mg/kg wet	3.333		90	30-130			
Surrogate: Nitrobenzene-d5	2.79		mg/kg wet	3.333		84	30-130			
Surrogate: p-Terphenyl-d14	3.11		mg/kg wet	3.333		93	30-130			

**LCS Dup**

2-Methylnaphthalene	2.44	0.333	mg/kg wet	3.333		73	40-140	12	30	
Acenaphthene	2.47	0.333	mg/kg wet	3.333		74	40-140	12	30	
Acenaphthylene	2.68	0.333	mg/kg wet	3.333		80	40-140	10	30	
Anthracene	2.77	0.333	mg/kg wet	3.333		83	40-140	4	30	
Benzo(a)anthracene	2.87	0.333	mg/kg wet	3.333		86	40-140	4	30	
Benzo(a)pyrene	2.96	0.167	mg/kg wet	3.333		89	40-140	2	30	
Benzo(b)fluoranthene	2.94	0.333	mg/kg wet	3.333		88	40-140	2	30	



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1709754

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
<b>8270D Polynuclear Aromatic Hydrocarbons</b>										
<b>Batch CI72716 - 3546</b>										
Benzo(g,h,i)perylene	2.93	0.333	mg/kg wet	3.333		88	40-140	0.7	30	
Benzo(k)fluoranthene	3.07	0.333	mg/kg wet	3.333		92	40-140	3	30	
Chrysene	2.88	0.167	mg/kg wet	3.333		86	40-140	3	30	
Dibenzo(a,h)Anthracene	2.96	0.167	mg/kg wet	3.333		89	40-140	0	30	
Fluoranthene	2.94	0.333	mg/kg wet	3.333		88	40-140	7	30	
Fluorene	2.78	0.333	mg/kg wet	3.333		83	40-140	10	30	
Indeno(1,2,3-cd)Pyrene	2.92	0.333	mg/kg wet	3.333		88	40-140	0.1	30	
Naphthalene	2.48	0.333	mg/kg wet	3.333		74	40-140	12	30	
Phenanthrene	2.65	0.333	mg/kg wet	3.333		80	40-140	5	30	
Pyrene	2.82	0.333	mg/kg wet	3.333		84	40-140	3	30	
Surrogate: 1,2-Dichlorobenzene-d4	2.36		mg/kg wet	3.333		71	30-130			
Surrogate: 2-Fluorobiphenyl	2.58		mg/kg wet	3.333		78	30-130			
Surrogate: Nitrobenzene-d5	2.41		mg/kg wet	3.333		72	30-130			
Surrogate: p-Terphenyl-d14	2.94		mg/kg wet	3.333		88	30-130			

Classical Chemistry

<b>Batch CI72918 - TCN Prep</b>										
<b>Blank</b>										
Total Cyanide	ND	1.00	mg/kg wet							
<b>LCS</b>										
Total Cyanide	5.06	1.00	mg/kg wet	5.015		101	90-110			
<b>Reference</b>										
Total Cyanide	48.4	4.85	mg/kg wet	48.40		100	36.1577-206.6 12			
<b>Reference</b>										
Total Cyanide	50.1	4.88	mg/kg wet	48.40		104	36.1577-206.6 12			
<b>Batch CJ70215 - TCN Prep</b>										
<b>Blank</b>										
Total Cyanide	ND	1.00	mg/kg wet							
<b>LCS</b>										
Total Cyanide	5.06	1.00	mg/kg wet	5.015		101	90-110			
<b>Reference</b>										
Total Cyanide	49.8	4.84	mg/kg wet	48.40		103	36.1577-206.6 12			
<b>Reference</b>										
Total Cyanide	51.1	4.92	mg/kg wet	48.40		105	36.1577-206.6 12			



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1709754

**Notes and Definitions**

- U Analyte included in the analysis, but not detected
- SD Surrogate recovery(ies) diluted below the MRL (SD).
- J Reported between MDL and MRL
- E Reported above the quantitation limit; Estimated value (E).
- D Diluted.
- CD- Continuing Calibration %Diff/Drift is below control limit (CD-).
- ND Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference
- MDL Method Detection Limit
- MRL Method Reporting Limit
- LOD Limit of Detection
- LOQ Limit of Quantitation
- DL Detection Limit
- I/V Initial Volume
- F/V Final Volume
- § Subcontracted analysis; see attached report
- 1 Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
- 2 Range result excludes concentrations of target analytes eluting in that range.
- 3 Range result excludes the concentration of the C9-C10 aromatic range.
- Avg Results reported as a mathematical average.
- NR No Recovery
- [CALC] Calculated Analyte
- SUB Subcontracted analysis; see attached report
- RL Reporting Limit
- EDL Estimated Detection Limit



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1709754

**ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS**

**ENVIRONMENTAL**

Rhode Island Potable and Non Potable Water: LAI00179

<http://www.health.ri.gov/find/labs/analytical/ESS.pdf>

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750

[http://www.ct.gov/dph/lib/dph/environmental\\_health/environmental\\_laboratories/pdf/OutofStateCommercialLaboratories.pdf](http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf)

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002

<http://www.maine.gov/dhhs/meecd/environmental-health/dwp/partners/labCert.shtml>

Massachusetts Potable and Non Potable Water: M-RI002

<http://public.dep.state.ma.us/Labcert/Labcert.aspx>

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424

<http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm>

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313

<http://www.wadsworth.org/labcert/elap/comm.html>

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006

[http://datamine2.state.nj.us/DEP\\_OPRA/OpraMain/pi\\_main?mode=pi\\_by\\_site&sort\\_order=PI\\_NAMEA&Select+a+Site:=58715](http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715)

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752

<http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx>

## ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Providence, RI - GZA/HDM

ESS Project ID: 1709754

Shipped/Delivered Via: ESS Courier

Date Received: 9/26/2017

Project Due Date: 10/3/2017

Days for Project: 5 Day

1. Air bill manifest present?  No  
Air No.: NA
2. Were custody seals present?  No
3. Is radiation count <100 CPM?  Yes
4. Is a Cooler Present?  Yes  
Temp: 5.3 Iced with: Ice
5. Was COC signed and dated by client?  Yes

6. Does COC match bottles?  Yes
7. Is COC complete and correct?  Yes
8. Were samples received intact?  Yes
9. Were labs informed about short holds & rushes? Yes / No /  NA
10. Were any analyses received outside of hold time? Yes  No

11. Any Subcontracting needed? Yes /  No  
ESS Sample IDs: \_\_\_\_\_  
Analysis: \_\_\_\_\_  
TAT: \_\_\_\_\_

12. Were VOAs received?  Yes / No  
a. Air bubbles in aqueous VOAs?  Yes / No  
b. Does methanol cover soil completely?  Yes / No / NA

13. Are the samples properly preserved?  Yes / No  
a. If metals preserved upon receipt: Date: 9/26/17 Time: 1959 By: [Signature]  
b. Low Level VOA vials frozen: Date: \_\_\_\_\_ Time: \_\_\_\_\_ By: \_\_\_\_\_

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes /  No  
a. Was there a need to contact the client? Yes / No  
Who was contacted? \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_ By: \_\_\_\_\_

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
01	167450	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
01	167487	Yes	NA	Yes	VOA Vial - Other	Other	
01	167488	Yes	NA	Yes	VOA Vial - Other	Other	
01	167535	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
01	167536	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
01	167574	Yes	NA	Yes	2 oz. Jar - Unpres	NP	
02	167449	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
02	167485	Yes	NA	Yes	VOA Vial - Other	Other	
02	167486	Yes	NA	Yes	VOA Vial - Other	Other	
02	167533	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
02	167534	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
02	167573	Yes	NA	Yes	2 oz. Jar - Unpres	NP	
03	167448	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
03	167483	Yes	NA	Yes	VOA Vial - Other	Other	
03	167484	Yes	NA	Yes	VOA Vial - Other	Other	
03	167531	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
03	167532	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
03	167572	Yes	NA	Yes	2 oz. Jar - Unpres	NP	
04	167447	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
04	167481	Yes	NA	Yes	VOA Vial - Other	Other	
04	167482	Yes	NA	Yes	VOA Vial - Other	Other	
04	167529	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
04	167530	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
04	167571	Yes	NA	Yes	2 oz. Jar - Unpres	NP	



## ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Providence, RI - GZA/HDM

ESS Project ID: 1709754

Date Received: 9/26/2017

05	167446	Yes	NA	Yes	VOA Vial - Methanol	MeOH
05	167479	Yes	NA	Yes	VOA Vial - Other	Other
05	167480	Yes	NA	Yes	VOA Vial - Other	Other
05	167527	Yes	NA	Yes	4 oz. Jar - Unpres	NP
05	167528	Yes	NA	Yes	4 oz. Jar - Unpres	NP
05	167570	Yes	NA	Yes	2 oz. Jar - Unpres	NP
06	167445	Yes	NA	Yes	VOA Vial - Methanol	MeOH
06	167477	Yes	NA	Yes	VOA Vial - Other	Other
06	167478	Yes	NA	Yes	VOA Vial - Other	Other
06	167525	Yes	NA	Yes	4 oz. Jar - Unpres	NP
06	167526	Yes	NA	Yes	4 oz. Jar - Unpres	NP
06	167569	Yes	NA	Yes	2 oz. Jar - Unpres	NP
07	167444	Yes	NA	Yes	VOA Vial - Methanol	MeOH
07	167475	Yes	NA	Yes	VOA Vial - Other	Other
07	167476	Yes	NA	Yes	VOA Vial - Other	Other
07	167523	Yes	NA	Yes	4 oz. Jar - Unpres	NP
07	167524	Yes	NA	Yes	4 oz. Jar - Unpres	NP
07	167568	Yes	NA	Yes	2 oz. Jar - Unpres	NP
08	167443	Yes	NA	Yes	VOA Vial - Methanol	MeOH
08	167473	Yes	NA	Yes	VOA Vial - Other	Other
08	167474	Yes	NA	Yes	VOA Vial - Other	Other
08	167521	Yes	NA	Yes	4 oz. Jar - Unpres	NP
08	167522	Yes	NA	Yes	4 oz. Jar - Unpres	NP
08	167567	Yes	NA	Yes	2 oz. Jar - Unpres	NP
09	167442	Yes	NA	Yes	VOA Vial - Methanol	MeOH
09	167471	Yes	NA	Yes	VOA Vial - Other	Other
09	167472	Yes	NA	Yes	VOA Vial - Other	Other
09	167519	Yes	NA	Yes	4 oz. Jar - Unpres	NP
09	167520	Yes	NA	Yes	4 oz. Jar - Unpres	NP
09	167566	Yes	NA	Yes	2 oz. Jar - Unpres	NP
10	167441	Yes	NA	Yes	VOA Vial - Methanol	MeOH
10	167469	Yes	NA	Yes	VOA Vial - Other	Other
10	167470	Yes	NA	Yes	VOA Vial - Other	Other
10	167517	Yes	NA	Yes	4 oz. Jar - Unpres	NP
10	167518	Yes	NA	Yes	4 oz. Jar - Unpres	NP
10	167565	Yes	NA	Yes	2 oz. Jar - Unpres	NP
11	167440	Yes	NA	Yes	VOA Vial - Methanol	MeOH
11	167467	Yes	NA	Yes	VOA Vial - Other	Other
11	167468	Yes	NA	Yes	VOA Vial - Other	Other
11	167515	Yes	NA	Yes	4 oz. Jar - Unpres	NP
11	167516	Yes	NA	Yes	4 oz. Jar - Unpres	NP
11	167564	Yes	NA	Yes	2 oz. Jar - Unpres	NP
12	167439	Yes	NA	Yes	VOA Vial - Methanol	MeOH
12	167465	Yes	NA	Yes	VOA Vial - Other	Other
12	167466	Yes	NA	Yes	VOA Vial - Other	Other
12	167513	Yes	NA	Yes	4 oz. Jar - Unpres	NP
12	167514	Yes	NA	Yes	4 oz. Jar - Unpres	NP
12	167563	Yes	NA	Yes	2 oz. Jar - Unpres	NP
13	167438	Yes	NA	Yes	VOA Vial - Methanol	MeOH
13	167463	Yes	NA	Yes	VOA Vial - Other	Other
13	167464	Yes	NA	Yes	VOA Vial - Other	Other
13	167511	Yes	NA	Yes	4 oz. Jar - Unpres	NP
13	167512	Yes	NA	Yes	4 oz. Jar - Unpres	NP
13	167562	Yes	NA	Yes	2 oz. Jar - Unpres	NP
14	167437	Yes	NA	Yes	VOA Vial - Methanol	MeOH
14	167461	Yes	NA	Yes	VOA Vial - Other	Other
14	167462	Yes	NA	Yes	VOA Vial - Other	Other
14	167509	Yes	NA	Yes	4 oz. Jar - Unpres	NP
14	167510	Yes	NA	Yes	4 oz. Jar - Unpres	NP
14	167561	Yes	NA	Yes	2 oz. Jar - Unpres	NP
15	167436	Yes	NA	Yes	VOA Vial - Methanol	MeOH
15	167459	Yes	NA	Yes	VOA Vial - Other	Other
15	167460	Yes	NA	Yes	VOA Vial - Other	Other
15	167507	Yes	NA	Yes	4 oz. Jar - Unpres	NP
15	167508	Yes	NA	Yes	4 oz. Jar - Unpres	NP
15	167560	Yes	NA	Yes	2 oz. Jar - Unpres	NP
16	167435	Yes	NA	Yes	VOA Vial - Methanol	MeOH
16	167457	Yes	NA	Yes	VOA Vial - Other	Other
16	167458	Yes	NA	Yes	VOA Vial - Other	Other
16	167505	Yes	NA	Yes	4 oz. Jar - Unpres	NP

## ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Providence, RI - GZA/HDM

ESS Project ID: 1709754

Date Received: 9/26/2017

16	167506	Yes	NA	Yes	4 oz. Jar - Unpres	NP
16	167559	Yes	NA	Yes	2 oz. Jar - Unpres	NP
17	167434	Yes	NA	Yes	VOA Vial - Methanol	MeOH
17	167455	Yes	NA	Yes	VOA Vial - Other	Other
17	167456	Yes	NA	Yes	VOA Vial - Other	Other
17	167503	Yes	NA	Yes	4 oz. Jar - Unpres	NP
17	167504	Yes	NA	Yes	4 oz. Jar - Unpres	NP
17	167558	Yes	NA	Yes	2 oz. Jar - Unpres	NP
18	167433	Yes	NA	Yes	VOA Vial - Methanol	MeOH
18	167453	Yes	NA	Yes	VOA Vial - Other	Other
18	167454	Yes	NA	Yes	VOA Vial - Other	Other
18	167501	Yes	NA	Yes	4 oz. Jar - Unpres	NP
18	167502	Yes	NA	Yes	4 oz. Jar - Unpres	NP
18	167557	Yes	NA	Yes	2 oz. Jar - Unpres	NP
19	167432	Yes	NA	Yes	VOA Vial - Methanol	MeOH
19	167451	Yes	NA	Yes	VOA Vial - Other	Other

**2nd Review**

Are barcode labels on correct containers?

Yes  No

Completed

By: [Signature]

Date & Time: 9/26/17 1958

Reviewed

By: [Signature]

Date & Time: 9/26/17 2009

Delivered

By: [Signature]

Date & Time: 9/26/17 2009

ESS Laboratory

Division of Thielsch Engineering, Inc.  
 185 Frances Avenue, Cranston RI 02910  
 Tel. (401) 461-7181 Fax (401) 461-4486  
 www.esslaboratory.com

CHAIN OF CUSTODY

Turn Time 5-Day Rush  
 Regulatory State Rhode Island  
 Is this project for any of the following?:  
 OCT RCP  MA MCP  ORGP  
 Project # 05.0043654.00 Project Name Former Tidewater Facility  
 Address 530 Broadway  
 City Providence State RI Zip Code 02909 PO # 43654  
 Telephone Number 401-421-4140 FAX Number Email Address sean.connelly@gza.com

ESS Lab # 1709754  
 Reporting Limits RIDEM R-DEC and GB Leachability  
 Electronic  Limit Checker  Standard Excel  
 Deliverables  Other (Please Specify →)

Company Name GZA  
 Contact Person Sean Connelly  
 City Providence State RI  
 Telephone Number 401-421-4140

ESS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID
19	9/26/17	0800	---	---	TB-092617
1	9/26/17	0815	Grab	Soil	GZ-SS-518 (0-2') hdm 9/27/17
2	9/26/17	0825	Grab	Soil	GZ-SS-519
3	9/26/17	0840	Grab	Soil	GZ-SS-520
4	9/26/17	0850	Grab	Soil	GZ-SS-521
5	9/26/17	0905	Grab	Soil	GZ-SS-522
6	9/26/17	0920	Grab	Soil	GZ-SS-523
7	9/26/17	1000	Grab	Soil	GZ-SS-524
8	9/26/17	1030	Grab	Soil	GZ-SS-525
9	9/26/17	1135	Grab	Soil	GZ-SS-526

Analysis	Deliverables										
	VOC (P606)	TPH (P606)	PAHs (P606)	AP-13 Metals	Total Cyanide						
X	X	X	X	X							
X	X	X	X	X							
X	X	X	X	X							
X	X	X	X	X							
X	X	X	X	X							
X	X	X	X	X							
X	X	X	X	X							
X	X	X	X	X							

Container Type: AC-Air Cassette AG-Amber Glass B-BOD Bottle C-Cubitainer G - Glass O-Other P-Poly S-Sterile V-Vial  
 Container Volume: 1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other\*  
 Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAce, NaOH 9-NH4Cl 10-DI H2O 11-Other\*  
 Number of Containers per Sample: 3

Laboratory Use Only  
 Cooler Present: Yes  
 Seals Intact: N/A  
 Cooler Temperature: 5.3°C ice Mmm 9/26/17

Sampled by: Sean Connelly, Sarah McLeod, Erik Beloff  
 Comments: Please specify "Other" preservative and containers types in this space  
 NGRID rates apply  
 Please email sarah.mcleod@gza.com also

Relinquished by: (Signature, Date & Time) <i>Sean Connelly</i> 9/26/17 1530	Received By: (Signature, Date & Time) <i>[Signature]</i> 9/26/17 1530	Relinquished By: (Signature, Date & Time) <i>[Signature]</i> 9/26/17 1555	Received By: (Signature, Date & Time) <i>[Signature]</i> 9/26/17 1858
--	--	--	--















## CERTIFICATE OF ANALYSIS

Sarah McLeod  
GZA GeoEnvironmental, Inc.  
530 Broadway  
Providence, RI 02909

**RE: Former Tidewater Facility (05.0043654.00)**  
**ESS Laboratory Work Order Number: 1709779**

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.



Laurel Stoddard  
Laboratory Director

**REVIEWED**

*By ESS Laboratory at 4:52 pm, Oct 05, 2017*

**Analytical Summary**

The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1709779

**SAMPLE RECEIPT**

The following samples were received on September 27, 2017 for the analyses specified on the enclosed Chain of Custody Record.

**Low Level VOA vials were frozen by ESS Laboratory on September 27, 2017 at 17:06.**

<u>Lab Number</u>	<u>Sample Name</u>	<u>Matrix</u>	<u>Analysis</u>
1709779-01	GZ SS-535 (0-2')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1709779-02	GZ SS-536 (0-2')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1709779-03	GZ SS-537 (0-2')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1709779-04	GZ SS-538 (0-2')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1709779-05	GZ SS-539 (0-2')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1709779-06	GZ SS-556 (0-2')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1709779-07	GZ SS-557 (0-2')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1709779-08	GZ SS-558 (0-2')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1709779-09	GZ SS-559 (0-2')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1709779-10	GZ SS-560 (0-2')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1709779-11	TB-092717	Solid	8260B Low

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1709779

PROJECT NARRATIVE

**5035/8260B Volatile Organic Compounds / Low Level**

1709779-01 Internal Standard(s) outside of criteria. Sample was reanalyzed to confirm (IC).  
1,4-Dichlorobenzene-D4 (34% @ 50-200%)

1709779-01 Surrogate recovery(ies) outside of criteria. Reextraction/Reanalysis confirms results (SC).  
4-Bromofluorobenzene (68% @ 70-130%)

1709779-02 Internal Standard(s) outside of criteria. Sample was reanalyzed to confirm (IC).  
1,4-Dichlorobenzene-D4 (28% @ 50-200%)

1709779-02 Surrogate recovery(ies) outside of criteria. Reextraction/Reanalysis confirms results (SC).  
4-Bromofluorobenzene (69% @ 70-130%)

1709779-03 Internal Standard(s) outside of criteria. Sample was reanalyzed to confirm (IC).  
1,4-Dichlorobenzene-D4 (48% @ 50-200%)

1709779-05 Internal Standard(s) outside of criteria. Sample was reanalyzed to confirm (IC).  
1,4-Dichlorobenzene-D4 (39% @ 50-200%)

1709779-06 Internal Standard(s) outside of criteria. Sample was reanalyzed to confirm (IC).  
1,4-Dichlorobenzene-D4 (35% @ 50-200%)

1709779-06 Surrogate recovery(ies) below lower control limit (S-).  
4-Bromofluorobenzene (67% @ 70-130%)

1709779-08 Internal Standard(s) outside of criteria. Sample was reanalyzed to confirm (IC).  
1,4-Dichlorobenzene-D4 (32% @ 50-200%)

1709779-08 Surrogate recovery(ies) outside of criteria. Reextraction/Reanalysis confirms results (SC).  
4-Bromofluorobenzene (67% @ 70-130%)

1709779-09 Internal Standard(s) outside of criteria. Sample was reanalyzed to confirm (IC).  
1,4-Dichlorobenzene-D4 (46% @ 50-200%)

1709779-10 Internal Standard(s) outside of criteria. Sample was reanalyzed to confirm (IC).  
1,4-Dichlorobenzene-D4 (24% @ 50-200%), Chlorobenzene-d5 (47% @ 50-200%)

1709779-10 Surrogate recovery(ies) outside of criteria. Reextraction/Reanalysis confirms results (SC).  
4-Bromofluorobenzene (62% @ 70-130%), Toluene-d8 (132% @ 70-130%)

**Total Metals**

CJ70220-BSD1 Blank Spike recovery is below lower control limit (B-).  
Cadmium (79% @ 80-120%)

**No other observations noted.**

**End of Project Narrative.**



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1709779

**DATA USABILITY LINKS**

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- [Definitions of Quality Control Parameters](#)
- [Semivolatile Organics Internal Standard Information](#)
- [Semivolatile Organics Surrogate Information](#)
- [Volatile Organics Internal Standard Information](#)
- [Volatile Organics Surrogate Information](#)
- [EPH and VPH Alkane Lists](#)

**CURRENT SW-846 METHODOLOGY VERSIONS**

**Analytical Methods**

- 1010A - Flashpoint
- 6010C - ICP
- 6020A - ICP MS
- 7010 - Graphite Furnace
- 7196A - Hexavalent Chromium
- 7470A - Aqueous Mercury
- 7471B - Solid Mercury
- 8011 - EDB/DBCP/TCP
- 8015C - GRO/DRO
- 8081B - Pesticides
- 8082A - PCB
- 8100M - TPH
- 8151A - Herbicides
- 8260B - VOA
- 8270D - SVOA
- 8270D SIM - SVOA Low Level
- 9014 - Cyanide
- 9038 - Sulfate
- 9040C - Aqueous pH
- 9045D - Solid pH (Corrosivity)
- 9050A - Specific Conductance
- 9056A - Anions (IC)
- 9060A - TOC
- 9095B - Paint Filter
- MADEP 04-1.1 - EPH / VPH

**Prep Methods**

- 3005A - Aqueous ICP Digestion
- 3020A - Aqueous Graphite Furnace / ICP MS Digestion
- 3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
- 3060A - Solid Hexavalent Chromium Digestion
- 3510C - Separatory Funnel Extraction
- 3520C - Liquid / Liquid Extraction
- 3540C - Manual Soxhlet Extraction
- 3541 - Automated Soxhlet Extraction
- 3546 - Microwave Extraction
- 3580A - Waste Dilution
- 5030B - Aqueous Purge and Trap
- 5030C - Aqueous Purge and Trap
- 5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ SS-535 (0-2')  
 Date Sampled: 09/27/17 08:20  
 Percent Solids: 94

ESS Laboratory Work Order: 1709779  
 ESS Laboratory Sample ID: 1709779-01  
 Sample Matrix: Soil  
 Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (1.98)		6020A		20	NAR	10/04/17 10:24	2.16	100	CJ70220
Arsenic	<b>5.86</b> (2.47)		6010C		1	KJK	10/03/17 23:19	2.16	100	CJ70220
Beryllium	<b>0.14</b> (0.11)		6010C		1	KJK	10/03/17 23:19	2.16	100	CJ70220
Cadmium	ND (0.49)		6010C		1	KJK	10/03/17 23:19	2.16	100	CJ70220
Chromium	<b>2.68</b> (0.99)		6010C		1	KJK	10/03/17 23:19	2.16	100	CJ70220
Copper	<b>33.0</b> (2.47)		6010C		1	KJK	10/03/17 23:19	2.16	100	CJ70220
Lead	<b>154</b> (4.94)		6010C		1	KJK	10/03/17 23:19	2.16	100	CJ70220
Mercury	<b>1.24</b> (0.173)		7471B		5	MJV	10/02/17 14:23	0.61	40	CI72941
Nickel	<b>52.0</b> (2.47)		6010C		1	KJK	10/03/17 23:19	2.16	100	CJ70220
Selenium	ND (1.98)		6020A		20	NAR	10/04/17 10:24	2.16	100	CJ70220
Silver	ND (0.49)		6010C		1	KJK	10/03/17 23:19	2.16	100	CJ70220
Thallium	ND (1.98)		6020A		20	NAR	10/04/17 10:24	2.16	100	CJ70220
Zinc	<b>39.1</b> (2.47)		6010C		1	KJK	10/03/17 23:19	2.16	100	CJ70220



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ SS-535 (0-2')  
 Date Sampled: 09/27/17 08:20  
 Percent Solids: 94  
 Initial Volume: 6.4  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709779  
 ESS Laboratory Sample ID: 1709779-01  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MD

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0042)		8260B Low		1	09/28/17 16:16	C7I0471	CI72831
1,1,1-Trichloroethane	ND (0.0042)		8260B Low		1	09/28/17 16:16	C7I0471	CI72831
1,1,2,2-Tetrachloroethane	ND (0.0042)		8260B Low		1	09/28/17 16:16	C7I0471	CI72831
1,1,2-Trichloroethane	ND (0.0042)		8260B Low		1	09/28/17 16:16	C7I0471	CI72831
1,1-Dichloroethane	ND (0.0042)		8260B Low		1	09/28/17 16:16	C7I0471	CI72831
1,1-Dichloroethene	ND (0.0042)		8260B Low		1	09/28/17 16:16	C7I0471	CI72831
1,1-Dichloropropene	ND (0.0042)		8260B Low		1	09/28/17 16:16	C7I0471	CI72831
1,2,3-Trichlorobenzene	ND (0.0042)		8260B Low		1	09/28/17 16:16	C7I0471	CI72831
1,2,3-Trichloropropane	ND (0.0042)		8260B Low		1	09/28/17 16:16	C7I0471	CI72831
1,2,4-Trichlorobenzene	ND (0.0042)		8260B Low		1	09/28/17 16:16	C7I0471	CI72831
1,2,4-Trimethylbenzene	ND (0.0042)		8260B Low		1	09/28/17 16:16	C7I0471	CI72831
1,2-Dibromo-3-Chloropropane	ND (0.0042)		8260B Low		1	09/28/17 16:16	C7I0471	CI72831
1,2-Dibromoethane	ND (0.0042)		8260B Low		1	09/28/17 16:16	C7I0471	CI72831
1,2-Dichlorobenzene	ND (0.0042)		8260B Low		1	09/28/17 16:16	C7I0471	CI72831
1,2-Dichloroethane	ND (0.0042)		8260B Low		1	09/28/17 16:16	C7I0471	CI72831
1,2-Dichloropropane	ND (0.0042)		8260B Low		1	09/28/17 16:16	C7I0471	CI72831
1,3,5-Trimethylbenzene	ND (0.0042)		8260B Low		1	09/28/17 16:16	C7I0471	CI72831
1,3-Dichlorobenzene	ND (0.0042)		8260B Low		1	09/28/17 16:16	C7I0471	CI72831
1,3-Dichloropropane	ND (0.0042)		8260B Low		1	09/28/17 16:16	C7I0471	CI72831
1,4-Dichlorobenzene	ND (0.0042)		8260B Low		1	09/28/17 16:16	C7I0471	CI72831
1,4-Dioxane	ND (0.0833)		8260B Low		1	09/28/17 16:16	C7I0471	CI72831
1-Chlorohexane	ND (0.0042)		8260B Low		1	09/28/17 16:16	C7I0471	CI72831
2,2-Dichloropropane	ND (0.0042)		8260B Low		1	09/28/17 16:16	C7I0471	CI72831
2-Butanone	ND (0.0417)		8260B Low		1	09/28/17 16:16	C7I0471	CI72831
2-Chlorotoluene	ND (0.0042)		8260B Low		1	09/28/17 16:16	C7I0471	CI72831
2-Hexanone	ND (0.0417)		8260B Low		1	09/28/17 16:16	C7I0471	CI72831
4-Chlorotoluene	ND (0.0042)		8260B Low		1	09/28/17 16:16	C7I0471	CI72831
4-Isopropyltoluene	ND (0.0042)		8260B Low		1	09/28/17 16:16	C7I0471	CI72831
4-Methyl-2-Pentanone	ND (0.0417)		8260B Low		1	09/28/17 16:16	C7I0471	CI72831
Acetone	ND (0.0417)		8260B Low		1	09/28/17 16:16	C7I0471	CI72831
Benzene	ND (0.0042)		8260B Low		1	09/28/17 16:16	C7I0471	CI72831
Bromobenzene	ND (0.0042)		8260B Low		1	09/28/17 16:16	C7I0471	CI72831





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ SS-535 (0-2')  
Date Sampled: 09/27/17 08:20  
Percent Solids: 94  
Initial Volume: 6.4  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1709779  
ESS Laboratory Sample ID: 1709779-01  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MD

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0042)		8260B Low		1	09/28/17 16:16	C7I0471	CI72831
Bromodichloromethane	ND (0.0042)		8260B Low		1	09/28/17 16:16	C7I0471	CI72831
Bromoform	ND (0.0042)		8260B Low		1	09/28/17 16:16	C7I0471	CI72831
Bromomethane	ND (0.0083)		8260B Low		1	09/28/17 16:16	C7I0471	CI72831
<b>Carbon Disulfide</b>	<b>0.0048</b> (0.0042)		8260B Low		1	09/28/17 16:16	C7I0471	CI72831
Carbon Tetrachloride	ND (0.0042)		8260B Low		1	09/28/17 16:16	C7I0471	CI72831
Chlorobenzene	ND (0.0042)		8260B Low		1	09/28/17 16:16	C7I0471	CI72831
Chloroethane	ND (0.0083)		8260B Low		1	09/28/17 16:16	C7I0471	CI72831
Chloroform	ND (0.0042)		8260B Low		1	09/28/17 16:16	C7I0471	CI72831
Chloromethane	ND (0.0083)		8260B Low		1	09/28/17 16:16	C7I0471	CI72831
cis-1,2-Dichloroethene	ND (0.0042)		8260B Low		1	09/28/17 16:16	C7I0471	CI72831
cis-1,3-Dichloropropene	ND (0.0042)		8260B Low		1	09/28/17 16:16	C7I0471	CI72831
Dibromochloromethane	ND (0.0042)		8260B Low		1	09/28/17 16:16	C7I0471	CI72831
Dibromomethane	ND (0.0042)		8260B Low		1	09/28/17 16:16	C7I0471	CI72831
Dichlorodifluoromethane	ND (0.0083)		8260B Low		1	09/28/17 16:16	C7I0471	CI72831
Diethyl Ether	ND (0.0042)		8260B Low		1	09/28/17 16:16	C7I0471	CI72831
Di-isopropyl ether	ND (0.0042)		8260B Low		1	09/28/17 16:16	C7I0471	CI72831
Ethyl tertiary-butyl ether	ND (0.0042)		8260B Low		1	09/28/17 16:16	C7I0471	CI72831
Ethylbenzene	ND (0.0042)		8260B Low		1	09/28/17 16:16	C7I0471	CI72831
Hexachlorobutadiene	ND (0.0042)		8260B Low		1	09/28/17 16:16	C7I0471	CI72831
Isopropylbenzene	ND (0.0042)		8260B Low		1	09/28/17 16:16	C7I0471	CI72831
Methyl tert-Butyl Ether	ND (0.0042)		8260B Low		1	09/28/17 16:16	C7I0471	CI72831
Methylene Chloride	ND (0.0208)		8260B Low		1	09/28/17 16:16	C7I0471	CI72831
Naphthalene	ND (0.0042)		8260B Low		1	09/28/17 16:16	C7I0471	CI72831
n-Butylbenzene	ND (0.0042)		8260B Low		1	09/28/17 16:16	C7I0471	CI72831
n-Propylbenzene	ND (0.0042)		8260B Low		1	09/28/17 16:16	C7I0471	CI72831
sec-Butylbenzene	ND (0.0042)		8260B Low		1	09/28/17 16:16	C7I0471	CI72831
Styrene	ND (0.0042)		8260B Low		1	09/28/17 16:16	C7I0471	CI72831
tert-Butylbenzene	ND (0.0042)		8260B Low		1	09/28/17 16:16	C7I0471	CI72831
Tertiary-amyl methyl ether	ND (0.0042)		8260B Low		1	09/28/17 16:16	C7I0471	CI72831
Tetrachloroethene	ND (0.0042)		8260B Low		1	09/28/17 16:16	C7I0471	CI72831
Tetrahydrofuran	ND (0.0042)		8260B Low		1	09/28/17 16:16	C7I0471	CI72831



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ SS-535 (0-2')  
 Date Sampled: 09/27/17 08:20  
 Percent Solids: 94  
 Initial Volume: 6.4  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709779  
 ESS Laboratory Sample ID: 1709779-01  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MD

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0042)		8260B Low		1	09/28/17 16:16	C7I0471	CI72831
trans-1,2-Dichloroethene	ND (0.0042)		8260B Low		1	09/28/17 16:16	C7I0471	CI72831
trans-1,3-Dichloropropene	ND (0.0042)		8260B Low		1	09/28/17 16:16	C7I0471	CI72831
Trichloroethene	ND (0.0042)		8260B Low		1	09/28/17 16:16	C7I0471	CI72831
Trichlorofluoromethane	ND (0.0042)		8260B Low		1	09/28/17 16:16	C7I0471	CI72831
Vinyl Acetate	ND (0.0042)		8260B Low		1	09/28/17 16:16	C7I0471	CI72831
Vinyl Chloride	ND (0.0083)		8260B Low		1	09/28/17 16:16	C7I0471	CI72831
Xylene O	ND (0.0042)		8260B Low		1	09/28/17 16:16	C7I0471	CI72831
Xylene P,M	ND (0.0083)		8260B Low		1	09/28/17 16:16	C7I0471	CI72831
Xylenes (Total)	ND (0.0083)		8260B Low		1	09/28/17 16:16		[CALC]

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: 1,2-Dichloroethane-d4	93 %		70-130
Surrogate: 4-Bromofluorobenzene	68 %	SC	70-130
Surrogate: Dibromofluoromethane	84 %		70-130
Surrogate: Toluene-d8	110 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ SS-535 (0-2')  
 Date Sampled: 09/27/17 08:20  
 Percent Solids: 94  
 Initial Volume: 19.3  
 Final Volume: 2  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709779  
 ESS Laboratory Sample ID: 1709779-01  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: SMR  
 Prepared: 9/27/17 17:24

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	3510 (829)		8100M		10	10/03/17 0:22	C7J0014	CI72713
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		130 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ SS-535 (0-2')  
Date Sampled: 09/27/17 08:20  
Percent Solids: 94  
Initial Volume: 14.4  
Final Volume: 2  
Extraction Method: 3546

ESS Laboratory Work Order: 1709779  
ESS Laboratory Sample ID: 1709779-01  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: TJ  
Prepared: 9/27/17 17:15

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	9.96 (1.48)		8270D		1	09/30/17 1:03	C7I0480	CI72717
Acenaphthene	1.54 (1.48)		8270D		1	09/30/17 1:03	C7I0480	CI72717
Acenaphthylene	27.3 (1.48)		8270D		1	09/30/17 1:03	C7I0480	CI72717
Anthracene	23.1 (1.48)		8270D		1	09/30/17 1:03	C7I0480	CI72717
Benzo(a)anthracene	68.2 (14.8)		8270D		10	10/02/17 19:40	C7I0480	CI72717
Benzo(a)pyrene	30.5 (0.742)		8270D		1	09/30/17 1:03	C7I0480	CI72717
Benzo(b)fluoranthene	35.4 (1.48)		8270D		1	09/30/17 1:03	C7I0480	CI72717
Benzo(g,h,i)perylene	18.7 (1.48)		8270D		1	09/30/17 1:03	C7I0480	CI72717
Benzo(k)fluoranthene	11.9 (1.48)		8270D		1	09/30/17 1:03	C7I0480	CI72717
Chrysene	72.7 (7.42)		8270D		10	10/02/17 19:40	C7I0480	CI72717
Dibenzo(a,h)Anthracene	8.38 (0.742)		8270D		1	09/30/17 1:03	C7I0480	CI72717
Fluoranthene	91.7 (14.8)		8270D		10	10/02/17 19:40	C7I0480	CI72717
Fluorene	18.0 (1.48)		8270D		1	09/30/17 1:03	C7I0480	CI72717
Indeno(1,2,3-cd)Pyrene	16.6 (1.48)		8270D		1	09/30/17 1:03	C7I0480	CI72717
Naphthalene	14.6 (1.48)		8270D		1	09/30/17 1:03	C7I0480	CI72717
Phenanthrene	168 (14.8)		8270D		10	10/02/17 19:40	C7I0480	CI72717
Pyrene	137 (14.8)		8270D		10	10/02/17 19:40	C7I0480	CI72717

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	65 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	80 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	69 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	86 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ SS-535 (0-2')  
Date Sampled: 09/27/17 08:20  
Percent Solids: 94

ESS Laboratory Work Order: 1709779  
ESS Laboratory Sample ID: 1709779-01  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	126 (10.4)		9014		10	EEM	10/03/17 12:40	mg/kg dry	CJ70314



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ SS-536 (0-2')  
 Date Sampled: 09/27/17 08:35  
 Percent Solids: 95

ESS Laboratory Work Order: 1709779  
 ESS Laboratory Sample ID: 1709779-02  
 Sample Matrix: Soil  
 Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (2.02)		6020A		20	NAR	10/04/17 10:54	2.08	100	CJ70220
Arsenic	5.93 (2.52)		6010C		1	KJK	10/03/17 23:53	2.08	100	CJ70220
Beryllium	0.15 (0.11)		6010C		1	KJK	10/03/17 23:53	2.08	100	CJ70220
Cadmium	ND (0.50)		6010C		1	KJK	10/03/17 23:53	2.08	100	CJ70220
Chromium	7.40 (1.01)		6010C		1	KJK	10/03/17 23:53	2.08	100	CJ70220
Copper	35.7 (2.52)		6010C		1	KJK	10/03/17 23:53	2.08	100	CJ70220
Lead	125 (5.05)		6010C		1	KJK	10/03/17 23:53	2.08	100	CJ70220
Mercury	1.09 (0.165)		7471B		5	MJV	10/02/17 14:25	0.63	40	CI72941
Nickel	12.7 (2.52)		6010C		1	KJK	10/03/17 23:53	2.08	100	CJ70220
Selenium	ND (2.02)		6020A		20	NAR	10/04/17 10:54	2.08	100	CJ70220
Silver	ND (0.50)		6010C		1	KJK	10/04/17 15:15	2.08	100	CJ70220
Thallium	ND (2.02)		6020A		20	NAR	10/04/17 10:54	2.08	100	CJ70220
Zinc	29.3 (2.52)		6010C		1	KJK	10/03/17 23:53	2.08	100	CJ70220





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ SS-536 (0-2')  
Date Sampled: 09/27/17 08:35  
Percent Solids: 95  
Initial Volume: 5.1  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1709779  
ESS Laboratory Sample ID: 1709779-02  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MD

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0051)		8260B Low		1	09/28/17 16:42	C7I0471	CI72831
1,1,1-Trichloroethane	ND (0.0051)		8260B Low		1	09/28/17 16:42	C7I0471	CI72831
1,1,2,2-Tetrachloroethane	ND (0.0051)		8260B Low		1	09/28/17 16:42	C7I0471	CI72831
1,1,2-Trichloroethane	ND (0.0051)		8260B Low		1	09/28/17 16:42	C7I0471	CI72831
1,1-Dichloroethane	ND (0.0051)		8260B Low		1	09/28/17 16:42	C7I0471	CI72831
1,1-Dichloroethene	ND (0.0051)		8260B Low		1	09/28/17 16:42	C7I0471	CI72831
1,1-Dichloropropene	ND (0.0051)		8260B Low		1	09/28/17 16:42	C7I0471	CI72831
1,2,3-Trichlorobenzene	ND (0.0051)		8260B Low		1	09/28/17 16:42	C7I0471	CI72831
1,2,3-Trichloropropane	ND (0.0051)		8260B Low		1	09/28/17 16:42	C7I0471	CI72831
1,2,4-Trichlorobenzene	ND (0.0051)		8260B Low		1	09/28/17 16:42	C7I0471	CI72831
1,2,4-Trimethylbenzene	ND (0.0051)		8260B Low		1	09/28/17 16:42	C7I0471	CI72831
1,2-Dibromo-3-Chloropropane	ND (0.0051)		8260B Low		1	09/28/17 16:42	C7I0471	CI72831
1,2-Dibromoethane	ND (0.0051)		8260B Low		1	09/28/17 16:42	C7I0471	CI72831
1,2-Dichlorobenzene	ND (0.0051)		8260B Low		1	09/28/17 16:42	C7I0471	CI72831
1,2-Dichloroethane	ND (0.0051)		8260B Low		1	09/28/17 16:42	C7I0471	CI72831
1,2-Dichloropropane	ND (0.0051)		8260B Low		1	09/28/17 16:42	C7I0471	CI72831
1,3,5-Trimethylbenzene	ND (0.0051)		8260B Low		1	09/28/17 16:42	C7I0471	CI72831
1,3-Dichlorobenzene	ND (0.0051)		8260B Low		1	09/28/17 16:42	C7I0471	CI72831
1,3-Dichloropropane	ND (0.0051)		8260B Low		1	09/28/17 16:42	C7I0471	CI72831
1,4-Dichlorobenzene	ND (0.0051)		8260B Low		1	09/28/17 16:42	C7I0471	CI72831
1,4-Dioxane	ND (0.103)		8260B Low		1	09/28/17 16:42	C7I0471	CI72831
1-Chlorohexane	ND (0.0051)		8260B Low		1	09/28/17 16:42	C7I0471	CI72831
2,2-Dichloropropane	ND (0.0051)		8260B Low		1	09/28/17 16:42	C7I0471	CI72831
2-Butanone	ND (0.0515)		8260B Low		1	09/28/17 16:42	C7I0471	CI72831
2-Chlorotoluene	ND (0.0051)		8260B Low		1	09/28/17 16:42	C7I0471	CI72831
2-Hexanone	ND (0.0515)		8260B Low		1	09/28/17 16:42	C7I0471	CI72831
4-Chlorotoluene	ND (0.0051)		8260B Low		1	09/28/17 16:42	C7I0471	CI72831
4-Isopropyltoluene	ND (0.0051)		8260B Low		1	09/28/17 16:42	C7I0471	CI72831
4-Methyl-2-Pentanone	ND (0.0515)		8260B Low		1	09/28/17 16:42	C7I0471	CI72831
Acetone	ND (0.0515)		8260B Low		1	09/28/17 16:42	C7I0471	CI72831
Benzene	ND (0.0051)		8260B Low		1	09/28/17 16:42	C7I0471	CI72831
Bromobenzene	ND (0.0051)		8260B Low		1	09/28/17 16:42	C7I0471	CI72831



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ SS-536 (0-2')  
 Date Sampled: 09/27/17 08:35  
 Percent Solids: 95  
 Initial Volume: 5.1  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709779  
 ESS Laboratory Sample ID: 1709779-02  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MD

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0051)		8260B Low		1	09/28/17 16:42	C7I0471	CI72831
Bromodichloromethane	ND (0.0051)		8260B Low		1	09/28/17 16:42	C7I0471	CI72831
Bromoform	ND (0.0051)		8260B Low		1	09/28/17 16:42	C7I0471	CI72831
Bromomethane	ND (0.0103)		8260B Low		1	09/28/17 16:42	C7I0471	CI72831
Carbon Disulfide	ND (0.0051)		8260B Low		1	09/28/17 16:42	C7I0471	CI72831
Carbon Tetrachloride	ND (0.0051)		8260B Low		1	09/28/17 16:42	C7I0471	CI72831
Chlorobenzene	ND (0.0051)		8260B Low		1	09/28/17 16:42	C7I0471	CI72831
Chloroethane	ND (0.0103)		8260B Low		1	09/28/17 16:42	C7I0471	CI72831
Chloroform	ND (0.0051)		8260B Low		1	09/28/17 16:42	C7I0471	CI72831
Chloromethane	ND (0.0103)		8260B Low		1	09/28/17 16:42	C7I0471	CI72831
cis-1,2-Dichloroethene	ND (0.0051)		8260B Low		1	09/28/17 16:42	C7I0471	CI72831
cis-1,3-Dichloropropene	ND (0.0051)		8260B Low		1	09/28/17 16:42	C7I0471	CI72831
Dibromochloromethane	ND (0.0051)		8260B Low		1	09/28/17 16:42	C7I0471	CI72831
Dibromomethane	ND (0.0051)		8260B Low		1	09/28/17 16:42	C7I0471	CI72831
Dichlorodifluoromethane	ND (0.0103)		8260B Low		1	09/28/17 16:42	C7I0471	CI72831
Diethyl Ether	ND (0.0051)		8260B Low		1	09/28/17 16:42	C7I0471	CI72831
Di-isopropyl ether	ND (0.0051)		8260B Low		1	09/28/17 16:42	C7I0471	CI72831
Ethyl tertiary-butyl ether	ND (0.0051)		8260B Low		1	09/28/17 16:42	C7I0471	CI72831
Ethylbenzene	ND (0.0051)		8260B Low		1	09/28/17 16:42	C7I0471	CI72831
Hexachlorobutadiene	ND (0.0051)		8260B Low		1	09/28/17 16:42	C7I0471	CI72831
Isopropylbenzene	ND (0.0051)		8260B Low		1	09/28/17 16:42	C7I0471	CI72831
Methyl tert-Butyl Ether	ND (0.0051)		8260B Low		1	09/28/17 16:42	C7I0471	CI72831
Methylene Chloride	ND (0.0257)		8260B Low		1	09/28/17 16:42	C7I0471	CI72831
<b>Naphthalene</b>	<b>0.0396</b> (0.0051)		8260B Low		1	09/28/17 16:42	C7I0471	CI72831
n-Butylbenzene	ND (0.0051)		8260B Low		1	09/28/17 16:42	C7I0471	CI72831
n-Propylbenzene	ND (0.0051)		8260B Low		1	09/28/17 16:42	C7I0471	CI72831
sec-Butylbenzene	ND (0.0051)		8260B Low		1	09/28/17 16:42	C7I0471	CI72831
Styrene	ND (0.0051)		8260B Low		1	09/28/17 16:42	C7I0471	CI72831
tert-Butylbenzene	ND (0.0051)		8260B Low		1	09/28/17 16:42	C7I0471	CI72831
Tertiary-amyl methyl ether	ND (0.0051)		8260B Low		1	09/28/17 16:42	C7I0471	CI72831
Tetrachloroethene	ND (0.0051)		8260B Low		1	09/28/17 16:42	C7I0471	CI72831
Tetrahydrofuran	ND (0.0051)		8260B Low		1	09/28/17 16:42	C7I0471	CI72831



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ SS-536 (0-2')  
 Date Sampled: 09/27/17 08:35  
 Percent Solids: 95  
 Initial Volume: 5.1  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709779  
 ESS Laboratory Sample ID: 1709779-02  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MD

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0051)		8260B Low		1	09/28/17 16:42	C7I0471	CI72831
trans-1,2-Dichloroethene	ND (0.0051)		8260B Low		1	09/28/17 16:42	C7I0471	CI72831
trans-1,3-Dichloropropene	ND (0.0051)		8260B Low		1	09/28/17 16:42	C7I0471	CI72831
Trichloroethene	ND (0.0051)		8260B Low		1	09/28/17 16:42	C7I0471	CI72831
Trichlorofluoromethane	ND (0.0051)		8260B Low		1	09/28/17 16:42	C7I0471	CI72831
Vinyl Acetate	ND (0.0051)		8260B Low		1	09/28/17 16:42	C7I0471	CI72831
Vinyl Chloride	ND (0.0103)		8260B Low		1	09/28/17 16:42	C7I0471	CI72831
Xylene O	ND (0.0051)		8260B Low		1	09/28/17 16:42	C7I0471	CI72831
Xylene P,M	ND (0.0103)		8260B Low		1	09/28/17 16:42	C7I0471	CI72831
Xylenes (Total)	ND (0.0103)		8260B Low		1	09/28/17 16:42		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	93 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	69 %	SC	70-130
<i>Surrogate: Dibromofluoromethane</i>	80 %		70-130
<i>Surrogate: Toluene-d8</i>	108 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ SS-536 (0-2')  
Date Sampled: 09/27/17 08:35  
Percent Solids: 95  
Initial Volume: 19.6  
Final Volume: 2  
Extraction Method: 3546

ESS Laboratory Work Order: 1709779  
ESS Laboratory Sample ID: 1709779-02  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: SMR  
Prepared: 9/27/17 17:24

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	7910 (804)		8100M		10	10/03/17 0:58	C7J0014	CI72713
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		136 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ SS-536 (0-2')  
Date Sampled: 09/27/17 08:35  
Percent Solids: 95  
Initial Volume: 14.4  
Final Volume: 2  
Extraction Method: 3546

ESS Laboratory Work Order: 1709779  
ESS Laboratory Sample ID: 1709779-02  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: TJ  
Prepared: 9/27/17 17:15

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	22.9 (1.46)		8270D		1	09/30/17 1:51	C7I0487	CI72717
Acenaphthene	3.44 (1.46)		8270D		1	09/30/17 1:51	C7I0487	CI72717
Acenaphthylene	52.2 (14.6)		8270D		10	10/02/17 17:34	C7I0487	CI72717
Anthracene	36.1 (1.46)		8270D		1	09/30/17 1:51	C7I0487	CI72717
Benzo(a)anthracene	114 (14.6)		8270D		10	10/02/17 17:34	C7I0487	CI72717
Benzo(a)pyrene	76.0 (7.31)		8270D		10	10/02/17 17:34	C7I0487	CI72717
Benzo(b)fluoranthene	67.4 (14.6)		8270D		10	10/02/17 17:34	C7I0487	CI72717
Benzo(g,h,i)perylene	25.1 (1.46)		8270D		1	09/30/17 1:51	C7I0487	CI72717
Benzo(k)fluoranthene	34.3 (1.46)		8270D		1	09/30/17 1:51	C7I0487	CI72717
Chrysene	122 (7.31)		8270D		10	10/02/17 17:34	C7I0487	CI72717
Dibenzo(a,h)Anthracene	15.6 (0.731)		8270D		1	09/30/17 1:51	C7I0487	CI72717
Fluoranthene	178 (14.6)		8270D		10	10/02/17 17:34	C7I0487	CI72717
Fluorene	33.9 (1.46)		8270D		1	09/30/17 1:51	C7I0487	CI72717
Indeno(1,2,3-cd)Pyrene	22.6 (1.46)		8270D		1	09/30/17 1:51	C7I0487	CI72717
Naphthalene	27.9 (1.46)		8270D		1	09/30/17 1:51	C7I0487	CI72717
Phenanthrene	243 (14.6)		8270D		10	10/02/17 17:34	C7I0487	CI72717
Pyrene	199 (14.6)		8270D		10	10/02/17 17:34	C7I0487	CI72717

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
Surrogate: 1,2-Dichlorobenzene-d4	71 %		30-130
Surrogate: 2-Fluorobiphenyl	76 %		30-130
Surrogate: Nitrobenzene-d5	73 %		30-130
Surrogate: p-Terphenyl-d14	78 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ SS-536 (0-2')  
Date Sampled: 09/27/17 08:35  
Percent Solids: 95

ESS Laboratory Work Order: 1709779  
ESS Laboratory Sample ID: 1709779-02  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	234 (48.7)		9014		50	EEM	10/03/17 12:40	mg/kg dry	CJ70314





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ SS-537 (0-2')  
 Date Sampled: 09/27/17 08:55  
 Percent Solids: 95

ESS Laboratory Work Order: 1709779  
 ESS Laboratory Sample ID: 1709779-03  
 Sample Matrix: Soil  
 Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (1.89)		6020A		20	NAR	10/04/17 10:59	2.23	100	CJ70220
<b>Arsenic</b>	<b>6.53</b> (2.37)		6010C		1	KJK	10/03/17 23:57	2.23	100	CJ70220
Beryllium	ND (0.10)		6010C		1	KJK	10/03/17 23:57	2.23	100	CJ70220
Cadmium	ND (0.47)		6010C		1	KJK	10/03/17 23:57	2.23	100	CJ70220
<b>Chromium</b>	<b>2.32</b> (0.95)		6010C		1	KJK	10/03/17 23:57	2.23	100	CJ70220
<b>Copper</b>	<b>29.2</b> (2.37)		6010C		1	KJK	10/03/17 23:57	2.23	100	CJ70220
<b>Lead</b>	<b>115</b> (4.73)		6010C		1	KJK	10/03/17 23:57	2.23	100	CJ70220
<b>Mercury</b>	<b>0.433</b> (0.027)		7471B		1	MJV	10/02/17 13:27	0.78	40	CI72941
<b>Nickel</b>	<b>7.18</b> (2.37)		6010C		1	KJK	10/03/17 23:57	2.23	100	CJ70220
Selenium	ND (1.89)		6020A		20	NAR	10/04/17 10:59	2.23	100	CJ70220
<b>Silver</b>	<b>0.58</b> (0.47)		6010C		1	KJK	10/03/17 23:57	2.23	100	CJ70220
Thallium	ND (1.89)		6020A		20	NAR	10/04/17 10:59	2.23	100	CJ70220
<b>Zinc</b>	<b>12.4</b> (2.37)		6010C		1	KJK	10/03/17 23:57	2.23	100	CJ70220



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ SS-537 (0-2')  
 Date Sampled: 09/27/17 08:55  
 Percent Solids: 95  
 Initial Volume: 6.4  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709779  
 ESS Laboratory Sample ID: 1709779-03  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MD

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0041)		8260B Low		1	09/28/17 17:08	C7I0471	CI72831
1,1,1-Trichloroethane	ND (0.0041)		8260B Low		1	09/28/17 17:08	C7I0471	CI72831
1,1,2,2-Tetrachloroethane	ND (0.0041)		8260B Low		1	09/28/17 17:08	C7I0471	CI72831
1,1,2-Trichloroethane	ND (0.0041)		8260B Low		1	09/28/17 17:08	C7I0471	CI72831
1,1-Dichloroethane	ND (0.0041)		8260B Low		1	09/28/17 17:08	C7I0471	CI72831
1,1-Dichloroethene	ND (0.0041)		8260B Low		1	09/28/17 17:08	C7I0471	CI72831
1,1-Dichloropropene	ND (0.0041)		8260B Low		1	09/28/17 17:08	C7I0471	CI72831
1,2,3-Trichlorobenzene	ND (0.0041)		8260B Low		1	09/28/17 17:08	C7I0471	CI72831
1,2,3-Trichloropropane	ND (0.0041)		8260B Low		1	09/28/17 17:08	C7I0471	CI72831
1,2,4-Trichlorobenzene	ND (0.0041)		8260B Low		1	09/28/17 17:08	C7I0471	CI72831
1,2,4-Trimethylbenzene	ND (0.0041)		8260B Low		1	09/28/17 17:08	C7I0471	CI72831
1,2-Dibromo-3-Chloropropane	ND (0.0041)		8260B Low		1	09/28/17 17:08	C7I0471	CI72831
1,2-Dibromoethane	ND (0.0041)		8260B Low		1	09/28/17 17:08	C7I0471	CI72831
1,2-Dichlorobenzene	ND (0.0041)		8260B Low		1	09/28/17 17:08	C7I0471	CI72831
1,2-Dichloroethane	ND (0.0041)		8260B Low		1	09/28/17 17:08	C7I0471	CI72831
1,2-Dichloropropane	ND (0.0041)		8260B Low		1	09/28/17 17:08	C7I0471	CI72831
1,3,5-Trimethylbenzene	ND (0.0041)		8260B Low		1	09/28/17 17:08	C7I0471	CI72831
1,3-Dichlorobenzene	ND (0.0041)		8260B Low		1	09/28/17 17:08	C7I0471	CI72831
1,3-Dichloropropane	ND (0.0041)		8260B Low		1	09/28/17 17:08	C7I0471	CI72831
1,4-Dichlorobenzene	ND (0.0041)		8260B Low		1	09/28/17 17:08	C7I0471	CI72831
1,4-Dioxane	ND (0.0825)		8260B Low		1	09/28/17 17:08	C7I0471	CI72831
1-Chlorohexane	ND (0.0041)		8260B Low		1	09/28/17 17:08	C7I0471	CI72831
2,2-Dichloropropane	ND (0.0041)		8260B Low		1	09/28/17 17:08	C7I0471	CI72831
2-Butanone	ND (0.0412)		8260B Low		1	09/28/17 17:08	C7I0471	CI72831
2-Chlorotoluene	ND (0.0041)		8260B Low		1	09/28/17 17:08	C7I0471	CI72831
2-Hexanone	ND (0.0412)		8260B Low		1	09/28/17 17:08	C7I0471	CI72831
4-Chlorotoluene	ND (0.0041)		8260B Low		1	09/28/17 17:08	C7I0471	CI72831
4-Isopropyltoluene	ND (0.0041)		8260B Low		1	09/28/17 17:08	C7I0471	CI72831
4-Methyl-2-Pentanone	ND (0.0412)		8260B Low		1	09/28/17 17:08	C7I0471	CI72831
Acetone	ND (0.0412)		8260B Low		1	09/28/17 17:08	C7I0471	CI72831
Benzene	ND (0.0041)		8260B Low		1	09/28/17 17:08	C7I0471	CI72831
Bromobenzene	ND (0.0041)		8260B Low		1	09/28/17 17:08	C7I0471	CI72831



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ SS-537 (0-2')  
 Date Sampled: 09/27/17 08:55  
 Percent Solids: 95  
 Initial Volume: 6.4  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709779  
 ESS Laboratory Sample ID: 1709779-03  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MD

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0041)		8260B Low		1	09/28/17 17:08	C7I0471	CI72831
Bromodichloromethane	ND (0.0041)		8260B Low		1	09/28/17 17:08	C7I0471	CI72831
Bromoform	ND (0.0041)		8260B Low		1	09/28/17 17:08	C7I0471	CI72831
Bromomethane	ND (0.0082)		8260B Low		1	09/28/17 17:08	C7I0471	CI72831
Carbon Disulfide	ND (0.0041)		8260B Low		1	09/28/17 17:08	C7I0471	CI72831
Carbon Tetrachloride	ND (0.0041)		8260B Low		1	09/28/17 17:08	C7I0471	CI72831
Chlorobenzene	ND (0.0041)		8260B Low		1	09/28/17 17:08	C7I0471	CI72831
Chloroethane	ND (0.0082)		8260B Low		1	09/28/17 17:08	C7I0471	CI72831
Chloroform	ND (0.0041)		8260B Low		1	09/28/17 17:08	C7I0471	CI72831
Chloromethane	ND (0.0082)		8260B Low		1	09/28/17 17:08	C7I0471	CI72831
cis-1,2-Dichloroethene	ND (0.0041)		8260B Low		1	09/28/17 17:08	C7I0471	CI72831
cis-1,3-Dichloropropene	ND (0.0041)		8260B Low		1	09/28/17 17:08	C7I0471	CI72831
Dibromochloromethane	ND (0.0041)		8260B Low		1	09/28/17 17:08	C7I0471	CI72831
Dibromomethane	ND (0.0041)		8260B Low		1	09/28/17 17:08	C7I0471	CI72831
Dichlorodifluoromethane	ND (0.0082)		8260B Low		1	09/28/17 17:08	C7I0471	CI72831
Diethyl Ether	ND (0.0041)		8260B Low		1	09/28/17 17:08	C7I0471	CI72831
Di-isopropyl ether	ND (0.0041)		8260B Low		1	09/28/17 17:08	C7I0471	CI72831
Ethyl tertiary-butyl ether	ND (0.0041)		8260B Low		1	09/28/17 17:08	C7I0471	CI72831
Ethylbenzene	ND (0.0041)		8260B Low		1	09/28/17 17:08	C7I0471	CI72831
Hexachlorobutadiene	ND (0.0041)		8260B Low		1	09/28/17 17:08	C7I0471	CI72831
Isopropylbenzene	ND (0.0041)		8260B Low		1	09/28/17 17:08	C7I0471	CI72831
Methyl tert-Butyl Ether	ND (0.0041)		8260B Low		1	09/28/17 17:08	C7I0471	CI72831
Methylene Chloride	ND (0.0206)		8260B Low		1	09/28/17 17:08	C7I0471	CI72831
<b>Naphthalene</b>	<b>0.0122 (0.0041)</b>		8260B Low		1	09/28/17 17:08	C7I0471	CI72831
n-Butylbenzene	ND (0.0041)		8260B Low		1	09/28/17 17:08	C7I0471	CI72831
n-Propylbenzene	ND (0.0041)		8260B Low		1	09/28/17 17:08	C7I0471	CI72831
sec-Butylbenzene	ND (0.0041)		8260B Low		1	09/28/17 17:08	C7I0471	CI72831
Styrene	ND (0.0041)		8260B Low		1	09/28/17 17:08	C7I0471	CI72831
tert-Butylbenzene	ND (0.0041)		8260B Low		1	09/28/17 17:08	C7I0471	CI72831
Tertiary-amyl methyl ether	ND (0.0041)		8260B Low		1	09/28/17 17:08	C7I0471	CI72831
Tetrachloroethene	ND (0.0041)		8260B Low		1	09/28/17 17:08	C7I0471	CI72831
Tetrahydrofuran	ND (0.0041)		8260B Low		1	09/28/17 17:08	C7I0471	CI72831



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ SS-537 (0-2')  
 Date Sampled: 09/27/17 08:55  
 Percent Solids: 95  
 Initial Volume: 6.4  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709779  
 ESS Laboratory Sample ID: 1709779-03  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MD

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0041)		8260B Low		1	09/28/17 17:08	C7I0471	CI72831
trans-1,2-Dichloroethene	ND (0.0041)		8260B Low		1	09/28/17 17:08	C7I0471	CI72831
trans-1,3-Dichloropropene	ND (0.0041)		8260B Low		1	09/28/17 17:08	C7I0471	CI72831
Trichloroethene	ND (0.0041)		8260B Low		1	09/28/17 17:08	C7I0471	CI72831
Trichlorofluoromethane	ND (0.0041)		8260B Low		1	09/28/17 17:08	C7I0471	CI72831
Vinyl Acetate	ND (0.0041)		8260B Low		1	09/28/17 17:08	C7I0471	CI72831
Vinyl Chloride	ND (0.0082)		8260B Low		1	09/28/17 17:08	C7I0471	CI72831
Xylene O	ND (0.0041)		8260B Low		1	09/28/17 17:08	C7I0471	CI72831
Xylene P,M	ND (0.0082)		8260B Low		1	09/28/17 17:08	C7I0471	CI72831
Xylenes (Total)	ND (0.0082)		8260B Low		1	09/28/17 17:08		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	96 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	75 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	85 %		70-130
<i>Surrogate: Toluene-d8</i>	102 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ SS-537 (0-2')  
 Date Sampled: 09/27/17 08:55  
 Percent Solids: 95  
 Initial Volume: 19.8  
 Final Volume: 2  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709779  
 ESS Laboratory Sample ID: 1709779-03  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: SMR  
 Prepared: 9/27/17 17:24

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	3810 (400)		8100M		5	10/03/17 1:32	C7J0014	CI72713
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		129 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ SS-537 (0-2')  
Date Sampled: 09/27/17 08:55  
Percent Solids: 95  
Initial Volume: 14.4  
Final Volume: 1  
Extraction Method: 3546

ESS Laboratory Work Order: 1709779  
ESS Laboratory Sample ID: 1709779-03  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: TJ  
Prepared: 9/27/17 17:15

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	15.5 (0.732)		8270D		1	09/30/17 2:26	C7I0487	CI72717
Acenaphthene	2.17 (0.732)		8270D		1	09/30/17 2:26	C7I0487	CI72717
Acenaphthylene	24.6 (7.32)		8270D		10	10/02/17 18:45	C7I0487	CI72717
Anthracene	13.8 (0.732)		8270D		1	09/30/17 2:26	C7I0487	CI72717
Benzo(a)anthracene	51.6 (7.32)		8270D		10	10/02/17 18:45	C7I0487	CI72717
Benzo(a)pyrene	34.2 (3.67)		8270D		10	10/02/17 18:45	C7I0487	CI72717
Benzo(b)fluoranthene	34.5 (7.32)		8270D		10	10/02/17 18:45	C7I0487	CI72717
Benzo(g,h,i)perylene	12.1 (0.732)		8270D		1	09/30/17 2:26	C7I0487	CI72717
Benzo(k)fluoranthene	33.7 (7.32)		8270D		10	10/02/17 18:45	C7I0487	CI72717
Chrysene	57.1 (3.67)		8270D		10	10/02/17 18:45	C7I0487	CI72717
Dibenzo(a,h)Anthracene	6.75 (0.367)		8270D		1	09/30/17 2:26	C7I0487	CI72717
Fluoranthene	69.4 (7.32)		8270D		10	10/02/17 18:45	C7I0487	CI72717
Fluorene	14.0 (0.732)		8270D		1	09/30/17 2:26	C7I0487	CI72717
Indeno(1,2,3-cd)Pyrene	11.5 (0.732)		8270D		1	09/30/17 2:26	C7I0487	CI72717
Naphthalene	14.0 (0.732)		8270D		1	09/30/17 2:26	C7I0487	CI72717
Phenanthrene	95.4 (7.32)		8270D		10	10/02/17 18:45	C7I0487	CI72717
Pyrene	75.7 (7.32)		8270D		10	10/02/17 18:45	C7I0487	CI72717

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	61 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	66 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	65 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	62 %		30-130





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ SS-537 (0-2')  
Date Sampled: 09/27/17 08:55  
Percent Solids: 95

ESS Laboratory Work Order: 1709779  
ESS Laboratory Sample ID: 1709779-03  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	238 (48.2)		9014		50	EEM	10/03/17 12:40	mg/kg dry	CJ70314



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ SS-538 (0-2')  
Date Sampled: 09/27/17 09:10  
Percent Solids: 97

ESS Laboratory Work Order: 1709779  
ESS Laboratory Sample ID: 1709779-04  
Sample Matrix: Soil  
Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (2.00)		6020A		20	NAR	10/04/17 11:05	2.05	100	CJ70220
Arsenic	<b>4.18</b> (2.51)		6010C		1	KJK	10/04/17 0:01	2.05	100	CJ70220
Beryllium	<b>0.21</b> (0.11)		6010C		1	KJK	10/04/17 0:01	2.05	100	CJ70220
Cadmium	ND (0.50)		6010C		1	KJK	10/04/17 0:01	2.05	100	CJ70220
Chromium	<b>8.38</b> (1.00)		6010C		1	KJK	10/04/17 0:01	2.05	100	CJ70220
Copper	<b>39.2</b> (2.51)		6010C		1	KJK	10/04/17 0:01	2.05	100	CJ70220
Lead	<b>99.8</b> (5.01)		6010C		1	KJK	10/04/17 0:01	2.05	100	CJ70220
Mercury	<b>0.201</b> (0.024)		7471B		1	MJV	10/02/17 13:29	0.84	40	CI72941
Nickel	<b>16.8</b> (2.51)		6010C		1	KJK	10/04/17 0:01	2.05	100	CJ70220
Selenium	ND (2.00)		6020A		20	NAR	10/04/17 11:05	2.05	100	CJ70220
Silver	<b>0.82</b> (0.50)		6010C		1	KJK	10/04/17 0:01	2.05	100	CJ70220
Thallium	ND (2.00)		6020A		20	NAR	10/04/17 11:05	2.05	100	CJ70220
Zinc	<b>67.8</b> (2.51)		6010C		1	KJK	10/04/17 0:01	2.05	100	CJ70220



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ SS-538 (0-2')  
 Date Sampled: 09/27/17 09:10  
 Percent Solids: 97  
 Initial Volume: 7.1  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709779  
 ESS Laboratory Sample ID: 1709779-04  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MD

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0036)		8260B Low		1	09/28/17 17:33	C7I0471	CI72831
1,1,1-Trichloroethane	ND (0.0036)		8260B Low		1	09/28/17 17:33	C7I0471	CI72831
1,1,2,2-Tetrachloroethane	ND (0.0036)		8260B Low		1	09/28/17 17:33	C7I0471	CI72831
1,1,2-Trichloroethane	ND (0.0036)		8260B Low		1	09/28/17 17:33	C7I0471	CI72831
1,1-Dichloroethane	ND (0.0036)		8260B Low		1	09/28/17 17:33	C7I0471	CI72831
1,1-Dichloroethene	ND (0.0036)		8260B Low		1	09/28/17 17:33	C7I0471	CI72831
1,1-Dichloropropene	ND (0.0036)		8260B Low		1	09/28/17 17:33	C7I0471	CI72831
1,2,3-Trichlorobenzene	ND (0.0036)		8260B Low		1	09/28/17 17:33	C7I0471	CI72831
1,2,3-Trichloropropane	ND (0.0036)		8260B Low		1	09/28/17 17:33	C7I0471	CI72831
1,2,4-Trichlorobenzene	ND (0.0036)		8260B Low		1	09/28/17 17:33	C7I0471	CI72831
1,2,4-Trimethylbenzene	ND (0.0036)		8260B Low		1	09/28/17 17:33	C7I0471	CI72831
1,2-Dibromo-3-Chloropropane	ND (0.0036)		8260B Low		1	09/28/17 17:33	C7I0471	CI72831
1,2-Dibromoethane	ND (0.0036)		8260B Low		1	09/28/17 17:33	C7I0471	CI72831
1,2-Dichlorobenzene	ND (0.0036)		8260B Low		1	09/28/17 17:33	C7I0471	CI72831
1,2-Dichloroethane	ND (0.0036)		8260B Low		1	09/28/17 17:33	C7I0471	CI72831
1,2-Dichloropropane	ND (0.0036)		8260B Low		1	09/28/17 17:33	C7I0471	CI72831
1,3,5-Trimethylbenzene	ND (0.0036)		8260B Low		1	09/28/17 17:33	C7I0471	CI72831
1,3-Dichlorobenzene	ND (0.0036)		8260B Low		1	09/28/17 17:33	C7I0471	CI72831
1,3-Dichloropropane	ND (0.0036)		8260B Low		1	09/28/17 17:33	C7I0471	CI72831
1,4-Dichlorobenzene	ND (0.0036)		8260B Low		1	09/28/17 17:33	C7I0471	CI72831
1,4-Dioxane	ND (0.0723)		8260B Low		1	09/28/17 17:33	C7I0471	CI72831
1-Chlorohexane	ND (0.0036)		8260B Low		1	09/28/17 17:33	C7I0471	CI72831
2,2-Dichloropropane	ND (0.0036)		8260B Low		1	09/28/17 17:33	C7I0471	CI72831
2-Butanone	ND (0.0362)		8260B Low		1	09/28/17 17:33	C7I0471	CI72831
2-Chlorotoluene	ND (0.0036)		8260B Low		1	09/28/17 17:33	C7I0471	CI72831
2-Hexanone	ND (0.0362)		8260B Low		1	09/28/17 17:33	C7I0471	CI72831
4-Chlorotoluene	ND (0.0036)		8260B Low		1	09/28/17 17:33	C7I0471	CI72831
4-Isopropyltoluene	ND (0.0036)		8260B Low		1	09/28/17 17:33	C7I0471	CI72831
4-Methyl-2-Pentanone	ND (0.0362)		8260B Low		1	09/28/17 17:33	C7I0471	CI72831
Acetone	ND (0.0362)		8260B Low		1	09/28/17 17:33	C7I0471	CI72831
Benzene	ND (0.0036)		8260B Low		1	09/28/17 17:33	C7I0471	CI72831
Bromobenzene	ND (0.0036)		8260B Low		1	09/28/17 17:33	C7I0471	CI72831



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ SS-538 (0-2')  
 Date Sampled: 09/27/17 09:10  
 Percent Solids: 97  
 Initial Volume: 7.1  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709779  
 ESS Laboratory Sample ID: 1709779-04  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MD

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0036)		8260B Low		1	09/28/17 17:33	C7I0471	CI72831
Bromodichloromethane	ND (0.0036)		8260B Low		1	09/28/17 17:33	C7I0471	CI72831
Bromoform	ND (0.0036)		8260B Low		1	09/28/17 17:33	C7I0471	CI72831
Bromomethane	ND (0.0072)		8260B Low		1	09/28/17 17:33	C7I0471	CI72831
Carbon Disulfide	ND (0.0036)		8260B Low		1	09/28/17 17:33	C7I0471	CI72831
Carbon Tetrachloride	ND (0.0036)		8260B Low		1	09/28/17 17:33	C7I0471	CI72831
Chlorobenzene	ND (0.0036)		8260B Low		1	09/28/17 17:33	C7I0471	CI72831
Chloroethane	ND (0.0072)		8260B Low		1	09/28/17 17:33	C7I0471	CI72831
Chloroform	ND (0.0036)		8260B Low		1	09/28/17 17:33	C7I0471	CI72831
Chloromethane	ND (0.0072)		8260B Low		1	09/28/17 17:33	C7I0471	CI72831
cis-1,2-Dichloroethene	ND (0.0036)		8260B Low		1	09/28/17 17:33	C7I0471	CI72831
cis-1,3-Dichloropropene	ND (0.0036)		8260B Low		1	09/28/17 17:33	C7I0471	CI72831
Dibromochloromethane	ND (0.0036)		8260B Low		1	09/28/17 17:33	C7I0471	CI72831
Dibromomethane	ND (0.0036)		8260B Low		1	09/28/17 17:33	C7I0471	CI72831
Dichlorodifluoromethane	ND (0.0072)		8260B Low		1	09/28/17 17:33	C7I0471	CI72831
Diethyl Ether	ND (0.0036)		8260B Low		1	09/28/17 17:33	C7I0471	CI72831
Di-isopropyl ether	ND (0.0036)		8260B Low		1	09/28/17 17:33	C7I0471	CI72831
Ethyl tertiary-butyl ether	ND (0.0036)		8260B Low		1	09/28/17 17:33	C7I0471	CI72831
Ethylbenzene	ND (0.0036)		8260B Low		1	09/28/17 17:33	C7I0471	CI72831
Hexachlorobutadiene	ND (0.0036)		8260B Low		1	09/28/17 17:33	C7I0471	CI72831
Isopropylbenzene	ND (0.0036)		8260B Low		1	09/28/17 17:33	C7I0471	CI72831
Methyl tert-Butyl Ether	ND (0.0036)		8260B Low		1	09/28/17 17:33	C7I0471	CI72831
Methylene Chloride	ND (0.0181)		8260B Low		1	09/28/17 17:33	C7I0471	CI72831
<b>Naphthalene</b>	<b>0.0451</b> (0.0036)		8260B Low		1	09/28/17 17:33	C7I0471	CI72831
n-Butylbenzene	ND (0.0036)		8260B Low		1	09/28/17 17:33	C7I0471	CI72831
n-Propylbenzene	ND (0.0036)		8260B Low		1	09/28/17 17:33	C7I0471	CI72831
sec-Butylbenzene	ND (0.0036)		8260B Low		1	09/28/17 17:33	C7I0471	CI72831
Styrene	ND (0.0036)		8260B Low		1	09/28/17 17:33	C7I0471	CI72831
tert-Butylbenzene	ND (0.0036)		8260B Low		1	09/28/17 17:33	C7I0471	CI72831
Tertiary-amyl methyl ether	ND (0.0036)		8260B Low		1	09/28/17 17:33	C7I0471	CI72831
Tetrachloroethene	ND (0.0036)		8260B Low		1	09/28/17 17:33	C7I0471	CI72831
Tetrahydrofuran	ND (0.0036)		8260B Low		1	09/28/17 17:33	C7I0471	CI72831



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ SS-538 (0-2')  
 Date Sampled: 09/27/17 09:10  
 Percent Solids: 97  
 Initial Volume: 7.1  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709779  
 ESS Laboratory Sample ID: 1709779-04  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MD

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0036)		8260B Low		1	09/28/17 17:33	C7I0471	CI72831
trans-1,2-Dichloroethene	ND (0.0036)		8260B Low		1	09/28/17 17:33	C7I0471	CI72831
trans-1,3-Dichloropropene	ND (0.0036)		8260B Low		1	09/28/17 17:33	C7I0471	CI72831
Trichloroethene	ND (0.0036)		8260B Low		1	09/28/17 17:33	C7I0471	CI72831
Trichlorofluoromethane	ND (0.0036)		8260B Low		1	09/28/17 17:33	C7I0471	CI72831
Vinyl Acetate	ND (0.0036)		8260B Low		1	09/28/17 17:33	C7I0471	CI72831
Vinyl Chloride	ND (0.0072)		8260B Low		1	09/28/17 17:33	C7I0471	CI72831
Xylene O	ND (0.0036)		8260B Low		1	09/28/17 17:33	C7I0471	CI72831
Xylene P,M	ND (0.0072)		8260B Low		1	09/28/17 17:33	C7I0471	CI72831
Xylenes (Total)	ND (0.0072)		8260B Low		1	09/28/17 17:33		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	97 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	77 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	84 %		70-130
<i>Surrogate: Toluene-d8</i>	99 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ SS-538 (0-2')  
 Date Sampled: 09/27/17 09:10  
 Percent Solids: 97  
 Initial Volume: 20.5  
 Final Volume: 1  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709779  
 ESS Laboratory Sample ID: 1709779-04  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: SMR  
 Prepared: 9/27/17 17:24

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	652 (188)		8100M		5	10/03/17 2:07	C7J0014	CI72713
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		73 %		40-140				





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ SS-538 (0-2')  
Date Sampled: 09/27/17 09:10  
Percent Solids: 97  
Initial Volume: 15.1  
Final Volume: 0.5  
Extraction Method: 3546

ESS Laboratory Work Order: 1709779  
ESS Laboratory Sample ID: 1709779-04  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: TJ  
Prepared: 9/27/17 17:15

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	0.438 (0.340)		8270D		1	10/02/17 16:59	C7J0001	CI72717
Acenaphthene	ND (0.340)		8270D		1	10/02/17 16:59	C7J0001	CI72717
Acenaphthylene	1.96 (0.340)		8270D		1	10/02/17 16:59	C7J0001	CI72717
Anthracene	1.27 (0.340)		8270D		1	10/02/17 16:59	C7J0001	CI72717
Benzo(a)anthracene	4.79 (0.340)		8270D		1	10/02/17 16:59	C7J0001	CI72717
Benzo(a)pyrene	4.18 (0.170)		8270D		1	10/02/17 16:59	C7J0001	CI72717
Benzo(b)fluoranthene	5.27 (0.340)		8270D		1	10/02/17 16:59	C7J0001	CI72717
Benzo(g,h,i)perylene	1.91 (0.340)		8270D		1	10/02/17 16:59	C7J0001	CI72717
Benzo(k)fluoranthene	3.71 (0.340)		8270D		1	10/02/17 16:59	C7J0001	CI72717
Chrysene	4.90 (0.170)		8270D		1	10/02/17 16:59	C7J0001	CI72717
Dibenzo(a,h)Anthracene	0.884 (0.170)		8270D		1	10/02/17 16:59	C7J0001	CI72717
Fluoranthene	8.17 (0.340)		8270D		1	10/02/17 16:59	C7J0001	CI72717
Fluorene	0.541 (0.340)		8270D		1	10/02/17 16:59	C7J0001	CI72717
Indeno(1,2,3-cd)Pyrene	1.68 (0.340)		8270D		1	10/02/17 16:59	C7J0001	CI72717
Naphthalene	0.850 (0.340)		8270D		1	10/02/17 16:59	C7J0001	CI72717
Phenanthrene	4.77 (0.340)		8270D		1	10/02/17 16:59	C7J0001	CI72717
Pyrene	6.22 (0.340)		8270D		1	10/02/17 16:59	C7J0001	CI72717

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	43 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	55 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	48 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	51 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ SS-538 (0-2')  
Date Sampled: 09/27/17 09:10  
Percent Solids: 97

ESS Laboratory Work Order: 1709779  
ESS Laboratory Sample ID: 1709779-04  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	88.8 (10.1)		9014		10	EEM	10/03/17 12:40	mg/kg dry	CJ70314



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ SS-539 (0-2')  
 Date Sampled: 09/27/17 09:25  
 Percent Solids: 96

ESS Laboratory Work Order: 1709779  
 ESS Laboratory Sample ID: 1709779-05  
 Sample Matrix: Soil  
 Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (2.03)		6020A		20	NAR	10/04/17 11:23	2.06	100	CJ70220
<b>Arsenic</b>	<b>9.45</b> (2.53)		6010C		1	KJK	10/04/17 0:05	2.06	100	CJ70220
<b>Beryllium</b>	<b>0.19</b> (0.11)		6010C		1	KJK	10/04/17 0:05	2.06	100	CJ70220
Cadmium	ND (0.51)		6010C		1	KJK	10/04/17 0:05	2.06	100	CJ70220
Chromium	ND (4.05)		6010C		4	KJK	10/04/17 15:19	2.06	100	CJ70220
<b>Copper</b>	<b>71.3</b> (2.53)		6010C		1	KJK	10/04/17 0:05	2.06	100	CJ70220
<b>Lead</b>	<b>247</b> (5.07)		6010C		1	KJK	10/04/17 0:05	2.06	100	CJ70220
<b>Mercury</b>	<b>1.43</b> (0.308)		7471B		10	MJV	10/02/17 14:27	0.67	40	CI72941
<b>Nickel</b>	<b>64.9</b> (2.53)		6010C		1	KJK	10/04/17 0:05	2.06	100	CJ70220
Selenium	ND (2.03)		6020A		20	NAR	10/04/17 11:23	2.06	100	CJ70220
Silver	ND (0.51)		6010C		1	KJK	10/04/17 0:05	2.06	100	CJ70220
Thallium	ND (2.03)		6020A		20	NAR	10/04/17 11:23	2.06	100	CJ70220
<b>Zinc</b>	<b>48.9</b> (2.53)		6010C		1	KJK	10/04/17 0:05	2.06	100	CJ70220



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ SS-539 (0-2')  
 Date Sampled: 09/27/17 09:25  
 Percent Solids: 96  
 Initial Volume: 5.9  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709779  
 ESS Laboratory Sample ID: 1709779-05  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MD

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0044)		8260B Low		1	09/28/17 17:59	C7I0471	CI72831
1,1,1-Trichloroethane	ND (0.0044)		8260B Low		1	09/28/17 17:59	C7I0471	CI72831
1,1,2,2-Tetrachloroethane	ND (0.0044)		8260B Low		1	09/28/17 17:59	C7I0471	CI72831
1,1,2-Trichloroethane	ND (0.0044)		8260B Low		1	09/28/17 17:59	C7I0471	CI72831
1,1-Dichloroethane	ND (0.0044)		8260B Low		1	09/28/17 17:59	C7I0471	CI72831
1,1-Dichloroethene	ND (0.0044)		8260B Low		1	09/28/17 17:59	C7I0471	CI72831
1,1-Dichloropropene	ND (0.0044)		8260B Low		1	09/28/17 17:59	C7I0471	CI72831
1,2,3-Trichlorobenzene	ND (0.0044)		8260B Low		1	09/28/17 17:59	C7I0471	CI72831
1,2,3-Trichloropropane	ND (0.0044)		8260B Low		1	09/28/17 17:59	C7I0471	CI72831
1,2,4-Trichlorobenzene	ND (0.0044)		8260B Low		1	09/28/17 17:59	C7I0471	CI72831
1,2,4-Trimethylbenzene	ND (0.0044)		8260B Low		1	09/28/17 17:59	C7I0471	CI72831
1,2-Dibromo-3-Chloropropane	ND (0.0044)		8260B Low		1	09/28/17 17:59	C7I0471	CI72831
1,2-Dibromoethane	ND (0.0044)		8260B Low		1	09/28/17 17:59	C7I0471	CI72831
1,2-Dichlorobenzene	ND (0.0044)		8260B Low		1	09/28/17 17:59	C7I0471	CI72831
1,2-Dichloroethane	ND (0.0044)		8260B Low		1	09/28/17 17:59	C7I0471	CI72831
1,2-Dichloropropane	ND (0.0044)		8260B Low		1	09/28/17 17:59	C7I0471	CI72831
1,3,5-Trimethylbenzene	ND (0.0044)		8260B Low		1	09/28/17 17:59	C7I0471	CI72831
1,3-Dichlorobenzene	ND (0.0044)		8260B Low		1	09/28/17 17:59	C7I0471	CI72831
1,3-Dichloropropane	ND (0.0044)		8260B Low		1	09/28/17 17:59	C7I0471	CI72831
1,4-Dichlorobenzene	ND (0.0044)		8260B Low		1	09/28/17 17:59	C7I0471	CI72831
1,4-Dioxane	ND (0.0885)		8260B Low		1	09/28/17 17:59	C7I0471	CI72831
1-Chlorohexane	ND (0.0044)		8260B Low		1	09/28/17 17:59	C7I0471	CI72831
2,2-Dichloropropane	ND (0.0044)		8260B Low		1	09/28/17 17:59	C7I0471	CI72831
2-Butanone	ND (0.0442)		8260B Low		1	09/28/17 17:59	C7I0471	CI72831
2-Chlorotoluene	ND (0.0044)		8260B Low		1	09/28/17 17:59	C7I0471	CI72831
2-Hexanone	ND (0.0442)		8260B Low		1	09/28/17 17:59	C7I0471	CI72831
4-Chlorotoluene	ND (0.0044)		8260B Low		1	09/28/17 17:59	C7I0471	CI72831
4-Isopropyltoluene	ND (0.0044)		8260B Low		1	09/28/17 17:59	C7I0471	CI72831
4-Methyl-2-Pentanone	ND (0.0442)		8260B Low		1	09/28/17 17:59	C7I0471	CI72831
Acetone	ND (0.0442)		8260B Low		1	09/28/17 17:59	C7I0471	CI72831
Benzene	ND (0.0044)		8260B Low		1	09/28/17 17:59	C7I0471	CI72831
Bromobenzene	ND (0.0044)		8260B Low		1	09/28/17 17:59	C7I0471	CI72831



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ SS-539 (0-2')  
Date Sampled: 09/27/17 09:25  
Percent Solids: 96  
Initial Volume: 5.9  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1709779  
ESS Laboratory Sample ID: 1709779-05  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MD

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0044)		8260B Low		1	09/28/17 17:59	C7I0471	CI72831
Bromodichloromethane	ND (0.0044)		8260B Low		1	09/28/17 17:59	C7I0471	CI72831
Bromoform	ND (0.0044)		8260B Low		1	09/28/17 17:59	C7I0471	CI72831
Bromomethane	ND (0.0088)		8260B Low		1	09/28/17 17:59	C7I0471	CI72831
Carbon Disulfide	ND (0.0044)		8260B Low		1	09/28/17 17:59	C7I0471	CI72831
Carbon Tetrachloride	ND (0.0044)		8260B Low		1	09/28/17 17:59	C7I0471	CI72831
Chlorobenzene	ND (0.0044)		8260B Low		1	09/28/17 17:59	C7I0471	CI72831
Chloroethane	ND (0.0088)		8260B Low		1	09/28/17 17:59	C7I0471	CI72831
Chloroform	ND (0.0044)		8260B Low		1	09/28/17 17:59	C7I0471	CI72831
Chloromethane	ND (0.0088)		8260B Low		1	09/28/17 17:59	C7I0471	CI72831
cis-1,2-Dichloroethene	ND (0.0044)		8260B Low		1	09/28/17 17:59	C7I0471	CI72831
cis-1,3-Dichloropropene	ND (0.0044)		8260B Low		1	09/28/17 17:59	C7I0471	CI72831
Dibromochloromethane	ND (0.0044)		8260B Low		1	09/28/17 17:59	C7I0471	CI72831
Dibromomethane	ND (0.0044)		8260B Low		1	09/28/17 17:59	C7I0471	CI72831
Dichlorodifluoromethane	ND (0.0088)		8260B Low		1	09/28/17 17:59	C7I0471	CI72831
Diethyl Ether	ND (0.0044)		8260B Low		1	09/28/17 17:59	C7I0471	CI72831
Di-isopropyl ether	ND (0.0044)		8260B Low		1	09/28/17 17:59	C7I0471	CI72831
Ethyl tertiary-butyl ether	ND (0.0044)		8260B Low		1	09/28/17 17:59	C7I0471	CI72831
Ethylbenzene	ND (0.0044)		8260B Low		1	09/28/17 17:59	C7I0471	CI72831
Hexachlorobutadiene	ND (0.0044)		8260B Low		1	09/28/17 17:59	C7I0471	CI72831
Isopropylbenzene	ND (0.0044)		8260B Low		1	09/28/17 17:59	C7I0471	CI72831
Methyl tert-Butyl Ether	ND (0.0044)		8260B Low		1	09/28/17 17:59	C7I0471	CI72831
Methylene Chloride	ND (0.0221)		8260B Low		1	09/28/17 17:59	C7I0471	CI72831
<b>Naphthalene</b>	<b>0.0126</b> (0.0044)		8260B Low		1	09/28/17 17:59	C7I0471	CI72831
n-Butylbenzene	ND (0.0044)		8260B Low		1	09/28/17 17:59	C7I0471	CI72831
n-Propylbenzene	ND (0.0044)		8260B Low		1	09/28/17 17:59	C7I0471	CI72831
sec-Butylbenzene	ND (0.0044)		8260B Low		1	09/28/17 17:59	C7I0471	CI72831
Styrene	ND (0.0044)		8260B Low		1	09/28/17 17:59	C7I0471	CI72831
tert-Butylbenzene	ND (0.0044)		8260B Low		1	09/28/17 17:59	C7I0471	CI72831
Tertiary-amyl methyl ether	ND (0.0044)		8260B Low		1	09/28/17 17:59	C7I0471	CI72831
Tetrachloroethene	ND (0.0044)		8260B Low		1	09/28/17 17:59	C7I0471	CI72831
Tetrahydrofuran	ND (0.0044)		8260B Low		1	09/28/17 17:59	C7I0471	CI72831



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ SS-539 (0-2')  
 Date Sampled: 09/27/17 09:25  
 Percent Solids: 96  
 Initial Volume: 5.9  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709779  
 ESS Laboratory Sample ID: 1709779-05  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MD

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0044)		8260B Low		1	09/28/17 17:59	C7I0471	CI72831
trans-1,2-Dichloroethene	ND (0.0044)		8260B Low		1	09/28/17 17:59	C7I0471	CI72831
trans-1,3-Dichloropropene	ND (0.0044)		8260B Low		1	09/28/17 17:59	C7I0471	CI72831
Trichloroethene	ND (0.0044)		8260B Low		1	09/28/17 17:59	C7I0471	CI72831
Trichlorofluoromethane	ND (0.0044)		8260B Low		1	09/28/17 17:59	C7I0471	CI72831
Vinyl Acetate	ND (0.0044)		8260B Low		1	09/28/17 17:59	C7I0471	CI72831
Vinyl Chloride	ND (0.0088)		8260B Low		1	09/28/17 17:59	C7I0471	CI72831
Xylene O	ND (0.0044)		8260B Low		1	09/28/17 17:59	C7I0471	CI72831
Xylene P,M	ND (0.0088)		8260B Low		1	09/28/17 17:59	C7I0471	CI72831
Xylenes (Total)	ND (0.0088)		8260B Low		1	09/28/17 17:59		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	96 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	71 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	84 %		70-130
<i>Surrogate: Toluene-d8</i>	106 %		70-130





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ SS-539 (0-2')  
 Date Sampled: 09/27/17 09:25  
 Percent Solids: 96  
 Initial Volume: 19.4  
 Final Volume: 2  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709779  
 ESS Laboratory Sample ID: 1709779-05  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: SMR  
 Prepared: 9/27/17 17:24

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	3490 (404)		8100M		5	10/03/17 2:42	C7J0014	CI72713
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		97 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ SS-539 (0-2')  
 Date Sampled: 09/27/17 09:25  
 Percent Solids: 96  
 Initial Volume: 14.5  
 Final Volume: 1  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709779  
 ESS Laboratory Sample ID: 1709779-05  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: TJ  
 Prepared: 9/27/17 17:15

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	6.57 (0.719)		8270D		1	09/30/17 3:36	C7I0487	CI72717
Acenaphthene	1.10 (0.719)		8270D		1	09/30/17 3:36	C7I0487	CI72717
Acenaphthylene	12.0 (0.719)		8270D		1	09/30/17 3:36	C7I0487	CI72717
Anthracene	8.18 (0.719)		8270D		1	09/30/17 3:36	C7I0487	CI72717
Benzo(a)anthracene	29.6 (7.19)		8270D		10	10/02/17 19:20	C7I0487	CI72717
Benzo(a)pyrene	22.3 (3.61)		8270D		10	10/02/17 19:20	C7I0487	CI72717
Benzo(b)fluoranthene	24.1 (7.19)		8270D		10	10/02/17 19:20	C7I0487	CI72717
Benzo(g,h,i)perylene	11.4 (0.719)		8270D		1	09/30/17 3:36	C7I0487	CI72717
Benzo(k)fluoranthene	24.7 (7.19)		8270D		10	10/02/17 19:20	C7I0487	CI72717
Chrysene	32.9 (3.61)		8270D		10	10/02/17 19:20	C7I0487	CI72717
Dibenzo(a,h)Anthracene	5.28 (0.361)		8270D		1	09/30/17 3:36	C7I0487	CI72717
Fluoranthene	39.6 (7.19)		8270D		10	10/02/17 19:20	C7I0487	CI72717
Fluorene	6.55 (0.719)		8270D		1	09/30/17 3:36	C7I0487	CI72717
Indeno(1,2,3-cd)Pyrene	9.41 (0.719)		8270D		1	09/30/17 3:36	C7I0487	CI72717
Naphthalene	9.82 (0.719)		8270D		1	09/30/17 3:36	C7I0487	CI72717
Phenanthrene	44.1 (7.19)		8270D		10	10/02/17 19:20	C7I0487	CI72717
Pyrene	44.6 (7.19)		8270D		10	10/02/17 19:20	C7I0487	CI72717

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	62 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	68 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	66 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	62 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ SS-539 (0-2')  
Date Sampled: 09/27/17 09:25  
Percent Solids: 96

ESS Laboratory Work Order: 1709779  
ESS Laboratory Sample ID: 1709779-05  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	280 (49.9)		9014		50	EEM	10/03/17 12:40	mg/kg dry	CJ70314



## CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ SS-556 (0-2')  
Date Sampled: 09/27/17 10:00  
Percent Solids: 91

ESS Laboratory Work Order: 1709779  
ESS Laboratory Sample ID: 1709779-06  
Sample Matrix: Soil  
Units: mg/kg dry

Extraction Method: 3050B

### Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (1.79)		6020A		20	NAR	10/04/17 11:29	2.46	100	CJ70220
Arsenic	9.57 (2.24)		6010C		1	KJK	10/04/17 15:23	2.46	100	CJ70220
Beryllium	0.43 (0.10)		6010C		1	KJK	10/04/17 15:23	2.46	100	CJ70220
Cadmium	4.83 (0.45)		6010C		1	KJK	10/04/17 15:23	2.46	100	CJ70220
Chromium	9.64 (0.89)		6010C		1	KJK	10/04/17 15:23	2.46	100	CJ70220
Copper	32.1 (2.24)		6010C		1	KJK	10/04/17 15:23	2.46	100	CJ70220
Lead	137 (4.47)		6010C		1	KJK	10/04/17 15:23	2.46	100	CJ70220
Mercury	0.276 (0.026)		7471B		1	MJV	10/02/17 13:33	0.83	40	CI72941
Nickel	13.3 (2.24)		6010C		1	KJK	10/04/17 15:23	2.46	100	CJ70220
Selenium	ND (1.79)		6020A		20	NAR	10/04/17 11:29	2.46	100	CJ70220
Silver	ND (0.45)		6010C		1	KJK	10/04/17 15:23	2.46	100	CJ70220
Thallium	ND (1.79)		6020A		20	NAR	10/04/17 11:29	2.46	100	CJ70220
Zinc	674 (2.24)		6010C		1	KJK	10/04/17 15:23	2.46	100	CJ70220

*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ SS-556 (0-2')  
Date Sampled: 09/27/17 10:00  
Percent Solids: 91  
Initial Volume: 6.1  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1709779  
ESS Laboratory Sample ID: 1709779-06  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MD

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0045)		8260B Low		1	09/28/17 18:25	C7I0471	CI72831
1,1,1-Trichloroethane	ND (0.0045)		8260B Low		1	09/28/17 18:25	C7I0471	CI72831
1,1,2,2-Tetrachloroethane	ND (0.0045)		8260B Low		1	09/28/17 18:25	C7I0471	CI72831
1,1,2-Trichloroethane	ND (0.0045)		8260B Low		1	09/28/17 18:25	C7I0471	CI72831
1,1-Dichloroethane	ND (0.0045)		8260B Low		1	09/28/17 18:25	C7I0471	CI72831
1,1-Dichloroethene	ND (0.0045)		8260B Low		1	09/28/17 18:25	C7I0471	CI72831
1,1-Dichloropropene	ND (0.0045)		8260B Low		1	09/28/17 18:25	C7I0471	CI72831
1,2,3-Trichlorobenzene	ND (0.0045)		8260B Low		1	09/28/17 18:25	C7I0471	CI72831
1,2,3-Trichloropropane	ND (0.0045)		8260B Low		1	09/28/17 18:25	C7I0471	CI72831
1,2,4-Trichlorobenzene	ND (0.0045)		8260B Low		1	09/28/17 18:25	C7I0471	CI72831
1,2,4-Trimethylbenzene	ND (0.0045)		8260B Low		1	09/28/17 18:25	C7I0471	CI72831
1,2-Dibromo-3-Chloropropane	ND (0.0045)		8260B Low		1	09/28/17 18:25	C7I0471	CI72831
1,2-Dibromoethane	ND (0.0045)		8260B Low		1	09/28/17 18:25	C7I0471	CI72831
1,2-Dichlorobenzene	ND (0.0045)		8260B Low		1	09/28/17 18:25	C7I0471	CI72831
1,2-Dichloroethane	ND (0.0045)		8260B Low		1	09/28/17 18:25	C7I0471	CI72831
1,2-Dichloropropane	ND (0.0045)		8260B Low		1	09/28/17 18:25	C7I0471	CI72831
1,3,5-Trimethylbenzene	ND (0.0045)		8260B Low		1	09/28/17 18:25	C7I0471	CI72831
1,3-Dichlorobenzene	ND (0.0045)		8260B Low		1	09/28/17 18:25	C7I0471	CI72831
1,3-Dichloropropane	ND (0.0045)		8260B Low		1	09/28/17 18:25	C7I0471	CI72831
1,4-Dichlorobenzene	ND (0.0045)		8260B Low		1	09/28/17 18:25	C7I0471	CI72831
1,4-Dioxane	ND (0.0901)		8260B Low		1	09/28/17 18:25	C7I0471	CI72831
1-Chlorohexane	ND (0.0045)		8260B Low		1	09/28/17 18:25	C7I0471	CI72831
2,2-Dichloropropane	ND (0.0045)		8260B Low		1	09/28/17 18:25	C7I0471	CI72831
2-Butanone	ND (0.0451)		8260B Low		1	09/28/17 18:25	C7I0471	CI72831
2-Chlorotoluene	ND (0.0045)		8260B Low		1	09/28/17 18:25	C7I0471	CI72831
2-Hexanone	ND (0.0451)		8260B Low		1	09/28/17 18:25	C7I0471	CI72831
4-Chlorotoluene	ND (0.0045)		8260B Low		1	09/28/17 18:25	C7I0471	CI72831
4-Isopropyltoluene	ND (0.0045)		8260B Low		1	09/28/17 18:25	C7I0471	CI72831
4-Methyl-2-Pentanone	ND (0.0451)		8260B Low		1	09/28/17 18:25	C7I0471	CI72831
Acetone	ND (0.0451)		8260B Low		1	09/28/17 18:25	C7I0471	CI72831
Benzene	ND (0.0045)		8260B Low		1	09/28/17 18:25	C7I0471	CI72831
Bromobenzene	ND (0.0045)		8260B Low		1	09/28/17 18:25	C7I0471	CI72831



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ SS-556 (0-2')  
 Date Sampled: 09/27/17 10:00  
 Percent Solids: 91  
 Initial Volume: 6.1  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709779  
 ESS Laboratory Sample ID: 1709779-06  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MD

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0045)		8260B Low		1	09/28/17 18:25	C7I0471	CI72831
Bromodichloromethane	ND (0.0045)		8260B Low		1	09/28/17 18:25	C7I0471	CI72831
Bromoform	ND (0.0045)		8260B Low		1	09/28/17 18:25	C7I0471	CI72831
Bromomethane	ND (0.0090)		8260B Low		1	09/28/17 18:25	C7I0471	CI72831
Carbon Disulfide	ND (0.0045)		8260B Low		1	09/28/17 18:25	C7I0471	CI72831
Carbon Tetrachloride	ND (0.0045)		8260B Low		1	09/28/17 18:25	C7I0471	CI72831
Chlorobenzene	ND (0.0045)		8260B Low		1	09/28/17 18:25	C7I0471	CI72831
Chloroethane	ND (0.0090)		8260B Low		1	09/28/17 18:25	C7I0471	CI72831
Chloroform	ND (0.0045)		8260B Low		1	09/28/17 18:25	C7I0471	CI72831
Chloromethane	ND (0.0090)		8260B Low		1	09/28/17 18:25	C7I0471	CI72831
cis-1,2-Dichloroethene	ND (0.0045)		8260B Low		1	09/28/17 18:25	C7I0471	CI72831
cis-1,3-Dichloropropene	ND (0.0045)		8260B Low		1	09/28/17 18:25	C7I0471	CI72831
Dibromochloromethane	ND (0.0045)		8260B Low		1	09/28/17 18:25	C7I0471	CI72831
Dibromomethane	ND (0.0045)		8260B Low		1	09/28/17 18:25	C7I0471	CI72831
Dichlorodifluoromethane	ND (0.0090)		8260B Low		1	09/28/17 18:25	C7I0471	CI72831
Diethyl Ether	ND (0.0045)		8260B Low		1	09/28/17 18:25	C7I0471	CI72831
Di-isopropyl ether	ND (0.0045)		8260B Low		1	09/28/17 18:25	C7I0471	CI72831
Ethyl tertiary-butyl ether	ND (0.0045)		8260B Low		1	09/28/17 18:25	C7I0471	CI72831
Ethylbenzene	ND (0.0045)		8260B Low		1	09/28/17 18:25	C7I0471	CI72831
Hexachlorobutadiene	ND (0.0045)		8260B Low		1	09/28/17 18:25	C7I0471	CI72831
Isopropylbenzene	ND (0.0045)		8260B Low		1	09/28/17 18:25	C7I0471	CI72831
Methyl tert-Butyl Ether	ND (0.0045)		8260B Low		1	09/28/17 18:25	C7I0471	CI72831
Methylene Chloride	ND (0.0225)		8260B Low		1	09/28/17 18:25	C7I0471	CI72831
Naphthalene	ND (0.0045)		8260B Low		1	09/28/17 18:25	C7I0471	CI72831
n-Butylbenzene	ND (0.0045)		8260B Low		1	09/28/17 18:25	C7I0471	CI72831
n-Propylbenzene	ND (0.0045)		8260B Low		1	09/28/17 18:25	C7I0471	CI72831
sec-Butylbenzene	ND (0.0045)		8260B Low		1	09/28/17 18:25	C7I0471	CI72831
Styrene	ND (0.0045)		8260B Low		1	09/28/17 18:25	C7I0471	CI72831
tert-Butylbenzene	ND (0.0045)		8260B Low		1	09/28/17 18:25	C7I0471	CI72831
Tertiary-amyl methyl ether	ND (0.0045)		8260B Low		1	09/28/17 18:25	C7I0471	CI72831
Tetrachloroethene	ND (0.0045)		8260B Low		1	09/28/17 18:25	C7I0471	CI72831
Tetrahydrofuran	ND (0.0045)		8260B Low		1	09/28/17 18:25	C7I0471	CI72831





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ SS-556 (0-2')  
 Date Sampled: 09/27/17 10:00  
 Percent Solids: 91  
 Initial Volume: 6.1  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709779  
 ESS Laboratory Sample ID: 1709779-06  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MD

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0045)		8260B Low		1	09/28/17 18:25	C7I0471	CI72831
trans-1,2-Dichloroethene	ND (0.0045)		8260B Low		1	09/28/17 18:25	C7I0471	CI72831
trans-1,3-Dichloropropene	ND (0.0045)		8260B Low		1	09/28/17 18:25	C7I0471	CI72831
Trichloroethene	ND (0.0045)		8260B Low		1	09/28/17 18:25	C7I0471	CI72831
Trichlorofluoromethane	ND (0.0045)		8260B Low		1	09/28/17 18:25	C7I0471	CI72831
Vinyl Acetate	ND (0.0045)		8260B Low		1	09/28/17 18:25	C7I0471	CI72831
Vinyl Chloride	ND (0.0090)		8260B Low		1	09/28/17 18:25	C7I0471	CI72831
Xylene O	ND (0.0045)		8260B Low		1	09/28/17 18:25	C7I0471	CI72831
Xylene P,M	ND (0.0090)		8260B Low		1	09/28/17 18:25	C7I0471	CI72831
Xylenes (Total)	ND (0.0090)		8260B Low		1	09/28/17 18:25		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	94 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	67 %	S-	70-130
<i>Surrogate: Dibromofluoromethane</i>	84 %		70-130
<i>Surrogate: Toluene-d8</i>	114 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ SS-556 (0-2')  
 Date Sampled: 09/27/17 10:00  
 Percent Solids: 91  
 Initial Volume: 19.6  
 Final Volume: 1  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709779  
 ESS Laboratory Sample ID: 1709779-06  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: SMR  
 Prepared: 9/27/17 17:24

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	119 (42.1)		8100M		1	10/02/17 23:13	C7J0014	CI72713
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		77 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ SS-556 (0-2')  
Date Sampled: 09/27/17 10:00  
Percent Solids: 91  
Initial Volume: 15.1  
Final Volume: 0.5  
Extraction Method: 3546

ESS Laboratory Work Order: 1709779  
ESS Laboratory Sample ID: 1709779-06  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: TJ  
Prepared: 9/27/17 17:15

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.364)		8270D		1	10/02/17 20:50	C7J0002	CI72717
Acenaphthene	ND (0.364)		8270D		1	10/02/17 20:50	C7J0002	CI72717
Acenaphthylene	ND (0.364)		8270D		1	10/02/17 20:50	C7J0002	CI72717
Anthracene	ND (0.364)		8270D		1	10/02/17 20:50	C7J0002	CI72717
<b>Benzo(a)anthracene</b>	<b>1.15</b> (0.364)		8270D		1	10/02/17 20:50	C7J0002	CI72717
<b>Benzo(a)pyrene</b>	<b>1.34</b> (0.182)		8270D		1	10/02/17 20:50	C7J0002	CI72717
<b>Benzo(b)fluoranthene</b>	<b>1.79</b> (0.364)		8270D		1	10/02/17 20:50	C7J0002	CI72717
<b>Benzo(g,h,i)perylene</b>	<b>1.23</b> (0.364)		8270D		1	10/02/17 20:50	C7J0002	CI72717
<b>Benzo(k)fluoranthene</b>	<b>0.590</b> (0.364)		8270D		1	10/02/17 20:50	C7J0002	CI72717
<b>Chrysene</b>	<b>1.12</b> (0.182)		8270D		1	10/02/17 20:50	C7J0002	CI72717
<b>Dibenzo(a,h)Anthracene</b>	<b>0.464</b> (0.182)		8270D		1	10/02/17 20:50	C7J0002	CI72717
<b>Fluoranthene</b>	<b>1.50</b> (0.364)		8270D		1	10/02/17 20:50	C7J0002	CI72717
Fluorene	ND (0.364)		8270D		1	10/02/17 20:50	C7J0002	CI72717
<b>Indeno(1,2,3-cd)Pyrene</b>	<b>1.04</b> (0.364)		8270D		1	10/02/17 20:50	C7J0002	CI72717
Naphthalene	ND (0.364)		8270D		1	10/02/17 20:50	C7J0002	CI72717
<b>Phenanthrene</b>	<b>0.520</b> (0.364)		8270D		1	10/02/17 20:50	C7J0002	CI72717
<b>Pyrene</b>	<b>1.57</b> (0.364)		8270D		1	10/02/17 20:50	C7J0002	CI72717

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	62 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	69 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	64 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	82 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ SS-556 (0-2')  
Date Sampled: 09/27/17 10:00  
Percent Solids: 91

ESS Laboratory Work Order: 1709779  
ESS Laboratory Sample ID: 1709779-06  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	33.0 (10.5)		9014		10	EEM	10/03/17 12:40	mg/kg dry	CJ70314



## CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ SS-557 (0-2')  
 Date Sampled: 09/27/17 10:15  
 Percent Solids: 90

ESS Laboratory Work Order: 1709779  
 ESS Laboratory Sample ID: 1709779-07  
 Sample Matrix: Soil  
 Units: mg/kg dry

Extraction Method: 3050B

### Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	2.97 (2.09)		6020A		20	NAR	10/04/17 11:34	2.12	100	CJ70220
Arsenic	6.60 (2.61)		6010C		1	KJK	10/04/17 0:13	2.12	100	CJ70220
Beryllium	0.43 (0.11)		6010C		1	KJK	10/04/17 0:13	2.12	100	CJ70220
Cadmium	2.17 (0.52)		6010C		1	KJK	10/04/17 0:13	2.12	100	CJ70220
Chromium	7.88 (1.04)		6010C		1	KJK	10/04/17 0:13	2.12	100	CJ70220
Copper	39.8 (2.61)		6010C		1	KJK	10/04/17 0:13	2.12	100	CJ70220
Lead	178 (5.21)		6010C		1	KJK	10/04/17 0:13	2.12	100	CJ70220
Mercury	0.560 (0.032)		7471B		1	MJV	10/02/17 13:35	0.68	40	CI72941
Nickel	12.5 (2.61)		6010C		1	KJK	10/04/17 0:13	2.12	100	CJ70220
Selenium	ND (2.09)		6020A		20	NAR	10/04/17 11:34	2.12	100	CJ70220
Silver	0.63 (0.52)		6010C		1	KJK	10/04/17 0:13	2.12	100	CJ70220
Thallium	ND (2.09)		6020A		20	NAR	10/04/17 11:34	2.12	100	CJ70220
Zinc	624 (2.61)		6010C		1	KJK	10/04/17 0:13	2.12	100	CJ70220



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ SS-557 (0-2')  
 Date Sampled: 09/27/17 10:15  
 Percent Solids: 90  
 Initial Volume: 7.4  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709779  
 ESS Laboratory Sample ID: 1709779-07  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MD

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0037)		8260B Low		1	09/29/17 14:27	C7I0483	CI72927
1,1,1-Trichloroethane	ND (0.0037)		8260B Low		1	09/29/17 14:27	C7I0483	CI72927
1,1,2,2-Tetrachloroethane	ND (0.0037)		8260B Low		1	09/29/17 14:27	C7I0483	CI72927
1,1,2-Trichloroethane	ND (0.0037)		8260B Low		1	09/29/17 14:27	C7I0483	CI72927
1,1-Dichloroethane	ND (0.0037)		8260B Low		1	09/29/17 14:27	C7I0483	CI72927
1,1-Dichloroethene	ND (0.0037)		8260B Low		1	09/29/17 14:27	C7I0483	CI72927
1,1-Dichloropropene	ND (0.0037)		8260B Low		1	09/29/17 14:27	C7I0483	CI72927
1,2,3-Trichlorobenzene	ND (0.0037)		8260B Low		1	09/29/17 14:27	C7I0483	CI72927
1,2,3-Trichloropropane	ND (0.0037)		8260B Low		1	09/29/17 14:27	C7I0483	CI72927
1,2,4-Trichlorobenzene	ND (0.0037)		8260B Low		1	09/29/17 14:27	C7I0483	CI72927
1,2,4-Trimethylbenzene	ND (0.0037)		8260B Low		1	09/29/17 14:27	C7I0483	CI72927
1,2-Dibromo-3-Chloropropane	ND (0.0037)		8260B Low		1	09/29/17 14:27	C7I0483	CI72927
1,2-Dibromoethane	ND (0.0037)		8260B Low		1	09/29/17 14:27	C7I0483	CI72927
1,2-Dichlorobenzene	ND (0.0037)		8260B Low		1	09/29/17 14:27	C7I0483	CI72927
1,2-Dichloroethane	ND (0.0037)		8260B Low		1	09/29/17 14:27	C7I0483	CI72927
1,2-Dichloropropane	ND (0.0037)		8260B Low		1	09/29/17 14:27	C7I0483	CI72927
1,3,5-Trimethylbenzene	ND (0.0037)		8260B Low		1	09/29/17 14:27	C7I0483	CI72927
1,3-Dichlorobenzene	ND (0.0037)		8260B Low		1	09/29/17 14:27	C7I0483	CI72927
1,3-Dichloropropane	ND (0.0037)		8260B Low		1	09/29/17 14:27	C7I0483	CI72927
1,4-Dichlorobenzene	ND (0.0037)		8260B Low		1	09/29/17 14:27	C7I0483	CI72927
1,4-Dioxane	ND (0.0747)		8260B Low		1	09/29/17 14:27	C7I0483	CI72927
1-Chlorohexane	ND (0.0037)		8260B Low		1	09/29/17 14:27	C7I0483	CI72927
2,2-Dichloropropane	ND (0.0037)		8260B Low		1	09/29/17 14:27	C7I0483	CI72927
2-Butanone	ND (0.0373)		8260B Low		1	09/29/17 14:27	C7I0483	CI72927
2-Chlorotoluene	ND (0.0037)		8260B Low		1	09/29/17 14:27	C7I0483	CI72927
2-Hexanone	ND (0.0373)		8260B Low		1	09/29/17 14:27	C7I0483	CI72927
4-Chlorotoluene	ND (0.0037)		8260B Low		1	09/29/17 14:27	C7I0483	CI72927
4-Isopropyltoluene	ND (0.0037)		8260B Low		1	09/29/17 14:27	C7I0483	CI72927
4-Methyl-2-Pentanone	ND (0.0373)		8260B Low		1	09/29/17 14:27	C7I0483	CI72927
Acetone	ND (0.0373)		8260B Low		1	09/29/17 14:27	C7I0483	CI72927
Benzene	ND (0.0037)		8260B Low		1	09/29/17 14:27	C7I0483	CI72927
Bromobenzene	ND (0.0037)		8260B Low		1	09/29/17 14:27	C7I0483	CI72927





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ SS-557 (0-2')  
Date Sampled: 09/27/17 10:15  
Percent Solids: 90  
Initial Volume: 7.4  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1709779  
ESS Laboratory Sample ID: 1709779-07  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MD

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0037)		8260B Low		1	09/29/17 14:27	C7I0483	C172927
Bromodichloromethane	ND (0.0037)		8260B Low		1	09/29/17 14:27	C7I0483	C172927
Bromoform	ND (0.0037)		8260B Low		1	09/29/17 14:27	C7I0483	C172927
Bromomethane	ND (0.0075)		8260B Low		1	09/29/17 14:27	C7I0483	C172927
Carbon Disulfide	ND (0.0037)		8260B Low		1	09/29/17 14:27	C7I0483	C172927
Carbon Tetrachloride	ND (0.0037)		8260B Low		1	09/29/17 14:27	C7I0483	C172927
Chlorobenzene	ND (0.0037)		8260B Low		1	09/29/17 14:27	C7I0483	C172927
Chloroethane	ND (0.0075)		8260B Low		1	09/29/17 14:27	C7I0483	C172927
Chloroform	ND (0.0037)		8260B Low		1	09/29/17 14:27	C7I0483	C172927
Chloromethane	ND (0.0075)		8260B Low		1	09/29/17 14:27	C7I0483	C172927
cis-1,2-Dichloroethene	ND (0.0037)		8260B Low		1	09/29/17 14:27	C7I0483	C172927
cis-1,3-Dichloropropene	ND (0.0037)		8260B Low		1	09/29/17 14:27	C7I0483	C172927
Dibromochloromethane	ND (0.0037)		8260B Low		1	09/29/17 14:27	C7I0483	C172927
Dibromomethane	ND (0.0037)		8260B Low		1	09/29/17 14:27	C7I0483	C172927
Dichlorodifluoromethane	ND (0.0075)		8260B Low		1	09/29/17 14:27	C7I0483	C172927
Diethyl Ether	ND (0.0037)		8260B Low		1	09/29/17 14:27	C7I0483	C172927
Di-isopropyl ether	ND (0.0037)		8260B Low		1	09/29/17 14:27	C7I0483	C172927
Ethyl tertiary-butyl ether	ND (0.0037)		8260B Low		1	09/29/17 14:27	C7I0483	C172927
Ethylbenzene	ND (0.0037)		8260B Low		1	09/29/17 14:27	C7I0483	C172927
Hexachlorobutadiene	ND (0.0037)		8260B Low		1	09/29/17 14:27	C7I0483	C172927
Isopropylbenzene	ND (0.0037)		8260B Low		1	09/29/17 14:27	C7I0483	C172927
Methyl tert-Butyl Ether	ND (0.0037)		8260B Low		1	09/29/17 14:27	C7I0483	C172927
Methylene Chloride	ND (0.0187)		8260B Low		1	09/29/17 14:27	C7I0483	C172927
Naphthalene	ND (0.0037)		8260B Low		1	09/29/17 14:27	C7I0483	C172927
n-Butylbenzene	ND (0.0037)		8260B Low		1	09/29/17 14:27	C7I0483	C172927
n-Propylbenzene	ND (0.0037)		8260B Low		1	09/29/17 14:27	C7I0483	C172927
sec-Butylbenzene	ND (0.0037)		8260B Low		1	09/29/17 14:27	C7I0483	C172927
Styrene	ND (0.0037)		8260B Low		1	09/29/17 14:27	C7I0483	C172927
tert-Butylbenzene	ND (0.0037)		8260B Low		1	09/29/17 14:27	C7I0483	C172927
Tertiary-amyl methyl ether	ND (0.0037)		8260B Low		1	09/29/17 14:27	C7I0483	C172927
Tetrachloroethene	ND (0.0037)		8260B Low		1	09/29/17 14:27	C7I0483	C172927
Tetrahydrofuran	ND (0.0037)		8260B Low		1	09/29/17 14:27	C7I0483	C172927



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ SS-557 (0-2')  
 Date Sampled: 09/27/17 10:15  
 Percent Solids: 90  
 Initial Volume: 7.4  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709779  
 ESS Laboratory Sample ID: 1709779-07  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MD

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0037)		8260B Low		1	09/29/17 14:27	C7I0483	CI72927
trans-1,2-Dichloroethene	ND (0.0037)		8260B Low		1	09/29/17 14:27	C7I0483	CI72927
trans-1,3-Dichloropropene	ND (0.0037)		8260B Low		1	09/29/17 14:27	C7I0483	CI72927
Trichloroethene	ND (0.0037)		8260B Low		1	09/29/17 14:27	C7I0483	CI72927
Trichlorofluoromethane	ND (0.0037)		8260B Low		1	09/29/17 14:27	C7I0483	CI72927
Vinyl Acetate	ND (0.0037)		8260B Low		1	09/29/17 14:27	C7I0483	CI72927
Vinyl Chloride	ND (0.0075)		8260B Low		1	09/29/17 14:27	C7I0483	CI72927
Xylene O	ND (0.0037)		8260B Low		1	09/29/17 14:27	C7I0483	CI72927
Xylene P,M	ND (0.0075)		8260B Low		1	09/29/17 14:27	C7I0483	CI72927
Xylenes (Total)	ND (0.0075)		8260B Low		1	09/29/17 14:27		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	100 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	77 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	86 %		70-130
<i>Surrogate: Toluene-d8</i>	100 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ SS-557 (0-2')  
 Date Sampled: 09/27/17 10:15  
 Percent Solids: 90  
 Initial Volume: 20  
 Final Volume: 1  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709779  
 ESS Laboratory Sample ID: 1709779-07  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: SMR  
 Prepared: 9/27/17 17:24

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	201 (41.5)		8100M		1	10/02/17 23:48	C7J0014	CI72713
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		76 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ SS-557 (0-2')  
 Date Sampled: 09/27/17 10:15  
 Percent Solids: 90  
 Initial Volume: 14.6  
 Final Volume: 0.5  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709779  
 ESS Laboratory Sample ID: 1709779-07  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: TJ  
 Prepared: 9/27/17 17:15

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.378)		8270D		1	10/02/17 21:24	C7J0002	CI72717
Acenaphthene	ND (0.378)		8270D		1	10/02/17 21:24	C7J0002	CI72717
Acenaphthylene	ND (0.378)		8270D		1	10/02/17 21:24	C7J0002	CI72717
<b>Anthracene</b>	<b>0.381</b> (0.378)		8270D		1	10/02/17 21:24	C7J0002	CI72717
<b>Benzo(a)anthracene</b>	<b>2.38</b> (0.378)		8270D		1	10/02/17 21:24	C7J0002	CI72717
<b>Benzo(a)pyrene</b>	<b>3.91</b> (0.190)		8270D		1	10/02/17 21:24	C7J0002	CI72717
<b>Benzo(b)fluoranthene</b>	<b>4.08</b> (0.378)		8270D		1	10/02/17 21:24	C7J0002	CI72717
<b>Benzo(g,h,i)perylene</b>	<b>4.67</b> (0.378)		8270D		1	10/02/17 21:24	C7J0002	CI72717
<b>Benzo(k)fluoranthene</b>	<b>1.65</b> (0.378)		8270D		1	10/02/17 21:24	C7J0002	CI72717
<b>Chrysene</b>	<b>2.28</b> (0.190)		8270D		1	10/02/17 21:24	C7J0002	CI72717
<b>Dibenzo(a,h)Anthracene</b>	<b>1.52</b> (0.190)		8270D		1	10/02/17 21:24	C7J0002	CI72717
<b>Fluoranthene</b>	<b>2.85</b> (0.378)		8270D		1	10/02/17 21:24	C7J0002	CI72717
Fluorene	ND (0.378)		8270D		1	10/02/17 21:24	C7J0002	CI72717
<b>Indeno(1,2,3-cd)Pyrene</b>	<b>3.68</b> (0.378)		8270D		1	10/02/17 21:24	C7J0002	CI72717
<b>Naphthalene</b>	<b>1.67</b> (0.378)		8270D		1	10/02/17 21:24	C7J0002	CI72717
<b>Phenanthrene</b>	<b>1.37</b> (0.378)		8270D		1	10/02/17 21:24	C7J0002	CI72717
<b>Pyrene</b>	<b>2.94</b> (0.378)		8270D		1	10/02/17 21:24	C7J0002	CI72717

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	54 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	64 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	55 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	74 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ SS-557 (0-2')  
Date Sampled: 09/27/17 10:15  
Percent Solids: 90

ESS Laboratory Work Order: 1709779  
ESS Laboratory Sample ID: 1709779-07  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	27.0 (5.40)		9014		5	EEM	10/03/17 12:40	mg/kg dry	CJ70314



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ SS-558 (0-2')  
 Date Sampled: 09/27/17 10:30  
 Percent Solids: 89

ESS Laboratory Work Order: 1709779  
 ESS Laboratory Sample ID: 1709779-08  
 Sample Matrix: Soil  
 Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	11.5 (1.80)		6020A		20	NAR	10/04/17 11:40	2.5	100	CJ70220
Arsenic	19.8 (2.25)		6010C		1	KJK	10/04/17 0:17	2.5	100	CJ70220
Beryllium	0.37 (0.10)		6010C		1	KJK	10/04/17 0:17	2.5	100	CJ70220
Cadmium	1.52 (0.45)		6010C		1	KJK	10/04/17 0:17	2.5	100	CJ70220
Chromium	7.94 (0.90)		6010C		1	KJK	10/04/17 0:17	2.5	100	CJ70220
Copper	55.3 (2.25)		6010C		1	KJK	10/04/17 0:17	2.5	100	CJ70220
Lead	469 (4.49)		6010C		1	KJK	10/04/17 0:17	2.5	100	CJ70220
Mercury	0.589 (0.029)		7471B		1	MJV	10/02/17 13:37	0.76	40	CI72941
Nickel	9.54 (2.25)		6010C		1	KJK	10/04/17 0:17	2.5	100	CJ70220
Selenium	2.16 (1.80)		6020A		20	NAR	10/04/17 11:40	2.5	100	CJ70220
Silver	0.55 (0.45)		6010C		1	KJK	10/04/17 0:17	2.5	100	CJ70220
Thallium	ND (1.80)		6020A		20	NAR	10/04/17 11:40	2.5	100	CJ70220
Zinc	205 (2.25)		6010C		1	KJK	10/04/17 0:17	2.5	100	CJ70220





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ SS-558 (0-2')  
Date Sampled: 09/27/17 10:30  
Percent Solids: 89  
Initial Volume: 7.1  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1709779  
ESS Laboratory Sample ID: 1709779-08  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MD

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0040)		8260B Low		1	09/28/17 19:16	C7I0471	CI72831
1,1,1-Trichloroethane	ND (0.0040)		8260B Low		1	09/28/17 19:16	C7I0471	CI72831
1,1,2,2-Tetrachloroethane	ND (0.0040)		8260B Low		1	09/28/17 19:16	C7I0471	CI72831
1,1,2-Trichloroethane	ND (0.0040)		8260B Low		1	09/28/17 19:16	C7I0471	CI72831
1,1-Dichloroethane	ND (0.0040)		8260B Low		1	09/28/17 19:16	C7I0471	CI72831
1,1-Dichloroethene	ND (0.0040)		8260B Low		1	09/28/17 19:16	C7I0471	CI72831
1,1-Dichloropropene	ND (0.0040)		8260B Low		1	09/28/17 19:16	C7I0471	CI72831
1,2,3-Trichlorobenzene	ND (0.0040)		8260B Low		1	09/28/17 19:16	C7I0471	CI72831
1,2,3-Trichloropropane	ND (0.0040)		8260B Low		1	09/28/17 19:16	C7I0471	CI72831
1,2,4-Trichlorobenzene	ND (0.0040)		8260B Low		1	09/28/17 19:16	C7I0471	CI72831
1,2,4-Trimethylbenzene	ND (0.0040)		8260B Low		1	09/28/17 19:16	C7I0471	CI72831
1,2-Dibromo-3-Chloropropane	ND (0.0040)		8260B Low		1	09/28/17 19:16	C7I0471	CI72831
1,2-Dibromoethane	ND (0.0040)		8260B Low		1	09/28/17 19:16	C7I0471	CI72831
1,2-Dichlorobenzene	ND (0.0040)		8260B Low		1	09/28/17 19:16	C7I0471	CI72831
1,2-Dichloroethane	ND (0.0040)		8260B Low		1	09/28/17 19:16	C7I0471	CI72831
1,2-Dichloropropane	ND (0.0040)		8260B Low		1	09/28/17 19:16	C7I0471	CI72831
1,3,5-Trimethylbenzene	ND (0.0040)		8260B Low		1	09/28/17 19:16	C7I0471	CI72831
1,3-Dichlorobenzene	ND (0.0040)		8260B Low		1	09/28/17 19:16	C7I0471	CI72831
1,3-Dichloropropane	ND (0.0040)		8260B Low		1	09/28/17 19:16	C7I0471	CI72831
1,4-Dichlorobenzene	ND (0.0040)		8260B Low		1	09/28/17 19:16	C7I0471	CI72831
1,4-Dioxane	ND (0.0791)		8260B Low		1	09/28/17 19:16	C7I0471	CI72831
1-Chlorohexane	ND (0.0040)		8260B Low		1	09/28/17 19:16	C7I0471	CI72831
2,2-Dichloropropane	ND (0.0040)		8260B Low		1	09/28/17 19:16	C7I0471	CI72831
2-Butanone	ND (0.0395)		8260B Low		1	09/28/17 19:16	C7I0471	CI72831
2-Chlorotoluene	ND (0.0040)		8260B Low		1	09/28/17 19:16	C7I0471	CI72831
2-Hexanone	ND (0.0395)		8260B Low		1	09/28/17 19:16	C7I0471	CI72831
4-Chlorotoluene	ND (0.0040)		8260B Low		1	09/28/17 19:16	C7I0471	CI72831
4-Isopropyltoluene	ND (0.0040)		8260B Low		1	09/28/17 19:16	C7I0471	CI72831
4-Methyl-2-Pentanone	ND (0.0395)		8260B Low		1	09/28/17 19:16	C7I0471	CI72831
Acetone	ND (0.0395)		8260B Low		1	09/28/17 19:16	C7I0471	CI72831
Benzene	ND (0.0040)		8260B Low		1	09/28/17 19:16	C7I0471	CI72831
Bromobenzene	ND (0.0040)		8260B Low		1	09/28/17 19:16	C7I0471	CI72831



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ SS-558 (0-2')  
Date Sampled: 09/27/17 10:30  
Percent Solids: 89  
Initial Volume: 7.1  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1709779  
ESS Laboratory Sample ID: 1709779-08  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MD

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0040)		8260B Low		1	09/28/17 19:16	C7I0471	CI72831
Bromodichloromethane	ND (0.0040)		8260B Low		1	09/28/17 19:16	C7I0471	CI72831
Bromoform	ND (0.0040)		8260B Low		1	09/28/17 19:16	C7I0471	CI72831
Bromomethane	ND (0.0079)		8260B Low		1	09/28/17 19:16	C7I0471	CI72831
Carbon Disulfide	ND (0.0040)		8260B Low		1	09/28/17 19:16	C7I0471	CI72831
Carbon Tetrachloride	ND (0.0040)		8260B Low		1	09/28/17 19:16	C7I0471	CI72831
Chlorobenzene	ND (0.0040)		8260B Low		1	09/28/17 19:16	C7I0471	CI72831
Chloroethane	ND (0.0079)		8260B Low		1	09/28/17 19:16	C7I0471	CI72831
Chloroform	ND (0.0040)		8260B Low		1	09/28/17 19:16	C7I0471	CI72831
Chloromethane	ND (0.0079)		8260B Low		1	09/28/17 19:16	C7I0471	CI72831
cis-1,2-Dichloroethene	ND (0.0040)		8260B Low		1	09/28/17 19:16	C7I0471	CI72831
cis-1,3-Dichloropropene	ND (0.0040)		8260B Low		1	09/28/17 19:16	C7I0471	CI72831
Dibromochloromethane	ND (0.0040)		8260B Low		1	09/28/17 19:16	C7I0471	CI72831
Dibromomethane	ND (0.0040)		8260B Low		1	09/28/17 19:16	C7I0471	CI72831
Dichlorodifluoromethane	ND (0.0079)		8260B Low		1	09/28/17 19:16	C7I0471	CI72831
Diethyl Ether	ND (0.0040)		8260B Low		1	09/28/17 19:16	C7I0471	CI72831
Di-isopropyl ether	ND (0.0040)		8260B Low		1	09/28/17 19:16	C7I0471	CI72831
Ethyl tertiary-butyl ether	ND (0.0040)		8260B Low		1	09/28/17 19:16	C7I0471	CI72831
Ethylbenzene	ND (0.0040)		8260B Low		1	09/28/17 19:16	C7I0471	CI72831
Hexachlorobutadiene	ND (0.0040)		8260B Low		1	09/28/17 19:16	C7I0471	CI72831
Isopropylbenzene	ND (0.0040)		8260B Low		1	09/28/17 19:16	C7I0471	CI72831
Methyl tert-Butyl Ether	ND (0.0040)		8260B Low		1	09/28/17 19:16	C7I0471	CI72831
Methylene Chloride	ND (0.0198)		8260B Low		1	09/28/17 19:16	C7I0471	CI72831
Naphthalene	ND (0.0040)		8260B Low		1	09/28/17 19:16	C7I0471	CI72831
n-Butylbenzene	ND (0.0040)		8260B Low		1	09/28/17 19:16	C7I0471	CI72831
n-Propylbenzene	ND (0.0040)		8260B Low		1	09/28/17 19:16	C7I0471	CI72831
sec-Butylbenzene	ND (0.0040)		8260B Low		1	09/28/17 19:16	C7I0471	CI72831
Styrene	ND (0.0040)		8260B Low		1	09/28/17 19:16	C7I0471	CI72831
tert-Butylbenzene	ND (0.0040)		8260B Low		1	09/28/17 19:16	C7I0471	CI72831
Tertiary-amyl methyl ether	ND (0.0040)		8260B Low		1	09/28/17 19:16	C7I0471	CI72831
Tetrachloroethene	ND (0.0040)		8260B Low		1	09/28/17 19:16	C7I0471	CI72831
Tetrahydrofuran	ND (0.0040)		8260B Low		1	09/28/17 19:16	C7I0471	CI72831



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ SS-558 (0-2')  
 Date Sampled: 09/27/17 10:30  
 Percent Solids: 89  
 Initial Volume: 7.1  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709779  
 ESS Laboratory Sample ID: 1709779-08  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MD

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0040)		8260B Low		1	09/28/17 19:16	C7I0471	CI72831
trans-1,2-Dichloroethene	ND (0.0040)		8260B Low		1	09/28/17 19:16	C7I0471	CI72831
trans-1,3-Dichloropropene	ND (0.0040)		8260B Low		1	09/28/17 19:16	C7I0471	CI72831
Trichloroethene	ND (0.0040)		8260B Low		1	09/28/17 19:16	C7I0471	CI72831
Trichlorofluoromethane	ND (0.0040)		8260B Low		1	09/28/17 19:16	C7I0471	CI72831
Vinyl Acetate	ND (0.0040)		8260B Low		1	09/28/17 19:16	C7I0471	CI72831
Vinyl Chloride	ND (0.0079)		8260B Low		1	09/28/17 19:16	C7I0471	CI72831
Xylene O	ND (0.0040)		8260B Low		1	09/28/17 19:16	C7I0471	CI72831
Xylene P,M	ND (0.0079)		8260B Low		1	09/28/17 19:16	C7I0471	CI72831
Xylenes (Total)	ND (0.0079)		8260B Low		1	09/28/17 19:16		[CALC]

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: 1,2-Dichloroethane-d4	91 %		70-130
Surrogate: 4-Bromofluorobenzene	67 %	SC	70-130
Surrogate: Dibromofluoromethane	83 %		70-130
Surrogate: Toluene-d8	117 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ SS-558 (0-2')  
Date Sampled: 09/27/17 10:30  
Percent Solids: 89  
Initial Volume: 19.8  
Final Volume: 2  
Extraction Method: 3546

ESS Laboratory Work Order: 1709779  
ESS Laboratory Sample ID: 1709779-08  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: SMR  
Prepared: 9/27/17 17:24

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	2300 (425)		8100M		5	10/03/17 3:17	C7J0014	CI72713
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		65 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ SS-558 (0-2')  
Date Sampled: 09/27/17 10:30  
Percent Solids: 89  
Initial Volume: 14.8  
Final Volume: 2  
Extraction Method: 3546

ESS Laboratory Work Order: 1709779  
ESS Laboratory Sample ID: 1709779-08  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: TJ  
Prepared: 9/27/17 17:15

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	7.49 (1.52)		8270D		1	10/02/17 21:59	C7J0002	CI72717
Acenaphthene	ND (1.52)		8270D		1	10/02/17 21:59	C7J0002	CI72717
Acenaphthylene	7.27 (1.52)		8270D		1	10/02/17 21:59	C7J0002	CI72717
Anthracene	3.09 (1.52)		8270D		1	10/02/17 21:59	C7J0002	CI72717
Benzo(a)anthracene	11.7 (1.52)		8270D		1	10/02/17 21:59	C7J0002	CI72717
Benzo(a)pyrene	13.5 (0.760)		8270D		1	10/02/17 21:59	C7J0002	CI72717
Benzo(b)fluoranthene	19.1 (1.52)		8270D		1	10/02/17 21:59	C7J0002	CI72717
Benzo(g,h,i)perylene	12.5 (1.52)		8270D		1	10/02/17 21:59	C7J0002	CI72717
Benzo(k)fluoranthene	5.17 (1.52)		8270D		1	10/02/17 21:59	C7J0002	CI72717
Chrysene	10.9 (0.760)		8270D		1	10/02/17 21:59	C7J0002	CI72717
Dibenzo(a,h)Anthracene	5.01 (0.760)		8270D		1	10/02/17 21:59	C7J0002	CI72717
Fluoranthene	14.9 (1.52)		8270D		1	10/02/17 21:59	C7J0002	CI72717
Fluorene	ND (1.52)		8270D		1	10/02/17 21:59	C7J0002	CI72717
Indeno(1,2,3-cd)Pyrene	12.2 (1.52)		8270D		1	10/02/17 21:59	C7J0002	CI72717
Naphthalene	6.22 (1.52)		8270D		1	10/02/17 21:59	C7J0002	CI72717
Phenanthrene	7.18 (1.52)		8270D		1	10/02/17 21:59	C7J0002	CI72717
Pyrene	14.4 (1.52)		8270D		1	10/02/17 21:59	C7J0002	CI72717

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
Surrogate: 1,2-Dichlorobenzene-d4	67 %		30-130
Surrogate: 2-Fluorobiphenyl	82 %		30-130
Surrogate: Nitrobenzene-d5	70 %		30-130
Surrogate: p-Terphenyl-d14	89 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ SS-558 (0-2')  
Date Sampled: 09/27/17 10:30  
Percent Solids: 89

ESS Laboratory Work Order: 1709779  
ESS Laboratory Sample ID: 1709779-08  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	21.1 (5.57)		9014		5	EEM	10/03/17 12:40	mg/kg dry	CJ70314





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ SS-559 (0-2')  
 Date Sampled: 09/27/17 10:40  
 Percent Solids: 86

ESS Laboratory Work Order: 1709779  
 ESS Laboratory Sample ID: 1709779-09  
 Sample Matrix: Soil  
 Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	4.47 (2.12)		6020A		20	NAR	10/04/17 11:46	2.2	100	CJ70220
Arsenic	6.43 (2.65)		6010C		1	KJK	10/04/17 0:21	2.2	100	CJ70220
Beryllium	0.31 (0.12)		6010C		1	KJK	10/04/17 0:21	2.2	100	CJ70220
Cadmium	0.84 (0.53)		6010C		1	KJK	10/04/17 0:21	2.2	100	CJ70220
Chromium	6.16 (1.06)		6010C		1	KJK	10/04/17 0:21	2.2	100	CJ70220
Copper	28.5 (2.65)		6010C		1	KJK	10/04/17 0:21	2.2	100	CJ70220
Lead	153 (5.30)		6010C		1	KJK	10/04/17 0:21	2.2	100	CJ70220
Mercury	0.190 (0.036)		7471B		1	MJV	10/02/17 13:39	0.64	40	CI72941
Nickel	8.24 (2.65)		6010C		1	KJK	10/04/17 0:21	2.2	100	CJ70220
Selenium	ND (2.12)		6020A		20	NAR	10/04/17 11:46	2.2	100	CJ70220
Silver	ND (0.53)		6010C		1	KJK	10/04/17 0:21	2.2	100	CJ70220
Thallium	ND (2.12)		6020A		20	NAR	10/04/17 11:46	2.2	100	CJ70220
Zinc	210 (2.65)		6010C		1	KJK	10/04/17 0:21	2.2	100	CJ70220



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ SS-559 (0-2')  
Date Sampled: 09/27/17 10:40  
Percent Solids: 86  
Initial Volume: 5.2  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1709779  
ESS Laboratory Sample ID: 1709779-09  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MD

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0056)		8260B Low		1	09/28/17 19:42	C7I0471	CI72831
1,1,1-Trichloroethane	ND (0.0056)		8260B Low		1	09/28/17 19:42	C7I0471	CI72831
1,1,2,2-Tetrachloroethane	ND (0.0056)		8260B Low		1	09/28/17 19:42	C7I0471	CI72831
1,1,2-Trichloroethane	ND (0.0056)		8260B Low		1	09/28/17 19:42	C7I0471	CI72831
1,1-Dichloroethane	ND (0.0056)		8260B Low		1	09/28/17 19:42	C7I0471	CI72831
1,1-Dichloroethene	ND (0.0056)		8260B Low		1	09/28/17 19:42	C7I0471	CI72831
1,1-Dichloropropene	ND (0.0056)		8260B Low		1	09/28/17 19:42	C7I0471	CI72831
1,2,3-Trichlorobenzene	ND (0.0056)		8260B Low		1	09/28/17 19:42	C7I0471	CI72831
1,2,3-Trichloropropane	ND (0.0056)		8260B Low		1	09/28/17 19:42	C7I0471	CI72831
1,2,4-Trichlorobenzene	ND (0.0056)		8260B Low		1	09/28/17 19:42	C7I0471	CI72831
1,2,4-Trimethylbenzene	ND (0.0056)		8260B Low		1	09/28/17 19:42	C7I0471	CI72831
1,2-Dibromo-3-Chloropropane	ND (0.0056)		8260B Low		1	09/28/17 19:42	C7I0471	CI72831
1,2-Dibromoethane	ND (0.0056)		8260B Low		1	09/28/17 19:42	C7I0471	CI72831
1,2-Dichlorobenzene	ND (0.0056)		8260B Low		1	09/28/17 19:42	C7I0471	CI72831
1,2-Dichloroethane	ND (0.0056)		8260B Low		1	09/28/17 19:42	C7I0471	CI72831
1,2-Dichloropropane	ND (0.0056)		8260B Low		1	09/28/17 19:42	C7I0471	CI72831
1,3,5-Trimethylbenzene	ND (0.0056)		8260B Low		1	09/28/17 19:42	C7I0471	CI72831
1,3-Dichlorobenzene	ND (0.0056)		8260B Low		1	09/28/17 19:42	C7I0471	CI72831
1,3-Dichloropropane	ND (0.0056)		8260B Low		1	09/28/17 19:42	C7I0471	CI72831
1,4-Dichlorobenzene	ND (0.0056)		8260B Low		1	09/28/17 19:42	C7I0471	CI72831
1,4-Dioxane	ND (0.112)		8260B Low		1	09/28/17 19:42	C7I0471	CI72831
1-Chlorohexane	ND (0.0056)		8260B Low		1	09/28/17 19:42	C7I0471	CI72831
2,2-Dichloropropane	ND (0.0056)		8260B Low		1	09/28/17 19:42	C7I0471	CI72831
2-Butanone	ND (0.0560)		8260B Low		1	09/28/17 19:42	C7I0471	CI72831
2-Chlorotoluene	ND (0.0056)		8260B Low		1	09/28/17 19:42	C7I0471	CI72831
2-Hexanone	ND (0.0560)		8260B Low		1	09/28/17 19:42	C7I0471	CI72831
4-Chlorotoluene	ND (0.0056)		8260B Low		1	09/28/17 19:42	C7I0471	CI72831
4-Isopropyltoluene	ND (0.0056)		8260B Low		1	09/28/17 19:42	C7I0471	CI72831
4-Methyl-2-Pentanone	ND (0.0560)		8260B Low		1	09/28/17 19:42	C7I0471	CI72831
Acetone	ND (0.0560)		8260B Low		1	09/28/17 19:42	C7I0471	CI72831
Benzene	ND (0.0056)		8260B Low		1	09/28/17 19:42	C7I0471	CI72831
Bromobenzene	ND (0.0056)		8260B Low		1	09/28/17 19:42	C7I0471	CI72831



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ SS-559 (0-2')  
Date Sampled: 09/27/17 10:40  
Percent Solids: 86  
Initial Volume: 5.2  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1709779  
ESS Laboratory Sample ID: 1709779-09  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MD

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0056)		8260B Low		1	09/28/17 19:42	C7I0471	CI72831
Bromodichloromethane	ND (0.0056)		8260B Low		1	09/28/17 19:42	C7I0471	CI72831
Bromoform	ND (0.0056)		8260B Low		1	09/28/17 19:42	C7I0471	CI72831
Bromomethane	ND (0.0112)		8260B Low		1	09/28/17 19:42	C7I0471	CI72831
Carbon Disulfide	ND (0.0056)		8260B Low		1	09/28/17 19:42	C7I0471	CI72831
Carbon Tetrachloride	ND (0.0056)		8260B Low		1	09/28/17 19:42	C7I0471	CI72831
Chlorobenzene	ND (0.0056)		8260B Low		1	09/28/17 19:42	C7I0471	CI72831
Chloroethane	ND (0.0112)		8260B Low		1	09/28/17 19:42	C7I0471	CI72831
Chloroform	ND (0.0056)		8260B Low		1	09/28/17 19:42	C7I0471	CI72831
Chloromethane	ND (0.0112)		8260B Low		1	09/28/17 19:42	C7I0471	CI72831
cis-1,2-Dichloroethene	ND (0.0056)		8260B Low		1	09/28/17 19:42	C7I0471	CI72831
cis-1,3-Dichloropropene	ND (0.0056)		8260B Low		1	09/28/17 19:42	C7I0471	CI72831
Dibromochloromethane	ND (0.0056)		8260B Low		1	09/28/17 19:42	C7I0471	CI72831
Dibromomethane	ND (0.0056)		8260B Low		1	09/28/17 19:42	C7I0471	CI72831
Dichlorodifluoromethane	ND (0.0112)		8260B Low		1	09/28/17 19:42	C7I0471	CI72831
Diethyl Ether	ND (0.0056)		8260B Low		1	09/28/17 19:42	C7I0471	CI72831
Di-isopropyl ether	ND (0.0056)		8260B Low		1	09/28/17 19:42	C7I0471	CI72831
Ethyl tertiary-butyl ether	ND (0.0056)		8260B Low		1	09/28/17 19:42	C7I0471	CI72831
Ethylbenzene	ND (0.0056)		8260B Low		1	09/28/17 19:42	C7I0471	CI72831
Hexachlorobutadiene	ND (0.0056)		8260B Low		1	09/28/17 19:42	C7I0471	CI72831
Isopropylbenzene	ND (0.0056)		8260B Low		1	09/28/17 19:42	C7I0471	CI72831
Methyl tert-Butyl Ether	ND (0.0056)		8260B Low		1	09/28/17 19:42	C7I0471	CI72831
Methylene Chloride	ND (0.0280)		8260B Low		1	09/28/17 19:42	C7I0471	CI72831
Naphthalene	ND (0.0056)		8260B Low		1	09/28/17 19:42	C7I0471	CI72831
n-Butylbenzene	ND (0.0056)		8260B Low		1	09/28/17 19:42	C7I0471	CI72831
n-Propylbenzene	ND (0.0056)		8260B Low		1	09/28/17 19:42	C7I0471	CI72831
sec-Butylbenzene	ND (0.0056)		8260B Low		1	09/28/17 19:42	C7I0471	CI72831
Styrene	ND (0.0056)		8260B Low		1	09/28/17 19:42	C7I0471	CI72831
tert-Butylbenzene	ND (0.0056)		8260B Low		1	09/28/17 19:42	C7I0471	CI72831
Tertiary-amyl methyl ether	ND (0.0056)		8260B Low		1	09/28/17 19:42	C7I0471	CI72831
Tetrachloroethene	ND (0.0056)		8260B Low		1	09/28/17 19:42	C7I0471	CI72831
Tetrahydrofuran	ND (0.0056)		8260B Low		1	09/28/17 19:42	C7I0471	CI72831



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ SS-559 (0-2')  
 Date Sampled: 09/27/17 10:40  
 Percent Solids: 86  
 Initial Volume: 5.2  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709779  
 ESS Laboratory Sample ID: 1709779-09  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MD

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0056)		8260B Low		1	09/28/17 19:42	C7I0471	CI72831
trans-1,2-Dichloroethene	ND (0.0056)		8260B Low		1	09/28/17 19:42	C7I0471	CI72831
trans-1,3-Dichloropropene	ND (0.0056)		8260B Low		1	09/28/17 19:42	C7I0471	CI72831
Trichloroethene	ND (0.0056)		8260B Low		1	09/28/17 19:42	C7I0471	CI72831
Trichlorofluoromethane	ND (0.0056)		8260B Low		1	09/28/17 19:42	C7I0471	CI72831
Vinyl Acetate	ND (0.0056)		8260B Low		1	09/28/17 19:42	C7I0471	CI72831
Vinyl Chloride	ND (0.0112)		8260B Low		1	09/28/17 19:42	C7I0471	CI72831
Xylene O	ND (0.0056)		8260B Low		1	09/28/17 19:42	C7I0471	CI72831
Xylene P,M	ND (0.0112)		8260B Low		1	09/28/17 19:42	C7I0471	CI72831
Xylenes (Total)	ND (0.0112)		8260B Low		1	09/28/17 19:42		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	95 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	74 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	83 %		70-130
<i>Surrogate: Toluene-d8</i>	106 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ SS-559 (0-2')  
 Date Sampled: 09/27/17 10:40  
 Percent Solids: 86  
 Initial Volume: 19.2  
 Final Volume: 2  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709779  
 ESS Laboratory Sample ID: 1709779-09  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: SMR  
 Prepared: 9/27/17 17:24

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	7240 (911)		8100M		10	10/03/17 3:52	C7J0014	CI72713
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		79 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ SS-559 (0-2')  
 Date Sampled: 09/27/17 10:40  
 Percent Solids: 86  
 Initial Volume: 14.8  
 Final Volume: 2  
 Extraction Method: 3546

ESS Laboratory Work Order: 1709779  
 ESS Laboratory Sample ID: 1709779-09  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: TJ  
 Prepared: 9/27/17 17:15

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	3.15 (1.57)		8270D		1	10/02/17 22:34	C7J0002	CI72717
Acenaphthene	ND (1.57)		8270D		1	10/02/17 22:34	C7J0002	CI72717
Acenaphthylene	32.7 (1.57)		8270D		1	10/02/17 22:34	C7J0002	CI72717
Anthracene	10.1 (1.57)		8270D		1	10/02/17 22:34	C7J0002	CI72717
Benzo(a)anthracene	49.3 (15.7)		8270D		10	10/03/17 16:07	C7J0002	CI72717
Benzo(a)pyrene	72.5 (7.89)		8270D		10	10/03/17 16:07	C7J0002	CI72717
Benzo(b)fluoranthene	96.9 (15.7)		8270D		10	10/03/17 16:07	C7J0002	CI72717
Benzo(g,h,i)perylene	56.8 (15.7)		8270D		10	10/03/17 16:07	C7J0002	CI72717
Benzo(k)fluoranthene	36.7 (15.7)		8270D		10	10/03/17 16:07	C7J0002	CI72717
Chrysene	43.9 (7.89)		8270D		10	10/03/17 16:07	C7J0002	CI72717
Dibenzo(a,h)Anthracene	23.0 (0.789)		8270D		1	10/02/17 22:34	C7J0002	CI72717
Fluoranthene	52.8 (15.7)		8270D		10	10/03/17 16:07	C7J0002	CI72717
Fluorene	ND (1.57)		8270D		1	10/02/17 22:34	C7J0002	CI72717
Indeno(1,2,3-cd)Pyrene	54.9 (15.7)		8270D		10	10/03/17 16:07	C7J0002	CI72717
Naphthalene	4.00 (1.57)		8270D		1	10/02/17 22:34	C7J0002	CI72717
Phenanthrene	4.53 (1.57)		8270D		1	10/02/17 22:34	C7J0002	CI72717
Pyrene	67.0 (15.7)		8270D		10	10/03/17 16:07	C7J0002	CI72717

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	73 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	85 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	79 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	80 %		30-130





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ SS-559 (0-2')  
Date Sampled: 09/27/17 10:40  
Percent Solids: 86

ESS Laboratory Work Order: 1709779  
ESS Laboratory Sample ID: 1709779-09  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	21.0 (5.67)		9014		5	EEM	10/03/17 12:40	mg/kg dry	CJ70314



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ SS-560 (0-2')  
 Date Sampled: 09/27/17 10:50  
 Percent Solids: 84

ESS Laboratory Work Order: 1709779  
 ESS Laboratory Sample ID: 1709779-10  
 Sample Matrix: Soil  
 Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (2.14)		6020A		20	NAR	10/04/17 11:52	2.22	100	CJ70220
Arsenic	<b>6.65</b> (2.68)		6010C		1	KJK	10/04/17 0:25	2.22	100	CJ70220
Beryllium	<b>0.43</b> (0.12)		6010C		1	KJK	10/04/17 0:25	2.22	100	CJ70220
Cadmium	ND (0.54)		6010C		1	KJK	10/04/17 0:25	2.22	100	CJ70220
Chromium	<b>4.08</b> (1.07)		6010C		1	KJK	10/04/17 0:25	2.22	100	CJ70220
Copper	<b>33.3</b> (2.68)		6010C		1	KJK	10/04/17 0:25	2.22	100	CJ70220
Lead	<b>130</b> (5.35)		6010C		1	KJK	10/04/17 0:25	2.22	100	CJ70220
Mercury	<b>0.080</b> (0.039)		7471B		1	MJV	10/02/17 13:41	0.6	40	CI72941
Nickel	<b>11.1</b> (2.68)		6010C		1	KJK	10/04/17 0:25	2.22	100	CJ70220
Selenium	ND (2.14)		6020A		20	NAR	10/04/17 11:52	2.22	100	CJ70220
Silver	ND (0.54)		6010C		1	KJK	10/04/17 0:25	2.22	100	CJ70220
Thallium	ND (2.14)		6020A		20	NAR	10/04/17 11:52	2.22	100	CJ70220
Zinc	<b>135</b> (2.68)		6010C		1	KJK	10/04/17 0:25	2.22	100	CJ70220



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ SS-560 (0-2')  
 Date Sampled: 09/27/17 10:50  
 Percent Solids: 84  
 Initial Volume: 5.4  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709779  
 ESS Laboratory Sample ID: 1709779-10  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MD

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0055)		8260B Low		1	09/28/17 20:08	C7I0471	CI72831
1,1,1-Trichloroethane	ND (0.0055)		8260B Low		1	09/28/17 20:08	C7I0471	CI72831
1,1,2,2-Tetrachloroethane	ND (0.0055)		8260B Low		1	09/28/17 20:08	C7I0471	CI72831
1,1,2-Trichloroethane	ND (0.0055)		8260B Low		1	09/28/17 20:08	C7I0471	CI72831
1,1-Dichloroethane	ND (0.0055)		8260B Low		1	09/28/17 20:08	C7I0471	CI72831
1,1-Dichloroethene	ND (0.0055)		8260B Low		1	09/28/17 20:08	C7I0471	CI72831
1,1-Dichloropropene	ND (0.0055)		8260B Low		1	09/28/17 20:08	C7I0471	CI72831
1,2,3-Trichlorobenzene	ND (0.0055)		8260B Low		1	09/28/17 20:08	C7I0471	CI72831
1,2,3-Trichloropropane	ND (0.0055)		8260B Low		1	09/28/17 20:08	C7I0471	CI72831
1,2,4-Trichlorobenzene	ND (0.0055)		8260B Low		1	09/28/17 20:08	C7I0471	CI72831
1,2,4-Trimethylbenzene	ND (0.0055)		8260B Low		1	09/28/17 20:08	C7I0471	CI72831
1,2-Dibromo-3-Chloropropane	ND (0.0055)		8260B Low		1	09/28/17 20:08	C7I0471	CI72831
1,2-Dibromoethane	ND (0.0055)		8260B Low		1	09/28/17 20:08	C7I0471	CI72831
1,2-Dichlorobenzene	ND (0.0055)		8260B Low		1	09/28/17 20:08	C7I0471	CI72831
1,2-Dichloroethane	ND (0.0055)		8260B Low		1	09/28/17 20:08	C7I0471	CI72831
1,2-Dichloropropane	ND (0.0055)		8260B Low		1	09/28/17 20:08	C7I0471	CI72831
1,3,5-Trimethylbenzene	ND (0.0055)		8260B Low		1	09/28/17 20:08	C7I0471	CI72831
1,3-Dichlorobenzene	ND (0.0055)		8260B Low		1	09/28/17 20:08	C7I0471	CI72831
1,3-Dichloropropane	ND (0.0055)		8260B Low		1	09/28/17 20:08	C7I0471	CI72831
1,4-Dichlorobenzene	ND (0.0055)		8260B Low		1	09/28/17 20:08	C7I0471	CI72831
1,4-Dioxane	ND (0.110)		8260B Low		1	09/28/17 20:08	C7I0471	CI72831
1-Chlorohexane	ND (0.0055)		8260B Low		1	09/28/17 20:08	C7I0471	CI72831
2,2-Dichloropropane	ND (0.0055)		8260B Low		1	09/28/17 20:08	C7I0471	CI72831
2-Butanone	ND (0.0550)		8260B Low		1	09/28/17 20:08	C7I0471	CI72831
2-Chlorotoluene	ND (0.0055)		8260B Low		1	09/28/17 20:08	C7I0471	CI72831
2-Hexanone	ND (0.0550)		8260B Low		1	09/28/17 20:08	C7I0471	CI72831
4-Chlorotoluene	ND (0.0055)		8260B Low		1	09/28/17 20:08	C7I0471	CI72831
4-Isopropyltoluene	ND (0.0055)		8260B Low		1	09/28/17 20:08	C7I0471	CI72831
4-Methyl-2-Pentanone	ND (0.0550)		8260B Low		1	09/28/17 20:08	C7I0471	CI72831
Acetone	ND (0.0550)		8260B Low		1	09/28/17 20:08	C7I0471	CI72831
Benzene	ND (0.0055)		8260B Low		1	09/28/17 20:08	C7I0471	CI72831
Bromobenzene	ND (0.0055)		8260B Low		1	09/28/17 20:08	C7I0471	CI72831



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ SS-560 (0-2')  
 Date Sampled: 09/27/17 10:50  
 Percent Solids: 84  
 Initial Volume: 5.4  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709779  
 ESS Laboratory Sample ID: 1709779-10  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MD

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0055)		8260B Low		1	09/28/17 20:08	C7I0471	CI72831
Bromodichloromethane	ND (0.0055)		8260B Low		1	09/28/17 20:08	C7I0471	CI72831
Bromoform	ND (0.0055)		8260B Low		1	09/28/17 20:08	C7I0471	CI72831
Bromomethane	ND (0.0110)		8260B Low		1	09/28/17 20:08	C7I0471	CI72831
Carbon Disulfide	ND (0.0055)		8260B Low		1	09/28/17 20:08	C7I0471	CI72831
Carbon Tetrachloride	ND (0.0055)		8260B Low		1	09/28/17 20:08	C7I0471	CI72831
Chlorobenzene	ND (0.0055)		8260B Low		1	09/28/17 20:08	C7I0471	CI72831
Chloroethane	ND (0.0110)		8260B Low		1	09/28/17 20:08	C7I0471	CI72831
Chloroform	ND (0.0055)		8260B Low		1	09/28/17 20:08	C7I0471	CI72831
Chloromethane	ND (0.0110)		8260B Low		1	09/28/17 20:08	C7I0471	CI72831
cis-1,2-Dichloroethene	ND (0.0055)		8260B Low		1	09/28/17 20:08	C7I0471	CI72831
cis-1,3-Dichloropropene	ND (0.0055)		8260B Low		1	09/28/17 20:08	C7I0471	CI72831
Dibromochloromethane	ND (0.0055)		8260B Low		1	09/28/17 20:08	C7I0471	CI72831
Dibromomethane	ND (0.0055)		8260B Low		1	09/28/17 20:08	C7I0471	CI72831
Dichlorodifluoromethane	ND (0.0110)		8260B Low		1	09/28/17 20:08	C7I0471	CI72831
Diethyl Ether	ND (0.0055)		8260B Low		1	09/28/17 20:08	C7I0471	CI72831
Di-isopropyl ether	ND (0.0055)		8260B Low		1	09/28/17 20:08	C7I0471	CI72831
Ethyl tertiary-butyl ether	ND (0.0055)		8260B Low		1	09/28/17 20:08	C7I0471	CI72831
Ethylbenzene	ND (0.0055)		8260B Low		1	09/28/17 20:08	C7I0471	CI72831
Hexachlorobutadiene	ND (0.0055)		8260B Low		1	09/28/17 20:08	C7I0471	CI72831
Isopropylbenzene	ND (0.0055)		8260B Low		1	09/28/17 20:08	C7I0471	CI72831
Methyl tert-Butyl Ether	ND (0.0055)		8260B Low		1	09/28/17 20:08	C7I0471	CI72831
Methylene Chloride	ND (0.0275)		8260B Low		1	09/28/17 20:08	C7I0471	CI72831
Naphthalene	ND (0.0055)		8260B Low		1	09/28/17 20:08	C7I0471	CI72831
n-Butylbenzene	ND (0.0055)		8260B Low		1	09/28/17 20:08	C7I0471	CI72831
n-Propylbenzene	ND (0.0055)		8260B Low		1	09/28/17 20:08	C7I0471	CI72831
sec-Butylbenzene	ND (0.0055)		8260B Low		1	09/28/17 20:08	C7I0471	CI72831
Styrene	ND (0.0055)		8260B Low		1	09/28/17 20:08	C7I0471	CI72831
tert-Butylbenzene	ND (0.0055)		8260B Low		1	09/28/17 20:08	C7I0471	CI72831
Tertiary-amyl methyl ether	ND (0.0055)		8260B Low		1	09/28/17 20:08	C7I0471	CI72831
Tetrachloroethene	ND (0.0055)		8260B Low		1	09/28/17 20:08	C7I0471	CI72831
Tetrahydrofuran	ND (0.0055)		8260B Low		1	09/28/17 20:08	C7I0471	CI72831



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ SS-560 (0-2')  
 Date Sampled: 09/27/17 10:50  
 Percent Solids: 84  
 Initial Volume: 5.4  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709779  
 ESS Laboratory Sample ID: 1709779-10  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MD

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0055)		8260B Low		1	09/28/17 20:08	C7I0471	CI72831
trans-1,2-Dichloroethene	ND (0.0055)		8260B Low		1	09/28/17 20:08	C7I0471	CI72831
trans-1,3-Dichloropropene	ND (0.0055)		8260B Low		1	09/28/17 20:08	C7I0471	CI72831
Trichloroethene	ND (0.0055)		8260B Low		1	09/28/17 20:08	C7I0471	CI72831
Trichlorofluoromethane	ND (0.0055)		8260B Low		1	09/28/17 20:08	C7I0471	CI72831
Vinyl Acetate	ND (0.0055)		8260B Low		1	09/28/17 20:08	C7I0471	CI72831
Vinyl Chloride	ND (0.0110)		8260B Low		1	09/28/17 20:08	C7I0471	CI72831
Xylene O	ND (0.0055)		8260B Low		1	09/28/17 20:08	C7I0471	CI72831
Xylene P,M	ND (0.0110)		8260B Low		1	09/28/17 20:08	C7I0471	CI72831
Xylenes (Total)	ND (0.0110)		8260B Low		1	09/28/17 20:08		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	84 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	62 %	SC	70-130
<i>Surrogate: Dibromofluoromethane</i>	80 %		70-130
<i>Surrogate: Toluene-d8</i>	132 %	SC	70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ SS-560 (0-2')  
Date Sampled: 09/27/17 10:50  
Percent Solids: 84  
Initial Volume: 19.7  
Final Volume: 1  
Extraction Method: 3546

ESS Laboratory Work Order: 1709779  
ESS Laboratory Sample ID: 1709779-10  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: SMR  
Prepared: 9/28/17 16:30

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	722 (45.3)		8100M		1	10/03/17 16:28	C7J0047	CI72814
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		79 %		40-140				





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ SS-560 (0-2')  
Date Sampled: 09/27/17 10:50  
Percent Solids: 84  
Initial Volume: 14.2  
Final Volume: 0.5  
Extraction Method: 3546

ESS Laboratory Work Order: 1709779  
ESS Laboratory Sample ID: 1709779-10  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: TJ  
Prepared: 9/27/17 17:15

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
<b>2-Methylnaphthalene</b>	<b>4.86</b> (0.418)		8270D		1	10/02/17 23:08	C7J0002	CI72717
Acenaphthene	ND (0.418)		8270D		1	10/02/17 23:08	C7J0002	CI72717
<b>Acenaphthylene</b>	<b>0.470</b> (0.418)		8270D		1	10/02/17 23:08	C7J0002	CI72717
Anthracene	ND (0.418)		8270D		1	10/02/17 23:08	C7J0002	CI72717
<b>Benzo(a)anthracene</b>	<b>1.66</b> (0.418)		8270D		1	10/02/17 23:08	C7J0002	CI72717
<b>Benzo(a)pyrene</b>	<b>1.27</b> (0.210)		8270D		1	10/02/17 23:08	C7J0002	CI72717
<b>Benzo(b)fluoranthene</b>	<b>1.93</b> (0.418)		8270D		1	10/02/17 23:08	C7J0002	CI72717
<b>Benzo(g,h,i)perylene</b>	<b>1.20</b> (0.418)		8270D		1	10/02/17 23:08	C7J0002	CI72717
<b>Benzo(k)fluoranthene</b>	<b>0.792</b> (0.418)		8270D		1	10/02/17 23:08	C7J0002	CI72717
<b>Chrysene</b>	<b>1.88</b> (0.210)		8270D		1	10/02/17 23:08	C7J0002	CI72717
<b>Dibenzo(a,h)Anthracene</b>	<b>0.486</b> (0.210)		8270D		1	10/02/17 23:08	C7J0002	CI72717
<b>Fluoranthene</b>	<b>1.74</b> (0.418)		8270D		1	10/02/17 23:08	C7J0002	CI72717
Fluorene	ND (0.418)		8270D		1	10/02/17 23:08	C7J0002	CI72717
<b>Indeno(1,2,3-cd)Pyrene</b>	<b>0.980</b> (0.418)		8270D		1	10/02/17 23:08	C7J0002	CI72717
<b>Naphthalene</b>	<b>3.18</b> (0.418)		8270D		1	10/02/17 23:08	C7J0002	CI72717
<b>Phenanthrene</b>	<b>3.51</b> (0.418)		8270D		1	10/02/17 23:08	C7J0002	CI72717
<b>Pyrene</b>	<b>1.99</b> (0.418)		8270D		1	10/02/17 23:08	C7J0002	CI72717

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	62 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	68 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	64 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	82 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ SS-560 (0-2')  
Date Sampled: 09/27/17 10:50  
Percent Solids: 84

ESS Laboratory Work Order: 1709779  
ESS Laboratory Sample ID: 1709779-10  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	9.21 (1.13)		9014		1	EEM	10/03/17 12:40	mg/kg dry	CJ70314



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: TB-092717  
 Date Sampled: 09/27/17 00:00  
 Percent Solids: N/A  
 Initial Volume: 5  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709779  
 ESS Laboratory Sample ID: 1709779-11  
 Sample Matrix: Solid  
 Units: mg/kg wet  
 Analyst: MD

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0050)		8260B Low		1	09/28/17 12:25	C7I0471	CI72831
1,1,1-Trichloroethane	ND (0.0050)		8260B Low		1	09/28/17 12:25	C7I0471	CI72831
1,1,2,2-Tetrachloroethane	ND (0.0050)		8260B Low		1	09/28/17 12:25	C7I0471	CI72831
1,1,2-Trichloroethane	ND (0.0050)		8260B Low		1	09/28/17 12:25	C7I0471	CI72831
1,1-Dichloroethane	ND (0.0050)		8260B Low		1	09/28/17 12:25	C7I0471	CI72831
1,1-Dichloroethene	ND (0.0050)		8260B Low		1	09/28/17 12:25	C7I0471	CI72831
1,1-Dichloropropene	ND (0.0050)		8260B Low		1	09/28/17 12:25	C7I0471	CI72831
1,2,3-Trichlorobenzene	ND (0.0050)		8260B Low		1	09/28/17 12:25	C7I0471	CI72831
1,2,3-Trichloropropane	ND (0.0050)		8260B Low		1	09/28/17 12:25	C7I0471	CI72831
1,2,4-Trichlorobenzene	ND (0.0050)		8260B Low		1	09/28/17 12:25	C7I0471	CI72831
1,2,4-Trimethylbenzene	ND (0.0050)		8260B Low		1	09/28/17 12:25	C7I0471	CI72831
1,2-Dibromo-3-Chloropropane	ND (0.0050)		8260B Low		1	09/28/17 12:25	C7I0471	CI72831
1,2-Dibromoethane	ND (0.0050)		8260B Low		1	09/28/17 12:25	C7I0471	CI72831
1,2-Dichlorobenzene	ND (0.0050)		8260B Low		1	09/28/17 12:25	C7I0471	CI72831
1,2-Dichloroethane	ND (0.0050)		8260B Low		1	09/28/17 12:25	C7I0471	CI72831
1,2-Dichloropropane	ND (0.0050)		8260B Low		1	09/28/17 12:25	C7I0471	CI72831
1,3,5-Trimethylbenzene	ND (0.0050)		8260B Low		1	09/28/17 12:25	C7I0471	CI72831
1,3-Dichlorobenzene	ND (0.0050)		8260B Low		1	09/28/17 12:25	C7I0471	CI72831
1,3-Dichloropropane	ND (0.0050)		8260B Low		1	09/28/17 12:25	C7I0471	CI72831
1,4-Dichlorobenzene	ND (0.0050)		8260B Low		1	09/28/17 12:25	C7I0471	CI72831
1,4-Dioxane	ND (0.100)		8260B Low		1	09/28/17 12:25	C7I0471	CI72831
1-Chlorohexane	ND (0.0050)		8260B Low		1	09/28/17 12:25	C7I0471	CI72831
2,2-Dichloropropane	ND (0.0050)		8260B Low		1	09/28/17 12:25	C7I0471	CI72831
2-Butanone	ND (0.0500)		8260B Low		1	09/28/17 12:25	C7I0471	CI72831
2-Chlorotoluene	ND (0.0050)		8260B Low		1	09/28/17 12:25	C7I0471	CI72831
2-Hexanone	ND (0.0500)		8260B Low		1	09/28/17 12:25	C7I0471	CI72831
4-Chlorotoluene	ND (0.0050)		8260B Low		1	09/28/17 12:25	C7I0471	CI72831
4-Isopropyltoluene	ND (0.0050)		8260B Low		1	09/28/17 12:25	C7I0471	CI72831
4-Methyl-2-Pentanone	ND (0.0500)		8260B Low		1	09/28/17 12:25	C7I0471	CI72831
Acetone	ND (0.0500)		8260B Low		1	09/28/17 12:25	C7I0471	CI72831
Benzene	ND (0.0050)		8260B Low		1	09/28/17 12:25	C7I0471	CI72831
Bromobenzene	ND (0.0050)		8260B Low		1	09/28/17 12:25	C7I0471	CI72831



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: TB-092717  
Date Sampled: 09/27/17 00:00  
Percent Solids: N/A  
Initial Volume: 5  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1709779  
ESS Laboratory Sample ID: 1709779-11  
Sample Matrix: Solid  
Units: mg/kg wet  
Analyst: MD

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0050)		8260B Low		1	09/28/17 12:25	C7I0471	CI72831
Bromodichloromethane	ND (0.0050)		8260B Low		1	09/28/17 12:25	C7I0471	CI72831
Bromoform	ND (0.0050)		8260B Low		1	09/28/17 12:25	C7I0471	CI72831
Bromomethane	ND (0.0100)		8260B Low		1	09/28/17 12:25	C7I0471	CI72831
Carbon Disulfide	ND (0.0050)		8260B Low		1	09/28/17 12:25	C7I0471	CI72831
Carbon Tetrachloride	ND (0.0050)		8260B Low		1	09/28/17 12:25	C7I0471	CI72831
Chlorobenzene	ND (0.0050)		8260B Low		1	09/28/17 12:25	C7I0471	CI72831
Chloroethane	ND (0.0100)		8260B Low		1	09/28/17 12:25	C7I0471	CI72831
Chloroform	ND (0.0050)		8260B Low		1	09/28/17 12:25	C7I0471	CI72831
Chloromethane	ND (0.0100)		8260B Low		1	09/28/17 12:25	C7I0471	CI72831
cis-1,2-Dichloroethene	ND (0.0050)		8260B Low		1	09/28/17 12:25	C7I0471	CI72831
cis-1,3-Dichloropropene	ND (0.0050)		8260B Low		1	09/28/17 12:25	C7I0471	CI72831
Dibromochloromethane	ND (0.0050)		8260B Low		1	09/28/17 12:25	C7I0471	CI72831
Dibromomethane	ND (0.0050)		8260B Low		1	09/28/17 12:25	C7I0471	CI72831
Dichlorodifluoromethane	ND (0.0100)		8260B Low		1	09/28/17 12:25	C7I0471	CI72831
Diethyl Ether	ND (0.0050)		8260B Low		1	09/28/17 12:25	C7I0471	CI72831
Di-isopropyl ether	ND (0.0050)		8260B Low		1	09/28/17 12:25	C7I0471	CI72831
Ethyl tertiary-butyl ether	ND (0.0050)		8260B Low		1	09/28/17 12:25	C7I0471	CI72831
Ethylbenzene	ND (0.0050)		8260B Low		1	09/28/17 12:25	C7I0471	CI72831
Hexachlorobutadiene	ND (0.0050)		8260B Low		1	09/28/17 12:25	C7I0471	CI72831
Isopropylbenzene	ND (0.0050)		8260B Low		1	09/28/17 12:25	C7I0471	CI72831
Methyl tert-Butyl Ether	ND (0.0050)		8260B Low		1	09/28/17 12:25	C7I0471	CI72831
Methylene Chloride	ND (0.0250)		8260B Low		1	09/28/17 12:25	C7I0471	CI72831
Naphthalene	ND (0.0050)		8260B Low		1	09/28/17 12:25	C7I0471	CI72831
n-Butylbenzene	ND (0.0050)		8260B Low		1	09/28/17 12:25	C7I0471	CI72831
n-Propylbenzene	ND (0.0050)		8260B Low		1	09/28/17 12:25	C7I0471	CI72831
sec-Butylbenzene	ND (0.0050)		8260B Low		1	09/28/17 12:25	C7I0471	CI72831
Styrene	ND (0.0050)		8260B Low		1	09/28/17 12:25	C7I0471	CI72831
tert-Butylbenzene	ND (0.0050)		8260B Low		1	09/28/17 12:25	C7I0471	CI72831
Tertiary-amyl methyl ether	ND (0.0050)		8260B Low		1	09/28/17 12:25	C7I0471	CI72831
Tetrachloroethene	ND (0.0050)		8260B Low		1	09/28/17 12:25	C7I0471	CI72831
Tetrahydrofuran	ND (0.0050)		8260B Low		1	09/28/17 12:25	C7I0471	CI72831



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: TB-092717  
 Date Sampled: 09/27/17 00:00  
 Percent Solids: N/A  
 Initial Volume: 5  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1709779  
 ESS Laboratory Sample ID: 1709779-11  
 Sample Matrix: Solid  
 Units: mg/kg wet  
 Analyst: MD

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0050)		8260B Low		1	09/28/17 12:25	C7I0471	CI72831
trans-1,2-Dichloroethene	ND (0.0050)		8260B Low		1	09/28/17 12:25	C7I0471	CI72831
trans-1,3-Dichloropropene	ND (0.0050)		8260B Low		1	09/28/17 12:25	C7I0471	CI72831
Trichloroethene	ND (0.0050)		8260B Low		1	09/28/17 12:25	C7I0471	CI72831
Trichlorofluoromethane	ND (0.0050)		8260B Low		1	09/28/17 12:25	C7I0471	CI72831
Vinyl Acetate	ND (0.0050)		8260B Low		1	09/28/17 12:25	C7I0471	CI72831
Vinyl Chloride	ND (0.0100)		8260B Low		1	09/28/17 12:25	C7I0471	CI72831
Xylene O	ND (0.0050)		8260B Low		1	09/28/17 12:25	C7I0471	CI72831
Xylene P,M	ND (0.0100)		8260B Low		1	09/28/17 12:25	C7I0471	CI72831
Xylenes (Total)	ND (0.0100)		8260B Low		1	09/28/17 12:25		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	96 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	92 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	87 %		70-130
<i>Surrogate: Toluene-d8</i>	90 %		70-130



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1709779

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
<b>Total Metals</b>										
<b>Batch CI72941 - 7471B</b>										
<b>Blank</b>										
Mercury	ND	0.033	mg/kg wet							
<b>LCS</b>										
Mercury	2.70	0.747	mg/kg wet	2.900		93	80-120			
<b>LCS Dup</b>										
Mercury	2.50	0.629	mg/kg wet	2.900		86	80-120	8	20	
<b>Batch CJ70220 - 3050B</b>										
<b>Blank</b>										
Antimony	ND	0.50	mg/kg wet							
Arsenic	ND	2.50	mg/kg wet							
Beryllium	ND	0.11	mg/kg wet							
Cadmium	ND	0.50	mg/kg wet							
Chromium	ND	1.00	mg/kg wet							
Copper	ND	2.50	mg/kg wet							
Lead	ND	5.00	mg/kg wet							
Nickel	ND	2.50	mg/kg wet							
Selenium	ND	0.50	mg/kg wet							
Silver	ND	0.50	mg/kg wet							
Thallium	ND	0.50	mg/kg wet							
Zinc	ND	2.50	mg/kg wet							
<b>LCS</b>										
Antimony	43.7	2.75	mg/kg wet	48.00		91	0-238			
Arsenic	112	5.49	mg/kg wet	123.0		91	80-120			
Beryllium	179	0.24	mg/kg wet	192.0		93	80-120			
Cadmium	182	1.10	mg/kg wet	224.0		81	80-120			
Chromium	167	2.20	mg/kg wet	179.0		93	80-120			
Copper	75.0	5.49	mg/kg wet	78.90		95	80-120			
Lead	129	11.0	mg/kg wet	145.0		89	80-120			
Nickel	132	5.49	mg/kg wet	143.0		93	80-120			
Selenium	45.9	2.75	mg/kg wet	42.40		108	80-120			
Silver	80.4	1.10	mg/kg wet	81.60		99	80-120			
Thallium	52.1	2.75	mg/kg wet	52.00		100	80-120			
Zinc	665	5.49	mg/kg wet	770.0		86	80-120			
<b>LCS Dup</b>										
Antimony	36.5	3.21	mg/kg wet	48.00		76	0-238	18	30	
Arsenic	107	6.41	mg/kg wet	123.0		87	80-120	4	20	
Beryllium	172	0.28	mg/kg wet	192.0		90	80-120	4	20	
Cadmium	176	1.28	mg/kg wet	224.0		79	80-120	3	20	B-
Chromium	159	2.56	mg/kg wet	179.0		89	80-120	4	20	
Copper	72.4	6.41	mg/kg wet	78.90		92	80-120	3	20	
Lead	123	12.8	mg/kg wet	145.0		85	80-120	5	20	
Nickel	123	6.41	mg/kg wet	143.0		86	80-120	7	20	
Selenium	45.0	3.21	mg/kg wet	42.40		106	80-120	2	30	
Silver	77.6	1.28	mg/kg wet	81.60		95	80-120	4	20	





CERTIFICATE OF ANALYSIS

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**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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Total Metals

**Batch CJ70220 - 3050B**

Thallium	50.0	3.21	mg/kg wet	52.00		96	80-120	4	30	
Zinc	642	6.41	mg/kg wet	770.0		83	80-120	4	20	

5035/8260B Volatile Organic Compounds / Low Level

**Batch CI72831 - 5035**

**Blank**

1,1,1,2-Tetrachloroethane	ND	0.0050	mg/kg wet
1,1,1-Trichloroethane	ND	0.0050	mg/kg wet
1,1,2,2-Tetrachloroethane	ND	0.0050	mg/kg wet
1,1,2-Trichloroethane	ND	0.0050	mg/kg wet
1,1-Dichloroethane	ND	0.0050	mg/kg wet
1,1-Dichloroethene	ND	0.0050	mg/kg wet
1,1-Dichloropropene	ND	0.0050	mg/kg wet
1,2,3-Trichlorobenzene	ND	0.0050	mg/kg wet
1,2,3-Trichloropropane	ND	0.0050	mg/kg wet
1,2,4-Trichlorobenzene	ND	0.0050	mg/kg wet
1,2,4-Trimethylbenzene	ND	0.0050	mg/kg wet
1,2-Dibromo-3-Chloropropane	ND	0.0050	mg/kg wet
1,2-Dibromoethane	ND	0.0050	mg/kg wet
1,2-Dichlorobenzene	ND	0.0050	mg/kg wet
1,2-Dichloroethane	ND	0.0050	mg/kg wet
1,2-Dichloropropane	ND	0.0050	mg/kg wet
1,3,5-Trimethylbenzene	ND	0.0050	mg/kg wet
1,3-Dichlorobenzene	ND	0.0050	mg/kg wet
1,3-Dichloropropane	ND	0.0050	mg/kg wet
1,4-Dichlorobenzene	ND	0.0050	mg/kg wet
1,4-Dioxane	ND	0.100	mg/kg wet
1-Chlorohexane	ND	0.0050	mg/kg wet
2,2-Dichloropropane	ND	0.0050	mg/kg wet
2-Butanone	ND	0.0500	mg/kg wet
2-Chlorotoluene	ND	0.0050	mg/kg wet
2-Hexanone	ND	0.0500	mg/kg wet
4-Chlorotoluene	ND	0.0050	mg/kg wet
4-Isopropyltoluene	ND	0.0050	mg/kg wet
4-Methyl-2-Pentanone	ND	0.0500	mg/kg wet
Acetone	ND	0.0500	mg/kg wet
Benzene	ND	0.0050	mg/kg wet
Bromobenzene	ND	0.0050	mg/kg wet
Bromochloromethane	ND	0.0050	mg/kg wet
Bromodichloromethane	ND	0.0050	mg/kg wet
Bromoform	ND	0.0050	mg/kg wet
Bromomethane	ND	0.0100	mg/kg wet
Carbon Disulfide	ND	0.0050	mg/kg wet
Carbon Tetrachloride	ND	0.0050	mg/kg wet
Chlorobenzene	ND	0.0050	mg/kg wet



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1709779

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CI72831 - 5035**

Chloroethane	ND	0.0100	mg/kg wet							
Chloroform	ND	0.0050	mg/kg wet							
Chloromethane	ND	0.0100	mg/kg wet							
cis-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
cis-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Dibromochloromethane	ND	0.0050	mg/kg wet							
Dibromomethane	ND	0.0050	mg/kg wet							
Dichlorodifluoromethane	ND	0.0100	mg/kg wet							
Diethyl Ether	ND	0.0050	mg/kg wet							
Di-isopropyl ether	ND	0.0050	mg/kg wet							
Ethyl tertiary-butyl ether	ND	0.0050	mg/kg wet							
Ethylbenzene	ND	0.0050	mg/kg wet							
Hexachlorobutadiene	ND	0.0050	mg/kg wet							
Isopropylbenzene	ND	0.0050	mg/kg wet							
Methyl tert-Butyl Ether	ND	0.0050	mg/kg wet							
Methylene Chloride	ND	0.0250	mg/kg wet							
Naphthalene	ND	0.0050	mg/kg wet							
n-Butylbenzene	ND	0.0050	mg/kg wet							
n-Propylbenzene	ND	0.0050	mg/kg wet							
sec-Butylbenzene	ND	0.0050	mg/kg wet							
Styrene	ND	0.0050	mg/kg wet							
tert-Butylbenzene	ND	0.0050	mg/kg wet							
Tertiary-amyl methyl ether	ND	0.0050	mg/kg wet							
Tetrachloroethene	ND	0.0050	mg/kg wet							
Tetrahydrofuran	ND	0.0050	mg/kg wet							
Toluene	ND	0.0050	mg/kg wet							
trans-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
trans-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Trichloroethene	ND	0.0050	mg/kg wet							
Trichlorofluoromethane	ND	0.0050	mg/kg wet							
Vinyl Acetate	ND	0.0050	mg/kg wet							
Vinyl Chloride	ND	0.0100	mg/kg wet							
Xylene O	ND	0.0050	mg/kg wet							
Xylene P,M	ND	0.0100	mg/kg wet							
Xylenes (Total)	ND	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	0.0472		mg/kg wet	0.05000		94	70-130			
Surrogate: 4-Bromofluorobenzene	0.0467		mg/kg wet	0.05000		93	70-130			
Surrogate: Dibromofluoromethane	0.0420		mg/kg wet	0.05000		84	70-130			
Surrogate: Toluene-d8	0.0454		mg/kg wet	0.05000		91	70-130			

**LCS**

1,1,1,2-Tetrachloroethane	0.0476	0.0050	mg/kg wet	0.05000		95	70-130			
1,1,1-Trichloroethane	0.0480	0.0050	mg/kg wet	0.05000		96	70-130			
1,1,2,2-Tetrachloroethane	0.0455	0.0050	mg/kg wet	0.05000		91	70-130			
1,1,2-Trichloroethane	0.0440	0.0050	mg/kg wet	0.05000		88	70-130			
1,1-Dichloroethane	0.0438	0.0050	mg/kg wet	0.05000		88	70-130			



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**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CI72831 - 5035**

1,1-Dichloroethene	0.0474	0.0050	mg/kg wet	0.05000		95	70-130			
1,1-Dichloropropene	0.0462	0.0050	mg/kg wet	0.05000		92	70-130			
1,2,3-Trichlorobenzene	0.0483	0.0050	mg/kg wet	0.05000		97	70-130			
1,2,3-Trichloropropane	0.0403	0.0050	mg/kg wet	0.05000		81	70-130			
1,2,4-Trichlorobenzene	0.0490	0.0050	mg/kg wet	0.05000		98	70-130			
1,2,4-Trimethylbenzene	0.0470	0.0050	mg/kg wet	0.05000		94	70-130			
1,2-Dibromo-3-Chloropropane	0.0430	0.0050	mg/kg wet	0.05000		86	70-130			
1,2-Dibromoethane	0.0486	0.0050	mg/kg wet	0.05000		97	70-130			
1,2-Dichlorobenzene	0.0484	0.0050	mg/kg wet	0.05000		97	70-130			
1,2-Dichloroethane	0.0487	0.0050	mg/kg wet	0.05000		97	70-130			
1,2-Dichloropropane	0.0431	0.0050	mg/kg wet	0.05000		86	70-130			
1,3,5-Trimethylbenzene	0.0465	0.0050	mg/kg wet	0.05000		93	70-130			
1,3-Dichlorobenzene	0.0483	0.0050	mg/kg wet	0.05000		97	70-130			
1,3-Dichloropropane	0.0489	0.0050	mg/kg wet	0.05000		98	70-130			
1,4-Dichlorobenzene	0.0494	0.0050	mg/kg wet	0.05000		99	70-130			
1,4-Dioxane	0.913	0.100	mg/kg wet	1.000		91	70-130			
1-Chlorohexane	0.0458	0.0050	mg/kg wet	0.05000		92	70-130			
2,2-Dichloropropane	0.0450	0.0050	mg/kg wet	0.05000		90	70-130			
2-Butanone	0.208	0.0500	mg/kg wet	0.2500		83	70-130			
2-Chlorotoluene	0.0459	0.0050	mg/kg wet	0.05000		92	70-130			
2-Hexanone	0.225	0.0500	mg/kg wet	0.2500		90	70-130			
4-Chlorotoluene	0.0460	0.0050	mg/kg wet	0.05000		92	70-130			
4-Isopropyltoluene	0.0483	0.0050	mg/kg wet	0.05000		97	70-130			
4-Methyl-2-Pentanone	0.211	0.0500	mg/kg wet	0.2500		84	70-130			
Acetone	0.212	0.0500	mg/kg wet	0.2500		85	70-130			
Benzene	0.0442	0.0050	mg/kg wet	0.05000		88	70-130			
Bromobenzene	0.0475	0.0050	mg/kg wet	0.05000		95	70-130			
Bromochloromethane	0.0457	0.0050	mg/kg wet	0.05000		91	70-130			
Bromodichloromethane	0.0449	0.0050	mg/kg wet	0.05000		90	70-130			
Bromoform	0.0421	0.0050	mg/kg wet	0.05000		84	70-130			
Bromomethane	0.0564	0.0100	mg/kg wet	0.05000		113	70-130			
Carbon Disulfide	0.0451	0.0050	mg/kg wet	0.05000		90	70-130			
Carbon Tetrachloride	0.0467	0.0050	mg/kg wet	0.05000		93	70-130			
Chlorobenzene	0.0486	0.0050	mg/kg wet	0.05000		97	70-130			
Chloroethane	0.0459	0.0100	mg/kg wet	0.05000		92	70-130			
Chloroform	0.0467	0.0050	mg/kg wet	0.05000		93	70-130			
Chloromethane	0.0446	0.0100	mg/kg wet	0.05000		89	70-130			
cis-1,2-Dichloroethene	0.0437	0.0050	mg/kg wet	0.05000		87	70-130			
cis-1,3-Dichloropropene	0.0453	0.0050	mg/kg wet	0.05000		91	70-130			
Dibromochloromethane	0.0482	0.0050	mg/kg wet	0.05000		96	70-130			
Dibromomethane	0.0451	0.0050	mg/kg wet	0.05000		90	70-130			
Dichlorodifluoromethane	0.0489	0.0100	mg/kg wet	0.05000		98	70-130			
Diethyl Ether	0.0435	0.0050	mg/kg wet	0.05000		87	70-130			
Di-isopropyl ether	0.0432	0.0050	mg/kg wet	0.05000		86	70-130			
Ethyl tertiary-butyl ether	0.0428	0.0050	mg/kg wet	0.05000		86	70-130			



CERTIFICATE OF ANALYSIS

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ESS Laboratory Work Order: 1709779

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CI72831 - 5035**

Ethylbenzene	0.0483	0.0050	mg/kg wet	0.05000		97	70-130			
Hexachlorobutadiene	0.0467	0.0050	mg/kg wet	0.05000		93	70-130			
Isopropylbenzene	0.0446	0.0050	mg/kg wet	0.05000		89	70-130			
Methyl tert-Butyl Ether	0.0436	0.0050	mg/kg wet	0.05000		87	70-130			
Methylene Chloride	0.0457	0.0250	mg/kg wet	0.05000		91	70-130			
Naphthalene	0.0461	0.0050	mg/kg wet	0.05000		92	70-130			
n-Butylbenzene	0.0470	0.0050	mg/kg wet	0.05000		94	70-130			
n-Propylbenzene	0.0473	0.0050	mg/kg wet	0.05000		95	70-130			
sec-Butylbenzene	0.0467	0.0050	mg/kg wet	0.05000		93	70-130			
Styrene	0.0475	0.0050	mg/kg wet	0.05000		95	70-130			
tert-Butylbenzene	0.0480	0.0050	mg/kg wet	0.05000		96	70-130			
Tertiary-amyl methyl ether	0.0410	0.0050	mg/kg wet	0.05000		82	70-130			
Tetrachloroethene	0.0475	0.0050	mg/kg wet	0.05000		95	70-130			
Tetrahydrofuran	0.0438	0.0050	mg/kg wet	0.05000		88	70-130			
Toluene	0.0437	0.0050	mg/kg wet	0.05000		87	70-130			
trans-1,2-Dichloroethene	0.0466	0.0050	mg/kg wet	0.05000		93	70-130			
trans-1,3-Dichloropropene	0.0435	0.0050	mg/kg wet	0.05000		87	70-130			
Trichloroethene	0.0456	0.0050	mg/kg wet	0.05000		91	70-130			
Trichlorofluoromethane	0.0511	0.0050	mg/kg wet	0.05000		102	70-130			
Vinyl Acetate	0.0427	0.0050	mg/kg wet	0.05000		85	70-130			
Vinyl Chloride	0.0461	0.0100	mg/kg wet	0.05000		92	70-130			
Xylene O	0.0483	0.0050	mg/kg wet	0.05000		97	70-130			
Xylene P,M	0.0957	0.0100	mg/kg wet	0.1000		96	70-130			
Xylenes (Total)	0.144	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	0.0469		mg/kg wet	0.05000		94	70-130			
Surrogate: 4-Bromofluorobenzene	0.0466		mg/kg wet	0.05000		93	70-130			
Surrogate: Dibromofluoromethane	0.0450		mg/kg wet	0.05000		90	70-130			
Surrogate: Toluene-d8	0.0461		mg/kg wet	0.05000		92	70-130			

**LCS Dup**

1,1,1,2-Tetrachloroethane	0.0477	0.0050	mg/kg wet	0.05000		95	70-130	0.2	25	
1,1,1-Trichloroethane	0.0472	0.0050	mg/kg wet	0.05000		94	70-130	2	25	
1,1,2,2-Tetrachloroethane	0.0455	0.0050	mg/kg wet	0.05000		91	70-130	0.04	25	
1,1,2-Trichloroethane	0.0453	0.0050	mg/kg wet	0.05000		91	70-130	3	25	
1,1-Dichloroethane	0.0440	0.0050	mg/kg wet	0.05000		88	70-130	0.5	25	
1,1-Dichloroethene	0.0467	0.0050	mg/kg wet	0.05000		93	70-130	1	25	
1,1-Dichloropropene	0.0459	0.0050	mg/kg wet	0.05000		92	70-130	0.5	25	
1,2,3-Trichlorobenzene	0.0496	0.0050	mg/kg wet	0.05000		99	70-130	3	25	
1,2,3-Trichloropropane	0.0403	0.0050	mg/kg wet	0.05000		81	70-130	0.2	25	
1,2,4-Trichlorobenzene	0.0494	0.0050	mg/kg wet	0.05000		99	70-130	0.8	25	
1,2,4-Trimethylbenzene	0.0461	0.0050	mg/kg wet	0.05000		92	70-130	2	25	
1,2-Dibromo-3-Chloropropane	0.0440	0.0050	mg/kg wet	0.05000		88	70-130	2	25	
1,2-Dibromoethane	0.0487	0.0050	mg/kg wet	0.05000		97	70-130	0.3	25	
1,2-Dichlorobenzene	0.0486	0.0050	mg/kg wet	0.05000		97	70-130	0.5	25	
1,2-Dichloroethane	0.0491	0.0050	mg/kg wet	0.05000		98	70-130	0.8	25	
1,2-Dichloropropane	0.0440	0.0050	mg/kg wet	0.05000		88	70-130	2	25	

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1709779

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CI72831 - 5035**

1,3,5-Trimethylbenzene	0.0452	0.0050	mg/kg wet	0.05000		90	70-130	3	25	
1,3-Dichlorobenzene	0.0479	0.0050	mg/kg wet	0.05000		96	70-130	1	25	
1,3-Dichloropropane	0.0487	0.0050	mg/kg wet	0.05000		97	70-130	0.5	25	
1,4-Dichlorobenzene	0.0487	0.0050	mg/kg wet	0.05000		97	70-130	1	25	
1,4-Dioxane	1.00	0.100	mg/kg wet	1.000		100	70-130	9	20	
1-Chlorohexane	0.0442	0.0050	mg/kg wet	0.05000		88	70-130	4	25	
2,2-Dichloropropane	0.0445	0.0050	mg/kg wet	0.05000		89	70-130	1	25	
2-Butanone	0.212	0.0500	mg/kg wet	0.2500		85	70-130	2	25	
2-Chlorotoluene	0.0450	0.0050	mg/kg wet	0.05000		90	70-130	2	25	
2-Hexanone	0.229	0.0500	mg/kg wet	0.2500		92	70-130	2	25	
4-Chlorotoluene	0.0453	0.0050	mg/kg wet	0.05000		91	70-130	1	25	
4-Isopropyltoluene	0.0473	0.0050	mg/kg wet	0.05000		95	70-130	2	25	
4-Methyl-2-Pentanone	0.218	0.0500	mg/kg wet	0.2500		87	70-130	4	25	
Acetone	0.219	0.0500	mg/kg wet	0.2500		88	70-130	3	25	
Benzene	0.0444	0.0050	mg/kg wet	0.05000		89	70-130	0.5	25	
Bromobenzene	0.0471	0.0050	mg/kg wet	0.05000		94	70-130	0.9	25	
Bromochloromethane	0.0464	0.0050	mg/kg wet	0.05000		93	70-130	2	25	
Bromodichloromethane	0.0457	0.0050	mg/kg wet	0.05000		91	70-130	2	25	
Bromoform	0.0418	0.0050	mg/kg wet	0.05000		84	70-130	0.7	25	
Bromomethane	0.0563	0.0100	mg/kg wet	0.05000		113	70-130	0.04	25	
Carbon Disulfide	0.0448	0.0050	mg/kg wet	0.05000		90	70-130	0.7	25	
Carbon Tetrachloride	0.0461	0.0050	mg/kg wet	0.05000		92	70-130	1	25	
Chlorobenzene	0.0477	0.0050	mg/kg wet	0.05000		95	70-130	2	25	
Chloroethane	0.0458	0.0100	mg/kg wet	0.05000		92	70-130	0.2	25	
Chloroform	0.0468	0.0050	mg/kg wet	0.05000		94	70-130	0.2	25	
Chloromethane	0.0444	0.0100	mg/kg wet	0.05000		89	70-130	0.4	25	
cis-1,2-Dichloroethene	0.0445	0.0050	mg/kg wet	0.05000		89	70-130	2	25	
cis-1,3-Dichloropropene	0.0465	0.0050	mg/kg wet	0.05000		93	70-130	3	25	
Dibromochloromethane	0.0483	0.0050	mg/kg wet	0.05000		97	70-130	0.2	25	
Dibromomethane	0.0462	0.0050	mg/kg wet	0.05000		92	70-130	2	25	
Dichlorodifluoromethane	0.0477	0.0100	mg/kg wet	0.05000		95	70-130	2	25	
Diethyl Ether	0.0445	0.0050	mg/kg wet	0.05000		89	70-130	2	25	
Di-isopropyl ether	0.0446	0.0050	mg/kg wet	0.05000		89	70-130	3	25	
Ethyl tertiary-butyl ether	0.0440	0.0050	mg/kg wet	0.05000		88	70-130	3	25	
Ethylbenzene	0.0469	0.0050	mg/kg wet	0.05000		94	70-130	3	25	
Hexachlorobutadiene	0.0501	0.0050	mg/kg wet	0.05000		100	70-130	7	25	
Isopropylbenzene	0.0433	0.0050	mg/kg wet	0.05000		87	70-130	3	25	
Methyl tert-Butyl Ether	0.0450	0.0050	mg/kg wet	0.05000		90	70-130	3	25	
Methylene Chloride	0.0464	0.0250	mg/kg wet	0.05000		93	70-130	2	25	
Naphthalene	0.0470	0.0050	mg/kg wet	0.05000		94	70-130	2	25	
n-Butylbenzene	0.0461	0.0050	mg/kg wet	0.05000		92	70-130	2	25	
n-Propylbenzene	0.0458	0.0050	mg/kg wet	0.05000		92	70-130	3	25	
sec-Butylbenzene	0.0458	0.0050	mg/kg wet	0.05000		92	70-130	2	25	
Styrene	0.0464	0.0050	mg/kg wet	0.05000		93	70-130	2	25	
tert-Butylbenzene	0.0465	0.0050	mg/kg wet	0.05000		93	70-130	3	25	



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1709779

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CI72831 - 5035**

Tertiary-amyl methyl ether	0.0426	0.0050	mg/kg wet	0.05000		85	70-130	4	25	
Tetrachloroethene	0.0457	0.0050	mg/kg wet	0.05000		91	70-130	4	25	
Tetrahydrofuran	0.0455	0.0050	mg/kg wet	0.05000		91	70-130	4	25	
Toluene	0.0439	0.0050	mg/kg wet	0.05000		88	70-130	0.4	25	
trans-1,2-Dichloroethene	0.0469	0.0050	mg/kg wet	0.05000		94	70-130	0.6	25	
trans-1,3-Dichloropropene	0.0451	0.0050	mg/kg wet	0.05000		90	70-130	4	25	
Trichloroethene	0.0458	0.0050	mg/kg wet	0.05000		92	70-130	0.5	25	
Trichlorofluoromethane	0.0496	0.0050	mg/kg wet	0.05000		99	70-130	3	25	
Vinyl Acetate	0.0444	0.0050	mg/kg wet	0.05000		89	70-130	4	25	
Vinyl Chloride	0.0456	0.0100	mg/kg wet	0.05000		91	70-130	1	25	
Xylene O	0.0468	0.0050	mg/kg wet	0.05000		94	70-130	3	25	
Xylene P,M	0.0933	0.0100	mg/kg wet	0.1000		93	70-130	3	25	
Xylenes (Total)	0.140	0.0100	mg/kg wet							
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0479</i>		mg/kg wet	<i>0.05000</i>		<i>96</i>	<i>70-130</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0465</i>		mg/kg wet	<i>0.05000</i>		<i>93</i>	<i>70-130</i>			
<i>Surrogate: Dibromofluoromethane</i>	<i>0.0457</i>		mg/kg wet	<i>0.05000</i>		<i>91</i>	<i>70-130</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0455</i>		mg/kg wet	<i>0.05000</i>		<i>91</i>	<i>70-130</i>			

**Batch CI72927 - 5035**

<b>Blank</b>										
1,1,1,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,1-Trichloroethane	ND	0.0050	mg/kg wet							
1,1,2,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,2-Trichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethene	ND	0.0050	mg/kg wet							
1,1-Dichloropropene	ND	0.0050	mg/kg wet							
1,2,3-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,3-Trichloropropane	ND	0.0050	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,4-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,2-Dibromo-3-Chloropropane	ND	0.0050	mg/kg wet							
1,2-Dibromoethane	ND	0.0050	mg/kg wet							
1,2-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,2-Dichloroethane	ND	0.0050	mg/kg wet							
1,2-Dichloropropane	ND	0.0050	mg/kg wet							
1,3,5-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,3-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,3-Dichloropropane	ND	0.0050	mg/kg wet							
1,4-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,4-Dioxane	ND	0.100	mg/kg wet							
1-Chlorohexane	ND	0.0050	mg/kg wet							
2,2-Dichloropropane	ND	0.0050	mg/kg wet							
2-Butanone	ND	0.0500	mg/kg wet							
2-Chlorotoluene	ND	0.0050	mg/kg wet							
2-Hexanone	ND	0.0500	mg/kg wet							





CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1709779

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CI72927 - 5035**

4-Chlorotoluene	ND	0.0050	mg/kg wet							
4-Isopropyltoluene	ND	0.0050	mg/kg wet							
4-Methyl-2-Pentanone	ND	0.0500	mg/kg wet							
Acetone	ND	0.0500	mg/kg wet							
Benzene	ND	0.0050	mg/kg wet							
Bromobenzene	ND	0.0050	mg/kg wet							
Bromochloromethane	ND	0.0050	mg/kg wet							
Bromodichloromethane	ND	0.0050	mg/kg wet							
Bromoform	ND	0.0050	mg/kg wet							
Bromomethane	ND	0.0100	mg/kg wet							
Carbon Disulfide	ND	0.0050	mg/kg wet							
Carbon Tetrachloride	ND	0.0050	mg/kg wet							
Chlorobenzene	ND	0.0050	mg/kg wet							
Chloroethane	ND	0.0100	mg/kg wet							
Chloroform	ND	0.0050	mg/kg wet							
Chloromethane	ND	0.0100	mg/kg wet							
cis-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
cis-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Dibromochloromethane	ND	0.0050	mg/kg wet							
Dibromomethane	ND	0.0050	mg/kg wet							
Dichlorodifluoromethane	ND	0.0100	mg/kg wet							
Diethyl Ether	ND	0.0050	mg/kg wet							
Di-isopropyl ether	ND	0.0050	mg/kg wet							
Ethyl tertiary-butyl ether	ND	0.0050	mg/kg wet							
Ethylbenzene	ND	0.0050	mg/kg wet							
Hexachlorobutadiene	ND	0.0050	mg/kg wet							
Isopropylbenzene	ND	0.0050	mg/kg wet							
Methyl tert-Butyl Ether	ND	0.0050	mg/kg wet							
Methylene Chloride	ND	0.0250	mg/kg wet							
Naphthalene	ND	0.0050	mg/kg wet							
n-Butylbenzene	ND	0.0050	mg/kg wet							
n-Propylbenzene	ND	0.0050	mg/kg wet							
sec-Butylbenzene	ND	0.0050	mg/kg wet							
Styrene	ND	0.0050	mg/kg wet							
tert-Butylbenzene	ND	0.0050	mg/kg wet							
Tertiary-amyl methyl ether	ND	0.0050	mg/kg wet							
Tetrachloroethene	ND	0.0050	mg/kg wet							
Tetrahydrofuran	ND	0.0050	mg/kg wet							
Toluene	ND	0.0050	mg/kg wet							
trans-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
trans-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Trichloroethene	ND	0.0050	mg/kg wet							
Trichlorofluoromethane	ND	0.0050	mg/kg wet							
Vinyl Acetate	ND	0.0050	mg/kg wet							
Vinyl Chloride	ND	0.0100	mg/kg wet							



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1709779

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CI72927 - 5035**

Xylene O	ND	0.0050	mg/kg wet							
Xylene P,M	ND	0.0100	mg/kg wet							
Xylenes (Total)	ND	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	0.0480		mg/kg wet	0.05000		96	70-130			
Surrogate: 4-Bromofluorobenzene	0.0461		mg/kg wet	0.05000		92	70-130			
Surrogate: Dibromofluoromethane	0.0421		mg/kg wet	0.05000		84	70-130			
Surrogate: Toluene-d8	0.0453		mg/kg wet	0.05000		91	70-130			

**LCS**

1,1,1,2-Tetrachloroethane	0.0464	0.0050	mg/kg wet	0.05000		93	70-130			
1,1,1-Trichloroethane	0.0474	0.0050	mg/kg wet	0.05000		95	70-130			
1,1,2,2-Tetrachloroethane	0.0433	0.0050	mg/kg wet	0.05000		87	70-130			
1,1,2-Trichloroethane	0.0437	0.0050	mg/kg wet	0.05000		87	70-130			
1,1-Dichloroethane	0.0433	0.0050	mg/kg wet	0.05000		87	70-130			
1,1-Dichloroethene	0.0465	0.0050	mg/kg wet	0.05000		93	70-130			
1,1-Dichloropropene	0.0454	0.0050	mg/kg wet	0.05000		91	70-130			
1,2,3-Trichlorobenzene	0.0477	0.0050	mg/kg wet	0.05000		95	70-130			
1,2,3-Trichloropropane	0.0381	0.0050	mg/kg wet	0.05000		76	70-130			
1,2,4-Trichlorobenzene	0.0479	0.0050	mg/kg wet	0.05000		96	70-130			
1,2,4-Trimethylbenzene	0.0456	0.0050	mg/kg wet	0.05000		91	70-130			
1,2-Dibromo-3-Chloropropane	0.0405	0.0050	mg/kg wet	0.05000		81	70-130			
1,2-Dibromoethane	0.0474	0.0050	mg/kg wet	0.05000		95	70-130			
1,2-Dichlorobenzene	0.0473	0.0050	mg/kg wet	0.05000		95	70-130			
1,2-Dichloroethane	0.0488	0.0050	mg/kg wet	0.05000		98	70-130			
1,2-Dichloropropane	0.0428	0.0050	mg/kg wet	0.05000		86	70-130			
1,3,5-Trimethylbenzene	0.0445	0.0050	mg/kg wet	0.05000		89	70-130			
1,3-Dichlorobenzene	0.0471	0.0050	mg/kg wet	0.05000		94	70-130			
1,3-Dichloropropane	0.0477	0.0050	mg/kg wet	0.05000		95	70-130			
1,4-Dichlorobenzene	0.0483	0.0050	mg/kg wet	0.05000		97	70-130			
1,4-Dioxane	0.904	0.100	mg/kg wet	1.000		90	70-130			
1-Chlorohexane	0.0436	0.0050	mg/kg wet	0.05000		87	70-130			
2,2-Dichloropropane	0.0439	0.0050	mg/kg wet	0.05000		88	70-130			
2-Butanone	0.208	0.0500	mg/kg wet	0.2500		83	70-130			
2-Chlorotoluene	0.0443	0.0050	mg/kg wet	0.05000		89	70-130			
2-Hexanone	0.224	0.0500	mg/kg wet	0.2500		90	70-130			
4-Chlorotoluene	0.0446	0.0050	mg/kg wet	0.05000		89	70-130			
4-Isopropyltoluene	0.0471	0.0050	mg/kg wet	0.05000		94	70-130			
4-Methyl-2-Pentanone	0.209	0.0500	mg/kg wet	0.2500		84	70-130			
Acetone	0.215	0.0500	mg/kg wet	0.2500		86	70-130			
Benzene	0.0437	0.0050	mg/kg wet	0.05000		87	70-130			
Bromobenzene	0.0461	0.0050	mg/kg wet	0.05000		92	70-130			
Bromochloromethane	0.0452	0.0050	mg/kg wet	0.05000		90	70-130			
Bromodichloromethane	0.0443	0.0050	mg/kg wet	0.05000		89	70-130			
Bromoform	0.0396	0.0050	mg/kg wet	0.05000		79	70-130			
Bromomethane	0.0575	0.0100	mg/kg wet	0.05000		115	70-130			
Carbon Disulfide	0.0432	0.0050	mg/kg wet	0.05000		86	70-130			

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1709779

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
<b>5035/8260B Volatile Organic Compounds / Low Level</b>										
<b>Batch CI72927 - 5035</b>										
Carbon Tetrachloride	0.0459	0.0050	mg/kg wet	0.05000		92	70-130			
Chlorobenzene	0.0477	0.0050	mg/kg wet	0.05000		95	70-130			
Chloroethane	0.0452	0.0100	mg/kg wet	0.05000		90	70-130			
Chloroform	0.0465	0.0050	mg/kg wet	0.05000		93	70-130			
Chloromethane	0.0449	0.0100	mg/kg wet	0.05000		90	70-130			
cis-1,2-Dichloroethene	0.0435	0.0050	mg/kg wet	0.05000		87	70-130			
cis-1,3-Dichloropropene	0.0438	0.0050	mg/kg wet	0.05000		88	70-130			
Dibromochloromethane	0.0460	0.0050	mg/kg wet	0.05000		92	70-130			
Dibromomethane	0.0446	0.0050	mg/kg wet	0.05000		89	70-130			
Dichlorodifluoromethane	0.0495	0.0100	mg/kg wet	0.05000		99	70-130			
Diethyl Ether	0.0431	0.0050	mg/kg wet	0.05000		86	70-130			
Di-isopropyl ether	0.0429	0.0050	mg/kg wet	0.05000		86	70-130			
Ethyl tertiary-butyl ether	0.0419	0.0050	mg/kg wet	0.05000		84	70-130			
Ethylbenzene	0.0470	0.0050	mg/kg wet	0.05000		94	70-130			
Hexachlorobutadiene	0.0492	0.0050	mg/kg wet	0.05000		98	70-130			
Isopropylbenzene	0.0429	0.0050	mg/kg wet	0.05000		86	70-130			
Methyl tert-Butyl Ether	0.0429	0.0050	mg/kg wet	0.05000		86	70-130			
Methylene Chloride	0.0449	0.0250	mg/kg wet	0.05000		90	70-130			
Naphthalene	0.0445	0.0050	mg/kg wet	0.05000		89	70-130			
n-Butylbenzene	0.0458	0.0050	mg/kg wet	0.05000		92	70-130			
n-Propylbenzene	0.0455	0.0050	mg/kg wet	0.05000		91	70-130			
sec-Butylbenzene	0.0456	0.0050	mg/kg wet	0.05000		91	70-130			
Styrene	0.0458	0.0050	mg/kg wet	0.05000		92	70-130			
tert-Butylbenzene	0.0460	0.0050	mg/kg wet	0.05000		92	70-130			
Tertiary-amyl methyl ether	0.0398	0.0050	mg/kg wet	0.05000		80	70-130			
Tetrachloroethene	0.0465	0.0050	mg/kg wet	0.05000		93	70-130			
Tetrahydrofuran	0.0443	0.0050	mg/kg wet	0.05000		89	70-130			
Toluene	0.0431	0.0050	mg/kg wet	0.05000		86	70-130			
trans-1,2-Dichloroethene	0.0461	0.0050	mg/kg wet	0.05000		92	70-130			
trans-1,3-Dichloropropene	0.0419	0.0050	mg/kg wet	0.05000		84	70-130			
Trichloroethene	0.0445	0.0050	mg/kg wet	0.05000		89	70-130			
Trichlorofluoromethane	0.0512	0.0050	mg/kg wet	0.05000		102	70-130			
Vinyl Acetate	0.0420	0.0050	mg/kg wet	0.05000		84	70-130			
Vinyl Chloride	0.0465	0.0100	mg/kg wet	0.05000		93	70-130			
Xylene O	0.0473	0.0050	mg/kg wet	0.05000		95	70-130			
Xylene P,M	0.0934	0.0100	mg/kg wet	0.1000		93	70-130			
Xylenes (Total)	0.141	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	0.0476		mg/kg wet	0.05000		95	70-130			
Surrogate: 4-Bromofluorobenzene	0.0471		mg/kg wet	0.05000		94	70-130			
Surrogate: Dibromofluoromethane	0.0451		mg/kg wet	0.05000		90	70-130			
Surrogate: Toluene-d8	0.0456		mg/kg wet	0.05000		91	70-130			
<b>LCS Dup</b>										
1,1,1,2-Tetrachloroethane	0.0464	0.0050	mg/kg wet	0.05000		93	70-130	0.09	25	
1,1,1-Trichloroethane	0.0481	0.0050	mg/kg wet	0.05000		96	70-130	2	25	
1,1,2,2-Tetrachloroethane	0.0436	0.0050	mg/kg wet	0.05000		87	70-130	0.6	25	

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1709779

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CI72927 - 5035**

1,1,2-Trichloroethane	0.0453	0.0050	mg/kg wet	0.05000		91	70-130	4	25	
1,1-Dichloroethane	0.0439	0.0050	mg/kg wet	0.05000		88	70-130	1	25	
1,1-Dichloroethene	0.0473	0.0050	mg/kg wet	0.05000		95	70-130	2	25	
1,1-Dichloropropene	0.0464	0.0050	mg/kg wet	0.05000		93	70-130	2	25	
1,2,3-Trichlorobenzene	0.0487	0.0050	mg/kg wet	0.05000		97	70-130	2	25	
1,2,3-Trichloropropane	0.0383	0.0050	mg/kg wet	0.05000		77	70-130	0.4	25	
1,2,4-Trichlorobenzene	0.0483	0.0050	mg/kg wet	0.05000		97	70-130	0.8	25	
1,2,4-Trimethylbenzene	0.0450	0.0050	mg/kg wet	0.05000		90	70-130	1	25	
1,2-Dibromo-3-Chloropropane	0.0414	0.0050	mg/kg wet	0.05000		83	70-130	2	25	
1,2-Dibromoethane	0.0479	0.0050	mg/kg wet	0.05000		96	70-130	1	25	
1,2-Dichlorobenzene	0.0472	0.0050	mg/kg wet	0.05000		94	70-130	0.08	25	
1,2-Dichloroethane	0.0498	0.0050	mg/kg wet	0.05000		100	70-130	2	25	
1,2-Dichloropropane	0.0433	0.0050	mg/kg wet	0.05000		87	70-130	1	25	
1,3,5-Trimethylbenzene	0.0443	0.0050	mg/kg wet	0.05000		89	70-130	0.5	25	
1,3-Dichlorobenzene	0.0468	0.0050	mg/kg wet	0.05000		94	70-130	0.7	25	
1,3-Dichloropropane	0.0476	0.0050	mg/kg wet	0.05000		95	70-130	0.04	25	
1,4-Dichlorobenzene	0.0478	0.0050	mg/kg wet	0.05000		96	70-130	1	25	
1,4-Dioxane	0.911	0.100	mg/kg wet	1.000		91	70-130	0.8	20	
1-Chlorohexane	0.0434	0.0050	mg/kg wet	0.05000		87	70-130	0.5	25	
2,2-Dichloropropane	0.0442	0.0050	mg/kg wet	0.05000		88	70-130	0.8	25	
2-Butanone	0.213	0.0500	mg/kg wet	0.2500		85	70-130	2	25	
2-Chlorotoluene	0.0437	0.0050	mg/kg wet	0.05000		87	70-130	1	25	
2-Hexanone	0.227	0.0500	mg/kg wet	0.2500		91	70-130	1	25	
4-Chlorotoluene	0.0443	0.0050	mg/kg wet	0.05000		89	70-130	0.6	25	
4-Isopropyltoluene	0.0464	0.0050	mg/kg wet	0.05000		93	70-130	1	25	
4-Methyl-2-Pentanone	0.217	0.0500	mg/kg wet	0.2500		87	70-130	4	25	
Acetone	0.220	0.0500	mg/kg wet	0.2500		88	70-130	2	25	
Benzene	0.0444	0.0050	mg/kg wet	0.05000		89	70-130	2	25	
Bromobenzene	0.0458	0.0050	mg/kg wet	0.05000		92	70-130	0.6	25	
Bromochloromethane	0.0457	0.0050	mg/kg wet	0.05000		91	70-130	1	25	
Bromodichloromethane	0.0455	0.0050	mg/kg wet	0.05000		91	70-130	3	25	
Bromoform	0.0402	0.0050	mg/kg wet	0.05000		80	70-130	2	25	
Bromomethane	0.0576	0.0100	mg/kg wet	0.05000		115	70-130	0.2	25	
Carbon Disulfide	0.0443	0.0050	mg/kg wet	0.05000		89	70-130	2	25	
Carbon Tetrachloride	0.0464	0.0050	mg/kg wet	0.05000		93	70-130	1	25	
Chlorobenzene	0.0474	0.0050	mg/kg wet	0.05000		95	70-130	0.6	25	
Chloroethane	0.0448	0.0100	mg/kg wet	0.05000		90	70-130	0.9	25	
Chloroform	0.0471	0.0050	mg/kg wet	0.05000		94	70-130	1	25	
Chloromethane	0.0457	0.0100	mg/kg wet	0.05000		91	70-130	2	25	
cis-1,2-Dichloroethene	0.0442	0.0050	mg/kg wet	0.05000		88	70-130	2	25	
cis-1,3-Dichloropropene	0.0450	0.0050	mg/kg wet	0.05000		90	70-130	3	25	
Dibromochloromethane	0.0467	0.0050	mg/kg wet	0.05000		93	70-130	2	25	
Dibromomethane	0.0456	0.0050	mg/kg wet	0.05000		91	70-130	2	25	
Dichlorodifluoromethane	0.0497	0.0100	mg/kg wet	0.05000		99	70-130	0.4	25	
Diethyl Ether	0.0442	0.0050	mg/kg wet	0.05000		88	70-130	3	25	

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1709779

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CI72927 - 5035**

Di-isopropyl ether	0.0438	0.0050	mg/kg wet	0.05000		88	70-130	2	25	
Ethyl tertiary-butyl ether	0.0426	0.0050	mg/kg wet	0.05000		85	70-130	2	25	
Ethylbenzene	0.0467	0.0050	mg/kg wet	0.05000		93	70-130	0.7	25	
Hexachlorobutadiene	0.0494	0.0050	mg/kg wet	0.05000		99	70-130	0.4	25	
Isopropylbenzene	0.0421	0.0050	mg/kg wet	0.05000		84	70-130	2	25	
Methyl tert-Butyl Ether	0.0439	0.0050	mg/kg wet	0.05000		88	70-130	2	25	
Methylene Chloride	0.0463	0.0250	mg/kg wet	0.05000		93	70-130	3	25	
Naphthalene	0.0458	0.0050	mg/kg wet	0.05000		92	70-130	3	25	
n-Butylbenzene	0.0455	0.0050	mg/kg wet	0.05000		91	70-130	0.6	25	
n-Propylbenzene	0.0448	0.0050	mg/kg wet	0.05000		90	70-130	2	25	
sec-Butylbenzene	0.0451	0.0050	mg/kg wet	0.05000		90	70-130	1	25	
Styrene	0.0463	0.0050	mg/kg wet	0.05000		93	70-130	1	25	
tert-Butylbenzene	0.0455	0.0050	mg/kg wet	0.05000		91	70-130	1	25	
Tertiary-amyl methyl ether	0.0409	0.0050	mg/kg wet	0.05000		82	70-130	3	25	
Tetrachloroethene	0.0460	0.0050	mg/kg wet	0.05000		92	70-130	1	25	
Tetrahydrofuran	0.0451	0.0050	mg/kg wet	0.05000		90	70-130	2	25	
Toluene	0.0441	0.0050	mg/kg wet	0.05000		88	70-130	2	25	
trans-1,2-Dichloroethene	0.0467	0.0050	mg/kg wet	0.05000		93	70-130	1	25	
trans-1,3-Dichloropropene	0.0436	0.0050	mg/kg wet	0.05000		87	70-130	4	25	
Trichloroethene	0.0462	0.0050	mg/kg wet	0.05000		92	70-130	4	25	
Trichlorofluoromethane	0.0517	0.0050	mg/kg wet	0.05000		103	70-130	1	25	
Vinyl Acetate	0.0437	0.0050	mg/kg wet	0.05000		87	70-130	4	25	
Vinyl Chloride	0.0475	0.0100	mg/kg wet	0.05000		95	70-130	2	25	
Xylene O	0.0471	0.0050	mg/kg wet	0.05000		94	70-130	0.4	25	
Xylene P,M	0.0934	0.0100	mg/kg wet	0.1000		93	70-130	0.04	25	
Xylenes (Total)	0.141	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	0.0487		mg/kg wet	0.05000		97	70-130			
Surrogate: 4-Bromofluorobenzene	0.0476		mg/kg wet	0.05000		95	70-130			
Surrogate: Dibromofluoromethane	0.0471		mg/kg wet	0.05000		94	70-130			
Surrogate: Toluene-d8	0.0454		mg/kg wet	0.05000		91	70-130			

8100M Total Petroleum Hydrocarbons

**Batch CI72713 - 3546**

<b>Blank</b>										
Decane (C10)	ND	0.2	mg/kg wet							
Docosane (C22)	ND	0.2	mg/kg wet							
Dodecane (C12)	ND	0.2	mg/kg wet							
Eicosane (C20)	ND	0.2	mg/kg wet							
Hexacosane (C26)	ND	0.2	mg/kg wet							
Hexadecane (C16)	ND	0.2	mg/kg wet							
Nonadecane (C19)	ND	0.2	mg/kg wet							
Nonane (C9)	ND	0.2	mg/kg wet							
Octacosane (C28)	ND	0.2	mg/kg wet							
Octadecane (C18)	ND	0.2	mg/kg wet							
Tetracosane (C24)	ND	0.2	mg/kg wet							



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1709779

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
<b>8100M Total Petroleum Hydrocarbons</b>										
<b>Batch CI72713 - 3546</b>										
Tetradecane (C14)	ND	0.2	mg/kg wet							
Total Petroleum Hydrocarbons	ND	37.5	mg/kg wet							
Triacontane (C30)	ND	0.2	mg/kg wet							
<i>Surrogate: O-Terphenyl</i>	<i>3.70</i>		mg/kg wet	<i>5.000</i>		<i>74</i>	<i>40-140</i>			
<b>LCS</b>										
Decane (C10)	1.7	0.2	mg/kg wet	2.500		66	40-140			
Docosane (C22)	2.0	0.2	mg/kg wet	2.500		78	40-140			
Dodecane (C12)	1.7	0.2	mg/kg wet	2.500		69	40-140			
Eicosane (C20)	1.9	0.2	mg/kg wet	2.500		76	40-140			
Hexacosane (C26)	2.0	0.2	mg/kg wet	2.500		79	40-140			
Hexadecane (C16)	1.8	0.2	mg/kg wet	2.500		72	40-140			
Nonadecane (C19)	2.0	0.2	mg/kg wet	2.500		80	40-140			
Nonane (C9)	1.4	0.2	mg/kg wet	2.500		57	30-140			
Octacosane (C28)	2.0	0.2	mg/kg wet	2.500		78	40-140			
Octadecane (C18)	1.8	0.2	mg/kg wet	2.500		71	40-140			
Tetracosane (C24)	2.0	0.2	mg/kg wet	2.500		78	40-140			
Tetradecane (C14)	1.7	0.2	mg/kg wet	2.500		69	40-140			
Total Petroleum Hydrocarbons	25.4	37.5	mg/kg wet	35.00		73	40-140			
Triacontane (C30)	2.0	0.2	mg/kg wet	2.500		79	40-140			
<i>Surrogate: O-Terphenyl</i>	<i>3.87</i>		mg/kg wet	<i>5.000</i>		<i>77</i>	<i>40-140</i>			
<b>LCS Dup</b>										
Decane (C10)	1.6	0.2	mg/kg wet	2.500		65	40-140	1	25	
Docosane (C22)	2.0	0.2	mg/kg wet	2.500		79	40-140	1	25	
Dodecane (C12)	1.7	0.2	mg/kg wet	2.500		69	40-140	0.8	25	
Eicosane (C20)	1.9	0.2	mg/kg wet	2.500		77	40-140	0.7	25	
Hexacosane (C26)	2.0	0.2	mg/kg wet	2.500		80	40-140	1	25	
Hexadecane (C16)	1.8	0.2	mg/kg wet	2.500		73	40-140	0.6	25	
Nonadecane (C19)	2.0	0.2	mg/kg wet	2.500		81	40-140	0.9	25	
Nonane (C9)	1.4	0.2	mg/kg wet	2.500		56	30-140	1	25	
Octacosane (C28)	2.0	0.2	mg/kg wet	2.500		80	40-140	2	25	
Octadecane (C18)	1.8	0.2	mg/kg wet	2.500		72	40-140	1	25	
Tetracosane (C24)	2.0	0.2	mg/kg wet	2.500		79	40-140	1	25	
Tetradecane (C14)	1.7	0.2	mg/kg wet	2.500		69	40-140	0.3	25	
Total Petroleum Hydrocarbons	25.5	37.5	mg/kg wet	35.00		73	40-140	0.4	25	
Triacontane (C30)	2.0	0.2	mg/kg wet	2.500		79	40-140	1	25	
<i>Surrogate: O-Terphenyl</i>	<i>3.90</i>		mg/kg wet	<i>5.000</i>		<i>78</i>	<i>40-140</i>			
<b>Batch CI72814 - 3546</b>										
<b>Blank</b>										
Decane (C10)	ND	0.2	mg/kg wet							
Docosane (C22)	ND	0.2	mg/kg wet							
Dodecane (C12)	ND	0.2	mg/kg wet							
Eicosane (C20)	ND	0.2	mg/kg wet							





CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1709779

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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8100M Total Petroleum Hydrocarbons

**Batch CI72814 - 3546**

Hexacosane (C26)	ND	0.2	mg/kg wet							
Hexadecane (C16)	ND	0.2	mg/kg wet							
Nonadecane (C19)	ND	0.2	mg/kg wet							
Nonane (C9)	ND	0.2	mg/kg wet							
Octacosane (C28)	ND	0.2	mg/kg wet							
Octadecane (C18)	ND	0.2	mg/kg wet							
Tetracosane (C24)	ND	0.2	mg/kg wet							
Tetradecane (C14)	ND	0.2	mg/kg wet							
Total Petroleum Hydrocarbons	ND	37.5	mg/kg wet							
Triacontane (C30)	ND	0.2	mg/kg wet							

Surrogate: O-Terphenyl	4.11		mg/kg wet	5.000		82	40-140			
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**LCS**

Decane (C10)	1.7	0.2	mg/kg wet	2.500		69	40-140			
Docosane (C22)	2.0	0.2	mg/kg wet	2.500		80	40-140			
Dodecane (C12)	1.8	0.2	mg/kg wet	2.500		73	40-140			
Eicosane (C20)	2.0	0.2	mg/kg wet	2.500		79	40-140			
Hexacosane (C26)	2.0	0.2	mg/kg wet	2.500		80	40-140			
Hexadecane (C16)	1.9	0.2	mg/kg wet	2.500		77	40-140			
Nonadecane (C19)	2.1	0.2	mg/kg wet	2.500		84	40-140			
Nonane (C9)	1.4	0.2	mg/kg wet	2.500		58	30-140			
Octacosane (C28)	2.0	0.2	mg/kg wet	2.500		80	40-140			
Octadecane (C18)	1.9	0.2	mg/kg wet	2.500		75	40-140			
Tetracosane (C24)	2.0	0.2	mg/kg wet	2.500		80	40-140			
Tetradecane (C14)	1.8	0.2	mg/kg wet	2.500		74	40-140			
Total Petroleum Hydrocarbons	26.7	37.5	mg/kg wet	35.00		76	40-140			
Triacontane (C30)	2.0	0.2	mg/kg wet	2.500		80	40-140			

Surrogate: O-Terphenyl	4.14		mg/kg wet	5.000		83	40-140			
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**LCS Dup**

Decane (C10)	1.7	0.2	mg/kg wet	2.500		68	40-140	2	25	
Docosane (C22)	2.0	0.2	mg/kg wet	2.500		78	40-140	2	25	
Dodecane (C12)	1.8	0.2	mg/kg wet	2.500		71	40-140	3	25	
Eicosane (C20)	1.9	0.2	mg/kg wet	2.500		77	40-140	2	25	
Hexacosane (C26)	2.0	0.2	mg/kg wet	2.500		79	40-140	2	25	
Hexadecane (C16)	1.9	0.2	mg/kg wet	2.500		75	40-140	3	25	
Nonadecane (C19)	2.0	0.2	mg/kg wet	2.500		82	40-140	2	25	
Nonane (C9)	1.5	0.2	mg/kg wet	2.500		58	30-140	0.6	25	
Octacosane (C28)	2.0	0.2	mg/kg wet	2.500		78	40-140	2	25	
Octadecane (C18)	1.8	0.2	mg/kg wet	2.500		74	40-140	2	25	
Tetracosane (C24)	2.0	0.2	mg/kg wet	2.500		78	40-140	2	25	
Tetradecane (C14)	1.8	0.2	mg/kg wet	2.500		72	40-140	3	25	
Total Petroleum Hydrocarbons	27.2	37.5	mg/kg wet	35.00		78	40-140	2	25	
Triacontane (C30)	2.0	0.2	mg/kg wet	2.500		79	40-140	2	25	

Surrogate: O-Terphenyl	3.99		mg/kg wet	5.000		80	40-140			
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CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1709779

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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8270D Polynuclear Aromatic Hydrocarbons

**Batch CI72717 - 3546**

**Blank**

2-Methylnaphthalene	ND	0.333	mg/kg wet							
Acenaphthene	ND	0.333	mg/kg wet							
Acenaphthylene	ND	0.333	mg/kg wet							
Anthracene	ND	0.333	mg/kg wet							
Benzo(a)anthracene	ND	0.333	mg/kg wet							
Benzo(a)pyrene	ND	0.167	mg/kg wet							
Benzo(b)fluoranthene	ND	0.333	mg/kg wet							
Benzo(g,h,i)perylene	ND	0.333	mg/kg wet							
Benzo(k)fluoranthene	ND	0.333	mg/kg wet							
Chrysene	ND	0.167	mg/kg wet							
Dibenzo(a,h)Anthracene	ND	0.167	mg/kg wet							
Fluoranthene	ND	0.333	mg/kg wet							
Fluorene	ND	0.333	mg/kg wet							
Indeno(1,2,3-cd)Pyrene	ND	0.333	mg/kg wet							
Naphthalene	ND	0.333	mg/kg wet							
Phenanthrene	ND	0.333	mg/kg wet							
Pyrene	ND	0.333	mg/kg wet							
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	2.35		mg/kg wet	3.333		70	30-130			
<i>Surrogate: 2-Fluorobiphenyl</i>	2.52		mg/kg wet	3.333		76	30-130			
<i>Surrogate: Nitrobenzene-d5</i>	2.37		mg/kg wet	3.333		71	30-130			
<i>Surrogate: p-Terphenyl-d14</i>	3.24		mg/kg wet	3.333		97	30-130			

**LCS**

2-Methylnaphthalene	2.57	0.333	mg/kg wet	3.333		77	40-140			
Acenaphthene	2.69	0.333	mg/kg wet	3.333		81	40-140			
Acenaphthylene	2.83	0.333	mg/kg wet	3.333		85	40-140			
Anthracene	2.89	0.333	mg/kg wet	3.333		87	40-140			
Benzo(a)anthracene	3.00	0.333	mg/kg wet	3.333		90	40-140			
Benzo(a)pyrene	3.06	0.167	mg/kg wet	3.333		92	40-140			
Benzo(b)fluoranthene	3.24	0.333	mg/kg wet	3.333		97	40-140			
Benzo(g,h,i)perylene	2.96	0.333	mg/kg wet	3.333		89	40-140			
Benzo(k)fluoranthene	3.02	0.333	mg/kg wet	3.333		90	40-140			
Chrysene	3.00	0.167	mg/kg wet	3.333		90	40-140			
Dibenzo(a,h)Anthracene	3.00	0.167	mg/kg wet	3.333		90	40-140			
Fluoranthene	3.24	0.333	mg/kg wet	3.333		97	40-140			
Fluorene	2.99	0.333	mg/kg wet	3.333		90	40-140			
Indeno(1,2,3-cd)Pyrene	2.97	0.333	mg/kg wet	3.333		89	40-140			
Naphthalene	2.69	0.333	mg/kg wet	3.333		81	40-140			
Phenanthrene	2.74	0.333	mg/kg wet	3.333		82	40-140			
Pyrene	2.89	0.333	mg/kg wet	3.333		87	40-140			
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	2.47		mg/kg wet	3.333		74	30-130			
<i>Surrogate: 2-Fluorobiphenyl</i>	2.67		mg/kg wet	3.333		80	30-130			
<i>Surrogate: Nitrobenzene-d5</i>	2.56		mg/kg wet	3.333		77	30-130			
<i>Surrogate: p-Terphenyl-d14</i>	2.97		mg/kg wet	3.333		89	30-130			

**LCS Dup**



CERTIFICATE OF ANALYSIS

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**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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8270D Polynuclear Aromatic Hydrocarbons

**Batch CI72717 - 3546**

2-Methylnaphthalene	2.62	0.333	mg/kg wet	3.333		79	40-140	2	30	
Acenaphthene	2.66	0.333	mg/kg wet	3.333		80	40-140	1	30	
Acenaphthylene	2.93	0.333	mg/kg wet	3.333		88	40-140	3	30	
Anthracene	2.91	0.333	mg/kg wet	3.333		87	40-140	0.6	30	
Benzo(a)anthracene	3.01	0.333	mg/kg wet	3.333		90	40-140	0.2	30	
Benzo(a)pyrene	3.10	0.167	mg/kg wet	3.333		93	40-140	1	30	
Benzo(b)fluoranthene	3.00	0.333	mg/kg wet	3.333		90	40-140	8	30	
Benzo(g,h,i)perylene	3.01	0.333	mg/kg wet	3.333		90	40-140	2	30	
Benzo(k)fluoranthene	3.25	0.333	mg/kg wet	3.333		98	40-140	8	30	
Chrysene	3.01	0.167	mg/kg wet	3.333		90	40-140	0.4	30	
Dibenzo(a,h)Anthracene	3.06	0.167	mg/kg wet	3.333		92	40-140	2	30	
Fluoranthene	3.21	0.333	mg/kg wet	3.333		96	40-140	0.8	30	
Fluorene	3.00	0.333	mg/kg wet	3.333		90	40-140	0.3	30	
Indeno(1,2,3-cd)Pyrene	3.01	0.333	mg/kg wet	3.333		90	40-140	2	30	
Naphthalene	2.72	0.333	mg/kg wet	3.333		82	40-140	1	30	
Phenanthrene	2.77	0.333	mg/kg wet	3.333		83	40-140	1	30	
Pyrene	2.96	0.333	mg/kg wet	3.333		89	40-140	2	30	
Surrogate: 1,2-Dichlorobenzene-d4	2.57		mg/kg wet	3.333		77	30-130			
Surrogate: 2-Fluorobiphenyl	2.77		mg/kg wet	3.333		83	30-130			
Surrogate: Nitrobenzene-d5	2.65		mg/kg wet	3.333		79	30-130			
Surrogate: p-Terphenyl-d14	3.08		mg/kg wet	3.333		92	30-130			

Classical Chemistry

**Batch CJ70314 - TCN Prep**

<b>Blank</b>										
Total Cyanide	ND	1.00	mg/kg wet							
<b>LCS</b>										
Total Cyanide	4.97	1.00	mg/kg wet	5.015		99	90-110			
<b>Reference</b>										
Total Cyanide	49.1	4.92	mg/kg wet	48.40		101	36.1577-206.6 12			
<b>Reference</b>										
Total Cyanide	48.8	4.88	mg/kg wet	48.40		101	36.1577-206.6 12			



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1709779

**Notes and Definitions**

- U Analyte included in the analysis, but not detected
- SC Surrogate recovery(ies) outside of criteria. Reextraction/Reanalysis confirms results (SC).
- S- Surrogate recovery(ies) below lower control limit (S-).
- IC Internal Standard(s) outside of criteria. Sample was reanalyzed to confirm (IC).
- D Diluted.
- B- Blank Spike recovery is below lower control limit (B-).
- ND Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference
- MDL Method Detection Limit
- MRL Method Reporting Limit
- LOD Limit of Detection
- LOQ Limit of Quantitation
- DL Detection Limit
- I/V Initial Volume
- F/V Final Volume
- § Subcontracted analysis; see attached report
- 1 Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
- 2 Range result excludes concentrations of target analytes eluting in that range.
- 3 Range result excludes the concentration of the C9-C10 aromatic range.
- Avg Results reported as a mathematical average.
- NR No Recovery
- [CALC] Calculated Analyte
- SUB Subcontracted analysis; see attached report
- RL Reporting Limit
- EDL Estimated Detection Limit



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1709779

**ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS**

**ENVIRONMENTAL**

Rhode Island Potable and Non Potable Water: LAI00179

<http://www.health.ri.gov/find/labs/analytical/ESS.pdf>

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750

[http://www.ct.gov/dph/lib/dph/environmental\\_health/environmental\\_laboratories/pdf/OutofStateCommercialLaboratories.pdf](http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf)

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002

<http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml>

Massachusetts Potable and Non Potable Water: M-RI002

<http://public.dep.state.ma.us/Labcert/Labcert.aspx>

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424

<http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm>

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313

<http://www.wadsworth.org/labcert/elap/comm.html>

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006

[http://datamine2.state.nj.us/DEP\\_OPRA/OpraMain/pi\\_main?mode=pi\\_by\\_site&sort\\_order=PI\\_NAMEA&Select+a+Site:=58715](http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715)

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752

<http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx>

## ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Providence, RI - GZA/HDM

ESS Project ID: 1709779

Date Received: 9/27/2017

Shipped/Delivered Via: ESS Courier

Project Due Date: 10/4/2017

Days for Project: 5 Day

1. Air bill manifest present?  No  
Air No.: NA

6. Does COC match bottles?  Yes  No u 9/27/17

2. Were custody seals present?  No

7. Is COC complete and correct?  Yes

3. Is radiation count <100 CPM?  Yes

8. Were samples received intact?  Yes

4. Is a Cooler Present?  Yes  
Temp: 3.4 Iced with: Ice

9. Were labs informed about short holds & rushes? Yes / No / NA

5. Was COC signed and dated by client?  Yes

10. Were any analyses received outside of hold time? Yes / No

11. Any Subcontracting needed? Yes  No  
ESS Sample IDs: \_\_\_\_\_  
Analysis: \_\_\_\_\_  
TAT: \_\_\_\_\_

12. Were VOAs received? Yes / No   
a. Air bubbles in aqueous VOAs? Yes / No   
b. Does methanol cover soil completely? Yes / No / NA

13. Are the samples properly preserved? Yes  No  
a. If metals preserved upon receipt: Date: \_\_\_\_\_ Time: \_\_\_\_\_ By: \_\_\_\_\_  
b. Low Level VOA vials frozen: Date: 9/27/17 Time: 1706 By: uc

Sample Receiving Notes:

COC = 6Z-SS-536 (0-2) collected 835; Label = 6Z-SS-537 (0-2) (MeOH vial) collected 835

14. Was there a need to contact Project Manager? Yes/No   
a. Was there a need to contact the client? Yes / No   
Who was contacted? \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_ By: \_\_\_\_\_

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
01	167770	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
01	167789	Yes	NA	Yes	VOA Vial - Other	Other	
01	167790	Yes	NA	Yes	VOA Vial - Other	Other	
01	167810	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
01	167811	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
01	167821	Yes	NA	Yes	2 oz. Jar - Unpres	NP	
02	167769	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
02	167787	Yes	NA	Yes	VOA Vial - Other	Other	
02	167788	Yes	NA	Yes	VOA Vial - Other	Other	
02	167808	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
02	167809	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
02	167820	Yes	NA	Yes	2 oz. Jar - Unpres	NP	
03	167768	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
03	167785	Yes	NA	Yes	VOA Vial - Other	Other	
03	167786	Yes	NA	Yes	VOA Vial - Other	Other	
03	167806	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
03	167807	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
03	167819	Yes	NA	Yes	2 oz. Jar - Unpres	NP	
04	167767	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
04	167783	Yes	NA	Yes	VOA Vial - Other	Other	
04	167784	Yes	NA	Yes	VOA Vial - Other	Other	
04	167804	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
04	167805	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
04	167818	Yes	NA	Yes	2 oz. Jar - Unpres	NP	



## ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Providence, RI - GZA/HDM

ESS Project ID: 1709779

Date Received: 9/27/2017

05	167766	Yes	NA	Yes	VOA Vial - Methanol	MeOH
05	167781	Yes	NA	Yes	VOA Vial - Other	Other
05	167782	Yes	NA	Yes	VOA Vial - Other	Other
05	167802	Yes	NA	Yes	4 oz. Jar - Unpres	NP
05	167803	Yes	NA	Yes	4 oz. Jar - Unpres	NP
05	167817	Yes	NA	Yes	2 oz. Jar - Unpres	NP
06	167765	Yes	NA	Yes	VOA Vial - Methanol	MeOH
06	167779	Yes	NA	Yes	VOA Vial - Other	Other
06	167780	Yes	NA	Yes	VOA Vial - Other	Other
06	167800	Yes	NA	Yes	4 oz. Jar - Unpres	NP
06	167801	Yes	NA	Yes	4 oz. Jar - Unpres	NP
06	167816	Yes	NA	Yes	2 oz. Jar - Unpres	NP
07	167764	Yes	NA	Yes	VOA Vial - Methanol	MeOH
07	167777	Yes	NA	Yes	VOA Vial - Other	NP
07	167778	Yes	NA	Yes	VOA Vial - Other	NP
07	167798	Yes	NA	Yes	4 oz. Jar - Unpres	NP
07	167799	Yes	NA	Yes	4 oz. Jar - Unpres	NP
07	167815	Yes	NA	Yes	2 oz. Jar - Unpres	NP
08	167763	Yes	NA	Yes	VOA Vial - Methanol	MeOH
08	167775	Yes	NA	Yes	VOA Vial - Other	Other
08	167776	Yes	NA	Yes	VOA Vial - Other	Other
08	167796	Yes	NA	Yes	4 oz. Jar - Unpres	NP
08	167797	Yes	NA	Yes	4 oz. Jar - Unpres	NP
08	167814	Yes	NA	Yes	2 oz. Jar - Unpres	NP
09	167762	Yes	NA	Yes	VOA Vial - Methanol	MeOH
09	167773	Yes	NA	Yes	VOA Vial - Other	Other
09	167774	Yes	NA	Yes	VOA Vial - Other	Other
09	167794	Yes	NA	Yes	4 oz. Jar - Unpres	NP
09	167795	Yes	NA	Yes	4 oz. Jar - Unpres	NP
09	167813	Yes	NA	Yes	2 oz. Jar - Unpres	NP
10	167761	Yes	NA	Yes	VOA Vial - Methanol	MeOH
10	167771	Yes	NA	Yes	VOA Vial - Other	Other
10	167772	Yes	NA	Yes	VOA Vial - Other	Other
10	167792	Yes	NA	Yes	4 oz. Jar - Unpres	NP
10	167793	Yes	NA	Yes	4 oz. Jar - Unpres	NP
10	167812	Yes	NA	Yes	2 oz. Jar - Unpres	NP
11	167760	Yes	NA	Yes	VOA Vial - Methanol	MeOH
11	167791	Yes	NA	Yes	VOA Vial - Other	Other

**2nd Review**

Are barcode labels on correct containers?

Yes  No

Completed

By: [Signature]

Date & Time: 9/27/17 1642

Reviewed

By: [Signature]

Date & Time: 9/27/17 1706

Delivered

By: [Signature]

Date & Time: 9/27/17 1706





## CERTIFICATE OF ANALYSIS

Sarah McLeod  
GZA GeoEnvironmental, Inc.  
530 Broadway  
Providence, RI 02909

**RE: Former Tidewater Facility (05.0043654.00)**  
**ESS Laboratory Work Order Number: 1709819**

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.



Laurel Stoddard  
Laboratory Director

**REVIEWED****By ESS Laboratory at 2:40 pm, Oct 05, 2017****Analytical Summary**

The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1709819

**SAMPLE RECEIPT**

The following samples were received on September 28, 2017 for the analyses specified on the enclosed Chain of Custody Record.

<b>Lab Number</b>	<b>Sample Name</b>	<b>Matrix</b>	<b>Analysis</b>
1709819-01	GZ-CS-501 (0-0.5")	Solid	8082A
1709819-02	GZ-CS-502 (0-0.5")	Solid	8082A
1709819-03	GZ-CS-503 (0-0.5")	Solid	8082A
1709819-04	GZ-CS-504 (0-0.5")	Solid	8082A
1709819-05	GZ-CS-505 (0-0.5")	Solid	8082A
1709819-06	GZ-CS-506 (0-0.5")	Solid	8082A
1709819-07	GZ-CS-507 (0-0.5")	Solid	8082A
1709819-08	GZ-CS-508 (0-0.5")	Solid	8082A



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1709819

**PROJECT NARRATIVE**

**No unusual observations noted.**

**End of Project Narrative.**

**DATA USABILITY LINKS**

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[Definitions of Quality Control Parameters](#)

[Semivolatile Organics Internal Standard Information](#)

[Semivolatile Organics Surrogate Information](#)

[Volatile Organics Internal Standard Information](#)

[Volatile Organics Surrogate Information](#)

[EPH and VPH Alkane Lists](#)





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1709819

**CURRENT SW-846 METHODOLOGY VERSIONS**

**Analytical Methods**

- 1010A - Flashpoint
- 6010C - ICP
- 6020A - ICP MS
- 7010 - Graphite Furnace
- 7196A - Hexavalent Chromium
- 7470A - Aqueous Mercury
- 7471B - Solid Mercury
- 8011 - EDB/DBCP/TCP
- 8015C - GRO/DRO
- 8081B - Pesticides
- 8082A - PCB
- 8100M - TPH
- 8151A - Herbicides
- 8260B - VOA
- 8270D - SVOA
- 8270D SIM - SVOA Low Level
- 9014 - Cyanide
- 9038 - Sulfate
- 9040C - Aqueous pH
- 9045D - Solid pH (Corrosivity)
- 9050A - Specific Conductance
- 9056A - Anions (IC)
- 9060A - TOC
- 9095B - Paint Filter
- MADEP 04-1.1 - EPH / VPH

**Prep Methods**

- 3005A - Aqueous ICP Digestion
- 3020A - Aqueous Graphite Furnace / ICP MS Digestion
- 3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
- 3060A - Solid Hexavalent Chromium Digestion
- 3510C - Separatory Funnel Extraction
- 3520C - Liquid / Liquid Extraction
- 3540C - Manual Soxhlet Extraction
- 3541 - Automated Soxhlet Extraction
- 3546 - Microwave Extraction
- 3580A - Waste Dilution
- 5030B - Aqueous Purge and Trap
- 5030C - Aqueous Purge and Trap
- 5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-CS-501 (0-0.5")  
 Date Sampled: 09/28/17 11:45  
 Percent Solids: 98  
 Initial Volume: 5.13  
 Final Volume: 10  
 Extraction Method: 3540C

ESS Laboratory Work Order: 1709819  
 ESS Laboratory Sample ID: 1709819-01  
 Sample Matrix: Solid  
 Units: mg/kg dry  
 Analyst: CAD  
 Prepared: 9/29/17 17:35

**8082A Polychlorinated Biphenyls (PCB)**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Aroclor 1016	ND (0.2)		8082A		1	10/02/17 18:27		CI72909
Aroclor 1221	ND (0.2)		8082A		1	10/02/17 18:27		CI72909
Aroclor 1232	ND (0.2)		8082A		1	10/02/17 18:27		CI72909
Aroclor 1242	ND (0.2)		8082A		1	10/02/17 18:27		CI72909
Aroclor 1248	ND (0.2)		8082A		1	10/02/17 18:27		CI72909
Aroclor 1254	ND (0.2)		8082A		1	10/02/17 18:27		CI72909
Aroclor 1260	ND (0.2)		8082A		1	10/02/17 18:27		CI72909
Aroclor 1262	ND (0.2)		8082A		1	10/02/17 18:27		CI72909
Aroclor 1268	ND (0.2)		8082A		1	10/02/17 18:27		CI72909

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: Decachlorobiphenyl	79 %		30-150
Surrogate: Decachlorobiphenyl [2C]	77 %		30-150
Surrogate: Tetrachloro-m-xylene	69 %		30-150
Surrogate: Tetrachloro-m-xylene [2C]	71 %		30-150



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-CS-502 (0-0.5")  
 Date Sampled: 09/28/17 11:55  
 Percent Solids: 98  
 Initial Volume: 5.01  
 Final Volume: 10  
 Extraction Method: 3540C

ESS Laboratory Work Order: 1709819  
 ESS Laboratory Sample ID: 1709819-02  
 Sample Matrix: Solid  
 Units: mg/kg dry  
 Analyst: CAD  
 Prepared: 9/29/17 17:35

**8082A Polychlorinated Biphenyls (PCB)**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Aroclor 1016	ND (0.2)		8082A		1	10/02/17 18:44		CI72909
Aroclor 1221	ND (0.2)		8082A		1	10/02/17 18:44		CI72909
Aroclor 1232	ND (0.2)		8082A		1	10/02/17 18:44		CI72909
Aroclor 1242	ND (0.2)		8082A		1	10/02/17 18:44		CI72909
Aroclor 1248	ND (0.2)		8082A		1	10/02/17 18:44		CI72909
Aroclor 1254	ND (0.2)		8082A		1	10/02/17 18:44		CI72909
Aroclor 1260 [2C]	ND (0.2)		8082A		1	10/02/17 18:44		CI72909
Aroclor 1262	ND (0.2)		8082A		1	10/02/17 18:44		CI72909
Aroclor 1268	ND (0.2)		8082A		1	10/02/17 18:44		CI72909

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: Decachlorobiphenyl	97 %		30-150
Surrogate: Decachlorobiphenyl [2C]	94 %		30-150
Surrogate: Tetrachloro-m-xylene	79 %		30-150
Surrogate: Tetrachloro-m-xylene [2C]	87 %		30-150



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-CS-503 (0-0.5")  
 Date Sampled: 09/28/17 12:05  
 Percent Solids: 98  
 Initial Volume: 5.57  
 Final Volume: 10  
 Extraction Method: 3540C

ESS Laboratory Work Order: 1709819  
 ESS Laboratory Sample ID: 1709819-03  
 Sample Matrix: Solid  
 Units: mg/kg dry  
 Analyst: CAD  
 Prepared: 9/29/17 17:35

**8082A Polychlorinated Biphenyls (PCB)**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Aroclor 1016	ND (0.2)		8082A		1	10/02/17 19:03		CI72909
Aroclor 1221	ND (0.2)		8082A		1	10/02/17 19:03		CI72909
Aroclor 1232	ND (0.2)		8082A		1	10/02/17 19:03		CI72909
Aroclor 1242	ND (0.2)		8082A		1	10/02/17 19:03		CI72909
Aroclor 1248	ND (0.2)		8082A		1	10/02/17 19:03		CI72909
Aroclor 1254	ND (0.2)		8082A		1	10/02/17 19:03		CI72909
Aroclor 1260	ND (0.2)		8082A		1	10/02/17 19:03		CI72909
Aroclor 1262	ND (0.2)		8082A		1	10/02/17 19:03		CI72909
Aroclor 1268	ND (0.2)		8082A		1	10/02/17 19:03		CI72909

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: Decachlorobiphenyl	114 %		30-150
Surrogate: Decachlorobiphenyl [2C]	109 %		30-150
Surrogate: Tetrachloro-m-xylene	86 %		30-150
Surrogate: Tetrachloro-m-xylene [2C]	95 %		30-150



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-CS-504 (0-0.5")  
 Date Sampled: 09/28/17 12:20  
 Percent Solids: 98  
 Initial Volume: 5.52  
 Final Volume: 10  
 Extraction Method: 3540C

ESS Laboratory Work Order: 1709819  
 ESS Laboratory Sample ID: 1709819-04  
 Sample Matrix: Solid  
 Units: mg/kg dry  
 Analyst: CAD  
 Prepared: 9/29/17 17:35

**8082A Polychlorinated Biphenyls (PCB)**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Aroclor 1016	ND (0.2)		8082A		1	10/02/17 19:22		CI72909
Aroclor 1221	ND (0.2)		8082A		1	10/02/17 19:22		CI72909
Aroclor 1232	ND (0.2)		8082A		1	10/02/17 19:22		CI72909
Aroclor 1242	ND (0.2)		8082A		1	10/02/17 19:22		CI72909
Aroclor 1248	ND (0.2)		8082A		1	10/02/17 19:22		CI72909
Aroclor 1254	ND (0.2)		8082A		1	10/02/17 19:22		CI72909
Aroclor 1260	ND (0.2)		8082A		1	10/02/17 19:22		CI72909
Aroclor 1262	ND (0.2)		8082A		1	10/02/17 19:22		CI72909
Aroclor 1268	ND (0.2)		8082A		1	10/02/17 19:22		CI72909

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: Decachlorobiphenyl	100 %		30-150
Surrogate: Decachlorobiphenyl [2C]	99 %		30-150
Surrogate: Tetrachloro-m-xylene	84 %		30-150
Surrogate: Tetrachloro-m-xylene [2C]	88 %		30-150



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-CS-505 (0-0.5")  
 Date Sampled: 09/28/17 12:30  
 Percent Solids: 97  
 Initial Volume: 5.2  
 Final Volume: 10  
 Extraction Method: 3540C

ESS Laboratory Work Order: 1709819  
 ESS Laboratory Sample ID: 1709819-05  
 Sample Matrix: Solid  
 Units: mg/kg dry  
 Analyst: CAD  
 Prepared: 9/29/17 17:35

**8082A Polychlorinated Biphenyls (PCB)**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Aroclor 1016	ND (0.2)		8082A		1	10/02/17 19:41		CI72909
Aroclor 1221	ND (0.2)		8082A		1	10/02/17 19:41		CI72909
Aroclor 1232	ND (0.2)		8082A		1	10/02/17 19:41		CI72909
Aroclor 1242	ND (0.2)		8082A		1	10/02/17 19:41		CI72909
Aroclor 1248	ND (0.2)		8082A		1	10/02/17 19:41		CI72909
Aroclor 1254	ND (0.2)		8082A		1	10/02/17 19:41		CI72909
Aroclor 1260	ND (0.2)		8082A		1	10/02/17 19:41		CI72909
Aroclor 1262	ND (0.2)		8082A		1	10/02/17 19:41		CI72909
Aroclor 1268	ND (0.2)		8082A		1	10/02/17 19:41		CI72909

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: Decachlorobiphenyl	100 %		30-150
Surrogate: Decachlorobiphenyl [2C]	99 %		30-150
Surrogate: Tetrachloro-m-xylene	83 %		30-150
Surrogate: Tetrachloro-m-xylene [2C]	87 %		30-150





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-CS-506 (0-0.5")  
 Date Sampled: 09/28/17 12:35  
 Percent Solids: 98  
 Initial Volume: 5.37  
 Final Volume: 10  
 Extraction Method: 3540C

ESS Laboratory Work Order: 1709819  
 ESS Laboratory Sample ID: 1709819-06  
 Sample Matrix: Solid  
 Units: mg/kg dry  
 Analyst: CAD  
 Prepared: 9/29/17 17:35

**8082A Polychlorinated Biphenyls (PCB)**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Aroclor 1016	ND (0.2)		8082A		1	10/02/17 20:00		CI72909
Aroclor 1221	ND (0.2)		8082A		1	10/02/17 20:00		CI72909
Aroclor 1232	ND (0.2)		8082A		1	10/02/17 20:00		CI72909
Aroclor 1242	ND (0.2)		8082A		1	10/02/17 20:00		CI72909
Aroclor 1248	ND (0.2)		8082A		1	10/02/17 20:00		CI72909
Aroclor 1254	ND (0.2)		8082A		1	10/02/17 20:00		CI72909
Aroclor 1260 [2C]	ND (0.2)		8082A		1	10/02/17 20:00		CI72909
Aroclor 1262	ND (0.2)		8082A		1	10/02/17 20:00		CI72909
Aroclor 1268	ND (0.2)		8082A		1	10/02/17 20:00		CI72909

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: Decachlorobiphenyl	95 %		30-150
Surrogate: Decachlorobiphenyl [2C]	92 %		30-150
Surrogate: Tetrachloro-m-xylene	75 %		30-150
Surrogate: Tetrachloro-m-xylene [2C]	80 %		30-150



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-CS-507 (0-0.5")  
 Date Sampled: 09/28/17 12:40  
 Percent Solids: 96  
 Initial Volume: 5.06  
 Final Volume: 10  
 Extraction Method: 3540C

ESS Laboratory Work Order: 1709819  
 ESS Laboratory Sample ID: 1709819-07  
 Sample Matrix: Solid  
 Units: mg/kg dry  
 Analyst: CAD  
 Prepared: 9/29/17 17:35

**8082A Polychlorinated Biphenyls (PCB)**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Aroclor 1016	ND (0.2)		8082A		1	10/02/17 20:19		CI72909
Aroclor 1221	ND (0.2)		8082A		1	10/02/17 20:19		CI72909
Aroclor 1232	ND (0.2)		8082A		1	10/02/17 20:19		CI72909
Aroclor 1242	ND (0.2)		8082A		1	10/02/17 20:19		CI72909
Aroclor 1248	ND (0.2)		8082A		1	10/02/17 20:19		CI72909
Aroclor 1254	ND (0.2)		8082A		1	10/02/17 20:19		CI72909
Aroclor 1260	ND (0.2)		8082A		1	10/02/17 20:19		CI72909
Aroclor 1262	ND (0.2)		8082A		1	10/02/17 20:19		CI72909
Aroclor 1268	ND (0.2)		8082A		1	10/02/17 20:19		CI72909

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: Decachlorobiphenyl	78 %		30-150
Surrogate: Decachlorobiphenyl [2C]	71 %		30-150
Surrogate: Tetrachloro-m-xylene	78 %		30-150
Surrogate: Tetrachloro-m-xylene [2C]	85 %		30-150



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-CS-508 (0-0.5")  
Date Sampled: 09/28/17 12:50  
Percent Solids: 100  
Initial Volume: 5.23  
Final Volume: 10  
Extraction Method: 3540C

ESS Laboratory Work Order: 1709819  
ESS Laboratory Sample ID: 1709819-08  
Sample Matrix: Solid  
Units: mg/kg dry  
Analyst: CAD  
Prepared: 9/29/17 17:35

**8082A Polychlorinated Biphenyls (PCB)**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Aroclor 1016	ND (0.2)		8082A		1	10/02/17 20:38		CI72909
Aroclor 1221	ND (0.2)		8082A		1	10/02/17 20:38		CI72909
Aroclor 1232	ND (0.2)		8082A		1	10/02/17 20:38		CI72909
Aroclor 1242	ND (0.2)		8082A		1	10/02/17 20:38		CI72909
Aroclor 1248	ND (0.2)		8082A		1	10/02/17 20:38		CI72909
Aroclor 1254	ND (0.2)		8082A		1	10/02/17 20:38		CI72909
Aroclor 1260	ND (0.2)		8082A		1	10/02/17 20:38		CI72909
Aroclor 1262	ND (0.2)		8082A		1	10/02/17 20:38		CI72909
Aroclor 1268	ND (0.2)		8082A		1	10/02/17 20:38		CI72909

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
<i>Surrogate: Decachlorobiphenyl</i>	88 %		30-150
<i>Surrogate: Decachlorobiphenyl [2C]</i>	82 %		30-150
<i>Surrogate: Tetrachloro-m-xylene</i>	77 %		30-150
<i>Surrogate: Tetrachloro-m-xylene [2C]</i>	82 %		30-150



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1709819

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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8082A Polychlorinated Biphenyls (PCB)

**Batch CI72909 - 3540C**

**Blank**

Aroclor 1016	ND	0.05	mg/kg wet							
Aroclor 1016 [2C]	ND	0.05	mg/kg wet							
Aroclor 1221	ND	0.05	mg/kg wet							
Aroclor 1221 [2C]	ND	0.05	mg/kg wet							
Aroclor 1232	ND	0.05	mg/kg wet							
Aroclor 1232 [2C]	ND	0.05	mg/kg wet							
Aroclor 1242	ND	0.05	mg/kg wet							
Aroclor 1242 [2C]	ND	0.05	mg/kg wet							
Aroclor 1248	ND	0.05	mg/kg wet							
Aroclor 1248 [2C]	ND	0.05	mg/kg wet							
Aroclor 1254	ND	0.05	mg/kg wet							
Aroclor 1254 [2C]	ND	0.05	mg/kg wet							
Aroclor 1260	ND	0.05	mg/kg wet							
Aroclor 1260 [2C]	ND	0.05	mg/kg wet							
Aroclor 1262	ND	0.05	mg/kg wet							
Aroclor 1262 [2C]	ND	0.05	mg/kg wet							
Aroclor 1268	ND	0.05	mg/kg wet							
Aroclor 1268 [2C]	ND	0.05	mg/kg wet							

Surrogate: Decachlorobiphenyl	0.0214		mg/kg wet	0.02500		86	30-150			
Surrogate: Decachlorobiphenyl [2C]	0.0209		mg/kg wet	0.02500		84	30-150			
Surrogate: Tetrachloro-m-xylene	0.0176		mg/kg wet	0.02500		71	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	0.0198		mg/kg wet	0.02500		79	30-150			

**LCS**

Aroclor 1016	0.5	0.05	mg/kg wet	0.5000		106	40-140			
Aroclor 1016 [2C]	0.5	0.05	mg/kg wet	0.5000		104	40-140			
Aroclor 1260	0.5	0.05	mg/kg wet	0.5000		107	40-140			
Aroclor 1260 [2C]	0.5	0.05	mg/kg wet	0.5000		94	40-140			

Surrogate: Decachlorobiphenyl	0.0251		mg/kg wet	0.02500		100	30-150			
Surrogate: Decachlorobiphenyl [2C]	0.0242		mg/kg wet	0.02500		97	30-150			
Surrogate: Tetrachloro-m-xylene	0.0214		mg/kg wet	0.02500		86	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	0.0213		mg/kg wet	0.02500		85	30-150			

**LCS Dup**

Aroclor 1016	0.5	0.05	mg/kg wet	0.5000		100	40-140	6	30	
Aroclor 1016 [2C]	0.5	0.05	mg/kg wet	0.5000		98	40-140	6	30	
Aroclor 1260	0.5	0.05	mg/kg wet	0.5000		102	40-140	5	30	
Aroclor 1260 [2C]	0.5	0.05	mg/kg wet	0.5000		90	40-140	4	30	

Surrogate: Decachlorobiphenyl	0.0238		mg/kg wet	0.02500		95	30-150			
Surrogate: Decachlorobiphenyl [2C]	0.0230		mg/kg wet	0.02500		92	30-150			
Surrogate: Tetrachloro-m-xylene	0.0198		mg/kg wet	0.02500		79	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	0.0196		mg/kg wet	0.02500		78	30-150			



## CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1709819

### Notes and Definitions

- U Analyte included in the analysis, but not detected
- ND Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference
- MDL Method Detection Limit
- MRL Method Reporting Limit
- LOD Limit of Detection
- LOQ Limit of Quantitation
- DL Detection Limit
- I/V Initial Volume
- F/V Final Volume
- § Subcontracted analysis; see attached report
- 1 Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
- 2 Range result excludes concentrations of target analytes eluting in that range.
- 3 Range result excludes the concentration of the C9-C10 aromatic range.
- Avg Results reported as a mathematical average.
- NR No Recovery
- [CALC] Calculated Analyte
- SUB Subcontracted analysis; see attached report
- RL Reporting Limit
- EDL Estimated Detection Limit



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1709819

**ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS**

**ENVIRONMENTAL**

Rhode Island Potable and Non Potable Water: LAI00179

<http://www.health.ri.gov/find/labs/analytical/ESS.pdf>

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750

[http://www.ct.gov/dph/lib/dph/environmental\\_health/environmental\\_laboratories/pdf/OutofStateCommercialLaboratories.pdf](http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf)

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002

<http://www.maine.gov/dhhs/meecd/environmental-health/dwp/partners/labCert.shtml>

Massachusetts Potable and Non Potable Water: M-RI002

<http://public.dep.state.ma.us/Labcert/Labcert.aspx>

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424

<http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm>

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313

<http://www.wadsworth.org/labcert/elap/comm.html>

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006

[http://datamine2.state.nj.us/DEP\\_OPRA/OpraMain/pi\\_main?mode=pi\\_by\\_site&sort\\_order=PI\\_NAMEA&Select+a+Site:=58715](http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715)

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752

<http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx>



## ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Providence, RI - GZA/HDM

ESS Project ID: 1709819

Date Received: 9/28/2017

Project Due Date: 10/5/2017

Days for Project: 5 Day

Shipped/Delivered Via: ESS Courier client  
21-11-2017

1. Air bill manifest present?  No  
Air No.: NA
2. Were custody seals present?  No
3. Is radiation count <100 CPM?  Yes
4. Is a Cooler Present?  Yes  
Temp: 4.8 Iced with: Ice
5. Was COC signed and dated by client?  Yes

6. Does COC match bottles?  Yes
7. Is COC complete and correct?  Yes
8. Were samples received intact?  Yes
9. Were labs informed about short holds & rushes? Yes / No / NA
10. Were any analyses received outside of hold time? Yes / No

11. Any Subcontracting needed? Yes / No  
ESS Sample IDs: \_\_\_\_\_  
Analysis: \_\_\_\_\_  
TAT: \_\_\_\_\_

12. Were VOAs received? Yes / No  
a. Air bubbles in aqueous VOAs? Yes / No  
b. Does methanol cover soil completely? Yes / No / NA

13. Are the samples properly preserved? Yes / No  
a. If metals preserved upon receipt: Date: \_\_\_\_\_ Time: \_\_\_\_\_ By: \_\_\_\_\_  
b. Low Level VOA vials frozen: Date: \_\_\_\_\_ Time: \_\_\_\_\_ By: \_\_\_\_\_

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / No  
a. Was there a need to contact the client? Yes / No  
Who was contacted? \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_ By: \_\_\_\_\_

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
01	168267	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
02	168266	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
03	168265	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
04	168264	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
05	168263	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
06	168262	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
07	168261	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
08	168260	Yes	NA	Yes	4 oz. Jar - Unpres	NP	

- 2nd Review  
Are barcode labels on correct containers? Yes / No
- Completed By: [Signature] Date & Time: 9/28/17 1606
- Reviewed By: [Signature] Date & Time: 9/28/17 1643
- Delivered By: [Signature] Date & Time: 9/28/17 1643



## CERTIFICATE OF ANALYSIS

Sarah McLeod  
GZA GeoEnvironmental, Inc.  
530 Broadway  
Providence, RI 02909

**RE: Former Tidewater Facility (05.0043654.00)**  
**ESS Laboratory Work Order Number: 1709820**

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.



Laurel Stoddard  
Laboratory Director

**REVIEWED****By ESS Laboratory at 2:41 pm, Oct 05, 2017****Analytical Summary**

The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1709820

**SAMPLE RECEIPT**

The following samples were received on September 28, 2017 for the analyses specified on the enclosed Chain of Custody Record.

<b>Lab Number</b>	<b>Sample Name</b>	<b>Matrix</b>	<b>Analysis</b>
1709820-01	G2-SS-FT-501 (0-0.25')	Soil	8082A
1709820-02	G2-SS-FT-501 (0.75-1')	Soil	8082A
1709820-03	G2-SS-FT-501 (1.75'-2')	Soil	8082A
1709820-04	G2-SS-FT-502 (0-0.25')	Soil	8082A
1709820-05	G2-SS-FT-502 (0.75-1')	Soil	8082A
1709820-06	G2-SS-FT-502 (1.75'-2')	Soil	8082A
1709820-07	G2-SS-FT-503 (0-0.25')	Soil	8082A
1709820-08	G2-SS-FT-503 (0.75-1')	Soil	8082A
1709820-09	G2-SS-FT-503 (1.75'-2')	Soil	8082A
1709820-10	G2-SS-FT-504 (0-0.25')	Soil	8082A
1709820-11	G2-SS-FT-504 (0.75-1')	Soil	8082A
1709820-12	G2-SS-FT-504 (1.75'-2')	Soil	8082A
1709820-13	G2-SS-FT-505 (0-0.25')	Soil	8082A
1709820-14	G2-SS-FT-505 (0.75-1')	Soil	8082A
1709820-15	G2-SS-FT-505 (1.75'-2')	Soil	8082A
1709820-16	G2-SS-FT-506 (0-0.25')	Soil	8082A
1709820-17	G2-SS-FT-506 (0.75-1')	Soil	8082A
1709820-18	G2-SS-FT-506 (1.75'-2')	Soil	8082A
1709820-19	BD-092817 (0-0.25')	Soil	8082A



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1709820

**PROJECT NARRATIVE**

**8082A Polychlorinated Biphenyls (PCB)**

1709820-05 [Surrogate recovery\(ies\) outside of criteria. Reextraction/Reanalysis confirms results \(SC\).](#)

Tetrachloro-m-xylene (23% @ 30-150%), Tetrachloro-m-xylene [2C] (26% @ 30-150%)

**No other observations noted.**

**End of Project Narrative.**

**DATA USABILITY LINKS**

*To ensure you are viewing the most current version of the documents below, please clear your internet cookies for [www.ESSLaboratory.com](http://www.ESSLaboratory.com). Consult your IT Support personnel for information on how to clear your internet cookies.*

[Definitions of Quality Control Parameters](#)

[Semivolatile Organics Internal Standard Information](#)

[Semivolatile Organics Surrogate Information](#)

[Volatile Organics Internal Standard Information](#)

[Volatile Organics Surrogate Information](#)

[EPH and VPH Alkane Lists](#)





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1709820

**CURRENT SW-846 METHODOLOGY VERSIONS**

**Analytical Methods**

- 1010A - Flashpoint
- 6010C - ICP
- 6020A - ICP MS
- 7010 - Graphite Furnace
- 7196A - Hexavalent Chromium
- 7470A - Aqueous Mercury
- 7471B - Solid Mercury
- 8011 - EDB/DBCP/TCP
- 8015C - GRO/DRO
- 8081B - Pesticides
- 8082A - PCB
- 8100M - TPH
- 8151A - Herbicides
- 8260B - VOA
- 8270D - SVOA
- 8270D SIM - SVOA Low Level
- 9014 - Cyanide
- 9038 - Sulfate
- 9040C - Aqueous pH
- 9045D - Solid pH (Corrosivity)
- 9050A - Specific Conductance
- 9056A - Anions (IC)
- 9060A - TOC
- 9095B - Paint Filter
- MADEP 04-1.1 - EPH / VPH

**Prep Methods**

- 3005A - Aqueous ICP Digestion
- 3020A - Aqueous Graphite Furnace / ICP MS Digestion
- 3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
- 3060A - Solid Hexavalent Chromium Digestion
- 3510C - Separatory Funnel Extraction
- 3520C - Liquid / Liquid Extraction
- 3540C - Manual Soxhlet Extraction
- 3541 - Automated Soxhlet Extraction
- 3546 - Microwave Extraction
- 3580A - Waste Dilution
- 5030B - Aqueous Purge and Trap
- 5030C - Aqueous Purge and Trap
- 5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: G2-SS-FT-501 (0-0.25')  
 Date Sampled: 09/28/17 08:10  
 Percent Solids: 91  
 Initial Volume: 19.4  
 Final Volume: 10  
 Extraction Method: 3540C

ESS Laboratory Work Order: 1709820  
 ESS Laboratory Sample ID: 1709820-01  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: CAD  
 Prepared: 9/29/17 17:35

**8082A Polychlorinated Biphenyls (PCB)**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Aroclor 1016	ND (0.06)		8082A		1	10/02/17 22:51		CI72909
Aroclor 1221	ND (0.06)		8082A		1	10/02/17 22:51		CI72909
Aroclor 1232	ND (0.06)		8082A		1	10/02/17 22:51		CI72909
Aroclor 1242	ND (0.06)		8082A		1	10/02/17 22:51		CI72909
Aroclor 1248	ND (0.06)		8082A		1	10/02/17 22:51		CI72909
Aroclor 1254	ND (0.06)		8082A		1	10/02/17 22:51		CI72909
<b>Aroclor 1260</b>	<b>0.3</b> (0.06)		8082A		1	10/02/17 22:51		CI72909
Aroclor 1262	ND (0.06)		8082A		1	10/02/17 22:51		CI72909
Aroclor 1268	ND (0.06)		8082A		1	10/02/17 22:51		CI72909

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: Decachlorobiphenyl	81 %		30-150
Surrogate: Decachlorobiphenyl [2C]	79 %		30-150
Surrogate: Tetrachloro-m-xylene	69 %		30-150
Surrogate: Tetrachloro-m-xylene [2C]	72 %		30-150



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: G2-SS-FT-501 (0.75-1')  
 Date Sampled: 09/28/17 08:20  
 Percent Solids: 95  
 Initial Volume: 19.1  
 Final Volume: 10  
 Extraction Method: 3540C

ESS Laboratory Work Order: 1709820  
 ESS Laboratory Sample ID: 1709820-02  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: CAD  
 Prepared: 10/2/17 16:00

**8082A Polychlorinated Biphenyls (PCB)**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Aroclor 1016	ND (0.06)		8082A		1	10/03/17 13:12		CJ70206
Aroclor 1221	ND (0.06)		8082A		1	10/03/17 13:12		CJ70206
Aroclor 1232	ND (0.06)		8082A		1	10/03/17 13:12		CJ70206
Aroclor 1242	ND (0.06)		8082A		1	10/03/17 13:12		CJ70206
Aroclor 1248	ND (0.06)		8082A		1	10/03/17 13:12		CJ70206
Aroclor 1254	ND (0.06)		8082A		1	10/03/17 13:12		CJ70206
Aroclor 1260	ND (0.06)		8082A		1	10/03/17 13:12		CJ70206
Aroclor 1262	ND (0.06)		8082A		1	10/03/17 13:12		CJ70206
Aroclor 1268	ND (0.06)		8082A		1	10/03/17 13:12		CJ70206

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: Decachlorobiphenyl	88 %		30-150
Surrogate: Decachlorobiphenyl [2C]	100 %		30-150
Surrogate: Tetrachloro-m-xylene	95 %		30-150
Surrogate: Tetrachloro-m-xylene [2C]	94 %		30-150



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: G2-SS-FT-501 (1.75'-2')  
 Date Sampled: 09/28/17 08:25  
 Percent Solids: 94  
 Initial Volume: 19.6  
 Final Volume: 10  
 Extraction Method: 3540C

ESS Laboratory Work Order: 1709820  
 ESS Laboratory Sample ID: 1709820-03  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: CAD  
 Prepared: 9/29/17 17:35

**8082A Polychlorinated Biphenyls (PCB)**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Aroclor 1016	ND (0.05)		8082A		1	10/02/17 23:10		CI72909
Aroclor 1221	ND (0.05)		8082A		1	10/02/17 23:10		CI72909
Aroclor 1232	ND (0.05)		8082A		1	10/02/17 23:10		CI72909
Aroclor 1242	ND (0.05)		8082A		1	10/02/17 23:10		CI72909
Aroclor 1248	ND (0.05)		8082A		1	10/02/17 23:10		CI72909
Aroclor 1254	ND (0.05)		8082A		1	10/02/17 23:10		CI72909
Aroclor 1260	ND (0.05)		8082A		1	10/02/17 23:10		CI72909
Aroclor 1262	ND (0.05)		8082A		1	10/02/17 23:10		CI72909
Aroclor 1268	ND (0.05)		8082A		1	10/02/17 23:10		CI72909

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: Decachlorobiphenyl	94 %		30-150
Surrogate: Decachlorobiphenyl [2C]	88 %		30-150
Surrogate: Tetrachloro-m-xylene	75 %		30-150
Surrogate: Tetrachloro-m-xylene [2C]	79 %		30-150



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: G2-SS-FT-502 (0-0.25')  
 Date Sampled: 09/28/17 08:35  
 Percent Solids: 94  
 Initial Volume: 19.9  
 Final Volume: 10  
 Extraction Method: 3540C

ESS Laboratory Work Order: 1709820  
 ESS Laboratory Sample ID: 1709820-04  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: CAD  
 Prepared: 9/29/17 17:35

**8082A Polychlorinated Biphenyls (PCB)**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Aroclor 1016	ND (0.05)		8082A		1	10/02/17 23:30		CI72909
Aroclor 1221	ND (0.05)		8082A		1	10/02/17 23:30		CI72909
Aroclor 1232	ND (0.05)		8082A		1	10/02/17 23:30		CI72909
Aroclor 1242	ND (0.05)		8082A		1	10/02/17 23:30		CI72909
Aroclor 1248	ND (0.05)		8082A		1	10/02/17 23:30		CI72909
<b>Aroclor 1254 [2C]</b>	<b>0.1</b> (0.05)		8082A		1	10/02/17 23:30		CI72909
<b>Aroclor 1260</b>	<b>0.2</b> (0.05)		8082A		1	10/02/17 23:30		CI72909
Aroclor 1262	ND (0.05)		8082A		1	10/02/17 23:30		CI72909
Aroclor 1268	ND (0.05)		8082A		1	10/02/17 23:30		CI72909

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: Decachlorobiphenyl</i>	86 %		30-150
<i>Surrogate: Decachlorobiphenyl [2C]</i>	78 %		30-150
<i>Surrogate: Tetrachloro-m-xylene</i>	67 %		30-150
<i>Surrogate: Tetrachloro-m-xylene [2C]</i>	66 %		30-150



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: G2-SS-FT-502 (0.75-1')  
Date Sampled: 09/28/17 08:40  
Percent Solids: 91  
Initial Volume: 19.2  
Final Volume: 10  
Extraction Method: 3540C

ESS Laboratory Work Order: 1709820  
ESS Laboratory Sample ID: 1709820-05  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: CAD  
Prepared: 9/29/17 17:35

**8082A Polychlorinated Biphenyls (PCB)**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Aroclor 1016	ND (0.06)		8082A		1	10/02/17 23:49		CI72909
Aroclor 1221	ND (0.06)		8082A		1	10/02/17 23:49		CI72909
Aroclor 1232	ND (0.06)		8082A		1	10/02/17 23:49		CI72909
Aroclor 1242	ND (0.06)		8082A		1	10/02/17 23:49		CI72909
Aroclor 1248	ND (0.06)		8082A		1	10/02/17 23:49		CI72909
Aroclor 1254	ND (0.06)		8082A		1	10/02/17 23:49		CI72909
Aroclor 1260	ND (0.06)		8082A		1	10/02/17 23:49		CI72909
Aroclor 1262	ND (0.06)		8082A		1	10/02/17 23:49		CI72909
Aroclor 1268	ND (0.06)		8082A		1	10/02/17 23:49		CI72909

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: Decachlorobiphenyl</i>	47 %		30-150
<i>Surrogate: Decachlorobiphenyl [2C]</i>	31 %		30-150
<i>Surrogate: Tetrachloro-m-xylene</i>	23 %	SC	30-150
<i>Surrogate: Tetrachloro-m-xylene [2C]</i>	26 %	SC	30-150



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: G2-SS-FT-502 (1.75'-2')  
 Date Sampled: 09/28/17 08:50  
 Percent Solids: 92  
 Initial Volume: 19.3  
 Final Volume: 10  
 Extraction Method: 3540C

ESS Laboratory Work Order: 1709820  
 ESS Laboratory Sample ID: 1709820-06  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: CAD  
 Prepared: 9/29/17 17:35

**8082A Polychlorinated Biphenyls (PCB)**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Aroclor 1016	ND (0.06)		8082A		1	10/03/17 0:08		CI72909
Aroclor 1221	ND (0.06)		8082A		1	10/03/17 0:08		CI72909
Aroclor 1232	ND (0.06)		8082A		1	10/03/17 0:08		CI72909
Aroclor 1242	ND (0.06)		8082A		1	10/03/17 0:08		CI72909
Aroclor 1248	ND (0.06)		8082A		1	10/03/17 0:08		CI72909
Aroclor 1254	ND (0.06)		8082A		1	10/03/17 0:08		CI72909
Aroclor 1260	ND (0.06)		8082A		1	10/03/17 0:08		CI72909
Aroclor 1262	ND (0.06)		8082A		1	10/03/17 0:08		CI72909
Aroclor 1268	ND (0.06)		8082A		1	10/03/17 0:08		CI72909

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: Decachlorobiphenyl	92 %		30-150
Surrogate: Decachlorobiphenyl [2C]	85 %		30-150
Surrogate: Tetrachloro-m-xylene	81 %		30-150
Surrogate: Tetrachloro-m-xylene [2C]	83 %		30-150





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: G2-SS-FT-503 (0-0.25')  
Date Sampled: 09/28/17 09:00  
Percent Solids: 89  
Initial Volume: 19  
Final Volume: 10  
Extraction Method: 3540C

ESS Laboratory Work Order: 1709820  
ESS Laboratory Sample ID: 1709820-07  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: CAD  
Prepared: 9/29/17 17:35

**8082A Polychlorinated Biphenyls (PCB)**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Aroclor 1016	ND (0.06)		8082A		1	10/03/17 0:27		CI72909
Aroclor 1221	ND (0.06)		8082A		1	10/03/17 0:27		CI72909
Aroclor 1232	ND (0.06)		8082A		1	10/03/17 0:27		CI72909
Aroclor 1242	ND (0.06)		8082A		1	10/03/17 0:27		CI72909
Aroclor 1248	ND (0.06)		8082A		1	10/03/17 0:27		CI72909
Aroclor 1254	ND (0.06)		8082A		1	10/03/17 0:27		CI72909
<b>Aroclor 1260</b>	<b>0.2</b> (0.06)		8082A		1	10/03/17 0:27		CI72909
Aroclor 1262	ND (0.06)		8082A		1	10/03/17 0:27		CI72909
Aroclor 1268	ND (0.06)		8082A		1	10/03/17 0:27		CI72909

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: Decachlorobiphenyl</i>	97 %		30-150
<i>Surrogate: Decachlorobiphenyl [2C]</i>	89 %		30-150
<i>Surrogate: Tetrachloro-m-xylene</i>	74 %		30-150
<i>Surrogate: Tetrachloro-m-xylene [2C]</i>	73 %		30-150



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: G2-SS-FT-503 (0.75-1')  
 Date Sampled: 09/28/17 09:10  
 Percent Solids: 97  
 Initial Volume: 19.6  
 Final Volume: 10  
 Extraction Method: 3540C

ESS Laboratory Work Order: 1709820  
 ESS Laboratory Sample ID: 1709820-08  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: CAD  
 Prepared: 9/29/17 17:35

**8082A Polychlorinated Biphenyls (PCB)**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Aroclor 1016	ND (0.05)		8082A		1	10/03/17 0:46		CI72909
Aroclor 1221	ND (0.05)		8082A		1	10/03/17 0:46		CI72909
Aroclor 1232	ND (0.05)		8082A		1	10/03/17 0:46		CI72909
Aroclor 1242	ND (0.05)		8082A		1	10/03/17 0:46		CI72909
Aroclor 1248	ND (0.05)		8082A		1	10/03/17 0:46		CI72909
Aroclor 1254	ND (0.05)		8082A		1	10/03/17 0:46		CI72909
<b>Aroclor 1260</b>	<b>0.08</b> (0.05)		8082A		1	10/03/17 0:46		CI72909
Aroclor 1262	ND (0.05)		8082A		1	10/03/17 0:46		CI72909
Aroclor 1268	ND (0.05)		8082A		1	10/03/17 0:46		CI72909

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: Decachlorobiphenyl	78 %		30-150
Surrogate: Decachlorobiphenyl [2C]	73 %		30-150
Surrogate: Tetrachloro-m-xylene	63 %		30-150
Surrogate: Tetrachloro-m-xylene [2C]	61 %		30-150



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: G2-SS-FT-503 (1.75'-2')  
 Date Sampled: 09/28/17 09:15  
 Percent Solids: 90  
 Initial Volume: 19.7  
 Final Volume: 10  
 Extraction Method: 3540C

ESS Laboratory Work Order: 1709820  
 ESS Laboratory Sample ID: 1709820-09  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: CAD  
 Prepared: 9/29/17 17:35

**8082A Polychlorinated Biphenyls (PCB)**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Aroclor 1016	ND (0.06)		8082A		1	10/03/17 1:05		CI72909
Aroclor 1221	ND (0.06)		8082A		1	10/03/17 1:05		CI72909
Aroclor 1232	ND (0.06)		8082A		1	10/03/17 1:05		CI72909
Aroclor 1242	ND (0.06)		8082A		1	10/03/17 1:05		CI72909
Aroclor 1248	ND (0.06)		8082A		1	10/03/17 1:05		CI72909
Aroclor 1254	ND (0.06)		8082A		1	10/03/17 1:05		CI72909
Aroclor 1260	ND (0.06)		8082A		1	10/03/17 1:05		CI72909
Aroclor 1262	ND (0.06)		8082A		1	10/03/17 1:05		CI72909
Aroclor 1268	ND (0.06)		8082A		1	10/03/17 1:05		CI72909

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: Decachlorobiphenyl	91 %		30-150
Surrogate: Decachlorobiphenyl [2C]	86 %		30-150
Surrogate: Tetrachloro-m-xylene	73 %		30-150
Surrogate: Tetrachloro-m-xylene [2C]	78 %		30-150



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: G2-SS-FT-504 (0-0.25')  
 Date Sampled: 09/28/17 09:25  
 Percent Solids: 96  
 Initial Volume: 20.2  
 Final Volume: 10  
 Extraction Method: 3540C

ESS Laboratory Work Order: 1709820  
 ESS Laboratory Sample ID: 1709820-10  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: CAD  
 Prepared: 9/29/17 17:35

**8082A Polychlorinated Biphenyls (PCB)**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Aroclor 1016	ND (0.05)		8082A		1	10/03/17 1:24		CI72909
Aroclor 1221	ND (0.05)		8082A		1	10/03/17 1:24		CI72909
Aroclor 1232	ND (0.05)		8082A		1	10/03/17 1:24		CI72909
Aroclor 1242	ND (0.05)		8082A		1	10/03/17 1:24		CI72909
Aroclor 1248	ND (0.05)		8082A		1	10/03/17 1:24		CI72909
Aroclor 1254	ND (0.05)		8082A		1	10/03/17 1:24		CI72909
<b>Aroclor 1260</b>	<b>0.07</b> (0.05)		8082A		1	10/03/17 1:24		CI72909
Aroclor 1262	ND (0.05)		8082A		1	10/03/17 1:24		CI72909
Aroclor 1268	ND (0.05)		8082A		1	10/03/17 1:24		CI72909

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: Decachlorobiphenyl	102 %		30-150
Surrogate: Decachlorobiphenyl [2C]	97 %		30-150
Surrogate: Tetrachloro-m-xylene	76 %		30-150
Surrogate: Tetrachloro-m-xylene [2C]	77 %		30-150



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: G2-SS-FT-504 (0.75-1')  
 Date Sampled: 09/28/17 09:30  
 Percent Solids: 81  
 Initial Volume: 20.9  
 Final Volume: 10  
 Extraction Method: 3540C

ESS Laboratory Work Order: 1709820  
 ESS Laboratory Sample ID: 1709820-11  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: CAD  
 Prepared: 9/29/17 17:50

**8082A Polychlorinated Biphenyls (PCB)**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Aroclor 1016	ND (0.06)		8082A		1	10/03/17 2:40		CI72910
Aroclor 1221	ND (0.06)		8082A		1	10/03/17 2:40		CI72910
Aroclor 1232	ND (0.06)		8082A		1	10/03/17 2:40		CI72910
Aroclor 1242	ND (0.06)		8082A		1	10/03/17 2:40		CI72910
Aroclor 1248	ND (0.06)		8082A		1	10/03/17 2:40		CI72910
Aroclor 1254	ND (0.06)		8082A		1	10/03/17 2:40		CI72910
Aroclor 1260	ND (0.06)		8082A		1	10/03/17 2:40		CI72910
Aroclor 1262	ND (0.06)		8082A		1	10/03/17 2:40		CI72910
Aroclor 1268	ND (0.06)		8082A		1	10/03/17 2:40		CI72910

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: Decachlorobiphenyl	87 %		30-150
Surrogate: Decachlorobiphenyl [2C]	80 %		30-150
Surrogate: Tetrachloro-m-xylene	70 %		30-150
Surrogate: Tetrachloro-m-xylene [2C]	75 %		30-150



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: G2-SS-FT-504 (1.75'-2')  
 Date Sampled: 09/28/17 09:40  
 Percent Solids: 93  
 Initial Volume: 20.9  
 Final Volume: 10  
 Extraction Method: 3540C

ESS Laboratory Work Order: 1709820  
 ESS Laboratory Sample ID: 1709820-12  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: CAD  
 Prepared: 9/29/17 17:50

**8082A Polychlorinated Biphenyls (PCB)**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Aroclor 1016	ND (0.05)		8082A		1	10/03/17 2:59		CI72910
Aroclor 1221	ND (0.05)		8082A		1	10/03/17 2:59		CI72910
Aroclor 1232	ND (0.05)		8082A		1	10/03/17 2:59		CI72910
Aroclor 1242	ND (0.05)		8082A		1	10/03/17 2:59		CI72910
Aroclor 1248	ND (0.05)		8082A		1	10/03/17 2:59		CI72910
Aroclor 1254	ND (0.05)		8082A		1	10/03/17 2:59		CI72910
Aroclor 1260	ND (0.05)		8082A		1	10/03/17 2:59		CI72910
Aroclor 1262	ND (0.05)		8082A		1	10/03/17 2:59		CI72910
Aroclor 1268	ND (0.05)		8082A		1	10/03/17 2:59		CI72910

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: Decachlorobiphenyl	51 %		30-150
Surrogate: Decachlorobiphenyl [2C]	43 %		30-150
Surrogate: Tetrachloro-m-xylene	41 %		30-150
Surrogate: Tetrachloro-m-xylene [2C]	35 %		30-150





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: G2-SS-FT-505 (0-0.25')  
 Date Sampled: 09/28/17 10:15  
 Percent Solids: 88  
 Initial Volume: 19.1  
 Final Volume: 10  
 Extraction Method: 3540C

ESS Laboratory Work Order: 1709820  
 ESS Laboratory Sample ID: 1709820-13  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: CAD  
 Prepared: 9/29/17 17:50

**8082A Polychlorinated Biphenyls (PCB)**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Aroclor 1016	ND (0.06)		8082A		1	10/03/17 3:18		CI72910
Aroclor 1221	ND (0.06)		8082A		1	10/03/17 3:18		CI72910
Aroclor 1232	ND (0.06)		8082A		1	10/03/17 3:18		CI72910
Aroclor 1242	ND (0.06)		8082A		1	10/03/17 3:18		CI72910
Aroclor 1248	ND (0.06)		8082A		1	10/03/17 3:18		CI72910
Aroclor 1254	ND (0.06)		8082A		1	10/03/17 3:18		CI72910
Aroclor 1260	ND (0.06)		8082A		1	10/03/17 3:18		CI72910
Aroclor 1262	ND (0.06)		8082A		1	10/03/17 3:18		CI72910
Aroclor 1268	ND (0.06)		8082A		1	10/03/17 3:18		CI72910

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: Decachlorobiphenyl	95 %		30-150
Surrogate: Decachlorobiphenyl [2C]	91 %		30-150
Surrogate: Tetrachloro-m-xylene	72 %		30-150
Surrogate: Tetrachloro-m-xylene [2C]	76 %		30-150



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: G2-SS-FT-505 (0.75-1')  
 Date Sampled: 09/28/17 10:30  
 Percent Solids: 92  
 Initial Volume: 19.3  
 Final Volume: 10  
 Extraction Method: 3540C

ESS Laboratory Work Order: 1709820  
 ESS Laboratory Sample ID: 1709820-14  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: CAD  
 Prepared: 9/29/17 17:50

**8082A Polychlorinated Biphenyls (PCB)**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Aroclor 1016	ND (0.06)		8082A		1	10/03/17 3:37		CI72910
Aroclor 1221	ND (0.06)		8082A		1	10/03/17 3:37		CI72910
Aroclor 1232	ND (0.06)		8082A		1	10/03/17 3:37		CI72910
Aroclor 1242	ND (0.06)		8082A		1	10/03/17 3:37		CI72910
Aroclor 1248	ND (0.06)		8082A		1	10/03/17 3:37		CI72910
Aroclor 1254	ND (0.06)		8082A		1	10/03/17 3:37		CI72910
Aroclor 1260	ND (0.06)		8082A		1	10/03/17 3:37		CI72910
Aroclor 1262	ND (0.06)		8082A		1	10/03/17 3:37		CI72910
Aroclor 1268	ND (0.06)		8082A		1	10/03/17 3:37		CI72910

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: Decachlorobiphenyl	51 %		30-150
Surrogate: Decachlorobiphenyl [2C]	45 %		30-150
Surrogate: Tetrachloro-m-xylene	45 %		30-150
Surrogate: Tetrachloro-m-xylene [2C]	47 %		30-150



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: G2-SS-FT-505 (1.75'-2')  
Date Sampled: 09/28/17 10:45  
Percent Solids: 94  
Initial Volume: 19.7  
Final Volume: 10  
Extraction Method: 3540C

ESS Laboratory Work Order: 1709820  
ESS Laboratory Sample ID: 1709820-15  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: CAD  
Prepared: 9/29/17 17:50

**8082A Polychlorinated Biphenyls (PCB)**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Aroclor 1016	ND (0.05)		8082A		1	10/03/17 3:56		CI72910
Aroclor 1221	ND (0.05)		8082A		1	10/03/17 3:56		CI72910
Aroclor 1232	ND (0.05)		8082A		1	10/03/17 3:56		CI72910
Aroclor 1242	ND (0.05)		8082A		1	10/03/17 3:56		CI72910
Aroclor 1248	ND (0.05)		8082A		1	10/03/17 3:56		CI72910
Aroclor 1254	ND (0.05)		8082A		1	10/03/17 3:56		CI72910
Aroclor 1260	ND (0.05)		8082A		1	10/03/17 3:56		CI72910
Aroclor 1262	ND (0.05)		8082A		1	10/03/17 3:56		CI72910
Aroclor 1268	ND (0.05)		8082A		1	10/03/17 3:56		CI72910

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
<i>Surrogate: Decachlorobiphenyl</i>	67 %		30-150
<i>Surrogate: Decachlorobiphenyl [2C]</i>	61 %		30-150
<i>Surrogate: Tetrachloro-m-xylene</i>	57 %		30-150
<i>Surrogate: Tetrachloro-m-xylene [2C]</i>	54 %		30-150



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: G2-SS-FT-506 (0-0.25')  
 Date Sampled: 09/28/17 10:55  
 Percent Solids: 95  
 Initial Volume: 19.9  
 Final Volume: 10  
 Extraction Method: 3540C

ESS Laboratory Work Order: 1709820  
 ESS Laboratory Sample ID: 1709820-16  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: CAD  
 Prepared: 9/29/17 17:50

**8082A Polychlorinated Biphenyls (PCB)**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Aroclor 1016	ND (0.05)		8082A		1	10/03/17 4:15		CI72910
Aroclor 1221	ND (0.05)		8082A		1	10/03/17 4:15		CI72910
Aroclor 1232	ND (0.05)		8082A		1	10/03/17 4:15		CI72910
Aroclor 1242	ND (0.05)		8082A		1	10/03/17 4:15		CI72910
Aroclor 1248	ND (0.05)		8082A		1	10/03/17 4:15		CI72910
Aroclor 1254	ND (0.05)		8082A		1	10/03/17 4:15		CI72910
Aroclor 1260	ND (0.05)		8082A		1	10/03/17 4:15		CI72910
Aroclor 1262	ND (0.05)		8082A		1	10/03/17 4:15		CI72910
Aroclor 1268	ND (0.05)		8082A		1	10/03/17 4:15		CI72910

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: Decachlorobiphenyl	92 %		30-150
Surrogate: Decachlorobiphenyl [2C]	82 %		30-150
Surrogate: Tetrachloro-m-xylene	67 %		30-150
Surrogate: Tetrachloro-m-xylene [2C]	69 %		30-150



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: G2-SS-FT-506 (0.75-1')  
 Date Sampled: 09/28/17 11:05  
 Percent Solids: 95  
 Initial Volume: 20.5  
 Final Volume: 10  
 Extraction Method: 3540C

ESS Laboratory Work Order: 1709820  
 ESS Laboratory Sample ID: 1709820-17  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: CAD  
 Prepared: 9/29/17 17:50

**8082A Polychlorinated Biphenyls (PCB)**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Aroclor 1016	ND (0.05)		8082A		1	10/03/17 4:34		CI72910
Aroclor 1221	ND (0.05)		8082A		1	10/03/17 4:34		CI72910
Aroclor 1232	ND (0.05)		8082A		1	10/03/17 4:34		CI72910
Aroclor 1242	ND (0.05)		8082A		1	10/03/17 4:34		CI72910
Aroclor 1248	ND (0.05)		8082A		1	10/03/17 4:34		CI72910
Aroclor 1254	ND (0.05)		8082A		1	10/03/17 4:34		CI72910
Aroclor 1260	ND (0.05)		8082A		1	10/03/17 4:34		CI72910
Aroclor 1262	ND (0.05)		8082A		1	10/03/17 4:34		CI72910
Aroclor 1268	ND (0.05)		8082A		1	10/03/17 4:34		CI72910

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: Decachlorobiphenyl	98 %		30-150
Surrogate: Decachlorobiphenyl [2C]	90 %		30-150
Surrogate: Tetrachloro-m-xylene	79 %		30-150
Surrogate: Tetrachloro-m-xylene [2C]	78 %		30-150



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: G2-SS-FT-506 (1.75'-2')  
 Date Sampled: 09/28/17 11:15  
 Percent Solids: 88  
 Initial Volume: 20.8  
 Final Volume: 10  
 Extraction Method: 3540C

ESS Laboratory Work Order: 1709820  
 ESS Laboratory Sample ID: 1709820-18  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: CAD  
 Prepared: 9/29/17 17:50

**8082A Polychlorinated Biphenyls (PCB)**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Aroclor 1016	ND (0.05)		8082A		1	10/03/17 4:53		CI72910
Aroclor 1221	ND (0.05)		8082A		1	10/03/17 4:53		CI72910
Aroclor 1232	ND (0.05)		8082A		1	10/03/17 4:53		CI72910
Aroclor 1242	ND (0.05)		8082A		1	10/03/17 4:53		CI72910
Aroclor 1248	ND (0.05)		8082A		1	10/03/17 4:53		CI72910
Aroclor 1254	ND (0.05)		8082A		1	10/03/17 4:53		CI72910
Aroclor 1260	ND (0.05)		8082A		1	10/03/17 4:53		CI72910
Aroclor 1262	ND (0.05)		8082A		1	10/03/17 4:53		CI72910
Aroclor 1268	ND (0.05)		8082A		1	10/03/17 4:53		CI72910

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: Decachlorobiphenyl	99 %		30-150
Surrogate: Decachlorobiphenyl [2C]	91 %		30-150
Surrogate: Tetrachloro-m-xylene	76 %		30-150
Surrogate: Tetrachloro-m-xylene [2C]	81 %		30-150





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: BD-092817 (0-0.25')  
 Date Sampled: 09/28/17 00:00  
 Percent Solids: 96  
 Initial Volume: 19.3  
 Final Volume: 10  
 Extraction Method: 3540C

ESS Laboratory Work Order: 1709820  
 ESS Laboratory Sample ID: 1709820-19  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: CAD  
 Prepared: 9/29/17 17:50

**8082A Polychlorinated Biphenyls (PCB)**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Aroclor 1016	ND (0.05)		8082A		1	10/03/17 7:07		CI72910
Aroclor 1221	ND (0.05)		8082A		1	10/03/17 7:07		CI72910
Aroclor 1232	ND (0.05)		8082A		1	10/03/17 7:07		CI72910
Aroclor 1242	ND (0.05)		8082A		1	10/03/17 7:07		CI72910
Aroclor 1248	ND (0.05)		8082A		1	10/03/17 7:07		CI72910
Aroclor 1254	ND (0.05)		8082A		1	10/03/17 7:07		CI72910
<b>Aroclor 1260</b>	<b>0.3</b> (0.05)		8082A		1	10/03/17 7:07		CI72910
Aroclor 1262	ND (0.05)		8082A		1	10/03/17 7:07		CI72910
Aroclor 1268	ND (0.05)		8082A		1	10/03/17 7:07		CI72910

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: Decachlorobiphenyl	88 %		30-150
Surrogate: Decachlorobiphenyl [2C]	85 %		30-150
Surrogate: Tetrachloro-m-xylene	71 %		30-150
Surrogate: Tetrachloro-m-xylene [2C]	73 %		30-150



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1709820

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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8082A Polychlorinated Biphenyls (PCB)

**Batch CI72909 - 3540C**

**Blank**

Aroclor 1016	ND	0.05	mg/kg wet							
Aroclor 1016 [2C]	ND	0.05	mg/kg wet							
Aroclor 1221	ND	0.05	mg/kg wet							
Aroclor 1221 [2C]	ND	0.05	mg/kg wet							
Aroclor 1232	ND	0.05	mg/kg wet							
Aroclor 1232 [2C]	ND	0.05	mg/kg wet							
Aroclor 1242	ND	0.05	mg/kg wet							
Aroclor 1242 [2C]	ND	0.05	mg/kg wet							
Aroclor 1248	ND	0.05	mg/kg wet							
Aroclor 1248 [2C]	ND	0.05	mg/kg wet							
Aroclor 1254	ND	0.05	mg/kg wet							
Aroclor 1254 [2C]	ND	0.05	mg/kg wet							
Aroclor 1260	ND	0.05	mg/kg wet							
Aroclor 1260 [2C]	ND	0.05	mg/kg wet							
Aroclor 1262	ND	0.05	mg/kg wet							
Aroclor 1262 [2C]	ND	0.05	mg/kg wet							
Aroclor 1268	ND	0.05	mg/kg wet							
Aroclor 1268 [2C]	ND	0.05	mg/kg wet							

Surrogate: Decachlorobiphenyl	0.0214		mg/kg wet	0.02500		86	30-150			
Surrogate: Decachlorobiphenyl [2C]	0.0209		mg/kg wet	0.02500		84	30-150			
Surrogate: Tetrachloro-m-xylene	0.0176		mg/kg wet	0.02500		71	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	0.0198		mg/kg wet	0.02500		79	30-150			

**LCS**

Aroclor 1016	0.5	0.05	mg/kg wet	0.5000		106	40-140			
Aroclor 1016 [2C]	0.5	0.05	mg/kg wet	0.5000		104	40-140			
Aroclor 1260	0.5	0.05	mg/kg wet	0.5000		107	40-140			
Aroclor 1260 [2C]	0.5	0.05	mg/kg wet	0.5000		94	40-140			

Surrogate: Decachlorobiphenyl	0.0251		mg/kg wet	0.02500		100	30-150			
Surrogate: Decachlorobiphenyl [2C]	0.0242		mg/kg wet	0.02500		97	30-150			
Surrogate: Tetrachloro-m-xylene	0.0214		mg/kg wet	0.02500		86	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	0.0213		mg/kg wet	0.02500		85	30-150			

**LCS Dup**

Aroclor 1016	0.5	0.05	mg/kg wet	0.5000		100	40-140	6	30	
Aroclor 1016 [2C]	0.5	0.05	mg/kg wet	0.5000		98	40-140	6	30	
Aroclor 1260	0.5	0.05	mg/kg wet	0.5000		102	40-140	5	30	
Aroclor 1260 [2C]	0.5	0.05	mg/kg wet	0.5000		90	40-140	4	30	

Surrogate: Decachlorobiphenyl	0.0238		mg/kg wet	0.02500		95	30-150			
Surrogate: Decachlorobiphenyl [2C]	0.0230		mg/kg wet	0.02500		92	30-150			
Surrogate: Tetrachloro-m-xylene	0.0198		mg/kg wet	0.02500		79	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	0.0196		mg/kg wet	0.02500		78	30-150			

**Batch CI72910 - 3540C**



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1709820

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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8082A Polychlorinated Biphenyls (PCB)

**Batch CI72910 - 3540C**

**Blank**

Aroclor 1016	ND	0.05	mg/kg wet
Aroclor 1016 [2C]	ND	0.05	mg/kg wet
Aroclor 1221	ND	0.05	mg/kg wet
Aroclor 1221 [2C]	ND	0.05	mg/kg wet
Aroclor 1232	ND	0.05	mg/kg wet
Aroclor 1232 [2C]	ND	0.05	mg/kg wet
Aroclor 1242	ND	0.05	mg/kg wet
Aroclor 1242 [2C]	ND	0.05	mg/kg wet
Aroclor 1248	ND	0.05	mg/kg wet
Aroclor 1248 [2C]	ND	0.05	mg/kg wet
Aroclor 1254	ND	0.05	mg/kg wet
Aroclor 1254 [2C]	ND	0.05	mg/kg wet
Aroclor 1260	ND	0.05	mg/kg wet
Aroclor 1260 [2C]	ND	0.05	mg/kg wet
Aroclor 1262	ND	0.05	mg/kg wet
Aroclor 1262 [2C]	ND	0.05	mg/kg wet
Aroclor 1268	ND	0.05	mg/kg wet
Aroclor 1268 [2C]	ND	0.05	mg/kg wet

Surrogate: Decachlorobiphenyl	0.0259		mg/kg wet	0.02500	104	30-150
Surrogate: Decachlorobiphenyl [2C]	0.0234		mg/kg wet	0.02500	93	30-150
Surrogate: Tetrachloro-m-xylene	0.0190		mg/kg wet	0.02500	76	30-150
Surrogate: Tetrachloro-m-xylene [2C]	0.0200		mg/kg wet	0.02500	80	30-150

**LCS**

Aroclor 1016	0.5	0.05	mg/kg wet	0.5000	103	40-140
Aroclor 1016 [2C]	0.5	0.05	mg/kg wet	0.5000	99	40-140
Aroclor 1260	0.5	0.05	mg/kg wet	0.5000	105	40-140
Aroclor 1260 [2C]	0.5	0.05	mg/kg wet	0.5000	92	40-140

Surrogate: Decachlorobiphenyl	0.0264		mg/kg wet	0.02500	105	30-150
Surrogate: Decachlorobiphenyl [2C]	0.0245		mg/kg wet	0.02500	98	30-150
Surrogate: Tetrachloro-m-xylene	0.0204		mg/kg wet	0.02500	82	30-150
Surrogate: Tetrachloro-m-xylene [2C]	0.0195		mg/kg wet	0.02500	78	30-150

**LCS Dup**

Aroclor 1016	0.5	0.05	mg/kg wet	0.5000	107	40-140	4	30
Aroclor 1016 [2C]	0.5	0.05	mg/kg wet	0.5000	103	40-140	4	30
Aroclor 1260	0.5	0.05	mg/kg wet	0.5000	109	40-140	3	30
Aroclor 1260 [2C]	0.5	0.05	mg/kg wet	0.5000	96	40-140	4	30

Surrogate: Decachlorobiphenyl	0.0269		mg/kg wet	0.02500	108	30-150
Surrogate: Decachlorobiphenyl [2C]	0.0251		mg/kg wet	0.02500	100	30-150
Surrogate: Tetrachloro-m-xylene	0.0211		mg/kg wet	0.02500	84	30-150
Surrogate: Tetrachloro-m-xylene [2C]	0.0203		mg/kg wet	0.02500	81	30-150

**Batch CJ70206 - 3540C**



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1709820

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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8082A Polychlorinated Biphenyls (PCB)

**Batch CJ70206 - 3540C**

**Blank**

Aroclor 1016	ND	0.05	mg/kg wet
Aroclor 1016 [2C]	ND	0.05	mg/kg wet
Aroclor 1221	ND	0.05	mg/kg wet
Aroclor 1221 [2C]	ND	0.05	mg/kg wet
Aroclor 1232	ND	0.05	mg/kg wet
Aroclor 1232 [2C]	ND	0.05	mg/kg wet
Aroclor 1242	ND	0.05	mg/kg wet
Aroclor 1242 [2C]	ND	0.05	mg/kg wet
Aroclor 1248	ND	0.05	mg/kg wet
Aroclor 1248 [2C]	ND	0.05	mg/kg wet
Aroclor 1254	ND	0.05	mg/kg wet
Aroclor 1254 [2C]	ND	0.05	mg/kg wet
Aroclor 1260	ND	0.05	mg/kg wet
Aroclor 1260 [2C]	ND	0.05	mg/kg wet
Aroclor 1262	ND	0.05	mg/kg wet
Aroclor 1262 [2C]	ND	0.05	mg/kg wet
Aroclor 1268	ND	0.05	mg/kg wet
Aroclor 1268 [2C]	ND	0.05	mg/kg wet

Surrogate: Decachlorobiphenyl	0.0161		mg/kg wet	0.02500	64	30-150
Surrogate: Decachlorobiphenyl [2C]	0.0182		mg/kg wet	0.02500	73	30-150
Surrogate: Tetrachloro-m-xylene	0.0227		mg/kg wet	0.02500	91	30-150
Surrogate: Tetrachloro-m-xylene [2C]	0.0230		mg/kg wet	0.02500	92	30-150

**LCS**

Aroclor 1016	0.5	0.05	mg/kg wet	0.5000	100	40-140
Aroclor 1016 [2C]	0.6	0.05	mg/kg wet	0.5000	111	40-140
Aroclor 1260	0.4	0.05	mg/kg wet	0.5000	90	40-140
Aroclor 1260 [2C]	0.6	0.05	mg/kg wet	0.5000	111	40-140

Surrogate: Decachlorobiphenyl	0.0234		mg/kg wet	0.02500	94	30-150
Surrogate: Decachlorobiphenyl [2C]	0.0259		mg/kg wet	0.02500	104	30-150
Surrogate: Tetrachloro-m-xylene	0.0238		mg/kg wet	0.02500	95	30-150
Surrogate: Tetrachloro-m-xylene [2C]	0.0235		mg/kg wet	0.02500	94	30-150

**LCS Dup**

Aroclor 1016	0.5	0.05	mg/kg wet	0.5000	96	40-140	3	30
Aroclor 1016 [2C]	0.5	0.05	mg/kg wet	0.5000	107	40-140	4	30
Aroclor 1260	0.4	0.05	mg/kg wet	0.5000	86	40-140	4	30
Aroclor 1260 [2C]	0.5	0.05	mg/kg wet	0.5000	108	40-140	2	30

Surrogate: Decachlorobiphenyl	0.0225		mg/kg wet	0.02500	90	30-150
Surrogate: Decachlorobiphenyl [2C]	0.0248		mg/kg wet	0.02500	99	30-150
Surrogate: Tetrachloro-m-xylene	0.0230		mg/kg wet	0.02500	92	30-150
Surrogate: Tetrachloro-m-xylene [2C]	0.0224		mg/kg wet	0.02500	90	30-150



## CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1709820

### Notes and Definitions

- U Analyte included in the analysis, but not detected
- SC Surrogate recovery(ies) outside of criteria. Reextraction/Reanalysis confirms results (SC).
- ND Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference
- MDL Method Detection Limit
- MRL Method Reporting Limit
- LOD Limit of Detection
- LOQ Limit of Quantitation
- DL Detection Limit
- I/V Initial Volume
- F/V Final Volume
- § Subcontracted analysis; see attached report
- 1 Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
- 2 Range result excludes concentrations of target analytes eluting in that range.
- 3 Range result excludes the concentration of the C9-C10 aromatic range.
- Avg Results reported as a mathematical average.
- NR No Recovery
- [CALC] Calculated Analyte
- SUB Subcontracted analysis; see attached report
- RL Reporting Limit
- EDL Estimated Detection Limit



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1709820

**ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS**

**ENVIRONMENTAL**

Rhode Island Potable and Non Potable Water: LAI00179

<http://www.health.ri.gov/find/labs/analytical/ESS.pdf>

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750

[http://www.ct.gov/dph/lib/dph/environmental\\_health/environmental\\_laboratories/pdf/OutofStateCommercialLaboratories.pdf](http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf)

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002

<http://www.maine.gov/dhhs/meecd/environmental-health/dwp/partners/labCert.shtml>

Massachusetts Potable and Non Potable Water: M-RI002

<http://public.dep.state.ma.us/Labcert/Labcert.aspx>

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424

<http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm>

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313

<http://www.wadsworth.org/labcert/elap/comm.html>

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006

[http://datamine2.state.nj.us/DEP\\_OPRA/OpraMain/pi\\_main?mode=pi\\_by\\_site&sort\\_order=PI\\_NAMEA&Select+a+Site:=58715](http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715)

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752

<http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx>



## ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Providence, RI - GZA/HDM

ESS Project ID: 1709820

Shipped/Delivered Via: Client

Date Received: 9/28/2017

Project Due Date: 10/5/2017

Days for Project: 5 Day

- |  |   |
|--|---|
| <p>1. Air bill manifest present? <input type="checkbox"/> No<br/>Air No.: <u>NA</u></p> <p>2. Were custody seals present? <input type="checkbox"/> No</p> <p>3. Is radiation count &lt;100 CPM? <input type="checkbox"/> Yes</p> <p>4. Is a Cooler Present? <input type="checkbox"/> Yes<br/>Temp: <u>4.8</u> Iced with: <u>Ice</u></p> <p>5. Was COC signed and dated by client? <input type="checkbox"/> Yes</p> | <p>6. Does COC match bottles? <input type="checkbox"/> No</p> <p>7. Is COC complete and correct? <input type="checkbox"/> Yes</p> <p>8. Were samples received intact? <input type="checkbox"/> Yes</p> <p>9. Were labs informed about short holds &amp; rushes? Yes / No <input checked="" type="checkbox"/> NA</p> <p>10. Were any analyses received outside of hold time? Yes / No <input checked="" type="checkbox"/> No</p> |
|--|---|

- |  |   |
|--|---|
| <p>11. Any Subcontracting needed? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/><br/>ESS Sample IDs: _____<br/>Analysis: _____<br/>TAT: _____</p> | <p>12. Were VOAs received? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/><br/>a. Air bubbles in aqueous VOAs? Yes / No<br/>b. Does methanol cover soil completely? Yes / No / NA</p> |
|--|---|

13. Are the samples properly preserved?  Yes / No   
 a. If metals preserved upon receipt: Date: \_\_\_\_\_ Time: \_\_\_\_\_ By: \_\_\_\_\_  
 b. Low Level VOA vials frozen: Date: \_\_\_\_\_ Time: \_\_\_\_\_ By: \_\_\_\_\_

Sample Receiving Notes:

COC = GZ-SS-FT-506 (1.75-2') collected 1115 ; Label = GZ-SS-FT-506 (0.75-1') collected 1115.

No analyses on COC page 2 RL 9/28/17

14. Was there a need to contact Project Manager?  Yes / No   
 a. Was there a need to contact the client?  Yes / No   
 Who was contacted? \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_ By: \_\_\_\_\_

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
01	168286	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
02	168285	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
03	168284	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
04	168283	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
05	168282	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
06	168281	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
07	168280	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
08	168279	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
09	168278	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
10	168277	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
11	168276	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
12	168275	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
13	168274	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
14	168273	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
15	168272	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
16	168271	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
17	168270	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
18	168269	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
19	168268	Yes	NA	Yes	4 oz. Jar - Unpres	NP	

2nd Review

Are barcode labels on correct containers?  Yes / No

# ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA, Providence, RI - GZA/HDM ESS Project ID: 1709820  
Date Received: 9/28/2017

Completed By: [Signature] Date & Time: 9/28/17 1615

Reviewed By: [Signature] Date & Time: 9/28/17 1652

Delivered By: [Signature] 9/28/17 1652









*CERTIFICATE OF ANALYSIS*

Sarah McLeod  
GZA GeoEnvironmental, Inc.  
530 Broadway  
Providence, RI 02909

**RE: Former Tidewater Facility (05.0043654.00)**  
**ESS Laboratory Work Order Number: 1710025**

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard  
Laboratory Director

**REVIEWED**  
*By ESS Laboratory at 2:00 pm, Oct 10, 2017*

**Analytical Summary**

The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710025

**SAMPLE RECEIPT**

The following samples were received on October 02, 2017 for the analyses specified on the enclosed Chain of Custody Record.

**The cooler temperature was not within the acceptance limit of <6°C.**

**Low Level VOA vials were frozen by ESS Laboratory on October 2, 2017 at 1646.**

<u>Lab Number</u>	<u>Sample Name</u>	<u>Matrix</u>	<u>Analysis</u>
1710025-01	GZ-SS-540 (0-2')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1710025-02	GZ-SS-541 (0-2')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1710025-03	GZ-SS-542 (0-2')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1710025-04	GZ-SS-543 (0-2')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1710025-05	GZ-SS-544 (0-2')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1710025-06	GZ-SS-545 (0-2')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1710025-07	GZ-SS-546 (0-2')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1710025-08	GZ-SS-547 (0-2')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1710025-09	GZ-SS-548 (0-2')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1710025-10	GZ-SS-549 (0-2')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1710025-11	GZ-SS-550 (0-2')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1710025-12	GZ-SS-551 (0-2')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1710025-13	GZ-SS-552 (0-2')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1710025-14	GZ-SS-553 (0-2')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1710025-15	GZ-SS-554 (0-2')	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.

Client Project ID: Former Tidewater Facility

1710025-16

GZ-SS-555 (0-2')

Soil

ESS Laboratory Work Order: 1710025

6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D,  
9014

1710025-17

TB-100217

Solid

8260B Low



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710025

**PROJECT NARRATIVE**

**5035/8260B Volatile Organic Compounds / Low Level**

- 1710025-01 **Internal Standard(s) outside of criteria. Sample was reanalyzed to confirm (IC).**  
1,4-Dichlorobenzene-D4 (31% @ 50-200%), Chlorobenzene-d5 (49% @ 50-200%)
- 1710025-09 **Internal Standard(s) outside of criteria. Sample was reanalyzed to confirm (IC).**  
1,4-Dichlorobenzene-D4 (25% @ 50-200%)
- 1710025-09 **Surrogate recovery(ies) above upper control limit (S+).**  
Toluene-d8 (134% @ 70-130%)
- 1710025-09 **Surrogate recovery(ies) below lower control limit (S-).**  
4-Bromofluorobenzene (69% @ 70-130%)
- 1710025-12 **Internal Standard(s) outside of criteria. Sample was reanalyzed to confirm (IC).**  
1,4-Dichlorobenzene-D4 (46% @ 50-200%)
- CJ70323-BS1 **Blank Spike recovery is below lower control limit (B-).**  
Dichlorodifluoromethane (67% @ 70-130%)

**8270D Polynuclear Aromatic Hydrocarbons**

- 1710025-06 **Internal Standard(s) outside of criteria due to matrix (UCM/coelution is present) (IM).**  
p-Terphenyl-d14 (136% @ 30-130%)

**No other observations noted.**

**End of Project Narrative.**

**DATA USABILITY LINKS**

*To ensure you are viewing the most current version of the documents below, please clear your internet cookies for [www.ESSLaboratory.com](http://www.ESSLaboratory.com). Consult your IT Support personnel for information on how to clear your internet cookies.*

[Definitions of Quality Control Parameters](#)

[Semivolatile Organics Internal Standard Information](#)

[Semivolatile Organics Surrogate Information](#)

[Volatile Organics Internal Standard Information](#)

[Volatile Organics Surrogate Information](#)

[EPH and VPH Alkane Lists](#)



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710025

**CURRENT SW-846 METHODOLOGY VERSIONS**

**Analytical Methods**

- 1010A - Flashpoint
- 6010C - ICP
- 6020A - ICP MS
- 7010 - Graphite Furnace
- 7196A - Hexavalent Chromium
- 7470A - Aqueous Mercury
- 7471B - Solid Mercury
- 8011 - EDB/DBCP/TCP
- 8015C - GRO/DRO
- 8081B - Pesticides
- 8082A - PCB
- 8100M - TPH
- 8151A - Herbicides
- 8260B - VOA
- 8270D - SVOA
- 8270D SIM - SVOA Low Level
- 9014 - Cyanide
- 9038 - Sulfate
- 9040C - Aqueous pH
- 9045D - Solid pH (Corrosivity)
- 9050A - Specific Conductance
- 9056A - Anions (IC)
- 9060A - TOC
- 9095B - Paint Filter
- MADEP 04-1.1 - EPH / VPH

**Prep Methods**

- 3005A - Aqueous ICP Digestion
- 3020A - Aqueous Graphite Furnace / ICP MS Digestion
- 3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
- 3060A - Solid Hexavalent Chromium Digestion
- 3510C - Separatory Funnel Extraction
- 3520C - Liquid / Liquid Extraction
- 3540C - Manual Soxhlet Extraction
- 3541 - Automated Soxhlet Extraction
- 3546 - Microwave Extraction
- 3580A - Waste Dilution
- 5030B - Aqueous Purge and Trap
- 5030C - Aqueous Purge and Trap
- 5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-540 (0-2')  
Date Sampled: 10/02/17 10:40  
Percent Solids: 94

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-01  
Sample Matrix: Soil  
Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (1.96)		6020A		20	NAR	10/04/17 16:39	2.18	100	CJ70328
Arsenic	<b>6.62</b> (2.44)		6010C		1	KJK	10/04/17 19:37	2.18	100	CJ70328
Beryllium	<b>0.20</b> (0.11)		6010C		1	KJK	10/04/17 19:37	2.18	100	CJ70328
Cadmium	ND (0.49)		6010C		1	KJK	10/04/17 19:37	2.18	100	CJ70328
Chromium	<b>7.51</b> (0.98)		6010C		1	KJK	10/04/17 19:37	2.18	100	CJ70328
Copper	<b>22.3</b> (2.44)		6010C		1	KJK	10/04/17 19:37	2.18	100	CJ70328
Lead	<b>59.9</b> (4.89)		6010C		1	KJK	10/04/17 19:37	2.18	100	CJ70328
Mercury	<b>0.069</b> (0.022)		7471B		1	MJV	10/04/17 11:28	0.97	40	CJ70303
Nickel	<b>7.23</b> (2.44)		6010C		1	KJK	10/04/17 19:37	2.18	100	CJ70328
Selenium	ND (1.96)		6020A		20	NAR	10/04/17 16:39	2.18	100	CJ70328
Silver	ND (0.49)		6010C		1	KJK	10/04/17 19:37	2.18	100	CJ70328
Thallium	ND (1.96)		6020A		20	NAR	10/04/17 16:39	2.18	100	CJ70328
Zinc	<b>49.1</b> (2.44)		6010C		1	KJK	10/04/17 19:37	2.18	100	CJ70328



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-540 (0-2')  
Date Sampled: 10/02/17 10:40  
Percent Solids: 94  
Initial Volume: 8.3  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-01  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0032)		8260B Low		1	10/04/17 16:23	C7J0034	CJ70323
1,1,1-Trichloroethane	ND (0.0032)		8260B Low		1	10/04/17 16:23	C7J0034	CJ70323
1,1,2,2-Tetrachloroethane	ND (0.0032)		8260B Low		1	10/04/17 16:23	C7J0034	CJ70323
1,1,2-Trichloroethane	ND (0.0032)		8260B Low		1	10/04/17 16:23	C7J0034	CJ70323
1,1-Dichloroethane	ND (0.0032)		8260B Low		1	10/04/17 16:23	C7J0034	CJ70323
1,1-Dichloroethene	ND (0.0032)		8260B Low		1	10/04/17 16:23	C7J0034	CJ70323
1,1-Dichloropropene	ND (0.0032)		8260B Low		1	10/04/17 16:23	C7J0034	CJ70323
1,2,3-Trichlorobenzene	ND (0.0032)		8260B Low		1	10/04/17 16:23	C7J0034	CJ70323
1,2,3-Trichloropropane	ND (0.0032)		8260B Low		1	10/04/17 16:23	C7J0034	CJ70323
1,2,4-Trichlorobenzene	ND (0.0032)		8260B Low		1	10/04/17 16:23	C7J0034	CJ70323
1,2,4-Trimethylbenzene	ND (0.0032)		8260B Low		1	10/04/17 16:23	C7J0034	CJ70323
1,2-Dibromo-3-Chloropropane	ND (0.0032)		8260B Low		1	10/04/17 16:23	C7J0034	CJ70323
1,2-Dibromoethane	ND (0.0032)		8260B Low		1	10/04/17 16:23	C7J0034	CJ70323
1,2-Dichlorobenzene	ND (0.0032)		8260B Low		1	10/04/17 16:23	C7J0034	CJ70323
1,2-Dichloroethane	ND (0.0032)		8260B Low		1	10/04/17 16:23	C7J0034	CJ70323
1,2-Dichloropropane	ND (0.0032)		8260B Low		1	10/04/17 16:23	C7J0034	CJ70323
1,3,5-Trimethylbenzene	ND (0.0032)		8260B Low		1	10/04/17 16:23	C7J0034	CJ70323
1,3-Dichlorobenzene	ND (0.0032)		8260B Low		1	10/04/17 16:23	C7J0034	CJ70323
1,3-Dichloropropane	ND (0.0032)		8260B Low		1	10/04/17 16:23	C7J0034	CJ70323
1,4-Dichlorobenzene	ND (0.0032)		8260B Low		1	10/04/17 16:23	C7J0034	CJ70323
1,4-Dioxane	ND (0.0642)		8260B Low		1	10/04/17 16:23	C7J0034	CJ70323
1-Chlorohexane	ND (0.0032)		8260B Low		1	10/04/17 16:23	C7J0034	CJ70323
2,2-Dichloropropane	ND (0.0032)		8260B Low		1	10/04/17 16:23	C7J0034	CJ70323
2-Butanone	ND (0.0321)		8260B Low		1	10/04/17 16:23	C7J0034	CJ70323
2-Chlorotoluene	ND (0.0032)		8260B Low		1	10/04/17 16:23	C7J0034	CJ70323
2-Hexanone	ND (0.0321)		8260B Low		1	10/04/17 16:23	C7J0034	CJ70323
4-Chlorotoluene	ND (0.0032)		8260B Low		1	10/04/17 16:23	C7J0034	CJ70323
4-Isopropyltoluene	ND (0.0032)		8260B Low		1	10/04/17 16:23	C7J0034	CJ70323
4-Methyl-2-Pentanone	ND (0.0321)		8260B Low		1	10/04/17 16:23	C7J0034	CJ70323
Acetone	ND (0.0321)		8260B Low		1	10/04/17 16:23	C7J0034	CJ70323
Benzene	ND (0.0032)		8260B Low		1	10/04/17 16:23	C7J0034	CJ70323
Bromobenzene	ND (0.0032)		8260B Low		1	10/04/17 16:23	C7J0034	CJ70323



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-540 (0-2')  
Date Sampled: 10/02/17 10:40  
Percent Solids: 94  
Initial Volume: 8.3  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-01  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0032)		8260B Low		1	10/04/17 16:23	C7J0034	CJ70323
Bromodichloromethane	ND (0.0032)		8260B Low		1	10/04/17 16:23	C7J0034	CJ70323
Bromoform	ND (0.0032)		8260B Low		1	10/04/17 16:23	C7J0034	CJ70323
Bromomethane	ND (0.0064)		8260B Low		1	10/04/17 16:23	C7J0034	CJ70323
Carbon Disulfide	ND (0.0032)		8260B Low		1	10/04/17 16:23	C7J0034	CJ70323
Carbon Tetrachloride	ND (0.0032)		8260B Low		1	10/04/17 16:23	C7J0034	CJ70323
Chlorobenzene	ND (0.0032)		8260B Low		1	10/04/17 16:23	C7J0034	CJ70323
Chloroethane	ND (0.0064)		8260B Low		1	10/04/17 16:23	C7J0034	CJ70323
Chloroform	ND (0.0032)		8260B Low		1	10/04/17 16:23	C7J0034	CJ70323
Chloromethane	ND (0.0064)		8260B Low		1	10/04/17 16:23	C7J0034	CJ70323
cis-1,2-Dichloroethene	ND (0.0032)		8260B Low		1	10/04/17 16:23	C7J0034	CJ70323
cis-1,3-Dichloropropene	ND (0.0032)		8260B Low		1	10/04/17 16:23	C7J0034	CJ70323
Dibromochloromethane	ND (0.0032)		8260B Low		1	10/04/17 16:23	C7J0034	CJ70323
Dibromomethane	ND (0.0032)		8260B Low		1	10/04/17 16:23	C7J0034	CJ70323
Dichlorodifluoromethane	ND (0.0064)		8260B Low		1	10/04/17 16:23	C7J0034	CJ70323
Diethyl Ether	ND (0.0032)		8260B Low		1	10/04/17 16:23	C7J0034	CJ70323
Di-isopropyl ether	ND (0.0032)		8260B Low		1	10/04/17 16:23	C7J0034	CJ70323
Ethyl tertiary-butyl ether	ND (0.0032)		8260B Low		1	10/04/17 16:23	C7J0034	CJ70323
Ethylbenzene	ND (0.0032)		8260B Low		1	10/04/17 16:23	C7J0034	CJ70323
Hexachlorobutadiene	ND (0.0032)		8260B Low		1	10/04/17 16:23	C7J0034	CJ70323
Isopropylbenzene	ND (0.0032)		8260B Low		1	10/04/17 16:23	C7J0034	CJ70323
Methyl tert-Butyl Ether	ND (0.0032)		8260B Low		1	10/04/17 16:23	C7J0034	CJ70323
Methylene Chloride	ND (0.0160)		8260B Low		1	10/04/17 16:23	C7J0034	CJ70323
Naphthalene	ND (0.0032)		8260B Low		1	10/04/17 16:23	C7J0034	CJ70323
n-Butylbenzene	ND (0.0032)		8260B Low		1	10/04/17 16:23	C7J0034	CJ70323
n-Propylbenzene	ND (0.0032)		8260B Low		1	10/04/17 16:23	C7J0034	CJ70323
sec-Butylbenzene	ND (0.0032)		8260B Low		1	10/04/17 16:23	C7J0034	CJ70323
Styrene	ND (0.0032)		8260B Low		1	10/04/17 16:23	C7J0034	CJ70323
tert-Butylbenzene	ND (0.0032)		8260B Low		1	10/04/17 16:23	C7J0034	CJ70323
Tertiary-amyl methyl ether	ND (0.0032)		8260B Low		1	10/04/17 16:23	C7J0034	CJ70323
Tetrachloroethene	ND (0.0032)		8260B Low		1	10/04/17 16:23	C7J0034	CJ70323
Tetrahydrofuran	ND (0.0032)		8260B Low		1	10/04/17 16:23	C7J0034	CJ70323





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-540 (0-2')  
 Date Sampled: 10/02/17 10:40  
 Percent Solids: 94  
 Initial Volume: 8.3  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1710025  
 ESS Laboratory Sample ID: 1710025-01  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0032)		8260B Low		1	10/04/17 16:23	C7J0034	CJ70323
trans-1,2-Dichloroethene	ND (0.0032)		8260B Low		1	10/04/17 16:23	C7J0034	CJ70323
trans-1,3-Dichloropropene	ND (0.0032)		8260B Low		1	10/04/17 16:23	C7J0034	CJ70323
Trichloroethene	ND (0.0032)		8260B Low		1	10/04/17 16:23	C7J0034	CJ70323
Trichlorofluoromethane	ND (0.0032)		8260B Low		1	10/04/17 16:23	C7J0034	CJ70323
Vinyl Acetate	ND (0.0032)		8260B Low		1	10/04/17 16:23	C7J0034	CJ70323
Vinyl Chloride	ND (0.0064)		8260B Low		1	10/04/17 16:23	C7J0034	CJ70323
Xylene O	ND (0.0032)		8260B Low		1	10/04/17 16:23	C7J0034	CJ70323
Xylene P,M	ND (0.0064)		8260B Low		1	10/04/17 16:23	C7J0034	CJ70323
Xylenes (Total)	ND (0.0064)		8260B Low		1	10/04/17 16:23		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>110 %</i>		<i>70-130</i>
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>82 %</i>		<i>70-130</i>
<i>Surrogate: Dibromofluoromethane</i>	<i>104 %</i>		<i>70-130</i>
<i>Surrogate: Toluene-d8</i>	<i>126 %</i>		<i>70-130</i>



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-540 (0-2')  
Date Sampled: 10/02/17 10:40  
Percent Solids: 94  
Initial Volume: 19.2  
Final Volume: 1  
Extraction Method: 3546

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-01  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: SMR  
Prepared: 10/3/17 13:00

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	546 (208)		8100M		5	10/06/17 14:28	C7J0111	CJ70310
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		70 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-540 (0-2')  
Date Sampled: 10/02/17 10:40  
Percent Solids: 94  
Initial Volume: 14.5  
Final Volume: 0.5  
Extraction Method: 3546

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-01  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: TJ  
Prepared: 10/3/17 10:00

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.367)		8270D		1	10/04/17 18:52	C7J0049	CJ70211
Acenaphthene	ND (0.367)		8270D		1	10/04/17 18:52	C7J0049	CJ70211
<b>Acenaphthylene</b>	<b>0.786</b> (0.367)		8270D		1	10/04/17 18:52	C7J0049	CJ70211
Anthracene	ND (0.367)		8270D		1	10/04/17 18:52	C7J0049	CJ70211
<b>Benzo(a)anthracene</b>	<b>1.29</b> (0.367)		8270D		1	10/04/17 18:52	C7J0049	CJ70211
<b>Benzo(a)pyrene</b>	<b>1.48</b> (0.184)		8270D		1	10/04/17 18:52	C7J0049	CJ70211
<b>Benzo(b)fluoranthene</b>	<b>2.28</b> (0.367)		8270D		1	10/04/17 18:52	C7J0049	CJ70211
<b>Benzo(g,h,i)perylene</b>	<b>1.02</b> (0.367)		8270D		1	10/04/17 18:52	C7J0049	CJ70211
<b>Benzo(k)fluoranthene</b>	<b>1.75</b> (0.367)		8270D		1	10/04/17 18:52	C7J0049	CJ70211
<b>Chrysene</b>	<b>1.54</b> (0.184)		8270D		1	10/04/17 18:52	C7J0049	CJ70211
<b>Dibenzo(a,h)Anthracene</b>	<b>0.463</b> (0.184)		8270D		1	10/04/17 18:52	C7J0049	CJ70211
<b>Fluoranthene</b>	<b>2.01</b> (0.367)		8270D		1	10/04/17 18:52	C7J0049	CJ70211
Fluorene	ND (0.367)		8270D		1	10/04/17 18:52	C7J0049	CJ70211
<b>Indeno(1,2,3-cd)Pyrene</b>	<b>0.958</b> (0.367)		8270D		1	10/04/17 18:52	C7J0049	CJ70211
<b>Naphthalene</b>	<b>0.713</b> (0.367)		8270D		1	10/04/17 18:52	C7J0049	CJ70211
<b>Phenanthrene</b>	<b>0.700</b> (0.367)		8270D		1	10/04/17 18:52	C7J0049	CJ70211
<b>Pyrene</b>	<b>1.69</b> (0.367)		8270D		1	10/04/17 18:52	C7J0049	CJ70211

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	44 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	55 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	52 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	55 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-540 (0-2')  
Date Sampled: 10/02/17 10:40  
Percent Solids: 94

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-01  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	251 (51.1)		9014		50	EEM	10/05/17 11:20	mg/kg dry	CJ70513



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-541 (0-2')  
Date Sampled: 10/02/17 10:55  
Percent Solids: 97

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-02  
Sample Matrix: Soil  
Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (1.70)		6020A		20	NAR	10/04/17 17:20	2.43	100	CJ70328
Arsenic	7.63 (2.12)		6010C		1	KJK	10/04/17 19:57	2.43	100	CJ70328
Beryllium	0.14 (0.09)		6010C		1	KJK	10/04/17 19:57	2.43	100	CJ70328
Cadmium	ND (0.42)		6010C		1	KJK	10/04/17 19:57	2.43	100	CJ70328
Chromium	3.71 (0.85)		6010C		1	KJK	10/04/17 19:57	2.43	100	CJ70328
Copper	13.5 (2.12)		6010C		1	KJK	10/04/17 19:57	2.43	100	CJ70328
Lead	35.9 (4.25)		6010C		1	KJK	10/04/17 19:57	2.43	100	CJ70328
Mercury	0.077 (0.022)		7471B		1	MJV	10/04/17 11:30	0.95	40	CJ70303
Nickel	3.97 (2.12)		6010C		1	KJK	10/04/17 19:57	2.43	100	CJ70328
Selenium	ND (1.70)		6020A		20	NAR	10/04/17 17:20	2.43	100	CJ70328
Silver	ND (0.42)		6010C		1	KJK	10/04/17 19:57	2.43	100	CJ70328
Thallium	ND (1.70)		6020A		20	NAR	10/04/17 17:20	2.43	100	CJ70328
Zinc	21.4 (2.12)		6010C		1	KJK	10/04/17 19:57	2.43	100	CJ70328



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-541 (0-2')  
 Date Sampled: 10/02/17 10:55  
 Percent Solids: 97  
 Initial Volume: 9.9  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1710025  
 ESS Laboratory Sample ID: 1710025-02  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0026)		8260B Low		1	10/04/17 16:49	C7J0034	CJ70323
1,1,1-Trichloroethane	ND (0.0026)		8260B Low		1	10/04/17 16:49	C7J0034	CJ70323
1,1,2,2-Tetrachloroethane	ND (0.0026)		8260B Low		1	10/04/17 16:49	C7J0034	CJ70323
1,1,2-Trichloroethane	ND (0.0026)		8260B Low		1	10/04/17 16:49	C7J0034	CJ70323
1,1-Dichloroethane	ND (0.0026)		8260B Low		1	10/04/17 16:49	C7J0034	CJ70323
1,1-Dichloroethene	ND (0.0026)		8260B Low		1	10/04/17 16:49	C7J0034	CJ70323
1,1-Dichloropropene	ND (0.0026)		8260B Low		1	10/04/17 16:49	C7J0034	CJ70323
1,2,3-Trichlorobenzene	ND (0.0026)		8260B Low		1	10/04/17 16:49	C7J0034	CJ70323
1,2,3-Trichloropropane	ND (0.0026)		8260B Low		1	10/04/17 16:49	C7J0034	CJ70323
1,2,4-Trichlorobenzene	ND (0.0026)		8260B Low		1	10/04/17 16:49	C7J0034	CJ70323
1,2,4-Trimethylbenzene	ND (0.0026)		8260B Low		1	10/04/17 16:49	C7J0034	CJ70323
1,2-Dibromo-3-Chloropropane	ND (0.0026)		8260B Low		1	10/04/17 16:49	C7J0034	CJ70323
1,2-Dibromoethane	ND (0.0026)		8260B Low		1	10/04/17 16:49	C7J0034	CJ70323
1,2-Dichlorobenzene	ND (0.0026)		8260B Low		1	10/04/17 16:49	C7J0034	CJ70323
1,2-Dichloroethane	ND (0.0026)		8260B Low		1	10/04/17 16:49	C7J0034	CJ70323
1,2-Dichloropropane	ND (0.0026)		8260B Low		1	10/04/17 16:49	C7J0034	CJ70323
1,3,5-Trimethylbenzene	ND (0.0026)		8260B Low		1	10/04/17 16:49	C7J0034	CJ70323
1,3-Dichlorobenzene	ND (0.0026)		8260B Low		1	10/04/17 16:49	C7J0034	CJ70323
1,3-Dichloropropane	ND (0.0026)		8260B Low		1	10/04/17 16:49	C7J0034	CJ70323
1,4-Dichlorobenzene	ND (0.0026)		8260B Low		1	10/04/17 16:49	C7J0034	CJ70323
1,4-Dioxane	ND (0.0521)		8260B Low		1	10/04/17 16:49	C7J0034	CJ70323
1-Chlorohexane	ND (0.0026)		8260B Low		1	10/04/17 16:49	C7J0034	CJ70323
2,2-Dichloropropane	ND (0.0026)		8260B Low		1	10/04/17 16:49	C7J0034	CJ70323
2-Butanone	ND (0.0261)		8260B Low		1	10/04/17 16:49	C7J0034	CJ70323
2-Chlorotoluene	ND (0.0026)		8260B Low		1	10/04/17 16:49	C7J0034	CJ70323
2-Hexanone	ND (0.0261)		8260B Low		1	10/04/17 16:49	C7J0034	CJ70323
4-Chlorotoluene	ND (0.0026)		8260B Low		1	10/04/17 16:49	C7J0034	CJ70323
4-Isopropyltoluene	ND (0.0026)		8260B Low		1	10/04/17 16:49	C7J0034	CJ70323
4-Methyl-2-Pentanone	ND (0.0261)		8260B Low		1	10/04/17 16:49	C7J0034	CJ70323
Acetone	ND (0.0261)		8260B Low		1	10/04/17 16:49	C7J0034	CJ70323
Benzene	ND (0.0026)		8260B Low		1	10/04/17 16:49	C7J0034	CJ70323
Bromobenzene	ND (0.0026)		8260B Low		1	10/04/17 16:49	C7J0034	CJ70323





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-541 (0-2')  
Date Sampled: 10/02/17 10:55  
Percent Solids: 97  
Initial Volume: 9.9  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-02  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0026)		8260B Low		1	10/04/17 16:49	C7J0034	CJ70323
Bromodichloromethane	ND (0.0026)		8260B Low		1	10/04/17 16:49	C7J0034	CJ70323
Bromoform	ND (0.0026)		8260B Low		1	10/04/17 16:49	C7J0034	CJ70323
Bromomethane	ND (0.0052)		8260B Low		1	10/04/17 16:49	C7J0034	CJ70323
Carbon Disulfide	ND (0.0026)		8260B Low		1	10/04/17 16:49	C7J0034	CJ70323
Carbon Tetrachloride	ND (0.0026)		8260B Low		1	10/04/17 16:49	C7J0034	CJ70323
Chlorobenzene	ND (0.0026)		8260B Low		1	10/04/17 16:49	C7J0034	CJ70323
Chloroethane	ND (0.0052)		8260B Low		1	10/04/17 16:49	C7J0034	CJ70323
Chloroform	ND (0.0026)		8260B Low		1	10/04/17 16:49	C7J0034	CJ70323
Chloromethane	ND (0.0052)		8260B Low		1	10/04/17 16:49	C7J0034	CJ70323
cis-1,2-Dichloroethene	ND (0.0026)		8260B Low		1	10/04/17 16:49	C7J0034	CJ70323
cis-1,3-Dichloropropene	ND (0.0026)		8260B Low		1	10/04/17 16:49	C7J0034	CJ70323
Dibromochloromethane	ND (0.0026)		8260B Low		1	10/04/17 16:49	C7J0034	CJ70323
Dibromomethane	ND (0.0026)		8260B Low		1	10/04/17 16:49	C7J0034	CJ70323
Dichlorodifluoromethane	ND (0.0052)		8260B Low		1	10/04/17 16:49	C7J0034	CJ70323
Diethyl Ether	ND (0.0026)		8260B Low		1	10/04/17 16:49	C7J0034	CJ70323
Di-isopropyl ether	ND (0.0026)		8260B Low		1	10/04/17 16:49	C7J0034	CJ70323
Ethyl tertiary-butyl ether	ND (0.0026)		8260B Low		1	10/04/17 16:49	C7J0034	CJ70323
Ethylbenzene	ND (0.0026)		8260B Low		1	10/04/17 16:49	C7J0034	CJ70323
Hexachlorobutadiene	ND (0.0026)		8260B Low		1	10/04/17 16:49	C7J0034	CJ70323
Isopropylbenzene	ND (0.0026)		8260B Low		1	10/04/17 16:49	C7J0034	CJ70323
Methyl tert-Butyl Ether	ND (0.0026)		8260B Low		1	10/04/17 16:49	C7J0034	CJ70323
Methylene Chloride	ND (0.0130)		8260B Low		1	10/04/17 16:49	C7J0034	CJ70323
Naphthalene	ND (0.0026)		8260B Low		1	10/04/17 16:49	C7J0034	CJ70323
n-Butylbenzene	ND (0.0026)		8260B Low		1	10/04/17 16:49	C7J0034	CJ70323
n-Propylbenzene	ND (0.0026)		8260B Low		1	10/04/17 16:49	C7J0034	CJ70323
sec-Butylbenzene	ND (0.0026)		8260B Low		1	10/04/17 16:49	C7J0034	CJ70323
Styrene	ND (0.0026)		8260B Low		1	10/04/17 16:49	C7J0034	CJ70323
tert-Butylbenzene	ND (0.0026)		8260B Low		1	10/04/17 16:49	C7J0034	CJ70323
Tertiary-amyl methyl ether	ND (0.0026)		8260B Low		1	10/04/17 16:49	C7J0034	CJ70323
Tetrachloroethene	ND (0.0026)		8260B Low		1	10/04/17 16:49	C7J0034	CJ70323
Tetrahydrofuran	ND (0.0026)		8260B Low		1	10/04/17 16:49	C7J0034	CJ70323



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-541 (0-2')  
Date Sampled: 10/02/17 10:55  
Percent Solids: 97  
Initial Volume: 9.9  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-02  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0026)		8260B Low		1	10/04/17 16:49	C7J0034	CJ70323
trans-1,2-Dichloroethene	ND (0.0026)		8260B Low		1	10/04/17 16:49	C7J0034	CJ70323
trans-1,3-Dichloropropene	ND (0.0026)		8260B Low		1	10/04/17 16:49	C7J0034	CJ70323
Trichloroethene	ND (0.0026)		8260B Low		1	10/04/17 16:49	C7J0034	CJ70323
Trichlorofluoromethane	ND (0.0026)		8260B Low		1	10/04/17 16:49	C7J0034	CJ70323
Vinyl Acetate	ND (0.0026)		8260B Low		1	10/04/17 16:49	C7J0034	CJ70323
Vinyl Chloride	ND (0.0052)		8260B Low		1	10/04/17 16:49	C7J0034	CJ70323
Xylene O	ND (0.0026)		8260B Low		1	10/04/17 16:49	C7J0034	CJ70323
Xylene P,M	ND (0.0052)		8260B Low		1	10/04/17 16:49	C7J0034	CJ70323
Xylenes (Total)	ND (0.0052)		8260B Low		1	10/04/17 16:49		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	108 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	96 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	101 %		70-130
<i>Surrogate: Toluene-d8</i>	110 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-541 (0-2')  
Date Sampled: 10/02/17 10:55  
Percent Solids: 97  
Initial Volume: 19.4  
Final Volume: 1  
Extraction Method: 3546

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-02  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: SMR  
Prepared: 10/3/17 13:00

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	266 (39.9)		8100M		1	10/05/17 9:09	C7J0068	CJ70310
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		57 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-541 (0-2')  
Date Sampled: 10/02/17 10:55  
Percent Solids: 97  
Initial Volume: 15.2  
Final Volume: 0.5  
Extraction Method: 3546

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-02  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: TJ  
Prepared: 10/3/17 10:00

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	0.570 (0.339)		8270D		1	10/04/17 19:27	C7J0049	CJ70211
Acenaphthene	ND (0.339)		8270D		1	10/04/17 19:27	C7J0049	CJ70211
Acenaphthylene	0.583 (0.339)		8270D		1	10/04/17 19:27	C7J0049	CJ70211
Anthracene	ND (0.339)		8270D		1	10/04/17 19:27	C7J0049	CJ70211
Benzo(a)anthracene	0.793 (0.339)		8270D		1	10/04/17 19:27	C7J0049	CJ70211
Benzo(a)pyrene	0.632 (0.170)		8270D		1	10/04/17 19:27	C7J0049	CJ70211
Benzo(b)fluoranthene	1.44 (0.339)		8270D		1	10/04/17 19:27	C7J0049	CJ70211
Benzo(g,h,i)perylene	0.490 (0.339)		8270D		1	10/04/17 19:27	C7J0049	CJ70211
Benzo(k)fluoranthene	1.10 (0.339)		8270D		1	10/04/17 19:27	C7J0049	CJ70211
Chrysene	1.06 (0.170)		8270D		1	10/04/17 19:27	C7J0049	CJ70211
Dibenzo(a,h)Anthracene	0.249 (0.170)		8270D		1	10/04/17 19:27	C7J0049	CJ70211
Fluoranthene	1.18 (0.339)		8270D		1	10/04/17 19:27	C7J0049	CJ70211
Fluorene	ND (0.339)		8270D		1	10/04/17 19:27	C7J0049	CJ70211
Indeno(1,2,3-cd)Pyrene	0.486 (0.339)		8270D		1	10/04/17 19:27	C7J0049	CJ70211
Naphthalene	1.40 (0.339)		8270D		1	10/04/17 19:27	C7J0049	CJ70211
Phenanthrene	0.485 (0.339)		8270D		1	10/04/17 19:27	C7J0049	CJ70211
Pyrene	0.968 (0.339)		8270D		1	10/04/17 19:27	C7J0049	CJ70211

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
Surrogate: 1,2-Dichlorobenzene-d4	55 %		30-130
Surrogate: 2-Fluorobiphenyl	59 %		30-130
Surrogate: Nitrobenzene-d5	59 %		30-130
Surrogate: p-Terphenyl-d14	57 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-541 (0-2')  
Date Sampled: 10/02/17 10:55  
Percent Solids: 97

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-02  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	363 (50.9)		9014		50	EEM	10/05/17 11:20	mg/kg dry	CJ70513



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-542 (0-2')  
Date Sampled: 10/02/17 11:00  
Percent Solids: 96

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-03  
Sample Matrix: Soil  
Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (1.81)		6020A		20	NAR	10/04/17 17:26	2.3	100	CJ70328
Arsenic	<b>5.10</b> (2.26)		6010C		1	KJK	10/04/17 20:02	2.3	100	CJ70328
Beryllium	<b>0.22</b> (0.10)		6010C		1	KJK	10/04/17 20:02	2.3	100	CJ70328
Cadmium	ND (0.45)		6010C		1	KJK	10/04/17 20:02	2.3	100	CJ70328
Chromium	<b>6.60</b> (0.91)		6010C		1	KJK	10/04/17 20:02	2.3	100	CJ70328
Copper	<b>19.5</b> (2.26)		6010C		1	KJK	10/04/17 20:02	2.3	100	CJ70328
Lead	<b>45.3</b> (4.53)		6010C		1	KJK	10/04/17 20:02	2.3	100	CJ70328
Mercury	<b>0.135</b> (0.034)		7471B		1	MJV	10/04/17 11:32	0.61	40	CJ70303
Nickel	<b>13.2</b> (2.26)		6010C		1	KJK	10/04/17 20:02	2.3	100	CJ70328
Selenium	ND (1.81)		6020A		20	NAR	10/04/17 17:26	2.3	100	CJ70328
Silver	ND (0.45)		6010C		1	KJK	10/04/17 20:02	2.3	100	CJ70328
Thallium	ND (1.81)		6020A		20	NAR	10/04/17 17:26	2.3	100	CJ70328
Zinc	<b>54.1</b> (2.26)		6010C		1	KJK	10/04/17 20:02	2.3	100	CJ70328





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-542 (0-2')  
Date Sampled: 10/02/17 11:00  
Percent Solids: 96  
Initial Volume: 4.5  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-03  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0058)		8260B Low		1	10/04/17 17:14	C7J0034	CJ70323
1,1,1-Trichloroethane	ND (0.0058)		8260B Low		1	10/04/17 17:14	C7J0034	CJ70323
1,1,2,2-Tetrachloroethane	ND (0.0058)		8260B Low		1	10/04/17 17:14	C7J0034	CJ70323
1,1,2-Trichloroethane	ND (0.0058)		8260B Low		1	10/04/17 17:14	C7J0034	CJ70323
1,1-Dichloroethane	ND (0.0058)		8260B Low		1	10/04/17 17:14	C7J0034	CJ70323
1,1-Dichloroethene	ND (0.0058)		8260B Low		1	10/04/17 17:14	C7J0034	CJ70323
1,1-Dichloropropene	ND (0.0058)		8260B Low		1	10/04/17 17:14	C7J0034	CJ70323
1,2,3-Trichlorobenzene	ND (0.0058)		8260B Low		1	10/04/17 17:14	C7J0034	CJ70323
1,2,3-Trichloropropane	ND (0.0058)		8260B Low		1	10/04/17 17:14	C7J0034	CJ70323
1,2,4-Trichlorobenzene	ND (0.0058)		8260B Low		1	10/04/17 17:14	C7J0034	CJ70323
1,2,4-Trimethylbenzene	ND (0.0058)		8260B Low		1	10/04/17 17:14	C7J0034	CJ70323
1,2-Dibromo-3-Chloropropane	ND (0.0058)		8260B Low		1	10/04/17 17:14	C7J0034	CJ70323
1,2-Dibromoethane	ND (0.0058)		8260B Low		1	10/04/17 17:14	C7J0034	CJ70323
1,2-Dichlorobenzene	ND (0.0058)		8260B Low		1	10/04/17 17:14	C7J0034	CJ70323
1,2-Dichloroethane	ND (0.0058)		8260B Low		1	10/04/17 17:14	C7J0034	CJ70323
1,2-Dichloropropane	ND (0.0058)		8260B Low		1	10/04/17 17:14	C7J0034	CJ70323
1,3,5-Trimethylbenzene	ND (0.0058)		8260B Low		1	10/04/17 17:14	C7J0034	CJ70323
1,3-Dichlorobenzene	ND (0.0058)		8260B Low		1	10/04/17 17:14	C7J0034	CJ70323
1,3-Dichloropropane	ND (0.0058)		8260B Low		1	10/04/17 17:14	C7J0034	CJ70323
1,4-Dichlorobenzene	ND (0.0058)		8260B Low		1	10/04/17 17:14	C7J0034	CJ70323
1,4-Dioxane	ND (0.116)		8260B Low		1	10/04/17 17:14	C7J0034	CJ70323
1-Chlorohexane	ND (0.0058)		8260B Low		1	10/04/17 17:14	C7J0034	CJ70323
2,2-Dichloropropane	ND (0.0058)		8260B Low		1	10/04/17 17:14	C7J0034	CJ70323
2-Butanone	ND (0.0579)		8260B Low		1	10/04/17 17:14	C7J0034	CJ70323
2-Chlorotoluene	ND (0.0058)		8260B Low		1	10/04/17 17:14	C7J0034	CJ70323
2-Hexanone	ND (0.0579)		8260B Low		1	10/04/17 17:14	C7J0034	CJ70323
4-Chlorotoluene	ND (0.0058)		8260B Low		1	10/04/17 17:14	C7J0034	CJ70323
4-Isopropyltoluene	ND (0.0058)		8260B Low		1	10/04/17 17:14	C7J0034	CJ70323
4-Methyl-2-Pentanone	ND (0.0579)		8260B Low		1	10/04/17 17:14	C7J0034	CJ70323
Acetone	ND (0.0579)		8260B Low		1	10/04/17 17:14	C7J0034	CJ70323
Benzene	ND (0.0058)		8260B Low		1	10/04/17 17:14	C7J0034	CJ70323
Bromobenzene	ND (0.0058)		8260B Low		1	10/04/17 17:14	C7J0034	CJ70323



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-542 (0-2')  
Date Sampled: 10/02/17 11:00  
Percent Solids: 96  
Initial Volume: 4.5  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-03  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0058)		8260B Low		1	10/04/17 17:14	C7J0034	CJ70323
Bromodichloromethane	ND (0.0058)		8260B Low		1	10/04/17 17:14	C7J0034	CJ70323
Bromoform	ND (0.0058)		8260B Low		1	10/04/17 17:14	C7J0034	CJ70323
Bromomethane	ND (0.0116)		8260B Low		1	10/04/17 17:14	C7J0034	CJ70323
Carbon Disulfide	ND (0.0058)		8260B Low		1	10/04/17 17:14	C7J0034	CJ70323
Carbon Tetrachloride	ND (0.0058)		8260B Low		1	10/04/17 17:14	C7J0034	CJ70323
Chlorobenzene	ND (0.0058)		8260B Low		1	10/04/17 17:14	C7J0034	CJ70323
Chloroethane	ND (0.0116)		8260B Low		1	10/04/17 17:14	C7J0034	CJ70323
Chloroform	ND (0.0058)		8260B Low		1	10/04/17 17:14	C7J0034	CJ70323
Chloromethane	ND (0.0116)		8260B Low		1	10/04/17 17:14	C7J0034	CJ70323
cis-1,2-Dichloroethene	ND (0.0058)		8260B Low		1	10/04/17 17:14	C7J0034	CJ70323
cis-1,3-Dichloropropene	ND (0.0058)		8260B Low		1	10/04/17 17:14	C7J0034	CJ70323
Dibromochloromethane	ND (0.0058)		8260B Low		1	10/04/17 17:14	C7J0034	CJ70323
Dibromomethane	ND (0.0058)		8260B Low		1	10/04/17 17:14	C7J0034	CJ70323
Dichlorodifluoromethane	ND (0.0116)		8260B Low		1	10/04/17 17:14	C7J0034	CJ70323
Diethyl Ether	ND (0.0058)		8260B Low		1	10/04/17 17:14	C7J0034	CJ70323
Di-isopropyl ether	ND (0.0058)		8260B Low		1	10/04/17 17:14	C7J0034	CJ70323
Ethyl tertiary-butyl ether	ND (0.0058)		8260B Low		1	10/04/17 17:14	C7J0034	CJ70323
Ethylbenzene	ND (0.0058)		8260B Low		1	10/04/17 17:14	C7J0034	CJ70323
Hexachlorobutadiene	ND (0.0058)		8260B Low		1	10/04/17 17:14	C7J0034	CJ70323
Isopropylbenzene	ND (0.0058)		8260B Low		1	10/04/17 17:14	C7J0034	CJ70323
Methyl tert-Butyl Ether	ND (0.0058)		8260B Low		1	10/04/17 17:14	C7J0034	CJ70323
Methylene Chloride	ND (0.0289)		8260B Low		1	10/04/17 17:14	C7J0034	CJ70323
Naphthalene	ND (0.0058)		8260B Low		1	10/04/17 17:14	C7J0034	CJ70323
n-Butylbenzene	ND (0.0058)		8260B Low		1	10/04/17 17:14	C7J0034	CJ70323
n-Propylbenzene	ND (0.0058)		8260B Low		1	10/04/17 17:14	C7J0034	CJ70323
sec-Butylbenzene	ND (0.0058)		8260B Low		1	10/04/17 17:14	C7J0034	CJ70323
Styrene	ND (0.0058)		8260B Low		1	10/04/17 17:14	C7J0034	CJ70323
tert-Butylbenzene	ND (0.0058)		8260B Low		1	10/04/17 17:14	C7J0034	CJ70323
Tertiary-amyl methyl ether	ND (0.0058)		8260B Low		1	10/04/17 17:14	C7J0034	CJ70323
Tetrachloroethene	ND (0.0058)		8260B Low		1	10/04/17 17:14	C7J0034	CJ70323
Tetrahydrofuran	ND (0.0058)		8260B Low		1	10/04/17 17:14	C7J0034	CJ70323



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-542 (0-2')  
 Date Sampled: 10/02/17 11:00  
 Percent Solids: 96  
 Initial Volume: 4.5  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1710025  
 ESS Laboratory Sample ID: 1710025-03  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0058)		8260B Low		1	10/04/17 17:14	C7J0034	CJ70323
trans-1,2-Dichloroethene	ND (0.0058)		8260B Low		1	10/04/17 17:14	C7J0034	CJ70323
trans-1,3-Dichloropropene	ND (0.0058)		8260B Low		1	10/04/17 17:14	C7J0034	CJ70323
Trichloroethene	ND (0.0058)		8260B Low		1	10/04/17 17:14	C7J0034	CJ70323
Trichlorofluoromethane	ND (0.0058)		8260B Low		1	10/04/17 17:14	C7J0034	CJ70323
Vinyl Acetate	ND (0.0058)		8260B Low		1	10/04/17 17:14	C7J0034	CJ70323
Vinyl Chloride	ND (0.0116)		8260B Low		1	10/04/17 17:14	C7J0034	CJ70323
Xylene O	ND (0.0058)		8260B Low		1	10/04/17 17:14	C7J0034	CJ70323
Xylene P,M	ND (0.0116)		8260B Low		1	10/04/17 17:14	C7J0034	CJ70323
Xylenes (Total)	ND (0.0116)		8260B Low		1	10/04/17 17:14		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	105 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	99 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	102 %		70-130
<i>Surrogate: Toluene-d8</i>	110 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-542 (0-2')  
Date Sampled: 10/02/17 11:00  
Percent Solids: 96  
Initial Volume: 20.4  
Final Volume: 1  
Extraction Method: 3546

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-03  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: SMR  
Prepared: 10/3/17 13:00

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	177 (38.3)		8100M		1	10/05/17 9:45	C7J0068	CJ70310
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		67 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-542 (0-2')  
Date Sampled: 10/02/17 11:00  
Percent Solids: 96  
Initial Volume: 15.3  
Final Volume: 0.5  
Extraction Method: 3546

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-03  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: TJ  
Prepared: 10/3/17 12:30

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.340)		8270D		1	10/04/17 20:02	C7J0049	CJ70309
Acenaphthene	ND (0.340)		8270D		1	10/04/17 20:02	C7J0049	CJ70309
<b>Acenaphthylene</b>	<b>0.425</b> (0.340)		8270D		1	10/04/17 20:02	C7J0049	CJ70309
Anthracene	ND (0.340)		8270D		1	10/04/17 20:02	C7J0049	CJ70309
<b>Benzo(a)anthracene</b>	<b>1.05</b> (0.340)		8270D		1	10/04/17 20:02	C7J0049	CJ70309
<b>Benzo(a)pyrene</b>	<b>0.949</b> (0.171)		8270D		1	10/04/17 20:02	C7J0049	CJ70309
<b>Benzo(b)fluoranthene</b>	<b>1.03</b> (0.340)		8270D		1	10/04/17 20:02	C7J0049	CJ70309
<b>Benzo(g,h,i)perylene</b>	<b>0.459</b> (0.340)		8270D		1	10/04/17 20:02	C7J0049	CJ70309
<b>Benzo(k)fluoranthene</b>	<b>1.03</b> (0.340)		8270D		1	10/04/17 20:02	C7J0049	CJ70309
<b>Chrysene</b>	<b>1.09</b> (0.171)		8270D		1	10/04/17 20:02	C7J0049	CJ70309
<b>Dibenzo(a,h)Anthracene</b>	<b>0.218</b> (0.171)		8270D		1	10/04/17 20:02	C7J0049	CJ70309
<b>Fluoranthene</b>	<b>1.96</b> (0.340)		8270D		1	10/04/17 20:02	C7J0049	CJ70309
Fluorene	ND (0.340)		8270D		1	10/04/17 20:02	C7J0049	CJ70309
<b>Indeno(1,2,3-cd)Pyrene</b>	<b>0.424</b> (0.340)		8270D		1	10/04/17 20:02	C7J0049	CJ70309
Naphthalene	ND (0.340)		8270D		1	10/04/17 20:02	C7J0049	CJ70309
<b>Phenanthrene</b>	<b>1.07</b> (0.340)		8270D		1	10/04/17 20:02	C7J0049	CJ70309
<b>Pyrene</b>	<b>1.60</b> (0.340)		8270D		1	10/04/17 20:02	C7J0049	CJ70309

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	54 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	63 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	59 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	64 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-542 (0-2')  
Date Sampled: 10/02/17 11:00  
Percent Solids: 96

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-03  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	38.5 (10.0)		9014		10	EEM	10/05/17 11:20	mg/kg dry	CJ70513





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-543 (0-2')  
Date Sampled: 10/02/17 11:15  
Percent Solids: 97

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-04  
Sample Matrix: Soil  
Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (1.96)		6020A		20	NAR	10/04/17 17:31	2.1	100	CJ70328
Arsenic	<b>3.18</b> (2.45)		6010C		1	KJK	10/04/17 20:06	2.1	100	CJ70328
Beryllium	<b>0.24</b> (0.11)		6010C		1	KJK	10/04/17 20:06	2.1	100	CJ70328
Cadmium	ND (0.49)		6010C		1	KJK	10/04/17 20:06	2.1	100	CJ70328
Chromium	<b>7.26</b> (0.98)		6010C		1	KJK	10/04/17 20:06	2.1	100	CJ70328
Copper	<b>18.2</b> (2.45)		6010C		1	KJK	10/04/17 20:06	2.1	100	CJ70328
Lead	<b>92.8</b> (4.90)		6010C		1	KJK	10/04/17 20:06	2.1	100	CJ70328
Mercury	<b>0.145</b> (0.024)		7471B		1	MJV	10/04/17 11:35	0.86	40	CJ70303
Nickel	<b>12.2</b> (2.45)		6010C		1	KJK	10/04/17 20:06	2.1	100	CJ70328
Selenium	ND (1.96)		6020A		20	NAR	10/04/17 17:31	2.1	100	CJ70328
Silver	ND (0.49)		6010C		1	KJK	10/04/17 20:06	2.1	100	CJ70328
Thallium	ND (1.96)		6020A		20	NAR	10/04/17 17:31	2.1	100	CJ70328
Zinc	<b>103</b> (2.45)		6010C		1	KJK	10/04/17 20:06	2.1	100	CJ70328



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-543 (0-2')  
Date Sampled: 10/02/17 11:15  
Percent Solids: 97  
Initial Volume: 6.5  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-04  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0040)		8260B Low		1	10/04/17 17:40	C7J0034	CJ70323
1,1,1-Trichloroethane	ND (0.0040)		8260B Low		1	10/04/17 17:40	C7J0034	CJ70323
1,1,2,2-Tetrachloroethane	ND (0.0040)		8260B Low		1	10/04/17 17:40	C7J0034	CJ70323
1,1,2-Trichloroethane	ND (0.0040)		8260B Low		1	10/04/17 17:40	C7J0034	CJ70323
1,1-Dichloroethane	ND (0.0040)		8260B Low		1	10/04/17 17:40	C7J0034	CJ70323
1,1-Dichloroethene	ND (0.0040)		8260B Low		1	10/04/17 17:40	C7J0034	CJ70323
1,1-Dichloropropene	ND (0.0040)		8260B Low		1	10/04/17 17:40	C7J0034	CJ70323
1,2,3-Trichlorobenzene	ND (0.0040)		8260B Low		1	10/04/17 17:40	C7J0034	CJ70323
1,2,3-Trichloropropane	ND (0.0040)		8260B Low		1	10/04/17 17:40	C7J0034	CJ70323
1,2,4-Trichlorobenzene	ND (0.0040)		8260B Low		1	10/04/17 17:40	C7J0034	CJ70323
1,2,4-Trimethylbenzene	ND (0.0040)		8260B Low		1	10/04/17 17:40	C7J0034	CJ70323
1,2-Dibromo-3-Chloropropane	ND (0.0040)		8260B Low		1	10/04/17 17:40	C7J0034	CJ70323
1,2-Dibromoethane	ND (0.0040)		8260B Low		1	10/04/17 17:40	C7J0034	CJ70323
1,2-Dichlorobenzene	ND (0.0040)		8260B Low		1	10/04/17 17:40	C7J0034	CJ70323
1,2-Dichloroethane	ND (0.0040)		8260B Low		1	10/04/17 17:40	C7J0034	CJ70323
1,2-Dichloropropane	ND (0.0040)		8260B Low		1	10/04/17 17:40	C7J0034	CJ70323
1,3,5-Trimethylbenzene	ND (0.0040)		8260B Low		1	10/04/17 17:40	C7J0034	CJ70323
1,3-Dichlorobenzene	ND (0.0040)		8260B Low		1	10/04/17 17:40	C7J0034	CJ70323
1,3-Dichloropropane	ND (0.0040)		8260B Low		1	10/04/17 17:40	C7J0034	CJ70323
1,4-Dichlorobenzene	ND (0.0040)		8260B Low		1	10/04/17 17:40	C7J0034	CJ70323
1,4-Dioxane	ND (0.0792)		8260B Low		1	10/04/17 17:40	C7J0034	CJ70323
1-Chlorohexane	ND (0.0040)		8260B Low		1	10/04/17 17:40	C7J0034	CJ70323
2,2-Dichloropropane	ND (0.0040)		8260B Low		1	10/04/17 17:40	C7J0034	CJ70323
2-Butanone	ND (0.0396)		8260B Low		1	10/04/17 17:40	C7J0034	CJ70323
2-Chlorotoluene	ND (0.0040)		8260B Low		1	10/04/17 17:40	C7J0034	CJ70323
2-Hexanone	ND (0.0396)		8260B Low		1	10/04/17 17:40	C7J0034	CJ70323
4-Chlorotoluene	ND (0.0040)		8260B Low		1	10/04/17 17:40	C7J0034	CJ70323
4-Isopropyltoluene	ND (0.0040)		8260B Low		1	10/04/17 17:40	C7J0034	CJ70323
4-Methyl-2-Pentanone	ND (0.0396)		8260B Low		1	10/04/17 17:40	C7J0034	CJ70323
Acetone	ND (0.0396)		8260B Low		1	10/04/17 17:40	C7J0034	CJ70323
Benzene	ND (0.0040)		8260B Low		1	10/04/17 17:40	C7J0034	CJ70323
Bromobenzene	ND (0.0040)		8260B Low		1	10/04/17 17:40	C7J0034	CJ70323



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-543 (0-2')  
Date Sampled: 10/02/17 11:15  
Percent Solids: 97  
Initial Volume: 6.5  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-04  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0040)		8260B Low		1	10/04/17 17:40	C7J0034	CJ70323
Bromodichloromethane	ND (0.0040)		8260B Low		1	10/04/17 17:40	C7J0034	CJ70323
Bromoform	ND (0.0040)		8260B Low		1	10/04/17 17:40	C7J0034	CJ70323
Bromomethane	ND (0.0079)		8260B Low		1	10/04/17 17:40	C7J0034	CJ70323
Carbon Disulfide	ND (0.0040)		8260B Low		1	10/04/17 17:40	C7J0034	CJ70323
Carbon Tetrachloride	ND (0.0040)		8260B Low		1	10/04/17 17:40	C7J0034	CJ70323
Chlorobenzene	ND (0.0040)		8260B Low		1	10/04/17 17:40	C7J0034	CJ70323
Chloroethane	ND (0.0079)		8260B Low		1	10/04/17 17:40	C7J0034	CJ70323
Chloroform	ND (0.0040)		8260B Low		1	10/04/17 17:40	C7J0034	CJ70323
Chloromethane	ND (0.0079)		8260B Low		1	10/04/17 17:40	C7J0034	CJ70323
cis-1,2-Dichloroethene	ND (0.0040)		8260B Low		1	10/04/17 17:40	C7J0034	CJ70323
cis-1,3-Dichloropropene	ND (0.0040)		8260B Low		1	10/04/17 17:40	C7J0034	CJ70323
Dibromochloromethane	ND (0.0040)		8260B Low		1	10/04/17 17:40	C7J0034	CJ70323
Dibromomethane	ND (0.0040)		8260B Low		1	10/04/17 17:40	C7J0034	CJ70323
Dichlorodifluoromethane	ND (0.0079)		8260B Low		1	10/04/17 17:40	C7J0034	CJ70323
Diethyl Ether	ND (0.0040)		8260B Low		1	10/04/17 17:40	C7J0034	CJ70323
Di-isopropyl ether	ND (0.0040)		8260B Low		1	10/04/17 17:40	C7J0034	CJ70323
Ethyl tertiary-butyl ether	ND (0.0040)		8260B Low		1	10/04/17 17:40	C7J0034	CJ70323
Ethylbenzene	ND (0.0040)		8260B Low		1	10/04/17 17:40	C7J0034	CJ70323
Hexachlorobutadiene	ND (0.0040)		8260B Low		1	10/04/17 17:40	C7J0034	CJ70323
Isopropylbenzene	ND (0.0040)		8260B Low		1	10/04/17 17:40	C7J0034	CJ70323
Methyl tert-Butyl Ether	ND (0.0040)		8260B Low		1	10/04/17 17:40	C7J0034	CJ70323
Methylene Chloride	ND (0.0198)		8260B Low		1	10/04/17 17:40	C7J0034	CJ70323
Naphthalene	ND (0.0040)		8260B Low		1	10/04/17 17:40	C7J0034	CJ70323
n-Butylbenzene	ND (0.0040)		8260B Low		1	10/04/17 17:40	C7J0034	CJ70323
n-Propylbenzene	ND (0.0040)		8260B Low		1	10/04/17 17:40	C7J0034	CJ70323
sec-Butylbenzene	ND (0.0040)		8260B Low		1	10/04/17 17:40	C7J0034	CJ70323
Styrene	ND (0.0040)		8260B Low		1	10/04/17 17:40	C7J0034	CJ70323
tert-Butylbenzene	ND (0.0040)		8260B Low		1	10/04/17 17:40	C7J0034	CJ70323
Tertiary-amyl methyl ether	ND (0.0040)		8260B Low		1	10/04/17 17:40	C7J0034	CJ70323
Tetrachloroethene	ND (0.0040)		8260B Low		1	10/04/17 17:40	C7J0034	CJ70323
Tetrahydrofuran	ND (0.0040)		8260B Low		1	10/04/17 17:40	C7J0034	CJ70323



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-543 (0-2')  
Date Sampled: 10/02/17 11:15  
Percent Solids: 97  
Initial Volume: 6.5  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-04  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0040)		8260B Low		1	10/04/17 17:40	C7J0034	CJ70323
trans-1,2-Dichloroethene	ND (0.0040)		8260B Low		1	10/04/17 17:40	C7J0034	CJ70323
trans-1,3-Dichloropropene	ND (0.0040)		8260B Low		1	10/04/17 17:40	C7J0034	CJ70323
Trichloroethene	ND (0.0040)		8260B Low		1	10/04/17 17:40	C7J0034	CJ70323
Trichlorofluoromethane	ND (0.0040)		8260B Low		1	10/04/17 17:40	C7J0034	CJ70323
Vinyl Acetate	ND (0.0040)		8260B Low		1	10/04/17 17:40	C7J0034	CJ70323
Vinyl Chloride	ND (0.0079)		8260B Low		1	10/04/17 17:40	C7J0034	CJ70323
Xylene O	ND (0.0040)		8260B Low		1	10/04/17 17:40	C7J0034	CJ70323
Xylene P,M	ND (0.0079)		8260B Low		1	10/04/17 17:40	C7J0034	CJ70323
Xylenes (Total)	ND (0.0079)		8260B Low		1	10/04/17 17:40		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>107 %</i>		<i>70-130</i>
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>97 %</i>		<i>70-130</i>
<i>Surrogate: Dibromofluoromethane</i>	<i>102 %</i>		<i>70-130</i>
<i>Surrogate: Toluene-d8</i>	<i>107 %</i>		<i>70-130</i>



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-543 (0-2')  
Date Sampled: 10/02/17 11:15  
Percent Solids: 97  
Initial Volume: 19.4  
Final Volume: 1  
Extraction Method: 3546

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-04  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: SMR  
Prepared: 10/3/17 13:00

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	112 (39.8)		8100M		1	10/05/17 10:20	C7J0068	CJ70310
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		74 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-543 (0-2')  
Date Sampled: 10/02/17 11:15  
Percent Solids: 97  
Initial Volume: 14.8  
Final Volume: 0.5  
Extraction Method: 3546

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-04  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: TJ  
Prepared: 10/3/17 12:30

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.348)		8270D		1	10/04/17 20:37	C7J0049	CJ70309
Acenaphthene	ND (0.348)		8270D		1	10/04/17 20:37	C7J0049	CJ70309
Acenaphthylene	ND (0.348)		8270D		1	10/04/17 20:37	C7J0049	CJ70309
Anthracene	ND (0.348)		8270D		1	10/04/17 20:37	C7J0049	CJ70309
<b>Benzo(a)anthracene</b>	<b>0.765</b> (0.348)		8270D		1	10/04/17 20:37	C7J0049	CJ70309
<b>Benzo(a)pyrene</b>	<b>0.782</b> (0.174)		8270D		1	10/04/17 20:37	C7J0049	CJ70309
<b>Benzo(b)fluoranthene</b>	<b>0.946</b> (0.348)		8270D		1	10/04/17 20:37	C7J0049	CJ70309
<b>Benzo(g,h,i)perylene</b>	<b>0.375</b> (0.348)		8270D		1	10/04/17 20:37	C7J0049	CJ70309
<b>Benzo(k)fluoranthene</b>	<b>0.745</b> (0.348)		8270D		1	10/04/17 20:37	C7J0049	CJ70309
<b>Chrysene</b>	<b>0.771</b> (0.174)		8270D		1	10/04/17 20:37	C7J0049	CJ70309
<b>Dibenzo(a,h)Anthracene</b>	<b>0.180</b> (0.174)		8270D		1	10/04/17 20:37	C7J0049	CJ70309
<b>Fluoranthene</b>	<b>1.49</b> (0.348)		8270D		1	10/04/17 20:37	C7J0049	CJ70309
Fluorene	ND (0.348)		8270D		1	10/04/17 20:37	C7J0049	CJ70309
<b>Indeno(1,2,3-cd)Pyrene</b>	<b>0.356</b> (0.348)		8270D		1	10/04/17 20:37	C7J0049	CJ70309
Naphthalene	ND (0.348)		8270D		1	10/04/17 20:37	C7J0049	CJ70309
<b>Phenanthrene</b>	<b>0.573</b> (0.348)		8270D		1	10/04/17 20:37	C7J0049	CJ70309
<b>Pyrene</b>	<b>1.12</b> (0.348)		8270D		1	10/04/17 20:37	C7J0049	CJ70309

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	53 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	62 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	56 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	66 %		30-130





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-543 (0-2')  
Date Sampled: 10/02/17 11:15  
Percent Solids: 97

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-04  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	7.50 (1.02)		9014		1	EEM	10/05/17 11:20	mg/kg dry	CJ70513



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-544 (0-2')  
Date Sampled: 10/02/17 11:25  
Percent Solids: 97

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-05  
Sample Matrix: Soil  
Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (1.59)		6020A		20	NAR	10/04/17 17:37	2.59	100	CJ70328
Arsenic	4.77 (1.99)		6010C		1	KJK	10/04/17 20:10	2.59	100	CJ70328
Beryllium	0.10 (0.09)		6010C		1	KJK	10/04/17 20:10	2.59	100	CJ70328
Cadmium	ND (0.40)		6010C		1	KJK	10/04/17 20:10	2.59	100	CJ70328
Chromium	10.9 (0.80)		6010C		1	KJK	10/04/17 20:10	2.59	100	CJ70328
Copper	15.2 (1.99)		6010C		1	KJK	10/04/17 20:10	2.59	100	CJ70328
Lead	61.8 (3.98)		6010C		1	KJK	10/04/17 20:10	2.59	100	CJ70328
Mercury	0.142 (0.029)		7471B		1	MJV	10/04/17 11:36	0.7	40	CJ70303
Nickel	8.35 (1.99)		6010C		1	KJK	10/04/17 20:10	2.59	100	CJ70328
Selenium	ND (1.59)		6020A		20	NAR	10/04/17 17:37	2.59	100	CJ70328
Silver	ND (0.40)		6010C		1	KJK	10/04/17 20:10	2.59	100	CJ70328
Thallium	ND (1.59)		6020A		20	NAR	10/04/17 17:37	2.59	100	CJ70328
Zinc	27.0 (1.99)		6010C		1	KJK	10/04/17 20:10	2.59	100	CJ70328



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-544 (0-2')  
Date Sampled: 10/02/17 11:25  
Percent Solids: 97  
Initial Volume: 7.2  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-05  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0036)		8260B Low		1	10/04/17 18:05	C7J0034	CJ70323
1,1,1-Trichloroethane	ND (0.0036)		8260B Low		1	10/04/17 18:05	C7J0034	CJ70323
1,1,2,2-Tetrachloroethane	ND (0.0036)		8260B Low		1	10/04/17 18:05	C7J0034	CJ70323
1,1,2-Trichloroethane	ND (0.0036)		8260B Low		1	10/04/17 18:05	C7J0034	CJ70323
1,1-Dichloroethane	ND (0.0036)		8260B Low		1	10/04/17 18:05	C7J0034	CJ70323
1,1-Dichloroethene	ND (0.0036)		8260B Low		1	10/04/17 18:05	C7J0034	CJ70323
1,1-Dichloropropene	ND (0.0036)		8260B Low		1	10/04/17 18:05	C7J0034	CJ70323
1,2,3-Trichlorobenzene	ND (0.0036)		8260B Low		1	10/04/17 18:05	C7J0034	CJ70323
1,2,3-Trichloropropane	ND (0.0036)		8260B Low		1	10/04/17 18:05	C7J0034	CJ70323
1,2,4-Trichlorobenzene	ND (0.0036)		8260B Low		1	10/04/17 18:05	C7J0034	CJ70323
1,2,4-Trimethylbenzene	ND (0.0036)		8260B Low		1	10/04/17 18:05	C7J0034	CJ70323
1,2-Dibromo-3-Chloropropane	ND (0.0036)		8260B Low		1	10/04/17 18:05	C7J0034	CJ70323
1,2-Dibromoethane	ND (0.0036)		8260B Low		1	10/04/17 18:05	C7J0034	CJ70323
1,2-Dichlorobenzene	ND (0.0036)		8260B Low		1	10/04/17 18:05	C7J0034	CJ70323
1,2-Dichloroethane	ND (0.0036)		8260B Low		1	10/04/17 18:05	C7J0034	CJ70323
1,2-Dichloropropane	ND (0.0036)		8260B Low		1	10/04/17 18:05	C7J0034	CJ70323
1,3,5-Trimethylbenzene	ND (0.0036)		8260B Low		1	10/04/17 18:05	C7J0034	CJ70323
1,3-Dichlorobenzene	ND (0.0036)		8260B Low		1	10/04/17 18:05	C7J0034	CJ70323
1,3-Dichloropropane	ND (0.0036)		8260B Low		1	10/04/17 18:05	C7J0034	CJ70323
1,4-Dichlorobenzene	ND (0.0036)		8260B Low		1	10/04/17 18:05	C7J0034	CJ70323
1,4-Dioxane	ND (0.0716)		8260B Low		1	10/04/17 18:05	C7J0034	CJ70323
1-Chlorohexane	ND (0.0036)		8260B Low		1	10/04/17 18:05	C7J0034	CJ70323
2,2-Dichloropropane	ND (0.0036)		8260B Low		1	10/04/17 18:05	C7J0034	CJ70323
2-Butanone	ND (0.0358)		8260B Low		1	10/04/17 18:05	C7J0034	CJ70323
2-Chlorotoluene	ND (0.0036)		8260B Low		1	10/04/17 18:05	C7J0034	CJ70323
2-Hexanone	ND (0.0358)		8260B Low		1	10/04/17 18:05	C7J0034	CJ70323
4-Chlorotoluene	ND (0.0036)		8260B Low		1	10/04/17 18:05	C7J0034	CJ70323
4-Isopropyltoluene	ND (0.0036)		8260B Low		1	10/04/17 18:05	C7J0034	CJ70323
4-Methyl-2-Pentanone	ND (0.0358)		8260B Low		1	10/04/17 18:05	C7J0034	CJ70323
Acetone	ND (0.0358)		8260B Low		1	10/04/17 18:05	C7J0034	CJ70323
Benzene	ND (0.0036)		8260B Low		1	10/04/17 18:05	C7J0034	CJ70323
Bromobenzene	ND (0.0036)		8260B Low		1	10/04/17 18:05	C7J0034	CJ70323



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-544 (0-2')  
Date Sampled: 10/02/17 11:25  
Percent Solids: 97  
Initial Volume: 7.2  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-05  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0036)		8260B Low		1	10/04/17 18:05	C7J0034	CJ70323
Bromodichloromethane	ND (0.0036)		8260B Low		1	10/04/17 18:05	C7J0034	CJ70323
Bromoform	ND (0.0036)		8260B Low		1	10/04/17 18:05	C7J0034	CJ70323
Bromomethane	ND (0.0072)		8260B Low		1	10/04/17 18:05	C7J0034	CJ70323
Carbon Disulfide	ND (0.0036)		8260B Low		1	10/04/17 18:05	C7J0034	CJ70323
Carbon Tetrachloride	ND (0.0036)		8260B Low		1	10/04/17 18:05	C7J0034	CJ70323
Chlorobenzene	ND (0.0036)		8260B Low		1	10/04/17 18:05	C7J0034	CJ70323
Chloroethane	ND (0.0072)		8260B Low		1	10/04/17 18:05	C7J0034	CJ70323
Chloroform	ND (0.0036)		8260B Low		1	10/04/17 18:05	C7J0034	CJ70323
Chloromethane	ND (0.0072)		8260B Low		1	10/04/17 18:05	C7J0034	CJ70323
cis-1,2-Dichloroethene	ND (0.0036)		8260B Low		1	10/04/17 18:05	C7J0034	CJ70323
cis-1,3-Dichloropropene	ND (0.0036)		8260B Low		1	10/04/17 18:05	C7J0034	CJ70323
Dibromochloromethane	ND (0.0036)		8260B Low		1	10/04/17 18:05	C7J0034	CJ70323
Dibromomethane	ND (0.0036)		8260B Low		1	10/04/17 18:05	C7J0034	CJ70323
Dichlorodifluoromethane	ND (0.0072)		8260B Low		1	10/04/17 18:05	C7J0034	CJ70323
Diethyl Ether	ND (0.0036)		8260B Low		1	10/04/17 18:05	C7J0034	CJ70323
Di-isopropyl ether	ND (0.0036)		8260B Low		1	10/04/17 18:05	C7J0034	CJ70323
Ethyl tertiary-butyl ether	ND (0.0036)		8260B Low		1	10/04/17 18:05	C7J0034	CJ70323
Ethylbenzene	ND (0.0036)		8260B Low		1	10/04/17 18:05	C7J0034	CJ70323
Hexachlorobutadiene	ND (0.0036)		8260B Low		1	10/04/17 18:05	C7J0034	CJ70323
Isopropylbenzene	ND (0.0036)		8260B Low		1	10/04/17 18:05	C7J0034	CJ70323
Methyl tert-Butyl Ether	ND (0.0036)		8260B Low		1	10/04/17 18:05	C7J0034	CJ70323
Methylene Chloride	ND (0.0179)		8260B Low		1	10/04/17 18:05	C7J0034	CJ70323
Naphthalene	ND (0.0036)		8260B Low		1	10/04/17 18:05	C7J0034	CJ70323
n-Butylbenzene	ND (0.0036)		8260B Low		1	10/04/17 18:05	C7J0034	CJ70323
n-Propylbenzene	ND (0.0036)		8260B Low		1	10/04/17 18:05	C7J0034	CJ70323
sec-Butylbenzene	ND (0.0036)		8260B Low		1	10/04/17 18:05	C7J0034	CJ70323
Styrene	ND (0.0036)		8260B Low		1	10/04/17 18:05	C7J0034	CJ70323
tert-Butylbenzene	ND (0.0036)		8260B Low		1	10/04/17 18:05	C7J0034	CJ70323
Tertiary-amyl methyl ether	ND (0.0036)		8260B Low		1	10/04/17 18:05	C7J0034	CJ70323
Tetrachloroethene	ND (0.0036)		8260B Low		1	10/04/17 18:05	C7J0034	CJ70323
Tetrahydrofuran	ND (0.0036)		8260B Low		1	10/04/17 18:05	C7J0034	CJ70323



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-544 (0-2')  
Date Sampled: 10/02/17 11:25  
Percent Solids: 97  
Initial Volume: 7.2  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-05  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0036)		8260B Low		1	10/04/17 18:05	C7J0034	CJ70323
trans-1,2-Dichloroethene	ND (0.0036)		8260B Low		1	10/04/17 18:05	C7J0034	CJ70323
trans-1,3-Dichloropropene	ND (0.0036)		8260B Low		1	10/04/17 18:05	C7J0034	CJ70323
Trichloroethene	ND (0.0036)		8260B Low		1	10/04/17 18:05	C7J0034	CJ70323
Trichlorofluoromethane	ND (0.0036)		8260B Low		1	10/04/17 18:05	C7J0034	CJ70323
Vinyl Acetate	ND (0.0036)		8260B Low		1	10/04/17 18:05	C7J0034	CJ70323
Vinyl Chloride	ND (0.0072)		8260B Low		1	10/04/17 18:05	C7J0034	CJ70323
Xylene O	ND (0.0036)		8260B Low		1	10/04/17 18:05	C7J0034	CJ70323
Xylene P,M	ND (0.0072)		8260B Low		1	10/04/17 18:05	C7J0034	CJ70323
Xylenes (Total)	ND (0.0072)		8260B Low		1	10/04/17 18:05		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>109 %</i>		<i>70-130</i>
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>97 %</i>		<i>70-130</i>
<i>Surrogate: Dibromofluoromethane</i>	<i>104 %</i>		<i>70-130</i>
<i>Surrogate: Toluene-d8</i>	<i>110 %</i>		<i>70-130</i>



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-544 (0-2')  
Date Sampled: 10/02/17 11:25  
Percent Solids: 97  
Initial Volume: 19.8  
Final Volume: 1  
Extraction Method: 3546

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-05  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: SMR  
Prepared: 10/3/17 13:00

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	136 (39.1)		8100M		1	10/05/17 10:56	C7J0068	CJ70310
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		65 %		40-140				





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-544 (0-2')  
Date Sampled: 10/02/17 11:25  
Percent Solids: 97  
Initial Volume: 14.9  
Final Volume: 0.5  
Extraction Method: 3546

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-05  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: TJ  
Prepared: 10/3/17 12:30

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.346)		8270D		1	10/04/17 21:13	C7J0049	CJ70309
Acenaphthene	ND (0.346)		8270D		1	10/04/17 21:13	C7J0049	CJ70309
Acenaphthylene	ND (0.346)		8270D		1	10/04/17 21:13	C7J0049	CJ70309
<b>Anthracene</b>	<b>0.389</b> (0.346)		8270D		1	10/04/17 21:13	C7J0049	CJ70309
<b>Benzo(a)anthracene</b>	<b>1.28</b> (0.346)		8270D		1	10/04/17 21:13	C7J0049	CJ70309
<b>Benzo(a)pyrene</b>	<b>1.13</b> (0.173)		8270D		1	10/04/17 21:13	C7J0049	CJ70309
<b>Benzo(b)fluoranthene</b>	<b>1.58</b> (0.346)		8270D		1	10/04/17 21:13	C7J0049	CJ70309
<b>Benzo(g,h,i)perylene</b>	<b>0.556</b> (0.346)		8270D		1	10/04/17 21:13	C7J0049	CJ70309
<b>Benzo(k)fluoranthene</b>	<b>1.21</b> (0.346)		8270D		1	10/04/17 21:13	C7J0049	CJ70309
<b>Chrysene</b>	<b>1.38</b> (0.173)		8270D		1	10/04/17 21:13	C7J0049	CJ70309
<b>Dibenzo(a,h)Anthracene</b>	<b>0.283</b> (0.173)		8270D		1	10/04/17 21:13	C7J0049	CJ70309
<b>Fluoranthene</b>	<b>2.62</b> (0.346)		8270D		1	10/04/17 21:13	C7J0049	CJ70309
Fluorene	ND (0.346)		8270D		1	10/04/17 21:13	C7J0049	CJ70309
<b>Indeno(1,2,3-cd)Pyrene</b>	<b>0.544</b> (0.346)		8270D		1	10/04/17 21:13	C7J0049	CJ70309
Naphthalene	ND (0.346)		8270D		1	10/04/17 21:13	C7J0049	CJ70309
<b>Phenanthrene</b>	<b>1.53</b> (0.346)		8270D		1	10/04/17 21:13	C7J0049	CJ70309
<b>Pyrene</b>	<b>1.89</b> (0.346)		8270D		1	10/04/17 21:13	C7J0049	CJ70309

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	48 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	56 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	52 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	58 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-544 (0-2')  
Date Sampled: 10/02/17 11:25  
Percent Solids: 97

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-05  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	94.6 (9.96)		9014		10	EEM	10/05/17 11:20	mg/kg dry	CJ70513



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-545 (0-2')  
Date Sampled: 10/02/17 11:45  
Percent Solids: 94

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-06  
Sample Matrix: Soil  
Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (2.07)		6020A		20	NAR	10/04/17 17:43	2.06	100	CJ70328
Arsenic	<b>5.60</b> (2.59)		6010C		1	KJK	10/04/17 20:26	2.06	100	CJ70328
Beryllium	<b>0.20</b> (0.11)		6010C		1	KJK	10/04/17 20:26	2.06	100	CJ70328
Cadmium	<b>0.92</b> (0.52)		6010C		1	KJK	10/04/17 20:26	2.06	100	CJ70328
Chromium	<b>10.5</b> (1.03)		6010C		1	KJK	10/04/17 20:26	2.06	100	CJ70328
Copper	<b>67.8</b> (2.59)		6010C		1	KJK	10/04/17 20:26	2.06	100	CJ70328
Lead	<b>208</b> (5.17)		6010C		1	KJK	10/04/17 20:26	2.06	100	CJ70328
Mercury	<b>0.824</b> (0.160)		7471B		5	MJV	10/04/17 12:58	0.66	40	CJ70303
Nickel	<b>47.3</b> (2.59)		6010C		1	KJK	10/04/17 20:26	2.06	100	CJ70328
Selenium	ND (2.07)		6020A		20	NAR	10/04/17 17:43	2.06	100	CJ70328
Silver	ND (0.52)		6010C		1	KJK	10/04/17 20:26	2.06	100	CJ70328
Thallium	ND (2.07)		6020A		20	NAR	10/04/17 17:43	2.06	100	CJ70328
Zinc	<b>114</b> (2.59)		6010C		1	KJK	10/04/17 20:26	2.06	100	CJ70328



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-545 (0-2')  
Date Sampled: 10/02/17 11:45  
Percent Solids: 94  
Initial Volume: 6  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-06  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0044)		8260B Low		1	10/04/17 18:31	C7J0034	CJ70323
1,1,1-Trichloroethane	ND (0.0044)		8260B Low		1	10/04/17 18:31	C7J0034	CJ70323
1,1,2,2-Tetrachloroethane	ND (0.0044)		8260B Low		1	10/04/17 18:31	C7J0034	CJ70323
1,1,2-Trichloroethane	ND (0.0044)		8260B Low		1	10/04/17 18:31	C7J0034	CJ70323
1,1-Dichloroethane	ND (0.0044)		8260B Low		1	10/04/17 18:31	C7J0034	CJ70323
1,1-Dichloroethene	ND (0.0044)		8260B Low		1	10/04/17 18:31	C7J0034	CJ70323
1,1-Dichloropropene	ND (0.0044)		8260B Low		1	10/04/17 18:31	C7J0034	CJ70323
1,2,3-Trichlorobenzene	ND (0.0044)		8260B Low		1	10/04/17 18:31	C7J0034	CJ70323
1,2,3-Trichloropropane	ND (0.0044)		8260B Low		1	10/04/17 18:31	C7J0034	CJ70323
1,2,4-Trichlorobenzene	ND (0.0044)		8260B Low		1	10/04/17 18:31	C7J0034	CJ70323
1,2,4-Trimethylbenzene	ND (0.0044)		8260B Low		1	10/04/17 18:31	C7J0034	CJ70323
1,2-Dibromo-3-Chloropropane	ND (0.0044)		8260B Low		1	10/04/17 18:31	C7J0034	CJ70323
1,2-Dibromoethane	ND (0.0044)		8260B Low		1	10/04/17 18:31	C7J0034	CJ70323
1,2-Dichlorobenzene	ND (0.0044)		8260B Low		1	10/04/17 18:31	C7J0034	CJ70323
1,2-Dichloroethane	ND (0.0044)		8260B Low		1	10/04/17 18:31	C7J0034	CJ70323
1,2-Dichloropropane	ND (0.0044)		8260B Low		1	10/04/17 18:31	C7J0034	CJ70323
1,3,5-Trimethylbenzene	ND (0.0044)		8260B Low		1	10/04/17 18:31	C7J0034	CJ70323
1,3-Dichlorobenzene	ND (0.0044)		8260B Low		1	10/04/17 18:31	C7J0034	CJ70323
1,3-Dichloropropane	ND (0.0044)		8260B Low		1	10/04/17 18:31	C7J0034	CJ70323
1,4-Dichlorobenzene	ND (0.0044)		8260B Low		1	10/04/17 18:31	C7J0034	CJ70323
1,4-Dioxane	ND (0.0888)		8260B Low		1	10/04/17 18:31	C7J0034	CJ70323
1-Chlorohexane	ND (0.0044)		8260B Low		1	10/04/17 18:31	C7J0034	CJ70323
2,2-Dichloropropane	ND (0.0044)		8260B Low		1	10/04/17 18:31	C7J0034	CJ70323
2-Butanone	ND (0.0444)		8260B Low		1	10/04/17 18:31	C7J0034	CJ70323
2-Chlorotoluene	ND (0.0044)		8260B Low		1	10/04/17 18:31	C7J0034	CJ70323
2-Hexanone	ND (0.0444)		8260B Low		1	10/04/17 18:31	C7J0034	CJ70323
4-Chlorotoluene	ND (0.0044)		8260B Low		1	10/04/17 18:31	C7J0034	CJ70323
4-Isopropyltoluene	ND (0.0044)		8260B Low		1	10/04/17 18:31	C7J0034	CJ70323
4-Methyl-2-Pentanone	ND (0.0444)		8260B Low		1	10/04/17 18:31	C7J0034	CJ70323
Acetone	ND (0.0444)		8260B Low		1	10/04/17 18:31	C7J0034	CJ70323
Benzene	ND (0.0044)		8260B Low		1	10/04/17 18:31	C7J0034	CJ70323
Bromobenzene	ND (0.0044)		8260B Low		1	10/04/17 18:31	C7J0034	CJ70323



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-545 (0-2')  
Date Sampled: 10/02/17 11:45  
Percent Solids: 94  
Initial Volume: 6  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-06  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0044)		8260B Low		1	10/04/17 18:31	C7J0034	CJ70323
Bromodichloromethane	ND (0.0044)		8260B Low		1	10/04/17 18:31	C7J0034	CJ70323
Bromoform	ND (0.0044)		8260B Low		1	10/04/17 18:31	C7J0034	CJ70323
Bromomethane	ND (0.0089)		8260B Low		1	10/04/17 18:31	C7J0034	CJ70323
Carbon Disulfide	ND (0.0044)		8260B Low		1	10/04/17 18:31	C7J0034	CJ70323
Carbon Tetrachloride	ND (0.0044)		8260B Low		1	10/04/17 18:31	C7J0034	CJ70323
Chlorobenzene	ND (0.0044)		8260B Low		1	10/04/17 18:31	C7J0034	CJ70323
Chloroethane	ND (0.0089)		8260B Low		1	10/04/17 18:31	C7J0034	CJ70323
Chloroform	ND (0.0044)		8260B Low		1	10/04/17 18:31	C7J0034	CJ70323
Chloromethane	ND (0.0089)		8260B Low		1	10/04/17 18:31	C7J0034	CJ70323
cis-1,2-Dichloroethene	ND (0.0044)		8260B Low		1	10/04/17 18:31	C7J0034	CJ70323
cis-1,3-Dichloropropene	ND (0.0044)		8260B Low		1	10/04/17 18:31	C7J0034	CJ70323
Dibromochloromethane	ND (0.0044)		8260B Low		1	10/04/17 18:31	C7J0034	CJ70323
Dibromomethane	ND (0.0044)		8260B Low		1	10/04/17 18:31	C7J0034	CJ70323
Dichlorodifluoromethane	ND (0.0089)		8260B Low		1	10/04/17 18:31	C7J0034	CJ70323
Diethyl Ether	ND (0.0044)		8260B Low		1	10/04/17 18:31	C7J0034	CJ70323
Di-isopropyl ether	ND (0.0044)		8260B Low		1	10/04/17 18:31	C7J0034	CJ70323
Ethyl tertiary-butyl ether	ND (0.0044)		8260B Low		1	10/04/17 18:31	C7J0034	CJ70323
Ethylbenzene	ND (0.0044)		8260B Low		1	10/04/17 18:31	C7J0034	CJ70323
Hexachlorobutadiene	ND (0.0044)		8260B Low		1	10/04/17 18:31	C7J0034	CJ70323
Isopropylbenzene	ND (0.0044)		8260B Low		1	10/04/17 18:31	C7J0034	CJ70323
Methyl tert-Butyl Ether	ND (0.0044)		8260B Low		1	10/04/17 18:31	C7J0034	CJ70323
Methylene Chloride	ND (0.0222)		8260B Low		1	10/04/17 18:31	C7J0034	CJ70323
Naphthalene	ND (0.0044)		8260B Low		1	10/04/17 18:31	C7J0034	CJ70323
n-Butylbenzene	ND (0.0044)		8260B Low		1	10/04/17 18:31	C7J0034	CJ70323
n-Propylbenzene	ND (0.0044)		8260B Low		1	10/04/17 18:31	C7J0034	CJ70323
sec-Butylbenzene	ND (0.0044)		8260B Low		1	10/04/17 18:31	C7J0034	CJ70323
Styrene	ND (0.0044)		8260B Low		1	10/04/17 18:31	C7J0034	CJ70323
tert-Butylbenzene	ND (0.0044)		8260B Low		1	10/04/17 18:31	C7J0034	CJ70323
Tertiary-amyl methyl ether	ND (0.0044)		8260B Low		1	10/04/17 18:31	C7J0034	CJ70323
Tetrachloroethene	ND (0.0044)		8260B Low		1	10/04/17 18:31	C7J0034	CJ70323
Tetrahydrofuran	ND (0.0044)		8260B Low		1	10/04/17 18:31	C7J0034	CJ70323



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-545 (0-2')  
 Date Sampled: 10/02/17 11:45  
 Percent Solids: 94  
 Initial Volume: 6  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1710025  
 ESS Laboratory Sample ID: 1710025-06  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0044)		8260B Low		1	10/04/17 18:31	C7J0034	CJ70323
trans-1,2-Dichloroethene	ND (0.0044)		8260B Low		1	10/04/17 18:31	C7J0034	CJ70323
trans-1,3-Dichloropropene	ND (0.0044)		8260B Low		1	10/04/17 18:31	C7J0034	CJ70323
Trichloroethene	ND (0.0044)		8260B Low		1	10/04/17 18:31	C7J0034	CJ70323
Trichlorofluoromethane	ND (0.0044)		8260B Low		1	10/04/17 18:31	C7J0034	CJ70323
Vinyl Acetate	ND (0.0044)		8260B Low		1	10/04/17 18:31	C7J0034	CJ70323
Vinyl Chloride	ND (0.0089)		8260B Low		1	10/04/17 18:31	C7J0034	CJ70323
Xylene O	ND (0.0044)		8260B Low		1	10/04/17 18:31	C7J0034	CJ70323
Xylene P,M	ND (0.0089)		8260B Low		1	10/04/17 18:31	C7J0034	CJ70323
Xylenes (Total)	ND (0.0089)		8260B Low		1	10/04/17 18:31		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	113 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	90 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	105 %		70-130
<i>Surrogate: Toluene-d8</i>	114 %		70-130





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-545 (0-2')  
Date Sampled: 10/02/17 11:45  
Percent Solids: 94  
Initial Volume: 19.8  
Final Volume: 1  
Extraction Method: 3546

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-06  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: SMR  
Prepared: 10/3/17 13:00

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	2990 (403)		8100M		10	10/06/17 15:03	C7J0111	CJ70310
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		100 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-545 (0-2')  
 Date Sampled: 10/02/17 11:45  
 Percent Solids: 94  
 Initial Volume: 14.9  
 Final Volume: 1  
 Extraction Method: 3546

ESS Laboratory Work Order: 1710025  
 ESS Laboratory Sample ID: 1710025-06  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: TJ  
 Prepared: 10/3/17 12:30

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	10.3 (0.714)		8270D		1	10/04/17 21:48	C7J0049	CJ70309
Acenaphthene	1.77 (0.714)		8270D		1	10/04/17 21:48	C7J0049	CJ70309
Acenaphthylene	17.6 (0.714)		8270D		1	10/04/17 21:48	C7J0049	CJ70309
Anthracene	12.1 (0.714)		8270D		1	10/04/17 21:48	C7J0049	CJ70309
Benzo(a)anthracene	44.4 (7.14)		8270D		10	10/05/17 19:04	C7J0049	CJ70309
Benzo(a)pyrene	32.4 (3.58)		8270D		10	10/05/17 19:04	C7J0049	CJ70309
Benzo(b)fluoranthene	22.7 (7.14)		8270D		10	10/05/17 19:04	C7J0049	CJ70309
Benzo(g,h,i)perylene	17.7 (0.714)		8270D		1	10/04/17 21:48	C7J0049	CJ70309
Benzo(k)fluoranthene	30.8 (7.14)		8270D		10	10/05/17 19:04	C7J0049	CJ70309
Chrysene	48.1 (3.58)		8270D		10	10/05/17 19:04	C7J0049	CJ70309
Dibenzo(a,h)Anthracene	8.79 (0.358)		8270D		1	10/04/17 21:48	C7J0049	CJ70309
Fluoranthene	60.3 (7.14)		8270D		10	10/05/17 19:04	C7J0049	CJ70309
Fluorene	9.04 (0.714)		8270D		1	10/04/17 21:48	C7J0049	CJ70309
Indeno(1,2,3-cd)Pyrene	15.6 (0.714)		8270D		1	10/04/17 21:48	C7J0049	CJ70309
Naphthalene	14.4 (0.714)		8270D		1	10/04/17 21:48	C7J0049	CJ70309
Phenanthrene	53.7 (7.14)		8270D		10	10/05/17 19:04	C7J0049	CJ70309
Pyrene	62.5 (7.14)		8270D		10	10/05/17 19:04	C7J0049	CJ70309

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	75 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	79 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	81 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	136 %	IM	30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-545 (0-2')  
Date Sampled: 10/02/17 11:45  
Percent Solids: 94

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-06  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	143 (10.5)		9014		10	EEM	10/05/17 11:20	mg/kg dry	CJ70513



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-546 (0-2')  
Date Sampled: 10/02/17 11:55  
Percent Solids: 90

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-07  
Sample Matrix: Soil  
Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (1.71)		6020A		20	NAR	10/04/17 17:49	2.59	100	CJ70328
Arsenic	<b>2.44</b> (2.13)		6010C		1	KJK	10/04/17 20:30	2.59	100	CJ70328
Beryllium	ND (0.09)		6010C		1	KJK	10/04/17 20:30	2.59	100	CJ70328
Cadmium	ND (0.43)		6010C		1	KJK	10/04/17 20:30	2.59	100	CJ70328
Chromium	<b>8.22</b> (0.85)		6010C		1	KJK	10/04/17 20:30	2.59	100	CJ70328
Copper	<b>17.0</b> (2.13)		6010C		1	KJK	10/04/17 20:30	2.59	100	CJ70328
Lead	<b>112</b> (4.27)		6010C		1	KJK	10/04/17 20:30	2.59	100	CJ70328
Mercury	<b>0.180</b> (0.034)		7471B		1	MJV	10/04/17 11:40	0.64	40	CJ70303
Nickel	<b>7.92</b> (2.13)		6010C		1	KJK	10/04/17 20:30	2.59	100	CJ70328
Selenium	ND (1.71)		6020A		20	NAR	10/04/17 17:49	2.59	100	CJ70328
Silver	ND (0.43)		6010C		1	KJK	10/04/17 20:30	2.59	100	CJ70328
Thallium	ND (1.71)		6020A		20	NAR	10/04/17 17:49	2.59	100	CJ70328
Zinc	<b>45.2</b> (2.13)		6010C		1	KJK	10/04/17 20:30	2.59	100	CJ70328



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-546 (0-2')  
Date Sampled: 10/02/17 11:55  
Percent Solids: 90  
Initial Volume: 6.7  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-07  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0041)		8260B Low		1	10/04/17 18:56	C7J0034	CJ70323
1,1,1-Trichloroethane	ND (0.0041)		8260B Low		1	10/04/17 18:56	C7J0034	CJ70323
1,1,2,2-Tetrachloroethane	ND (0.0041)		8260B Low		1	10/04/17 18:56	C7J0034	CJ70323
1,1,2-Trichloroethane	ND (0.0041)		8260B Low		1	10/04/17 18:56	C7J0034	CJ70323
1,1-Dichloroethane	ND (0.0041)		8260B Low		1	10/04/17 18:56	C7J0034	CJ70323
1,1-Dichloroethene	ND (0.0041)		8260B Low		1	10/04/17 18:56	C7J0034	CJ70323
1,1-Dichloropropene	ND (0.0041)		8260B Low		1	10/04/17 18:56	C7J0034	CJ70323
1,2,3-Trichlorobenzene	ND (0.0041)		8260B Low		1	10/04/17 18:56	C7J0034	CJ70323
1,2,3-Trichloropropane	ND (0.0041)		8260B Low		1	10/04/17 18:56	C7J0034	CJ70323
1,2,4-Trichlorobenzene	ND (0.0041)		8260B Low		1	10/04/17 18:56	C7J0034	CJ70323
1,2,4-Trimethylbenzene	ND (0.0041)		8260B Low		1	10/04/17 18:56	C7J0034	CJ70323
1,2-Dibromo-3-Chloropropane	ND (0.0041)		8260B Low		1	10/04/17 18:56	C7J0034	CJ70323
1,2-Dibromoethane	ND (0.0041)		8260B Low		1	10/04/17 18:56	C7J0034	CJ70323
1,2-Dichlorobenzene	ND (0.0041)		8260B Low		1	10/04/17 18:56	C7J0034	CJ70323
1,2-Dichloroethane	ND (0.0041)		8260B Low		1	10/04/17 18:56	C7J0034	CJ70323
1,2-Dichloropropane	ND (0.0041)		8260B Low		1	10/04/17 18:56	C7J0034	CJ70323
1,3,5-Trimethylbenzene	ND (0.0041)		8260B Low		1	10/04/17 18:56	C7J0034	CJ70323
1,3-Dichlorobenzene	ND (0.0041)		8260B Low		1	10/04/17 18:56	C7J0034	CJ70323
1,3-Dichloropropane	ND (0.0041)		8260B Low		1	10/04/17 18:56	C7J0034	CJ70323
1,4-Dichlorobenzene	ND (0.0041)		8260B Low		1	10/04/17 18:56	C7J0034	CJ70323
1,4-Dioxane	ND (0.0825)		8260B Low		1	10/04/17 18:56	C7J0034	CJ70323
1-Chlorohexane	ND (0.0041)		8260B Low		1	10/04/17 18:56	C7J0034	CJ70323
2,2-Dichloropropane	ND (0.0041)		8260B Low		1	10/04/17 18:56	C7J0034	CJ70323
2-Butanone	ND (0.0412)		8260B Low		1	10/04/17 18:56	C7J0034	CJ70323
2-Chlorotoluene	ND (0.0041)		8260B Low		1	10/04/17 18:56	C7J0034	CJ70323
2-Hexanone	ND (0.0412)		8260B Low		1	10/04/17 18:56	C7J0034	CJ70323
4-Chlorotoluene	ND (0.0041)		8260B Low		1	10/04/17 18:56	C7J0034	CJ70323
4-Isopropyltoluene	ND (0.0041)		8260B Low		1	10/04/17 18:56	C7J0034	CJ70323
4-Methyl-2-Pentanone	ND (0.0412)		8260B Low		1	10/04/17 18:56	C7J0034	CJ70323
Acetone	ND (0.0412)		8260B Low		1	10/04/17 18:56	C7J0034	CJ70323
Benzene	ND (0.0041)		8260B Low		1	10/04/17 18:56	C7J0034	CJ70323
Bromobenzene	ND (0.0041)		8260B Low		1	10/04/17 18:56	C7J0034	CJ70323



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-546 (0-2')  
 Date Sampled: 10/02/17 11:55  
 Percent Solids: 90  
 Initial Volume: 6.7  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1710025  
 ESS Laboratory Sample ID: 1710025-07  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0041)		8260B Low		1	10/04/17 18:56	C7J0034	CJ70323
Bromodichloromethane	ND (0.0041)		8260B Low		1	10/04/17 18:56	C7J0034	CJ70323
Bromoform	ND (0.0041)		8260B Low		1	10/04/17 18:56	C7J0034	CJ70323
Bromomethane	ND (0.0082)		8260B Low		1	10/04/17 18:56	C7J0034	CJ70323
Carbon Disulfide	ND (0.0041)		8260B Low		1	10/04/17 18:56	C7J0034	CJ70323
Carbon Tetrachloride	ND (0.0041)		8260B Low		1	10/04/17 18:56	C7J0034	CJ70323
Chlorobenzene	ND (0.0041)		8260B Low		1	10/04/17 18:56	C7J0034	CJ70323
Chloroethane	ND (0.0082)		8260B Low		1	10/04/17 18:56	C7J0034	CJ70323
Chloroform	ND (0.0041)		8260B Low		1	10/04/17 18:56	C7J0034	CJ70323
Chloromethane	ND (0.0082)		8260B Low		1	10/04/17 18:56	C7J0034	CJ70323
cis-1,2-Dichloroethene	ND (0.0041)		8260B Low		1	10/04/17 18:56	C7J0034	CJ70323
cis-1,3-Dichloropropene	ND (0.0041)		8260B Low		1	10/04/17 18:56	C7J0034	CJ70323
Dibromochloromethane	ND (0.0041)		8260B Low		1	10/04/17 18:56	C7J0034	CJ70323
Dibromomethane	ND (0.0041)		8260B Low		1	10/04/17 18:56	C7J0034	CJ70323
Dichlorodifluoromethane	ND (0.0082)		8260B Low		1	10/04/17 18:56	C7J0034	CJ70323
Diethyl Ether	ND (0.0041)		8260B Low		1	10/04/17 18:56	C7J0034	CJ70323
Di-isopropyl ether	ND (0.0041)		8260B Low		1	10/04/17 18:56	C7J0034	CJ70323
Ethyl tertiary-butyl ether	ND (0.0041)		8260B Low		1	10/04/17 18:56	C7J0034	CJ70323
Ethylbenzene	ND (0.0041)		8260B Low		1	10/04/17 18:56	C7J0034	CJ70323
Hexachlorobutadiene	ND (0.0041)		8260B Low		1	10/04/17 18:56	C7J0034	CJ70323
Isopropylbenzene	ND (0.0041)		8260B Low		1	10/04/17 18:56	C7J0034	CJ70323
Methyl tert-Butyl Ether	ND (0.0041)		8260B Low		1	10/04/17 18:56	C7J0034	CJ70323
Methylene Chloride	ND (0.0206)		8260B Low		1	10/04/17 18:56	C7J0034	CJ70323
Naphthalene	ND (0.0041)		8260B Low		1	10/04/17 18:56	C7J0034	CJ70323
n-Butylbenzene	ND (0.0041)		8260B Low		1	10/04/17 18:56	C7J0034	CJ70323
n-Propylbenzene	ND (0.0041)		8260B Low		1	10/04/17 18:56	C7J0034	CJ70323
sec-Butylbenzene	ND (0.0041)		8260B Low		1	10/04/17 18:56	C7J0034	CJ70323
Styrene	ND (0.0041)		8260B Low		1	10/04/17 18:56	C7J0034	CJ70323
tert-Butylbenzene	ND (0.0041)		8260B Low		1	10/04/17 18:56	C7J0034	CJ70323
Tertiary-amyl methyl ether	ND (0.0041)		8260B Low		1	10/04/17 18:56	C7J0034	CJ70323
Tetrachloroethene	ND (0.0041)		8260B Low		1	10/04/17 18:56	C7J0034	CJ70323
Tetrahydrofuran	ND (0.0041)		8260B Low		1	10/04/17 18:56	C7J0034	CJ70323





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-546 (0-2')  
 Date Sampled: 10/02/17 11:55  
 Percent Solids: 90  
 Initial Volume: 6.7  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1710025  
 ESS Laboratory Sample ID: 1710025-07  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0041)		8260B Low		1	10/04/17 18:56	C7J0034	CJ70323
trans-1,2-Dichloroethene	ND (0.0041)		8260B Low		1	10/04/17 18:56	C7J0034	CJ70323
trans-1,3-Dichloropropene	ND (0.0041)		8260B Low		1	10/04/17 18:56	C7J0034	CJ70323
Trichloroethene	ND (0.0041)		8260B Low		1	10/04/17 18:56	C7J0034	CJ70323
Trichlorofluoromethane	ND (0.0041)		8260B Low		1	10/04/17 18:56	C7J0034	CJ70323
Vinyl Acetate	ND (0.0041)		8260B Low		1	10/04/17 18:56	C7J0034	CJ70323
Vinyl Chloride	ND (0.0082)		8260B Low		1	10/04/17 18:56	C7J0034	CJ70323
Xylene O	ND (0.0041)		8260B Low		1	10/04/17 18:56	C7J0034	CJ70323
Xylene P,M	ND (0.0082)		8260B Low		1	10/04/17 18:56	C7J0034	CJ70323
Xylenes (Total)	ND (0.0082)		8260B Low		1	10/04/17 18:56		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	110 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	97 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	104 %		70-130
<i>Surrogate: Toluene-d8</i>	109 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-546 (0-2')  
Date Sampled: 10/02/17 11:55  
Percent Solids: 90  
Initial Volume: 19.1  
Final Volume: 1  
Extraction Method: 3546

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-07  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: SMR  
Prepared: 10/3/17 13:00

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	365 (217)		8100M		5	10/06/17 15:39	C7J0111	CJ70310
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		80 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-546 (0-2')  
 Date Sampled: 10/02/17 11:55  
 Percent Solids: 90  
 Initial Volume: 15  
 Final Volume: 0.5  
 Extraction Method: 3546

ESS Laboratory Work Order: 1710025  
 ESS Laboratory Sample ID: 1710025-07  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: TJ  
 Prepared: 10/3/17 12:30

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.368)		8270D		1	10/04/17 22:23	C7J0049	CJ70309
Acenaphthene	ND (0.368)		8270D		1	10/04/17 22:23	C7J0049	CJ70309
Acenaphthylene	ND (0.368)		8270D		1	10/04/17 22:23	C7J0049	CJ70309
Anthracene	ND (0.368)		8270D		1	10/04/17 22:23	C7J0049	CJ70309
<b>Benzo(a)anthracene</b>	<b>0.768</b> (0.368)		8270D		1	10/04/17 22:23	C7J0049	CJ70309
<b>Benzo(a)pyrene</b>	<b>0.737</b> (0.185)		8270D		1	10/04/17 22:23	C7J0049	CJ70309
<b>Benzo(b)fluoranthene</b>	<b>1.19</b> (0.368)		8270D		1	10/04/17 22:23	C7J0049	CJ70309
<b>Benzo(g,h,i)perylene</b>	<b>0.397</b> (0.368)		8270D		1	10/04/17 22:23	C7J0049	CJ70309
<b>Benzo(k)fluoranthene</b>	<b>0.736</b> (0.368)		8270D		1	10/04/17 22:23	C7J0049	CJ70309
<b>Chrysene</b>	<b>0.856</b> (0.185)		8270D		1	10/04/17 22:23	C7J0049	CJ70309
<b>Dibenzo(a,h)Anthracene</b>	<b>0.196</b> (0.185)		8270D		1	10/04/17 22:23	C7J0049	CJ70309
<b>Fluoranthene</b>	<b>1.56</b> (0.368)		8270D		1	10/04/17 22:23	C7J0049	CJ70309
Fluorene	ND (0.368)		8270D		1	10/04/17 22:23	C7J0049	CJ70309
<b>Indeno(1,2,3-cd)Pyrene</b>	<b>0.395</b> (0.368)		8270D		1	10/04/17 22:23	C7J0049	CJ70309
Naphthalene	ND (0.368)		8270D		1	10/04/17 22:23	C7J0049	CJ70309
<b>Phenanthrene</b>	<b>0.590</b> (0.368)		8270D		1	10/04/17 22:23	C7J0049	CJ70309
<b>Pyrene</b>	<b>1.27</b> (0.368)		8270D		1	10/04/17 22:23	C7J0049	CJ70309

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	47 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	60 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	53 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	77 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-546 (0-2')  
Date Sampled: 10/02/17 11:55  
Percent Solids: 90

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-07  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	68.7 (11.0)		9014		10	EEM	10/05/17 11:20	mg/kg dry	CJ70513



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-547 (0-2')  
Date Sampled: 10/02/17 12:15  
Percent Solids: 95

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-08  
Sample Matrix: Soil  
Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (1.80)		6020A		20	NAR	10/04/17 17:55	2.33	100	CJ70328
Arsenic	<b>3.50</b> (2.25)		6010C		1	KJK	10/04/17 20:35	2.33	100	CJ70328
Beryllium	<b>0.11</b> (0.10)		6010C		1	KJK	10/04/17 20:35	2.33	100	CJ70328
Cadmium	ND (0.45)		6010C		1	KJK	10/04/17 20:35	2.33	100	CJ70328
Chromium	<b>9.63</b> (0.90)		6010C		1	KJK	10/04/17 20:35	2.33	100	CJ70328
Copper	<b>19.0</b> (2.25)		6010C		1	KJK	10/04/17 20:35	2.33	100	CJ70328
Lead	<b>58.2</b> (4.50)		6010C		1	KJK	10/04/17 20:35	2.33	100	CJ70328
Mercury	<b>0.097</b> (0.021)		7471B		1	MJV	10/04/17 11:42	0.98	40	CJ70303
Nickel	<b>8.02</b> (2.25)		6010C		1	KJK	10/04/17 20:35	2.33	100	CJ70328
Selenium	ND (1.80)		6020A		20	NAR	10/04/17 17:55	2.33	100	CJ70328
Silver	ND (0.45)		6010C		1	KJK	10/04/17 20:35	2.33	100	CJ70328
Thallium	ND (1.80)		6020A		20	NAR	10/04/17 17:55	2.33	100	CJ70328
Zinc	<b>27.4</b> (2.25)		6010C		1	KJK	10/04/17 20:35	2.33	100	CJ70328



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-547 (0-2')  
 Date Sampled: 10/02/17 12:15  
 Percent Solids: 95  
 Initial Volume: 6.2  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1710025  
 ESS Laboratory Sample ID: 1710025-08  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0042)		8260B Low		1	10/04/17 19:21	C7J0034	CJ70323
1,1,1-Trichloroethane	ND (0.0042)		8260B Low		1	10/04/17 19:21	C7J0034	CJ70323
1,1,2,2-Tetrachloroethane	ND (0.0042)		8260B Low		1	10/04/17 19:21	C7J0034	CJ70323
1,1,2-Trichloroethane	ND (0.0042)		8260B Low		1	10/04/17 19:21	C7J0034	CJ70323
1,1-Dichloroethane	ND (0.0042)		8260B Low		1	10/04/17 19:21	C7J0034	CJ70323
1,1-Dichloroethene	ND (0.0042)		8260B Low		1	10/04/17 19:21	C7J0034	CJ70323
1,1-Dichloropropene	ND (0.0042)		8260B Low		1	10/04/17 19:21	C7J0034	CJ70323
1,2,3-Trichlorobenzene	ND (0.0042)		8260B Low		1	10/04/17 19:21	C7J0034	CJ70323
1,2,3-Trichloropropane	ND (0.0042)		8260B Low		1	10/04/17 19:21	C7J0034	CJ70323
1,2,4-Trichlorobenzene	ND (0.0042)		8260B Low		1	10/04/17 19:21	C7J0034	CJ70323
1,2,4-Trimethylbenzene	ND (0.0042)		8260B Low		1	10/04/17 19:21	C7J0034	CJ70323
1,2-Dibromo-3-Chloropropane	ND (0.0042)		8260B Low		1	10/04/17 19:21	C7J0034	CJ70323
1,2-Dibromoethane	ND (0.0042)		8260B Low		1	10/04/17 19:21	C7J0034	CJ70323
1,2-Dichlorobenzene	ND (0.0042)		8260B Low		1	10/04/17 19:21	C7J0034	CJ70323
1,2-Dichloroethane	ND (0.0042)		8260B Low		1	10/04/17 19:21	C7J0034	CJ70323
1,2-Dichloropropane	ND (0.0042)		8260B Low		1	10/04/17 19:21	C7J0034	CJ70323
1,3,5-Trimethylbenzene	ND (0.0042)		8260B Low		1	10/04/17 19:21	C7J0034	CJ70323
1,3-Dichlorobenzene	ND (0.0042)		8260B Low		1	10/04/17 19:21	C7J0034	CJ70323
1,3-Dichloropropane	ND (0.0042)		8260B Low		1	10/04/17 19:21	C7J0034	CJ70323
1,4-Dichlorobenzene	ND (0.0042)		8260B Low		1	10/04/17 19:21	C7J0034	CJ70323
1,4-Dioxane	ND (0.0846)		8260B Low		1	10/04/17 19:21	C7J0034	CJ70323
1-Chlorohexane	ND (0.0042)		8260B Low		1	10/04/17 19:21	C7J0034	CJ70323
2,2-Dichloropropane	ND (0.0042)		8260B Low		1	10/04/17 19:21	C7J0034	CJ70323
2-Butanone	ND (0.0423)		8260B Low		1	10/04/17 19:21	C7J0034	CJ70323
2-Chlorotoluene	ND (0.0042)		8260B Low		1	10/04/17 19:21	C7J0034	CJ70323
2-Hexanone	ND (0.0423)		8260B Low		1	10/04/17 19:21	C7J0034	CJ70323
4-Chlorotoluene	ND (0.0042)		8260B Low		1	10/04/17 19:21	C7J0034	CJ70323
4-Isopropyltoluene	ND (0.0042)		8260B Low		1	10/04/17 19:21	C7J0034	CJ70323
4-Methyl-2-Pentanone	ND (0.0423)		8260B Low		1	10/04/17 19:21	C7J0034	CJ70323
Acetone	ND (0.0423)		8260B Low		1	10/04/17 19:21	C7J0034	CJ70323
Benzene	ND (0.0042)		8260B Low		1	10/04/17 19:21	C7J0034	CJ70323
Bromobenzene	ND (0.0042)		8260B Low		1	10/04/17 19:21	C7J0034	CJ70323





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-547 (0-2')  
Date Sampled: 10/02/17 12:15  
Percent Solids: 95  
Initial Volume: 6.2  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-08  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0042)		8260B Low		1	10/04/17 19:21	C7J0034	CJ70323
Bromodichloromethane	ND (0.0042)		8260B Low		1	10/04/17 19:21	C7J0034	CJ70323
Bromoform	ND (0.0042)		8260B Low		1	10/04/17 19:21	C7J0034	CJ70323
Bromomethane	ND (0.0085)		8260B Low		1	10/04/17 19:21	C7J0034	CJ70323
Carbon Disulfide	ND (0.0042)		8260B Low		1	10/04/17 19:21	C7J0034	CJ70323
Carbon Tetrachloride	ND (0.0042)		8260B Low		1	10/04/17 19:21	C7J0034	CJ70323
Chlorobenzene	ND (0.0042)		8260B Low		1	10/04/17 19:21	C7J0034	CJ70323
Chloroethane	ND (0.0085)		8260B Low		1	10/04/17 19:21	C7J0034	CJ70323
Chloroform	ND (0.0042)		8260B Low		1	10/04/17 19:21	C7J0034	CJ70323
Chloromethane	ND (0.0085)		8260B Low		1	10/04/17 19:21	C7J0034	CJ70323
cis-1,2-Dichloroethene	ND (0.0042)		8260B Low		1	10/04/17 19:21	C7J0034	CJ70323
cis-1,3-Dichloropropene	ND (0.0042)		8260B Low		1	10/04/17 19:21	C7J0034	CJ70323
Dibromochloromethane	ND (0.0042)		8260B Low		1	10/04/17 19:21	C7J0034	CJ70323
Dibromomethane	ND (0.0042)		8260B Low		1	10/04/17 19:21	C7J0034	CJ70323
Dichlorodifluoromethane	ND (0.0085)		8260B Low		1	10/04/17 19:21	C7J0034	CJ70323
Diethyl Ether	ND (0.0042)		8260B Low		1	10/04/17 19:21	C7J0034	CJ70323
Di-isopropyl ether	ND (0.0042)		8260B Low		1	10/04/17 19:21	C7J0034	CJ70323
Ethyl tertiary-butyl ether	ND (0.0042)		8260B Low		1	10/04/17 19:21	C7J0034	CJ70323
Ethylbenzene	ND (0.0042)		8260B Low		1	10/04/17 19:21	C7J0034	CJ70323
Hexachlorobutadiene	ND (0.0042)		8260B Low		1	10/04/17 19:21	C7J0034	CJ70323
Isopropylbenzene	ND (0.0042)		8260B Low		1	10/04/17 19:21	C7J0034	CJ70323
Methyl tert-Butyl Ether	ND (0.0042)		8260B Low		1	10/04/17 19:21	C7J0034	CJ70323
Methylene Chloride	ND (0.0212)		8260B Low		1	10/04/17 19:21	C7J0034	CJ70323
Naphthalene	ND (0.0042)		8260B Low		1	10/04/17 19:21	C7J0034	CJ70323
n-Butylbenzene	ND (0.0042)		8260B Low		1	10/04/17 19:21	C7J0034	CJ70323
n-Propylbenzene	ND (0.0042)		8260B Low		1	10/04/17 19:21	C7J0034	CJ70323
sec-Butylbenzene	ND (0.0042)		8260B Low		1	10/04/17 19:21	C7J0034	CJ70323
Styrene	ND (0.0042)		8260B Low		1	10/04/17 19:21	C7J0034	CJ70323
tert-Butylbenzene	ND (0.0042)		8260B Low		1	10/04/17 19:21	C7J0034	CJ70323
Tertiary-amyl methyl ether	ND (0.0042)		8260B Low		1	10/04/17 19:21	C7J0034	CJ70323
Tetrachloroethene	ND (0.0042)		8260B Low		1	10/04/17 19:21	C7J0034	CJ70323
Tetrahydrofuran	ND (0.0042)		8260B Low		1	10/04/17 19:21	C7J0034	CJ70323



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-547 (0-2')  
Date Sampled: 10/02/17 12:15  
Percent Solids: 95  
Initial Volume: 6.2  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-08  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0042)		8260B Low		1	10/04/17 19:21	C7J0034	CJ70323
trans-1,2-Dichloroethene	ND (0.0042)		8260B Low		1	10/04/17 19:21	C7J0034	CJ70323
trans-1,3-Dichloropropene	ND (0.0042)		8260B Low		1	10/04/17 19:21	C7J0034	CJ70323
Trichloroethene	ND (0.0042)		8260B Low		1	10/04/17 19:21	C7J0034	CJ70323
Trichlorofluoromethane	ND (0.0042)		8260B Low		1	10/04/17 19:21	C7J0034	CJ70323
Vinyl Acetate	ND (0.0042)		8260B Low		1	10/04/17 19:21	C7J0034	CJ70323
Vinyl Chloride	ND (0.0085)		8260B Low		1	10/04/17 19:21	C7J0034	CJ70323
Xylene O	ND (0.0042)		8260B Low		1	10/04/17 19:21	C7J0034	CJ70323
Xylene P,M	ND (0.0085)		8260B Low		1	10/04/17 19:21	C7J0034	CJ70323
Xylenes (Total)	ND (0.0085)		8260B Low		1	10/04/17 19:21		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>112 %</i>		<i>70-130</i>
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>95 %</i>		<i>70-130</i>
<i>Surrogate: Dibromofluoromethane</i>	<i>107 %</i>		<i>70-130</i>
<i>Surrogate: Toluene-d8</i>	<i>110 %</i>		<i>70-130</i>



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-547 (0-2')  
Date Sampled: 10/02/17 12:15  
Percent Solids: 95  
Initial Volume: 19.5  
Final Volume: 1  
Extraction Method: 3546

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-08  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: SMR  
Prepared: 10/3/17 13:00

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	313 (202)		8100M		5	10/06/17 16:14	C7J0111	CJ70310
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		76 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-547 (0-2')  
Date Sampled: 10/02/17 12:15  
Percent Solids: 95  
Initial Volume: 14.4  
Final Volume: 0.5  
Extraction Method: 3546

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-08  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: TJ  
Prepared: 10/3/17 12:30

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.364)		8270D		1	10/04/17 22:58	C7J0049	CJ70309
Acenaphthene	ND (0.364)		8270D		1	10/04/17 22:58	C7J0049	CJ70309
<b>Acenaphthylene</b>	<b>0.425</b> (0.364)		8270D		1	10/04/17 22:58	C7J0049	CJ70309
Anthracene	ND (0.364)		8270D		1	10/04/17 22:58	C7J0049	CJ70309
<b>Benzo(a)anthracene</b>	<b>1.23</b> (0.364)		8270D		1	10/04/17 22:58	C7J0049	CJ70309
<b>Benzo(a)pyrene</b>	<b>1.10</b> (0.182)		8270D		1	10/04/17 22:58	C7J0049	CJ70309
<b>Benzo(b)fluoranthene</b>	<b>1.59</b> (0.364)		8270D		1	10/04/17 22:58	C7J0049	CJ70309
<b>Benzo(g,h,i)perylene</b>	<b>0.565</b> (0.364)		8270D		1	10/04/17 22:58	C7J0049	CJ70309
<b>Benzo(k)fluoranthene</b>	<b>1.07</b> (0.364)		8270D		1	10/04/17 22:58	C7J0049	CJ70309
<b>Chrysene</b>	<b>1.24</b> (0.182)		8270D		1	10/04/17 22:58	C7J0049	CJ70309
<b>Dibenzo(a,h)Anthracene</b>	<b>0.290</b> (0.182)		8270D		1	10/04/17 22:58	C7J0049	CJ70309
<b>Fluoranthene</b>	<b>2.64</b> (0.364)		8270D		1	10/04/17 22:58	C7J0049	CJ70309
Fluorene	ND (0.364)		8270D		1	10/04/17 22:58	C7J0049	CJ70309
<b>Indeno(1,2,3-cd)Pyrene</b>	<b>0.549</b> (0.364)		8270D		1	10/04/17 22:58	C7J0049	CJ70309
Naphthalene	ND (0.364)		8270D		1	10/04/17 22:58	C7J0049	CJ70309
<b>Phenanthrene</b>	<b>1.06</b> (0.364)		8270D		1	10/04/17 22:58	C7J0049	CJ70309
<b>Pyrene</b>	<b>2.21</b> (0.364)		8270D		1	10/04/17 22:58	C7J0049	CJ70309

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	48 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	65 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	57 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	83 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-547 (0-2')  
Date Sampled: 10/02/17 12:15  
Percent Solids: 95

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-08  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	117 (10.4)		9014		10	EEM	10/05/17 11:20	mg/kg dry	CJ70513



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-548 (0-2')  
Date Sampled: 10/02/17 12:30  
Percent Solids: 90

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-09  
Sample Matrix: Soil  
Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (2.06)		6020A		20	NAR	10/04/17 18:01	2.17	100	CJ70328
Arsenic	3.95 (2.57)		6010C		1	KJK	10/04/17 20:39	2.17	100	CJ70328
Beryllium	0.20 (0.11)		6010C		1	KJK	10/04/17 20:39	2.17	100	CJ70328
Cadmium	ND (0.51)		6010C		1	KJK	10/04/17 20:39	2.17	100	CJ70328
Chromium	17.2 (1.03)		6010C		1	KJK	10/04/17 20:39	2.17	100	CJ70328
Copper	33.3 (2.57)		6010C		1	KJK	10/04/17 20:39	2.17	100	CJ70328
Lead	163 (5.14)		6010C		1	KJK	10/04/17 20:39	2.17	100	CJ70328
Mercury	0.226 (0.025)		7471B		1	MJV	10/04/17 11:48	0.88	40	CJ70303
Nickel	10.2 (2.57)		6010C		1	KJK	10/04/17 20:39	2.17	100	CJ70328
Selenium	ND (2.06)		6020A		20	NAR	10/04/17 18:01	2.17	100	CJ70328
Silver	0.63 (0.51)		6010C		1	KJK	10/04/17 20:39	2.17	100	CJ70328
Thallium	ND (2.06)		6020A		20	NAR	10/04/17 18:01	2.17	100	CJ70328
Zinc	80.6 (2.57)		6010C		1	KJK	10/04/17 20:39	2.17	100	CJ70328





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-548 (0-2')  
Date Sampled: 10/02/17 12:30  
Percent Solids: 90  
Initial Volume: 5.5  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-09  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0051)		8260B Low		1	10/04/17 19:47	C7J0034	CJ70323
1,1,1-Trichloroethane	ND (0.0051)		8260B Low		1	10/04/17 19:47	C7J0034	CJ70323
1,1,2,2-Tetrachloroethane	ND (0.0051)		8260B Low		1	10/04/17 19:47	C7J0034	CJ70323
1,1,2-Trichloroethane	ND (0.0051)		8260B Low		1	10/04/17 19:47	C7J0034	CJ70323
1,1-Dichloroethane	ND (0.0051)		8260B Low		1	10/04/17 19:47	C7J0034	CJ70323
1,1-Dichloroethene	ND (0.0051)		8260B Low		1	10/04/17 19:47	C7J0034	CJ70323
1,1-Dichloropropene	ND (0.0051)		8260B Low		1	10/04/17 19:47	C7J0034	CJ70323
1,2,3-Trichlorobenzene	ND (0.0051)		8260B Low		1	10/04/17 19:47	C7J0034	CJ70323
1,2,3-Trichloropropane	ND (0.0051)		8260B Low		1	10/04/17 19:47	C7J0034	CJ70323
1,2,4-Trichlorobenzene	ND (0.0051)		8260B Low		1	10/04/17 19:47	C7J0034	CJ70323
1,2,4-Trimethylbenzene	ND (0.0051)		8260B Low		1	10/04/17 19:47	C7J0034	CJ70323
1,2-Dibromo-3-Chloropropane	ND (0.0051)		8260B Low		1	10/04/17 19:47	C7J0034	CJ70323
1,2-Dibromoethane	ND (0.0051)		8260B Low		1	10/04/17 19:47	C7J0034	CJ70323
1,2-Dichlorobenzene	ND (0.0051)		8260B Low		1	10/04/17 19:47	C7J0034	CJ70323
1,2-Dichloroethane	ND (0.0051)		8260B Low		1	10/04/17 19:47	C7J0034	CJ70323
1,2-Dichloropropane	ND (0.0051)		8260B Low		1	10/04/17 19:47	C7J0034	CJ70323
1,3,5-Trimethylbenzene	ND (0.0051)		8260B Low		1	10/04/17 19:47	C7J0034	CJ70323
1,3-Dichlorobenzene	ND (0.0051)		8260B Low		1	10/04/17 19:47	C7J0034	CJ70323
1,3-Dichloropropane	ND (0.0051)		8260B Low		1	10/04/17 19:47	C7J0034	CJ70323
1,4-Dichlorobenzene	ND (0.0051)		8260B Low		1	10/04/17 19:47	C7J0034	CJ70323
1,4-Dioxane	ND (0.101)		8260B Low		1	10/04/17 19:47	C7J0034	CJ70323
1-Chlorohexane	ND (0.0051)		8260B Low		1	10/04/17 19:47	C7J0034	CJ70323
2,2-Dichloropropane	ND (0.0051)		8260B Low		1	10/04/17 19:47	C7J0034	CJ70323
2-Butanone	ND (0.0507)		8260B Low		1	10/04/17 19:47	C7J0034	CJ70323
2-Chlorotoluene	ND (0.0051)		8260B Low		1	10/04/17 19:47	C7J0034	CJ70323
2-Hexanone	ND (0.0507)		8260B Low		1	10/04/17 19:47	C7J0034	CJ70323
4-Chlorotoluene	ND (0.0051)		8260B Low		1	10/04/17 19:47	C7J0034	CJ70323
4-Isopropyltoluene	ND (0.0051)		8260B Low		1	10/04/17 19:47	C7J0034	CJ70323
4-Methyl-2-Pentanone	ND (0.0507)		8260B Low		1	10/04/17 19:47	C7J0034	CJ70323
Acetone	ND (0.0507)		8260B Low		1	10/04/17 19:47	C7J0034	CJ70323
Benzene	ND (0.0051)		8260B Low		1	10/04/17 19:47	C7J0034	CJ70323
Bromobenzene	ND (0.0051)		8260B Low		1	10/04/17 19:47	C7J0034	CJ70323



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-548 (0-2')  
Date Sampled: 10/02/17 12:30  
Percent Solids: 90  
Initial Volume: 5.5  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-09  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0051)		8260B Low		1	10/04/17 19:47	C7J0034	CJ70323
Bromodichloromethane	ND (0.0051)		8260B Low		1	10/04/17 19:47	C7J0034	CJ70323
Bromoform	ND (0.0051)		8260B Low		1	10/04/17 19:47	C7J0034	CJ70323
Bromomethane	ND (0.0101)		8260B Low		1	10/04/17 19:47	C7J0034	CJ70323
Carbon Disulfide	ND (0.0051)		8260B Low		1	10/04/17 19:47	C7J0034	CJ70323
Carbon Tetrachloride	ND (0.0051)		8260B Low		1	10/04/17 19:47	C7J0034	CJ70323
Chlorobenzene	ND (0.0051)		8260B Low		1	10/04/17 19:47	C7J0034	CJ70323
Chloroethane	ND (0.0101)		8260B Low		1	10/04/17 19:47	C7J0034	CJ70323
Chloroform	ND (0.0051)		8260B Low		1	10/04/17 19:47	C7J0034	CJ70323
Chloromethane	ND (0.0101)		8260B Low		1	10/04/17 19:47	C7J0034	CJ70323
cis-1,2-Dichloroethene	ND (0.0051)		8260B Low		1	10/04/17 19:47	C7J0034	CJ70323
cis-1,3-Dichloropropene	ND (0.0051)		8260B Low		1	10/04/17 19:47	C7J0034	CJ70323
Dibromochloromethane	ND (0.0051)		8260B Low		1	10/04/17 19:47	C7J0034	CJ70323
Dibromomethane	ND (0.0051)		8260B Low		1	10/04/17 19:47	C7J0034	CJ70323
Dichlorodifluoromethane	ND (0.0101)		8260B Low		1	10/04/17 19:47	C7J0034	CJ70323
Diethyl Ether	ND (0.0051)		8260B Low		1	10/04/17 19:47	C7J0034	CJ70323
Di-isopropyl ether	ND (0.0051)		8260B Low		1	10/04/17 19:47	C7J0034	CJ70323
Ethyl tertiary-butyl ether	ND (0.0051)		8260B Low		1	10/04/17 19:47	C7J0034	CJ70323
Ethylbenzene	ND (0.0051)		8260B Low		1	10/04/17 19:47	C7J0034	CJ70323
Hexachlorobutadiene	ND (0.0051)		8260B Low		1	10/04/17 19:47	C7J0034	CJ70323
Isopropylbenzene	ND (0.0051)		8260B Low		1	10/04/17 19:47	C7J0034	CJ70323
Methyl tert-Butyl Ether	ND (0.0051)		8260B Low		1	10/04/17 19:47	C7J0034	CJ70323
Methylene Chloride	ND (0.0253)		8260B Low		1	10/04/17 19:47	C7J0034	CJ70323
Naphthalene	ND (0.0051)		8260B Low		1	10/04/17 19:47	C7J0034	CJ70323
n-Butylbenzene	ND (0.0051)		8260B Low		1	10/04/17 19:47	C7J0034	CJ70323
n-Propylbenzene	ND (0.0051)		8260B Low		1	10/04/17 19:47	C7J0034	CJ70323
sec-Butylbenzene	ND (0.0051)		8260B Low		1	10/04/17 19:47	C7J0034	CJ70323
Styrene	ND (0.0051)		8260B Low		1	10/04/17 19:47	C7J0034	CJ70323
tert-Butylbenzene	ND (0.0051)		8260B Low		1	10/04/17 19:47	C7J0034	CJ70323
Tertiary-amyl methyl ether	ND (0.0051)		8260B Low		1	10/04/17 19:47	C7J0034	CJ70323
Tetrachloroethene	ND (0.0051)		8260B Low		1	10/04/17 19:47	C7J0034	CJ70323
Tetrahydrofuran	ND (0.0051)		8260B Low		1	10/04/17 19:47	C7J0034	CJ70323



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-548 (0-2')  
Date Sampled: 10/02/17 12:30  
Percent Solids: 90  
Initial Volume: 5.5  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-09  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0051)		8260B Low		1	10/04/17 19:47	C7J0034	CJ70323
trans-1,2-Dichloroethene	ND (0.0051)		8260B Low		1	10/04/17 19:47	C7J0034	CJ70323
trans-1,3-Dichloropropene	ND (0.0051)		8260B Low		1	10/04/17 19:47	C7J0034	CJ70323
Trichloroethene	ND (0.0051)		8260B Low		1	10/04/17 19:47	C7J0034	CJ70323
Trichlorofluoromethane	ND (0.0051)		8260B Low		1	10/04/17 19:47	C7J0034	CJ70323
Vinyl Acetate	ND (0.0051)		8260B Low		1	10/04/17 19:47	C7J0034	CJ70323
Vinyl Chloride	ND (0.0101)		8260B Low		1	10/04/17 19:47	C7J0034	CJ70323
Xylene O	ND (0.0051)		8260B Low		1	10/04/17 19:47	C7J0034	CJ70323
Xylene P,M	ND (0.0101)		8260B Low		1	10/04/17 19:47	C7J0034	CJ70323
Xylenes (Total)	ND (0.0101)		8260B Low		1	10/04/17 19:47		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	108 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	69 %	S-	70-130
<i>Surrogate: Dibromofluoromethane</i>	105 %		70-130
<i>Surrogate: Toluene-d8</i>	134 %	S+	70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-548 (0-2')  
Date Sampled: 10/02/17 12:30  
Percent Solids: 90  
Initial Volume: 19.5  
Final Volume: 1  
Extraction Method: 3546

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-09  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: SMR  
Prepared: 10/3/17 13:00

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	357 (214)		8100M		5	10/06/17 16:49	C7J0111	CJ70310
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		77 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-548 (0-2')  
Date Sampled: 10/02/17 12:30  
Percent Solids: 90  
Initial Volume: 15.8  
Final Volume: 0.5  
Extraction Method: 3546

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-09  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: TJ  
Prepared: 10/3/17 12:30

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.353)		8270D		1	10/04/17 23:33	C7J0049	CJ70309
Acenaphthene	ND (0.353)		8270D		1	10/04/17 23:33	C7J0049	CJ70309
Acenaphthylene	ND (0.353)		8270D		1	10/04/17 23:33	C7J0049	CJ70309
Anthracene	ND (0.353)		8270D		1	10/04/17 23:33	C7J0049	CJ70309
<b>Benzo(a)anthracene</b>	<b>1.24</b> (0.353)		8270D		1	10/04/17 23:33	C7J0049	CJ70309
<b>Benzo(a)pyrene</b>	<b>1.16</b> (0.177)		8270D		1	10/04/17 23:33	C7J0049	CJ70309
<b>Benzo(b)fluoranthene</b>	<b>1.48</b> (0.353)		8270D		1	10/04/17 23:33	C7J0049	CJ70309
<b>Benzo(g,h,i)perylene</b>	<b>0.550</b> (0.353)		8270D		1	10/04/17 23:33	C7J0049	CJ70309
<b>Benzo(k)fluoranthene</b>	<b>0.992</b> (0.353)		8270D		1	10/04/17 23:33	C7J0049	CJ70309
<b>Chrysene</b>	<b>1.24</b> (0.177)		8270D		1	10/04/17 23:33	C7J0049	CJ70309
<b>Dibenzo(a,h)Anthracene</b>	<b>0.282</b> (0.177)		8270D		1	10/04/17 23:33	C7J0049	CJ70309
<b>Fluoranthene</b>	<b>2.95</b> (0.353)		8270D		1	10/04/17 23:33	C7J0049	CJ70309
Fluorene	ND (0.353)		8270D		1	10/04/17 23:33	C7J0049	CJ70309
<b>Indeno(1,2,3-cd)Pyrene</b>	<b>0.532</b> (0.353)		8270D		1	10/04/17 23:33	C7J0049	CJ70309
Naphthalene	ND (0.353)		8270D		1	10/04/17 23:33	C7J0049	CJ70309
<b>Phenanthrene</b>	<b>1.40</b> (0.353)		8270D		1	10/04/17 23:33	C7J0049	CJ70309
<b>Pyrene</b>	<b>2.34</b> (0.353)		8270D		1	10/04/17 23:33	C7J0049	CJ70309

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	51 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	65 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	57 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	90 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-548 (0-2')  
Date Sampled: 10/02/17 12:30  
Percent Solids: 90

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-09  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	18.5 (1.09)		9014		1	EEM	10/05/17 11:20	mg/kg dry	CJ70513





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-549 (0-2')  
Date Sampled: 10/02/17 12:45  
Percent Solids: 95

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-10  
Sample Matrix: Soil  
Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (1.96)		6020A		20	NAR	10/04/17 18:07	2.15	100	CJ70328
Arsenic	<b>2.92</b> (2.45)		6010C		1	KJK	10/06/17 12:13	2.15	100	CJ70328
Beryllium	<b>0.29</b> (0.11)		6010C		1	KJK	10/04/17 20:43	2.15	100	CJ70328
Cadmium	ND (0.49)		6010C		1	KJK	10/04/17 20:43	2.15	100	CJ70328
Chromium	<b>7.07</b> (0.98)		6010C		1	KJK	10/04/17 20:43	2.15	100	CJ70328
Copper	<b>13.3</b> (2.45)		6010C		1	KJK	10/04/17 20:43	2.15	100	CJ70328
Lead	<b>44.5</b> (4.90)		6010C		1	KJK	10/04/17 20:43	2.15	100	CJ70328
Mercury	<b>0.047</b> (0.022)		7471B		1	MJV	10/04/17 11:50	0.97	40	CJ70303
Nickel	<b>8.87</b> (2.45)		6010C		1	KJK	10/04/17 20:43	2.15	100	CJ70328
Selenium	ND (1.96)		6020A		20	NAR	10/04/17 18:07	2.15	100	CJ70328
Silver	ND (0.49)		6010C		1	KJK	10/04/17 20:43	2.15	100	CJ70328
Thallium	ND (1.96)		6020A		20	NAR	10/04/17 18:07	2.15	100	CJ70328
Zinc	<b>131</b> (2.45)		6010C		1	KJK	10/04/17 20:43	2.15	100	CJ70328



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-549 (0-2')  
Date Sampled: 10/02/17 12:45  
Percent Solids: 95  
Initial Volume: 9.2  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-10  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0029)		8260B Low		1	10/04/17 20:12	C7J0034	CJ70323
1,1,1-Trichloroethane	ND (0.0029)		8260B Low		1	10/04/17 20:12	C7J0034	CJ70323
1,1,2,2-Tetrachloroethane	ND (0.0029)		8260B Low		1	10/04/17 20:12	C7J0034	CJ70323
1,1,2-Trichloroethane	ND (0.0029)		8260B Low		1	10/04/17 20:12	C7J0034	CJ70323
1,1-Dichloroethane	ND (0.0029)		8260B Low		1	10/04/17 20:12	C7J0034	CJ70323
1,1-Dichloroethene	ND (0.0029)		8260B Low		1	10/04/17 20:12	C7J0034	CJ70323
1,1-Dichloropropene	ND (0.0029)		8260B Low		1	10/04/17 20:12	C7J0034	CJ70323
1,2,3-Trichlorobenzene	ND (0.0029)		8260B Low		1	10/04/17 20:12	C7J0034	CJ70323
1,2,3-Trichloropropane	ND (0.0029)		8260B Low		1	10/04/17 20:12	C7J0034	CJ70323
1,2,4-Trichlorobenzene	ND (0.0029)		8260B Low		1	10/04/17 20:12	C7J0034	CJ70323
1,2,4-Trimethylbenzene	ND (0.0029)		8260B Low		1	10/04/17 20:12	C7J0034	CJ70323
1,2-Dibromo-3-Chloropropane	ND (0.0029)		8260B Low		1	10/04/17 20:12	C7J0034	CJ70323
1,2-Dibromoethane	ND (0.0029)		8260B Low		1	10/04/17 20:12	C7J0034	CJ70323
1,2-Dichlorobenzene	ND (0.0029)		8260B Low		1	10/04/17 20:12	C7J0034	CJ70323
1,2-Dichloroethane	ND (0.0029)		8260B Low		1	10/04/17 20:12	C7J0034	CJ70323
1,2-Dichloropropane	ND (0.0029)		8260B Low		1	10/04/17 20:12	C7J0034	CJ70323
1,3,5-Trimethylbenzene	ND (0.0029)		8260B Low		1	10/04/17 20:12	C7J0034	CJ70323
1,3-Dichlorobenzene	ND (0.0029)		8260B Low		1	10/04/17 20:12	C7J0034	CJ70323
1,3-Dichloropropane	ND (0.0029)		8260B Low		1	10/04/17 20:12	C7J0034	CJ70323
1,4-Dichlorobenzene	ND (0.0029)		8260B Low		1	10/04/17 20:12	C7J0034	CJ70323
1,4-Dioxane	ND (0.0573)		8260B Low		1	10/04/17 20:12	C7J0034	CJ70323
1-Chlorohexane	ND (0.0029)		8260B Low		1	10/04/17 20:12	C7J0034	CJ70323
2,2-Dichloropropane	ND (0.0029)		8260B Low		1	10/04/17 20:12	C7J0034	CJ70323
2-Butanone	ND (0.0286)		8260B Low		1	10/04/17 20:12	C7J0034	CJ70323
2-Chlorotoluene	ND (0.0029)		8260B Low		1	10/04/17 20:12	C7J0034	CJ70323
2-Hexanone	ND (0.0286)		8260B Low		1	10/04/17 20:12	C7J0034	CJ70323
4-Chlorotoluene	ND (0.0029)		8260B Low		1	10/04/17 20:12	C7J0034	CJ70323
4-Isopropyltoluene	ND (0.0029)		8260B Low		1	10/04/17 20:12	C7J0034	CJ70323
4-Methyl-2-Pentanone	ND (0.0286)		8260B Low		1	10/04/17 20:12	C7J0034	CJ70323
Acetone	ND (0.0286)		8260B Low		1	10/04/17 20:12	C7J0034	CJ70323
Benzene	ND (0.0029)		8260B Low		1	10/04/17 20:12	C7J0034	CJ70323
Bromobenzene	ND (0.0029)		8260B Low		1	10/04/17 20:12	C7J0034	CJ70323



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-549 (0-2')  
Date Sampled: 10/02/17 12:45  
Percent Solids: 95  
Initial Volume: 9.2  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-10  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0029)		8260B Low		1	10/04/17 20:12	C7J0034	CJ70323
Bromodichloromethane	ND (0.0029)		8260B Low		1	10/04/17 20:12	C7J0034	CJ70323
Bromoform	ND (0.0029)		8260B Low		1	10/04/17 20:12	C7J0034	CJ70323
Bromomethane	ND (0.0057)		8260B Low		1	10/04/17 20:12	C7J0034	CJ70323
Carbon Disulfide	ND (0.0029)		8260B Low		1	10/04/17 20:12	C7J0034	CJ70323
Carbon Tetrachloride	ND (0.0029)		8260B Low		1	10/04/17 20:12	C7J0034	CJ70323
Chlorobenzene	ND (0.0029)		8260B Low		1	10/04/17 20:12	C7J0034	CJ70323
Chloroethane	ND (0.0057)		8260B Low		1	10/04/17 20:12	C7J0034	CJ70323
Chloroform	ND (0.0029)		8260B Low		1	10/04/17 20:12	C7J0034	CJ70323
Chloromethane	ND (0.0057)		8260B Low		1	10/04/17 20:12	C7J0034	CJ70323
cis-1,2-Dichloroethene	ND (0.0029)		8260B Low		1	10/04/17 20:12	C7J0034	CJ70323
cis-1,3-Dichloropropene	ND (0.0029)		8260B Low		1	10/04/17 20:12	C7J0034	CJ70323
Dibromochloromethane	ND (0.0029)		8260B Low		1	10/04/17 20:12	C7J0034	CJ70323
Dibromomethane	ND (0.0029)		8260B Low		1	10/04/17 20:12	C7J0034	CJ70323
Dichlorodifluoromethane	ND (0.0057)		8260B Low		1	10/04/17 20:12	C7J0034	CJ70323
Diethyl Ether	ND (0.0029)		8260B Low		1	10/04/17 20:12	C7J0034	CJ70323
Di-isopropyl ether	ND (0.0029)		8260B Low		1	10/04/17 20:12	C7J0034	CJ70323
Ethyl tertiary-butyl ether	ND (0.0029)		8260B Low		1	10/04/17 20:12	C7J0034	CJ70323
Ethylbenzene	ND (0.0029)		8260B Low		1	10/04/17 20:12	C7J0034	CJ70323
Hexachlorobutadiene	ND (0.0029)		8260B Low		1	10/04/17 20:12	C7J0034	CJ70323
Isopropylbenzene	ND (0.0029)		8260B Low		1	10/04/17 20:12	C7J0034	CJ70323
Methyl tert-Butyl Ether	ND (0.0029)		8260B Low		1	10/04/17 20:12	C7J0034	CJ70323
Methylene Chloride	ND (0.0143)		8260B Low		1	10/04/17 20:12	C7J0034	CJ70323
Naphthalene	ND (0.0029)		8260B Low		1	10/04/17 20:12	C7J0034	CJ70323
n-Butylbenzene	ND (0.0029)		8260B Low		1	10/04/17 20:12	C7J0034	CJ70323
n-Propylbenzene	ND (0.0029)		8260B Low		1	10/04/17 20:12	C7J0034	CJ70323
sec-Butylbenzene	ND (0.0029)		8260B Low		1	10/04/17 20:12	C7J0034	CJ70323
Styrene	ND (0.0029)		8260B Low		1	10/04/17 20:12	C7J0034	CJ70323
tert-Butylbenzene	ND (0.0029)		8260B Low		1	10/04/17 20:12	C7J0034	CJ70323
Tertiary-amyl methyl ether	ND (0.0029)		8260B Low		1	10/04/17 20:12	C7J0034	CJ70323
Tetrachloroethene	ND (0.0029)		8260B Low		1	10/04/17 20:12	C7J0034	CJ70323
Tetrahydrofuran	ND (0.0029)		8260B Low		1	10/04/17 20:12	C7J0034	CJ70323



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-549 (0-2')  
Date Sampled: 10/02/17 12:45  
Percent Solids: 95  
Initial Volume: 9.2  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-10  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0029)		8260B Low		1	10/04/17 20:12	C7J0034	CJ70323
trans-1,2-Dichloroethene	ND (0.0029)		8260B Low		1	10/04/17 20:12	C7J0034	CJ70323
trans-1,3-Dichloropropene	ND (0.0029)		8260B Low		1	10/04/17 20:12	C7J0034	CJ70323
Trichloroethene	ND (0.0029)		8260B Low		1	10/04/17 20:12	C7J0034	CJ70323
Trichlorofluoromethane	ND (0.0029)		8260B Low		1	10/04/17 20:12	C7J0034	CJ70323
Vinyl Acetate	ND (0.0029)		8260B Low		1	10/04/17 20:12	C7J0034	CJ70323
Vinyl Chloride	ND (0.0057)		8260B Low		1	10/04/17 20:12	C7J0034	CJ70323
Xylene O	ND (0.0029)		8260B Low		1	10/04/17 20:12	C7J0034	CJ70323
Xylene P,M	ND (0.0057)		8260B Low		1	10/04/17 20:12	C7J0034	CJ70323
Xylenes (Total)	ND (0.0057)		8260B Low		1	10/04/17 20:12		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>117 %</i>		<i>70-130</i>
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>97 %</i>		<i>70-130</i>
<i>Surrogate: Dibromofluoromethane</i>	<i>108 %</i>		<i>70-130</i>
<i>Surrogate: Toluene-d8</i>	<i>110 %</i>		<i>70-130</i>



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-549 (0-2')  
Date Sampled: 10/02/17 12:45  
Percent Solids: 95  
Initial Volume: 19.2  
Final Volume: 1  
Extraction Method: 3546

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-10  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: SMR  
Prepared: 10/3/17 13:00

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	83.5 (41.2)		8100M		1	10/05/17 11:31	C7J0068	CJ70310
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		77 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-549 (0-2')  
Date Sampled: 10/02/17 12:45  
Percent Solids: 95  
Initial Volume: 14.4  
Final Volume: 0.5  
Extraction Method: 3546

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-10  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: TJ  
Prepared: 10/3/17 12:30

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.365)		8270D		1	10/05/17 0:08	C7J0049	CJ70309
Acenaphthene	ND (0.365)		8270D		1	10/05/17 0:08	C7J0049	CJ70309
Acenaphthylene	ND (0.365)		8270D		1	10/05/17 0:08	C7J0049	CJ70309
Anthracene	ND (0.365)		8270D		1	10/05/17 0:08	C7J0049	CJ70309
Benzo(a)anthracene	ND (0.365)		8270D		1	10/05/17 0:08	C7J0049	CJ70309
<b>Benzo(a)pyrene</b>	<b>0.202</b> (0.183)		8270D		1	10/05/17 0:08	C7J0049	CJ70309
Benzo(b)fluoranthene	ND (0.365)		8270D		1	10/05/17 0:08	C7J0049	CJ70309
Benzo(g,h,i)perylene	ND (0.365)		8270D		1	10/05/17 0:08	C7J0049	CJ70309
Benzo(k)fluoranthene	ND (0.365)		8270D		1	10/05/17 0:08	C7J0049	CJ70309
<b>Chrysene</b>	<b>0.215</b> (0.183)		8270D		1	10/05/17 0:08	C7J0049	CJ70309
Dibenzo(a,h)Anthracene	ND (0.183)		8270D		1	10/05/17 0:08	C7J0049	CJ70309
Fluoranthene	ND (0.365)		8270D		1	10/05/17 0:08	C7J0049	CJ70309
Fluorene	ND (0.365)		8270D		1	10/05/17 0:08	C7J0049	CJ70309
Indeno(1,2,3-cd)Pyrene	ND (0.365)		8270D		1	10/05/17 0:08	C7J0049	CJ70309
Naphthalene	ND (0.365)		8270D		1	10/05/17 0:08	C7J0049	CJ70309
Phenanthrene	ND (0.365)		8270D		1	10/05/17 0:08	C7J0049	CJ70309
Pyrene	ND (0.365)		8270D		1	10/05/17 0:08	C7J0049	CJ70309

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	52 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	59 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	56 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	80 %		30-130





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-549 (0-2')  
Date Sampled: 10/02/17 12:45  
Percent Solids: 95

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-10  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	1.45 (1.00)		9014		1	EEM	10/05/17 11:20	mg/kg dry	CJ70513



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-550 (0-2')  
Date Sampled: 10/02/17 12:55  
Percent Solids: 97

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-11  
Sample Matrix: Soil  
Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (1.85)		6020A		20	NAR	10/04/17 18:39	2.24	100	CJ70328
<b>Arsenic</b>	<b>3.74</b> (2.31)		6010C		1	KJK	10/04/17 20:47	2.24	100	CJ70328
Beryllium	ND (0.10)		6010C		1	KJK	10/04/17 20:47	2.24	100	CJ70328
Cadmium	ND (0.46)		6010C		1	KJK	10/04/17 20:47	2.24	100	CJ70328
<b>Chromium</b>	<b>48.6</b> (0.92)		6010C		1	KJK	10/04/17 20:47	2.24	100	CJ70328
<b>Copper</b>	<b>23.3</b> (2.31)		6010C		1	KJK	10/04/17 20:47	2.24	100	CJ70328
<b>Lead</b>	<b>57.6</b> (4.62)		6010C		1	KJK	10/04/17 20:47	2.24	100	CJ70328
<b>Mercury</b>	<b>0.154</b> (0.028)		7471B		1	MJV	10/04/17 11:52	0.74	40	CJ70303
<b>Nickel</b>	<b>17.9</b> (2.31)		6010C		1	KJK	10/04/17 20:47	2.24	100	CJ70328
Selenium	ND (1.85)		6020A		20	NAR	10/04/17 18:39	2.24	100	CJ70328
Silver	ND (0.46)		6010C		1	KJK	10/04/17 20:47	2.24	100	CJ70328
Thallium	ND (1.85)		6020A		20	NAR	10/04/17 18:39	2.24	100	CJ70328
<b>Zinc</b>	<b>38.6</b> (2.31)		6010C		1	KJK	10/04/17 20:47	2.24	100	CJ70328



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-550 (0-2')  
Date Sampled: 10/02/17 12:55  
Percent Solids: 97  
Initial Volume: 5.8  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-11  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0045)		8260B Low		1	10/04/17 20:38	C7J0034	CJ70323
1,1,1-Trichloroethane	ND (0.0045)		8260B Low		1	10/04/17 20:38	C7J0034	CJ70323
1,1,2,2-Tetrachloroethane	ND (0.0045)		8260B Low		1	10/04/17 20:38	C7J0034	CJ70323
1,1,2-Trichloroethane	ND (0.0045)		8260B Low		1	10/04/17 20:38	C7J0034	CJ70323
1,1-Dichloroethane	ND (0.0045)		8260B Low		1	10/04/17 20:38	C7J0034	CJ70323
1,1-Dichloroethene	ND (0.0045)		8260B Low		1	10/04/17 20:38	C7J0034	CJ70323
1,1-Dichloropropene	ND (0.0045)		8260B Low		1	10/04/17 20:38	C7J0034	CJ70323
1,2,3-Trichlorobenzene	ND (0.0045)		8260B Low		1	10/04/17 20:38	C7J0034	CJ70323
1,2,3-Trichloropropane	ND (0.0045)		8260B Low		1	10/04/17 20:38	C7J0034	CJ70323
1,2,4-Trichlorobenzene	ND (0.0045)		8260B Low		1	10/04/17 20:38	C7J0034	CJ70323
1,2,4-Trimethylbenzene	ND (0.0045)		8260B Low		1	10/04/17 20:38	C7J0034	CJ70323
1,2-Dibromo-3-Chloropropane	ND (0.0045)		8260B Low		1	10/04/17 20:38	C7J0034	CJ70323
1,2-Dibromoethane	ND (0.0045)		8260B Low		1	10/04/17 20:38	C7J0034	CJ70323
1,2-Dichlorobenzene	ND (0.0045)		8260B Low		1	10/04/17 20:38	C7J0034	CJ70323
1,2-Dichloroethane	ND (0.0045)		8260B Low		1	10/04/17 20:38	C7J0034	CJ70323
1,2-Dichloropropane	ND (0.0045)		8260B Low		1	10/04/17 20:38	C7J0034	CJ70323
1,3,5-Trimethylbenzene	ND (0.0045)		8260B Low		1	10/04/17 20:38	C7J0034	CJ70323
1,3-Dichlorobenzene	ND (0.0045)		8260B Low		1	10/04/17 20:38	C7J0034	CJ70323
1,3-Dichloropropane	ND (0.0045)		8260B Low		1	10/04/17 20:38	C7J0034	CJ70323
1,4-Dichlorobenzene	ND (0.0045)		8260B Low		1	10/04/17 20:38	C7J0034	CJ70323
1,4-Dioxane	ND (0.0892)		8260B Low		1	10/04/17 20:38	C7J0034	CJ70323
1-Chlorohexane	ND (0.0045)		8260B Low		1	10/04/17 20:38	C7J0034	CJ70323
2,2-Dichloropropane	ND (0.0045)		8260B Low		1	10/04/17 20:38	C7J0034	CJ70323
2-Butanone	ND (0.0446)		8260B Low		1	10/04/17 20:38	C7J0034	CJ70323
2-Chlorotoluene	ND (0.0045)		8260B Low		1	10/04/17 20:38	C7J0034	CJ70323
2-Hexanone	ND (0.0446)		8260B Low		1	10/04/17 20:38	C7J0034	CJ70323
4-Chlorotoluene	ND (0.0045)		8260B Low		1	10/04/17 20:38	C7J0034	CJ70323
4-Isopropyltoluene	ND (0.0045)		8260B Low		1	10/04/17 20:38	C7J0034	CJ70323
4-Methyl-2-Pentanone	ND (0.0446)		8260B Low		1	10/04/17 20:38	C7J0034	CJ70323
Acetone	ND (0.0446)		8260B Low		1	10/04/17 20:38	C7J0034	CJ70323
Benzene	ND (0.0045)		8260B Low		1	10/04/17 20:38	C7J0034	CJ70323
Bromobenzene	ND (0.0045)		8260B Low		1	10/04/17 20:38	C7J0034	CJ70323



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-550 (0-2')  
Date Sampled: 10/02/17 12:55  
Percent Solids: 97  
Initial Volume: 5.8  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-11  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0045)		8260B Low		1	10/04/17 20:38	C7J0034	CJ70323
Bromodichloromethane	ND (0.0045)		8260B Low		1	10/04/17 20:38	C7J0034	CJ70323
Bromoform	ND (0.0045)		8260B Low		1	10/04/17 20:38	C7J0034	CJ70323
Bromomethane	ND (0.0089)		8260B Low		1	10/04/17 20:38	C7J0034	CJ70323
Carbon Disulfide	ND (0.0045)		8260B Low		1	10/04/17 20:38	C7J0034	CJ70323
Carbon Tetrachloride	ND (0.0045)		8260B Low		1	10/04/17 20:38	C7J0034	CJ70323
Chlorobenzene	ND (0.0045)		8260B Low		1	10/04/17 20:38	C7J0034	CJ70323
Chloroethane	ND (0.0089)		8260B Low		1	10/04/17 20:38	C7J0034	CJ70323
Chloroform	ND (0.0045)		8260B Low		1	10/04/17 20:38	C7J0034	CJ70323
Chloromethane	ND (0.0089)		8260B Low		1	10/04/17 20:38	C7J0034	CJ70323
cis-1,2-Dichloroethene	ND (0.0045)		8260B Low		1	10/04/17 20:38	C7J0034	CJ70323
cis-1,3-Dichloropropene	ND (0.0045)		8260B Low		1	10/04/17 20:38	C7J0034	CJ70323
Dibromochloromethane	ND (0.0045)		8260B Low		1	10/04/17 20:38	C7J0034	CJ70323
Dibromomethane	ND (0.0045)		8260B Low		1	10/04/17 20:38	C7J0034	CJ70323
Dichlorodifluoromethane	ND (0.0089)		8260B Low		1	10/04/17 20:38	C7J0034	CJ70323
Diethyl Ether	ND (0.0045)		8260B Low		1	10/04/17 20:38	C7J0034	CJ70323
Di-isopropyl ether	ND (0.0045)		8260B Low		1	10/04/17 20:38	C7J0034	CJ70323
Ethyl tertiary-butyl ether	ND (0.0045)		8260B Low		1	10/04/17 20:38	C7J0034	CJ70323
Ethylbenzene	ND (0.0045)		8260B Low		1	10/04/17 20:38	C7J0034	CJ70323
Hexachlorobutadiene	ND (0.0045)		8260B Low		1	10/04/17 20:38	C7J0034	CJ70323
Isopropylbenzene	ND (0.0045)		8260B Low		1	10/04/17 20:38	C7J0034	CJ70323
Methyl tert-Butyl Ether	ND (0.0045)		8260B Low		1	10/04/17 20:38	C7J0034	CJ70323
Methylene Chloride	ND (0.0223)		8260B Low		1	10/04/17 20:38	C7J0034	CJ70323
Naphthalene	ND (0.0045)		8260B Low		1	10/04/17 20:38	C7J0034	CJ70323
n-Butylbenzene	ND (0.0045)		8260B Low		1	10/04/17 20:38	C7J0034	CJ70323
n-Propylbenzene	ND (0.0045)		8260B Low		1	10/04/17 20:38	C7J0034	CJ70323
sec-Butylbenzene	ND (0.0045)		8260B Low		1	10/04/17 20:38	C7J0034	CJ70323
Styrene	ND (0.0045)		8260B Low		1	10/04/17 20:38	C7J0034	CJ70323
tert-Butylbenzene	ND (0.0045)		8260B Low		1	10/04/17 20:38	C7J0034	CJ70323
Tertiary-amyl methyl ether	ND (0.0045)		8260B Low		1	10/04/17 20:38	C7J0034	CJ70323
Tetrachloroethene	ND (0.0045)		8260B Low		1	10/04/17 20:38	C7J0034	CJ70323
Tetrahydrofuran	ND (0.0045)		8260B Low		1	10/04/17 20:38	C7J0034	CJ70323



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-550 (0-2')  
Date Sampled: 10/02/17 12:55  
Percent Solids: 97  
Initial Volume: 5.8  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-11  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0045)		8260B Low		1	10/04/17 20:38	C7J0034	CJ70323
trans-1,2-Dichloroethene	ND (0.0045)		8260B Low		1	10/04/17 20:38	C7J0034	CJ70323
trans-1,3-Dichloropropene	ND (0.0045)		8260B Low		1	10/04/17 20:38	C7J0034	CJ70323
Trichloroethene	ND (0.0045)		8260B Low		1	10/04/17 20:38	C7J0034	CJ70323
Trichlorofluoromethane	ND (0.0045)		8260B Low		1	10/04/17 20:38	C7J0034	CJ70323
Vinyl Acetate	ND (0.0045)		8260B Low		1	10/04/17 20:38	C7J0034	CJ70323
Vinyl Chloride	ND (0.0089)		8260B Low		1	10/04/17 20:38	C7J0034	CJ70323
Xylene O	ND (0.0045)		8260B Low		1	10/04/17 20:38	C7J0034	CJ70323
Xylene P,M	ND (0.0089)		8260B Low		1	10/04/17 20:38	C7J0034	CJ70323
Xylenes (Total)	ND (0.0089)		8260B Low		1	10/04/17 20:38		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>112 %</i>		<i>70-130</i>
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>95 %</i>		<i>70-130</i>
<i>Surrogate: Dibromofluoromethane</i>	<i>109 %</i>		<i>70-130</i>
<i>Surrogate: Toluene-d8</i>	<i>109 %</i>		<i>70-130</i>



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-550 (0-2')  
Date Sampled: 10/02/17 12:55  
Percent Solids: 97  
Initial Volume: 19.7  
Final Volume: 1  
Extraction Method: 3546

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-11  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: SMR  
Prepared: 10/3/17 13:00

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	182 (39.4)		8100M		1	10/05/17 12:06	C7J0068	CJ70310
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		77 %		40-140				





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-550 (0-2')  
 Date Sampled: 10/02/17 12:55  
 Percent Solids: 97  
 Initial Volume: 14.3  
 Final Volume: 0.5  
 Extraction Method: 3546

ESS Laboratory Work Order: 1710025  
 ESS Laboratory Sample ID: 1710025-11  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: TJ  
 Prepared: 10/3/17 12:30

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.361)		8270D		1	10/04/17 19:41	C7J0050	CJ70309
Acenaphthene	ND (0.361)		8270D		1	10/04/17 19:41	C7J0050	CJ70309
Acenaphthylene	ND (0.361)		8270D		1	10/04/17 19:41	C7J0050	CJ70309
Anthracene	ND (0.361)		8270D		1	10/04/17 19:41	C7J0050	CJ70309
<b>Benzo(a)anthracene</b>	<b>0.548</b> (0.361)		8270D		1	10/04/17 19:41	C7J0050	CJ70309
<b>Benzo(a)pyrene</b>	<b>0.477</b> (0.181)		8270D		1	10/04/17 19:41	C7J0050	CJ70309
<b>Benzo(b)fluoranthene</b>	<b>0.734</b> (0.361)		8270D		1	10/04/17 19:41	C7J0050	CJ70309
<b>Benzo(g,h,i)perylene</b>	<b>0.485</b> (0.361)		8270D		1	10/04/17 19:41	C7J0050	CJ70309
Benzo(k)fluoranthene	ND (0.361)		8270D		1	10/04/17 19:41	C7J0050	CJ70309
<b>Chrysene</b>	<b>0.579</b> (0.181)		8270D		1	10/04/17 19:41	C7J0050	CJ70309
<b>Dibenzo(a,h)Anthracene</b>	<b>0.183</b> (0.181)		8270D		1	10/04/17 19:41	C7J0050	CJ70309
<b>Fluoranthene</b>	<b>0.661</b> (0.361)		8270D		1	10/04/17 19:41	C7J0050	CJ70309
Fluorene	ND (0.361)		8270D		1	10/04/17 19:41	C7J0050	CJ70309
<b>Indeno(1,2,3-cd)Pyrene</b>	<b>0.414</b> (0.361)		8270D		1	10/04/17 19:41	C7J0050	CJ70309
Naphthalene	ND (0.361)		8270D		1	10/04/17 19:41	C7J0050	CJ70309
Phenanthrene	ND (0.361)		8270D		1	10/04/17 19:41	C7J0050	CJ70309
<b>Pyrene</b>	<b>0.674</b> (0.361)		8270D		1	10/04/17 19:41	C7J0050	CJ70309

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	42 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	58 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	48 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	71 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-550 (0-2')  
Date Sampled: 10/02/17 12:55  
Percent Solids: 97

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-11  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	56.3 (10.1)		9014		10	EEM	10/05/17 11:20	mg/kg dry	CJ70513



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-551 (0-2')  
Date Sampled: 10/02/17 13:10  
Percent Solids: 93

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-12  
Sample Matrix: Soil  
Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (1.79)		6020A		20	NAR	10/04/17 18:45	2.4	100	CJ70328
Arsenic	<b>4.26</b> (2.24)		6010C		1	KJK	10/04/17 20:52	2.4	100	CJ70328
Beryllium	<b>0.15</b> (0.10)		6010C		1	KJK	10/04/17 20:52	2.4	100	CJ70328
Cadmium	ND (0.45)		6010C		1	KJK	10/04/17 20:52	2.4	100	CJ70328
Chromium	<b>15.5</b> (0.90)		6010C		1	KJK	10/04/17 20:52	2.4	100	CJ70328
Copper	<b>17.1</b> (2.24)		6010C		1	KJK	10/04/17 20:52	2.4	100	CJ70328
Lead	<b>50.9</b> (4.48)		6010C		1	KJK	10/04/17 20:52	2.4	100	CJ70328
Mercury	<b>0.185</b> (0.027)		7471B		1	MJV	10/04/17 11:54	0.8	40	CJ70303
Nickel	<b>7.67</b> (2.24)		6010C		1	KJK	10/04/17 20:52	2.4	100	CJ70328
Selenium	ND (1.79)		6020A		20	NAR	10/04/17 18:45	2.4	100	CJ70328
Silver	ND (0.45)		6010C		1	KJK	10/04/17 20:52	2.4	100	CJ70328
Thallium	ND (1.79)		6020A		20	NAR	10/04/17 18:45	2.4	100	CJ70328
Zinc	<b>30.4</b> (2.24)		6010C		1	KJK	10/04/17 20:52	2.4	100	CJ70328



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-551 (0-2')  
Date Sampled: 10/02/17 13:10  
Percent Solids: 93  
Initial Volume: 5.9  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-12  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0046)		8260B Low		1	10/04/17 21:03	C7J0034	CJ70323
1,1,1-Trichloroethane	ND (0.0046)		8260B Low		1	10/04/17 21:03	C7J0034	CJ70323
1,1,2,2-Tetrachloroethane	ND (0.0046)		8260B Low		1	10/04/17 21:03	C7J0034	CJ70323
1,1,2-Trichloroethane	ND (0.0046)		8260B Low		1	10/04/17 21:03	C7J0034	CJ70323
1,1-Dichloroethane	ND (0.0046)		8260B Low		1	10/04/17 21:03	C7J0034	CJ70323
1,1-Dichloroethene	ND (0.0046)		8260B Low		1	10/04/17 21:03	C7J0034	CJ70323
1,1-Dichloropropene	ND (0.0046)		8260B Low		1	10/04/17 21:03	C7J0034	CJ70323
1,2,3-Trichlorobenzene	ND (0.0046)		8260B Low		1	10/04/17 21:03	C7J0034	CJ70323
1,2,3-Trichloropropane	ND (0.0046)		8260B Low		1	10/04/17 21:03	C7J0034	CJ70323
1,2,4-Trichlorobenzene	ND (0.0046)		8260B Low		1	10/04/17 21:03	C7J0034	CJ70323
1,2,4-Trimethylbenzene	ND (0.0046)		8260B Low		1	10/04/17 21:03	C7J0034	CJ70323
1,2-Dibromo-3-Chloropropane	ND (0.0046)		8260B Low		1	10/04/17 21:03	C7J0034	CJ70323
1,2-Dibromoethane	ND (0.0046)		8260B Low		1	10/04/17 21:03	C7J0034	CJ70323
1,2-Dichlorobenzene	ND (0.0046)		8260B Low		1	10/04/17 21:03	C7J0034	CJ70323
1,2-Dichloroethane	ND (0.0046)		8260B Low		1	10/04/17 21:03	C7J0034	CJ70323
1,2-Dichloropropane	ND (0.0046)		8260B Low		1	10/04/17 21:03	C7J0034	CJ70323
1,3,5-Trimethylbenzene	ND (0.0046)		8260B Low		1	10/04/17 21:03	C7J0034	CJ70323
1,3-Dichlorobenzene	ND (0.0046)		8260B Low		1	10/04/17 21:03	C7J0034	CJ70323
1,3-Dichloropropane	ND (0.0046)		8260B Low		1	10/04/17 21:03	C7J0034	CJ70323
1,4-Dichlorobenzene	ND (0.0046)		8260B Low		1	10/04/17 21:03	C7J0034	CJ70323
1,4-Dioxane	ND (0.0911)		8260B Low		1	10/04/17 21:03	C7J0034	CJ70323
1-Chlorohexane	ND (0.0046)		8260B Low		1	10/04/17 21:03	C7J0034	CJ70323
2,2-Dichloropropane	ND (0.0046)		8260B Low		1	10/04/17 21:03	C7J0034	CJ70323
2-Butanone	ND (0.0456)		8260B Low		1	10/04/17 21:03	C7J0034	CJ70323
2-Chlorotoluene	ND (0.0046)		8260B Low		1	10/04/17 21:03	C7J0034	CJ70323
2-Hexanone	ND (0.0456)		8260B Low		1	10/04/17 21:03	C7J0034	CJ70323
4-Chlorotoluene	ND (0.0046)		8260B Low		1	10/04/17 21:03	C7J0034	CJ70323
4-Isopropyltoluene	ND (0.0046)		8260B Low		1	10/04/17 21:03	C7J0034	CJ70323
4-Methyl-2-Pentanone	ND (0.0456)		8260B Low		1	10/04/17 21:03	C7J0034	CJ70323
Acetone	ND (0.0456)		8260B Low		1	10/04/17 21:03	C7J0034	CJ70323
Benzene	ND (0.0046)		8260B Low		1	10/04/17 21:03	C7J0034	CJ70323
Bromobenzene	ND (0.0046)		8260B Low		1	10/04/17 21:03	C7J0034	CJ70323



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-551 (0-2')  
Date Sampled: 10/02/17 13:10  
Percent Solids: 93  
Initial Volume: 5.9  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-12  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0046)		8260B Low		1	10/04/17 21:03	C7J0034	CJ70323
Bromodichloromethane	ND (0.0046)		8260B Low		1	10/04/17 21:03	C7J0034	CJ70323
Bromoform	ND (0.0046)		8260B Low		1	10/04/17 21:03	C7J0034	CJ70323
Bromomethane	ND (0.0091)		8260B Low		1	10/04/17 21:03	C7J0034	CJ70323
Carbon Disulfide	ND (0.0046)		8260B Low		1	10/04/17 21:03	C7J0034	CJ70323
Carbon Tetrachloride	ND (0.0046)		8260B Low		1	10/04/17 21:03	C7J0034	CJ70323
Chlorobenzene	ND (0.0046)		8260B Low		1	10/04/17 21:03	C7J0034	CJ70323
Chloroethane	ND (0.0091)		8260B Low		1	10/04/17 21:03	C7J0034	CJ70323
Chloroform	ND (0.0046)		8260B Low		1	10/04/17 21:03	C7J0034	CJ70323
Chloromethane	ND (0.0091)		8260B Low		1	10/04/17 21:03	C7J0034	CJ70323
cis-1,2-Dichloroethene	ND (0.0046)		8260B Low		1	10/04/17 21:03	C7J0034	CJ70323
cis-1,3-Dichloropropene	ND (0.0046)		8260B Low		1	10/04/17 21:03	C7J0034	CJ70323
Dibromochloromethane	ND (0.0046)		8260B Low		1	10/04/17 21:03	C7J0034	CJ70323
Dibromomethane	ND (0.0046)		8260B Low		1	10/04/17 21:03	C7J0034	CJ70323
Dichlorodifluoromethane	ND (0.0091)		8260B Low		1	10/04/17 21:03	C7J0034	CJ70323
Diethyl Ether	ND (0.0046)		8260B Low		1	10/04/17 21:03	C7J0034	CJ70323
Di-isopropyl ether	ND (0.0046)		8260B Low		1	10/04/17 21:03	C7J0034	CJ70323
Ethyl tertiary-butyl ether	ND (0.0046)		8260B Low		1	10/04/17 21:03	C7J0034	CJ70323
Ethylbenzene	ND (0.0046)		8260B Low		1	10/04/17 21:03	C7J0034	CJ70323
Hexachlorobutadiene	ND (0.0046)		8260B Low		1	10/04/17 21:03	C7J0034	CJ70323
Isopropylbenzene	ND (0.0046)		8260B Low		1	10/04/17 21:03	C7J0034	CJ70323
Methyl tert-Butyl Ether	ND (0.0046)		8260B Low		1	10/04/17 21:03	C7J0034	CJ70323
Methylene Chloride	ND (0.0228)		8260B Low		1	10/04/17 21:03	C7J0034	CJ70323
Naphthalene	ND (0.0046)		8260B Low		1	10/04/17 21:03	C7J0034	CJ70323
n-Butylbenzene	ND (0.0046)		8260B Low		1	10/04/17 21:03	C7J0034	CJ70323
n-Propylbenzene	ND (0.0046)		8260B Low		1	10/04/17 21:03	C7J0034	CJ70323
sec-Butylbenzene	ND (0.0046)		8260B Low		1	10/04/17 21:03	C7J0034	CJ70323
Styrene	ND (0.0046)		8260B Low		1	10/04/17 21:03	C7J0034	CJ70323
tert-Butylbenzene	ND (0.0046)		8260B Low		1	10/04/17 21:03	C7J0034	CJ70323
Tertiary-amyl methyl ether	ND (0.0046)		8260B Low		1	10/04/17 21:03	C7J0034	CJ70323
Tetrachloroethene	ND (0.0046)		8260B Low		1	10/04/17 21:03	C7J0034	CJ70323
Tetrahydrofuran	ND (0.0046)		8260B Low		1	10/04/17 21:03	C7J0034	CJ70323



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-551 (0-2')  
 Date Sampled: 10/02/17 13:10  
 Percent Solids: 93  
 Initial Volume: 5.9  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1710025  
 ESS Laboratory Sample ID: 1710025-12  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0046)		8260B Low		1	10/04/17 21:03	C7J0034	CJ70323
trans-1,2-Dichloroethene	ND (0.0046)		8260B Low		1	10/04/17 21:03	C7J0034	CJ70323
trans-1,3-Dichloropropene	ND (0.0046)		8260B Low		1	10/04/17 21:03	C7J0034	CJ70323
Trichloroethene	ND (0.0046)		8260B Low		1	10/04/17 21:03	C7J0034	CJ70323
Trichlorofluoromethane	ND (0.0046)		8260B Low		1	10/04/17 21:03	C7J0034	CJ70323
Vinyl Acetate	ND (0.0046)		8260B Low		1	10/04/17 21:03	C7J0034	CJ70323
Vinyl Chloride	ND (0.0091)		8260B Low		1	10/04/17 21:03	C7J0034	CJ70323
Xylene O	ND (0.0046)		8260B Low		1	10/04/17 21:03	C7J0034	CJ70323
Xylene P,M	ND (0.0091)		8260B Low		1	10/04/17 21:03	C7J0034	CJ70323
Xylenes (Total)	ND (0.0091)		8260B Low		1	10/04/17 21:03		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>111 %</i>		<i>70-130</i>
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>85 %</i>		<i>70-130</i>
<i>Surrogate: Dibromofluoromethane</i>	<i>107 %</i>		<i>70-130</i>
<i>Surrogate: Toluene-d8</i>	<i>119 %</i>		<i>70-130</i>





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-551 (0-2')  
Date Sampled: 10/02/17 13:10  
Percent Solids: 93  
Initial Volume: 19.6  
Final Volume: 1  
Extraction Method: 3546

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-12  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: SMR  
Prepared: 10/3/17 13:00

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	217 (41.2)		8100M		1	10/05/17 12:42	C7J0068	CJ70310
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		78 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-551 (0-2')  
Date Sampled: 10/02/17 13:10  
Percent Solids: 93  
Initial Volume: 14.6  
Final Volume: 0.5  
Extraction Method: 3546

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-12  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: TJ  
Prepared: 10/3/17 12:30

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.368)		8270D		1	10/04/17 20:16	C7J0050	CJ70309
Acenaphthene	ND (0.368)		8270D		1	10/04/17 20:16	C7J0050	CJ70309
<b>Acenaphthylene</b>	<b>0.400</b> (0.368)		8270D		1	10/04/17 20:16	C7J0050	CJ70309
<b>Anthracene</b>	<b>0.450</b> (0.368)		8270D		1	10/04/17 20:16	C7J0050	CJ70309
<b>Benzo(a)anthracene</b>	<b>1.54</b> (0.368)		8270D		1	10/04/17 20:16	C7J0050	CJ70309
<b>Benzo(a)pyrene</b>	<b>1.05</b> (0.185)		8270D		1	10/04/17 20:16	C7J0050	CJ70309
<b>Benzo(b)fluoranthene</b>	<b>1.29</b> (0.368)		8270D		1	10/04/17 20:16	C7J0050	CJ70309
<b>Benzo(g,h,i)perylene</b>	<b>0.901</b> (0.368)		8270D		1	10/04/17 20:16	C7J0050	CJ70309
<b>Benzo(k)fluoranthene</b>	<b>0.611</b> (0.368)		8270D		1	10/04/17 20:16	C7J0050	CJ70309
<b>Chrysene</b>	<b>1.55</b> (0.185)		8270D		1	10/04/17 20:16	C7J0050	CJ70309
<b>Dibenzo(a,h)Anthracene</b>	<b>0.347</b> (0.185)		8270D		1	10/04/17 20:16	C7J0050	CJ70309
<b>Fluoranthene</b>	<b>2.08</b> (0.368)		8270D		1	10/04/17 20:16	C7J0050	CJ70309
Fluorene	ND (0.368)		8270D		1	10/04/17 20:16	C7J0050	CJ70309
<b>Indeno(1,2,3-cd)Pyrene</b>	<b>0.749</b> (0.368)		8270D		1	10/04/17 20:16	C7J0050	CJ70309
Naphthalene	ND (0.368)		8270D		1	10/04/17 20:16	C7J0050	CJ70309
<b>Phenanthrene</b>	<b>1.83</b> (0.368)		8270D		1	10/04/17 20:16	C7J0050	CJ70309
<b>Pyrene</b>	<b>2.34</b> (0.368)		8270D		1	10/04/17 20:16	C7J0050	CJ70309

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	45 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	60 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	51 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	69 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-551 (0-2')  
Date Sampled: 10/02/17 13:10  
Percent Solids: 93

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-12  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	30.7 (5.09)		9014		5	EEM	10/05/17 11:20	mg/kg dry	CJ70513



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-552 (0-2')  
Date Sampled: 10/02/17 13:25  
Percent Solids: 96

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-13  
Sample Matrix: Soil  
Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (1.72)		6020A		20	NAR	10/04/17 18:51	2.43	100	CJ70328
Arsenic	<b>3.03</b> (2.15)		6010C		1	KJK	10/04/17 20:56	2.43	100	CJ70328
Beryllium	<b>0.10</b> (0.09)		6010C		1	KJK	10/04/17 20:56	2.43	100	CJ70328
Cadmium	ND (0.43)		6010C		1	KJK	10/04/17 20:56	2.43	100	CJ70328
Chromium	<b>9.22</b> (0.86)		6010C		1	KJK	10/04/17 20:56	2.43	100	CJ70328
Copper	<b>14.8</b> (2.15)		6010C		1	KJK	10/04/17 20:56	2.43	100	CJ70328
Lead	<b>47.0</b> (4.30)		6010C		1	KJK	10/04/17 20:56	2.43	100	CJ70328
Mercury	<b>0.089</b> (0.025)		7471B		1	MJV	10/04/17 11:56	0.83	40	CJ70303
Nickel	<b>7.13</b> (2.15)		6010C		1	KJK	10/04/17 20:56	2.43	100	CJ70328
Selenium	ND (1.72)		6020A		20	NAR	10/04/17 18:51	2.43	100	CJ70328
Silver	ND (0.43)		6010C		1	KJK	10/04/17 20:56	2.43	100	CJ70328
Thallium	ND (1.72)		6020A		20	NAR	10/04/17 18:51	2.43	100	CJ70328
Zinc	<b>22.4</b> (2.15)		6010C		1	KJK	10/04/17 20:56	2.43	100	CJ70328



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-552 (0-2')  
Date Sampled: 10/02/17 13:25  
Percent Solids: 96  
Initial Volume: 5.7  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-13  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0046)		8260B Low		1	10/04/17 21:28	C7J0034	CJ70323
1,1,1-Trichloroethane	ND (0.0046)		8260B Low		1	10/04/17 21:28	C7J0034	CJ70323
1,1,2,2-Tetrachloroethane	ND (0.0046)		8260B Low		1	10/04/17 21:28	C7J0034	CJ70323
1,1,2-Trichloroethane	ND (0.0046)		8260B Low		1	10/04/17 21:28	C7J0034	CJ70323
1,1-Dichloroethane	ND (0.0046)		8260B Low		1	10/04/17 21:28	C7J0034	CJ70323
1,1-Dichloroethene	ND (0.0046)		8260B Low		1	10/04/17 21:28	C7J0034	CJ70323
1,1-Dichloropropene	ND (0.0046)		8260B Low		1	10/04/17 21:28	C7J0034	CJ70323
1,2,3-Trichlorobenzene	ND (0.0046)		8260B Low		1	10/04/17 21:28	C7J0034	CJ70323
1,2,3-Trichloropropane	ND (0.0046)		8260B Low		1	10/04/17 21:28	C7J0034	CJ70323
1,2,4-Trichlorobenzene	ND (0.0046)		8260B Low		1	10/04/17 21:28	C7J0034	CJ70323
1,2,4-Trimethylbenzene	ND (0.0046)		8260B Low		1	10/04/17 21:28	C7J0034	CJ70323
1,2-Dibromo-3-Chloropropane	ND (0.0046)		8260B Low		1	10/04/17 21:28	C7J0034	CJ70323
1,2-Dibromoethane	ND (0.0046)		8260B Low		1	10/04/17 21:28	C7J0034	CJ70323
1,2-Dichlorobenzene	ND (0.0046)		8260B Low		1	10/04/17 21:28	C7J0034	CJ70323
1,2-Dichloroethane	ND (0.0046)		8260B Low		1	10/04/17 21:28	C7J0034	CJ70323
1,2-Dichloropropane	ND (0.0046)		8260B Low		1	10/04/17 21:28	C7J0034	CJ70323
1,3,5-Trimethylbenzene	ND (0.0046)		8260B Low		1	10/04/17 21:28	C7J0034	CJ70323
1,3-Dichlorobenzene	ND (0.0046)		8260B Low		1	10/04/17 21:28	C7J0034	CJ70323
1,3-Dichloropropane	ND (0.0046)		8260B Low		1	10/04/17 21:28	C7J0034	CJ70323
1,4-Dichlorobenzene	ND (0.0046)		8260B Low		1	10/04/17 21:28	C7J0034	CJ70323
1,4-Dioxane	ND (0.0916)		8260B Low		1	10/04/17 21:28	C7J0034	CJ70323
1-Chlorohexane	ND (0.0046)		8260B Low		1	10/04/17 21:28	C7J0034	CJ70323
2,2-Dichloropropane	ND (0.0046)		8260B Low		1	10/04/17 21:28	C7J0034	CJ70323
2-Butanone	ND (0.0458)		8260B Low		1	10/04/17 21:28	C7J0034	CJ70323
2-Chlorotoluene	ND (0.0046)		8260B Low		1	10/04/17 21:28	C7J0034	CJ70323
2-Hexanone	ND (0.0458)		8260B Low		1	10/04/17 21:28	C7J0034	CJ70323
4-Chlorotoluene	ND (0.0046)		8260B Low		1	10/04/17 21:28	C7J0034	CJ70323
4-Isopropyltoluene	ND (0.0046)		8260B Low		1	10/04/17 21:28	C7J0034	CJ70323
4-Methyl-2-Pentanone	ND (0.0458)		8260B Low		1	10/04/17 21:28	C7J0034	CJ70323
<b>Acetone</b>	<b>0.0479</b> (0.0458)		8260B Low		1	10/04/17 21:28	C7J0034	CJ70323
Benzene	ND (0.0046)		8260B Low		1	10/04/17 21:28	C7J0034	CJ70323
Bromobenzene	ND (0.0046)		8260B Low		1	10/04/17 21:28	C7J0034	CJ70323



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-552 (0-2')  
Date Sampled: 10/02/17 13:25  
Percent Solids: 96  
Initial Volume: 5.7  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-13  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0046)		8260B Low		1	10/04/17 21:28	C7J0034	CJ70323
Bromodichloromethane	ND (0.0046)		8260B Low		1	10/04/17 21:28	C7J0034	CJ70323
Bromoform	ND (0.0046)		8260B Low		1	10/04/17 21:28	C7J0034	CJ70323
Bromomethane	ND (0.0092)		8260B Low		1	10/04/17 21:28	C7J0034	CJ70323
Carbon Disulfide	ND (0.0046)		8260B Low		1	10/04/17 21:28	C7J0034	CJ70323
Carbon Tetrachloride	ND (0.0046)		8260B Low		1	10/04/17 21:28	C7J0034	CJ70323
Chlorobenzene	ND (0.0046)		8260B Low		1	10/04/17 21:28	C7J0034	CJ70323
Chloroethane	ND (0.0092)		8260B Low		1	10/04/17 21:28	C7J0034	CJ70323
Chloroform	ND (0.0046)		8260B Low		1	10/04/17 21:28	C7J0034	CJ70323
Chloromethane	ND (0.0092)		8260B Low		1	10/04/17 21:28	C7J0034	CJ70323
cis-1,2-Dichloroethene	ND (0.0046)		8260B Low		1	10/04/17 21:28	C7J0034	CJ70323
cis-1,3-Dichloropropene	ND (0.0046)		8260B Low		1	10/04/17 21:28	C7J0034	CJ70323
Dibromochloromethane	ND (0.0046)		8260B Low		1	10/04/17 21:28	C7J0034	CJ70323
Dibromomethane	ND (0.0046)		8260B Low		1	10/04/17 21:28	C7J0034	CJ70323
Dichlorodifluoromethane	ND (0.0092)		8260B Low		1	10/04/17 21:28	C7J0034	CJ70323
Diethyl Ether	ND (0.0046)		8260B Low		1	10/04/17 21:28	C7J0034	CJ70323
Di-isopropyl ether	ND (0.0046)		8260B Low		1	10/04/17 21:28	C7J0034	CJ70323
Ethyl tertiary-butyl ether	ND (0.0046)		8260B Low		1	10/04/17 21:28	C7J0034	CJ70323
Ethylbenzene	ND (0.0046)		8260B Low		1	10/04/17 21:28	C7J0034	CJ70323
Hexachlorobutadiene	ND (0.0046)		8260B Low		1	10/04/17 21:28	C7J0034	CJ70323
Isopropylbenzene	ND (0.0046)		8260B Low		1	10/04/17 21:28	C7J0034	CJ70323
Methyl tert-Butyl Ether	ND (0.0046)		8260B Low		1	10/04/17 21:28	C7J0034	CJ70323
Methylene Chloride	ND (0.0229)		8260B Low		1	10/04/17 21:28	C7J0034	CJ70323
Naphthalene	ND (0.0046)		8260B Low		1	10/04/17 21:28	C7J0034	CJ70323
n-Butylbenzene	ND (0.0046)		8260B Low		1	10/04/17 21:28	C7J0034	CJ70323
n-Propylbenzene	ND (0.0046)		8260B Low		1	10/04/17 21:28	C7J0034	CJ70323
sec-Butylbenzene	ND (0.0046)		8260B Low		1	10/04/17 21:28	C7J0034	CJ70323
Styrene	ND (0.0046)		8260B Low		1	10/04/17 21:28	C7J0034	CJ70323
tert-Butylbenzene	ND (0.0046)		8260B Low		1	10/04/17 21:28	C7J0034	CJ70323
Tertiary-amyl methyl ether	ND (0.0046)		8260B Low		1	10/04/17 21:28	C7J0034	CJ70323
Tetrachloroethene	ND (0.0046)		8260B Low		1	10/04/17 21:28	C7J0034	CJ70323
Tetrahydrofuran	ND (0.0046)		8260B Low		1	10/04/17 21:28	C7J0034	CJ70323





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-552 (0-2')  
 Date Sampled: 10/02/17 13:25  
 Percent Solids: 96  
 Initial Volume: 5.7  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1710025  
 ESS Laboratory Sample ID: 1710025-13  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0046)		8260B Low		1	10/04/17 21:28	C7J0034	CJ70323
trans-1,2-Dichloroethene	ND (0.0046)		8260B Low		1	10/04/17 21:28	C7J0034	CJ70323
trans-1,3-Dichloropropene	ND (0.0046)		8260B Low		1	10/04/17 21:28	C7J0034	CJ70323
Trichloroethene	ND (0.0046)		8260B Low		1	10/04/17 21:28	C7J0034	CJ70323
Trichlorofluoromethane	ND (0.0046)		8260B Low		1	10/04/17 21:28	C7J0034	CJ70323
Vinyl Acetate	ND (0.0046)		8260B Low		1	10/04/17 21:28	C7J0034	CJ70323
Vinyl Chloride	ND (0.0092)		8260B Low		1	10/04/17 21:28	C7J0034	CJ70323
Xylene O	ND (0.0046)		8260B Low		1	10/04/17 21:28	C7J0034	CJ70323
Xylene P,M	ND (0.0092)		8260B Low		1	10/04/17 21:28	C7J0034	CJ70323
Xylenes (Total)	ND (0.0092)		8260B Low		1	10/04/17 21:28		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>111 %</i>		<i>70-130</i>
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>96 %</i>		<i>70-130</i>
<i>Surrogate: Dibromofluoromethane</i>	<i>108 %</i>		<i>70-130</i>
<i>Surrogate: Toluene-d8</i>	<i>111 %</i>		<i>70-130</i>



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-552 (0-2')  
Date Sampled: 10/02/17 13:25  
Percent Solids: 96  
Initial Volume: 19.5  
Final Volume: 1  
Extraction Method: 3546

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-13  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: SMR  
Prepared: 10/3/17 13:00

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	158 (40.1)		8100M		1	10/05/17 13:18	C7J0068	CJ70310
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		81 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-552 (0-2')  
Date Sampled: 10/02/17 13:25  
Percent Solids: 96  
Initial Volume: 14.9  
Final Volume: 0.5  
Extraction Method: 3546

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-13  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: TJ  
Prepared: 10/3/17 12:30

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.350)		8270D		1	10/04/17 20:51	C7J0050	CJ70309
Acenaphthene	ND (0.350)		8270D		1	10/04/17 20:51	C7J0050	CJ70309
Acenaphthylene	ND (0.350)		8270D		1	10/04/17 20:51	C7J0050	CJ70309
Anthracene	ND (0.350)		8270D		1	10/04/17 20:51	C7J0050	CJ70309
<b>Benzo(a)anthracene</b>	<b>0.458</b> (0.350)		8270D		1	10/04/17 20:51	C7J0050	CJ70309
<b>Benzo(a)pyrene</b>	<b>0.386</b> (0.175)		8270D		1	10/04/17 20:51	C7J0050	CJ70309
<b>Benzo(b)fluoranthene</b>	<b>0.552</b> (0.350)		8270D		1	10/04/17 20:51	C7J0050	CJ70309
<b>Benzo(g,h,i)perylene</b>	<b>0.392</b> (0.350)		8270D		1	10/04/17 20:51	C7J0050	CJ70309
Benzo(k)fluoranthene	ND (0.350)		8270D		1	10/04/17 20:51	C7J0050	CJ70309
<b>Chrysene</b>	<b>0.492</b> (0.175)		8270D		1	10/04/17 20:51	C7J0050	CJ70309
Dibenzo(a,h)Anthracene	ND (0.175)		8270D		1	10/04/17 20:51	C7J0050	CJ70309
<b>Fluoranthene</b>	<b>0.623</b> (0.350)		8270D		1	10/04/17 20:51	C7J0050	CJ70309
Fluorene	ND (0.350)		8270D		1	10/04/17 20:51	C7J0050	CJ70309
Indeno(1,2,3-cd)Pyrene	ND (0.350)		8270D		1	10/04/17 20:51	C7J0050	CJ70309
Naphthalene	ND (0.350)		8270D		1	10/04/17 20:51	C7J0050	CJ70309
<b>Phenanthrene</b>	<b>0.361</b> (0.350)		8270D		1	10/04/17 20:51	C7J0050	CJ70309
<b>Pyrene</b>	<b>0.636</b> (0.350)		8270D		1	10/04/17 20:51	C7J0050	CJ70309

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	54 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	68 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	60 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	79 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-552 (0-2')  
Date Sampled: 10/02/17 13:25  
Percent Solids: 96

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-13  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	28.4 (5.11)		9014		5	EEM	10/05/17 11:20	mg/kg dry	CJ70513



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-553 (0-2')  
Date Sampled: 10/02/17 13:35  
Percent Solids: 97

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-14  
Sample Matrix: Soil  
Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (2.03)		6020A		20	NAR	10/04/17 18:56	2.02	100	CJ70328
Arsenic	ND (2.54)		6010C		1	KJK	10/04/17 21:00	2.02	100	CJ70328
Beryllium	ND (0.11)		6010C		1	KJK	10/04/17 21:00	2.02	100	CJ70328
Cadmium	ND (0.51)		6010C		1	KJK	10/04/17 21:00	2.02	100	CJ70328
<b>Chromium</b>	<b>9.68</b> (1.02)		6010C		1	KJK	10/04/17 21:00	2.02	100	CJ70328
<b>Copper</b>	<b>12.5</b> (2.54)		6010C		1	KJK	10/04/17 21:00	2.02	100	CJ70328
<b>Lead</b>	<b>38.0</b> (5.08)		6010C		1	KJK	10/04/17 21:00	2.02	100	CJ70328
<b>Mercury</b>	<b>0.042</b> (0.023)		7471B		1	MJV	10/04/17 11:58	0.9	40	CJ70303
<b>Nickel</b>	<b>6.02</b> (2.54)		6010C		1	KJK	10/04/17 21:00	2.02	100	CJ70328
Selenium	ND (2.03)		6020A		20	NAR	10/04/17 18:56	2.02	100	CJ70328
Silver	ND (0.51)		6010C		1	KJK	10/04/17 21:00	2.02	100	CJ70328
Thallium	ND (2.03)		6020A		20	NAR	10/04/17 18:56	2.02	100	CJ70328
<b>Zinc</b>	<b>25.4</b> (2.54)		6010C		1	KJK	10/04/17 21:00	2.02	100	CJ70328



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-553 (0-2')  
Date Sampled: 10/02/17 13:35  
Percent Solids: 97  
Initial Volume: 6.8  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-14  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0038)		8260B Low		1	10/04/17 21:54	C7J0034	CJ70323
1,1,1-Trichloroethane	ND (0.0038)		8260B Low		1	10/04/17 21:54	C7J0034	CJ70323
1,1,2,2-Tetrachloroethane	ND (0.0038)		8260B Low		1	10/04/17 21:54	C7J0034	CJ70323
1,1,2-Trichloroethane	ND (0.0038)		8260B Low		1	10/04/17 21:54	C7J0034	CJ70323
1,1-Dichloroethane	ND (0.0038)		8260B Low		1	10/04/17 21:54	C7J0034	CJ70323
1,1-Dichloroethene	ND (0.0038)		8260B Low		1	10/04/17 21:54	C7J0034	CJ70323
1,1-Dichloropropene	ND (0.0038)		8260B Low		1	10/04/17 21:54	C7J0034	CJ70323
1,2,3-Trichlorobenzene	ND (0.0038)		8260B Low		1	10/04/17 21:54	C7J0034	CJ70323
1,2,3-Trichloropropane	ND (0.0038)		8260B Low		1	10/04/17 21:54	C7J0034	CJ70323
1,2,4-Trichlorobenzene	ND (0.0038)		8260B Low		1	10/04/17 21:54	C7J0034	CJ70323
1,2,4-Trimethylbenzene	ND (0.0038)		8260B Low		1	10/04/17 21:54	C7J0034	CJ70323
1,2-Dibromo-3-Chloropropane	ND (0.0038)		8260B Low		1	10/04/17 21:54	C7J0034	CJ70323
1,2-Dibromoethane	ND (0.0038)		8260B Low		1	10/04/17 21:54	C7J0034	CJ70323
1,2-Dichlorobenzene	ND (0.0038)		8260B Low		1	10/04/17 21:54	C7J0034	CJ70323
1,2-Dichloroethane	ND (0.0038)		8260B Low		1	10/04/17 21:54	C7J0034	CJ70323
1,2-Dichloropropane	ND (0.0038)		8260B Low		1	10/04/17 21:54	C7J0034	CJ70323
1,3,5-Trimethylbenzene	ND (0.0038)		8260B Low		1	10/04/17 21:54	C7J0034	CJ70323
1,3-Dichlorobenzene	ND (0.0038)		8260B Low		1	10/04/17 21:54	C7J0034	CJ70323
1,3-Dichloropropane	ND (0.0038)		8260B Low		1	10/04/17 21:54	C7J0034	CJ70323
1,4-Dichlorobenzene	ND (0.0038)		8260B Low		1	10/04/17 21:54	C7J0034	CJ70323
1,4-Dioxane	ND (0.0755)		8260B Low		1	10/04/17 21:54	C7J0034	CJ70323
1-Chlorohexane	ND (0.0038)		8260B Low		1	10/04/17 21:54	C7J0034	CJ70323
2,2-Dichloropropane	ND (0.0038)		8260B Low		1	10/04/17 21:54	C7J0034	CJ70323
2-Butanone	ND (0.0377)		8260B Low		1	10/04/17 21:54	C7J0034	CJ70323
2-Chlorotoluene	ND (0.0038)		8260B Low		1	10/04/17 21:54	C7J0034	CJ70323
2-Hexanone	ND (0.0377)		8260B Low		1	10/04/17 21:54	C7J0034	CJ70323
4-Chlorotoluene	ND (0.0038)		8260B Low		1	10/04/17 21:54	C7J0034	CJ70323
4-Isopropyltoluene	ND (0.0038)		8260B Low		1	10/04/17 21:54	C7J0034	CJ70323
4-Methyl-2-Pentanone	ND (0.0377)		8260B Low		1	10/04/17 21:54	C7J0034	CJ70323
Acetone	ND (0.0377)		8260B Low		1	10/04/17 21:54	C7J0034	CJ70323
Benzene	ND (0.0038)		8260B Low		1	10/04/17 21:54	C7J0034	CJ70323
Bromobenzene	ND (0.0038)		8260B Low		1	10/04/17 21:54	C7J0034	CJ70323





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-553 (0-2')  
Date Sampled: 10/02/17 13:35  
Percent Solids: 97  
Initial Volume: 6.8  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-14  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0038)		8260B Low		1	10/04/17 21:54	C7J0034	CJ70323
Bromodichloromethane	ND (0.0038)		8260B Low		1	10/04/17 21:54	C7J0034	CJ70323
Bromoform	ND (0.0038)		8260B Low		1	10/04/17 21:54	C7J0034	CJ70323
Bromomethane	ND (0.0075)		8260B Low		1	10/04/17 21:54	C7J0034	CJ70323
Carbon Disulfide	ND (0.0038)		8260B Low		1	10/04/17 21:54	C7J0034	CJ70323
Carbon Tetrachloride	ND (0.0038)		8260B Low		1	10/04/17 21:54	C7J0034	CJ70323
Chlorobenzene	ND (0.0038)		8260B Low		1	10/04/17 21:54	C7J0034	CJ70323
Chloroethane	ND (0.0075)		8260B Low		1	10/04/17 21:54	C7J0034	CJ70323
Chloroform	ND (0.0038)		8260B Low		1	10/04/17 21:54	C7J0034	CJ70323
Chloromethane	ND (0.0075)		8260B Low		1	10/04/17 21:54	C7J0034	CJ70323
cis-1,2-Dichloroethene	ND (0.0038)		8260B Low		1	10/04/17 21:54	C7J0034	CJ70323
cis-1,3-Dichloropropene	ND (0.0038)		8260B Low		1	10/04/17 21:54	C7J0034	CJ70323
Dibromochloromethane	ND (0.0038)		8260B Low		1	10/04/17 21:54	C7J0034	CJ70323
Dibromomethane	ND (0.0038)		8260B Low		1	10/04/17 21:54	C7J0034	CJ70323
Dichlorodifluoromethane	ND (0.0075)		8260B Low		1	10/04/17 21:54	C7J0034	CJ70323
Diethyl Ether	ND (0.0038)		8260B Low		1	10/04/17 21:54	C7J0034	CJ70323
Di-isopropyl ether	ND (0.0038)		8260B Low		1	10/04/17 21:54	C7J0034	CJ70323
Ethyl tertiary-butyl ether	ND (0.0038)		8260B Low		1	10/04/17 21:54	C7J0034	CJ70323
Ethylbenzene	ND (0.0038)		8260B Low		1	10/04/17 21:54	C7J0034	CJ70323
Hexachlorobutadiene	ND (0.0038)		8260B Low		1	10/04/17 21:54	C7J0034	CJ70323
Isopropylbenzene	ND (0.0038)		8260B Low		1	10/04/17 21:54	C7J0034	CJ70323
Methyl tert-Butyl Ether	ND (0.0038)		8260B Low		1	10/04/17 21:54	C7J0034	CJ70323
Methylene Chloride	ND (0.0189)		8260B Low		1	10/04/17 21:54	C7J0034	CJ70323
Naphthalene	ND (0.0038)		8260B Low		1	10/04/17 21:54	C7J0034	CJ70323
n-Butylbenzene	ND (0.0038)		8260B Low		1	10/04/17 21:54	C7J0034	CJ70323
n-Propylbenzene	ND (0.0038)		8260B Low		1	10/04/17 21:54	C7J0034	CJ70323
sec-Butylbenzene	ND (0.0038)		8260B Low		1	10/04/17 21:54	C7J0034	CJ70323
Styrene	ND (0.0038)		8260B Low		1	10/04/17 21:54	C7J0034	CJ70323
tert-Butylbenzene	ND (0.0038)		8260B Low		1	10/04/17 21:54	C7J0034	CJ70323
Tertiary-amyl methyl ether	ND (0.0038)		8260B Low		1	10/04/17 21:54	C7J0034	CJ70323
Tetrachloroethene	ND (0.0038)		8260B Low		1	10/04/17 21:54	C7J0034	CJ70323
Tetrahydrofuran	ND (0.0038)		8260B Low		1	10/04/17 21:54	C7J0034	CJ70323



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-553 (0-2')  
Date Sampled: 10/02/17 13:35  
Percent Solids: 97  
Initial Volume: 6.8  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-14  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0038)		8260B Low		1	10/04/17 21:54	C7J0034	CJ70323
trans-1,2-Dichloroethene	ND (0.0038)		8260B Low		1	10/04/17 21:54	C7J0034	CJ70323
trans-1,3-Dichloropropene	ND (0.0038)		8260B Low		1	10/04/17 21:54	C7J0034	CJ70323
Trichloroethene	ND (0.0038)		8260B Low		1	10/04/17 21:54	C7J0034	CJ70323
Trichlorofluoromethane	ND (0.0038)		8260B Low		1	10/04/17 21:54	C7J0034	CJ70323
Vinyl Acetate	ND (0.0038)		8260B Low		1	10/04/17 21:54	C7J0034	CJ70323
Vinyl Chloride	ND (0.0075)		8260B Low		1	10/04/17 21:54	C7J0034	CJ70323
Xylene O	ND (0.0038)		8260B Low		1	10/04/17 21:54	C7J0034	CJ70323
Xylene P,M	ND (0.0075)		8260B Low		1	10/04/17 21:54	C7J0034	CJ70323
Xylenes (Total)	ND (0.0075)		8260B Low		1	10/04/17 21:54		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>113 %</i>		<i>70-130</i>
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>91 %</i>		<i>70-130</i>
<i>Surrogate: Dibromofluoromethane</i>	<i>108 %</i>		<i>70-130</i>
<i>Surrogate: Toluene-d8</i>	<i>114 %</i>		<i>70-130</i>



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-553 (0-2')  
Date Sampled: 10/02/17 13:35  
Percent Solids: 97  
Initial Volume: 20.4  
Final Volume: 1  
Extraction Method: 3546

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-14  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: SMR  
Prepared: 10/3/17 13:00

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	74.1 (37.7)		8100M		1	10/05/17 13:53	C7J0068	CJ70310
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		77 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-553 (0-2')  
Date Sampled: 10/02/17 13:35  
Percent Solids: 97  
Initial Volume: 15  
Final Volume: 0.5  
Extraction Method: 3546

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-14  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: TJ  
Prepared: 10/3/17 12:30

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.342)		8270D		1	10/04/17 21:25	C7J0050	CJ70309
Acenaphthene	ND (0.342)		8270D		1	10/04/17 21:25	C7J0050	CJ70309
Acenaphthylene	ND (0.342)		8270D		1	10/04/17 21:25	C7J0050	CJ70309
Anthracene	ND (0.342)		8270D		1	10/04/17 21:25	C7J0050	CJ70309
Benzo(a)anthracene	ND (0.342)		8270D		1	10/04/17 21:25	C7J0050	CJ70309
<b>Benzo(a)pyrene</b>	<b>0.323</b> (0.171)		8270D		1	10/04/17 21:25	C7J0050	CJ70309
<b>Benzo(b)fluoranthene</b>	<b>0.440</b> (0.342)		8270D		1	10/04/17 21:25	C7J0050	CJ70309
Benzo(g,h,i)perylene	ND (0.342)		8270D		1	10/04/17 21:25	C7J0050	CJ70309
Benzo(k)fluoranthene	ND (0.342)		8270D		1	10/04/17 21:25	C7J0050	CJ70309
<b>Chrysene</b>	<b>0.349</b> (0.171)		8270D		1	10/04/17 21:25	C7J0050	CJ70309
Dibenzo(a,h)Anthracene	ND (0.171)		8270D		1	10/04/17 21:25	C7J0050	CJ70309
<b>Fluoranthene</b>	<b>0.411</b> (0.342)		8270D		1	10/04/17 21:25	C7J0050	CJ70309
Fluorene	ND (0.342)		8270D		1	10/04/17 21:25	C7J0050	CJ70309
Indeno(1,2,3-cd)Pyrene	ND (0.342)		8270D		1	10/04/17 21:25	C7J0050	CJ70309
Naphthalene	ND (0.342)		8270D		1	10/04/17 21:25	C7J0050	CJ70309
Phenanthrene	ND (0.342)		8270D		1	10/04/17 21:25	C7J0050	CJ70309
<b>Pyrene</b>	<b>0.426</b> (0.342)		8270D		1	10/04/17 21:25	C7J0050	CJ70309

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	57 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	66 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	61 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	82 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-553 (0-2')  
Date Sampled: 10/02/17 13:35  
Percent Solids: 97

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-14  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	7.48 (0.99)		9014		1	EEM	10/05/17 11:20	mg/kg dry	CJ70513



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-554 (0-2')  
Date Sampled: 10/02/17 13:50  
Percent Solids: 96

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-15  
Sample Matrix: Soil  
Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (1.60)		6020A		20	NAR	10/04/17 19:02	2.6	100	CJ70328
Arsenic	<b>3.70</b> (2.00)		6010C		1	KJK	10/04/17 21:04	2.6	100	CJ70328
Beryllium	<b>0.14</b> (0.09)		6010C		1	KJK	10/04/17 21:04	2.6	100	CJ70328
Cadmium	ND (0.40)		6010C		1	KJK	10/04/17 21:04	2.6	100	CJ70328
Chromium	<b>15.4</b> (0.80)		6010C		1	KJK	10/04/17 21:04	2.6	100	CJ70328
Copper	<b>18.6</b> (2.00)		6010C		1	KJK	10/04/17 21:04	2.6	100	CJ70328
Lead	<b>132</b> (4.00)		6010C		1	KJK	10/04/17 21:04	2.6	100	CJ70328
Mercury	<b>0.086</b> (0.023)		7471B		1	MJV	10/04/17 12:00	0.88	40	CJ70303
Nickel	<b>7.78</b> (2.00)		6010C		1	KJK	10/04/17 21:04	2.6	100	CJ70328
Selenium	ND (1.60)		6020A		20	NAR	10/04/17 19:02	2.6	100	CJ70328
Silver	ND (0.40)		6010C		1	KJK	10/04/17 21:04	2.6	100	CJ70328
Thallium	ND (1.60)		6020A		20	NAR	10/04/17 19:02	2.6	100	CJ70328
Zinc	<b>35.9</b> (2.00)		6010C		1	KJK	10/04/17 21:04	2.6	100	CJ70328





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-554 (0-2')  
Date Sampled: 10/02/17 13:50  
Percent Solids: 96  
Initial Volume: 11.5  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-15  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0023)		8260B Low		1	10/04/17 22:19	C7J0034	CJ70323
1,1,1-Trichloroethane	ND (0.0023)		8260B Low		1	10/04/17 22:19	C7J0034	CJ70323
1,1,2,2-Tetrachloroethane	ND (0.0023)		8260B Low		1	10/04/17 22:19	C7J0034	CJ70323
1,1,2-Trichloroethane	ND (0.0023)		8260B Low		1	10/04/17 22:19	C7J0034	CJ70323
1,1-Dichloroethane	ND (0.0023)		8260B Low		1	10/04/17 22:19	C7J0034	CJ70323
1,1-Dichloroethene	ND (0.0023)		8260B Low		1	10/04/17 22:19	C7J0034	CJ70323
1,1-Dichloropropene	ND (0.0023)		8260B Low		1	10/04/17 22:19	C7J0034	CJ70323
1,2,3-Trichlorobenzene	ND (0.0023)		8260B Low		1	10/04/17 22:19	C7J0034	CJ70323
1,2,3-Trichloropropane	ND (0.0023)		8260B Low		1	10/04/17 22:19	C7J0034	CJ70323
1,2,4-Trichlorobenzene	ND (0.0023)		8260B Low		1	10/04/17 22:19	C7J0034	CJ70323
1,2,4-Trimethylbenzene	ND (0.0023)		8260B Low		1	10/04/17 22:19	C7J0034	CJ70323
1,2-Dibromo-3-Chloropropane	ND (0.0023)		8260B Low		1	10/04/17 22:19	C7J0034	CJ70323
1,2-Dibromoethane	ND (0.0023)		8260B Low		1	10/04/17 22:19	C7J0034	CJ70323
1,2-Dichlorobenzene	ND (0.0023)		8260B Low		1	10/04/17 22:19	C7J0034	CJ70323
1,2-Dichloroethane	ND (0.0023)		8260B Low		1	10/04/17 22:19	C7J0034	CJ70323
1,2-Dichloropropane	ND (0.0023)		8260B Low		1	10/04/17 22:19	C7J0034	CJ70323
1,3,5-Trimethylbenzene	ND (0.0023)		8260B Low		1	10/04/17 22:19	C7J0034	CJ70323
1,3-Dichlorobenzene	ND (0.0023)		8260B Low		1	10/04/17 22:19	C7J0034	CJ70323
1,3-Dichloropropane	ND (0.0023)		8260B Low		1	10/04/17 22:19	C7J0034	CJ70323
1,4-Dichlorobenzene	ND (0.0023)		8260B Low		1	10/04/17 22:19	C7J0034	CJ70323
1,4-Dioxane	ND (0.0452)		8260B Low		1	10/04/17 22:19	C7J0034	CJ70323
1-Chlorohexane	ND (0.0023)		8260B Low		1	10/04/17 22:19	C7J0034	CJ70323
2,2-Dichloropropane	ND (0.0023)		8260B Low		1	10/04/17 22:19	C7J0034	CJ70323
2-Butanone	ND (0.0226)		8260B Low		1	10/04/17 22:19	C7J0034	CJ70323
2-Chlorotoluene	ND (0.0023)		8260B Low		1	10/04/17 22:19	C7J0034	CJ70323
2-Hexanone	ND (0.0226)		8260B Low		1	10/04/17 22:19	C7J0034	CJ70323
4-Chlorotoluene	ND (0.0023)		8260B Low		1	10/04/17 22:19	C7J0034	CJ70323
4-Isopropyltoluene	ND (0.0023)		8260B Low		1	10/04/17 22:19	C7J0034	CJ70323
4-Methyl-2-Pentanone	ND (0.0226)		8260B Low		1	10/04/17 22:19	C7J0034	CJ70323
Acetone	ND (0.0226)		8260B Low		1	10/04/17 22:19	C7J0034	CJ70323
Benzene	ND (0.0023)		8260B Low		1	10/04/17 22:19	C7J0034	CJ70323
Bromobenzene	ND (0.0023)		8260B Low		1	10/04/17 22:19	C7J0034	CJ70323



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-554 (0-2')  
Date Sampled: 10/02/17 13:50  
Percent Solids: 96  
Initial Volume: 11.5  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-15  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0023)		8260B Low		1	10/04/17 22:19	C7J0034	CJ70323
Bromodichloromethane	ND (0.0023)		8260B Low		1	10/04/17 22:19	C7J0034	CJ70323
Bromoform	ND (0.0023)		8260B Low		1	10/04/17 22:19	C7J0034	CJ70323
Bromomethane	ND (0.0045)		8260B Low		1	10/04/17 22:19	C7J0034	CJ70323
Carbon Disulfide	ND (0.0023)		8260B Low		1	10/04/17 22:19	C7J0034	CJ70323
Carbon Tetrachloride	ND (0.0023)		8260B Low		1	10/04/17 22:19	C7J0034	CJ70323
Chlorobenzene	ND (0.0023)		8260B Low		1	10/04/17 22:19	C7J0034	CJ70323
Chloroethane	ND (0.0045)		8260B Low		1	10/04/17 22:19	C7J0034	CJ70323
Chloroform	ND (0.0023)		8260B Low		1	10/04/17 22:19	C7J0034	CJ70323
Chloromethane	ND (0.0045)		8260B Low		1	10/04/17 22:19	C7J0034	CJ70323
cis-1,2-Dichloroethene	ND (0.0023)		8260B Low		1	10/04/17 22:19	C7J0034	CJ70323
cis-1,3-Dichloropropene	ND (0.0023)		8260B Low		1	10/04/17 22:19	C7J0034	CJ70323
Dibromochloromethane	ND (0.0023)		8260B Low		1	10/04/17 22:19	C7J0034	CJ70323
Dibromomethane	ND (0.0023)		8260B Low		1	10/04/17 22:19	C7J0034	CJ70323
Dichlorodifluoromethane	ND (0.0045)		8260B Low		1	10/04/17 22:19	C7J0034	CJ70323
Diethyl Ether	ND (0.0023)		8260B Low		1	10/04/17 22:19	C7J0034	CJ70323
Di-isopropyl ether	ND (0.0023)		8260B Low		1	10/04/17 22:19	C7J0034	CJ70323
Ethyl tertiary-butyl ether	ND (0.0023)		8260B Low		1	10/04/17 22:19	C7J0034	CJ70323
Ethylbenzene	ND (0.0023)		8260B Low		1	10/04/17 22:19	C7J0034	CJ70323
Hexachlorobutadiene	ND (0.0023)		8260B Low		1	10/04/17 22:19	C7J0034	CJ70323
Isopropylbenzene	ND (0.0023)		8260B Low		1	10/04/17 22:19	C7J0034	CJ70323
Methyl tert-Butyl Ether	ND (0.0023)		8260B Low		1	10/04/17 22:19	C7J0034	CJ70323
Methylene Chloride	ND (0.0113)		8260B Low		1	10/04/17 22:19	C7J0034	CJ70323
Naphthalene	ND (0.0023)		8260B Low		1	10/04/17 22:19	C7J0034	CJ70323
n-Butylbenzene	ND (0.0023)		8260B Low		1	10/04/17 22:19	C7J0034	CJ70323
n-Propylbenzene	ND (0.0023)		8260B Low		1	10/04/17 22:19	C7J0034	CJ70323
sec-Butylbenzene	ND (0.0023)		8260B Low		1	10/04/17 22:19	C7J0034	CJ70323
Styrene	ND (0.0023)		8260B Low		1	10/04/17 22:19	C7J0034	CJ70323
tert-Butylbenzene	ND (0.0023)		8260B Low		1	10/04/17 22:19	C7J0034	CJ70323
Tertiary-amyl methyl ether	ND (0.0023)		8260B Low		1	10/04/17 22:19	C7J0034	CJ70323
Tetrachloroethene	ND (0.0023)		8260B Low		1	10/04/17 22:19	C7J0034	CJ70323
Tetrahydrofuran	ND (0.0023)		8260B Low		1	10/04/17 22:19	C7J0034	CJ70323



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-554 (0-2')  
 Date Sampled: 10/02/17 13:50  
 Percent Solids: 96  
 Initial Volume: 11.5  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1710025  
 ESS Laboratory Sample ID: 1710025-15  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0023)		8260B Low		1	10/04/17 22:19	C7J0034	CJ70323
trans-1,2-Dichloroethene	ND (0.0023)		8260B Low		1	10/04/17 22:19	C7J0034	CJ70323
trans-1,3-Dichloropropene	ND (0.0023)		8260B Low		1	10/04/17 22:19	C7J0034	CJ70323
Trichloroethene	ND (0.0023)		8260B Low		1	10/04/17 22:19	C7J0034	CJ70323
Trichlorofluoromethane	ND (0.0023)		8260B Low		1	10/04/17 22:19	C7J0034	CJ70323
Vinyl Acetate	ND (0.0023)		8260B Low		1	10/04/17 22:19	C7J0034	CJ70323
Vinyl Chloride	ND (0.0045)		8260B Low		1	10/04/17 22:19	C7J0034	CJ70323
Xylene O	ND (0.0023)		8260B Low		1	10/04/17 22:19	C7J0034	CJ70323
Xylene P,M	ND (0.0045)		8260B Low		1	10/04/17 22:19	C7J0034	CJ70323
Xylenes (Total)	ND (0.0045)		8260B Low		1	10/04/17 22:19		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>121 %</i>		<i>70-130</i>
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>93 %</i>		<i>70-130</i>
<i>Surrogate: Dibromofluoromethane</i>	<i>110 %</i>		<i>70-130</i>
<i>Surrogate: Toluene-d8</i>	<i>112 %</i>		<i>70-130</i>



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-554 (0-2')  
Date Sampled: 10/02/17 13:50  
Percent Solids: 96  
Initial Volume: 19.2  
Final Volume: 1  
Extraction Method: 3546

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-15  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: SMR  
Prepared: 10/3/17 13:00

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	127 (40.6)		8100M		1	10/05/17 14:28	C7J0068	CJ70310
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		82 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-554 (0-2')  
Date Sampled: 10/02/17 13:50  
Percent Solids: 96  
Initial Volume: 14.5  
Final Volume: 0.5  
Extraction Method: 3546

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-15  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: TJ  
Prepared: 10/3/17 12:30

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.358)		8270D		1	10/04/17 22:00	C7J0050	CJ70309
Acenaphthene	ND (0.358)		8270D		1	10/04/17 22:00	C7J0050	CJ70309
Acenaphthylene	ND (0.358)		8270D		1	10/04/17 22:00	C7J0050	CJ70309
Anthracene	ND (0.358)		8270D		1	10/04/17 22:00	C7J0050	CJ70309
<b>Benzo(a)anthracene</b>	<b>0.526</b> (0.358)		8270D		1	10/04/17 22:00	C7J0050	CJ70309
<b>Benzo(a)pyrene</b>	<b>0.439</b> (0.180)		8270D		1	10/04/17 22:00	C7J0050	CJ70309
<b>Benzo(b)fluoranthene</b>	<b>0.582</b> (0.358)		8270D		1	10/04/17 22:00	C7J0050	CJ70309
<b>Benzo(g,h,i)perylene</b>	<b>0.378</b> (0.358)		8270D		1	10/04/17 22:00	C7J0050	CJ70309
Benzo(k)fluoranthene	ND (0.358)		8270D		1	10/04/17 22:00	C7J0050	CJ70309
<b>Chrysene</b>	<b>0.533</b> (0.180)		8270D		1	10/04/17 22:00	C7J0050	CJ70309
Dibenzo(a,h)Anthracene	ND (0.180)		8270D		1	10/04/17 22:00	C7J0050	CJ70309
<b>Fluoranthene</b>	<b>0.759</b> (0.358)		8270D		1	10/04/17 22:00	C7J0050	CJ70309
Fluorene	ND (0.358)		8270D		1	10/04/17 22:00	C7J0050	CJ70309
Indeno(1,2,3-cd)Pyrene	ND (0.358)		8270D		1	10/04/17 22:00	C7J0050	CJ70309
Naphthalene	ND (0.358)		8270D		1	10/04/17 22:00	C7J0050	CJ70309
<b>Phenanthrene</b>	<b>0.492</b> (0.358)		8270D		1	10/04/17 22:00	C7J0050	CJ70309
<b>Pyrene</b>	<b>0.757</b> (0.358)		8270D		1	10/04/17 22:00	C7J0050	CJ70309

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	49 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	67 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	58 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	79 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-554 (0-2')  
Date Sampled: 10/02/17 13:50  
Percent Solids: 96

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-15  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	14.0 (0.98)		9014		1	EEM	10/05/17 11:20	mg/kg dry	CJ70513





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-555 (0-2')  
Date Sampled: 10/02/17 14:05  
Percent Solids: 97

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-16  
Sample Matrix: Soil  
Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (1.50)		6020A		20	NAR	10/04/17 19:08	2.76	100	CJ70328
Arsenic	3.93 (1.87)		6010C		1	KJK	10/04/17 21:21	2.76	100	CJ70328
Beryllium	0.25 (0.08)		6010C		1	KJK	10/04/17 21:21	2.76	100	CJ70328
Cadmium	ND (0.37)		6010C		1	KJK	10/04/17 21:21	2.76	100	CJ70328
Chromium	9.13 (0.75)		6010C		1	KJK	10/04/17 21:21	2.76	100	CJ70328
Copper	21.4 (1.87)		6010C		1	KJK	10/04/17 21:21	2.76	100	CJ70328
Lead	135 (3.75)		6010C		1	KJK	10/04/17 21:21	2.76	100	CJ70328
Mercury	0.101 (0.030)		7471B		1	MJV	10/04/17 12:02	0.69	40	CJ70303
Nickel	9.53 (1.87)		6010C		1	KJK	10/04/17 21:21	2.76	100	CJ70328
Selenium	ND (1.50)		6020A		20	NAR	10/04/17 19:08	2.76	100	CJ70328
Silver	ND (0.37)		6010C		1	KJK	10/04/17 21:21	2.76	100	CJ70328
Thallium	ND (1.50)		6020A		20	NAR	10/04/17 19:08	2.76	100	CJ70328
Zinc	61.7 (1.87)		6010C		1	KJK	10/04/17 21:21	2.76	100	CJ70328



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-555 (0-2')  
Date Sampled: 10/02/17 14:05  
Percent Solids: 97  
Initial Volume: 7.6  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-16  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0034)		8260B Low		1	10/04/17 22:45	C7J0034	CJ70323
1,1,1-Trichloroethane	ND (0.0034)		8260B Low		1	10/04/17 22:45	C7J0034	CJ70323
1,1,2,2-Tetrachloroethane	ND (0.0034)		8260B Low		1	10/04/17 22:45	C7J0034	CJ70323
1,1,2-Trichloroethane	ND (0.0034)		8260B Low		1	10/04/17 22:45	C7J0034	CJ70323
1,1-Dichloroethane	ND (0.0034)		8260B Low		1	10/04/17 22:45	C7J0034	CJ70323
1,1-Dichloroethene	ND (0.0034)		8260B Low		1	10/04/17 22:45	C7J0034	CJ70323
1,1-Dichloropropene	ND (0.0034)		8260B Low		1	10/04/17 22:45	C7J0034	CJ70323
1,2,3-Trichlorobenzene	ND (0.0034)		8260B Low		1	10/04/17 22:45	C7J0034	CJ70323
1,2,3-Trichloropropane	ND (0.0034)		8260B Low		1	10/04/17 22:45	C7J0034	CJ70323
1,2,4-Trichlorobenzene	ND (0.0034)		8260B Low		1	10/04/17 22:45	C7J0034	CJ70323
1,2,4-Trimethylbenzene	ND (0.0034)		8260B Low		1	10/04/17 22:45	C7J0034	CJ70323
1,2-Dibromo-3-Chloropropane	ND (0.0034)		8260B Low		1	10/04/17 22:45	C7J0034	CJ70323
1,2-Dibromoethane	ND (0.0034)		8260B Low		1	10/04/17 22:45	C7J0034	CJ70323
1,2-Dichlorobenzene	ND (0.0034)		8260B Low		1	10/04/17 22:45	C7J0034	CJ70323
1,2-Dichloroethane	ND (0.0034)		8260B Low		1	10/04/17 22:45	C7J0034	CJ70323
1,2-Dichloropropane	ND (0.0034)		8260B Low		1	10/04/17 22:45	C7J0034	CJ70323
1,3,5-Trimethylbenzene	ND (0.0034)		8260B Low		1	10/04/17 22:45	C7J0034	CJ70323
1,3-Dichlorobenzene	ND (0.0034)		8260B Low		1	10/04/17 22:45	C7J0034	CJ70323
1,3-Dichloropropane	ND (0.0034)		8260B Low		1	10/04/17 22:45	C7J0034	CJ70323
1,4-Dichlorobenzene	ND (0.0034)		8260B Low		1	10/04/17 22:45	C7J0034	CJ70323
1,4-Dioxane	ND (0.0681)		8260B Low		1	10/04/17 22:45	C7J0034	CJ70323
1-Chlorohexane	ND (0.0034)		8260B Low		1	10/04/17 22:45	C7J0034	CJ70323
2,2-Dichloropropane	ND (0.0034)		8260B Low		1	10/04/17 22:45	C7J0034	CJ70323
2-Butanone	ND (0.0340)		8260B Low		1	10/04/17 22:45	C7J0034	CJ70323
2-Chlorotoluene	ND (0.0034)		8260B Low		1	10/04/17 22:45	C7J0034	CJ70323
2-Hexanone	ND (0.0340)		8260B Low		1	10/04/17 22:45	C7J0034	CJ70323
4-Chlorotoluene	ND (0.0034)		8260B Low		1	10/04/17 22:45	C7J0034	CJ70323
4-Isopropyltoluene	ND (0.0034)		8260B Low		1	10/04/17 22:45	C7J0034	CJ70323
4-Methyl-2-Pentanone	ND (0.0340)		8260B Low		1	10/04/17 22:45	C7J0034	CJ70323
Acetone	ND (0.0340)		8260B Low		1	10/04/17 22:45	C7J0034	CJ70323
Benzene	ND (0.0034)		8260B Low		1	10/04/17 22:45	C7J0034	CJ70323
Bromobenzene	ND (0.0034)		8260B Low		1	10/04/17 22:45	C7J0034	CJ70323



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-555 (0-2')  
 Date Sampled: 10/02/17 14:05  
 Percent Solids: 97  
 Initial Volume: 7.6  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1710025  
 ESS Laboratory Sample ID: 1710025-16  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0034)		8260B Low		1	10/04/17 22:45	C7J0034	CJ70323
Bromodichloromethane	ND (0.0034)		8260B Low		1	10/04/17 22:45	C7J0034	CJ70323
Bromoform	ND (0.0034)		8260B Low		1	10/04/17 22:45	C7J0034	CJ70323
Bromomethane	ND (0.0068)		8260B Low		1	10/04/17 22:45	C7J0034	CJ70323
Carbon Disulfide	ND (0.0034)		8260B Low		1	10/04/17 22:45	C7J0034	CJ70323
Carbon Tetrachloride	ND (0.0034)		8260B Low		1	10/04/17 22:45	C7J0034	CJ70323
Chlorobenzene	ND (0.0034)		8260B Low		1	10/04/17 22:45	C7J0034	CJ70323
Chloroethane	ND (0.0068)		8260B Low		1	10/04/17 22:45	C7J0034	CJ70323
Chloroform	ND (0.0034)		8260B Low		1	10/04/17 22:45	C7J0034	CJ70323
Chloromethane	ND (0.0068)		8260B Low		1	10/04/17 22:45	C7J0034	CJ70323
cis-1,2-Dichloroethene	ND (0.0034)		8260B Low		1	10/04/17 22:45	C7J0034	CJ70323
cis-1,3-Dichloropropene	ND (0.0034)		8260B Low		1	10/04/17 22:45	C7J0034	CJ70323
Dibromochloromethane	ND (0.0034)		8260B Low		1	10/04/17 22:45	C7J0034	CJ70323
Dibromomethane	ND (0.0034)		8260B Low		1	10/04/17 22:45	C7J0034	CJ70323
Dichlorodifluoromethane	ND (0.0068)		8260B Low		1	10/04/17 22:45	C7J0034	CJ70323
Diethyl Ether	ND (0.0034)		8260B Low		1	10/04/17 22:45	C7J0034	CJ70323
Di-isopropyl ether	ND (0.0034)		8260B Low		1	10/04/17 22:45	C7J0034	CJ70323
Ethyl tertiary-butyl ether	ND (0.0034)		8260B Low		1	10/04/17 22:45	C7J0034	CJ70323
Ethylbenzene	ND (0.0034)		8260B Low		1	10/04/17 22:45	C7J0034	CJ70323
Hexachlorobutadiene	ND (0.0034)		8260B Low		1	10/04/17 22:45	C7J0034	CJ70323
Isopropylbenzene	ND (0.0034)		8260B Low		1	10/04/17 22:45	C7J0034	CJ70323
Methyl tert-Butyl Ether	ND (0.0034)		8260B Low		1	10/04/17 22:45	C7J0034	CJ70323
Methylene Chloride	ND (0.0170)		8260B Low		1	10/04/17 22:45	C7J0034	CJ70323
Naphthalene	ND (0.0034)		8260B Low		1	10/04/17 22:45	C7J0034	CJ70323
n-Butylbenzene	ND (0.0034)		8260B Low		1	10/04/17 22:45	C7J0034	CJ70323
n-Propylbenzene	ND (0.0034)		8260B Low		1	10/04/17 22:45	C7J0034	CJ70323
sec-Butylbenzene	ND (0.0034)		8260B Low		1	10/04/17 22:45	C7J0034	CJ70323
Styrene	ND (0.0034)		8260B Low		1	10/04/17 22:45	C7J0034	CJ70323
tert-Butylbenzene	ND (0.0034)		8260B Low		1	10/04/17 22:45	C7J0034	CJ70323
Tertiary-amyl methyl ether	ND (0.0034)		8260B Low		1	10/04/17 22:45	C7J0034	CJ70323
Tetrachloroethene	ND (0.0034)		8260B Low		1	10/04/17 22:45	C7J0034	CJ70323
Tetrahydrofuran	ND (0.0034)		8260B Low		1	10/04/17 22:45	C7J0034	CJ70323



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-555 (0-2')  
 Date Sampled: 10/02/17 14:05  
 Percent Solids: 97  
 Initial Volume: 7.6  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1710025  
 ESS Laboratory Sample ID: 1710025-16  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0034)		8260B Low		1	10/04/17 22:45	C7J0034	CJ70323
trans-1,2-Dichloroethene	ND (0.0034)		8260B Low		1	10/04/17 22:45	C7J0034	CJ70323
trans-1,3-Dichloropropene	ND (0.0034)		8260B Low		1	10/04/17 22:45	C7J0034	CJ70323
Trichloroethene	ND (0.0034)		8260B Low		1	10/04/17 22:45	C7J0034	CJ70323
Trichlorofluoromethane	ND (0.0034)		8260B Low		1	10/04/17 22:45	C7J0034	CJ70323
Vinyl Acetate	ND (0.0034)		8260B Low		1	10/04/17 22:45	C7J0034	CJ70323
Vinyl Chloride	ND (0.0068)		8260B Low		1	10/04/17 22:45	C7J0034	CJ70323
Xylene O	ND (0.0034)		8260B Low		1	10/04/17 22:45	C7J0034	CJ70323
Xylene P,M	ND (0.0068)		8260B Low		1	10/04/17 22:45	C7J0034	CJ70323
Xylenes (Total)	ND (0.0068)		8260B Low		1	10/04/17 22:45		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>119 %</i>		<i>70-130</i>
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>98 %</i>		<i>70-130</i>
<i>Surrogate: Dibromofluoromethane</i>	<i>110 %</i>		<i>70-130</i>
<i>Surrogate: Toluene-d8</i>	<i>108 %</i>		<i>70-130</i>



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-555 (0-2')  
Date Sampled: 10/02/17 14:05  
Percent Solids: 97  
Initial Volume: 19.1  
Final Volume: 1  
Extraction Method: 3546

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-16  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: SMR  
Prepared: 10/3/17 13:00

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	94.8 (40.6)		8100M		1	10/05/17 15:04	C7J0068	CJ70310
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		75 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-555 (0-2')  
Date Sampled: 10/02/17 14:05  
Percent Solids: 97  
Initial Volume: 14.4  
Final Volume: 0.5  
Extraction Method: 3546

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-16  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: TJ  
Prepared: 10/3/17 12:30

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.359)		8270D		1	10/04/17 22:35	C7J0050	CJ70309
Acenaphthene	ND (0.359)		8270D		1	10/04/17 22:35	C7J0050	CJ70309
Acenaphthylene	ND (0.359)		8270D		1	10/04/17 22:35	C7J0050	CJ70309
Anthracene	ND (0.359)		8270D		1	10/04/17 22:35	C7J0050	CJ70309
<b>Benzo(a)anthracene</b>	<b>0.443</b> (0.359)		8270D		1	10/04/17 22:35	C7J0050	CJ70309
<b>Benzo(a)pyrene</b>	<b>0.461</b> (0.180)		8270D		1	10/04/17 22:35	C7J0050	CJ70309
<b>Benzo(b)fluoranthene</b>	<b>0.606</b> (0.359)		8270D		1	10/04/17 22:35	C7J0050	CJ70309
<b>Benzo(g,h,i)perylene</b>	<b>0.377</b> (0.359)		8270D		1	10/04/17 22:35	C7J0050	CJ70309
Benzo(k)fluoranthene	ND (0.359)		8270D		1	10/04/17 22:35	C7J0050	CJ70309
<b>Chrysene</b>	<b>0.470</b> (0.180)		8270D		1	10/04/17 22:35	C7J0050	CJ70309
Dibenzo(a,h)Anthracene	ND (0.180)		8270D		1	10/04/17 22:35	C7J0050	CJ70309
<b>Fluoranthene</b>	<b>0.690</b> (0.359)		8270D		1	10/04/17 22:35	C7J0050	CJ70309
Fluorene	ND (0.359)		8270D		1	10/04/17 22:35	C7J0050	CJ70309
Indeno(1,2,3-cd)Pyrene	ND (0.359)		8270D		1	10/04/17 22:35	C7J0050	CJ70309
Naphthalene	ND (0.359)		8270D		1	10/04/17 22:35	C7J0050	CJ70309
Phenanthrene	ND (0.359)		8270D		1	10/04/17 22:35	C7J0050	CJ70309
<b>Pyrene</b>	<b>0.675</b> (0.359)		8270D		1	10/04/17 22:35	C7J0050	CJ70309

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	56 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	68 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	60 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	79 %		30-130





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-555 (0-2')  
Date Sampled: 10/02/17 14:05  
Percent Solids: 97

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-16  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	3.59 (1.00)		9014		1	EEM	10/06/17 11:15	mg/kg dry	CJ70615



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: TB-100217  
Date Sampled: 10/02/17 00:00  
Percent Solids: N/A  
Initial Volume: 5  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-17  
Sample Matrix: Solid  
Units: mg/kg wet  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0050)		8260B Low		1	10/04/17 14:42	C7J0034	CJ70323
1,1,1-Trichloroethane	ND (0.0050)		8260B Low		1	10/04/17 14:42	C7J0034	CJ70323
1,1,2,2-Tetrachloroethane	ND (0.0050)		8260B Low		1	10/04/17 14:42	C7J0034	CJ70323
1,1,2-Trichloroethane	ND (0.0050)		8260B Low		1	10/04/17 14:42	C7J0034	CJ70323
1,1-Dichloroethane	ND (0.0050)		8260B Low		1	10/04/17 14:42	C7J0034	CJ70323
1,1-Dichloroethene	ND (0.0050)		8260B Low		1	10/04/17 14:42	C7J0034	CJ70323
1,1-Dichloropropene	ND (0.0050)		8260B Low		1	10/04/17 14:42	C7J0034	CJ70323
1,2,3-Trichlorobenzene	ND (0.0050)		8260B Low		1	10/04/17 14:42	C7J0034	CJ70323
1,2,3-Trichloropropane	ND (0.0050)		8260B Low		1	10/04/17 14:42	C7J0034	CJ70323
1,2,4-Trichlorobenzene	ND (0.0050)		8260B Low		1	10/04/17 14:42	C7J0034	CJ70323
1,2,4-Trimethylbenzene	ND (0.0050)		8260B Low		1	10/04/17 14:42	C7J0034	CJ70323
1,2-Dibromo-3-Chloropropane	ND (0.0050)		8260B Low		1	10/04/17 14:42	C7J0034	CJ70323
1,2-Dibromoethane	ND (0.0050)		8260B Low		1	10/04/17 14:42	C7J0034	CJ70323
1,2-Dichlorobenzene	ND (0.0050)		8260B Low		1	10/04/17 14:42	C7J0034	CJ70323
1,2-Dichloroethane	ND (0.0050)		8260B Low		1	10/04/17 14:42	C7J0034	CJ70323
1,2-Dichloropropane	ND (0.0050)		8260B Low		1	10/04/17 14:42	C7J0034	CJ70323
1,3,5-Trimethylbenzene	ND (0.0050)		8260B Low		1	10/04/17 14:42	C7J0034	CJ70323
1,3-Dichlorobenzene	ND (0.0050)		8260B Low		1	10/04/17 14:42	C7J0034	CJ70323
1,3-Dichloropropane	ND (0.0050)		8260B Low		1	10/04/17 14:42	C7J0034	CJ70323
1,4-Dichlorobenzene	ND (0.0050)		8260B Low		1	10/04/17 14:42	C7J0034	CJ70323
1,4-Dioxane	ND (0.100)		8260B Low		1	10/04/17 14:42	C7J0034	CJ70323
1-Chlorohexane	ND (0.0050)		8260B Low		1	10/04/17 14:42	C7J0034	CJ70323
2,2-Dichloropropane	ND (0.0050)		8260B Low		1	10/04/17 14:42	C7J0034	CJ70323
2-Butanone	ND (0.0500)		8260B Low		1	10/04/17 14:42	C7J0034	CJ70323
2-Chlorotoluene	ND (0.0050)		8260B Low		1	10/04/17 14:42	C7J0034	CJ70323
2-Hexanone	ND (0.0500)		8260B Low		1	10/04/17 14:42	C7J0034	CJ70323
4-Chlorotoluene	ND (0.0050)		8260B Low		1	10/04/17 14:42	C7J0034	CJ70323
4-Isopropyltoluene	ND (0.0050)		8260B Low		1	10/04/17 14:42	C7J0034	CJ70323
4-Methyl-2-Pentanone	ND (0.0500)		8260B Low		1	10/04/17 14:42	C7J0034	CJ70323
Acetone	ND (0.0500)		8260B Low		1	10/04/17 14:42	C7J0034	CJ70323
Benzene	ND (0.0050)		8260B Low		1	10/04/17 14:42	C7J0034	CJ70323
Bromobenzene	ND (0.0050)		8260B Low		1	10/04/17 14:42	C7J0034	CJ70323



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: TB-100217  
Date Sampled: 10/02/17 00:00  
Percent Solids: N/A  
Initial Volume: 5  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710025  
ESS Laboratory Sample ID: 1710025-17  
Sample Matrix: Solid  
Units: mg/kg wet  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0050)		8260B Low		1	10/04/17 14:42	C7J0034	CJ70323
Bromodichloromethane	ND (0.0050)		8260B Low		1	10/04/17 14:42	C7J0034	CJ70323
Bromoform	ND (0.0050)		8260B Low		1	10/04/17 14:42	C7J0034	CJ70323
Bromomethane	ND (0.0100)		8260B Low		1	10/04/17 14:42	C7J0034	CJ70323
Carbon Disulfide	ND (0.0050)		8260B Low		1	10/04/17 14:42	C7J0034	CJ70323
Carbon Tetrachloride	ND (0.0050)		8260B Low		1	10/04/17 14:42	C7J0034	CJ70323
Chlorobenzene	ND (0.0050)		8260B Low		1	10/04/17 14:42	C7J0034	CJ70323
Chloroethane	ND (0.0100)		8260B Low		1	10/04/17 14:42	C7J0034	CJ70323
Chloroform	ND (0.0050)		8260B Low		1	10/04/17 14:42	C7J0034	CJ70323
Chloromethane	ND (0.0100)		8260B Low		1	10/04/17 14:42	C7J0034	CJ70323
cis-1,2-Dichloroethene	ND (0.0050)		8260B Low		1	10/04/17 14:42	C7J0034	CJ70323
cis-1,3-Dichloropropene	ND (0.0050)		8260B Low		1	10/04/17 14:42	C7J0034	CJ70323
Dibromochloromethane	ND (0.0050)		8260B Low		1	10/04/17 14:42	C7J0034	CJ70323
Dibromomethane	ND (0.0050)		8260B Low		1	10/04/17 14:42	C7J0034	CJ70323
Dichlorodifluoromethane	ND (0.0100)		8260B Low		1	10/04/17 14:42	C7J0034	CJ70323
Diethyl Ether	ND (0.0050)		8260B Low		1	10/04/17 14:42	C7J0034	CJ70323
Di-isopropyl ether	ND (0.0050)		8260B Low		1	10/04/17 14:42	C7J0034	CJ70323
Ethyl tertiary-butyl ether	ND (0.0050)		8260B Low		1	10/04/17 14:42	C7J0034	CJ70323
Ethylbenzene	ND (0.0050)		8260B Low		1	10/04/17 14:42	C7J0034	CJ70323
Hexachlorobutadiene	ND (0.0050)		8260B Low		1	10/04/17 14:42	C7J0034	CJ70323
Isopropylbenzene	ND (0.0050)		8260B Low		1	10/04/17 14:42	C7J0034	CJ70323
Methyl tert-Butyl Ether	ND (0.0050)		8260B Low		1	10/04/17 14:42	C7J0034	CJ70323
Methylene Chloride	ND (0.0250)		8260B Low		1	10/04/17 14:42	C7J0034	CJ70323
Naphthalene	ND (0.0050)		8260B Low		1	10/04/17 14:42	C7J0034	CJ70323
n-Butylbenzene	ND (0.0050)		8260B Low		1	10/04/17 14:42	C7J0034	CJ70323
n-Propylbenzene	ND (0.0050)		8260B Low		1	10/04/17 14:42	C7J0034	CJ70323
sec-Butylbenzene	ND (0.0050)		8260B Low		1	10/04/17 14:42	C7J0034	CJ70323
Styrene	ND (0.0050)		8260B Low		1	10/04/17 14:42	C7J0034	CJ70323
tert-Butylbenzene	ND (0.0050)		8260B Low		1	10/04/17 14:42	C7J0034	CJ70323
Tertiary-amyl methyl ether	ND (0.0050)		8260B Low		1	10/04/17 14:42	C7J0034	CJ70323
Tetrachloroethene	ND (0.0050)		8260B Low		1	10/04/17 14:42	C7J0034	CJ70323
Tetrahydrofuran	ND (0.0050)		8260B Low		1	10/04/17 14:42	C7J0034	CJ70323



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: TB-100217  
 Date Sampled: 10/02/17 00:00  
 Percent Solids: N/A  
 Initial Volume: 5  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1710025  
 ESS Laboratory Sample ID: 1710025-17  
 Sample Matrix: Solid  
 Units: mg/kg wet  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0050)		8260B Low		1	10/04/17 14:42	C7J0034	CJ70323
trans-1,2-Dichloroethene	ND (0.0050)		8260B Low		1	10/04/17 14:42	C7J0034	CJ70323
trans-1,3-Dichloropropene	ND (0.0050)		8260B Low		1	10/04/17 14:42	C7J0034	CJ70323
Trichloroethene	ND (0.0050)		8260B Low		1	10/04/17 14:42	C7J0034	CJ70323
Trichlorofluoromethane	ND (0.0050)		8260B Low		1	10/04/17 14:42	C7J0034	CJ70323
Vinyl Acetate	ND (0.0050)		8260B Low		1	10/04/17 14:42	C7J0034	CJ70323
Vinyl Chloride	ND (0.0100)		8260B Low		1	10/04/17 14:42	C7J0034	CJ70323
Xylene O	ND (0.0050)		8260B Low		1	10/04/17 14:42	C7J0034	CJ70323
Xylene P,M	ND (0.0100)		8260B Low		1	10/04/17 14:42	C7J0034	CJ70323
Xylenes (Total)	ND (0.0100)		8260B Low		1	10/04/17 14:42		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>94 %</i>		<i>70-130</i>
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>101 %</i>		<i>70-130</i>
<i>Surrogate: Dibromofluoromethane</i>	<i>98 %</i>		<i>70-130</i>
<i>Surrogate: Toluene-d8</i>	<i>109 %</i>		<i>70-130</i>



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710025

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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**Total Metals**

**Batch CJ70303 - 7471B**

**Blank**

Mercury	ND	0.033	mg/kg wet							
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**LCS**

Mercury	2.77	0.720	mg/kg wet	2.900		96	80-120			
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**LCS Dup**

Mercury	2.71	0.649	mg/kg wet	2.900		94	80-120	2	20	
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**Reference**

Mercury	0.935	0.194	mg/kg wet	1000		0.09	0-200			
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**Batch CJ70328 - 3050B**

**Blank**

Antimony	ND	2.00	mg/kg wet							
Arsenic	ND	2.50	mg/kg wet							
Beryllium	ND	0.11	mg/kg wet							
Cadmium	ND	0.50	mg/kg wet							
Chromium	ND	1.00	mg/kg wet							
Copper	ND	2.50	mg/kg wet							
Lead	ND	5.00	mg/kg wet							
Nickel	ND	2.50	mg/kg wet							
Selenium	ND	2.00	mg/kg wet							
Silver	ND	0.50	mg/kg wet							
Thallium	ND	2.00	mg/kg wet							
Zinc	ND	2.50	mg/kg wet							

**LCS**

Antimony	55.5	17.5	mg/kg wet	48.00		116	0-238			
Arsenic	120	8.77	mg/kg wet	123.0		97	80-120			
Beryllium	191	0.39	mg/kg wet	192.0		100	80-120			
Cadmium	211	1.75	mg/kg wet	224.0		94	80-120			
Chromium	184	3.51	mg/kg wet	179.0		103	80-120			
Copper	80.0	8.77	mg/kg wet	78.90		101	80-120			
Lead	144	17.5	mg/kg wet	145.0		99	80-120			
Nickel	136	8.77	mg/kg wet	143.0		95	80-120			
Selenium	48.8	17.5	mg/kg wet	42.40		115	80-120			
Silver	85.6	1.75	mg/kg wet	81.60		105	80-120			
Thallium	57.6	17.5	mg/kg wet	52.00		111	78-122			
Zinc	688	8.77	mg/kg wet	770.0		89	80-120			

**5035/8260B Volatile Organic Compounds / Low Level**

**Batch CJ70323 - 5035**

**Blank**

1,1,1,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,1-Trichloroethane	ND	0.0050	mg/kg wet							
1,1,2,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,2-Trichloroethane	ND	0.0050	mg/kg wet							



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710025

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CJ70323 - 5035**

1,1-Dichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethene	ND	0.0050	mg/kg wet							
1,1-Dichloropropene	ND	0.0050	mg/kg wet							
1,2,3-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,3-Trichloropropane	ND	0.0050	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,4-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,2-Dibromo-3-Chloropropane	ND	0.0050	mg/kg wet							
1,2-Dibromoethane	ND	0.0050	mg/kg wet							
1,2-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,2-Dichloroethane	ND	0.0050	mg/kg wet							
1,2-Dichloropropane	ND	0.0050	mg/kg wet							
1,3,5-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,3-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,3-Dichloropropane	ND	0.0050	mg/kg wet							
1,4-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,4-Dioxane	ND	0.100	mg/kg wet							
1-Chlorohexane	ND	0.0050	mg/kg wet							
2,2-Dichloropropane	ND	0.0050	mg/kg wet							
2-Butanone	ND	0.0500	mg/kg wet							
2-Chlorotoluene	ND	0.0050	mg/kg wet							
2-Hexanone	ND	0.0500	mg/kg wet							
4-Chlorotoluene	ND	0.0050	mg/kg wet							
4-Isopropyltoluene	ND	0.0050	mg/kg wet							
4-Methyl-2-Pentanone	ND	0.0500	mg/kg wet							
Acetone	ND	0.0500	mg/kg wet							
Benzene	ND	0.0050	mg/kg wet							
Bromobenzene	ND	0.0050	mg/kg wet							
Bromochloromethane	ND	0.0050	mg/kg wet							
Bromodichloromethane	ND	0.0050	mg/kg wet							
Bromoform	ND	0.0050	mg/kg wet							
Bromomethane	ND	0.0100	mg/kg wet							
Carbon Disulfide	ND	0.0050	mg/kg wet							
Carbon Tetrachloride	ND	0.0050	mg/kg wet							
Chlorobenzene	ND	0.0050	mg/kg wet							
Chloroethane	ND	0.0100	mg/kg wet							
Chloroform	ND	0.0050	mg/kg wet							
Chloromethane	ND	0.0100	mg/kg wet							
cis-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
cis-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Dibromochloromethane	ND	0.0050	mg/kg wet							
Dibromomethane	ND	0.0050	mg/kg wet							
Dichlorodifluoromethane	ND	0.0100	mg/kg wet							
Diethyl Ether	ND	0.0050	mg/kg wet							
Di-isopropyl ether	ND	0.0050	mg/kg wet							





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**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CJ70323 - 5035**

Ethyl tertiary-butyl ether	ND	0.0050	mg/kg wet							
Ethylbenzene	ND	0.0050	mg/kg wet							
Hexachlorobutadiene	ND	0.0050	mg/kg wet							
Isopropylbenzene	ND	0.0050	mg/kg wet							
Methyl tert-Butyl Ether	ND	0.0050	mg/kg wet							
Methylene Chloride	ND	0.0250	mg/kg wet							
Naphthalene	ND	0.0050	mg/kg wet							
n-Butylbenzene	ND	0.0050	mg/kg wet							
n-Propylbenzene	ND	0.0050	mg/kg wet							
sec-Butylbenzene	ND	0.0050	mg/kg wet							
Styrene	ND	0.0050	mg/kg wet							
tert-Butylbenzene	ND	0.0050	mg/kg wet							
Tertiary-amyl methyl ether	ND	0.0050	mg/kg wet							
Tetrachloroethene	ND	0.0050	mg/kg wet							
Tetrahydrofuran	ND	0.0050	mg/kg wet							
Toluene	ND	0.0050	mg/kg wet							
trans-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
trans-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Trichloroethene	ND	0.0050	mg/kg wet							
Trichlorofluoromethane	ND	0.0050	mg/kg wet							
Vinyl Acetate	ND	0.0050	mg/kg wet							
Vinyl Chloride	ND	0.0100	mg/kg wet							
Xylene O	ND	0.0050	mg/kg wet							
Xylene P,M	ND	0.0100	mg/kg wet							
Xylenes (Total)	ND	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	0.0479		mg/kg wet	0.05000		96	70-130			
Surrogate: 4-Bromofluorobenzene	0.0506		mg/kg wet	0.05000		101	70-130			
Surrogate: Dibromofluoromethane	0.0481		mg/kg wet	0.05000		96	70-130			
Surrogate: Toluene-d8	0.0546		mg/kg wet	0.05000		109	70-130			

**LCS**

1,1,1,2-Tetrachloroethane	0.0439	0.0050	mg/kg wet	0.05000		88	70-130			
1,1,1-Trichloroethane	0.0413	0.0050	mg/kg wet	0.05000		83	70-130			
1,1,2,2-Tetrachloroethane	0.0453	0.0050	mg/kg wet	0.05000		91	70-130			
1,1,2-Trichloroethane	0.0439	0.0050	mg/kg wet	0.05000		88	70-130			
1,1-Dichloroethane	0.0404	0.0050	mg/kg wet	0.05000		81	70-130			
1,1-Dichloroethene	0.0439	0.0050	mg/kg wet	0.05000		88	70-130			
1,1-Dichloropropene	0.0429	0.0050	mg/kg wet	0.05000		86	70-130			
1,2,3-Trichlorobenzene	0.0475	0.0050	mg/kg wet	0.05000		95	70-130			
1,2,3-Trichloropropane	0.0465	0.0050	mg/kg wet	0.05000		93	70-130			
1,2,4-Trichlorobenzene	0.0478	0.0050	mg/kg wet	0.05000		96	70-130			
1,2,4-Trimethylbenzene	0.0459	0.0050	mg/kg wet	0.05000		92	70-130			
1,2-Dibromo-3-Chloropropane	0.0431	0.0050	mg/kg wet	0.05000		86	70-130			
1,2-Dibromoethane	0.0466	0.0050	mg/kg wet	0.05000		93	70-130			
1,2-Dichlorobenzene	0.0454	0.0050	mg/kg wet	0.05000		91	70-130			
1,2-Dichloroethane	0.0426	0.0050	mg/kg wet	0.05000		85	70-130			



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710025

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CJ70323 - 5035**

1,2-Dichloropropane	0.0433	0.0050	mg/kg wet	0.05000		87	70-130			
1,3,5-Trimethylbenzene	0.0448	0.0050	mg/kg wet	0.05000		90	70-130			
1,3-Dichlorobenzene	0.0445	0.0050	mg/kg wet	0.05000		89	70-130			
1,3-Dichloropropane	0.0470	0.0050	mg/kg wet	0.05000		94	70-130			
1,4-Dichlorobenzene	0.0444	0.0050	mg/kg wet	0.05000		89	70-130			
1,4-Dioxane	0.914	0.100	mg/kg wet	1.000		91	70-130			
1-Chlorohexane	0.0436	0.0050	mg/kg wet	0.05000		87	70-130			
2,2-Dichloropropane	0.0407	0.0050	mg/kg wet	0.05000		81	70-130			
2-Butanone	0.228	0.0500	mg/kg wet	0.2500		91	70-130			
2-Chlorotoluene	0.0441	0.0050	mg/kg wet	0.05000		88	70-130			
2-Hexanone	0.222	0.0500	mg/kg wet	0.2500		89	70-130			
4-Chlorotoluene	0.0438	0.0050	mg/kg wet	0.05000		88	70-130			
4-Isopropyltoluene	0.0442	0.0050	mg/kg wet	0.05000		88	70-130			
4-Methyl-2-Pentanone	0.218	0.0500	mg/kg wet	0.2500		87	70-130			
Acetone	0.219	0.0500	mg/kg wet	0.2500		88	70-130			
Benzene	0.0420	0.0050	mg/kg wet	0.05000		84	70-130			
Bromobenzene	0.0454	0.0050	mg/kg wet	0.05000		91	70-130			
Bromochloromethane	0.0422	0.0050	mg/kg wet	0.05000		84	70-130			
Bromodichloromethane	0.0445	0.0050	mg/kg wet	0.05000		89	70-130			
Bromoform	0.0401	0.0050	mg/kg wet	0.05000		80	70-130			
Bromomethane	0.0383	0.0100	mg/kg wet	0.05000		77	70-130			
Carbon Disulfide	0.0440	0.0050	mg/kg wet	0.05000		88	70-130			
Carbon Tetrachloride	0.0406	0.0050	mg/kg wet	0.05000		81	70-130			
Chlorobenzene	0.0432	0.0050	mg/kg wet	0.05000		86	70-130			
Chloroethane	0.0396	0.0100	mg/kg wet	0.05000		79	70-130			
Chloroform	0.0411	0.0050	mg/kg wet	0.05000		82	70-130			
Chloromethane	0.0408	0.0100	mg/kg wet	0.05000		82	70-130			
cis-1,2-Dichloroethene	0.0427	0.0050	mg/kg wet	0.05000		85	70-130			
cis-1,3-Dichloropropene	0.0483	0.0050	mg/kg wet	0.05000		97	70-130			
Dibromochloromethane	0.0428	0.0050	mg/kg wet	0.05000		86	70-130			
Dibromomethane	0.0423	0.0050	mg/kg wet	0.05000		85	70-130			
Dichlorodifluoromethane	0.0337	0.0100	mg/kg wet	0.05000		67	70-130			
Diethyl Ether	0.0462	0.0050	mg/kg wet	0.05000		92	70-130			
Di-isopropyl ether	0.0434	0.0050	mg/kg wet	0.05000		87	70-130			
Ethyl tertiary-butyl ether	0.0443	0.0050	mg/kg wet	0.05000		89	70-130			
Ethylbenzene	0.0437	0.0050	mg/kg wet	0.05000		87	70-130			
Hexachlorobutadiene	0.0452	0.0050	mg/kg wet	0.05000		90	70-130			
Isopropylbenzene	0.0429	0.0050	mg/kg wet	0.05000		86	70-130			
Methyl tert-Butyl Ether	0.0456	0.0050	mg/kg wet	0.05000		91	70-130			
Methylene Chloride	0.0448	0.0250	mg/kg wet	0.05000		90	70-130			
Naphthalene	0.0447	0.0050	mg/kg wet	0.05000		89	70-130			
n-Butylbenzene	0.0451	0.0050	mg/kg wet	0.05000		90	70-130			
n-Propylbenzene	0.0452	0.0050	mg/kg wet	0.05000		90	70-130			
sec-Butylbenzene	0.0436	0.0050	mg/kg wet	0.05000		87	70-130			
Styrene	0.0456	0.0050	mg/kg wet	0.05000		91	70-130			

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CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710025

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CJ70323 - 5035**

tert-Butylbenzene	0.0449	0.0050	mg/kg wet	0.05000		90	70-130			
Tertiary-amyl methyl ether	0.0444	0.0050	mg/kg wet	0.05000		89	70-130			
Tetrachloroethene	0.0423	0.0050	mg/kg wet	0.05000		85	70-130			
Tetrahydrofuran	0.0442	0.0050	mg/kg wet	0.05000		88	70-130			
Toluene	0.0424	0.0050	mg/kg wet	0.05000		85	70-130			
trans-1,2-Dichloroethene	0.0433	0.0050	mg/kg wet	0.05000		87	70-130			
trans-1,3-Dichloropropene	0.0438	0.0050	mg/kg wet	0.05000		88	70-130			
Trichloroethene	0.0420	0.0050	mg/kg wet	0.05000		84	70-130			
Trichlorofluoromethane	0.0389	0.0050	mg/kg wet	0.05000		78	70-130			
Vinyl Acetate	0.0437	0.0050	mg/kg wet	0.05000		87	70-130			
Vinyl Chloride	0.0413	0.0100	mg/kg wet	0.05000		83	70-130			
Xylene O	0.0453	0.0050	mg/kg wet	0.05000		91	70-130			
Xylene P,M	0.0901	0.0100	mg/kg wet	0.1000		90	70-130			
Xylenes (Total)	0.135	0.0100	mg/kg wet							
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0433</i>		mg/kg wet	<i>0.05000</i>		<i>87</i>	<i>70-130</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0457</i>		mg/kg wet	<i>0.05000</i>		<i>91</i>	<i>70-130</i>			
<i>Surrogate: Dibromofluoromethane</i>	<i>0.0448</i>		mg/kg wet	<i>0.05000</i>		<i>90</i>	<i>70-130</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0473</i>		mg/kg wet	<i>0.05000</i>		<i>95</i>	<i>70-130</i>			

**LCS Dup**

1,1,1,2-Tetrachloroethane	0.0493	0.0050	mg/kg wet	0.05000		99	70-130	12	25	
1,1,1-Trichloroethane	0.0449	0.0050	mg/kg wet	0.05000		90	70-130	8	25	
1,1,2,2-Tetrachloroethane	0.0494	0.0050	mg/kg wet	0.05000		99	70-130	9	25	
1,1,2-Trichloroethane	0.0474	0.0050	mg/kg wet	0.05000		95	70-130	8	25	
1,1-Dichloroethane	0.0436	0.0050	mg/kg wet	0.05000		87	70-130	8	25	
1,1-Dichloroethene	0.0474	0.0050	mg/kg wet	0.05000		95	70-130	8	25	
1,1-Dichloropropene	0.0466	0.0050	mg/kg wet	0.05000		93	70-130	8	25	
1,2,3-Trichlorobenzene	0.0511	0.0050	mg/kg wet	0.05000		102	70-130	7	25	
1,2,3-Trichloropropane	0.0496	0.0050	mg/kg wet	0.05000		99	70-130	6	25	
1,2,4-Trichlorobenzene	0.0512	0.0050	mg/kg wet	0.05000		102	70-130	7	25	
1,2,4-Trimethylbenzene	0.0494	0.0050	mg/kg wet	0.05000		99	70-130	7	25	
1,2-Dibromo-3-Chloropropane	0.0449	0.0050	mg/kg wet	0.05000		90	70-130	4	25	
1,2-Dibromoethane	0.0514	0.0050	mg/kg wet	0.05000		103	70-130	10	25	
1,2-Dichlorobenzene	0.0487	0.0050	mg/kg wet	0.05000		97	70-130	7	25	
1,2-Dichloroethane	0.0450	0.0050	mg/kg wet	0.05000		90	70-130	6	25	
1,2-Dichloropropane	0.0469	0.0050	mg/kg wet	0.05000		94	70-130	8	25	
1,3,5-Trimethylbenzene	0.0485	0.0050	mg/kg wet	0.05000		97	70-130	8	25	
1,3-Dichlorobenzene	0.0471	0.0050	mg/kg wet	0.05000		94	70-130	6	25	
1,3-Dichloropropane	0.0521	0.0050	mg/kg wet	0.05000		104	70-130	10	25	
1,4-Dichlorobenzene	0.0479	0.0050	mg/kg wet	0.05000		96	70-130	8	25	
1,4-Dioxane	0.991	0.100	mg/kg wet	1.000		99	70-130	8	20	
1-Chlorohexane	0.0501	0.0050	mg/kg wet	0.05000		100	70-130	14	25	
2,2-Dichloropropane	0.0441	0.0050	mg/kg wet	0.05000		88	70-130	8	25	
2-Butanone	0.240	0.0500	mg/kg wet	0.2500		96	70-130	5	25	
2-Chlorotoluene	0.0475	0.0050	mg/kg wet	0.05000		95	70-130	7	25	
2-Hexanone	0.242	0.0500	mg/kg wet	0.2500		97	70-130	9	25	



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710025

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CJ70323 - 5035**

4-Chlorotoluene	0.0477	0.0050	mg/kg wet	0.05000		95	70-130	8	25	
4-Isopropyltoluene	0.0478	0.0050	mg/kg wet	0.05000		96	70-130	8	25	
4-Methyl-2-Pentanone	0.229	0.0500	mg/kg wet	0.2500		92	70-130	5	25	
Acetone	0.230	0.0500	mg/kg wet	0.2500		92	70-130	5	25	
Benzene	0.0456	0.0050	mg/kg wet	0.05000		91	70-130	8	25	
Bromobenzene	0.0493	0.0050	mg/kg wet	0.05000		99	70-130	8	25	
Bromochloromethane	0.0453	0.0050	mg/kg wet	0.05000		91	70-130	7	25	
Bromodichloromethane	0.0478	0.0050	mg/kg wet	0.05000		96	70-130	7	25	
Bromoform	0.0444	0.0050	mg/kg wet	0.05000		89	70-130	10	25	
Bromomethane	0.0417	0.0100	mg/kg wet	0.05000		83	70-130	8	25	
Carbon Disulfide	0.0479	0.0050	mg/kg wet	0.05000		96	70-130	8	25	
Carbon Tetrachloride	0.0443	0.0050	mg/kg wet	0.05000		89	70-130	9	25	
Chlorobenzene	0.0479	0.0050	mg/kg wet	0.05000		96	70-130	10	25	
Chloroethane	0.0429	0.0100	mg/kg wet	0.05000		86	70-130	8	25	
Chloroform	0.0441	0.0050	mg/kg wet	0.05000		88	70-130	7	25	
Chloromethane	0.0434	0.0100	mg/kg wet	0.05000		87	70-130	6	25	
cis-1,2-Dichloroethene	0.0459	0.0050	mg/kg wet	0.05000		92	70-130	7	25	
cis-1,3-Dichloropropene	0.0518	0.0050	mg/kg wet	0.05000		104	70-130	7	25	
Dibromochloromethane	0.0472	0.0050	mg/kg wet	0.05000		94	70-130	10	25	
Dibromomethane	0.0450	0.0050	mg/kg wet	0.05000		90	70-130	6	25	
Dichlorodifluoromethane	0.0362	0.0100	mg/kg wet	0.05000		72	70-130	7	25	
Diethyl Ether	0.0501	0.0050	mg/kg wet	0.05000		100	70-130	8	25	
Di-isopropyl ether	0.0470	0.0050	mg/kg wet	0.05000		94	70-130	8	25	
Ethyl tertiary-butyl ether	0.0479	0.0050	mg/kg wet	0.05000		96	70-130	8	25	
Ethylbenzene	0.0488	0.0050	mg/kg wet	0.05000		98	70-130	11	25	
Hexachlorobutadiene	0.0497	0.0050	mg/kg wet	0.05000		99	70-130	9	25	
Isopropylbenzene	0.0468	0.0050	mg/kg wet	0.05000		94	70-130	9	25	
Methyl tert-Butyl Ether	0.0488	0.0050	mg/kg wet	0.05000		98	70-130	7	25	
Methylene Chloride	0.0482	0.0250	mg/kg wet	0.05000		96	70-130	7	25	
Naphthalene	0.0477	0.0050	mg/kg wet	0.05000		95	70-130	7	25	
n-Butylbenzene	0.0486	0.0050	mg/kg wet	0.05000		97	70-130	7	25	
n-Propylbenzene	0.0489	0.0050	mg/kg wet	0.05000		98	70-130	8	25	
sec-Butylbenzene	0.0475	0.0050	mg/kg wet	0.05000		95	70-130	9	25	
Styrene	0.0501	0.0050	mg/kg wet	0.05000		100	70-130	9	25	
tert-Butylbenzene	0.0486	0.0050	mg/kg wet	0.05000		97	70-130	8	25	
Tertiary-amyl methyl ether	0.0474	0.0050	mg/kg wet	0.05000		95	70-130	7	25	
Tetrachloroethene	0.0472	0.0050	mg/kg wet	0.05000		94	70-130	11	25	
Tetrahydrofuran	0.0468	0.0050	mg/kg wet	0.05000		94	70-130	6	25	
Toluene	0.0456	0.0050	mg/kg wet	0.05000		91	70-130	7	25	
trans-1,2-Dichloroethene	0.0471	0.0050	mg/kg wet	0.05000		94	70-130	8	25	
trans-1,3-Dichloropropene	0.0468	0.0050	mg/kg wet	0.05000		94	70-130	6	25	
Trichloroethene	0.0455	0.0050	mg/kg wet	0.05000		91	70-130	8	25	
Trichlorofluoromethane	0.0421	0.0050	mg/kg wet	0.05000		84	70-130	8	25	
Vinyl Acetate	0.0467	0.0050	mg/kg wet	0.05000		93	70-130	7	25	
Vinyl Chloride	0.0450	0.0100	mg/kg wet	0.05000		90	70-130	9	25	



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710025

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CJ70323 - 5035**

Xylene O	0.0500	0.0050	mg/kg wet	0.05000		100	70-130	10	25	
Xylene P,M	0.0995	0.0100	mg/kg wet	0.1000		100	70-130	10	25	
Xylenes (Total)	0.149	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	0.0436		mg/kg wet	0.05000		87	70-130			
Surrogate: 4-Bromofluorobenzene	0.0468		mg/kg wet	0.05000		94	70-130			
Surrogate: Dibromofluoromethane	0.0450		mg/kg wet	0.05000		90	70-130			
Surrogate: Toluene-d8	0.0493		mg/kg wet	0.05000		99	70-130			

8100M Total Petroleum Hydrocarbons

**Batch CJ70310 - 3546**

<b>Blank</b>										
Decane (C10)	ND	0.2	mg/kg wet							
Docosane (C22)	ND	0.2	mg/kg wet							
Dodecane (C12)	ND	0.2	mg/kg wet							
Eicosane (C20)	ND	0.2	mg/kg wet							
Hexacosane (C26)	ND	0.2	mg/kg wet							
Hexadecane (C16)	ND	0.2	mg/kg wet							
Nonadecane (C19)	ND	0.2	mg/kg wet							
Nonane (C9)	ND	0.2	mg/kg wet							
Octacosane (C28)	ND	0.2	mg/kg wet							
Octadecane (C18)	ND	0.2	mg/kg wet							
Tetracosane (C24)	ND	0.2	mg/kg wet							
Tetradecane (C14)	ND	0.2	mg/kg wet							
Total Petroleum Hydrocarbons	ND	37.5	mg/kg wet							
Triacotane (C30)	ND	0.2	mg/kg wet							

Surrogate: O-Terphenyl	4.21		mg/kg wet	5.000		84	40-140			
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<b>LCS</b>										
Decane (C10)	1.7	0.2	mg/kg wet	2.500		68	40-140			
Docosane (C22)	2.0	0.2	mg/kg wet	2.500		79	40-140			
Dodecane (C12)	1.8	0.2	mg/kg wet	2.500		72	40-140			
Eicosane (C20)	1.9	0.2	mg/kg wet	2.500		78	40-140			
Hexacosane (C26)	2.0	0.2	mg/kg wet	2.500		79	40-140			
Hexadecane (C16)	1.9	0.2	mg/kg wet	2.500		76	40-140			
Nonadecane (C19)	2.1	0.2	mg/kg wet	2.500		83	40-140			
Nonane (C9)	1.4	0.2	mg/kg wet	2.500		57	30-140			
Octacosane (C28)	2.0	0.2	mg/kg wet	2.500		79	40-140			
Octadecane (C18)	1.9	0.2	mg/kg wet	2.500		75	40-140			
Tetracosane (C24)	2.0	0.2	mg/kg wet	2.500		79	40-140			
Tetradecane (C14)	1.8	0.2	mg/kg wet	2.500		74	40-140			
Total Petroleum Hydrocarbons	26.0	37.5	mg/kg wet	35.00		74	40-140			
Triacotane (C30)	2.0	0.2	mg/kg wet	2.500		79	40-140			

Surrogate: O-Terphenyl	4.12		mg/kg wet	5.000		82	40-140			
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**LCS Dup**



*CERTIFICATE OF ANALYSIS*

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ESS Laboratory Work Order: 1710025

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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**8100M Total Petroleum Hydrocarbons**

**Batch CJ70310 - 3546**

Decane (C10)	1.8	0.2	mg/kg wet	2.500		71	40-140	4	25	
Docosane (C22)	2.0	0.2	mg/kg wet	2.500		82	40-140	4	25	
Dodecane (C12)	1.9	0.2	mg/kg wet	2.500		75	40-140	4	25	
Eicosane (C20)	2.0	0.2	mg/kg wet	2.500		82	40-140	5	25	
Hexacosane (C26)	2.1	0.2	mg/kg wet	2.500		82	40-140	4	25	
Hexadecane (C16)	2.0	0.2	mg/kg wet	2.500		79	40-140	3	25	
Nonadecane (C19)	2.2	0.2	mg/kg wet	2.500		86	40-140	4	25	
Nonane (C9)	1.5	0.2	mg/kg wet	2.500		60	30-140	4	25	
Octacosane (C28)	2.1	0.2	mg/kg wet	2.500		83	40-140	4	25	
Octadecane (C18)	1.9	0.2	mg/kg wet	2.500		78	40-140	4	25	
Tetracosane (C24)	2.0	0.2	mg/kg wet	2.500		82	40-140	4	25	
Tetradecane (C14)	1.9	0.2	mg/kg wet	2.500		76	40-140	3	25	
Total Petroleum Hydrocarbons	27.0	37.5	mg/kg wet	35.00		77	40-140	4	25	
Triacotane (C30)	2.1	0.2	mg/kg wet	2.500		83	40-140	4	25	

Surrogate: *O*-Terphenyl 4.22 mg/kg wet 5.000 84 40-140

**8270D Polynuclear Aromatic Hydrocarbons**

**Batch CJ70211 - 3546**

<b>Blank</b>										
2-Methylnaphthalene	ND	0.333	mg/kg wet							
Acenaphthene	ND	0.333	mg/kg wet							
Acenaphthylene	ND	0.333	mg/kg wet							
Anthracene	ND	0.333	mg/kg wet							
Benzo(a)anthracene	ND	0.333	mg/kg wet							
Benzo(a)pyrene	ND	0.167	mg/kg wet							
Benzo(b)fluoranthene	ND	0.333	mg/kg wet							
Benzo(g,h,i)perylene	ND	0.333	mg/kg wet							
Benzo(k)fluoranthene	ND	0.333	mg/kg wet							
Chrysene	ND	0.167	mg/kg wet							
Dibenzo(a,h)Anthracene	ND	0.167	mg/kg wet							
Fluoranthene	ND	0.333	mg/kg wet							
Fluorene	ND	0.333	mg/kg wet							
Indeno(1,2,3-cd)Pyrene	ND	0.333	mg/kg wet							
Naphthalene	ND	0.333	mg/kg wet							
Phenanthrene	ND	0.333	mg/kg wet							
Pyrene	ND	0.333	mg/kg wet							
Surrogate: 1,2-Dichlorobenzene-d4	2.80		mg/kg wet	3.333		84	30-130			
Surrogate: 2-Fluorobiphenyl	2.82		mg/kg wet	3.333		85	30-130			
Surrogate: Nitrobenzene-d5	2.71		mg/kg wet	3.333		81	30-130			
Surrogate: p-Terphenyl-d14	3.40		mg/kg wet	3.333		102	30-130			

<b>LCS</b>										
2-Methylnaphthalene	2.46	0.333	mg/kg wet	3.333		74	40-140			
Acenaphthene	2.51	0.333	mg/kg wet	3.333		75	40-140			
Acenaphthylene	2.57	0.333	mg/kg wet	3.333		77	40-140			





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**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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**8270D Polynuclear Aromatic Hydrocarbons**

**Batch CJ70211 - 3546**

Anthracene	2.52	0.333	mg/kg wet	3.333		76	40-140			
Benzo(a)anthracene	2.53	0.333	mg/kg wet	3.333		76	40-140			
Benzo(a)pyrene	2.60	0.167	mg/kg wet	3.333		78	40-140			
Benzo(b)fluoranthene	2.63	0.333	mg/kg wet	3.333		79	40-140			
Benzo(g,h,i)perylene	2.28	0.333	mg/kg wet	3.333		68	40-140			
Benzo(k)fluoranthene	2.69	0.333	mg/kg wet	3.333		81	40-140			
Chrysene	2.55	0.167	mg/kg wet	3.333		76	40-140			
Dibenzo(a,h)Anthracene	2.37	0.167	mg/kg wet	3.333		71	40-140			
Fluoranthene	2.73	0.333	mg/kg wet	3.333		82	40-140			
Fluorene	2.74	0.333	mg/kg wet	3.333		82	40-140			
Indeno(1,2,3-cd)Pyrene	2.35	0.333	mg/kg wet	3.333		70	40-140			
Naphthalene	2.52	0.333	mg/kg wet	3.333		76	40-140			
Phenanthrene	2.41	0.333	mg/kg wet	3.333		72	40-140			
Pyrene	2.39	0.333	mg/kg wet	3.333		72	40-140			
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	2.55		mg/kg wet	3.333		76	30-130			
<i>Surrogate: 2-Fluorobiphenyl</i>	2.78		mg/kg wet	3.333		83	30-130			
<i>Surrogate: Nitrobenzene-d5</i>	2.63		mg/kg wet	3.333		79	30-130			
<i>Surrogate: p-Terphenyl-d14</i>	2.72		mg/kg wet	3.333		81	30-130			

**LCS Dup**

2-Methylnaphthalene	2.88	0.333	mg/kg wet	3.333		86	40-140	16	30	
Acenaphthene	2.87	0.333	mg/kg wet	3.333		86	40-140	13	30	
Acenaphthylene	2.99	0.333	mg/kg wet	3.333		90	40-140	15	30	
Anthracene	2.87	0.333	mg/kg wet	3.333		86	40-140	13	30	
Benzo(a)anthracene	2.89	0.333	mg/kg wet	3.333		87	40-140	13	30	
Benzo(a)pyrene	2.96	0.167	mg/kg wet	3.333		89	40-140	13	30	
Benzo(b)fluoranthene	3.16	0.333	mg/kg wet	3.333		95	40-140	18	30	
Benzo(g,h,i)perylene	2.51	0.333	mg/kg wet	3.333		75	40-140	9	30	
Benzo(k)fluoranthene	2.95	0.333	mg/kg wet	3.333		89	40-140	9	30	
Chrysene	2.88	0.167	mg/kg wet	3.333		86	40-140	12	30	
Dibenzo(a,h)Anthracene	2.63	0.167	mg/kg wet	3.333		79	40-140	10	30	
Fluoranthene	3.12	0.333	mg/kg wet	3.333		94	40-140	13	30	
Fluorene	3.24	0.333	mg/kg wet	3.333		97	40-140	17	30	
Indeno(1,2,3-cd)Pyrene	2.60	0.333	mg/kg wet	3.333		78	40-140	10	30	
Naphthalene	2.85	0.333	mg/kg wet	3.333		85	40-140	12	30	
Phenanthrene	2.75	0.333	mg/kg wet	3.333		83	40-140	13	30	
Pyrene	2.77	0.333	mg/kg wet	3.333		83	40-140	15	30	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	2.86		mg/kg wet	3.333		86	30-130			
<i>Surrogate: 2-Fluorobiphenyl</i>	2.97		mg/kg wet	3.333		89	30-130			
<i>Surrogate: Nitrobenzene-d5</i>	2.91		mg/kg wet	3.333		87	30-130			
<i>Surrogate: p-Terphenyl-d14</i>	3.06		mg/kg wet	3.333		92	30-130			

**Batch CJ70309 - 3546**

<b>Blank</b>										
2-Methylnaphthalene	ND	0.333	mg/kg wet							
Acenaphthene	ND	0.333	mg/kg wet							
Acenaphthylene	ND	0.333	mg/kg wet							



CERTIFICATE OF ANALYSIS

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**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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8270D Polynuclear Aromatic Hydrocarbons

**Batch CJ70309 - 3546**

Anthracene	ND	0.333	mg/kg wet							
Benzo(a)anthracene	ND	0.333	mg/kg wet							
Benzo(a)pyrene	ND	0.167	mg/kg wet							
Benzo(b)fluoranthene	ND	0.333	mg/kg wet							
Benzo(g,h,i)perylene	ND	0.333	mg/kg wet							
Benzo(k)fluoranthene	ND	0.333	mg/kg wet							
Chrysene	ND	0.167	mg/kg wet							
Dibenzo(a,h)Anthracene	ND	0.167	mg/kg wet							
Fluoranthene	ND	0.333	mg/kg wet							
Fluorene	ND	0.333	mg/kg wet							
Indeno(1,2,3-cd)Pyrene	ND	0.333	mg/kg wet							
Naphthalene	ND	0.333	mg/kg wet							
Phenanthrene	ND	0.333	mg/kg wet							
Pyrene	ND	0.333	mg/kg wet							
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	2.65		mg/kg wet	3.333		80	30-130			
<i>Surrogate: 2-Fluorobiphenyl</i>	2.73		mg/kg wet	3.333		82	30-130			
<i>Surrogate: Nitrobenzene-d5</i>	2.76		mg/kg wet	3.333		83	30-130			
<i>Surrogate: p-Terphenyl-d14</i>	3.36		mg/kg wet	3.333		101	30-130			

**LCS**

2-Methylnaphthalene	2.25	0.333	mg/kg wet	3.333		67	40-140			
Acenaphthene	2.42	0.333	mg/kg wet	3.333		73	40-140			
Acenaphthylene	2.57	0.333	mg/kg wet	3.333		77	40-140			
Anthracene	2.86	0.333	mg/kg wet	3.333		86	40-140			
Benzo(a)anthracene	2.88	0.333	mg/kg wet	3.333		86	40-140			
Benzo(a)pyrene	3.02	0.167	mg/kg wet	3.333		91	40-140			
Benzo(b)fluoranthene	2.87	0.333	mg/kg wet	3.333		86	40-140			
Benzo(g,h,i)perylene	2.82	0.333	mg/kg wet	3.333		85	40-140			
Benzo(k)fluoranthene	3.13	0.333	mg/kg wet	3.333		94	40-140			
Chrysene	2.89	0.167	mg/kg wet	3.333		87	40-140			
Dibenzo(a,h)Anthracene	2.84	0.167	mg/kg wet	3.333		85	40-140			
Fluoranthene	2.51	0.333	mg/kg wet	3.333		75	40-140			
Fluorene	2.59	0.333	mg/kg wet	3.333		78	40-140			
Indeno(1,2,3-cd)Pyrene	2.86	0.333	mg/kg wet	3.333		86	40-140			
Naphthalene	2.43	0.333	mg/kg wet	3.333		73	40-140			
Phenanthrene	2.74	0.333	mg/kg wet	3.333		82	40-140			
Pyrene	3.28	0.333	mg/kg wet	3.333		98	40-140			
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	2.57		mg/kg wet	3.333		77	30-130			
<i>Surrogate: 2-Fluorobiphenyl</i>	2.83		mg/kg wet	3.333		85	30-130			
<i>Surrogate: Nitrobenzene-d5</i>	2.70		mg/kg wet	3.333		81	30-130			
<i>Surrogate: p-Terphenyl-d14</i>	3.73		mg/kg wet	3.333		112	30-130			

**LCS Dup**

2-Methylnaphthalene	2.34	0.333	mg/kg wet	3.333		70	40-140	4	30	
Acenaphthene	2.48	0.333	mg/kg wet	3.333		74	40-140	2	30	
Acenaphthylene	2.65	0.333	mg/kg wet	3.333		80	40-140	3	30	
Anthracene	2.91	0.333	mg/kg wet	3.333		87	40-140	2	30	



*CERTIFICATE OF ANALYSIS*

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**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
<b>8270D Polynuclear Aromatic Hydrocarbons</b>										
<b>Batch CJ70309 - 3546</b>										
Benzo(a)anthracene	2.80	0.333	mg/kg wet	3.333		84	40-140	3	30	
Benzo(a)pyrene	3.02	0.167	mg/kg wet	3.333		91	40-140	0.1	30	
Benzo(b)fluoranthene	2.85	0.333	mg/kg wet	3.333		86	40-140	0.7	30	
Benzo(g,h,i)perylene	2.96	0.333	mg/kg wet	3.333		89	40-140	5	30	
Benzo(k)fluoranthene	3.16	0.333	mg/kg wet	3.333		95	40-140	1	30	
Chrysene	2.93	0.167	mg/kg wet	3.333		88	40-140	1	30	
Dibenzo(a,h)Anthracene	3.00	0.167	mg/kg wet	3.333		90	40-140	5	30	
Fluoranthene	2.52	0.333	mg/kg wet	3.333		76	40-140	0.2	30	
Fluorene	2.68	0.333	mg/kg wet	3.333		80	40-140	3	30	
Indeno(1,2,3-cd)Pyrene	3.05	0.333	mg/kg wet	3.333		92	40-140	6	30	
Naphthalene	2.49	0.333	mg/kg wet	3.333		75	40-140	2	30	
Phenanthrene	2.78	0.333	mg/kg wet	3.333		84	40-140	2	30	
Pyrene	2.93	0.333	mg/kg wet	3.333		88	40-140	11	30	
Surrogate: 1,2-Dichlorobenzene-d4	2.60		mg/kg wet	3.333		78	30-130			
Surrogate: 2-Fluorobiphenyl	2.79		mg/kg wet	3.333		84	30-130			
Surrogate: Nitrobenzene-d5	2.74		mg/kg wet	3.333		82	30-130			
Surrogate: p-Terphenyl-d14	3.24		mg/kg wet	3.333		97	30-130			

**Classical Chemistry**

**Batch CJ70513 - TCN Prep**

<b>Blank</b>										
Total Cyanide	ND	1.00	mg/kg wet							
<b>LCS</b>										
Total Cyanide	4.99	1.00	mg/kg wet	5.015		99	90-110			
<b>Reference</b>										
Total Cyanide	49.1	4.84	mg/kg wet	48.40		101	36.1577-206.6 12			
<b>Reference</b>										
Total Cyanide	49.8	4.86	mg/kg wet	48.40		103	36.1577-206.6 12			

**Batch CJ70615 - TCN Prep**

<b>Blank</b>										
Total Cyanide	ND	1.00	mg/kg wet							
<b>LCS</b>										
Total Cyanide	5.00	1.00	mg/kg wet	5.015		100	90-110			
<b>Reference</b>										
Total Cyanide	50.0	4.99	mg/kg wet	48.40		103	36.1577-206.6 12			
<b>Reference</b>										
Total Cyanide	48.9	4.94	mg/kg wet	48.40		101	36.1577-206.6 12			



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**Notes and Definitions**

- U Analyte included in the analysis, but not detected
- S+ Surrogate recovery(ies) above upper control limit (S+).
- S- Surrogate recovery(ies) below lower control limit (S-).
- IM Internal Standard(s) outside of criteria due to matrix (UCM/coelution is present) (IM).
- IC Internal Standard(s) outside of criteria. Sample was reanalyzed to confirm (IC).
- D Diluted.
- B- Blank Spike recovery is below lower control limit (B-).
- ND Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference
- MDL Method Detection Limit
- MRL Method Reporting Limit
- LOD Limit of Detection
- LOQ Limit of Quantitation
- DL Detection Limit
- I/V Initial Volume
- F/V Final Volume
- § Subcontracted analysis; see attached report
- 1 Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
- 2 Range result excludes concentrations of target analytes eluting in that range.
- 3 Range result excludes the concentration of the C9-C10 aromatic range.
- Avg Results reported as a mathematical average.
- NR No Recovery
- [CALC] Calculated Analyte
- SUB Subcontracted analysis; see attached report
- RL Reporting Limit
- EDL Estimated Detection Limit



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710025

**ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS**

**ENVIRONMENTAL**

Rhode Island Potable and Non Potable Water: LAI00179

<http://www.health.ri.gov/find/labs/analytical/ESS.pdf>

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750

[http://www.ct.gov/dph/lib/dph/environmental\\_health/environmental\\_laboratories/pdf/OutOfStateCommercialLaboratories.pdf](http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutOfStateCommercialLaboratories.pdf)

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002

<http://www.maine.gov/dhhs/meecd/environmental-health/dwp/partners/labCert.shtml>

Massachusetts Potable and Non Potable Water: M-RI002

<http://public.dep.state.ma.us/Labcert/Labcert.aspx>

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424

<http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm>

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313

<http://www.wadsworth.org/labcert/elap/comm.html>

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006

[http://datamine2.state.nj.us/DEP\\_OPRA/OpraMain/pi\\_main?mode=pi\\_by\\_site&sort\\_order=PI\\_NAMEA&Select+a+Site:=58715](http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715)

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752

<http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx>

## ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Providence, RI - GZA/HDM

ESS Project ID: 1710025

Shipped/Delivered Via: Client

Date Received: 10/2/2017

Project Due Date: 10/10/2017

Days for Project: 5 Day

- |   |   |
|---|---|
| <p>1. Air bill manifest present? <input type="checkbox"/> No<br/>Air No.: <u>NA</u></p> <p>2. Were custody seals present? <input type="checkbox"/> No</p> <p>3. Is radiation count &lt;100 CPM? <input type="checkbox"/> Yes</p> <p>4. Is a Cooler Present? <input type="checkbox"/> Yes<br/>Temp: <u>22.3</u> Iced with: <u>Ice</u></p> <p>5. Was COC signed and dated by client? <input type="checkbox"/> Yes</p> | <p>6. Does COC match bottles? <input type="checkbox"/> Yes</p> <p>7. Is COC complete and correct? <input type="checkbox"/> Yes</p> <p>8. Were samples received intact? <input type="checkbox"/> Yes</p> <p>9. Were labs informed about <u>short holds &amp; rushes</u>? Yes / No <u>NA</u></p> <p>10. Were any analyses received outside of hold time? Yes / No <u>No</u></p> |
|---|---|

- |   |  |
|---|--|
| <p>11. Any Subcontracting needed? Yes / <input checked="" type="checkbox"/> No<br/>ESS Sample IDs: _____<br/>Analysis: _____<br/>TAT: _____</p> | <p>12. Were VOAs received? <input checked="" type="checkbox"/> Yes / No<br/>a. Air bubbles in aqueous VOAs? Yes / No<br/>b. Does methanol cover soil completely? Yes / No / NA</p> |
|---|--|

13. Are the samples properly preserved?  Yes / No
- a. If metals preserved upon receipt: Date: \_\_\_\_\_ Time: \_\_\_\_\_ By: \_\_\_\_\_
- b. Low Level VOA vials frozen: Date: 10/2/17 Time: 11:46 By: AL

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes /  No
- a. Was there a need to contact the client? Yes /  No
- Who was contacted? \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_ By: \_\_\_\_\_

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
01	169206	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
01	169223	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
01	169254	Yes	NA	Yes	VOA Vial - Other	Other	
01	169255	Yes	NA	Yes	VOA Vial - Other	Other	
02	169205	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
02	169222	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
02	169252	Yes	NA	Yes	VOA Vial - Other	Other	
02	169253	Yes	NA	Yes	VOA Vial - Other	Other	
03	169204	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
03	169221	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
03	169250	Yes	NA	Yes	VOA Vial - Other	Other	
03	169251	Yes	NA	Yes	VOA Vial - Other	Other	
04	169203	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
04	169220	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
04	169248	Yes	NA	Yes	VOA Vial - Other	Other	
04	169249	Yes	NA	Yes	VOA Vial - Other	Other	
05	169202	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
05	169219	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
05	169246	Yes	NA	Yes	VOA Vial - Other	Other	
05	169247	Yes	NA	Yes	VOA Vial - Other	Other	
06	169201	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
06	169218	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
06	169244	Yes	NA	Yes	VOA Vial - Other	Other	
06	169245	Yes	NA	Yes	VOA Vial - Other	Other	



## ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Providence, RI - GZA/HDM

ESS Project ID: 1710025

Date Received: 10/2/2017

07	169200	Yes	NA	Yes	8 oz. Jar - Unpres	NP
07	169217	Yes	NA	Yes	VOA Vial - Methanol	MeOH
07	169242	Yes	NA	Yes	VOA Vial - Other	Other
07	169243	Yes	NA	Yes	VOA Vial - Other	Other
08	169199	Yes	NA	Yes	8 oz. Jar - Unpres	NP
08	169216	Yes	NA	Yes	VOA Vial - Methanol	MeOH
08	169240	Yes	NA	Yes	VOA Vial - Other	Other
08	169241	Yes	NA	Yes	VOA Vial - Other	Other
09	169198	Yes	NA	Yes	8 oz. Jar - Unpres	NP
09	169215	Yes	NA	Yes	VOA Vial - Methanol	MeOH
09	169238	Yes	NA	Yes	VOA Vial - Other	Other
09	169239	Yes	NA	Yes	VOA Vial - Other	Other
10	169197	Yes	NA	Yes	8 oz. Jar - Unpres	NP
10	169214	Yes	NA	Yes	VOA Vial - Methanol	MeOH
10	169236	Yes	NA	Yes	VOA Vial - Other	Other
10	169237	Yes	NA	Yes	VOA Vial - Other	Other
11	169196	Yes	NA	Yes	8 oz. Jar - Unpres	NP
11	169213	Yes	NA	Yes	VOA Vial - Methanol	MeOH
11	169234	Yes	NA	Yes	VOA Vial - Other	Other
11	169235	Yes	NA	Yes	VOA Vial - Other	Other
12	169195	Yes	NA	Yes	8 oz. Jar - Unpres	NP
12	169212	Yes	NA	Yes	VOA Vial - Methanol	MeOH
12	169232	Yes	NA	Yes	VOA Vial - Other	Other
12	169233	Yes	NA	Yes	VOA Vial - Other	Other
13	169194	Yes	NA	Yes	8 oz. Jar - Unpres	NP
13	169211	Yes	NA	Yes	VOA Vial - Methanol	MeOH
13	169230	Yes	NA	Yes	VOA Vial - Other	Other
13	169231	Yes	NA	Yes	VOA Vial - Other	Other
14	169193	Yes	NA	Yes	8 oz. Jar - Unpres	NP
14	169210	Yes	NA	Yes	VOA Vial - Methanol	MeOH
14	169228	Yes	NA	Yes	VOA Vial - Other	Other
14	169229	Yes	NA	Yes	VOA Vial - Other	Other
15	169192	Yes	NA	Yes	8 oz. Jar - Unpres	NP
15	169209	Yes	NA	Yes	VOA Vial - Methanol	MeOH
15	169226	Yes	NA	Yes	VOA Vial - Other	Other
15	169227	Yes	NA	Yes	VOA Vial - Other	Other
16	169191	Yes	NA	Yes	8 oz. Jar - Unpres	NP
16	169208	Yes	NA	Yes	VOA Vial - Methanol	MeOH
16	169224	Yes	NA	Yes	VOA Vial - Other	Other
16	169225	Yes	NA	Yes	VOA Vial - Other	Other
17	169207	Yes	NA	Yes	VOA Vial - Methanol	MeOH
17	169256	Yes	NA	Yes	VOA Vial - Other	Other

2nd Review

Are barcode labels on correct containers?

Yes / No

Completed

By: 

Date & Time: 10/2/17 1639

Reviewed

By: 

Date & Time: 10/2/17 1647

Delivered

By: 

Date & Time: 10/2/17 1647







## CERTIFICATE OF ANALYSIS

Sarah McLeod  
GZA GeoEnvironmental, Inc.  
530 Broadway  
Providence, RI 02909

**RE: Former Tidewater Facility (05.0043654.00)**  
**ESS Laboratory Work Order Number: 1710285**

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.



Laurel Stoddard  
Laboratory Director

**REVIEWED**

By ESS Laboratory at 2:59 pm, Oct 18, 2017

**Analytical Summary**

The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710285

**SAMPLE RECEIPT**

The following samples were received on October 11, 2017 for the analyses specified on the enclosed Chain of Custody Record.

**Low Level VOA vials were frozen by ESS Laboratory on October 11, 2017 at 1641.**

<u>Lab Number</u>	<u>Sample Name</u>	<u>Matrix</u>	<u>Analysis</u>
1710285-01	GZ-BW-502 0-2ft	Soil	8260B, 8260B Low, 8270D
1710285-02	GZ-BW-504A 0-2ft	Soil	8260B Low, 8270D
1710285-03	GZ-BW-503 2-4ft	Soil	8260B, 8270D
1710285-04	GZ-BW-505 0-2ft	Soil	8260B Low, 8270D
1710285-05	BD-101017	Soil	8260B Low, 8270D
1710285-06	GZ-BW-506 0-2ft	Soil	8260B Low, 8270D
1710285-07	GZ-BW-507 2-4ft	Soil	8260B Low, 8270D
1710285-08	TB-100917	Solid	8260B Low



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710285

**PROJECT NARRATIVE**

**5035/8260B Volatile Organic Compounds / Low Level**

1710285-01 Reported above the quantitation limit; Estimated value (E).  
 Naphthalene

**5035/8260B Volatile Organic Compounds / Methanol**

C7J0217-CCV1 Continuing Calibration %Diff/Drift is below control limit (CD-).  
 1,4-Dioxane - Screen (46% @ 30%)  
 CJ71324-BSD1 Blank Spike recovery is above upper control limit (B+).  
 Acetone (142% @ 70-130%)

No other observations noted.

End of Project Narrative.

**DATA USABILITY LINKS**

*To ensure you are viewing the most current version of the documents below, please clear your internet cookies for [www.ESSLaboratory.com](http://www.ESSLaboratory.com). Consult your IT Support personnel for information on how to clear your internet cookies.*

[Definitions of Quality Control Parameters](#)

[Semivolatile Organics Internal Standard Information](#)

[Semivolatile Organics Surrogate Information](#)

[Volatile Organics Internal Standard Information](#)

[Volatile Organics Surrogate Information](#)

[EPH and VPH Alkane Lists](#)





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710285

**CURRENT SW-846 METHODOLOGY VERSIONS**

**Analytical Methods**

- 1010A - Flashpoint
- 6010C - ICP
- 6020A - ICP MS
- 7010 - Graphite Furnace
- 7196A - Hexavalent Chromium
- 7470A - Aqueous Mercury
- 7471B - Solid Mercury
- 8011 - EDB/DBCP/TCP
- 8015C - GRO/DRO
- 8081B - Pesticides
- 8082A - PCB
- 8100M - TPH
- 8151A - Herbicides
- 8260B - VOA
- 8270D - SVOA
- 8270D SIM - SVOA Low Level
- 9014 - Cyanide
- 9038 - Sulfate
- 9040C - Aqueous pH
- 9045D - Solid pH (Corrosivity)
- 9050A - Specific Conductance
- 9056A - Anions (IC)
- 9060A - TOC
- 9095B - Paint Filter
- MADEP 04-1.1 - EPH / VPH

**Prep Methods**

- 3005A - Aqueous ICP Digestion
- 3020A - Aqueous Graphite Furnace / ICP MS Digestion
- 3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
- 3060A - Solid Hexavalent Chromium Digestion
- 3510C - Separatory Funnel Extraction
- 3520C - Liquid / Liquid Extraction
- 3540C - Manual Soxhlet Extraction
- 3541 - Automated Soxhlet Extraction
- 3546 - Microwave Extraction
- 3580A - Waste Dilution
- 5030B - Aqueous Purge and Trap
- 5030C - Aqueous Purge and Trap
- 5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-BW-502 0-2ft  
 Date Sampled: 10/09/17 14:00  
 Percent Solids: 92  
 Initial Volume: 6.4  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1710285  
 ESS Laboratory Sample ID: 1710285-01  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0043)		8260B Low		1	10/16/17 19:50	C7J0252	CJ71646
1,1,1-Trichloroethane	ND (0.0043)		8260B Low		1	10/16/17 19:50	C7J0252	CJ71646
1,1,2,2-Tetrachloroethane	ND (0.0043)		8260B Low		1	10/16/17 19:50	C7J0252	CJ71646
1,1,2-Trichloroethane	ND (0.0043)		8260B Low		1	10/16/17 19:50	C7J0252	CJ71646
1,1-Dichloroethane	ND (0.0043)		8260B Low		1	10/16/17 19:50	C7J0252	CJ71646
1,1-Dichloroethene	ND (0.0043)		8260B Low		1	10/16/17 19:50	C7J0252	CJ71646
1,1-Dichloropropene	ND (0.0043)		8260B Low		1	10/16/17 19:50	C7J0252	CJ71646
1,2,3-Trichlorobenzene	ND (0.0043)		8260B Low		1	10/16/17 19:50	C7J0252	CJ71646
1,2,3-Trichloropropane	ND (0.0043)		8260B Low		1	10/16/17 19:50	C7J0252	CJ71646
1,2,4-Trichlorobenzene	ND (0.0043)		8260B Low		1	10/16/17 19:50	C7J0252	CJ71646
<b>1,2,4-Trimethylbenzene</b>	<b>0.0067</b> (0.0043)		8260B Low		1	10/16/17 19:50	C7J0252	CJ71646
1,2-Dibromo-3-Chloropropane	ND (0.0043)		8260B Low		1	10/16/17 19:50	C7J0252	CJ71646
1,2-Dibromoethane	ND (0.0043)		8260B Low		1	10/16/17 19:50	C7J0252	CJ71646
1,2-Dichlorobenzene	ND (0.0043)		8260B Low		1	10/16/17 19:50	C7J0252	CJ71646
1,2-Dichloroethane	ND (0.0043)		8260B Low		1	10/16/17 19:50	C7J0252	CJ71646
1,2-Dichloropropane	ND (0.0043)		8260B Low		1	10/16/17 19:50	C7J0252	CJ71646
1,3,5-Trimethylbenzene	ND (0.0043)		8260B Low		1	10/16/17 19:50	C7J0252	CJ71646
1,3-Dichlorobenzene	ND (0.0043)		8260B Low		1	10/16/17 19:50	C7J0252	CJ71646
1,3-Dichloropropane	ND (0.0043)		8260B Low		1	10/16/17 19:50	C7J0252	CJ71646
1,4-Dichlorobenzene	ND (0.0043)		8260B Low		1	10/16/17 19:50	C7J0252	CJ71646
1,4-Dioxane	ND (0.0851)		8260B Low		1	10/16/17 19:50	C7J0252	CJ71646
1-Chlorohexane	ND (0.0043)		8260B Low		1	10/16/17 19:50	C7J0252	CJ71646
2,2-Dichloropropane	ND (0.0043)		8260B Low		1	10/16/17 19:50	C7J0252	CJ71646
2-Butanone	ND (0.0426)		8260B Low		1	10/16/17 19:50	C7J0252	CJ71646
2-Chlorotoluene	ND (0.0043)		8260B Low		1	10/16/17 19:50	C7J0252	CJ71646
2-Hexanone	ND (0.0426)		8260B Low		1	10/16/17 19:50	C7J0252	CJ71646
4-Chlorotoluene	ND (0.0043)		8260B Low		1	10/16/17 19:50	C7J0252	CJ71646
4-Isopropyltoluene	ND (0.0043)		8260B Low		1	10/16/17 19:50	C7J0252	CJ71646
4-Methyl-2-Pentanone	ND (0.0426)		8260B Low		1	10/16/17 19:50	C7J0252	CJ71646
Acetone	ND (0.0426)		8260B Low		1	10/16/17 19:50	C7J0252	CJ71646
<b>Benzene</b>	<b>0.0071</b> (0.0043)		8260B Low		1	10/16/17 19:50	C7J0252	CJ71646
Bromobenzene	ND (0.0043)		8260B Low		1	10/16/17 19:50	C7J0252	CJ71646

*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-BW-502 0-2ft  
 Date Sampled: 10/09/17 14:00  
 Percent Solids: 92  
 Initial Volume: 6.4  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1710285  
 ESS Laboratory Sample ID: 1710285-01  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0043)		8260B Low		1	10/16/17 19:50	C7J0252	CJ71646
Bromodichloromethane	ND (0.0043)		8260B Low		1	10/16/17 19:50	C7J0252	CJ71646
Bromoform	ND (0.0043)		8260B Low		1	10/16/17 19:50	C7J0252	CJ71646
Bromomethane	ND (0.0085)		8260B Low		1	10/16/17 19:50	C7J0252	CJ71646
Carbon Disulfide	ND (0.0043)		8260B Low		1	10/16/17 19:50	C7J0252	CJ71646
Carbon Tetrachloride	ND (0.0043)		8260B Low		1	10/16/17 19:50	C7J0252	CJ71646
Chlorobenzene	ND (0.0043)		8260B Low		1	10/16/17 19:50	C7J0252	CJ71646
Chloroethane	ND (0.0085)		8260B Low		1	10/16/17 19:50	C7J0252	CJ71646
Chloroform	ND (0.0043)		8260B Low		1	10/16/17 19:50	C7J0252	CJ71646
Chloromethane	ND (0.0085)		8260B Low		1	10/16/17 19:50	C7J0252	CJ71646
cis-1,2-Dichloroethene	ND (0.0043)		8260B Low		1	10/16/17 19:50	C7J0252	CJ71646
cis-1,3-Dichloropropene	ND (0.0043)		8260B Low		1	10/16/17 19:50	C7J0252	CJ71646
Dibromochloromethane	ND (0.0043)		8260B Low		1	10/16/17 19:50	C7J0252	CJ71646
Dibromomethane	ND (0.0043)		8260B Low		1	10/16/17 19:50	C7J0252	CJ71646
Dichlorodifluoromethane	ND (0.0085)		8260B Low		1	10/16/17 19:50	C7J0252	CJ71646
Diethyl Ether	ND (0.0043)		8260B Low		1	10/16/17 19:50	C7J0252	CJ71646
Di-isopropyl ether	ND (0.0043)		8260B Low		1	10/16/17 19:50	C7J0252	CJ71646
Ethyl tertiary-butyl ether	ND (0.0043)		8260B Low		1	10/16/17 19:50	C7J0252	CJ71646
Ethylbenzene	ND (0.0043)		8260B Low		1	10/16/17 19:50	C7J0252	CJ71646
Hexachlorobutadiene	ND (0.0043)		8260B Low		1	10/16/17 19:50	C7J0252	CJ71646
Isopropylbenzene	ND (0.0043)		8260B Low		1	10/16/17 19:50	C7J0252	CJ71646
Methyl tert-Butyl Ether	ND (0.0043)		8260B Low		1	10/16/17 19:50	C7J0252	CJ71646
Methylene Chloride	ND (0.0213)		8260B Low		1	10/16/17 19:50	C7J0252	CJ71646
<b>Naphthalene</b>	<b>E 0.469</b> (0.0043)		8260B Low		1	10/16/17 19:50	C7J0252	CJ71646
n-Butylbenzene	ND (0.0043)		8260B Low		1	10/16/17 19:50	C7J0252	CJ71646
n-Propylbenzene	ND (0.0043)		8260B Low		1	10/16/17 19:50	C7J0252	CJ71646
sec-Butylbenzene	ND (0.0043)		8260B Low		1	10/16/17 19:50	C7J0252	CJ71646
<b>Styrene</b>	<b>0.0135</b> (0.0043)		8260B Low		1	10/16/17 19:50	C7J0252	CJ71646
tert-Butylbenzene	ND (0.0043)		8260B Low		1	10/16/17 19:50	C7J0252	CJ71646
Tertiary-amyl methyl ether	ND (0.0043)		8260B Low		1	10/16/17 19:50	C7J0252	CJ71646
Tetrachloroethene	ND (0.0043)		8260B Low		1	10/16/17 19:50	C7J0252	CJ71646
Tetrahydrofuran	ND (0.0043)		8260B Low		1	10/16/17 19:50	C7J0252	CJ71646



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-BW-502 0-2ft  
 Date Sampled: 10/09/17 14:00  
 Percent Solids: 92  
 Initial Volume: 6.4  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1710285  
 ESS Laboratory Sample ID: 1710285-01  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
<b>Toluene</b>	<b>0.0179</b> (0.0043)		8260B Low		1	10/16/17 19:50	C7J0252	CJ71646
trans-1,2-Dichloroethene	ND (0.0043)		8260B Low		1	10/16/17 19:50	C7J0252	CJ71646
trans-1,3-Dichloropropene	ND (0.0043)		8260B Low		1	10/16/17 19:50	C7J0252	CJ71646
Trichloroethene	ND (0.0043)		8260B Low		1	10/16/17 19:50	C7J0252	CJ71646
Trichlorofluoromethane	ND (0.0043)		8260B Low		1	10/16/17 19:50	C7J0252	CJ71646
Vinyl Acetate	ND (0.0043)		8260B Low		1	10/16/17 19:50	C7J0252	CJ71646
Vinyl Chloride	ND (0.0085)		8260B Low		1	10/16/17 19:50	C7J0252	CJ71646
<b>Xylene O</b>	<b>0.0063</b> (0.0043)		8260B Low		1	10/16/17 19:50	C7J0252	CJ71646
<b>Xylene P,M</b>	<b>0.0124</b> (0.0085)		8260B Low		1	10/16/17 19:50	C7J0252	CJ71646
<b>Xylenes (Total)</b>	<b>0.0187</b> (0.0085)		8260B Low		1	10/16/17 19:50		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	118 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	105 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	111 %		70-130
<i>Surrogate: Toluene-d8</i>	104 %		70-130

*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-BW-502 0-2ft  
 Date Sampled: 10/09/17 14:00  
 Percent Solids: 92  
 Initial Volume: 15.2  
 Final Volume: 15  
 Extraction Method: 5035

ESS Laboratory Work Order: 1710285  
 ESS Laboratory Sample ID: 1710285-01  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MD

**5035/8260B Volatile Organic Compounds / Methanol**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.233)	0.0233	8260B		1	10/13/17 16:57	C7J0217	CJ71324
1,1,1-Trichloroethane	ND (0.233)	0.0466	8260B		1	10/13/17 16:57	C7J0217	CJ71324
1,1,2,2-Tetrachloroethane	ND (0.233)	0.0233	8260B		1	10/13/17 16:57	C7J0217	CJ71324
1,1,2-Trichloroethane	ND (0.233)	0.0466	8260B		1	10/13/17 16:57	C7J0217	CJ71324
1,1-Dichloroethane	ND (0.233)	0.0466	8260B		1	10/13/17 16:57	C7J0217	CJ71324
1,1-Dichloroethene	ND (0.233)	0.0699	8260B		1	10/13/17 16:57	C7J0217	CJ71324
1,1-Dichloropropene	ND (0.233)	0.0466	8260B		1	10/13/17 16:57	C7J0217	CJ71324
1,2,3-Trichlorobenzene	ND (0.233)	0.0466	8260B		1	10/13/17 16:57	C7J0217	CJ71324
1,2,3-Trichloropropane	ND (0.233)	0.0699	8260B		1	10/13/17 16:57	C7J0217	CJ71324
1,2,4-Trichlorobenzene	ND (0.233)	0.0466	8260B		1	10/13/17 16:57	C7J0217	CJ71324
<b>1,2,4-Trimethylbenzene</b>	<b>0.408</b> (0.233)	0.0233	8260B		1	10/13/17 16:57	C7J0217	CJ71324
1,2-Dibromo-3-Chloropropane	ND (1.17)	0.233	8260B		1	10/13/17 16:57	C7J0217	CJ71324
1,2-Dibromoethane	ND (0.233)	0.0466	8260B		1	10/13/17 16:57	C7J0217	CJ71324
1,2-Dichlorobenzene	ND (0.233)	0.0233	8260B		1	10/13/17 16:57	C7J0217	CJ71324
1,2-Dichloroethane	ND (0.233)	0.0466	8260B		1	10/13/17 16:57	C7J0217	CJ71324
1,2-Dichloropropane	ND (0.233)	0.0466	8260B		1	10/13/17 16:57	C7J0217	CJ71324
<b>1,3,5-Trimethylbenzene</b>	<b>J 0.154</b> (0.233)	0.0233	8260B		1	10/13/17 16:57	C7J0217	CJ71324
1,3-Dichlorobenzene	ND (0.233)	0.0466	8260B		1	10/13/17 16:57	C7J0217	CJ71324
1,3-Dichloropropane	ND (0.233)	0.0233	8260B		1	10/13/17 16:57	C7J0217	CJ71324
1,4-Dichlorobenzene	ND (0.233)	0.0233	8260B		1	10/13/17 16:57	C7J0217	CJ71324
1,4-Dioxane - Screen	ND (46.6)	44.3	8260B		1	10/13/17 16:57	C7J0217	CJ71324
1-Chlorohexane	ND (0.233)	0.0932	8260B		1	10/13/17 16:57	C7J0217	CJ71324
2,2-Dichloropropane	ND (0.233)	0.0699	8260B		1	10/13/17 16:57	C7J0217	CJ71324
2-Butanone	ND (1.17)	0.792	8260B		1	10/13/17 16:57	C7J0217	CJ71324
2-Chlorotoluene	ND (0.233)	0.0233	8260B		1	10/13/17 16:57	C7J0217	CJ71324
2-Hexanone	ND (1.17)	0.350	8260B		1	10/13/17 16:57	C7J0217	CJ71324
4-Chlorotoluene	ND (0.233)	0.0233	8260B		1	10/13/17 16:57	C7J0217	CJ71324
4-Isopropyltoluene	ND (0.233)	0.0233	8260B		1	10/13/17 16:57	C7J0217	CJ71324
4-Methyl-2-Pentanone	ND (1.17)	0.373	8260B		1	10/13/17 16:57	C7J0217	CJ71324
Acetone	ND (1.17)	0.629	8260B		1	10/13/17 16:57	C7J0217	CJ71324
<b>Benzene</b>	<b>J 0.203</b> (0.233)	0.0233	8260B		1	10/13/17 16:57	C7J0217	CJ71324
Bromobenzene	ND (0.233)	0.0466	8260B		1	10/13/17 16:57	C7J0217	CJ71324



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-BW-502 0-2ft  
Date Sampled: 10/09/17 14:00  
Percent Solids: 92  
Initial Volume: 15.2  
Final Volume: 15  
Extraction Method: 5035

ESS Laboratory Work Order: 1710285  
ESS Laboratory Sample ID: 1710285-01  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MD

**5035/8260B Volatile Organic Compounds / Methanol**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.233)	0.0699	8260B		1	10/13/17 16:57	C7J0217	CJ71324
Bromodichloromethane	ND (0.233)	0.0233	8260B		1	10/13/17 16:57	C7J0217	CJ71324
Bromoform	ND (0.233)	0.0466	8260B		1	10/13/17 16:57	C7J0217	CJ71324
Bromomethane	ND (0.233)	0.0932	8260B		1	10/13/17 16:57	C7J0217	CJ71324
Carbon Disulfide	ND (0.233)	0.0233	8260B		1	10/13/17 16:57	C7J0217	CJ71324
Carbon Tetrachloride	ND (0.233)	0.0233	8260B		1	10/13/17 16:57	C7J0217	CJ71324
Chlorobenzene	ND (0.233)	0.0233	8260B		1	10/13/17 16:57	C7J0217	CJ71324
Chloroethane	ND (0.233)	0.0932	8260B		1	10/13/17 16:57	C7J0217	CJ71324
Chloroform	ND (0.233)	0.0466	8260B		1	10/13/17 16:57	C7J0217	CJ71324
Chloromethane	ND (0.233)	0.0233	8260B		1	10/13/17 16:57	C7J0217	CJ71324
cis-1,2-Dichloroethene	ND (0.233)	0.0466	8260B		1	10/13/17 16:57	C7J0217	CJ71324
cis-1,3-Dichloropropene	ND (0.233)	0.0699	8260B		1	10/13/17 16:57	C7J0217	CJ71324
Dibromochloromethane	ND (0.233)	0.0466	8260B		1	10/13/17 16:57	C7J0217	CJ71324
Dibromomethane	ND (0.233)	0.0699	8260B		1	10/13/17 16:57	C7J0217	CJ71324
Dichlorodifluoromethane	ND (0.233)	0.0699	8260B		1	10/13/17 16:57	C7J0217	CJ71324
Diethyl Ether	ND (0.233)	0.0699	8260B		1	10/13/17 16:57	C7J0217	CJ71324
Di-isopropyl ether	ND (0.233)	0.0466	8260B		1	10/13/17 16:57	C7J0217	CJ71324
Ethyl tertiary-butyl ether	ND (0.233)	0.0233	8260B		1	10/13/17 16:57	C7J0217	CJ71324
<b>Ethylbenzene</b>	<b>J 0.0885</b> (0.233)	0.0233	8260B		1	10/13/17 16:57	C7J0217	CJ71324
Hexachlorobutadiene	ND (0.233)	0.0466	8260B		1	10/13/17 16:57	C7J0217	CJ71324
Isopropylbenzene	ND (0.233)	0.0233	8260B		1	10/13/17 16:57	C7J0217	CJ71324
Methyl tert-Butyl Ether	ND (0.233)	0.0699	8260B		1	10/13/17 16:57	C7J0217	CJ71324
Methylene Chloride	ND (0.466)	0.0466	8260B		1	10/13/17 16:57	C7J0217	CJ71324
<b>Naphthalene</b>	<b>42.1</b> (2.33)	0.466	8260B		10	10/16/17 14:05	C7J0217	CJ71324
n-Butylbenzene	ND (0.233)	0.0233	8260B		1	10/13/17 16:57	C7J0217	CJ71324
n-Propylbenzene	ND (0.233)	0.0466	8260B		1	10/13/17 16:57	C7J0217	CJ71324
sec-Butylbenzene	ND (0.233)	0.0233	8260B		1	10/13/17 16:57	C7J0217	CJ71324
<b>Styrene</b>	<b>0.664</b> (0.233)	0.0233	8260B		1	10/13/17 16:57	C7J0217	CJ71324
tert-Butylbenzene	ND (0.233)	0.0233	8260B		1	10/13/17 16:57	C7J0217	CJ71324
Tertiary-amyl methyl ether	ND (0.233)	0.0466	8260B		1	10/13/17 16:57	C7J0217	CJ71324
Tetrachloroethene	ND (0.233)	0.0466	8260B		1	10/13/17 16:57	C7J0217	CJ71324
Tetrahydrofuran	ND (1.17)	0.373	8260B		1	10/13/17 16:57	C7J0217	CJ71324





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-BW-502 0-2ft  
 Date Sampled: 10/09/17 14:00  
 Percent Solids: 92  
 Initial Volume: 15.2  
 Final Volume: 15  
 Extraction Method: 5035

ESS Laboratory Work Order: 1710285  
 ESS Laboratory Sample ID: 1710285-01  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MD

**5035/8260B Volatile Organic Compounds / Methanol**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
<b>Toluene</b>	<b>0.515</b> (0.233)	0.0233	8260B		1	10/13/17 16:57	C7J0217	CJ71324
trans-1,2-Dichloroethene	ND (0.233)	0.0699	8260B		1	10/13/17 16:57	C7J0217	CJ71324
trans-1,3-Dichloropropene	ND (0.233)	0.0466	8260B		1	10/13/17 16:57	C7J0217	CJ71324
Trichloroethene	ND (0.233)	0.0466	8260B		1	10/13/17 16:57	C7J0217	CJ71324
Trichlorofluoromethane	ND (0.233)	0.0932	8260B		1	10/13/17 16:57	C7J0217	CJ71324
Vinyl Acetate	ND (0.233)	0.117	8260B		1	10/13/17 16:57	C7J0217	CJ71324
Vinyl Chloride	ND (0.233)	0.0466	8260B		1	10/13/17 16:57	C7J0217	CJ71324
<b>Xylene O</b>	<b>0.240</b> (0.233)	0.0233	8260B		1	10/13/17 16:57	C7J0217	CJ71324
<b>Xylene P,M</b>	<b>0.552</b> (0.466)	0.0466	8260B		1	10/13/17 16:57	C7J0217	CJ71324
<b>Xylenes (Total)</b>	<b>0.792</b> (0.466)		8260B		1	10/13/17 16:57		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	91 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	94 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	86 %		70-130
<i>Surrogate: Toluene-d8</i>	95 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-BW-502 0-2ft  
 Date Sampled: 10/09/17 14:00  
 Percent Solids: 92  
 Initial Volume: 1.13  
 Final Volume: 0.5  
 Extraction Method: 3546

ESS Laboratory Work Order: 1710285  
 ESS Laboratory Sample ID: 1710285-01  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: TJ  
 Prepared: 10/12/17 11:30

**8270D Semi-Volatile Organic Compounds**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Naphthalene	250 (48.2)		8270D		10	10/13/17 19:48	C7J0199	CJ71214

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	62 %		30-130
<i>Surrogate: 2,4,6-Tribromophenol</i>	81 %		30-130
<i>Surrogate: 2-Chlorophenol-d4</i>	68 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	68 %		30-130
<i>Surrogate: 2-Fluorophenol</i>	67 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	70 %		30-130
<i>Surrogate: Phenol-d6</i>	73 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	79 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-BW-504A 0-2ft  
 Date Sampled: 10/10/17 10:30  
 Percent Solids: 93  
 Initial Volume: 5.3  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1710285  
 ESS Laboratory Sample ID: 1710285-02  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0050)		8260B Low		1	10/16/17 18:09	C7J0252	CJ71646
1,1,1-Trichloroethane	ND (0.0050)		8260B Low		1	10/16/17 18:09	C7J0252	CJ71646
1,1,2,2-Tetrachloroethane	ND (0.0050)		8260B Low		1	10/16/17 18:09	C7J0252	CJ71646
1,1,2-Trichloroethane	ND (0.0050)		8260B Low		1	10/16/17 18:09	C7J0252	CJ71646
1,1-Dichloroethane	ND (0.0050)		8260B Low		1	10/16/17 18:09	C7J0252	CJ71646
1,1-Dichloroethene	ND (0.0050)		8260B Low		1	10/16/17 18:09	C7J0252	CJ71646
1,1-Dichloropropene	ND (0.0050)		8260B Low		1	10/16/17 18:09	C7J0252	CJ71646
1,2,3-Trichlorobenzene	ND (0.0050)		8260B Low		1	10/16/17 18:09	C7J0252	CJ71646
1,2,3-Trichloropropane	ND (0.0050)		8260B Low		1	10/16/17 18:09	C7J0252	CJ71646
1,2,4-Trichlorobenzene	ND (0.0050)		8260B Low		1	10/16/17 18:09	C7J0252	CJ71646
1,2,4-Trimethylbenzene	ND (0.0050)		8260B Low		1	10/16/17 18:09	C7J0252	CJ71646
1,2-Dibromo-3-Chloropropane	ND (0.0050)		8260B Low		1	10/16/17 18:09	C7J0252	CJ71646
1,2-Dibromoethane	ND (0.0050)		8260B Low		1	10/16/17 18:09	C7J0252	CJ71646
1,2-Dichlorobenzene	ND (0.0050)		8260B Low		1	10/16/17 18:09	C7J0252	CJ71646
1,2-Dichloroethane	ND (0.0050)		8260B Low		1	10/16/17 18:09	C7J0252	CJ71646
1,2-Dichloropropane	ND (0.0050)		8260B Low		1	10/16/17 18:09	C7J0252	CJ71646
1,3,5-Trimethylbenzene	ND (0.0050)		8260B Low		1	10/16/17 18:09	C7J0252	CJ71646
1,3-Dichlorobenzene	ND (0.0050)		8260B Low		1	10/16/17 18:09	C7J0252	CJ71646
1,3-Dichloropropane	ND (0.0050)		8260B Low		1	10/16/17 18:09	C7J0252	CJ71646
1,4-Dichlorobenzene	ND (0.0050)		8260B Low		1	10/16/17 18:09	C7J0252	CJ71646
1,4-Dioxane	ND (0.101)		8260B Low		1	10/16/17 18:09	C7J0252	CJ71646
1-Chlorohexane	ND (0.0050)		8260B Low		1	10/16/17 18:09	C7J0252	CJ71646
2,2-Dichloropropane	ND (0.0050)		8260B Low		1	10/16/17 18:09	C7J0252	CJ71646
2-Butanone	ND (0.0505)		8260B Low		1	10/16/17 18:09	C7J0252	CJ71646
2-Chlorotoluene	ND (0.0050)		8260B Low		1	10/16/17 18:09	C7J0252	CJ71646
2-Hexanone	ND (0.0505)		8260B Low		1	10/16/17 18:09	C7J0252	CJ71646
4-Chlorotoluene	ND (0.0050)		8260B Low		1	10/16/17 18:09	C7J0252	CJ71646
4-Isopropyltoluene	ND (0.0050)		8260B Low		1	10/16/17 18:09	C7J0252	CJ71646
4-Methyl-2-Pentanone	ND (0.0505)		8260B Low		1	10/16/17 18:09	C7J0252	CJ71646
Acetone	ND (0.0505)		8260B Low		1	10/16/17 18:09	C7J0252	CJ71646
Benzene	ND (0.0050)		8260B Low		1	10/16/17 18:09	C7J0252	CJ71646
Bromobenzene	ND (0.0050)		8260B Low		1	10/16/17 18:09	C7J0252	CJ71646



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-BW-504A 0-2ft  
 Date Sampled: 10/10/17 10:30  
 Percent Solids: 93  
 Initial Volume: 5.3  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1710285  
 ESS Laboratory Sample ID: 1710285-02  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0050)		8260B Low		1	10/16/17 18:09	C7J0252	CJ71646
Bromodichloromethane	ND (0.0050)		8260B Low		1	10/16/17 18:09	C7J0252	CJ71646
Bromoform	ND (0.0050)		8260B Low		1	10/16/17 18:09	C7J0252	CJ71646
Bromomethane	ND (0.0101)		8260B Low		1	10/16/17 18:09	C7J0252	CJ71646
Carbon Disulfide	ND (0.0050)		8260B Low		1	10/16/17 18:09	C7J0252	CJ71646
Carbon Tetrachloride	ND (0.0050)		8260B Low		1	10/16/17 18:09	C7J0252	CJ71646
Chlorobenzene	ND (0.0050)		8260B Low		1	10/16/17 18:09	C7J0252	CJ71646
Chloroethane	ND (0.0101)		8260B Low		1	10/16/17 18:09	C7J0252	CJ71646
Chloroform	ND (0.0050)		8260B Low		1	10/16/17 18:09	C7J0252	CJ71646
Chloromethane	ND (0.0101)		8260B Low		1	10/16/17 18:09	C7J0252	CJ71646
cis-1,2-Dichloroethene	ND (0.0050)		8260B Low		1	10/16/17 18:09	C7J0252	CJ71646
cis-1,3-Dichloropropene	ND (0.0050)		8260B Low		1	10/16/17 18:09	C7J0252	CJ71646
Dibromochloromethane	ND (0.0050)		8260B Low		1	10/16/17 18:09	C7J0252	CJ71646
Dibromomethane	ND (0.0050)		8260B Low		1	10/16/17 18:09	C7J0252	CJ71646
Dichlorodifluoromethane	ND (0.0101)		8260B Low		1	10/16/17 18:09	C7J0252	CJ71646
Diethyl Ether	ND (0.0050)		8260B Low		1	10/16/17 18:09	C7J0252	CJ71646
Di-isopropyl ether	ND (0.0050)		8260B Low		1	10/16/17 18:09	C7J0252	CJ71646
Ethyl tertiary-butyl ether	ND (0.0050)		8260B Low		1	10/16/17 18:09	C7J0252	CJ71646
Ethylbenzene	ND (0.0050)		8260B Low		1	10/16/17 18:09	C7J0252	CJ71646
Hexachlorobutadiene	ND (0.0050)		8260B Low		1	10/16/17 18:09	C7J0252	CJ71646
Isopropylbenzene	ND (0.0050)		8260B Low		1	10/16/17 18:09	C7J0252	CJ71646
Methyl tert-Butyl Ether	ND (0.0050)		8260B Low		1	10/16/17 18:09	C7J0252	CJ71646
Methylene Chloride	ND (0.0252)		8260B Low		1	10/16/17 18:09	C7J0252	CJ71646
Naphthalene	ND (0.0050)		8260B Low		1	10/16/17 18:09	C7J0252	CJ71646
n-Butylbenzene	ND (0.0050)		8260B Low		1	10/16/17 18:09	C7J0252	CJ71646
n-Propylbenzene	ND (0.0050)		8260B Low		1	10/16/17 18:09	C7J0252	CJ71646
sec-Butylbenzene	ND (0.0050)		8260B Low		1	10/16/17 18:09	C7J0252	CJ71646
Styrene	ND (0.0050)		8260B Low		1	10/16/17 18:09	C7J0252	CJ71646
tert-Butylbenzene	ND (0.0050)		8260B Low		1	10/16/17 18:09	C7J0252	CJ71646
Tertiary-amyl methyl ether	ND (0.0050)		8260B Low		1	10/16/17 18:09	C7J0252	CJ71646
Tetrachloroethene	ND (0.0050)		8260B Low		1	10/16/17 18:09	C7J0252	CJ71646
Tetrahydrofuran	ND (0.0050)		8260B Low		1	10/16/17 18:09	C7J0252	CJ71646



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-BW-504A 0-2ft  
 Date Sampled: 10/10/17 10:30  
 Percent Solids: 93  
 Initial Volume: 5.3  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1710285  
 ESS Laboratory Sample ID: 1710285-02  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0050)		8260B Low		1	10/16/17 18:09	C7J0252	CJ71646
trans-1,2-Dichloroethene	ND (0.0050)		8260B Low		1	10/16/17 18:09	C7J0252	CJ71646
trans-1,3-Dichloropropene	ND (0.0050)		8260B Low		1	10/16/17 18:09	C7J0252	CJ71646
Trichloroethene	ND (0.0050)		8260B Low		1	10/16/17 18:09	C7J0252	CJ71646
Trichlorofluoromethane	ND (0.0050)		8260B Low		1	10/16/17 18:09	C7J0252	CJ71646
Vinyl Acetate	ND (0.0050)		8260B Low		1	10/16/17 18:09	C7J0252	CJ71646
Vinyl Chloride	ND (0.0101)		8260B Low		1	10/16/17 18:09	C7J0252	CJ71646
Xylene O	ND (0.0050)		8260B Low		1	10/16/17 18:09	C7J0252	CJ71646
Xylene P,M	ND (0.0101)		8260B Low		1	10/16/17 18:09	C7J0252	CJ71646
Xylenes (Total)	ND (0.0101)		8260B Low		1	10/16/17 18:09		[CALC]

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: 1,2-Dichloroethane-d4	112 %		70-130
Surrogate: 4-Bromofluorobenzene	103 %		70-130
Surrogate: Dibromofluoromethane	109 %		70-130
Surrogate: Toluene-d8	103 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-BW-504A 0-2ft  
 Date Sampled: 10/10/17 10:30  
 Percent Solids: 93  
 Initial Volume: 15.3  
 Final Volume: 0.5  
 Extraction Method: 3546

ESS Laboratory Work Order: 1710285  
 ESS Laboratory Sample ID: 1710285-02  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: TJ  
 Prepared: 10/12/17 11:30

**8270D Semi-Volatile Organic Compounds**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Naphthalene	0.705 (0.349)		8270D		1	10/13/17 6:07	C7J0199	CJ71214

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	73 %		30-130
<i>Surrogate: 2,4,6-Tribromophenol</i>	78 %		30-130
<i>Surrogate: 2-Chlorophenol-d4</i>	78 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	77 %		30-130
<i>Surrogate: 2-Fluorophenol</i>	77 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	80 %		30-130
<i>Surrogate: Phenol-d6</i>	82 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	90 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-BW-503 2-4ft  
 Date Sampled: 10/10/17 11:20  
 Percent Solids: 92  
 Initial Volume: 13.6  
 Final Volume: 15  
 Extraction Method: 5035

ESS Laboratory Work Order: 1710285  
 ESS Laboratory Sample ID: 1710285-03  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MD

**5035/8260B Volatile Organic Compounds / Methanol**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.259)	0.0259	8260B		1	10/13/17 17:23	C7J0217	CJ71324
1,1,1-Trichloroethane	ND (0.259)	0.0519	8260B		1	10/13/17 17:23	C7J0217	CJ71324
1,1,2,2-Tetrachloroethane	ND (0.259)	0.0259	8260B		1	10/13/17 17:23	C7J0217	CJ71324
1,1,2-Trichloroethane	ND (0.259)	0.0519	8260B		1	10/13/17 17:23	C7J0217	CJ71324
1,1-Dichloroethane	ND (0.259)	0.0519	8260B		1	10/13/17 17:23	C7J0217	CJ71324
1,1-Dichloroethene	ND (0.259)	0.0778	8260B		1	10/13/17 17:23	C7J0217	CJ71324
1,1-Dichloropropene	ND (0.259)	0.0519	8260B		1	10/13/17 17:23	C7J0217	CJ71324
1,2,3-Trichlorobenzene	ND (0.259)	0.0519	8260B		1	10/13/17 17:23	C7J0217	CJ71324
1,2,3-Trichloropropane	ND (0.259)	0.0778	8260B		1	10/13/17 17:23	C7J0217	CJ71324
1,2,4-Trichlorobenzene	ND (0.259)	0.0519	8260B		1	10/13/17 17:23	C7J0217	CJ71324
<b>1,2,4-Trimethylbenzene</b>	<b>19.0</b> (0.259)	0.0259	8260B		1	10/13/17 17:23	C7J0217	CJ71324
1,2-Dibromo-3-Chloropropane	ND (1.30)	0.259	8260B		1	10/13/17 17:23	C7J0217	CJ71324
1,2-Dibromoethane	ND (0.259)	0.0519	8260B		1	10/13/17 17:23	C7J0217	CJ71324
1,2-Dichlorobenzene	ND (0.259)	0.0259	8260B		1	10/13/17 17:23	C7J0217	CJ71324
1,2-Dichloroethane	ND (0.259)	0.0519	8260B		1	10/13/17 17:23	C7J0217	CJ71324
1,2-Dichloropropane	ND (0.259)	0.0519	8260B		1	10/13/17 17:23	C7J0217	CJ71324
<b>1,3,5-Trimethylbenzene</b>	<b>6.47</b> (0.259)	0.0259	8260B		1	10/13/17 17:23	C7J0217	CJ71324
1,3-Dichlorobenzene	ND (0.259)	0.0519	8260B		1	10/13/17 17:23	C7J0217	CJ71324
1,3-Dichloropropane	ND (0.259)	0.0259	8260B		1	10/13/17 17:23	C7J0217	CJ71324
1,4-Dichlorobenzene	ND (0.259)	0.0259	8260B		1	10/13/17 17:23	C7J0217	CJ71324
1,4-Dioxane - Screen	ND (51.9)	49.3	8260B		1	10/13/17 17:23	C7J0217	CJ71324
1-Chlorohexane	ND (0.259)	0.104	8260B		1	10/13/17 17:23	C7J0217	CJ71324
2,2-Dichloropropane	ND (0.259)	0.0778	8260B		1	10/13/17 17:23	C7J0217	CJ71324
2-Butanone	ND (1.30)	0.881	8260B		1	10/13/17 17:23	C7J0217	CJ71324
2-Chlorotoluene	ND (0.259)	0.0259	8260B		1	10/13/17 17:23	C7J0217	CJ71324
2-Hexanone	ND (1.30)	0.389	8260B		1	10/13/17 17:23	C7J0217	CJ71324
4-Chlorotoluene	ND (0.259)	0.0259	8260B		1	10/13/17 17:23	C7J0217	CJ71324
<b>4-Isopropyltoluene</b>	<b>J 0.140</b> (0.259)	0.0259	8260B		1	10/13/17 17:23	C7J0217	CJ71324
4-Methyl-2-Pentanone	ND (1.30)	0.415	8260B		1	10/13/17 17:23	C7J0217	CJ71324
Acetone	ND (1.30)	0.700	8260B		1	10/13/17 17:23	C7J0217	CJ71324
<b>Benzene</b>	<b>34.0</b> (25.9)	2.59	8260B		100	10/17/17 17:46	C7J0217	CJ71324
Bromobenzene	ND (0.259)	0.0519	8260B		1	10/13/17 17:23	C7J0217	CJ71324



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-BW-503 2-4ft  
Date Sampled: 10/10/17 11:20  
Percent Solids: 92  
Initial Volume: 13.6  
Final Volume: 15  
Extraction Method: 5035

ESS Laboratory Work Order: 1710285  
ESS Laboratory Sample ID: 1710285-03  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MD

**5035/8260B Volatile Organic Compounds / Methanol**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.259)	0.0778	8260B		1	10/13/17 17:23	C7J0217	CJ71324
Bromodichloromethane	ND (0.259)	0.0259	8260B		1	10/13/17 17:23	C7J0217	CJ71324
Bromoform	ND (0.259)	0.0519	8260B		1	10/13/17 17:23	C7J0217	CJ71324
Bromomethane	ND (0.259)	0.104	8260B		1	10/13/17 17:23	C7J0217	CJ71324
Carbon Disulfide	ND (0.259)	0.0259	8260B		1	10/13/17 17:23	C7J0217	CJ71324
Carbon Tetrachloride	ND (0.259)	0.0259	8260B		1	10/13/17 17:23	C7J0217	CJ71324
Chlorobenzene	ND (0.259)	0.0259	8260B		1	10/13/17 17:23	C7J0217	CJ71324
Chloroethane	ND (0.259)	0.104	8260B		1	10/13/17 17:23	C7J0217	CJ71324
Chloroform	ND (0.259)	0.0519	8260B		1	10/13/17 17:23	C7J0217	CJ71324
Chloromethane	ND (0.259)	0.0259	8260B		1	10/13/17 17:23	C7J0217	CJ71324
cis-1,2-Dichloroethene	ND (0.259)	0.0519	8260B		1	10/13/17 17:23	C7J0217	CJ71324
cis-1,3-Dichloropropene	ND (0.259)	0.0778	8260B		1	10/13/17 17:23	C7J0217	CJ71324
Dibromochloromethane	ND (0.259)	0.0519	8260B		1	10/13/17 17:23	C7J0217	CJ71324
Dibromomethane	ND (0.259)	0.0778	8260B		1	10/13/17 17:23	C7J0217	CJ71324
Dichlorodifluoromethane	ND (0.259)	0.0778	8260B		1	10/13/17 17:23	C7J0217	CJ71324
Diethyl Ether	ND (0.259)	0.0778	8260B		1	10/13/17 17:23	C7J0217	CJ71324
Di-isopropyl ether	ND (0.259)	0.0519	8260B		1	10/13/17 17:23	C7J0217	CJ71324
Ethyl tertiary-butyl ether	ND (0.259)	0.0259	8260B		1	10/13/17 17:23	C7J0217	CJ71324
<b>Ethylbenzene</b>	<b>2.58</b> (0.259)	0.0259	8260B		1	10/13/17 17:23	C7J0217	CJ71324
Hexachlorobutadiene	ND (0.259)	0.0519	8260B		1	10/13/17 17:23	C7J0217	CJ71324
<b>Isopropylbenzene</b>	<b>J 0.140</b> (0.259)	0.0259	8260B		1	10/13/17 17:23	C7J0217	CJ71324
Methyl tert-Butyl Ether	ND (0.259)	0.0778	8260B		1	10/13/17 17:23	C7J0217	CJ71324
Methylene Chloride	ND (0.519)	0.0519	8260B		1	10/13/17 17:23	C7J0217	CJ71324
<b>Naphthalene</b>	<b>2080</b> (25.9)	5.19	8260B		100	10/17/17 17:46	C7J0217	CJ71324
n-Butylbenzene	ND (0.259)	0.0259	8260B		1	10/13/17 17:23	C7J0217	CJ71324
<b>n-Propylbenzene</b>	<b>0.521</b> (0.259)	0.0519	8260B		1	10/13/17 17:23	C7J0217	CJ71324
<b>sec-Butylbenzene</b>	<b>J 0.0726</b> (0.259)	0.0259	8260B		1	10/13/17 17:23	C7J0217	CJ71324
<b>Styrene</b>	<b>18.0</b> (0.259)	0.0259	8260B		1	10/13/17 17:23	C7J0217	CJ71324
tert-Butylbenzene	ND (0.259)	0.0259	8260B		1	10/13/17 17:23	C7J0217	CJ71324
Tertiary-amyl methyl ether	ND (0.259)	0.0519	8260B		1	10/13/17 17:23	C7J0217	CJ71324
Tetrachloroethene	ND (0.259)	0.0519	8260B		1	10/13/17 17:23	C7J0217	CJ71324
Tetrahydrofuran	ND (1.30)	0.415	8260B		1	10/13/17 17:23	C7J0217	CJ71324



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-BW-503 2-4ft  
 Date Sampled: 10/10/17 11:20  
 Percent Solids: 92  
 Initial Volume: 13.6  
 Final Volume: 15  
 Extraction Method: 5035

ESS Laboratory Work Order: 1710285  
 ESS Laboratory Sample ID: 1710285-03  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MD

**5035/8260B Volatile Organic Compounds / Methanol**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
<b>Toluene</b>	<b>41.5</b> (25.9)	2.59	8260B		100	10/17/17 17:46	C7J0217	CJ71324
trans-1,2-Dichloroethene	ND (0.259)	0.0778	8260B		1	10/13/17 17:23	C7J0217	CJ71324
trans-1,3-Dichloropropene	ND (0.259)	0.0519	8260B		1	10/13/17 17:23	C7J0217	CJ71324
Trichloroethene	ND (0.259)	0.0519	8260B		1	10/13/17 17:23	C7J0217	CJ71324
Trichlorofluoromethane	ND (0.259)	0.104	8260B		1	10/13/17 17:23	C7J0217	CJ71324
Vinyl Acetate	ND (0.259)	0.130	8260B		1	10/13/17 17:23	C7J0217	CJ71324
Vinyl Chloride	ND (0.259)	0.0519	8260B		1	10/13/17 17:23	C7J0217	CJ71324
<b>Xylene O</b>	<b>15.6</b> (0.259)	0.0259	8260B		1	10/13/17 17:23	C7J0217	CJ71324
<b>Xylene P,M</b>	<b>33.4</b> (0.519)	0.0519	8260B		1	10/13/17 17:23	C7J0217	CJ71324
<b>Xylenes (Total)</b>	<b>49.0</b> (0.519)		8260B		1	10/13/17 17:23		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	93 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	92 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	87 %		70-130
<i>Surrogate: Toluene-d8</i>	93 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-BW-503 2-4ft  
 Date Sampled: 10/10/17 11:20  
 Percent Solids: 92  
 Initial Volume: 1.04  
 Final Volume: 1  
 Extraction Method: 3546

ESS Laboratory Work Order: 1710285  
 ESS Laboratory Sample ID: 1710285-03  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: TJ  
 Prepared: 10/12/17 11:30

**8270D Semi-Volatile Organic Compounds**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Naphthalene	7230 (2100)		8270D		200	10/17/17 0:05	C7J0204	CJ71214

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	68 %		30-130
<i>Surrogate: 2,4,6-Tribromophenol</i>	94 %		30-130
<i>Surrogate: 2-Chlorophenol-d4</i>	72 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	61 %		30-130
<i>Surrogate: 2-Fluorophenol</i>	71 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	79 %		30-130
<i>Surrogate: Phenol-d6</i>	80 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	96 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-BW-505 0-2ft  
 Date Sampled: 10/10/17 14:30  
 Percent Solids: 96  
 Initial Volume: 4.8  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1710285  
 ESS Laboratory Sample ID: 1710285-04  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0054)		8260B Low		1	10/16/17 18:34	C7J0252	CJ71646
1,1,1-Trichloroethane	ND (0.0054)		8260B Low		1	10/16/17 18:34	C7J0252	CJ71646
1,1,2,2-Tetrachloroethane	ND (0.0054)		8260B Low		1	10/16/17 18:34	C7J0252	CJ71646
1,1,2-Trichloroethane	ND (0.0054)		8260B Low		1	10/16/17 18:34	C7J0252	CJ71646
1,1-Dichloroethane	ND (0.0054)		8260B Low		1	10/16/17 18:34	C7J0252	CJ71646
1,1-Dichloroethene	ND (0.0054)		8260B Low		1	10/16/17 18:34	C7J0252	CJ71646
1,1-Dichloropropene	ND (0.0054)		8260B Low		1	10/16/17 18:34	C7J0252	CJ71646
1,2,3-Trichlorobenzene	ND (0.0054)		8260B Low		1	10/16/17 18:34	C7J0252	CJ71646
1,2,3-Trichloropropane	ND (0.0054)		8260B Low		1	10/16/17 18:34	C7J0252	CJ71646
1,2,4-Trichlorobenzene	ND (0.0054)		8260B Low		1	10/16/17 18:34	C7J0252	CJ71646
1,2,4-Trimethylbenzene	ND (0.0054)		8260B Low		1	10/16/17 18:34	C7J0252	CJ71646
1,2-Dibromo-3-Chloropropane	ND (0.0054)		8260B Low		1	10/16/17 18:34	C7J0252	CJ71646
1,2-Dibromoethane	ND (0.0054)		8260B Low		1	10/16/17 18:34	C7J0252	CJ71646
1,2-Dichlorobenzene	ND (0.0054)		8260B Low		1	10/16/17 18:34	C7J0252	CJ71646
1,2-Dichloroethane	ND (0.0054)		8260B Low		1	10/16/17 18:34	C7J0252	CJ71646
1,2-Dichloropropane	ND (0.0054)		8260B Low		1	10/16/17 18:34	C7J0252	CJ71646
1,3,5-Trimethylbenzene	ND (0.0054)		8260B Low		1	10/16/17 18:34	C7J0252	CJ71646
1,3-Dichlorobenzene	ND (0.0054)		8260B Low		1	10/16/17 18:34	C7J0252	CJ71646
1,3-Dichloropropane	ND (0.0054)		8260B Low		1	10/16/17 18:34	C7J0252	CJ71646
1,4-Dichlorobenzene	ND (0.0054)		8260B Low		1	10/16/17 18:34	C7J0252	CJ71646
1,4-Dioxane	ND (0.109)		8260B Low		1	10/16/17 18:34	C7J0252	CJ71646
1-Chlorohexane	ND (0.0054)		8260B Low		1	10/16/17 18:34	C7J0252	CJ71646
2,2-Dichloropropane	ND (0.0054)		8260B Low		1	10/16/17 18:34	C7J0252	CJ71646
2-Butanone	ND (0.0543)		8260B Low		1	10/16/17 18:34	C7J0252	CJ71646
2-Chlorotoluene	ND (0.0054)		8260B Low		1	10/16/17 18:34	C7J0252	CJ71646
2-Hexanone	ND (0.0543)		8260B Low		1	10/16/17 18:34	C7J0252	CJ71646
4-Chlorotoluene	ND (0.0054)		8260B Low		1	10/16/17 18:34	C7J0252	CJ71646
4-Isopropyltoluene	ND (0.0054)		8260B Low		1	10/16/17 18:34	C7J0252	CJ71646
4-Methyl-2-Pentanone	ND (0.0543)		8260B Low		1	10/16/17 18:34	C7J0252	CJ71646
Acetone	ND (0.0543)		8260B Low		1	10/16/17 18:34	C7J0252	CJ71646
Benzene	ND (0.0054)		8260B Low		1	10/16/17 18:34	C7J0252	CJ71646
Bromobenzene	ND (0.0054)		8260B Low		1	10/16/17 18:34	C7J0252	CJ71646



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-BW-505 0-2ft  
Date Sampled: 10/10/17 14:30  
Percent Solids: 96  
Initial Volume: 4.8  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710285  
ESS Laboratory Sample ID: 1710285-04  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0054)		8260B Low		1	10/16/17 18:34	C7J0252	CJ71646
Bromodichloromethane	ND (0.0054)		8260B Low		1	10/16/17 18:34	C7J0252	CJ71646
Bromoform	ND (0.0054)		8260B Low		1	10/16/17 18:34	C7J0252	CJ71646
Bromomethane	ND (0.0109)		8260B Low		1	10/16/17 18:34	C7J0252	CJ71646
Carbon Disulfide	ND (0.0054)		8260B Low		1	10/16/17 18:34	C7J0252	CJ71646
Carbon Tetrachloride	ND (0.0054)		8260B Low		1	10/16/17 18:34	C7J0252	CJ71646
Chlorobenzene	ND (0.0054)		8260B Low		1	10/16/17 18:34	C7J0252	CJ71646
Chloroethane	ND (0.0109)		8260B Low		1	10/16/17 18:34	C7J0252	CJ71646
Chloroform	ND (0.0054)		8260B Low		1	10/16/17 18:34	C7J0252	CJ71646
Chloromethane	ND (0.0109)		8260B Low		1	10/16/17 18:34	C7J0252	CJ71646
cis-1,2-Dichloroethene	ND (0.0054)		8260B Low		1	10/16/17 18:34	C7J0252	CJ71646
cis-1,3-Dichloropropene	ND (0.0054)		8260B Low		1	10/16/17 18:34	C7J0252	CJ71646
Dibromochloromethane	ND (0.0054)		8260B Low		1	10/16/17 18:34	C7J0252	CJ71646
Dibromomethane	ND (0.0054)		8260B Low		1	10/16/17 18:34	C7J0252	CJ71646
Dichlorodifluoromethane	ND (0.0109)		8260B Low		1	10/16/17 18:34	C7J0252	CJ71646
Diethyl Ether	ND (0.0054)		8260B Low		1	10/16/17 18:34	C7J0252	CJ71646
Di-isopropyl ether	ND (0.0054)		8260B Low		1	10/16/17 18:34	C7J0252	CJ71646
Ethyl tertiary-butyl ether	ND (0.0054)		8260B Low		1	10/16/17 18:34	C7J0252	CJ71646
Ethylbenzene	ND (0.0054)		8260B Low		1	10/16/17 18:34	C7J0252	CJ71646
Hexachlorobutadiene	ND (0.0054)		8260B Low		1	10/16/17 18:34	C7J0252	CJ71646
Isopropylbenzene	ND (0.0054)		8260B Low		1	10/16/17 18:34	C7J0252	CJ71646
Methyl tert-Butyl Ether	ND (0.0054)		8260B Low		1	10/16/17 18:34	C7J0252	CJ71646
Methylene Chloride	ND (0.0272)		8260B Low		1	10/16/17 18:34	C7J0252	CJ71646
Naphthalene	ND (0.0054)		8260B Low		1	10/16/17 18:34	C7J0252	CJ71646
n-Butylbenzene	ND (0.0054)		8260B Low		1	10/16/17 18:34	C7J0252	CJ71646
n-Propylbenzene	ND (0.0054)		8260B Low		1	10/16/17 18:34	C7J0252	CJ71646
sec-Butylbenzene	ND (0.0054)		8260B Low		1	10/16/17 18:34	C7J0252	CJ71646
Styrene	ND (0.0054)		8260B Low		1	10/16/17 18:34	C7J0252	CJ71646
tert-Butylbenzene	ND (0.0054)		8260B Low		1	10/16/17 18:34	C7J0252	CJ71646
Tertiary-amyl methyl ether	ND (0.0054)		8260B Low		1	10/16/17 18:34	C7J0252	CJ71646
Tetrachloroethene	ND (0.0054)		8260B Low		1	10/16/17 18:34	C7J0252	CJ71646
Tetrahydrofuran	ND (0.0054)		8260B Low		1	10/16/17 18:34	C7J0252	CJ71646





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-BW-505 0-2ft  
 Date Sampled: 10/10/17 14:30  
 Percent Solids: 96  
 Initial Volume: 4.8  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1710285  
 ESS Laboratory Sample ID: 1710285-04  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0054)		8260B Low		1	10/16/17 18:34	C7J0252	CJ71646
trans-1,2-Dichloroethene	ND (0.0054)		8260B Low		1	10/16/17 18:34	C7J0252	CJ71646
trans-1,3-Dichloropropene	ND (0.0054)		8260B Low		1	10/16/17 18:34	C7J0252	CJ71646
Trichloroethene	ND (0.0054)		8260B Low		1	10/16/17 18:34	C7J0252	CJ71646
Trichlorofluoromethane	ND (0.0054)		8260B Low		1	10/16/17 18:34	C7J0252	CJ71646
Vinyl Acetate	ND (0.0054)		8260B Low		1	10/16/17 18:34	C7J0252	CJ71646
Vinyl Chloride	ND (0.0109)		8260B Low		1	10/16/17 18:34	C7J0252	CJ71646
Xylene O	ND (0.0054)		8260B Low		1	10/16/17 18:34	C7J0252	CJ71646
Xylene P,M	ND (0.0109)		8260B Low		1	10/16/17 18:34	C7J0252	CJ71646
Xylenes (Total)	ND (0.0109)		8260B Low		1	10/16/17 18:34		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	114 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	98 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	108 %		70-130
<i>Surrogate: Toluene-d8</i>	101 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-BW-505 0-2ft  
 Date Sampled: 10/10/17 14:30  
 Percent Solids: 96  
 Initial Volume: 15.8  
 Final Volume: 0.5  
 Extraction Method: 3546

ESS Laboratory Work Order: 1710285  
 ESS Laboratory Sample ID: 1710285-04  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: TJ  
 Prepared: 10/12/17 11:30

**8270D Semi-Volatile Organic Compounds**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Naphthalene	3.24 (0.330)		8270D		1	10/13/17 6:42	C7J0199	CJ71214

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	66 %		30-130
<i>Surrogate: 2,4,6-Tribromophenol</i>	74 %		30-130
<i>Surrogate: 2-Chlorophenol-d4</i>	65 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	70 %		30-130
<i>Surrogate: 2-Fluorophenol</i>	64 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	73 %		30-130
<i>Surrogate: Phenol-d6</i>	65 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	90 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: BD-101017  
Date Sampled: 10/10/17 00:00  
Percent Solids: 96  
Initial Volume: 5.8  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710285  
ESS Laboratory Sample ID: 1710285-05  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0045)		8260B Low		1	10/16/17 19:00	C7J0252	CJ71646
1,1,1-Trichloroethane	ND (0.0045)		8260B Low		1	10/16/17 19:00	C7J0252	CJ71646
1,1,2,2-Tetrachloroethane	ND (0.0045)		8260B Low		1	10/16/17 19:00	C7J0252	CJ71646
1,1,2-Trichloroethane	ND (0.0045)		8260B Low		1	10/16/17 19:00	C7J0252	CJ71646
1,1-Dichloroethane	ND (0.0045)		8260B Low		1	10/16/17 19:00	C7J0252	CJ71646
1,1-Dichloroethene	ND (0.0045)		8260B Low		1	10/16/17 19:00	C7J0252	CJ71646
1,1-Dichloropropene	ND (0.0045)		8260B Low		1	10/16/17 19:00	C7J0252	CJ71646
1,2,3-Trichlorobenzene	ND (0.0045)		8260B Low		1	10/16/17 19:00	C7J0252	CJ71646
1,2,3-Trichloropropane	ND (0.0045)		8260B Low		1	10/16/17 19:00	C7J0252	CJ71646
1,2,4-Trichlorobenzene	ND (0.0045)		8260B Low		1	10/16/17 19:00	C7J0252	CJ71646
1,2,4-Trimethylbenzene	ND (0.0045)		8260B Low		1	10/16/17 19:00	C7J0252	CJ71646
1,2-Dibromo-3-Chloropropane	ND (0.0045)		8260B Low		1	10/16/17 19:00	C7J0252	CJ71646
1,2-Dibromoethane	ND (0.0045)		8260B Low		1	10/16/17 19:00	C7J0252	CJ71646
1,2-Dichlorobenzene	ND (0.0045)		8260B Low		1	10/16/17 19:00	C7J0252	CJ71646
1,2-Dichloroethane	ND (0.0045)		8260B Low		1	10/16/17 19:00	C7J0252	CJ71646
1,2-Dichloropropane	ND (0.0045)		8260B Low		1	10/16/17 19:00	C7J0252	CJ71646
1,3,5-Trimethylbenzene	ND (0.0045)		8260B Low		1	10/16/17 19:00	C7J0252	CJ71646
1,3-Dichlorobenzene	ND (0.0045)		8260B Low		1	10/16/17 19:00	C7J0252	CJ71646
1,3-Dichloropropane	ND (0.0045)		8260B Low		1	10/16/17 19:00	C7J0252	CJ71646
1,4-Dichlorobenzene	ND (0.0045)		8260B Low		1	10/16/17 19:00	C7J0252	CJ71646
1,4-Dioxane	ND (0.0897)		8260B Low		1	10/16/17 19:00	C7J0252	CJ71646
1-Chlorohexane	ND (0.0045)		8260B Low		1	10/16/17 19:00	C7J0252	CJ71646
2,2-Dichloropropane	ND (0.0045)		8260B Low		1	10/16/17 19:00	C7J0252	CJ71646
2-Butanone	ND (0.0448)		8260B Low		1	10/16/17 19:00	C7J0252	CJ71646
2-Chlorotoluene	ND (0.0045)		8260B Low		1	10/16/17 19:00	C7J0252	CJ71646
2-Hexanone	ND (0.0448)		8260B Low		1	10/16/17 19:00	C7J0252	CJ71646
4-Chlorotoluene	ND (0.0045)		8260B Low		1	10/16/17 19:00	C7J0252	CJ71646
4-Isopropyltoluene	ND (0.0045)		8260B Low		1	10/16/17 19:00	C7J0252	CJ71646
4-Methyl-2-Pentanone	ND (0.0448)		8260B Low		1	10/16/17 19:00	C7J0252	CJ71646
Acetone	ND (0.0448)		8260B Low		1	10/16/17 19:00	C7J0252	CJ71646
Benzene	ND (0.0045)		8260B Low		1	10/16/17 19:00	C7J0252	CJ71646
Bromobenzene	ND (0.0045)		8260B Low		1	10/16/17 19:00	C7J0252	CJ71646



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: BD-101017  
Date Sampled: 10/10/17 00:00  
Percent Solids: 96  
Initial Volume: 5.8  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710285  
ESS Laboratory Sample ID: 1710285-05  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0045)		8260B Low		1	10/16/17 19:00	C7J0252	CJ71646
Bromodichloromethane	ND (0.0045)		8260B Low		1	10/16/17 19:00	C7J0252	CJ71646
Bromoform	ND (0.0045)		8260B Low		1	10/16/17 19:00	C7J0252	CJ71646
Bromomethane	ND (0.0090)		8260B Low		1	10/16/17 19:00	C7J0252	CJ71646
Carbon Disulfide	ND (0.0045)		8260B Low		1	10/16/17 19:00	C7J0252	CJ71646
Carbon Tetrachloride	ND (0.0045)		8260B Low		1	10/16/17 19:00	C7J0252	CJ71646
Chlorobenzene	ND (0.0045)		8260B Low		1	10/16/17 19:00	C7J0252	CJ71646
Chloroethane	ND (0.0090)		8260B Low		1	10/16/17 19:00	C7J0252	CJ71646
Chloroform	ND (0.0045)		8260B Low		1	10/16/17 19:00	C7J0252	CJ71646
Chloromethane	ND (0.0090)		8260B Low		1	10/16/17 19:00	C7J0252	CJ71646
cis-1,2-Dichloroethene	ND (0.0045)		8260B Low		1	10/16/17 19:00	C7J0252	CJ71646
cis-1,3-Dichloropropene	ND (0.0045)		8260B Low		1	10/16/17 19:00	C7J0252	CJ71646
Dibromochloromethane	ND (0.0045)		8260B Low		1	10/16/17 19:00	C7J0252	CJ71646
Dibromomethane	ND (0.0045)		8260B Low		1	10/16/17 19:00	C7J0252	CJ71646
Dichlorodifluoromethane	ND (0.0090)		8260B Low		1	10/16/17 19:00	C7J0252	CJ71646
Diethyl Ether	ND (0.0045)		8260B Low		1	10/16/17 19:00	C7J0252	CJ71646
Di-isopropyl ether	ND (0.0045)		8260B Low		1	10/16/17 19:00	C7J0252	CJ71646
Ethyl tertiary-butyl ether	ND (0.0045)		8260B Low		1	10/16/17 19:00	C7J0252	CJ71646
Ethylbenzene	ND (0.0045)		8260B Low		1	10/16/17 19:00	C7J0252	CJ71646
Hexachlorobutadiene	ND (0.0045)		8260B Low		1	10/16/17 19:00	C7J0252	CJ71646
Isopropylbenzene	ND (0.0045)		8260B Low		1	10/16/17 19:00	C7J0252	CJ71646
Methyl tert-Butyl Ether	ND (0.0045)		8260B Low		1	10/16/17 19:00	C7J0252	CJ71646
Methylene Chloride	ND (0.0224)		8260B Low		1	10/16/17 19:00	C7J0252	CJ71646
Naphthalene	ND (0.0045)		8260B Low		1	10/16/17 19:00	C7J0252	CJ71646
n-Butylbenzene	ND (0.0045)		8260B Low		1	10/16/17 19:00	C7J0252	CJ71646
n-Propylbenzene	ND (0.0045)		8260B Low		1	10/16/17 19:00	C7J0252	CJ71646
sec-Butylbenzene	ND (0.0045)		8260B Low		1	10/16/17 19:00	C7J0252	CJ71646
Styrene	ND (0.0045)		8260B Low		1	10/16/17 19:00	C7J0252	CJ71646
tert-Butylbenzene	ND (0.0045)		8260B Low		1	10/16/17 19:00	C7J0252	CJ71646
Tertiary-amyl methyl ether	ND (0.0045)		8260B Low		1	10/16/17 19:00	C7J0252	CJ71646
Tetrachloroethene	ND (0.0045)		8260B Low		1	10/16/17 19:00	C7J0252	CJ71646
Tetrahydrofuran	ND (0.0045)		8260B Low		1	10/16/17 19:00	C7J0252	CJ71646



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: BD-101017  
 Date Sampled: 10/10/17 00:00  
 Percent Solids: 96  
 Initial Volume: 5.8  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1710285  
 ESS Laboratory Sample ID: 1710285-05  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0045)		8260B Low		1	10/16/17 19:00	C7J0252	CJ71646
trans-1,2-Dichloroethene	ND (0.0045)		8260B Low		1	10/16/17 19:00	C7J0252	CJ71646
trans-1,3-Dichloropropene	ND (0.0045)		8260B Low		1	10/16/17 19:00	C7J0252	CJ71646
Trichloroethene	ND (0.0045)		8260B Low		1	10/16/17 19:00	C7J0252	CJ71646
Trichlorofluoromethane	ND (0.0045)		8260B Low		1	10/16/17 19:00	C7J0252	CJ71646
Vinyl Acetate	ND (0.0045)		8260B Low		1	10/16/17 19:00	C7J0252	CJ71646
Vinyl Chloride	ND (0.0090)		8260B Low		1	10/16/17 19:00	C7J0252	CJ71646
Xylene O	ND (0.0045)		8260B Low		1	10/16/17 19:00	C7J0252	CJ71646
Xylene P,M	ND (0.0090)		8260B Low		1	10/16/17 19:00	C7J0252	CJ71646
Xylenes (Total)	ND (0.0090)		8260B Low		1	10/16/17 19:00		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	114 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	95 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	108 %		70-130
<i>Surrogate: Toluene-d8</i>	107 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: BD-101017  
 Date Sampled: 10/10/17 00:00  
 Percent Solids: 96  
 Initial Volume: 15.2  
 Final Volume: 0.5  
 Extraction Method: 3546

ESS Laboratory Work Order: 1710285  
 ESS Laboratory Sample ID: 1710285-05  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: TJ  
 Prepared: 10/12/17 11:30

**8270D Semi-Volatile Organic Compounds**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Naphthalene	2.10 (0.342)		8270D		1	10/13/17 7:17	C7J0199	CJ71214

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	58 %		30-130
<i>Surrogate: 2,4,6-Tribromophenol</i>	69 %		30-130
<i>Surrogate: 2-Chlorophenol-d4</i>	60 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	62 %		30-130
<i>Surrogate: 2-Fluorophenol</i>	58 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	62 %		30-130
<i>Surrogate: Phenol-d6</i>	62 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	84 %		30-130





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-BW-506 0-2ft  
 Date Sampled: 10/10/17 16:20  
 Percent Solids: 93  
 Initial Volume: 6.5  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1710285  
 ESS Laboratory Sample ID: 1710285-06  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0041)		8260B Low		1	10/16/17 19:25	C7J0252	CJ71646
1,1,1-Trichloroethane	ND (0.0041)		8260B Low		1	10/16/17 19:25	C7J0252	CJ71646
1,1,2,2-Tetrachloroethane	ND (0.0041)		8260B Low		1	10/16/17 19:25	C7J0252	CJ71646
1,1,2-Trichloroethane	ND (0.0041)		8260B Low		1	10/16/17 19:25	C7J0252	CJ71646
1,1-Dichloroethane	ND (0.0041)		8260B Low		1	10/16/17 19:25	C7J0252	CJ71646
1,1-Dichloroethene	ND (0.0041)		8260B Low		1	10/16/17 19:25	C7J0252	CJ71646
1,1-Dichloropropene	ND (0.0041)		8260B Low		1	10/16/17 19:25	C7J0252	CJ71646
1,2,3-Trichlorobenzene	ND (0.0041)		8260B Low		1	10/16/17 19:25	C7J0252	CJ71646
1,2,3-Trichloropropane	ND (0.0041)		8260B Low		1	10/16/17 19:25	C7J0252	CJ71646
1,2,4-Trichlorobenzene	ND (0.0041)		8260B Low		1	10/16/17 19:25	C7J0252	CJ71646
1,2,4-Trimethylbenzene	ND (0.0041)		8260B Low		1	10/16/17 19:25	C7J0252	CJ71646
1,2-Dibromo-3-Chloropropane	ND (0.0041)		8260B Low		1	10/16/17 19:25	C7J0252	CJ71646
1,2-Dibromoethane	ND (0.0041)		8260B Low		1	10/16/17 19:25	C7J0252	CJ71646
1,2-Dichlorobenzene	ND (0.0041)		8260B Low		1	10/16/17 19:25	C7J0252	CJ71646
1,2-Dichloroethane	ND (0.0041)		8260B Low		1	10/16/17 19:25	C7J0252	CJ71646
1,2-Dichloropropane	ND (0.0041)		8260B Low		1	10/16/17 19:25	C7J0252	CJ71646
1,3,5-Trimethylbenzene	ND (0.0041)		8260B Low		1	10/16/17 19:25	C7J0252	CJ71646
1,3-Dichlorobenzene	ND (0.0041)		8260B Low		1	10/16/17 19:25	C7J0252	CJ71646
1,3-Dichloropropane	ND (0.0041)		8260B Low		1	10/16/17 19:25	C7J0252	CJ71646
1,4-Dichlorobenzene	ND (0.0041)		8260B Low		1	10/16/17 19:25	C7J0252	CJ71646
1,4-Dioxane	ND (0.0826)		8260B Low		1	10/16/17 19:25	C7J0252	CJ71646
1-Chlorohexane	ND (0.0041)		8260B Low		1	10/16/17 19:25	C7J0252	CJ71646
2,2-Dichloropropane	ND (0.0041)		8260B Low		1	10/16/17 19:25	C7J0252	CJ71646
2-Butanone	ND (0.0413)		8260B Low		1	10/16/17 19:25	C7J0252	CJ71646
2-Chlorotoluene	ND (0.0041)		8260B Low		1	10/16/17 19:25	C7J0252	CJ71646
2-Hexanone	ND (0.0413)		8260B Low		1	10/16/17 19:25	C7J0252	CJ71646
4-Chlorotoluene	ND (0.0041)		8260B Low		1	10/16/17 19:25	C7J0252	CJ71646
4-Isopropyltoluene	ND (0.0041)		8260B Low		1	10/16/17 19:25	C7J0252	CJ71646
4-Methyl-2-Pentanone	ND (0.0413)		8260B Low		1	10/16/17 19:25	C7J0252	CJ71646
Acetone	ND (0.0413)		8260B Low		1	10/16/17 19:25	C7J0252	CJ71646
Benzene	ND (0.0041)		8260B Low		1	10/16/17 19:25	C7J0252	CJ71646
Bromobenzene	ND (0.0041)		8260B Low		1	10/16/17 19:25	C7J0252	CJ71646

*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-BW-506 0-2ft  
Date Sampled: 10/10/17 16:20  
Percent Solids: 93  
Initial Volume: 6.5  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710285  
ESS Laboratory Sample ID: 1710285-06  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0041)		8260B Low		1	10/16/17 19:25	C7J0252	CJ71646
Bromodichloromethane	ND (0.0041)		8260B Low		1	10/16/17 19:25	C7J0252	CJ71646
Bromoform	ND (0.0041)		8260B Low		1	10/16/17 19:25	C7J0252	CJ71646
Bromomethane	ND (0.0083)		8260B Low		1	10/16/17 19:25	C7J0252	CJ71646
Carbon Disulfide	ND (0.0041)		8260B Low		1	10/16/17 19:25	C7J0252	CJ71646
Carbon Tetrachloride	ND (0.0041)		8260B Low		1	10/16/17 19:25	C7J0252	CJ71646
Chlorobenzene	ND (0.0041)		8260B Low		1	10/16/17 19:25	C7J0252	CJ71646
Chloroethane	ND (0.0083)		8260B Low		1	10/16/17 19:25	C7J0252	CJ71646
Chloroform	ND (0.0041)		8260B Low		1	10/16/17 19:25	C7J0252	CJ71646
Chloromethane	ND (0.0083)		8260B Low		1	10/16/17 19:25	C7J0252	CJ71646
cis-1,2-Dichloroethene	ND (0.0041)		8260B Low		1	10/16/17 19:25	C7J0252	CJ71646
cis-1,3-Dichloropropene	ND (0.0041)		8260B Low		1	10/16/17 19:25	C7J0252	CJ71646
Dibromochloromethane	ND (0.0041)		8260B Low		1	10/16/17 19:25	C7J0252	CJ71646
Dibromomethane	ND (0.0041)		8260B Low		1	10/16/17 19:25	C7J0252	CJ71646
Dichlorodifluoromethane	ND (0.0083)		8260B Low		1	10/16/17 19:25	C7J0252	CJ71646
Diethyl Ether	ND (0.0041)		8260B Low		1	10/16/17 19:25	C7J0252	CJ71646
Di-isopropyl ether	ND (0.0041)		8260B Low		1	10/16/17 19:25	C7J0252	CJ71646
Ethyl tertiary-butyl ether	ND (0.0041)		8260B Low		1	10/16/17 19:25	C7J0252	CJ71646
Ethylbenzene	ND (0.0041)		8260B Low		1	10/16/17 19:25	C7J0252	CJ71646
Hexachlorobutadiene	ND (0.0041)		8260B Low		1	10/16/17 19:25	C7J0252	CJ71646
Isopropylbenzene	ND (0.0041)		8260B Low		1	10/16/17 19:25	C7J0252	CJ71646
Methyl tert-Butyl Ether	ND (0.0041)		8260B Low		1	10/16/17 19:25	C7J0252	CJ71646
Methylene Chloride	ND (0.0207)		8260B Low		1	10/16/17 19:25	C7J0252	CJ71646
Naphthalene	ND (0.0041)		8260B Low		1	10/16/17 19:25	C7J0252	CJ71646
n-Butylbenzene	ND (0.0041)		8260B Low		1	10/16/17 19:25	C7J0252	CJ71646
n-Propylbenzene	ND (0.0041)		8260B Low		1	10/16/17 19:25	C7J0252	CJ71646
sec-Butylbenzene	ND (0.0041)		8260B Low		1	10/16/17 19:25	C7J0252	CJ71646
Styrene	ND (0.0041)		8260B Low		1	10/16/17 19:25	C7J0252	CJ71646
tert-Butylbenzene	ND (0.0041)		8260B Low		1	10/16/17 19:25	C7J0252	CJ71646
Tertiary-amyl methyl ether	ND (0.0041)		8260B Low		1	10/16/17 19:25	C7J0252	CJ71646
Tetrachloroethene	ND (0.0041)		8260B Low		1	10/16/17 19:25	C7J0252	CJ71646
Tetrahydrofuran	ND (0.0041)		8260B Low		1	10/16/17 19:25	C7J0252	CJ71646



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-BW-506 0-2ft  
 Date Sampled: 10/10/17 16:20  
 Percent Solids: 93  
 Initial Volume: 6.5  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1710285  
 ESS Laboratory Sample ID: 1710285-06  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0041)		8260B Low		1	10/16/17 19:25	C7J0252	CJ71646
trans-1,2-Dichloroethene	ND (0.0041)		8260B Low		1	10/16/17 19:25	C7J0252	CJ71646
trans-1,3-Dichloropropene	ND (0.0041)		8260B Low		1	10/16/17 19:25	C7J0252	CJ71646
Trichloroethene	ND (0.0041)		8260B Low		1	10/16/17 19:25	C7J0252	CJ71646
Trichlorofluoromethane	ND (0.0041)		8260B Low		1	10/16/17 19:25	C7J0252	CJ71646
Vinyl Acetate	ND (0.0041)		8260B Low		1	10/16/17 19:25	C7J0252	CJ71646
Vinyl Chloride	ND (0.0083)		8260B Low		1	10/16/17 19:25	C7J0252	CJ71646
Xylene O	ND (0.0041)		8260B Low		1	10/16/17 19:25	C7J0252	CJ71646
Xylene P,M	ND (0.0083)		8260B Low		1	10/16/17 19:25	C7J0252	CJ71646
Xylenes (Total)	ND (0.0083)		8260B Low		1	10/16/17 19:25		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	115 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	93 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	110 %		70-130
<i>Surrogate: Toluene-d8</i>	112 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-BW-506 0-2ft  
 Date Sampled: 10/10/17 16:20  
 Percent Solids: 93  
 Initial Volume: 15.8  
 Final Volume: 0.5  
 Extraction Method: 3546

ESS Laboratory Work Order: 1710285  
 ESS Laboratory Sample ID: 1710285-06  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: TJ  
 Prepared: 10/12/17 11:30

**8270D Semi-Volatile Organic Compounds**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Naphthalene	3.15 (0.679)		8270D		2	10/13/17 20:58	C7J0204	CJ71214

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	60 %		30-130
<i>Surrogate: 2,4,6-Tribromophenol</i>	74 %		30-130
<i>Surrogate: 2-Chlorophenol-d4</i>	66 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	73 %		30-130
<i>Surrogate: 2-Fluorophenol</i>	62 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	70 %		30-130
<i>Surrogate: Phenol-d6</i>	69 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	68 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-BW-507 2-4ft  
Date Sampled: 10/11/17 11:20  
Percent Solids: 85  
Initial Volume: 5.2  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710285  
ESS Laboratory Sample ID: 1710285-07  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0056)		8260B Low		1	10/16/17 17:44	C7J0252	CJ71646
1,1,1-Trichloroethane	ND (0.0056)		8260B Low		1	10/16/17 17:44	C7J0252	CJ71646
1,1,2,2-Tetrachloroethane	ND (0.0056)		8260B Low		1	10/16/17 17:44	C7J0252	CJ71646
1,1,2-Trichloroethane	ND (0.0056)		8260B Low		1	10/16/17 17:44	C7J0252	CJ71646
1,1-Dichloroethane	ND (0.0056)		8260B Low		1	10/16/17 17:44	C7J0252	CJ71646
1,1-Dichloroethene	ND (0.0056)		8260B Low		1	10/16/17 17:44	C7J0252	CJ71646
1,1-Dichloropropene	ND (0.0056)		8260B Low		1	10/16/17 17:44	C7J0252	CJ71646
1,2,3-Trichlorobenzene	ND (0.0056)		8260B Low		1	10/16/17 17:44	C7J0252	CJ71646
1,2,3-Trichloropropane	ND (0.0056)		8260B Low		1	10/16/17 17:44	C7J0252	CJ71646
1,2,4-Trichlorobenzene	ND (0.0056)		8260B Low		1	10/16/17 17:44	C7J0252	CJ71646
1,2,4-Trimethylbenzene	ND (0.0056)		8260B Low		1	10/16/17 17:44	C7J0252	CJ71646
1,2-Dibromo-3-Chloropropane	ND (0.0056)		8260B Low		1	10/16/17 17:44	C7J0252	CJ71646
1,2-Dibromoethane	ND (0.0056)		8260B Low		1	10/16/17 17:44	C7J0252	CJ71646
1,2-Dichlorobenzene	ND (0.0056)		8260B Low		1	10/16/17 17:44	C7J0252	CJ71646
1,2-Dichloroethane	ND (0.0056)		8260B Low		1	10/16/17 17:44	C7J0252	CJ71646
1,2-Dichloropropane	ND (0.0056)		8260B Low		1	10/16/17 17:44	C7J0252	CJ71646
1,3,5-Trimethylbenzene	ND (0.0056)		8260B Low		1	10/16/17 17:44	C7J0252	CJ71646
1,3-Dichlorobenzene	ND (0.0056)		8260B Low		1	10/16/17 17:44	C7J0252	CJ71646
1,3-Dichloropropane	ND (0.0056)		8260B Low		1	10/16/17 17:44	C7J0252	CJ71646
1,4-Dichlorobenzene	ND (0.0056)		8260B Low		1	10/16/17 17:44	C7J0252	CJ71646
1,4-Dioxane	ND (0.113)		8260B Low		1	10/16/17 17:44	C7J0252	CJ71646
1-Chlorohexane	ND (0.0056)		8260B Low		1	10/16/17 17:44	C7J0252	CJ71646
2,2-Dichloropropane	ND (0.0056)		8260B Low		1	10/16/17 17:44	C7J0252	CJ71646
2-Butanone	ND (0.0563)		8260B Low		1	10/16/17 17:44	C7J0252	CJ71646
2-Chlorotoluene	ND (0.0056)		8260B Low		1	10/16/17 17:44	C7J0252	CJ71646
2-Hexanone	ND (0.0563)		8260B Low		1	10/16/17 17:44	C7J0252	CJ71646
4-Chlorotoluene	ND (0.0056)		8260B Low		1	10/16/17 17:44	C7J0252	CJ71646
4-Isopropyltoluene	ND (0.0056)		8260B Low		1	10/16/17 17:44	C7J0252	CJ71646
4-Methyl-2-Pentanone	ND (0.0563)		8260B Low		1	10/16/17 17:44	C7J0252	CJ71646
Acetone	ND (0.0563)		8260B Low		1	10/16/17 17:44	C7J0252	CJ71646
Benzene	ND (0.0056)		8260B Low		1	10/16/17 17:44	C7J0252	CJ71646
Bromobenzene	ND (0.0056)		8260B Low		1	10/16/17 17:44	C7J0252	CJ71646

*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-BW-507 2-4ft  
 Date Sampled: 10/11/17 11:20  
 Percent Solids: 85  
 Initial Volume: 5.2  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1710285  
 ESS Laboratory Sample ID: 1710285-07  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0056)		8260B Low		1	10/16/17 17:44	C7J0252	CJ71646
Bromodichloromethane	ND (0.0056)		8260B Low		1	10/16/17 17:44	C7J0252	CJ71646
Bromoform	ND (0.0056)		8260B Low		1	10/16/17 17:44	C7J0252	CJ71646
Bromomethane	ND (0.0113)		8260B Low		1	10/16/17 17:44	C7J0252	CJ71646
Carbon Disulfide	ND (0.0056)		8260B Low		1	10/16/17 17:44	C7J0252	CJ71646
Carbon Tetrachloride	ND (0.0056)		8260B Low		1	10/16/17 17:44	C7J0252	CJ71646
Chlorobenzene	ND (0.0056)		8260B Low		1	10/16/17 17:44	C7J0252	CJ71646
Chloroethane	ND (0.0113)		8260B Low		1	10/16/17 17:44	C7J0252	CJ71646
Chloroform	ND (0.0056)		8260B Low		1	10/16/17 17:44	C7J0252	CJ71646
Chloromethane	ND (0.0113)		8260B Low		1	10/16/17 17:44	C7J0252	CJ71646
cis-1,2-Dichloroethene	ND (0.0056)		8260B Low		1	10/16/17 17:44	C7J0252	CJ71646
cis-1,3-Dichloropropene	ND (0.0056)		8260B Low		1	10/16/17 17:44	C7J0252	CJ71646
Dibromochloromethane	ND (0.0056)		8260B Low		1	10/16/17 17:44	C7J0252	CJ71646
Dibromomethane	ND (0.0056)		8260B Low		1	10/16/17 17:44	C7J0252	CJ71646
Dichlorodifluoromethane	ND (0.0113)		8260B Low		1	10/16/17 17:44	C7J0252	CJ71646
Diethyl Ether	ND (0.0056)		8260B Low		1	10/16/17 17:44	C7J0252	CJ71646
Di-isopropyl ether	ND (0.0056)		8260B Low		1	10/16/17 17:44	C7J0252	CJ71646
Ethyl tertiary-butyl ether	ND (0.0056)		8260B Low		1	10/16/17 17:44	C7J0252	CJ71646
Ethylbenzene	ND (0.0056)		8260B Low		1	10/16/17 17:44	C7J0252	CJ71646
Hexachlorobutadiene	ND (0.0056)		8260B Low		1	10/16/17 17:44	C7J0252	CJ71646
Isopropylbenzene	ND (0.0056)		8260B Low		1	10/16/17 17:44	C7J0252	CJ71646
Methyl tert-Butyl Ether	ND (0.0056)		8260B Low		1	10/16/17 17:44	C7J0252	CJ71646
Methylene Chloride	ND (0.0282)		8260B Low		1	10/16/17 17:44	C7J0252	CJ71646
Naphthalene	ND (0.0056)		8260B Low		1	10/16/17 17:44	C7J0252	CJ71646
n-Butylbenzene	ND (0.0056)		8260B Low		1	10/16/17 17:44	C7J0252	CJ71646
n-Propylbenzene	ND (0.0056)		8260B Low		1	10/16/17 17:44	C7J0252	CJ71646
sec-Butylbenzene	ND (0.0056)		8260B Low		1	10/16/17 17:44	C7J0252	CJ71646
Styrene	ND (0.0056)		8260B Low		1	10/16/17 17:44	C7J0252	CJ71646
tert-Butylbenzene	ND (0.0056)		8260B Low		1	10/16/17 17:44	C7J0252	CJ71646
Tertiary-amyl methyl ether	ND (0.0056)		8260B Low		1	10/16/17 17:44	C7J0252	CJ71646
Tetrachloroethene	ND (0.0056)		8260B Low		1	10/16/17 17:44	C7J0252	CJ71646
Tetrahydrofuran	ND (0.0056)		8260B Low		1	10/16/17 17:44	C7J0252	CJ71646





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-BW-507 2-4ft  
 Date Sampled: 10/11/17 11:20  
 Percent Solids: 85  
 Initial Volume: 5.2  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1710285  
 ESS Laboratory Sample ID: 1710285-07  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0056)		8260B Low		1	10/16/17 17:44	C7J0252	CJ71646
trans-1,2-Dichloroethene	ND (0.0056)		8260B Low		1	10/16/17 17:44	C7J0252	CJ71646
trans-1,3-Dichloropropene	ND (0.0056)		8260B Low		1	10/16/17 17:44	C7J0252	CJ71646
Trichloroethene	ND (0.0056)		8260B Low		1	10/16/17 17:44	C7J0252	CJ71646
Trichlorofluoromethane	ND (0.0056)		8260B Low		1	10/16/17 17:44	C7J0252	CJ71646
Vinyl Acetate	ND (0.0056)		8260B Low		1	10/16/17 17:44	C7J0252	CJ71646
Vinyl Chloride	ND (0.0113)		8260B Low		1	10/16/17 17:44	C7J0252	CJ71646
Xylene O	ND (0.0056)		8260B Low		1	10/16/17 17:44	C7J0252	CJ71646
Xylene P,M	ND (0.0113)		8260B Low		1	10/16/17 17:44	C7J0252	CJ71646
Xylenes (Total)	ND (0.0113)		8260B Low		1	10/16/17 17:44		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	115 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	102 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	109 %		70-130
<i>Surrogate: Toluene-d8</i>	104 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-BW-507 2-4ft  
 Date Sampled: 10/11/17 11:20  
 Percent Solids: 85  
 Initial Volume: 14.8  
 Final Volume: 0.5  
 Extraction Method: 3546

ESS Laboratory Work Order: 1710285  
 ESS Laboratory Sample ID: 1710285-07  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: TJ  
 Prepared: 10/12/17 11:30

**8270D Semi-Volatile Organic Compounds**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Naphthalene	2.88 (0.791)		8270D		2	10/13/17 21:33	C7J0204	CJ71214

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	65 %		30-130
<i>Surrogate: 2,4,6-Tribromophenol</i>	79 %		30-130
<i>Surrogate: 2-Chlorophenol-d4</i>	72 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	78 %		30-130
<i>Surrogate: 2-Fluorophenol</i>	70 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	74 %		30-130
<i>Surrogate: Phenol-d6</i>	77 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	71 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: TB-100917  
Date Sampled: 10/09/17 00:00  
Percent Solids: N/A  
Initial Volume: 5  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710285  
ESS Laboratory Sample ID: 1710285-08  
Sample Matrix: Solid  
Units: mg/kg wet  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0050)		8260B Low		1	10/16/17 16:02	C7J0252	CJ71646
1,1,1-Trichloroethane	ND (0.0050)		8260B Low		1	10/16/17 16:02	C7J0252	CJ71646
1,1,2,2-Tetrachloroethane	ND (0.0050)		8260B Low		1	10/16/17 16:02	C7J0252	CJ71646
1,1,2-Trichloroethane	ND (0.0050)		8260B Low		1	10/16/17 16:02	C7J0252	CJ71646
1,1-Dichloroethane	ND (0.0050)		8260B Low		1	10/16/17 16:02	C7J0252	CJ71646
1,1-Dichloroethene	ND (0.0050)		8260B Low		1	10/16/17 16:02	C7J0252	CJ71646
1,1-Dichloropropene	ND (0.0050)		8260B Low		1	10/16/17 16:02	C7J0252	CJ71646
1,2,3-Trichlorobenzene	ND (0.0050)		8260B Low		1	10/16/17 16:02	C7J0252	CJ71646
1,2,3-Trichloropropane	ND (0.0050)		8260B Low		1	10/16/17 16:02	C7J0252	CJ71646
1,2,4-Trichlorobenzene	ND (0.0050)		8260B Low		1	10/16/17 16:02	C7J0252	CJ71646
1,2,4-Trimethylbenzene	ND (0.0050)		8260B Low		1	10/16/17 16:02	C7J0252	CJ71646
1,2-Dibromo-3-Chloropropane	ND (0.0050)		8260B Low		1	10/16/17 16:02	C7J0252	CJ71646
1,2-Dibromoethane	ND (0.0050)		8260B Low		1	10/16/17 16:02	C7J0252	CJ71646
1,2-Dichlorobenzene	ND (0.0050)		8260B Low		1	10/16/17 16:02	C7J0252	CJ71646
1,2-Dichloroethane	ND (0.0050)		8260B Low		1	10/16/17 16:02	C7J0252	CJ71646
1,2-Dichloropropane	ND (0.0050)		8260B Low		1	10/16/17 16:02	C7J0252	CJ71646
1,3,5-Trimethylbenzene	ND (0.0050)		8260B Low		1	10/16/17 16:02	C7J0252	CJ71646
1,3-Dichlorobenzene	ND (0.0050)		8260B Low		1	10/16/17 16:02	C7J0252	CJ71646
1,3-Dichloropropane	ND (0.0050)		8260B Low		1	10/16/17 16:02	C7J0252	CJ71646
1,4-Dichlorobenzene	ND (0.0050)		8260B Low		1	10/16/17 16:02	C7J0252	CJ71646
1,4-Dioxane	ND (0.100)		8260B Low		1	10/16/17 16:02	C7J0252	CJ71646
1-Chlorohexane	ND (0.0050)		8260B Low		1	10/16/17 16:02	C7J0252	CJ71646
2,2-Dichloropropane	ND (0.0050)		8260B Low		1	10/16/17 16:02	C7J0252	CJ71646
2-Butanone	ND (0.0500)		8260B Low		1	10/16/17 16:02	C7J0252	CJ71646
2-Chlorotoluene	ND (0.0050)		8260B Low		1	10/16/17 16:02	C7J0252	CJ71646
2-Hexanone	ND (0.0500)		8260B Low		1	10/16/17 16:02	C7J0252	CJ71646
4-Chlorotoluene	ND (0.0050)		8260B Low		1	10/16/17 16:02	C7J0252	CJ71646
4-Isopropyltoluene	ND (0.0050)		8260B Low		1	10/16/17 16:02	C7J0252	CJ71646
4-Methyl-2-Pentanone	ND (0.0500)		8260B Low		1	10/16/17 16:02	C7J0252	CJ71646
Acetone	ND (0.0500)		8260B Low		1	10/16/17 16:02	C7J0252	CJ71646
Benzene	ND (0.0050)		8260B Low		1	10/16/17 16:02	C7J0252	CJ71646
Bromobenzene	ND (0.0050)		8260B Low		1	10/16/17 16:02	C7J0252	CJ71646



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: TB-100917  
Date Sampled: 10/09/17 00:00  
Percent Solids: N/A  
Initial Volume: 5  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710285  
ESS Laboratory Sample ID: 1710285-08  
Sample Matrix: Solid  
Units: mg/kg wet  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0050)		8260B Low		1	10/16/17 16:02	C7J0252	CJ71646
Bromodichloromethane	ND (0.0050)		8260B Low		1	10/16/17 16:02	C7J0252	CJ71646
Bromoform	ND (0.0050)		8260B Low		1	10/16/17 16:02	C7J0252	CJ71646
Bromomethane	ND (0.0100)		8260B Low		1	10/16/17 16:02	C7J0252	CJ71646
Carbon Disulfide	ND (0.0050)		8260B Low		1	10/16/17 16:02	C7J0252	CJ71646
Carbon Tetrachloride	ND (0.0050)		8260B Low		1	10/16/17 16:02	C7J0252	CJ71646
Chlorobenzene	ND (0.0050)		8260B Low		1	10/16/17 16:02	C7J0252	CJ71646
Chloroethane	ND (0.0100)		8260B Low		1	10/16/17 16:02	C7J0252	CJ71646
Chloroform	ND (0.0050)		8260B Low		1	10/16/17 16:02	C7J0252	CJ71646
Chloromethane	ND (0.0100)		8260B Low		1	10/16/17 16:02	C7J0252	CJ71646
cis-1,2-Dichloroethene	ND (0.0050)		8260B Low		1	10/16/17 16:02	C7J0252	CJ71646
cis-1,3-Dichloropropene	ND (0.0050)		8260B Low		1	10/16/17 16:02	C7J0252	CJ71646
Dibromochloromethane	ND (0.0050)		8260B Low		1	10/16/17 16:02	C7J0252	CJ71646
Dibromomethane	ND (0.0050)		8260B Low		1	10/16/17 16:02	C7J0252	CJ71646
Dichlorodifluoromethane	ND (0.0100)		8260B Low		1	10/16/17 16:02	C7J0252	CJ71646
Diethyl Ether	ND (0.0050)		8260B Low		1	10/16/17 16:02	C7J0252	CJ71646
Di-isopropyl ether	ND (0.0050)		8260B Low		1	10/16/17 16:02	C7J0252	CJ71646
Ethyl tertiary-butyl ether	ND (0.0050)		8260B Low		1	10/16/17 16:02	C7J0252	CJ71646
Ethylbenzene	ND (0.0050)		8260B Low		1	10/16/17 16:02	C7J0252	CJ71646
Hexachlorobutadiene	ND (0.0050)		8260B Low		1	10/16/17 16:02	C7J0252	CJ71646
Isopropylbenzene	ND (0.0050)		8260B Low		1	10/16/17 16:02	C7J0252	CJ71646
Methyl tert-Butyl Ether	ND (0.0050)		8260B Low		1	10/16/17 16:02	C7J0252	CJ71646
Methylene Chloride	ND (0.0250)		8260B Low		1	10/16/17 16:02	C7J0252	CJ71646
Naphthalene	ND (0.0050)		8260B Low		1	10/16/17 16:02	C7J0252	CJ71646
n-Butylbenzene	ND (0.0050)		8260B Low		1	10/16/17 16:02	C7J0252	CJ71646
n-Propylbenzene	ND (0.0050)		8260B Low		1	10/16/17 16:02	C7J0252	CJ71646
sec-Butylbenzene	ND (0.0050)		8260B Low		1	10/16/17 16:02	C7J0252	CJ71646
Styrene	ND (0.0050)		8260B Low		1	10/16/17 16:02	C7J0252	CJ71646
tert-Butylbenzene	ND (0.0050)		8260B Low		1	10/16/17 16:02	C7J0252	CJ71646
Tertiary-amyl methyl ether	ND (0.0050)		8260B Low		1	10/16/17 16:02	C7J0252	CJ71646
Tetrachloroethene	ND (0.0050)		8260B Low		1	10/16/17 16:02	C7J0252	CJ71646
Tetrahydrofuran	ND (0.0050)		8260B Low		1	10/16/17 16:02	C7J0252	CJ71646



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: TB-100917  
 Date Sampled: 10/09/17 00:00  
 Percent Solids: N/A  
 Initial Volume: 5  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1710285  
 ESS Laboratory Sample ID: 1710285-08  
 Sample Matrix: Solid  
 Units: mg/kg wet  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0050)		8260B Low		1	10/16/17 16:02	C7J0252	CJ71646
trans-1,2-Dichloroethene	ND (0.0050)		8260B Low		1	10/16/17 16:02	C7J0252	CJ71646
trans-1,3-Dichloropropene	ND (0.0050)		8260B Low		1	10/16/17 16:02	C7J0252	CJ71646
Trichloroethene	ND (0.0050)		8260B Low		1	10/16/17 16:02	C7J0252	CJ71646
Trichlorofluoromethane	ND (0.0050)		8260B Low		1	10/16/17 16:02	C7J0252	CJ71646
Vinyl Acetate	ND (0.0050)		8260B Low		1	10/16/17 16:02	C7J0252	CJ71646
Vinyl Chloride	ND (0.0100)		8260B Low		1	10/16/17 16:02	C7J0252	CJ71646
Xylene O	ND (0.0050)		8260B Low		1	10/16/17 16:02	C7J0252	CJ71646
Xylene P,M	ND (0.0100)		8260B Low		1	10/16/17 16:02	C7J0252	CJ71646
Xylenes (Total)	ND (0.0100)		8260B Low		1	10/16/17 16:02		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	104 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	103 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	103 %		70-130
<i>Surrogate: Toluene-d8</i>	104 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710285

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CJ71646 - 5035**

**Blank**

1,1,1,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,1-Trichloroethane	ND	0.0050	mg/kg wet							
1,1,2,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,2-Trichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethene	ND	0.0050	mg/kg wet							
1,1-Dichloropropene	ND	0.0050	mg/kg wet							
1,2,3-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,3-Trichloropropane	ND	0.0050	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,4-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,2-Dibromo-3-Chloropropane	ND	0.0050	mg/kg wet							
1,2-Dibromoethane	ND	0.0050	mg/kg wet							
1,2-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,2-Dichloroethane	ND	0.0050	mg/kg wet							
1,2-Dichloropropane	ND	0.0050	mg/kg wet							
1,3,5-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,3-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,3-Dichloropropane	ND	0.0050	mg/kg wet							
1,4-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,4-Dioxane	ND	0.100	mg/kg wet							
1-Chlorohexane	ND	0.0050	mg/kg wet							
2,2-Dichloropropane	ND	0.0050	mg/kg wet							
2-Butanone	ND	0.0500	mg/kg wet							
2-Chlorotoluene	ND	0.0050	mg/kg wet							
2-Hexanone	ND	0.0500	mg/kg wet							
4-Chlorotoluene	ND	0.0050	mg/kg wet							
4-Isopropyltoluene	ND	0.0050	mg/kg wet							
4-Methyl-2-Pentanone	ND	0.0500	mg/kg wet							
Acetone	ND	0.0500	mg/kg wet							
Benzene	ND	0.0050	mg/kg wet							
Bromobenzene	ND	0.0050	mg/kg wet							
Bromochloromethane	ND	0.0050	mg/kg wet							
Bromodichloromethane	ND	0.0050	mg/kg wet							
Bromoform	ND	0.0050	mg/kg wet							
Bromomethane	ND	0.0100	mg/kg wet							
Carbon Disulfide	ND	0.0050	mg/kg wet							
Carbon Tetrachloride	ND	0.0050	mg/kg wet							
Chlorobenzene	ND	0.0050	mg/kg wet							
Chloroethane	ND	0.0100	mg/kg wet							
Chloroform	ND	0.0050	mg/kg wet							
Chloromethane	ND	0.0100	mg/kg wet							
cis-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
cis-1,3-Dichloropropene	ND	0.0050	mg/kg wet							





CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710285

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CJ71646 - 5035**

Dibromochloromethane	ND	0.0050	mg/kg wet							
Dibromomethane	ND	0.0050	mg/kg wet							
Dichlorodifluoromethane	ND	0.0100	mg/kg wet							
Diethyl Ether	ND	0.0050	mg/kg wet							
Di-isopropyl ether	ND	0.0050	mg/kg wet							
Ethyl tertiary-butyl ether	ND	0.0050	mg/kg wet							
Ethylbenzene	ND	0.0050	mg/kg wet							
Hexachlorobutadiene	ND	0.0050	mg/kg wet							
Isopropylbenzene	ND	0.0050	mg/kg wet							
Methyl tert-Butyl Ether	ND	0.0050	mg/kg wet							
Methylene Chloride	ND	0.0250	mg/kg wet							
Naphthalene	ND	0.0050	mg/kg wet							
n-Butylbenzene	ND	0.0050	mg/kg wet							
n-Propylbenzene	ND	0.0050	mg/kg wet							
sec-Butylbenzene	ND	0.0050	mg/kg wet							
Styrene	ND	0.0050	mg/kg wet							
tert-Butylbenzene	ND	0.0050	mg/kg wet							
Tertiary-amyl methyl ether	ND	0.0050	mg/kg wet							
Tetrachloroethene	ND	0.0050	mg/kg wet							
Tetrahydrofuran	ND	0.0050	mg/kg wet							
Toluene	ND	0.0050	mg/kg wet							
trans-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
trans-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Trichloroethene	ND	0.0050	mg/kg wet							
Trichlorofluoromethane	ND	0.0050	mg/kg wet							
Vinyl Acetate	ND	0.0050	mg/kg wet							
Vinyl Chloride	ND	0.0100	mg/kg wet							
Xylene O	ND	0.0050	mg/kg wet							
Xylene P,M	ND	0.0100	mg/kg wet							
Xylenes (Total)	ND	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	0.0531		mg/kg wet	0.05000		106	70-130			
Surrogate: 4-Bromofluorobenzene	0.0507		mg/kg wet	0.05000		101	70-130			
Surrogate: Dibromofluoromethane	0.0525		mg/kg wet	0.05000		105	70-130			
Surrogate: Toluene-d8	0.0513		mg/kg wet	0.05000		103	70-130			

**LCS**

1,1,1,2-Tetrachloroethane	0.0547	0.0050	mg/kg wet	0.05000		109	70-130			
1,1,1-Trichloroethane	0.0521	0.0050	mg/kg wet	0.05000		104	70-130			
1,1,2,2-Tetrachloroethane	0.0536	0.0050	mg/kg wet	0.05000		107	70-130			
1,1,2-Trichloroethane	0.0541	0.0050	mg/kg wet	0.05000		108	70-130			
1,1-Dichloroethane	0.0504	0.0050	mg/kg wet	0.05000		101	70-130			
1,1-Dichloroethene	0.0525	0.0050	mg/kg wet	0.05000		105	70-130			
1,1-Dichloropropene	0.0528	0.0050	mg/kg wet	0.05000		106	70-130			
1,2,3-Trichlorobenzene	0.0563	0.0050	mg/kg wet	0.05000		113	70-130			
1,2,3-Trichloropropane	0.0539	0.0050	mg/kg wet	0.05000		108	70-130			
1,2,4-Trichlorobenzene	0.0553	0.0050	mg/kg wet	0.05000		111	70-130			



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710285

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CJ71646 - 5035**

1,2,4-Trimethylbenzene	0.0550	0.0050	mg/kg wet	0.05000		110	70-130			
1,2-Dibromo-3-Chloropropane	0.0473	0.0050	mg/kg wet	0.05000		95	70-130			
1,2-Dibromoethane	0.0568	0.0050	mg/kg wet	0.05000		114	70-130			
1,2-Dichlorobenzene	0.0541	0.0050	mg/kg wet	0.05000		108	70-130			
1,2-Dichloroethane	0.0543	0.0050	mg/kg wet	0.05000		109	70-130			
1,2-Dichloropropane	0.0530	0.0050	mg/kg wet	0.05000		106	70-130			
1,3,5-Trimethylbenzene	0.0535	0.0050	mg/kg wet	0.05000		107	70-130			
1,3-Dichlorobenzene	0.0536	0.0050	mg/kg wet	0.05000		107	70-130			
1,3-Dichloropropane	0.0576	0.0050	mg/kg wet	0.05000		115	70-130			
1,4-Dichlorobenzene	0.0534	0.0050	mg/kg wet	0.05000		107	70-130			
1,4-Dioxane	0.977	0.100	mg/kg wet	1.000		98	70-130			
1-Chlorohexane	0.0520	0.0050	mg/kg wet	0.05000		104	70-130			
2,2-Dichloropropane	0.0500	0.0050	mg/kg wet	0.05000		100	70-130			
2-Butanone	0.279	0.0500	mg/kg wet	0.2500		112	70-130			
2-Chlorotoluene	0.0521	0.0050	mg/kg wet	0.05000		104	70-130			
2-Hexanone	0.264	0.0500	mg/kg wet	0.2500		106	70-130			
4-Chlorotoluene	0.0532	0.0050	mg/kg wet	0.05000		106	70-130			
4-Isopropyltoluene	0.0523	0.0050	mg/kg wet	0.05000		105	70-130			
4-Methyl-2-Pentanone	0.256	0.0500	mg/kg wet	0.2500		103	70-130			
Acetone	0.293	0.0500	mg/kg wet	0.2500		117	70-130			
Benzene	0.0520	0.0050	mg/kg wet	0.05000		104	70-130			
Bromobenzene	0.0544	0.0050	mg/kg wet	0.05000		109	70-130			
Bromochloromethane	0.0520	0.0050	mg/kg wet	0.05000		104	70-130			
Bromodichloromethane	0.0555	0.0050	mg/kg wet	0.05000		111	70-130			
Bromoform	0.0480	0.0050	mg/kg wet	0.05000		96	70-130			
Bromomethane	0.0501	0.0100	mg/kg wet	0.05000		100	70-130			
Carbon Disulfide	0.0523	0.0050	mg/kg wet	0.05000		105	70-130			
Carbon Tetrachloride	0.0514	0.0050	mg/kg wet	0.05000		103	70-130			
Chlorobenzene	0.0530	0.0050	mg/kg wet	0.05000		106	70-130			
Chloroethane	0.0496	0.0100	mg/kg wet	0.05000		99	70-130			
Chloroform	0.0522	0.0050	mg/kg wet	0.05000		104	70-130			
Chloromethane	0.0520	0.0100	mg/kg wet	0.05000		104	70-130			
cis-1,2-Dichloroethene	0.0524	0.0050	mg/kg wet	0.05000		105	70-130			
cis-1,3-Dichloropropene	0.0581	0.0050	mg/kg wet	0.05000		116	70-130			
Dibromochloromethane	0.0519	0.0050	mg/kg wet	0.05000		104	70-130			
Dibromomethane	0.0518	0.0050	mg/kg wet	0.05000		104	70-130			
Dichlorodifluoromethane	0.0427	0.0100	mg/kg wet	0.05000		85	70-130			
Diethyl Ether	0.0561	0.0050	mg/kg wet	0.05000		112	70-130			
Di-isopropyl ether	0.0522	0.0050	mg/kg wet	0.05000		104	70-130			
Ethyl tertiary-butyl ether	0.0535	0.0050	mg/kg wet	0.05000		107	70-130			
Ethylbenzene	0.0532	0.0050	mg/kg wet	0.05000		106	70-130			
Hexachlorobutadiene	0.0545	0.0050	mg/kg wet	0.05000		109	70-130			
Isopropylbenzene	0.0505	0.0050	mg/kg wet	0.05000		101	70-130			
Methyl tert-Butyl Ether	0.0550	0.0050	mg/kg wet	0.05000		110	70-130			
Methylene Chloride	0.0547	0.0250	mg/kg wet	0.05000		109	70-130			

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710285

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CJ71646 - 5035**

Naphthalene	0.0507	0.0050	mg/kg wet	0.05000		101	70-130			
n-Butylbenzene	0.0528	0.0050	mg/kg wet	0.05000		106	70-130			
n-Propylbenzene	0.0534	0.0050	mg/kg wet	0.05000		107	70-130			
sec-Butylbenzene	0.0517	0.0050	mg/kg wet	0.05000		103	70-130			
Styrene	0.0551	0.0050	mg/kg wet	0.05000		110	70-130			
tert-Butylbenzene	0.0532	0.0050	mg/kg wet	0.05000		106	70-130			
Tertiary-amyl methyl ether	0.0530	0.0050	mg/kg wet	0.05000		106	70-130			
Tetrachloroethene	0.0527	0.0050	mg/kg wet	0.05000		105	70-130			
Tetrahydrofuran	0.0486	0.0050	mg/kg wet	0.05000		97	70-130			
Toluene	0.0517	0.0050	mg/kg wet	0.05000		103	70-130			
trans-1,2-Dichloroethene	0.0526	0.0050	mg/kg wet	0.05000		105	70-130			
trans-1,3-Dichloropropene	0.0516	0.0050	mg/kg wet	0.05000		103	70-130			
Trichloroethene	0.0520	0.0050	mg/kg wet	0.05000		104	70-130			
Trichlorofluoromethane	0.0500	0.0050	mg/kg wet	0.05000		100	70-130			
Vinyl Acetate	0.0465	0.0050	mg/kg wet	0.05000		93	70-130			
Vinyl Chloride	0.0534	0.0100	mg/kg wet	0.05000		107	70-130			
Xylene O	0.0556	0.0050	mg/kg wet	0.05000		111	70-130			
Xylene P,M	0.110	0.0100	mg/kg wet	0.1000		110	70-130			
Xylenes (Total)	0.165	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	0.0537		mg/kg wet	0.05000		107	70-130			
Surrogate: 4-Bromofluorobenzene	0.0531		mg/kg wet	0.05000		106	70-130			
Surrogate: Dibromofluoromethane	0.0528		mg/kg wet	0.05000		106	70-130			
Surrogate: Toluene-d8	0.0527		mg/kg wet	0.05000		105	70-130			

**LCS Dup**

1,1,1,2-Tetrachloroethane	0.0526	0.0050	mg/kg wet	0.05000		105	70-130	4	25	
1,1,1-Trichloroethane	0.0502	0.0050	mg/kg wet	0.05000		100	70-130	4	25	
1,1,2,2-Tetrachloroethane	0.0530	0.0050	mg/kg wet	0.05000		106	70-130	1	25	
1,1,2-Trichloroethane	0.0526	0.0050	mg/kg wet	0.05000		105	70-130	3	25	
1,1-Dichloroethane	0.0483	0.0050	mg/kg wet	0.05000		97	70-130	4	25	
1,1-Dichloroethene	0.0505	0.0050	mg/kg wet	0.05000		101	70-130	4	25	
1,1-Dichloropropene	0.0506	0.0050	mg/kg wet	0.05000		101	70-130	4	25	
1,2,3-Trichlorobenzene	0.0530	0.0050	mg/kg wet	0.05000		106	70-130	6	25	
1,2,3-Trichloropropane	0.0534	0.0050	mg/kg wet	0.05000		107	70-130	1	25	
1,2,4-Trichlorobenzene	0.0518	0.0050	mg/kg wet	0.05000		104	70-130	7	25	
1,2,4-Trimethylbenzene	0.0520	0.0050	mg/kg wet	0.05000		104	70-130	6	25	
1,2-Dibromo-3-Chloropropane	0.0480	0.0050	mg/kg wet	0.05000		96	70-130	1	25	
1,2-Dibromoethane	0.0552	0.0050	mg/kg wet	0.05000		110	70-130	3	25	
1,2-Dichlorobenzene	0.0515	0.0050	mg/kg wet	0.05000		103	70-130	5	25	
1,2-Dichloroethane	0.0524	0.0050	mg/kg wet	0.05000		105	70-130	4	25	
1,2-Dichloropropane	0.0505	0.0050	mg/kg wet	0.05000		101	70-130	5	25	
1,3,5-Trimethylbenzene	0.0509	0.0050	mg/kg wet	0.05000		102	70-130	5	25	
1,3-Dichlorobenzene	0.0513	0.0050	mg/kg wet	0.05000		103	70-130	4	25	
1,3-Dichloropropane	0.0562	0.0050	mg/kg wet	0.05000		112	70-130	2	25	
1,4-Dichlorobenzene	0.0493	0.0050	mg/kg wet	0.05000		99	70-130	8	25	
1,4-Dioxane	1.01	0.100	mg/kg wet	1.000		101	70-130	3	20	

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710285

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CJ71646 - 5035**

1-Chlorohexane	0.0500	0.0050	mg/kg wet	0.05000		100	70-130	4	25	
2,2-Dichloropropane	0.0480	0.0050	mg/kg wet	0.05000		96	70-130	4	25	
2-Butanone	0.268	0.0500	mg/kg wet	0.2500		107	70-130	4	25	
2-Chlorotoluene	0.0498	0.0050	mg/kg wet	0.05000		100	70-130	5	25	
2-Hexanone	0.267	0.0500	mg/kg wet	0.2500		107	70-130	1	25	
4-Chlorotoluene	0.0501	0.0050	mg/kg wet	0.05000		100	70-130	6	25	
4-Isopropyltoluene	0.0495	0.0050	mg/kg wet	0.05000		99	70-130	6	25	
4-Methyl-2-Pentanone	0.260	0.0500	mg/kg wet	0.2500		104	70-130	1	25	
Acetone	0.265	0.0500	mg/kg wet	0.2500		106	70-130	10	25	
Benzene	0.0493	0.0050	mg/kg wet	0.05000		99	70-130	5	25	
Bromobenzene	0.0523	0.0050	mg/kg wet	0.05000		105	70-130	4	25	
Bromochloromethane	0.0502	0.0050	mg/kg wet	0.05000		100	70-130	4	25	
Bromodichloromethane	0.0535	0.0050	mg/kg wet	0.05000		107	70-130	4	25	
Bromoform	0.0475	0.0050	mg/kg wet	0.05000		95	70-130	1	25	
Bromomethane	0.0483	0.0100	mg/kg wet	0.05000		97	70-130	4	25	
Carbon Disulfide	0.0503	0.0050	mg/kg wet	0.05000		101	70-130	4	25	
Carbon Tetrachloride	0.0492	0.0050	mg/kg wet	0.05000		98	70-130	4	25	
Chlorobenzene	0.0508	0.0050	mg/kg wet	0.05000		102	70-130	4	25	
Chloroethane	0.0470	0.0100	mg/kg wet	0.05000		94	70-130	5	25	
Chloroform	0.0497	0.0050	mg/kg wet	0.05000		99	70-130	5	25	
Chloromethane	0.0498	0.0100	mg/kg wet	0.05000		100	70-130	4	25	
cis-1,2-Dichloroethene	0.0501	0.0050	mg/kg wet	0.05000		100	70-130	4	25	
cis-1,3-Dichloropropene	0.0558	0.0050	mg/kg wet	0.05000		112	70-130	4	25	
Dibromochloromethane	0.0502	0.0050	mg/kg wet	0.05000		100	70-130	3	25	
Dibromomethane	0.0503	0.0050	mg/kg wet	0.05000		101	70-130	3	25	
Dichlorodifluoromethane	0.0410	0.0100	mg/kg wet	0.05000		82	70-130	4	25	
Diethyl Ether	0.0546	0.0050	mg/kg wet	0.05000		109	70-130	3	25	
Di-isopropyl ether	0.0502	0.0050	mg/kg wet	0.05000		100	70-130	4	25	
Ethyl tertiary-butyl ether	0.0523	0.0050	mg/kg wet	0.05000		105	70-130	2	25	
Ethylbenzene	0.0512	0.0050	mg/kg wet	0.05000		102	70-130	4	25	
Hexachlorobutadiene	0.0510	0.0050	mg/kg wet	0.05000		102	70-130	7	25	
Isopropylbenzene	0.0488	0.0050	mg/kg wet	0.05000		98	70-130	3	25	
Methyl tert-Butyl Ether	0.0546	0.0050	mg/kg wet	0.05000		109	70-130	0.7	25	
Methylene Chloride	0.0523	0.0250	mg/kg wet	0.05000		105	70-130	5	25	
Naphthalene	0.0497	0.0050	mg/kg wet	0.05000		99	70-130	2	25	
n-Butylbenzene	0.0495	0.0050	mg/kg wet	0.05000		99	70-130	7	25	
n-Propylbenzene	0.0507	0.0050	mg/kg wet	0.05000		101	70-130	5	25	
sec-Butylbenzene	0.0491	0.0050	mg/kg wet	0.05000		98	70-130	5	25	
Styrene	0.0522	0.0050	mg/kg wet	0.05000		104	70-130	5	25	
tert-Butylbenzene	0.0505	0.0050	mg/kg wet	0.05000		101	70-130	5	25	
Tertiary-amyl methyl ether	0.0522	0.0050	mg/kg wet	0.05000		104	70-130	1	25	
Tetrachloroethene	0.0502	0.0050	mg/kg wet	0.05000		100	70-130	5	25	
Tetrahydrofuran	0.0503	0.0050	mg/kg wet	0.05000		101	70-130	3	25	
Toluene	0.0494	0.0050	mg/kg wet	0.05000		99	70-130	5	25	
trans-1,2-Dichloroethene	0.0504	0.0050	mg/kg wet	0.05000		101	70-130	4	25	



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710285

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CJ71646 - 5035**

trans-1,3-Dichloropropene	0.0504	0.0050	mg/kg wet	0.05000		101	70-130	2	25	
Trichloroethene	0.0493	0.0050	mg/kg wet	0.05000		99	70-130	5	25	
Trichlorofluoromethane	0.0476	0.0050	mg/kg wet	0.05000		95	70-130	5	25	
Vinyl Acetate	0.0466	0.0050	mg/kg wet	0.05000		93	70-130	0.1	25	
Vinyl Chloride	0.0514	0.0100	mg/kg wet	0.05000		103	70-130	4	25	
Xylene O	0.0531	0.0050	mg/kg wet	0.05000		106	70-130	5	25	
Xylene P,M	0.104	0.0100	mg/kg wet	0.1000		104	70-130	5	25	
Xylenes (Total)	0.157	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	0.0547		mg/kg wet	0.05000		109	70-130			
Surrogate: 4-Bromofluorobenzene	0.0538		mg/kg wet	0.05000		108	70-130			
Surrogate: Dibromofluoromethane	0.0534		mg/kg wet	0.05000		107	70-130			
Surrogate: Toluene-d8	0.0535		mg/kg wet	0.05000		107	70-130			

5035/8260B Volatile Organic Compounds / Methanol

**Batch CJ71324 - 5035**

<b>Blank</b>										
1,1,1,2-Tetrachloroethane	ND	0.200	mg/kg wet							
1,1,1-Trichloroethane	ND	0.200	mg/kg wet							
1,1,2,2-Tetrachloroethane	ND	0.200	mg/kg wet							
1,1,2-Trichloroethane	ND	0.200	mg/kg wet							
1,1-Dichloroethane	ND	0.200	mg/kg wet							
1,1-Dichloroethene	ND	0.200	mg/kg wet							
1,1-Dichloropropene	ND	0.200	mg/kg wet							
1,2,3-Trichlorobenzene	ND	0.200	mg/kg wet							
1,2,3-Trichloropropane	ND	0.200	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.200	mg/kg wet							
1,2,4-Trimethylbenzene	ND	0.200	mg/kg wet							
1,2-Dibromo-3-Chloropropane	ND	1.00	mg/kg wet							
1,2-Dibromoethane	ND	0.200	mg/kg wet							
1,2-Dichlorobenzene	ND	0.200	mg/kg wet							
1,2-Dichloroethane	ND	0.200	mg/kg wet							
1,2-Dichloropropane	ND	0.200	mg/kg wet							
1,3,5-Trimethylbenzene	ND	0.200	mg/kg wet							
1,3-Dichlorobenzene	ND	0.200	mg/kg wet							
1,3-Dichloropropane	ND	0.200	mg/kg wet							
1,4-Dichlorobenzene	ND	0.200	mg/kg wet							
1,4-Dioxane - Screen	ND	40.0	mg/kg wet							
1-Chlorohexane	ND	0.200	mg/kg wet							
2,2-Dichloropropane	ND	0.200	mg/kg wet							
2-Butanone	ND	1.00	mg/kg wet							
2-Chlorotoluene	ND	0.200	mg/kg wet							
2-Hexanone	ND	1.00	mg/kg wet							
4-Chlorotoluene	ND	0.200	mg/kg wet							
4-Isopropyltoluene	ND	0.200	mg/kg wet							
4-Methyl-2-Pentanone	ND	1.00	mg/kg wet							



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710285

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Methanol

**Batch CJ71324 - 5035**

Acetone	ND	1.00	mg/kg wet							
Benzene	ND	0.200	mg/kg wet							
Bromobenzene	ND	0.200	mg/kg wet							
Bromochloromethane	ND	0.200	mg/kg wet							
Bromodichloromethane	ND	0.200	mg/kg wet							
Bromoform	ND	0.200	mg/kg wet							
Bromomethane	ND	0.200	mg/kg wet							
Carbon Disulfide	ND	0.200	mg/kg wet							
Carbon Tetrachloride	ND	0.200	mg/kg wet							
Chlorobenzene	ND	0.200	mg/kg wet							
Chloroethane	ND	0.200	mg/kg wet							
Chloroform	ND	0.200	mg/kg wet							
Chloromethane	ND	0.200	mg/kg wet							
cis-1,2-Dichloroethene	ND	0.200	mg/kg wet							
cis-1,3-Dichloropropene	ND	0.200	mg/kg wet							
Dibromochloromethane	ND	0.200	mg/kg wet							
Dibromomethane	ND	0.200	mg/kg wet							
Dichlorodifluoromethane	ND	0.200	mg/kg wet							
Diethyl Ether	ND	0.200	mg/kg wet							
Di-isopropyl ether	ND	0.200	mg/kg wet							
Ethyl tertiary-butyl ether	ND	0.200	mg/kg wet							
Ethylbenzene	ND	0.200	mg/kg wet							
Hexachlorobutadiene	ND	0.200	mg/kg wet							
Isopropylbenzene	ND	0.200	mg/kg wet							
Methyl tert-Butyl Ether	ND	0.200	mg/kg wet							
Methylene Chloride	ND	0.400	mg/kg wet							
Naphthalene	ND	0.200	mg/kg wet							
n-Butylbenzene	ND	0.200	mg/kg wet							
n-Propylbenzene	ND	0.200	mg/kg wet							
sec-Butylbenzene	ND	0.200	mg/kg wet							
Styrene	ND	0.200	mg/kg wet							
tert-Butylbenzene	ND	0.200	mg/kg wet							
Tertiary-amyl methyl ether	ND	0.200	mg/kg wet							
Tetrachloroethene	ND	0.200	mg/kg wet							
Tetrahydrofuran	ND	1.00	mg/kg wet							
Toluene	ND	0.200	mg/kg wet							
trans-1,2-Dichloroethene	ND	0.200	mg/kg wet							
trans-1,3-Dichloropropene	ND	0.200	mg/kg wet							
Trichloroethene	ND	0.200	mg/kg wet							
Vinyl Acetate	ND	0.200	mg/kg wet							
Vinyl Chloride	ND	0.200	mg/kg wet							
Xylene O	ND	0.200	mg/kg wet							
Xylene P,M	ND	0.400	mg/kg wet							
Xylenes (Total)	ND	0.400	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	4.24		mg/kg wet	5.000		85	70-130			





CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710285

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Methanol

**Batch CJ71324 - 5035**

Surrogate: 4-Bromofluorobenzene	4.65		mg/kg wet	5.000		93	70-130			
Surrogate: Dibromofluoromethane	4.03		mg/kg wet	5.000		81	70-130			
Surrogate: Toluene-d8	4.47		mg/kg wet	5.000		89	70-130			

**LCS**

1,1,1,2-Tetrachloroethane	1.85	0.200	mg/kg wet	2.000		92	70-130			
1,1,1-Trichloroethane	2.03	0.200	mg/kg wet	2.000		102	70-130			
1,1,2,2-Tetrachloroethane	1.90	0.200	mg/kg wet	2.000		95	70-130			
1,1,2-Trichloroethane	2.02	0.200	mg/kg wet	2.000		101	70-130			
1,1-Dichloroethane	2.07	0.200	mg/kg wet	2.000		103	70-130			
1,1-Dichloroethene	1.90	0.200	mg/kg wet	2.000		95	70-130			
1,1-Dichloropropene	2.13	0.200	mg/kg wet	2.000		106	70-130			
1,2,3-Trichlorobenzene	2.22	0.200	mg/kg wet	2.000		111	70-130			
1,2,3-Trichloropropane	1.85	0.200	mg/kg wet	2.000		93	70-130			
1,2,4-Trichlorobenzene	2.07	0.200	mg/kg wet	2.000		103	70-130			
1,2,4-Trimethylbenzene	2.10	0.200	mg/kg wet	2.000		105	70-130			
1,2-Dibromo-3-Chloropropane	1.93	1.00	mg/kg wet	2.000		96	70-130			
1,2-Dibromoethane	2.13	0.200	mg/kg wet	2.000		107	70-130			
1,2-Dichlorobenzene	2.05	0.200	mg/kg wet	2.000		103	70-130			
1,2-Dichloroethane	2.15	0.200	mg/kg wet	2.000		107	70-130			
1,2-Dichloropropane	2.15	0.200	mg/kg wet	2.000		108	70-130			
1,3,5-Trimethylbenzene	2.07	0.200	mg/kg wet	2.000		104	70-130			
1,3-Dichlorobenzene	2.02	0.200	mg/kg wet	2.000		101	70-130			
1,3-Dichloropropane	2.20	0.200	mg/kg wet	2.000		110	70-130			
1,4-Dichlorobenzene	1.99	0.200	mg/kg wet	2.000		100	70-130			
1,4-Dioxane - Screen	74.2	40.0	mg/kg wet	40.00		186	44-241			
1-Chlorohexane	2.07	0.200	mg/kg wet	2.000		104	70-130			
2,2-Dichloropropane	2.10	0.200	mg/kg wet	2.000		105	70-130			
2-Butanone	10.7	1.00	mg/kg wet	10.00		107	70-130			
2-Chlorotoluene	2.05	0.200	mg/kg wet	2.000		103	70-130			
2-Hexanone	10.5	1.00	mg/kg wet	10.00		105	70-130			
4-Chlorotoluene	2.04	0.200	mg/kg wet	2.000		102	70-130			
4-Isopropyltoluene	2.01	0.200	mg/kg wet	2.000		101	70-130			
4-Methyl-2-Pentanone	11.0	1.00	mg/kg wet	10.00		110	70-130			
Acetone	11.2	1.00	mg/kg wet	10.00		112	70-130			
Benzene	2.06	0.200	mg/kg wet	2.000		103	70-130			
Bromobenzene	2.07	0.200	mg/kg wet	2.000		104	70-130			
Bromochloromethane	1.83	0.200	mg/kg wet	2.000		92	70-130			
Bromodichloromethane	1.75	0.200	mg/kg wet	2.000		88	70-130			
Bromoform	1.52	0.200	mg/kg wet	2.000		76	70-130			
Bromomethane	2.07	0.200	mg/kg wet	2.000		103	70-130			
Carbon Disulfide	2.04	0.200	mg/kg wet	2.000		102	70-130			
Carbon Tetrachloride	2.01	0.200	mg/kg wet	2.000		101	70-130			
Chlorobenzene	2.09	0.200	mg/kg wet	2.000		105	70-130			
Chloroethane	1.97	0.200	mg/kg wet	2.000		98	70-130			

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710285

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Methanol

**Batch CJ71324 - 5035**

Chloroform	1.94	0.200	mg/kg wet	2.000		97	70-130			
Chloromethane	1.97	0.200	mg/kg wet	2.000		99	70-130			
cis-1,2-Dichloroethene	1.86	0.200	mg/kg wet	2.000		93	70-130			
cis-1,3-Dichloropropene	2.15	0.200	mg/kg wet	2.000		108	70-130			
Dibromochloromethane	1.60	0.200	mg/kg wet	2.000		80	70-130			
Dibromomethane	1.89	0.200	mg/kg wet	2.000		94	70-130			
Dichlorodifluoromethane	1.74	0.200	mg/kg wet	2.000		87	70-130			
Diethyl Ether	2.16	0.200	mg/kg wet	2.000		108	70-130			
Di-isopropyl ether	2.22	0.200	mg/kg wet	2.000		111	70-130			
Ethyl tertiary-butyl ether	2.17	0.200	mg/kg wet	2.000		109	70-130			
Ethylbenzene	2.10	0.200	mg/kg wet	2.000		105	70-130			
Hexachlorobutadiene	2.11	0.200	mg/kg wet	2.000		106	70-130			
Isopropylbenzene	1.95	0.200	mg/kg wet	2.000		98	70-130			
Methyl tert-Butyl Ether	2.06	0.200	mg/kg wet	2.000		103	70-130			
Methylene Chloride	1.94	0.400	mg/kg wet	2.000		97	70-130			
Naphthalene	2.23	0.200	mg/kg wet	2.000		111	70-130			
n-Butylbenzene	2.16	0.200	mg/kg wet	2.000		108	70-130			
n-Propylbenzene	2.13	0.200	mg/kg wet	2.000		106	70-130			
sec-Butylbenzene	2.12	0.200	mg/kg wet	2.000		106	70-130			
Styrene	2.00	0.200	mg/kg wet	2.000		100	70-130			
tert-Butylbenzene	2.10	0.200	mg/kg wet	2.000		105	70-130			
Tertiary-amyl methyl ether	2.07	0.200	mg/kg wet	2.000		103	70-130			
Tetrachloroethene	1.92	0.200	mg/kg wet	2.000		96	70-130			
Tetrahydrofuran	2.58	1.00	mg/kg wet	2.000		129	70-130			
Toluene	1.84	0.200	mg/kg wet	2.000		92	70-130			
trans-1,2-Dichloroethene	1.91	0.200	mg/kg wet	2.000		96	70-130			
trans-1,3-Dichloropropene	1.85	0.200	mg/kg wet	2.000		92	70-130			
Trichloroethene	2.03	0.200	mg/kg wet	2.000		101	70-130			
Vinyl Acetate	1.95	0.200	mg/kg wet	2.000		97	70-130			
Vinyl Chloride	2.07	0.200	mg/kg wet	2.000		103	70-130			
Xylene O	2.14	0.200	mg/kg wet	2.000		107	70-130			
Xylene P,M	4.03	0.400	mg/kg wet	4.000		101	70-130			
Xylenes (Total)	6.17	0.400	mg/kg wet							
<i>Surrogate: 1,2-Dichloroethane-d4</i>	4.86		mg/kg wet	5.000		97	70-130			
<i>Surrogate: 4-Bromofluorobenzene</i>	4.89		mg/kg wet	5.000		98	70-130			
<i>Surrogate: Dibromofluoromethane</i>	4.76		mg/kg wet	5.000		95	70-130			
<i>Surrogate: Toluene-d8</i>	4.78		mg/kg wet	5.000		96	70-130			

**LCS Dup**

1,1,1,2-Tetrachloroethane	1.72	0.200	mg/kg wet	2.000		86	70-130	7	25	
1,1,1-Trichloroethane	1.95	0.200	mg/kg wet	2.000		98	70-130	4	25	
1,1,1,2-Tetrachloroethane	1.80	0.200	mg/kg wet	2.000		90	70-130	5	25	
1,1,2-Trichloroethane	1.98	0.200	mg/kg wet	2.000		99	70-130	2	25	
1,1-Dichloroethane	1.92	0.200	mg/kg wet	2.000		96	70-130	7	25	
1,1-Dichloroethene	1.88	0.200	mg/kg wet	2.000		94	70-130	0.6	25	
1,1-Dichloropropene	2.00	0.200	mg/kg wet	2.000		100	70-130	6	25	



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710285

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
<b>5035/8260B Volatile Organic Compounds / Methanol</b>										
<b>Batch CJ71324 - 5035</b>										
1,2,3-Trichlorobenzene	1.98	0.200	mg/kg wet	2.000		99	70-130	12	25	
1,2,3-Trichloropropane	1.76	0.200	mg/kg wet	2.000		88	70-130	5	25	
1,2,4-Trichlorobenzene	1.89	0.200	mg/kg wet	2.000		94	70-130	9	25	
1,2,4-Trimethylbenzene	1.99	0.200	mg/kg wet	2.000		99	70-130	5	25	
1,2-Dibromo-3-Chloropropane	1.83	1.00	mg/kg wet	2.000		92	70-130	5	25	
1,2-Dibromoethane	1.97	0.200	mg/kg wet	2.000		98	70-130	8	25	
1,2-Dichlorobenzene	1.96	0.200	mg/kg wet	2.000		98	70-130	4	25	
1,2-Dichloroethane	1.99	0.200	mg/kg wet	2.000		99	70-130	8	25	
1,2-Dichloropropane	2.09	0.200	mg/kg wet	2.000		104	70-130	3	25	
1,3,5-Trimethylbenzene	1.99	0.200	mg/kg wet	2.000		99	70-130	4	25	
1,3-Dichlorobenzene	1.92	0.200	mg/kg wet	2.000		96	70-130	5	25	
1,3-Dichloropropane	2.07	0.200	mg/kg wet	2.000		104	70-130	6	25	
1,4-Dichlorobenzene	1.88	0.200	mg/kg wet	2.000		94	70-130	6	25	
1,4-Dioxane - Screen	51.2	40.0	mg/kg wet	40.00		128	44-241	37	200	
1-Chlorohexane	2.03	0.200	mg/kg wet	2.000		102	70-130	2	25	
2,2-Dichloropropane	2.02	0.200	mg/kg wet	2.000		101	70-130	4	25	
2-Butanone	11.0	1.00	mg/kg wet	10.00		110	70-130	2	25	
2-Chlorotoluene	1.94	0.200	mg/kg wet	2.000		97	70-130	5	25	
2-Hexanone	11.5	1.00	mg/kg wet	10.00		115	70-130	9	25	
4-Chlorotoluene	1.92	0.200	mg/kg wet	2.000		96	70-130	6	25	
4-Isopropyltoluene	1.90	0.200	mg/kg wet	2.000		95	70-130	6	25	
4-Methyl-2-Pentanone	10.7	1.00	mg/kg wet	10.00		107	70-130	3	25	
Acetone	14.2	1.00	mg/kg wet	10.00		142	70-130	24	25	B+
Benzene	2.00	0.200	mg/kg wet	2.000		100	70-130	3	25	
Bromobenzene	1.95	0.200	mg/kg wet	2.000		97	70-130	6	25	
Bromochloromethane	1.81	0.200	mg/kg wet	2.000		90	70-130	1	25	
Bromodichloromethane	1.64	0.200	mg/kg wet	2.000		82	70-130	7	25	
Bromoform	1.47	0.200	mg/kg wet	2.000		74	70-130	3	25	
Bromomethane	1.97	0.200	mg/kg wet	2.000		99	70-130	5	25	
Carbon Disulfide	1.96	0.200	mg/kg wet	2.000		98	70-130	4	25	
Carbon Tetrachloride	1.92	0.200	mg/kg wet	2.000		96	70-130	5	25	
Chlorobenzene	1.96	0.200	mg/kg wet	2.000		98	70-130	7	25	
Chloroethane	1.83	0.200	mg/kg wet	2.000		92	70-130	7	25	
Chloroform	1.94	0.200	mg/kg wet	2.000		97	70-130	0	25	
Chloromethane	1.98	0.200	mg/kg wet	2.000		99	70-130	0.4	25	
cis-1,2-Dichloroethene	1.86	0.200	mg/kg wet	2.000		93	70-130	0	25	
cis-1,3-Dichloropropene	2.09	0.200	mg/kg wet	2.000		104	70-130	3	25	
Dibromochloromethane	1.52	0.200	mg/kg wet	2.000		76	70-130	5	25	
Dibromomethane	1.83	0.200	mg/kg wet	2.000		91	70-130	3	25	
Dichlorodifluoromethane	1.63	0.200	mg/kg wet	2.000		81	70-130	7	25	
Diethyl Ether	2.07	0.200	mg/kg wet	2.000		103	70-130	4	25	
Di-isopropyl ether	2.12	0.200	mg/kg wet	2.000		106	70-130	5	25	
Ethyl tertiary-butyl ether	2.07	0.200	mg/kg wet	2.000		103	70-130	5	25	
Ethylbenzene	2.04	0.200	mg/kg wet	2.000		102	70-130	3	25	
Hexachlorobutadiene	2.11	0.200	mg/kg wet	2.000		106	70-130	0.09	25	



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710285

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Methanol

**Batch CJ71324 - 5035**

Isopropylbenzene	1.90	0.200	mg/kg wet	2.000		95	70-130	3	25	
Methyl tert-Butyl Ether	2.04	0.200	mg/kg wet	2.000		102	70-130	1	25	
Methylene Chloride	1.85	0.400	mg/kg wet	2.000		93	70-130	5	25	
Naphthalene	2.02	0.200	mg/kg wet	2.000		101	70-130	10	25	
n-Butylbenzene	1.97	0.200	mg/kg wet	2.000		98	70-130	9	25	
n-Propylbenzene	1.98	0.200	mg/kg wet	2.000		99	70-130	7	25	
sec-Butylbenzene	1.93	0.200	mg/kg wet	2.000		96	70-130	10	25	
Styrene	1.92	0.200	mg/kg wet	2.000		96	70-130	4	25	
tert-Butylbenzene	1.98	0.200	mg/kg wet	2.000		99	70-130	6	25	
Tertiary-amyl methyl ether	2.00	0.200	mg/kg wet	2.000		100	70-130	3	25	
Tetrachloroethene	1.87	0.200	mg/kg wet	2.000		93	70-130	3	25	
Tetrahydrofuran	2.26	1.00	mg/kg wet	2.000		113	70-130	13	25	
Toluene	1.74	0.200	mg/kg wet	2.000		87	70-130	6	25	
trans-1,2-Dichloroethene	1.97	0.200	mg/kg wet	2.000		98	70-130	3	25	
trans-1,3-Dichloropropene	1.63	0.200	mg/kg wet	2.000		81	70-130	13	25	
Trichloroethene	1.90	0.200	mg/kg wet	2.000		95	70-130	7	25	
Vinyl Acetate	2.04	0.200	mg/kg wet	2.000		102	70-130	5	25	
Vinyl Chloride	1.91	0.200	mg/kg wet	2.000		96	70-130	8	25	
Xylene O	1.97	0.200	mg/kg wet	2.000		98	70-130	8	25	
Xylene P,M	3.95	0.400	mg/kg wet	4.000		99	70-130	2	25	
Xylenes (Total)	5.92	0.400	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	4.68		mg/kg wet	5.000		94	70-130			
Surrogate: 4-Bromofluorobenzene	4.91		mg/kg wet	5.000		98	70-130			
Surrogate: Dibromofluoromethane	4.63		mg/kg wet	5.000		93	70-130			
Surrogate: Toluene-d8	4.75		mg/kg wet	5.000		95	70-130			

8270D Semi-Volatile Organic Compounds

**Batch CJ71214 - 3546**

<b>Blank</b>										
Naphthalene	ND	0.333	mg/kg wet							
Surrogate: 1,2-Dichlorobenzene-d4	2.71		mg/kg wet	3.333		81	30-130			
Surrogate: 2,4,6-Tribromophenol	3.91		mg/kg wet	5.000		78	30-130			
Surrogate: 2-Chlorophenol-d4	4.08		mg/kg wet	5.000		82	30-130			
Surrogate: 2-Fluorobiphenyl	2.94		mg/kg wet	3.333		88	30-130			
Surrogate: 2-Fluorophenol	4.12		mg/kg wet	5.000		82	30-130			
Surrogate: Nitrobenzene-d5	2.90		mg/kg wet	3.333		87	30-130			
Surrogate: Phenol-d6	4.28		mg/kg wet	5.000		86	30-130			
Surrogate: p-Terphenyl-d14	3.00		mg/kg wet	3.333		90	30-130			

<b>LCS</b>										
Naphthalene	2.24	0.333	mg/kg wet	3.333		67	40-140			
Surrogate: 1,2-Dichlorobenzene-d4	2.48		mg/kg wet	3.333		74	30-130			
Surrogate: 2,4,6-Tribromophenol	4.20		mg/kg wet	5.000		84	30-130			
Surrogate: 2-Chlorophenol-d4	3.81		mg/kg wet	5.000		76	30-130			
Surrogate: 2-Fluorobiphenyl	2.67		mg/kg wet	3.333		80	30-130			
Surrogate: 2-Fluorophenol	3.80		mg/kg wet	5.000		76	30-130			



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710285

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
---------	--------	-----	-------	-------------	---------------	------	-------------	-----	-----------	-----------

8270D Semi-Volatile Organic Compounds

**Batch CJ71214 - 3546**

<i>Surrogate: Nitrobenzene-d5</i>	2.64		mg/kg wet	3.333		79	30-130			
<i>Surrogate: Phenol-d6</i>	3.96		mg/kg wet	5.000		79	30-130			
<i>Surrogate: p-Terphenyl-d14</i>	2.87		mg/kg wet	3.333		86	30-130			
<b>LCS Dup</b>										
Naphthalene	2.37	0.333	mg/kg wet	3.333		71	40-140	6	30	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	2.61		mg/kg wet	3.333		78	30-130			
<i>Surrogate: 2,4,6-Tribromophenol</i>	4.13		mg/kg wet	5.000		83	30-130			
<i>Surrogate: 2-Chlorophenol-d4</i>	4.00		mg/kg wet	5.000		80	30-130			
<i>Surrogate: 2-Fluorobiphenyl</i>	2.77		mg/kg wet	3.333		83	30-130			
<i>Surrogate: 2-Fluorophenol</i>	4.04		mg/kg wet	5.000		81	30-130			
<i>Surrogate: Nitrobenzene-d5</i>	2.82		mg/kg wet	3.333		85	30-130			
<i>Surrogate: Phenol-d6</i>	4.13		mg/kg wet	5.000		83	30-130			
<i>Surrogate: p-Terphenyl-d14</i>	2.86		mg/kg wet	3.333		86	30-130			



## CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710285

### Notes and Definitions

- U Analyte included in the analysis, but not detected
- J Reported between MDL and MRL
- E Reported above the quantitation limit; Estimated value (E).
- D Diluted.
- CD- Continuing Calibration %Diff/Drift is below control limit (CD-).
- B+ Blank Spike recovery is above upper control limit (B+).
- ND Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference
- MDL Method Detection Limit
- MRL Method Reporting Limit
- LOD Limit of Detection
- LOQ Limit of Quantitation
- DL Detection Limit
- I/V Initial Volume
- F/V Final Volume
- § Subcontracted analysis; see attached report
- 1 Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
- 2 Range result excludes concentrations of target analytes eluting in that range.
- 3 Range result excludes the concentration of the C9-C10 aromatic range.
- Avg Results reported as a mathematical average.
- NR No Recovery
- [CALC] Calculated Analyte
- SUB Subcontracted analysis; see attached report
- RL Reporting Limit
- EDL Estimated Detection Limit





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710285

**ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS**

**ENVIRONMENTAL**

Rhode Island Potable and Non Potable Water: LAI00179

<http://www.health.ri.gov/find/labs/analytical/ESS.pdf>

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750

[http://www.ct.gov/dph/lib/dph/environmental\\_health/environmental\\_laboratories/pdf/OutofStateCommercialLaboratories.pdf](http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf)

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002

<http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml>

Massachusetts Potable and Non Potable Water: M-RI002

<http://public.dep.state.ma.us/Labcert/Labcert.aspx>

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424

<http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm>

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313

<http://www.wadsworth.org/labcert/elap/comm.html>

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006

[http://datamine2.state.nj.us/DEP\\_OPRA/OpraMain/pi\\_main?mode=pi\\_by\\_site&sort\\_order=PI\\_NAMEA&Select+a+Site:=58715](http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715)

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752

<http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx>

## ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Providence, RI - GZA/HDM

ESS Project ID: 1710285

Shipped/Delivered Via: ESS Courier

Date Received: 10/11/2017

Project Due Date: 10/18/2017

Days for Project: 5 Day

1. Air bill manifest present?  No  
Air No.: NA
2. Were custody seals present?  No
3. Is radiation count <100 CPM?  Yes
4. Is a Cooler Present?  Yes  
Temp: 3.2 Iced with: Ice
5. Was COC signed and dated by client?  Yes

6. Does COC match bottles?  Yes
7. Is COC complete and correct?  Yes
8. Were samples received intact?  Yes
9. Were labs informed about short holds & rushes? Yes / No  NA
10. Were any analyses received outside of hold time? Yes  No

11. Any Subcontracting needed? Yes  No  
ESS Sample IDs: \_\_\_\_\_  
Analysis: \_\_\_\_\_  
TAT: \_\_\_\_\_

12. Were VOAs received?  Yes / No  
a. Air bubbles in aqueous VOAs?  Yes / No  
b. Does methanol cover soil completely?  Yes / No / NA

13. Are the samples properly preserved?  Yes / No  
a. If metals preserved upon receipt: Date: \_\_\_\_\_ Time: \_\_\_\_\_ By: \_\_\_\_\_  
b. Low Level VOA vials frozen: Date: 10/11/2017 Time: (164) By: ZL

**Sample Receiving Notes:**

GZ-BW-503(2-4) - MeOH does not cover soil in vial JA 10-11-17

Rec'd 8oz jar GZ-BW-504 (0-2) collected 10/10/17 @ 1000 not on COC

14. Was there a need to contact Project Manager?  Yes / No  
a. Was there a need to contact the client?  Yes / No  
Who was contacted? \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_ By: \_\_\_\_\_

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
01	172027	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
01	172040	Yes	NA	Yes	VOA Vial - Other	Other	
01	172041	Yes	NA	Yes	VOA Vial - Other	Other	
01	172047	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
02	172026	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
02	172038	Yes	NA	Yes	VOA Vial - Other	Other	
02	172039	Yes	NA	Yes	VOA Vial - Other	Other	
02	172046	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
03	172025	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
03	172036	Yes	NA	Yes	VOA Vial - Other	Other	
03	172037	Yes	NA	Yes	VOA Vial - Other	Other	
03	172045	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
04	172024	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
04	172034	Yes	NA	Yes	VOA Vial - Other	Other	
04	172035	Yes	NA	Yes	VOA Vial - Other	Other	
04	172044	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
05	172023	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
05	172032	Yes	NA	Yes	VOA Vial - Other	Other	
05	172033	Yes	NA	Yes	VOA Vial - Other	Other	
05	172049	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
06	172022	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
06	172030	Yes	NA	Yes	VOA Vial - Other	Other	
06	172031	Yes	NA	Yes	VOA Vial - Other	Other	
06	172048	Yes	NA	Yes	4 oz. Jar - Unpres	NP	

## ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Providence, RI - GZA/HDM

ESS Project ID: 1710285

Date Received: 10/11/2017

07	172021	Yes	NA	Yes	VOA Vial - Methanol	MeOH
07	172028	Yes	NA	Yes	VOA Vial - Other	Other
07	172029	Yes	NA	Yes	VOA Vial - Other	Other
07	172043	Yes	NA	Yes	8 oz. Jar - Unpres	NP
08	172020	Yes	NA	Yes	VOA Vial - Methanol	MeOH
08	172042	Yes	NA	Yes	VOA Vial - Other	Other

2nd Review

Are barcode labels on correct containers?

Yes /  No

Completed

By: [Signature]

Date & Time: 10/11/17 1623

Reviewed

By: [Signature]

Date & Time: 10/11/17 1641

Delivered

By: [Signature]

Date & Time: 10/11/17 1641

ESS Laboratory

Division of Thielsch Engineering, Inc.  
 185 Frances Avenue, Cranston RI 02910  
 Tel. (401) 461-7181 Fax (401) 461-4486  
 www.esslaboratory.com

CHAIN OF CUSTODY

ESS Lab # 1710285

Turn Time 5-Day Rush  
 Regulatory State Rhode Island  
 Is this project for any of the following?:  
 OCT RCP  MA MCP  ORGP

Reporting Limits RIDEM R-DEC and GB Leachability  
 Electronic  Limit Checker  Standard Excel  
 Deliverables  Other (Please Specify →)

Company Name GZA  
 Project # 05.0043654.00  
 Project Name Former Tidewater Facility  
 Contact Person Sean Connelly  
 Address 530 Broadway  
 City Providence State RI Zip Code 02909 PO # 43654  
 Telephone Number 401-421-4140 FAX Number - Email Address sean.connelly@gza.com

Analysis  
 VOCs (62603)  
 Naphthalene (6270D)  
 HCB

ESS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID																
8	10/9/17	1200	—	—	TB-100917	X															
1	10/9/17	1400	Grab	Soil	GZ-BW-502 (0-2')	X	X														
	10/10/17	0835	Grab	Soil	GZ-BW-502 (8-10')						X										
2	10/10/17	1030	Grab	Soil	GZ-BW-504A (0-2')	X	X														
3	10/10/17	1120	Grab	Soil	GZ-BW-503 (2-4')	X	X														
4	10/10/17	1430	Grab	Soil	GZ-BW-505 (0-2')	X	X														
5	10/10/17	—	Grab	Soil	BD-101017	X	X														
6	10/10/17	1620	Grab	Soil	GZ-BW-506 (0-2')	X	X														
7	10/11/17	1120	Grab	Soil	GZ-BW-507 (2-4')	X	X														

Container Type: AC-Air Cassette AG-Amber Glass B-BOD Bottle C-Cubitainer G-Glass O-Other P-Poly S-Sterile V-Vial  
 Container Volume: 1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other\*  
 Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAce, NaOH 9-NH4Cl 10-DI H2O 11-Other\*  
 Number of Containers per Sample: 3 1

Laboratory Use Only  
 Cooler Present:   
 Seals Intact:   
 Cooler Temperature: 10-11-17 14:46

Sampled by: Sean Connelly, Sarah McLeod, Erik Beloff  
 Comments: Please specify "Other" preservative and containers types in this space  
 NGRID rates apply  
 Please email sarah.mcleod@gza.com also

Relinquished by: (Signature, Date & Time) <u>Sean Connelly</u> 10/11/17 1420	Received By: (Signature, Date & Time) <u>[Signature]</u> 10-11-17 14:20	Relinquished By: (Signature, Date & Time) <u>[Signature]</u> 10-11-17 14:46	Received By: (Signature, Date & Time) <u>[Signature]</u> 10/11/17 1550
Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)



**ESS Laboratory**

*Division of Thielsch Engineering, Inc.*

**BAL Laboratory**

*The Microbiology Division  
of Thielsch Engineering, Inc.*



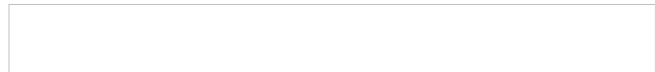
*CERTIFICATE OF ANALYSIS*

Sarah McLeod  
GZA GeoEnvironmental, Inc.  
530 Broadway  
Providence, RI 02909

**RE: Former Tidewater Facility (05.0043654.00)**  
**ESS Laboratory Work Order Number: 1710350**

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard  
Laboratory Director



**Analytical Summary**

The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710350

**SAMPLE RECEIPT**

The following samples were received on October 13, 2017 for the analyses specified on the enclosed Chain of Custody Record.

**Low Level VOA vials were frozen by client on October 12, 2017.**

<u>Lab Number</u>	<u>Sample Name</u>	<u>Matrix</u>	<u>Analysis</u>
1710350-01	GZ-BW-509 2-4ft	Soil	8260B Low, 8270D
1710350-02	TB-101317	Solid	8260B Low





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710350

**PROJECT NARRATIVE**

**5035/8260B Volatile Organic Compounds / Low Level**

CJ71501-BS1 [Blank Spike recovery is below lower control limit \(B-\).](#)

Dichlorodifluoromethane (66% @ 70-130%)

CJ71501-BSD1 [Blank Spike recovery is below lower control limit \(B-\).](#)

Dichlorodifluoromethane (59% @ 70-130%)

**No other observations noted.**

**End of Project Narrative.**

**DATA USABILITY LINKS**

*To ensure you are viewing the most current version of the documents below, please clear your internet cookies for [www.ESSLaboratory.com](http://www.ESSLaboratory.com). Consult your IT Support personnel for information on how to clear your internet cookies.*

[Definitions of Quality Control Parameters](#)

[Semivolatile Organics Internal Standard Information](#)

[Semivolatile Organics Surrogate Information](#)

[Volatile Organics Internal Standard Information](#)

[Volatile Organics Surrogate Information](#)

[EPH and VPH Alkane Lists](#)



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710350

**CURRENT SW-846 METHODOLOGY VERSIONS**

**Analytical Methods**

- 1010A - Flashpoint
- 6010C - ICP
- 6020A - ICP MS
- 7010 - Graphite Furnace
- 7196A - Hexavalent Chromium
- 7470A - Aqueous Mercury
- 7471B - Solid Mercury
- 8011 - EDB/DBCP/TCP
- 8015C - GRO/DRO
- 8081B - Pesticides
- 8082A - PCB
- 8100M - TPH
- 8151A - Herbicides
- 8260B - VOA
- 8270D - SVOA
- 8270D SIM - SVOA Low Level
- 9014 - Cyanide
- 9038 - Sulfate
- 9040C - Aqueous pH
- 9045D - Solid pH (Corrosivity)
- 9050A - Specific Conductance
- 9056A - Anions (IC)
- 9060A - TOC
- 9095B - Paint Filter
- MADEP 04-1.1 - EPH / VPH

**Prep Methods**

- 3005A - Aqueous ICP Digestion
- 3020A - Aqueous Graphite Furnace / ICP MS Digestion
- 3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
- 3060A - Solid Hexavalent Chromium Digestion
- 3510C - Separatory Funnel Extraction
- 3520C - Liquid / Liquid Extraction
- 3540C - Manual Soxhlet Extraction
- 3541 - Automated Soxhlet Extraction
- 3546 - Microwave Extraction
- 3580A - Waste Dilution
- 5030B - Aqueous Purge and Trap
- 5030C - Aqueous Purge and Trap
- 5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-BW-509 2-4ft  
Date Sampled: 10/11/17 15:00  
Percent Solids: 93  
Initial Volume: 6.2  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710350  
ESS Laboratory Sample ID: 1710350-01  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0043)		8260B Low		1	10/15/17 23:46	C7J0231	CJ71501
1,1,1-Trichloroethane	ND (0.0043)		8260B Low		1	10/15/17 23:46	C7J0231	CJ71501
1,1,2,2-Tetrachloroethane	ND (0.0043)		8260B Low		1	10/15/17 23:46	C7J0231	CJ71501
1,1,2-Trichloroethane	ND (0.0043)		8260B Low		1	10/15/17 23:46	C7J0231	CJ71501
1,1-Dichloroethane	ND (0.0043)		8260B Low		1	10/15/17 23:46	C7J0231	CJ71501
1,1-Dichloroethene	ND (0.0043)		8260B Low		1	10/15/17 23:46	C7J0231	CJ71501
1,1-Dichloropropene	ND (0.0043)		8260B Low		1	10/15/17 23:46	C7J0231	CJ71501
1,2,3-Trichlorobenzene	ND (0.0043)		8260B Low		1	10/15/17 23:46	C7J0231	CJ71501
1,2,3-Trichloropropane	ND (0.0043)		8260B Low		1	10/15/17 23:46	C7J0231	CJ71501
1,2,4-Trichlorobenzene	ND (0.0043)		8260B Low		1	10/15/17 23:46	C7J0231	CJ71501
1,2,4-Trimethylbenzene	ND (0.0043)		8260B Low		1	10/15/17 23:46	C7J0231	CJ71501
1,2-Dibromo-3-Chloropropane	ND (0.0043)		8260B Low		1	10/15/17 23:46	C7J0231	CJ71501
1,2-Dibromoethane	ND (0.0043)		8260B Low		1	10/15/17 23:46	C7J0231	CJ71501
1,2-Dichlorobenzene	ND (0.0043)		8260B Low		1	10/15/17 23:46	C7J0231	CJ71501
1,2-Dichloroethane	ND (0.0043)		8260B Low		1	10/15/17 23:46	C7J0231	CJ71501
1,2-Dichloropropane	ND (0.0043)		8260B Low		1	10/15/17 23:46	C7J0231	CJ71501
1,3,5-Trimethylbenzene	ND (0.0043)		8260B Low		1	10/15/17 23:46	C7J0231	CJ71501
1,3-Dichlorobenzene	ND (0.0043)		8260B Low		1	10/15/17 23:46	C7J0231	CJ71501
1,3-Dichloropropane	ND (0.0043)		8260B Low		1	10/15/17 23:46	C7J0231	CJ71501
1,4-Dichlorobenzene	ND (0.0043)		8260B Low		1	10/15/17 23:46	C7J0231	CJ71501
1,4-Dioxane	ND (0.0870)		8260B Low		1	10/15/17 23:46	C7J0231	CJ71501
1-Chlorohexane	ND (0.0043)		8260B Low		1	10/15/17 23:46	C7J0231	CJ71501
2,2-Dichloropropane	ND (0.0043)		8260B Low		1	10/15/17 23:46	C7J0231	CJ71501
2-Butanone	ND (0.0435)		8260B Low		1	10/15/17 23:46	C7J0231	CJ71501
2-Chlorotoluene	ND (0.0043)		8260B Low		1	10/15/17 23:46	C7J0231	CJ71501
2-Hexanone	ND (0.0435)		8260B Low		1	10/15/17 23:46	C7J0231	CJ71501
4-Chlorotoluene	ND (0.0043)		8260B Low		1	10/15/17 23:46	C7J0231	CJ71501
4-Isopropyltoluene	ND (0.0043)		8260B Low		1	10/15/17 23:46	C7J0231	CJ71501
4-Methyl-2-Pentanone	ND (0.0435)		8260B Low		1	10/15/17 23:46	C7J0231	CJ71501
Acetone	ND (0.0435)		8260B Low		1	10/15/17 23:46	C7J0231	CJ71501
Benzene	ND (0.0043)		8260B Low		1	10/15/17 23:46	C7J0231	CJ71501
Bromobenzene	ND (0.0043)		8260B Low		1	10/15/17 23:46	C7J0231	CJ71501



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-BW-509 2-4ft  
Date Sampled: 10/11/17 15:00  
Percent Solids: 93  
Initial Volume: 6.2  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710350  
ESS Laboratory Sample ID: 1710350-01  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0043)		8260B Low		1	10/15/17 23:46	C7J0231	CJ71501
Bromodichloromethane	ND (0.0043)		8260B Low		1	10/15/17 23:46	C7J0231	CJ71501
Bromoform	ND (0.0043)		8260B Low		1	10/15/17 23:46	C7J0231	CJ71501
Bromomethane	ND (0.0087)		8260B Low		1	10/15/17 23:46	C7J0231	CJ71501
Carbon Disulfide	ND (0.0043)		8260B Low		1	10/15/17 23:46	C7J0231	CJ71501
Carbon Tetrachloride	ND (0.0043)		8260B Low		1	10/15/17 23:46	C7J0231	CJ71501
Chlorobenzene	ND (0.0043)		8260B Low		1	10/15/17 23:46	C7J0231	CJ71501
Chloroethane	ND (0.0087)		8260B Low		1	10/15/17 23:46	C7J0231	CJ71501
Chloroform	ND (0.0043)		8260B Low		1	10/15/17 23:46	C7J0231	CJ71501
Chloromethane	ND (0.0087)		8260B Low		1	10/15/17 23:46	C7J0231	CJ71501
cis-1,2-Dichloroethene	ND (0.0043)		8260B Low		1	10/15/17 23:46	C7J0231	CJ71501
cis-1,3-Dichloropropene	ND (0.0043)		8260B Low		1	10/15/17 23:46	C7J0231	CJ71501
Dibromochloromethane	ND (0.0043)		8260B Low		1	10/15/17 23:46	C7J0231	CJ71501
Dibromomethane	ND (0.0043)		8260B Low		1	10/15/17 23:46	C7J0231	CJ71501
Dichlorodifluoromethane	ND (0.0087)		8260B Low		1	10/15/17 23:46	C7J0231	CJ71501
Diethyl Ether	ND (0.0043)		8260B Low		1	10/15/17 23:46	C7J0231	CJ71501
Di-isopropyl ether	ND (0.0043)		8260B Low		1	10/15/17 23:46	C7J0231	CJ71501
Ethyl tertiary-butyl ether	ND (0.0043)		8260B Low		1	10/15/17 23:46	C7J0231	CJ71501
Ethylbenzene	ND (0.0043)		8260B Low		1	10/15/17 23:46	C7J0231	CJ71501
Hexachlorobutadiene	ND (0.0043)		8260B Low		1	10/15/17 23:46	C7J0231	CJ71501
Isopropylbenzene	ND (0.0043)		8260B Low		1	10/15/17 23:46	C7J0231	CJ71501
Methyl tert-Butyl Ether	ND (0.0043)		8260B Low		1	10/15/17 23:46	C7J0231	CJ71501
Methylene Chloride	ND (0.0217)		8260B Low		1	10/15/17 23:46	C7J0231	CJ71501
<b>Naphthalene</b>	<b>0.0048</b> (0.0043)		8260B Low		1	10/15/17 23:46	C7J0231	CJ71501
n-Butylbenzene	ND (0.0043)		8260B Low		1	10/15/17 23:46	C7J0231	CJ71501
n-Propylbenzene	ND (0.0043)		8260B Low		1	10/15/17 23:46	C7J0231	CJ71501
sec-Butylbenzene	ND (0.0043)		8260B Low		1	10/15/17 23:46	C7J0231	CJ71501
Styrene	ND (0.0043)		8260B Low		1	10/15/17 23:46	C7J0231	CJ71501
tert-Butylbenzene	ND (0.0043)		8260B Low		1	10/15/17 23:46	C7J0231	CJ71501
Tertiary-amyl methyl ether	ND (0.0043)		8260B Low		1	10/15/17 23:46	C7J0231	CJ71501
Tetrachloroethene	ND (0.0043)		8260B Low		1	10/15/17 23:46	C7J0231	CJ71501
Tetrahydrofuran	ND (0.0043)		8260B Low		1	10/15/17 23:46	C7J0231	CJ71501



# ESS Laboratory

Division of Thielsch Engineering, Inc.

# BAL Laboratory

The Microbiology Division  
of Thielsch Engineering, Inc.



## CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-BW-509 2-4ft  
 Date Sampled: 10/11/17 15:00  
 Percent Solids: 93  
 Initial Volume: 6.2  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1710350  
 ESS Laboratory Sample ID: 1710350-01  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

### 5035/8260B Volatile Organic Compounds / Low Level

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0043)		8260B Low		1	10/15/17 23:46	C7J0231	CJ71501
trans-1,2-Dichloroethene	ND (0.0043)		8260B Low		1	10/15/17 23:46	C7J0231	CJ71501
trans-1,3-Dichloropropene	ND (0.0043)		8260B Low		1	10/15/17 23:46	C7J0231	CJ71501
Trichloroethene	ND (0.0043)		8260B Low		1	10/15/17 23:46	C7J0231	CJ71501
Trichlorofluoromethane	ND (0.0043)		8260B Low		1	10/15/17 23:46	C7J0231	CJ71501
Vinyl Acetate	ND (0.0043)		8260B Low		1	10/15/17 23:46	C7J0231	CJ71501
Vinyl Chloride	ND (0.0087)		8260B Low		1	10/15/17 23:46	C7J0231	CJ71501
Xylene O	ND (0.0043)		8260B Low		1	10/15/17 23:46	C7J0231	CJ71501
Xylene P,M	ND (0.0087)		8260B Low		1	10/15/17 23:46	C7J0231	CJ71501
Xylenes (Total)	ND (0.0087)		8260B Low		1	10/15/17 23:46		[CALC]

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: 1,2-Dichloroethane-d4	109 %		70-130
Surrogate: 4-Bromofluorobenzene	97 %		70-130
Surrogate: Dibromofluoromethane	105 %		70-130
Surrogate: Toluene-d8	102 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-BW-509 2-4ft  
 Date Sampled: 10/11/17 15:00  
 Percent Solids: 93  
 Initial Volume: 15.8  
 Final Volume: 1  
 Extraction Method: 3546

ESS Laboratory Work Order: 1710350  
 ESS Laboratory Sample ID: 1710350-01  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: TJ  
 Prepared: 10/16/17 15:49

**8270D Semi-Volatile Organic Compounds**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Naphthalene	1.34 (0.684)		8270D		2	10/18/17 4:29	C7J0278	CJ71621

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	49 %		30-130
<i>Surrogate: 2,4,6-Tribromophenol</i>	100 %		30-130
<i>Surrogate: 2-Chlorophenol-d4</i>	59 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	84 %		30-130
<i>Surrogate: 2-Fluorophenol</i>	54 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	60 %		30-130
<i>Surrogate: Phenol-d6</i>	68 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	84 %		30-130





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: TB-101317  
Date Sampled: 10/11/17 00:00  
Percent Solids: N/A  
Initial Volume: 5  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710350  
ESS Laboratory Sample ID: 1710350-02  
Sample Matrix: Solid  
Units: mg/kg wet  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0050)		8260B Low		1	10/15/17 16:33	C7J0231	CJ71501
1,1,1-Trichloroethane	ND (0.0050)		8260B Low		1	10/15/17 16:33	C7J0231	CJ71501
1,1,2,2-Tetrachloroethane	ND (0.0050)		8260B Low		1	10/15/17 16:33	C7J0231	CJ71501
1,1,2-Trichloroethane	ND (0.0050)		8260B Low		1	10/15/17 16:33	C7J0231	CJ71501
1,1-Dichloroethane	ND (0.0050)		8260B Low		1	10/15/17 16:33	C7J0231	CJ71501
1,1-Dichloroethene	ND (0.0050)		8260B Low		1	10/15/17 16:33	C7J0231	CJ71501
1,1-Dichloropropene	ND (0.0050)		8260B Low		1	10/15/17 16:33	C7J0231	CJ71501
1,2,3-Trichlorobenzene	ND (0.0050)		8260B Low		1	10/15/17 16:33	C7J0231	CJ71501
1,2,3-Trichloropropane	ND (0.0050)		8260B Low		1	10/15/17 16:33	C7J0231	CJ71501
1,2,4-Trichlorobenzene	ND (0.0050)		8260B Low		1	10/15/17 16:33	C7J0231	CJ71501
1,2,4-Trimethylbenzene	ND (0.0050)		8260B Low		1	10/15/17 16:33	C7J0231	CJ71501
1,2-Dibromo-3-Chloropropane	ND (0.0050)		8260B Low		1	10/15/17 16:33	C7J0231	CJ71501
1,2-Dibromoethane	ND (0.0050)		8260B Low		1	10/15/17 16:33	C7J0231	CJ71501
1,2-Dichlorobenzene	ND (0.0050)		8260B Low		1	10/15/17 16:33	C7J0231	CJ71501
1,2-Dichloroethane	ND (0.0050)		8260B Low		1	10/15/17 16:33	C7J0231	CJ71501
1,2-Dichloropropane	ND (0.0050)		8260B Low		1	10/15/17 16:33	C7J0231	CJ71501
1,3,5-Trimethylbenzene	ND (0.0050)		8260B Low		1	10/15/17 16:33	C7J0231	CJ71501
1,3-Dichlorobenzene	ND (0.0050)		8260B Low		1	10/15/17 16:33	C7J0231	CJ71501
1,3-Dichloropropane	ND (0.0050)		8260B Low		1	10/15/17 16:33	C7J0231	CJ71501
1,4-Dichlorobenzene	ND (0.0050)		8260B Low		1	10/15/17 16:33	C7J0231	CJ71501
1,4-Dioxane	ND (0.100)		8260B Low		1	10/15/17 16:33	C7J0231	CJ71501
1-Chlorohexane	ND (0.0050)		8260B Low		1	10/15/17 16:33	C7J0231	CJ71501
2,2-Dichloropropane	ND (0.0050)		8260B Low		1	10/15/17 16:33	C7J0231	CJ71501
2-Butanone	ND (0.0500)		8260B Low		1	10/15/17 16:33	C7J0231	CJ71501
2-Chlorotoluene	ND (0.0050)		8260B Low		1	10/15/17 16:33	C7J0231	CJ71501
2-Hexanone	ND (0.0500)		8260B Low		1	10/15/17 16:33	C7J0231	CJ71501
4-Chlorotoluene	ND (0.0050)		8260B Low		1	10/15/17 16:33	C7J0231	CJ71501
4-Isopropyltoluene	ND (0.0050)		8260B Low		1	10/15/17 16:33	C7J0231	CJ71501
4-Methyl-2-Pentanone	ND (0.0500)		8260B Low		1	10/15/17 16:33	C7J0231	CJ71501
Acetone	ND (0.0500)		8260B Low		1	10/15/17 16:33	C7J0231	CJ71501
Benzene	ND (0.0050)		8260B Low		1	10/15/17 16:33	C7J0231	CJ71501
Bromobenzene	ND (0.0050)		8260B Low		1	10/15/17 16:33	C7J0231	CJ71501



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: TB-101317  
Date Sampled: 10/11/17 00:00  
Percent Solids: N/A  
Initial Volume: 5  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710350  
ESS Laboratory Sample ID: 1710350-02  
Sample Matrix: Solid  
Units: mg/kg wet  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0050)		8260B Low		1	10/15/17 16:33	C7J0231	CJ71501
Bromodichloromethane	ND (0.0050)		8260B Low		1	10/15/17 16:33	C7J0231	CJ71501
Bromoform	ND (0.0050)		8260B Low		1	10/15/17 16:33	C7J0231	CJ71501
Bromomethane	ND (0.0100)		8260B Low		1	10/15/17 16:33	C7J0231	CJ71501
Carbon Disulfide	ND (0.0050)		8260B Low		1	10/15/17 16:33	C7J0231	CJ71501
Carbon Tetrachloride	ND (0.0050)		8260B Low		1	10/15/17 16:33	C7J0231	CJ71501
Chlorobenzene	ND (0.0050)		8260B Low		1	10/15/17 16:33	C7J0231	CJ71501
Chloroethane	ND (0.0100)		8260B Low		1	10/15/17 16:33	C7J0231	CJ71501
Chloroform	ND (0.0050)		8260B Low		1	10/15/17 16:33	C7J0231	CJ71501
Chloromethane	ND (0.0100)		8260B Low		1	10/15/17 16:33	C7J0231	CJ71501
cis-1,2-Dichloroethene	ND (0.0050)		8260B Low		1	10/15/17 16:33	C7J0231	CJ71501
cis-1,3-Dichloropropene	ND (0.0050)		8260B Low		1	10/15/17 16:33	C7J0231	CJ71501
Dibromochloromethane	ND (0.0050)		8260B Low		1	10/15/17 16:33	C7J0231	CJ71501
Dibromomethane	ND (0.0050)		8260B Low		1	10/15/17 16:33	C7J0231	CJ71501
Dichlorodifluoromethane	ND (0.0100)		8260B Low		1	10/15/17 16:33	C7J0231	CJ71501
Diethyl Ether	ND (0.0050)		8260B Low		1	10/15/17 16:33	C7J0231	CJ71501
Di-isopropyl ether	ND (0.0050)		8260B Low		1	10/15/17 16:33	C7J0231	CJ71501
Ethyl tertiary-butyl ether	ND (0.0050)		8260B Low		1	10/15/17 16:33	C7J0231	CJ71501
Ethylbenzene	ND (0.0050)		8260B Low		1	10/15/17 16:33	C7J0231	CJ71501
Hexachlorobutadiene	ND (0.0050)		8260B Low		1	10/15/17 16:33	C7J0231	CJ71501
Isopropylbenzene	ND (0.0050)		8260B Low		1	10/15/17 16:33	C7J0231	CJ71501
Methyl tert-Butyl Ether	ND (0.0050)		8260B Low		1	10/15/17 16:33	C7J0231	CJ71501
Methylene Chloride	ND (0.0250)		8260B Low		1	10/15/17 16:33	C7J0231	CJ71501
Naphthalene	ND (0.0050)		8260B Low		1	10/15/17 16:33	C7J0231	CJ71501
n-Butylbenzene	ND (0.0050)		8260B Low		1	10/15/17 16:33	C7J0231	CJ71501
n-Propylbenzene	ND (0.0050)		8260B Low		1	10/15/17 16:33	C7J0231	CJ71501
sec-Butylbenzene	ND (0.0050)		8260B Low		1	10/15/17 16:33	C7J0231	CJ71501
Styrene	ND (0.0050)		8260B Low		1	10/15/17 16:33	C7J0231	CJ71501
tert-Butylbenzene	ND (0.0050)		8260B Low		1	10/15/17 16:33	C7J0231	CJ71501
Tertiary-amyl methyl ether	ND (0.0050)		8260B Low		1	10/15/17 16:33	C7J0231	CJ71501
Tetrachloroethene	ND (0.0050)		8260B Low		1	10/15/17 16:33	C7J0231	CJ71501
Tetrahydrofuran	ND (0.0050)		8260B Low		1	10/15/17 16:33	C7J0231	CJ71501



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: TB-101317  
 Date Sampled: 10/11/17 00:00  
 Percent Solids: N/A  
 Initial Volume: 5  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1710350  
 ESS Laboratory Sample ID: 1710350-02  
 Sample Matrix: Solid  
 Units: mg/kg wet  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0050)		8260B Low		1	10/15/17 16:33	C7J0231	CJ71501
trans-1,2-Dichloroethene	ND (0.0050)		8260B Low		1	10/15/17 16:33	C7J0231	CJ71501
trans-1,3-Dichloropropene	ND (0.0050)		8260B Low		1	10/15/17 16:33	C7J0231	CJ71501
Trichloroethene	ND (0.0050)		8260B Low		1	10/15/17 16:33	C7J0231	CJ71501
Trichlorofluoromethane	ND (0.0050)		8260B Low		1	10/15/17 16:33	C7J0231	CJ71501
Vinyl Acetate	ND (0.0050)		8260B Low		1	10/15/17 16:33	C7J0231	CJ71501
Vinyl Chloride	ND (0.0100)		8260B Low		1	10/15/17 16:33	C7J0231	CJ71501
Xylene O	ND (0.0050)		8260B Low		1	10/15/17 16:33	C7J0231	CJ71501
Xylene P,M	ND (0.0100)		8260B Low		1	10/15/17 16:33	C7J0231	CJ71501
Xylenes (Total)	ND (0.0100)		8260B Low		1	10/15/17 16:33		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	93 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	103 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	96 %		70-130
<i>Surrogate: Toluene-d8</i>	104 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710350

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CJ71501 - 5035**

**Blank**

1,1,1,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,1-Trichloroethane	ND	0.0050	mg/kg wet							
1,1,2,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,2-Trichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethene	ND	0.0050	mg/kg wet							
1,1-Dichloropropene	ND	0.0050	mg/kg wet							
1,2,3-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,3-Trichloropropane	ND	0.0050	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,4-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,2-Dibromo-3-Chloropropane	ND	0.0050	mg/kg wet							
1,2-Dibromoethane	ND	0.0050	mg/kg wet							
1,2-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,2-Dichloroethane	ND	0.0050	mg/kg wet							
1,2-Dichloropropane	ND	0.0050	mg/kg wet							
1,3,5-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,3-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,3-Dichloropropane	ND	0.0050	mg/kg wet							
1,4-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,4-Dioxane	ND	0.100	mg/kg wet							
1-Chlorohexane	ND	0.0050	mg/kg wet							
2,2-Dichloropropane	ND	0.0050	mg/kg wet							
2-Butanone	ND	0.0500	mg/kg wet							
2-Chlorotoluene	ND	0.0050	mg/kg wet							
2-Hexanone	ND	0.0500	mg/kg wet							
4-Chlorotoluene	ND	0.0050	mg/kg wet							
4-Isopropyltoluene	ND	0.0050	mg/kg wet							
4-Methyl-2-Pentanone	ND	0.0500	mg/kg wet							
Acetone	ND	0.0500	mg/kg wet							
Benzene	ND	0.0050	mg/kg wet							
Bromobenzene	ND	0.0050	mg/kg wet							
Bromochloromethane	ND	0.0050	mg/kg wet							
Bromodichloromethane	ND	0.0050	mg/kg wet							
Bromoform	ND	0.0050	mg/kg wet							
Bromomethane	ND	0.0100	mg/kg wet							
Carbon Disulfide	ND	0.0050	mg/kg wet							
Carbon Tetrachloride	ND	0.0050	mg/kg wet							
Chlorobenzene	ND	0.0050	mg/kg wet							
Chloroethane	ND	0.0100	mg/kg wet							
Chloroform	ND	0.0050	mg/kg wet							
Chloromethane	ND	0.0100	mg/kg wet							
cis-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
cis-1,3-Dichloropropene	ND	0.0050	mg/kg wet							



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710350

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CJ71501 - 5035**

Dibromochloromethane	ND	0.0050	mg/kg wet							
Dibromomethane	ND	0.0050	mg/kg wet							
Dichlorodifluoromethane	ND	0.0100	mg/kg wet							
Diethyl Ether	ND	0.0050	mg/kg wet							
Di-isopropyl ether	ND	0.0050	mg/kg wet							
Ethyl tertiary-butyl ether	ND	0.0050	mg/kg wet							
Ethylbenzene	ND	0.0050	mg/kg wet							
Hexachlorobutadiene	ND	0.0050	mg/kg wet							
Isopropylbenzene	ND	0.0050	mg/kg wet							
Methyl tert-Butyl Ether	ND	0.0050	mg/kg wet							
Methylene Chloride	ND	0.0250	mg/kg wet							
Naphthalene	ND	0.0050	mg/kg wet							
n-Butylbenzene	ND	0.0050	mg/kg wet							
n-Propylbenzene	ND	0.0050	mg/kg wet							
sec-Butylbenzene	ND	0.0050	mg/kg wet							
Styrene	ND	0.0050	mg/kg wet							
tert-Butylbenzene	ND	0.0050	mg/kg wet							
Tertiary-amyl methyl ether	ND	0.0050	mg/kg wet							
Tetrachloroethene	ND	0.0050	mg/kg wet							
Tetrahydrofuran	ND	0.0050	mg/kg wet							
Toluene	ND	0.0050	mg/kg wet							
trans-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
trans-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Trichloroethene	ND	0.0050	mg/kg wet							
Trichlorofluoromethane	ND	0.0050	mg/kg wet							
Vinyl Acetate	ND	0.0050	mg/kg wet							
Vinyl Chloride	ND	0.0100	mg/kg wet							
Xylene O	ND	0.0050	mg/kg wet							
Xylene P,M	ND	0.0100	mg/kg wet							
Xylenes (Total)	ND	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	0.0453		mg/kg wet	0.05000		91	70-130			
Surrogate: 4-Bromofluorobenzene	0.0515		mg/kg wet	0.05000		103	70-130			
Surrogate: Dibromofluoromethane	0.0476		mg/kg wet	0.05000		95	70-130			
Surrogate: Toluene-d8	0.0525		mg/kg wet	0.05000		105	70-130			

**LCS**

1,1,1,2-Tetrachloroethane	0.0502	0.0050	mg/kg wet	0.05000		100	70-130			
1,1,1-Trichloroethane	0.0455	0.0050	mg/kg wet	0.05000		91	70-130			
1,1,2,2-Tetrachloroethane	0.0532	0.0050	mg/kg wet	0.05000		106	70-130			
1,1,2-Trichloroethane	0.0506	0.0050	mg/kg wet	0.05000		101	70-130			
1,1-Dichloroethane	0.0459	0.0050	mg/kg wet	0.05000		92	70-130			
1,1-Dichloroethene	0.0500	0.0050	mg/kg wet	0.05000		100	70-130			
1,1-Dichloropropene	0.0486	0.0050	mg/kg wet	0.05000		97	70-130			
1,2,3-Trichlorobenzene	0.0547	0.0050	mg/kg wet	0.05000		109	70-130			
1,2,3-Trichloropropane	0.0528	0.0050	mg/kg wet	0.05000		106	70-130			
1,2,4-Trichlorobenzene	0.0542	0.0050	mg/kg wet	0.05000		108	70-130			



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710350

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CJ71501 - 5035**

1,2,4-Trimethylbenzene	0.0526	0.0050	mg/kg wet	0.05000		105	70-130			
1,2-Dibromo-3-Chloropropane	0.0470	0.0050	mg/kg wet	0.05000		94	70-130			
1,2-Dibromoethane	0.0556	0.0050	mg/kg wet	0.05000		111	70-130			
1,2-Dichlorobenzene	0.0521	0.0050	mg/kg wet	0.05000		104	70-130			
1,2-Dichloroethane	0.0476	0.0050	mg/kg wet	0.05000		95	70-130			
1,2-Dichloropropane	0.0494	0.0050	mg/kg wet	0.05000		99	70-130			
1,3,5-Trimethylbenzene	0.0512	0.0050	mg/kg wet	0.05000		102	70-130			
1,3-Dichlorobenzene	0.0513	0.0050	mg/kg wet	0.05000		103	70-130			
1,3-Dichloropropane	0.0555	0.0050	mg/kg wet	0.05000		111	70-130			
1,4-Dichlorobenzene	0.0503	0.0050	mg/kg wet	0.05000		101	70-130			
1,4-Dioxane	1.01	0.100	mg/kg wet	1.000		101	70-130			
1-Chlorohexane	0.0528	0.0050	mg/kg wet	0.05000		106	70-130			
2,2-Dichloropropane	0.0450	0.0050	mg/kg wet	0.05000		90	70-130			
2-Butanone	0.256	0.0500	mg/kg wet	0.2500		102	70-130			
2-Chlorotoluene	0.0497	0.0050	mg/kg wet	0.05000		99	70-130			
2-Hexanone	0.264	0.0500	mg/kg wet	0.2500		106	70-130			
4-Chlorotoluene	0.0502	0.0050	mg/kg wet	0.05000		100	70-130			
4-Isopropyltoluene	0.0506	0.0050	mg/kg wet	0.05000		101	70-130			
4-Methyl-2-Pentanone	0.254	0.0500	mg/kg wet	0.2500		102	70-130			
Acetone	0.246	0.0500	mg/kg wet	0.2500		99	70-130			
Benzene	0.0479	0.0050	mg/kg wet	0.05000		96	70-130			
Bromobenzene	0.0532	0.0050	mg/kg wet	0.05000		106	70-130			
Bromochloromethane	0.0493	0.0050	mg/kg wet	0.05000		99	70-130			
Bromodichloromethane	0.0494	0.0050	mg/kg wet	0.05000		99	70-130			
Bromoform	0.0455	0.0050	mg/kg wet	0.05000		91	70-130			
Bromomethane	0.0445	0.0100	mg/kg wet	0.05000		89	70-130			
Carbon Disulfide	0.0491	0.0050	mg/kg wet	0.05000		98	70-130			
Carbon Tetrachloride	0.0441	0.0050	mg/kg wet	0.05000		88	70-130			
Chlorobenzene	0.0507	0.0050	mg/kg wet	0.05000		101	70-130			
Chloroethane	0.0449	0.0100	mg/kg wet	0.05000		90	70-130			
Chloroform	0.0462	0.0050	mg/kg wet	0.05000		92	70-130			
Chloromethane	0.0451	0.0100	mg/kg wet	0.05000		90	70-130			
cis-1,2-Dichloroethene	0.0486	0.0050	mg/kg wet	0.05000		97	70-130			
cis-1,3-Dichloropropene	0.0545	0.0050	mg/kg wet	0.05000		109	70-130			
Dibromochloromethane	0.0489	0.0050	mg/kg wet	0.05000		98	70-130			
Dibromomethane	0.0481	0.0050	mg/kg wet	0.05000		96	70-130			
Dichlorodifluoromethane	0.0331	0.0100	mg/kg wet	0.05000		66	70-130			
Diethyl Ether	0.0540	0.0050	mg/kg wet	0.05000		108	70-130			
Di-isopropyl ether	0.0493	0.0050	mg/kg wet	0.05000		99	70-130			
Ethyl tertiary-butyl ether	0.0518	0.0050	mg/kg wet	0.05000		104	70-130			
Ethylbenzene	0.0509	0.0050	mg/kg wet	0.05000		102	70-130			
Hexachlorobutadiene	0.0516	0.0050	mg/kg wet	0.05000		103	70-130			
Isopropylbenzene	0.0495	0.0050	mg/kg wet	0.05000		99	70-130			
Methyl tert-Butyl Ether	0.0536	0.0050	mg/kg wet	0.05000		107	70-130			
Methylene Chloride	0.0503	0.0250	mg/kg wet	0.05000		101	70-130			

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CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710350

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CJ71501 - 5035**

Naphthalene	0.0512	0.0050	mg/kg wet	0.05000		102	70-130			
n-Butylbenzene	0.0501	0.0050	mg/kg wet	0.05000		100	70-130			
n-Propylbenzene	0.0513	0.0050	mg/kg wet	0.05000		103	70-130			
sec-Butylbenzene	0.0496	0.0050	mg/kg wet	0.05000		99	70-130			
Styrene	0.0536	0.0050	mg/kg wet	0.05000		107	70-130			
tert-Butylbenzene	0.0513	0.0050	mg/kg wet	0.05000		103	70-130			
Tertiary-amyl methyl ether	0.0525	0.0050	mg/kg wet	0.05000		105	70-130			
Tetrachloroethene	0.0504	0.0050	mg/kg wet	0.05000		101	70-130			
Tetrahydrofuran	0.0505	0.0050	mg/kg wet	0.05000		101	70-130			
Toluene	0.0480	0.0050	mg/kg wet	0.05000		96	70-130			
trans-1,2-Dichloroethene	0.0499	0.0050	mg/kg wet	0.05000		100	70-130			
trans-1,3-Dichloropropene	0.0481	0.0050	mg/kg wet	0.05000		96	70-130			
Trichloroethene	0.0477	0.0050	mg/kg wet	0.05000		95	70-130			
Trichlorofluoromethane	0.0426	0.0050	mg/kg wet	0.05000		85	70-130			
Vinyl Acetate	0.0495	0.0050	mg/kg wet	0.05000		99	70-130			
Vinyl Chloride	0.0472	0.0100	mg/kg wet	0.05000		94	70-130			
Xylene O	0.0525	0.0050	mg/kg wet	0.05000		105	70-130			
Xylene P,M	0.106	0.0100	mg/kg wet	0.1000		106	70-130			
Xylenes (Total)	0.158	0.0100	mg/kg wet							
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0425</i>		mg/kg wet	<i>0.05000</i>		<i>85</i>	<i>70-130</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0460</i>		mg/kg wet	<i>0.05000</i>		<i>92</i>	<i>70-130</i>			
<i>Surrogate: Dibromofluoromethane</i>	<i>0.0439</i>		mg/kg wet	<i>0.05000</i>		<i>88</i>	<i>70-130</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0481</i>		mg/kg wet	<i>0.05000</i>		<i>96</i>	<i>70-130</i>			

**LCS Dup**

1,1,1,2-Tetrachloroethane	0.0458	0.0050	mg/kg wet	0.05000		92	70-130	9	25	
1,1,1-Trichloroethane	0.0409	0.0050	mg/kg wet	0.05000		82	70-130	11	25	
1,1,2,2-Tetrachloroethane	0.0467	0.0050	mg/kg wet	0.05000		93	70-130	13	25	
1,1,2-Trichloroethane	0.0444	0.0050	mg/kg wet	0.05000		89	70-130	13	25	
1,1-Dichloroethane	0.0414	0.0050	mg/kg wet	0.05000		83	70-130	10	25	
1,1-Dichloroethene	0.0449	0.0050	mg/kg wet	0.05000		90	70-130	11	25	
1,1-Dichloropropene	0.0439	0.0050	mg/kg wet	0.05000		88	70-130	10	25	
1,2,3-Trichlorobenzene	0.0484	0.0050	mg/kg wet	0.05000		97	70-130	12	25	
1,2,3-Trichloropropane	0.0462	0.0050	mg/kg wet	0.05000		92	70-130	13	25	
1,2,4-Trichlorobenzene	0.0483	0.0050	mg/kg wet	0.05000		97	70-130	12	25	
1,2,4-Trimethylbenzene	0.0475	0.0050	mg/kg wet	0.05000		95	70-130	10	25	
1,2-Dibromo-3-Chloropropane	0.0401	0.0050	mg/kg wet	0.05000		80	70-130	16	25	
1,2-Dibromoethane	0.0493	0.0050	mg/kg wet	0.05000		99	70-130	12	25	
1,2-Dichlorobenzene	0.0467	0.0050	mg/kg wet	0.05000		93	70-130	11	25	
1,2-Dichloroethane	0.0422	0.0050	mg/kg wet	0.05000		84	70-130	12	25	
1,2-Dichloropropane	0.0440	0.0050	mg/kg wet	0.05000		88	70-130	12	25	
1,3,5-Trimethylbenzene	0.0467	0.0050	mg/kg wet	0.05000		93	70-130	9	25	
1,3-Dichlorobenzene	0.0463	0.0050	mg/kg wet	0.05000		93	70-130	10	25	
1,3-Dichloropropane	0.0497	0.0050	mg/kg wet	0.05000		99	70-130	11	25	
1,4-Dichlorobenzene	0.0454	0.0050	mg/kg wet	0.05000		91	70-130	10	25	
1,4-Dioxane	0.924	0.100	mg/kg wet	1.000		92	70-130	9	20	



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710350

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CJ71501 - 5035**

1-Chlorohexane	0.0480	0.0050	mg/kg wet	0.05000		96	70-130	10	25	
2,2-Dichloropropane	0.0400	0.0050	mg/kg wet	0.05000		80	70-130	12	25	
2-Butanone	0.223	0.0500	mg/kg wet	0.2500		89	70-130	14	25	
2-Chlorotoluene	0.0452	0.0050	mg/kg wet	0.05000		90	70-130	10	25	
2-Hexanone	0.229	0.0500	mg/kg wet	0.2500		92	70-130	14	25	
4-Chlorotoluene	0.0455	0.0050	mg/kg wet	0.05000		91	70-130	10	25	
4-Isopropyltoluene	0.0457	0.0050	mg/kg wet	0.05000		91	70-130	10	25	
4-Methyl-2-Pentanone	0.217	0.0500	mg/kg wet	0.2500		87	70-130	16	25	
Acetone	0.211	0.0500	mg/kg wet	0.2500		85	70-130	15	25	
Benzene	0.0427	0.0050	mg/kg wet	0.05000		85	70-130	12	25	
Bromobenzene	0.0478	0.0050	mg/kg wet	0.05000		96	70-130	11	25	
Bromochloromethane	0.0431	0.0050	mg/kg wet	0.05000		86	70-130	13	25	
Bromodichloromethane	0.0436	0.0050	mg/kg wet	0.05000		87	70-130	13	25	
Bromoform	0.0404	0.0050	mg/kg wet	0.05000		81	70-130	12	25	
Bromomethane	0.0406	0.0100	mg/kg wet	0.05000		81	70-130	9	25	
Carbon Disulfide	0.0438	0.0050	mg/kg wet	0.05000		88	70-130	11	25	
Carbon Tetrachloride	0.0399	0.0050	mg/kg wet	0.05000		80	70-130	10	25	
Chlorobenzene	0.0457	0.0050	mg/kg wet	0.05000		91	70-130	10	25	
Chloroethane	0.0404	0.0100	mg/kg wet	0.05000		81	70-130	11	25	
Chloroform	0.0412	0.0050	mg/kg wet	0.05000		82	70-130	11	25	
Chloromethane	0.0404	0.0100	mg/kg wet	0.05000		81	70-130	11	25	
cis-1,2-Dichloroethene	0.0434	0.0050	mg/kg wet	0.05000		87	70-130	11	25	
cis-1,3-Dichloropropene	0.0483	0.0050	mg/kg wet	0.05000		97	70-130	12	25	
Dibromochloromethane	0.0435	0.0050	mg/kg wet	0.05000		87	70-130	12	25	
Dibromomethane	0.0416	0.0050	mg/kg wet	0.05000		83	70-130	14	25	
Dichlorodifluoromethane	0.0295	0.0100	mg/kg wet	0.05000		59	70-130	11	25	B-
Diethyl Ether	0.0473	0.0050	mg/kg wet	0.05000		95	70-130	13	25	
Di-isopropyl ether	0.0441	0.0050	mg/kg wet	0.05000		88	70-130	11	25	
Ethyl tertiary-butyl ether	0.0456	0.0050	mg/kg wet	0.05000		91	70-130	13	25	
Ethylbenzene	0.0462	0.0050	mg/kg wet	0.05000		92	70-130	10	25	
Hexachlorobutadiene	0.0468	0.0050	mg/kg wet	0.05000		94	70-130	10	25	
Isopropylbenzene	0.0449	0.0050	mg/kg wet	0.05000		90	70-130	10	25	
Methyl tert-Butyl Ether	0.0469	0.0050	mg/kg wet	0.05000		94	70-130	13	25	
Methylene Chloride	0.0440	0.0250	mg/kg wet	0.05000		88	70-130	13	25	
Naphthalene	0.0453	0.0050	mg/kg wet	0.05000		91	70-130	12	25	
n-Butylbenzene	0.0454	0.0050	mg/kg wet	0.05000		91	70-130	10	25	
n-Propylbenzene	0.0467	0.0050	mg/kg wet	0.05000		93	70-130	9	25	
sec-Butylbenzene	0.0450	0.0050	mg/kg wet	0.05000		90	70-130	10	25	
Styrene	0.0482	0.0050	mg/kg wet	0.05000		96	70-130	11	25	
tert-Butylbenzene	0.0469	0.0050	mg/kg wet	0.05000		94	70-130	9	25	
Tertiary-amyl methyl ether	0.0458	0.0050	mg/kg wet	0.05000		92	70-130	14	25	
Tetrachloroethene	0.0459	0.0050	mg/kg wet	0.05000		92	70-130	9	25	
Tetrahydrofuran	0.0435	0.0050	mg/kg wet	0.05000		87	70-130	15	25	
Toluene	0.0430	0.0050	mg/kg wet	0.05000		86	70-130	11	25	
trans-1,2-Dichloroethene	0.0447	0.0050	mg/kg wet	0.05000		89	70-130	11	25	



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710350

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CJ71501 - 5035**

trans-1,3-Dichloropropene	0.0430	0.0050	mg/kg wet	0.05000		86	70-130	11	25	
Trichloroethene	0.0424	0.0050	mg/kg wet	0.05000		85	70-130	12	25	
Trichlorofluoromethane	0.0387	0.0050	mg/kg wet	0.05000		77	70-130	10	25	
Vinyl Acetate	0.0434	0.0050	mg/kg wet	0.05000		87	70-130	13	25	
Vinyl Chloride	0.0422	0.0100	mg/kg wet	0.05000		84	70-130	11	25	
Xylene O	0.0475	0.0050	mg/kg wet	0.05000		95	70-130	10	25	
Xylene P,M	0.0949	0.0100	mg/kg wet	0.1000		95	70-130	11	25	
Xylenes (Total)	0.142	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	0.0418		mg/kg wet	0.05000		84	70-130			
Surrogate: 4-Bromofluorobenzene	0.0459		mg/kg wet	0.05000		92	70-130			
Surrogate: Dibromofluoromethane	0.0432		mg/kg wet	0.05000		86	70-130			
Surrogate: Toluene-d8	0.0487		mg/kg wet	0.05000		97	70-130			

8270D Semi-Volatile Organic Compounds

**Batch CJ71621 - 3546**

<b>Blank</b>										
Naphthalene	ND	0.167	mg/kg wet							
Surrogate: 1,2-Dichlorobenzene-d4	2.41		mg/kg wet	3.333		72	30-130			
Surrogate: 2,4,6-Tribromophenol	3.70		mg/kg wet	5.000		74	30-130			
Surrogate: 2-Chlorophenol-d4	3.62		mg/kg wet	5.000		72	30-130			
Surrogate: 2-Fluorobiphenyl	2.51		mg/kg wet	3.333		75	30-130			
Surrogate: 2-Fluorophenol	3.59		mg/kg wet	5.000		72	30-130			
Surrogate: Nitrobenzene-d5	2.53		mg/kg wet	3.333		76	30-130			
Surrogate: Phenol-d6	3.73		mg/kg wet	5.000		75	30-130			
Surrogate: p-Terphenyl-d14	3.12		mg/kg wet	3.333		93	30-130			

<b>LCS</b>										
Naphthalene	2.10	0.333	mg/kg wet	3.333		63	40-140			
Surrogate: 1,2-Dichlorobenzene-d4	2.18		mg/kg wet	3.333		65	30-130			
Surrogate: 2,4,6-Tribromophenol	4.67		mg/kg wet	5.000		93	30-130			
Surrogate: 2-Chlorophenol-d4	3.31		mg/kg wet	5.000		66	30-130			
Surrogate: 2-Fluorobiphenyl	2.37		mg/kg wet	3.333		71	30-130			
Surrogate: 2-Fluorophenol	3.33		mg/kg wet	5.000		67	30-130			
Surrogate: Nitrobenzene-d5	2.39		mg/kg wet	3.333		72	30-130			
Surrogate: Phenol-d6	3.38		mg/kg wet	5.000		68	30-130			
Surrogate: p-Terphenyl-d14	3.23		mg/kg wet	3.333		97	30-130			

<b>LCS Dup</b>										
Naphthalene	2.43	0.333	mg/kg wet	3.333		73	40-140	15	30	
Surrogate: 1,2-Dichlorobenzene-d4	2.43		mg/kg wet	3.333		73	30-130			
Surrogate: 2,4,6-Tribromophenol	4.95		mg/kg wet	5.000		99	30-130			
Surrogate: 2-Chlorophenol-d4	3.67		mg/kg wet	5.000		73	30-130			
Surrogate: 2-Fluorobiphenyl	2.67		mg/kg wet	3.333		80	30-130			
Surrogate: 2-Fluorophenol	3.72		mg/kg wet	5.000		74	30-130			
Surrogate: Nitrobenzene-d5	2.69		mg/kg wet	3.333		81	30-130			
Surrogate: Phenol-d6	3.71		mg/kg wet	5.000		74	30-130			
Surrogate: p-Terphenyl-d14	3.42		mg/kg wet	3.333		103	30-130			



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710350

**Notes and Definitions**

- U Analyte included in the analysis, but not detected
- D Diluted.
- B- Blank Spike recovery is below lower control limit (B-).
- ND Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference
- MDL Method Detection Limit
- MRL Method Reporting Limit
- LOD Limit of Detection
- LOQ Limit of Quantitation
- DL Detection Limit
- I/V Initial Volume
- F/V Final Volume
- § Subcontracted analysis; see attached report
- 1 Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
- 2 Range result excludes concentrations of target analytes eluting in that range.
- 3 Range result excludes the concentration of the C9-C10 aromatic range.
- Avg Results reported as a mathematical average.
- NR No Recovery
- [CALC] Calculated Analyte
- SUB Subcontracted analysis; see attached report
- RL Reporting Limit
- EDL Estimated Detection Limit



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710350

**ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS**

**ENVIRONMENTAL**

Rhode Island Potable and Non Potable Water: LAI00179

<http://www.health.ri.gov/find/labs/analytical/ESS.pdf>

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750

[http://www.ct.gov/dph/lib/dph/environmental\\_health/environmental\\_laboratories/pdf/OutofStateCommercialLaboratories.pdf](http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf)

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002

<http://www.maine.gov/dhhs/meecd/environmental-health/dwp/partners/labCert.shtml>

Massachusetts Potable and Non Potable Water: M-RI002

<http://public.dep.state.ma.us/Labcert/Labcert.aspx>

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424

<http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm>

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313

<http://www.wadsworth.org/labcert/elap/comm.html>

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006

[http://datamine2.state.nj.us/DEP\\_OPRA/OpraMain/pi\\_main?mode=pi\\_by\\_site&sort\\_order=PI\\_NAMEA&Select+a+Site=:58715](http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site=:58715)

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752

<http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx>



# ESS Laboratory

Division of Thielsch Engineering, Inc.

# BAL Laboratory

The Microbiology Division  
of Thielsch Engineering, Inc.



## CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.

Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710350

### *Items for Project Management Review*

#### **5035/8260B Volatile Organic Compounds / Low Level**

CJ71501-BS1

Dichlorodifluoromethane

Exceeds lower control limit

Dichlorodifluoromethane

B-: Blank Spike recovery is below lower control limit (B-

CJ71501-BSD1

Dichlorodifluoromethane

B-: Blank Spike recovery is below lower control limit (B-

Dichlorodifluoromethane

Exceeds lower control limit

#### **8270D Semi-Volatile Organic Compounds**

C7J0097-CALC

Naphthalene

Possible data entry error

#### **Classical Chemistry**





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710350

**PROJECT COMPLETION CHECKLIST**

All Reports:

- |  |     |    |     |
|--|-----|----|-----|
| 1. Has Report been Paginated?                              | Yes | No |     |
| 2. Has Report been Digitally Signed?                       | Yes | No |     |
| 3. Has MCP/PC Sheet been filled out?                       | Yes | No | N/A |
| 4. Have PRM and Fax Sheet been removed from the Project?   | Yes | No |     |
| 5. Is the correct Chain of Custody attached to the Report? | Yes | No |     |
| 6. Is the correct Cooler Receipt attached to the Report?   | Yes | No | N/A |

Contact Person: \_\_\_\_\_

EDD: \_\_\_\_\_

E-Mail: \_\_\_\_\_

- |  |     |    |     |
|--|-----|----|-----|
| 1. Does e-mail address in Element match the COC/CSR?           | Yes | No |     |
| 1a. If No, did you contact Customer Service?                   | Yes | No | N/A |
| 2. Are there any CCs for the report?                           | Yes | No |     |
| 3a. If Yes, did you include them?                              | Yes | No | N/A |
| 4. Did you save a copy of the e-mail in the Work Order Folder? | Yes | No |     |

Client Connect: \_\_\_\_\_

- |   |     |    |     |
|---|-----|----|-----|
| 1. Did you save Report in CORRECT ClientConnect Folder? | Yes | No | N/A |
| 2. Did you save EDD in CORRECT ClientConnect Folder?    | Yes | No | N/A |

Fax: \_\_\_\_\_

- |  |     |    |     |
|--|-----|----|-----|
| 1. Does fax number in Element match the COC? | Yes | No |     |
| 1a. Did you contact Customer Service?        | Yes | No | N/A |
| 2. Was the fax "rejected" for any reason?    | Yes | No |     |
| 2a. Was the project re-faxed?                | Yes | No | N/A |
| 2b. Was Customer Service notified?           | Yes | No | N/A |

Updated to Faxed:      Yes      No      N/A      Initials: \_\_\_\_\_      Date: \_\_\_\_\_

# ESS Laboratory

Division of Thielsch Engineering, Inc.



## FAX

Date: \_\_\_\_\_

To: Sarah McLeod \_\_\_\_\_

Company: GZA GeoEnvironmental, Inc. \_\_\_\_\_

Project Name: Former Tidewater Facility \_\_\_\_\_

ESS Work Order: 1710350 \_\_\_\_\_

Fax: (401) 751-8613 \_\_\_\_\_

**Comments:**

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Our certified laboratory provides a full range of services, including the following:

- Soil Characterization
- Petroleum Fingerprinting
- Priority Pollutant Analysis
- Groundwater, Wastewater and Drinking Water Analyses
- PCBs and Pesticides Analysis
- Trace Metals (ICAP/Furnace) Analysis
- Inorganic Analysis by Classic Methods, Flow Analyzer, and Ion Chromatography
- Organics by GC/Mass Spectroscopy
- Microbiology Analysis
- Massachusetts EPH/VPH Analysis
- Siloxanes
- Field Screening and Sample Technician Services

This message is meant for the use of the individual or entity to which it is addressed. This fax may contain privileged or confidential information that is intended for the recipient only. Any copying or unauthorized distribution of the enclosed information is prohibited. If you have received this communication incorrectly, please notify us immediately. Thank you for your cooperation

Number of pages (including this cover): \_\_\_\_\_

Date: \_\_\_\_\_ Faxed: \_\_\_\_\_ Initials: \_\_\_\_\_ Time: \_\_\_\_\_

## CERTIFICATE OF ANALYSIS

Sarah McLeod  
GZA GeoEnvironmental, Inc.  
530 Broadway  
Providence, RI 02909

**RE: Former Tidewater Facility (05.0043654.00)**  
**ESS Laboratory Work Order Number: 1710517**

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.



Laurel Stoddard  
Laboratory Director

**REVIEWED****By ESS Laboratory at 4:46 pm, Oct 26, 2017****Analytical Summary**

The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710517

**SAMPLE RECEIPT**

The following samples were received on October 19, 2017 for the analyses specified on the enclosed Chain of Custody Record.

**Low Level VOA vials were frozen by ESS Laboratory on October 19, 2017 at 2202.**

<u>Lab Number</u>	<u>Sample Name</u>	<u>Matrix</u>	<u>Analysis</u>
1710517-01	GZ-BW-508 0-2ft	Soil	8260B, 8260B Low, 8270D
1710517-02	GZ-BW-511 2-4ft	Soil	8260B Low, 8270D



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710517

**PROJECT NARRATIVE**

**5035/8260B Volatile Organic Compounds / Low Level**

CJ72515-BS1 [Blank Spike recovery is below lower control limit \(B-\).](#)  
 Dichlorodifluoromethane (55% @ 70-130%)

CJ72515-BSD1 [Blank Spike recovery is below lower control limit \(B-\).](#)  
 Dichlorodifluoromethane (61% @ 70-130%)

**8270D Polynuclear Aromatic Hydrocarbons**

1710517-01 [Internal Standard\(s\) outside of criteria due to matrix \(UCM/coelution is present\) \(IM\).](#)  
 Perylene-d12 (37% @ 50-200%)

No other observations noted.

End of Project Narrative.

**DATA USABILITY LINKS**

*To ensure you are viewing the most current version of the documents below, please clear your internet cookies for [www.ESSLaboratory.com](http://www.ESSLaboratory.com). Consult your IT Support personnel for information on how to clear your internet cookies.*

[Definitions of Quality Control Parameters](#)

[Semivolatile Organics Internal Standard Information](#)

[Semivolatile Organics Surrogate Information](#)

[Volatile Organics Internal Standard Information](#)

[Volatile Organics Surrogate Information](#)

[EPH and VPH Alkane Lists](#)



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710517

**CURRENT SW-846 METHODOLOGY VERSIONS**

**Analytical Methods**

- 1010A - Flashpoint
- 6010C - ICP
- 6020A - ICP MS
- 7010 - Graphite Furnace
- 7196A - Hexavalent Chromium
- 7470A - Aqueous Mercury
- 7471B - Solid Mercury
- 8011 - EDB/DBCP/TCP
- 8015C - GRO/DRO
- 8081B - Pesticides
- 8082A - PCB
- 8100M - TPH
- 8151A - Herbicides
- 8260B - VOA
- 8270D - SVOA
- 8270D SIM - SVOA Low Level
- 9014 - Cyanide
- 9038 - Sulfate
- 9040C - Aqueous pH
- 9045D - Solid pH (Corrosivity)
- 9050A - Specific Conductance
- 9056A - Anions (IC)
- 9060A - TOC
- 9095B - Paint Filter
- MADEP 04-1.1 - EPH / VPH

**Prep Methods**

- 3005A - Aqueous ICP Digestion
- 3020A - Aqueous Graphite Furnace / ICP MS Digestion
- 3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
- 3060A - Solid Hexavalent Chromium Digestion
- 3510C - Separatory Funnel Extraction
- 3520C - Liquid / Liquid Extraction
- 3540C - Manual Soxhlet Extraction
- 3541 - Automated Soxhlet Extraction
- 3546 - Microwave Extraction
- 3580A - Waste Dilution
- 5030B - Aqueous Purge and Trap
- 5030C - Aqueous Purge and Trap
- 5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-BW-508 0-2ft  
 Date Sampled: 10/18/17 11:00  
 Percent Solids: 90  
 Initial Volume: 7.2  
 Final Volume: 5  
 Extraction Method: 5035

ESS Laboratory Work Order: 1710517  
 ESS Laboratory Sample ID: 1710517-01  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0019)		8260B Low		1	10/25/17 17:06	C7J0389	CJ72515
1,1,1-Trichloroethane	ND (0.0019)		8260B Low		1	10/25/17 17:06	C7J0389	CJ72515
1,1,2,2-Tetrachloroethane	ND (0.0019)		8260B Low		1	10/25/17 17:06	C7J0389	CJ72515
1,1,2-Trichloroethane	ND (0.0019)		8260B Low		1	10/25/17 17:06	C7J0389	CJ72515
1,1-Dichloroethane	ND (0.0019)		8260B Low		1	10/25/17 17:06	C7J0389	CJ72515
1,1-Dichloroethene	ND (0.0019)		8260B Low		1	10/25/17 17:06	C7J0389	CJ72515
1,1-Dichloropropene	ND (0.0019)		8260B Low		1	10/25/17 17:06	C7J0389	CJ72515
1,2,3-Trichlorobenzene	ND (0.0019)		8260B Low		1	10/25/17 17:06	C7J0389	CJ72515
1,2,3-Trichloropropane	ND (0.0019)		8260B Low		1	10/25/17 17:06	C7J0389	CJ72515
1,2,4-Trichlorobenzene	ND (0.0019)		8260B Low		1	10/25/17 17:06	C7J0389	CJ72515
1,2,4-Trimethylbenzene	ND (0.0019)		8260B Low		1	10/25/17 17:06	C7J0389	CJ72515
1,2-Dibromo-3-Chloropropane	ND (0.0019)		8260B Low		1	10/25/17 17:06	C7J0389	CJ72515
1,2-Dibromoethane	ND (0.0019)		8260B Low		1	10/25/17 17:06	C7J0389	CJ72515
1,2-Dichlorobenzene	ND (0.0019)		8260B Low		1	10/25/17 17:06	C7J0389	CJ72515
1,2-Dichloroethane	ND (0.0019)		8260B Low		1	10/25/17 17:06	C7J0389	CJ72515
1,2-Dichloropropane	ND (0.0019)		8260B Low		1	10/25/17 17:06	C7J0389	CJ72515
1,3,5-Trimethylbenzene	ND (0.0019)		8260B Low		1	10/25/17 17:06	C7J0389	CJ72515
1,3-Dichlorobenzene	ND (0.0019)		8260B Low		1	10/25/17 17:06	C7J0389	CJ72515
1,3-Dichloropropane	ND (0.0019)		8260B Low		1	10/25/17 17:06	C7J0389	CJ72515
1,4-Dichlorobenzene	ND (0.0019)		8260B Low		1	10/25/17 17:06	C7J0389	CJ72515
1,4-Dioxane	ND (0.0387)		8260B Low		1	10/25/17 17:06	C7J0389	CJ72515
1-Chlorohexane	ND (0.0019)		8260B Low		1	10/25/17 17:06	C7J0389	CJ72515
2,2-Dichloropropane	ND (0.0019)		8260B Low		1	10/25/17 17:06	C7J0389	CJ72515
2-Butanone	ND (0.0193)		8260B Low		1	10/25/17 17:06	C7J0389	CJ72515
2-Chlorotoluene	ND (0.0019)		8260B Low		1	10/25/17 17:06	C7J0389	CJ72515
2-Hexanone	ND (0.0193)		8260B Low		1	10/25/17 17:06	C7J0389	CJ72515
4-Chlorotoluene	ND (0.0019)		8260B Low		1	10/25/17 17:06	C7J0389	CJ72515
4-Isopropyltoluene	ND (0.0019)		8260B Low		1	10/25/17 17:06	C7J0389	CJ72515
4-Methyl-2-Pentanone	ND (0.0193)		8260B Low		1	10/25/17 17:06	C7J0389	CJ72515
<b>Acetone</b>	<b>0.0229</b> (0.0193)		8260B Low		1	10/25/17 17:06	C7J0389	CJ72515
Benzene	ND (0.0019)		8260B Low		1	10/25/17 17:06	C7J0389	CJ72515
Bromobenzene	ND (0.0019)		8260B Low		1	10/25/17 17:06	C7J0389	CJ72515

*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-BW-508 0-2ft  
 Date Sampled: 10/18/17 11:00  
 Percent Solids: 90  
 Initial Volume: 7.2  
 Final Volume: 5  
 Extraction Method: 5035

ESS Laboratory Work Order: 1710517  
 ESS Laboratory Sample ID: 1710517-01  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0019)		8260B Low		1	10/25/17 17:06	C7J0389	CJ72515
Bromodichloromethane	ND (0.0019)		8260B Low		1	10/25/17 17:06	C7J0389	CJ72515
Bromoform	ND (0.0019)		8260B Low		1	10/25/17 17:06	C7J0389	CJ72515
Bromomethane	ND (0.0039)		8260B Low		1	10/25/17 17:06	C7J0389	CJ72515
Carbon Disulfide	ND (0.0019)		8260B Low		1	10/25/17 17:06	C7J0389	CJ72515
Carbon Tetrachloride	ND (0.0019)		8260B Low		1	10/25/17 17:06	C7J0389	CJ72515
Chlorobenzene	ND (0.0019)		8260B Low		1	10/25/17 17:06	C7J0389	CJ72515
Chloroethane	ND (0.0039)		8260B Low		1	10/25/17 17:06	C7J0389	CJ72515
Chloroform	ND (0.0019)		8260B Low		1	10/25/17 17:06	C7J0389	CJ72515
Chloromethane	ND (0.0039)		8260B Low		1	10/25/17 17:06	C7J0389	CJ72515
cis-1,2-Dichloroethene	ND (0.0019)		8260B Low		1	10/25/17 17:06	C7J0389	CJ72515
cis-1,3-Dichloropropene	ND (0.0019)		8260B Low		1	10/25/17 17:06	C7J0389	CJ72515
Dibromochloromethane	ND (0.0019)		8260B Low		1	10/25/17 17:06	C7J0389	CJ72515
Dibromomethane	ND (0.0019)		8260B Low		1	10/25/17 17:06	C7J0389	CJ72515
Dichlorodifluoromethane	ND (0.0039)		8260B Low		1	10/25/17 17:06	C7J0389	CJ72515
Diethyl Ether	ND (0.0019)		8260B Low		1	10/25/17 17:06	C7J0389	CJ72515
Di-isopropyl ether	ND (0.0019)		8260B Low		1	10/25/17 17:06	C7J0389	CJ72515
Ethyl tertiary-butyl ether	ND (0.0019)		8260B Low		1	10/25/17 17:06	C7J0389	CJ72515
Ethylbenzene	ND (0.0019)		8260B Low		1	10/25/17 17:06	C7J0389	CJ72515
Hexachlorobutadiene	ND (0.0019)		8260B Low		1	10/25/17 17:06	C7J0389	CJ72515
Isopropylbenzene	ND (0.0019)		8260B Low		1	10/25/17 17:06	C7J0389	CJ72515
Methyl tert-Butyl Ether	ND (0.0019)		8260B Low		1	10/25/17 17:06	C7J0389	CJ72515
Methylene Chloride	ND (0.0097)		8260B Low		1	10/25/17 17:06	C7J0389	CJ72515
Naphthalene	ND (0.0019)		8260B Low		1	10/25/17 17:06	C7J0389	CJ72515
n-Butylbenzene	ND (0.0019)		8260B Low		1	10/25/17 17:06	C7J0389	CJ72515
n-Propylbenzene	ND (0.0019)		8260B Low		1	10/25/17 17:06	C7J0389	CJ72515
sec-Butylbenzene	ND (0.0019)		8260B Low		1	10/25/17 17:06	C7J0389	CJ72515
Styrene	ND (0.0019)		8260B Low		1	10/25/17 17:06	C7J0389	CJ72515
tert-Butylbenzene	ND (0.0019)		8260B Low		1	10/25/17 17:06	C7J0389	CJ72515
Tertiary-amyl methyl ether	ND (0.0019)		8260B Low		1	10/25/17 17:06	C7J0389	CJ72515
Tetrachloroethene	ND (0.0019)		8260B Low		1	10/25/17 17:06	C7J0389	CJ72515
Tetrahydrofuran	ND (0.0019)		8260B Low		1	10/25/17 17:06	C7J0389	CJ72515



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-BW-508 0-2ft  
 Date Sampled: 10/18/17 11:00  
 Percent Solids: 90  
 Initial Volume: 7.2  
 Final Volume: 5  
 Extraction Method: 5035

ESS Laboratory Work Order: 1710517  
 ESS Laboratory Sample ID: 1710517-01  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0019)		8260B Low		1	10/25/17 17:06	C7J0389	CJ72515
trans-1,2-Dichloroethene	ND (0.0019)		8260B Low		1	10/25/17 17:06	C7J0389	CJ72515
trans-1,3-Dichloropropene	ND (0.0019)		8260B Low		1	10/25/17 17:06	C7J0389	CJ72515
Trichloroethene	ND (0.0019)		8260B Low		1	10/25/17 17:06	C7J0389	CJ72515
Trichlorofluoromethane	ND (0.0019)		8260B Low		1	10/25/17 17:06	C7J0389	CJ72515
Vinyl Acetate	ND (0.0019)		8260B Low		1	10/25/17 17:06	C7J0389	CJ72515
Vinyl Chloride	ND (0.0039)		8260B Low		1	10/25/17 17:06	C7J0389	CJ72515
Xylene O	ND (0.0019)		8260B Low		1	10/25/17 17:06	C7J0389	CJ72515
Xylene P,M	ND (0.0039)		8260B Low		1	10/25/17 17:06	C7J0389	CJ72515
Xylenes (Total)	ND (0.0039)		8260B Low		1	10/25/17 17:06		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	46 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	44 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	44 %		70-130
<i>Surrogate: Toluene-d8</i>	51 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-BW-508 0-2ft  
Date Sampled: 10/18/17 11:00  
Percent Solids: 90  
Initial Volume: 1  
Final Volume: 1  
Extraction Method: [CALC]

ESS Laboratory Work Order: 1710517  
ESS Laboratory Sample ID: 1710517-01  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MD

**5035/8260B Volatile Organic Compounds / Methanol**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Xylenes (Total)	ND (0.461)		8260B		1	10/25/17 12:28		[CALC]



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-BW-508 0-2ft  
 Date Sampled: 10/18/17 11:00  
 Percent Solids: 90  
 Initial Volume: 15.4  
 Final Volume: 2  
 Extraction Method: 3546

ESS Laboratory Work Order: 1710517  
 ESS Laboratory Sample ID: 1710517-01  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: IBM  
 Prepared: 10/20/17 9:45

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Naphthalene	4.5 (1.4)		8270D		1	10/20/17 19:40	C7J0315	CJ71914

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	76 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	83 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	95 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	99 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-BW-511 2-4ft  
 Date Sampled: 10/19/17 08:30  
 Percent Solids: 85  
 Initial Volume: 6.6  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1710517  
 ESS Laboratory Sample ID: 1710517-02  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0045)		8260B Low		1	10/20/17 20:16	C7J0321	CJ72021
1,1,1-Trichloroethane	ND (0.0045)		8260B Low		1	10/20/17 20:16	C7J0321	CJ72021
1,1,2,2-Tetrachloroethane	ND (0.0045)		8260B Low		1	10/20/17 20:16	C7J0321	CJ72021
1,1,2-Trichloroethane	ND (0.0045)		8260B Low		1	10/20/17 20:16	C7J0321	CJ72021
1,1-Dichloroethane	ND (0.0045)		8260B Low		1	10/20/17 20:16	C7J0321	CJ72021
1,1-Dichloroethene	ND (0.0045)		8260B Low		1	10/20/17 20:16	C7J0321	CJ72021
1,1-Dichloropropene	ND (0.0045)		8260B Low		1	10/20/17 20:16	C7J0321	CJ72021
1,2,3-Trichlorobenzene	ND (0.0045)		8260B Low		1	10/20/17 20:16	C7J0321	CJ72021
1,2,3-Trichloropropane	ND (0.0045)		8260B Low		1	10/20/17 20:16	C7J0321	CJ72021
1,2,4-Trichlorobenzene	ND (0.0045)		8260B Low		1	10/20/17 20:16	C7J0321	CJ72021
1,2,4-Trimethylbenzene	ND (0.0045)		8260B Low		1	10/20/17 20:16	C7J0321	CJ72021
1,2-Dibromo-3-Chloropropane	ND (0.0045)		8260B Low		1	10/20/17 20:16	C7J0321	CJ72021
1,2-Dibromoethane	ND (0.0045)		8260B Low		1	10/20/17 20:16	C7J0321	CJ72021
1,2-Dichlorobenzene	ND (0.0045)		8260B Low		1	10/20/17 20:16	C7J0321	CJ72021
1,2-Dichloroethane	ND (0.0045)		8260B Low		1	10/20/17 20:16	C7J0321	CJ72021
1,2-Dichloropropane	ND (0.0045)		8260B Low		1	10/20/17 20:16	C7J0321	CJ72021
1,3,5-Trimethylbenzene	ND (0.0045)		8260B Low		1	10/20/17 20:16	C7J0321	CJ72021
1,3-Dichlorobenzene	ND (0.0045)		8260B Low		1	10/20/17 20:16	C7J0321	CJ72021
1,3-Dichloropropane	ND (0.0045)		8260B Low		1	10/20/17 20:16	C7J0321	CJ72021
1,4-Dichlorobenzene	ND (0.0045)		8260B Low		1	10/20/17 20:16	C7J0321	CJ72021
1,4-Dioxane	ND (0.0894)		8260B Low		1	10/20/17 20:16	C7J0321	CJ72021
1-Chlorohexane	ND (0.0045)		8260B Low		1	10/20/17 20:16	C7J0321	CJ72021
2,2-Dichloropropane	ND (0.0045)		8260B Low		1	10/20/17 20:16	C7J0321	CJ72021
2-Butanone	ND (0.0447)		8260B Low		1	10/20/17 20:16	C7J0321	CJ72021
2-Chlorotoluene	ND (0.0045)		8260B Low		1	10/20/17 20:16	C7J0321	CJ72021
2-Hexanone	ND (0.0447)		8260B Low		1	10/20/17 20:16	C7J0321	CJ72021
4-Chlorotoluene	ND (0.0045)		8260B Low		1	10/20/17 20:16	C7J0321	CJ72021
4-Isopropyltoluene	ND (0.0045)		8260B Low		1	10/20/17 20:16	C7J0321	CJ72021
4-Methyl-2-Pentanone	ND (0.0447)		8260B Low		1	10/20/17 20:16	C7J0321	CJ72021
Acetone	ND (0.0447)		8260B Low		1	10/20/17 20:16	C7J0321	CJ72021
Benzene	ND (0.0045)		8260B Low		1	10/20/17 20:16	C7J0321	CJ72021
Bromobenzene	ND (0.0045)		8260B Low		1	10/20/17 20:16	C7J0321	CJ72021





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-BW-511 2-4ft  
 Date Sampled: 10/19/17 08:30  
 Percent Solids: 85  
 Initial Volume: 6.6  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1710517  
 ESS Laboratory Sample ID: 1710517-02  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0045)		8260B Low		1	10/20/17 20:16	C7J0321	CJ72021
Bromodichloromethane	ND (0.0045)		8260B Low		1	10/20/17 20:16	C7J0321	CJ72021
Bromoform	ND (0.0045)		8260B Low		1	10/20/17 20:16	C7J0321	CJ72021
Bromomethane	ND (0.0089)		8260B Low		1	10/20/17 20:16	C7J0321	CJ72021
Carbon Disulfide	ND (0.0045)		8260B Low		1	10/20/17 20:16	C7J0321	CJ72021
Carbon Tetrachloride	ND (0.0045)		8260B Low		1	10/20/17 20:16	C7J0321	CJ72021
Chlorobenzene	ND (0.0045)		8260B Low		1	10/20/17 20:16	C7J0321	CJ72021
Chloroethane	ND (0.0089)		8260B Low		1	10/20/17 20:16	C7J0321	CJ72021
Chloroform	ND (0.0045)		8260B Low		1	10/20/17 20:16	C7J0321	CJ72021
Chloromethane	ND (0.0089)		8260B Low		1	10/20/17 20:16	C7J0321	CJ72021
cis-1,2-Dichloroethene	ND (0.0045)		8260B Low		1	10/20/17 20:16	C7J0321	CJ72021
cis-1,3-Dichloropropene	ND (0.0045)		8260B Low		1	10/20/17 20:16	C7J0321	CJ72021
Dibromochloromethane	ND (0.0045)		8260B Low		1	10/20/17 20:16	C7J0321	CJ72021
Dibromomethane	ND (0.0045)		8260B Low		1	10/20/17 20:16	C7J0321	CJ72021
Dichlorodifluoromethane	ND (0.0089)		8260B Low		1	10/20/17 20:16	C7J0321	CJ72021
Diethyl Ether	ND (0.0045)		8260B Low		1	10/20/17 20:16	C7J0321	CJ72021
Di-isopropyl ether	ND (0.0045)		8260B Low		1	10/20/17 20:16	C7J0321	CJ72021
Ethyl tertiary-butyl ether	ND (0.0045)		8260B Low		1	10/20/17 20:16	C7J0321	CJ72021
Ethylbenzene	ND (0.0045)		8260B Low		1	10/20/17 20:16	C7J0321	CJ72021
Hexachlorobutadiene	ND (0.0045)		8260B Low		1	10/20/17 20:16	C7J0321	CJ72021
Isopropylbenzene	ND (0.0045)		8260B Low		1	10/20/17 20:16	C7J0321	CJ72021
Methyl tert-Butyl Ether	ND (0.0045)		8260B Low		1	10/20/17 20:16	C7J0321	CJ72021
Methylene Chloride	ND (0.0224)		8260B Low		1	10/20/17 20:16	C7J0321	CJ72021
Naphthalene	ND (0.0045)		8260B Low		1	10/20/17 20:16	C7J0321	CJ72021
n-Butylbenzene	ND (0.0045)		8260B Low		1	10/20/17 20:16	C7J0321	CJ72021
n-Propylbenzene	ND (0.0045)		8260B Low		1	10/20/17 20:16	C7J0321	CJ72021
sec-Butylbenzene	ND (0.0045)		8260B Low		1	10/20/17 20:16	C7J0321	CJ72021
Styrene	ND (0.0045)		8260B Low		1	10/20/17 20:16	C7J0321	CJ72021
tert-Butylbenzene	ND (0.0045)		8260B Low		1	10/20/17 20:16	C7J0321	CJ72021
Tertiary-amyl methyl ether	ND (0.0045)		8260B Low		1	10/20/17 20:16	C7J0321	CJ72021
Tetrachloroethene	ND (0.0045)		8260B Low		1	10/20/17 20:16	C7J0321	CJ72021
Tetrahydrofuran	ND (0.0045)		8260B Low		1	10/20/17 20:16	C7J0321	CJ72021



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-BW-511 2-4ft  
 Date Sampled: 10/19/17 08:30  
 Percent Solids: 85  
 Initial Volume: 6.6  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1710517  
 ESS Laboratory Sample ID: 1710517-02  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0045)		8260B Low		1	10/20/17 20:16	C7J0321	CJ72021
trans-1,2-Dichloroethene	ND (0.0045)		8260B Low		1	10/20/17 20:16	C7J0321	CJ72021
trans-1,3-Dichloropropene	ND (0.0045)		8260B Low		1	10/20/17 20:16	C7J0321	CJ72021
Trichloroethene	ND (0.0045)		8260B Low		1	10/20/17 20:16	C7J0321	CJ72021
Trichlorofluoromethane	ND (0.0045)		8260B Low		1	10/20/17 20:16	C7J0321	CJ72021
Vinyl Acetate	ND (0.0045)		8260B Low		1	10/20/17 20:16	C7J0321	CJ72021
Vinyl Chloride	ND (0.0089)		8260B Low		1	10/20/17 20:16	C7J0321	CJ72021
Xylene O	ND (0.0045)		8260B Low		1	10/20/17 20:16	C7J0321	CJ72021
Xylene P,M	ND (0.0089)		8260B Low		1	10/20/17 20:16	C7J0321	CJ72021
Xylenes (Total)	ND (0.0089)		8260B Low		1	10/20/17 20:16		[CALC]

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: 1,2-Dichloroethane-d4	119 %		70-130
Surrogate: 4-Bromofluorobenzene	84 %		70-130
Surrogate: Dibromofluoromethane	106 %		70-130
Surrogate: Toluene-d8	103 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-BW-511 2-4ft  
 Date Sampled: 10/19/17 08:30  
 Percent Solids: 85  
 Initial Volume: 14.2  
 Final Volume: 0.5  
 Extraction Method: 3546

ESS Laboratory Work Order: 1710517  
 ESS Laboratory Sample ID: 1710517-02  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: IBM  
 Prepared: 10/20/17 9:45

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Naphthalene	1.1 (0.4)		8270D		1	10/20/17 20:15	C7J0315	CJ71914

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	79 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	85 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	87 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	84 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710517

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CJ72021 - 5035**

**Blank**

1,1,1,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,1-Trichloroethane	ND	0.0050	mg/kg wet							
1,1,2,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,2-Trichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethene	ND	0.0050	mg/kg wet							
1,1-Dichloropropene	ND	0.0050	mg/kg wet							
1,2,3-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,3-Trichloropropane	ND	0.0050	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,4-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,2-Dibromo-3-Chloropropane	ND	0.0050	mg/kg wet							
1,2-Dibromoethane	ND	0.0050	mg/kg wet							
1,2-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,2-Dichloroethane	ND	0.0050	mg/kg wet							
1,2-Dichloropropane	ND	0.0050	mg/kg wet							
1,3,5-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,3-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,3-Dichloropropane	ND	0.0050	mg/kg wet							
1,4-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,4-Dioxane	ND	0.100	mg/kg wet							
1-Chlorohexane	ND	0.0050	mg/kg wet							
2,2-Dichloropropane	ND	0.0050	mg/kg wet							
2-Butanone	ND	0.0500	mg/kg wet							
2-Chlorotoluene	ND	0.0050	mg/kg wet							
2-Hexanone	ND	0.0500	mg/kg wet							
4-Chlorotoluene	ND	0.0050	mg/kg wet							
4-Isopropyltoluene	ND	0.0050	mg/kg wet							
4-Methyl-2-Pentanone	ND	0.0500	mg/kg wet							
Acetone	ND	0.0500	mg/kg wet							
Benzene	ND	0.0050	mg/kg wet							
Bromobenzene	ND	0.0050	mg/kg wet							
Bromochloromethane	ND	0.0050	mg/kg wet							
Bromodichloromethane	ND	0.0050	mg/kg wet							
Bromoform	ND	0.0050	mg/kg wet							
Bromomethane	ND	0.0100	mg/kg wet							
Carbon Disulfide	ND	0.0050	mg/kg wet							
Carbon Tetrachloride	ND	0.0050	mg/kg wet							
Chlorobenzene	ND	0.0050	mg/kg wet							
Chloroethane	ND	0.0100	mg/kg wet							
Chloroform	ND	0.0050	mg/kg wet							
Chloromethane	ND	0.0100	mg/kg wet							
cis-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
cis-1,3-Dichloropropene	ND	0.0050	mg/kg wet							



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710517

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CJ72021 - 5035**

Dibromochloromethane	ND	0.0050	mg/kg wet							
Dibromomethane	ND	0.0050	mg/kg wet							
Dichlorodifluoromethane	ND	0.0100	mg/kg wet							
Diethyl Ether	ND	0.0050	mg/kg wet							
Di-isopropyl ether	ND	0.0050	mg/kg wet							
Ethyl tertiary-butyl ether	ND	0.0050	mg/kg wet							
Ethylbenzene	ND	0.0050	mg/kg wet							
Hexachlorobutadiene	ND	0.0050	mg/kg wet							
Isopropylbenzene	ND	0.0050	mg/kg wet							
Methyl tert-Butyl Ether	ND	0.0050	mg/kg wet							
Methylene Chloride	ND	0.0250	mg/kg wet							
Naphthalene	ND	0.0050	mg/kg wet							
n-Butylbenzene	ND	0.0050	mg/kg wet							
n-Propylbenzene	ND	0.0050	mg/kg wet							
sec-Butylbenzene	ND	0.0050	mg/kg wet							
Styrene	ND	0.0050	mg/kg wet							
tert-Butylbenzene	ND	0.0050	mg/kg wet							
Tertiary-amyl methyl ether	ND	0.0050	mg/kg wet							
Tetrachloroethene	ND	0.0050	mg/kg wet							
Tetrahydrofuran	ND	0.0050	mg/kg wet							
Toluene	ND	0.0050	mg/kg wet							
trans-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
trans-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Trichloroethene	ND	0.0050	mg/kg wet							
Trichlorofluoromethane	ND	0.0050	mg/kg wet							
Vinyl Acetate	ND	0.0050	mg/kg wet							
Vinyl Chloride	ND	0.0100	mg/kg wet							
Xylene O	ND	0.0050	mg/kg wet							
Xylene P,M	ND	0.0100	mg/kg wet							
Xylenes (Total)	ND	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	0.0541		mg/kg wet	0.05000		108	70-130			
Surrogate: 4-Bromofluorobenzene	0.0460		mg/kg wet	0.05000		92	70-130			
Surrogate: Dibromofluoromethane	0.0507		mg/kg wet	0.05000		101	70-130			
Surrogate: Toluene-d8	0.0498		mg/kg wet	0.05000		100	70-130			

**LCS**

1,1,1,2-Tetrachloroethane	0.0543	0.0050	mg/kg wet	0.05000		109	70-130			
1,1,1-Trichloroethane	0.0560	0.0050	mg/kg wet	0.05000		112	70-130			
1,1,2,2-Tetrachloroethane	0.0478	0.0050	mg/kg wet	0.05000		96	70-130			
1,1,2-Trichloroethane	0.0515	0.0050	mg/kg wet	0.05000		103	70-130			
1,1-Dichloroethane	0.0504	0.0050	mg/kg wet	0.05000		101	70-130			
1,1-Dichloroethene	0.0520	0.0050	mg/kg wet	0.05000		104	70-130			
1,1-Dichloropropene	0.0544	0.0050	mg/kg wet	0.05000		109	70-130			
1,2,3-Trichlorobenzene	0.0531	0.0050	mg/kg wet	0.05000		106	70-130			
1,2,3-Trichloropropane	0.0485	0.0050	mg/kg wet	0.05000		97	70-130			
1,2,4-Trichlorobenzene	0.0519	0.0050	mg/kg wet	0.05000		104	70-130			



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710517

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CJ72021 - 5035**

1,2,4-Trimethylbenzene	0.0534	0.0050	mg/kg wet	0.05000		107	70-130			
1,2-Dibromo-3-Chloropropane	0.0434	0.0050	mg/kg wet	0.05000		87	70-130			
1,2-Dibromoethane	0.0511	0.0050	mg/kg wet	0.05000		102	70-130			
1,2-Dichlorobenzene	0.0514	0.0050	mg/kg wet	0.05000		103	70-130			
1,2-Dichloroethane	0.0555	0.0050	mg/kg wet	0.05000		111	70-130			
1,2-Dichloropropane	0.0512	0.0050	mg/kg wet	0.05000		102	70-130			
1,3,5-Trimethylbenzene	0.0521	0.0050	mg/kg wet	0.05000		104	70-130			
1,3-Dichlorobenzene	0.0502	0.0050	mg/kg wet	0.05000		100	70-130			
1,3-Dichloropropane	0.0543	0.0050	mg/kg wet	0.05000		109	70-130			
1,4-Dichlorobenzene	0.0522	0.0050	mg/kg wet	0.05000		104	70-130			
1,4-Dioxane	0.892	0.100	mg/kg wet	1.000		89	70-130			
1-Chlorohexane	0.0496	0.0050	mg/kg wet	0.05000		99	70-130			
2,2-Dichloropropane	0.0535	0.0050	mg/kg wet	0.05000		107	70-130			
2-Butanone	0.256	0.0500	mg/kg wet	0.2500		102	70-130			
2-Chlorotoluene	0.0506	0.0050	mg/kg wet	0.05000		101	70-130			
2-Hexanone	0.228	0.0500	mg/kg wet	0.2500		91	70-130			
4-Chlorotoluene	0.0511	0.0050	mg/kg wet	0.05000		102	70-130			
4-Isopropyltoluene	0.0515	0.0050	mg/kg wet	0.05000		103	70-130			
4-Methyl-2-Pentanone	0.229	0.0500	mg/kg wet	0.2500		91	70-130			
Acetone	0.244	0.0500	mg/kg wet	0.2500		97	70-130			
Benzene	0.0511	0.0050	mg/kg wet	0.05000		102	70-130			
Bromobenzene	0.0505	0.0050	mg/kg wet	0.05000		101	70-130			
Bromochloromethane	0.0513	0.0050	mg/kg wet	0.05000		103	70-130			
Bromodichloromethane	0.0568	0.0050	mg/kg wet	0.05000		114	70-130			
Bromoform	0.0465	0.0050	mg/kg wet	0.05000		93	70-130			
Bromomethane	0.0572	0.0100	mg/kg wet	0.05000		114	70-130			
Carbon Disulfide	0.0535	0.0050	mg/kg wet	0.05000		107	70-130			
Carbon Tetrachloride	0.0568	0.0050	mg/kg wet	0.05000		114	70-130			
Chlorobenzene	0.0510	0.0050	mg/kg wet	0.05000		102	70-130			
Chloroethane	0.0497	0.0100	mg/kg wet	0.05000		99	70-130			
Chloroform	0.0534	0.0050	mg/kg wet	0.05000		107	70-130			
Chloromethane	0.0570	0.0100	mg/kg wet	0.05000		114	70-130			
cis-1,2-Dichloroethene	0.0518	0.0050	mg/kg wet	0.05000		104	70-130			
cis-1,3-Dichloropropene	0.0563	0.0050	mg/kg wet	0.05000		113	70-130			
Dibromochloromethane	0.0501	0.0050	mg/kg wet	0.05000		100	70-130			
Dibromomethane	0.0507	0.0050	mg/kg wet	0.05000		101	70-130			
Dichlorodifluoromethane	0.0476	0.0100	mg/kg wet	0.05000		95	70-130			
Diethyl Ether	0.0515	0.0050	mg/kg wet	0.05000		103	70-130			
Di-isopropyl ether	0.0495	0.0050	mg/kg wet	0.05000		99	70-130			
Ethyl tertiary-butyl ether	0.0497	0.0050	mg/kg wet	0.05000		99	70-130			
Ethylbenzene	0.0520	0.0050	mg/kg wet	0.05000		104	70-130			
Hexachlorobutadiene	0.0542	0.0050	mg/kg wet	0.05000		108	70-130			
Isopropylbenzene	0.0488	0.0050	mg/kg wet	0.05000		98	70-130			
Methyl tert-Butyl Ether	0.0504	0.0050	mg/kg wet	0.05000		101	70-130			
Methylene Chloride	0.0544	0.0250	mg/kg wet	0.05000		109	70-130			





CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710517

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CJ72021 - 5035**

Naphthalene	0.0441	0.0050	mg/kg wet	0.05000		88	70-130			
n-Butylbenzene	0.0521	0.0050	mg/kg wet	0.05000		104	70-130			
n-Propylbenzene	0.0518	0.0050	mg/kg wet	0.05000		104	70-130			
sec-Butylbenzene	0.0507	0.0050	mg/kg wet	0.05000		101	70-130			
Styrene	0.0516	0.0050	mg/kg wet	0.05000		103	70-130			
tert-Butylbenzene	0.0512	0.0050	mg/kg wet	0.05000		102	70-130			
Tertiary-amyl methyl ether	0.0473	0.0050	mg/kg wet	0.05000		95	70-130			
Tetrachloroethene	0.0513	0.0050	mg/kg wet	0.05000		103	70-130			
Tetrahydrofuran	0.0420	0.0050	mg/kg wet	0.05000		84	70-130			
Toluene	0.0515	0.0050	mg/kg wet	0.05000		103	70-130			
trans-1,2-Dichloroethene	0.0511	0.0050	mg/kg wet	0.05000		102	70-130			
trans-1,3-Dichloropropene	0.0501	0.0050	mg/kg wet	0.05000		100	70-130			
Trichloroethene	0.0520	0.0050	mg/kg wet	0.05000		104	70-130			
Trichlorofluoromethane	0.0545	0.0050	mg/kg wet	0.05000		109	70-130			
Vinyl Acetate	0.0416	0.0050	mg/kg wet	0.05000		83	70-130			
Vinyl Chloride	0.0574	0.0100	mg/kg wet	0.05000		115	70-130			
Xylene O	0.0539	0.0050	mg/kg wet	0.05000		108	70-130			
Xylene P,M	0.107	0.0100	mg/kg wet	0.1000		107	70-130			
Xylenes (Total)	0.161	0.0100	mg/kg wet							
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0573</i>		mg/kg wet	<i>0.05000</i>		<i>115</i>	<i>70-130</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0541</i>		mg/kg wet	<i>0.05000</i>		<i>108</i>	<i>70-130</i>			
<i>Surrogate: Dibromofluoromethane</i>	<i>0.0556</i>		mg/kg wet	<i>0.05000</i>		<i>111</i>	<i>70-130</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0520</i>		mg/kg wet	<i>0.05000</i>		<i>104</i>	<i>70-130</i>			

**LCS Dup**

1,1,1,2-Tetrachloroethane	0.0504	0.0050	mg/kg wet	0.05000		101	70-130	7	25	
1,1,1-Trichloroethane	0.0508	0.0050	mg/kg wet	0.05000		102	70-130	10	25	
1,1,2,2-Tetrachloroethane	0.0462	0.0050	mg/kg wet	0.05000		92	70-130	3	25	
1,1,2-Trichloroethane	0.0478	0.0050	mg/kg wet	0.05000		96	70-130	8	25	
1,1-Dichloroethane	0.0465	0.0050	mg/kg wet	0.05000		93	70-130	8	25	
1,1-Dichloroethene	0.0484	0.0050	mg/kg wet	0.05000		97	70-130	7	25	
1,1-Dichloropropene	0.0495	0.0050	mg/kg wet	0.05000		99	70-130	9	25	
1,2,3-Trichlorobenzene	0.0505	0.0050	mg/kg wet	0.05000		101	70-130	5	25	
1,2,3-Trichloropropane	0.0468	0.0050	mg/kg wet	0.05000		94	70-130	4	25	
1,2,4-Trichlorobenzene	0.0496	0.0050	mg/kg wet	0.05000		99	70-130	5	25	
1,2,4-Trimethylbenzene	0.0505	0.0050	mg/kg wet	0.05000		101	70-130	6	25	
1,2-Dibromo-3-Chloropropane	0.0425	0.0050	mg/kg wet	0.05000		85	70-130	2	25	
1,2-Dibromoethane	0.0486	0.0050	mg/kg wet	0.05000		97	70-130	5	25	
1,2-Dichlorobenzene	0.0488	0.0050	mg/kg wet	0.05000		98	70-130	5	25	
1,2-Dichloroethane	0.0513	0.0050	mg/kg wet	0.05000		103	70-130	8	25	
1,2-Dichloropropane	0.0470	0.0050	mg/kg wet	0.05000		94	70-130	9	25	
1,3,5-Trimethylbenzene	0.0498	0.0050	mg/kg wet	0.05000		100	70-130	5	25	
1,3-Dichlorobenzene	0.0488	0.0050	mg/kg wet	0.05000		98	70-130	3	25	
1,3-Dichloropropane	0.0506	0.0050	mg/kg wet	0.05000		101	70-130	7	25	
1,4-Dichlorobenzene	0.0491	0.0050	mg/kg wet	0.05000		98	70-130	6	25	
1,4-Dioxane	0.866	0.100	mg/kg wet	1.000		87	70-130	3	20	



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710517

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CJ72021 - 5035**

1-Chlorohexane	0.0464	0.0050	mg/kg wet	0.05000		93	70-130	7	25	
2,2-Dichloropropane	0.0487	0.0050	mg/kg wet	0.05000		97	70-130	9	25	
2-Butanone	0.235	0.0500	mg/kg wet	0.2500		94	70-130	8	25	
2-Chlorotoluene	0.0485	0.0050	mg/kg wet	0.05000		97	70-130	4	25	
2-Hexanone	0.217	0.0500	mg/kg wet	0.2500		87	70-130	5	25	
4-Chlorotoluene	0.0489	0.0050	mg/kg wet	0.05000		98	70-130	4	25	
4-Isopropyltoluene	0.0492	0.0050	mg/kg wet	0.05000		98	70-130	4	25	
4-Methyl-2-Pentanone	0.216	0.0500	mg/kg wet	0.2500		86	70-130	6	25	
Acetone	0.228	0.0500	mg/kg wet	0.2500		91	70-130	6	25	
Benzene	0.0471	0.0050	mg/kg wet	0.05000		94	70-130	8	25	
Bromobenzene	0.0490	0.0050	mg/kg wet	0.05000		98	70-130	3	25	
Bromochloromethane	0.0472	0.0050	mg/kg wet	0.05000		94	70-130	8	25	
Bromodichloromethane	0.0517	0.0050	mg/kg wet	0.05000		103	70-130	9	25	
Bromoform	0.0428	0.0050	mg/kg wet	0.05000		86	70-130	8	25	
Bromomethane	0.0554	0.0100	mg/kg wet	0.05000		111	70-130	3	25	
Carbon Disulfide	0.0493	0.0050	mg/kg wet	0.05000		99	70-130	8	25	
Carbon Tetrachloride	0.0511	0.0050	mg/kg wet	0.05000		102	70-130	10	25	
Chlorobenzene	0.0476	0.0050	mg/kg wet	0.05000		95	70-130	7	25	
Chloroethane	0.0455	0.0100	mg/kg wet	0.05000		91	70-130	9	25	
Chloroform	0.0489	0.0050	mg/kg wet	0.05000		98	70-130	9	25	
Chloromethane	0.0519	0.0100	mg/kg wet	0.05000		104	70-130	9	25	
cis-1,2-Dichloroethene	0.0476	0.0050	mg/kg wet	0.05000		95	70-130	8	25	
cis-1,3-Dichloropropene	0.0518	0.0050	mg/kg wet	0.05000		104	70-130	8	25	
Dibromochloromethane	0.0472	0.0050	mg/kg wet	0.05000		94	70-130	6	25	
Dibromomethane	0.0465	0.0050	mg/kg wet	0.05000		93	70-130	9	25	
Dichlorodifluoromethane	0.0430	0.0100	mg/kg wet	0.05000		86	70-130	10	25	
Diethyl Ether	0.0486	0.0050	mg/kg wet	0.05000		97	70-130	6	25	
Di-isopropyl ether	0.0460	0.0050	mg/kg wet	0.05000		92	70-130	7	25	
Ethyl tertiary-butyl ether	0.0469	0.0050	mg/kg wet	0.05000		94	70-130	6	25	
Ethylbenzene	0.0482	0.0050	mg/kg wet	0.05000		96	70-130	8	25	
Hexachlorobutadiene	0.0513	0.0050	mg/kg wet	0.05000		103	70-130	5	25	
Isopropylbenzene	0.0466	0.0050	mg/kg wet	0.05000		93	70-130	5	25	
Methyl tert-Butyl Ether	0.0476	0.0050	mg/kg wet	0.05000		95	70-130	6	25	
Methylene Chloride	0.0505	0.0250	mg/kg wet	0.05000		101	70-130	7	25	
Naphthalene	0.0424	0.0050	mg/kg wet	0.05000		85	70-130	4	25	
n-Butylbenzene	0.0495	0.0050	mg/kg wet	0.05000		99	70-130	5	25	
n-Propylbenzene	0.0494	0.0050	mg/kg wet	0.05000		99	70-130	5	25	
sec-Butylbenzene	0.0483	0.0050	mg/kg wet	0.05000		97	70-130	5	25	
Styrene	0.0489	0.0050	mg/kg wet	0.05000		98	70-130	5	25	
tert-Butylbenzene	0.0494	0.0050	mg/kg wet	0.05000		99	70-130	3	25	
Tertiary-amyl methyl ether	0.0446	0.0050	mg/kg wet	0.05000		89	70-130	6	25	
Tetrachloroethene	0.0476	0.0050	mg/kg wet	0.05000		95	70-130	8	25	
Tetrahydrofuran	0.0396	0.0050	mg/kg wet	0.05000		79	70-130	6	25	
Toluene	0.0471	0.0050	mg/kg wet	0.05000		94	70-130	9	25	
trans-1,2-Dichloroethene	0.0475	0.0050	mg/kg wet	0.05000		95	70-130	7	25	



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710517

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CJ72021 - 5035**

trans-1,3-Dichloropropene	0.0471	0.0050	mg/kg wet	0.05000		94	70-130	6	25	
Trichloroethene	0.0476	0.0050	mg/kg wet	0.05000		95	70-130	9	25	
Trichlorofluoromethane	0.0496	0.0050	mg/kg wet	0.05000		99	70-130	9	25	
Vinyl Acetate	0.0396	0.0050	mg/kg wet	0.05000		79	70-130	5	25	
Vinyl Chloride	0.0524	0.0100	mg/kg wet	0.05000		105	70-130	9	25	
Xylene O	0.0507	0.0050	mg/kg wet	0.05000		101	70-130	6	25	
Xylene P,M	0.100	0.0100	mg/kg wet	0.1000		100	70-130	6	25	
Xylenes (Total)	0.151	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	0.0550		mg/kg wet	0.05000		110	70-130			
Surrogate: 4-Bromofluorobenzene	0.0525		mg/kg wet	0.05000		105	70-130			
Surrogate: Dibromofluoromethane	0.0528		mg/kg wet	0.05000		106	70-130			
Surrogate: Toluene-d8	0.0513		mg/kg wet	0.05000		103	70-130			

**Batch CJ72515 - 5035**

<b>Blank</b>										
1,1,1,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,1-Trichloroethane	ND	0.0050	mg/kg wet							
1,1,2,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,2-Trichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethene	ND	0.0050	mg/kg wet							
1,1-Dichloropropene	ND	0.0050	mg/kg wet							
1,2,3-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,3-Trichloropropane	ND	0.0050	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,4-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,2-Dibromo-3-Chloropropane	ND	0.0050	mg/kg wet							
1,2-Dibromoethane	ND	0.0050	mg/kg wet							
1,2-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,2-Dichloroethane	ND	0.0050	mg/kg wet							
1,2-Dichloropropane	ND	0.0050	mg/kg wet							
1,3,5-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,3-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,3-Dichloropropane	ND	0.0050	mg/kg wet							
1,4-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,4-Dioxane	ND	0.100	mg/kg wet							
1-Chlorohexane	ND	0.0050	mg/kg wet							
2,2-Dichloropropane	ND	0.0050	mg/kg wet							
2-Butanone	ND	0.0500	mg/kg wet							
2-Chlorotoluene	ND	0.0050	mg/kg wet							
2-Hexanone	ND	0.0500	mg/kg wet							
4-Chlorotoluene	ND	0.0050	mg/kg wet							
4-Isopropyltoluene	ND	0.0050	mg/kg wet							
4-Methyl-2-Pentanone	ND	0.0500	mg/kg wet							
Acetone	ND	0.0500	mg/kg wet							
Benzene	ND	0.0050	mg/kg wet							



CERTIFICATE OF ANALYSIS

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ESS Laboratory Work Order: 1710517

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CJ72515 - 5035**

Bromobenzene	ND	0.0050	mg/kg wet							
Bromochloromethane	ND	0.0050	mg/kg wet							
Bromodichloromethane	ND	0.0050	mg/kg wet							
Bromoform	ND	0.0050	mg/kg wet							
Bromomethane	ND	0.0100	mg/kg wet							
Carbon Disulfide	ND	0.0050	mg/kg wet							
Carbon Tetrachloride	ND	0.0050	mg/kg wet							
Chlorobenzene	ND	0.0050	mg/kg wet							
Chloroethane	ND	0.0100	mg/kg wet							
Chloroform	ND	0.0050	mg/kg wet							
Chloromethane	ND	0.0100	mg/kg wet							
cis-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
cis-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Dibromochloromethane	ND	0.0050	mg/kg wet							
Dibromomethane	ND	0.0050	mg/kg wet							
Dichlorodifluoromethane	ND	0.0100	mg/kg wet							
Diethyl Ether	ND	0.0050	mg/kg wet							
Di-isopropyl ether	ND	0.0050	mg/kg wet							
Ethyl tertiary-butyl ether	ND	0.0050	mg/kg wet							
Ethylbenzene	ND	0.0050	mg/kg wet							
Hexachlorobutadiene	ND	0.0050	mg/kg wet							
Isopropylbenzene	ND	0.0050	mg/kg wet							
Methyl tert-Butyl Ether	ND	0.0050	mg/kg wet							
Methylene Chloride	ND	0.0250	mg/kg wet							
Naphthalene	ND	0.0050	mg/kg wet							
n-Butylbenzene	ND	0.0050	mg/kg wet							
n-Propylbenzene	ND	0.0050	mg/kg wet							
sec-Butylbenzene	ND	0.0050	mg/kg wet							
Styrene	ND	0.0050	mg/kg wet							
tert-Butylbenzene	ND	0.0050	mg/kg wet							
Tertiary-amyl methyl ether	ND	0.0050	mg/kg wet							
Tetrachloroethene	ND	0.0050	mg/kg wet							
Tetrahydrofuran	ND	0.0050	mg/kg wet							
Toluene	ND	0.0050	mg/kg wet							
trans-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
trans-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Trichloroethene	ND	0.0050	mg/kg wet							
Trichlorofluoromethane	ND	0.0050	mg/kg wet							
Vinyl Acetate	ND	0.0050	mg/kg wet							
Vinyl Chloride	ND	0.0100	mg/kg wet							
Xylene O	ND	0.0050	mg/kg wet							
Xylene P,M	ND	0.0100	mg/kg wet							
Xylenes (Total)	ND	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	0.0389		mg/kg wet	0.05000		78	70-130			
Surrogate: 4-Bromofluorobenzene	0.0449		mg/kg wet	0.05000		90	70-130			



CERTIFICATE OF ANALYSIS

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ESS Laboratory Work Order: 1710517

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CJ72515 - 5035**

Surrogate: Dibromofluoromethane	0.0391		mg/kg wet	0.05000		78	70-130			
Surrogate: Toluene-d8	0.0507		mg/kg wet	0.05000		101	70-130			

**LCS**

1,1,1,2-Tetrachloroethane	0.0412	0.0050	mg/kg wet	0.05000		82	70-130			
1,1,1-Trichloroethane	0.0383	0.0050	mg/kg wet	0.05000		77	70-130			
1,1,2,2-Tetrachloroethane	0.0465	0.0050	mg/kg wet	0.05000		93	70-130			
1,1,2-Trichloroethane	0.0426	0.0050	mg/kg wet	0.05000		85	70-130			
1,1-Dichloroethane	0.0401	0.0050	mg/kg wet	0.05000		80	70-130			
1,1-Dichloroethene	0.0438	0.0050	mg/kg wet	0.05000		88	70-130			
1,1-Dichloropropene	0.0424	0.0050	mg/kg wet	0.05000		85	70-130			
1,2,3-Trichlorobenzene	0.0468	0.0050	mg/kg wet	0.05000		94	70-130			
1,2,3-Trichloropropane	0.0453	0.0050	mg/kg wet	0.05000		91	70-130			
1,2,4-Trichlorobenzene	0.0474	0.0050	mg/kg wet	0.05000		95	70-130			
1,2,4-Trimethylbenzene	0.0496	0.0050	mg/kg wet	0.05000		99	70-130			
1,2-Dibromo-3-Chloropropane	0.0377	0.0050	mg/kg wet	0.05000		75	70-130			
1,2-Dibromoethane	0.0477	0.0050	mg/kg wet	0.05000		95	70-130			
1,2-Dichlorobenzene	0.0479	0.0050	mg/kg wet	0.05000		96	70-130			
1,2-Dichloroethane	0.0395	0.0050	mg/kg wet	0.05000		79	70-130			
1,2-Dichloropropane	0.0431	0.0050	mg/kg wet	0.05000		86	70-130			
1,3,5-Trimethylbenzene	0.0483	0.0050	mg/kg wet	0.05000		97	70-130			
1,3-Dichlorobenzene	0.0470	0.0050	mg/kg wet	0.05000		94	70-130			
1,3-Dichloropropane	0.0480	0.0050	mg/kg wet	0.05000		96	70-130			
1,4-Dichlorobenzene	0.0479	0.0050	mg/kg wet	0.05000		96	70-130			
1,4-Dioxane	0.909	0.100	mg/kg wet	1.000		91	70-130			
1-Chlorohexane	0.0482	0.0050	mg/kg wet	0.05000		96	70-130			
2,2-Dichloropropane	0.0359	0.0050	mg/kg wet	0.05000		72	70-130			
2-Butanone	0.218	0.0500	mg/kg wet	0.2500		87	70-130			
2-Chlorotoluene	0.0466	0.0050	mg/kg wet	0.05000		93	70-130			
2-Hexanone	0.224	0.0500	mg/kg wet	0.2500		89	70-130			
4-Chlorotoluene	0.0470	0.0050	mg/kg wet	0.05000		94	70-130			
4-Isopropyltoluene	0.0480	0.0050	mg/kg wet	0.05000		96	70-130			
4-Methyl-2-Pentanone	0.209	0.0500	mg/kg wet	0.2500		84	70-130			
Acetone	0.217	0.0500	mg/kg wet	0.2500		87	70-130			
Benzene	0.0420	0.0050	mg/kg wet	0.05000		84	70-130			
Bromobenzene	0.0488	0.0050	mg/kg wet	0.05000		98	70-130			
Bromochloromethane	0.0414	0.0050	mg/kg wet	0.05000		83	70-130			
Bromodichloromethane	0.0399	0.0050	mg/kg wet	0.05000		80	70-130			
Bromoform	0.0358	0.0050	mg/kg wet	0.05000		72	70-130			
Bromomethane	0.0372	0.0100	mg/kg wet	0.05000		74	70-130			
Carbon Disulfide	0.0430	0.0050	mg/kg wet	0.05000		86	70-130			
Carbon Tetrachloride	0.0355	0.0050	mg/kg wet	0.05000		71	70-130			
Chlorobenzene	0.0451	0.0050	mg/kg wet	0.05000		90	70-130			
Chloroethane	0.0405	0.0100	mg/kg wet	0.05000		81	70-130			
Chloroform	0.0394	0.0050	mg/kg wet	0.05000		79	70-130			



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710517

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CJ72515 - 5035**

Chloromethane	0.0378	0.0100	mg/kg wet	0.05000		76	70-130			
cis-1,2-Dichloroethene	0.0422	0.0050	mg/kg wet	0.05000		84	70-130			
cis-1,3-Dichloropropene	0.0440	0.0050	mg/kg wet	0.05000		88	70-130			
Dibromochloromethane	0.0397	0.0050	mg/kg wet	0.05000		79	70-130			
Dibromomethane	0.0401	0.0050	mg/kg wet	0.05000		80	70-130			
Dichlorodifluoromethane	0.0273	0.0100	mg/kg wet	0.05000		55	70-130			
Diethyl Ether	0.0455	0.0050	mg/kg wet	0.05000		91	70-130			B-
Di-isopropyl ether	0.0430	0.0050	mg/kg wet	0.05000		86	70-130			
Ethyl tertiary-butyl ether	0.0441	0.0050	mg/kg wet	0.05000		88	70-130			
Ethylbenzene	0.0457	0.0050	mg/kg wet	0.05000		91	70-130			
Hexachlorobutadiene	0.0459	0.0050	mg/kg wet	0.05000		92	70-130			
Isopropylbenzene	0.0467	0.0050	mg/kg wet	0.05000		93	70-130			
Methyl tert-Butyl Ether	0.0445	0.0050	mg/kg wet	0.05000		89	70-130			
Methylene Chloride	0.0433	0.0250	mg/kg wet	0.05000		87	70-130			
Naphthalene	0.0434	0.0050	mg/kg wet	0.05000		87	70-130			
n-Butylbenzene	0.0476	0.0050	mg/kg wet	0.05000		95	70-130			
n-Propylbenzene	0.0486	0.0050	mg/kg wet	0.05000		97	70-130			
sec-Butylbenzene	0.0475	0.0050	mg/kg wet	0.05000		95	70-130			
Styrene	0.0467	0.0050	mg/kg wet	0.05000		93	70-130			
tert-Butylbenzene	0.0483	0.0050	mg/kg wet	0.05000		97	70-130			
Tertiary-amyl methyl ether	0.0439	0.0050	mg/kg wet	0.05000		88	70-130			
Tetrachloroethene	0.0466	0.0050	mg/kg wet	0.05000		93	70-130			
Tetrahydrofuran	0.0426	0.0050	mg/kg wet	0.05000		85	70-130			
Toluene	0.0420	0.0050	mg/kg wet	0.05000		84	70-130			
trans-1,2-Dichloroethene	0.0438	0.0050	mg/kg wet	0.05000		88	70-130			
trans-1,3-Dichloropropene	0.0380	0.0050	mg/kg wet	0.05000		76	70-130			
Trichloroethene	0.0418	0.0050	mg/kg wet	0.05000		84	70-130			
Trichlorofluoromethane	0.0372	0.0050	mg/kg wet	0.05000		74	70-130			
Vinyl Acetate	0.0389	0.0050	mg/kg wet	0.05000		78	70-130			
Vinyl Chloride	0.0391	0.0100	mg/kg wet	0.05000		78	70-130			
Xylene O	0.0475	0.0050	mg/kg wet	0.05000		95	70-130			
Xylene P,M	0.0951	0.0100	mg/kg wet	0.1000		95	70-130			
Xylenes (Total)	0.143	0.0100	mg/kg wet							
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0436</i>		mg/kg wet	<i>0.05000</i>		<i>87</i>	<i>70-130</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0501</i>		mg/kg wet	<i>0.05000</i>		<i>100</i>	<i>70-130</i>			
<i>Surrogate: Dibromofluoromethane</i>	<i>0.0456</i>		mg/kg wet	<i>0.05000</i>		<i>91</i>	<i>70-130</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0530</i>		mg/kg wet	<i>0.05000</i>		<i>106</i>	<i>70-130</i>			

**LCS Dup**

1,1,1,2-Tetrachloroethane	0.0459	0.0050	mg/kg wet	0.05000		92	70-130	11	25	
1,1,1-Trichloroethane	0.0422	0.0050	mg/kg wet	0.05000		84	70-130	10	25	
1,1,1,2-Tetrachloroethane	0.0515	0.0050	mg/kg wet	0.05000		103	70-130	10	25	
1,1,2-Trichloroethane	0.0460	0.0050	mg/kg wet	0.05000		92	70-130	8	25	
1,1-Dichloroethane	0.0439	0.0050	mg/kg wet	0.05000		88	70-130	9	25	
1,1-Dichloroethene	0.0485	0.0050	mg/kg wet	0.05000		97	70-130	10	25	
1,1-Dichloropropene	0.0466	0.0050	mg/kg wet	0.05000		93	70-130	10	25	





*CERTIFICATE OF ANALYSIS*

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**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CJ72515 - 5035**

1,2,3-Trichlorobenzene	0.0505	0.0050	mg/kg wet	0.05000		101	70-130	8	25	
1,2,3-Trichloropropane	0.0504	0.0050	mg/kg wet	0.05000		101	70-130	11	25	
1,2,4-Trichlorobenzene	0.0510	0.0050	mg/kg wet	0.05000		102	70-130	7	25	
1,2,4-Trimethylbenzene	0.0537	0.0050	mg/kg wet	0.05000		107	70-130	8	25	
1,2-Dibromo-3-Chloropropane	0.0422	0.0050	mg/kg wet	0.05000		84	70-130	11	25	
1,2-Dibromoethane	0.0540	0.0050	mg/kg wet	0.05000		108	70-130	12	25	
1,2-Dichlorobenzene	0.0520	0.0050	mg/kg wet	0.05000		104	70-130	8	25	
1,2-Dichloroethane	0.0429	0.0050	mg/kg wet	0.05000		86	70-130	8	25	
1,2-Dichloropropane	0.0465	0.0050	mg/kg wet	0.05000		93	70-130	8	25	
1,3,5-Trimethylbenzene	0.0528	0.0050	mg/kg wet	0.05000		106	70-130	9	25	
1,3-Dichlorobenzene	0.0507	0.0050	mg/kg wet	0.05000		101	70-130	7	25	
1,3-Dichloropropane	0.0537	0.0050	mg/kg wet	0.05000		107	70-130	11	25	
1,4-Dichlorobenzene	0.0515	0.0050	mg/kg wet	0.05000		103	70-130	7	25	
1,4-Dioxane	1.02	0.100	mg/kg wet	1.000		102	70-130	12	20	
1-Chlorohexane	0.0549	0.0050	mg/kg wet	0.05000		110	70-130	13	25	
2,2-Dichloropropane	0.0390	0.0050	mg/kg wet	0.05000		78	70-130	8	25	
2-Butanone	0.242	0.0500	mg/kg wet	0.2500		97	70-130	10	25	
2-Chlorotoluene	0.0510	0.0050	mg/kg wet	0.05000		102	70-130	9	25	
2-Hexanone	0.264	0.0500	mg/kg wet	0.2500		105	70-130	16	25	
4-Chlorotoluene	0.0513	0.0050	mg/kg wet	0.05000		103	70-130	9	25	
4-Isopropyltoluene	0.0520	0.0050	mg/kg wet	0.05000		104	70-130	8	25	
4-Methyl-2-Pentanone	0.237	0.0500	mg/kg wet	0.2500		95	70-130	13	25	
Acetone	0.241	0.0500	mg/kg wet	0.2500		96	70-130	10	25	
Benzene	0.0454	0.0050	mg/kg wet	0.05000		91	70-130	8	25	
Bromobenzene	0.0527	0.0050	mg/kg wet	0.05000		105	70-130	8	25	
Bromochloromethane	0.0447	0.0050	mg/kg wet	0.05000		89	70-130	8	25	
Bromodichloromethane	0.0435	0.0050	mg/kg wet	0.05000		87	70-130	9	25	
Bromoform	0.0408	0.0050	mg/kg wet	0.05000		82	70-130	13	25	
Bromomethane	0.0413	0.0100	mg/kg wet	0.05000		83	70-130	10	25	
Carbon Disulfide	0.0471	0.0050	mg/kg wet	0.05000		94	70-130	9	25	
Carbon Tetrachloride	0.0396	0.0050	mg/kg wet	0.05000		79	70-130	11	25	
Chlorobenzene	0.0506	0.0050	mg/kg wet	0.05000		101	70-130	11	25	
Chloroethane	0.0442	0.0100	mg/kg wet	0.05000		88	70-130	9	25	
Chloroform	0.0428	0.0050	mg/kg wet	0.05000		86	70-130	8	25	
Chloromethane	0.0417	0.0100	mg/kg wet	0.05000		83	70-130	10	25	
cis-1,2-Dichloroethene	0.0461	0.0050	mg/kg wet	0.05000		92	70-130	9	25	
cis-1,3-Dichloropropene	0.0478	0.0050	mg/kg wet	0.05000		96	70-130	8	25	
Dibromochloromethane	0.0447	0.0050	mg/kg wet	0.05000		89	70-130	12	25	
Dibromomethane	0.0435	0.0050	mg/kg wet	0.05000		87	70-130	8	25	
Dichlorodifluoromethane	0.0303	0.0100	mg/kg wet	0.05000		61	70-130	10	25	B-
Diethyl Ether	0.0497	0.0050	mg/kg wet	0.05000		99	70-130	9	25	
Di-isopropyl ether	0.0465	0.0050	mg/kg wet	0.05000		93	70-130	8	25	
Ethyl tertiary-butyl ether	0.0476	0.0050	mg/kg wet	0.05000		95	70-130	8	25	
Ethylbenzene	0.0516	0.0050	mg/kg wet	0.05000		103	70-130	12	25	
Hexachlorobutadiene	0.0505	0.0050	mg/kg wet	0.05000		101	70-130	10	25	



CERTIFICATE OF ANALYSIS

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ESS Laboratory Work Order: 1710517

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CJ72515 - 5035**

Isopropylbenzene	0.0510	0.0050	mg/kg wet	0.05000		102	70-130	9	25	
Methyl tert-Butyl Ether	0.0487	0.0050	mg/kg wet	0.05000		97	70-130	9	25	
Methylene Chloride	0.0469	0.0250	mg/kg wet	0.05000		94	70-130	8	25	
Naphthalene	0.0479	0.0050	mg/kg wet	0.05000		96	70-130	10	25	
n-Butylbenzene	0.0519	0.0050	mg/kg wet	0.05000		104	70-130	9	25	
n-Propylbenzene	0.0532	0.0050	mg/kg wet	0.05000		106	70-130	9	25	
sec-Butylbenzene	0.0520	0.0050	mg/kg wet	0.05000		104	70-130	9	25	
Styrene	0.0525	0.0050	mg/kg wet	0.05000		105	70-130	12	25	
tert-Butylbenzene	0.0533	0.0050	mg/kg wet	0.05000		107	70-130	10	25	
Tertiary-amyl methyl ether	0.0476	0.0050	mg/kg wet	0.05000		95	70-130	8	25	
Tetrachloroethene	0.0522	0.0050	mg/kg wet	0.05000		104	70-130	11	25	
Tetrahydrofuran	0.0499	0.0050	mg/kg wet	0.05000		100	70-130	16	25	
Toluene	0.0455	0.0050	mg/kg wet	0.05000		91	70-130	8	25	
trans-1,2-Dichloroethene	0.0475	0.0050	mg/kg wet	0.05000		95	70-130	8	25	
trans-1,3-Dichloropropene	0.0412	0.0050	mg/kg wet	0.05000		82	70-130	8	25	
Trichloroethene	0.0452	0.0050	mg/kg wet	0.05000		90	70-130	8	25	
Trichlorofluoromethane	0.0404	0.0050	mg/kg wet	0.05000		81	70-130	8	25	
Vinyl Acetate	0.0427	0.0050	mg/kg wet	0.05000		85	70-130	9	25	
Vinyl Chloride	0.0438	0.0100	mg/kg wet	0.05000		88	70-130	11	25	
Xylene O	0.0531	0.0050	mg/kg wet	0.05000		106	70-130	11	25	
Xylene P,M	0.107	0.0100	mg/kg wet	0.1000		107	70-130	12	25	
Xylenes (Total)	0.160	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	0.0437		mg/kg wet	0.05000		87	70-130			
Surrogate: 4-Bromofluorobenzene	0.0515		mg/kg wet	0.05000		103	70-130			
Surrogate: Dibromofluoromethane	0.0453		mg/kg wet	0.05000		91	70-130			
Surrogate: Toluene-d8	0.0547		mg/kg wet	0.05000		109	70-130			

5035/8260B Volatile Organic Compounds / Methanol

**Batch CJ72523 - [CALC]**

<b>Blank</b>										
Xylenes (Total)	ND	0.400	mg/kg wet							
<b>LCS</b>										
Xylenes (Total)	6.21	0.400	mg/kg wet							
<b>LCS Dup</b>										
Xylenes (Total)	6.09	0.400	mg/kg wet							

8270D Polynuclear Aromatic Hydrocarbons

**Batch CJ71914 - 3546**

<b>Blank</b>										
Naphthalene	ND	0.3	mg/kg wet							
Surrogate: 1,2-Dichlorobenzene-d4	2.84		mg/kg wet	3.333		85	30-130			
Surrogate: 2-Fluorobiphenyl	3.09		mg/kg wet	3.333		93	30-130			
Surrogate: Nitrobenzene-d5	3.19		mg/kg wet	3.333		96	30-130			
Surrogate: p-Terphenyl-d14	3.23		mg/kg wet	3.333		97	30-130			



CERTIFICATE OF ANALYSIS

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ESS Laboratory Work Order: 1710517

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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8270D Polynuclear Aromatic Hydrocarbons

**Batch CJ71914 - 3546**

**LCS**

Naphthalene	2.5	0.3	mg/kg wet	3.333		75	40-140			
Surrogate: 1,2-Dichlorobenzene-d4	2.47		mg/kg wet	3.333		74	30-130			
Surrogate: 2-Fluorobiphenyl	2.89		mg/kg wet	3.333		87	30-130			
Surrogate: Nitrobenzene-d5	2.76		mg/kg wet	3.333		83	30-130			
Surrogate: p-Terphenyl-d14	3.24		mg/kg wet	3.333		97	30-130			

**LCS Dup**

Naphthalene	3.0	0.3	mg/kg wet	3.333		89	40-140	18	30	
Surrogate: 1,2-Dichlorobenzene-d4	2.91		mg/kg wet	3.333		87	30-130			
Surrogate: 2-Fluorobiphenyl	3.15		mg/kg wet	3.333		95	30-130			
Surrogate: Nitrobenzene-d5	3.24		mg/kg wet	3.333		97	30-130			
Surrogate: p-Terphenyl-d14	3.24		mg/kg wet	3.333		97	30-130			

## CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
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ESS Laboratory Work Order: 1710517

**Notes and Definitions**

U	Analyte included in the analysis, but not detected
IM	Internal Standard(s) outside of criteria due to matrix (UCM/coelution is present) (IM).
D	Diluted.
B-	Blank Spike recovery is below lower control limit (B-).
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710517

**ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS**

**ENVIRONMENTAL**

Rhode Island Potable and Non Potable Water: LAI00179

<http://www.health.ri.gov/find/labs/analytical/ESS.pdf>

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750

[http://www.ct.gov/dph/lib/dph/environmental\\_health/environmental\\_laboratories/pdf/OutofStateCommercialLaboratories.pdf](http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf)

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002

<http://www.maine.gov/dhhs/meecd/environmental-health/dwp/partners/labCert.shtml>

Massachusetts Potable and Non Potable Water: M-RI002

<http://public.dep.state.ma.us/Labcert/Labcert.aspx>

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424

<http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm>

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313

<http://www.wadsworth.org/labcert/elap/comm.html>

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006

[http://datamine2.state.nj.us/DEP\\_OPRA/OpraMain/pi\\_main?mode=pi\\_by\\_site&sort\\_order=PI\\_NAMEA&Select+a+Site:=58715](http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715)

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752

<http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx>

## ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Providence, RI - GZA/HDM

ESS Project ID: 1710517  
 Date Received: 10/19/2017  
 Project Due Date: 10/26/2017  
 Days for Project: 5 Day

Shipped/Delivered Via: ESS Courier

- 1. Air bill manifest present?  No  
Air No.: NA
- 2. Were custody seals present?  No
- 3. Is radiation count <100 CPM?  Yes
- 4. Is a Cooler Present?  Yes  
Temp: 4.4 Iced with: Ice
- 5. Was COC signed and dated by client?  Yes

- 6. Does COC match bottles?  No
- 7. Is COC complete and correct?  Yes
- 8. Were samples received intact?  Yes
- 9. Were labs informed about short holds & rushes? Yes / No /  NA
- 10. Were any analyses received outside of hold time? Yes /  No

11. Any Subcontracting needed? Yes /  No  
 ESS Sample IDs: \_\_\_\_\_  
 Analysis: \_\_\_\_\_  
 TAT: \_\_\_\_\_

- 12. Were VOAs received?  Yes / No
- a. Air bubbles in aqueous VOAs?  Yes / No
- b. Does methanol cover soil completely?  Yes / No / NA

13. Are the samples properly preserved?  Yes / No  
 a. If metals preserved upon receipt: Date: \_\_\_\_\_ Time: ~~2:22~~  
 b. Low Level VOA vials frozen: Date: 10/19/17 Time: 2:30

By: \_\_\_\_\_  
 By: [Signature]

**Sample Receiving Notes:**

COC = 8oz jars, rec'd 4oz for GZ-BW-511 (2-4) re 10/19/17

14. Was there a need to contact Project Manager?  Yes / No  
 a. Was there a need to contact the client?  Yes / No  
 Who was contacted? \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_ By: \_\_\_\_\_

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
01	174388	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
01	174391	Yes	NA	Yes	VOA Vial - Other	Other	
01	174392	Yes	NA	Yes	VOA Vial - Other	Other	
01	174394	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
02	174387	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
02	174389	Yes	NA	Yes	VOA Vial - Other	Other	
02	174390	Yes	NA	Yes	VOA Vial - Other	Other	
02	174393	Yes	NA	Yes	4 oz. Jar - Unpres	NP	

2nd Review  
 Are barcode labels on correct containers?  Yes / No

Completed By: [Signature] Date & Time: 10/19/17 2:45  
 Reviewed By: [Signature] Date & Time: 10/19/17 2:01  
 Delivered By: [Signature] Date & Time: 10/19/17 2:01





## CERTIFICATE OF ANALYSIS

Sarah McLeod  
GZA GeoEnvironmental, Inc.  
530 Broadway  
Providence, RI 02909

**RE: Former Tidewater Facility (05.0043654.00)**  
**ESS Laboratory Work Order Number: 1710518**

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.



Laurel Stoddard  
Laboratory Director

**REVIEWED****By ESS Laboratory at 1:36 pm, Oct 26, 2017****Analytical Summary**

The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710518

**SAMPLE RECEIPT**

The following samples were received on October 19, 2017 for the analyses specified on the enclosed Chain of Custody Record.

**Low Level VOA vials were frozen by ESS Laboratory on October 19, 2017 at 2204.**

<u>Lab Number</u>	<u>Sample Name</u>	<u>Matrix</u>	<u>Analysis</u>
1710518-01	GZ-SB-514 3-4ft	Soil	6010C, 7010, 7471B, 8100M, 8260B Low, 8270D, 9014
1710518-02	GZ-SB-515 0-2ft	Soil	6010C, 7010, 7471B, 8100M, 8260B Low, 8270D, 9014



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710518

**PROJECT NARRATIVE**

**Total Metals**

CJ71947-BS1 Blank Spike recovery is above upper control limit (B+).  
Selenium (134% @ 80-120%)

CJ71947-BSD1 Blank Spike recovery is above upper control limit (B+).  
Selenium (133% @ 80-120%)

**No other observations noted.**

**End of Project Narrative.**

**DATA USABILITY LINKS**

*To ensure you are viewing the most current version of the documents below, please clear your internet cookies for [www.ESSLaboratory.com](http://www.ESSLaboratory.com). Consult your IT Support personnel for information on how to clear your internet cookies.*

[Definitions of Quality Control Parameters](#)

[Semivolatile Organics Internal Standard Information](#)

[Semivolatile Organics Surrogate Information](#)

[Volatile Organics Internal Standard Information](#)

[Volatile Organics Surrogate Information](#)

[EPH and VPH Alkane Lists](#)



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710518

**CURRENT SW-846 METHODOLOGY VERSIONS**

**Analytical Methods**

- 1010A - Flashpoint
- 6010C - ICP
- 6020A - ICP MS
- 7010 - Graphite Furnace
- 7196A - Hexavalent Chromium
- 7470A - Aqueous Mercury
- 7471B - Solid Mercury
- 8011 - EDB/DBCP/TCP
- 8015C - GRO/DRO
- 8081B - Pesticides
- 8082A - PCB
- 8100M - TPH
- 8151A - Herbicides
- 8260B - VOA
- 8270D - SVOA
- 8270D SIM - SVOA Low Level
- 9014 - Cyanide
- 9038 - Sulfate
- 9040C - Aqueous pH
- 9045D - Solid pH (Corrosivity)
- 9050A - Specific Conductance
- 9056A - Anions (IC)
- 9060A - TOC
- 9095B - Paint Filter
- MADEP 04-1.1 - EPH / VPH

**Prep Methods**

- 3005A - Aqueous ICP Digestion
- 3020A - Aqueous Graphite Furnace / ICP MS Digestion
- 3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
- 3060A - Solid Hexavalent Chromium Digestion
- 3510C - Separatory Funnel Extraction
- 3520C - Liquid / Liquid Extraction
- 3540C - Manual Soxhlet Extraction
- 3541 - Automated Soxhlet Extraction
- 3546 - Microwave Extraction
- 3580A - Waste Dilution
- 5030B - Aqueous Purge and Trap
- 5030C - Aqueous Purge and Trap
- 5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SB-514 3-4ft  
 Date Sampled: 10/18/17 14:20  
 Percent Solids: 81

ESS Laboratory Work Order: 1710518  
 ESS Laboratory Sample ID: 1710518-01  
 Sample Matrix: Soil  
 Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (4.95)		6010C		1	KJK	10/23/17 23:22	2.49	100	CJ71947
Arsenic	5.62 (2.48)		7010		10	MJV/KJK	10/25/17 15:39	2.49	100	CJ71947
Beryllium	0.12 (0.11)		6010C		1	KJK	10/23/17 23:22	2.49	100	CJ71947
Cadmium	ND (0.50)		6010C		1	KJK	10/23/17 23:22	2.49	100	CJ71947
Chromium	4.04 (0.99)		6010C		1	KJK	10/23/17 23:22	2.49	100	CJ71947
Copper	10.9 (2.48)		6010C		1	KJK	10/23/17 23:22	2.49	100	CJ71947
Lead	78.9 (4.95)		6010C		1	KJK	10/23/17 23:22	2.49	100	CJ71947
Mercury	0.367 (0.039)		7471B		1	MJV	10/23/17 13:00	0.63	40	CJ71840
Nickel	4.71 (2.48)		6010C		1	KJK	10/23/17 23:22	2.49	100	CJ71947
Selenium	ND (4.95)		7010		10	MJV/KJK	10/25/17 14:06	2.49	100	CJ71947
Silver	ND (0.50)		6010C		1	KJK	10/23/17 23:22	2.49	100	CJ71947
Thallium	ND (4.95)		6010C		1	KJK	10/23/17 23:22	2.49	100	CJ71947
Zinc	14.1 (2.48)		6010C		1	KJK	10/23/17 23:22	2.49	100	CJ71947





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SB-514 3-4ft  
 Date Sampled: 10/18/17 14:20  
 Percent Solids: 81  
 Initial Volume: 4.3  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1710518  
 ESS Laboratory Sample ID: 1710518-01  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0072)		8260B Low		1	10/20/17 19:25	C7J0321	CJ72021
1,1,1-Trichloroethane	ND (0.0072)		8260B Low		1	10/20/17 19:25	C7J0321	CJ72021
1,1,2,2-Tetrachloroethane	ND (0.0072)		8260B Low		1	10/20/17 19:25	C7J0321	CJ72021
1,1,2-Trichloroethane	ND (0.0072)		8260B Low		1	10/20/17 19:25	C7J0321	CJ72021
1,1-Dichloroethane	ND (0.0072)		8260B Low		1	10/20/17 19:25	C7J0321	CJ72021
1,1-Dichloroethene	ND (0.0072)		8260B Low		1	10/20/17 19:25	C7J0321	CJ72021
1,1-Dichloropropene	ND (0.0072)		8260B Low		1	10/20/17 19:25	C7J0321	CJ72021
1,2,3-Trichlorobenzene	ND (0.0072)		8260B Low		1	10/20/17 19:25	C7J0321	CJ72021
1,2,3-Trichloropropane	ND (0.0072)		8260B Low		1	10/20/17 19:25	C7J0321	CJ72021
1,2,4-Trichlorobenzene	ND (0.0072)		8260B Low		1	10/20/17 19:25	C7J0321	CJ72021
1,2,4-Trimethylbenzene	ND (0.0072)		8260B Low		1	10/20/17 19:25	C7J0321	CJ72021
1,2-Dibromo-3-Chloropropane	ND (0.0072)		8260B Low		1	10/20/17 19:25	C7J0321	CJ72021
1,2-Dibromoethane	ND (0.0072)		8260B Low		1	10/20/17 19:25	C7J0321	CJ72021
1,2-Dichlorobenzene	ND (0.0072)		8260B Low		1	10/20/17 19:25	C7J0321	CJ72021
1,2-Dichloroethane	ND (0.0072)		8260B Low		1	10/20/17 19:25	C7J0321	CJ72021
1,2-Dichloropropane	ND (0.0072)		8260B Low		1	10/20/17 19:25	C7J0321	CJ72021
1,3,5-Trimethylbenzene	ND (0.0072)		8260B Low		1	10/20/17 19:25	C7J0321	CJ72021
1,3-Dichlorobenzene	ND (0.0072)		8260B Low		1	10/20/17 19:25	C7J0321	CJ72021
1,3-Dichloropropane	ND (0.0072)		8260B Low		1	10/20/17 19:25	C7J0321	CJ72021
1,4-Dichlorobenzene	ND (0.0072)		8260B Low		1	10/20/17 19:25	C7J0321	CJ72021
1,4-Dioxane	ND (0.143)		8260B Low		1	10/20/17 19:25	C7J0321	CJ72021
1-Chlorohexane	ND (0.0072)		8260B Low		1	10/20/17 19:25	C7J0321	CJ72021
2,2-Dichloropropane	ND (0.0072)		8260B Low		1	10/20/17 19:25	C7J0321	CJ72021
2-Butanone	ND (0.0717)		8260B Low		1	10/20/17 19:25	C7J0321	CJ72021
2-Chlorotoluene	ND (0.0072)		8260B Low		1	10/20/17 19:25	C7J0321	CJ72021
2-Hexanone	ND (0.0717)		8260B Low		1	10/20/17 19:25	C7J0321	CJ72021
4-Chlorotoluene	ND (0.0072)		8260B Low		1	10/20/17 19:25	C7J0321	CJ72021
4-Isopropyltoluene	ND (0.0072)		8260B Low		1	10/20/17 19:25	C7J0321	CJ72021
4-Methyl-2-Pentanone	ND (0.0717)		8260B Low		1	10/20/17 19:25	C7J0321	CJ72021
Acetone	ND (0.0717)		8260B Low		1	10/20/17 19:25	C7J0321	CJ72021
Benzene	ND (0.0072)		8260B Low		1	10/20/17 19:25	C7J0321	CJ72021
Bromobenzene	ND (0.0072)		8260B Low		1	10/20/17 19:25	C7J0321	CJ72021



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SB-514 3-4ft  
 Date Sampled: 10/18/17 14:20  
 Percent Solids: 81  
 Initial Volume: 4.3  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1710518  
 ESS Laboratory Sample ID: 1710518-01  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0072)		8260B Low		1	10/20/17 19:25	C7J0321	CJ72021
Bromodichloromethane	ND (0.0072)		8260B Low		1	10/20/17 19:25	C7J0321	CJ72021
Bromoform	ND (0.0072)		8260B Low		1	10/20/17 19:25	C7J0321	CJ72021
Bromomethane	ND (0.0143)		8260B Low		1	10/20/17 19:25	C7J0321	CJ72021
Carbon Disulfide	ND (0.0072)		8260B Low		1	10/20/17 19:25	C7J0321	CJ72021
Carbon Tetrachloride	ND (0.0072)		8260B Low		1	10/20/17 19:25	C7J0321	CJ72021
Chlorobenzene	ND (0.0072)		8260B Low		1	10/20/17 19:25	C7J0321	CJ72021
Chloroethane	ND (0.0143)		8260B Low		1	10/20/17 19:25	C7J0321	CJ72021
Chloroform	ND (0.0072)		8260B Low		1	10/20/17 19:25	C7J0321	CJ72021
Chloromethane	ND (0.0143)		8260B Low		1	10/20/17 19:25	C7J0321	CJ72021
cis-1,2-Dichloroethene	ND (0.0072)		8260B Low		1	10/20/17 19:25	C7J0321	CJ72021
cis-1,3-Dichloropropene	ND (0.0072)		8260B Low		1	10/20/17 19:25	C7J0321	CJ72021
Dibromochloromethane	ND (0.0072)		8260B Low		1	10/20/17 19:25	C7J0321	CJ72021
Dibromomethane	ND (0.0072)		8260B Low		1	10/20/17 19:25	C7J0321	CJ72021
Dichlorodifluoromethane	ND (0.0143)		8260B Low		1	10/20/17 19:25	C7J0321	CJ72021
Diethyl Ether	ND (0.0072)		8260B Low		1	10/20/17 19:25	C7J0321	CJ72021
Di-isopropyl ether	ND (0.0072)		8260B Low		1	10/20/17 19:25	C7J0321	CJ72021
Ethyl tertiary-butyl ether	ND (0.0072)		8260B Low		1	10/20/17 19:25	C7J0321	CJ72021
Ethylbenzene	ND (0.0072)		8260B Low		1	10/20/17 19:25	C7J0321	CJ72021
Hexachlorobutadiene	ND (0.0072)		8260B Low		1	10/20/17 19:25	C7J0321	CJ72021
Isopropylbenzene	ND (0.0072)		8260B Low		1	10/20/17 19:25	C7J0321	CJ72021
Methyl tert-Butyl Ether	ND (0.0072)		8260B Low		1	10/20/17 19:25	C7J0321	CJ72021
Methylene Chloride	ND (0.0359)		8260B Low		1	10/20/17 19:25	C7J0321	CJ72021
Naphthalene	ND (0.0072)		8260B Low		1	10/20/17 19:25	C7J0321	CJ72021
n-Butylbenzene	ND (0.0072)		8260B Low		1	10/20/17 19:25	C7J0321	CJ72021
n-Propylbenzene	ND (0.0072)		8260B Low		1	10/20/17 19:25	C7J0321	CJ72021
sec-Butylbenzene	ND (0.0072)		8260B Low		1	10/20/17 19:25	C7J0321	CJ72021
Styrene	ND (0.0072)		8260B Low		1	10/20/17 19:25	C7J0321	CJ72021
tert-Butylbenzene	ND (0.0072)		8260B Low		1	10/20/17 19:25	C7J0321	CJ72021
Tertiary-amyl methyl ether	ND (0.0072)		8260B Low		1	10/20/17 19:25	C7J0321	CJ72021
Tetrachloroethene	ND (0.0072)		8260B Low		1	10/20/17 19:25	C7J0321	CJ72021
Tetrahydrofuran	ND (0.0072)		8260B Low		1	10/20/17 19:25	C7J0321	CJ72021



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SB-514 3-4ft  
 Date Sampled: 10/18/17 14:20  
 Percent Solids: 81  
 Initial Volume: 4.3  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1710518  
 ESS Laboratory Sample ID: 1710518-01  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0072)		8260B Low		1	10/20/17 19:25	C7J0321	CJ72021
trans-1,2-Dichloroethene	ND (0.0072)		8260B Low		1	10/20/17 19:25	C7J0321	CJ72021
trans-1,3-Dichloropropene	ND (0.0072)		8260B Low		1	10/20/17 19:25	C7J0321	CJ72021
Trichloroethene	ND (0.0072)		8260B Low		1	10/20/17 19:25	C7J0321	CJ72021
Trichlorofluoromethane	ND (0.0072)		8260B Low		1	10/20/17 19:25	C7J0321	CJ72021
Vinyl Acetate	ND (0.0072)		8260B Low		1	10/20/17 19:25	C7J0321	CJ72021
Vinyl Chloride	ND (0.0143)		8260B Low		1	10/20/17 19:25	C7J0321	CJ72021
Xylene O	ND (0.0072)		8260B Low		1	10/20/17 19:25	C7J0321	CJ72021
Xylene P,M	ND (0.0143)		8260B Low		1	10/20/17 19:25	C7J0321	CJ72021
Xylenes (Total)	ND (0.0143)		8260B Low		1	10/20/17 19:25		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	119 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	90 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	106 %		70-130
<i>Surrogate: Toluene-d8</i>	98 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SB-514 3-4ft  
 Date Sampled: 10/18/17 14:20  
 Percent Solids: 81  
 Initial Volume: 20  
 Final Volume: 1  
 Extraction Method: 3546

ESS Laboratory Work Order: 1710518  
 ESS Laboratory Sample ID: 1710518-01  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: SMR  
 Prepared: 10/20/17 9:50

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	580 (231)		8100M		5	10/21/17 8:23	C7J0327	CJ71915

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: O-Terphenyl</i>	81 %		40-140



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SB-514 3-4ft  
 Date Sampled: 10/18/17 14:20  
 Percent Solids: 81  
 Initial Volume: 14.5  
 Final Volume: 0.5  
 Extraction Method: 3546

ESS Laboratory Work Order: 1710518  
 ESS Laboratory Sample ID: 1710518-01  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: TJ  
 Prepared: 10/20/17 9:45

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.425)		8270D		1	10/20/17 20:51	C7J0315	CJ71914
Acenaphthene	ND (0.425)		8270D		1	10/20/17 20:51	C7J0315	CJ71914
Acenaphthylene	1.53 (0.425)		8270D		1	10/20/17 20:51	C7J0315	CJ71914
Anthracene	0.615 (0.425)		8270D		1	10/20/17 20:51	C7J0315	CJ71914
Benzo(a)anthracene	8.97 (0.425)		8270D		1	10/20/17 20:51	C7J0315	CJ71914
Benzo(a)pyrene	18.3 (2.13)		8270D		10	10/23/17 17:39	C7J0315	CJ71914
Benzo(b)fluoranthene	19.9 (4.25)		8270D		10	10/23/17 17:39	C7J0315	CJ71914
Benzo(g,h,i)perylene	21.3 (4.25)		8270D		10	10/23/17 17:39	C7J0315	CJ71914
Benzo(k)fluoranthene	12.3 (4.25)		8270D		10	10/23/17 17:39	C7J0315	CJ71914
Chrysene	8.09 (0.213)		8270D		1	10/20/17 20:51	C7J0315	CJ71914
Dibenzo(a,h)Anthracene	4.78 (0.213)		8270D		1	10/20/17 20:51	C7J0315	CJ71914
Fluoranthene	10.4 (0.425)		8270D		1	10/20/17 20:51	C7J0315	CJ71914
Fluorene	ND (0.425)		8270D		1	10/20/17 20:51	C7J0315	CJ71914
Indeno(1,2,3-cd)Pyrene	18.0 (4.25)		8270D		10	10/23/17 17:39	C7J0315	CJ71914
Naphthalene	1.10 (0.425)		8270D		1	10/20/17 20:51	C7J0315	CJ71914
Phenanthrene	1.12 (0.425)		8270D		1	10/20/17 20:51	C7J0315	CJ71914
Pyrene	9.79 (0.425)		8270D		1	10/20/17 20:51	C7J0315	CJ71914

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	71 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	82 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	83 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	74 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SB-514 3-4ft  
Date Sampled: 10/18/17 14:20  
Percent Solids: 81

ESS Laboratory Work Order: 1710518  
ESS Laboratory Sample ID: 1710518-01  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	70.5 (12.1)		9014		10	EEM	10/23/17 12:15	mg/kg dry	CJ72317





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SB-515 0-2ft  
 Date Sampled: 10/18/17 14:50  
 Percent Solids: 89

ESS Laboratory Work Order: 1710518  
 ESS Laboratory Sample ID: 1710518-02  
 Sample Matrix: Soil  
 Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (4.61)		6010C		1	KJK	10/24/17 21:09	2.43	100	CJ71947
Arsenic	<b>10.4</b> (2.30)		6010C		1	KJK	10/24/17 21:09	2.43	100	CJ71947
Beryllium	<b>0.43</b> (0.10)		6010C		1	KJK	10/24/17 21:09	2.43	100	CJ71947
Cadmium	ND (0.46)		6010C		1	KJK	10/24/17 21:09	2.43	100	CJ71947
Chromium	<b>5.67</b> (0.92)		6010C		1	KJK	10/24/17 21:09	2.43	100	CJ71947
Copper	<b>59.9</b> (2.30)		6010C		1	KJK	10/24/17 21:09	2.43	100	CJ71947
Lead	<b>191</b> (4.61)		6010C		1	KJK	10/24/17 21:09	2.43	100	CJ71947
Mercury	<b>1.41</b> (0.241)		7471B		10	MJV	10/23/17 14:25	0.92	40	CJ71840
Nickel	<b>13.5</b> (2.30)		6010C		1	KJK	10/24/17 21:09	2.43	100	CJ71947
Selenium	ND (2.30)		7010		5	MJV/KJK	10/25/17 14:00	2.43	100	CJ71947
Silver	ND (0.46)		6010C		1	KJK	10/24/17 21:09	2.43	100	CJ71947
Thallium	ND (4.61)		6010C		1	KJK	10/24/17 21:09	2.43	100	CJ71947
Zinc	<b>95.1</b> (2.30)		6010C		1	KJK	10/24/17 21:09	2.43	100	CJ71947



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SB-515 0-2ft  
Date Sampled: 10/18/17 14:50  
Percent Solids: 89  
Initial Volume: 6.6  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710518  
ESS Laboratory Sample ID: 1710518-02  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0042)		8260B Low		1	10/20/17 19:50	C7J0321	CJ72021
1,1,1-Trichloroethane	ND (0.0042)		8260B Low		1	10/20/17 19:50	C7J0321	CJ72021
1,1,2,2-Tetrachloroethane	ND (0.0042)		8260B Low		1	10/20/17 19:50	C7J0321	CJ72021
1,1,2-Trichloroethane	ND (0.0042)		8260B Low		1	10/20/17 19:50	C7J0321	CJ72021
1,1-Dichloroethane	ND (0.0042)		8260B Low		1	10/20/17 19:50	C7J0321	CJ72021
1,1-Dichloroethene	ND (0.0042)		8260B Low		1	10/20/17 19:50	C7J0321	CJ72021
1,1-Dichloropropene	ND (0.0042)		8260B Low		1	10/20/17 19:50	C7J0321	CJ72021
1,2,3-Trichlorobenzene	ND (0.0042)		8260B Low		1	10/20/17 19:50	C7J0321	CJ72021
1,2,3-Trichloropropane	ND (0.0042)		8260B Low		1	10/20/17 19:50	C7J0321	CJ72021
1,2,4-Trichlorobenzene	ND (0.0042)		8260B Low		1	10/20/17 19:50	C7J0321	CJ72021
1,2,4-Trimethylbenzene	ND (0.0042)		8260B Low		1	10/20/17 19:50	C7J0321	CJ72021
1,2-Dibromo-3-Chloropropane	ND (0.0042)		8260B Low		1	10/20/17 19:50	C7J0321	CJ72021
1,2-Dibromoethane	ND (0.0042)		8260B Low		1	10/20/17 19:50	C7J0321	CJ72021
1,2-Dichlorobenzene	ND (0.0042)		8260B Low		1	10/20/17 19:50	C7J0321	CJ72021
1,2-Dichloroethane	ND (0.0042)		8260B Low		1	10/20/17 19:50	C7J0321	CJ72021
1,2-Dichloropropane	ND (0.0042)		8260B Low		1	10/20/17 19:50	C7J0321	CJ72021
1,3,5-Trimethylbenzene	ND (0.0042)		8260B Low		1	10/20/17 19:50	C7J0321	CJ72021
1,3-Dichlorobenzene	ND (0.0042)		8260B Low		1	10/20/17 19:50	C7J0321	CJ72021
1,3-Dichloropropane	ND (0.0042)		8260B Low		1	10/20/17 19:50	C7J0321	CJ72021
1,4-Dichlorobenzene	ND (0.0042)		8260B Low		1	10/20/17 19:50	C7J0321	CJ72021
1,4-Dioxane	ND (0.0849)		8260B Low		1	10/20/17 19:50	C7J0321	CJ72021
1-Chlorohexane	ND (0.0042)		8260B Low		1	10/20/17 19:50	C7J0321	CJ72021
2,2-Dichloropropane	ND (0.0042)		8260B Low		1	10/20/17 19:50	C7J0321	CJ72021
2-Butanone	ND (0.0424)		8260B Low		1	10/20/17 19:50	C7J0321	CJ72021
2-Chlorotoluene	ND (0.0042)		8260B Low		1	10/20/17 19:50	C7J0321	CJ72021
2-Hexanone	ND (0.0424)		8260B Low		1	10/20/17 19:50	C7J0321	CJ72021
4-Chlorotoluene	ND (0.0042)		8260B Low		1	10/20/17 19:50	C7J0321	CJ72021
4-Isopropyltoluene	ND (0.0042)		8260B Low		1	10/20/17 19:50	C7J0321	CJ72021
4-Methyl-2-Pentanone	ND (0.0424)		8260B Low		1	10/20/17 19:50	C7J0321	CJ72021
Acetone	ND (0.0424)		8260B Low		1	10/20/17 19:50	C7J0321	CJ72021
Benzene	ND (0.0042)		8260B Low		1	10/20/17 19:50	C7J0321	CJ72021
Bromobenzene	ND (0.0042)		8260B Low		1	10/20/17 19:50	C7J0321	CJ72021



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SB-515 0-2ft  
 Date Sampled: 10/18/17 14:50  
 Percent Solids: 89  
 Initial Volume: 6.6  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1710518  
 ESS Laboratory Sample ID: 1710518-02  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0042)		8260B Low		1	10/20/17 19:50	C7J0321	CJ72021
Bromodichloromethane	ND (0.0042)		8260B Low		1	10/20/17 19:50	C7J0321	CJ72021
Bromoform	ND (0.0042)		8260B Low		1	10/20/17 19:50	C7J0321	CJ72021
Bromomethane	ND (0.0085)		8260B Low		1	10/20/17 19:50	C7J0321	CJ72021
Carbon Disulfide	ND (0.0042)		8260B Low		1	10/20/17 19:50	C7J0321	CJ72021
Carbon Tetrachloride	ND (0.0042)		8260B Low		1	10/20/17 19:50	C7J0321	CJ72021
Chlorobenzene	ND (0.0042)		8260B Low		1	10/20/17 19:50	C7J0321	CJ72021
Chloroethane	ND (0.0085)		8260B Low		1	10/20/17 19:50	C7J0321	CJ72021
Chloroform	ND (0.0042)		8260B Low		1	10/20/17 19:50	C7J0321	CJ72021
Chloromethane	ND (0.0085)		8260B Low		1	10/20/17 19:50	C7J0321	CJ72021
cis-1,2-Dichloroethene	ND (0.0042)		8260B Low		1	10/20/17 19:50	C7J0321	CJ72021
cis-1,3-Dichloropropene	ND (0.0042)		8260B Low		1	10/20/17 19:50	C7J0321	CJ72021
Dibromochloromethane	ND (0.0042)		8260B Low		1	10/20/17 19:50	C7J0321	CJ72021
Dibromomethane	ND (0.0042)		8260B Low		1	10/20/17 19:50	C7J0321	CJ72021
Dichlorodifluoromethane	ND (0.0085)		8260B Low		1	10/20/17 19:50	C7J0321	CJ72021
Diethyl Ether	ND (0.0042)		8260B Low		1	10/20/17 19:50	C7J0321	CJ72021
Di-isopropyl ether	ND (0.0042)		8260B Low		1	10/20/17 19:50	C7J0321	CJ72021
Ethyl tertiary-butyl ether	ND (0.0042)		8260B Low		1	10/20/17 19:50	C7J0321	CJ72021
Ethylbenzene	ND (0.0042)		8260B Low		1	10/20/17 19:50	C7J0321	CJ72021
Hexachlorobutadiene	ND (0.0042)		8260B Low		1	10/20/17 19:50	C7J0321	CJ72021
Isopropylbenzene	ND (0.0042)		8260B Low		1	10/20/17 19:50	C7J0321	CJ72021
Methyl tert-Butyl Ether	ND (0.0042)		8260B Low		1	10/20/17 19:50	C7J0321	CJ72021
Methylene Chloride	ND (0.0212)		8260B Low		1	10/20/17 19:50	C7J0321	CJ72021
Naphthalene	ND (0.0042)		8260B Low		1	10/20/17 19:50	C7J0321	CJ72021
n-Butylbenzene	ND (0.0042)		8260B Low		1	10/20/17 19:50	C7J0321	CJ72021
n-Propylbenzene	ND (0.0042)		8260B Low		1	10/20/17 19:50	C7J0321	CJ72021
sec-Butylbenzene	ND (0.0042)		8260B Low		1	10/20/17 19:50	C7J0321	CJ72021
Styrene	ND (0.0042)		8260B Low		1	10/20/17 19:50	C7J0321	CJ72021
tert-Butylbenzene	ND (0.0042)		8260B Low		1	10/20/17 19:50	C7J0321	CJ72021
Tertiary-amyl methyl ether	ND (0.0042)		8260B Low		1	10/20/17 19:50	C7J0321	CJ72021
Tetrachloroethene	ND (0.0042)		8260B Low		1	10/20/17 19:50	C7J0321	CJ72021
Tetrahydrofuran	ND (0.0042)		8260B Low		1	10/20/17 19:50	C7J0321	CJ72021



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SB-515 0-2ft  
 Date Sampled: 10/18/17 14:50  
 Percent Solids: 89  
 Initial Volume: 6.6  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1710518  
 ESS Laboratory Sample ID: 1710518-02  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0042)		8260B Low		1	10/20/17 19:50	C7J0321	CJ72021
trans-1,2-Dichloroethene	ND (0.0042)		8260B Low		1	10/20/17 19:50	C7J0321	CJ72021
trans-1,3-Dichloropropene	ND (0.0042)		8260B Low		1	10/20/17 19:50	C7J0321	CJ72021
Trichloroethene	ND (0.0042)		8260B Low		1	10/20/17 19:50	C7J0321	CJ72021
Trichlorofluoromethane	ND (0.0042)		8260B Low		1	10/20/17 19:50	C7J0321	CJ72021
Vinyl Acetate	ND (0.0042)		8260B Low		1	10/20/17 19:50	C7J0321	CJ72021
Vinyl Chloride	ND (0.0085)		8260B Low		1	10/20/17 19:50	C7J0321	CJ72021
Xylene O	ND (0.0042)		8260B Low		1	10/20/17 19:50	C7J0321	CJ72021
Xylene P,M	ND (0.0085)		8260B Low		1	10/20/17 19:50	C7J0321	CJ72021
Xylenes (Total)	ND (0.0085)		8260B Low		1	10/20/17 19:50		[CALC]

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: 1,2-Dichloroethane-d4	125 %		70-130
Surrogate: 4-Bromofluorobenzene	88 %		70-130
Surrogate: Dibromofluoromethane	108 %		70-130
Surrogate: Toluene-d8	101 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SB-515 0-2ft  
 Date Sampled: 10/18/17 14:50  
 Percent Solids: 89  
 Initial Volume: 20  
 Final Volume: 1  
 Extraction Method: 3546

ESS Laboratory Work Order: 1710518  
 ESS Laboratory Sample ID: 1710518-02  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: SMR  
 Prepared: 10/20/17 9:50

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	2380 (210)		8100M		5	10/21/17 8:58	C7J0327	CJ71915
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		88 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SB-515 0-2ft  
Date Sampled: 10/18/17 14:50  
Percent Solids: 89  
Initial Volume: 14.6  
Final Volume: 0.5  
Extraction Method: 3546

ESS Laboratory Work Order: 1710518  
ESS Laboratory Sample ID: 1710518-02  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: TJ  
Prepared: 10/20/17 9:45

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	11.1 (3.83)		8270D		10	10/24/17 1:53	C7J0336	CJ71914
Acenaphthene	7.12 (0.383)		8270D		1	10/23/17 18:14	C7J0336	CJ71914
Acenaphthylene	4.43 (0.383)		8270D		1	10/23/17 18:14	C7J0336	CJ71914
Anthracene	17.4 (3.83)		8270D		10	10/24/17 1:53	C7J0336	CJ71914
Benzo(a)anthracene	32.5 (3.83)		8270D		10	10/24/17 1:53	C7J0336	CJ71914
Benzo(a)pyrene	27.3 (1.92)		8270D		10	10/24/17 1:53	C7J0336	CJ71914
Benzo(b)fluoranthene	32.3 (3.83)		8270D		10	10/24/17 1:53	C7J0336	CJ71914
Benzo(g,h,i)perylene	15.5 (3.83)		8270D		10	10/24/17 1:53	C7J0336	CJ71914
Benzo(k)fluoranthene	20.1 (3.83)		8270D		10	10/24/17 1:53	C7J0336	CJ71914
Chrysene	30.1 (1.92)		8270D		10	10/24/17 1:53	C7J0336	CJ71914
Dibenzo(a,h)Anthracene	6.68 (0.192)		8270D		1	10/23/17 18:14	C7J0336	CJ71914
Fluoranthene	63.6 (3.83)		8270D		10	10/24/17 1:53	C7J0336	CJ71914
Fluorene	8.16 (0.383)		8270D		1	10/23/17 18:14	C7J0336	CJ71914
Indeno(1,2,3-cd)Pyrene	15.5 (3.83)		8270D		10	10/24/17 1:53	C7J0336	CJ71914
Naphthalene	23.6 (3.83)		8270D		10	10/24/17 1:53	C7J0336	CJ71914
Phenanthrene	53.4 (3.83)		8270D		10	10/24/17 1:53	C7J0336	CJ71914
Pyrene	56.3 (3.83)		8270D		10	10/24/17 1:53	C7J0336	CJ71914

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
Surrogate: 1,2-Dichlorobenzene-d4	81 %		30-130
Surrogate: 2-Fluorobiphenyl	96 %		30-130
Surrogate: Nitrobenzene-d5	89 %		30-130
Surrogate: p-Terphenyl-d14	100 %		30-130





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SB-515 0-2ft  
Date Sampled: 10/18/17 14:50  
Percent Solids: 89

ESS Laboratory Work Order: 1710518  
ESS Laboratory Sample ID: 1710518-02  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	39.7 (11.1)		9014		10	EEM	10/23/17 12:15	mg/kg dry	CJ72317



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710518

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
<b>Total Metals</b>										
<b>Batch CJ71840 - 7471B</b>										
<b>Blank</b>										
Mercury	ND	0.033	mg/kg wet							
<b>LCS</b>										
Mercury	2.79	0.733	mg/kg wet	2.900		96	80-120			
<b>LCS Dup</b>										
Mercury	2.72	0.762	mg/kg wet	2.900		94	80-120	3	20	
<b>Batch CJ71947 - 3050B</b>										
<b>Blank</b>										
Antimony	ND	5.00	mg/kg wet							
Arsenic	ND	2.50	mg/kg wet							
Arsenic	ND	0.25	mg/kg wet							
Beryllium	ND	0.11	mg/kg wet							
Cadmium	ND	0.50	mg/kg wet							
Chromium	ND	1.00	mg/kg wet							
Copper	ND	2.50	mg/kg wet							
Lead	ND	5.00	mg/kg wet							
Nickel	ND	2.50	mg/kg wet							
Selenium	ND	0.50	mg/kg wet							
Silver	ND	0.50	mg/kg wet							
Thallium	ND	5.00	mg/kg wet							
Zinc	ND	2.50	mg/kg wet							
<b>LCS</b>										
Antimony	50.5	18.9	mg/kg wet	48.00		105	80-120			
Arsenic	114	23.6	mg/kg wet	123.0		93	80-120			
Arsenic	112	9.43	mg/kg wet	123.0		91	80-120			
Beryllium	171	0.42	mg/kg wet	192.0		89	80-120			
Cadmium	186	1.89	mg/kg wet	224.0		83	80-120			
Chromium	164	3.77	mg/kg wet	179.0		92	80-120			
Copper	67.3	9.43	mg/kg wet	78.90		85	80-120			
Lead	136	18.9	mg/kg wet	145.0		94	80-120			
Nickel	134	9.43	mg/kg wet	143.0		94	80-120			
Selenium	56.7	47.2	mg/kg wet	42.40		134	80-120			B+
Silver	78.4	1.89	mg/kg wet	81.60		96	80-120			
Thallium	46.1	18.9	mg/kg wet	52.00		89	80-120			
Zinc	669	9.43	mg/kg wet	770.0		87	80-120			
<b>LCS Dup</b>										
Antimony	52.3	18.2	mg/kg wet	48.00		109	80-120	3	20	
Arsenic	113	9.09	mg/kg wet	123.0		92	80-120	0.9	20	
Arsenic	112	22.7	mg/kg wet	123.0		91	80-120	2	20	
Beryllium	167	0.40	mg/kg wet	192.0		87	80-120	2	20	
Cadmium	185	1.82	mg/kg wet	224.0		83	80-120	0.4	20	
Chromium	165	3.64	mg/kg wet	179.0		92	80-120	0.4	20	
Copper	67.9	9.09	mg/kg wet	78.90		86	80-120	0.9	20	
Lead	136	18.2	mg/kg wet	145.0		94	80-120	0.1	20	



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710518

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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Total Metals

**Batch CJ71947 - 3050B**

Nickel	134	9.09	mg/kg wet	143.0		94	80-120	0.3	20	
Selenium	56.6	45.5	mg/kg wet	42.40		133	80-120	0.1	20	B+
Silver	79.4	1.82	mg/kg wet	81.60		97	80-120	1	20	
Thallium	46.1	18.2	mg/kg wet	52.00		89	80-120	0.03	20	
Zinc	664	9.09	mg/kg wet	770.0		86	80-120	0.7	20	

5035/8260B Volatile Organic Compounds / Low Level

**Batch CJ72021 - 5035**

**Blank**

1,1,1,2-Tetrachloroethane	ND	0.0050	mg/kg wet
1,1,1-Trichloroethane	ND	0.0050	mg/kg wet
1,1,2,2-Tetrachloroethane	ND	0.0050	mg/kg wet
1,1,2-Trichloroethane	ND	0.0050	mg/kg wet
1,1-Dichloroethane	ND	0.0050	mg/kg wet
1,1-Dichloroethene	ND	0.0050	mg/kg wet
1,1-Dichloropropene	ND	0.0050	mg/kg wet
1,2,3-Trichlorobenzene	ND	0.0050	mg/kg wet
1,2,3-Trichloropropane	ND	0.0050	mg/kg wet
1,2,4-Trichlorobenzene	ND	0.0050	mg/kg wet
1,2,4-Trimethylbenzene	ND	0.0050	mg/kg wet
1,2-Dibromo-3-Chloropropane	ND	0.0050	mg/kg wet
1,2-Dibromoethane	ND	0.0050	mg/kg wet
1,2-Dichlorobenzene	ND	0.0050	mg/kg wet
1,2-Dichloroethane	ND	0.0050	mg/kg wet
1,2-Dichloropropane	ND	0.0050	mg/kg wet
1,3,5-Trimethylbenzene	ND	0.0050	mg/kg wet
1,3-Dichlorobenzene	ND	0.0050	mg/kg wet
1,3-Dichloropropane	ND	0.0050	mg/kg wet
1,4-Dichlorobenzene	ND	0.0050	mg/kg wet
1,4-Dioxane	ND	0.100	mg/kg wet
1-Chlorohexane	ND	0.0050	mg/kg wet
2,2-Dichloropropane	ND	0.0050	mg/kg wet
2-Butanone	ND	0.0500	mg/kg wet
2-Chlorotoluene	ND	0.0050	mg/kg wet
2-Hexanone	ND	0.0500	mg/kg wet
4-Chlorotoluene	ND	0.0050	mg/kg wet
4-Isopropyltoluene	ND	0.0050	mg/kg wet
4-Methyl-2-Pentanone	ND	0.0500	mg/kg wet
Acetone	ND	0.0500	mg/kg wet
Benzene	ND	0.0050	mg/kg wet
Bromobenzene	ND	0.0050	mg/kg wet
Bromochloromethane	ND	0.0050	mg/kg wet
Bromodichloromethane	ND	0.0050	mg/kg wet
Bromoform	ND	0.0050	mg/kg wet
Bromomethane	ND	0.0100	mg/kg wet



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710518

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CJ72021 - 5035**

Carbon Disulfide	ND	0.0050	mg/kg wet							
Carbon Tetrachloride	ND	0.0050	mg/kg wet							
Chlorobenzene	ND	0.0050	mg/kg wet							
Chloroethane	ND	0.0100	mg/kg wet							
Chloroform	ND	0.0050	mg/kg wet							
Chloromethane	ND	0.0100	mg/kg wet							
cis-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
cis-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Dibromochloromethane	ND	0.0050	mg/kg wet							
Dibromomethane	ND	0.0050	mg/kg wet							
Dichlorodifluoromethane	ND	0.0100	mg/kg wet							
Diethyl Ether	ND	0.0050	mg/kg wet							
Di-isopropyl ether	ND	0.0050	mg/kg wet							
Ethyl tertiary-butyl ether	ND	0.0050	mg/kg wet							
Ethylbenzene	ND	0.0050	mg/kg wet							
Hexachlorobutadiene	ND	0.0050	mg/kg wet							
Isopropylbenzene	ND	0.0050	mg/kg wet							
Methyl tert-Butyl Ether	ND	0.0050	mg/kg wet							
Methylene Chloride	ND	0.0250	mg/kg wet							
Naphthalene	ND	0.0050	mg/kg wet							
n-Butylbenzene	ND	0.0050	mg/kg wet							
n-Propylbenzene	ND	0.0050	mg/kg wet							
sec-Butylbenzene	ND	0.0050	mg/kg wet							
Styrene	ND	0.0050	mg/kg wet							
tert-Butylbenzene	ND	0.0050	mg/kg wet							
Tertiary-amyl methyl ether	ND	0.0050	mg/kg wet							
Tetrachloroethene	ND	0.0050	mg/kg wet							
Tetrahydrofuran	ND	0.0050	mg/kg wet							
Toluene	ND	0.0050	mg/kg wet							
trans-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
trans-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Trichloroethene	ND	0.0050	mg/kg wet							
Trichlorofluoromethane	ND	0.0050	mg/kg wet							
Vinyl Acetate	ND	0.0050	mg/kg wet							
Vinyl Chloride	ND	0.0100	mg/kg wet							
Xylene O	ND	0.0050	mg/kg wet							
Xylene P,M	ND	0.0100	mg/kg wet							
Xylenes (Total)	ND	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	0.0541		mg/kg wet	0.05000		108	70-130			
Surrogate: 4-Bromofluorobenzene	0.0460		mg/kg wet	0.05000		92	70-130			
Surrogate: Dibromofluoromethane	0.0507		mg/kg wet	0.05000		101	70-130			
Surrogate: Toluene-d8	0.0498		mg/kg wet	0.05000		100	70-130			

**LCS**

1,1,1,2-Tetrachloroethane	0.0543	0.0050	mg/kg wet	0.05000		109	70-130			
1,1,1-Trichloroethane	0.0560	0.0050	mg/kg wet	0.05000		112	70-130			



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
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ESS Laboratory Work Order: 1710518

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CJ72021 - 5035**

1,1,2,2-Tetrachloroethane	0.0478	0.0050	mg/kg wet	0.05000		96	70-130			
1,1,2-Trichloroethane	0.0515	0.0050	mg/kg wet	0.05000		103	70-130			
1,1-Dichloroethane	0.0504	0.0050	mg/kg wet	0.05000		101	70-130			
1,1-Dichloroethene	0.0520	0.0050	mg/kg wet	0.05000		104	70-130			
1,1-Dichloropropene	0.0544	0.0050	mg/kg wet	0.05000		109	70-130			
1,2,3-Trichlorobenzene	0.0531	0.0050	mg/kg wet	0.05000		106	70-130			
1,2,3-Trichloropropane	0.0485	0.0050	mg/kg wet	0.05000		97	70-130			
1,2,4-Trichlorobenzene	0.0519	0.0050	mg/kg wet	0.05000		104	70-130			
1,2,4-Trimethylbenzene	0.0534	0.0050	mg/kg wet	0.05000		107	70-130			
1,2-Dibromo-3-Chloropropane	0.0434	0.0050	mg/kg wet	0.05000		87	70-130			
1,2-Dibromoethane	0.0511	0.0050	mg/kg wet	0.05000		102	70-130			
1,2-Dichlorobenzene	0.0514	0.0050	mg/kg wet	0.05000		103	70-130			
1,2-Dichloroethane	0.0555	0.0050	mg/kg wet	0.05000		111	70-130			
1,2-Dichloropropane	0.0512	0.0050	mg/kg wet	0.05000		102	70-130			
1,3,5-Trimethylbenzene	0.0521	0.0050	mg/kg wet	0.05000		104	70-130			
1,3-Dichlorobenzene	0.0502	0.0050	mg/kg wet	0.05000		100	70-130			
1,3-Dichloropropane	0.0543	0.0050	mg/kg wet	0.05000		109	70-130			
1,4-Dichlorobenzene	0.0522	0.0050	mg/kg wet	0.05000		104	70-130			
1,4-Dioxane	0.892	0.100	mg/kg wet	1.000		89	70-130			
1-Chlorohexane	0.0496	0.0050	mg/kg wet	0.05000		99	70-130			
2,2-Dichloropropane	0.0535	0.0050	mg/kg wet	0.05000		107	70-130			
2-Butanone	0.256	0.0500	mg/kg wet	0.2500		102	70-130			
2-Chlorotoluene	0.0506	0.0050	mg/kg wet	0.05000		101	70-130			
2-Hexanone	0.228	0.0500	mg/kg wet	0.2500		91	70-130			
4-Chlorotoluene	0.0511	0.0050	mg/kg wet	0.05000		102	70-130			
4-Isopropyltoluene	0.0515	0.0050	mg/kg wet	0.05000		103	70-130			
4-Methyl-2-Pentanone	0.229	0.0500	mg/kg wet	0.2500		91	70-130			
Acetone	0.244	0.0500	mg/kg wet	0.2500		97	70-130			
Benzene	0.0511	0.0050	mg/kg wet	0.05000		102	70-130			
Bromobenzene	0.0505	0.0050	mg/kg wet	0.05000		101	70-130			
Bromochloromethane	0.0513	0.0050	mg/kg wet	0.05000		103	70-130			
Bromodichloromethane	0.0568	0.0050	mg/kg wet	0.05000		114	70-130			
Bromoform	0.0465	0.0050	mg/kg wet	0.05000		93	70-130			
Bromomethane	0.0572	0.0100	mg/kg wet	0.05000		114	70-130			
Carbon Disulfide	0.0535	0.0050	mg/kg wet	0.05000		107	70-130			
Carbon Tetrachloride	0.0568	0.0050	mg/kg wet	0.05000		114	70-130			
Chlorobenzene	0.0510	0.0050	mg/kg wet	0.05000		102	70-130			
Chloroethane	0.0497	0.0100	mg/kg wet	0.05000		99	70-130			
Chloroform	0.0534	0.0050	mg/kg wet	0.05000		107	70-130			
Chloromethane	0.0570	0.0100	mg/kg wet	0.05000		114	70-130			
cis-1,2-Dichloroethene	0.0518	0.0050	mg/kg wet	0.05000		104	70-130			
cis-1,3-Dichloropropene	0.0563	0.0050	mg/kg wet	0.05000		113	70-130			
Dibromochloromethane	0.0501	0.0050	mg/kg wet	0.05000		100	70-130			
Dibromomethane	0.0507	0.0050	mg/kg wet	0.05000		101	70-130			
Dichlorodifluoromethane	0.0476	0.0100	mg/kg wet	0.05000		95	70-130			



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710518

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CJ72021 - 5035**

Diethyl Ether	0.0515	0.0050	mg/kg wet	0.05000		103	70-130			
Di-isopropyl ether	0.0495	0.0050	mg/kg wet	0.05000		99	70-130			
Ethyl tertiary-butyl ether	0.0497	0.0050	mg/kg wet	0.05000		99	70-130			
Ethylbenzene	0.0520	0.0050	mg/kg wet	0.05000		104	70-130			
Hexachlorobutadiene	0.0542	0.0050	mg/kg wet	0.05000		108	70-130			
Isopropylbenzene	0.0488	0.0050	mg/kg wet	0.05000		98	70-130			
Methyl tert-Butyl Ether	0.0504	0.0050	mg/kg wet	0.05000		101	70-130			
Methylene Chloride	0.0544	0.0250	mg/kg wet	0.05000		109	70-130			
Naphthalene	0.0441	0.0050	mg/kg wet	0.05000		88	70-130			
n-Butylbenzene	0.0521	0.0050	mg/kg wet	0.05000		104	70-130			
n-Propylbenzene	0.0518	0.0050	mg/kg wet	0.05000		104	70-130			
sec-Butylbenzene	0.0507	0.0050	mg/kg wet	0.05000		101	70-130			
Styrene	0.0516	0.0050	mg/kg wet	0.05000		103	70-130			
tert-Butylbenzene	0.0512	0.0050	mg/kg wet	0.05000		102	70-130			
Tertiary-amyl methyl ether	0.0473	0.0050	mg/kg wet	0.05000		95	70-130			
Tetrachloroethene	0.0513	0.0050	mg/kg wet	0.05000		103	70-130			
Tetrahydrofuran	0.0420	0.0050	mg/kg wet	0.05000		84	70-130			
Toluene	0.0515	0.0050	mg/kg wet	0.05000		103	70-130			
trans-1,2-Dichloroethene	0.0511	0.0050	mg/kg wet	0.05000		102	70-130			
trans-1,3-Dichloropropene	0.0501	0.0050	mg/kg wet	0.05000		100	70-130			
Trichloroethene	0.0520	0.0050	mg/kg wet	0.05000		104	70-130			
Trichlorofluoromethane	0.0545	0.0050	mg/kg wet	0.05000		109	70-130			
Vinyl Acetate	0.0416	0.0050	mg/kg wet	0.05000		83	70-130			
Vinyl Chloride	0.0574	0.0100	mg/kg wet	0.05000		115	70-130			
Xylene O	0.0539	0.0050	mg/kg wet	0.05000		108	70-130			
Xylene P,M	0.107	0.0100	mg/kg wet	0.1000		107	70-130			
Xylenes (Total)	0.161	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	0.0573		mg/kg wet	0.05000		115	70-130			
Surrogate: 4-Bromofluorobenzene	0.0541		mg/kg wet	0.05000		108	70-130			
Surrogate: Dibromofluoromethane	0.0556		mg/kg wet	0.05000		111	70-130			
Surrogate: Toluene-d8	0.0520		mg/kg wet	0.05000		104	70-130			

**LCS Dup**

1,1,1,2-Tetrachloroethane	0.0504	0.0050	mg/kg wet	0.05000		101	70-130	7	25	
1,1,1-Trichloroethane	0.0508	0.0050	mg/kg wet	0.05000		102	70-130	10	25	
1,1,2,2-Tetrachloroethane	0.0462	0.0050	mg/kg wet	0.05000		92	70-130	3	25	
1,1,2-Trichloroethane	0.0478	0.0050	mg/kg wet	0.05000		96	70-130	8	25	
1,1-Dichloroethane	0.0465	0.0050	mg/kg wet	0.05000		93	70-130	8	25	
1,1-Dichloroethene	0.0484	0.0050	mg/kg wet	0.05000		97	70-130	7	25	
1,1-Dichloropropene	0.0495	0.0050	mg/kg wet	0.05000		99	70-130	9	25	
1,2,3-Trichlorobenzene	0.0505	0.0050	mg/kg wet	0.05000		101	70-130	5	25	
1,2,3-Trichloropropane	0.0468	0.0050	mg/kg wet	0.05000		94	70-130	4	25	
1,2,4-Trichlorobenzene	0.0496	0.0050	mg/kg wet	0.05000		99	70-130	5	25	
1,2,4-Trimethylbenzene	0.0505	0.0050	mg/kg wet	0.05000		101	70-130	6	25	
1,2-Dibromo-3-Chloropropane	0.0425	0.0050	mg/kg wet	0.05000		85	70-130	2	25	
1,2-Dibromoethane	0.0486	0.0050	mg/kg wet	0.05000		97	70-130	5	25	





CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710518

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CJ72021 - 5035**

1,2-Dichlorobenzene	0.0488	0.0050	mg/kg wet	0.05000		98	70-130	5	25	
1,2-Dichloroethane	0.0513	0.0050	mg/kg wet	0.05000		103	70-130	8	25	
1,2-Dichloropropane	0.0470	0.0050	mg/kg wet	0.05000		94	70-130	9	25	
1,3,5-Trimethylbenzene	0.0498	0.0050	mg/kg wet	0.05000		100	70-130	5	25	
1,3-Dichlorobenzene	0.0488	0.0050	mg/kg wet	0.05000		98	70-130	3	25	
1,3-Dichloropropane	0.0506	0.0050	mg/kg wet	0.05000		101	70-130	7	25	
1,4-Dichlorobenzene	0.0491	0.0050	mg/kg wet	0.05000		98	70-130	6	25	
1,4-Dioxane	0.866	0.100	mg/kg wet	1.000		87	70-130	3	20	
1-Chlorohexane	0.0464	0.0050	mg/kg wet	0.05000		93	70-130	7	25	
2,2-Dichloropropane	0.0487	0.0050	mg/kg wet	0.05000		97	70-130	9	25	
2-Butanone	0.235	0.0500	mg/kg wet	0.2500		94	70-130	8	25	
2-Chlorotoluene	0.0485	0.0050	mg/kg wet	0.05000		97	70-130	4	25	
2-Hexanone	0.217	0.0500	mg/kg wet	0.2500		87	70-130	5	25	
4-Chlorotoluene	0.0489	0.0050	mg/kg wet	0.05000		98	70-130	4	25	
4-Isopropyltoluene	0.0492	0.0050	mg/kg wet	0.05000		98	70-130	4	25	
4-Methyl-2-Pentanone	0.216	0.0500	mg/kg wet	0.2500		86	70-130	6	25	
Acetone	0.228	0.0500	mg/kg wet	0.2500		91	70-130	6	25	
Benzene	0.0471	0.0050	mg/kg wet	0.05000		94	70-130	8	25	
Bromobenzene	0.0490	0.0050	mg/kg wet	0.05000		98	70-130	3	25	
Bromochloromethane	0.0472	0.0050	mg/kg wet	0.05000		94	70-130	8	25	
Bromodichloromethane	0.0517	0.0050	mg/kg wet	0.05000		103	70-130	9	25	
Bromoform	0.0428	0.0050	mg/kg wet	0.05000		86	70-130	8	25	
Bromomethane	0.0554	0.0100	mg/kg wet	0.05000		111	70-130	3	25	
Carbon Disulfide	0.0493	0.0050	mg/kg wet	0.05000		99	70-130	8	25	
Carbon Tetrachloride	0.0511	0.0050	mg/kg wet	0.05000		102	70-130	10	25	
Chlorobenzene	0.0476	0.0050	mg/kg wet	0.05000		95	70-130	7	25	
Chloroethane	0.0455	0.0100	mg/kg wet	0.05000		91	70-130	9	25	
Chloroform	0.0489	0.0050	mg/kg wet	0.05000		98	70-130	9	25	
Chloromethane	0.0519	0.0100	mg/kg wet	0.05000		104	70-130	9	25	
cis-1,2-Dichloroethene	0.0476	0.0050	mg/kg wet	0.05000		95	70-130	8	25	
cis-1,3-Dichloropropene	0.0518	0.0050	mg/kg wet	0.05000		104	70-130	8	25	
Dibromochloromethane	0.0472	0.0050	mg/kg wet	0.05000		94	70-130	6	25	
Dibromomethane	0.0465	0.0050	mg/kg wet	0.05000		93	70-130	9	25	
Dichlorodifluoromethane	0.0430	0.0100	mg/kg wet	0.05000		86	70-130	10	25	
Diethyl Ether	0.0486	0.0050	mg/kg wet	0.05000		97	70-130	6	25	
Di-isopropyl ether	0.0460	0.0050	mg/kg wet	0.05000		92	70-130	7	25	
Ethyl tertiary-butyl ether	0.0469	0.0050	mg/kg wet	0.05000		94	70-130	6	25	
Ethylbenzene	0.0482	0.0050	mg/kg wet	0.05000		96	70-130	8	25	
Hexachlorobutadiene	0.0513	0.0050	mg/kg wet	0.05000		103	70-130	5	25	
Isopropylbenzene	0.0466	0.0050	mg/kg wet	0.05000		93	70-130	5	25	
Methyl tert-Butyl Ether	0.0476	0.0050	mg/kg wet	0.05000		95	70-130	6	25	
Methylene Chloride	0.0505	0.0250	mg/kg wet	0.05000		101	70-130	7	25	
Naphthalene	0.0424	0.0050	mg/kg wet	0.05000		85	70-130	4	25	
n-Butylbenzene	0.0495	0.0050	mg/kg wet	0.05000		99	70-130	5	25	
n-Propylbenzene	0.0494	0.0050	mg/kg wet	0.05000		99	70-130	5	25	



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710518

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CJ72021 - 5035**

sec-Butylbenzene	0.0483	0.0050	mg/kg wet	0.05000		97	70-130	5	25	
Styrene	0.0489	0.0050	mg/kg wet	0.05000		98	70-130	5	25	
tert-Butylbenzene	0.0494	0.0050	mg/kg wet	0.05000		99	70-130	3	25	
Tertiary-amyl methyl ether	0.0446	0.0050	mg/kg wet	0.05000		89	70-130	6	25	
Tetrachloroethene	0.0476	0.0050	mg/kg wet	0.05000		95	70-130	8	25	
Tetrahydrofuran	0.0396	0.0050	mg/kg wet	0.05000		79	70-130	6	25	
Toluene	0.0471	0.0050	mg/kg wet	0.05000		94	70-130	9	25	
trans-1,2-Dichloroethene	0.0475	0.0050	mg/kg wet	0.05000		95	70-130	7	25	
trans-1,3-Dichloropropene	0.0471	0.0050	mg/kg wet	0.05000		94	70-130	6	25	
Trichloroethene	0.0476	0.0050	mg/kg wet	0.05000		95	70-130	9	25	
Trichlorofluoromethane	0.0496	0.0050	mg/kg wet	0.05000		99	70-130	9	25	
Vinyl Acetate	0.0396	0.0050	mg/kg wet	0.05000		79	70-130	5	25	
Vinyl Chloride	0.0524	0.0100	mg/kg wet	0.05000		105	70-130	9	25	
Xylene O	0.0507	0.0050	mg/kg wet	0.05000		101	70-130	6	25	
Xylene P,M	0.100	0.0100	mg/kg wet	0.1000		100	70-130	6	25	
Xylenes (Total)	0.151	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	0.0550		mg/kg wet	0.05000		110	70-130			
Surrogate: 4-Bromofluorobenzene	0.0525		mg/kg wet	0.05000		105	70-130			
Surrogate: Dibromofluoromethane	0.0528		mg/kg wet	0.05000		106	70-130			
Surrogate: Toluene-d8	0.0513		mg/kg wet	0.05000		103	70-130			

8100M Total Petroleum Hydrocarbons

**Batch CJ71915 - 3546**

<b>Blank</b>										
Decane (C10)	ND	0.2	mg/kg wet							
Docosane (C22)	ND	0.2	mg/kg wet							
Dodecane (C12)	ND	0.2	mg/kg wet							
Eicosane (C20)	ND	0.2	mg/kg wet							
Hexacosane (C26)	ND	0.2	mg/kg wet							
Hexadecane (C16)	ND	0.2	mg/kg wet							
Nonadecane (C19)	ND	0.2	mg/kg wet							
Nonane (C9)	ND	0.2	mg/kg wet							
Octacosane (C28)	ND	0.2	mg/kg wet							
Octadecane (C18)	ND	0.2	mg/kg wet							
Tetracosane (C24)	ND	0.2	mg/kg wet							
Tetradecane (C14)	ND	0.2	mg/kg wet							
Total Petroleum Hydrocarbons	ND	37.5	mg/kg wet							
Triacotane (C30)	ND	0.2	mg/kg wet							

Surrogate: O-Terphenyl	4.31		mg/kg wet	5.000		86	40-140			
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<b>LCS</b>										
Decane (C10)	1.8	0.2	mg/kg wet	2.500		72	40-140			
Docosane (C22)	2.2	0.2	mg/kg wet	2.500		88	40-140			
Dodecane (C12)	2.0	0.2	mg/kg wet	2.500		78	40-140			
Eicosane (C20)	2.2	0.2	mg/kg wet	2.500		86	40-140			



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710518

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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**8100M Total Petroleum Hydrocarbons**

**Batch CJ71915 - 3546**

Hexacosane (C26)	2.2	0.2	mg/kg wet	2.500		88	40-140			
Hexadecane (C16)	2.0	0.2	mg/kg wet	2.500		82	40-140			
Nonadecane (C19)	2.3	0.2	mg/kg wet	2.500		91	40-140			
Nonane (C9)	1.5	0.2	mg/kg wet	2.500		61	30-140			
Octacosane (C28)	2.2	0.2	mg/kg wet	2.500		89	40-140			
Octadecane (C18)	2.0	0.2	mg/kg wet	2.500		81	40-140			
Tetracosane (C24)	2.2	0.2	mg/kg wet	2.500		88	40-140			
Tetradecane (C14)	2.0	0.2	mg/kg wet	2.500		79	40-140			
Total Petroleum Hydrocarbons	28.0	37.5	mg/kg wet	35.00		80	40-140			
Triacontane (C30)	2.2	0.2	mg/kg wet	2.500		89	40-140			

<i>Surrogate: O-Terphenyl</i>	<i>4.66</i>		mg/kg wet	<i>5.000</i>		<i>93</i>	<i>40-140</i>			
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**LCS Dup**

Decane (C10)	1.6	0.2	mg/kg wet	2.500		65	40-140	11	25	
Docosane (C22)	2.1	0.2	mg/kg wet	2.500		83	40-140	6	25	
Dodecane (C12)	1.8	0.2	mg/kg wet	2.500		71	40-140	10	25	
Eicosane (C20)	2.0	0.2	mg/kg wet	2.500		81	40-140	6	25	
Hexacosane (C26)	2.1	0.2	mg/kg wet	2.500		83	40-140	6	25	
Hexadecane (C16)	1.9	0.2	mg/kg wet	2.500		77	40-140	6	25	
Nonadecane (C19)	2.1	0.2	mg/kg wet	2.500		86	40-140	5	25	
Nonane (C9)	1.4	0.2	mg/kg wet	2.500		54	30-140	12	25	
Octacosane (C28)	2.1	0.2	mg/kg wet	2.500		83	40-140	6	25	
Octadecane (C18)	1.9	0.2	mg/kg wet	2.500		77	40-140	5	25	
Tetracosane (C24)	2.1	0.2	mg/kg wet	2.500		83	40-140	6	25	
Tetradecane (C14)	1.8	0.2	mg/kg wet	2.500		73	40-140	8	25	
Total Petroleum Hydrocarbons	26.1	37.5	mg/kg wet	35.00		75	40-140	7	25	
Triacontane (C30)	2.1	0.2	mg/kg wet	2.500		84	40-140	6	25	

<i>Surrogate: O-Terphenyl</i>	<i>4.33</i>		mg/kg wet	<i>5.000</i>		<i>87</i>	<i>40-140</i>			
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**8270D Polynuclear Aromatic Hydrocarbons**

**Batch CJ71914 - 3546**

**Blank**

2-Methylnaphthalene	ND	0.333	mg/kg wet							
Acenaphthene	ND	0.333	mg/kg wet							
Acenaphthylene	ND	0.333	mg/kg wet							
Anthracene	ND	0.333	mg/kg wet							
Benzo(a)anthracene	ND	0.333	mg/kg wet							
Benzo(a)pyrene	ND	0.167	mg/kg wet							
Benzo(b)fluoranthene	ND	0.333	mg/kg wet							
Benzo(g,h,i)perylene	ND	0.333	mg/kg wet							
Benzo(k)fluoranthene	ND	0.333	mg/kg wet							
Chrysene	ND	0.167	mg/kg wet							
Dibenzo(a,h)Anthracene	ND	0.167	mg/kg wet							
Fluoranthene	ND	0.333	mg/kg wet							



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710518

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
<b>8270D Polynuclear Aromatic Hydrocarbons</b>										
<b>Batch CJ71914 - 3546</b>										
Fluorene	ND	0.333	mg/kg wet							
Indeno(1,2,3-cd)Pyrene	ND	0.333	mg/kg wet							
Naphthalene	ND	0.333	mg/kg wet							
Phenanthrene	ND	0.333	mg/kg wet							
Pyrene	ND	0.333	mg/kg wet							
Surrogate: 1,2-Dichlorobenzene-d4	2.84		mg/kg wet	3.333		85	30-130			
Surrogate: 2-Fluorobiphenyl	3.09		mg/kg wet	3.333		93	30-130			
Surrogate: Nitrobenzene-d5	3.19		mg/kg wet	3.333		96	30-130			
Surrogate: p-Terphenyl-d14	3.23		mg/kg wet	3.333		97	30-130			
<b>LCS</b>										
2-Methylnaphthalene	2.50	0.333	mg/kg wet	3.333		75	40-140			
Acenaphthene	2.71	0.333	mg/kg wet	3.333		81	40-140			
Acenaphthylene	2.80	0.333	mg/kg wet	3.333		84	40-140			
Anthracene	3.04	0.333	mg/kg wet	3.333		91	40-140			
Benzo(a)anthracene	3.00	0.333	mg/kg wet	3.333		90	40-140			
Benzo(a)pyrene	2.82	0.167	mg/kg wet	3.333		85	40-140			
Benzo(b)fluoranthene	3.19	0.333	mg/kg wet	3.333		96	40-140			
Benzo(g,h,i)perylene	3.32	0.333	mg/kg wet	3.333		100	40-140			
Benzo(k)fluoranthene	2.85	0.333	mg/kg wet	3.333		86	40-140			
Chrysene	2.96	0.167	mg/kg wet	3.333		89	40-140			
Dibenzo(a,h)Anthracene	3.21	0.167	mg/kg wet	3.333		96	40-140			
Fluoranthene	3.21	0.333	mg/kg wet	3.333		96	40-140			
Fluorene	3.05	0.333	mg/kg wet	3.333		91	40-140			
Indeno(1,2,3-cd)Pyrene	3.17	0.333	mg/kg wet	3.333		95	40-140			
Naphthalene	2.50	0.333	mg/kg wet	3.333		75	40-140			
Phenanthrene	2.87	0.333	mg/kg wet	3.333		86	40-140			
Pyrene	2.75	0.333	mg/kg wet	3.333		83	40-140			
Surrogate: 1,2-Dichlorobenzene-d4	2.47		mg/kg wet	3.333		74	30-130			
Surrogate: 2-Fluorobiphenyl	2.89		mg/kg wet	3.333		87	30-130			
Surrogate: Nitrobenzene-d5	2.76		mg/kg wet	3.333		83	30-130			
Surrogate: p-Terphenyl-d14	3.24		mg/kg wet	3.333		97	30-130			
<b>LCS Dup</b>										
2-Methylnaphthalene	3.03	0.333	mg/kg wet	3.333		91	40-140	19	30	
Acenaphthene	3.11	0.333	mg/kg wet	3.333		93	40-140	14	30	
Acenaphthylene	3.16	0.333	mg/kg wet	3.333		95	40-140	12	30	
Anthracene	3.35	0.333	mg/kg wet	3.333		101	40-140	10	30	
Benzo(a)anthracene	3.31	0.333	mg/kg wet	3.333		99	40-140	10	30	
Benzo(a)pyrene	3.40	0.167	mg/kg wet	3.333		102	40-140	19	30	
Benzo(b)fluoranthene	3.47	0.333	mg/kg wet	3.333		104	40-140	8	30	
Benzo(g,h,i)perylene	3.66	0.333	mg/kg wet	3.333		110	40-140	10	30	
Benzo(k)fluoranthene	3.35	0.333	mg/kg wet	3.333		100	40-140	16	30	
Chrysene	3.25	0.167	mg/kg wet	3.333		98	40-140	9	30	
Dibenzo(a,h)Anthracene	3.70	0.167	mg/kg wet	3.333		111	40-140	14	30	
Fluoranthene	3.64	0.333	mg/kg wet	3.333		109	40-140	13	30	
Fluorene	3.53	0.333	mg/kg wet	3.333		106	40-140	15	30	



CERTIFICATE OF ANALYSIS

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ESS Laboratory Work Order: 1710518

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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8270D Polynuclear Aromatic Hydrocarbons

**Batch CJ71914 - 3546**

Indeno(1,2,3-cd)Pyrene	3.73	0.333	mg/kg wet	3.333		112	40-140	16	30	
Naphthalene	2.98	0.333	mg/kg wet	3.333		89	40-140	18	30	
Phenanthrene	3.20	0.333	mg/kg wet	3.333		96	40-140	11	30	
Pyrene	2.86	0.333	mg/kg wet	3.333		86	40-140	4	30	
Surrogate: 1,2-Dichlorobenzene-d4	2.91		mg/kg wet	3.333		87	30-130			
Surrogate: 2-Fluorobiphenyl	3.15		mg/kg wet	3.333		95	30-130			
Surrogate: Nitrobenzene-d5	3.24		mg/kg wet	3.333		97	30-130			
Surrogate: p-Terphenyl-d14	3.24		mg/kg wet	3.333		97	30-130			

Classical Chemistry

**Batch CJ72317 - TCN Prep**

<b>Blank</b>										
Total Cyanide	ND	1.00	mg/kg wet							
<b>LCS</b>										
Total Cyanide	5.07	1.00	mg/kg wet	5.015		101	90-110			
<b>Reference</b>										
Total Cyanide	50.1	4.93	mg/kg wet	48.40		104	36.1577-206.6 12			
<b>Reference</b>										
Total Cyanide	49.1	4.89	mg/kg wet	48.40		101	36.1577-206.6 12			



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Client Name: GZA GeoEnvironmental, Inc.  
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**Notes and Definitions**

- U Analyte included in the analysis, but not detected
- D Diluted.
- B+ Blank Spike recovery is above upper control limit (B+).
- ND Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference
- MDL Method Detection Limit
- MRL Method Reporting Limit
- LOD Limit of Detection
- LOQ Limit of Quantitation
- DL Detection Limit
- I/V Initial Volume
- F/V Final Volume
- § Subcontracted analysis; see attached report
- 1 Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
- 2 Range result excludes concentrations of target analytes eluting in that range.
- 3 Range result excludes the concentration of the C9-C10 aromatic range.
- Avg Results reported as a mathematical average.
- NR No Recovery
- [CALC] Calculated Analyte
- SUB Subcontracted analysis; see attached report
- RL Reporting Limit
- EDL Estimated Detection Limit





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710518

**ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS**

**ENVIRONMENTAL**

Rhode Island Potable and Non Potable Water: LAI00179

<http://www.health.ri.gov/find/labs/analytical/ESS.pdf>

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750

[http://www.ct.gov/dph/lib/dph/environmental\\_health/environmental\\_laboratories/pdf/OutofStateCommercialLaboratories.pdf](http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf)

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002

<http://www.maine.gov/dhhs/meecd/environmental-health/dwp/partners/labCert.shtml>

Massachusetts Potable and Non Potable Water: M-RI002

<http://public.dep.state.ma.us/Labcert/Labcert.aspx>

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424

<http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm>

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313

<http://www.wadsworth.org/labcert/elap/comm.html>

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006

[http://datamine2.state.nj.us/DEP\\_OPRA/OpraMain/pi\\_main?mode=pi\\_by\\_site&sort\\_order=PI\\_NAMEA&Select+a+Site:=58715](http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715)

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752

<http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx>

## ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Providence, RI - GZA/HDM

ESS Project ID: 1710518

Date Received: 10/19/2017

Shipped/Delivered Via: ESS Courier

Project Due Date: 10/26/2017

Days for Project: 5 Day

1. Air bill manifest present?  No

Air No.: NA

6. Does COC match bottles?  Yes

2. Were custody seals present?  No

7. Is COC complete and correct?  Yes

3. Is radiation count <100 CPM?  Yes

8. Were samples received intact?  Yes

4. Is a Cooler Present?  Yes

Temp: 4.4 Iced with: Ice

9. Were labs informed about short holds & rushes? Yes / No /  NA

5. Was COC signed and dated by client?  Yes

10. Were any analyses received outside of hold time? Yes /  No

11. Any Subcontracting needed? Yes /  No

ESS Sample IDs: \_\_\_\_\_

Analysis: \_\_\_\_\_

TAT: \_\_\_\_\_

12. Were VOAs received?  Yes / No

a. Air bubbles in aqueous VOAs?  Yes / No

b. Does methanol cover soil completely?  Yes / No / NA

13. Are the samples properly preserved?  Yes / No

a. If metals preserved upon receipt: Date: \_\_\_\_\_

b. Low Level VOA vials frozen: Date: 10/19/17

Time: \_\_\_\_\_

Time: 2207

By: \_\_\_\_\_

By: [Signature]

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes /  No

a. Was there a need to contact the client? Yes /  No

Who was contacted? \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_ By: \_\_\_\_\_

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
01	174396	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
01	174399	Yes	NA	Yes	VOA Vial - Other	Other	
01	174400	Yes	NA	Yes	VOA Vial - Other	Other	
01	174402	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
02	174395	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
02	174397	Yes	NA	Yes	VOA Vial - Other	Other	
02	174398	Yes	NA	Yes	VOA Vial - Other	Other	
02	174401	Yes	NA	Yes	8 oz. Jar - Unpres	NP	

**2nd Review**

Are barcode labels on correct containers?  Yes / No

Completed By: [Signature] Date & Time: 10/19/17 2148

Reviewed By: [Signature] Date & Time: 10/19/17 2003 10/19/17 2203

Delivered By: [Signature] Date & Time: 10/19/17 2207 10/19/17 2207



## CERTIFICATE OF ANALYSIS

Sarah McLeod  
GZA GeoEnvironmental, Inc.  
530 Broadway  
Providence, RI 02909

**RE: Former Tidewater Facility (05.0043654.00)**  
**ESS Laboratory Work Order Number: 1710571**

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.



Laurel Stoddard  
Laboratory Director

**REVIEWED**

By ESS Laboratory at 5:52 pm, Oct 30, 2017

**Analytical Summary**

The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710571

**SAMPLE RECEIPT**

The following samples were received on October 23, 2017 for the analyses specified on the enclosed Chain of Custody Record.

**Low Level VOA vials were frozen by Client on October 20, 2017 at 1630.**

<u>Lab Number</u>	<u>Sample Name</u>	<u>Matrix</u>	<u>Analysis</u>
1710571-01	GZ-SB-514 10-11ft	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1710571-02	GZ-SB-515 8-9ft	Soil	6010C, 6020A, 7010, 7471B, 8100M, 8260B Low, 8270D, 9014



## CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710571

## PROJECT NARRATIVE

### 5035/8260B Volatile Organic Compounds / Low Level

CJ72430-BS1 Blank Spike recovery is above upper control limit (B+).

Vinyl Chloride (131% @ 70-130%)

CJ72515-BS1 Blank Spike recovery is below lower control limit (B-).

Dichlorodifluoromethane (55% @ 70-130%)

CJ72515-BSD1 Blank Spike recovery is below lower control limit (B-).

Dichlorodifluoromethane (61% @ 70-130%)

### Total Metals

CJ72042-SRM1 Standard Reference Material is biased low (R-).

Silver (29% @ 70-130%)

No other observations noted.

End of Project Narrative.

## DATA USABILITY LINKS

*To ensure you are viewing the most current version of the documents below, please clear your internet cookies for [www.ESSLaboratory.com](http://www.ESSLaboratory.com). Consult your IT Support personnel for information on how to clear your internet cookies.*

[Definitions of Quality Control Parameters](#)

[Semivolatile Organics Internal Standard Information](#)

[Semivolatile Organics Surrogate Information](#)

[Volatile Organics Internal Standard Information](#)

[Volatile Organics Surrogate Information](#)

[EPH and VPH Alkane Lists](#)





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710571

**CURRENT SW-846 METHODOLOGY VERSIONS**

**Analytical Methods**

- 1010A - Flashpoint
- 6010C - ICP
- 6020A - ICP MS
- 7010 - Graphite Furnace
- 7196A - Hexavalent Chromium
- 7470A - Aqueous Mercury
- 7471B - Solid Mercury
- 8011 - EDB/DBCP/TCP
- 8015C - GRO/DRO
- 8081B - Pesticides
- 8082A - PCB
- 8100M - TPH
- 8151A - Herbicides
- 8260B - VOA
- 8270D - SVOA
- 8270D SIM - SVOA Low Level
- 9014 - Cyanide
- 9038 - Sulfate
- 9040C - Aqueous pH
- 9045D - Solid pH (Corrosivity)
- 9050A - Specific Conductance
- 9056A - Anions (IC)
- 9060A - TOC
- 9095B - Paint Filter
- MADEP 04-1.1 - EPH / VPH

**Prep Methods**

- 3005A - Aqueous ICP Digestion
- 3020A - Aqueous Graphite Furnace / ICP MS Digestion
- 3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
- 3060A - Solid Hexavalent Chromium Digestion
- 3510C - Separatory Funnel Extraction
- 3520C - Liquid / Liquid Extraction
- 3540C - Manual Soxhlet Extraction
- 3541 - Automated Soxhlet Extraction
- 3546 - Microwave Extraction
- 3580A - Waste Dilution
- 5030B - Aqueous Purge and Trap
- 5030C - Aqueous Purge and Trap
- 5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SB-514 10-11ft  
Date Sampled: 10/20/17 14:20  
Percent Solids: 66

ESS Laboratory Work Order: 1710571  
ESS Laboratory Sample ID: 1710571-01  
Sample Matrix: Soil  
Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (2.57)		6020A		20	NAR	10/30/17 12:03	2.35	100	CJ72042
<b>Arsenic</b>	<b>13.0</b> (3.21)		6010C		1	KJK	10/24/17 16:55	2.35	100	CJ72042
<b>Beryllium</b>	<b>0.42</b> (0.14)		6010C		1	KJK	10/24/17 16:55	2.35	100	CJ72042
Cadmium	ND (0.64)		6010C		1	KJK	10/24/17 16:55	2.35	100	CJ72042
<b>Chromium</b>	<b>62.6</b> (1.28)		6010C		1	KJK	10/24/17 16:55	2.35	100	CJ72042
<b>Copper</b>	<b>43.2</b> (3.21)		6010C		1	KJK	10/24/17 16:55	2.35	100	CJ72042
<b>Lead</b>	<b>97.5</b> (6.42)		6010C		1	KJK	10/24/17 16:55	2.35	100	CJ72042
<b>Mercury</b>	<b>0.410</b> (0.045)		7471B		1	MJV	10/24/17 13:19	0.66	40	CJ72041
<b>Nickel</b>	<b>8.69</b> (3.21)		6010C		1	KJK	10/24/17 16:55	2.35	100	CJ72042
Selenium	ND (0.64)		6020A		20	NAR	10/30/17 14:12	2.35	100	CJ72042
Silver	ND (0.64)		6010C		1	KJK	10/24/17 16:55	2.35	100	CJ72042
Thallium	ND (2.57)		6020A		20	NAR	10/30/17 12:03	2.35	100	CJ72042
<b>Zinc</b>	<b>46.3</b> (3.21)		6010C		1	KJK	10/24/17 16:55	2.35	100	CJ72042



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SB-514 10-11ft  
 Date Sampled: 10/20/17 14:20  
 Percent Solids: 66  
 Initial Volume: 6.9  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1710571  
 ESS Laboratory Sample ID: 1710571-01  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0055)		8260B Low		1	10/24/17 21:13	C7J0365	CJ72430
1,1,1-Trichloroethane	ND (0.0055)		8260B Low		1	10/24/17 21:13	C7J0365	CJ72430
1,1,2,2-Tetrachloroethane	ND (0.0055)		8260B Low		1	10/24/17 21:13	C7J0365	CJ72430
1,1,2-Trichloroethane	ND (0.0055)		8260B Low		1	10/24/17 21:13	C7J0365	CJ72430
1,1-Dichloroethane	ND (0.0055)		8260B Low		1	10/24/17 21:13	C7J0365	CJ72430
1,1-Dichloroethene	ND (0.0055)		8260B Low		1	10/24/17 21:13	C7J0365	CJ72430
1,1-Dichloropropene	ND (0.0055)		8260B Low		1	10/24/17 21:13	C7J0365	CJ72430
1,2,3-Trichlorobenzene	ND (0.0055)		8260B Low		1	10/24/17 21:13	C7J0365	CJ72430
1,2,3-Trichloropropane	ND (0.0055)		8260B Low		1	10/24/17 21:13	C7J0365	CJ72430
1,2,4-Trichlorobenzene	ND (0.0055)		8260B Low		1	10/24/17 21:13	C7J0365	CJ72430
1,2,4-Trimethylbenzene	ND (0.0055)		8260B Low		1	10/24/17 21:13	C7J0365	CJ72430
1,2-Dibromo-3-Chloropropane	ND (0.0055)		8260B Low		1	10/24/17 21:13	C7J0365	CJ72430
1,2-Dibromoethane	ND (0.0055)		8260B Low		1	10/24/17 21:13	C7J0365	CJ72430
1,2-Dichlorobenzene	ND (0.0055)		8260B Low		1	10/24/17 21:13	C7J0365	CJ72430
1,2-Dichloroethane	ND (0.0055)		8260B Low		1	10/24/17 21:13	C7J0365	CJ72430
1,2-Dichloropropane	ND (0.0055)		8260B Low		1	10/24/17 21:13	C7J0365	CJ72430
1,3,5-Trimethylbenzene	ND (0.0055)		8260B Low		1	10/24/17 21:13	C7J0365	CJ72430
1,3-Dichlorobenzene	ND (0.0055)		8260B Low		1	10/24/17 21:13	C7J0365	CJ72430
1,3-Dichloropropane	ND (0.0055)		8260B Low		1	10/24/17 21:13	C7J0365	CJ72430
1,4-Dichlorobenzene	ND (0.0055)		8260B Low		1	10/24/17 21:13	C7J0365	CJ72430
1,4-Dioxane	ND (0.109)		8260B Low		1	10/24/17 21:13	C7J0365	CJ72430
1-Chlorohexane	ND (0.0055)		8260B Low		1	10/24/17 21:13	C7J0365	CJ72430
2,2-Dichloropropane	ND (0.0055)		8260B Low		1	10/24/17 21:13	C7J0365	CJ72430
2-Butanone	ND (0.0547)		8260B Low		1	10/24/17 21:13	C7J0365	CJ72430
2-Chlorotoluene	ND (0.0055)		8260B Low		1	10/24/17 21:13	C7J0365	CJ72430
2-Hexanone	ND (0.0547)		8260B Low		1	10/24/17 21:13	C7J0365	CJ72430
4-Chlorotoluene	ND (0.0055)		8260B Low		1	10/24/17 21:13	C7J0365	CJ72430
4-Isopropyltoluene	ND (0.0055)		8260B Low		1	10/24/17 21:13	C7J0365	CJ72430
4-Methyl-2-Pentanone	ND (0.0547)		8260B Low		1	10/24/17 21:13	C7J0365	CJ72430
<b>Acetone</b>	<b>0.0649</b> (0.0547)		8260B Low		1	10/24/17 21:13	C7J0365	CJ72430
Benzene	ND (0.0055)		8260B Low		1	10/24/17 21:13	C7J0365	CJ72430
Bromobenzene	ND (0.0055)		8260B Low		1	10/24/17 21:13	C7J0365	CJ72430



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SB-514 10-11ft  
 Date Sampled: 10/20/17 14:20  
 Percent Solids: 66  
 Initial Volume: 6.9  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1710571  
 ESS Laboratory Sample ID: 1710571-01  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0055)		8260B Low		1	10/24/17 21:13	C7J0365	CJ72430
Bromodichloromethane	ND (0.0055)		8260B Low		1	10/24/17 21:13	C7J0365	CJ72430
Bromoform	ND (0.0055)		8260B Low		1	10/24/17 21:13	C7J0365	CJ72430
Bromomethane	ND (0.0109)		8260B Low		1	10/24/17 21:13	C7J0365	CJ72430
Carbon Disulfide	ND (0.0055)		8260B Low		1	10/24/17 21:13	C7J0365	CJ72430
Carbon Tetrachloride	ND (0.0055)		8260B Low		1	10/24/17 21:13	C7J0365	CJ72430
Chlorobenzene	ND (0.0055)		8260B Low		1	10/24/17 21:13	C7J0365	CJ72430
Chloroethane	ND (0.0109)		8260B Low		1	10/24/17 21:13	C7J0365	CJ72430
Chloroform	ND (0.0055)		8260B Low		1	10/24/17 21:13	C7J0365	CJ72430
Chloromethane	ND (0.0109)		8260B Low		1	10/24/17 21:13	C7J0365	CJ72430
cis-1,2-Dichloroethene	ND (0.0055)		8260B Low		1	10/24/17 21:13	C7J0365	CJ72430
cis-1,3-Dichloropropene	ND (0.0055)		8260B Low		1	10/24/17 21:13	C7J0365	CJ72430
Dibromochloromethane	ND (0.0055)		8260B Low		1	10/24/17 21:13	C7J0365	CJ72430
Dibromomethane	ND (0.0055)		8260B Low		1	10/24/17 21:13	C7J0365	CJ72430
Dichlorodifluoromethane	ND (0.0109)		8260B Low		1	10/24/17 21:13	C7J0365	CJ72430
Diethyl Ether	ND (0.0055)		8260B Low		1	10/24/17 21:13	C7J0365	CJ72430
Di-isopropyl ether	ND (0.0055)		8260B Low		1	10/24/17 21:13	C7J0365	CJ72430
Ethyl tertiary-butyl ether	ND (0.0055)		8260B Low		1	10/24/17 21:13	C7J0365	CJ72430
Ethylbenzene	ND (0.0055)		8260B Low		1	10/24/17 21:13	C7J0365	CJ72430
Hexachlorobutadiene	ND (0.0055)		8260B Low		1	10/24/17 21:13	C7J0365	CJ72430
Isopropylbenzene	ND (0.0055)		8260B Low		1	10/24/17 21:13	C7J0365	CJ72430
Methyl tert-Butyl Ether	ND (0.0055)		8260B Low		1	10/24/17 21:13	C7J0365	CJ72430
Methylene Chloride	ND (0.0273)		8260B Low		1	10/24/17 21:13	C7J0365	CJ72430
Naphthalene	ND (0.0055)		8260B Low		1	10/24/17 21:13	C7J0365	CJ72430
n-Butylbenzene	ND (0.0055)		8260B Low		1	10/24/17 21:13	C7J0365	CJ72430
n-Propylbenzene	ND (0.0055)		8260B Low		1	10/24/17 21:13	C7J0365	CJ72430
sec-Butylbenzene	ND (0.0055)		8260B Low		1	10/24/17 21:13	C7J0365	CJ72430
Styrene	ND (0.0055)		8260B Low		1	10/24/17 21:13	C7J0365	CJ72430
tert-Butylbenzene	ND (0.0055)		8260B Low		1	10/24/17 21:13	C7J0365	CJ72430
Tertiary-amyl methyl ether	ND (0.0055)		8260B Low		1	10/24/17 21:13	C7J0365	CJ72430
Tetrachloroethene	ND (0.0055)		8260B Low		1	10/24/17 21:13	C7J0365	CJ72430
Tetrahydrofuran	ND (0.0055)		8260B Low		1	10/24/17 21:13	C7J0365	CJ72430



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SB-514 10-11ft  
 Date Sampled: 10/20/17 14:20  
 Percent Solids: 66  
 Initial Volume: 6.9  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1710571  
 ESS Laboratory Sample ID: 1710571-01  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0055)		8260B Low		1	10/24/17 21:13	C7J0365	CJ72430
trans-1,2-Dichloroethene	ND (0.0055)		8260B Low		1	10/24/17 21:13	C7J0365	CJ72430
trans-1,3-Dichloropropene	ND (0.0055)		8260B Low		1	10/24/17 21:13	C7J0365	CJ72430
Trichloroethene	ND (0.0055)		8260B Low		1	10/24/17 21:13	C7J0365	CJ72430
Trichlorofluoromethane	ND (0.0055)		8260B Low		1	10/24/17 21:13	C7J0365	CJ72430
Vinyl Acetate	ND (0.0055)		8260B Low		1	10/24/17 21:13	C7J0365	CJ72430
Vinyl Chloride	ND (0.0109)		8260B Low		1	10/24/17 21:13	C7J0365	CJ72430
Xylene O	ND (0.0055)		8260B Low		1	10/24/17 21:13	C7J0365	CJ72430
Xylene P,M	ND (0.0109)		8260B Low		1	10/24/17 21:13	C7J0365	CJ72430
Xylenes (Total)	ND (0.0109)		8260B Low		1	10/24/17 21:13		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	126 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	92 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	110 %		70-130
<i>Surrogate: Toluene-d8</i>	98 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SB-514 10-11ft  
Date Sampled: 10/20/17 14:20  
Percent Solids: 66  
Initial Volume: 20.8  
Final Volume: 1  
Extraction Method: 3546

ESS Laboratory Work Order: 1710571  
ESS Laboratory Sample ID: 1710571-01  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: SMR  
Prepared: 10/24/17 12:00

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	59.1 (54.4)		8100M		1	10/24/17 19:33	C7J0382	CJ72426
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		77 %		40-140				





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SB-514 10-11ft  
Date Sampled: 10/20/17 14:20  
Percent Solids: 66  
Initial Volume: 14.5  
Final Volume: 0.5  
Extraction Method: 3546

ESS Laboratory Work Order: 1710571  
ESS Laboratory Sample ID: 1710571-01  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: TJ  
Prepared: 10/23/17 16:53

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.520)		8270D		1	10/23/17 23:32	C7J0336	CJ72309
Acenaphthene	ND (0.520)		8270D		1	10/23/17 23:32	C7J0336	CJ72309
Acenaphthylene	ND (0.520)		8270D		1	10/23/17 23:32	C7J0336	CJ72309
<b>Anthracene</b>	<b>0.680</b> (0.520)		8270D		1	10/23/17 23:32	C7J0336	CJ72309
<b>Benzo(a)anthracene</b>	<b>1.34</b> (0.520)		8270D		1	10/23/17 23:32	C7J0336	CJ72309
<b>Benzo(a)pyrene</b>	<b>0.958</b> (0.261)		8270D		1	10/23/17 23:32	C7J0336	CJ72309
<b>Benzo(b)fluoranthene</b>	<b>0.793</b> (0.520)		8270D		1	10/23/17 23:32	C7J0336	CJ72309
Benzo(g,h,i)perylene	ND (0.520)		8270D		1	10/23/17 23:32	C7J0336	CJ72309
<b>Benzo(k)fluoranthene</b>	<b>0.927</b> (0.520)		8270D		1	10/23/17 23:32	C7J0336	CJ72309
<b>Chrysene</b>	<b>1.04</b> (0.261)		8270D		1	10/23/17 23:32	C7J0336	CJ72309
Dibenzo(a,h)Anthracene	ND (0.261)		8270D		1	10/23/17 23:32	C7J0336	CJ72309
<b>Fluoranthene</b>	<b>2.19</b> (0.520)		8270D		1	10/23/17 23:32	C7J0336	CJ72309
Fluorene	ND (0.520)		8270D		1	10/23/17 23:32	C7J0336	CJ72309
Indeno(1,2,3-cd)Pyrene	ND (0.520)		8270D		1	10/23/17 23:32	C7J0336	CJ72309
Naphthalene	ND (0.520)		8270D		1	10/23/17 23:32	C7J0336	CJ72309
<b>Phenanthrene</b>	<b>1.05</b> (0.520)		8270D		1	10/23/17 23:32	C7J0336	CJ72309
<b>Pyrene</b>	<b>1.68</b> (0.520)		8270D		1	10/23/17 23:32	C7J0336	CJ72309

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	57 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	72 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	62 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	84 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SB-514 10-11ft  
Date Sampled: 10/20/17 14:20  
Percent Solids: 66

ESS Laboratory Work Order: 1710571  
ESS Laboratory Sample ID: 1710571-01  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	ND (1.46)		9014		1	EEM	10/24/17 11:40	mg/kg dry	CJ72414



## CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SB-515 8-9ft  
 Date Sampled: 10/20/17 14:45  
 Percent Solids: 70

ESS Laboratory Work Order: 1710571  
 ESS Laboratory Sample ID: 1710571-02  
 Sample Matrix: Soil  
 Units: mg/kg dry

Extraction Method: 3050B

### Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (0.59)		6020A		20	NAR	10/30/17 12:56	2.42	100	CJ72042
<b>Arsenic</b>	<b>4.86</b> (2.96)		7010		10	MJV/KJK	10/25/17 16:02	2.42	100	CJ72042
Beryllium	ND (0.13)		6010C		1	KJK	10/24/17 21:24	2.42	100	CJ72042
Cadmium	ND (0.59)		6010C		1	KJK	10/24/17 21:24	2.42	100	CJ72042
<b>Chromium</b>	<b>2.63</b> (1.18)		6010C		1	KJK	10/24/17 21:24	2.42	100	CJ72042
<b>Copper</b>	<b>4.25</b> (2.96)		6010C		1	KJK	10/24/17 21:24	2.42	100	CJ72042
<b>Lead</b>	<b>389</b> (5.92)		6010C		1	KJK	10/24/17 21:24	2.42	100	CJ72042
<b>Mercury</b>	<b>0.075</b> (0.037)		7471B		1	MJV	10/24/17 13:33	0.76	40	CJ72041
Nickel	ND (2.96)		6010C		1	KJK	10/24/17 21:24	2.42	100	CJ72042
Selenium	ND (0.59)		6020A		20	NAR	10/30/17 12:56	2.42	100	CJ72042
Silver	ND (0.59)		6010C		1	KJK	10/24/17 21:24	2.42	100	CJ72042
Thallium	ND (0.59)		6020A		20	NAR	10/30/17 12:56	2.42	100	CJ72042
Zinc	ND (2.96)		6010C		1	KJK	10/24/17 21:24	2.42	100	CJ72042



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SB-515 8-9ft  
Date Sampled: 10/20/17 14:45  
Percent Solids: 70  
Initial Volume: 5.9  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710571  
ESS Laboratory Sample ID: 1710571-02  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0061)		8260B Low		1	10/25/17 18:22	C7J0389	CJ72515
1,1,1-Trichloroethane	ND (0.0061)		8260B Low		1	10/25/17 18:22	C7J0389	CJ72515
1,1,2,2-Tetrachloroethane	ND (0.0061)		8260B Low		1	10/25/17 18:22	C7J0389	CJ72515
1,1,2-Trichloroethane	ND (0.0061)		8260B Low		1	10/25/17 18:22	C7J0389	CJ72515
1,1-Dichloroethane	ND (0.0061)		8260B Low		1	10/25/17 18:22	C7J0389	CJ72515
1,1-Dichloroethene	ND (0.0061)		8260B Low		1	10/25/17 18:22	C7J0389	CJ72515
1,1-Dichloropropene	ND (0.0061)		8260B Low		1	10/25/17 18:22	C7J0389	CJ72515
1,2,3-Trichlorobenzene	ND (0.0061)		8260B Low		1	10/25/17 18:22	C7J0389	CJ72515
1,2,3-Trichloropropane	ND (0.0061)		8260B Low		1	10/25/17 18:22	C7J0389	CJ72515
1,2,4-Trichlorobenzene	ND (0.0061)		8260B Low		1	10/25/17 18:22	C7J0389	CJ72515
1,2,4-Trimethylbenzene	ND (0.0061)		8260B Low		1	10/25/17 18:22	C7J0389	CJ72515
1,2-Dibromo-3-Chloropropane	ND (0.0061)		8260B Low		1	10/25/17 18:22	C7J0389	CJ72515
1,2-Dibromoethane	ND (0.0061)		8260B Low		1	10/25/17 18:22	C7J0389	CJ72515
1,2-Dichlorobenzene	ND (0.0061)		8260B Low		1	10/25/17 18:22	C7J0389	CJ72515
1,2-Dichloroethane	ND (0.0061)		8260B Low		1	10/25/17 18:22	C7J0389	CJ72515
1,2-Dichloropropane	ND (0.0061)		8260B Low		1	10/25/17 18:22	C7J0389	CJ72515
1,3,5-Trimethylbenzene	ND (0.0061)		8260B Low		1	10/25/17 18:22	C7J0389	CJ72515
1,3-Dichlorobenzene	ND (0.0061)		8260B Low		1	10/25/17 18:22	C7J0389	CJ72515
1,3-Dichloropropane	ND (0.0061)		8260B Low		1	10/25/17 18:22	C7J0389	CJ72515
1,4-Dichlorobenzene	ND (0.0061)		8260B Low		1	10/25/17 18:22	C7J0389	CJ72515
1,4-Dioxane	ND (0.121)		8260B Low		1	10/25/17 18:22	C7J0389	CJ72515
1-Chlorohexane	ND (0.0061)		8260B Low		1	10/25/17 18:22	C7J0389	CJ72515
2,2-Dichloropropane	ND (0.0061)		8260B Low		1	10/25/17 18:22	C7J0389	CJ72515
2-Butanone	ND (0.0607)		8260B Low		1	10/25/17 18:22	C7J0389	CJ72515
2-Chlorotoluene	ND (0.0061)		8260B Low		1	10/25/17 18:22	C7J0389	CJ72515
2-Hexanone	ND (0.0607)		8260B Low		1	10/25/17 18:22	C7J0389	CJ72515
4-Chlorotoluene	ND (0.0061)		8260B Low		1	10/25/17 18:22	C7J0389	CJ72515
4-Isopropyltoluene	ND (0.0061)		8260B Low		1	10/25/17 18:22	C7J0389	CJ72515
4-Methyl-2-Pentanone	ND (0.0607)		8260B Low		1	10/25/17 18:22	C7J0389	CJ72515
Acetone	ND (0.0607)		8260B Low		1	10/25/17 18:22	C7J0389	CJ72515
Benzene	ND (0.0061)		8260B Low		1	10/25/17 18:22	C7J0389	CJ72515
Bromobenzene	ND (0.0061)		8260B Low		1	10/25/17 18:22	C7J0389	CJ72515



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SB-515 8-9ft  
 Date Sampled: 10/20/17 14:45  
 Percent Solids: 70  
 Initial Volume: 5.9  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1710571  
 ESS Laboratory Sample ID: 1710571-02  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0061)		8260B Low		1	10/25/17 18:22	C7J0389	CJ72515
Bromodichloromethane	ND (0.0061)		8260B Low		1	10/25/17 18:22	C7J0389	CJ72515
Bromoform	ND (0.0061)		8260B Low		1	10/25/17 18:22	C7J0389	CJ72515
Bromomethane	ND (0.0121)		8260B Low		1	10/25/17 18:22	C7J0389	CJ72515
Carbon Disulfide	ND (0.0061)		8260B Low		1	10/25/17 18:22	C7J0389	CJ72515
Carbon Tetrachloride	ND (0.0061)		8260B Low		1	10/25/17 18:22	C7J0389	CJ72515
Chlorobenzene	ND (0.0061)		8260B Low		1	10/25/17 18:22	C7J0389	CJ72515
Chloroethane	ND (0.0121)		8260B Low		1	10/25/17 18:22	C7J0389	CJ72515
Chloroform	ND (0.0061)		8260B Low		1	10/25/17 18:22	C7J0389	CJ72515
Chloromethane	ND (0.0121)		8260B Low		1	10/25/17 18:22	C7J0389	CJ72515
cis-1,2-Dichloroethene	ND (0.0061)		8260B Low		1	10/25/17 18:22	C7J0389	CJ72515
cis-1,3-Dichloropropene	ND (0.0061)		8260B Low		1	10/25/17 18:22	C7J0389	CJ72515
Dibromochloromethane	ND (0.0061)		8260B Low		1	10/25/17 18:22	C7J0389	CJ72515
Dibromomethane	ND (0.0061)		8260B Low		1	10/25/17 18:22	C7J0389	CJ72515
Dichlorodifluoromethane	ND (0.0121)		8260B Low		1	10/25/17 18:22	C7J0389	CJ72515
Diethyl Ether	ND (0.0061)		8260B Low		1	10/25/17 18:22	C7J0389	CJ72515
Di-isopropyl ether	ND (0.0061)		8260B Low		1	10/25/17 18:22	C7J0389	CJ72515
Ethyl tertiary-butyl ether	ND (0.0061)		8260B Low		1	10/25/17 18:22	C7J0389	CJ72515
Ethylbenzene	ND (0.0061)		8260B Low		1	10/25/17 18:22	C7J0389	CJ72515
Hexachlorobutadiene	ND (0.0061)		8260B Low		1	10/25/17 18:22	C7J0389	CJ72515
Isopropylbenzene	ND (0.0061)		8260B Low		1	10/25/17 18:22	C7J0389	CJ72515
Methyl tert-Butyl Ether	ND (0.0061)		8260B Low		1	10/25/17 18:22	C7J0389	CJ72515
Methylene Chloride	ND (0.0304)		8260B Low		1	10/25/17 18:22	C7J0389	CJ72515
Naphthalene	ND (0.0061)		8260B Low		1	10/25/17 18:22	C7J0389	CJ72515
n-Butylbenzene	ND (0.0061)		8260B Low		1	10/25/17 18:22	C7J0389	CJ72515
n-Propylbenzene	ND (0.0061)		8260B Low		1	10/25/17 18:22	C7J0389	CJ72515
sec-Butylbenzene	ND (0.0061)		8260B Low		1	10/25/17 18:22	C7J0389	CJ72515
Styrene	ND (0.0061)		8260B Low		1	10/25/17 18:22	C7J0389	CJ72515
tert-Butylbenzene	ND (0.0061)		8260B Low		1	10/25/17 18:22	C7J0389	CJ72515
Tertiary-amyl methyl ether	ND (0.0061)		8260B Low		1	10/25/17 18:22	C7J0389	CJ72515
Tetrachloroethene	ND (0.0061)		8260B Low		1	10/25/17 18:22	C7J0389	CJ72515
Tetrahydrofuran	ND (0.0061)		8260B Low		1	10/25/17 18:22	C7J0389	CJ72515



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SB-515 8-9ft  
 Date Sampled: 10/20/17 14:45  
 Percent Solids: 70  
 Initial Volume: 5.9  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1710571  
 ESS Laboratory Sample ID: 1710571-02  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0061)		8260B Low		1	10/25/17 18:22	C7J0389	CJ72515
trans-1,2-Dichloroethene	ND (0.0061)		8260B Low		1	10/25/17 18:22	C7J0389	CJ72515
trans-1,3-Dichloropropene	ND (0.0061)		8260B Low		1	10/25/17 18:22	C7J0389	CJ72515
Trichloroethene	ND (0.0061)		8260B Low		1	10/25/17 18:22	C7J0389	CJ72515
Trichlorofluoromethane	ND (0.0061)		8260B Low		1	10/25/17 18:22	C7J0389	CJ72515
Vinyl Acetate	ND (0.0061)		8260B Low		1	10/25/17 18:22	C7J0389	CJ72515
Vinyl Chloride	ND (0.0121)		8260B Low		1	10/25/17 18:22	C7J0389	CJ72515
Xylene O	ND (0.0061)		8260B Low		1	10/25/17 18:22	C7J0389	CJ72515
Xylene P,M	ND (0.0121)		8260B Low		1	10/25/17 18:22	C7J0389	CJ72515
Xylenes (Total)	ND (0.0121)		8260B Low		1	10/25/17 18:22		[CALC]

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: 1,2-Dichloroethane-d4	92 %		70-130
Surrogate: 4-Bromofluorobenzene	90 %		70-130
Surrogate: Dibromofluoromethane	89 %		70-130
Surrogate: Toluene-d8	101 %		70-130





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SB-515 8-9ft  
 Date Sampled: 10/20/17 14:45  
 Percent Solids: 70  
 Initial Volume: 20.1  
 Final Volume: 1  
 Extraction Method: 3546

ESS Laboratory Work Order: 1710571  
 ESS Laboratory Sample ID: 1710571-02  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: SMR  
 Prepared: 10/24/17 12:00

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	547 (267)		8100M		5	10/25/17 5:05	C7J0382	CJ72426
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		87 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SB-515 8-9ft  
Date Sampled: 10/20/17 14:45  
Percent Solids: 70  
Initial Volume: 14.5  
Final Volume: 0.5  
Extraction Method: 3546

ESS Laboratory Work Order: 1710571  
ESS Laboratory Sample ID: 1710571-02  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: TJ  
Prepared: 10/23/17 16:53

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.494)		8270D		1	10/24/17 0:07	C7J0336	CJ72309
Acenaphthene	ND (0.494)		8270D		1	10/24/17 0:07	C7J0336	CJ72309
Acenaphthylene	<b>0.632</b> (0.494)		8270D		1	10/24/17 0:07	C7J0336	CJ72309
Anthracene	<b>0.857</b> (0.494)		8270D		1	10/24/17 0:07	C7J0336	CJ72309
Benzo(a)anthracene	<b>10.4</b> (0.494)		8270D		1	10/24/17 0:07	C7J0336	CJ72309
Benzo(a)pyrene	<b>14.7</b> (2.48)		8270D		10	10/25/17 18:14	C7J0336	CJ72309
Benzo(b)fluoranthene	<b>16.2</b> (4.94)		8270D		10	10/25/17 18:14	C7J0336	CJ72309
Benzo(g,h,i)perylene	<b>7.88</b> (0.494)		8270D		1	10/24/17 0:07	C7J0336	CJ72309
Benzo(k)fluoranthene	<b>8.61</b> (0.494)		8270D		1	10/24/17 0:07	C7J0336	CJ72309
Chrysene	<b>9.01</b> (0.248)		8270D		1	10/24/17 0:07	C7J0336	CJ72309
Dibenzo(a,h)Anthracene	<b>3.07</b> (0.248)		8270D		1	10/24/17 0:07	C7J0336	CJ72309
Fluoranthene	<b>16.9</b> (4.94)		8270D		10	10/25/17 18:14	C7J0336	CJ72309
Fluorene	ND (0.494)		8270D		1	10/24/17 0:07	C7J0336	CJ72309
Indeno(1,2,3-cd)Pyrene	<b>7.05</b> (0.494)		8270D		1	10/24/17 0:07	C7J0336	CJ72309
Naphthalene	<b>1.54</b> (0.494)		8270D		1	10/24/17 0:07	C7J0336	CJ72309
Phenanthrene	<b>2.58</b> (0.494)		8270D		1	10/24/17 0:07	C7J0336	CJ72309
Pyrene	<b>17.5</b> (4.94)		8270D		10	10/25/17 18:14	C7J0336	CJ72309

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	66 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	87 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	77 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	91 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SB-515 8-9ft  
Date Sampled: 10/20/17 14:45  
Percent Solids: 70

ESS Laboratory Work Order: 1710571  
ESS Laboratory Sample ID: 1710571-02  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	78.0 (14.0)		9014		10	EEM	10/24/17 11:40	mg/kg dry	CJ72414



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710571

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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Total Metals

**Batch CJ72041 - 7471B**

<b>Blank</b>										
Mercury	ND	0.033	mg/kg wet							
<b>LCS</b>										
Mercury	2.93	0.776	mg/kg wet	2.900		101	80-120			
<b>LCS Dup</b>										
Mercury	2.90	0.776	mg/kg wet	2.900		100	80-120	1	20	
<b>Reference</b>										
Mercury	0.919	0.187	mg/kg wet	1000		0.09	0-200			

**Batch CJ72042 - 3050B**

<b>Blank</b>										
Antimony	ND	0.50	mg/kg wet							
Arsenic	ND	0.25	mg/kg wet							
Arsenic	ND	2.50	mg/kg wet							
Beryllium	ND	0.11	mg/kg wet							
Cadmium	ND	0.50	mg/kg wet							
Chromium	ND	1.00	mg/kg wet							
Copper	ND	2.50	mg/kg wet							
Lead	ND	5.00	mg/kg wet							
Nickel	ND	2.50	mg/kg wet							
Selenium	ND	0.50	mg/kg wet							
Silver	ND	0.50	mg/kg wet							
Thallium	ND	0.50	mg/kg wet							
Zinc	ND	2.50	mg/kg wet							
<b>LCS</b>										
Antimony	75.8	4.39	mg/kg wet	48.00		158	0-238			
Arsenic	111	8.77	mg/kg wet	123.0		90	80-120			
Arsenic	124	21.9	mg/kg wet	123.0		101	80-120			
Beryllium	168	0.39	mg/kg wet	192.0		87	80-120			
Cadmium	188	1.75	mg/kg wet	224.0		84	80-120			
Chromium	165	3.51	mg/kg wet	179.0		92	80-120			
Copper	69.5	8.77	mg/kg wet	78.90		88	80-120			
Lead	137	17.5	mg/kg wet	145.0		94	80-120			
Nickel	129	8.77	mg/kg wet	143.0		90	80-120			
Selenium	45.2	4.39	mg/kg wet	42.40		107	80-120			
Silver	75.2	1.75	mg/kg wet	81.60		92	80-120			
Thallium	53.2	4.39	mg/kg wet	52.00		102	80-120			
Zinc	666	8.77	mg/kg wet	770.0		86	80-120			
<b>LCS Dup</b>										
Antimony	71.8	4.55	mg/kg wet	48.00		150	0-238	5	30	
Arsenic	106	9.09	mg/kg wet	123.0		86	80-120	5	20	
Arsenic	122	22.7	mg/kg wet	123.0		99	80-120	2	20	
Beryllium	161	0.40	mg/kg wet	192.0		84	80-120	4	20	
Cadmium	180	1.82	mg/kg wet	224.0		80	80-120	5	20	
Chromium	157	3.64	mg/kg wet	179.0		88	80-120	5	20	

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710571

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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Total Metals

**Batch CJ72042 - 3050B**

Copper	65.7	9.09	mg/kg wet	78.90		83	80-120	6	20	
Lead	130	18.2	mg/kg wet	145.0		90	80-120	5	20	
Nickel	123	9.09	mg/kg wet	143.0		86	80-120	5	20	
Selenium	44.9	4.55	mg/kg wet	42.40		106	80-120	0.6	30	
Silver	71.8	1.82	mg/kg wet	81.60		88	80-120	5	20	
Thallium	53.9	4.55	mg/kg wet	52.00		104	80-120	1	30	
Zinc	631	9.09	mg/kg wet	770.0		82	80-120	5	20	

**Reference**

Cadmium	392	2.00	mg/kg wet	500.0		78	70-130			
Chromium	450	4.00	mg/kg wet	500.0		90	70-130			
Lead	433	20.0	mg/kg wet	500.0		87	70-130			
Silver	147	2.00	mg/kg wet	500.0		29	70-130			R-

5035/8260B Volatile Organic Compounds / Low Level

**Batch CJ72430 - 5035**

**Blank**

1,1,1,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,1-Trichloroethane	ND	0.0050	mg/kg wet							
1,1,2,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,2-Trichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethene	ND	0.0050	mg/kg wet							
1,1-Dichloropropene	ND	0.0050	mg/kg wet							
1,2,3-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,3-Trichloropropane	ND	0.0050	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,4-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,2-Dibromo-3-Chloropropane	ND	0.0050	mg/kg wet							
1,2-Dibromoethane	ND	0.0050	mg/kg wet							
1,2-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,2-Dichloroethane	ND	0.0050	mg/kg wet							
1,2-Dichloropropane	ND	0.0050	mg/kg wet							
1,3,5-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,3-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,3-Dichloropropane	ND	0.0050	mg/kg wet							
1,4-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,4-Dioxane	ND	0.100	mg/kg wet							
1-Chlorohexane	ND	0.0050	mg/kg wet							
2,2-Dichloropropane	ND	0.0050	mg/kg wet							
2-Butanone	ND	0.0500	mg/kg wet							
2-Chlorotoluene	ND	0.0050	mg/kg wet							
2-Hexanone	ND	0.0500	mg/kg wet							
4-Chlorotoluene	ND	0.0050	mg/kg wet							
4-Isopropyltoluene	ND	0.0050	mg/kg wet							
4-Methyl-2-Pentanone	ND	0.0500	mg/kg wet							



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710571

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CJ72430 - 5035**

Acetone	ND	0.0500	mg/kg wet							
Benzene	ND	0.0050	mg/kg wet							
Bromobenzene	ND	0.0050	mg/kg wet							
Bromochloromethane	ND	0.0050	mg/kg wet							
Bromodichloromethane	ND	0.0050	mg/kg wet							
Bromoform	ND	0.0050	mg/kg wet							
Bromomethane	ND	0.0100	mg/kg wet							
Carbon Disulfide	ND	0.0050	mg/kg wet							
Carbon Tetrachloride	ND	0.0050	mg/kg wet							
Chlorobenzene	ND	0.0050	mg/kg wet							
Chloroethane	ND	0.0100	mg/kg wet							
Chloroform	ND	0.0050	mg/kg wet							
Chloromethane	ND	0.0100	mg/kg wet							
cis-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
cis-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Dibromochloromethane	ND	0.0050	mg/kg wet							
Dibromomethane	ND	0.0050	mg/kg wet							
Dichlorodifluoromethane	ND	0.0100	mg/kg wet							
Diethyl Ether	ND	0.0050	mg/kg wet							
Di-isopropyl ether	ND	0.0050	mg/kg wet							
Ethyl tertiary-butyl ether	ND	0.0050	mg/kg wet							
Ethylbenzene	ND	0.0050	mg/kg wet							
Hexachlorobutadiene	ND	0.0050	mg/kg wet							
Isopropylbenzene	ND	0.0050	mg/kg wet							
Methyl tert-Butyl Ether	ND	0.0050	mg/kg wet							
Methylene Chloride	ND	0.0250	mg/kg wet							
Naphthalene	ND	0.0050	mg/kg wet							
n-Butylbenzene	ND	0.0050	mg/kg wet							
n-Propylbenzene	ND	0.0050	mg/kg wet							
sec-Butylbenzene	ND	0.0050	mg/kg wet							
Styrene	ND	0.0050	mg/kg wet							
tert-Butylbenzene	ND	0.0050	mg/kg wet							
Tertiary-amyl methyl ether	ND	0.0050	mg/kg wet							
Tetrachloroethene	ND	0.0050	mg/kg wet							
Tetrahydrofuran	ND	0.0050	mg/kg wet							
Toluene	ND	0.0050	mg/kg wet							
trans-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
trans-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Trichloroethene	ND	0.0050	mg/kg wet							
Trichlorofluoromethane	ND	0.0050	mg/kg wet							
Vinyl Acetate	ND	0.0050	mg/kg wet							
Vinyl Chloride	ND	0.0100	mg/kg wet							
Xylene O	ND	0.0050	mg/kg wet							
Xylene P,M	ND	0.0100	mg/kg wet							
Xylenes (Total)	ND	0.0100	mg/kg wet							





CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710571

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CJ72430 - 5035**

Surrogate: 1,2-Dichloroethane-d4	0.0554		mg/kg wet	0.05000		111	70-130			
Surrogate: 4-Bromofluorobenzene	0.0453		mg/kg wet	0.05000		91	70-130			
Surrogate: Dibromofluoromethane	0.0518		mg/kg wet	0.05000		104	70-130			
Surrogate: Toluene-d8	0.0487		mg/kg wet	0.05000		97	70-130			

**LCS**

1,1,1,2-Tetrachloroethane	0.0580	0.0050	mg/kg wet	0.05000		116	70-130			
1,1,1-Trichloroethane	0.0605	0.0050	mg/kg wet	0.05000		121	70-130			
1,1,2,2-Tetrachloroethane	0.0514	0.0050	mg/kg wet	0.05000		103	70-130			
1,1,2-Trichloroethane	0.0553	0.0050	mg/kg wet	0.05000		111	70-130			
1,1-Dichloroethane	0.0537	0.0050	mg/kg wet	0.05000		107	70-130			
1,1-Dichloroethene	0.0552	0.0050	mg/kg wet	0.05000		110	70-130			
1,1-Dichloropropene	0.0585	0.0050	mg/kg wet	0.05000		117	70-130			
1,2,3-Trichlorobenzene	0.0566	0.0050	mg/kg wet	0.05000		113	70-130			
1,2,3-Trichloropropane	0.0519	0.0050	mg/kg wet	0.05000		104	70-130			
1,2,4-Trichlorobenzene	0.0561	0.0050	mg/kg wet	0.05000		112	70-130			
1,2,4-Trimethylbenzene	0.0573	0.0050	mg/kg wet	0.05000		115	70-130			
1,2-Dibromo-3-Chloropropane	0.0466	0.0050	mg/kg wet	0.05000		93	70-130			
1,2-Dibromoethane	0.0542	0.0050	mg/kg wet	0.05000		108	70-130			
1,2-Dichlorobenzene	0.0552	0.0050	mg/kg wet	0.05000		110	70-130			
1,2-Dichloroethane	0.0593	0.0050	mg/kg wet	0.05000		119	70-130			
1,2-Dichloropropane	0.0541	0.0050	mg/kg wet	0.05000		108	70-130			
1,3,5-Trimethylbenzene	0.0557	0.0050	mg/kg wet	0.05000		111	70-130			
1,3-Dichlorobenzene	0.0548	0.0050	mg/kg wet	0.05000		110	70-130			
1,3-Dichloropropane	0.0576	0.0050	mg/kg wet	0.05000		115	70-130			
1,4-Dichlorobenzene	0.0555	0.0050	mg/kg wet	0.05000		111	70-130			
1,4-Dioxane	0.890	0.100	mg/kg wet	1.000		89	70-130			
1-Chlorohexane	0.0527	0.0050	mg/kg wet	0.05000		105	70-130			
2,2-Dichloropropane	0.0582	0.0050	mg/kg wet	0.05000		116	70-130			
2-Butanone	0.273	0.0500	mg/kg wet	0.2500		109	70-130			
2-Chlorotoluene	0.0545	0.0050	mg/kg wet	0.05000		109	70-130			
2-Hexanone	0.241	0.0500	mg/kg wet	0.2500		96	70-130			
4-Chlorotoluene	0.0550	0.0050	mg/kg wet	0.05000		110	70-130			
4-Isopropyltoluene	0.0555	0.0050	mg/kg wet	0.05000		111	70-130			
4-Methyl-2-Pentanone	0.243	0.0500	mg/kg wet	0.2500		97	70-130			
Acetone	0.263	0.0500	mg/kg wet	0.2500		105	70-130			
Benzene	0.0545	0.0050	mg/kg wet	0.05000		109	70-130			
Bromobenzene	0.0542	0.0050	mg/kg wet	0.05000		108	70-130			
Bromochloromethane	0.0551	0.0050	mg/kg wet	0.05000		110	70-130			
Bromodichloromethane	0.0612	0.0050	mg/kg wet	0.05000		122	70-130			
Bromoform	0.0491	0.0050	mg/kg wet	0.05000		98	70-130			
Bromomethane	0.0622	0.0100	mg/kg wet	0.05000		124	70-130			
Carbon Disulfide	0.0575	0.0050	mg/kg wet	0.05000		115	70-130			
Carbon Tetrachloride	0.0620	0.0050	mg/kg wet	0.05000		124	70-130			
Chlorobenzene	0.0542	0.0050	mg/kg wet	0.05000		108	70-130			



CERTIFICATE OF ANALYSIS

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ESS Laboratory Work Order: 1710571

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CJ72430 - 5035**

Chloroethane	0.0524	0.0100	mg/kg wet	0.05000		105	70-130			
Chloroform	0.0576	0.0050	mg/kg wet	0.05000		115	70-130			
Chloromethane	0.0614	0.0100	mg/kg wet	0.05000		123	70-130			
cis-1,2-Dichloroethene	0.0551	0.0050	mg/kg wet	0.05000		110	70-130			
cis-1,3-Dichloropropene	0.0603	0.0050	mg/kg wet	0.05000		121	70-130			
Dibromochloromethane	0.0536	0.0050	mg/kg wet	0.05000		107	70-130			
Dibromomethane	0.0538	0.0050	mg/kg wet	0.05000		108	70-130			
Dichlorodifluoromethane	0.0498	0.0100	mg/kg wet	0.05000		100	70-130			
Diethyl Ether	0.0549	0.0050	mg/kg wet	0.05000		110	70-130			
Di-isopropyl ether	0.0519	0.0050	mg/kg wet	0.05000		104	70-130			
Ethyl tertiary-butyl ether	0.0522	0.0050	mg/kg wet	0.05000		104	70-130			
Ethylbenzene	0.0547	0.0050	mg/kg wet	0.05000		109	70-130			
Hexachlorobutadiene	0.0589	0.0050	mg/kg wet	0.05000		118	70-130			
Isopropylbenzene	0.0527	0.0050	mg/kg wet	0.05000		105	70-130			
Methyl tert-Butyl Ether	0.0533	0.0050	mg/kg wet	0.05000		107	70-130			
Methylene Chloride	0.0585	0.0250	mg/kg wet	0.05000		117	70-130			
Naphthalene	0.0471	0.0050	mg/kg wet	0.05000		94	70-130			
n-Butylbenzene	0.0560	0.0050	mg/kg wet	0.05000		112	70-130			
n-Propylbenzene	0.0558	0.0050	mg/kg wet	0.05000		112	70-130			
sec-Butylbenzene	0.0546	0.0050	mg/kg wet	0.05000		109	70-130			
Styrene	0.0544	0.0050	mg/kg wet	0.05000		109	70-130			
tert-Butylbenzene	0.0553	0.0050	mg/kg wet	0.05000		111	70-130			
Tertiary-amyl methyl ether	0.0495	0.0050	mg/kg wet	0.05000		99	70-130			
Tetrachloroethene	0.0543	0.0050	mg/kg wet	0.05000		109	70-130			
Tetrahydrofuran	0.0436	0.0050	mg/kg wet	0.05000		87	70-130			
Toluene	0.0554	0.0050	mg/kg wet	0.05000		111	70-130			
trans-1,2-Dichloroethene	0.0548	0.0050	mg/kg wet	0.05000		110	70-130			
trans-1,3-Dichloropropene	0.0538	0.0050	mg/kg wet	0.05000		108	70-130			
Trichloroethene	0.0561	0.0050	mg/kg wet	0.05000		112	70-130			
Trichlorofluoromethane	0.0589	0.0050	mg/kg wet	0.05000		118	70-130			
Vinyl Acetate	0.0437	0.0050	mg/kg wet	0.05000		87	70-130			
Vinyl Chloride	0.0653	0.0100	mg/kg wet	0.05000		131	70-130			B+
Xylene O	0.0577	0.0050	mg/kg wet	0.05000		115	70-130			
Xylene P,M	0.113	0.0100	mg/kg wet	0.1000		113	70-130			
Xylenes (Total)	0.171	0.0100	mg/kg wet							
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0573</i>		mg/kg wet	<i>0.05000</i>		<i>115</i>	<i>70-130</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0527</i>		mg/kg wet	<i>0.05000</i>		<i>105</i>	<i>70-130</i>			
<i>Surrogate: Dibromofluoromethane</i>	<i>0.0553</i>		mg/kg wet	<i>0.05000</i>		<i>111</i>	<i>70-130</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0508</i>		mg/kg wet	<i>0.05000</i>		<i>102</i>	<i>70-130</i>			

**LCS Dup**

1,1,1,2-Tetrachloroethane	0.0553	0.0050	mg/kg wet	0.05000		111	70-130	5	25	
1,1,1-Trichloroethane	0.0554	0.0050	mg/kg wet	0.05000		111	70-130	9	25	
1,1,2,2-Tetrachloroethane	0.0490	0.0050	mg/kg wet	0.05000		98	70-130	5	25	
1,1,2-Trichloroethane	0.0514	0.0050	mg/kg wet	0.05000		103	70-130	7	25	
1,1-Dichloroethane	0.0498	0.0050	mg/kg wet	0.05000		100	70-130	8	25	



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
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ESS Laboratory Work Order: 1710571

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CJ72430 - 5035**

1,1-Dichloroethene	0.0517	0.0050	mg/kg wet	0.05000		103	70-130	7	25	
1,1-Dichloropropene	0.0538	0.0050	mg/kg wet	0.05000		108	70-130	8	25	
1,2,3-Trichlorobenzene	0.0547	0.0050	mg/kg wet	0.05000		109	70-130	3	25	
1,2,3-Trichloropropane	0.0498	0.0050	mg/kg wet	0.05000		100	70-130	4	25	
1,2,4-Trichlorobenzene	0.0540	0.0050	mg/kg wet	0.05000		108	70-130	4	25	
1,2,4-Trimethylbenzene	0.0549	0.0050	mg/kg wet	0.05000		110	70-130	4	25	
1,2-Dibromo-3-Chloropropane	0.0454	0.0050	mg/kg wet	0.05000		91	70-130	3	25	
1,2-Dibromoethane	0.0523	0.0050	mg/kg wet	0.05000		105	70-130	4	25	
1,2-Dichlorobenzene	0.0533	0.0050	mg/kg wet	0.05000		107	70-130	4	25	
1,2-Dichloroethane	0.0549	0.0050	mg/kg wet	0.05000		110	70-130	8	25	
1,2-Dichloropropane	0.0507	0.0050	mg/kg wet	0.05000		101	70-130	6	25	
1,3,5-Trimethylbenzene	0.0537	0.0050	mg/kg wet	0.05000		107	70-130	4	25	
1,3-Dichlorobenzene	0.0525	0.0050	mg/kg wet	0.05000		105	70-130	4	25	
1,3-Dichloropropane	0.0547	0.0050	mg/kg wet	0.05000		109	70-130	5	25	
1,4-Dichlorobenzene	0.0532	0.0050	mg/kg wet	0.05000		106	70-130	4	25	
1,4-Dioxane	0.852	0.100	mg/kg wet	1.000		85	70-130	4	20	
1-Chlorohexane	0.0506	0.0050	mg/kg wet	0.05000		101	70-130	4	25	
2,2-Dichloropropane	0.0534	0.0050	mg/kg wet	0.05000		107	70-130	9	25	
2-Butanone	0.254	0.0500	mg/kg wet	0.2500		102	70-130	7	25	
2-Chlorotoluene	0.0525	0.0050	mg/kg wet	0.05000		105	70-130	4	25	
2-Hexanone	0.230	0.0500	mg/kg wet	0.2500		92	70-130	5	25	
4-Chlorotoluene	0.0528	0.0050	mg/kg wet	0.05000		106	70-130	4	25	
4-Isopropyltoluene	0.0531	0.0050	mg/kg wet	0.05000		106	70-130	4	25	
4-Methyl-2-Pentanone	0.226	0.0500	mg/kg wet	0.2500		90	70-130	7	25	
Acetone	0.243	0.0500	mg/kg wet	0.2500		97	70-130	8	25	
Benzene	0.0505	0.0050	mg/kg wet	0.05000		101	70-130	7	25	
Bromobenzene	0.0527	0.0050	mg/kg wet	0.05000		105	70-130	3	25	
Bromochloromethane	0.0512	0.0050	mg/kg wet	0.05000		102	70-130	7	25	
Bromodichloromethane	0.0563	0.0050	mg/kg wet	0.05000		113	70-130	8	25	
Bromoform	0.0473	0.0050	mg/kg wet	0.05000		95	70-130	4	25	
Bromomethane	0.0569	0.0100	mg/kg wet	0.05000		114	70-130	9	25	
Carbon Disulfide	0.0533	0.0050	mg/kg wet	0.05000		107	70-130	8	25	
Carbon Tetrachloride	0.0566	0.0050	mg/kg wet	0.05000		113	70-130	9	25	
Chlorobenzene	0.0518	0.0050	mg/kg wet	0.05000		104	70-130	4	25	
Chloroethane	0.0494	0.0100	mg/kg wet	0.05000		99	70-130	6	25	
Chloroform	0.0531	0.0050	mg/kg wet	0.05000		106	70-130	8	25	
Chloromethane	0.0566	0.0100	mg/kg wet	0.05000		113	70-130	8	25	
cis-1,2-Dichloroethene	0.0512	0.0050	mg/kg wet	0.05000		102	70-130	7	25	
cis-1,3-Dichloropropene	0.0563	0.0050	mg/kg wet	0.05000		113	70-130	7	25	
Dibromochloromethane	0.0519	0.0050	mg/kg wet	0.05000		104	70-130	3	25	
Dibromomethane	0.0498	0.0050	mg/kg wet	0.05000		100	70-130	8	25	
Dichlorodifluoromethane	0.0453	0.0100	mg/kg wet	0.05000		91	70-130	9	25	
Diethyl Ether	0.0522	0.0050	mg/kg wet	0.05000		104	70-130	5	25	
Di-isopropyl ether	0.0494	0.0050	mg/kg wet	0.05000		99	70-130	5	25	
Ethyl tertiary-butyl ether	0.0495	0.0050	mg/kg wet	0.05000		99	70-130	5	25	

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710571

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CJ72430 - 5035**

Ethylbenzene	0.0523	0.0050	mg/kg wet	0.05000		105	70-130	4	25	
Hexachlorobutadiene	0.0563	0.0050	mg/kg wet	0.05000		113	70-130	5	25	
Isopropylbenzene	0.0504	0.0050	mg/kg wet	0.05000		101	70-130	4	25	
Methyl tert-Butyl Ether	0.0511	0.0050	mg/kg wet	0.05000		102	70-130	4	25	
Methylene Chloride	0.0547	0.0250	mg/kg wet	0.05000		109	70-130	7	25	
Naphthalene	0.0458	0.0050	mg/kg wet	0.05000		92	70-130	3	25	
n-Butylbenzene	0.0536	0.0050	mg/kg wet	0.05000		107	70-130	4	25	
n-Propylbenzene	0.0532	0.0050	mg/kg wet	0.05000		106	70-130	5	25	
sec-Butylbenzene	0.0523	0.0050	mg/kg wet	0.05000		105	70-130	4	25	
Styrene	0.0530	0.0050	mg/kg wet	0.05000		106	70-130	2	25	
tert-Butylbenzene	0.0533	0.0050	mg/kg wet	0.05000		107	70-130	4	25	
Tertiary-amyl methyl ether	0.0474	0.0050	mg/kg wet	0.05000		95	70-130	4	25	
Tetrachloroethene	0.0522	0.0050	mg/kg wet	0.05000		104	70-130	4	25	
Tetrahydrofuran	0.0405	0.0050	mg/kg wet	0.05000		81	70-130	7	25	
Toluene	0.0509	0.0050	mg/kg wet	0.05000		102	70-130	8	25	
trans-1,2-Dichloroethene	0.0516	0.0050	mg/kg wet	0.05000		103	70-130	6	25	
trans-1,3-Dichloropropene	0.0507	0.0050	mg/kg wet	0.05000		101	70-130	6	25	
Trichloroethene	0.0520	0.0050	mg/kg wet	0.05000		104	70-130	8	25	
Trichlorofluoromethane	0.0536	0.0050	mg/kg wet	0.05000		107	70-130	9	25	
Vinyl Acetate	0.0419	0.0050	mg/kg wet	0.05000		84	70-130	4	25	
Vinyl Chloride	0.0605	0.0100	mg/kg wet	0.05000		121	70-130	8	25	
Xylene O	0.0551	0.0050	mg/kg wet	0.05000		110	70-130	5	25	
Xylene P,M	0.108	0.0100	mg/kg wet	0.1000		108	70-130	4	25	
Xylenes (Total)	0.163	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	0.0547		mg/kg wet	0.05000		109	70-130			
Surrogate: 4-Bromofluorobenzene	0.0524		mg/kg wet	0.05000		105	70-130			
Surrogate: Dibromofluoromethane	0.0536		mg/kg wet	0.05000		107	70-130			
Surrogate: Toluene-d8	0.0510		mg/kg wet	0.05000		102	70-130			

**Batch CJ72515 - 5035**

Blank										
1,1,1,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,1-Trichloroethane	ND	0.0050	mg/kg wet							
1,1,2,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,2-Trichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethene	ND	0.0050	mg/kg wet							
1,1-Dichloropropene	ND	0.0050	mg/kg wet							
1,2,3-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,3-Trichloropropane	ND	0.0050	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,4-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,2-Dibromo-3-Chloropropane	ND	0.0050	mg/kg wet							
1,2-Dibromoethane	ND	0.0050	mg/kg wet							
1,2-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,2-Dichloroethane	ND	0.0050	mg/kg wet							



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710571

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CJ72515 - 5035**

1,2-Dichloropropane	ND	0.0050	mg/kg wet							
1,3,5-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,3-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,3-Dichloropropane	ND	0.0050	mg/kg wet							
1,4-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,4-Dioxane	ND	0.100	mg/kg wet							
1-Chlorohexane	ND	0.0050	mg/kg wet							
2,2-Dichloropropane	ND	0.0050	mg/kg wet							
2-Butanone	ND	0.0500	mg/kg wet							
2-Chlorotoluene	ND	0.0050	mg/kg wet							
2-Hexanone	ND	0.0500	mg/kg wet							
4-Chlorotoluene	ND	0.0050	mg/kg wet							
4-Isopropyltoluene	ND	0.0050	mg/kg wet							
4-Methyl-2-Pentanone	ND	0.0500	mg/kg wet							
Acetone	ND	0.0500	mg/kg wet							
Benzene	ND	0.0050	mg/kg wet							
Bromobenzene	ND	0.0050	mg/kg wet							
Bromochloromethane	ND	0.0050	mg/kg wet							
Bromodichloromethane	ND	0.0050	mg/kg wet							
Bromoform	ND	0.0050	mg/kg wet							
Bromomethane	ND	0.0100	mg/kg wet							
Carbon Disulfide	ND	0.0050	mg/kg wet							
Carbon Tetrachloride	ND	0.0050	mg/kg wet							
Chlorobenzene	ND	0.0050	mg/kg wet							
Chloroethane	ND	0.0100	mg/kg wet							
Chloroform	ND	0.0050	mg/kg wet							
Chloromethane	ND	0.0100	mg/kg wet							
cis-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
cis-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Dibromochloromethane	ND	0.0050	mg/kg wet							
Dibromomethane	ND	0.0050	mg/kg wet							
Dichlorodifluoromethane	ND	0.0100	mg/kg wet							
Diethyl Ether	ND	0.0050	mg/kg wet							
Di-isopropyl ether	ND	0.0050	mg/kg wet							
Ethyl tertiary-butyl ether	ND	0.0050	mg/kg wet							
Ethylbenzene	ND	0.0050	mg/kg wet							
Hexachlorobutadiene	ND	0.0050	mg/kg wet							
Isopropylbenzene	ND	0.0050	mg/kg wet							
Methyl tert-Butyl Ether	ND	0.0050	mg/kg wet							
Methylene Chloride	ND	0.0250	mg/kg wet							
Naphthalene	ND	0.0050	mg/kg wet							
n-Butylbenzene	ND	0.0050	mg/kg wet							
n-Propylbenzene	ND	0.0050	mg/kg wet							
sec-Butylbenzene	ND	0.0050	mg/kg wet							
Styrene	ND	0.0050	mg/kg wet							



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710571

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
<b>5035/8260B Volatile Organic Compounds / Low Level</b>										
<b>Batch CJ72515 - 5035</b>										
tert-Butylbenzene	ND	0.0050	mg/kg wet							
Tertiary-amyl methyl ether	ND	0.0050	mg/kg wet							
Tetrachloroethene	ND	0.0050	mg/kg wet							
Tetrahydrofuran	ND	0.0050	mg/kg wet							
Toluene	ND	0.0050	mg/kg wet							
trans-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
trans-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Trichloroethene	ND	0.0050	mg/kg wet							
Trichlorofluoromethane	ND	0.0050	mg/kg wet							
Vinyl Acetate	ND	0.0050	mg/kg wet							
Vinyl Chloride	ND	0.0100	mg/kg wet							
Xylene O	ND	0.0050	mg/kg wet							
Xylene P,M	ND	0.0100	mg/kg wet							
Xylenes (Total)	ND	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	0.0389		mg/kg wet	0.05000		78	70-130			
Surrogate: 4-Bromofluorobenzene	0.0449		mg/kg wet	0.05000		90	70-130			
Surrogate: Dibromofluoromethane	0.0391		mg/kg wet	0.05000		78	70-130			
Surrogate: Toluene-d8	0.0507		mg/kg wet	0.05000		101	70-130			
<b>LCS</b>										
1,1,1,2-Tetrachloroethane	0.0412	0.0050	mg/kg wet	0.05000		82	70-130			
1,1,1-Trichloroethane	0.0383	0.0050	mg/kg wet	0.05000		77	70-130			
1,1,2,2-Tetrachloroethane	0.0465	0.0050	mg/kg wet	0.05000		93	70-130			
1,1,2-Trichloroethane	0.0426	0.0050	mg/kg wet	0.05000		85	70-130			
1,1-Dichloroethane	0.0401	0.0050	mg/kg wet	0.05000		80	70-130			
1,1-Dichloroethene	0.0438	0.0050	mg/kg wet	0.05000		88	70-130			
1,1-Dichloropropene	0.0424	0.0050	mg/kg wet	0.05000		85	70-130			
1,2,3-Trichlorobenzene	0.0468	0.0050	mg/kg wet	0.05000		94	70-130			
1,2,3-Trichloropropane	0.0453	0.0050	mg/kg wet	0.05000		91	70-130			
1,2,4-Trichlorobenzene	0.0474	0.0050	mg/kg wet	0.05000		95	70-130			
1,2,4-Trimethylbenzene	0.0496	0.0050	mg/kg wet	0.05000		99	70-130			
1,2-Dibromo-3-Chloropropane	0.0377	0.0050	mg/kg wet	0.05000		75	70-130			
1,2-Dibromoethane	0.0477	0.0050	mg/kg wet	0.05000		95	70-130			
1,2-Dichlorobenzene	0.0479	0.0050	mg/kg wet	0.05000		96	70-130			
1,2-Dichloroethane	0.0395	0.0050	mg/kg wet	0.05000		79	70-130			
1,2-Dichloropropane	0.0431	0.0050	mg/kg wet	0.05000		86	70-130			
1,3,5-Trimethylbenzene	0.0483	0.0050	mg/kg wet	0.05000		97	70-130			
1,3-Dichlorobenzene	0.0470	0.0050	mg/kg wet	0.05000		94	70-130			
1,3-Dichloropropane	0.0480	0.0050	mg/kg wet	0.05000		96	70-130			
1,4-Dichlorobenzene	0.0479	0.0050	mg/kg wet	0.05000		96	70-130			
1,4-Dioxane	0.909	0.100	mg/kg wet	1.000		91	70-130			
1-Chlorohexane	0.0482	0.0050	mg/kg wet	0.05000		96	70-130			
2,2-Dichloropropane	0.0359	0.0050	mg/kg wet	0.05000		72	70-130			
2-Butanone	0.218	0.0500	mg/kg wet	0.2500		87	70-130			
2-Chlorotoluene	0.0466	0.0050	mg/kg wet	0.05000		93	70-130			
2-Hexanone	0.224	0.0500	mg/kg wet	0.2500		89	70-130			





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710571

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
<b>5035/8260B Volatile Organic Compounds / Low Level</b>										
<b>Batch CJ72515 - 5035</b>										
4-Chlorotoluene	0.0470	0.0050	mg/kg wet	0.05000		94	70-130			
4-Isopropyltoluene	0.0480	0.0050	mg/kg wet	0.05000		96	70-130			
4-Methyl-2-Pentanone	0.209	0.0500	mg/kg wet	0.2500		84	70-130			
Acetone	0.217	0.0500	mg/kg wet	0.2500		87	70-130			
Benzene	0.0420	0.0050	mg/kg wet	0.05000		84	70-130			
Bromobenzene	0.0488	0.0050	mg/kg wet	0.05000		98	70-130			
Bromochloromethane	0.0414	0.0050	mg/kg wet	0.05000		83	70-130			
Bromodichloromethane	0.0399	0.0050	mg/kg wet	0.05000		80	70-130			
Bromoform	0.0358	0.0050	mg/kg wet	0.05000		72	70-130			
Bromomethane	0.0372	0.0100	mg/kg wet	0.05000		74	70-130			
Carbon Disulfide	0.0430	0.0050	mg/kg wet	0.05000		86	70-130			
Carbon Tetrachloride	0.0355	0.0050	mg/kg wet	0.05000		71	70-130			
Chlorobenzene	0.0451	0.0050	mg/kg wet	0.05000		90	70-130			
Chloroethane	0.0405	0.0100	mg/kg wet	0.05000		81	70-130			
Chloroform	0.0394	0.0050	mg/kg wet	0.05000		79	70-130			
Chloromethane	0.0378	0.0100	mg/kg wet	0.05000		76	70-130			
cis-1,2-Dichloroethene	0.0422	0.0050	mg/kg wet	0.05000		84	70-130			
cis-1,3-Dichloropropene	0.0440	0.0050	mg/kg wet	0.05000		88	70-130			
Dibromochloromethane	0.0397	0.0050	mg/kg wet	0.05000		79	70-130			
Dibromomethane	0.0401	0.0050	mg/kg wet	0.05000		80	70-130			
Dichlorodifluoromethane	0.0273	0.0100	mg/kg wet	0.05000		55	70-130			B-
Diethyl Ether	0.0455	0.0050	mg/kg wet	0.05000		91	70-130			
Di-isopropyl ether	0.0430	0.0050	mg/kg wet	0.05000		86	70-130			
Ethyl tertiary-butyl ether	0.0441	0.0050	mg/kg wet	0.05000		88	70-130			
Ethylbenzene	0.0457	0.0050	mg/kg wet	0.05000		91	70-130			
Hexachlorobutadiene	0.0459	0.0050	mg/kg wet	0.05000		92	70-130			
Isopropylbenzene	0.0467	0.0050	mg/kg wet	0.05000		93	70-130			
Methyl tert-Butyl Ether	0.0445	0.0050	mg/kg wet	0.05000		89	70-130			
Methylene Chloride	0.0433	0.0250	mg/kg wet	0.05000		87	70-130			
Naphthalene	0.0434	0.0050	mg/kg wet	0.05000		87	70-130			
n-Butylbenzene	0.0476	0.0050	mg/kg wet	0.05000		95	70-130			
n-Propylbenzene	0.0486	0.0050	mg/kg wet	0.05000		97	70-130			
sec-Butylbenzene	0.0475	0.0050	mg/kg wet	0.05000		95	70-130			
Styrene	0.0467	0.0050	mg/kg wet	0.05000		93	70-130			
tert-Butylbenzene	0.0483	0.0050	mg/kg wet	0.05000		97	70-130			
Tertiary-amyl methyl ether	0.0439	0.0050	mg/kg wet	0.05000		88	70-130			
Tetrachloroethene	0.0466	0.0050	mg/kg wet	0.05000		93	70-130			
Tetrahydrofuran	0.0426	0.0050	mg/kg wet	0.05000		85	70-130			
Toluene	0.0420	0.0050	mg/kg wet	0.05000		84	70-130			
trans-1,2-Dichloroethene	0.0438	0.0050	mg/kg wet	0.05000		88	70-130			
trans-1,3-Dichloropropene	0.0380	0.0050	mg/kg wet	0.05000		76	70-130			
Trichloroethene	0.0418	0.0050	mg/kg wet	0.05000		84	70-130			
Trichlorofluoromethane	0.0372	0.0050	mg/kg wet	0.05000		74	70-130			
Vinyl Acetate	0.0389	0.0050	mg/kg wet	0.05000		78	70-130			
Vinyl Chloride	0.0391	0.0100	mg/kg wet	0.05000		78	70-130			



CERTIFICATE OF ANALYSIS

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Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710571

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CJ72515 - 5035**

Xylene O	0.0475	0.0050	mg/kg wet	0.05000		95	70-130			
Xylene P,M	0.0951	0.0100	mg/kg wet	0.1000		95	70-130			
Xylenes (Total)	0.143	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	0.0436		mg/kg wet	0.05000		87	70-130			
Surrogate: 4-Bromofluorobenzene	0.0501		mg/kg wet	0.05000		100	70-130			
Surrogate: Dibromofluoromethane	0.0456		mg/kg wet	0.05000		91	70-130			
Surrogate: Toluene-d8	0.0530		mg/kg wet	0.05000		106	70-130			

**LCS Dup**

1,1,1,2-Tetrachloroethane	0.0459	0.0050	mg/kg wet	0.05000		92	70-130	11	25	
1,1,1-Trichloroethane	0.0422	0.0050	mg/kg wet	0.05000		84	70-130	10	25	
1,1,2,2-Tetrachloroethane	0.0515	0.0050	mg/kg wet	0.05000		103	70-130	10	25	
1,1,2-Trichloroethane	0.0460	0.0050	mg/kg wet	0.05000		92	70-130	8	25	
1,1-Dichloroethane	0.0439	0.0050	mg/kg wet	0.05000		88	70-130	9	25	
1,1-Dichloroethene	0.0485	0.0050	mg/kg wet	0.05000		97	70-130	10	25	
1,1-Dichloropropene	0.0466	0.0050	mg/kg wet	0.05000		93	70-130	10	25	
1,2,3-Trichlorobenzene	0.0505	0.0050	mg/kg wet	0.05000		101	70-130	8	25	
1,2,3-Trichloropropane	0.0504	0.0050	mg/kg wet	0.05000		101	70-130	11	25	
1,2,4-Trichlorobenzene	0.0510	0.0050	mg/kg wet	0.05000		102	70-130	7	25	
1,2,4-Trimethylbenzene	0.0537	0.0050	mg/kg wet	0.05000		107	70-130	8	25	
1,2-Dibromo-3-Chloropropane	0.0422	0.0050	mg/kg wet	0.05000		84	70-130	11	25	
1,2-Dibromoethane	0.0540	0.0050	mg/kg wet	0.05000		108	70-130	12	25	
1,2-Dichlorobenzene	0.0520	0.0050	mg/kg wet	0.05000		104	70-130	8	25	
1,2-Dichloroethane	0.0429	0.0050	mg/kg wet	0.05000		86	70-130	8	25	
1,2-Dichloropropane	0.0465	0.0050	mg/kg wet	0.05000		93	70-130	8	25	
1,3,5-Trimethylbenzene	0.0528	0.0050	mg/kg wet	0.05000		106	70-130	9	25	
1,3-Dichlorobenzene	0.0507	0.0050	mg/kg wet	0.05000		101	70-130	7	25	
1,3-Dichloropropane	0.0537	0.0050	mg/kg wet	0.05000		107	70-130	11	25	
1,4-Dichlorobenzene	0.0515	0.0050	mg/kg wet	0.05000		103	70-130	7	25	
1,4-Dioxane	1.02	0.100	mg/kg wet	1.000		102	70-130	12	20	
1-Chlorohexane	0.0549	0.0050	mg/kg wet	0.05000		110	70-130	13	25	
2,2-Dichloropropane	0.0390	0.0050	mg/kg wet	0.05000		78	70-130	8	25	
2-Butanone	0.242	0.0500	mg/kg wet	0.2500		97	70-130	10	25	
2-Chlorotoluene	0.0510	0.0050	mg/kg wet	0.05000		102	70-130	9	25	
2-Hexanone	0.264	0.0500	mg/kg wet	0.2500		105	70-130	16	25	
4-Chlorotoluene	0.0513	0.0050	mg/kg wet	0.05000		103	70-130	9	25	
4-Isopropyltoluene	0.0520	0.0050	mg/kg wet	0.05000		104	70-130	8	25	
4-Methyl-2-Pentanone	0.237	0.0500	mg/kg wet	0.2500		95	70-130	13	25	
Acetone	0.241	0.0500	mg/kg wet	0.2500		96	70-130	10	25	
Benzene	0.0454	0.0050	mg/kg wet	0.05000		91	70-130	8	25	
Bromobenzene	0.0527	0.0050	mg/kg wet	0.05000		105	70-130	8	25	
Bromochloromethane	0.0447	0.0050	mg/kg wet	0.05000		89	70-130	8	25	
Bromodichloromethane	0.0435	0.0050	mg/kg wet	0.05000		87	70-130	9	25	
Bromoform	0.0408	0.0050	mg/kg wet	0.05000		82	70-130	13	25	
Bromomethane	0.0413	0.0100	mg/kg wet	0.05000		83	70-130	10	25	
Carbon Disulfide	0.0471	0.0050	mg/kg wet	0.05000		94	70-130	9	25	



CERTIFICATE OF ANALYSIS

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ESS Laboratory Work Order: 1710571

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CJ72515 - 5035**

Carbon Tetrachloride	0.0396	0.0050	mg/kg wet	0.05000		79	70-130	11	25	
Chlorobenzene	0.0506	0.0050	mg/kg wet	0.05000		101	70-130	11	25	
Chloroethane	0.0442	0.0100	mg/kg wet	0.05000		88	70-130	9	25	
Chloroform	0.0428	0.0050	mg/kg wet	0.05000		86	70-130	8	25	
Chloromethane	0.0417	0.0100	mg/kg wet	0.05000		83	70-130	10	25	
cis-1,2-Dichloroethene	0.0461	0.0050	mg/kg wet	0.05000		92	70-130	9	25	
cis-1,3-Dichloropropene	0.0478	0.0050	mg/kg wet	0.05000		96	70-130	8	25	
Dibromochloromethane	0.0447	0.0050	mg/kg wet	0.05000		89	70-130	12	25	
Dibromomethane	0.0435	0.0050	mg/kg wet	0.05000		87	70-130	8	25	
Dichlorodifluoromethane	0.0303	0.0100	mg/kg wet	0.05000		61	70-130	10	25	B-
Diethyl Ether	0.0497	0.0050	mg/kg wet	0.05000		99	70-130	9	25	
Di-isopropyl ether	0.0465	0.0050	mg/kg wet	0.05000		93	70-130	8	25	
Ethyl tertiary-butyl ether	0.0476	0.0050	mg/kg wet	0.05000		95	70-130	8	25	
Ethylbenzene	0.0516	0.0050	mg/kg wet	0.05000		103	70-130	12	25	
Hexachlorobutadiene	0.0505	0.0050	mg/kg wet	0.05000		101	70-130	10	25	
Isopropylbenzene	0.0510	0.0050	mg/kg wet	0.05000		102	70-130	9	25	
Methyl tert-Butyl Ether	0.0487	0.0050	mg/kg wet	0.05000		97	70-130	9	25	
Methylene Chloride	0.0469	0.0250	mg/kg wet	0.05000		94	70-130	8	25	
Naphthalene	0.0479	0.0050	mg/kg wet	0.05000		96	70-130	10	25	
n-Butylbenzene	0.0519	0.0050	mg/kg wet	0.05000		104	70-130	9	25	
n-Propylbenzene	0.0532	0.0050	mg/kg wet	0.05000		106	70-130	9	25	
sec-Butylbenzene	0.0520	0.0050	mg/kg wet	0.05000		104	70-130	9	25	
Styrene	0.0525	0.0050	mg/kg wet	0.05000		105	70-130	12	25	
tert-Butylbenzene	0.0533	0.0050	mg/kg wet	0.05000		107	70-130	10	25	
Tertiary-amyl methyl ether	0.0476	0.0050	mg/kg wet	0.05000		95	70-130	8	25	
Tetrachloroethene	0.0522	0.0050	mg/kg wet	0.05000		104	70-130	11	25	
Tetrahydrofuran	0.0499	0.0050	mg/kg wet	0.05000		100	70-130	16	25	
Toluene	0.0455	0.0050	mg/kg wet	0.05000		91	70-130	8	25	
trans-1,2-Dichloroethene	0.0475	0.0050	mg/kg wet	0.05000		95	70-130	8	25	
trans-1,3-Dichloropropene	0.0412	0.0050	mg/kg wet	0.05000		82	70-130	8	25	
Trichloroethene	0.0452	0.0050	mg/kg wet	0.05000		90	70-130	8	25	
Trichlorofluoromethane	0.0404	0.0050	mg/kg wet	0.05000		81	70-130	8	25	
Vinyl Acetate	0.0427	0.0050	mg/kg wet	0.05000		85	70-130	9	25	
Vinyl Chloride	0.0438	0.0100	mg/kg wet	0.05000		88	70-130	11	25	
Xylene O	0.0531	0.0050	mg/kg wet	0.05000		106	70-130	11	25	
Xylene P,M	0.107	0.0100	mg/kg wet	0.1000		107	70-130	12	25	
Xylenes (Total)	0.160	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	0.0437		mg/kg wet	0.05000		87	70-130			
Surrogate: 4-Bromofluorobenzene	0.0515		mg/kg wet	0.05000		103	70-130			
Surrogate: Dibromofluoromethane	0.0453		mg/kg wet	0.05000		91	70-130			
Surrogate: Toluene-d8	0.0547		mg/kg wet	0.05000		109	70-130			

8100M Total Petroleum Hydrocarbons

**Batch CJ72426 - 3546**

Blank



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710571

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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8100M Total Petroleum Hydrocarbons

**Batch CJ72426 - 3546**

Decane (C10)	ND	0.2	mg/kg wet							
Docosane (C22)	ND	0.2	mg/kg wet							
Dodecane (C12)	ND	0.2	mg/kg wet							
Eicosane (C20)	ND	0.2	mg/kg wet							
Hexacosane (C26)	ND	0.2	mg/kg wet							
Hexadecane (C16)	ND	0.2	mg/kg wet							
Nonadecane (C19)	ND	0.2	mg/kg wet							
Nonane (C9)	ND	0.2	mg/kg wet							
Octacosane (C28)	ND	0.2	mg/kg wet							
Octadecane (C18)	ND	0.2	mg/kg wet							
Tetracosane (C24)	ND	0.2	mg/kg wet							
Tetradecane (C14)	ND	0.2	mg/kg wet							
Total Petroleum Hydrocarbons	ND	37.5	mg/kg wet							
Triacontane (C30)	ND	0.2	mg/kg wet							

<i>Surrogate: O-Terphenyl</i>	4.22		mg/kg wet	5.000		84	40-140			
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**LCS**

Decane (C10)	1.7	0.2	mg/kg wet	2.500		70	40-140			
Docosane (C22)	2.0	0.2	mg/kg wet	2.500		79	40-140			
Dodecane (C12)	1.9	0.2	mg/kg wet	2.500		74	40-140			
Eicosane (C20)	2.0	0.2	mg/kg wet	2.500		79	40-140			
Hexacosane (C26)	2.0	0.2	mg/kg wet	2.500		80	40-140			
Hexadecane (C16)	1.9	0.2	mg/kg wet	2.500		77	40-140			
Nonadecane (C19)	2.1	0.2	mg/kg wet	2.500		84	40-140			
Nonane (C9)	1.5	0.2	mg/kg wet	2.500		59	30-140			
Octacosane (C28)	2.0	0.2	mg/kg wet	2.500		80	40-140			
Octadecane (C18)	1.9	0.2	mg/kg wet	2.500		76	40-140			
Tetracosane (C24)	2.0	0.2	mg/kg wet	2.500		80	40-140			
Tetradecane (C14)	1.9	0.2	mg/kg wet	2.500		75	40-140			
Total Petroleum Hydrocarbons	26.1	37.5	mg/kg wet	35.00		75	40-140			
Triacontane (C30)	2.0	0.2	mg/kg wet	2.500		80	40-140			

<i>Surrogate: O-Terphenyl</i>	4.18		mg/kg wet	5.000		84	40-140			
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**LCS Dup**

Decane (C10)	1.8	0.2	mg/kg wet	2.500		73	40-140	4	25	
Docosane (C22)	2.1	0.2	mg/kg wet	2.500		83	40-140	5	25	
Dodecane (C12)	1.9	0.2	mg/kg wet	2.500		78	40-140	4	25	
Eicosane (C20)	2.1	0.2	mg/kg wet	2.500		83	40-140	5	25	
Hexacosane (C26)	2.1	0.2	mg/kg wet	2.500		84	40-140	5	25	
Hexadecane (C16)	2.0	0.2	mg/kg wet	2.500		81	40-140	5	25	
Nonadecane (C19)	2.2	0.2	mg/kg wet	2.500		88	40-140	5	25	
Nonane (C9)	1.5	0.2	mg/kg wet	2.500		61	30-140	3	25	
Octacosane (C28)	2.1	0.2	mg/kg wet	2.500		84	40-140	5	25	
Octadecane (C18)	2.0	0.2	mg/kg wet	2.500		79	40-140	5	25	
Tetracosane (C24)	2.1	0.2	mg/kg wet	2.500		84	40-140	5	25	

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710571

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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8100M Total Petroleum Hydrocarbons

**Batch CJ72426 - 3546**

Tetradecane (C14)	1.9	0.2	mg/kg wet	2.500		78	40-140	4	25	
Total Petroleum Hydrocarbons	27.1	37.5	mg/kg wet	35.00		77	40-140	4	25	
Triacotane (C30)	2.1	0.2	mg/kg wet	2.500		84	40-140	5	25	
<i>Surrogate: O-Terphenyl</i>	<i>4.28</i>		mg/kg wet	<i>5.000</i>		<i>86</i>	<i>40-140</i>			

8270D Polynuclear Aromatic Hydrocarbons

**Batch CJ72309 - 3546**

<b>Blank</b>										
2-Methylnaphthalene	ND	0.333	mg/kg wet							
Acenaphthene	ND	0.333	mg/kg wet							
Acenaphthylene	ND	0.333	mg/kg wet							
Anthracene	ND	0.333	mg/kg wet							
Benzo(a)anthracene	ND	0.333	mg/kg wet							
Benzo(a)pyrene	ND	0.167	mg/kg wet							
Benzo(b)fluoranthene	ND	0.333	mg/kg wet							
Benzo(g,h,i)perylene	ND	0.333	mg/kg wet							
Benzo(k)fluoranthene	ND	0.333	mg/kg wet							
Chrysene	ND	0.167	mg/kg wet							
Dibenzo(a,h)Anthracene	ND	0.167	mg/kg wet							
Fluoranthene	ND	0.333	mg/kg wet							
Fluorene	ND	0.333	mg/kg wet							
Indeno(1,2,3-cd)Pyrene	ND	0.333	mg/kg wet							
Naphthalene	ND	0.333	mg/kg wet							
Phenanthrene	ND	0.333	mg/kg wet							
Pyrene	ND	0.333	mg/kg wet							
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	<i>2.30</i>		mg/kg wet	<i>3.333</i>		<i>69</i>	<i>30-130</i>			
<i>Surrogate: 2-Fluorobiphenyl</i>	<i>2.52</i>		mg/kg wet	<i>3.333</i>		<i>76</i>	<i>30-130</i>			
<i>Surrogate: Nitrobenzene-d5</i>	<i>2.51</i>		mg/kg wet	<i>3.333</i>		<i>75</i>	<i>30-130</i>			
<i>Surrogate: p-Terphenyl-d14</i>	<i>3.30</i>		mg/kg wet	<i>3.333</i>		<i>99</i>	<i>30-130</i>			

<b>LCS</b>										
2-Methylnaphthalene	2.57	0.333	mg/kg wet	3.333		77	40-140			
Acenaphthene	2.57	0.333	mg/kg wet	3.333		77	40-140			
Acenaphthylene	2.67	0.333	mg/kg wet	3.333		80	40-140			
Anthracene	2.91	0.333	mg/kg wet	3.333		87	40-140			
Benzo(a)anthracene	3.01	0.333	mg/kg wet	3.333		90	40-140			
Benzo(a)pyrene	3.13	0.167	mg/kg wet	3.333		94	40-140			
Benzo(b)fluoranthene	3.16	0.333	mg/kg wet	3.333		95	40-140			
Benzo(g,h,i)perylene	3.09	0.333	mg/kg wet	3.333		93	40-140			
Benzo(k)fluoranthene	3.15	0.333	mg/kg wet	3.333		95	40-140			
Chrysene	3.03	0.167	mg/kg wet	3.333		91	40-140			
Dibenzo(a,h)Anthracene	3.13	0.167	mg/kg wet	3.333		94	40-140			
Fluoranthene	3.27	0.333	mg/kg wet	3.333		98	40-140			
Fluorene	2.79	0.333	mg/kg wet	3.333		84	40-140			
Indeno(1,2,3-cd)Pyrene	3.16	0.333	mg/kg wet	3.333		95	40-140			

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710571

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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8270D Polynuclear Aromatic Hydrocarbons

**Batch CJ72309 - 3546**

Naphthalene	2.61	0.333	mg/kg wet	3.333		78	40-140			
Phenanthrene	2.82	0.333	mg/kg wet	3.333		84	40-140			
Pyrene	2.98	0.333	mg/kg wet	3.333		89	40-140			
Surrogate: 1,2-Dichlorobenzene-d4	2.64		mg/kg wet	3.333		79	30-130			
Surrogate: 2-Fluorobiphenyl	2.82		mg/kg wet	3.333		85	30-130			
Surrogate: Nitrobenzene-d5	2.82		mg/kg wet	3.333		85	30-130			
Surrogate: p-Terphenyl-d14	3.46		mg/kg wet	3.333		104	30-130			

**LCS Dup**

2-Methylnaphthalene	2.55	0.333	mg/kg wet	3.333		77	40-140	0.7	30	
Acenaphthene	2.53	0.333	mg/kg wet	3.333		76	40-140	2	30	
Acenaphthylene	2.63	0.333	mg/kg wet	3.333		79	40-140	1	30	
Anthracene	2.91	0.333	mg/kg wet	3.333		87	40-140	0.07	30	
Benzo(a)anthracene	3.05	0.333	mg/kg wet	3.333		92	40-140	1	30	
Benzo(a)pyrene	3.15	0.167	mg/kg wet	3.333		95	40-140	0.8	30	
Benzo(b)fluoranthene	3.35	0.333	mg/kg wet	3.333		100	40-140	6	30	
Benzo(g,h,i)perylene	3.13	0.333	mg/kg wet	3.333		94	40-140	1	30	
Benzo(k)fluoranthene	2.94	0.333	mg/kg wet	3.333		88	40-140	7	30	
Chrysene	3.02	0.167	mg/kg wet	3.333		90	40-140	0.4	30	
Dibenzo(a,h)Anthracene	3.16	0.167	mg/kg wet	3.333		95	40-140	1	30	
Fluoranthene	3.05	0.333	mg/kg wet	3.333		92	40-140	7	30	
Fluorene	2.80	0.333	mg/kg wet	3.333		84	40-140	0.3	30	
Indeno(1,2,3-cd)Pyrene	3.19	0.333	mg/kg wet	3.333		96	40-140	1	30	
Naphthalene	2.56	0.333	mg/kg wet	3.333		77	40-140	2	30	
Phenanthrene	2.82	0.333	mg/kg wet	3.333		85	40-140	0.2	30	
Pyrene	3.16	0.333	mg/kg wet	3.333		95	40-140	6	30	
Surrogate: 1,2-Dichlorobenzene-d4	2.46		mg/kg wet	3.333		74	30-130			
Surrogate: 2-Fluorobiphenyl	2.64		mg/kg wet	3.333		79	30-130			
Surrogate: Nitrobenzene-d5	2.74		mg/kg wet	3.333		82	30-130			
Surrogate: p-Terphenyl-d14	3.52		mg/kg wet	3.333		106	30-130			

Classical Chemistry

**Batch CJ72414 - TCN Prep**

**Blank**

Total Cyanide	ND	1.00	mg/kg wet							
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**LCS**

Total Cyanide	5.07	1.00	mg/kg wet	5.015		101	90-110			
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**Reference**

Total Cyanide	49.8	4.92	mg/kg wet	48.40		103	36.1577-206.6 12			
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**Reference**

Total Cyanide	49.9	4.96	mg/kg wet	48.40		103	36.1577-206.6 12			
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## CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710571

### Notes and Definitions

- U Analyte included in the analysis, but not detected
- R- Standard Reference Material is biased low (R-).
- D Diluted.
- B+ Blank Spike recovery is above upper control limit (B+).
- B- Blank Spike recovery is below lower control limit (B-).
- ND Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference
- MDL Method Detection Limit
- MRL Method Reporting Limit
- LOD Limit of Detection
- LOQ Limit of Quantitation
- DL Detection Limit
- I/V Initial Volume
- F/V Final Volume
- § Subcontracted analysis; see attached report
- 1 Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
- 2 Range result excludes concentrations of target analytes eluting in that range.
- 3 Range result excludes the concentration of the C9-C10 aromatic range.
- Avg Results reported as a mathematical average.
- NR No Recovery
- [CALC] Calculated Analyte
- SUB Subcontracted analysis; see attached report
- RL Reporting Limit
- EDL Estimated Detection Limit



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710571

**ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS**

**ENVIRONMENTAL**

Rhode Island Potable and Non Potable Water: LAI00179

<http://www.health.ri.gov/find/labs/analytical/ESS.pdf>

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750

[http://www.ct.gov/dph/lib/dph/environmental\\_health/environmental\\_laboratories/pdf/OutofStateCommercialLaboratories.pdf](http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf)

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002

<http://www.maine.gov/dhhs/meecd/environmental-health/dwp/partners/labCert.shtml>

Massachusetts Potable and Non Potable Water: M-RI002

<http://public.dep.state.ma.us/Labcert/Labcert.aspx>

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424

<http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm>

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313

<http://www.wadsworth.org/labcert/elap/comm.html>

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006

[http://datamine2.state.nj.us/DEP\\_OPRA/OpraMain/pi\\_main?mode=pi\\_by\\_site&sort\\_order=PI\\_NAMEA&Select+a+Site:=58715](http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715)

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752

<http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx>

## ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Providence, RI - GZA/HDM

ESS Project ID: 1710571

Date Received: 10/23/2017

Project Due Date: 10/30/2017

Days for Project: 5 Day

Shipped/Delivered Via: Client

- 1. Air bill manifest present?  No  
Air No.: NA
- 2. Were custody seals present?  No
- 3. Is radiation count <100 CPM?  Yes
- 4. Is a Cooler Present?  Yes  
Temp: 4.1 Iced with: Ice
- 5. Was COC signed and dated by client?  Yes

- 6. Does COC match bottles?  Yes
- 7. Is COC complete and correct?  Yes
- 8. Were samples received intact?  Yes
- 9. Were labs informed about **short holds & rushes**? Yes / No / NA
- 10. Were any analyses received outside of hold time? Yes  No

11. Any Subcontracting needed? Yes  No  
 ESS Sample IDs: \_\_\_\_\_  
 Analysis: \_\_\_\_\_  
 TAT: \_\_\_\_\_

12. Were VOAs received?  Yes / No  
 a. Air bubbles in aqueous VOAs?  Yes / No  
 b. Does methanol cover soil completely?  Yes / No / NA

13. Are the samples properly preserved?  Yes / No  
 a. If metals preserved upon receipt: Date: \_\_\_\_\_  
 b. Low Level VOA vials frozen: Date: 10/20/17

Time: \_\_\_\_\_  
 By: \_\_\_\_\_  
 By: Client  
wr 10/23/17

Sample Receiving Notes:

14. Was there a need to contact Project Manager?  Yes /  No  
 a. Was there a need to contact the client?  Yes /  No  
 Who was contacted? \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_ By: \_\_\_\_\_

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
01	175155	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
<del>01</del>	<del>175156</del>	<del>Yes</del>	<del>NA</del>	<del>Yes</del>	<del>8 oz. Jar - Unpres</del>	<del>NP</del>	<u>wr 10/23/17</u>
01	175158	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
01	175160	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
01	175163	Yes	NA	Yes	VOA Vial - Other	Other	
01	175164	Yes	NA	Yes	VOA Vial - Other	Other	
02	175153	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
<del>02</del>	<del>175154</del>	<del>Yes</del>	<del>NA</del>	<del>Yes</del>	<del>8 oz. Jar - Unpres</del>	<del>NP</del>	<u>wr 10/23/17</u>
02	175157	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
02	175159	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
02	175161	Yes	NA	Yes	VOA Vial - Other	Other	
02	175162	Yes	NA	Yes	VOA Vial - Other	Other	

2nd Review  
 Are barcode labels on correct containers?  Yes /  No

Completed By: [Signature] Date & Time: 10/23/17 1457  
 Reviewed By: [Signature] Date & Time: 10/23/17 1527  
 Delivered By: [Signature] Date & Time: 10/23/17 1527

ESS Laboratory

Division of Thielsch Engineering, Inc.  
 185 Frances Avenue, Cranston RI 02910  
 Tel. (401) 461-7181 Fax (401) 461-4486  
 www.esslaboratory.com

CHAIN OF CUSTODY

ESS Lab # 1710571

Turn Time 5-Day Rush  
 Regulatory State Rhode Island  
 Is this project for any of the following?:  
 OCT RCP  MA MCP  ORGP

Reporting Limits RIDEM R-DEC and GB Leachability  
 Electronic  Limit Checker  Standard Excel  
 Deliverables  Other (Please Specify →)

Company Name GZA Project # 05.0043654.00 Project Name Former Tidewater Facility  
 Contact Person Sean Connelly Address 530 Broadway  
 City Providence State RI Zip Code 02909 PO # 43654  
 Telephone Number 401-421-4140 FAX Number - Email Address sean.connelly@gza.com

Analysis  
VOCs (82606)  
TPH (8100M)  
PAHs (8270D)  
PP-13 Metals  
Total cyanide

ESS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID																
					SB																
<u>1</u>	<u>10-20-17</u>	<u>1420</u>	<u>Grab</u>	<u>Soil</u>	<u>G2-8B-514 (10-11')</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>											
<u>2</u>	<u>10-20-17</u>	<u>1445</u>	<u>Grab</u>	<u>Soil</u>	<u>G2-5B-515 (8-9')</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>											
					SB (hdm 10/25/17)																

Container Type: AC-Air Cassette AG-Amber Glass B-BOD Bottle C-Cubitainer G - Glass O-Other P-Poly S-Sterile V-Vial V AG  
 Container Volume: 1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other\* 7 10  
 Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAce, NaOH 9-NH4Cl 10-DI H2O 11-Other\* 10 1  
 Number of Containers per Sample: 3

Laboratory Use Only  
 Cooler Present: ✓  
 Seals Intact: ✓  
 Cooler Temperature: sent to temp 4°C 10/23/17

Sampled by: Sean Connelly, Sarah McLeod, Erik Beloff  
 Comments: Please specify "Other" preservative and containers types in this space  
 NGRID rates apply  
 Please email sarah.mcleod@gza.com also

Relinquished by: (Signature, Date & Time) <u>Lorah McLeod 10/20/17 1630</u>	Received By: (Signature, Date & Time) <u>Fridgel Freezer 10/20/17 1630</u>	Relinquished By: (Signature, Date & Time) <u>Fridgel Freezer 10/23/17 0830</u>	Received By: (Signature, Date & Time) <u>Lorah McLeod 10/23/17 0830</u>
Relinquished by: (Signature, Date & Time) <u>Sarah McLeod 10-23-17 0945</u>	Received By: (Signature, Date & Time) <u>[Signature] 10/23/17 8:45</u>	Relinquished By: (Signature, Date & Time) <u>[Signature] 10/23/17 1253</u>	Received By: (Signature, Date & Time) <u>[Signature] 10/23/17</u>





## CERTIFICATE OF ANALYSIS

Sarah McLeod  
GZA GeoEnvironmental, Inc.  
530 Broadway  
Providence, RI 02909

**RE: Former Tidewater Facility (05.0043654.00)**  
**ESS Laboratory Work Order Number: 1710573**

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.



Laurel Stoddard  
Laboratory Director

**REVIEWED**

By ESS Laboratory at 5:21 pm, Oct 30, 2017

**Analytical Summary**

The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710573

**SAMPLE RECEIPT**

The following samples were received on October 23, 2017 for the analyses specified on the enclosed Chain of Custody Record.

**Low Level VOA vials were frozen by Client on October 20, 2017 at 1630.**

<u>Lab Number</u>	<u>Sample Name</u>	<u>Matrix</u>	<u>Analysis</u>
1710573-01	GZ-BW-513 0-2ft	Soil	8260B Low, 8270D
1710573-02	GZ-BW-512 2-4ft	Soil	8260B Low, 8270D
1710573-03	TB-102017	Solid	8260B Low



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710573

**PROJECT NARRATIVE**

**5035/8260B Volatile Organic Compounds / Low Level**

CJ72430-BS1 [Blank Spike recovery is above upper control limit \(B+\).](#)

Vinyl Chloride (131% @ 70-130%)

CJ72515-BS1 [Blank Spike recovery is below lower control limit \(B-\).](#)

Dichlorodifluoromethane (55% @ 70-130%)

CJ72515-BSD1 [Blank Spike recovery is below lower control limit \(B-\).](#)

Dichlorodifluoromethane (61% @ 70-130%)

**No other observations noted.**

**End of Project Narrative.**

**DATA USABILITY LINKS**

*To ensure you are viewing the most current version of the documents below, please clear your internet cookies for [www.ESSLaboratory.com](http://www.ESSLaboratory.com). Consult your IT Support personnel for information on how to clear your internet cookies.*

[Definitions of Quality Control Parameters](#)

[Semivolatile Organics Internal Standard Information](#)

[Semivolatile Organics Surrogate Information](#)

[Volatile Organics Internal Standard Information](#)

[Volatile Organics Surrogate Information](#)

[EPH and VPH Alkane Lists](#)



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710573

**CURRENT SW-846 METHODOLOGY VERSIONS**

**Analytical Methods**

- 1010A - Flashpoint
- 6010C - ICP
- 6020A - ICP MS
- 7010 - Graphite Furnace
- 7196A - Hexavalent Chromium
- 7470A - Aqueous Mercury
- 7471B - Solid Mercury
- 8011 - EDB/DBCP/TCP
- 8015C - GRO/DRO
- 8081B - Pesticides
- 8082A - PCB
- 8100M - TPH
- 8151A - Herbicides
- 8260B - VOA
- 8270D - SVOA
- 8270D SIM - SVOA Low Level
- 9014 - Cyanide
- 9038 - Sulfate
- 9040C - Aqueous pH
- 9045D - Solid pH (Corrosivity)
- 9050A - Specific Conductance
- 9056A - Anions (IC)
- 9060A - TOC
- 9095B - Paint Filter
- MADEP 04-1.1 - EPH / VPH

**Prep Methods**

- 3005A - Aqueous ICP Digestion
- 3020A - Aqueous Graphite Furnace / ICP MS Digestion
- 3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
- 3060A - Solid Hexavalent Chromium Digestion
- 3510C - Separatory Funnel Extraction
- 3520C - Liquid / Liquid Extraction
- 3540C - Manual Soxhlet Extraction
- 3541 - Automated Soxhlet Extraction
- 3546 - Microwave Extraction
- 3580A - Waste Dilution
- 5030B - Aqueous Purge and Trap
- 5030C - Aqueous Purge and Trap
- 5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-BW-513 0-2ft  
 Date Sampled: 10/19/17 14:00  
 Percent Solids: 84  
 Initial Volume: 4  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1710573  
 ESS Laboratory Sample ID: 1710573-01  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0074)		8260B Low		1	10/25/17 16:15	C7J0389	CJ72515
1,1,1-Trichloroethane	ND (0.0074)		8260B Low		1	10/25/17 16:15	C7J0389	CJ72515
1,1,2,2-Tetrachloroethane	ND (0.0074)		8260B Low		1	10/25/17 16:15	C7J0389	CJ72515
1,1,2-Trichloroethane	ND (0.0074)		8260B Low		1	10/25/17 16:15	C7J0389	CJ72515
1,1-Dichloroethane	ND (0.0074)		8260B Low		1	10/25/17 16:15	C7J0389	CJ72515
1,1-Dichloroethene	ND (0.0074)		8260B Low		1	10/25/17 16:15	C7J0389	CJ72515
1,1-Dichloropropene	ND (0.0074)		8260B Low		1	10/25/17 16:15	C7J0389	CJ72515
1,2,3-Trichlorobenzene	ND (0.0074)		8260B Low		1	10/25/17 16:15	C7J0389	CJ72515
1,2,3-Trichloropropane	ND (0.0074)		8260B Low		1	10/25/17 16:15	C7J0389	CJ72515
1,2,4-Trichlorobenzene	ND (0.0074)		8260B Low		1	10/25/17 16:15	C7J0389	CJ72515
1,2,4-Trimethylbenzene	ND (0.0074)		8260B Low		1	10/25/17 16:15	C7J0389	CJ72515
1,2-Dibromo-3-Chloropropane	ND (0.0074)		8260B Low		1	10/25/17 16:15	C7J0389	CJ72515
1,2-Dibromoethane	ND (0.0074)		8260B Low		1	10/25/17 16:15	C7J0389	CJ72515
1,2-Dichlorobenzene	ND (0.0074)		8260B Low		1	10/25/17 16:15	C7J0389	CJ72515
1,2-Dichloroethane	ND (0.0074)		8260B Low		1	10/25/17 16:15	C7J0389	CJ72515
1,2-Dichloropropane	ND (0.0074)		8260B Low		1	10/25/17 16:15	C7J0389	CJ72515
1,3,5-Trimethylbenzene	ND (0.0074)		8260B Low		1	10/25/17 16:15	C7J0389	CJ72515
1,3-Dichlorobenzene	ND (0.0074)		8260B Low		1	10/25/17 16:15	C7J0389	CJ72515
1,3-Dichloropropane	ND (0.0074)		8260B Low		1	10/25/17 16:15	C7J0389	CJ72515
1,4-Dichlorobenzene	ND (0.0074)		8260B Low		1	10/25/17 16:15	C7J0389	CJ72515
1,4-Dioxane	ND (0.148)		8260B Low		1	10/25/17 16:15	C7J0389	CJ72515
1-Chlorohexane	ND (0.0074)		8260B Low		1	10/25/17 16:15	C7J0389	CJ72515
2,2-Dichloropropane	ND (0.0074)		8260B Low		1	10/25/17 16:15	C7J0389	CJ72515
2-Butanone	ND (0.0742)		8260B Low		1	10/25/17 16:15	C7J0389	CJ72515
2-Chlorotoluene	ND (0.0074)		8260B Low		1	10/25/17 16:15	C7J0389	CJ72515
2-Hexanone	ND (0.0742)		8260B Low		1	10/25/17 16:15	C7J0389	CJ72515
4-Chlorotoluene	ND (0.0074)		8260B Low		1	10/25/17 16:15	C7J0389	CJ72515
4-Isopropyltoluene	ND (0.0074)		8260B Low		1	10/25/17 16:15	C7J0389	CJ72515
4-Methyl-2-Pentanone	ND (0.0742)		8260B Low		1	10/25/17 16:15	C7J0389	CJ72515
Acetone	ND (0.0742)		8260B Low		1	10/25/17 16:15	C7J0389	CJ72515
<b>Benzene</b>	<b>0.0532</b> (0.0074)		8260B Low		1	10/25/17 16:15	C7J0389	CJ72515
Bromobenzene	ND (0.0074)		8260B Low		1	10/25/17 16:15	C7J0389	CJ72515

*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-BW-513 0-2ft  
 Date Sampled: 10/19/17 14:00  
 Percent Solids: 84  
 Initial Volume: 4  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1710573  
 ESS Laboratory Sample ID: 1710573-01  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0074)		8260B Low		1	10/25/17 16:15	C7J0389	CJ72515
Bromodichloromethane	ND (0.0074)		8260B Low		1	10/25/17 16:15	C7J0389	CJ72515
Bromoform	ND (0.0074)		8260B Low		1	10/25/17 16:15	C7J0389	CJ72515
Bromomethane	ND (0.0148)		8260B Low		1	10/25/17 16:15	C7J0389	CJ72515
Carbon Disulfide	ND (0.0074)		8260B Low		1	10/25/17 16:15	C7J0389	CJ72515
Carbon Tetrachloride	ND (0.0074)		8260B Low		1	10/25/17 16:15	C7J0389	CJ72515
Chlorobenzene	ND (0.0074)		8260B Low		1	10/25/17 16:15	C7J0389	CJ72515
Chloroethane	ND (0.0148)		8260B Low		1	10/25/17 16:15	C7J0389	CJ72515
Chloroform	ND (0.0074)		8260B Low		1	10/25/17 16:15	C7J0389	CJ72515
Chloromethane	ND (0.0148)		8260B Low		1	10/25/17 16:15	C7J0389	CJ72515
cis-1,2-Dichloroethene	ND (0.0074)		8260B Low		1	10/25/17 16:15	C7J0389	CJ72515
cis-1,3-Dichloropropene	ND (0.0074)		8260B Low		1	10/25/17 16:15	C7J0389	CJ72515
Dibromochloromethane	ND (0.0074)		8260B Low		1	10/25/17 16:15	C7J0389	CJ72515
Dibromomethane	ND (0.0074)		8260B Low		1	10/25/17 16:15	C7J0389	CJ72515
Dichlorodifluoromethane	ND (0.0148)		8260B Low		1	10/25/17 16:15	C7J0389	CJ72515
Diethyl Ether	ND (0.0074)		8260B Low		1	10/25/17 16:15	C7J0389	CJ72515
Di-isopropyl ether	ND (0.0074)		8260B Low		1	10/25/17 16:15	C7J0389	CJ72515
Ethyl tertiary-butyl ether	ND (0.0074)		8260B Low		1	10/25/17 16:15	C7J0389	CJ72515
Ethylbenzene	ND (0.0074)		8260B Low		1	10/25/17 16:15	C7J0389	CJ72515
Hexachlorobutadiene	ND (0.0074)		8260B Low		1	10/25/17 16:15	C7J0389	CJ72515
Isopropylbenzene	ND (0.0074)		8260B Low		1	10/25/17 16:15	C7J0389	CJ72515
Methyl tert-Butyl Ether	ND (0.0074)		8260B Low		1	10/25/17 16:15	C7J0389	CJ72515
Methylene Chloride	ND (0.0371)		8260B Low		1	10/25/17 16:15	C7J0389	CJ72515
<b>Naphthalene</b>	<b>0.0793</b> (0.0074)		8260B Low		1	10/25/17 16:15	C7J0389	CJ72515
n-Butylbenzene	ND (0.0074)		8260B Low		1	10/25/17 16:15	C7J0389	CJ72515
n-Propylbenzene	ND (0.0074)		8260B Low		1	10/25/17 16:15	C7J0389	CJ72515
sec-Butylbenzene	ND (0.0074)		8260B Low		1	10/25/17 16:15	C7J0389	CJ72515
<b>Styrene</b>	<b>0.0351</b> (0.0074)		8260B Low		1	10/25/17 16:15	C7J0389	CJ72515
tert-Butylbenzene	ND (0.0074)		8260B Low		1	10/25/17 16:15	C7J0389	CJ72515
Tertiary-amyl methyl ether	ND (0.0074)		8260B Low		1	10/25/17 16:15	C7J0389	CJ72515
Tetrachloroethene	ND (0.0074)		8260B Low		1	10/25/17 16:15	C7J0389	CJ72515
Tetrahydrofuran	ND (0.0074)		8260B Low		1	10/25/17 16:15	C7J0389	CJ72515



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-BW-513 0-2ft  
 Date Sampled: 10/19/17 14:00  
 Percent Solids: 84  
 Initial Volume: 4  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1710573  
 ESS Laboratory Sample ID: 1710573-01  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	0.0215 (0.0074)		8260B Low		1	10/25/17 16:15	C7J0389	CJ72515
trans-1,2-Dichloroethene	ND (0.0074)		8260B Low		1	10/25/17 16:15	C7J0389	CJ72515
trans-1,3-Dichloropropene	ND (0.0074)		8260B Low		1	10/25/17 16:15	C7J0389	CJ72515
Trichloroethene	ND (0.0074)		8260B Low		1	10/25/17 16:15	C7J0389	CJ72515
Trichlorofluoromethane	ND (0.0074)		8260B Low		1	10/25/17 16:15	C7J0389	CJ72515
Vinyl Acetate	ND (0.0074)		8260B Low		1	10/25/17 16:15	C7J0389	CJ72515
Vinyl Chloride	ND (0.0148)		8260B Low		1	10/25/17 16:15	C7J0389	CJ72515
Xylene O	ND (0.0074)		8260B Low		1	10/25/17 16:15	C7J0389	CJ72515
Xylene P,M	ND (0.0148)		8260B Low		1	10/25/17 16:15	C7J0389	CJ72515
Xylenes (Total)	ND (0.0148)		8260B Low		1	10/25/17 16:15		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	91 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	90 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	87 %		70-130
<i>Surrogate: Toluene-d8</i>	102 %		70-130





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-BW-513 0-2ft  
 Date Sampled: 10/19/17 14:00  
 Percent Solids: 84  
 Initial Volume: 14.4  
 Final Volume: 2  
 Extraction Method: 3546

ESS Laboratory Work Order: 1710573  
 ESS Laboratory Sample ID: 1710573-01  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: TJ  
 Prepared: 10/23/17 16:53

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Naphthalene	516 (33.0)		8270D		20	10/25/17 18:50	C7J0336	CJ72309

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	74 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	81 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	86 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	116 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-BW-512 2-4ft  
Date Sampled: 10/20/17 09:15  
Percent Solids: 99  
Initial Volume: 6.5  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710573  
ESS Laboratory Sample ID: 1710573-02  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0039)		8260B Low		1	10/25/17 16:41	C7J0389	CJ72515
1,1,1-Trichloroethane	ND (0.0039)		8260B Low		1	10/25/17 16:41	C7J0389	CJ72515
1,1,2,2-Tetrachloroethane	ND (0.0039)		8260B Low		1	10/25/17 16:41	C7J0389	CJ72515
1,1,2-Trichloroethane	ND (0.0039)		8260B Low		1	10/25/17 16:41	C7J0389	CJ72515
1,1-Dichloroethane	ND (0.0039)		8260B Low		1	10/25/17 16:41	C7J0389	CJ72515
1,1-Dichloroethene	ND (0.0039)		8260B Low		1	10/25/17 16:41	C7J0389	CJ72515
1,1-Dichloropropene	ND (0.0039)		8260B Low		1	10/25/17 16:41	C7J0389	CJ72515
1,2,3-Trichlorobenzene	ND (0.0039)		8260B Low		1	10/25/17 16:41	C7J0389	CJ72515
1,2,3-Trichloropropane	ND (0.0039)		8260B Low		1	10/25/17 16:41	C7J0389	CJ72515
1,2,4-Trichlorobenzene	ND (0.0039)		8260B Low		1	10/25/17 16:41	C7J0389	CJ72515
1,2,4-Trimethylbenzene	ND (0.0039)		8260B Low		1	10/25/17 16:41	C7J0389	CJ72515
1,2-Dibromo-3-Chloropropane	ND (0.0039)		8260B Low		1	10/25/17 16:41	C7J0389	CJ72515
1,2-Dibromoethane	ND (0.0039)		8260B Low		1	10/25/17 16:41	C7J0389	CJ72515
1,2-Dichlorobenzene	ND (0.0039)		8260B Low		1	10/25/17 16:41	C7J0389	CJ72515
1,2-Dichloroethane	ND (0.0039)		8260B Low		1	10/25/17 16:41	C7J0389	CJ72515
1,2-Dichloropropane	ND (0.0039)		8260B Low		1	10/25/17 16:41	C7J0389	CJ72515
1,3,5-Trimethylbenzene	ND (0.0039)		8260B Low		1	10/25/17 16:41	C7J0389	CJ72515
1,3-Dichlorobenzene	ND (0.0039)		8260B Low		1	10/25/17 16:41	C7J0389	CJ72515
1,3-Dichloropropane	ND (0.0039)		8260B Low		1	10/25/17 16:41	C7J0389	CJ72515
1,4-Dichlorobenzene	ND (0.0039)		8260B Low		1	10/25/17 16:41	C7J0389	CJ72515
1,4-Dioxane	ND (0.0779)		8260B Low		1	10/25/17 16:41	C7J0389	CJ72515
1-Chlorohexane	ND (0.0039)		8260B Low		1	10/25/17 16:41	C7J0389	CJ72515
2,2-Dichloropropane	ND (0.0039)		8260B Low		1	10/25/17 16:41	C7J0389	CJ72515
2-Butanone	ND (0.0389)		8260B Low		1	10/25/17 16:41	C7J0389	CJ72515
2-Chlorotoluene	ND (0.0039)		8260B Low		1	10/25/17 16:41	C7J0389	CJ72515
2-Hexanone	ND (0.0389)		8260B Low		1	10/25/17 16:41	C7J0389	CJ72515
4-Chlorotoluene	ND (0.0039)		8260B Low		1	10/25/17 16:41	C7J0389	CJ72515
4-Isopropyltoluene	ND (0.0039)		8260B Low		1	10/25/17 16:41	C7J0389	CJ72515
4-Methyl-2-Pentanone	ND (0.0389)		8260B Low		1	10/25/17 16:41	C7J0389	CJ72515
Acetone	ND (0.0389)		8260B Low		1	10/25/17 16:41	C7J0389	CJ72515
Benzene	ND (0.0039)		8260B Low		1	10/25/17 16:41	C7J0389	CJ72515
Bromobenzene	ND (0.0039)		8260B Low		1	10/25/17 16:41	C7J0389	CJ72515



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-BW-512 2-4ft  
 Date Sampled: 10/20/17 09:15  
 Percent Solids: 99  
 Initial Volume: 6.5  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1710573  
 ESS Laboratory Sample ID: 1710573-02  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0039)		8260B Low		1	10/25/17 16:41	C7J0389	CJ72515
Bromodichloromethane	ND (0.0039)		8260B Low		1	10/25/17 16:41	C7J0389	CJ72515
Bromoform	ND (0.0039)		8260B Low		1	10/25/17 16:41	C7J0389	CJ72515
Bromomethane	ND (0.0078)		8260B Low		1	10/25/17 16:41	C7J0389	CJ72515
Carbon Disulfide	ND (0.0039)		8260B Low		1	10/25/17 16:41	C7J0389	CJ72515
Carbon Tetrachloride	ND (0.0039)		8260B Low		1	10/25/17 16:41	C7J0389	CJ72515
Chlorobenzene	ND (0.0039)		8260B Low		1	10/25/17 16:41	C7J0389	CJ72515
Chloroethane	ND (0.0078)		8260B Low		1	10/25/17 16:41	C7J0389	CJ72515
Chloroform	ND (0.0039)		8260B Low		1	10/25/17 16:41	C7J0389	CJ72515
Chloromethane	ND (0.0078)		8260B Low		1	10/25/17 16:41	C7J0389	CJ72515
cis-1,2-Dichloroethene	ND (0.0039)		8260B Low		1	10/25/17 16:41	C7J0389	CJ72515
cis-1,3-Dichloropropene	ND (0.0039)		8260B Low		1	10/25/17 16:41	C7J0389	CJ72515
Dibromochloromethane	ND (0.0039)		8260B Low		1	10/25/17 16:41	C7J0389	CJ72515
Dibromomethane	ND (0.0039)		8260B Low		1	10/25/17 16:41	C7J0389	CJ72515
Dichlorodifluoromethane	ND (0.0078)		8260B Low		1	10/25/17 16:41	C7J0389	CJ72515
Diethyl Ether	ND (0.0039)		8260B Low		1	10/25/17 16:41	C7J0389	CJ72515
Di-isopropyl ether	ND (0.0039)		8260B Low		1	10/25/17 16:41	C7J0389	CJ72515
Ethyl tertiary-butyl ether	ND (0.0039)		8260B Low		1	10/25/17 16:41	C7J0389	CJ72515
Ethylbenzene	ND (0.0039)		8260B Low		1	10/25/17 16:41	C7J0389	CJ72515
Hexachlorobutadiene	ND (0.0039)		8260B Low		1	10/25/17 16:41	C7J0389	CJ72515
Isopropylbenzene	ND (0.0039)		8260B Low		1	10/25/17 16:41	C7J0389	CJ72515
Methyl tert-Butyl Ether	ND (0.0039)		8260B Low		1	10/25/17 16:41	C7J0389	CJ72515
Methylene Chloride	ND (0.0195)		8260B Low		1	10/25/17 16:41	C7J0389	CJ72515
Naphthalene	ND (0.0039)		8260B Low		1	10/25/17 16:41	C7J0389	CJ72515
n-Butylbenzene	ND (0.0039)		8260B Low		1	10/25/17 16:41	C7J0389	CJ72515
n-Propylbenzene	ND (0.0039)		8260B Low		1	10/25/17 16:41	C7J0389	CJ72515
sec-Butylbenzene	ND (0.0039)		8260B Low		1	10/25/17 16:41	C7J0389	CJ72515
Styrene	ND (0.0039)		8260B Low		1	10/25/17 16:41	C7J0389	CJ72515
tert-Butylbenzene	ND (0.0039)		8260B Low		1	10/25/17 16:41	C7J0389	CJ72515
Tertiary-amyl methyl ether	ND (0.0039)		8260B Low		1	10/25/17 16:41	C7J0389	CJ72515
Tetrachloroethene	ND (0.0039)		8260B Low		1	10/25/17 16:41	C7J0389	CJ72515
Tetrahydrofuran	ND (0.0039)		8260B Low		1	10/25/17 16:41	C7J0389	CJ72515



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-BW-512 2-4ft  
 Date Sampled: 10/20/17 09:15  
 Percent Solids: 99  
 Initial Volume: 6.5  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1710573  
 ESS Laboratory Sample ID: 1710573-02  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0039)		8260B Low		1	10/25/17 16:41	C7J0389	CJ72515
trans-1,2-Dichloroethene	ND (0.0039)		8260B Low		1	10/25/17 16:41	C7J0389	CJ72515
trans-1,3-Dichloropropene	ND (0.0039)		8260B Low		1	10/25/17 16:41	C7J0389	CJ72515
Trichloroethene	ND (0.0039)		8260B Low		1	10/25/17 16:41	C7J0389	CJ72515
Trichlorofluoromethane	ND (0.0039)		8260B Low		1	10/25/17 16:41	C7J0389	CJ72515
Vinyl Acetate	ND (0.0039)		8260B Low		1	10/25/17 16:41	C7J0389	CJ72515
Vinyl Chloride	ND (0.0078)		8260B Low		1	10/25/17 16:41	C7J0389	CJ72515
Xylene O	ND (0.0039)		8260B Low		1	10/25/17 16:41	C7J0389	CJ72515
Xylene P,M	ND (0.0078)		8260B Low		1	10/25/17 16:41	C7J0389	CJ72515
Xylenes (Total)	ND (0.0078)		8260B Low		1	10/25/17 16:41		[CALC]

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: 1,2-Dichloroethane-d4	86 %		70-130
Surrogate: 4-Bromofluorobenzene	86 %		70-130
Surrogate: Dibromofluoromethane	85 %		70-130
Surrogate: Toluene-d8	107 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-BW-512 2-4ft  
 Date Sampled: 10/20/17 09:15  
 Percent Solids: 99  
 Initial Volume: 14.3  
 Final Volume: 0.5  
 Extraction Method: 3546

ESS Laboratory Work Order: 1710573  
 ESS Laboratory Sample ID: 1710573-02  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: TJ  
 Prepared: 10/23/17 16:53

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Naphthalene	ND (0.4)		8270D		1	10/24/17 1:18	C7J0336	CJ72309

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	65 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	73 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	71 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	91 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: TB-102017  
Date Sampled: 10/20/17 14:30  
Percent Solids: N/A  
Initial Volume: 5  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710573  
ESS Laboratory Sample ID: 1710573-03  
Sample Matrix: Solid  
Units: mg/kg wet  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0050)		8260B Low		1	10/24/17 15:43	C7J0365	CJ72430
1,1,1-Trichloroethane	ND (0.0050)		8260B Low		1	10/24/17 15:43	C7J0365	CJ72430
1,1,2,2-Tetrachloroethane	ND (0.0050)		8260B Low		1	10/24/17 15:43	C7J0365	CJ72430
1,1,2-Trichloroethane	ND (0.0050)		8260B Low		1	10/24/17 15:43	C7J0365	CJ72430
1,1-Dichloroethane	ND (0.0050)		8260B Low		1	10/24/17 15:43	C7J0365	CJ72430
1,1-Dichloroethene	ND (0.0050)		8260B Low		1	10/24/17 15:43	C7J0365	CJ72430
1,1-Dichloropropene	ND (0.0050)		8260B Low		1	10/24/17 15:43	C7J0365	CJ72430
1,2,3-Trichlorobenzene	ND (0.0050)		8260B Low		1	10/24/17 15:43	C7J0365	CJ72430
1,2,3-Trichloropropane	ND (0.0050)		8260B Low		1	10/24/17 15:43	C7J0365	CJ72430
1,2,4-Trichlorobenzene	ND (0.0050)		8260B Low		1	10/24/17 15:43	C7J0365	CJ72430
1,2,4-Trimethylbenzene	ND (0.0050)		8260B Low		1	10/24/17 15:43	C7J0365	CJ72430
1,2-Dibromo-3-Chloropropane	ND (0.0050)		8260B Low		1	10/24/17 15:43	C7J0365	CJ72430
1,2-Dibromoethane	ND (0.0050)		8260B Low		1	10/24/17 15:43	C7J0365	CJ72430
1,2-Dichlorobenzene	ND (0.0050)		8260B Low		1	10/24/17 15:43	C7J0365	CJ72430
1,2-Dichloroethane	ND (0.0050)		8260B Low		1	10/24/17 15:43	C7J0365	CJ72430
1,2-Dichloropropane	ND (0.0050)		8260B Low		1	10/24/17 15:43	C7J0365	CJ72430
1,3,5-Trimethylbenzene	ND (0.0050)		8260B Low		1	10/24/17 15:43	C7J0365	CJ72430
1,3-Dichlorobenzene	ND (0.0050)		8260B Low		1	10/24/17 15:43	C7J0365	CJ72430
1,3-Dichloropropane	ND (0.0050)		8260B Low		1	10/24/17 15:43	C7J0365	CJ72430
1,4-Dichlorobenzene	ND (0.0050)		8260B Low		1	10/24/17 15:43	C7J0365	CJ72430
1,4-Dioxane	ND (0.100)		8260B Low		1	10/24/17 15:43	C7J0365	CJ72430
1-Chlorohexane	ND (0.0050)		8260B Low		1	10/24/17 15:43	C7J0365	CJ72430
2,2-Dichloropropane	ND (0.0050)		8260B Low		1	10/24/17 15:43	C7J0365	CJ72430
2-Butanone	ND (0.0500)		8260B Low		1	10/24/17 15:43	C7J0365	CJ72430
2-Chlorotoluene	ND (0.0050)		8260B Low		1	10/24/17 15:43	C7J0365	CJ72430
2-Hexanone	ND (0.0500)		8260B Low		1	10/24/17 15:43	C7J0365	CJ72430
4-Chlorotoluene	ND (0.0050)		8260B Low		1	10/24/17 15:43	C7J0365	CJ72430
4-Isopropyltoluene	ND (0.0050)		8260B Low		1	10/24/17 15:43	C7J0365	CJ72430
4-Methyl-2-Pentanone	ND (0.0500)		8260B Low		1	10/24/17 15:43	C7J0365	CJ72430
Acetone	ND (0.0500)		8260B Low		1	10/24/17 15:43	C7J0365	CJ72430
Benzene	ND (0.0050)		8260B Low		1	10/24/17 15:43	C7J0365	CJ72430
Bromobenzene	ND (0.0050)		8260B Low		1	10/24/17 15:43	C7J0365	CJ72430





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: TB-102017  
 Date Sampled: 10/20/17 14:30  
 Percent Solids: N/A  
 Initial Volume: 5  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1710573  
 ESS Laboratory Sample ID: 1710573-03  
 Sample Matrix: Solid  
 Units: mg/kg wet  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0050)		8260B Low		1	10/24/17 15:43	C7J0365	CJ72430
Bromodichloromethane	ND (0.0050)		8260B Low		1	10/24/17 15:43	C7J0365	CJ72430
Bromoform	ND (0.0050)		8260B Low		1	10/24/17 15:43	C7J0365	CJ72430
Bromomethane	ND (0.0100)		8260B Low		1	10/24/17 15:43	C7J0365	CJ72430
Carbon Disulfide	ND (0.0050)		8260B Low		1	10/24/17 15:43	C7J0365	CJ72430
Carbon Tetrachloride	ND (0.0050)		8260B Low		1	10/24/17 15:43	C7J0365	CJ72430
Chlorobenzene	ND (0.0050)		8260B Low		1	10/24/17 15:43	C7J0365	CJ72430
Chloroethane	ND (0.0100)		8260B Low		1	10/24/17 15:43	C7J0365	CJ72430
Chloroform	ND (0.0050)		8260B Low		1	10/24/17 15:43	C7J0365	CJ72430
Chloromethane	ND (0.0100)		8260B Low		1	10/24/17 15:43	C7J0365	CJ72430
cis-1,2-Dichloroethene	ND (0.0050)		8260B Low		1	10/24/17 15:43	C7J0365	CJ72430
cis-1,3-Dichloropropene	ND (0.0050)		8260B Low		1	10/24/17 15:43	C7J0365	CJ72430
Dibromochloromethane	ND (0.0050)		8260B Low		1	10/24/17 15:43	C7J0365	CJ72430
Dibromomethane	ND (0.0050)		8260B Low		1	10/24/17 15:43	C7J0365	CJ72430
Dichlorodifluoromethane	ND (0.0100)		8260B Low		1	10/24/17 15:43	C7J0365	CJ72430
Diethyl Ether	ND (0.0050)		8260B Low		1	10/24/17 15:43	C7J0365	CJ72430
Di-isopropyl ether	ND (0.0050)		8260B Low		1	10/24/17 15:43	C7J0365	CJ72430
Ethyl tertiary-butyl ether	ND (0.0050)		8260B Low		1	10/24/17 15:43	C7J0365	CJ72430
Ethylbenzene	ND (0.0050)		8260B Low		1	10/24/17 15:43	C7J0365	CJ72430
Hexachlorobutadiene	ND (0.0050)		8260B Low		1	10/24/17 15:43	C7J0365	CJ72430
Isopropylbenzene	ND (0.0050)		8260B Low		1	10/24/17 15:43	C7J0365	CJ72430
Methyl tert-Butyl Ether	ND (0.0050)		8260B Low		1	10/24/17 15:43	C7J0365	CJ72430
Methylene Chloride	ND (0.0250)		8260B Low		1	10/24/17 15:43	C7J0365	CJ72430
Naphthalene	ND (0.0050)		8260B Low		1	10/24/17 15:43	C7J0365	CJ72430
n-Butylbenzene	ND (0.0050)		8260B Low		1	10/24/17 15:43	C7J0365	CJ72430
n-Propylbenzene	ND (0.0050)		8260B Low		1	10/24/17 15:43	C7J0365	CJ72430
sec-Butylbenzene	ND (0.0050)		8260B Low		1	10/24/17 15:43	C7J0365	CJ72430
Styrene	ND (0.0050)		8260B Low		1	10/24/17 15:43	C7J0365	CJ72430
tert-Butylbenzene	ND (0.0050)		8260B Low		1	10/24/17 15:43	C7J0365	CJ72430
Tertiary-amyl methyl ether	ND (0.0050)		8260B Low		1	10/24/17 15:43	C7J0365	CJ72430
Tetrachloroethene	ND (0.0050)		8260B Low		1	10/24/17 15:43	C7J0365	CJ72430
Tetrahydrofuran	ND (0.0050)		8260B Low		1	10/24/17 15:43	C7J0365	CJ72430



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: TB-102017  
 Date Sampled: 10/20/17 14:30  
 Percent Solids: N/A  
 Initial Volume: 5  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1710573  
 ESS Laboratory Sample ID: 1710573-03  
 Sample Matrix: Solid  
 Units: mg/kg wet  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0050)		8260B Low		1	10/24/17 15:43	C7J0365	CJ72430
trans-1,2-Dichloroethene	ND (0.0050)		8260B Low		1	10/24/17 15:43	C7J0365	CJ72430
trans-1,3-Dichloropropene	ND (0.0050)		8260B Low		1	10/24/17 15:43	C7J0365	CJ72430
Trichloroethene	ND (0.0050)		8260B Low		1	10/24/17 15:43	C7J0365	CJ72430
Trichlorofluoromethane	ND (0.0050)		8260B Low		1	10/24/17 15:43	C7J0365	CJ72430
Vinyl Acetate	ND (0.0050)		8260B Low		1	10/24/17 15:43	C7J0365	CJ72430
Vinyl Chloride	ND (0.0100)		8260B Low		1	10/24/17 15:43	C7J0365	CJ72430
Xylene O	ND (0.0050)		8260B Low		1	10/24/17 15:43	C7J0365	CJ72430
Xylene P,M	ND (0.0100)		8260B Low		1	10/24/17 15:43	C7J0365	CJ72430
Xylenes (Total)	ND (0.0100)		8260B Low		1	10/24/17 15:43		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	111 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	92 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	103 %		70-130
<i>Surrogate: Toluene-d8</i>	100 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710573

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CJ72430 - 5035**

**Blank**

1,1,1,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,1-Trichloroethane	ND	0.0050	mg/kg wet							
1,1,2,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,2-Trichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethene	ND	0.0050	mg/kg wet							
1,1-Dichloropropene	ND	0.0050	mg/kg wet							
1,2,3-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,3-Trichloropropane	ND	0.0050	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,4-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,2-Dibromo-3-Chloropropane	ND	0.0050	mg/kg wet							
1,2-Dibromoethane	ND	0.0050	mg/kg wet							
1,2-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,2-Dichloroethane	ND	0.0050	mg/kg wet							
1,2-Dichloropropane	ND	0.0050	mg/kg wet							
1,3,5-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,3-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,3-Dichloropropane	ND	0.0050	mg/kg wet							
1,4-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,4-Dioxane	ND	0.100	mg/kg wet							
1-Chlorohexane	ND	0.0050	mg/kg wet							
2,2-Dichloropropane	ND	0.0050	mg/kg wet							
2-Butanone	ND	0.0500	mg/kg wet							
2-Chlorotoluene	ND	0.0050	mg/kg wet							
2-Hexanone	ND	0.0500	mg/kg wet							
4-Chlorotoluene	ND	0.0050	mg/kg wet							
4-Isopropyltoluene	ND	0.0050	mg/kg wet							
4-Methyl-2-Pentanone	ND	0.0500	mg/kg wet							
Acetone	ND	0.0500	mg/kg wet							
Benzene	ND	0.0050	mg/kg wet							
Bromobenzene	ND	0.0050	mg/kg wet							
Bromochloromethane	ND	0.0050	mg/kg wet							
Bromodichloromethane	ND	0.0050	mg/kg wet							
Bromoform	ND	0.0050	mg/kg wet							
Bromomethane	ND	0.0100	mg/kg wet							
Carbon Disulfide	ND	0.0050	mg/kg wet							
Carbon Tetrachloride	ND	0.0050	mg/kg wet							
Chlorobenzene	ND	0.0050	mg/kg wet							
Chloroethane	ND	0.0100	mg/kg wet							
Chloroform	ND	0.0050	mg/kg wet							
Chloromethane	ND	0.0100	mg/kg wet							
cis-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
cis-1,3-Dichloropropene	ND	0.0050	mg/kg wet							



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710573

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CJ72430 - 5035**

Dibromochloromethane	ND	0.0050	mg/kg wet							
Dibromomethane	ND	0.0050	mg/kg wet							
Dichlorodifluoromethane	ND	0.0100	mg/kg wet							
Diethyl Ether	ND	0.0050	mg/kg wet							
Di-isopropyl ether	ND	0.0050	mg/kg wet							
Ethyl tertiary-butyl ether	ND	0.0050	mg/kg wet							
Ethylbenzene	ND	0.0050	mg/kg wet							
Hexachlorobutadiene	ND	0.0050	mg/kg wet							
Isopropylbenzene	ND	0.0050	mg/kg wet							
Methyl tert-Butyl Ether	ND	0.0050	mg/kg wet							
Methylene Chloride	ND	0.0250	mg/kg wet							
Naphthalene	ND	0.0050	mg/kg wet							
n-Butylbenzene	ND	0.0050	mg/kg wet							
n-Propylbenzene	ND	0.0050	mg/kg wet							
sec-Butylbenzene	ND	0.0050	mg/kg wet							
Styrene	ND	0.0050	mg/kg wet							
tert-Butylbenzene	ND	0.0050	mg/kg wet							
Tertiary-amyl methyl ether	ND	0.0050	mg/kg wet							
Tetrachloroethene	ND	0.0050	mg/kg wet							
Tetrahydrofuran	ND	0.0050	mg/kg wet							
Toluene	ND	0.0050	mg/kg wet							
trans-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
trans-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Trichloroethene	ND	0.0050	mg/kg wet							
Trichlorofluoromethane	ND	0.0050	mg/kg wet							
Vinyl Acetate	ND	0.0050	mg/kg wet							
Vinyl Chloride	ND	0.0100	mg/kg wet							
Xylene O	ND	0.0050	mg/kg wet							
Xylene P,M	ND	0.0100	mg/kg wet							
Xylenes (Total)	ND	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	0.0554		mg/kg wet	0.05000		111	70-130			
Surrogate: 4-Bromofluorobenzene	0.0453		mg/kg wet	0.05000		91	70-130			
Surrogate: Dibromofluoromethane	0.0518		mg/kg wet	0.05000		104	70-130			
Surrogate: Toluene-d8	0.0487		mg/kg wet	0.05000		97	70-130			

**LCS**

1,1,1,2-Tetrachloroethane	0.0580	0.0050	mg/kg wet	0.05000		116	70-130			
1,1,1-Trichloroethane	0.0605	0.0050	mg/kg wet	0.05000		121	70-130			
1,1,2,2-Tetrachloroethane	0.0514	0.0050	mg/kg wet	0.05000		103	70-130			
1,1,2-Trichloroethane	0.0553	0.0050	mg/kg wet	0.05000		111	70-130			
1,1-Dichloroethane	0.0537	0.0050	mg/kg wet	0.05000		107	70-130			
1,1-Dichloroethene	0.0552	0.0050	mg/kg wet	0.05000		110	70-130			
1,1-Dichloropropene	0.0585	0.0050	mg/kg wet	0.05000		117	70-130			
1,2,3-Trichlorobenzene	0.0566	0.0050	mg/kg wet	0.05000		113	70-130			
1,2,3-Trichloropropane	0.0519	0.0050	mg/kg wet	0.05000		104	70-130			
1,2,4-Trichlorobenzene	0.0561	0.0050	mg/kg wet	0.05000		112	70-130			



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710573

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CJ72430 - 5035**

1,2,4-Trimethylbenzene	0.0573	0.0050	mg/kg wet	0.05000		115	70-130			
1,2-Dibromo-3-Chloropropane	0.0466	0.0050	mg/kg wet	0.05000		93	70-130			
1,2-Dibromoethane	0.0542	0.0050	mg/kg wet	0.05000		108	70-130			
1,2-Dichlorobenzene	0.0552	0.0050	mg/kg wet	0.05000		110	70-130			
1,2-Dichloroethane	0.0593	0.0050	mg/kg wet	0.05000		119	70-130			
1,2-Dichloropropane	0.0541	0.0050	mg/kg wet	0.05000		108	70-130			
1,3,5-Trimethylbenzene	0.0557	0.0050	mg/kg wet	0.05000		111	70-130			
1,3-Dichlorobenzene	0.0548	0.0050	mg/kg wet	0.05000		110	70-130			
1,3-Dichloropropane	0.0576	0.0050	mg/kg wet	0.05000		115	70-130			
1,4-Dichlorobenzene	0.0555	0.0050	mg/kg wet	0.05000		111	70-130			
1,4-Dioxane	0.890	0.100	mg/kg wet	1.000		89	70-130			
1-Chlorohexane	0.0527	0.0050	mg/kg wet	0.05000		105	70-130			
2,2-Dichloropropane	0.0582	0.0050	mg/kg wet	0.05000		116	70-130			
2-Butanone	0.273	0.0500	mg/kg wet	0.2500		109	70-130			
2-Chlorotoluene	0.0545	0.0050	mg/kg wet	0.05000		109	70-130			
2-Hexanone	0.241	0.0500	mg/kg wet	0.2500		96	70-130			
4-Chlorotoluene	0.0550	0.0050	mg/kg wet	0.05000		110	70-130			
4-Isopropyltoluene	0.0555	0.0050	mg/kg wet	0.05000		111	70-130			
4-Methyl-2-Pentanone	0.243	0.0500	mg/kg wet	0.2500		97	70-130			
Acetone	0.263	0.0500	mg/kg wet	0.2500		105	70-130			
Benzene	0.0545	0.0050	mg/kg wet	0.05000		109	70-130			
Bromobenzene	0.0542	0.0050	mg/kg wet	0.05000		108	70-130			
Bromochloromethane	0.0551	0.0050	mg/kg wet	0.05000		110	70-130			
Bromodichloromethane	0.0612	0.0050	mg/kg wet	0.05000		122	70-130			
Bromoform	0.0491	0.0050	mg/kg wet	0.05000		98	70-130			
Bromomethane	0.0622	0.0100	mg/kg wet	0.05000		124	70-130			
Carbon Disulfide	0.0575	0.0050	mg/kg wet	0.05000		115	70-130			
Carbon Tetrachloride	0.0620	0.0050	mg/kg wet	0.05000		124	70-130			
Chlorobenzene	0.0542	0.0050	mg/kg wet	0.05000		108	70-130			
Chloroethane	0.0524	0.0100	mg/kg wet	0.05000		105	70-130			
Chloroform	0.0576	0.0050	mg/kg wet	0.05000		115	70-130			
Chloromethane	0.0614	0.0100	mg/kg wet	0.05000		123	70-130			
cis-1,2-Dichloroethene	0.0551	0.0050	mg/kg wet	0.05000		110	70-130			
cis-1,3-Dichloropropene	0.0603	0.0050	mg/kg wet	0.05000		121	70-130			
Dibromochloromethane	0.0536	0.0050	mg/kg wet	0.05000		107	70-130			
Dibromomethane	0.0538	0.0050	mg/kg wet	0.05000		108	70-130			
Dichlorodifluoromethane	0.0498	0.0100	mg/kg wet	0.05000		100	70-130			
Diethyl Ether	0.0549	0.0050	mg/kg wet	0.05000		110	70-130			
Di-isopropyl ether	0.0519	0.0050	mg/kg wet	0.05000		104	70-130			
Ethyl tertiary-butyl ether	0.0522	0.0050	mg/kg wet	0.05000		104	70-130			
Ethylbenzene	0.0547	0.0050	mg/kg wet	0.05000		109	70-130			
Hexachlorobutadiene	0.0589	0.0050	mg/kg wet	0.05000		118	70-130			
Isopropylbenzene	0.0527	0.0050	mg/kg wet	0.05000		105	70-130			
Methyl tert-Butyl Ether	0.0533	0.0050	mg/kg wet	0.05000		107	70-130			
Methylene Chloride	0.0585	0.0250	mg/kg wet	0.05000		117	70-130			



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710573

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CJ72430 - 5035**

Naphthalene	0.0471	0.0050	mg/kg wet	0.05000		94	70-130			
n-Butylbenzene	0.0560	0.0050	mg/kg wet	0.05000		112	70-130			
n-Propylbenzene	0.0558	0.0050	mg/kg wet	0.05000		112	70-130			
sec-Butylbenzene	0.0546	0.0050	mg/kg wet	0.05000		109	70-130			
Styrene	0.0544	0.0050	mg/kg wet	0.05000		109	70-130			
tert-Butylbenzene	0.0553	0.0050	mg/kg wet	0.05000		111	70-130			
Tertiary-amyl methyl ether	0.0495	0.0050	mg/kg wet	0.05000		99	70-130			
Tetrachloroethene	0.0543	0.0050	mg/kg wet	0.05000		109	70-130			
Tetrahydrofuran	0.0436	0.0050	mg/kg wet	0.05000		87	70-130			
Toluene	0.0554	0.0050	mg/kg wet	0.05000		111	70-130			
trans-1,2-Dichloroethene	0.0548	0.0050	mg/kg wet	0.05000		110	70-130			
trans-1,3-Dichloropropene	0.0538	0.0050	mg/kg wet	0.05000		108	70-130			
Trichloroethene	0.0561	0.0050	mg/kg wet	0.05000		112	70-130			
Trichlorofluoromethane	0.0589	0.0050	mg/kg wet	0.05000		118	70-130			
Vinyl Acetate	0.0437	0.0050	mg/kg wet	0.05000		87	70-130			
Vinyl Chloride	0.0653	0.0100	mg/kg wet	0.05000		131	70-130			B+
Xylene O	0.0577	0.0050	mg/kg wet	0.05000		115	70-130			
Xylene P,M	0.113	0.0100	mg/kg wet	0.1000		113	70-130			
Xylenes (Total)	0.171	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	0.0573		mg/kg wet	0.05000		115	70-130			
Surrogate: 4-Bromofluorobenzene	0.0527		mg/kg wet	0.05000		105	70-130			
Surrogate: Dibromofluoromethane	0.0553		mg/kg wet	0.05000		111	70-130			
Surrogate: Toluene-d8	0.0508		mg/kg wet	0.05000		102	70-130			

**LCS Dup**

1,1,1,2-Tetrachloroethane	0.0553	0.0050	mg/kg wet	0.05000		111	70-130	5	25	
1,1,1-Trichloroethane	0.0554	0.0050	mg/kg wet	0.05000		111	70-130	9	25	
1,1,2,2-Tetrachloroethane	0.0490	0.0050	mg/kg wet	0.05000		98	70-130	5	25	
1,1,2-Trichloroethane	0.0514	0.0050	mg/kg wet	0.05000		103	70-130	7	25	
1,1-Dichloroethane	0.0498	0.0050	mg/kg wet	0.05000		100	70-130	8	25	
1,1-Dichloroethene	0.0517	0.0050	mg/kg wet	0.05000		103	70-130	7	25	
1,1-Dichloropropene	0.0538	0.0050	mg/kg wet	0.05000		108	70-130	8	25	
1,2,3-Trichlorobenzene	0.0547	0.0050	mg/kg wet	0.05000		109	70-130	3	25	
1,2,3-Trichloropropane	0.0498	0.0050	mg/kg wet	0.05000		100	70-130	4	25	
1,2,4-Trichlorobenzene	0.0540	0.0050	mg/kg wet	0.05000		108	70-130	4	25	
1,2,4-Trimethylbenzene	0.0549	0.0050	mg/kg wet	0.05000		110	70-130	4	25	
1,2-Dibromo-3-Chloropropane	0.0454	0.0050	mg/kg wet	0.05000		91	70-130	3	25	
1,2-Dibromoethane	0.0523	0.0050	mg/kg wet	0.05000		105	70-130	4	25	
1,2-Dichlorobenzene	0.0533	0.0050	mg/kg wet	0.05000		107	70-130	4	25	
1,2-Dichloroethane	0.0549	0.0050	mg/kg wet	0.05000		110	70-130	8	25	
1,2-Dichloropropane	0.0507	0.0050	mg/kg wet	0.05000		101	70-130	6	25	
1,3,5-Trimethylbenzene	0.0537	0.0050	mg/kg wet	0.05000		107	70-130	4	25	
1,3-Dichlorobenzene	0.0525	0.0050	mg/kg wet	0.05000		105	70-130	4	25	
1,3-Dichloropropane	0.0547	0.0050	mg/kg wet	0.05000		109	70-130	5	25	
1,4-Dichlorobenzene	0.0532	0.0050	mg/kg wet	0.05000		106	70-130	4	25	
1,4-Dioxane	0.852	0.100	mg/kg wet	1.000		85	70-130	4	20	





CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710573

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
<b>5035/8260B Volatile Organic Compounds / Low Level</b>										
<b>Batch CJ72430 - 5035</b>										
1-Chlorohexane	0.0506	0.0050	mg/kg wet	0.05000		101	70-130	4	25	
2,2-Dichloropropane	0.0534	0.0050	mg/kg wet	0.05000		107	70-130	9	25	
2-Butanone	0.254	0.0500	mg/kg wet	0.2500		102	70-130	7	25	
2-Chlorotoluene	0.0525	0.0050	mg/kg wet	0.05000		105	70-130	4	25	
2-Hexanone	0.230	0.0500	mg/kg wet	0.2500		92	70-130	5	25	
4-Chlorotoluene	0.0528	0.0050	mg/kg wet	0.05000		106	70-130	4	25	
4-Isopropyltoluene	0.0531	0.0050	mg/kg wet	0.05000		106	70-130	4	25	
4-Methyl-2-Pentanone	0.226	0.0500	mg/kg wet	0.2500		90	70-130	7	25	
Acetone	0.243	0.0500	mg/kg wet	0.2500		97	70-130	8	25	
Benzene	0.0505	0.0050	mg/kg wet	0.05000		101	70-130	7	25	
Bromobenzene	0.0527	0.0050	mg/kg wet	0.05000		105	70-130	3	25	
Bromochloromethane	0.0512	0.0050	mg/kg wet	0.05000		102	70-130	7	25	
Bromodichloromethane	0.0563	0.0050	mg/kg wet	0.05000		113	70-130	8	25	
Bromoform	0.0473	0.0050	mg/kg wet	0.05000		95	70-130	4	25	
Bromomethane	0.0569	0.0100	mg/kg wet	0.05000		114	70-130	9	25	
Carbon Disulfide	0.0533	0.0050	mg/kg wet	0.05000		107	70-130	8	25	
Carbon Tetrachloride	0.0566	0.0050	mg/kg wet	0.05000		113	70-130	9	25	
Chlorobenzene	0.0518	0.0050	mg/kg wet	0.05000		104	70-130	4	25	
Chloroethane	0.0494	0.0100	mg/kg wet	0.05000		99	70-130	6	25	
Chloroform	0.0531	0.0050	mg/kg wet	0.05000		106	70-130	8	25	
Chloromethane	0.0566	0.0100	mg/kg wet	0.05000		113	70-130	8	25	
cis-1,2-Dichloroethene	0.0512	0.0050	mg/kg wet	0.05000		102	70-130	7	25	
cis-1,3-Dichloropropene	0.0563	0.0050	mg/kg wet	0.05000		113	70-130	7	25	
Dibromochloromethane	0.0519	0.0050	mg/kg wet	0.05000		104	70-130	3	25	
Dibromomethane	0.0498	0.0050	mg/kg wet	0.05000		100	70-130	8	25	
Dichlorodifluoromethane	0.0453	0.0100	mg/kg wet	0.05000		91	70-130	9	25	
Diethyl Ether	0.0522	0.0050	mg/kg wet	0.05000		104	70-130	5	25	
Di-isopropyl ether	0.0494	0.0050	mg/kg wet	0.05000		99	70-130	5	25	
Ethyl tertiary-butyl ether	0.0495	0.0050	mg/kg wet	0.05000		99	70-130	5	25	
Ethylbenzene	0.0523	0.0050	mg/kg wet	0.05000		105	70-130	4	25	
Hexachlorobutadiene	0.0563	0.0050	mg/kg wet	0.05000		113	70-130	5	25	
Isopropylbenzene	0.0504	0.0050	mg/kg wet	0.05000		101	70-130	4	25	
Methyl tert-Butyl Ether	0.0511	0.0050	mg/kg wet	0.05000		102	70-130	4	25	
Methylene Chloride	0.0547	0.0250	mg/kg wet	0.05000		109	70-130	7	25	
Naphthalene	0.0458	0.0050	mg/kg wet	0.05000		92	70-130	3	25	
n-Butylbenzene	0.0536	0.0050	mg/kg wet	0.05000		107	70-130	4	25	
n-Propylbenzene	0.0532	0.0050	mg/kg wet	0.05000		106	70-130	5	25	
sec-Butylbenzene	0.0523	0.0050	mg/kg wet	0.05000		105	70-130	4	25	
Styrene	0.0530	0.0050	mg/kg wet	0.05000		106	70-130	2	25	
tert-Butylbenzene	0.0533	0.0050	mg/kg wet	0.05000		107	70-130	4	25	
Tertiary-amyl methyl ether	0.0474	0.0050	mg/kg wet	0.05000		95	70-130	4	25	
Tetrachloroethene	0.0522	0.0050	mg/kg wet	0.05000		104	70-130	4	25	
Tetrahydrofuran	0.0405	0.0050	mg/kg wet	0.05000		81	70-130	7	25	
Toluene	0.0509	0.0050	mg/kg wet	0.05000		102	70-130	8	25	
trans-1,2-Dichloroethene	0.0516	0.0050	mg/kg wet	0.05000		103	70-130	6	25	



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710573

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CJ72430 - 5035**

trans-1,3-Dichloropropene	0.0507	0.0050	mg/kg wet	0.05000		101	70-130	6	25	
Trichloroethene	0.0520	0.0050	mg/kg wet	0.05000		104	70-130	8	25	
Trichlorofluoromethane	0.0536	0.0050	mg/kg wet	0.05000		107	70-130	9	25	
Vinyl Acetate	0.0419	0.0050	mg/kg wet	0.05000		84	70-130	4	25	
Vinyl Chloride	0.0605	0.0100	mg/kg wet	0.05000		121	70-130	8	25	
Xylene O	0.0551	0.0050	mg/kg wet	0.05000		110	70-130	5	25	
Xylene P,M	0.108	0.0100	mg/kg wet	0.1000		108	70-130	4	25	
Xylenes (Total)	0.163	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	0.0547		mg/kg wet	0.05000		109	70-130			
Surrogate: 4-Bromofluorobenzene	0.0524		mg/kg wet	0.05000		105	70-130			
Surrogate: Dibromofluoromethane	0.0536		mg/kg wet	0.05000		107	70-130			
Surrogate: Toluene-d8	0.0510		mg/kg wet	0.05000		102	70-130			

**Batch CJ72515 - 5035**

<b>Blank</b>										
1,1,1,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,1-Trichloroethane	ND	0.0050	mg/kg wet							
1,1,2,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,2-Trichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethene	ND	0.0050	mg/kg wet							
1,1-Dichloropropene	ND	0.0050	mg/kg wet							
1,2,3-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,3-Trichloropropane	ND	0.0050	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,4-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,2-Dibromo-3-Chloropropane	ND	0.0050	mg/kg wet							
1,2-Dibromoethane	ND	0.0050	mg/kg wet							
1,2-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,2-Dichloroethane	ND	0.0050	mg/kg wet							
1,2-Dichloropropane	ND	0.0050	mg/kg wet							
1,3,5-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,3-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,3-Dichloropropane	ND	0.0050	mg/kg wet							
1,4-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,4-Dioxane	ND	0.100	mg/kg wet							
1-Chlorohexane	ND	0.0050	mg/kg wet							
2,2-Dichloropropane	ND	0.0050	mg/kg wet							
2-Butanone	ND	0.0500	mg/kg wet							
2-Chlorotoluene	ND	0.0050	mg/kg wet							
2-Hexanone	ND	0.0500	mg/kg wet							
4-Chlorotoluene	ND	0.0050	mg/kg wet							
4-Isopropyltoluene	ND	0.0050	mg/kg wet							
4-Methyl-2-Pentanone	ND	0.0500	mg/kg wet							
Acetone	ND	0.0500	mg/kg wet							
Benzene	ND	0.0050	mg/kg wet							



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710573

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CJ72515 - 5035**

Bromobenzene	ND	0.0050	mg/kg wet							
Bromochloromethane	ND	0.0050	mg/kg wet							
Bromodichloromethane	ND	0.0050	mg/kg wet							
Bromoform	ND	0.0050	mg/kg wet							
Bromomethane	ND	0.0100	mg/kg wet							
Carbon Disulfide	ND	0.0050	mg/kg wet							
Carbon Tetrachloride	ND	0.0050	mg/kg wet							
Chlorobenzene	ND	0.0050	mg/kg wet							
Chloroethane	ND	0.0100	mg/kg wet							
Chloroform	ND	0.0050	mg/kg wet							
Chloromethane	ND	0.0100	mg/kg wet							
cis-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
cis-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Dibromochloromethane	ND	0.0050	mg/kg wet							
Dibromomethane	ND	0.0050	mg/kg wet							
Dichlorodifluoromethane	ND	0.0100	mg/kg wet							
Diethyl Ether	ND	0.0050	mg/kg wet							
Di-isopropyl ether	ND	0.0050	mg/kg wet							
Ethyl tertiary-butyl ether	ND	0.0050	mg/kg wet							
Ethylbenzene	ND	0.0050	mg/kg wet							
Hexachlorobutadiene	ND	0.0050	mg/kg wet							
Isopropylbenzene	ND	0.0050	mg/kg wet							
Methyl tert-Butyl Ether	ND	0.0050	mg/kg wet							
Methylene Chloride	ND	0.0250	mg/kg wet							
Naphthalene	ND	0.0050	mg/kg wet							
n-Butylbenzene	ND	0.0050	mg/kg wet							
n-Propylbenzene	ND	0.0050	mg/kg wet							
sec-Butylbenzene	ND	0.0050	mg/kg wet							
Styrene	ND	0.0050	mg/kg wet							
tert-Butylbenzene	ND	0.0050	mg/kg wet							
Tertiary-amyl methyl ether	ND	0.0050	mg/kg wet							
Tetrachloroethene	ND	0.0050	mg/kg wet							
Tetrahydrofuran	ND	0.0050	mg/kg wet							
Toluene	ND	0.0050	mg/kg wet							
trans-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
trans-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Trichloroethene	ND	0.0050	mg/kg wet							
Trichlorofluoromethane	ND	0.0050	mg/kg wet							
Vinyl Acetate	ND	0.0050	mg/kg wet							
Vinyl Chloride	ND	0.0100	mg/kg wet							
Xylene O	ND	0.0050	mg/kg wet							
Xylene P,M	ND	0.0100	mg/kg wet							
Xylenes (Total)	ND	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	0.0389		mg/kg wet	0.05000		78	70-130			
Surrogate: 4-Bromofluorobenzene	0.0449		mg/kg wet	0.05000		90	70-130			



CERTIFICATE OF ANALYSIS

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ESS Laboratory Work Order: 1710573

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CJ72515 - 5035**

Surrogate: Dibromofluoromethane	0.0391		mg/kg wet	0.05000		78	70-130			
Surrogate: Toluene-d8	0.0507		mg/kg wet	0.05000		101	70-130			

**LCS**

1,1,1,2-Tetrachloroethane	0.0412	0.0050	mg/kg wet	0.05000		82	70-130			
1,1,1-Trichloroethane	0.0383	0.0050	mg/kg wet	0.05000		77	70-130			
1,1,2,2-Tetrachloroethane	0.0465	0.0050	mg/kg wet	0.05000		93	70-130			
1,1,2-Trichloroethane	0.0426	0.0050	mg/kg wet	0.05000		85	70-130			
1,1-Dichloroethane	0.0401	0.0050	mg/kg wet	0.05000		80	70-130			
1,1-Dichloroethene	0.0438	0.0050	mg/kg wet	0.05000		88	70-130			
1,1-Dichloropropene	0.0424	0.0050	mg/kg wet	0.05000		85	70-130			
1,2,3-Trichlorobenzene	0.0468	0.0050	mg/kg wet	0.05000		94	70-130			
1,2,3-Trichloropropane	0.0453	0.0050	mg/kg wet	0.05000		91	70-130			
1,2,4-Trichlorobenzene	0.0474	0.0050	mg/kg wet	0.05000		95	70-130			
1,2,4-Trimethylbenzene	0.0496	0.0050	mg/kg wet	0.05000		99	70-130			
1,2-Dibromo-3-Chloropropane	0.0377	0.0050	mg/kg wet	0.05000		75	70-130			
1,2-Dibromoethane	0.0477	0.0050	mg/kg wet	0.05000		95	70-130			
1,2-Dichlorobenzene	0.0479	0.0050	mg/kg wet	0.05000		96	70-130			
1,2-Dichloroethane	0.0395	0.0050	mg/kg wet	0.05000		79	70-130			
1,2-Dichloropropane	0.0431	0.0050	mg/kg wet	0.05000		86	70-130			
1,3,5-Trimethylbenzene	0.0483	0.0050	mg/kg wet	0.05000		97	70-130			
1,3-Dichlorobenzene	0.0470	0.0050	mg/kg wet	0.05000		94	70-130			
1,3-Dichloropropane	0.0480	0.0050	mg/kg wet	0.05000		96	70-130			
1,4-Dichlorobenzene	0.0479	0.0050	mg/kg wet	0.05000		96	70-130			
1,4-Dioxane	0.909	0.100	mg/kg wet	1.000		91	70-130			
1-Chlorohexane	0.0482	0.0050	mg/kg wet	0.05000		96	70-130			
2,2-Dichloropropane	0.0359	0.0050	mg/kg wet	0.05000		72	70-130			
2-Butanone	0.218	0.0500	mg/kg wet	0.2500		87	70-130			
2-Chlorotoluene	0.0466	0.0050	mg/kg wet	0.05000		93	70-130			
2-Hexanone	0.224	0.0500	mg/kg wet	0.2500		89	70-130			
4-Chlorotoluene	0.0470	0.0050	mg/kg wet	0.05000		94	70-130			
4-Isopropyltoluene	0.0480	0.0050	mg/kg wet	0.05000		96	70-130			
4-Methyl-2-Pentanone	0.209	0.0500	mg/kg wet	0.2500		84	70-130			
Acetone	0.217	0.0500	mg/kg wet	0.2500		87	70-130			
Benzene	0.0420	0.0050	mg/kg wet	0.05000		84	70-130			
Bromobenzene	0.0488	0.0050	mg/kg wet	0.05000		98	70-130			
Bromochloromethane	0.0414	0.0050	mg/kg wet	0.05000		83	70-130			
Bromodichloromethane	0.0399	0.0050	mg/kg wet	0.05000		80	70-130			
Bromoform	0.0358	0.0050	mg/kg wet	0.05000		72	70-130			
Bromomethane	0.0372	0.0100	mg/kg wet	0.05000		74	70-130			
Carbon Disulfide	0.0430	0.0050	mg/kg wet	0.05000		86	70-130			
Carbon Tetrachloride	0.0355	0.0050	mg/kg wet	0.05000		71	70-130			
Chlorobenzene	0.0451	0.0050	mg/kg wet	0.05000		90	70-130			
Chloroethane	0.0405	0.0100	mg/kg wet	0.05000		81	70-130			
Chloroform	0.0394	0.0050	mg/kg wet	0.05000		79	70-130			



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
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ESS Laboratory Work Order: 1710573

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CJ72515 - 5035**

Chloromethane	0.0378	0.0100	mg/kg wet	0.05000		76	70-130			
cis-1,2-Dichloroethene	0.0422	0.0050	mg/kg wet	0.05000		84	70-130			
cis-1,3-Dichloropropene	0.0440	0.0050	mg/kg wet	0.05000		88	70-130			
Dibromochloromethane	0.0397	0.0050	mg/kg wet	0.05000		79	70-130			
Dibromomethane	0.0401	0.0050	mg/kg wet	0.05000		80	70-130			
Dichlorodifluoromethane	0.0273	0.0100	mg/kg wet	0.05000		55	70-130			
Diethyl Ether	0.0455	0.0050	mg/kg wet	0.05000		91	70-130			B-
Di-isopropyl ether	0.0430	0.0050	mg/kg wet	0.05000		86	70-130			
Ethyl tertiary-butyl ether	0.0441	0.0050	mg/kg wet	0.05000		88	70-130			
Ethylbenzene	0.0457	0.0050	mg/kg wet	0.05000		91	70-130			
Hexachlorobutadiene	0.0459	0.0050	mg/kg wet	0.05000		92	70-130			
Isopropylbenzene	0.0467	0.0050	mg/kg wet	0.05000		93	70-130			
Methyl tert-Butyl Ether	0.0445	0.0050	mg/kg wet	0.05000		89	70-130			
Methylene Chloride	0.0433	0.0250	mg/kg wet	0.05000		87	70-130			
Naphthalene	0.0434	0.0050	mg/kg wet	0.05000		87	70-130			
n-Butylbenzene	0.0476	0.0050	mg/kg wet	0.05000		95	70-130			
n-Propylbenzene	0.0486	0.0050	mg/kg wet	0.05000		97	70-130			
sec-Butylbenzene	0.0475	0.0050	mg/kg wet	0.05000		95	70-130			
Styrene	0.0467	0.0050	mg/kg wet	0.05000		93	70-130			
tert-Butylbenzene	0.0483	0.0050	mg/kg wet	0.05000		97	70-130			
Tertiary-amyl methyl ether	0.0439	0.0050	mg/kg wet	0.05000		88	70-130			
Tetrachloroethene	0.0466	0.0050	mg/kg wet	0.05000		93	70-130			
Tetrahydrofuran	0.0426	0.0050	mg/kg wet	0.05000		85	70-130			
Toluene	0.0420	0.0050	mg/kg wet	0.05000		84	70-130			
trans-1,2-Dichloroethene	0.0438	0.0050	mg/kg wet	0.05000		88	70-130			
trans-1,3-Dichloropropene	0.0380	0.0050	mg/kg wet	0.05000		76	70-130			
Trichloroethene	0.0418	0.0050	mg/kg wet	0.05000		84	70-130			
Trichlorofluoromethane	0.0372	0.0050	mg/kg wet	0.05000		74	70-130			
Vinyl Acetate	0.0389	0.0050	mg/kg wet	0.05000		78	70-130			
Vinyl Chloride	0.0391	0.0100	mg/kg wet	0.05000		78	70-130			
Xylene O	0.0475	0.0050	mg/kg wet	0.05000		95	70-130			
Xylene P,M	0.0951	0.0100	mg/kg wet	0.1000		95	70-130			
Xylenes (Total)	0.143	0.0100	mg/kg wet							
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0436</i>		mg/kg wet	<i>0.05000</i>		<i>87</i>	<i>70-130</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0501</i>		mg/kg wet	<i>0.05000</i>		<i>100</i>	<i>70-130</i>			
<i>Surrogate: Dibromofluoromethane</i>	<i>0.0456</i>		mg/kg wet	<i>0.05000</i>		<i>91</i>	<i>70-130</i>			
<i>Surrogate: Toluene-d8</i>	<i>0.0530</i>		mg/kg wet	<i>0.05000</i>		<i>106</i>	<i>70-130</i>			

**LCS Dup**

1,1,1,2-Tetrachloroethane	0.0459	0.0050	mg/kg wet	0.05000		92	70-130	11	25	
1,1,1-Trichloroethane	0.0422	0.0050	mg/kg wet	0.05000		84	70-130	10	25	
1,1,1,2-Tetrachloroethane	0.0515	0.0050	mg/kg wet	0.05000		103	70-130	10	25	
1,1,2-Trichloroethane	0.0460	0.0050	mg/kg wet	0.05000		92	70-130	8	25	
1,1-Dichloroethane	0.0439	0.0050	mg/kg wet	0.05000		88	70-130	9	25	
1,1-Dichloroethene	0.0485	0.0050	mg/kg wet	0.05000		97	70-130	10	25	
1,1-Dichloropropene	0.0466	0.0050	mg/kg wet	0.05000		93	70-130	10	25	



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710573

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CJ72515 - 5035**

1,2,3-Trichlorobenzene	0.0505	0.0050	mg/kg wet	0.05000		101	70-130	8	25	
1,2,3-Trichloropropane	0.0504	0.0050	mg/kg wet	0.05000		101	70-130	11	25	
1,2,4-Trichlorobenzene	0.0510	0.0050	mg/kg wet	0.05000		102	70-130	7	25	
1,2,4-Trimethylbenzene	0.0537	0.0050	mg/kg wet	0.05000		107	70-130	8	25	
1,2-Dibromo-3-Chloropropane	0.0422	0.0050	mg/kg wet	0.05000		84	70-130	11	25	
1,2-Dibromoethane	0.0540	0.0050	mg/kg wet	0.05000		108	70-130	12	25	
1,2-Dichlorobenzene	0.0520	0.0050	mg/kg wet	0.05000		104	70-130	8	25	
1,2-Dichloroethane	0.0429	0.0050	mg/kg wet	0.05000		86	70-130	8	25	
1,2-Dichloropropane	0.0465	0.0050	mg/kg wet	0.05000		93	70-130	8	25	
1,3,5-Trimethylbenzene	0.0528	0.0050	mg/kg wet	0.05000		106	70-130	9	25	
1,3-Dichlorobenzene	0.0507	0.0050	mg/kg wet	0.05000		101	70-130	7	25	
1,3-Dichloropropane	0.0537	0.0050	mg/kg wet	0.05000		107	70-130	11	25	
1,4-Dichlorobenzene	0.0515	0.0050	mg/kg wet	0.05000		103	70-130	7	25	
1,4-Dioxane	1.02	0.100	mg/kg wet	1.000		102	70-130	12	20	
1-Chlorohexane	0.0549	0.0050	mg/kg wet	0.05000		110	70-130	13	25	
2,2-Dichloropropane	0.0390	0.0050	mg/kg wet	0.05000		78	70-130	8	25	
2-Butanone	0.242	0.0500	mg/kg wet	0.2500		97	70-130	10	25	
2-Chlorotoluene	0.0510	0.0050	mg/kg wet	0.05000		102	70-130	9	25	
2-Hexanone	0.264	0.0500	mg/kg wet	0.2500		105	70-130	16	25	
4-Chlorotoluene	0.0513	0.0050	mg/kg wet	0.05000		103	70-130	9	25	
4-Isopropyltoluene	0.0520	0.0050	mg/kg wet	0.05000		104	70-130	8	25	
4-Methyl-2-Pentanone	0.237	0.0500	mg/kg wet	0.2500		95	70-130	13	25	
Acetone	0.241	0.0500	mg/kg wet	0.2500		96	70-130	10	25	
Benzene	0.0454	0.0050	mg/kg wet	0.05000		91	70-130	8	25	
Bromobenzene	0.0527	0.0050	mg/kg wet	0.05000		105	70-130	8	25	
Bromochloromethane	0.0447	0.0050	mg/kg wet	0.05000		89	70-130	8	25	
Bromodichloromethane	0.0435	0.0050	mg/kg wet	0.05000		87	70-130	9	25	
Bromoform	0.0408	0.0050	mg/kg wet	0.05000		82	70-130	13	25	
Bromomethane	0.0413	0.0100	mg/kg wet	0.05000		83	70-130	10	25	
Carbon Disulfide	0.0471	0.0050	mg/kg wet	0.05000		94	70-130	9	25	
Carbon Tetrachloride	0.0396	0.0050	mg/kg wet	0.05000		79	70-130	11	25	
Chlorobenzene	0.0506	0.0050	mg/kg wet	0.05000		101	70-130	11	25	
Chloroethane	0.0442	0.0100	mg/kg wet	0.05000		88	70-130	9	25	
Chloroform	0.0428	0.0050	mg/kg wet	0.05000		86	70-130	8	25	
Chloromethane	0.0417	0.0100	mg/kg wet	0.05000		83	70-130	10	25	
cis-1,2-Dichloroethene	0.0461	0.0050	mg/kg wet	0.05000		92	70-130	9	25	
cis-1,3-Dichloropropene	0.0478	0.0050	mg/kg wet	0.05000		96	70-130	8	25	
Dibromochloromethane	0.0447	0.0050	mg/kg wet	0.05000		89	70-130	12	25	
Dibromomethane	0.0435	0.0050	mg/kg wet	0.05000		87	70-130	8	25	
Dichlorodifluoromethane	0.0303	0.0100	mg/kg wet	0.05000		61	70-130	10	25	B-
Diethyl Ether	0.0497	0.0050	mg/kg wet	0.05000		99	70-130	9	25	
Di-isopropyl ether	0.0465	0.0050	mg/kg wet	0.05000		93	70-130	8	25	
Ethyl tertiary-butyl ether	0.0476	0.0050	mg/kg wet	0.05000		95	70-130	8	25	
Ethylbenzene	0.0516	0.0050	mg/kg wet	0.05000		103	70-130	12	25	
Hexachlorobutadiene	0.0505	0.0050	mg/kg wet	0.05000		101	70-130	10	25	





CERTIFICATE OF ANALYSIS

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**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CJ72515 - 5035**

Isopropylbenzene	0.0510	0.0050	mg/kg wet	0.05000		102	70-130	9	25	
Methyl tert-Butyl Ether	0.0487	0.0050	mg/kg wet	0.05000		97	70-130	9	25	
Methylene Chloride	0.0469	0.0250	mg/kg wet	0.05000		94	70-130	8	25	
Naphthalene	0.0479	0.0050	mg/kg wet	0.05000		96	70-130	10	25	
n-Butylbenzene	0.0519	0.0050	mg/kg wet	0.05000		104	70-130	9	25	
n-Propylbenzene	0.0532	0.0050	mg/kg wet	0.05000		106	70-130	9	25	
sec-Butylbenzene	0.0520	0.0050	mg/kg wet	0.05000		104	70-130	9	25	
Styrene	0.0525	0.0050	mg/kg wet	0.05000		105	70-130	12	25	
tert-Butylbenzene	0.0533	0.0050	mg/kg wet	0.05000		107	70-130	10	25	
Tertiary-amyl methyl ether	0.0476	0.0050	mg/kg wet	0.05000		95	70-130	8	25	
Tetrachloroethene	0.0522	0.0050	mg/kg wet	0.05000		104	70-130	11	25	
Tetrahydrofuran	0.0499	0.0050	mg/kg wet	0.05000		100	70-130	16	25	
Toluene	0.0455	0.0050	mg/kg wet	0.05000		91	70-130	8	25	
trans-1,2-Dichloroethene	0.0475	0.0050	mg/kg wet	0.05000		95	70-130	8	25	
trans-1,3-Dichloropropene	0.0412	0.0050	mg/kg wet	0.05000		82	70-130	8	25	
Trichloroethene	0.0452	0.0050	mg/kg wet	0.05000		90	70-130	8	25	
Trichlorofluoromethane	0.0404	0.0050	mg/kg wet	0.05000		81	70-130	8	25	
Vinyl Acetate	0.0427	0.0050	mg/kg wet	0.05000		85	70-130	9	25	
Vinyl Chloride	0.0438	0.0100	mg/kg wet	0.05000		88	70-130	11	25	
Xylene O	0.0531	0.0050	mg/kg wet	0.05000		106	70-130	11	25	
Xylene P,M	0.107	0.0100	mg/kg wet	0.1000		107	70-130	12	25	
Xylenes (Total)	0.160	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	0.0437		mg/kg wet	0.05000		87	70-130			
Surrogate: 4-Bromofluorobenzene	0.0515		mg/kg wet	0.05000		103	70-130			
Surrogate: Dibromofluoromethane	0.0453		mg/kg wet	0.05000		91	70-130			
Surrogate: Toluene-d8	0.0547		mg/kg wet	0.05000		109	70-130			

8270D Polynuclear Aromatic Hydrocarbons

**Batch CJ72309 - 3546**

<b>Blank</b>										
Naphthalene	ND	0.3	mg/kg wet							
Surrogate: 1,2-Dichlorobenzene-d4	2.30		mg/kg wet	3.333		69	30-130			
Surrogate: 2-Fluorobiphenyl	2.52		mg/kg wet	3.333		76	30-130			
Surrogate: Nitrobenzene-d5	2.51		mg/kg wet	3.333		75	30-130			
Surrogate: p-Terphenyl-d14	3.30		mg/kg wet	3.333		99	30-130			

<b>LCS</b>										
Naphthalene	2.6	0.3	mg/kg wet	3.333		78	40-140			
Surrogate: 1,2-Dichlorobenzene-d4	2.64		mg/kg wet	3.333		79	30-130			
Surrogate: 2-Fluorobiphenyl	2.82		mg/kg wet	3.333		85	30-130			
Surrogate: Nitrobenzene-d5	2.82		mg/kg wet	3.333		85	30-130			
Surrogate: p-Terphenyl-d14	3.46		mg/kg wet	3.333		104	30-130			

<b>LCS Dup</b>										
Naphthalene	2.6	0.3	mg/kg wet	3.333		77	40-140	2	30	
Surrogate: 1,2-Dichlorobenzene-d4	2.46		mg/kg wet	3.333		74	30-130			
Surrogate: 2-Fluorobiphenyl	2.64		mg/kg wet	3.333		79	30-130			



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710573

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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8270D Polynuclear Aromatic Hydrocarbons

**Batch CJ72309 - 3546**

<i>Surrogate: Nitrobenzene-d5</i>	2.74		mg/kg wet	3.333		82	30-130			
<i>Surrogate: p-Terphenyl-d14</i>	3.52		mg/kg wet	3.333		106	30-130			



## CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710573

### Notes and Definitions

- U Analyte included in the analysis, but not detected
- D Diluted.
- B+ Blank Spike recovery is above upper control limit (B+).
- B- Blank Spike recovery is below lower control limit (B-).
- ND Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference
- MDL Method Detection Limit
- MRL Method Reporting Limit
- LOD Limit of Detection
- LOQ Limit of Quantitation
- DL Detection Limit
- I/V Initial Volume
- F/V Final Volume
- § Subcontracted analysis; see attached report
- 1 Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
- 2 Range result excludes concentrations of target analytes eluting in that range.
- 3 Range result excludes the concentration of the C9-C10 aromatic range.
- Avg Results reported as a mathematical average.
- NR No Recovery
- [CALC] Calculated Analyte
- SUB Subcontracted analysis; see attached report
- RL Reporting Limit
- EDL Estimated Detection Limit



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710573

**ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS**

**ENVIRONMENTAL**

Rhode Island Potable and Non Potable Water: LAI00179

<http://www.health.ri.gov/find/labs/analytical/ESS.pdf>

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750

[http://www.ct.gov/dph/lib/dph/environmental\\_health/environmental\\_laboratories/pdf/OutofStateCommercialLaboratories.pdf](http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf)

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002

<http://www.maine.gov/dhhs/meecd/environmental-health/dwp/partners/labCert.shtml>

Massachusetts Potable and Non Potable Water: M-RI002

<http://public.dep.state.ma.us/Labcert/Labcert.aspx>

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424

<http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm>

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313

<http://www.wadsworth.org/labcert/elap/comm.html>

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006

[http://datamine2.state.nj.us/DEP\\_OPRA/OpraMain/pi\\_main?mode=pi\\_by\\_site&sort\\_order=PI\\_NAMEA&Select+a+Site:=58715](http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715)

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752

<http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx>

## ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Providence, RI - GZA/HDM

ESS Project ID: 1710573

Date Received: 10/23/2017

Project Due Date: 10/30/2017

Days for Project: 5 Day

Shipped/Delivered Via: Client

1. Air bill manifest present?  No  
Air No.: NA
2. Were custody seals present?  No
3. Is radiation count <100 CPM?  Yes
4. Is a Cooler Present?  Yes  
Temp: 4.1 Iced with: Ice
5. Was COC signed and dated by client?  Yes

6. Does COC match bottles?  Yes
7. Is COC complete and correct?  Yes
8. Were samples received intact?  Yes
9. Were labs informed about **short holds & rushes**? Yes / No  NA
10. Were any analyses received outside of hold time? Yes /  No

11. Any Subcontracting needed? Yes /  No  
ESS Sample IDs: \_\_\_\_\_  
Analysis: \_\_\_\_\_  
TAT: \_\_\_\_\_

12. Were VOAs received?  Yes / No  
a. Air bubbles in aqueous VOAs? Yes / No  
b. Does methanol cover soil completely?  Yes / No / NA

13. Are the samples properly preserved?  Yes / No  
a. If metals preserved upon receipt: Date: \_\_\_\_\_ Time: \_\_\_\_\_  
b. Low Level VOA vials frozen: Date: 10/23/17 Time: 1630

By: \_\_\_\_\_  
By: Client  
ur 10/23/17

Sample Receiving Notes:

14. Was there a need to contact Project Manager?  Yes / No  
a. Was there a need to contact the client?  Yes / No  
Who was contacted? \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_ By: \_\_\_\_\_

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
01	175186	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
01	175189	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
01	175190	Yes	NA	Yes	VOA Vial - Other	Other	
01	175191	Yes	NA	Yes	VOA Vial - Other	Other	
02	175185	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
02	175188	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
02	175194	Yes	NA	Yes	VOA Vial - Other	Other	
02	175195	Yes	NA	Yes	VOA Vial - Other	Other	
03	175187	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
03	175192	Yes	NA	Yes	VOA Vial - Other	Other	

2nd Review  
Are barcode labels on correct containers?  Yes / No

Completed By: [Signature] Date & Time: 10/23/17 1448  
Reviewed By: [Signature] Date & Time: 10/23/17 1526  
Delivered By: [Signature] Date & Time: 10/23/17 1526







## CERTIFICATE OF ANALYSIS

Sarah McLeod  
GZA GeoEnvironmental, Inc.  
530 Broadway  
Providence, RI 02909

**RE: Former Tidewater Facility (05.0043654.00)**  
**ESS Laboratory Work Order Number: 1710601**

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.



Laurel Stoddard  
Laboratory Director

**REVIEWED****By ESS Laboratory at 5:03 pm, Oct 31, 2017****Analytical Summary**

The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710601

**SAMPLE RECEIPT**

The following samples were received on October 24, 2017 for the analyses specified on the enclosed Chain of Custody Record.

**Low Level VOA vials were frozen by ESS Laboratory on October 24, 2017 at 1507.**

**Volatile Analysis:** There were inconsistent naphthalene results from the Low Level VOA Analysis, High Level Methanol VOA analysis and 8270 analysis. The second Low Level vial was analyzed with similar results. The Low Level VOA analysis may be producing an inefficient extraction due to sample matrix and/or nonhomogeneous sample.

<u>Lab Number</u>	<u>Sample Name</u>	<u>Matrix</u>	<u>Analysis</u>
1710601-01	GZ-BK-501 2-4ft	Soil	8260B, 8260B Low, 8270D
1710601-02	TB-102417	Solid	8260B Low

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710601

PROJECT NARRATIVE

**5035/8260B Volatile Organic Compounds / Low Level**

1710601-01 Reported above the quantitation limit; Estimated value (E).

Naphthalene

CJ72515-BS1 Blank Spike recovery is below lower control limit (B-).

Dichlorodifluoromethane (55% @ 70-130%)

CJ72515-BSD1 Blank Spike recovery is below lower control limit (B-).

Dichlorodifluoromethane (61% @ 70-130%)

**5035/8260B Volatile Organic Compounds / Methanol**

C7J0424-CCV1 Continuing Calibration %Diff/Drift is below control limit (CD-).

1,4-Dioxane - Screen (48% @ 30%)

CJ72721-BS1 Blank Spike recovery is below lower control limit (B-).

1,2,3-Trichloropropane (67% @ 70-130%), 2-Hexanone (65% @ 70-130%), Bromoform (66% @ 70-130%), Chloroethane (69% @ 70-130%), Tetrahydrofuran (67% @ 70-130%), Vinyl Acetate (68% @ 70-130%)

CJ72721-BSD1 Blank Spike recovery is below lower control limit (B-).

1,2,3-Trichloropropane (65% @ 70-130%), 1,2-Dibromo-3-Chloropropane (68% @ 70-130%), 1,4-Dioxane - Screen (0% @ 44-241%), 2-Butanone (67% @ 70-130%), 2-Hexanone (65% @ 70-130%), Bromoform (61% @ 70-130%), Dibromochloromethane (62% @ 70-130%), Tetrahydrofuran (64% @ 70-130%), trans-1,3-Dichloropropene (63% @ 70-130%), Vinyl Acetate (66% @ 70-130%)

No other observations noted.

End of Project Narrative.

DATA USABILITY LINKS

*To ensure you are viewing the most current version of the documents below, please clear your internet cookies for [www.ESSLaboratory.com](http://www.ESSLaboratory.com). Consult your IT Support personnel for information on how to clear your internet cookies.*

[Definitions of Quality Control Parameters](#)

[Semivolatile Organics Internal Standard Information](#)

[Semivolatile Organics Surrogate Information](#)

[Volatile Organics Internal Standard Information](#)

[Volatile Organics Surrogate Information](#)

[EPH and VPH Alkane Lists](#)



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710601

**CURRENT SW-846 METHODOLOGY VERSIONS**

**Analytical Methods**

- 1010A - Flashpoint
- 6010C - ICP
- 6020A - ICP MS
- 7010 - Graphite Furnace
- 7196A - Hexavalent Chromium
- 7470A - Aqueous Mercury
- 7471B - Solid Mercury
- 8011 - EDB/DBCP/TCP
- 8015C - GRO/DRO
- 8081B - Pesticides
- 8082A - PCB
- 8100M - TPH
- 8151A - Herbicides
- 8260B - VOA
- 8270D - SVOA
- 8270D SIM - SVOA Low Level
- 9014 - Cyanide
- 9038 - Sulfate
- 9040C - Aqueous pH
- 9045D - Solid pH (Corrosivity)
- 9050A - Specific Conductance
- 9056A - Anions (IC)
- 9060A - TOC
- 9095B - Paint Filter
- MADEP 04-1.1 - EPH / VPH

**Prep Methods**

- 3005A - Aqueous ICP Digestion
- 3020A - Aqueous Graphite Furnace / ICP MS Digestion
- 3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
- 3060A - Solid Hexavalent Chromium Digestion
- 3510C - Separatory Funnel Extraction
- 3520C - Liquid / Liquid Extraction
- 3540C - Manual Soxhlet Extraction
- 3541 - Automated Soxhlet Extraction
- 3546 - Microwave Extraction
- 3580A - Waste Dilution
- 5030B - Aqueous Purge and Trap
- 5030C - Aqueous Purge and Trap
- 5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-BK-501 2-4ft  
Date Sampled: 10/24/17 09:30  
Percent Solids: 95  
Initial Volume: 5.8  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710601  
ESS Laboratory Sample ID: 1710601-01  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0045)		8260B Low		1	10/25/17 18:48	C7J0389	CJ72515
1,1,1-Trichloroethane	ND (0.0045)		8260B Low		1	10/25/17 18:48	C7J0389	CJ72515
1,1,2,2-Tetrachloroethane	ND (0.0045)		8260B Low		1	10/25/17 18:48	C7J0389	CJ72515
1,1,2-Trichloroethane	ND (0.0045)		8260B Low		1	10/25/17 18:48	C7J0389	CJ72515
1,1-Dichloroethane	ND (0.0045)		8260B Low		1	10/25/17 18:48	C7J0389	CJ72515
1,1-Dichloroethene	ND (0.0045)		8260B Low		1	10/25/17 18:48	C7J0389	CJ72515
1,1-Dichloropropene	ND (0.0045)		8260B Low		1	10/25/17 18:48	C7J0389	CJ72515
1,2,3-Trichlorobenzene	ND (0.0045)		8260B Low		1	10/25/17 18:48	C7J0389	CJ72515
1,2,3-Trichloropropane	ND (0.0045)		8260B Low		1	10/25/17 18:48	C7J0389	CJ72515
1,2,4-Trichlorobenzene	ND (0.0045)		8260B Low		1	10/25/17 18:48	C7J0389	CJ72515
1,2,4-Trimethylbenzene	ND (0.0045)		8260B Low		1	10/25/17 18:48	C7J0389	CJ72515
1,2-Dibromo-3-Chloropropane	ND (0.0045)		8260B Low		1	10/25/17 18:48	C7J0389	CJ72515
1,2-Dibromoethane	ND (0.0045)		8260B Low		1	10/25/17 18:48	C7J0389	CJ72515
1,2-Dichlorobenzene	ND (0.0045)		8260B Low		1	10/25/17 18:48	C7J0389	CJ72515
1,2-Dichloroethane	ND (0.0045)		8260B Low		1	10/25/17 18:48	C7J0389	CJ72515
1,2-Dichloropropane	ND (0.0045)		8260B Low		1	10/25/17 18:48	C7J0389	CJ72515
1,3,5-Trimethylbenzene	ND (0.0045)		8260B Low		1	10/25/17 18:48	C7J0389	CJ72515
1,3-Dichlorobenzene	ND (0.0045)		8260B Low		1	10/25/17 18:48	C7J0389	CJ72515
1,3-Dichloropropane	ND (0.0045)		8260B Low		1	10/25/17 18:48	C7J0389	CJ72515
1,4-Dichlorobenzene	ND (0.0045)		8260B Low		1	10/25/17 18:48	C7J0389	CJ72515
1,4-Dioxane	ND (0.0903)		8260B Low		1	10/25/17 18:48	C7J0389	CJ72515
1-Chlorohexane	ND (0.0045)		8260B Low		1	10/25/17 18:48	C7J0389	CJ72515
2,2-Dichloropropane	ND (0.0045)		8260B Low		1	10/25/17 18:48	C7J0389	CJ72515
2-Butanone	ND (0.0452)		8260B Low		1	10/25/17 18:48	C7J0389	CJ72515
2-Chlorotoluene	ND (0.0045)		8260B Low		1	10/25/17 18:48	C7J0389	CJ72515
2-Hexanone	ND (0.0452)		8260B Low		1	10/25/17 18:48	C7J0389	CJ72515
4-Chlorotoluene	ND (0.0045)		8260B Low		1	10/25/17 18:48	C7J0389	CJ72515
4-Isopropyltoluene	ND (0.0045)		8260B Low		1	10/25/17 18:48	C7J0389	CJ72515
4-Methyl-2-Pentanone	ND (0.0452)		8260B Low		1	10/25/17 18:48	C7J0389	CJ72515
Acetone	ND (0.0452)		8260B Low		1	10/25/17 18:48	C7J0389	CJ72515
Benzene	ND (0.0045)		8260B Low		1	10/25/17 18:48	C7J0389	CJ72515
Bromobenzene	ND (0.0045)		8260B Low		1	10/25/17 18:48	C7J0389	CJ72515



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-BK-501 2-4ft  
 Date Sampled: 10/24/17 09:30  
 Percent Solids: 95  
 Initial Volume: 5.8  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1710601  
 ESS Laboratory Sample ID: 1710601-01  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0045)		8260B Low		1	10/25/17 18:48	C7J0389	CJ72515
Bromodichloromethane	ND (0.0045)		8260B Low		1	10/25/17 18:48	C7J0389	CJ72515
Bromoform	ND (0.0045)		8260B Low		1	10/25/17 18:48	C7J0389	CJ72515
Bromomethane	ND (0.0090)		8260B Low		1	10/25/17 18:48	C7J0389	CJ72515
Carbon Disulfide	ND (0.0045)		8260B Low		1	10/25/17 18:48	C7J0389	CJ72515
Carbon Tetrachloride	ND (0.0045)		8260B Low		1	10/25/17 18:48	C7J0389	CJ72515
Chlorobenzene	ND (0.0045)		8260B Low		1	10/25/17 18:48	C7J0389	CJ72515
Chloroethane	ND (0.0090)		8260B Low		1	10/25/17 18:48	C7J0389	CJ72515
Chloroform	ND (0.0045)		8260B Low		1	10/25/17 18:48	C7J0389	CJ72515
Chloromethane	ND (0.0090)		8260B Low		1	10/25/17 18:48	C7J0389	CJ72515
cis-1,2-Dichloroethene	ND (0.0045)		8260B Low		1	10/25/17 18:48	C7J0389	CJ72515
cis-1,3-Dichloropropene	ND (0.0045)		8260B Low		1	10/25/17 18:48	C7J0389	CJ72515
Dibromochloromethane	ND (0.0045)		8260B Low		1	10/25/17 18:48	C7J0389	CJ72515
Dibromomethane	ND (0.0045)		8260B Low		1	10/25/17 18:48	C7J0389	CJ72515
Dichlorodifluoromethane	ND (0.0090)		8260B Low		1	10/25/17 18:48	C7J0389	CJ72515
Diethyl Ether	ND (0.0045)		8260B Low		1	10/25/17 18:48	C7J0389	CJ72515
Di-isopropyl ether	ND (0.0045)		8260B Low		1	10/25/17 18:48	C7J0389	CJ72515
Ethyl tertiary-butyl ether	ND (0.0045)		8260B Low		1	10/25/17 18:48	C7J0389	CJ72515
Ethylbenzene	ND (0.0045)		8260B Low		1	10/25/17 18:48	C7J0389	CJ72515
Hexachlorobutadiene	ND (0.0045)		8260B Low		1	10/25/17 18:48	C7J0389	CJ72515
Isopropylbenzene	ND (0.0045)		8260B Low		1	10/25/17 18:48	C7J0389	CJ72515
Methyl tert-Butyl Ether	ND (0.0045)		8260B Low		1	10/25/17 18:48	C7J0389	CJ72515
Methylene Chloride	ND (0.0226)		8260B Low		1	10/25/17 18:48	C7J0389	CJ72515
<b>Naphthalene</b>	<b>E 0.183</b> (0.0045)		8260B Low		1	10/25/17 18:48	C7J0389	CJ72515
n-Butylbenzene	ND (0.0045)		8260B Low		1	10/25/17 18:48	C7J0389	CJ72515
n-Propylbenzene	ND (0.0045)		8260B Low		1	10/25/17 18:48	C7J0389	CJ72515
sec-Butylbenzene	ND (0.0045)		8260B Low		1	10/25/17 18:48	C7J0389	CJ72515
Styrene	ND (0.0045)		8260B Low		1	10/25/17 18:48	C7J0389	CJ72515
tert-Butylbenzene	ND (0.0045)		8260B Low		1	10/25/17 18:48	C7J0389	CJ72515
Tertiary-amyl methyl ether	ND (0.0045)		8260B Low		1	10/25/17 18:48	C7J0389	CJ72515
Tetrachloroethene	ND (0.0045)		8260B Low		1	10/25/17 18:48	C7J0389	CJ72515
Tetrahydrofuran	ND (0.0045)		8260B Low		1	10/25/17 18:48	C7J0389	CJ72515





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-BK-501 2-4ft  
 Date Sampled: 10/24/17 09:30  
 Percent Solids: 95  
 Initial Volume: 5.8  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1710601  
 ESS Laboratory Sample ID: 1710601-01  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0045)		8260B Low		1	10/25/17 18:48	C7J0389	CJ72515
trans-1,2-Dichloroethene	ND (0.0045)		8260B Low		1	10/25/17 18:48	C7J0389	CJ72515
trans-1,3-Dichloropropene	ND (0.0045)		8260B Low		1	10/25/17 18:48	C7J0389	CJ72515
Trichloroethene	ND (0.0045)		8260B Low		1	10/25/17 18:48	C7J0389	CJ72515
Trichlorofluoromethane	ND (0.0045)		8260B Low		1	10/25/17 18:48	C7J0389	CJ72515
Vinyl Acetate	ND (0.0045)		8260B Low		1	10/25/17 18:48	C7J0389	CJ72515
Vinyl Chloride	ND (0.0090)		8260B Low		1	10/25/17 18:48	C7J0389	CJ72515
Xylene O	ND (0.0045)		8260B Low		1	10/25/17 18:48	C7J0389	CJ72515
Xylene P,M	ND (0.0090)		8260B Low		1	10/25/17 18:48	C7J0389	CJ72515
Xylenes (Total)	ND (0.0090)		8260B Low		1	10/25/17 18:48		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	92 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	89 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	90 %		70-130
<i>Surrogate: Toluene-d8</i>	102 %		70-130

*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-BK-501 2-4ft  
 Date Sampled: 10/24/17 09:30  
 Percent Solids: 95  
 Initial Volume: 16  
 Final Volume: 15  
 Extraction Method: 5035

ESS Laboratory Work Order: 1710601  
 ESS Laboratory Sample ID: 1710601-01  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MD

**5035/8260B Volatile Organic Compounds / Methanol**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.206)	0.0206	8260B		1	10/27/17 13:45	C7J0424	CJ72721
1,1,1-Trichloroethane	ND (0.206)	0.0412	8260B		1	10/27/17 13:45	C7J0424	CJ72721
1,1,2,2-Tetrachloroethane	ND (0.206)	0.0206	8260B		1	10/27/17 13:45	C7J0424	CJ72721
1,1,2-Trichloroethane	ND (0.206)	0.0412	8260B		1	10/27/17 13:45	C7J0424	CJ72721
1,1-Dichloroethane	ND (0.206)	0.0412	8260B		1	10/27/17 13:45	C7J0424	CJ72721
1,1-Dichloroethene	ND (0.206)	0.0618	8260B		1	10/27/17 13:45	C7J0424	CJ72721
1,1-Dichloropropene	ND (0.206)	0.0412	8260B		1	10/27/17 13:45	C7J0424	CJ72721
1,2,3-Trichlorobenzene	ND (0.206)	0.0412	8260B		1	10/27/17 13:45	C7J0424	CJ72721
1,2,3-Trichloropropane	ND (0.206)	0.0618	8260B		1	10/27/17 13:45	C7J0424	CJ72721
1,2,4-Trichlorobenzene	ND (0.206)	0.0412	8260B		1	10/27/17 13:45	C7J0424	CJ72721
<b>1,2,4-Trimethylbenzene</b>	<b>J 0.136</b> (0.206)	0.0206	8260B		1	10/27/17 13:45	C7J0424	CJ72721
1,2-Dibromo-3-Chloropropane	ND (1.03)	0.206	8260B		1	10/27/17 13:45	C7J0424	CJ72721
1,2-Dibromoethane	ND (0.206)	0.0412	8260B		1	10/27/17 13:45	C7J0424	CJ72721
1,2-Dichlorobenzene	ND (0.206)	0.0206	8260B		1	10/27/17 13:45	C7J0424	CJ72721
1,2-Dichloroethane	ND (0.206)	0.0412	8260B		1	10/27/17 13:45	C7J0424	CJ72721
1,2-Dichloropropane	ND (0.206)	0.0412	8260B		1	10/27/17 13:45	C7J0424	CJ72721
<b>1,3,5-Trimethylbenzene</b>	<b>J 0.0536</b> (0.206)	0.0206	8260B		1	10/27/17 13:45	C7J0424	CJ72721
1,3-Dichlorobenzene	ND (0.206)	0.0412	8260B		1	10/27/17 13:45	C7J0424	CJ72721
1,3-Dichloropropane	ND (0.206)	0.0206	8260B		1	10/27/17 13:45	C7J0424	CJ72721
1,4-Dichlorobenzene	ND (0.206)	0.0206	8260B		1	10/27/17 13:45	C7J0424	CJ72721
1,4-Dioxane - Screen	ND (41.2)	39.1	8260B		1	10/27/17 13:45	C7J0424	CJ72721
1-Chlorohexane	ND (0.206)	0.0824	8260B		1	10/27/17 13:45	C7J0424	CJ72721
2,2-Dichloropropane	ND (0.206)	0.0618	8260B		1	10/27/17 13:45	C7J0424	CJ72721
2-Butanone	ND (1.03)	0.700	8260B		1	10/27/17 13:45	C7J0424	CJ72721
2-Chlorotoluene	ND (0.206)	0.0206	8260B		1	10/27/17 13:45	C7J0424	CJ72721
2-Hexanone	ND (1.03)	0.309	8260B		1	10/27/17 13:45	C7J0424	CJ72721
4-Chlorotoluene	ND (0.206)	0.0206	8260B		1	10/27/17 13:45	C7J0424	CJ72721
4-Isopropyltoluene	ND (0.206)	0.0206	8260B		1	10/27/17 13:45	C7J0424	CJ72721
4-Methyl-2-Pentanone	ND (1.03)	0.330	8260B		1	10/27/17 13:45	C7J0424	CJ72721
Acetone	ND (1.03)	0.556	8260B		1	10/27/17 13:45	C7J0424	CJ72721
<b>Benzene</b>	<b>0.272</b> (0.206)	0.0206	8260B		1	10/27/17 13:45	C7J0424	CJ72721
Bromobenzene	ND (0.206)	0.0412	8260B		1	10/27/17 13:45	C7J0424	CJ72721



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-BK-501 2-4ft  
 Date Sampled: 10/24/17 09:30  
 Percent Solids: 95  
 Initial Volume: 16  
 Final Volume: 15  
 Extraction Method: 5035

ESS Laboratory Work Order: 1710601  
 ESS Laboratory Sample ID: 1710601-01  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MD

**5035/8260B Volatile Organic Compounds / Methanol**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.206)	0.0618	8260B		1	10/27/17 13:45	C7J0424	CJ72721
Bromodichloromethane	ND (0.206)	0.0206	8260B		1	10/27/17 13:45	C7J0424	CJ72721
Bromoform	ND (0.206)	0.0412	8260B		1	10/27/17 13:45	C7J0424	CJ72721
Bromomethane	ND (0.206)	0.0824	8260B		1	10/27/17 13:45	C7J0424	CJ72721
Carbon Disulfide	ND (0.206)	0.0206	8260B		1	10/27/17 13:45	C7J0424	CJ72721
Carbon Tetrachloride	ND (0.206)	0.0206	8260B		1	10/27/17 13:45	C7J0424	CJ72721
Chlorobenzene	ND (0.206)	0.0206	8260B		1	10/27/17 13:45	C7J0424	CJ72721
Chloroethane	ND (0.206)	0.0824	8260B		1	10/27/17 13:45	C7J0424	CJ72721
Chloroform	ND (0.206)	0.0412	8260B		1	10/27/17 13:45	C7J0424	CJ72721
Chloromethane	ND (0.206)	0.0206	8260B		1	10/27/17 13:45	C7J0424	CJ72721
cis-1,2-Dichloroethene	ND (0.206)	0.0412	8260B		1	10/27/17 13:45	C7J0424	CJ72721
cis-1,3-Dichloropropene	ND (0.206)	0.0618	8260B		1	10/27/17 13:45	C7J0424	CJ72721
Dibromochloromethane	ND (0.206)	0.0412	8260B		1	10/27/17 13:45	C7J0424	CJ72721
Dibromomethane	ND (0.206)	0.0618	8260B		1	10/27/17 13:45	C7J0424	CJ72721
Dichlorodifluoromethane	ND (0.206)	0.0618	8260B		1	10/27/17 13:45	C7J0424	CJ72721
Diethyl Ether	ND (0.206)	0.0618	8260B		1	10/27/17 13:45	C7J0424	CJ72721
Di-isopropyl ether	ND (0.206)	0.0412	8260B		1	10/27/17 13:45	C7J0424	CJ72721
Ethyl tertiary-butyl ether	ND (0.206)	0.0206	8260B		1	10/27/17 13:45	C7J0424	CJ72721
<b>Ethylbenzene</b>	<b>J 0.0309</b> (0.206)	0.0206	8260B		1	10/27/17 13:45	C7J0424	CJ72721
Hexachlorobutadiene	ND (0.206)	0.0412	8260B		1	10/27/17 13:45	C7J0424	CJ72721
Isopropylbenzene	ND (0.206)	0.0206	8260B		1	10/27/17 13:45	C7J0424	CJ72721
Methyl tert-Butyl Ether	ND (0.206)	0.0618	8260B		1	10/27/17 13:45	C7J0424	CJ72721
Methylene Chloride	ND (0.412)	0.0412	8260B		1	10/27/17 13:45	C7J0424	CJ72721
<b>Naphthalene</b>	<b>9.73</b> (0.206)	0.0412	8260B		1	10/27/17 13:45	C7J0424	CJ72721
n-Butylbenzene	ND (0.206)	0.0206	8260B		1	10/27/17 13:45	C7J0424	CJ72721
n-Propylbenzene	ND (0.206)	0.0412	8260B		1	10/27/17 13:45	C7J0424	CJ72721
sec-Butylbenzene	ND (0.206)	0.0206	8260B		1	10/27/17 13:45	C7J0424	CJ72721
<b>Styrene</b>	<b>J 0.0865</b> (0.206)	0.0206	8260B		1	10/27/17 13:45	C7J0424	CJ72721
tert-Butylbenzene	ND (0.206)	0.0206	8260B		1	10/27/17 13:45	C7J0424	CJ72721
Tertiary-amyl methyl ether	ND (0.206)	0.0412	8260B		1	10/27/17 13:45	C7J0424	CJ72721
Tetrachloroethene	ND (0.206)	0.0412	8260B		1	10/27/17 13:45	C7J0424	CJ72721
Tetrahydrofuran	ND (1.03)	0.330	8260B		1	10/27/17 13:45	C7J0424	CJ72721



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-BK-501 2-4ft  
 Date Sampled: 10/24/17 09:30  
 Percent Solids: 95  
 Initial Volume: 16  
 Final Volume: 15  
 Extraction Method: 5035

ESS Laboratory Work Order: 1710601  
 ESS Laboratory Sample ID: 1710601-01  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MD

**5035/8260B Volatile Organic Compounds / Methanol**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
<b>Toluene</b>	<b>0.410</b> (0.206)	0.0206	8260B		1	10/27/17 13:45	C7J0424	CJ72721
trans-1,2-Dichloroethene	ND (0.206)	0.0618	8260B		1	10/27/17 13:45	C7J0424	CJ72721
trans-1,3-Dichloropropene	ND (0.206)	0.0412	8260B		1	10/27/17 13:45	C7J0424	CJ72721
Trichloroethene	ND (0.206)	0.0412	8260B		1	10/27/17 13:45	C7J0424	CJ72721
Trichlorofluoromethane	ND (0.206)	0.0824	8260B		1	10/27/17 13:45	C7J0424	CJ72721
Vinyl Acetate	ND (0.206)	0.103	8260B		1	10/27/17 13:45	C7J0424	CJ72721
Vinyl Chloride	ND (0.206)	0.0412	8260B		1	10/27/17 13:45	C7J0424	CJ72721
<b>Xylene O</b>	<b>J 0.138</b> (0.206)	0.0206	8260B		1	10/27/17 13:45	C7J0424	CJ72721
<b>Xylene P,M</b>	<b>J 0.290</b> (0.412)	0.0412	8260B		1	10/27/17 13:45	C7J0424	CJ72721
<b>Xylenes (Total)</b>	<b>0.429</b> (0.412)		8260B		1	10/27/17 13:45		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	114 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	101 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	118 %		70-130
<i>Surrogate: Toluene-d8</i>	102 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-BK-501 2-4ft  
 Date Sampled: 10/24/17 09:30  
 Percent Solids: 95  
 Initial Volume: 15.1  
 Final Volume: 1  
 Extraction Method: 3546

ESS Laboratory Work Order: 1710601  
 ESS Laboratory Sample ID: 1710601-01  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: TJ  
 Prepared: 10/25/17 12:45

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Naphthalene	87.9 (13.9)		8270D		20	10/26/17 17:54	C7J0379	CJ72508

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	51 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	49 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	30 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	38 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: TB-102417  
 Date Sampled: 10/24/17 00:00  
 Percent Solids: N/A  
 Initial Volume: 5  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1710601  
 ESS Laboratory Sample ID: 1710601-02  
 Sample Matrix: Solid  
 Units: mg/kg wet  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0050)		8260B Low		1	10/25/17 14:59	C7J0389	CJ72515
1,1,1-Trichloroethane	ND (0.0050)		8260B Low		1	10/25/17 14:59	C7J0389	CJ72515
1,1,2,2-Tetrachloroethane	ND (0.0050)		8260B Low		1	10/25/17 14:59	C7J0389	CJ72515
1,1,2-Trichloroethane	ND (0.0050)		8260B Low		1	10/25/17 14:59	C7J0389	CJ72515
1,1-Dichloroethane	ND (0.0050)		8260B Low		1	10/25/17 14:59	C7J0389	CJ72515
1,1-Dichloroethene	ND (0.0050)		8260B Low		1	10/25/17 14:59	C7J0389	CJ72515
1,1-Dichloropropene	ND (0.0050)		8260B Low		1	10/25/17 14:59	C7J0389	CJ72515
1,2,3-Trichlorobenzene	ND (0.0050)		8260B Low		1	10/25/17 14:59	C7J0389	CJ72515
1,2,3-Trichloropropane	ND (0.0050)		8260B Low		1	10/25/17 14:59	C7J0389	CJ72515
1,2,4-Trichlorobenzene	ND (0.0050)		8260B Low		1	10/25/17 14:59	C7J0389	CJ72515
1,2,4-Trimethylbenzene	ND (0.0050)		8260B Low		1	10/25/17 14:59	C7J0389	CJ72515
1,2-Dibromo-3-Chloropropane	ND (0.0050)		8260B Low		1	10/25/17 14:59	C7J0389	CJ72515
1,2-Dibromoethane	ND (0.0050)		8260B Low		1	10/25/17 14:59	C7J0389	CJ72515
1,2-Dichlorobenzene	ND (0.0050)		8260B Low		1	10/25/17 14:59	C7J0389	CJ72515
1,2-Dichloroethane	ND (0.0050)		8260B Low		1	10/25/17 14:59	C7J0389	CJ72515
1,2-Dichloropropane	ND (0.0050)		8260B Low		1	10/25/17 14:59	C7J0389	CJ72515
1,3,5-Trimethylbenzene	ND (0.0050)		8260B Low		1	10/25/17 14:59	C7J0389	CJ72515
1,3-Dichlorobenzene	ND (0.0050)		8260B Low		1	10/25/17 14:59	C7J0389	CJ72515
1,3-Dichloropropane	ND (0.0050)		8260B Low		1	10/25/17 14:59	C7J0389	CJ72515
1,4-Dichlorobenzene	ND (0.0050)		8260B Low		1	10/25/17 14:59	C7J0389	CJ72515
1,4-Dioxane	ND (0.100)		8260B Low		1	10/25/17 14:59	C7J0389	CJ72515
1-Chlorohexane	ND (0.0050)		8260B Low		1	10/25/17 14:59	C7J0389	CJ72515
2,2-Dichloropropane	ND (0.0050)		8260B Low		1	10/25/17 14:59	C7J0389	CJ72515
2-Butanone	ND (0.0500)		8260B Low		1	10/25/17 14:59	C7J0389	CJ72515
2-Chlorotoluene	ND (0.0050)		8260B Low		1	10/25/17 14:59	C7J0389	CJ72515
2-Hexanone	ND (0.0500)		8260B Low		1	10/25/17 14:59	C7J0389	CJ72515
4-Chlorotoluene	ND (0.0050)		8260B Low		1	10/25/17 14:59	C7J0389	CJ72515
4-Isopropyltoluene	ND (0.0050)		8260B Low		1	10/25/17 14:59	C7J0389	CJ72515
4-Methyl-2-Pentanone	ND (0.0500)		8260B Low		1	10/25/17 14:59	C7J0389	CJ72515
Acetone	ND (0.0500)		8260B Low		1	10/25/17 14:59	C7J0389	CJ72515
Benzene	ND (0.0050)		8260B Low		1	10/25/17 14:59	C7J0389	CJ72515
Bromobenzene	ND (0.0050)		8260B Low		1	10/25/17 14:59	C7J0389	CJ72515





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: TB-102417  
Date Sampled: 10/24/17 00:00  
Percent Solids: N/A  
Initial Volume: 5  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710601  
ESS Laboratory Sample ID: 1710601-02  
Sample Matrix: Solid  
Units: mg/kg wet  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0050)		8260B Low		1	10/25/17 14:59	C7J0389	CJ72515
Bromodichloromethane	ND (0.0050)		8260B Low		1	10/25/17 14:59	C7J0389	CJ72515
Bromoform	ND (0.0050)		8260B Low		1	10/25/17 14:59	C7J0389	CJ72515
Bromomethane	ND (0.0100)		8260B Low		1	10/25/17 14:59	C7J0389	CJ72515
Carbon Disulfide	ND (0.0050)		8260B Low		1	10/25/17 14:59	C7J0389	CJ72515
Carbon Tetrachloride	ND (0.0050)		8260B Low		1	10/25/17 14:59	C7J0389	CJ72515
Chlorobenzene	ND (0.0050)		8260B Low		1	10/25/17 14:59	C7J0389	CJ72515
Chloroethane	ND (0.0100)		8260B Low		1	10/25/17 14:59	C7J0389	CJ72515
Chloroform	ND (0.0050)		8260B Low		1	10/25/17 14:59	C7J0389	CJ72515
Chloromethane	ND (0.0100)		8260B Low		1	10/25/17 14:59	C7J0389	CJ72515
cis-1,2-Dichloroethene	ND (0.0050)		8260B Low		1	10/25/17 14:59	C7J0389	CJ72515
cis-1,3-Dichloropropene	ND (0.0050)		8260B Low		1	10/25/17 14:59	C7J0389	CJ72515
Dibromochloromethane	ND (0.0050)		8260B Low		1	10/25/17 14:59	C7J0389	CJ72515
Dibromomethane	ND (0.0050)		8260B Low		1	10/25/17 14:59	C7J0389	CJ72515
Dichlorodifluoromethane	ND (0.0100)		8260B Low		1	10/25/17 14:59	C7J0389	CJ72515
Diethyl Ether	ND (0.0050)		8260B Low		1	10/25/17 14:59	C7J0389	CJ72515
Di-isopropyl ether	ND (0.0050)		8260B Low		1	10/25/17 14:59	C7J0389	CJ72515
Ethyl tertiary-butyl ether	ND (0.0050)		8260B Low		1	10/25/17 14:59	C7J0389	CJ72515
Ethylbenzene	ND (0.0050)		8260B Low		1	10/25/17 14:59	C7J0389	CJ72515
Hexachlorobutadiene	ND (0.0050)		8260B Low		1	10/25/17 14:59	C7J0389	CJ72515
Isopropylbenzene	ND (0.0050)		8260B Low		1	10/25/17 14:59	C7J0389	CJ72515
Methyl tert-Butyl Ether	ND (0.0050)		8260B Low		1	10/25/17 14:59	C7J0389	CJ72515
Methylene Chloride	ND (0.0250)		8260B Low		1	10/25/17 14:59	C7J0389	CJ72515
Naphthalene	ND (0.0050)		8260B Low		1	10/25/17 14:59	C7J0389	CJ72515
n-Butylbenzene	ND (0.0050)		8260B Low		1	10/25/17 14:59	C7J0389	CJ72515
n-Propylbenzene	ND (0.0050)		8260B Low		1	10/25/17 14:59	C7J0389	CJ72515
sec-Butylbenzene	ND (0.0050)		8260B Low		1	10/25/17 14:59	C7J0389	CJ72515
Styrene	ND (0.0050)		8260B Low		1	10/25/17 14:59	C7J0389	CJ72515
tert-Butylbenzene	ND (0.0050)		8260B Low		1	10/25/17 14:59	C7J0389	CJ72515
Tertiary-amyl methyl ether	ND (0.0050)		8260B Low		1	10/25/17 14:59	C7J0389	CJ72515
Tetrachloroethene	ND (0.0050)		8260B Low		1	10/25/17 14:59	C7J0389	CJ72515
Tetrahydrofuran	ND (0.0050)		8260B Low		1	10/25/17 14:59	C7J0389	CJ72515



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: TB-102417  
 Date Sampled: 10/24/17 00:00  
 Percent Solids: N/A  
 Initial Volume: 5  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1710601  
 ESS Laboratory Sample ID: 1710601-02  
 Sample Matrix: Solid  
 Units: mg/kg wet  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0050)		8260B Low		1	10/25/17 14:59	C7J0389	CJ72515
trans-1,2-Dichloroethene	ND (0.0050)		8260B Low		1	10/25/17 14:59	C7J0389	CJ72515
trans-1,3-Dichloropropene	ND (0.0050)		8260B Low		1	10/25/17 14:59	C7J0389	CJ72515
Trichloroethene	ND (0.0050)		8260B Low		1	10/25/17 14:59	C7J0389	CJ72515
Trichlorofluoromethane	ND (0.0050)		8260B Low		1	10/25/17 14:59	C7J0389	CJ72515
Vinyl Acetate	ND (0.0050)		8260B Low		1	10/25/17 14:59	C7J0389	CJ72515
Vinyl Chloride	ND (0.0100)		8260B Low		1	10/25/17 14:59	C7J0389	CJ72515
Xylene O	ND (0.0050)		8260B Low		1	10/25/17 14:59	C7J0389	CJ72515
Xylene P,M	ND (0.0100)		8260B Low		1	10/25/17 14:59	C7J0389	CJ72515
Xylenes (Total)	ND (0.0100)		8260B Low		1	10/25/17 14:59		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	79 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	89 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	79 %		70-130
<i>Surrogate: Toluene-d8</i>	101 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710601

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CJ72515 - 5035**

**Blank**

1,1,1,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,1-Trichloroethane	ND	0.0050	mg/kg wet							
1,1,2,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,2-Trichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethene	ND	0.0050	mg/kg wet							
1,1-Dichloropropene	ND	0.0050	mg/kg wet							
1,2,3-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,3-Trichloropropane	ND	0.0050	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,4-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,2-Dibromo-3-Chloropropane	ND	0.0050	mg/kg wet							
1,2-Dibromoethane	ND	0.0050	mg/kg wet							
1,2-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,2-Dichloroethane	ND	0.0050	mg/kg wet							
1,2-Dichloropropane	ND	0.0050	mg/kg wet							
1,3,5-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,3-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,3-Dichloropropane	ND	0.0050	mg/kg wet							
1,4-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,4-Dioxane	ND	0.100	mg/kg wet							
1-Chlorohexane	ND	0.0050	mg/kg wet							
2,2-Dichloropropane	ND	0.0050	mg/kg wet							
2-Butanone	ND	0.0500	mg/kg wet							
2-Chlorotoluene	ND	0.0050	mg/kg wet							
2-Hexanone	ND	0.0500	mg/kg wet							
4-Chlorotoluene	ND	0.0050	mg/kg wet							
4-Isopropyltoluene	ND	0.0050	mg/kg wet							
4-Methyl-2-Pentanone	ND	0.0500	mg/kg wet							
Acetone	ND	0.0500	mg/kg wet							
Benzene	ND	0.0050	mg/kg wet							
Bromobenzene	ND	0.0050	mg/kg wet							
Bromochloromethane	ND	0.0050	mg/kg wet							
Bromodichloromethane	ND	0.0050	mg/kg wet							
Bromoform	ND	0.0050	mg/kg wet							
Bromomethane	ND	0.0100	mg/kg wet							
Carbon Disulfide	ND	0.0050	mg/kg wet							
Carbon Tetrachloride	ND	0.0050	mg/kg wet							
Chlorobenzene	ND	0.0050	mg/kg wet							
Chloroethane	ND	0.0100	mg/kg wet							
Chloroform	ND	0.0050	mg/kg wet							
Chloromethane	ND	0.0100	mg/kg wet							
cis-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
cis-1,3-Dichloropropene	ND	0.0050	mg/kg wet							



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710601

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CJ72515 - 5035**

Dibromochloromethane	ND	0.0050	mg/kg wet							
Dibromomethane	ND	0.0050	mg/kg wet							
Dichlorodifluoromethane	ND	0.0100	mg/kg wet							
Diethyl Ether	ND	0.0050	mg/kg wet							
Di-isopropyl ether	ND	0.0050	mg/kg wet							
Ethyl tertiary-butyl ether	ND	0.0050	mg/kg wet							
Ethylbenzene	ND	0.0050	mg/kg wet							
Hexachlorobutadiene	ND	0.0050	mg/kg wet							
Isopropylbenzene	ND	0.0050	mg/kg wet							
Methyl tert-Butyl Ether	ND	0.0050	mg/kg wet							
Methylene Chloride	ND	0.0250	mg/kg wet							
Naphthalene	ND	0.0050	mg/kg wet							
n-Butylbenzene	ND	0.0050	mg/kg wet							
n-Propylbenzene	ND	0.0050	mg/kg wet							
sec-Butylbenzene	ND	0.0050	mg/kg wet							
Styrene	ND	0.0050	mg/kg wet							
tert-Butylbenzene	ND	0.0050	mg/kg wet							
Tertiary-amyl methyl ether	ND	0.0050	mg/kg wet							
Tetrachloroethene	ND	0.0050	mg/kg wet							
Tetrahydrofuran	ND	0.0050	mg/kg wet							
Toluene	ND	0.0050	mg/kg wet							
trans-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
trans-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Trichloroethene	ND	0.0050	mg/kg wet							
Trichlorofluoromethane	ND	0.0050	mg/kg wet							
Vinyl Acetate	ND	0.0050	mg/kg wet							
Vinyl Chloride	ND	0.0100	mg/kg wet							
Xylene O	ND	0.0050	mg/kg wet							
Xylene P,M	ND	0.0100	mg/kg wet							
Xylenes (Total)	ND	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	0.0389		mg/kg wet	0.05000		78	70-130			
Surrogate: 4-Bromofluorobenzene	0.0449		mg/kg wet	0.05000		90	70-130			
Surrogate: Dibromofluoromethane	0.0391		mg/kg wet	0.05000		78	70-130			
Surrogate: Toluene-d8	0.0507		mg/kg wet	0.05000		101	70-130			

**LCS**

1,1,1,2-Tetrachloroethane	0.0412	0.0050	mg/kg wet	0.05000		82	70-130			
1,1,1-Trichloroethane	0.0383	0.0050	mg/kg wet	0.05000		77	70-130			
1,1,2,2-Tetrachloroethane	0.0465	0.0050	mg/kg wet	0.05000		93	70-130			
1,1,2-Trichloroethane	0.0426	0.0050	mg/kg wet	0.05000		85	70-130			
1,1-Dichloroethane	0.0401	0.0050	mg/kg wet	0.05000		80	70-130			
1,1-Dichloroethene	0.0438	0.0050	mg/kg wet	0.05000		88	70-130			
1,1-Dichloropropene	0.0424	0.0050	mg/kg wet	0.05000		85	70-130			
1,2,3-Trichlorobenzene	0.0468	0.0050	mg/kg wet	0.05000		94	70-130			
1,2,3-Trichloropropane	0.0453	0.0050	mg/kg wet	0.05000		91	70-130			
1,2,4-Trichlorobenzene	0.0474	0.0050	mg/kg wet	0.05000		95	70-130			



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710601

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CJ72515 - 5035**

1,2,4-Trimethylbenzene	0.0496	0.0050	mg/kg wet	0.05000		99	70-130			
1,2-Dibromo-3-Chloropropane	0.0377	0.0050	mg/kg wet	0.05000		75	70-130			
1,2-Dibromoethane	0.0477	0.0050	mg/kg wet	0.05000		95	70-130			
1,2-Dichlorobenzene	0.0479	0.0050	mg/kg wet	0.05000		96	70-130			
1,2-Dichloroethane	0.0395	0.0050	mg/kg wet	0.05000		79	70-130			
1,2-Dichloropropane	0.0431	0.0050	mg/kg wet	0.05000		86	70-130			
1,3,5-Trimethylbenzene	0.0483	0.0050	mg/kg wet	0.05000		97	70-130			
1,3-Dichlorobenzene	0.0470	0.0050	mg/kg wet	0.05000		94	70-130			
1,3-Dichloropropane	0.0480	0.0050	mg/kg wet	0.05000		96	70-130			
1,4-Dichlorobenzene	0.0479	0.0050	mg/kg wet	0.05000		96	70-130			
1,4-Dioxane	0.909	0.100	mg/kg wet	1.000		91	70-130			
1-Chlorohexane	0.0482	0.0050	mg/kg wet	0.05000		96	70-130			
2,2-Dichloropropane	0.0359	0.0050	mg/kg wet	0.05000		72	70-130			
2-Butanone	0.218	0.0500	mg/kg wet	0.2500		87	70-130			
2-Chlorotoluene	0.0466	0.0050	mg/kg wet	0.05000		93	70-130			
2-Hexanone	0.224	0.0500	mg/kg wet	0.2500		89	70-130			
4-Chlorotoluene	0.0470	0.0050	mg/kg wet	0.05000		94	70-130			
4-Isopropyltoluene	0.0480	0.0050	mg/kg wet	0.05000		96	70-130			
4-Methyl-2-Pentanone	0.209	0.0500	mg/kg wet	0.2500		84	70-130			
Acetone	0.217	0.0500	mg/kg wet	0.2500		87	70-130			
Benzene	0.0420	0.0050	mg/kg wet	0.05000		84	70-130			
Bromobenzene	0.0488	0.0050	mg/kg wet	0.05000		98	70-130			
Bromochloromethane	0.0414	0.0050	mg/kg wet	0.05000		83	70-130			
Bromodichloromethane	0.0399	0.0050	mg/kg wet	0.05000		80	70-130			
Bromoform	0.0358	0.0050	mg/kg wet	0.05000		72	70-130			
Bromomethane	0.0372	0.0100	mg/kg wet	0.05000		74	70-130			
Carbon Disulfide	0.0430	0.0050	mg/kg wet	0.05000		86	70-130			
Carbon Tetrachloride	0.0355	0.0050	mg/kg wet	0.05000		71	70-130			
Chlorobenzene	0.0451	0.0050	mg/kg wet	0.05000		90	70-130			
Chloroethane	0.0405	0.0100	mg/kg wet	0.05000		81	70-130			
Chloroform	0.0394	0.0050	mg/kg wet	0.05000		79	70-130			
Chloromethane	0.0378	0.0100	mg/kg wet	0.05000		76	70-130			
cis-1,2-Dichloroethene	0.0422	0.0050	mg/kg wet	0.05000		84	70-130			
cis-1,3-Dichloropropene	0.0440	0.0050	mg/kg wet	0.05000		88	70-130			
Dibromochloromethane	0.0397	0.0050	mg/kg wet	0.05000		79	70-130			
Dibromomethane	0.0401	0.0050	mg/kg wet	0.05000		80	70-130			
Dichlorodifluoromethane	0.0273	0.0100	mg/kg wet	0.05000		55	70-130			
Diethyl Ether	0.0455	0.0050	mg/kg wet	0.05000		91	70-130			
Di-isopropyl ether	0.0430	0.0050	mg/kg wet	0.05000		86	70-130			
Ethyl tertiary-butyl ether	0.0441	0.0050	mg/kg wet	0.05000		88	70-130			
Ethylbenzene	0.0457	0.0050	mg/kg wet	0.05000		91	70-130			
Hexachlorobutadiene	0.0459	0.0050	mg/kg wet	0.05000		92	70-130			
Isopropylbenzene	0.0467	0.0050	mg/kg wet	0.05000		93	70-130			
Methyl tert-Butyl Ether	0.0445	0.0050	mg/kg wet	0.05000		89	70-130			
Methylene Chloride	0.0433	0.0250	mg/kg wet	0.05000		87	70-130			

B-



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710601

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CJ72515 - 5035**

Naphthalene	0.0434	0.0050	mg/kg wet	0.05000		87	70-130			
n-Butylbenzene	0.0476	0.0050	mg/kg wet	0.05000		95	70-130			
n-Propylbenzene	0.0486	0.0050	mg/kg wet	0.05000		97	70-130			
sec-Butylbenzene	0.0475	0.0050	mg/kg wet	0.05000		95	70-130			
Styrene	0.0467	0.0050	mg/kg wet	0.05000		93	70-130			
tert-Butylbenzene	0.0483	0.0050	mg/kg wet	0.05000		97	70-130			
Tertiary-amyl methyl ether	0.0439	0.0050	mg/kg wet	0.05000		88	70-130			
Tetrachloroethene	0.0466	0.0050	mg/kg wet	0.05000		93	70-130			
Tetrahydrofuran	0.0426	0.0050	mg/kg wet	0.05000		85	70-130			
Toluene	0.0420	0.0050	mg/kg wet	0.05000		84	70-130			
trans-1,2-Dichloroethene	0.0438	0.0050	mg/kg wet	0.05000		88	70-130			
trans-1,3-Dichloropropene	0.0380	0.0050	mg/kg wet	0.05000		76	70-130			
Trichloroethene	0.0418	0.0050	mg/kg wet	0.05000		84	70-130			
Trichlorofluoromethane	0.0372	0.0050	mg/kg wet	0.05000		74	70-130			
Vinyl Acetate	0.0389	0.0050	mg/kg wet	0.05000		78	70-130			
Vinyl Chloride	0.0391	0.0100	mg/kg wet	0.05000		78	70-130			
Xylene O	0.0475	0.0050	mg/kg wet	0.05000		95	70-130			
Xylene P,M	0.0951	0.0100	mg/kg wet	0.1000		95	70-130			
Xylenes (Total)	0.143	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	0.0436		mg/kg wet	0.05000		87	70-130			
Surrogate: 4-Bromofluorobenzene	0.0501		mg/kg wet	0.05000		100	70-130			
Surrogate: Dibromofluoromethane	0.0456		mg/kg wet	0.05000		91	70-130			
Surrogate: Toluene-d8	0.0530		mg/kg wet	0.05000		106	70-130			

**LCS Dup**

1,1,1,2-Tetrachloroethane	0.0459	0.0050	mg/kg wet	0.05000		92	70-130	11	25	
1,1,1-Trichloroethane	0.0422	0.0050	mg/kg wet	0.05000		84	70-130	10	25	
1,1,2,2-Tetrachloroethane	0.0515	0.0050	mg/kg wet	0.05000		103	70-130	10	25	
1,1,2-Trichloroethane	0.0460	0.0050	mg/kg wet	0.05000		92	70-130	8	25	
1,1-Dichloroethane	0.0439	0.0050	mg/kg wet	0.05000		88	70-130	9	25	
1,1-Dichloroethene	0.0485	0.0050	mg/kg wet	0.05000		97	70-130	10	25	
1,1-Dichloropropene	0.0466	0.0050	mg/kg wet	0.05000		93	70-130	10	25	
1,2,3-Trichlorobenzene	0.0505	0.0050	mg/kg wet	0.05000		101	70-130	8	25	
1,2,3-Trichloropropane	0.0504	0.0050	mg/kg wet	0.05000		101	70-130	11	25	
1,2,4-Trichlorobenzene	0.0510	0.0050	mg/kg wet	0.05000		102	70-130	7	25	
1,2,4-Trimethylbenzene	0.0537	0.0050	mg/kg wet	0.05000		107	70-130	8	25	
1,2-Dibromo-3-Chloropropane	0.0422	0.0050	mg/kg wet	0.05000		84	70-130	11	25	
1,2-Dibromoethane	0.0540	0.0050	mg/kg wet	0.05000		108	70-130	12	25	
1,2-Dichlorobenzene	0.0520	0.0050	mg/kg wet	0.05000		104	70-130	8	25	
1,2-Dichloroethane	0.0429	0.0050	mg/kg wet	0.05000		86	70-130	8	25	
1,2-Dichloropropane	0.0465	0.0050	mg/kg wet	0.05000		93	70-130	8	25	
1,3,5-Trimethylbenzene	0.0528	0.0050	mg/kg wet	0.05000		106	70-130	9	25	
1,3-Dichlorobenzene	0.0507	0.0050	mg/kg wet	0.05000		101	70-130	7	25	
1,3-Dichloropropane	0.0537	0.0050	mg/kg wet	0.05000		107	70-130	11	25	
1,4-Dichlorobenzene	0.0515	0.0050	mg/kg wet	0.05000		103	70-130	7	25	
1,4-Dioxane	1.02	0.100	mg/kg wet	1.000		102	70-130	12	20	





CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710601

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CJ72515 - 5035**

1-Chlorohexane	0.0549	0.0050	mg/kg wet	0.05000		110	70-130	13	25	
2,2-Dichloropropane	0.0390	0.0050	mg/kg wet	0.05000		78	70-130	8	25	
2-Butanone	0.242	0.0500	mg/kg wet	0.2500		97	70-130	10	25	
2-Chlorotoluene	0.0510	0.0050	mg/kg wet	0.05000		102	70-130	9	25	
2-Hexanone	0.264	0.0500	mg/kg wet	0.2500		105	70-130	16	25	
4-Chlorotoluene	0.0513	0.0050	mg/kg wet	0.05000		103	70-130	9	25	
4-Isopropyltoluene	0.0520	0.0050	mg/kg wet	0.05000		104	70-130	8	25	
4-Methyl-2-Pentanone	0.237	0.0500	mg/kg wet	0.2500		95	70-130	13	25	
Acetone	0.241	0.0500	mg/kg wet	0.2500		96	70-130	10	25	
Benzene	0.0454	0.0050	mg/kg wet	0.05000		91	70-130	8	25	
Bromobenzene	0.0527	0.0050	mg/kg wet	0.05000		105	70-130	8	25	
Bromochloromethane	0.0447	0.0050	mg/kg wet	0.05000		89	70-130	8	25	
Bromodichloromethane	0.0435	0.0050	mg/kg wet	0.05000		87	70-130	9	25	
Bromoform	0.0408	0.0050	mg/kg wet	0.05000		82	70-130	13	25	
Bromomethane	0.0413	0.0100	mg/kg wet	0.05000		83	70-130	10	25	
Carbon Disulfide	0.0471	0.0050	mg/kg wet	0.05000		94	70-130	9	25	
Carbon Tetrachloride	0.0396	0.0050	mg/kg wet	0.05000		79	70-130	11	25	
Chlorobenzene	0.0506	0.0050	mg/kg wet	0.05000		101	70-130	11	25	
Chloroethane	0.0442	0.0100	mg/kg wet	0.05000		88	70-130	9	25	
Chloroform	0.0428	0.0050	mg/kg wet	0.05000		86	70-130	8	25	
Chloromethane	0.0417	0.0100	mg/kg wet	0.05000		83	70-130	10	25	
cis-1,2-Dichloroethene	0.0461	0.0050	mg/kg wet	0.05000		92	70-130	9	25	
cis-1,3-Dichloropropene	0.0478	0.0050	mg/kg wet	0.05000		96	70-130	8	25	
Dibromochloromethane	0.0447	0.0050	mg/kg wet	0.05000		89	70-130	12	25	
Dibromomethane	0.0435	0.0050	mg/kg wet	0.05000		87	70-130	8	25	
Dichlorodifluoromethane	0.0303	0.0100	mg/kg wet	0.05000		61	70-130	10	25	
Diethyl Ether	0.0497	0.0050	mg/kg wet	0.05000		99	70-130	9	25	B-
Di-isopropyl ether	0.0465	0.0050	mg/kg wet	0.05000		93	70-130	8	25	
Ethyl tertiary-butyl ether	0.0476	0.0050	mg/kg wet	0.05000		95	70-130	8	25	
Ethylbenzene	0.0516	0.0050	mg/kg wet	0.05000		103	70-130	12	25	
Hexachlorobutadiene	0.0505	0.0050	mg/kg wet	0.05000		101	70-130	10	25	
Isopropylbenzene	0.0510	0.0050	mg/kg wet	0.05000		102	70-130	9	25	
Methyl tert-Butyl Ether	0.0487	0.0050	mg/kg wet	0.05000		97	70-130	9	25	
Methylene Chloride	0.0469	0.0250	mg/kg wet	0.05000		94	70-130	8	25	
Naphthalene	0.0479	0.0050	mg/kg wet	0.05000		96	70-130	10	25	
n-Butylbenzene	0.0519	0.0050	mg/kg wet	0.05000		104	70-130	9	25	
n-Propylbenzene	0.0532	0.0050	mg/kg wet	0.05000		106	70-130	9	25	
sec-Butylbenzene	0.0520	0.0050	mg/kg wet	0.05000		104	70-130	9	25	
Styrene	0.0525	0.0050	mg/kg wet	0.05000		105	70-130	12	25	
tert-Butylbenzene	0.0533	0.0050	mg/kg wet	0.05000		107	70-130	10	25	
Tertiary-amyl methyl ether	0.0476	0.0050	mg/kg wet	0.05000		95	70-130	8	25	
Tetrachloroethene	0.0522	0.0050	mg/kg wet	0.05000		104	70-130	11	25	
Tetrahydrofuran	0.0499	0.0050	mg/kg wet	0.05000		100	70-130	16	25	
Toluene	0.0455	0.0050	mg/kg wet	0.05000		91	70-130	8	25	
trans-1,2-Dichloroethene	0.0475	0.0050	mg/kg wet	0.05000		95	70-130	8	25	



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
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ESS Laboratory Work Order: 1710601

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CJ72515 - 5035**

trans-1,3-Dichloropropene	0.0412	0.0050	mg/kg wet	0.05000		82	70-130	8	25	
Trichloroethene	0.0452	0.0050	mg/kg wet	0.05000		90	70-130	8	25	
Trichlorofluoromethane	0.0404	0.0050	mg/kg wet	0.05000		81	70-130	8	25	
Vinyl Acetate	0.0427	0.0050	mg/kg wet	0.05000		85	70-130	9	25	
Vinyl Chloride	0.0438	0.0100	mg/kg wet	0.05000		88	70-130	11	25	
Xylene O	0.0531	0.0050	mg/kg wet	0.05000		106	70-130	11	25	
Xylene P,M	0.107	0.0100	mg/kg wet	0.1000		107	70-130	12	25	
Xylenes (Total)	0.160	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	0.0437		mg/kg wet	0.05000		87	70-130			
Surrogate: 4-Bromofluorobenzene	0.0515		mg/kg wet	0.05000		103	70-130			
Surrogate: Dibromofluoromethane	0.0453		mg/kg wet	0.05000		91	70-130			
Surrogate: Toluene-d8	0.0547		mg/kg wet	0.05000		109	70-130			

5035/8260B Volatile Organic Compounds / Methanol

**Batch CJ72721 - 5035**

<b>Blank</b>										
1,1,1,2-Tetrachloroethane	ND	0.200	mg/kg wet							
1,1,1-Trichloroethane	ND	0.200	mg/kg wet							
1,1,2,2-Tetrachloroethane	ND	0.200	mg/kg wet							
1,1,2-Trichloroethane	ND	0.200	mg/kg wet							
1,1-Dichloroethane	ND	0.200	mg/kg wet							
1,1-Dichloroethene	ND	0.200	mg/kg wet							
1,1-Dichloropropene	ND	0.200	mg/kg wet							
1,2,3-Trichlorobenzene	ND	0.200	mg/kg wet							
1,2,3-Trichloropropane	ND	0.200	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.200	mg/kg wet							
1,2,4-Trimethylbenzene	ND	0.200	mg/kg wet							
1,2-Dibromo-3-Chloropropane	ND	1.00	mg/kg wet							
1,2-Dibromoethane	ND	0.200	mg/kg wet							
1,2-Dichlorobenzene	ND	0.200	mg/kg wet							
1,2-Dichloroethane	ND	0.200	mg/kg wet							
1,2-Dichloropropane	ND	0.200	mg/kg wet							
1,3,5-Trimethylbenzene	ND	0.200	mg/kg wet							
1,3-Dichlorobenzene	ND	0.200	mg/kg wet							
1,3-Dichloropropane	ND	0.200	mg/kg wet							
1,4-Dichlorobenzene	ND	0.200	mg/kg wet							
1,4-Dioxane - Screen	ND	40.0	mg/kg wet							
1-Chlorohexane	ND	0.200	mg/kg wet							
2,2-Dichloropropane	ND	0.200	mg/kg wet							
2-Butanone	ND	1.00	mg/kg wet							
2-Chlorotoluene	ND	0.200	mg/kg wet							
2-Hexanone	ND	1.00	mg/kg wet							
4-Chlorotoluene	ND	0.200	mg/kg wet							
4-Isopropyltoluene	ND	0.200	mg/kg wet							
4-Methyl-2-Pentanone	ND	1.00	mg/kg wet							



CERTIFICATE OF ANALYSIS

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ESS Laboratory Work Order: 1710601

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Methanol

**Batch CJ72721 - 5035**

Acetone	ND	1.00	mg/kg wet							
Benzene	ND	0.200	mg/kg wet							
Bromobenzene	ND	0.200	mg/kg wet							
Bromochloromethane	ND	0.200	mg/kg wet							
Bromodichloromethane	ND	0.200	mg/kg wet							
Bromoform	ND	0.200	mg/kg wet							
Bromomethane	ND	0.200	mg/kg wet							
Carbon Disulfide	ND	0.200	mg/kg wet							
Carbon Tetrachloride	ND	0.200	mg/kg wet							
Chlorobenzene	ND	0.200	mg/kg wet							
Chloroethane	ND	0.200	mg/kg wet							
Chloroform	ND	0.200	mg/kg wet							
Chloromethane	ND	0.200	mg/kg wet							
cis-1,2-Dichloroethene	ND	0.200	mg/kg wet							
cis-1,3-Dichloropropene	ND	0.200	mg/kg wet							
Dibromochloromethane	ND	0.200	mg/kg wet							
Dibromomethane	ND	0.200	mg/kg wet							
Dichlorodifluoromethane	ND	0.200	mg/kg wet							
Diethyl Ether	ND	0.200	mg/kg wet							
Di-isopropyl ether	ND	0.200	mg/kg wet							
Ethyl tertiary-butyl ether	ND	0.200	mg/kg wet							
Ethylbenzene	ND	0.200	mg/kg wet							
Hexachlorobutadiene	ND	0.200	mg/kg wet							
Isopropylbenzene	ND	0.200	mg/kg wet							
Methyl tert-Butyl Ether	ND	0.200	mg/kg wet							
Methylene Chloride	ND	0.400	mg/kg wet							
Naphthalene	ND	0.200	mg/kg wet							
n-Butylbenzene	ND	0.200	mg/kg wet							
n-Propylbenzene	ND	0.200	mg/kg wet							
sec-Butylbenzene	ND	0.200	mg/kg wet							
Styrene	ND	0.200	mg/kg wet							
tert-Butylbenzene	ND	0.200	mg/kg wet							
Tertiary-amyl methyl ether	ND	0.200	mg/kg wet							
Tetrachloroethene	ND	0.200	mg/kg wet							
Tetrahydrofuran	ND	1.00	mg/kg wet							
Toluene	ND	0.200	mg/kg wet							
trans-1,2-Dichloroethene	ND	0.200	mg/kg wet							
trans-1,3-Dichloropropene	ND	0.200	mg/kg wet							
Trichloroethene	ND	0.200	mg/kg wet							
Vinyl Acetate	ND	0.200	mg/kg wet							
Vinyl Chloride	ND	0.200	mg/kg wet							
Xylene O	ND	0.200	mg/kg wet							
Xylene P,M	ND	0.400	mg/kg wet							
Xylenes (Total)	ND	0.400	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	5.48		mg/kg wet	5.000		110	70-130			



CERTIFICATE OF ANALYSIS

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ESS Laboratory Work Order: 1710601

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Methanol

**Batch CJ72721 - 5035**

Surrogate: 4-Bromofluorobenzene	4.47		mg/kg wet	5.000		89	70-130			
Surrogate: Dibromofluoromethane	5.48		mg/kg wet	5.000		110	70-130			
Surrogate: Toluene-d8	4.42		mg/kg wet	5.000		88	70-130			

**LCS**

1,1,1,2-Tetrachloroethane	1.90	0.200	mg/kg wet	2.500		76	70-130			
1,1,1-Trichloroethane	2.01	0.200	mg/kg wet	2.500		80	70-130			
1,1,2,2-Tetrachloroethane	1.86	0.200	mg/kg wet	2.500		74	70-130			
1,1,2-Trichloroethane	2.06	0.200	mg/kg wet	2.500		83	70-130			
1,1-Dichloroethane	1.89	0.200	mg/kg wet	2.500		75	70-130			
1,1-Dichloroethene	2.05	0.200	mg/kg wet	2.500		82	70-130			
1,1-Dichloropropene	2.01	0.200	mg/kg wet	2.500		80	70-130			
1,2,3-Trichlorobenzene	2.15	0.200	mg/kg wet	2.500		86	70-130			
1,2,3-Trichloropropane	1.67	0.200	mg/kg wet	2.500		67	70-130			B-
1,2,4-Trichlorobenzene	1.99	0.200	mg/kg wet	2.500		80	70-130			
1,2,4-Trimethylbenzene	2.02	0.200	mg/kg wet	2.500		81	70-130			
1,2-Dibromo-3-Chloropropane	1.82	1.00	mg/kg wet	2.500		73	70-130			
1,2-Dibromoethane	2.12	0.200	mg/kg wet	2.500		85	70-130			
1,2-Dichlorobenzene	2.02	0.200	mg/kg wet	2.500		81	70-130			
1,2-Dichloroethane	2.12	0.200	mg/kg wet	2.500		85	70-130			
1,2-Dichloropropane	1.96	0.200	mg/kg wet	2.500		79	70-130			
1,3,5-Trimethylbenzene	2.04	0.200	mg/kg wet	2.500		81	70-130			
1,3-Dichlorobenzene	2.03	0.200	mg/kg wet	2.500		81	70-130			
1,3-Dichloropropane	2.10	0.200	mg/kg wet	2.500		84	70-130			
1,4-Dichlorobenzene	1.92	0.200	mg/kg wet	2.500		77	70-130			
1,4-Dioxane - Screen	65.6	40.0	mg/kg wet	50.00		131	44-241			
1-Chlorohexane	2.01	0.200	mg/kg wet	2.500		80	70-130			
2,2-Dichloropropane	2.00	0.200	mg/kg wet	2.500		80	70-130			
2-Butanone	8.93	1.00	mg/kg wet	12.50		71	70-130			
2-Chlorotoluene	1.96	0.200	mg/kg wet	2.500		78	70-130			
2-Hexanone	8.12	1.00	mg/kg wet	12.50		65	70-130			B-
4-Chlorotoluene	1.88	0.200	mg/kg wet	2.500		75	70-130			
4-Isopropyltoluene	1.99	0.200	mg/kg wet	2.500		80	70-130			
4-Methyl-2-Pentanone	8.97	1.00	mg/kg wet	12.50		72	70-130			
Acetone	9.97	1.00	mg/kg wet	12.50		80	70-130			
Benzene	1.97	0.200	mg/kg wet	2.500		79	70-130			
Bromobenzene	2.08	0.200	mg/kg wet	2.500		83	70-130			
Bromochloromethane	2.04	0.200	mg/kg wet	2.500		82	70-130			
Bromodichloromethane	1.82	0.200	mg/kg wet	2.500		73	70-130			
Bromoform	1.65	0.200	mg/kg wet	2.500		66	70-130			B-
Bromomethane	2.23	0.200	mg/kg wet	2.500		89	70-130			
Carbon Disulfide	2.03	0.200	mg/kg wet	2.500		81	70-130			
Carbon Tetrachloride	2.09	0.200	mg/kg wet	2.500		84	70-130			
Chlorobenzene	2.04	0.200	mg/kg wet	2.500		82	70-130			
Chloroethane	1.71	0.200	mg/kg wet	2.500		69	70-130			B-

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710601

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Methanol

**Batch CJ72721 - 5035**

Chloroform	2.07	0.200	mg/kg wet	2.500		83	70-130			
Chloromethane	1.96	0.200	mg/kg wet	2.500		78	70-130			
cis-1,2-Dichloroethene	1.96	0.200	mg/kg wet	2.500		79	70-130			
cis-1,3-Dichloropropene	2.03	0.200	mg/kg wet	2.500		81	70-130			
Dibromochloromethane	1.76	0.200	mg/kg wet	2.500		70	70-130			
Dibromomethane	1.92	0.200	mg/kg wet	2.500		77	70-130			
Dichlorodifluoromethane	1.89	0.200	mg/kg wet	2.500		76	70-130			
Diethyl Ether	1.91	0.200	mg/kg wet	2.500		76	70-130			
Di-isopropyl ether	1.90	0.200	mg/kg wet	2.500		76	70-130			
Ethyl tertiary-butyl ether	2.00	0.200	mg/kg wet	2.500		80	70-130			
Ethylbenzene	1.96	0.200	mg/kg wet	2.500		79	70-130			
Hexachlorobutadiene	1.99	0.200	mg/kg wet	2.500		80	70-130			
Isopropylbenzene	1.97	0.200	mg/kg wet	2.500		79	70-130			
Methyl tert-Butyl Ether	1.90	0.200	mg/kg wet	2.500		76	70-130			
Methylene Chloride	1.99	0.400	mg/kg wet	2.500		80	70-130			
Naphthalene	2.03	0.200	mg/kg wet	2.500		81	70-130			
n-Butylbenzene	2.01	0.200	mg/kg wet	2.500		80	70-130			
n-Propylbenzene	2.02	0.200	mg/kg wet	2.500		81	70-130			
sec-Butylbenzene	2.07	0.200	mg/kg wet	2.500		83	70-130			
Styrene	1.92	0.200	mg/kg wet	2.500		77	70-130			
tert-Butylbenzene	2.02	0.200	mg/kg wet	2.500		81	70-130			
Tertiary-amyl methyl ether	1.97	0.200	mg/kg wet	2.500		79	70-130			
Tetrachloroethene	1.77	0.200	mg/kg wet	2.500		71	70-130			
Tetrahydrofuran	1.67	1.00	mg/kg wet	2.500		67	70-130			B-
Toluene	1.81	0.200	mg/kg wet	2.500		72	70-130			
trans-1,2-Dichloroethene	2.04	0.200	mg/kg wet	2.500		82	70-130			
trans-1,3-Dichloropropene	1.75	0.200	mg/kg wet	2.500		70	70-130			
Trichloroethene	1.99	0.200	mg/kg wet	2.500		80	70-130			
Vinyl Acetate	1.69	0.200	mg/kg wet	2.500		68	70-130			B-
Vinyl Chloride	2.04	0.200	mg/kg wet	2.500		82	70-130			
Xylene O	2.06	0.200	mg/kg wet	2.500		82	70-130			
Xylene P,M	4.02	0.400	mg/kg wet	5.000		80	70-130			
Xylenes (Total)	6.08	0.400	mg/kg wet							
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>5.40</i>		mg/kg wet	<i>5.000</i>		<i>108</i>	<i>70-130</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>5.23</i>		mg/kg wet	<i>5.000</i>		<i>105</i>	<i>70-130</i>			
<i>Surrogate: Dibromofluoromethane</i>	<i>5.52</i>		mg/kg wet	<i>5.000</i>		<i>110</i>	<i>70-130</i>			
<i>Surrogate: Toluene-d8</i>	<i>5.20</i>		mg/kg wet	<i>5.000</i>		<i>104</i>	<i>70-130</i>			

**LCS Dup**

1,1,1,2-Tetrachloroethane	1.76	0.200	mg/kg wet	2.500		70	70-130	8	25	
1,1,1-Trichloroethane	2.12	0.200	mg/kg wet	2.500		85	70-130	5	25	
1,1,1,2-Tetrachloroethane	1.74	0.200	mg/kg wet	2.500		70	70-130	6	25	
1,1,2-Trichloroethane	1.91	0.200	mg/kg wet	2.500		76	70-130	8	25	
1,1-Dichloroethane	1.79	0.200	mg/kg wet	2.500		72	70-130	5	25	
1,1-Dichloroethene	1.92	0.200	mg/kg wet	2.500		77	70-130	7	25	
1,1-Dichloropropene	1.98	0.200	mg/kg wet	2.500		79	70-130	1	25	



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710601

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Methanol

**Batch CJ72721 - 5035**

1,2,3-Trichlorobenzene	1.94	0.200	mg/kg wet	2.500		78	70-130	10	25	
1,2,3-Trichloropropane	1.63	0.200	mg/kg wet	2.500		65	70-130	2	25	B-
1,2,4-Trichlorobenzene	1.93	0.200	mg/kg wet	2.500		77	70-130	3	25	
1,2,4-Trimethylbenzene	2.00	0.200	mg/kg wet	2.500		80	70-130	1	25	
1,2-Dibromo-3-Chloropropane	1.70	1.00	mg/kg wet	2.500		68	70-130	7	25	B-
1,2-Dibromoethane	2.01	0.200	mg/kg wet	2.500		80	70-130	5	25	
1,2-Dichlorobenzene	1.99	0.200	mg/kg wet	2.500		80	70-130	1	25	
1,2-Dichloroethane	1.99	0.200	mg/kg wet	2.500		80	70-130	6	25	
1,2-Dichloropropane	1.89	0.200	mg/kg wet	2.500		75	70-130	4	25	
1,3,5-Trimethylbenzene	2.03	0.200	mg/kg wet	2.500		81	70-130	0.1	25	
1,3-Dichlorobenzene	1.98	0.200	mg/kg wet	2.500		79	70-130	2	25	
1,3-Dichloropropane	2.00	0.200	mg/kg wet	2.500		80	70-130	5	25	
1,4-Dichlorobenzene	1.93	0.200	mg/kg wet	2.500		77	70-130	0.5	25	
1,4-Dioxane - Screen	ND	40.0	mg/kg wet	50.00		0	44-241	200	200	B-
1-Chlorohexane	1.95	0.200	mg/kg wet	2.500		78	70-130	3	25	
2,2-Dichloropropane	1.97	0.200	mg/kg wet	2.500		79	70-130	1	25	
2-Butanone	8.38	1.00	mg/kg wet	12.50		67	70-130	6	25	B-
2-Chlorotoluene	1.89	0.200	mg/kg wet	2.500		76	70-130	3	25	
2-Hexanone	8.16	1.00	mg/kg wet	12.50		65	70-130	0.5	25	B-
4-Chlorotoluene	1.86	0.200	mg/kg wet	2.500		75	70-130	0.6	25	
4-Isopropyltoluene	1.97	0.200	mg/kg wet	2.500		79	70-130	1	25	
4-Methyl-2-Pentanone	8.78	1.00	mg/kg wet	12.50		70	70-130	2	25	
Acetone	8.75	1.00	mg/kg wet	12.50		70	70-130	13	25	
Benzene	1.95	0.200	mg/kg wet	2.500		78	70-130	1	25	
Bromobenzene	2.00	0.200	mg/kg wet	2.500		80	70-130	4	25	
Bromochloromethane	2.06	0.200	mg/kg wet	2.500		82	70-130	1	25	
Bromodichloromethane	1.79	0.200	mg/kg wet	2.500		72	70-130	2	25	
Bromoform	1.53	0.200	mg/kg wet	2.500		61	70-130	7	25	B-
Bromomethane	2.17	0.200	mg/kg wet	2.500		87	70-130	3	25	
Carbon Disulfide	1.97	0.200	mg/kg wet	2.500		79	70-130	3	25	
Carbon Tetrachloride	2.07	0.200	mg/kg wet	2.500		83	70-130	1	25	
Chlorobenzene	1.95	0.200	mg/kg wet	2.500		78	70-130	5	25	
Chloroethane	1.77	0.200	mg/kg wet	2.500		71	70-130	3	25	
Chloroform	2.02	0.200	mg/kg wet	2.500		81	70-130	3	25	
Chloromethane	2.00	0.200	mg/kg wet	2.500		80	70-130	2	25	
cis-1,2-Dichloroethene	1.90	0.200	mg/kg wet	2.500		76	70-130	3	25	
cis-1,3-Dichloropropene	1.91	0.200	mg/kg wet	2.500		77	70-130	6	25	
Dibromochloromethane	1.54	0.200	mg/kg wet	2.500		62	70-130	13	25	B-
Dibromomethane	1.87	0.200	mg/kg wet	2.500		75	70-130	3	25	
Dichlorodifluoromethane	1.88	0.200	mg/kg wet	2.500		75	70-130	1	25	
Diethyl Ether	1.94	0.200	mg/kg wet	2.500		77	70-130	1	25	
Di-isopropyl ether	1.80	0.200	mg/kg wet	2.500		72	70-130	5	25	
Ethyl tertiary-butyl ether	1.94	0.200	mg/kg wet	2.500		78	70-130	3	25	
Ethylbenzene	1.90	0.200	mg/kg wet	2.500		76	70-130	4	25	
Hexachlorobutadiene	1.91	0.200	mg/kg wet	2.500		76	70-130	4	25	





CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710601

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Methanol

**Batch CJ72721 - 5035**

Isopropylbenzene	1.93	0.200	mg/kg wet	2.500		77	70-130	2	25	
Methyl tert-Butyl Ether	1.87	0.200	mg/kg wet	2.500		75	70-130	1	25	
Methylene Chloride	1.93	0.400	mg/kg wet	2.500		77	70-130	3	25	
Naphthalene	1.89	0.200	mg/kg wet	2.500		76	70-130	7	25	
n-Butylbenzene	1.94	0.200	mg/kg wet	2.500		77	70-130	4	25	
n-Propylbenzene	2.00	0.200	mg/kg wet	2.500		80	70-130	0.8	25	
sec-Butylbenzene	1.94	0.200	mg/kg wet	2.500		78	70-130	7	25	
Styrene	1.88	0.200	mg/kg wet	2.500		75	70-130	2	25	
tert-Butylbenzene	1.99	0.200	mg/kg wet	2.500		80	70-130	2	25	
Tertiary-amyl methyl ether	1.82	0.200	mg/kg wet	2.500		73	70-130	7	25	
Tetrachloroethene	1.77	0.200	mg/kg wet	2.500		71	70-130	0.2	25	
Tetrahydrofuran	1.60	1.00	mg/kg wet	2.500		64	70-130	4	25	B-
Toluene	1.76	0.200	mg/kg wet	2.500		70	70-130	3	25	
trans-1,2-Dichloroethene	1.93	0.200	mg/kg wet	2.500		77	70-130	6	25	
trans-1,3-Dichloropropene	1.58	0.200	mg/kg wet	2.500		63	70-130	10	25	B-
Trichloroethene	1.93	0.200	mg/kg wet	2.500		77	70-130	3	25	
Vinyl Acetate	1.65	0.200	mg/kg wet	2.500		66	70-130	3	25	B-
Vinyl Chloride	2.01	0.200	mg/kg wet	2.500		80	70-130	2	25	
Xylene O	1.96	0.200	mg/kg wet	2.500		78	70-130	5	25	
Xylene P,M	3.97	0.400	mg/kg wet	5.000		79	70-130	1	25	
Xylenes (Total)	5.93	0.400	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	5.05		mg/kg wet	5.000		101	70-130			
Surrogate: 4-Bromofluorobenzene	5.19		mg/kg wet	5.000		104	70-130			
Surrogate: Dibromofluoromethane	5.55		mg/kg wet	5.000		111	70-130			
Surrogate: Toluene-d8	5.14		mg/kg wet	5.000		103	70-130			

8270D Polynuclear Aromatic Hydrocarbons

**Batch CJ72508 - 3546**

<b>Blank</b>										
Naphthalene	ND	0.3	mg/kg wet							
Surrogate: 1,2-Dichlorobenzene-d4	2.82		mg/kg wet	3.333		84	30-130			
Surrogate: 2-Fluorobiphenyl	3.12		mg/kg wet	3.333		93	30-130			
Surrogate: Nitrobenzene-d5	3.05		mg/kg wet	3.333		91	30-130			
Surrogate: p-Terphenyl-d14	3.20		mg/kg wet	3.333		96	30-130			
<b>LCS</b>										
Naphthalene	2.6	0.3	mg/kg wet	3.333		79	40-140			
Surrogate: 1,2-Dichlorobenzene-d4	2.66		mg/kg wet	3.333		80	30-130			
Surrogate: 2-Fluorobiphenyl	2.88		mg/kg wet	3.333		86	30-130			
Surrogate: Nitrobenzene-d5	2.91		mg/kg wet	3.333		87	30-130			
Surrogate: p-Terphenyl-d14	3.34		mg/kg wet	3.333		100	30-130			
<b>LCS Dup</b>										
Naphthalene	2.8	0.3	mg/kg wet	3.333		84	40-140	7	30	
Surrogate: 1,2-Dichlorobenzene-d4	2.71		mg/kg wet	3.333		81	30-130			
Surrogate: 2-Fluorobiphenyl	3.04		mg/kg wet	3.333		91	30-130			
Surrogate: Nitrobenzene-d5	3.03		mg/kg wet	3.333		91	30-130			



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710601

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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8270D Polynuclear Aromatic Hydrocarbons

**Batch CJ72508 - 3546**

<i>Surrogate: p-Terphenyl-d14</i>	3.45		mg/kg wet	3.333		103	30-130			
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*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710601

**Notes and Definitions**

- U Analyte included in the analysis, but not detected
- J Reported between MDL and MRL
- E Reported above the quantitation limit; Estimated value (E).
- D Diluted.
- CD- Continuing Calibration %Diff/Drift is below control limit (CD-).
- B- Blank Spike recovery is below lower control limit (B-).
- ND Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference
- MDL Method Detection Limit
- MRL Method Reporting Limit
- LOD Limit of Detection
- LOQ Limit of Quantitation
- DL Detection Limit
- I/V Initial Volume
- F/V Final Volume
- § Subcontracted analysis; see attached report
- 1 Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
- 2 Range result excludes concentrations of target analytes eluting in that range.
- 3 Range result excludes the concentration of the C9-C10 aromatic range.
- Avg Results reported as a mathematical average.
- NR No Recovery
- [CALC] Calculated Analyte
- SUB Subcontracted analysis; see attached report
- RL Reporting Limit
- EDL Estimated Detection Limit



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710601

**ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS**

**ENVIRONMENTAL**

Rhode Island Potable and Non Potable Water: LAI00179

<http://www.health.ri.gov/find/labs/analytical/ESS.pdf>

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750

[http://www.ct.gov/dph/lib/dph/environmental\\_health/environmental\\_laboratories/pdf/OutofStateCommercialLaboratories.pdf](http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf)

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002

<http://www.maine.gov/dhhs/meecd/environmental-health/dwp/partners/labCert.shtml>

Massachusetts Potable and Non Potable Water: M-RI002

<http://public.dep.state.ma.us/Labcert/Labcert.aspx>

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424

<http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm>

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313

<http://www.wadsworth.org/labcert/elap/comm.html>

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006

[http://datamine2.state.nj.us/DEP\\_OPRA/OpraMain/pi\\_main?mode=pi\\_by\\_site&sort\\_order=PI\\_NAMEA&Select+a+Site:=58715](http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715)

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752

<http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx>

## ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Providence, RI - GZA/HDM

ESS Project ID: 1710601

Date Received: 10/24/2017

Project Due Date: 10/31/2017

Days for Project: 5 Day

Shipped/Delivered Via: ESS Courier

1. Air bill manifest present?  No  
Air No.: NA

6. Does COC match bottles?  Yes

2. Were custody seals present?  No

7. Is COC complete and correct?  Yes

3. Is radiation count <100 CPM?  Yes

8. Were samples received intact?  Yes

4. Is a Cooler Present?  Yes  
Temp: 2.1 Iced with: Ice

9. Were labs informed about **short holds & rushes**? Yes / No / NA

5. Was COC signed and dated by client?  Yes

10. Were any analyses received outside of hold time? Yes / No

11. Any Subcontracting needed? Yes / No  
ESS Sample IDs: \_\_\_\_\_  
Analysis: \_\_\_\_\_  
TAT: \_\_\_\_\_

12. Were VOAs received? Yes / No  
a. Air bubbles in aqueous VOAs? Yes / No  
b. Does methanol cover soil completely? Yes / No / NA

13. Are the samples properly preserved? Yes / No  
a. If metals preserved upon receipt: Date: \_\_\_\_\_  
b. Low Level VOA vials frozen: Date: 10/24/17

Time: \_\_\_\_\_ By: \_\_\_\_\_  
Time: 1:37 By: ax

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / No  
a. Was there a need to contact the client? Yes / No  
Who was contacted? \_\_\_\_\_ Date: \_\_\_\_\_

Time: \_\_\_\_\_ By: \_\_\_\_\_

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
01	175509	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
01	175511	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
01	175514	Yes	NA	Yes	VOA Vial - Other	Other	
01	175515	Yes	NA	Yes	VOA Vial - Other	Other	
02	175510	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
02	175513	Yes	NA	Yes	VOA Vial - Other	Other	

2nd Review  
Are barcode labels on correct containers? Yes / No

Completed By: [Signature] Date & Time: 10/24/17 1448  
Reviewed By: [Signature] Date & Time: 10/24/17 1505  
Delivered By: [Signature] Date & Time: 10/24/17 1505

ESS Laboratory

Division of Thielsch Engineering, Inc.  
 185 Frances Avenue, Cranston RI 02910  
 Tel. (401) 461-7181 Fax (401) 461-4486  
 www.esslaboratory.com

CHAIN OF CUSTODY

ESS Lab # 1710601

Reporting Limits RIDEM R-DEC and GB Leachability

Electronic Deliverables  Limit Checker  Standard Excel  
 Other (Please Specify →)

Turn Time 5-Day Rush

Regulatory State Rhode Island

Is this project for any of the following?:  
 OCT RCP  MA MCP  RGP

Company Name GZA Project # 05.0043654.00 Project Name Former Tidewater Facility

Contact Person Sean Connolly Address 530 Broadway

City Providence State RI Zip Code 02909 PO # 43654

Telephone Number 401-421-4140 FAX Number - Email Address sean.connolly@gza.com

ESS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID	Analysis	VOCs (8260B)	Naphthalene (8270D)													
2	10/24/17	0800	—	—	T13-102417		X														
1	10/24/17	0930	Grabs	SO4	GZ-BK-501 (2-4')		X	X													

Container Type: AC-Air Cassette AG-Amber Glass B-BOD Bottle C-Cubitainer G - Glass O-Other P-Poly S-Sterile V-Vial V AG

Container Volume: 1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other\* 7 9

Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAce, NaOH 9-NH4Cl 10-DI H2O 11-Other\* 6/10 1

Number of Containers per Sample: 2/3 1

**Laboratory Use Only**

Cooler Present:

Seals Intact:

Cooler Temperature: Ice temp 2.1 °C 10/24/17 14:32

Sampled by: Sean Connolly, Sarah McLeod, Erik Beloff

Comments: Please specify "Other" preservative and containers types in this space

NGRID rates apply

Please email sarah.mcleod@gza.com also

Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)
<u>Sean Connolly 10-24-17/1410</u>	<u>[Signature] 10-24-17 14:10</u>	<u>[Signature] 10/24/17 14:32</u>	<u>[Signature] 10/24/17 1446</u>
Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)





*CERTIFICATE OF ANALYSIS*

Sarah McLeod  
GZA GeoEnvironmental, Inc.  
530 Broadway  
Providence, RI 02909

**RE: Former Tidewater Facility (05.0043654.00)**  
**ESS Laboratory Work Order Number: 1710683**

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard  
Laboratory Director

**REVIEWED**  
*By ESS Laboratory at 5:01 pm, Nov 01, 2017*

**Analytical Summary**

The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710683

**SAMPLE RECEIPT**

The following samples were received on October 26, 2017 for the analyses specified on the enclosed Chain of Custody Record.

**Low Level VOA vials were frozen by ESS Laboratory on October 26, 2017 at 15:38.**

<u>Lab Number</u>	<u>Sample Name</u>	<u>Matrix</u>	<u>Analysis</u>
1710683-01	GZ-BW-501 0-2ft	Soil	8260B Low, 8270D
1710683-02	TB-102617	Soil	8260B Low



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710683

**PROJECT NARRATIVE**

**5035/8260B Volatile Organic Compounds / Low Level**

- C7J0407-CCV1 Continuing Calibration %Diff/Drift is above control limit (CD+).  
Bromomethane (44% @ 30%)
- CJ72623-BS1 Blank Spike recovery is above upper control limit (B+).  
Acetone (133% @ 70-130%)
- CJ72623-BSD1 Blank Spike recovery is above upper control limit (B+).  
Bromomethane (133% @ 70-130%)
- CJ72623-BSD1 Blank Spike recovery is below lower control limit (B-).  
1,4-Dioxane (66% @ 70-130%)
- CJ72623-BSD1 Relative percent difference for duplicate is outside of criteria (D+).  
Bromomethane (30% @ 25%)

**8270D Polynuclear Aromatic Hydrocarbons**

- 1710683-01 Internal Standard(s) outside of criteria due to matrix (UCM/coelution is present) (IM).  
Perylene-d12 (205% @ 50-200%)

No other observations noted.

End of Project Narrative.

**DATA USABILITY LINKS**

*To ensure you are viewing the most current version of the documents below, please clear your internet cookies for [www.ESSLaboratory.com](http://www.ESSLaboratory.com). Consult your IT Support personnel for information on how to clear your internet cookies.*

[Definitions of Quality Control Parameters](#)

[Semivolatile Organics Internal Standard Information](#)

[Semivolatile Organics Surrogate Information](#)

[Volatile Organics Internal Standard Information](#)

[Volatile Organics Surrogate Information](#)

[EPH and VPH Alkane Lists](#)



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710683

**CURRENT SW-846 METHODOLOGY VERSIONS**

**Analytical Methods**

1010A - Flashpoint  
6010C - ICP  
6020A - ICP MS  
7010 - Graphite Furnace  
7196A - Hexavalent Chromium  
7470A - Aqueous Mercury  
7471B - Solid Mercury  
8011 - EDB/DBCP/TCP  
8015C - GRO/DRO  
8081B - Pesticides  
8082A - PCB  
8100M - TPH  
8151A - Herbicides  
8260B - VOA  
8270D - SVOA  
8270D SIM - SVOA Low Level  
9014 - Cyanide  
9038 - Sulfate  
9040C - Aqueous pH  
9045D - Solid pH (Corrosivity)  
9050A - Specific Conductance  
9056A - Anions (IC)  
9060A - TOC  
9095B - Paint Filter  
MADEP 04-1.1 - EPH / VPH

**Prep Methods**

3005A - Aqueous ICP Digestion  
3020A - Aqueous Graphite Furnace / ICP MS Digestion  
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion  
3060A - Solid Hexavalent Chromium Digestion  
3510C - Separatory Funnel Extraction  
3520C - Liquid / Liquid Extraction  
3540C - Manual Soxhlet Extraction  
3541 - Automated Soxhlet Extraction  
3546 - Microwave Extraction  
3580A - Waste Dilution  
5030B - Aqueous Purge and Trap  
5030C - Aqueous Purge and Trap  
5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-BW-501 0-2ft  
Date Sampled: 10/25/17 10:30  
Percent Solids: 88  
Initial Volume: 7  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710683  
ESS Laboratory Sample ID: 1710683-01  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0040)		8260B Low		1	10/26/17 18:25	C7J0407	CJ72623
1,1,1-Trichloroethane	ND (0.0040)		8260B Low		1	10/26/17 18:25	C7J0407	CJ72623
1,1,2,2-Tetrachloroethane	ND (0.0040)		8260B Low		1	10/26/17 18:25	C7J0407	CJ72623
1,1,2-Trichloroethane	ND (0.0040)		8260B Low		1	10/26/17 18:25	C7J0407	CJ72623
1,1-Dichloroethane	ND (0.0040)		8260B Low		1	10/26/17 18:25	C7J0407	CJ72623
1,1-Dichloroethene	ND (0.0040)		8260B Low		1	10/26/17 18:25	C7J0407	CJ72623
1,1-Dichloropropene	ND (0.0040)		8260B Low		1	10/26/17 18:25	C7J0407	CJ72623
1,2,3-Trichlorobenzene	ND (0.0040)		8260B Low		1	10/26/17 18:25	C7J0407	CJ72623
1,2,3-Trichloropropane	ND (0.0040)		8260B Low		1	10/26/17 18:25	C7J0407	CJ72623
1,2,4-Trichlorobenzene	ND (0.0040)		8260B Low		1	10/26/17 18:25	C7J0407	CJ72623
1,2,4-Trimethylbenzene	ND (0.0040)		8260B Low		1	10/26/17 18:25	C7J0407	CJ72623
1,2-Dibromo-3-Chloropropane	ND (0.0040)		8260B Low		1	10/26/17 18:25	C7J0407	CJ72623
1,2-Dibromoethane	ND (0.0040)		8260B Low		1	10/26/17 18:25	C7J0407	CJ72623
1,2-Dichlorobenzene	ND (0.0040)		8260B Low		1	10/26/17 18:25	C7J0407	CJ72623
1,2-Dichloroethane	ND (0.0040)		8260B Low		1	10/26/17 18:25	C7J0407	CJ72623
1,2-Dichloropropane	ND (0.0040)		8260B Low		1	10/26/17 18:25	C7J0407	CJ72623
1,3,5-Trimethylbenzene	ND (0.0040)		8260B Low		1	10/26/17 18:25	C7J0407	CJ72623
1,3-Dichlorobenzene	ND (0.0040)		8260B Low		1	10/26/17 18:25	C7J0407	CJ72623
1,3-Dichloropropane	ND (0.0040)		8260B Low		1	10/26/17 18:25	C7J0407	CJ72623
1,4-Dichlorobenzene	ND (0.0040)		8260B Low		1	10/26/17 18:25	C7J0407	CJ72623
1,4-Dioxane	ND (0.0809)		8260B Low		1	10/26/17 18:25	C7J0407	CJ72623
1-Chlorohexane	ND (0.0040)		8260B Low		1	10/26/17 18:25	C7J0407	CJ72623
2,2-Dichloropropane	ND (0.0040)		8260B Low		1	10/26/17 18:25	C7J0407	CJ72623
2-Butanone	ND (0.0405)		8260B Low		1	10/26/17 18:25	C7J0407	CJ72623
2-Chlorotoluene	ND (0.0040)		8260B Low		1	10/26/17 18:25	C7J0407	CJ72623
2-Hexanone	ND (0.0405)		8260B Low		1	10/26/17 18:25	C7J0407	CJ72623
4-Chlorotoluene	ND (0.0040)		8260B Low		1	10/26/17 18:25	C7J0407	CJ72623
4-Isopropyltoluene	ND (0.0040)		8260B Low		1	10/26/17 18:25	C7J0407	CJ72623
4-Methyl-2-Pentanone	ND (0.0405)		8260B Low		1	10/26/17 18:25	C7J0407	CJ72623
Acetone	ND (0.0405)		8260B Low		1	10/26/17 18:25	C7J0407	CJ72623
Benzene	ND (0.0040)		8260B Low		1	10/26/17 18:25	C7J0407	CJ72623
Bromobenzene	ND (0.0040)		8260B Low		1	10/26/17 18:25	C7J0407	CJ72623



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-BW-501 0-2ft  
Date Sampled: 10/25/17 10:30  
Percent Solids: 88  
Initial Volume: 7  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710683  
ESS Laboratory Sample ID: 1710683-01  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0040)		8260B Low		1	10/26/17 18:25	C7J0407	CJ72623
Bromodichloromethane	ND (0.0040)		8260B Low		1	10/26/17 18:25	C7J0407	CJ72623
Bromoform	ND (0.0040)		8260B Low		1	10/26/17 18:25	C7J0407	CJ72623
Bromomethane	ND (0.0081)		8260B Low		1	10/26/17 18:25	C7J0407	CJ72623
Carbon Disulfide	ND (0.0040)		8260B Low		1	10/26/17 18:25	C7J0407	CJ72623
Carbon Tetrachloride	ND (0.0040)		8260B Low		1	10/26/17 18:25	C7J0407	CJ72623
Chlorobenzene	ND (0.0040)		8260B Low		1	10/26/17 18:25	C7J0407	CJ72623
Chloroethane	ND (0.0081)		8260B Low		1	10/26/17 18:25	C7J0407	CJ72623
Chloroform	ND (0.0040)		8260B Low		1	10/26/17 18:25	C7J0407	CJ72623
Chloromethane	ND (0.0081)		8260B Low		1	10/26/17 18:25	C7J0407	CJ72623
cis-1,2-Dichloroethene	ND (0.0040)		8260B Low		1	10/26/17 18:25	C7J0407	CJ72623
cis-1,3-Dichloropropene	ND (0.0040)		8260B Low		1	10/26/17 18:25	C7J0407	CJ72623
Dibromochloromethane	ND (0.0040)		8260B Low		1	10/26/17 18:25	C7J0407	CJ72623
Dibromomethane	ND (0.0040)		8260B Low		1	10/26/17 18:25	C7J0407	CJ72623
Dichlorodifluoromethane	ND (0.0081)		8260B Low		1	10/26/17 18:25	C7J0407	CJ72623
Diethyl Ether	ND (0.0040)		8260B Low		1	10/26/17 18:25	C7J0407	CJ72623
Di-isopropyl ether	ND (0.0040)		8260B Low		1	10/26/17 18:25	C7J0407	CJ72623
Ethyl tertiary-butyl ether	ND (0.0040)		8260B Low		1	10/26/17 18:25	C7J0407	CJ72623
Ethylbenzene	ND (0.0040)		8260B Low		1	10/26/17 18:25	C7J0407	CJ72623
Hexachlorobutadiene	ND (0.0040)		8260B Low		1	10/26/17 18:25	C7J0407	CJ72623
Isopropylbenzene	ND (0.0040)		8260B Low		1	10/26/17 18:25	C7J0407	CJ72623
Methyl tert-Butyl Ether	ND (0.0040)		8260B Low		1	10/26/17 18:25	C7J0407	CJ72623
Methylene Chloride	ND (0.0202)		8260B Low		1	10/26/17 18:25	C7J0407	CJ72623
<b>Naphthalene</b>	<b>0.0096</b> (0.0040)		8260B Low		1	10/26/17 18:25	C7J0407	CJ72623
n-Butylbenzene	ND (0.0040)		8260B Low		1	10/26/17 18:25	C7J0407	CJ72623
n-Propylbenzene	ND (0.0040)		8260B Low		1	10/26/17 18:25	C7J0407	CJ72623
sec-Butylbenzene	ND (0.0040)		8260B Low		1	10/26/17 18:25	C7J0407	CJ72623
Styrene	ND (0.0040)		8260B Low		1	10/26/17 18:25	C7J0407	CJ72623
tert-Butylbenzene	ND (0.0040)		8260B Low		1	10/26/17 18:25	C7J0407	CJ72623
Tertiary-amyl methyl ether	ND (0.0040)		8260B Low		1	10/26/17 18:25	C7J0407	CJ72623
Tetrachloroethene	ND (0.0040)		8260B Low		1	10/26/17 18:25	C7J0407	CJ72623
Tetrahydrofuran	ND (0.0040)		8260B Low		1	10/26/17 18:25	C7J0407	CJ72623





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-BW-501 0-2ft  
 Date Sampled: 10/25/17 10:30  
 Percent Solids: 88  
 Initial Volume: 7  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1710683  
 ESS Laboratory Sample ID: 1710683-01  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0040)		8260B Low		1	10/26/17 18:25	C7J0407	CJ72623
trans-1,2-Dichloroethene	ND (0.0040)		8260B Low		1	10/26/17 18:25	C7J0407	CJ72623
trans-1,3-Dichloropropene	ND (0.0040)		8260B Low		1	10/26/17 18:25	C7J0407	CJ72623
Trichloroethene	ND (0.0040)		8260B Low		1	10/26/17 18:25	C7J0407	CJ72623
Trichlorofluoromethane	ND (0.0040)		8260B Low		1	10/26/17 18:25	C7J0407	CJ72623
Vinyl Acetate	ND (0.0040)		8260B Low		1	10/26/17 18:25	C7J0407	CJ72623
Vinyl Chloride	ND (0.0081)		8260B Low		1	10/26/17 18:25	C7J0407	CJ72623
Xylene O	ND (0.0040)		8260B Low		1	10/26/17 18:25	C7J0407	CJ72623
Xylene P,M	ND (0.0081)		8260B Low		1	10/26/17 18:25	C7J0407	CJ72623
Xylenes (Total)	ND (0.0081)		8260B Low		1	10/26/17 18:25		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>106 %</i>		<i>70-130</i>
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>80 %</i>		<i>70-130</i>
<i>Surrogate: Dibromofluoromethane</i>	<i>103 %</i>		<i>70-130</i>
<i>Surrogate: Toluene-d8</i>	<i>106 %</i>		<i>70-130</i>



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-BW-501 0-2ft  
Date Sampled: 10/25/17 10:30  
Percent Solids: 88  
Initial Volume: 14.3  
Final Volume: 1  
Extraction Method: 3546

ESS Laboratory Work Order: 1710683  
ESS Laboratory Sample ID: 1710683-01  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: TJ  
Prepared: 10/27/17 10:46

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Naphthalene	61.8 (15.8)		8270D		20	10/27/17 22:34	C7J0418	CJ72708
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>		69 %		30-130				
<i>Surrogate: 2-Fluorobiphenyl</i>		82 %		30-130				
<i>Surrogate: Nitrobenzene-d5</i>		78 %		30-130				
<i>Surrogate: p-Terphenyl-d14</i>		86 %		30-130				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: TB-102617  
Date Sampled: 10/26/17 00:00  
Percent Solids: N/A  
Initial Volume: 5  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710683  
ESS Laboratory Sample ID: 1710683-02  
Sample Matrix: Soil  
Units: mg/kg wet  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0050)		8260B Low		1	10/26/17 17:59	C7J0407	CJ72623
1,1,1-Trichloroethane	ND (0.0050)		8260B Low		1	10/26/17 17:59	C7J0407	CJ72623
1,1,2,2-Tetrachloroethane	ND (0.0050)		8260B Low		1	10/26/17 17:59	C7J0407	CJ72623
1,1,2-Trichloroethane	ND (0.0050)		8260B Low		1	10/26/17 17:59	C7J0407	CJ72623
1,1-Dichloroethane	ND (0.0050)		8260B Low		1	10/26/17 17:59	C7J0407	CJ72623
1,1-Dichloroethene	ND (0.0050)		8260B Low		1	10/26/17 17:59	C7J0407	CJ72623
1,1-Dichloropropene	ND (0.0050)		8260B Low		1	10/26/17 17:59	C7J0407	CJ72623
1,2,3-Trichlorobenzene	ND (0.0050)		8260B Low		1	10/26/17 17:59	C7J0407	CJ72623
1,2,3-Trichloropropane	ND (0.0050)		8260B Low		1	10/26/17 17:59	C7J0407	CJ72623
1,2,4-Trichlorobenzene	ND (0.0050)		8260B Low		1	10/26/17 17:59	C7J0407	CJ72623
1,2,4-Trimethylbenzene	ND (0.0050)		8260B Low		1	10/26/17 17:59	C7J0407	CJ72623
1,2-Dibromo-3-Chloropropane	ND (0.0050)		8260B Low		1	10/26/17 17:59	C7J0407	CJ72623
1,2-Dibromoethane	ND (0.0050)		8260B Low		1	10/26/17 17:59	C7J0407	CJ72623
1,2-Dichlorobenzene	ND (0.0050)		8260B Low		1	10/26/17 17:59	C7J0407	CJ72623
1,2-Dichloroethane	ND (0.0050)		8260B Low		1	10/26/17 17:59	C7J0407	CJ72623
1,2-Dichloropropane	ND (0.0050)		8260B Low		1	10/26/17 17:59	C7J0407	CJ72623
1,3,5-Trimethylbenzene	ND (0.0050)		8260B Low		1	10/26/17 17:59	C7J0407	CJ72623
1,3-Dichlorobenzene	ND (0.0050)		8260B Low		1	10/26/17 17:59	C7J0407	CJ72623
1,3-Dichloropropane	ND (0.0050)		8260B Low		1	10/26/17 17:59	C7J0407	CJ72623
1,4-Dichlorobenzene	ND (0.0050)		8260B Low		1	10/26/17 17:59	C7J0407	CJ72623
1,4-Dioxane	ND (0.100)		8260B Low		1	10/26/17 17:59	C7J0407	CJ72623
1-Chlorohexane	ND (0.0050)		8260B Low		1	10/26/17 17:59	C7J0407	CJ72623
2,2-Dichloropropane	ND (0.0050)		8260B Low		1	10/26/17 17:59	C7J0407	CJ72623
2-Butanone	ND (0.0500)		8260B Low		1	10/26/17 17:59	C7J0407	CJ72623
2-Chlorotoluene	ND (0.0050)		8260B Low		1	10/26/17 17:59	C7J0407	CJ72623
2-Hexanone	ND (0.0500)		8260B Low		1	10/26/17 17:59	C7J0407	CJ72623
4-Chlorotoluene	ND (0.0050)		8260B Low		1	10/26/17 17:59	C7J0407	CJ72623
4-Isopropyltoluene	ND (0.0050)		8260B Low		1	10/26/17 17:59	C7J0407	CJ72623
4-Methyl-2-Pentanone	ND (0.0500)		8260B Low		1	10/26/17 17:59	C7J0407	CJ72623
Acetone	ND (0.0500)		8260B Low		1	10/26/17 17:59	C7J0407	CJ72623
Benzene	ND (0.0050)		8260B Low		1	10/26/17 17:59	C7J0407	CJ72623
Bromobenzene	ND (0.0050)		8260B Low		1	10/26/17 17:59	C7J0407	CJ72623



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: TB-102617  
Date Sampled: 10/26/17 00:00  
Percent Solids: N/A  
Initial Volume: 5  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710683  
ESS Laboratory Sample ID: 1710683-02  
Sample Matrix: Soil  
Units: mg/kg wet  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0050)		8260B Low		1	10/26/17 17:59	C7J0407	CJ72623
Bromodichloromethane	ND (0.0050)		8260B Low		1	10/26/17 17:59	C7J0407	CJ72623
Bromoform	ND (0.0050)		8260B Low		1	10/26/17 17:59	C7J0407	CJ72623
Bromomethane	ND (0.0100)		8260B Low		1	10/26/17 17:59	C7J0407	CJ72623
Carbon Disulfide	ND (0.0050)		8260B Low		1	10/26/17 17:59	C7J0407	CJ72623
Carbon Tetrachloride	ND (0.0050)		8260B Low		1	10/26/17 17:59	C7J0407	CJ72623
Chlorobenzene	ND (0.0050)		8260B Low		1	10/26/17 17:59	C7J0407	CJ72623
Chloroethane	ND (0.0100)		8260B Low		1	10/26/17 17:59	C7J0407	CJ72623
Chloroform	ND (0.0050)		8260B Low		1	10/26/17 17:59	C7J0407	CJ72623
Chloromethane	ND (0.0100)		8260B Low		1	10/26/17 17:59	C7J0407	CJ72623
cis-1,2-Dichloroethene	ND (0.0050)		8260B Low		1	10/26/17 17:59	C7J0407	CJ72623
cis-1,3-Dichloropropene	ND (0.0050)		8260B Low		1	10/26/17 17:59	C7J0407	CJ72623
Dibromochloromethane	ND (0.0050)		8260B Low		1	10/26/17 17:59	C7J0407	CJ72623
Dibromomethane	ND (0.0050)		8260B Low		1	10/26/17 17:59	C7J0407	CJ72623
Dichlorodifluoromethane	ND (0.0100)		8260B Low		1	10/26/17 17:59	C7J0407	CJ72623
Diethyl Ether	ND (0.0050)		8260B Low		1	10/26/17 17:59	C7J0407	CJ72623
Di-isopropyl ether	ND (0.0050)		8260B Low		1	10/26/17 17:59	C7J0407	CJ72623
Ethyl tertiary-butyl ether	ND (0.0050)		8260B Low		1	10/26/17 17:59	C7J0407	CJ72623
Ethylbenzene	ND (0.0050)		8260B Low		1	10/26/17 17:59	C7J0407	CJ72623
Hexachlorobutadiene	ND (0.0050)		8260B Low		1	10/26/17 17:59	C7J0407	CJ72623
Isopropylbenzene	ND (0.0050)		8260B Low		1	10/26/17 17:59	C7J0407	CJ72623
Methyl tert-Butyl Ether	ND (0.0050)		8260B Low		1	10/26/17 17:59	C7J0407	CJ72623
Methylene Chloride	ND (0.0250)		8260B Low		1	10/26/17 17:59	C7J0407	CJ72623
Naphthalene	ND (0.0050)		8260B Low		1	10/26/17 17:59	C7J0407	CJ72623
n-Butylbenzene	ND (0.0050)		8260B Low		1	10/26/17 17:59	C7J0407	CJ72623
n-Propylbenzene	ND (0.0050)		8260B Low		1	10/26/17 17:59	C7J0407	CJ72623
sec-Butylbenzene	ND (0.0050)		8260B Low		1	10/26/17 17:59	C7J0407	CJ72623
Styrene	ND (0.0050)		8260B Low		1	10/26/17 17:59	C7J0407	CJ72623
tert-Butylbenzene	ND (0.0050)		8260B Low		1	10/26/17 17:59	C7J0407	CJ72623
Tertiary-amyl methyl ether	ND (0.0050)		8260B Low		1	10/26/17 17:59	C7J0407	CJ72623
Tetrachloroethene	ND (0.0050)		8260B Low		1	10/26/17 17:59	C7J0407	CJ72623
Tetrahydrofuran	ND (0.0050)		8260B Low		1	10/26/17 17:59	C7J0407	CJ72623



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: TB-102617  
Date Sampled: 10/26/17 00:00  
Percent Solids: N/A  
Initial Volume: 5  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710683  
ESS Laboratory Sample ID: 1710683-02  
Sample Matrix: Soil  
Units: mg/kg wet  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0050)		8260B Low		1	10/26/17 17:59	C7J0407	CJ72623
trans-1,2-Dichloroethene	ND (0.0050)		8260B Low		1	10/26/17 17:59	C7J0407	CJ72623
trans-1,3-Dichloropropene	ND (0.0050)		8260B Low		1	10/26/17 17:59	C7J0407	CJ72623
Trichloroethene	ND (0.0050)		8260B Low		1	10/26/17 17:59	C7J0407	CJ72623
Trichlorofluoromethane	ND (0.0050)		8260B Low		1	10/26/17 17:59	C7J0407	CJ72623
Vinyl Acetate	ND (0.0050)		8260B Low		1	10/26/17 17:59	C7J0407	CJ72623
Vinyl Chloride	ND (0.0100)		8260B Low		1	10/26/17 17:59	C7J0407	CJ72623
Xylene O	ND (0.0050)		8260B Low		1	10/26/17 17:59	C7J0407	CJ72623
Xylene P,M	ND (0.0100)		8260B Low		1	10/26/17 17:59	C7J0407	CJ72623
Xylenes (Total)	ND (0.0100)		8260B Low		1	10/26/17 17:59		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>97 %</i>		<i>70-130</i>
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>85 %</i>		<i>70-130</i>
<i>Surrogate: Dibromofluoromethane</i>	<i>97 %</i>		<i>70-130</i>
<i>Surrogate: Toluene-d8</i>	<i>101 %</i>		<i>70-130</i>



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710683

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CJ72623 - 5035**

**Blank**

1,1,1,2-Tetrachloroethane	ND	0.0050	mg/kg wet
1,1,1-Trichloroethane	ND	0.0050	mg/kg wet
1,1,2,2-Tetrachloroethane	ND	0.0050	mg/kg wet
1,1,2-Trichloroethane	ND	0.0050	mg/kg wet
1,1-Dichloroethane	ND	0.0050	mg/kg wet
1,1-Dichloroethene	ND	0.0050	mg/kg wet
1,1-Dichloropropene	ND	0.0050	mg/kg wet
1,2,3-Trichlorobenzene	ND	0.0050	mg/kg wet
1,2,3-Trichloropropane	ND	0.0050	mg/kg wet
1,2,4-Trichlorobenzene	ND	0.0050	mg/kg wet
1,2,4-Trimethylbenzene	ND	0.0050	mg/kg wet
1,2-Dibromo-3-Chloropropane	ND	0.0050	mg/kg wet
1,2-Dibromoethane	ND	0.0050	mg/kg wet
1,2-Dichlorobenzene	ND	0.0050	mg/kg wet
1,2-Dichloroethane	ND	0.0050	mg/kg wet
1,2-Dichloropropane	ND	0.0050	mg/kg wet
1,3,5-Trimethylbenzene	ND	0.0050	mg/kg wet
1,3-Dichlorobenzene	ND	0.0050	mg/kg wet
1,3-Dichloropropane	ND	0.0050	mg/kg wet
1,4-Dichlorobenzene	ND	0.0050	mg/kg wet
1,4-Dioxane	ND	0.100	mg/kg wet
1-Chlorohexane	ND	0.0050	mg/kg wet
2,2-Dichloropropane	ND	0.0050	mg/kg wet
2-Butanone	ND	0.0500	mg/kg wet
2-Chlorotoluene	ND	0.0050	mg/kg wet
2-Hexanone	ND	0.0500	mg/kg wet
4-Chlorotoluene	ND	0.0050	mg/kg wet
4-Isopropyltoluene	ND	0.0050	mg/kg wet
4-Methyl-2-Pentanone	ND	0.0500	mg/kg wet
Acetone	ND	0.0500	mg/kg wet
Benzene	ND	0.0050	mg/kg wet
Bromobenzene	ND	0.0050	mg/kg wet
Bromochloromethane	ND	0.0050	mg/kg wet
Bromodichloromethane	ND	0.0050	mg/kg wet
Bromoform	ND	0.0050	mg/kg wet
Bromomethane	ND	0.0100	mg/kg wet
Carbon Disulfide	ND	0.0050	mg/kg wet
Carbon Tetrachloride	ND	0.0050	mg/kg wet
Chlorobenzene	ND	0.0050	mg/kg wet
Chloroethane	ND	0.0100	mg/kg wet
Chloroform	ND	0.0050	mg/kg wet
Chloromethane	ND	0.0100	mg/kg wet
cis-1,2-Dichloroethene	ND	0.0050	mg/kg wet
cis-1,3-Dichloropropene	ND	0.0050	mg/kg wet





CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710683

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CJ72623 - 5035**

Dibromochloromethane	ND	0.0050	mg/kg wet							
Dibromomethane	ND	0.0050	mg/kg wet							
Dichlorodifluoromethane	ND	0.0100	mg/kg wet							
Diethyl Ether	ND	0.0050	mg/kg wet							
Di-isopropyl ether	ND	0.0050	mg/kg wet							
Ethyl tertiary-butyl ether	ND	0.0050	mg/kg wet							
Ethylbenzene	ND	0.0050	mg/kg wet							
Hexachlorobutadiene	ND	0.0050	mg/kg wet							
Isopropylbenzene	ND	0.0050	mg/kg wet							
Methyl tert-Butyl Ether	ND	0.0050	mg/kg wet							
Methylene Chloride	ND	0.0250	mg/kg wet							
Naphthalene	ND	0.0050	mg/kg wet							
n-Butylbenzene	ND	0.0050	mg/kg wet							
n-Propylbenzene	ND	0.0050	mg/kg wet							
sec-Butylbenzene	ND	0.0050	mg/kg wet							
Styrene	ND	0.0050	mg/kg wet							
tert-Butylbenzene	ND	0.0050	mg/kg wet							
Tertiary-amyl methyl ether	ND	0.0050	mg/kg wet							
Tetrachloroethene	ND	0.0050	mg/kg wet							
Tetrahydrofuran	ND	0.0050	mg/kg wet							
Toluene	ND	0.0050	mg/kg wet							
trans-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
trans-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Trichloroethene	ND	0.0050	mg/kg wet							
Trichlorofluoromethane	ND	0.0050	mg/kg wet							
Vinyl Acetate	ND	0.0050	mg/kg wet							
Vinyl Chloride	ND	0.0100	mg/kg wet							
Xylene O	ND	0.0050	mg/kg wet							
Xylene P,M	ND	0.0100	mg/kg wet							
Xylenes (Total)	ND	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	0.0505		mg/kg wet	0.05000		101	70-130			
Surrogate: 4-Bromofluorobenzene	0.0427		mg/kg wet	0.05000		85	70-130			
Surrogate: Dibromofluoromethane	0.0497		mg/kg wet	0.05000		99	70-130			
Surrogate: Toluene-d8	0.0511		mg/kg wet	0.05000		102	70-130			

**LCS**

1,1,1,2-Tetrachloroethane	0.0500	0.0050	mg/kg wet	0.05000		100	70-130			
1,1,1-Trichloroethane	0.0512	0.0050	mg/kg wet	0.05000		102	70-130			
1,1,2,2-Tetrachloroethane	0.0546	0.0050	mg/kg wet	0.05000		109	70-130			
1,1,2-Trichloroethane	0.0527	0.0050	mg/kg wet	0.05000		105	70-130			
1,1-Dichloroethane	0.0515	0.0050	mg/kg wet	0.05000		103	70-130			
1,1-Dichloroethene	0.0521	0.0050	mg/kg wet	0.05000		104	70-130			
1,1-Dichloropropene	0.0543	0.0050	mg/kg wet	0.05000		109	70-130			
1,2,3-Trichlorobenzene	0.0491	0.0050	mg/kg wet	0.05000		98	70-130			
1,2,3-Trichloropropane	0.0523	0.0050	mg/kg wet	0.05000		105	70-130			
1,2,4-Trichlorobenzene	0.0476	0.0050	mg/kg wet	0.05000		95	70-130			



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710683

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CJ72623 - 5035**

1,2,4-Trimethylbenzene	0.0536	0.0050	mg/kg wet	0.05000		107	70-130			
1,2-Dibromo-3-Chloropropane	0.0451	0.0050	mg/kg wet	0.05000		90	70-130			
1,2-Dibromoethane	0.0508	0.0050	mg/kg wet	0.05000		102	70-130			
1,2-Dichlorobenzene	0.0510	0.0050	mg/kg wet	0.05000		102	70-130			
1,2-Dichloroethane	0.0518	0.0050	mg/kg wet	0.05000		104	70-130			
1,2-Dichloropropane	0.0530	0.0050	mg/kg wet	0.05000		106	70-130			
1,3,5-Trimethylbenzene	0.0529	0.0050	mg/kg wet	0.05000		106	70-130			
1,3-Dichlorobenzene	0.0519	0.0050	mg/kg wet	0.05000		104	70-130			
1,3-Dichloropropane	0.0549	0.0050	mg/kg wet	0.05000		110	70-130			
1,4-Dichlorobenzene	0.0525	0.0050	mg/kg wet	0.05000		105	70-130			
1,4-Dioxane	0.714	0.100	mg/kg wet	1.000		71	70-130			
1-Chlorohexane	0.0505	0.0050	mg/kg wet	0.05000		101	70-130			
2,2-Dichloropropane	0.0498	0.0050	mg/kg wet	0.05000		100	70-130			
2-Butanone	0.295	0.0500	mg/kg wet	0.2500		118	70-130			
2-Chlorotoluene	0.0514	0.0050	mg/kg wet	0.05000		103	70-130			
2-Hexanone	0.264	0.0500	mg/kg wet	0.2500		106	70-130			
4-Chlorotoluene	0.0521	0.0050	mg/kg wet	0.05000		104	70-130			
4-Isopropyltoluene	0.0523	0.0050	mg/kg wet	0.05000		105	70-130			
4-Methyl-2-Pentanone	0.257	0.0500	mg/kg wet	0.2500		103	70-130			
Acetone	0.333	0.0500	mg/kg wet	0.2500		133	70-130			B+
Benzene	0.0533	0.0050	mg/kg wet	0.05000		107	70-130			
Bromobenzene	0.0507	0.0050	mg/kg wet	0.05000		101	70-130			
Bromochloromethane	0.0501	0.0050	mg/kg wet	0.05000		100	70-130			
Bromodichloromethane	0.0534	0.0050	mg/kg wet	0.05000		107	70-130			
Bromoform	0.0415	0.0050	mg/kg wet	0.05000		83	70-130			
Bromomethane	0.0491	0.0100	mg/kg wet	0.05000		98	70-130			
Carbon Disulfide	0.0554	0.0050	mg/kg wet	0.05000		111	70-130			
Carbon Tetrachloride	0.0512	0.0050	mg/kg wet	0.05000		102	70-130			
Chlorobenzene	0.0506	0.0050	mg/kg wet	0.05000		101	70-130			
Chloroethane	0.0531	0.0100	mg/kg wet	0.05000		106	70-130			
Chloroform	0.0516	0.0050	mg/kg wet	0.05000		103	70-130			
Chloromethane	0.0508	0.0100	mg/kg wet	0.05000		102	70-130			
cis-1,2-Dichloroethene	0.0527	0.0050	mg/kg wet	0.05000		105	70-130			
cis-1,3-Dichloropropene	0.0539	0.0050	mg/kg wet	0.05000		108	70-130			
Dibromochloromethane	0.0461	0.0050	mg/kg wet	0.05000		92	70-130			
Dibromomethane	0.0506	0.0050	mg/kg wet	0.05000		101	70-130			
Dichlorodifluoromethane	0.0462	0.0100	mg/kg wet	0.05000		92	70-130			
Diethyl Ether	0.0524	0.0050	mg/kg wet	0.05000		105	70-130			
Di-isopropyl ether	0.0523	0.0050	mg/kg wet	0.05000		105	70-130			
Ethyl tertiary-butyl ether	0.0504	0.0050	mg/kg wet	0.05000		101	70-130			
Ethylbenzene	0.0509	0.0050	mg/kg wet	0.05000		102	70-130			
Hexachlorobutadiene	0.0489	0.0050	mg/kg wet	0.05000		98	70-130			
Isopropylbenzene	0.0501	0.0050	mg/kg wet	0.05000		100	70-130			
Methyl tert-Butyl Ether	0.0487	0.0050	mg/kg wet	0.05000		97	70-130			
Methylene Chloride	0.0543	0.0250	mg/kg wet	0.05000		109	70-130			



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710683

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CJ72623 - 5035**

Naphthalene	0.0444	0.0050	mg/kg wet	0.05000		89	70-130			
n-Butylbenzene	0.0530	0.0050	mg/kg wet	0.05000		106	70-130			
n-Propylbenzene	0.0536	0.0050	mg/kg wet	0.05000		107	70-130			
sec-Butylbenzene	0.0525	0.0050	mg/kg wet	0.05000		105	70-130			
Styrene	0.0500	0.0050	mg/kg wet	0.05000		100	70-130			
tert-Butylbenzene	0.0515	0.0050	mg/kg wet	0.05000		103	70-130			
Tertiary-amyl methyl ether	0.0485	0.0050	mg/kg wet	0.05000		97	70-130			
Tetrachloroethene	0.0509	0.0050	mg/kg wet	0.05000		102	70-130			
Tetrahydrofuran	0.0471	0.0050	mg/kg wet	0.05000		94	70-130			
Toluene	0.0521	0.0050	mg/kg wet	0.05000		104	70-130			
trans-1,2-Dichloroethene	0.0521	0.0050	mg/kg wet	0.05000		104	70-130			
trans-1,3-Dichloropropene	0.0469	0.0050	mg/kg wet	0.05000		94	70-130			
Trichloroethene	0.0519	0.0050	mg/kg wet	0.05000		104	70-130			
Trichlorofluoromethane	0.0509	0.0050	mg/kg wet	0.05000		102	70-130			
Vinyl Acetate	0.0437	0.0050	mg/kg wet	0.05000		87	70-130			
Vinyl Chloride	0.0507	0.0100	mg/kg wet	0.05000		101	70-130			
Xylene O	0.0535	0.0050	mg/kg wet	0.05000		107	70-130			
Xylene P,M	0.106	0.0100	mg/kg wet	0.1000		106	70-130			
Xylenes (Total)	0.160	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	0.0536		mg/kg wet	0.05000		107	70-130			
Surrogate: 4-Bromofluorobenzene	0.0519		mg/kg wet	0.05000		104	70-130			
Surrogate: Dibromofluoromethane	0.0550		mg/kg wet	0.05000		110	70-130			
Surrogate: Toluene-d8	0.0539		mg/kg wet	0.05000		108	70-130			

**LCS Dup**

1,1,1,2-Tetrachloroethane	0.0480	0.0050	mg/kg wet	0.05000		96	70-130	4	25	
1,1,1-Trichloroethane	0.0488	0.0050	mg/kg wet	0.05000		98	70-130	5	25	
1,1,2,2-Tetrachloroethane	0.0529	0.0050	mg/kg wet	0.05000		106	70-130	3	25	
1,1,2-Trichloroethane	0.0510	0.0050	mg/kg wet	0.05000		102	70-130	3	25	
1,1-Dichloroethane	0.0490	0.0050	mg/kg wet	0.05000		98	70-130	5	25	
1,1-Dichloroethene	0.0505	0.0050	mg/kg wet	0.05000		101	70-130	3	25	
1,1-Dichloropropene	0.0509	0.0050	mg/kg wet	0.05000		102	70-130	6	25	
1,2,3-Trichlorobenzene	0.0456	0.0050	mg/kg wet	0.05000		91	70-130	8	25	
1,2,3-Trichloropropane	0.0518	0.0050	mg/kg wet	0.05000		104	70-130	1	25	
1,2,4-Trichlorobenzene	0.0446	0.0050	mg/kg wet	0.05000		89	70-130	6	25	
1,2,4-Trimethylbenzene	0.0535	0.0050	mg/kg wet	0.05000		107	70-130	0.2	25	
1,2-Dibromo-3-Chloropropane	0.0438	0.0050	mg/kg wet	0.05000		88	70-130	3	25	
1,2-Dibromoethane	0.0507	0.0050	mg/kg wet	0.05000		101	70-130	0.2	25	
1,2-Dichlorobenzene	0.0506	0.0050	mg/kg wet	0.05000		101	70-130	0.8	25	
1,2-Dichloroethane	0.0498	0.0050	mg/kg wet	0.05000		100	70-130	4	25	
1,2-Dichloropropane	0.0507	0.0050	mg/kg wet	0.05000		101	70-130	4	25	
1,3,5-Trimethylbenzene	0.0526	0.0050	mg/kg wet	0.05000		105	70-130	0.6	25	
1,3-Dichlorobenzene	0.0504	0.0050	mg/kg wet	0.05000		101	70-130	3	25	
1,3-Dichloropropane	0.0529	0.0050	mg/kg wet	0.05000		106	70-130	4	25	
1,4-Dichlorobenzene	0.0518	0.0050	mg/kg wet	0.05000		104	70-130	1	25	
1,4-Dioxane	0.664	0.100	mg/kg wet	1.000		66	70-130	7	20	B-



*CERTIFICATE OF ANALYSIS*

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ESS Laboratory Work Order: 1710683

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CJ72623 - 5035**

1-Chlorohexane	0.0495	0.0050	mg/kg wet	0.05000		99	70-130	2	25	
2,2-Dichloropropane	0.0474	0.0050	mg/kg wet	0.05000		95	70-130	5	25	
2-Butanone	0.270	0.0500	mg/kg wet	0.2500		108	70-130	9	25	
2-Chlorotoluene	0.0513	0.0050	mg/kg wet	0.05000		103	70-130	0.2	25	
2-Hexanone	0.247	0.0500	mg/kg wet	0.2500		99	70-130	7	25	
4-Chlorotoluene	0.0514	0.0050	mg/kg wet	0.05000		103	70-130	1	25	
4-Isopropyltoluene	0.0519	0.0050	mg/kg wet	0.05000		104	70-130	0.8	25	
4-Methyl-2-Pentanone	0.246	0.0500	mg/kg wet	0.2500		98	70-130	5	25	
Acetone	0.273	0.0500	mg/kg wet	0.2500		109	70-130	20	25	
Benzene	0.0502	0.0050	mg/kg wet	0.05000		100	70-130	6	25	
Bromobenzene	0.0505	0.0050	mg/kg wet	0.05000		101	70-130	0.5	25	
Bromochloromethane	0.0484	0.0050	mg/kg wet	0.05000		97	70-130	4	25	
Bromodichloromethane	0.0508	0.0050	mg/kg wet	0.05000		102	70-130	5	25	
Bromoform	0.0399	0.0050	mg/kg wet	0.05000		80	70-130	4	25	
Bromomethane	0.0664	0.0100	mg/kg wet	0.05000		133	70-130	30	25	B+, D+
Carbon Disulfide	0.0523	0.0050	mg/kg wet	0.05000		105	70-130	6	25	
Carbon Tetrachloride	0.0482	0.0050	mg/kg wet	0.05000		96	70-130	6	25	
Chlorobenzene	0.0484	0.0050	mg/kg wet	0.05000		97	70-130	4	25	
Chloroethane	0.0511	0.0100	mg/kg wet	0.05000		102	70-130	4	25	
Chloroform	0.0488	0.0050	mg/kg wet	0.05000		98	70-130	6	25	
Chloromethane	0.0480	0.0100	mg/kg wet	0.05000		96	70-130	6	25	
cis-1,2-Dichloroethene	0.0504	0.0050	mg/kg wet	0.05000		101	70-130	4	25	
cis-1,3-Dichloropropene	0.0524	0.0050	mg/kg wet	0.05000		105	70-130	3	25	
Dibromochloromethane	0.0449	0.0050	mg/kg wet	0.05000		90	70-130	3	25	
Dibromomethane	0.0487	0.0050	mg/kg wet	0.05000		97	70-130	4	25	
Dichlorodifluoromethane	0.0426	0.0100	mg/kg wet	0.05000		85	70-130	8	25	
Diethyl Ether	0.0522	0.0050	mg/kg wet	0.05000		104	70-130	0.3	25	
Di-isopropyl ether	0.0510	0.0050	mg/kg wet	0.05000		102	70-130	3	25	
Ethyl tertiary-butyl ether	0.0493	0.0050	mg/kg wet	0.05000		99	70-130	2	25	
Ethylbenzene	0.0490	0.0050	mg/kg wet	0.05000		98	70-130	4	25	
Hexachlorobutadiene	0.0476	0.0050	mg/kg wet	0.05000		95	70-130	3	25	
Isopropylbenzene	0.0498	0.0050	mg/kg wet	0.05000		100	70-130	0.6	25	
Methyl tert-Butyl Ether	0.0482	0.0050	mg/kg wet	0.05000		96	70-130	1	25	
Methylene Chloride	0.0520	0.0250	mg/kg wet	0.05000		104	70-130	4	25	
Naphthalene	0.0390	0.0050	mg/kg wet	0.05000		78	70-130	13	25	
n-Butylbenzene	0.0521	0.0050	mg/kg wet	0.05000		104	70-130	2	25	
n-Propylbenzene	0.0533	0.0050	mg/kg wet	0.05000		107	70-130	0.4	25	
sec-Butylbenzene	0.0521	0.0050	mg/kg wet	0.05000		104	70-130	0.8	25	
Styrene	0.0483	0.0050	mg/kg wet	0.05000		97	70-130	3	25	
tert-Butylbenzene	0.0518	0.0050	mg/kg wet	0.05000		104	70-130	0.5	25	
Tertiary-amyl methyl ether	0.0476	0.0050	mg/kg wet	0.05000		95	70-130	2	25	
Tetrachloroethene	0.0478	0.0050	mg/kg wet	0.05000		96	70-130	6	25	
Tetrahydrofuran	0.0469	0.0050	mg/kg wet	0.05000		94	70-130	0.6	25	
Toluene	0.0495	0.0050	mg/kg wet	0.05000		99	70-130	5	25	
trans-1,2-Dichloroethene	0.0501	0.0050	mg/kg wet	0.05000		100	70-130	4	25	



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710683

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CJ72623 - 5035**

trans-1,3-Dichloropropene	0.0456	0.0050	mg/kg wet	0.05000		91	70-130	3	25	
Trichloroethene	0.0499	0.0050	mg/kg wet	0.05000		100	70-130	4	25	
Trichlorofluoromethane	0.0476	0.0050	mg/kg wet	0.05000		95	70-130	7	25	
Vinyl Acetate	0.0443	0.0050	mg/kg wet	0.05000		89	70-130	1	25	
Vinyl Chloride	0.0475	0.0100	mg/kg wet	0.05000		95	70-130	7	25	
Xylene O	0.0513	0.0050	mg/kg wet	0.05000		103	70-130	4	25	
Xylene P,M	0.102	0.0100	mg/kg wet	0.1000		102	70-130	4	25	
Xylenes (Total)	0.154	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	0.0522		mg/kg wet	0.05000		104	70-130			
Surrogate: 4-Bromofluorobenzene	0.0504		mg/kg wet	0.05000		101	70-130			
Surrogate: Dibromofluoromethane	0.0534		mg/kg wet	0.05000		107	70-130			
Surrogate: Toluene-d8	0.0529		mg/kg wet	0.05000		106	70-130			

8270D Polynuclear Aromatic Hydrocarbons

**Batch CJ72708 - 3546**

<b>Blank</b>										
2-Methylnaphthalene	ND	0.333	mg/kg wet							
Acenaphthene	ND	0.333	mg/kg wet							
Acenaphthylene	ND	0.333	mg/kg wet							
Anthracene	ND	0.333	mg/kg wet							
Benzo(a)anthracene	ND	0.333	mg/kg wet							
Benzo(a)pyrene	ND	0.167	mg/kg wet							
Benzo(b)fluoranthene	ND	0.333	mg/kg wet							
Benzo(g,h,i)perylene	ND	0.333	mg/kg wet							
Benzo(k)fluoranthene	ND	0.333	mg/kg wet							
Chrysene	ND	0.167	mg/kg wet							
Dibenzo(a,h)Anthracene	ND	0.167	mg/kg wet							
Fluoranthene	ND	0.333	mg/kg wet							
Fluorene	ND	0.333	mg/kg wet							
Indeno(1,2,3-cd)Pyrene	ND	0.333	mg/kg wet							
Naphthalene	ND	0.333	mg/kg wet							
Phenanthrene	ND	0.333	mg/kg wet							
Pyrene	ND	0.333	mg/kg wet							
Surrogate: 1,2-Dichlorobenzene-d4	2.19		mg/kg wet	3.333		66	30-130			
Surrogate: 2-Fluorobiphenyl	2.43		mg/kg wet	3.333		73	30-130			
Surrogate: Nitrobenzene-d5	2.33		mg/kg wet	3.333		70	30-130			
Surrogate: p-Terphenyl-d14	3.17		mg/kg wet	3.333		95	30-130			

<b>LCS</b>										
2-Methylnaphthalene	2.14	0.333	mg/kg wet	3.333		64	40-140			
Acenaphthene	2.16	0.333	mg/kg wet	3.333		65	40-140			
Acenaphthylene	2.25	0.333	mg/kg wet	3.333		68	40-140			
Anthracene	2.56	0.333	mg/kg wet	3.333		77	40-140			
Benzo(a)anthracene	2.67	0.333	mg/kg wet	3.333		80	40-140			
Benzo(a)pyrene	2.73	0.167	mg/kg wet	3.333		82	40-140			
Benzo(b)fluoranthene	2.85	0.333	mg/kg wet	3.333		86	40-140			



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710683

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
<b>8270D Polynuclear Aromatic Hydrocarbons</b>										
<b>Batch CJ72708 - 3546</b>										
Benzo(g,h,i)perylene	2.75	0.333	mg/kg wet	3.333		83	40-140			
Benzo(k)fluoranthene	2.68	0.333	mg/kg wet	3.333		80	40-140			
Chrysene	2.62	0.167	mg/kg wet	3.333		78	40-140			
Dibenzo(a,h)Anthracene	2.78	0.167	mg/kg wet	3.333		84	40-140			
Fluoranthene	2.58	0.333	mg/kg wet	3.333		77	40-140			
Fluorene	2.52	0.333	mg/kg wet	3.333		75	40-140			
Indeno(1,2,3-cd)Pyrene	2.80	0.333	mg/kg wet	3.333		84	40-140			
Naphthalene	2.06	0.333	mg/kg wet	3.333		62	40-140			
Phenanthrene	2.48	0.333	mg/kg wet	3.333		74	40-140			
Pyrene	2.77	0.333	mg/kg wet	3.333		83	40-140			
Surrogate: 1,2-Dichlorobenzene-d4	2.05		mg/kg wet	3.333		62	30-130			
Surrogate: 2-Fluorobiphenyl	2.28		mg/kg wet	3.333		68	30-130			
Surrogate: Nitrobenzene-d5	2.22		mg/kg wet	3.333		67	30-130			
Surrogate: p-Terphenyl-d14	3.20		mg/kg wet	3.333		96	30-130			
<b>LCS Dup</b>										
2-Methylnaphthalene	2.34	0.333	mg/kg wet	3.333		70	40-140	9	30	
Acenaphthene	2.36	0.333	mg/kg wet	3.333		71	40-140	9	30	
Acenaphthylene	2.47	0.333	mg/kg wet	3.333		74	40-140	9	30	
Anthracene	2.78	0.333	mg/kg wet	3.333		84	40-140	8	30	
Benzo(a)anthracene	2.89	0.333	mg/kg wet	3.333		87	40-140	8	30	
Benzo(a)pyrene	2.97	0.167	mg/kg wet	3.333		89	40-140	8	30	
Benzo(b)fluoranthene	2.98	0.333	mg/kg wet	3.333		89	40-140	5	30	
Benzo(g,h,i)perylene	2.95	0.333	mg/kg wet	3.333		89	40-140	7	30	
Benzo(k)fluoranthene	2.97	0.333	mg/kg wet	3.333		89	40-140	10	30	
Chrysene	2.85	0.167	mg/kg wet	3.333		86	40-140	9	30	
Dibenzo(a,h)Anthracene	3.00	0.167	mg/kg wet	3.333		90	40-140	8	30	
Fluoranthene	2.94	0.333	mg/kg wet	3.333		88	40-140	13	30	
Fluorene	2.65	0.333	mg/kg wet	3.333		80	40-140	5	30	
Indeno(1,2,3-cd)Pyrene	3.02	0.333	mg/kg wet	3.333		91	40-140	7	30	
Naphthalene	2.34	0.333	mg/kg wet	3.333		70	40-140	13	30	
Phenanthrene	2.68	0.333	mg/kg wet	3.333		81	40-140	8	30	
Pyrene	2.91	0.333	mg/kg wet	3.333		87	40-140	5	30	
Surrogate: 1,2-Dichlorobenzene-d4	2.24		mg/kg wet	3.333		67	30-130			
Surrogate: 2-Fluorobiphenyl	2.47		mg/kg wet	3.333		74	30-130			
Surrogate: Nitrobenzene-d5	2.51		mg/kg wet	3.333		75	30-130			
Surrogate: p-Terphenyl-d14	3.27		mg/kg wet	3.333		98	30-130			





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710683

**Notes and Definitions**

- U Analyte included in the analysis, but not detected
- IM Internal Standard(s) outside of criteria due to matrix (UCM/coelution is present) (IM).
- D+ Relative percent difference for duplicate is outside of criteria (D+).
- D Diluted.
- CD+ Continuing Calibration %Diff/Drift is above control limit (CD+).
- B+ Blank Spike recovery is above upper control limit (B+).
- B- Blank Spike recovery is below lower control limit (B-).
- ND Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference
- MDL Method Detection Limit
- MRL Method Reporting Limit
- LOD Limit of Detection
- LOQ Limit of Quantitation
- DL Detection Limit
- I/V Initial Volume
- F/V Final Volume
- § Subcontracted analysis; see attached report
- 1 Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
- 2 Range result excludes concentrations of target analytes eluting in that range.
- 3 Range result excludes the concentration of the C9-C10 aromatic range.
- Avg Results reported as a mathematical average.
- NR No Recovery
- [CALC] Calculated Analyte
- SUB Subcontracted analysis; see attached report
- RL Reporting Limit
- EDL Estimated Detection Limit



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710683

**ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS**

**ENVIRONMENTAL**

Rhode Island Potable and Non Potable Water: LAI00179

<http://www.health.ri.gov/find/labs/analytical/ESS.pdf>

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750

[http://www.ct.gov/dph/lib/dph/environmental\\_health/environmental\\_laboratories/pdf/OutOfStateCommercialLaboratories.pdf](http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutOfStateCommercialLaboratories.pdf)

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002

<http://www.maine.gov/dhhs/meecd/environmental-health/dwp/partners/labCert.shtml>

Massachusetts Potable and Non Potable Water: M-RI002

<http://public.dep.state.ma.us/Labcert/Labcert.aspx>

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424

<http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm>

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313

<http://www.wadsworth.org/labcert/elap/comm.html>

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006

[http://datamine2.state.nj.us/DEP\\_OPRA/OpraMain/pi\\_main?mode=pi\\_by\\_site&sort\\_order=PI\\_NAMEA&Select+a+Site:=58715](http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715)

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752

<http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx>

## ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Providence, RI - GZA/HDM

ESS Project ID: 1710683  
 Date Received: 10/26/2017  
 Project Due Date: 11/2/2017  
 Days for Project: 5 Day

Shipped/Delivered Via: ESS Courier

- 1. Air bill manifest present?  No  
 Air No.: NA
- 2. Were custody seals present?  No
- 3. Is radiation count <100 CPM?  Yes
- 4. Is a Cooler Present?  Yes  
 Temp: 2.9 Iced with: Ice
- 5. Was COC signed and dated by client?  Yes

- 6. Does COC match bottles?  Yes
- 7. Is COC complete and correct?  Yes
- 8. Were samples received intact?  Yes
- 9. Were labs informed about short holds & rushes? Yes / No /  NA
- 10. Were any analyses received outside of hold time? Yes /  No

11. Any Subcontracting needed? Yes /  No  
 ESS Sample IDs: \_\_\_\_\_  
 Analysis: \_\_\_\_\_  
 TAT: \_\_\_\_\_

- 12. Were VOAs received?  Yes / No
- a. Air bubbles in aqueous VOAs? Yes / No
- b. Does methanol cover soil completely?  Yes / No / NA

13. Are the samples properly preserved?  Yes / No  
 a. If metals preserved upon receipt: Date: \_\_\_\_\_ Time: \_\_\_\_\_ By: \_\_\_\_\_  
 b. Low Level VOA vials frozen: Date: 10/26/17 Time: 1538 By: RL

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes /  No  
 a. Was there a need to contact the client? Yes / No  
 Who was contacted? \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_ By: \_\_\_\_\_

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
01	176317	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
01	176318	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
01	176332	Yes	NA	Yes	VOA Vial - Other	Other	
01	176333	Yes	NA	Yes	VOA Vial - Other	Other	
02	176319	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
02	176334	Yes	NA	Yes	VOA Vial - Other	Other	

2nd Review  
 Are barcode labels on correct containers?  Yes / No

Completed By: [Signature] Date & Time: 10/26/17 1511  
 Reviewed By: [Signature] Date & Time: 10/26/17 1538  
 Delivered By: [Signature] Date & Time: 10/26/17 1538

ESS Laboratory

Division of Thielsch Engineering, Inc.  
 185 Frances Avenue, Cranston RI 02910  
 Tel. (401) 461-7181 Fax (401) 461-4486  
 www.esslaboratory.com

CHAIN OF CUSTODY

ESS Lab # **1710683**

Reporting Limits **RIDEM R-DEC and GB Leachability**

Electronic Deliverables  Limit Checker  Standard Excel  
 Other (Please Specify →)

Turn Time **5-Day** Rush

Regulatory State **Rhode Island**

Is this project for any of the following?:  
 CT RCP  MA MCP  RGP

Company Name **GZA** Project # **05.0043654.00** Project Name **Former Tidewater Facility**

Contact Person **Sean Connolly** Address **530 Broadway**

City **Providence** State **RI** Zip Code **02909** PO # **43654**

Telephone Number **401-421-4140** FAX Number **-** Email Address **sean.connolly@gza.com**

ESS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID	Analysis															
1	10/25/17	1030	Grab	Soil	GZ-BW-501 (0-2')	X	X														
2	10/25/17	1105	Grab	Soil	GZ-BW-501 (7-8')			X													
3	10/26/17	1105	Grab	Soil	GZ-BW-505 (6-8')			X													
4	10/25/17	0920	Grdly	Soil	GZ-SS <sup>620</sup> GZ-BW-501A (0-2')			X													
5	10/26/17	1400	-	-	TB-102617	X															

Container Type: AC-Air Cassette AG-Amber Glass B-BOD Bottle C-Cubitainer G - Glass O-Other P-Poly S-Sterile V-Vial

Container Volume: 1-100 mL 2-2.5 gal 3-250 mL 4-300 mL 5-500 mL 6-1L 7-VOA 8-2 oz 9-4 oz 10-8 oz 11-Other\*

Preservation Code: 1-Non Preserved 2-HCl 3-H2SO4 4-HNO3 5-NaOH 6-Methanol 7-Na2S2O3 8-ZnAce, NaOH 9-NH4Cl 10-DI H2O 11-Other\*

Number of Containers per Sample:

**Laboratory Use Only**

Cooler Present:  Seals Intact:  Cooler Temperature: **See temp 2.9°C 10/26/17 14:32**

Sampled by: Sean Connolly, Sarah McLeod, Erik Beloff

Comments: Please specify "Other" preservative and containers types in this space

NGRID rates apply

Please email sarah.mcleod@gza.com also

Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)
<i>Sean Connolly</i> 10/26/17 14:02	<i>[Signature]</i> 10/26/17 14:09	<i>[Signature]</i> 10/26/17 14:32	<i>[Signature]</i> 10/26/17 14:58
Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)



*CERTIFICATE OF ANALYSIS*

Sarah McLeod  
GZA GeoEnvironmental, Inc.  
530 Broadway  
Providence, RI 02909

**RE: Former Tidewater Facility (05.0043654.00)**  
**ESS Laboratory Work Order Number: 1710790**

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard  
Laboratory Director

**REVIEWED**  
*By ESS Laboratory at 2:31 pm, Nov 07, 2017*

**Analytical Summary**

The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710790

**SAMPLE RECEIPT**

The following samples were received on October 31, 2017 for the analyses specified on the enclosed Chain of Custody Record.

**Low Level VOA vials were frozen by ESS Laboratory on October 31, 2017 at 19:05.**

<u>Lab Number</u>	<u>Sample Name</u>	<u>Matrix</u>	<u>Analysis</u>
1710790-01	GZ-BW-510 0-2	Soil	8260B Low, 8270D
1710790-02	GZ-BK-502 0-2	Soil	8260B Low, 8270D





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710790

**PROJECT NARRATIVE**

**5035/8260B Volatile Organic Compounds / Low Level**

CK70133-BS1 Blank Spike recovery is below lower control limit (B-).  
1,4-Dioxane (69% @ 70-130%), Dichlorodifluoromethane (58% @ 70-130%)

CK70133-BSD1 Blank Spike recovery is below lower control limit (B-).  
1,4-Dioxane (67% @ 70-130%), Dichlorodifluoromethane (58% @ 70-130%)

**8270D Polynuclear Aromatic Hydrocarbons**

C7K0001-CCV1 Continuing Calibration %Diff/Drift is below control limit (CD-).  
Nitrobenzene-d5 (25% @ 20%)

**No other observations noted.**

**End of Project Narrative.**

**DATA USABILITY LINKS**

*To ensure you are viewing the most current version of the documents below, please clear your internet cookies for [www.ESSLaboratory.com](http://www.ESSLaboratory.com). Consult your IT Support personnel for information on how to clear your internet cookies.*

[Definitions of Quality Control Parameters](#)

[Semivolatile Organics Internal Standard Information](#)

[Semivolatile Organics Surrogate Information](#)

[Volatile Organics Internal Standard Information](#)

[Volatile Organics Surrogate Information](#)

[EPH and VPH Alkane Lists](#)



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710790

**CURRENT SW-846 METHODOLOGY VERSIONS**

**Analytical Methods**

- 1010A - Flashpoint
- 6010C - ICP
- 6020A - ICP MS
- 7010 - Graphite Furnace
- 7196A - Hexavalent Chromium
- 7470A - Aqueous Mercury
- 7471B - Solid Mercury
- 8011 - EDB/DBCP/TCP
- 8015C - GRO/DRO
- 8081B - Pesticides
- 8082A - PCB
- 8100M - TPH
- 8151A - Herbicides
- 8260B - VOA
- 8270D - SVOA
- 8270D SIM - SVOA Low Level
- 9014 - Cyanide
- 9038 - Sulfate
- 9040C - Aqueous pH
- 9045D - Solid pH (Corrosivity)
- 9050A - Specific Conductance
- 9056A - Anions (IC)
- 9060A - TOC
- 9095B - Paint Filter
- MADEP 04-1.1 - EPH / VPH

**Prep Methods**

- 3005A - Aqueous ICP Digestion
- 3020A - Aqueous Graphite Furnace / ICP MS Digestion
- 3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
- 3060A - Solid Hexavalent Chromium Digestion
- 3510C - Separatory Funnel Extraction
- 3520C - Liquid / Liquid Extraction
- 3540C - Manual Soxhlet Extraction
- 3541 - Automated Soxhlet Extraction
- 3546 - Microwave Extraction
- 3580A - Waste Dilution
- 5030B - Aqueous Purge and Trap
- 5030C - Aqueous Purge and Trap
- 5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-BW-510 0-2  
Date Sampled: 10/30/17 14:10  
Percent Solids: 91  
Initial Volume: 8.1  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710790  
ESS Laboratory Sample ID: 1710790-01  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0034)		8260B Low		1	11/01/17 17:58	C7K0012	CK70133
1,1,1-Trichloroethane	ND (0.0034)		8260B Low		1	11/01/17 17:58	C7K0012	CK70133
1,1,2,2-Tetrachloroethane	ND (0.0034)		8260B Low		1	11/01/17 17:58	C7K0012	CK70133
1,1,2-Trichloroethane	ND (0.0034)		8260B Low		1	11/01/17 17:58	C7K0012	CK70133
1,1-Dichloroethane	ND (0.0034)		8260B Low		1	11/01/17 17:58	C7K0012	CK70133
1,1-Dichloroethene	ND (0.0034)		8260B Low		1	11/01/17 17:58	C7K0012	CK70133
1,1-Dichloropropene	ND (0.0034)		8260B Low		1	11/01/17 17:58	C7K0012	CK70133
1,2,3-Trichlorobenzene	ND (0.0034)		8260B Low		1	11/01/17 17:58	C7K0012	CK70133
1,2,3-Trichloropropane	ND (0.0034)		8260B Low		1	11/01/17 17:58	C7K0012	CK70133
1,2,4-Trichlorobenzene	ND (0.0034)		8260B Low		1	11/01/17 17:58	C7K0012	CK70133
1,2,4-Trimethylbenzene	ND (0.0034)		8260B Low		1	11/01/17 17:58	C7K0012	CK70133
1,2-Dibromo-3-Chloropropane	ND (0.0034)		8260B Low		1	11/01/17 17:58	C7K0012	CK70133
1,2-Dibromoethane	ND (0.0034)		8260B Low		1	11/01/17 17:58	C7K0012	CK70133
1,2-Dichlorobenzene	ND (0.0034)		8260B Low		1	11/01/17 17:58	C7K0012	CK70133
1,2-Dichloroethane	ND (0.0034)		8260B Low		1	11/01/17 17:58	C7K0012	CK70133
1,2-Dichloropropane	ND (0.0034)		8260B Low		1	11/01/17 17:58	C7K0012	CK70133
1,3,5-Trimethylbenzene	ND (0.0034)		8260B Low		1	11/01/17 17:58	C7K0012	CK70133
1,3-Dichlorobenzene	ND (0.0034)		8260B Low		1	11/01/17 17:58	C7K0012	CK70133
1,3-Dichloropropane	ND (0.0034)		8260B Low		1	11/01/17 17:58	C7K0012	CK70133
1,4-Dichlorobenzene	ND (0.0034)		8260B Low		1	11/01/17 17:58	C7K0012	CK70133
1,4-Dioxane	ND (0.0675)		8260B Low		1	11/01/17 17:58	C7K0012	CK70133
1-Chlorohexane	ND (0.0034)		8260B Low		1	11/01/17 17:58	C7K0012	CK70133
2,2-Dichloropropane	ND (0.0034)		8260B Low		1	11/01/17 17:58	C7K0012	CK70133
2-Butanone	ND (0.0337)		8260B Low		1	11/01/17 17:58	C7K0012	CK70133
2-Chlorotoluene	ND (0.0034)		8260B Low		1	11/01/17 17:58	C7K0012	CK70133
2-Hexanone	ND (0.0337)		8260B Low		1	11/01/17 17:58	C7K0012	CK70133
4-Chlorotoluene	ND (0.0034)		8260B Low		1	11/01/17 17:58	C7K0012	CK70133
4-Isopropyltoluene	ND (0.0034)		8260B Low		1	11/01/17 17:58	C7K0012	CK70133
4-Methyl-2-Pentanone	ND (0.0337)		8260B Low		1	11/01/17 17:58	C7K0012	CK70133
Acetone	ND (0.0337)		8260B Low		1	11/01/17 17:58	C7K0012	CK70133
Benzene	ND (0.0034)		8260B Low		1	11/01/17 17:58	C7K0012	CK70133
Bromobenzene	ND (0.0034)		8260B Low		1	11/01/17 17:58	C7K0012	CK70133



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-BW-510 0-2  
Date Sampled: 10/30/17 14:10  
Percent Solids: 91  
Initial Volume: 8.1  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710790  
ESS Laboratory Sample ID: 1710790-01  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0034)		8260B Low		1	11/01/17 17:58	C7K0012	CK70133
Bromodichloromethane	ND (0.0034)		8260B Low		1	11/01/17 17:58	C7K0012	CK70133
Bromoform	ND (0.0034)		8260B Low		1	11/01/17 17:58	C7K0012	CK70133
Bromomethane	ND (0.0067)		8260B Low		1	11/01/17 17:58	C7K0012	CK70133
Carbon Disulfide	ND (0.0034)		8260B Low		1	11/01/17 17:58	C7K0012	CK70133
Carbon Tetrachloride	ND (0.0034)		8260B Low		1	11/01/17 17:58	C7K0012	CK70133
Chlorobenzene	ND (0.0034)		8260B Low		1	11/01/17 17:58	C7K0012	CK70133
Chloroethane	ND (0.0067)		8260B Low		1	11/01/17 17:58	C7K0012	CK70133
Chloroform	ND (0.0034)		8260B Low		1	11/01/17 17:58	C7K0012	CK70133
Chloromethane	ND (0.0067)		8260B Low		1	11/01/17 17:58	C7K0012	CK70133
cis-1,2-Dichloroethene	ND (0.0034)		8260B Low		1	11/01/17 17:58	C7K0012	CK70133
cis-1,3-Dichloropropene	ND (0.0034)		8260B Low		1	11/01/17 17:58	C7K0012	CK70133
Dibromochloromethane	ND (0.0034)		8260B Low		1	11/01/17 17:58	C7K0012	CK70133
Dibromomethane	ND (0.0034)		8260B Low		1	11/01/17 17:58	C7K0012	CK70133
Dichlorodifluoromethane	ND (0.0067)		8260B Low		1	11/01/17 17:58	C7K0012	CK70133
Diethyl Ether	ND (0.0034)		8260B Low		1	11/01/17 17:58	C7K0012	CK70133
Di-isopropyl ether	ND (0.0034)		8260B Low		1	11/01/17 17:58	C7K0012	CK70133
Ethyl tertiary-butyl ether	ND (0.0034)		8260B Low		1	11/01/17 17:58	C7K0012	CK70133
Ethylbenzene	ND (0.0034)		8260B Low		1	11/01/17 17:58	C7K0012	CK70133
Hexachlorobutadiene	ND (0.0034)		8260B Low		1	11/01/17 17:58	C7K0012	CK70133
Isopropylbenzene	ND (0.0034)		8260B Low		1	11/01/17 17:58	C7K0012	CK70133
Methyl tert-Butyl Ether	ND (0.0034)		8260B Low		1	11/01/17 17:58	C7K0012	CK70133
Methylene Chloride	ND (0.0169)		8260B Low		1	11/01/17 17:58	C7K0012	CK70133
Naphthalene	ND (0.0034)		8260B Low		1	11/01/17 17:58	C7K0012	CK70133
n-Butylbenzene	ND (0.0034)		8260B Low		1	11/01/17 17:58	C7K0012	CK70133
n-Propylbenzene	ND (0.0034)		8260B Low		1	11/01/17 17:58	C7K0012	CK70133
sec-Butylbenzene	ND (0.0034)		8260B Low		1	11/01/17 17:58	C7K0012	CK70133
Styrene	ND (0.0034)		8260B Low		1	11/01/17 17:58	C7K0012	CK70133
tert-Butylbenzene	ND (0.0034)		8260B Low		1	11/01/17 17:58	C7K0012	CK70133
Tertiary-amyl methyl ether	ND (0.0034)		8260B Low		1	11/01/17 17:58	C7K0012	CK70133
Tetrachloroethene	ND (0.0034)		8260B Low		1	11/01/17 17:58	C7K0012	CK70133
Tetrahydrofuran	ND (0.0034)		8260B Low		1	11/01/17 17:58	C7K0012	CK70133



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-BW-510 0-2  
Date Sampled: 10/30/17 14:10  
Percent Solids: 91  
Initial Volume: 8.1  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710790  
ESS Laboratory Sample ID: 1710790-01  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0034)		8260B Low		1	11/01/17 17:58	C7K0012	CK70133
trans-1,2-Dichloroethene	ND (0.0034)		8260B Low		1	11/01/17 17:58	C7K0012	CK70133
trans-1,3-Dichloropropene	ND (0.0034)		8260B Low		1	11/01/17 17:58	C7K0012	CK70133
Trichloroethene	ND (0.0034)		8260B Low		1	11/01/17 17:58	C7K0012	CK70133
Trichlorofluoromethane	ND (0.0034)		8260B Low		1	11/01/17 17:58	C7K0012	CK70133
Vinyl Acetate	ND (0.0034)		8260B Low		1	11/01/17 17:58	C7K0012	CK70133
Vinyl Chloride	ND (0.0067)		8260B Low		1	11/01/17 17:58	C7K0012	CK70133
Xylene O	ND (0.0034)		8260B Low		1	11/01/17 17:58	C7K0012	CK70133
Xylene P,M	ND (0.0067)		8260B Low		1	11/01/17 17:58	C7K0012	CK70133
Xylenes (Total)	ND (0.0067)		8260B Low		1	11/01/17 17:58		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>97 %</i>		<i>70-130</i>
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>91 %</i>		<i>70-130</i>
<i>Surrogate: Dibromofluoromethane</i>	<i>89 %</i>		<i>70-130</i>
<i>Surrogate: Toluene-d8</i>	<i>104 %</i>		<i>70-130</i>



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-BW-510 0-2  
 Date Sampled: 10/30/17 14:10  
 Percent Solids: 91  
 Initial Volume: 14.4  
 Final Volume: 0.5  
 Extraction Method: 3546

ESS Laboratory Work Order: 1710790  
 ESS Laboratory Sample ID: 1710790-01  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: TJ  
 Prepared: 11/1/17 11:35

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Naphthalene	ND (0.4)		8270D		1	11/02/17 0:20	C7K0001	CK70112
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>		64 %		30-130				
<i>Surrogate: 2-Fluorobiphenyl</i>		79 %		30-130				
<i>Surrogate: Nitrobenzene-d5</i>		70 %		30-130				
<i>Surrogate: p-Terphenyl-d14</i>		86 %		30-130				





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-BK-502 0-2  
Date Sampled: 10/30/17 14:45  
Percent Solids: 78  
Initial Volume: 6.2  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710790  
ESS Laboratory Sample ID: 1710790-02  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0052)		8260B Low		1	11/01/17 18:24	C7K0012	CK70133
1,1,1-Trichloroethane	ND (0.0052)		8260B Low		1	11/01/17 18:24	C7K0012	CK70133
1,1,2,2-Tetrachloroethane	ND (0.0052)		8260B Low		1	11/01/17 18:24	C7K0012	CK70133
1,1,2-Trichloroethane	ND (0.0052)		8260B Low		1	11/01/17 18:24	C7K0012	CK70133
1,1-Dichloroethane	ND (0.0052)		8260B Low		1	11/01/17 18:24	C7K0012	CK70133
1,1-Dichloroethene	ND (0.0052)		8260B Low		1	11/01/17 18:24	C7K0012	CK70133
1,1-Dichloropropene	ND (0.0052)		8260B Low		1	11/01/17 18:24	C7K0012	CK70133
1,2,3-Trichlorobenzene	ND (0.0052)		8260B Low		1	11/01/17 18:24	C7K0012	CK70133
1,2,3-Trichloropropane	ND (0.0052)		8260B Low		1	11/01/17 18:24	C7K0012	CK70133
1,2,4-Trichlorobenzene	ND (0.0052)		8260B Low		1	11/01/17 18:24	C7K0012	CK70133
1,2,4-Trimethylbenzene	ND (0.0052)		8260B Low		1	11/01/17 18:24	C7K0012	CK70133
1,2-Dibromo-3-Chloropropane	ND (0.0052)		8260B Low		1	11/01/17 18:24	C7K0012	CK70133
1,2-Dibromoethane	ND (0.0052)		8260B Low		1	11/01/17 18:24	C7K0012	CK70133
1,2-Dichlorobenzene	ND (0.0052)		8260B Low		1	11/01/17 18:24	C7K0012	CK70133
1,2-Dichloroethane	ND (0.0052)		8260B Low		1	11/01/17 18:24	C7K0012	CK70133
1,2-Dichloropropane	ND (0.0052)		8260B Low		1	11/01/17 18:24	C7K0012	CK70133
1,3,5-Trimethylbenzene	ND (0.0052)		8260B Low		1	11/01/17 18:24	C7K0012	CK70133
1,3-Dichlorobenzene	ND (0.0052)		8260B Low		1	11/01/17 18:24	C7K0012	CK70133
1,3-Dichloropropane	ND (0.0052)		8260B Low		1	11/01/17 18:24	C7K0012	CK70133
1,4-Dichlorobenzene	ND (0.0052)		8260B Low		1	11/01/17 18:24	C7K0012	CK70133
1,4-Dioxane	ND (0.104)		8260B Low		1	11/01/17 18:24	C7K0012	CK70133
1-Chlorohexane	ND (0.0052)		8260B Low		1	11/01/17 18:24	C7K0012	CK70133
2,2-Dichloropropane	ND (0.0052)		8260B Low		1	11/01/17 18:24	C7K0012	CK70133
2-Butanone	ND (0.0519)		8260B Low		1	11/01/17 18:24	C7K0012	CK70133
2-Chlorotoluene	ND (0.0052)		8260B Low		1	11/01/17 18:24	C7K0012	CK70133
2-Hexanone	ND (0.0519)		8260B Low		1	11/01/17 18:24	C7K0012	CK70133
4-Chlorotoluene	ND (0.0052)		8260B Low		1	11/01/17 18:24	C7K0012	CK70133
4-Isopropyltoluene	ND (0.0052)		8260B Low		1	11/01/17 18:24	C7K0012	CK70133
4-Methyl-2-Pentanone	ND (0.0519)		8260B Low		1	11/01/17 18:24	C7K0012	CK70133
Acetone	ND (0.0519)		8260B Low		1	11/01/17 18:24	C7K0012	CK70133
Benzene	ND (0.0052)		8260B Low		1	11/01/17 18:24	C7K0012	CK70133
Bromobenzene	ND (0.0052)		8260B Low		1	11/01/17 18:24	C7K0012	CK70133



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-BK-502 0-2  
Date Sampled: 10/30/17 14:45  
Percent Solids: 78  
Initial Volume: 6.2  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710790  
ESS Laboratory Sample ID: 1710790-02  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0052)		8260B Low		1	11/01/17 18:24	C7K0012	CK70133
Bromodichloromethane	ND (0.0052)		8260B Low		1	11/01/17 18:24	C7K0012	CK70133
Bromoform	ND (0.0052)		8260B Low		1	11/01/17 18:24	C7K0012	CK70133
Bromomethane	ND (0.0104)		8260B Low		1	11/01/17 18:24	C7K0012	CK70133
Carbon Disulfide	ND (0.0052)		8260B Low		1	11/01/17 18:24	C7K0012	CK70133
Carbon Tetrachloride	ND (0.0052)		8260B Low		1	11/01/17 18:24	C7K0012	CK70133
Chlorobenzene	ND (0.0052)		8260B Low		1	11/01/17 18:24	C7K0012	CK70133
Chloroethane	ND (0.0104)		8260B Low		1	11/01/17 18:24	C7K0012	CK70133
Chloroform	ND (0.0052)		8260B Low		1	11/01/17 18:24	C7K0012	CK70133
Chloromethane	ND (0.0104)		8260B Low		1	11/01/17 18:24	C7K0012	CK70133
cis-1,2-Dichloroethene	ND (0.0052)		8260B Low		1	11/01/17 18:24	C7K0012	CK70133
cis-1,3-Dichloropropene	ND (0.0052)		8260B Low		1	11/01/17 18:24	C7K0012	CK70133
Dibromochloromethane	ND (0.0052)		8260B Low		1	11/01/17 18:24	C7K0012	CK70133
Dibromomethane	ND (0.0052)		8260B Low		1	11/01/17 18:24	C7K0012	CK70133
Dichlorodifluoromethane	ND (0.0104)		8260B Low		1	11/01/17 18:24	C7K0012	CK70133
Diethyl Ether	ND (0.0052)		8260B Low		1	11/01/17 18:24	C7K0012	CK70133
Di-isopropyl ether	ND (0.0052)		8260B Low		1	11/01/17 18:24	C7K0012	CK70133
Ethyl tertiary-butyl ether	ND (0.0052)		8260B Low		1	11/01/17 18:24	C7K0012	CK70133
Ethylbenzene	ND (0.0052)		8260B Low		1	11/01/17 18:24	C7K0012	CK70133
Hexachlorobutadiene	ND (0.0052)		8260B Low		1	11/01/17 18:24	C7K0012	CK70133
Isopropylbenzene	ND (0.0052)		8260B Low		1	11/01/17 18:24	C7K0012	CK70133
Methyl tert-Butyl Ether	ND (0.0052)		8260B Low		1	11/01/17 18:24	C7K0012	CK70133
Methylene Chloride	ND (0.0259)		8260B Low		1	11/01/17 18:24	C7K0012	CK70133
Naphthalene	ND (0.0052)		8260B Low		1	11/01/17 18:24	C7K0012	CK70133
n-Butylbenzene	ND (0.0052)		8260B Low		1	11/01/17 18:24	C7K0012	CK70133
n-Propylbenzene	ND (0.0052)		8260B Low		1	11/01/17 18:24	C7K0012	CK70133
sec-Butylbenzene	ND (0.0052)		8260B Low		1	11/01/17 18:24	C7K0012	CK70133
Styrene	ND (0.0052)		8260B Low		1	11/01/17 18:24	C7K0012	CK70133
tert-Butylbenzene	ND (0.0052)		8260B Low		1	11/01/17 18:24	C7K0012	CK70133
Tertiary-amyl methyl ether	ND (0.0052)		8260B Low		1	11/01/17 18:24	C7K0012	CK70133
Tetrachloroethene	ND (0.0052)		8260B Low		1	11/01/17 18:24	C7K0012	CK70133
Tetrahydrofuran	ND (0.0052)		8260B Low		1	11/01/17 18:24	C7K0012	CK70133



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-BK-502 0-2  
Date Sampled: 10/30/17 14:45  
Percent Solids: 78  
Initial Volume: 6.2  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710790  
ESS Laboratory Sample ID: 1710790-02  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0052)		8260B Low		1	11/01/17 18:24	C7K0012	CK70133
trans-1,2-Dichloroethene	ND (0.0052)		8260B Low		1	11/01/17 18:24	C7K0012	CK70133
trans-1,3-Dichloropropene	ND (0.0052)		8260B Low		1	11/01/17 18:24	C7K0012	CK70133
Trichloroethene	ND (0.0052)		8260B Low		1	11/01/17 18:24	C7K0012	CK70133
Trichlorofluoromethane	ND (0.0052)		8260B Low		1	11/01/17 18:24	C7K0012	CK70133
Vinyl Acetate	ND (0.0052)		8260B Low		1	11/01/17 18:24	C7K0012	CK70133
Vinyl Chloride	ND (0.0104)		8260B Low		1	11/01/17 18:24	C7K0012	CK70133
Xylene O	ND (0.0052)		8260B Low		1	11/01/17 18:24	C7K0012	CK70133
Xylene P,M	ND (0.0104)		8260B Low		1	11/01/17 18:24	C7K0012	CK70133
Xylenes (Total)	ND (0.0104)		8260B Low		1	11/01/17 18:24		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>99 %</i>		<i>70-130</i>
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>94 %</i>		<i>70-130</i>
<i>Surrogate: Dibromofluoromethane</i>	<i>90 %</i>		<i>70-130</i>
<i>Surrogate: Toluene-d8</i>	<i>103 %</i>		<i>70-130</i>



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-BK-502 0-2  
Date Sampled: 10/30/17 14:45  
Percent Solids: 78  
Initial Volume: 15.4  
Final Volume: 0.5  
Extraction Method: 3546

ESS Laboratory Work Order: 1710790  
ESS Laboratory Sample ID: 1710790-02  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: TJ  
Prepared: 11/1/17 11:35

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Naphthalene	0.9 (0.4)		8270D		1	11/02/17 0:55	C7K0001	CK70112
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>		73 %		30-130				
<i>Surrogate: 2-Fluorobiphenyl</i>		81 %		30-130				
<i>Surrogate: Nitrobenzene-d5</i>		75 %		30-130				
<i>Surrogate: p-Terphenyl-d14</i>		88 %		30-130				



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710790

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CK70133 - 5035**

**Blank**

1,1,1,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,1-Trichloroethane	ND	0.0050	mg/kg wet							
1,1,2,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,2-Trichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethene	ND	0.0050	mg/kg wet							
1,1-Dichloropropene	ND	0.0050	mg/kg wet							
1,2,3-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,3-Trichloropropane	ND	0.0050	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,4-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,2-Dibromo-3-Chloropropane	ND	0.0050	mg/kg wet							
1,2-Dibromoethane	ND	0.0050	mg/kg wet							
1,2-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,2-Dichloroethane	ND	0.0050	mg/kg wet							
1,2-Dichloropropane	ND	0.0050	mg/kg wet							
1,3,5-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,3-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,3-Dichloropropane	ND	0.0050	mg/kg wet							
1,4-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,4-Dioxane	ND	0.100	mg/kg wet							
1-Chlorohexane	ND	0.0050	mg/kg wet							
2,2-Dichloropropane	ND	0.0050	mg/kg wet							
2-Butanone	ND	0.0500	mg/kg wet							
2-Chlorotoluene	ND	0.0050	mg/kg wet							
2-Hexanone	ND	0.0500	mg/kg wet							
4-Chlorotoluene	ND	0.0050	mg/kg wet							
4-Isopropyltoluene	ND	0.0050	mg/kg wet							
4-Methyl-2-Pentanone	ND	0.0500	mg/kg wet							
Acetone	ND	0.0500	mg/kg wet							
Benzene	ND	0.0050	mg/kg wet							
Bromobenzene	ND	0.0050	mg/kg wet							
Bromochloromethane	ND	0.0050	mg/kg wet							
Bromodichloromethane	ND	0.0050	mg/kg wet							
Bromoform	ND	0.0050	mg/kg wet							
Bromomethane	ND	0.0100	mg/kg wet							
Carbon Disulfide	ND	0.0050	mg/kg wet							
Carbon Tetrachloride	ND	0.0050	mg/kg wet							
Chlorobenzene	ND	0.0050	mg/kg wet							
Chloroethane	ND	0.0100	mg/kg wet							
Chloroform	ND	0.0050	mg/kg wet							
Chloromethane	ND	0.0100	mg/kg wet							
cis-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
cis-1,3-Dichloropropene	ND	0.0050	mg/kg wet							



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710790

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CK70133 - 5035**

Dibromochloromethane	ND	0.0050	mg/kg wet							
Dibromomethane	ND	0.0050	mg/kg wet							
Dichlorodifluoromethane	ND	0.0100	mg/kg wet							
Diethyl Ether	ND	0.0050	mg/kg wet							
Di-isopropyl ether	ND	0.0050	mg/kg wet							
Ethyl tertiary-butyl ether	ND	0.0050	mg/kg wet							
Ethylbenzene	ND	0.0050	mg/kg wet							
Hexachlorobutadiene	ND	0.0050	mg/kg wet							
Isopropylbenzene	ND	0.0050	mg/kg wet							
Methyl tert-Butyl Ether	ND	0.0050	mg/kg wet							
Methylene Chloride	ND	0.0250	mg/kg wet							
Naphthalene	ND	0.0050	mg/kg wet							
n-Butylbenzene	ND	0.0050	mg/kg wet							
n-Propylbenzene	ND	0.0050	mg/kg wet							
sec-Butylbenzene	ND	0.0050	mg/kg wet							
Styrene	ND	0.0050	mg/kg wet							
tert-Butylbenzene	ND	0.0050	mg/kg wet							
Tertiary-amyl methyl ether	ND	0.0050	mg/kg wet							
Tetrachloroethene	ND	0.0050	mg/kg wet							
Tetrahydrofuran	ND	0.0050	mg/kg wet							
Toluene	ND	0.0050	mg/kg wet							
trans-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
trans-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Trichloroethene	ND	0.0050	mg/kg wet							
Trichlorofluoromethane	ND	0.0050	mg/kg wet							
Vinyl Acetate	ND	0.0050	mg/kg wet							
Vinyl Chloride	ND	0.0100	mg/kg wet							
Xylene O	ND	0.0050	mg/kg wet							
Xylene P,M	ND	0.0100	mg/kg wet							
Xylenes (Total)	ND	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	0.0407		mg/kg wet	0.05000		81	70-130			
Surrogate: 4-Bromofluorobenzene	0.0469		mg/kg wet	0.05000		94	70-130			
Surrogate: Dibromofluoromethane	0.0405		mg/kg wet	0.05000		81	70-130			
Surrogate: Toluene-d8	0.0540		mg/kg wet	0.05000		108	70-130			

**LCS**

1,1,1,2-Tetrachloroethane	0.0446	0.0050	mg/kg wet	0.05000		89	70-130			
1,1,1-Trichloroethane	0.0391	0.0050	mg/kg wet	0.05000		78	70-130			
1,1,2,2-Tetrachloroethane	0.0496	0.0050	mg/kg wet	0.05000		99	70-130			
1,1,2-Trichloroethane	0.0388	0.0050	mg/kg wet	0.05000		78	70-130			
1,1-Dichloroethane	0.0383	0.0050	mg/kg wet	0.05000		77	70-130			
1,1-Dichloroethene	0.0465	0.0050	mg/kg wet	0.05000		93	70-130			
1,1-Dichloropropene	0.0430	0.0050	mg/kg wet	0.05000		86	70-130			
1,2,3-Trichlorobenzene	0.0568	0.0050	mg/kg wet	0.05000		114	70-130			
1,2,3-Trichloropropane	0.0517	0.0050	mg/kg wet	0.05000		103	70-130			
1,2,4-Trichlorobenzene	0.0499	0.0050	mg/kg wet	0.05000		100	70-130			





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710790

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CK70133 - 5035**

1,2,4-Trimethylbenzene	0.0507	0.0050	mg/kg wet	0.05000		101	70-130			
1,2-Dibromo-3-Chloropropane	0.0488	0.0050	mg/kg wet	0.05000		98	70-130			
1,2-Dibromoethane	0.0463	0.0050	mg/kg wet	0.05000		93	70-130			
1,2-Dichlorobenzene	0.0513	0.0050	mg/kg wet	0.05000		103	70-130			
1,2-Dichloroethane	0.0398	0.0050	mg/kg wet	0.05000		80	70-130			
1,2-Dichloropropane	0.0391	0.0050	mg/kg wet	0.05000		78	70-130			
1,3,5-Trimethylbenzene	0.0490	0.0050	mg/kg wet	0.05000		98	70-130			
1,3-Dichlorobenzene	0.0491	0.0050	mg/kg wet	0.05000		98	70-130			
1,3-Dichloropropane	0.0449	0.0050	mg/kg wet	0.05000		90	70-130			
1,4-Dichlorobenzene	0.0471	0.0050	mg/kg wet	0.05000		94	70-130			
1,4-Dioxane	0.685	0.100	mg/kg wet	1.000		69	70-130			B-
1-Chlorohexane	0.0433	0.0050	mg/kg wet	0.05000		87	70-130			
2,2-Dichloropropane	0.0381	0.0050	mg/kg wet	0.05000		76	70-130			
2-Butanone	0.216	0.0500	mg/kg wet	0.2500		87	70-130			
2-Chlorotoluene	0.0470	0.0050	mg/kg wet	0.05000		94	70-130			
2-Hexanone	0.231	0.0500	mg/kg wet	0.2500		92	70-130			
4-Chlorotoluene	0.0480	0.0050	mg/kg wet	0.05000		96	70-130			
4-Isopropyltoluene	0.0486	0.0050	mg/kg wet	0.05000		97	70-130			
4-Methyl-2-Pentanone	0.211	0.0500	mg/kg wet	0.2500		84	70-130			
Acetone	0.211	0.0500	mg/kg wet	0.2500		84	70-130			
Benzene	0.0403	0.0050	mg/kg wet	0.05000		81	70-130			
Bromobenzene	0.0491	0.0050	mg/kg wet	0.05000		98	70-130			
Bromochloromethane	0.0412	0.0050	mg/kg wet	0.05000		82	70-130			
Bromodichloromethane	0.0385	0.0050	mg/kg wet	0.05000		77	70-130			
Bromoform	0.0540	0.0050	mg/kg wet	0.05000		108	70-130			
Bromomethane	0.0531	0.0100	mg/kg wet	0.05000		106	70-130			
Carbon Disulfide	0.0453	0.0050	mg/kg wet	0.05000		91	70-130			
Carbon Tetrachloride	0.0389	0.0050	mg/kg wet	0.05000		78	70-130			
Chlorobenzene	0.0426	0.0050	mg/kg wet	0.05000		85	70-130			
Chloroethane	0.0367	0.0100	mg/kg wet	0.05000		73	70-130			
Chloroform	0.0376	0.0050	mg/kg wet	0.05000		75	70-130			
Chloromethane	0.0360	0.0100	mg/kg wet	0.05000		72	70-130			
cis-1,2-Dichloroethene	0.0413	0.0050	mg/kg wet	0.05000		83	70-130			
cis-1,3-Dichloropropene	0.0387	0.0050	mg/kg wet	0.05000		77	70-130			
Dibromochloromethane	0.0459	0.0050	mg/kg wet	0.05000		92	70-130			
Dibromomethane	0.0393	0.0050	mg/kg wet	0.05000		79	70-130			
Dichlorodifluoromethane	0.0288	0.0100	mg/kg wet	0.05000		58	70-130			B-
Diethyl Ether	0.0530	0.0050	mg/kg wet	0.05000		106	70-130			
Di-isopropyl ether	0.0494	0.0050	mg/kg wet	0.05000		99	70-130			
Ethyl tertiary-butyl ether	0.0456	0.0050	mg/kg wet	0.05000		91	70-130			
Ethylbenzene	0.0445	0.0050	mg/kg wet	0.05000		89	70-130			
Hexachlorobutadiene	0.0525	0.0050	mg/kg wet	0.05000		105	70-130			
Isopropylbenzene	0.0467	0.0050	mg/kg wet	0.05000		93	70-130			
Methyl tert-Butyl Ether	0.0622	0.0050	mg/kg wet	0.05000		124	70-130			
Methylene Chloride	0.0451	0.0250	mg/kg wet	0.05000		90	70-130			



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710790

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CK70133 - 5035**

Naphthalene	0.0461	0.0050	mg/kg wet	0.05000		92	70-130			
n-Butylbenzene	0.0465	0.0050	mg/kg wet	0.05000		93	70-130			
n-Propylbenzene	0.0491	0.0050	mg/kg wet	0.05000		98	70-130			
sec-Butylbenzene	0.0491	0.0050	mg/kg wet	0.05000		98	70-130			
Styrene	0.0417	0.0050	mg/kg wet	0.05000		83	70-130			
tert-Butylbenzene	0.0519	0.0050	mg/kg wet	0.05000		104	70-130			
Tertiary-amyl methyl ether	0.0411	0.0050	mg/kg wet	0.05000		82	70-130			
Tetrachloroethene	0.0448	0.0050	mg/kg wet	0.05000		90	70-130			
Tetrahydrofuran	0.0473	0.0050	mg/kg wet	0.05000		95	70-130			
Toluene	0.0408	0.0050	mg/kg wet	0.05000		82	70-130			
trans-1,2-Dichloroethene	0.0435	0.0050	mg/kg wet	0.05000		87	70-130			
trans-1,3-Dichloropropene	0.0390	0.0050	mg/kg wet	0.05000		78	70-130			
Trichloroethene	0.0399	0.0050	mg/kg wet	0.05000		80	70-130			
Trichlorofluoromethane	0.0369	0.0050	mg/kg wet	0.05000		74	70-130			
Vinyl Acetate	0.0405	0.0050	mg/kg wet	0.05000		81	70-130			
Vinyl Chloride	0.0354	0.0100	mg/kg wet	0.05000		71	70-130			
Xylene O	0.0423	0.0050	mg/kg wet	0.05000		85	70-130			
Xylene P,M	0.0923	0.0100	mg/kg wet	0.1000		92	70-130			
Xylenes (Total)	0.135	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	0.0437		mg/kg wet	0.05000		87	70-130			
Surrogate: 4-Bromofluorobenzene	0.0519		mg/kg wet	0.05000		104	70-130			
Surrogate: Dibromofluoromethane	0.0450		mg/kg wet	0.05000		90	70-130			
Surrogate: Toluene-d8	0.0550		mg/kg wet	0.05000		110	70-130			

**LCS Dup**

1,1,1,2-Tetrachloroethane	0.0466	0.0050	mg/kg wet	0.05000		93	70-130	4	25	
1,1,1-Trichloroethane	0.0404	0.0050	mg/kg wet	0.05000		81	70-130	3	25	
1,1,2,2-Tetrachloroethane	0.0481	0.0050	mg/kg wet	0.05000		96	70-130	3	25	
1,1,2-Trichloroethane	0.0389	0.0050	mg/kg wet	0.05000		78	70-130	0.3	25	
1,1-Dichloroethane	0.0392	0.0050	mg/kg wet	0.05000		78	70-130	2	25	
1,1-Dichloroethene	0.0475	0.0050	mg/kg wet	0.05000		95	70-130	2	25	
1,1-Dichloropropene	0.0438	0.0050	mg/kg wet	0.05000		88	70-130	2	25	
1,2,3-Trichlorobenzene	0.0586	0.0050	mg/kg wet	0.05000		117	70-130	3	25	
1,2,3-Trichloropropane	0.0496	0.0050	mg/kg wet	0.05000		99	70-130	4	25	
1,2,4-Trichlorobenzene	0.0525	0.0050	mg/kg wet	0.05000		105	70-130	5	25	
1,2,4-Trimethylbenzene	0.0521	0.0050	mg/kg wet	0.05000		104	70-130	3	25	
1,2-Dibromo-3-Chloropropane	0.0467	0.0050	mg/kg wet	0.05000		93	70-130	4	25	
1,2-Dibromoethane	0.0474	0.0050	mg/kg wet	0.05000		95	70-130	2	25	
1,2-Dichlorobenzene	0.0524	0.0050	mg/kg wet	0.05000		105	70-130	2	25	
1,2-Dichloroethane	0.0405	0.0050	mg/kg wet	0.05000		81	70-130	2	25	
1,2-Dichloropropane	0.0398	0.0050	mg/kg wet	0.05000		80	70-130	2	25	
1,3,5-Trimethylbenzene	0.0501	0.0050	mg/kg wet	0.05000		100	70-130	2	25	
1,3-Dichlorobenzene	0.0489	0.0050	mg/kg wet	0.05000		98	70-130	0.2	25	
1,3-Dichloropropane	0.0459	0.0050	mg/kg wet	0.05000		92	70-130	2	25	
1,4-Dichlorobenzene	0.0494	0.0050	mg/kg wet	0.05000		99	70-130	5	25	
1,4-Dioxane	0.673	0.100	mg/kg wet	1.000		67	70-130	2	20	B-



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710790

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CK70133 - 5035**

1-Chlorohexane	0.0456	0.0050	mg/kg wet	0.05000		91	70-130	5	25	
2,2-Dichloropropane	0.0391	0.0050	mg/kg wet	0.05000		78	70-130	2	25	
2-Butanone	0.209	0.0500	mg/kg wet	0.2500		84	70-130	3	25	
2-Chlorotoluene	0.0487	0.0050	mg/kg wet	0.05000		97	70-130	3	25	
2-Hexanone	0.222	0.0500	mg/kg wet	0.2500		89	70-130	4	25	
4-Chlorotoluene	0.0487	0.0050	mg/kg wet	0.05000		97	70-130	1	25	
4-Isopropyltoluene	0.0500	0.0050	mg/kg wet	0.05000		100	70-130	3	25	
4-Methyl-2-Pentanone	0.200	0.0500	mg/kg wet	0.2500		80	70-130	5	25	
Acetone	0.200	0.0500	mg/kg wet	0.2500		80	70-130	5	25	
Benzene	0.0412	0.0050	mg/kg wet	0.05000		82	70-130	2	25	
Bromobenzene	0.0504	0.0050	mg/kg wet	0.05000		101	70-130	3	25	
Bromochloromethane	0.0423	0.0050	mg/kg wet	0.05000		85	70-130	3	25	
Bromodichloromethane	0.0394	0.0050	mg/kg wet	0.05000		79	70-130	2	25	
Bromoform	0.0558	0.0050	mg/kg wet	0.05000		112	70-130	3	25	
Bromomethane	0.0532	0.0100	mg/kg wet	0.05000		106	70-130	0.3	25	
Carbon Disulfide	0.0462	0.0050	mg/kg wet	0.05000		92	70-130	2	25	
Carbon Tetrachloride	0.0399	0.0050	mg/kg wet	0.05000		80	70-130	3	25	
Chlorobenzene	0.0441	0.0050	mg/kg wet	0.05000		88	70-130	4	25	
Chloroethane	0.0372	0.0100	mg/kg wet	0.05000		74	70-130	1	25	
Chloroform	0.0382	0.0050	mg/kg wet	0.05000		76	70-130	2	25	
Chloromethane	0.0363	0.0100	mg/kg wet	0.05000		73	70-130	0.8	25	
cis-1,2-Dichloroethene	0.0422	0.0050	mg/kg wet	0.05000		84	70-130	2	25	
cis-1,3-Dichloropropene	0.0395	0.0050	mg/kg wet	0.05000		79	70-130	2	25	
Dibromochloromethane	0.0474	0.0050	mg/kg wet	0.05000		95	70-130	3	25	
Dibromomethane	0.0391	0.0050	mg/kg wet	0.05000		78	70-130	0.7	25	
Dichlorodifluoromethane	0.0292	0.0100	mg/kg wet	0.05000		58	70-130	1	25	B-
Diethyl Ether	0.0535	0.0050	mg/kg wet	0.05000		107	70-130	1	25	
Di-isopropyl ether	0.0507	0.0050	mg/kg wet	0.05000		101	70-130	3	25	
Ethyl tertiary-butyl ether	0.0469	0.0050	mg/kg wet	0.05000		94	70-130	3	25	
Ethylbenzene	0.0464	0.0050	mg/kg wet	0.05000		93	70-130	4	25	
Hexachlorobutadiene	0.0536	0.0050	mg/kg wet	0.05000		107	70-130	2	25	
Isopropylbenzene	0.0478	0.0050	mg/kg wet	0.05000		96	70-130	2	25	
Methyl tert-Butyl Ether	0.0630	0.0050	mg/kg wet	0.05000		126	70-130	1	25	
Methylene Chloride	0.0451	0.0250	mg/kg wet	0.05000		90	70-130	0.2	25	
Naphthalene	0.0465	0.0050	mg/kg wet	0.05000		93	70-130	0.7	25	
n-Butylbenzene	0.0479	0.0050	mg/kg wet	0.05000		96	70-130	3	25	
n-Propylbenzene	0.0500	0.0050	mg/kg wet	0.05000		100	70-130	2	25	
sec-Butylbenzene	0.0500	0.0050	mg/kg wet	0.05000		100	70-130	2	25	
Styrene	0.0435	0.0050	mg/kg wet	0.05000		87	70-130	4	25	
tert-Butylbenzene	0.0531	0.0050	mg/kg wet	0.05000		106	70-130	2	25	
Tertiary-amyl methyl ether	0.0417	0.0050	mg/kg wet	0.05000		83	70-130	2	25	
Tetrachloroethene	0.0455	0.0050	mg/kg wet	0.05000		91	70-130	2	25	
Tetrahydrofuran	0.0442	0.0050	mg/kg wet	0.05000		88	70-130	7	25	
Toluene	0.0417	0.0050	mg/kg wet	0.05000		83	70-130	2	25	
trans-1,2-Dichloroethene	0.0451	0.0050	mg/kg wet	0.05000		90	70-130	4	25	



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710790

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CK70133 - 5035**

trans-1,3-Dichloropropene	0.0398	0.0050	mg/kg wet	0.05000		80	70-130	2	25	
Trichloroethene	0.0404	0.0050	mg/kg wet	0.05000		81	70-130	1	25	
Trichlorofluoromethane	0.0373	0.0050	mg/kg wet	0.05000		75	70-130	1	25	
Vinyl Acetate	0.0403	0.0050	mg/kg wet	0.05000		81	70-130	0.5	25	
Vinyl Chloride	0.0357	0.0100	mg/kg wet	0.05000		71	70-130	0.9	25	
Xylene O	0.0437	0.0050	mg/kg wet	0.05000		87	70-130	3	25	
Xylene P,M	0.0956	0.0100	mg/kg wet	0.1000		96	70-130	4	25	
Xylenes (Total)	0.139	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	0.0425		mg/kg wet	0.05000		85	70-130			
Surrogate: 4-Bromofluorobenzene	0.0521		mg/kg wet	0.05000		104	70-130			
Surrogate: Dibromofluoromethane	0.0439		mg/kg wet	0.05000		88	70-130			
Surrogate: Toluene-d8	0.0549		mg/kg wet	0.05000		110	70-130			

8270D Polynuclear Aromatic Hydrocarbons

**Batch CK70112 - 3546**

<b>Blank</b>										
Naphthalene	ND	0.3	mg/kg wet							
Surrogate: 1,2-Dichlorobenzene-d4	2.81		mg/kg wet	3.333		84	30-130			
Surrogate: 2-Fluorobiphenyl	2.94		mg/kg wet	3.333		88	30-130			
Surrogate: Nitrobenzene-d5	2.92		mg/kg wet	3.333		88	30-130			
Surrogate: p-Terphenyl-d14	3.53		mg/kg wet	3.333		106	30-130			

<b>LCS</b>										
Naphthalene	2.1	0.3	mg/kg wet	3.333		64	40-140			
Surrogate: 1,2-Dichlorobenzene-d4	2.24		mg/kg wet	3.333		67	30-130			
Surrogate: 2-Fluorobiphenyl	2.56		mg/kg wet	3.333		77	30-130			
Surrogate: Nitrobenzene-d5	2.41		mg/kg wet	3.333		72	30-130			
Surrogate: p-Terphenyl-d14	3.62		mg/kg wet	3.333		109	30-130			

<b>LCS Dup</b>										
Naphthalene	2.6	0.3	mg/kg wet	3.333		79	40-140	21	30	
Surrogate: 1,2-Dichlorobenzene-d4	2.76		mg/kg wet	3.333		83	30-130			
Surrogate: 2-Fluorobiphenyl	3.06		mg/kg wet	3.333		92	30-130			
Surrogate: Nitrobenzene-d5	3.21		mg/kg wet	3.333		96	30-130			
Surrogate: p-Terphenyl-d14	3.99		mg/kg wet	3.333		120	30-130			



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710790

**Notes and Definitions**

- U Analyte included in the analysis, but not detected
- CD- Continuing Calibration %Diff/Drift is below control limit (CD-).
- B- Blank Spike recovery is below lower control limit (B-).
- ND Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference
- MDL Method Detection Limit
- MRL Method Reporting Limit
- LOD Limit of Detection
- LOQ Limit of Quantitation
- DL Detection Limit
- I/V Initial Volume
- F/V Final Volume
- § Subcontracted analysis; see attached report
- 1 Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
- 2 Range result excludes concentrations of target analytes eluting in that range.
- 3 Range result excludes the concentration of the C9-C10 aromatic range.
- Avg Results reported as a mathematical average.
- NR No Recovery
- [CALC] Calculated Analyte
- SUB Subcontracted analysis; see attached report
- RL Reporting Limit
- EDL Estimated Detection Limit



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710790

**ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS**

**ENVIRONMENTAL**

Rhode Island Potable and Non Potable Water: LAI00179

<http://www.health.ri.gov/find/labs/analytical/ESS.pdf>

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750

[http://www.ct.gov/dph/lib/dph/environmental\\_health/environmental\\_laboratories/pdf/OutOfStateCommercialLaboratories.pdf](http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutOfStateCommercialLaboratories.pdf)

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002

<http://www.maine.gov/dhhs/meecd/environmental-health/dwp/partners/labCert.shtml>

Massachusetts Potable and Non Potable Water: M-RI002

<http://public.dep.state.ma.us/Labcert/Labcert.aspx>

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424

<http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm>

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313

<http://www.wadsworth.org/labcert/elap/comm.html>

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006

[http://datamine2.state.nj.us/DEP\\_OPRA/OpraMain/pi\\_main?mode=pi\\_by\\_site&sort\\_order=PI\\_NAMEA&Select+a+Site:=58715](http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715)

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752

<http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx>



# ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Providence, RI - GZA/HDM  
 Shipped/Delivered Via: ESS Courier

ESS Project ID: 1710790  
 Date Received: 10/31/2017  
 Project Due Date: 11/7/2017  
 Days for Project: 5 Day

- 1. Air bill manifest present?  No  
Air No.: NA
- 2. Were custody seals present?  No
- 3. Is radiation count <100 CPM?  Yes
- 4. Is a Cooler Present?  Yes  
Temp: 1.8 Iced with: Ice
- 5. Was COC signed and dated by client?  Yes

- 6. Does COC match bottles?  Yes
- 7. Is COC complete and correct?  Yes
- 8. Were samples received intact?  Yes
- 9. Were labs informed about short holds & rushes? Yes / No  NA
- 10. Were any analyses received outside of hold time? Yes  No

11. Any Subcontracting needed? Yes /  No  
 ESS Sample IDs: \_\_\_\_\_  
 Analysis: \_\_\_\_\_  
 TAT: \_\_\_\_\_

- 12. Were VOAs received?  Yes /  No
- a. Air bubbles in aqueous VOAs?  Yes /  No
- b. Does methanol cover soil completely?  Yes /  No /  NA

13. Are the samples properly preserved?  Yes /  No  
 a. If metals preserved upon receipt: Date: 10/31/17 Time: 1805 By: [Signature]  
 b. Low Level VOA vials frozen: Date: \_\_\_\_\_ Time: \_\_\_\_\_ By: \_\_\_\_\_

Sample Receiving Notes:  
 \_\_\_\_\_  
 \_\_\_\_\_

14. Was there a need to contact Project Manager? Yes /  No  
 a. Was there a need to contact the client? Yes /  No  
 Who was contacted? \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_ By: \_\_\_\_\_

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
01	177300	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
01	177302	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
01	177333	Yes	NA	Yes	VOA Vial - Other	Other	
01	177334	Yes	NA	Yes	VOA Vial - Other	Other	
02	177299	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
02	177301	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
02	177331	Yes	NA	Yes	VOA Vial - Other	Other	
02	177332	Yes	NA	Yes	VOA Vial - Other	Other	

2nd Review  
 Are barcode labels on correct containers?  Yes /  No

Completed By: [Signature] Date & Time: 10/31/17 1850  
 Reviewed By: [Signature] Date & Time: 10/31/17 1904  
 Delivered By: [Signature] Date & Time: 10/31/17 1904









*CERTIFICATE OF ANALYSIS*

Sarah McLeod  
GZA GeoEnvironmental, Inc.  
530 Broadway  
Providence, RI 02909

**RE: Former Tidewater Facility (05.0043654.00)**  
**ESS Laboratory Work Order Number: 1710793**

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard  
Laboratory Director

**REVIEWED**  
*By ESS Laboratory at 6:26 pm, Nov 07, 2017*

**Analytical Summary**

The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710793

**SAMPLE RECEIPT**

The following samples were received on October 31, 2017 for the analyses specified on the enclosed Chain of Custody Record.

**Low Level VOA vials were frozen by ESS Laboratory on October 31, 2017 at 19:05.**

<u>Lab Number</u>	<u>Sample Name</u>	<u>Matrix</u>	<u>Analysis</u>
1710793-01	GZ-SB-516 0-2ft	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1710793-02	GZ-SB-516 3-4ft	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1710793-03	GZ-SB-517 2-4ft	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1710793-04	GZ-SB-517 4-6ft	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1710793-05	Trip Blank	Solid	8260B Low



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710793

**PROJECT NARRATIVE**

**5035/8260B Volatile Organic Compounds / Low Level**

CK70133-BS1 Blank Spike recovery is below lower control limit (B-).  
1,4-Dioxane (69% @ 70-130%), Dichlorodifluoromethane (58% @ 70-130%)

CK70133-BSD1 Blank Spike recovery is below lower control limit (B-).  
1,4-Dioxane (67% @ 70-130%), Dichlorodifluoromethane (58% @ 70-130%)

**8270D Polynuclear Aromatic Hydrocarbons**

C7K0001-CCV1 Continuing Calibration %Diff/Drift is below control limit (CD-).  
2-Methylnaphthalene (28% @ 20%), Nitrobenzene-d5 (25% @ 20%)

**Total Metals**

CJ73153-BSD1 Blank Spike recovery is below lower control limit (B-).  
Selenium (73% @ 80-120%), Thallium (69% @ 80-120%)

CJ73153-BSD2 Relative percent difference for duplicate is outside of criteria (D+).  
Lead (22% @ 20%)

**No other observations noted.**

**End of Project Narrative.**

**DATA USABILITY LINKS**

*To ensure you are viewing the most current version of the documents below, please clear your internet cookies for [www.ESSLaboratory.com](http://www.ESSLaboratory.com). Consult your IT Support personnel for information on how to clear your internet cookies.*

[Definitions of Quality Control Parameters](#)

[Semivolatile Organics Internal Standard Information](#)

[Semivolatile Organics Surrogate Information](#)

[Volatile Organics Internal Standard Information](#)

[Volatile Organics Surrogate Information](#)

[EPH and VPH Alkane Lists](#)





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710793

**CURRENT SW-846 METHODOLOGY VERSIONS**

**Analytical Methods**

1010A - Flashpoint  
6010C - ICP  
6020A - ICP MS  
7010 - Graphite Furnace  
7196A - Hexavalent Chromium  
7470A - Aqueous Mercury  
7471B - Solid Mercury  
8011 - EDB/DBCP/TCP  
8015C - GRO/DRO  
8081B - Pesticides  
8082A - PCB  
8100M - TPH  
8151A - Herbicides  
8260B - VOA  
8270D - SVOA  
8270D SIM - SVOA Low Level  
9014 - Cyanide  
9038 - Sulfate  
9040C - Aqueous pH  
9045D - Solid pH (Corrosivity)  
9050A - Specific Conductance  
9056A - Anions (IC)  
9060A - TOC  
9095B - Paint Filter  
MADEP 04-1.1 - EPH / VPH

**Prep Methods**

3005A - Aqueous ICP Digestion  
3020A - Aqueous Graphite Furnace / ICP MS Digestion  
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion  
3060A - Solid Hexavalent Chromium Digestion  
3510C - Separatory Funnel Extraction  
3520C - Liquid / Liquid Extraction  
3540C - Manual Soxhlet Extraction  
3541 - Automated Soxhlet Extraction  
3546 - Microwave Extraction  
3580A - Waste Dilution  
5030B - Aqueous Purge and Trap  
5030C - Aqueous Purge and Trap  
5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SB-516 0-2ft  
Date Sampled: 10/30/17 10:05  
Percent Solids: 88

ESS Laboratory Work Order: 1710793  
ESS Laboratory Sample ID: 1710793-01  
Sample Matrix: Soil  
Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (2.06)		6020A		20	NAR	11/02/17 2:21	2.22	100	CJ73153
Arsenic	14.6 (2.57)		6010C		1	KJK	11/01/17 23:25	2.22	100	CJ73153
Beryllium	0.52 (0.11)		6010C		1	KJK	11/01/17 23:25	2.22	100	CJ73153
Cadmium	ND (0.51)		6010C		1	KJK	11/01/17 23:25	2.22	100	CJ73153
Chromium	9.50 (1.03)		6010C		1	KJK	11/01/17 23:25	2.22	100	CJ73153
Copper	85.9 (2.57)		6010C		1	KJK	11/01/17 23:25	2.22	100	CJ73153
Lead	124 (5.14)		6010C		1	KJK	11/01/17 23:25	2.22	100	CJ73153
Mercury	0.544 (0.034)		7471B		1	MJV	11/01/17 14:07	0.67	40	CJ73120
Nickel	11.8 (2.57)		6010C		1	KJK	11/01/17 23:25	2.22	100	CJ73153
Selenium	ND (2.06)		6020A		20	NAR	11/02/17 2:21	2.22	100	CJ73153
Silver	ND (0.51)		6010C		1	KJK	11/01/17 23:25	2.22	100	CJ73153
Thallium	ND (2.06)		6020A		20	NAR	11/02/17 2:21	2.22	100	CJ73153
Zinc	114 (2.57)		6010C		1	KJK	11/01/17 23:25	2.22	100	CJ73153



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SB-516 0-2ft  
Date Sampled: 10/30/17 10:05  
Percent Solids: 88  
Initial Volume: 7.1  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710793  
ESS Laboratory Sample ID: 1710793-01  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0040)		8260B Low		1	11/01/17 16:17	C7K0012	CK70133
1,1,1-Trichloroethane	ND (0.0040)		8260B Low		1	11/01/17 16:17	C7K0012	CK70133
1,1,2,2-Tetrachloroethane	ND (0.0040)		8260B Low		1	11/01/17 16:17	C7K0012	CK70133
1,1,2-Trichloroethane	ND (0.0040)		8260B Low		1	11/01/17 16:17	C7K0012	CK70133
1,1-Dichloroethane	ND (0.0040)		8260B Low		1	11/01/17 16:17	C7K0012	CK70133
1,1-Dichloroethene	ND (0.0040)		8260B Low		1	11/01/17 16:17	C7K0012	CK70133
1,1-Dichloropropene	ND (0.0040)		8260B Low		1	11/01/17 16:17	C7K0012	CK70133
1,2,3-Trichlorobenzene	ND (0.0040)		8260B Low		1	11/01/17 16:17	C7K0012	CK70133
1,2,3-Trichloropropane	ND (0.0040)		8260B Low		1	11/01/17 16:17	C7K0012	CK70133
1,2,4-Trichlorobenzene	ND (0.0040)		8260B Low		1	11/01/17 16:17	C7K0012	CK70133
1,2,4-Trimethylbenzene	ND (0.0040)		8260B Low		1	11/01/17 16:17	C7K0012	CK70133
1,2-Dibromo-3-Chloropropane	ND (0.0040)		8260B Low		1	11/01/17 16:17	C7K0012	CK70133
1,2-Dibromoethane	ND (0.0040)		8260B Low		1	11/01/17 16:17	C7K0012	CK70133
1,2-Dichlorobenzene	ND (0.0040)		8260B Low		1	11/01/17 16:17	C7K0012	CK70133
1,2-Dichloroethane	ND (0.0040)		8260B Low		1	11/01/17 16:17	C7K0012	CK70133
1,2-Dichloropropane	ND (0.0040)		8260B Low		1	11/01/17 16:17	C7K0012	CK70133
1,3,5-Trimethylbenzene	ND (0.0040)		8260B Low		1	11/01/17 16:17	C7K0012	CK70133
1,3-Dichlorobenzene	ND (0.0040)		8260B Low		1	11/01/17 16:17	C7K0012	CK70133
1,3-Dichloropropane	ND (0.0040)		8260B Low		1	11/01/17 16:17	C7K0012	CK70133
1,4-Dichlorobenzene	ND (0.0040)		8260B Low		1	11/01/17 16:17	C7K0012	CK70133
1,4-Dioxane	ND (0.0804)		8260B Low		1	11/01/17 16:17	C7K0012	CK70133
1-Chlorohexane	ND (0.0040)		8260B Low		1	11/01/17 16:17	C7K0012	CK70133
2,2-Dichloropropane	ND (0.0040)		8260B Low		1	11/01/17 16:17	C7K0012	CK70133
2-Butanone	ND (0.0402)		8260B Low		1	11/01/17 16:17	C7K0012	CK70133
2-Chlorotoluene	ND (0.0040)		8260B Low		1	11/01/17 16:17	C7K0012	CK70133
2-Hexanone	ND (0.0402)		8260B Low		1	11/01/17 16:17	C7K0012	CK70133
4-Chlorotoluene	ND (0.0040)		8260B Low		1	11/01/17 16:17	C7K0012	CK70133
4-Isopropyltoluene	ND (0.0040)		8260B Low		1	11/01/17 16:17	C7K0012	CK70133
4-Methyl-2-Pentanone	ND (0.0402)		8260B Low		1	11/01/17 16:17	C7K0012	CK70133
Acetone	ND (0.0402)		8260B Low		1	11/01/17 16:17	C7K0012	CK70133
Benzene	ND (0.0040)		8260B Low		1	11/01/17 16:17	C7K0012	CK70133
Bromobenzene	ND (0.0040)		8260B Low		1	11/01/17 16:17	C7K0012	CK70133



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SB-516 0-2ft  
 Date Sampled: 10/30/17 10:05  
 Percent Solids: 88  
 Initial Volume: 7.1  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1710793  
 ESS Laboratory Sample ID: 1710793-01  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0040)		8260B Low		1	11/01/17 16:17	C7K0012	CK70133
Bromodichloromethane	ND (0.0040)		8260B Low		1	11/01/17 16:17	C7K0012	CK70133
Bromoform	ND (0.0040)		8260B Low		1	11/01/17 16:17	C7K0012	CK70133
Bromomethane	ND (0.0080)		8260B Low		1	11/01/17 16:17	C7K0012	CK70133
Carbon Disulfide	ND (0.0040)		8260B Low		1	11/01/17 16:17	C7K0012	CK70133
<b>Carbon Tetrachloride</b>	<b>0.0061</b> (0.0040)		8260B Low		1	11/01/17 16:17	C7K0012	CK70133
Chlorobenzene	ND (0.0040)		8260B Low		1	11/01/17 16:17	C7K0012	CK70133
Chloroethane	ND (0.0080)		8260B Low		1	11/01/17 16:17	C7K0012	CK70133
Chloroform	ND (0.0040)		8260B Low		1	11/01/17 16:17	C7K0012	CK70133
Chloromethane	ND (0.0080)		8260B Low		1	11/01/17 16:17	C7K0012	CK70133
cis-1,2-Dichloroethene	ND (0.0040)		8260B Low		1	11/01/17 16:17	C7K0012	CK70133
cis-1,3-Dichloropropene	ND (0.0040)		8260B Low		1	11/01/17 16:17	C7K0012	CK70133
Dibromochloromethane	ND (0.0040)		8260B Low		1	11/01/17 16:17	C7K0012	CK70133
Dibromomethane	ND (0.0040)		8260B Low		1	11/01/17 16:17	C7K0012	CK70133
Dichlorodifluoromethane	ND (0.0080)		8260B Low		1	11/01/17 16:17	C7K0012	CK70133
Diethyl Ether	ND (0.0040)		8260B Low		1	11/01/17 16:17	C7K0012	CK70133
Di-isopropyl ether	ND (0.0040)		8260B Low		1	11/01/17 16:17	C7K0012	CK70133
Ethyl tertiary-butyl ether	ND (0.0040)		8260B Low		1	11/01/17 16:17	C7K0012	CK70133
Ethylbenzene	ND (0.0040)		8260B Low		1	11/01/17 16:17	C7K0012	CK70133
Hexachlorobutadiene	ND (0.0040)		8260B Low		1	11/01/17 16:17	C7K0012	CK70133
Isopropylbenzene	ND (0.0040)		8260B Low		1	11/01/17 16:17	C7K0012	CK70133
Methyl tert-Butyl Ether	ND (0.0040)		8260B Low		1	11/01/17 16:17	C7K0012	CK70133
Methylene Chloride	ND (0.0201)		8260B Low		1	11/01/17 16:17	C7K0012	CK70133
<b>Naphthalene</b>	<b>0.0084</b> (0.0040)		8260B Low		1	11/01/17 16:17	C7K0012	CK70133
n-Butylbenzene	ND (0.0040)		8260B Low		1	11/01/17 16:17	C7K0012	CK70133
n-Propylbenzene	ND (0.0040)		8260B Low		1	11/01/17 16:17	C7K0012	CK70133
sec-Butylbenzene	ND (0.0040)		8260B Low		1	11/01/17 16:17	C7K0012	CK70133
Styrene	ND (0.0040)		8260B Low		1	11/01/17 16:17	C7K0012	CK70133
tert-Butylbenzene	ND (0.0040)		8260B Low		1	11/01/17 16:17	C7K0012	CK70133
Tertiary-amyl methyl ether	ND (0.0040)		8260B Low		1	11/01/17 16:17	C7K0012	CK70133
Tetrachloroethene	ND (0.0040)		8260B Low		1	11/01/17 16:17	C7K0012	CK70133
Tetrahydrofuran	ND (0.0040)		8260B Low		1	11/01/17 16:17	C7K0012	CK70133



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SB-516 0-2ft  
Date Sampled: 10/30/17 10:05  
Percent Solids: 88  
Initial Volume: 7.1  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710793  
ESS Laboratory Sample ID: 1710793-01  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0040)		8260B Low		1	11/01/17 16:17	C7K0012	CK70133
trans-1,2-Dichloroethene	ND (0.0040)		8260B Low		1	11/01/17 16:17	C7K0012	CK70133
trans-1,3-Dichloropropene	ND (0.0040)		8260B Low		1	11/01/17 16:17	C7K0012	CK70133
Trichloroethene	ND (0.0040)		8260B Low		1	11/01/17 16:17	C7K0012	CK70133
Trichlorofluoromethane	ND (0.0040)		8260B Low		1	11/01/17 16:17	C7K0012	CK70133
Vinyl Acetate	ND (0.0040)		8260B Low		1	11/01/17 16:17	C7K0012	CK70133
Vinyl Chloride	ND (0.0080)		8260B Low		1	11/01/17 16:17	C7K0012	CK70133
Xylene O	ND (0.0040)		8260B Low		1	11/01/17 16:17	C7K0012	CK70133
Xylene P,M	ND (0.0080)		8260B Low		1	11/01/17 16:17	C7K0012	CK70133
Xylenes (Total)	ND (0.0080)		8260B Low		1	11/01/17 16:17		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>91 %</i>		<i>70-130</i>
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>85 %</i>		<i>70-130</i>
<i>Surrogate: Dibromofluoromethane</i>	<i>86 %</i>		<i>70-130</i>
<i>Surrogate: Toluene-d8</i>	<i>109 %</i>		<i>70-130</i>



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SB-516 0-2ft  
Date Sampled: 10/30/17 10:05  
Percent Solids: 88  
Initial Volume: 20.3  
Final Volume: 1  
Extraction Method: 3546

ESS Laboratory Work Order: 1710793  
ESS Laboratory Sample ID: 1710793-01  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: SMR  
Prepared: 11/1/17 11:45

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	2460 (422)		8100M		10	11/02/17 2:27	C7K0018	CK70111
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		101 %		40-140				





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SB-516 0-2ft  
Date Sampled: 10/30/17 10:05  
Percent Solids: 88  
Initial Volume: 14.3  
Final Volume: 0.5  
Extraction Method: 3546

ESS Laboratory Work Order: 1710793  
ESS Laboratory Sample ID: 1710793-01  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: TJ  
Prepared: 11/1/17 11:35

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	13.6 (3.99)		8270D		10	11/03/17 23:37	C7K0025	CK70112
Acenaphthene	0.563 (0.399)		8270D		1	11/02/17 20:26	C7K0025	CK70112
Acenaphthylene	17.9 (3.99)		8270D		10	11/03/17 23:37	C7K0025	CK70112
Anthracene	11.2 (3.99)		8270D		10	11/03/17 23:37	C7K0025	CK70112
Benzo(a)anthracene	25.2 (3.99)		8270D		10	11/03/17 23:37	C7K0025	CK70112
Benzo(a)pyrene	18.5 (2.00)		8270D		10	11/03/17 23:37	C7K0025	CK70112
Benzo(b)fluoranthene	19.2 (3.99)		8270D		10	11/03/17 23:37	C7K0025	CK70112
Benzo(g,h,i)perylene	6.81 (0.399)		8270D		1	11/02/17 20:26	C7K0025	CK70112
Benzo(k)fluoranthene	16.4 (3.99)		8270D		10	11/03/17 23:37	C7K0025	CK70112
Chrysene	26.8 (2.00)		8270D		10	11/03/17 23:37	C7K0025	CK70112
Dibenzo(a,h)Anthracene	4.12 (0.200)		8270D		1	11/02/17 20:26	C7K0025	CK70112
Fluoranthene	29.6 (3.99)		8270D		10	11/03/17 23:37	C7K0025	CK70112
Fluorene	1.14 (0.399)		8270D		1	11/02/17 20:26	C7K0025	CK70112
Indeno(1,2,3-cd)Pyrene	6.45 (0.399)		8270D		1	11/02/17 20:26	C7K0025	CK70112
Naphthalene	24.6 (3.99)		8270D		10	11/03/17 23:37	C7K0025	CK70112
Phenanthrene	31.7 (3.99)		8270D		10	11/03/17 23:37	C7K0025	CK70112
Pyrene	50.3 (3.99)		8270D		10	11/03/17 23:37	C7K0025	CK70112

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	69 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	77 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	76 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	82 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SB-516 0-2ft  
Date Sampled: 10/30/17 10:05  
Percent Solids: 88

ESS Laboratory Work Order: 1710793  
ESS Laboratory Sample ID: 1710793-01  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	87.5 (10.9)		9014		10	EEM	11/01/17 11:45	mg/kg dry	CK70114



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SB-516 3-4ft  
Date Sampled: 10/30/17 10:15  
Percent Solids: 65

ESS Laboratory Work Order: 1710793  
ESS Laboratory Sample ID: 1710793-02  
Sample Matrix: Soil  
Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (2.62)		6020A		20	NAR	11/02/17 2:28	2.34	100	CJ73153
Arsenic	ND (32.7)		6010C		10	KJK	11/02/17 20:16	2.34	100	CJ73153
Beryllium	ND (1.44)		6010C		10	KJK	11/02/17 20:16	2.34	100	CJ73153
Cadmium	ND (6.54)		6010C		10	KJK	11/02/17 20:16	2.34	100	CJ73153
Chromium	ND (13.1)		6010C		10	KJK	11/02/17 20:16	2.34	100	CJ73153
Copper	ND (32.7)		6010C		10	KJK	11/02/17 20:16	2.34	100	CJ73153
Lead	ND (65.4)		6010C		10	KJK	11/02/17 20:16	2.34	100	CJ73153
<b>Mercury</b>	<b>1.42 (0.421)</b>		7471B		10	MJV	11/01/17 14:35	0.72	40	CJ73120
Nickel	ND (32.7)		6010C		10	KJK	11/02/17 20:16	2.34	100	CJ73153
Selenium	ND (2.62)		6020A		20	NAR	11/02/17 2:28	2.34	100	CJ73153
Silver	ND (6.54)		6010C		10	KJK	11/02/17 20:16	2.34	100	CJ73153
Thallium	ND (2.62)		6020A		20	NAR	11/02/17 2:28	2.34	100	CJ73153
Zinc	ND (32.7)		6010C		10	KJK	11/02/17 20:16	2.34	100	CJ73153



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SB-516 3-4ft  
Date Sampled: 10/30/17 10:15  
Percent Solids: 65  
Initial Volume: 4.9  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710793  
ESS Laboratory Sample ID: 1710793-02  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0078)		8260B Low		1	11/01/17 16:42	C7K0012	CK70133
1,1,1-Trichloroethane	ND (0.0078)		8260B Low		1	11/01/17 16:42	C7K0012	CK70133
1,1,2,2-Tetrachloroethane	ND (0.0078)		8260B Low		1	11/01/17 16:42	C7K0012	CK70133
1,1,2-Trichloroethane	ND (0.0078)		8260B Low		1	11/01/17 16:42	C7K0012	CK70133
1,1-Dichloroethane	ND (0.0078)		8260B Low		1	11/01/17 16:42	C7K0012	CK70133
1,1-Dichloroethene	ND (0.0078)		8260B Low		1	11/01/17 16:42	C7K0012	CK70133
1,1-Dichloropropene	ND (0.0078)		8260B Low		1	11/01/17 16:42	C7K0012	CK70133
1,2,3-Trichlorobenzene	ND (0.0078)		8260B Low		1	11/01/17 16:42	C7K0012	CK70133
1,2,3-Trichloropropane	ND (0.0078)		8260B Low		1	11/01/17 16:42	C7K0012	CK70133
1,2,4-Trichlorobenzene	ND (0.0078)		8260B Low		1	11/01/17 16:42	C7K0012	CK70133
1,2,4-Trimethylbenzene	ND (0.0078)		8260B Low		1	11/01/17 16:42	C7K0012	CK70133
1,2-Dibromo-3-Chloropropane	ND (0.0078)		8260B Low		1	11/01/17 16:42	C7K0012	CK70133
1,2-Dibromoethane	ND (0.0078)		8260B Low		1	11/01/17 16:42	C7K0012	CK70133
1,2-Dichlorobenzene	ND (0.0078)		8260B Low		1	11/01/17 16:42	C7K0012	CK70133
1,2-Dichloroethane	ND (0.0078)		8260B Low		1	11/01/17 16:42	C7K0012	CK70133
1,2-Dichloropropane	ND (0.0078)		8260B Low		1	11/01/17 16:42	C7K0012	CK70133
1,3,5-Trimethylbenzene	ND (0.0078)		8260B Low		1	11/01/17 16:42	C7K0012	CK70133
1,3-Dichlorobenzene	ND (0.0078)		8260B Low		1	11/01/17 16:42	C7K0012	CK70133
1,3-Dichloropropane	ND (0.0078)		8260B Low		1	11/01/17 16:42	C7K0012	CK70133
1,4-Dichlorobenzene	ND (0.0078)		8260B Low		1	11/01/17 16:42	C7K0012	CK70133
1,4-Dioxane	ND (0.156)		8260B Low		1	11/01/17 16:42	C7K0012	CK70133
1-Chlorohexane	ND (0.0078)		8260B Low		1	11/01/17 16:42	C7K0012	CK70133
2,2-Dichloropropane	ND (0.0078)		8260B Low		1	11/01/17 16:42	C7K0012	CK70133
2-Butanone	ND (0.0781)		8260B Low		1	11/01/17 16:42	C7K0012	CK70133
2-Chlorotoluene	ND (0.0078)		8260B Low		1	11/01/17 16:42	C7K0012	CK70133
2-Hexanone	ND (0.0781)		8260B Low		1	11/01/17 16:42	C7K0012	CK70133
4-Chlorotoluene	ND (0.0078)		8260B Low		1	11/01/17 16:42	C7K0012	CK70133
4-Isopropyltoluene	ND (0.0078)		8260B Low		1	11/01/17 16:42	C7K0012	CK70133
4-Methyl-2-Pentanone	ND (0.0781)		8260B Low		1	11/01/17 16:42	C7K0012	CK70133
Acetone	ND (0.0781)		8260B Low		1	11/01/17 16:42	C7K0012	CK70133
Benzene	ND (0.0078)		8260B Low		1	11/01/17 16:42	C7K0012	CK70133
Bromobenzene	ND (0.0078)		8260B Low		1	11/01/17 16:42	C7K0012	CK70133



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SB-516 3-4ft  
Date Sampled: 10/30/17 10:15  
Percent Solids: 65  
Initial Volume: 4.9  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710793  
ESS Laboratory Sample ID: 1710793-02  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0078)		8260B Low		1	11/01/17 16:42	C7K0012	CK70133
Bromodichloromethane	ND (0.0078)		8260B Low		1	11/01/17 16:42	C7K0012	CK70133
Bromoform	ND (0.0078)		8260B Low		1	11/01/17 16:42	C7K0012	CK70133
Bromomethane	ND (0.0156)		8260B Low		1	11/01/17 16:42	C7K0012	CK70133
Carbon Disulfide	ND (0.0078)		8260B Low		1	11/01/17 16:42	C7K0012	CK70133
Carbon Tetrachloride	ND (0.0078)		8260B Low		1	11/01/17 16:42	C7K0012	CK70133
Chlorobenzene	ND (0.0078)		8260B Low		1	11/01/17 16:42	C7K0012	CK70133
Chloroethane	ND (0.0156)		8260B Low		1	11/01/17 16:42	C7K0012	CK70133
Chloroform	ND (0.0078)		8260B Low		1	11/01/17 16:42	C7K0012	CK70133
Chloromethane	ND (0.0156)		8260B Low		1	11/01/17 16:42	C7K0012	CK70133
cis-1,2-Dichloroethene	ND (0.0078)		8260B Low		1	11/01/17 16:42	C7K0012	CK70133
cis-1,3-Dichloropropene	ND (0.0078)		8260B Low		1	11/01/17 16:42	C7K0012	CK70133
Dibromochloromethane	ND (0.0078)		8260B Low		1	11/01/17 16:42	C7K0012	CK70133
Dibromomethane	ND (0.0078)		8260B Low		1	11/01/17 16:42	C7K0012	CK70133
Dichlorodifluoromethane	ND (0.0156)		8260B Low		1	11/01/17 16:42	C7K0012	CK70133
Diethyl Ether	ND (0.0078)		8260B Low		1	11/01/17 16:42	C7K0012	CK70133
Di-isopropyl ether	ND (0.0078)		8260B Low		1	11/01/17 16:42	C7K0012	CK70133
Ethyl tertiary-butyl ether	ND (0.0078)		8260B Low		1	11/01/17 16:42	C7K0012	CK70133
Ethylbenzene	ND (0.0078)		8260B Low		1	11/01/17 16:42	C7K0012	CK70133
Hexachlorobutadiene	ND (0.0078)		8260B Low		1	11/01/17 16:42	C7K0012	CK70133
Isopropylbenzene	ND (0.0078)		8260B Low		1	11/01/17 16:42	C7K0012	CK70133
Methyl tert-Butyl Ether	ND (0.0078)		8260B Low		1	11/01/17 16:42	C7K0012	CK70133
Methylene Chloride	ND (0.0391)		8260B Low		1	11/01/17 16:42	C7K0012	CK70133
Naphthalene	ND (0.0078)		8260B Low		1	11/01/17 16:42	C7K0012	CK70133
n-Butylbenzene	ND (0.0078)		8260B Low		1	11/01/17 16:42	C7K0012	CK70133
n-Propylbenzene	ND (0.0078)		8260B Low		1	11/01/17 16:42	C7K0012	CK70133
sec-Butylbenzene	ND (0.0078)		8260B Low		1	11/01/17 16:42	C7K0012	CK70133
Styrene	ND (0.0078)		8260B Low		1	11/01/17 16:42	C7K0012	CK70133
tert-Butylbenzene	ND (0.0078)		8260B Low		1	11/01/17 16:42	C7K0012	CK70133
Tertiary-amyl methyl ether	ND (0.0078)		8260B Low		1	11/01/17 16:42	C7K0012	CK70133
Tetrachloroethene	ND (0.0078)		8260B Low		1	11/01/17 16:42	C7K0012	CK70133
Tetrahydrofuran	ND (0.0078)		8260B Low		1	11/01/17 16:42	C7K0012	CK70133



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SB-516 3-4ft  
Date Sampled: 10/30/17 10:15  
Percent Solids: 65  
Initial Volume: 4.9  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710793  
ESS Laboratory Sample ID: 1710793-02  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0078)		8260B Low		1	11/01/17 16:42	C7K0012	CK70133
trans-1,2-Dichloroethene	ND (0.0078)		8260B Low		1	11/01/17 16:42	C7K0012	CK70133
trans-1,3-Dichloropropene	ND (0.0078)		8260B Low		1	11/01/17 16:42	C7K0012	CK70133
Trichloroethene	ND (0.0078)		8260B Low		1	11/01/17 16:42	C7K0012	CK70133
Trichlorofluoromethane	ND (0.0078)		8260B Low		1	11/01/17 16:42	C7K0012	CK70133
Vinyl Acetate	ND (0.0078)		8260B Low		1	11/01/17 16:42	C7K0012	CK70133
Vinyl Chloride	ND (0.0156)		8260B Low		1	11/01/17 16:42	C7K0012	CK70133
Xylene O	ND (0.0078)		8260B Low		1	11/01/17 16:42	C7K0012	CK70133
Xylene P,M	ND (0.0156)		8260B Low		1	11/01/17 16:42	C7K0012	CK70133
Xylenes (Total)	ND (0.0156)		8260B Low		1	11/01/17 16:42		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	89 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	94 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	85 %		70-130
<i>Surrogate: Toluene-d8</i>	101 %		70-130





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SB-516 3-4ft  
Date Sampled: 10/30/17 10:15  
Percent Solids: 65  
Initial Volume: 20.4  
Final Volume: 1  
Extraction Method: 3546

ESS Laboratory Work Order: 1710793  
ESS Laboratory Sample ID: 1710793-02  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: SMR  
Prepared: 11/1/17 11:45

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	357 (282)		8100M		5	11/02/17 3:02	C7K0018	CK70111
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		84 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SB-516 3-4ft  
 Date Sampled: 10/30/17 10:15  
 Percent Solids: 65  
 Initial Volume: 14.8  
 Final Volume: 0.5  
 Extraction Method: 3546

ESS Laboratory Work Order: 1710793  
 ESS Laboratory Sample ID: 1710793-02  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: TJ  
 Prepared: 11/1/17 11:35

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.517)		8270D		1	11/02/17 21:01	C7K0025	CK70112
Acenaphthene	ND (0.517)		8270D		1	11/02/17 21:01	C7K0025	CK70112
<b>Acenaphthylene</b>	<b>1.12</b> (0.517)		8270D		1	11/02/17 21:01	C7K0025	CK70112
Anthracene	ND (0.517)		8270D		1	11/02/17 21:01	C7K0025	CK70112
<b>Benzo(a)anthracene</b>	<b>4.76</b> (0.517)		8270D		1	11/02/17 21:01	C7K0025	CK70112
<b>Benzo(a)pyrene</b>	<b>7.68</b> (0.259)		8270D		1	11/02/17 21:01	C7K0025	CK70112
<b>Benzo(b)fluoranthene</b>	<b>10.4</b> (5.17)		8270D		10	11/04/17 0:12	C7K0025	CK70112
<b>Benzo(g,h,i)perylene</b>	<b>15.9</b> (5.17)		8270D		10	11/04/17 0:12	C7K0025	CK70112
<b>Benzo(k)fluoranthene</b>	<b>5.98</b> (5.17)		8270D		10	11/04/17 0:12	C7K0025	CK70112
<b>Chrysene</b>	<b>4.13</b> (0.259)		8270D		1	11/02/17 21:01	C7K0025	CK70112
<b>Dibenzo(a,h)Anthracene</b>	<b>4.76</b> (0.259)		8270D		1	11/02/17 21:01	C7K0025	CK70112
<b>Fluoranthene</b>	<b>5.61</b> (0.517)		8270D		1	11/02/17 21:01	C7K0025	CK70112
Fluorene	ND (0.517)		8270D		1	11/02/17 21:01	C7K0025	CK70112
<b>Indeno(1,2,3-cd)Pyrene</b>	<b>10.2</b> (0.517)		8270D		1	11/02/17 21:01	C7K0025	CK70112
<b>Naphthalene</b>	<b>1.60</b> (0.517)		8270D		1	11/02/17 21:01	C7K0025	CK70112
<b>Phenanthrene</b>	<b>1.02</b> (0.517)		8270D		1	11/02/17 21:01	C7K0025	CK70112
<b>Pyrene</b>	<b>7.98</b> (0.517)		8270D		1	11/02/17 21:01	C7K0025	CK70112

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	77 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	94 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	86 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	111 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SB-516 3-4ft  
Date Sampled: 10/30/17 10:15  
Percent Solids: 65

ESS Laboratory Work Order: 1710793  
ESS Laboratory Sample ID: 1710793-02  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	197 (14.8)		9014		10	EEM	11/01/17 11:45	mg/kg dry	CK70114



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SB-517 2-4ft  
Date Sampled: 10/30/17 10:25  
Percent Solids: 82

ESS Laboratory Work Order: 1710793  
ESS Laboratory Sample ID: 1710793-03  
Sample Matrix: Soil  
Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (2.01)		6020A		20	NAR	11/02/17 2:34	2.44	100	CJ73153
Arsenic	12.2 (2.51)		6010C		1	KJK	11/01/17 23:34	2.44	100	CJ73153
Beryllium	0.37 (0.11)		6010C		1	KJK	11/01/17 23:34	2.44	100	CJ73153
Cadmium	1.01 (0.50)		6010C		1	KJK	11/01/17 23:34	2.44	100	CJ73153
Chromium	11.1 (1.00)		6010C		1	KJK	11/01/17 23:34	2.44	100	CJ73153
Copper	86.1 (2.51)		6010C		1	KJK	11/01/17 23:34	2.44	100	CJ73153
Lead	333 (5.02)		6010C		1	KJK	11/01/17 23:34	2.44	100	CJ73153
Mercury	0.566 (0.213)		7471B		10	MJV	11/01/17 14:37	1.14	40	CJ73120
Nickel	19.9 (2.51)		6010C		1	KJK	11/01/17 23:34	2.44	100	CJ73153
Selenium	ND (2.01)		6020A		20	NAR	11/02/17 2:34	2.44	100	CJ73153
Silver	ND (0.50)		6010C		1	KJK	11/02/17 20:22	2.44	100	CJ73153
Thallium	ND (2.01)		6020A		20	NAR	11/02/17 2:34	2.44	100	CJ73153
Zinc	279 (2.51)		6010C		1	KJK	11/01/17 23:34	2.44	100	CJ73153



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SB-517 2-4ft  
Date Sampled: 10/30/17 10:25  
Percent Solids: 82  
Initial Volume: 6.8  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710793  
ESS Laboratory Sample ID: 1710793-03  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0045)		8260B Low		1	11/01/17 17:08	C7K0012	CK70133
1,1,1-Trichloroethane	ND (0.0045)		8260B Low		1	11/01/17 17:08	C7K0012	CK70133
1,1,2,2-Tetrachloroethane	ND (0.0045)		8260B Low		1	11/01/17 17:08	C7K0012	CK70133
1,1,2-Trichloroethane	ND (0.0045)		8260B Low		1	11/01/17 17:08	C7K0012	CK70133
1,1-Dichloroethane	ND (0.0045)		8260B Low		1	11/01/17 17:08	C7K0012	CK70133
1,1-Dichloroethene	ND (0.0045)		8260B Low		1	11/01/17 17:08	C7K0012	CK70133
1,1-Dichloropropene	ND (0.0045)		8260B Low		1	11/01/17 17:08	C7K0012	CK70133
1,2,3-Trichlorobenzene	ND (0.0045)		8260B Low		1	11/01/17 17:08	C7K0012	CK70133
1,2,3-Trichloropropane	ND (0.0045)		8260B Low		1	11/01/17 17:08	C7K0012	CK70133
1,2,4-Trichlorobenzene	ND (0.0045)		8260B Low		1	11/01/17 17:08	C7K0012	CK70133
1,2,4-Trimethylbenzene	ND (0.0045)		8260B Low		1	11/01/17 17:08	C7K0012	CK70133
1,2-Dibromo-3-Chloropropane	ND (0.0045)		8260B Low		1	11/01/17 17:08	C7K0012	CK70133
1,2-Dibromoethane	ND (0.0045)		8260B Low		1	11/01/17 17:08	C7K0012	CK70133
1,2-Dichlorobenzene	ND (0.0045)		8260B Low		1	11/01/17 17:08	C7K0012	CK70133
1,2-Dichloroethane	ND (0.0045)		8260B Low		1	11/01/17 17:08	C7K0012	CK70133
1,2-Dichloropropane	ND (0.0045)		8260B Low		1	11/01/17 17:08	C7K0012	CK70133
1,3,5-Trimethylbenzene	ND (0.0045)		8260B Low		1	11/01/17 17:08	C7K0012	CK70133
1,3-Dichlorobenzene	ND (0.0045)		8260B Low		1	11/01/17 17:08	C7K0012	CK70133
1,3-Dichloropropane	ND (0.0045)		8260B Low		1	11/01/17 17:08	C7K0012	CK70133
1,4-Dichlorobenzene	ND (0.0045)		8260B Low		1	11/01/17 17:08	C7K0012	CK70133
1,4-Dioxane	ND (0.0900)		8260B Low		1	11/01/17 17:08	C7K0012	CK70133
1-Chlorohexane	ND (0.0045)		8260B Low		1	11/01/17 17:08	C7K0012	CK70133
2,2-Dichloropropane	ND (0.0045)		8260B Low		1	11/01/17 17:08	C7K0012	CK70133
2-Butanone	ND (0.0450)		8260B Low		1	11/01/17 17:08	C7K0012	CK70133
2-Chlorotoluene	ND (0.0045)		8260B Low		1	11/01/17 17:08	C7K0012	CK70133
2-Hexanone	ND (0.0450)		8260B Low		1	11/01/17 17:08	C7K0012	CK70133
4-Chlorotoluene	ND (0.0045)		8260B Low		1	11/01/17 17:08	C7K0012	CK70133
4-Isopropyltoluene	ND (0.0045)		8260B Low		1	11/01/17 17:08	C7K0012	CK70133
4-Methyl-2-Pentanone	ND (0.0450)		8260B Low		1	11/01/17 17:08	C7K0012	CK70133
Acetone	ND (0.0450)		8260B Low		1	11/01/17 17:08	C7K0012	CK70133
Benzene	ND (0.0045)		8260B Low		1	11/01/17 17:08	C7K0012	CK70133
Bromobenzene	ND (0.0045)		8260B Low		1	11/01/17 17:08	C7K0012	CK70133



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SB-517 2-4ft  
 Date Sampled: 10/30/17 10:25  
 Percent Solids: 82  
 Initial Volume: 6.8  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1710793  
 ESS Laboratory Sample ID: 1710793-03  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0045)		8260B Low		1	11/01/17 17:08	C7K0012	CK70133
Bromodichloromethane	ND (0.0045)		8260B Low		1	11/01/17 17:08	C7K0012	CK70133
Bromoform	ND (0.0045)		8260B Low		1	11/01/17 17:08	C7K0012	CK70133
Bromomethane	ND (0.0090)		8260B Low		1	11/01/17 17:08	C7K0012	CK70133
Carbon Disulfide	ND (0.0045)		8260B Low		1	11/01/17 17:08	C7K0012	CK70133
Carbon Tetrachloride	ND (0.0045)		8260B Low		1	11/01/17 17:08	C7K0012	CK70133
Chlorobenzene	ND (0.0045)		8260B Low		1	11/01/17 17:08	C7K0012	CK70133
Chloroethane	ND (0.0090)		8260B Low		1	11/01/17 17:08	C7K0012	CK70133
Chloroform	ND (0.0045)		8260B Low		1	11/01/17 17:08	C7K0012	CK70133
Chloromethane	ND (0.0090)		8260B Low		1	11/01/17 17:08	C7K0012	CK70133
cis-1,2-Dichloroethene	ND (0.0045)		8260B Low		1	11/01/17 17:08	C7K0012	CK70133
cis-1,3-Dichloropropene	ND (0.0045)		8260B Low		1	11/01/17 17:08	C7K0012	CK70133
Dibromochloromethane	ND (0.0045)		8260B Low		1	11/01/17 17:08	C7K0012	CK70133
Dibromomethane	ND (0.0045)		8260B Low		1	11/01/17 17:08	C7K0012	CK70133
Dichlorodifluoromethane	ND (0.0090)		8260B Low		1	11/01/17 17:08	C7K0012	CK70133
Diethyl Ether	ND (0.0045)		8260B Low		1	11/01/17 17:08	C7K0012	CK70133
Di-isopropyl ether	ND (0.0045)		8260B Low		1	11/01/17 17:08	C7K0012	CK70133
Ethyl tertiary-butyl ether	ND (0.0045)		8260B Low		1	11/01/17 17:08	C7K0012	CK70133
Ethylbenzene	ND (0.0045)		8260B Low		1	11/01/17 17:08	C7K0012	CK70133
Hexachlorobutadiene	ND (0.0045)		8260B Low		1	11/01/17 17:08	C7K0012	CK70133
Isopropylbenzene	ND (0.0045)		8260B Low		1	11/01/17 17:08	C7K0012	CK70133
Methyl tert-Butyl Ether	ND (0.0045)		8260B Low		1	11/01/17 17:08	C7K0012	CK70133
Methylene Chloride	ND (0.0225)		8260B Low		1	11/01/17 17:08	C7K0012	CK70133
<b>Naphthalene</b>	<b>0.0050</b> (0.0045)		8260B Low		1	11/01/17 17:08	C7K0012	CK70133
n-Butylbenzene	ND (0.0045)		8260B Low		1	11/01/17 17:08	C7K0012	CK70133
n-Propylbenzene	ND (0.0045)		8260B Low		1	11/01/17 17:08	C7K0012	CK70133
sec-Butylbenzene	ND (0.0045)		8260B Low		1	11/01/17 17:08	C7K0012	CK70133
Styrene	ND (0.0045)		8260B Low		1	11/01/17 17:08	C7K0012	CK70133
tert-Butylbenzene	ND (0.0045)		8260B Low		1	11/01/17 17:08	C7K0012	CK70133
Tertiary-amyl methyl ether	ND (0.0045)		8260B Low		1	11/01/17 17:08	C7K0012	CK70133
Tetrachloroethene	ND (0.0045)		8260B Low		1	11/01/17 17:08	C7K0012	CK70133
Tetrahydrofuran	ND (0.0045)		8260B Low		1	11/01/17 17:08	C7K0012	CK70133





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SB-517 2-4ft  
Date Sampled: 10/30/17 10:25  
Percent Solids: 82  
Initial Volume: 6.8  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710793  
ESS Laboratory Sample ID: 1710793-03  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0045)		8260B Low		1	11/01/17 17:08	C7K0012	CK70133
trans-1,2-Dichloroethene	ND (0.0045)		8260B Low		1	11/01/17 17:08	C7K0012	CK70133
trans-1,3-Dichloropropene	ND (0.0045)		8260B Low		1	11/01/17 17:08	C7K0012	CK70133
Trichloroethene	ND (0.0045)		8260B Low		1	11/01/17 17:08	C7K0012	CK70133
Trichlorofluoromethane	ND (0.0045)		8260B Low		1	11/01/17 17:08	C7K0012	CK70133
Vinyl Acetate	ND (0.0045)		8260B Low		1	11/01/17 17:08	C7K0012	CK70133
Vinyl Chloride	ND (0.0090)		8260B Low		1	11/01/17 17:08	C7K0012	CK70133
Xylene O	ND (0.0045)		8260B Low		1	11/01/17 17:08	C7K0012	CK70133
Xylene P,M	ND (0.0090)		8260B Low		1	11/01/17 17:08	C7K0012	CK70133
Xylenes (Total)	ND (0.0090)		8260B Low		1	11/01/17 17:08		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>94 %</i>		<i>70-130</i>
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>89 %</i>		<i>70-130</i>
<i>Surrogate: Dibromofluoromethane</i>	<i>87 %</i>		<i>70-130</i>
<i>Surrogate: Toluene-d8</i>	<i>104 %</i>		<i>70-130</i>



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SB-517 2-4ft  
Date Sampled: 10/30/17 10:25  
Percent Solids: 82  
Initial Volume: 20.5  
Final Volume: 1  
Extraction Method: 3546

ESS Laboratory Work Order: 1710793  
ESS Laboratory Sample ID: 1710793-03  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: SMR  
Prepared: 11/1/17 11:45

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	8310 (448)		8100M		10	11/02/17 3:37	C7K0018	CK70111
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		140 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SB-517 2-4ft  
 Date Sampled: 10/30/17 10:25  
 Percent Solids: 82  
 Initial Volume: 15  
 Final Volume: 0.5  
 Extraction Method: 3546

ESS Laboratory Work Order: 1710793  
 ESS Laboratory Sample ID: 1710793-03  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: TJ  
 Prepared: 11/1/17 11:35

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	5.89 (0.408)		8270D		1	11/02/17 21:35	C7K0025	CK70112
Acenaphthene	0.658 (0.408)		8270D		1	11/02/17 21:35	C7K0025	CK70112
Acenaphthylene	7.12 (0.408)		8270D		1	11/02/17 21:35	C7K0025	CK70112
Anthracene	4.91 (0.408)		8270D		1	11/02/17 21:35	C7K0025	CK70112
Benzo(a)anthracene	8.47 (0.408)		8270D		1	11/02/17 21:35	C7K0025	CK70112
Benzo(a)pyrene	6.96 (0.204)		8270D		1	11/02/17 21:35	C7K0025	CK70112
Benzo(b)fluoranthene	8.46 (4.08)		8270D		10	11/04/17 0:47	C7K0025	CK70112
Benzo(g,h,i)perylene	5.73 (0.408)		8270D		1	11/02/17 21:35	C7K0025	CK70112
Benzo(k)fluoranthene	6.19 (4.08)		8270D		10	11/04/17 0:47	C7K0025	CK70112
Chrysene	9.16 (0.204)		8270D		1	11/02/17 21:35	C7K0025	CK70112
Dibenzo(a,h)Anthracene	3.55 (0.204)		8270D		1	11/02/17 21:35	C7K0025	CK70112
Fluoranthene	12.5 (4.08)		8270D		10	11/04/17 0:47	C7K0025	CK70112
Fluorene	3.44 (0.408)		8270D		1	11/02/17 21:35	C7K0025	CK70112
Indeno(1,2,3-cd)Pyrene	5.83 (0.408)		8270D		1	11/02/17 21:35	C7K0025	CK70112
Naphthalene	5.56 (0.408)		8270D		1	11/02/17 21:35	C7K0025	CK70112
Phenanthrene	14.8 (4.08)		8270D		10	11/04/17 0:47	C7K0025	CK70112
Pyrene	20.1 (4.08)		8270D		10	11/04/17 0:47	C7K0025	CK70112

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
Surrogate: 1,2-Dichlorobenzene-d4	67 %		30-130
Surrogate: 2-Fluorobiphenyl	100 %		30-130
Surrogate: Nitrobenzene-d5	79 %		30-130
Surrogate: p-Terphenyl-d14	86 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SB-517 2-4ft  
Date Sampled: 10/30/17 10:25  
Percent Solids: 82

ESS Laboratory Work Order: 1710793  
ESS Laboratory Sample ID: 1710793-03  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	128 (11.2)		9014		10	EEM	11/01/17 11:45	mg/kg dry	CK70114



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SB-517 4-6ft  
Date Sampled: 10/30/17 10:35  
Percent Solids: 64

ESS Laboratory Work Order: 1710793  
ESS Laboratory Sample ID: 1710793-04  
Sample Matrix: Soil  
Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (2.94)		6020A		20	NAR	11/02/17 2:41	2.14	100	CJ73153
Arsenic	ND (36.7)		6010C		10	KJK	11/02/17 20:26	2.14	100	CJ73153
Beryllium	ND (1.62)		6010C		10	KJK	11/02/17 20:26	2.14	100	CJ73153
Cadmium	ND (7.35)		6010C		10	KJK	11/02/17 20:26	2.14	100	CJ73153
Chromium	ND (14.7)		6010C		10	KJK	11/02/17 20:26	2.14	100	CJ73153
Copper	ND (36.7)		6010C		10	KJK	11/02/17 20:26	2.14	100	CJ73153
Lead	ND (73.5)		6010C		10	KJK	11/02/17 20:26	2.14	100	CJ73153
<b>Mercury</b>	<b>0.271</b> (0.032)		7471B		1	MJV	11/01/17 14:13	0.96	40	CJ73120
Nickel	ND (36.7)		6010C		10	KJK	11/02/17 20:26	2.14	100	CJ73153
Selenium	ND (2.94)		6020A		20	NAR	11/02/17 2:41	2.14	100	CJ73153
Silver	ND (7.35)		6010C		10	KJK	11/02/17 20:26	2.14	100	CJ73153
Thallium	ND (0.73)		6020A		20	NAR	11/02/17 2:41	2.14	100	CJ73153
Zinc	ND (36.7)		6010C		10	KJK	11/02/17 20:26	2.14	100	CJ73153



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SB-517 4-6ft  
Date Sampled: 10/30/17 10:35  
Percent Solids: 64  
Initial Volume: 5.7  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710793  
ESS Laboratory Sample ID: 1710793-04  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0069)		8260B Low		1	11/01/17 17:33	C7K0012	CK70133
1,1,1-Trichloroethane	ND (0.0069)		8260B Low		1	11/01/17 17:33	C7K0012	CK70133
1,1,2,2-Tetrachloroethane	ND (0.0069)		8260B Low		1	11/01/17 17:33	C7K0012	CK70133
1,1,2-Trichloroethane	ND (0.0069)		8260B Low		1	11/01/17 17:33	C7K0012	CK70133
1,1-Dichloroethane	ND (0.0069)		8260B Low		1	11/01/17 17:33	C7K0012	CK70133
1,1-Dichloroethene	ND (0.0069)		8260B Low		1	11/01/17 17:33	C7K0012	CK70133
1,1-Dichloropropene	ND (0.0069)		8260B Low		1	11/01/17 17:33	C7K0012	CK70133
1,2,3-Trichlorobenzene	ND (0.0069)		8260B Low		1	11/01/17 17:33	C7K0012	CK70133
1,2,3-Trichloropropane	ND (0.0069)		8260B Low		1	11/01/17 17:33	C7K0012	CK70133
1,2,4-Trichlorobenzene	ND (0.0069)		8260B Low		1	11/01/17 17:33	C7K0012	CK70133
1,2,4-Trimethylbenzene	ND (0.0069)		8260B Low		1	11/01/17 17:33	C7K0012	CK70133
1,2-Dibromo-3-Chloropropane	ND (0.0069)		8260B Low		1	11/01/17 17:33	C7K0012	CK70133
1,2-Dibromoethane	ND (0.0069)		8260B Low		1	11/01/17 17:33	C7K0012	CK70133
1,2-Dichlorobenzene	ND (0.0069)		8260B Low		1	11/01/17 17:33	C7K0012	CK70133
1,2-Dichloroethane	ND (0.0069)		8260B Low		1	11/01/17 17:33	C7K0012	CK70133
1,2-Dichloropropane	ND (0.0069)		8260B Low		1	11/01/17 17:33	C7K0012	CK70133
1,3,5-Trimethylbenzene	ND (0.0069)		8260B Low		1	11/01/17 17:33	C7K0012	CK70133
1,3-Dichlorobenzene	ND (0.0069)		8260B Low		1	11/01/17 17:33	C7K0012	CK70133
1,3-Dichloropropane	ND (0.0069)		8260B Low		1	11/01/17 17:33	C7K0012	CK70133
1,4-Dichlorobenzene	ND (0.0069)		8260B Low		1	11/01/17 17:33	C7K0012	CK70133
1,4-Dioxane	ND (0.138)		8260B Low		1	11/01/17 17:33	C7K0012	CK70133
1-Chlorohexane	ND (0.0069)		8260B Low		1	11/01/17 17:33	C7K0012	CK70133
2,2-Dichloropropane	ND (0.0069)		8260B Low		1	11/01/17 17:33	C7K0012	CK70133
2-Butanone	ND (0.0690)		8260B Low		1	11/01/17 17:33	C7K0012	CK70133
2-Chlorotoluene	ND (0.0069)		8260B Low		1	11/01/17 17:33	C7K0012	CK70133
2-Hexanone	ND (0.0690)		8260B Low		1	11/01/17 17:33	C7K0012	CK70133
4-Chlorotoluene	ND (0.0069)		8260B Low		1	11/01/17 17:33	C7K0012	CK70133
4-Isopropyltoluene	ND (0.0069)		8260B Low		1	11/01/17 17:33	C7K0012	CK70133
4-Methyl-2-Pentanone	ND (0.0690)		8260B Low		1	11/01/17 17:33	C7K0012	CK70133
Acetone	ND (0.0690)		8260B Low		1	11/01/17 17:33	C7K0012	CK70133
Benzene	ND (0.0069)		8260B Low		1	11/01/17 17:33	C7K0012	CK70133
Bromobenzene	ND (0.0069)		8260B Low		1	11/01/17 17:33	C7K0012	CK70133





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SB-517 4-6ft  
Date Sampled: 10/30/17 10:35  
Percent Solids: 64  
Initial Volume: 5.7  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710793  
ESS Laboratory Sample ID: 1710793-04  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0069)		8260B Low		1	11/01/17 17:33	C7K0012	CK70133
Bromodichloromethane	ND (0.0069)		8260B Low		1	11/01/17 17:33	C7K0012	CK70133
Bromoform	ND (0.0069)		8260B Low		1	11/01/17 17:33	C7K0012	CK70133
Bromomethane	ND (0.0138)		8260B Low		1	11/01/17 17:33	C7K0012	CK70133
<b>Carbon Disulfide</b>	<b>0.0111</b> (0.0069)		8260B Low		1	11/01/17 17:33	C7K0012	CK70133
Carbon Tetrachloride	ND (0.0069)		8260B Low		1	11/01/17 17:33	C7K0012	CK70133
Chlorobenzene	ND (0.0069)		8260B Low		1	11/01/17 17:33	C7K0012	CK70133
Chloroethane	ND (0.0138)		8260B Low		1	11/01/17 17:33	C7K0012	CK70133
Chloroform	ND (0.0069)		8260B Low		1	11/01/17 17:33	C7K0012	CK70133
Chloromethane	ND (0.0138)		8260B Low		1	11/01/17 17:33	C7K0012	CK70133
cis-1,2-Dichloroethene	ND (0.0069)		8260B Low		1	11/01/17 17:33	C7K0012	CK70133
cis-1,3-Dichloropropene	ND (0.0069)		8260B Low		1	11/01/17 17:33	C7K0012	CK70133
Dibromochloromethane	ND (0.0069)		8260B Low		1	11/01/17 17:33	C7K0012	CK70133
Dibromomethane	ND (0.0069)		8260B Low		1	11/01/17 17:33	C7K0012	CK70133
Dichlorodifluoromethane	ND (0.0138)		8260B Low		1	11/01/17 17:33	C7K0012	CK70133
Diethyl Ether	ND (0.0069)		8260B Low		1	11/01/17 17:33	C7K0012	CK70133
Di-isopropyl ether	ND (0.0069)		8260B Low		1	11/01/17 17:33	C7K0012	CK70133
Ethyl tertiary-butyl ether	ND (0.0069)		8260B Low		1	11/01/17 17:33	C7K0012	CK70133
Ethylbenzene	ND (0.0069)		8260B Low		1	11/01/17 17:33	C7K0012	CK70133
Hexachlorobutadiene	ND (0.0069)		8260B Low		1	11/01/17 17:33	C7K0012	CK70133
Isopropylbenzene	ND (0.0069)		8260B Low		1	11/01/17 17:33	C7K0012	CK70133
Methyl tert-Butyl Ether	ND (0.0069)		8260B Low		1	11/01/17 17:33	C7K0012	CK70133
Methylene Chloride	ND (0.0345)		8260B Low		1	11/01/17 17:33	C7K0012	CK70133
<b>Naphthalene</b>	<b>0.0105</b> (0.0069)		8260B Low		1	11/01/17 17:33	C7K0012	CK70133
n-Butylbenzene	ND (0.0069)		8260B Low		1	11/01/17 17:33	C7K0012	CK70133
n-Propylbenzene	ND (0.0069)		8260B Low		1	11/01/17 17:33	C7K0012	CK70133
sec-Butylbenzene	ND (0.0069)		8260B Low		1	11/01/17 17:33	C7K0012	CK70133
Styrene	ND (0.0069)		8260B Low		1	11/01/17 17:33	C7K0012	CK70133
tert-Butylbenzene	ND (0.0069)		8260B Low		1	11/01/17 17:33	C7K0012	CK70133
Tertiary-amyl methyl ether	ND (0.0069)		8260B Low		1	11/01/17 17:33	C7K0012	CK70133
Tetrachloroethene	ND (0.0069)		8260B Low		1	11/01/17 17:33	C7K0012	CK70133
Tetrahydrofuran	ND (0.0069)		8260B Low		1	11/01/17 17:33	C7K0012	CK70133



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SB-517 4-6ft  
Date Sampled: 10/30/17 10:35  
Percent Solids: 64  
Initial Volume: 5.7  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710793  
ESS Laboratory Sample ID: 1710793-04  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0069)		8260B Low		1	11/01/17 17:33	C7K0012	CK70133
trans-1,2-Dichloroethene	ND (0.0069)		8260B Low		1	11/01/17 17:33	C7K0012	CK70133
trans-1,3-Dichloropropene	ND (0.0069)		8260B Low		1	11/01/17 17:33	C7K0012	CK70133
Trichloroethene	ND (0.0069)		8260B Low		1	11/01/17 17:33	C7K0012	CK70133
Trichlorofluoromethane	ND (0.0069)		8260B Low		1	11/01/17 17:33	C7K0012	CK70133
Vinyl Acetate	ND (0.0069)		8260B Low		1	11/01/17 17:33	C7K0012	CK70133
Vinyl Chloride	ND (0.0138)		8260B Low		1	11/01/17 17:33	C7K0012	CK70133
Xylene O	ND (0.0069)		8260B Low		1	11/01/17 17:33	C7K0012	CK70133
Xylene P,M	ND (0.0138)		8260B Low		1	11/01/17 17:33	C7K0012	CK70133
Xylenes (Total)	ND (0.0138)		8260B Low		1	11/01/17 17:33		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	95 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	94 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	87 %		70-130
<i>Surrogate: Toluene-d8</i>	101 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SB-517 4-6ft  
Date Sampled: 10/30/17 10:35  
Percent Solids: 64  
Initial Volume: 19  
Final Volume: 1  
Extraction Method: 3546

ESS Laboratory Work Order: 1710793  
ESS Laboratory Sample ID: 1710793-04  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: SMR  
Prepared: 11/1/17 11:45

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	710 (310)		8100M		5	11/02/17 4:13	C7K0018	CK70111
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		86 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SB-517 4-6ft  
 Date Sampled: 10/30/17 10:35  
 Percent Solids: 64  
 Initial Volume: 14.1  
 Final Volume: 0.5  
 Extraction Method: 3546

ESS Laboratory Work Order: 1710793  
 ESS Laboratory Sample ID: 1710793-04  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: TJ  
 Prepared: 11/1/17 11:35

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.557)		8270D		1	11/02/17 22:11	C7K0025	CK70112
Acenaphthene	ND (0.557)		8270D		1	11/02/17 22:11	C7K0025	CK70112
Acenaphthylene	1.27 (0.557)		8270D		1	11/02/17 22:11	C7K0025	CK70112
Anthracene	0.832 (0.557)		8270D		1	11/02/17 22:11	C7K0025	CK70112
Benzo(a)anthracene	8.59 (0.557)		8270D		1	11/02/17 22:11	C7K0025	CK70112
Benzo(a)pyrene	10.9 (0.279)		8270D		1	11/02/17 22:11	C7K0025	CK70112
Benzo(b)fluoranthene	11.7 (5.57)		8270D		10	11/04/17 1:22	C7K0025	CK70112
Benzo(g,h,i)perylene	10.4 (0.557)		8270D		1	11/02/17 22:11	C7K0025	CK70112
Benzo(k)fluoranthene	9.82 (5.57)		8270D		10	11/04/17 1:22	C7K0025	CK70112
Chrysene	7.62 (0.279)		8270D		1	11/02/17 22:11	C7K0025	CK70112
Dibenzo(a,h)Anthracene	4.40 (0.279)		8270D		1	11/02/17 22:11	C7K0025	CK70112
Fluoranthene	11.4 (0.557)		8270D		1	11/02/17 22:11	C7K0025	CK70112
Fluorene	ND (0.557)		8270D		1	11/02/17 22:11	C7K0025	CK70112
Indeno(1,2,3-cd)Pyrene	9.07 (0.557)		8270D		1	11/02/17 22:11	C7K0025	CK70112
Naphthalene	0.951 (0.557)		8270D		1	11/02/17 22:11	C7K0025	CK70112
Phenanthrene	1.24 (0.557)		8270D		1	11/02/17 22:11	C7K0025	CK70112
Pyrene	18.3 (5.57)		8270D		10	11/04/17 1:22	C7K0025	CK70112

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	82 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	82 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	86 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	93 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SB-517 4-6ft  
Date Sampled: 10/30/17 10:35  
Percent Solids: 64

ESS Laboratory Work Order: 1710793  
ESS Laboratory Sample ID: 1710793-04  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	124 (15.0)		9014		10	EEM	11/01/17 11:45	mg/kg dry	CK70114



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: Trip Blank  
Date Sampled: 10/30/17 00:00  
Percent Solids: N/A  
Initial Volume: 5  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710793  
ESS Laboratory Sample ID: 1710793-05  
Sample Matrix: Solid  
Units: mg/kg wet  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0050)		8260B Low		1	11/01/17 15:52	C7K0012	CK70133
1,1,1-Trichloroethane	ND (0.0050)		8260B Low		1	11/01/17 15:52	C7K0012	CK70133
1,1,2,2-Tetrachloroethane	ND (0.0050)		8260B Low		1	11/01/17 15:52	C7K0012	CK70133
1,1,2-Trichloroethane	ND (0.0050)		8260B Low		1	11/01/17 15:52	C7K0012	CK70133
1,1-Dichloroethane	ND (0.0050)		8260B Low		1	11/01/17 15:52	C7K0012	CK70133
1,1-Dichloroethene	ND (0.0050)		8260B Low		1	11/01/17 15:52	C7K0012	CK70133
1,1-Dichloropropene	ND (0.0050)		8260B Low		1	11/01/17 15:52	C7K0012	CK70133
1,2,3-Trichlorobenzene	ND (0.0050)		8260B Low		1	11/01/17 15:52	C7K0012	CK70133
1,2,3-Trichloropropane	ND (0.0050)		8260B Low		1	11/01/17 15:52	C7K0012	CK70133
1,2,4-Trichlorobenzene	ND (0.0050)		8260B Low		1	11/01/17 15:52	C7K0012	CK70133
1,2,4-Trimethylbenzene	ND (0.0050)		8260B Low		1	11/01/17 15:52	C7K0012	CK70133
1,2-Dibromo-3-Chloropropane	ND (0.0050)		8260B Low		1	11/01/17 15:52	C7K0012	CK70133
1,2-Dibromoethane	ND (0.0050)		8260B Low		1	11/01/17 15:52	C7K0012	CK70133
1,2-Dichlorobenzene	ND (0.0050)		8260B Low		1	11/01/17 15:52	C7K0012	CK70133
1,2-Dichloroethane	ND (0.0050)		8260B Low		1	11/01/17 15:52	C7K0012	CK70133
1,2-Dichloropropane	ND (0.0050)		8260B Low		1	11/01/17 15:52	C7K0012	CK70133
1,3,5-Trimethylbenzene	ND (0.0050)		8260B Low		1	11/01/17 15:52	C7K0012	CK70133
1,3-Dichlorobenzene	ND (0.0050)		8260B Low		1	11/01/17 15:52	C7K0012	CK70133
1,3-Dichloropropane	ND (0.0050)		8260B Low		1	11/01/17 15:52	C7K0012	CK70133
1,4-Dichlorobenzene	ND (0.0050)		8260B Low		1	11/01/17 15:52	C7K0012	CK70133
1,4-Dioxane	ND (0.100)		8260B Low		1	11/01/17 15:52	C7K0012	CK70133
1-Chlorohexane	ND (0.0050)		8260B Low		1	11/01/17 15:52	C7K0012	CK70133
2,2-Dichloropropane	ND (0.0050)		8260B Low		1	11/01/17 15:52	C7K0012	CK70133
2-Butanone	ND (0.0500)		8260B Low		1	11/01/17 15:52	C7K0012	CK70133
2-Chlorotoluene	ND (0.0050)		8260B Low		1	11/01/17 15:52	C7K0012	CK70133
2-Hexanone	ND (0.0500)		8260B Low		1	11/01/17 15:52	C7K0012	CK70133
4-Chlorotoluene	ND (0.0050)		8260B Low		1	11/01/17 15:52	C7K0012	CK70133
4-Isopropyltoluene	ND (0.0050)		8260B Low		1	11/01/17 15:52	C7K0012	CK70133
4-Methyl-2-Pentanone	ND (0.0500)		8260B Low		1	11/01/17 15:52	C7K0012	CK70133
Acetone	ND (0.0500)		8260B Low		1	11/01/17 15:52	C7K0012	CK70133
Benzene	ND (0.0050)		8260B Low		1	11/01/17 15:52	C7K0012	CK70133
Bromobenzene	ND (0.0050)		8260B Low		1	11/01/17 15:52	C7K0012	CK70133





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: Trip Blank  
Date Sampled: 10/30/17 00:00  
Percent Solids: N/A  
Initial Volume: 5  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710793  
ESS Laboratory Sample ID: 1710793-05  
Sample Matrix: Solid  
Units: mg/kg wet  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0050)		8260B Low		1	11/01/17 15:52	C7K0012	CK70133
Bromodichloromethane	ND (0.0050)		8260B Low		1	11/01/17 15:52	C7K0012	CK70133
Bromoform	ND (0.0050)		8260B Low		1	11/01/17 15:52	C7K0012	CK70133
Bromomethane	ND (0.0100)		8260B Low		1	11/01/17 15:52	C7K0012	CK70133
Carbon Disulfide	ND (0.0050)		8260B Low		1	11/01/17 15:52	C7K0012	CK70133
Carbon Tetrachloride	ND (0.0050)		8260B Low		1	11/01/17 15:52	C7K0012	CK70133
Chlorobenzene	ND (0.0050)		8260B Low		1	11/01/17 15:52	C7K0012	CK70133
Chloroethane	ND (0.0100)		8260B Low		1	11/01/17 15:52	C7K0012	CK70133
Chloroform	ND (0.0050)		8260B Low		1	11/01/17 15:52	C7K0012	CK70133
Chloromethane	ND (0.0100)		8260B Low		1	11/01/17 15:52	C7K0012	CK70133
cis-1,2-Dichloroethene	ND (0.0050)		8260B Low		1	11/01/17 15:52	C7K0012	CK70133
cis-1,3-Dichloropropene	ND (0.0050)		8260B Low		1	11/01/17 15:52	C7K0012	CK70133
Dibromochloromethane	ND (0.0050)		8260B Low		1	11/01/17 15:52	C7K0012	CK70133
Dibromomethane	ND (0.0050)		8260B Low		1	11/01/17 15:52	C7K0012	CK70133
Dichlorodifluoromethane	ND (0.0100)		8260B Low		1	11/01/17 15:52	C7K0012	CK70133
Diethyl Ether	ND (0.0050)		8260B Low		1	11/01/17 15:52	C7K0012	CK70133
Di-isopropyl ether	ND (0.0050)		8260B Low		1	11/01/17 15:52	C7K0012	CK70133
Ethyl tertiary-butyl ether	ND (0.0050)		8260B Low		1	11/01/17 15:52	C7K0012	CK70133
Ethylbenzene	ND (0.0050)		8260B Low		1	11/01/17 15:52	C7K0012	CK70133
Hexachlorobutadiene	ND (0.0050)		8260B Low		1	11/01/17 15:52	C7K0012	CK70133
Isopropylbenzene	ND (0.0050)		8260B Low		1	11/01/17 15:52	C7K0012	CK70133
Methyl tert-Butyl Ether	ND (0.0050)		8260B Low		1	11/01/17 15:52	C7K0012	CK70133
Methylene Chloride	ND (0.0250)		8260B Low		1	11/01/17 15:52	C7K0012	CK70133
Naphthalene	ND (0.0050)		8260B Low		1	11/01/17 15:52	C7K0012	CK70133
n-Butylbenzene	ND (0.0050)		8260B Low		1	11/01/17 15:52	C7K0012	CK70133
n-Propylbenzene	ND (0.0050)		8260B Low		1	11/01/17 15:52	C7K0012	CK70133
sec-Butylbenzene	ND (0.0050)		8260B Low		1	11/01/17 15:52	C7K0012	CK70133
Styrene	ND (0.0050)		8260B Low		1	11/01/17 15:52	C7K0012	CK70133
tert-Butylbenzene	ND (0.0050)		8260B Low		1	11/01/17 15:52	C7K0012	CK70133
Tertiary-amyl methyl ether	ND (0.0050)		8260B Low		1	11/01/17 15:52	C7K0012	CK70133
Tetrachloroethene	ND (0.0050)		8260B Low		1	11/01/17 15:52	C7K0012	CK70133
Tetrahydrofuran	ND (0.0050)		8260B Low		1	11/01/17 15:52	C7K0012	CK70133



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: Trip Blank  
Date Sampled: 10/30/17 00:00  
Percent Solids: N/A  
Initial Volume: 5  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1710793  
ESS Laboratory Sample ID: 1710793-05  
Sample Matrix: Solid  
Units: mg/kg wet  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0050)		8260B Low		1	11/01/17 15:52	C7K0012	CK70133
trans-1,2-Dichloroethene	ND (0.0050)		8260B Low		1	11/01/17 15:52	C7K0012	CK70133
trans-1,3-Dichloropropene	ND (0.0050)		8260B Low		1	11/01/17 15:52	C7K0012	CK70133
Trichloroethene	ND (0.0050)		8260B Low		1	11/01/17 15:52	C7K0012	CK70133
Trichlorofluoromethane	ND (0.0050)		8260B Low		1	11/01/17 15:52	C7K0012	CK70133
Vinyl Acetate	ND (0.0050)		8260B Low		1	11/01/17 15:52	C7K0012	CK70133
Vinyl Chloride	ND (0.0100)		8260B Low		1	11/01/17 15:52	C7K0012	CK70133
Xylene O	ND (0.0050)		8260B Low		1	11/01/17 15:52	C7K0012	CK70133
Xylene P,M	ND (0.0100)		8260B Low		1	11/01/17 15:52	C7K0012	CK70133
Xylenes (Total)	ND (0.0100)		8260B Low		1	11/01/17 15:52		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>84 %</i>		<i>70-130</i>
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>94 %</i>		<i>70-130</i>
<i>Surrogate: Dibromofluoromethane</i>	<i>82 %</i>		<i>70-130</i>
<i>Surrogate: Toluene-d8</i>	<i>102 %</i>		<i>70-130</i>



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710793

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
<b>Total Metals</b>										
<b>Batch CJ73120 - 7471B</b>										
<b>Blank</b>										
Mercury	ND	0.033	mg/kg wet							
<b>LCS</b>										
Mercury	2.73	0.720	mg/kg wet	2.900		94	80-120			
<b>LCS Dup</b>										
Mercury	2.76	0.733	mg/kg wet	2.900		95	80-120	1	20	
<b>Batch CJ73153 - 3050B</b>										
<b>Blank</b>										
Antimony	ND	0.50	mg/kg wet							
Arsenic	ND	2.50	mg/kg wet							
Beryllium	ND	0.11	mg/kg wet							
Cadmium	ND	0.50	mg/kg wet							
Chromium	ND	1.00	mg/kg wet							
Copper	ND	2.50	mg/kg wet							
Lead	ND	5.00	mg/kg wet							
Nickel	ND	2.50	mg/kg wet							
Selenium	ND	0.50	mg/kg wet							
Silver	ND	0.50	mg/kg wet							
Thallium	ND	0.50	mg/kg wet							
Zinc	ND	2.50	mg/kg wet							
<b>LCS</b>										
Antimony	47.1	4.39	mg/kg wet	48.00		98	80-120			
Selenium	36.3	4.39	mg/kg wet	42.40		86	80-120			
Thallium	42.7	4.39	mg/kg wet	52.00		82	80-120			
<b>LCS</b>										
Arsenic	94.6	8.47	mg/kg wet	100.0		95	80-120			
Beryllium	130	0.37	mg/kg wet	147.0		88	80-120			
Cadmium	72.1	1.69	mg/kg wet	83.70		86	80-120			
Chromium	97.8	3.39	mg/kg wet	107.0		91	80-120			
Copper	156	8.47	mg/kg wet	166.0		94	80-120			
Lead	80.2	16.9	mg/kg wet	88.40		91	80-120			
Nickel	47.5	8.47	mg/kg wet	49.80		95	80-120			
Silver	39.6	1.69	mg/kg wet	41.40		96	80-120			
Zinc	126	8.47	mg/kg wet	145.0		87	80-120			
<b>LCS Dup</b>										
Antimony	41.1	4.55	mg/kg wet	48.00		86	80-120	14	30	
Selenium	30.9	4.55	mg/kg wet	42.40		73	80-120	16	30	B-
Thallium	36.0	4.55	mg/kg wet	52.00		69	80-120	17	30	B-
<b>LCS Dup</b>										
Arsenic	102	10.0	mg/kg wet	100.0		102	80-120	8	20	
Beryllium	139	0.44	mg/kg wet	147.0		94	80-120	6	20	
Cadmium	71.7	2.00	mg/kg wet	83.70		86	80-120	0.4	20	
Chromium	104	4.00	mg/kg wet	107.0		97	80-120	6	20	



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710793

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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**Total Metals**

**Batch CJ73153 - 3050B**

Copper	160	10.0	mg/kg wet	166.0		96	80-120	2	20	
Lead	99.6	20.0	mg/kg wet	88.40		113	80-120	22	20	D+
Nickel	47.1	10.0	mg/kg wet	49.80		94	80-120	1	20	
Silver	41.7	2.00	mg/kg wet	41.40		101	80-120	5	20	
Zinc	130	10.0	mg/kg wet	145.0		89	80-120	3	20	

**5035/8260B Volatile Organic Compounds / Low Level**

**Batch CK70133 - 5035**

**Blank**

1,1,1,2-Tetrachloroethane	ND	0.0050	mg/kg wet
1,1,1-Trichloroethane	ND	0.0050	mg/kg wet
1,1,2,2-Tetrachloroethane	ND	0.0050	mg/kg wet
1,1,2-Trichloroethane	ND	0.0050	mg/kg wet
1,1-Dichloroethane	ND	0.0050	mg/kg wet
1,1-Dichloroethene	ND	0.0050	mg/kg wet
1,1-Dichloropropene	ND	0.0050	mg/kg wet
1,2,3-Trichlorobenzene	ND	0.0050	mg/kg wet
1,2,3-Trichloropropane	ND	0.0050	mg/kg wet
1,2,4-Trichlorobenzene	ND	0.0050	mg/kg wet
1,2,4-Trimethylbenzene	ND	0.0050	mg/kg wet
1,2-Dibromo-3-Chloropropane	ND	0.0050	mg/kg wet
1,2-Dibromoethane	ND	0.0050	mg/kg wet
1,2-Dichlorobenzene	ND	0.0050	mg/kg wet
1,2-Dichloroethane	ND	0.0050	mg/kg wet
1,2-Dichloropropane	ND	0.0050	mg/kg wet
1,3,5-Trimethylbenzene	ND	0.0050	mg/kg wet
1,3-Dichlorobenzene	ND	0.0050	mg/kg wet
1,3-Dichloropropane	ND	0.0050	mg/kg wet
1,4-Dichlorobenzene	ND	0.0050	mg/kg wet
1,4-Dioxane	ND	0.100	mg/kg wet
1-Chlorohexane	ND	0.0050	mg/kg wet
2,2-Dichloropropane	ND	0.0050	mg/kg wet
2-Butanone	ND	0.0500	mg/kg wet
2-Chlorotoluene	ND	0.0050	mg/kg wet
2-Hexanone	ND	0.0500	mg/kg wet
4-Chlorotoluene	ND	0.0050	mg/kg wet
4-Isopropyltoluene	ND	0.0050	mg/kg wet
4-Methyl-2-Pentanone	ND	0.0500	mg/kg wet
Acetone	ND	0.0500	mg/kg wet
Benzene	ND	0.0050	mg/kg wet
Bromobenzene	ND	0.0050	mg/kg wet
Bromochloromethane	ND	0.0050	mg/kg wet
Bromodichloromethane	ND	0.0050	mg/kg wet
Bromoform	ND	0.0050	mg/kg wet
Bromomethane	ND	0.0100	mg/kg wet



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710793

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CK70133 - 5035**

Carbon Disulfide	ND	0.0050	mg/kg wet							
Carbon Tetrachloride	ND	0.0050	mg/kg wet							
Chlorobenzene	ND	0.0050	mg/kg wet							
Chloroethane	ND	0.0100	mg/kg wet							
Chloroform	ND	0.0050	mg/kg wet							
Chloromethane	ND	0.0100	mg/kg wet							
cis-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
cis-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Dibromochloromethane	ND	0.0050	mg/kg wet							
Dibromomethane	ND	0.0050	mg/kg wet							
Dichlorodifluoromethane	ND	0.0100	mg/kg wet							
Diethyl Ether	ND	0.0050	mg/kg wet							
Di-isopropyl ether	ND	0.0050	mg/kg wet							
Ethyl tertiary-butyl ether	ND	0.0050	mg/kg wet							
Ethylbenzene	ND	0.0050	mg/kg wet							
Hexachlorobutadiene	ND	0.0050	mg/kg wet							
Isopropylbenzene	ND	0.0050	mg/kg wet							
Methyl tert-Butyl Ether	ND	0.0050	mg/kg wet							
Methylene Chloride	ND	0.0250	mg/kg wet							
Naphthalene	ND	0.0050	mg/kg wet							
n-Butylbenzene	ND	0.0050	mg/kg wet							
n-Propylbenzene	ND	0.0050	mg/kg wet							
sec-Butylbenzene	ND	0.0050	mg/kg wet							
Styrene	ND	0.0050	mg/kg wet							
tert-Butylbenzene	ND	0.0050	mg/kg wet							
Tertiary-amyl methyl ether	ND	0.0050	mg/kg wet							
Tetrachloroethene	ND	0.0050	mg/kg wet							
Tetrahydrofuran	ND	0.0050	mg/kg wet							
Toluene	ND	0.0050	mg/kg wet							
trans-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
trans-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Trichloroethene	ND	0.0050	mg/kg wet							
Trichlorofluoromethane	ND	0.0050	mg/kg wet							
Vinyl Acetate	ND	0.0050	mg/kg wet							
Vinyl Chloride	ND	0.0100	mg/kg wet							
Xylene O	ND	0.0050	mg/kg wet							
Xylene P,M	ND	0.0100	mg/kg wet							
Xylenes (Total)	ND	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	0.0407		mg/kg wet	0.05000		81	70-130			
Surrogate: 4-Bromofluorobenzene	0.0469		mg/kg wet	0.05000		94	70-130			
Surrogate: Dibromofluoromethane	0.0405		mg/kg wet	0.05000		81	70-130			
Surrogate: Toluene-d8	0.0540		mg/kg wet	0.05000		108	70-130			

**LCS**

1,1,1,2-Tetrachloroethane	0.0446	0.0050	mg/kg wet	0.05000		89	70-130			
1,1,1-Trichloroethane	0.0391	0.0050	mg/kg wet	0.05000		78	70-130			



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710793

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CK70133 - 5035**

1,1,2,2-Tetrachloroethane	0.0496	0.0050	mg/kg wet	0.05000		99	70-130			
1,1,2-Trichloroethane	0.0388	0.0050	mg/kg wet	0.05000		78	70-130			
1,1-Dichloroethane	0.0383	0.0050	mg/kg wet	0.05000		77	70-130			
1,1-Dichloroethene	0.0465	0.0050	mg/kg wet	0.05000		93	70-130			
1,1-Dichloropropene	0.0430	0.0050	mg/kg wet	0.05000		86	70-130			
1,2,3-Trichlorobenzene	0.0568	0.0050	mg/kg wet	0.05000		114	70-130			
1,2,3-Trichloropropane	0.0517	0.0050	mg/kg wet	0.05000		103	70-130			
1,2,4-Trichlorobenzene	0.0499	0.0050	mg/kg wet	0.05000		100	70-130			
1,2,4-Trimethylbenzene	0.0507	0.0050	mg/kg wet	0.05000		101	70-130			
1,2-Dibromo-3-Chloropropane	0.0488	0.0050	mg/kg wet	0.05000		98	70-130			
1,2-Dibromoethane	0.0463	0.0050	mg/kg wet	0.05000		93	70-130			
1,2-Dichlorobenzene	0.0513	0.0050	mg/kg wet	0.05000		103	70-130			
1,2-Dichloroethane	0.0398	0.0050	mg/kg wet	0.05000		80	70-130			
1,2-Dichloropropane	0.0391	0.0050	mg/kg wet	0.05000		78	70-130			
1,3,5-Trimethylbenzene	0.0490	0.0050	mg/kg wet	0.05000		98	70-130			
1,3-Dichlorobenzene	0.0491	0.0050	mg/kg wet	0.05000		98	70-130			
1,3-Dichloropropane	0.0449	0.0050	mg/kg wet	0.05000		90	70-130			
1,4-Dichlorobenzene	0.0471	0.0050	mg/kg wet	0.05000		94	70-130			
1,4-Dioxane	0.685	0.100	mg/kg wet	1.000		69	70-130			B-
1-Chlorohexane	0.0433	0.0050	mg/kg wet	0.05000		87	70-130			
2,2-Dichloropropane	0.0381	0.0050	mg/kg wet	0.05000		76	70-130			
2-Butanone	0.216	0.0500	mg/kg wet	0.2500		87	70-130			
2-Chlorotoluene	0.0470	0.0050	mg/kg wet	0.05000		94	70-130			
2-Hexanone	0.231	0.0500	mg/kg wet	0.2500		92	70-130			
4-Chlorotoluene	0.0480	0.0050	mg/kg wet	0.05000		96	70-130			
4-Isopropyltoluene	0.0486	0.0050	mg/kg wet	0.05000		97	70-130			
4-Methyl-2-Pentanone	0.211	0.0500	mg/kg wet	0.2500		84	70-130			
Acetone	0.211	0.0500	mg/kg wet	0.2500		84	70-130			
Benzene	0.0403	0.0050	mg/kg wet	0.05000		81	70-130			
Bromobenzene	0.0491	0.0050	mg/kg wet	0.05000		98	70-130			
Bromochloromethane	0.0412	0.0050	mg/kg wet	0.05000		82	70-130			
Bromodichloromethane	0.0385	0.0050	mg/kg wet	0.05000		77	70-130			
Bromoform	0.0540	0.0050	mg/kg wet	0.05000		108	70-130			
Bromomethane	0.0531	0.0100	mg/kg wet	0.05000		106	70-130			
Carbon Disulfide	0.0453	0.0050	mg/kg wet	0.05000		91	70-130			
Carbon Tetrachloride	0.0389	0.0050	mg/kg wet	0.05000		78	70-130			
Chlorobenzene	0.0426	0.0050	mg/kg wet	0.05000		85	70-130			
Chloroethane	0.0367	0.0100	mg/kg wet	0.05000		73	70-130			
Chloroform	0.0376	0.0050	mg/kg wet	0.05000		75	70-130			
Chloromethane	0.0360	0.0100	mg/kg wet	0.05000		72	70-130			
cis-1,2-Dichloroethene	0.0413	0.0050	mg/kg wet	0.05000		83	70-130			
cis-1,3-Dichloropropene	0.0387	0.0050	mg/kg wet	0.05000		77	70-130			
Dibromochloromethane	0.0459	0.0050	mg/kg wet	0.05000		92	70-130			
Dibromomethane	0.0393	0.0050	mg/kg wet	0.05000		79	70-130			
Dichlorodifluoromethane	0.0288	0.0100	mg/kg wet	0.05000		58	70-130			B-





CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710793

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CK70133 - 5035**

Diethyl Ether	0.0530	0.0050	mg/kg wet	0.05000		106	70-130			
Di-isopropyl ether	0.0494	0.0050	mg/kg wet	0.05000		99	70-130			
Ethyl tertiary-butyl ether	0.0456	0.0050	mg/kg wet	0.05000		91	70-130			
Ethylbenzene	0.0445	0.0050	mg/kg wet	0.05000		89	70-130			
Hexachlorobutadiene	0.0525	0.0050	mg/kg wet	0.05000		105	70-130			
Isopropylbenzene	0.0467	0.0050	mg/kg wet	0.05000		93	70-130			
Methyl tert-Butyl Ether	0.0622	0.0050	mg/kg wet	0.05000		124	70-130			
Methylene Chloride	0.0451	0.0250	mg/kg wet	0.05000		90	70-130			
Naphthalene	0.0461	0.0050	mg/kg wet	0.05000		92	70-130			
n-Butylbenzene	0.0465	0.0050	mg/kg wet	0.05000		93	70-130			
n-Propylbenzene	0.0491	0.0050	mg/kg wet	0.05000		98	70-130			
sec-Butylbenzene	0.0491	0.0050	mg/kg wet	0.05000		98	70-130			
Styrene	0.0417	0.0050	mg/kg wet	0.05000		83	70-130			
tert-Butylbenzene	0.0519	0.0050	mg/kg wet	0.05000		104	70-130			
Tertiary-amyl methyl ether	0.0411	0.0050	mg/kg wet	0.05000		82	70-130			
Tetrachloroethene	0.0448	0.0050	mg/kg wet	0.05000		90	70-130			
Tetrahydrofuran	0.0473	0.0050	mg/kg wet	0.05000		95	70-130			
Toluene	0.0408	0.0050	mg/kg wet	0.05000		82	70-130			
trans-1,2-Dichloroethene	0.0435	0.0050	mg/kg wet	0.05000		87	70-130			
trans-1,3-Dichloropropene	0.0390	0.0050	mg/kg wet	0.05000		78	70-130			
Trichloroethene	0.0399	0.0050	mg/kg wet	0.05000		80	70-130			
Trichlorofluoromethane	0.0369	0.0050	mg/kg wet	0.05000		74	70-130			
Vinyl Acetate	0.0405	0.0050	mg/kg wet	0.05000		81	70-130			
Vinyl Chloride	0.0354	0.0100	mg/kg wet	0.05000		71	70-130			
Xylene O	0.0423	0.0050	mg/kg wet	0.05000		85	70-130			
Xylene P,M	0.0923	0.0100	mg/kg wet	0.1000		92	70-130			
Xylenes (Total)	0.135	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	0.0437		mg/kg wet	0.05000		87	70-130			
Surrogate: 4-Bromofluorobenzene	0.0519		mg/kg wet	0.05000		104	70-130			
Surrogate: Dibromofluoromethane	0.0450		mg/kg wet	0.05000		90	70-130			
Surrogate: Toluene-d8	0.0550		mg/kg wet	0.05000		110	70-130			

**LCS Dup**

1,1,1,2-Tetrachloroethane	0.0466	0.0050	mg/kg wet	0.05000		93	70-130	4	25	
1,1,1-Trichloroethane	0.0404	0.0050	mg/kg wet	0.05000		81	70-130	3	25	
1,1,2,2-Tetrachloroethane	0.0481	0.0050	mg/kg wet	0.05000		96	70-130	3	25	
1,1,2-Trichloroethane	0.0389	0.0050	mg/kg wet	0.05000		78	70-130	0.3	25	
1,1-Dichloroethane	0.0392	0.0050	mg/kg wet	0.05000		78	70-130	2	25	
1,1-Dichloroethene	0.0475	0.0050	mg/kg wet	0.05000		95	70-130	2	25	
1,1-Dichloropropene	0.0438	0.0050	mg/kg wet	0.05000		88	70-130	2	25	
1,2,3-Trichlorobenzene	0.0586	0.0050	mg/kg wet	0.05000		117	70-130	3	25	
1,2,3-Trichloropropane	0.0496	0.0050	mg/kg wet	0.05000		99	70-130	4	25	
1,2,4-Trichlorobenzene	0.0525	0.0050	mg/kg wet	0.05000		105	70-130	5	25	
1,2,4-Trimethylbenzene	0.0521	0.0050	mg/kg wet	0.05000		104	70-130	3	25	
1,2-Dibromo-3-Chloropropane	0.0467	0.0050	mg/kg wet	0.05000		93	70-130	4	25	
1,2-Dibromoethane	0.0474	0.0050	mg/kg wet	0.05000		95	70-130	2	25	



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**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CK70133 - 5035**

1,2-Dichlorobenzene	0.0524	0.0050	mg/kg wet	0.05000		105	70-130	2	25	
1,2-Dichloroethane	0.0405	0.0050	mg/kg wet	0.05000		81	70-130	2	25	
1,2-Dichloropropane	0.0398	0.0050	mg/kg wet	0.05000		80	70-130	2	25	
1,3,5-Trimethylbenzene	0.0501	0.0050	mg/kg wet	0.05000		100	70-130	2	25	
1,3-Dichlorobenzene	0.0489	0.0050	mg/kg wet	0.05000		98	70-130	0.2	25	
1,3-Dichloropropane	0.0459	0.0050	mg/kg wet	0.05000		92	70-130	2	25	
1,4-Dichlorobenzene	0.0494	0.0050	mg/kg wet	0.05000		99	70-130	5	25	
1,4-Dioxane	0.673	0.100	mg/kg wet	1.000		67	70-130	2	20	B-
1-Chlorohexane	0.0456	0.0050	mg/kg wet	0.05000		91	70-130	5	25	
2,2-Dichloropropane	0.0391	0.0050	mg/kg wet	0.05000		78	70-130	2	25	
2-Butanone	0.209	0.0500	mg/kg wet	0.2500		84	70-130	3	25	
2-Chlorotoluene	0.0487	0.0050	mg/kg wet	0.05000		97	70-130	3	25	
2-Hexanone	0.222	0.0500	mg/kg wet	0.2500		89	70-130	4	25	
4-Chlorotoluene	0.0487	0.0050	mg/kg wet	0.05000		97	70-130	1	25	
4-Isopropyltoluene	0.0500	0.0050	mg/kg wet	0.05000		100	70-130	3	25	
4-Methyl-2-Pentanone	0.200	0.0500	mg/kg wet	0.2500		80	70-130	5	25	
Acetone	0.200	0.0500	mg/kg wet	0.2500		80	70-130	5	25	
Benzene	0.0412	0.0050	mg/kg wet	0.05000		82	70-130	2	25	
Bromobenzene	0.0504	0.0050	mg/kg wet	0.05000		101	70-130	3	25	
Bromochloromethane	0.0423	0.0050	mg/kg wet	0.05000		85	70-130	3	25	
Bromodichloromethane	0.0394	0.0050	mg/kg wet	0.05000		79	70-130	2	25	
Bromoform	0.0558	0.0050	mg/kg wet	0.05000		112	70-130	3	25	
Bromomethane	0.0532	0.0100	mg/kg wet	0.05000		106	70-130	0.3	25	
Carbon Disulfide	0.0462	0.0050	mg/kg wet	0.05000		92	70-130	2	25	
Carbon Tetrachloride	0.0399	0.0050	mg/kg wet	0.05000		80	70-130	3	25	
Chlorobenzene	0.0441	0.0050	mg/kg wet	0.05000		88	70-130	4	25	
Chloroethane	0.0372	0.0100	mg/kg wet	0.05000		74	70-130	1	25	
Chloroform	0.0382	0.0050	mg/kg wet	0.05000		76	70-130	2	25	
Chloromethane	0.0363	0.0100	mg/kg wet	0.05000		73	70-130	0.8	25	
cis-1,2-Dichloroethene	0.0422	0.0050	mg/kg wet	0.05000		84	70-130	2	25	
cis-1,3-Dichloropropene	0.0395	0.0050	mg/kg wet	0.05000		79	70-130	2	25	
Dibromochloromethane	0.0474	0.0050	mg/kg wet	0.05000		95	70-130	3	25	
Dibromomethane	0.0391	0.0050	mg/kg wet	0.05000		78	70-130	0.7	25	
Dichlorodifluoromethane	0.0292	0.0100	mg/kg wet	0.05000		58	70-130	1	25	B-
Diethyl Ether	0.0535	0.0050	mg/kg wet	0.05000		107	70-130	1	25	
Di-isopropyl ether	0.0507	0.0050	mg/kg wet	0.05000		101	70-130	3	25	
Ethyl tertiary-butyl ether	0.0469	0.0050	mg/kg wet	0.05000		94	70-130	3	25	
Ethylbenzene	0.0464	0.0050	mg/kg wet	0.05000		93	70-130	4	25	
Hexachlorobutadiene	0.0536	0.0050	mg/kg wet	0.05000		107	70-130	2	25	
Isopropylbenzene	0.0478	0.0050	mg/kg wet	0.05000		96	70-130	2	25	
Methyl tert-Butyl Ether	0.0630	0.0050	mg/kg wet	0.05000		126	70-130	1	25	
Methylene Chloride	0.0451	0.0250	mg/kg wet	0.05000		90	70-130	0.2	25	
Naphthalene	0.0465	0.0050	mg/kg wet	0.05000		93	70-130	0.7	25	
n-Butylbenzene	0.0479	0.0050	mg/kg wet	0.05000		96	70-130	3	25	
n-Propylbenzene	0.0500	0.0050	mg/kg wet	0.05000		100	70-130	2	25	



CERTIFICATE OF ANALYSIS

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**Quality Control Data**

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5035/8260B Volatile Organic Compounds / Low Level

**Batch CK70133 - 5035**

sec-Butylbenzene	0.0500	0.0050	mg/kg wet	0.05000		100	70-130	2	25	
Styrene	0.0435	0.0050	mg/kg wet	0.05000		87	70-130	4	25	
tert-Butylbenzene	0.0531	0.0050	mg/kg wet	0.05000		106	70-130	2	25	
Tertiary-amyl methyl ether	0.0417	0.0050	mg/kg wet	0.05000		83	70-130	2	25	
Tetrachloroethene	0.0455	0.0050	mg/kg wet	0.05000		91	70-130	2	25	
Tetrahydrofuran	0.0442	0.0050	mg/kg wet	0.05000		88	70-130	7	25	
Toluene	0.0417	0.0050	mg/kg wet	0.05000		83	70-130	2	25	
trans-1,2-Dichloroethene	0.0451	0.0050	mg/kg wet	0.05000		90	70-130	4	25	
trans-1,3-Dichloropropene	0.0398	0.0050	mg/kg wet	0.05000		80	70-130	2	25	
Trichloroethene	0.0404	0.0050	mg/kg wet	0.05000		81	70-130	1	25	
Trichlorofluoromethane	0.0373	0.0050	mg/kg wet	0.05000		75	70-130	1	25	
Vinyl Acetate	0.0403	0.0050	mg/kg wet	0.05000		81	70-130	0.5	25	
Vinyl Chloride	0.0357	0.0100	mg/kg wet	0.05000		71	70-130	0.9	25	
Xylene O	0.0437	0.0050	mg/kg wet	0.05000		87	70-130	3	25	
Xylene P,M	0.0956	0.0100	mg/kg wet	0.1000		96	70-130	4	25	
Xylenes (Total)	0.139	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	0.0425		mg/kg wet	0.05000		85	70-130			
Surrogate: 4-Bromofluorobenzene	0.0521		mg/kg wet	0.05000		104	70-130			
Surrogate: Dibromofluoromethane	0.0439		mg/kg wet	0.05000		88	70-130			
Surrogate: Toluene-d8	0.0549		mg/kg wet	0.05000		110	70-130			

8100M Total Petroleum Hydrocarbons

**Batch CK70111 - 3546**

Blank										
Decane (C10)	ND	0.2	mg/kg wet							
Docosane (C22)	ND	0.2	mg/kg wet							
Dodecane (C12)	ND	0.2	mg/kg wet							
Eicosane (C20)	ND	0.2	mg/kg wet							
Hexacosane (C26)	ND	0.2	mg/kg wet							
Hexadecane (C16)	ND	0.2	mg/kg wet							
Nonadecane (C19)	ND	0.2	mg/kg wet							
Nonane (C9)	ND	0.2	mg/kg wet							
Octacosane (C28)	ND	0.2	mg/kg wet							
Octadecane (C18)	ND	0.2	mg/kg wet							
Tetracosane (C24)	ND	0.2	mg/kg wet							
Tetradecane (C14)	ND	0.2	mg/kg wet							
Total Petroleum Hydrocarbons	ND	37.5	mg/kg wet							
Triacotane (C30)	ND	0.2	mg/kg wet							

Surrogate: O-Terphenyl	4.17		mg/kg wet	5.000		83	40-140			
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LCS										
Decane (C10)	1.7	0.2	mg/kg wet	2.500		67	40-140			
Docosane (C22)	1.9	0.2	mg/kg wet	2.500		77	40-140			
Dodecane (C12)	1.8	0.2	mg/kg wet	2.500		72	40-140			
Eicosane (C20)	1.9	0.2	mg/kg wet	2.500		76	40-140			



*CERTIFICATE OF ANALYSIS*

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**8100M Total Petroleum Hydrocarbons**

**Batch CK70111 - 3546**

Hexacosane (C26)	1.9	0.2	mg/kg wet	2.500		77	40-140			
Hexadecane (C16)	1.9	0.2	mg/kg wet	2.500		75	40-140			
Nonadecane (C19)	2.1	0.2	mg/kg wet	2.500		83	40-140			
Nonane (C9)	1.4	0.2	mg/kg wet	2.500		55	30-140			
Octacosane (C28)	1.9	0.2	mg/kg wet	2.500		77	40-140			
Octadecane (C18)	1.8	0.2	mg/kg wet	2.500		73	40-140			
Tetracosane (C24)	1.9	0.2	mg/kg wet	2.500		77	40-140			
Tetradecane (C14)	1.8	0.2	mg/kg wet	2.500		73	40-140			
Total Petroleum Hydrocarbons	25.0	37.5	mg/kg wet	35.00		71	40-140			
Triacotane (C30)	1.9	0.2	mg/kg wet	2.500		77	40-140			

*Surrogate: O-Terphenyl*

4.14 mg/kg wet 5.000 83 40-140

**LCS Dup**

Decane (C10)	1.7	0.2	mg/kg wet	2.500		67	40-140	0.03	25	
Docosane (C22)	2.0	0.2	mg/kg wet	2.500		81	40-140	6	25	
Dodecane (C12)	1.8	0.2	mg/kg wet	2.500		72	40-140	0.2	25	
Eicosane (C20)	2.0	0.2	mg/kg wet	2.500		80	40-140	5	25	
Hexacosane (C26)	2.0	0.2	mg/kg wet	2.500		82	40-140	6	25	
Hexadecane (C16)	1.9	0.2	mg/kg wet	2.500		77	40-140	3	25	
Nonadecane (C19)	2.1	0.2	mg/kg wet	2.500		85	40-140	2	25	
Nonane (C9)	1.4	0.2	mg/kg wet	2.500		56	30-140	0.7	25	
Octacosane (C28)	2.0	0.2	mg/kg wet	2.500		82	40-140	6	25	
Octadecane (C18)	1.9	0.2	mg/kg wet	2.500		76	40-140	4	25	
Tetracosane (C24)	2.0	0.2	mg/kg wet	2.500		82	40-140	6	25	
Tetradecane (C14)	1.9	0.2	mg/kg wet	2.500		74	40-140	1	25	
Total Petroleum Hydrocarbons	26.1	37.5	mg/kg wet	35.00		75	40-140	4	25	
Triacotane (C30)	2.0	0.2	mg/kg wet	2.500		82	40-140	6	25	

*Surrogate: O-Terphenyl*

4.16 mg/kg wet 5.000 83 40-140

**8270D Polynuclear Aromatic Hydrocarbons**

**Batch CK70112 - 3546**

**Blank**

2-Methylnaphthalene	ND	0.333	mg/kg wet							
Acenaphthene	ND	0.333	mg/kg wet							
Acenaphthylene	ND	0.333	mg/kg wet							
Anthracene	ND	0.333	mg/kg wet							
Benzo(a)anthracene	ND	0.333	mg/kg wet							
Benzo(a)pyrene	ND	0.167	mg/kg wet							
Benzo(b)fluoranthene	ND	0.333	mg/kg wet							
Benzo(g,h,i)perylene	ND	0.333	mg/kg wet							
Benzo(k)fluoranthene	ND	0.333	mg/kg wet							
Chrysene	ND	0.167	mg/kg wet							
Dibenzo(a,h)Anthracene	ND	0.167	mg/kg wet							
Fluoranthene	ND	0.333	mg/kg wet							



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**8270D Polynuclear Aromatic Hydrocarbons**

**Batch CK70112 - 3546**

Fluorene	ND	0.333	mg/kg wet							
Indeno(1,2,3-cd)Pyrene	ND	0.333	mg/kg wet							
Naphthalene	ND	0.333	mg/kg wet							
Phenanthrene	ND	0.333	mg/kg wet							
Pyrene	ND	0.333	mg/kg wet							
Surrogate: 1,2-Dichlorobenzene-d4	2.81		mg/kg wet	3.333		84	30-130			
Surrogate: 2-Fluorobiphenyl	2.94		mg/kg wet	3.333		88	30-130			
Surrogate: Nitrobenzene-d5	2.92		mg/kg wet	3.333		88	30-130			
Surrogate: p-Terphenyl-d14	3.53		mg/kg wet	3.333		106	30-130			

**LCS**

2-Methylnaphthalene	2.17	0.333	mg/kg wet	3.333		65	40-140			
Acenaphthene	2.27	0.333	mg/kg wet	3.333		68	40-140			
Acenaphthylene	2.39	0.333	mg/kg wet	3.333		72	40-140			
Anthracene	2.48	0.333	mg/kg wet	3.333		74	40-140			
Benzo(a)anthracene	2.52	0.333	mg/kg wet	3.333		76	40-140			
Benzo(a)pyrene	2.57	0.167	mg/kg wet	3.333		77	40-140			
Benzo(b)fluoranthene	2.74	0.333	mg/kg wet	3.333		82	40-140			
Benzo(g,h,i)perylene	2.42	0.333	mg/kg wet	3.333		73	40-140			
Benzo(k)fluoranthene	2.52	0.333	mg/kg wet	3.333		76	40-140			
Chrysene	2.48	0.167	mg/kg wet	3.333		74	40-140			
Dibenzo(a,h)Anthracene	2.52	0.167	mg/kg wet	3.333		76	40-140			
Fluoranthene	1.91	0.333	mg/kg wet	3.333		57	40-140			
Fluorene	2.52	0.333	mg/kg wet	3.333		76	40-140			
Indeno(1,2,3-cd)Pyrene	2.51	0.333	mg/kg wet	3.333		75	40-140			
Naphthalene	2.12	0.333	mg/kg wet	3.333		64	40-140			
Phenanthrene	2.46	0.333	mg/kg wet	3.333		74	40-140			
Pyrene	2.99	0.333	mg/kg wet	3.333		90	40-140			
Surrogate: 1,2-Dichlorobenzene-d4	2.24		mg/kg wet	3.333		67	30-130			
Surrogate: 2-Fluorobiphenyl	2.56		mg/kg wet	3.333		77	30-130			
Surrogate: Nitrobenzene-d5	2.41		mg/kg wet	3.333		72	30-130			
Surrogate: p-Terphenyl-d14	3.62		mg/kg wet	3.333		109	30-130			

**LCS Dup**

2-Methylnaphthalene	1.96	0.333	mg/kg wet	3.333		59	40-140	10	30	
Acenaphthene	2.58	0.333	mg/kg wet	3.333		77	40-140	13	30	
Acenaphthylene	2.73	0.333	mg/kg wet	3.333		82	40-140	13	30	
Anthracene	2.72	0.333	mg/kg wet	3.333		82	40-140	9	30	
Benzo(a)anthracene	2.76	0.333	mg/kg wet	3.333		83	40-140	9	30	
Benzo(a)pyrene	2.87	0.167	mg/kg wet	3.333		86	40-140	11	30	
Benzo(b)fluoranthene	3.16	0.333	mg/kg wet	3.333		95	40-140	14	30	
Benzo(g,h,i)perylene	2.59	0.333	mg/kg wet	3.333		78	40-140	7	30	
Benzo(k)fluoranthene	2.75	0.333	mg/kg wet	3.333		83	40-140	9	30	
Chrysene	2.71	0.167	mg/kg wet	3.333		81	40-140	9	30	
Dibenzo(a,h)Anthracene	2.70	0.167	mg/kg wet	3.333		81	40-140	7	30	
Fluoranthene	2.36	0.333	mg/kg wet	3.333		71	40-140	21	30	
Fluorene	2.64	0.333	mg/kg wet	3.333		79	40-140	5	30	



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710793

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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8270D Polynuclear Aromatic Hydrocarbons

**Batch CK70112 - 3546**

Indeno(1,2,3-cd)Pyrene	2.69	0.333	mg/kg wet	3.333		81	40-140	7	30	
Naphthalene	2.62	0.333	mg/kg wet	3.333		79	40-140	21	30	
Phenanthrene	2.66	0.333	mg/kg wet	3.333		80	40-140	8	30	
Pyrene	3.45	0.333	mg/kg wet	3.333		104	40-140	14	30	
Surrogate: 1,2-Dichlorobenzene-d4	2.76		mg/kg wet	3.333		83	30-130			
Surrogate: 2-Fluorobiphenyl	3.06		mg/kg wet	3.333		92	30-130			
Surrogate: Nitrobenzene-d5	3.21		mg/kg wet	3.333		96	30-130			
Surrogate: p-Terphenyl-d14	3.99		mg/kg wet	3.333		120	30-130			

Classical Chemistry

**Batch CK70114 - TCN Prep**

<b>Blank</b>										
Total Cyanide	ND	1.00	mg/kg wet							
<b>LCS</b>										
Total Cyanide	4.97	1.00	mg/kg wet	5.015		99	90-110			
<b>Reference</b>										
Total Cyanide	50.6	4.98	mg/kg wet	48.40		105	36.1577-206.6 12			
<b>Reference</b>										
Total Cyanide	49.3	4.94	mg/kg wet	48.40		102	36.1577-206.6 12			





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.

Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710793

**Notes and Definitions**

- U Analyte included in the analysis, but not detected
- D+ Relative percent difference for duplicate is outside of criteria (D+).
- D Diluted.
- CD- Continuing Calibration %Diff/Drift is below control limit (CD-).
- B- Blank Spike recovery is below lower control limit (B-).
- ND Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference
- MDL Method Detection Limit
- MRL Method Reporting Limit
- LOD Limit of Detection
- LOQ Limit of Quantitation
- DL Detection Limit
- I/V Initial Volume
- F/V Final Volume
- § Subcontracted analysis; see attached report
- 1 Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
- 2 Range result excludes concentrations of target analytes eluting in that range.
- 3 Range result excludes the concentration of the C9-C10 aromatic range.
- Avg Results reported as a mathematical average.
- NR No Recovery
- [CALC] Calculated Analyte
- SUB Subcontracted analysis; see attached report
- RL Reporting Limit
- EDL Estimated Detection Limit



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1710793

**ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS**

**ENVIRONMENTAL**

Rhode Island Potable and Non Potable Water: LAI00179

<http://www.health.ri.gov/find/labs/analytical/ESS.pdf>

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750

[http://www.ct.gov/dph/lib/dph/environmental\\_health/environmental\\_laboratories/pdf/OutOfStateCommercialLaboratories.pdf](http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutOfStateCommercialLaboratories.pdf)

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002

<http://www.maine.gov/dhhs/meecd/environmental-health/dwp/partners/labCert.shtml>

Massachusetts Potable and Non Potable Water: M-RI002

<http://public.dep.state.ma.us/Labcert/Labcert.aspx>

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424

<http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm>

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313

<http://www.wadsworth.org/labcert/elap/comm.html>

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006

[http://datamine2.state.nj.us/DEP\\_OPRA/OpraMain/pi\\_main?mode=pi\\_by\\_site&sort\\_order=PI\\_NAMEA&Select+a+Site:=58715](http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715)

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752

<http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx>

## ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Providence, RI - GZA/HDM

ESS Project ID: 1710793

Date Received: 10/31/2017

Shipped/Delivered Via: ESS Courier

Project Due Date: 11/7/2017

Days for Project: 5 Day

- |  |   |
|--|---|
| <p>1. Air bill manifest present? <input type="checkbox"/> No<br/>Air No.: <u>NA</u></p> <p>2. Were custody seals present? <input type="checkbox"/> No</p> <p>3. Is radiation count &lt;100 CPM? <input type="checkbox"/> Yes</p> <p>4. Is a Cooler Present? <input type="checkbox"/> Yes<br/>Temp: <u>1.8</u> Iced with: <u>Ice</u></p> <p>5. Was COC signed and dated by client? <input type="checkbox"/> Yes</p> | <p>6. Does COC match bottles? <input type="checkbox"/> Yes</p> <p>7. Is COC complete and correct? <input type="checkbox"/> Yes</p> <p>8. Were samples received intact? <input type="checkbox"/> Yes</p> <p>9. Were labs informed about <u>short holds &amp; rushes</u>? Yes / No <input checked="" type="checkbox"/> NA</p> <p>10. Were any analyses received outside of hold time? Yes / No <input checked="" type="checkbox"/> No</p> |
|--|---|

- |  |   |
|--|---|
| <p>11. Any Subcontracting needed? Yes <input checked="" type="checkbox"/> No</p> <p>ESS Sample IDs: _____</p> <p>Analysis: _____</p> <p>TAT: _____</p> <p>13. Are the samples properly preserved? <input checked="" type="checkbox"/> Yes / No</p> <p>a. If metals preserved upon receipt: Date: _____</p> <p>b. Low Level VOA vials frozen: Date: <u>10/31/17</u></p> | <p>12. Were VOAs received? <input checked="" type="checkbox"/> Yes / No</p> <p>a. Air bubbles in aqueous VOAs? Yes / No</p> <p>b. Does methanol cover soil completely? <input checked="" type="checkbox"/> Yes / No / NA</p> <p>Time: _____</p> <p>By: <u>[Signature]</u></p> |
|--|---|

Sample Receiving Notes:



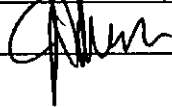
14. Was there a need to contact Project Manager? Yes  No
- a. Was there a need to contact the client? Yes  No
- Who was contacted? \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_ By: \_\_\_\_\_

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
01	177312	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
01	177316	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
01	177323	Yes	NA	Yes	VOA Vial - Other	Other	
01	177324	Yes	NA	Yes	VOA Vial - Other	Other	
02	177311	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
02	177315	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
02	177321	Yes	NA	Yes	VOA Vial - Other	Other	
02	177322	Yes	NA	Yes	VOA Vial - Other	Other	
03	177310	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
03	177314	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
03	177319	Yes	NA	Yes	VOA Vial - Other	Other	
03	177320	Yes	NA	Yes	VOA Vial - Other	Other	
04	177309	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
04	177313	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
04	177317	Yes	NA	Yes	VOA Vial - Other	Other	
04	177318	Yes	NA	Yes	VOA Vial - Other	Other	
05	177460	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
05	177461	Yes	NA	Yes	VOA Vial - Other	Other	

2nd Review  
Are barcode labels on correct containers?  Yes / No

Completed

# ESS Laboratory Sample and Cooler Receipt Checklist

Client:	GZA - Providence, RI - GZA/HDM	ESS Project ID:	1710793
		Date Received:	10/31/2017
By:		Date & Time:	10/31/17 1853
Reviewed By:		Date & Time:	10/31/17 1902
Delivered By:			10/31/17 1902





*CERTIFICATE OF ANALYSIS*

Sarah McLeod  
GZA GeoEnvironmental, Inc.  
530 Broadway  
Providence, RI 02909

**RE: Former Tidewater Facility (05.0043654.00)**  
**ESS Laboratory Work Order Number: 1712222**

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard  
Laboratory Director

**REVIEWED**

*By ESS Laboratory at 3:44 pm, Dec 18, 2017*

**Analytical Summary**

The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1712222

**SAMPLE RECEIPT**

The following samples were received on December 08, 2017 for the analyses specified on the enclosed Chain of Custody Record.

**Low Level VOA vials were frozen by ESS Laboratory on December 8, 2017 at 15:38.**

<u>Lab Number</u>	<u>Sample Name</u>	<u>Matrix</u>	<u>Analysis</u>
1712222-01	GZ-SS-561 1-2ft	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1712222-02	GZ-SS-562 0-2ft	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1712222-03	GZ-SS-563 0-2ft	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1712222-04	GZ-SS-564 0-2ft	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1712222-05	GZ-SS-565 0-2ft	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1712222-06	BD-120817	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1712222-07	GZ-SS-566 0-2ft	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1712222-08	GZ-SS-567 0-2ft	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1712222-09	GZ-SS-568 0-2ft	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1712222-10	GZ-SS-569 0-2ft	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1712222-11	GZ-SS-570 0-2ft	Soil	6010C, 6020A, 7471B, 8100M, 8260B Low, 8270D, 9014
1712222-12	TB-120817	Solid	8260B Low



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1712222

**PROJECT NARRATIVE**

**5035/8260B Volatile Organic Compounds / Low Level**

C7L0151-CCV1 [Continuing Calibration %Diff/Drift is below control limit \(CD-\).](#)

1-Chlorohexane (31% @ 30%)

**8270D Polynuclear Aromatic Hydrocarbons**

1712222-07 [Internal Standard\(s\) outside of criteria due to matrix \(UCM/coelution is present\) \(IM\).](#)

Perylene-d12 (213% @ 50-200%)

**No other observations noted.**

**End of Project Narrative.**

**DATA USABILITY LINKS**

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[Definitions of Quality Control Parameters](#)

[Semivolatile Organics Internal Standard Information](#)

[Semivolatile Organics Surrogate Information](#)

[Volatile Organics Internal Standard Information](#)

[Volatile Organics Surrogate Information](#)

[EPH and VPH Alkane Lists](#)



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1712222

**CURRENT SW-846 METHODOLOGY VERSIONS**

**Analytical Methods**

- 1010A - Flashpoint
- 6010C - ICP
- 6020A - ICP MS
- 7010 - Graphite Furnace
- 7196A - Hexavalent Chromium
- 7470A - Aqueous Mercury
- 7471B - Solid Mercury
- 8011 - EDB/DBCP/TCP
- 8015C - GRO/DRO
- 8081B - Pesticides
- 8082A - PCB
- 8100M - TPH
- 8151A - Herbicides
- 8260B - VOA
- 8270D - SVOA
- 8270D SIM - SVOA Low Level
- 9014 - Cyanide
- 9038 - Sulfate
- 9040C - Aqueous pH
- 9045D - Solid pH (Corrosivity)
- 9050A - Specific Conductance
- 9056A - Anions (IC)
- 9060A - TOC
- 9095B - Paint Filter
- MADEP 04-1.1 - EPH / VPH

**Prep Methods**

- 3005A - Aqueous ICP Digestion
- 3020A - Aqueous Graphite Furnace / ICP MS Digestion
- 3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
- 3060A - Solid Hexavalent Chromium Digestion
- 3510C - Separatory Funnel Extraction
- 3520C - Liquid / Liquid Extraction
- 3540C - Manual Soxhlet Extraction
- 3541 - Automated Soxhlet Extraction
- 3546 - Microwave Extraction
- 3580A - Waste Dilution
- 5030B - Aqueous Purge and Trap
- 5030C - Aqueous Purge and Trap
- 5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-561 1-2ft  
Date Sampled: 12/08/17 09:10  
Percent Solids: 91

ESS Laboratory Work Order: 1712222  
ESS Laboratory Sample ID: 1712222-01  
Sample Matrix: Soil  
Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (2.00)		6020A		20	NAR	12/13/17 15:09	2.2	100	CL71217
Arsenic	ND (2.50)		6010C		1	KJK	12/15/17 23:28	2.2	100	CL71217
<b>Beryllium</b>	<b>0.18</b> (0.11)		6010C		1	KJK	12/13/17 23:25	2.2	100	CL71217
Cadmium	ND (0.50)		6010C		1	KJK	12/13/17 23:25	2.2	100	CL71217
<b>Chromium</b>	<b>5.23</b> (1.00)		6010C		1	KJK	12/13/17 23:25	2.2	100	CL71217
<b>Copper</b>	<b>6.43</b> (2.50)		6010C		1	KJK	12/15/17 23:28	2.2	100	CL71217
Lead	ND (4.99)		6010C		1	KJK	12/13/17 23:25	2.2	100	CL71217
Mercury	ND (0.028)		7471B		1	MJV	12/13/17 12:21	0.78	40	CL71218
<b>Nickel</b>	<b>3.52</b> (2.50)		6010C		1	KJK	12/13/17 23:25	2.2	100	CL71217
Selenium	ND (2.00)		6020A		20	NAR	12/13/17 15:09	2.2	100	CL71217
Silver	ND (0.50)		6010C		1	KJK	12/13/17 23:25	2.2	100	CL71217
Thallium	ND (2.00)		6020A		20	NAR	12/13/17 15:09	2.2	100	CL71217
<b>Zinc</b>	<b>22.6</b> (2.50)		6010C		1	KJK	12/13/17 23:25	2.2	100	CL71217



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-561 1-2ft  
 Date Sampled: 12/08/17 09:10  
 Percent Solids: 91  
 Initial Volume: 6.1  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1712222  
 ESS Laboratory Sample ID: 1712222-01  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0045)		8260B Low		1	12/11/17 16:27	C7L0151	CL71129
1,1,1-Trichloroethane	ND (0.0045)		8260B Low		1	12/11/17 16:27	C7L0151	CL71129
1,1,2,2-Tetrachloroethane	ND (0.0045)		8260B Low		1	12/11/17 16:27	C7L0151	CL71129
1,1,2-Trichloroethane	ND (0.0045)		8260B Low		1	12/11/17 16:27	C7L0151	CL71129
1,1-Dichloroethane	ND (0.0045)		8260B Low		1	12/11/17 16:27	C7L0151	CL71129
1,1-Dichloroethene	ND (0.0045)		8260B Low		1	12/11/17 16:27	C7L0151	CL71129
1,1-Dichloropropene	ND (0.0045)		8260B Low		1	12/11/17 16:27	C7L0151	CL71129
1,2,3-Trichlorobenzene	ND (0.0045)		8260B Low		1	12/11/17 16:27	C7L0151	CL71129
1,2,3-Trichloropropane	ND (0.0045)		8260B Low		1	12/11/17 16:27	C7L0151	CL71129
1,2,4-Trichlorobenzene	ND (0.0045)		8260B Low		1	12/11/17 16:27	C7L0151	CL71129
1,2,4-Trimethylbenzene	ND (0.0045)		8260B Low		1	12/11/17 16:27	C7L0151	CL71129
1,2-Dibromo-3-Chloropropane	ND (0.0045)		8260B Low		1	12/11/17 16:27	C7L0151	CL71129
1,2-Dibromoethane	ND (0.0045)		8260B Low		1	12/11/17 16:27	C7L0151	CL71129
1,2-Dichlorobenzene	ND (0.0045)		8260B Low		1	12/11/17 16:27	C7L0151	CL71129
1,2-Dichloroethane	ND (0.0045)		8260B Low		1	12/11/17 16:27	C7L0151	CL71129
1,2-Dichloropropane	ND (0.0045)		8260B Low		1	12/11/17 16:27	C7L0151	CL71129
1,3,5-Trimethylbenzene	ND (0.0045)		8260B Low		1	12/11/17 16:27	C7L0151	CL71129
1,3-Dichlorobenzene	ND (0.0045)		8260B Low		1	12/11/17 16:27	C7L0151	CL71129
1,3-Dichloropropane	ND (0.0045)		8260B Low		1	12/11/17 16:27	C7L0151	CL71129
1,4-Dichlorobenzene	ND (0.0045)		8260B Low		1	12/11/17 16:27	C7L0151	CL71129
1,4-Dioxane	ND (0.0900)		8260B Low		1	12/11/17 16:27	C7L0151	CL71129
1-Chlorohexane	ND (0.0045)		8260B Low		1	12/11/17 16:27	C7L0151	CL71129
2,2-Dichloropropane	ND (0.0045)		8260B Low		1	12/11/17 16:27	C7L0151	CL71129
2-Butanone	ND (0.0450)		8260B Low		1	12/11/17 16:27	C7L0151	CL71129
2-Chlorotoluene	ND (0.0045)		8260B Low		1	12/11/17 16:27	C7L0151	CL71129
2-Hexanone	ND (0.0450)		8260B Low		1	12/11/17 16:27	C7L0151	CL71129
4-Chlorotoluene	ND (0.0045)		8260B Low		1	12/11/17 16:27	C7L0151	CL71129
4-Isopropyltoluene	ND (0.0045)		8260B Low		1	12/11/17 16:27	C7L0151	CL71129
4-Methyl-2-Pentanone	ND (0.0450)		8260B Low		1	12/11/17 16:27	C7L0151	CL71129
Acetone	ND (0.0450)		8260B Low		1	12/11/17 16:27	C7L0151	CL71129
Benzene	ND (0.0045)		8260B Low		1	12/11/17 16:27	C7L0151	CL71129
Bromobenzene	ND (0.0045)		8260B Low		1	12/11/17 16:27	C7L0151	CL71129



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-561 1-2ft  
 Date Sampled: 12/08/17 09:10  
 Percent Solids: 91  
 Initial Volume: 6.1  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1712222  
 ESS Laboratory Sample ID: 1712222-01  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0045)		8260B Low		1	12/11/17 16:27	C7L0151	CL71129
Bromodichloromethane	ND (0.0045)		8260B Low		1	12/11/17 16:27	C7L0151	CL71129
Bromoform	ND (0.0045)		8260B Low		1	12/11/17 16:27	C7L0151	CL71129
Bromomethane	ND (0.0090)		8260B Low		1	12/11/17 16:27	C7L0151	CL71129
Carbon Disulfide	ND (0.0045)		8260B Low		1	12/11/17 16:27	C7L0151	CL71129
Carbon Tetrachloride	ND (0.0045)		8260B Low		1	12/11/17 16:27	C7L0151	CL71129
Chlorobenzene	ND (0.0045)		8260B Low		1	12/11/17 16:27	C7L0151	CL71129
Chloroethane	ND (0.0090)		8260B Low		1	12/11/17 16:27	C7L0151	CL71129
Chloroform	ND (0.0045)		8260B Low		1	12/11/17 16:27	C7L0151	CL71129
Chloromethane	ND (0.0090)		8260B Low		1	12/11/17 16:27	C7L0151	CL71129
cis-1,2-Dichloroethene	ND (0.0045)		8260B Low		1	12/11/17 16:27	C7L0151	CL71129
cis-1,3-Dichloropropene	ND (0.0045)		8260B Low		1	12/11/17 16:27	C7L0151	CL71129
Dibromochloromethane	ND (0.0045)		8260B Low		1	12/11/17 16:27	C7L0151	CL71129
Dibromomethane	ND (0.0045)		8260B Low		1	12/11/17 16:27	C7L0151	CL71129
Dichlorodifluoromethane	ND (0.0090)		8260B Low		1	12/11/17 16:27	C7L0151	CL71129
Diethyl Ether	ND (0.0045)		8260B Low		1	12/11/17 16:27	C7L0151	CL71129
Di-isopropyl ether	ND (0.0045)		8260B Low		1	12/11/17 16:27	C7L0151	CL71129
Ethyl tertiary-butyl ether	ND (0.0045)		8260B Low		1	12/11/17 16:27	C7L0151	CL71129
Ethylbenzene	ND (0.0045)		8260B Low		1	12/11/17 16:27	C7L0151	CL71129
Hexachlorobutadiene	ND (0.0045)		8260B Low		1	12/11/17 16:27	C7L0151	CL71129
Isopropylbenzene	ND (0.0045)		8260B Low		1	12/11/17 16:27	C7L0151	CL71129
Methyl tert-Butyl Ether	ND (0.0045)		8260B Low		1	12/11/17 16:27	C7L0151	CL71129
Methylene Chloride	ND (0.0225)		8260B Low		1	12/11/17 16:27	C7L0151	CL71129
Naphthalene	ND (0.0045)		8260B Low		1	12/11/17 16:27	C7L0151	CL71129
n-Butylbenzene	ND (0.0045)		8260B Low		1	12/11/17 16:27	C7L0151	CL71129
n-Propylbenzene	ND (0.0045)		8260B Low		1	12/11/17 16:27	C7L0151	CL71129
sec-Butylbenzene	ND (0.0045)		8260B Low		1	12/11/17 16:27	C7L0151	CL71129
Styrene	ND (0.0045)		8260B Low		1	12/11/17 16:27	C7L0151	CL71129
tert-Butylbenzene	ND (0.0045)		8260B Low		1	12/11/17 16:27	C7L0151	CL71129
Tertiary-amyl methyl ether	ND (0.0045)		8260B Low		1	12/11/17 16:27	C7L0151	CL71129
Tetrachloroethene	ND (0.0045)		8260B Low		1	12/11/17 16:27	C7L0151	CL71129
Tetrahydrofuran	ND (0.0045)		8260B Low		1	12/11/17 16:27	C7L0151	CL71129





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-561 1-2ft  
 Date Sampled: 12/08/17 09:10  
 Percent Solids: 91  
 Initial Volume: 6.1  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1712222  
 ESS Laboratory Sample ID: 1712222-01  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0045)		8260B Low		1	12/11/17 16:27	C7L0151	CL71129
trans-1,2-Dichloroethene	ND (0.0045)		8260B Low		1	12/11/17 16:27	C7L0151	CL71129
trans-1,3-Dichloropropene	ND (0.0045)		8260B Low		1	12/11/17 16:27	C7L0151	CL71129
Trichloroethene	ND (0.0045)		8260B Low		1	12/11/17 16:27	C7L0151	CL71129
Trichlorofluoromethane	ND (0.0045)		8260B Low		1	12/11/17 16:27	C7L0151	CL71129
Vinyl Acetate	ND (0.0045)		8260B Low		1	12/11/17 16:27	C7L0151	CL71129
Vinyl Chloride	ND (0.0090)		8260B Low		1	12/11/17 16:27	C7L0151	CL71129
Xylene O	ND (0.0045)		8260B Low		1	12/11/17 16:27	C7L0151	CL71129
Xylene P,M	ND (0.0090)		8260B Low		1	12/11/17 16:27	C7L0151	CL71129
Xylenes (Total)	ND (0.0090)		8260B Low		1	12/11/17 16:27		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	116 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	96 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	112 %		70-130
<i>Surrogate: Toluene-d8</i>	99 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-561 1-2ft  
 Date Sampled: 12/08/17 09:10  
 Percent Solids: 91  
 Initial Volume: 19.8  
 Final Volume: 1  
 Extraction Method: 3546

ESS Laboratory Work Order: 1712222  
 ESS Laboratory Sample ID: 1712222-01  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: SMR  
 Prepared: 12/11/17 13:00

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	ND (38.8)		8100M		1	12/12/17 20:55	C7L0165	CL71116
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		77 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-561 1-2ft  
 Date Sampled: 12/08/17 09:10  
 Percent Solids: 91  
 Initial Volume: 14.5  
 Final Volume: 0.5  
 Extraction Method: 3546

ESS Laboratory Work Order: 1712222  
 ESS Laboratory Sample ID: 1712222-01  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: TJ  
 Prepared: 12/11/17 12:30

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.378)		8270D		1	12/12/17 18:24	C7L0159	CL71118
Acenaphthene	ND (0.378)		8270D		1	12/12/17 18:24	C7L0159	CL71118
Acenaphthylene	ND (0.378)		8270D		1	12/12/17 18:24	C7L0159	CL71118
Anthracene	ND (0.378)		8270D		1	12/12/17 18:24	C7L0159	CL71118
Benzo(a)anthracene	ND (0.378)		8270D		1	12/12/17 18:24	C7L0159	CL71118
Benzo(a)pyrene	ND (0.190)		8270D		1	12/12/17 18:24	C7L0159	CL71118
Benzo(b)fluoranthene	ND (0.378)		8270D		1	12/12/17 18:24	C7L0159	CL71118
Benzo(g,h,i)perylene	ND (0.378)		8270D		1	12/12/17 18:24	C7L0159	CL71118
Benzo(k)fluoranthene	ND (0.378)		8270D		1	12/12/17 18:24	C7L0159	CL71118
Chrysene	ND (0.190)		8270D		1	12/12/17 18:24	C7L0159	CL71118
Dibenzo(a,h)Anthracene	ND (0.190)		8270D		1	12/12/17 18:24	C7L0159	CL71118
Fluoranthene	ND (0.378)		8270D		1	12/12/17 18:24	C7L0159	CL71118
Fluorene	ND (0.378)		8270D		1	12/12/17 18:24	C7L0159	CL71118
Indeno(1,2,3-cd)Pyrene	ND (0.378)		8270D		1	12/12/17 18:24	C7L0159	CL71118
Naphthalene	ND (0.378)		8270D		1	12/12/17 18:24	C7L0159	CL71118
Phenanthrene	ND (0.378)		8270D		1	12/12/17 18:24	C7L0159	CL71118
Pyrene	ND (0.378)		8270D		1	12/12/17 18:24	C7L0159	CL71118

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: 1,2-Dichlorobenzene-d4	78 %		30-130
Surrogate: 2-Fluorobiphenyl	88 %		30-130
Surrogate: Nitrobenzene-d5	92 %		30-130
Surrogate: p-Terphenyl-d14	102 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-561 1-2ft  
Date Sampled: 12/08/17 09:10  
Percent Solids: 91

ESS Laboratory Work Order: 1712222  
ESS Laboratory Sample ID: 1712222-01  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	ND (1.00)		9014		1	EEM	12/14/17 11:55	mg/kg dry	CL71417



## CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-562 0-2ft  
 Date Sampled: 12/08/17 09:20  
 Percent Solids: 85

ESS Laboratory Work Order: 1712222  
 ESS Laboratory Sample ID: 1712222-02  
 Sample Matrix: Soil  
 Units: mg/kg dry

Extraction Method: 3050B

### Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (2.12)		6020A		20	NAR	12/13/17 15:39	2.23	100	CL71217
Arsenic	9.36 (2.65)		6010C		1	KJK	12/16/17 15:49	2.23	100	CL71217
Beryllium	0.16 (0.12)		6010C		1	KJK	12/13/17 23:45	2.23	100	CL71217
Cadmium	ND (0.53)		6010C		1	KJK	12/13/17 23:45	2.23	100	CL71217
Chromium	11.7 (1.06)		6010C		1	KJK	12/13/17 23:45	2.23	100	CL71217
Copper	38.5 (2.65)		6010C		1	KJK	12/15/17 23:59	2.23	100	CL71217
Lead	98.8 (5.30)		6010C		1	KJK	12/13/17 23:45	2.23	100	CL71217
Mercury	0.317 (0.036)		7471B		1	MJV	12/13/17 12:35	0.65	40	CL71218
Nickel	7.66 (2.65)		6010C		1	KJK	12/13/17 23:45	2.23	100	CL71217
Selenium	ND (2.12)		6020A		20	NAR	12/13/17 15:39	2.23	100	CL71217
Silver	ND (0.53)		6010C		1	KJK	12/13/17 23:45	2.23	100	CL71217
Thallium	ND (2.12)		6020A		20	NAR	12/13/17 15:39	2.23	100	CL71217
Zinc	17.1 (2.65)		6010C		1	KJK	12/13/17 23:45	2.23	100	CL71217



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-562 0-2ft  
 Date Sampled: 12/08/17 09:20  
 Percent Solids: 85  
 Initial Volume: 3.6  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1712222  
 ESS Laboratory Sample ID: 1712222-02  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0082)		8260B Low		1	12/11/17 16:53	C7L0151	CL71129
1,1,1-Trichloroethane	ND (0.0082)		8260B Low		1	12/11/17 16:53	C7L0151	CL71129
1,1,2,2-Tetrachloroethane	ND (0.0082)		8260B Low		1	12/11/17 16:53	C7L0151	CL71129
1,1,2-Trichloroethane	ND (0.0082)		8260B Low		1	12/11/17 16:53	C7L0151	CL71129
1,1-Dichloroethane	ND (0.0082)		8260B Low		1	12/11/17 16:53	C7L0151	CL71129
1,1-Dichloroethene	ND (0.0082)		8260B Low		1	12/11/17 16:53	C7L0151	CL71129
1,1-Dichloropropene	ND (0.0082)		8260B Low		1	12/11/17 16:53	C7L0151	CL71129
1,2,3-Trichlorobenzene	ND (0.0082)		8260B Low		1	12/11/17 16:53	C7L0151	CL71129
1,2,3-Trichloropropane	ND (0.0082)		8260B Low		1	12/11/17 16:53	C7L0151	CL71129
1,2,4-Trichlorobenzene	ND (0.0082)		8260B Low		1	12/11/17 16:53	C7L0151	CL71129
1,2,4-Trimethylbenzene	ND (0.0082)		8260B Low		1	12/11/17 16:53	C7L0151	CL71129
1,2-Dibromo-3-Chloropropane	ND (0.0082)		8260B Low		1	12/11/17 16:53	C7L0151	CL71129
1,2-Dibromoethane	ND (0.0082)		8260B Low		1	12/11/17 16:53	C7L0151	CL71129
1,2-Dichlorobenzene	ND (0.0082)		8260B Low		1	12/11/17 16:53	C7L0151	CL71129
1,2-Dichloroethane	ND (0.0082)		8260B Low		1	12/11/17 16:53	C7L0151	CL71129
1,2-Dichloropropane	ND (0.0082)		8260B Low		1	12/11/17 16:53	C7L0151	CL71129
1,3,5-Trimethylbenzene	ND (0.0082)		8260B Low		1	12/11/17 16:53	C7L0151	CL71129
1,3-Dichlorobenzene	ND (0.0082)		8260B Low		1	12/11/17 16:53	C7L0151	CL71129
1,3-Dichloropropane	ND (0.0082)		8260B Low		1	12/11/17 16:53	C7L0151	CL71129
1,4-Dichlorobenzene	ND (0.0082)		8260B Low		1	12/11/17 16:53	C7L0151	CL71129
1,4-Dioxane	ND (0.164)		8260B Low		1	12/11/17 16:53	C7L0151	CL71129
1-Chlorohexane	ND (0.0082)		8260B Low		1	12/11/17 16:53	C7L0151	CL71129
2,2-Dichloropropane	ND (0.0082)		8260B Low		1	12/11/17 16:53	C7L0151	CL71129
2-Butanone	ND (0.0820)		8260B Low		1	12/11/17 16:53	C7L0151	CL71129
2-Chlorotoluene	ND (0.0082)		8260B Low		1	12/11/17 16:53	C7L0151	CL71129
2-Hexanone	ND (0.0820)		8260B Low		1	12/11/17 16:53	C7L0151	CL71129
4-Chlorotoluene	ND (0.0082)		8260B Low		1	12/11/17 16:53	C7L0151	CL71129
4-Isopropyltoluene	ND (0.0082)		8260B Low		1	12/11/17 16:53	C7L0151	CL71129
4-Methyl-2-Pentanone	ND (0.0820)		8260B Low		1	12/11/17 16:53	C7L0151	CL71129
Acetone	ND (0.0820)		8260B Low		1	12/11/17 16:53	C7L0151	CL71129
Benzene	ND (0.0082)		8260B Low		1	12/11/17 16:53	C7L0151	CL71129
Bromobenzene	ND (0.0082)		8260B Low		1	12/11/17 16:53	C7L0151	CL71129





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-562 0-2ft  
Date Sampled: 12/08/17 09:20  
Percent Solids: 85  
Initial Volume: 3.6  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1712222  
ESS Laboratory Sample ID: 1712222-02  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0082)		8260B Low		1	12/11/17 16:53	C7L0151	CL71129
Bromodichloromethane	ND (0.0082)		8260B Low		1	12/11/17 16:53	C7L0151	CL71129
Bromoform	ND (0.0082)		8260B Low		1	12/11/17 16:53	C7L0151	CL71129
Bromomethane	ND (0.0164)		8260B Low		1	12/11/17 16:53	C7L0151	CL71129
Carbon Disulfide	ND (0.0082)		8260B Low		1	12/11/17 16:53	C7L0151	CL71129
Carbon Tetrachloride	ND (0.0082)		8260B Low		1	12/11/17 16:53	C7L0151	CL71129
Chlorobenzene	ND (0.0082)		8260B Low		1	12/11/17 16:53	C7L0151	CL71129
Chloroethane	ND (0.0164)		8260B Low		1	12/11/17 16:53	C7L0151	CL71129
Chloroform	ND (0.0082)		8260B Low		1	12/11/17 16:53	C7L0151	CL71129
Chloromethane	ND (0.0164)		8260B Low		1	12/11/17 16:53	C7L0151	CL71129
cis-1,2-Dichloroethene	ND (0.0082)		8260B Low		1	12/11/17 16:53	C7L0151	CL71129
cis-1,3-Dichloropropene	ND (0.0082)		8260B Low		1	12/11/17 16:53	C7L0151	CL71129
Dibromochloromethane	ND (0.0082)		8260B Low		1	12/11/17 16:53	C7L0151	CL71129
Dibromomethane	ND (0.0082)		8260B Low		1	12/11/17 16:53	C7L0151	CL71129
Dichlorodifluoromethane	ND (0.0164)		8260B Low		1	12/11/17 16:53	C7L0151	CL71129
Diethyl Ether	ND (0.0082)		8260B Low		1	12/11/17 16:53	C7L0151	CL71129
Di-isopropyl ether	ND (0.0082)		8260B Low		1	12/11/17 16:53	C7L0151	CL71129
Ethyl tertiary-butyl ether	ND (0.0082)		8260B Low		1	12/11/17 16:53	C7L0151	CL71129
Ethylbenzene	ND (0.0082)		8260B Low		1	12/11/17 16:53	C7L0151	CL71129
Hexachlorobutadiene	ND (0.0082)		8260B Low		1	12/11/17 16:53	C7L0151	CL71129
Isopropylbenzene	ND (0.0082)		8260B Low		1	12/11/17 16:53	C7L0151	CL71129
Methyl tert-Butyl Ether	ND (0.0082)		8260B Low		1	12/11/17 16:53	C7L0151	CL71129
Methylene Chloride	ND (0.0410)		8260B Low		1	12/11/17 16:53	C7L0151	CL71129
Naphthalene	ND (0.0082)		8260B Low		1	12/11/17 16:53	C7L0151	CL71129
n-Butylbenzene	ND (0.0082)		8260B Low		1	12/11/17 16:53	C7L0151	CL71129
n-Propylbenzene	ND (0.0082)		8260B Low		1	12/11/17 16:53	C7L0151	CL71129
sec-Butylbenzene	ND (0.0082)		8260B Low		1	12/11/17 16:53	C7L0151	CL71129
Styrene	ND (0.0082)		8260B Low		1	12/11/17 16:53	C7L0151	CL71129
tert-Butylbenzene	ND (0.0082)		8260B Low		1	12/11/17 16:53	C7L0151	CL71129
Tertiary-amyl methyl ether	ND (0.0082)		8260B Low		1	12/11/17 16:53	C7L0151	CL71129
Tetrachloroethene	ND (0.0082)		8260B Low		1	12/11/17 16:53	C7L0151	CL71129
Tetrahydrofuran	ND (0.0082)		8260B Low		1	12/11/17 16:53	C7L0151	CL71129



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-562 0-2ft  
 Date Sampled: 12/08/17 09:20  
 Percent Solids: 85  
 Initial Volume: 3.6  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1712222  
 ESS Laboratory Sample ID: 1712222-02  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0082)		8260B Low		1	12/11/17 16:53	C7L0151	CL71129
trans-1,2-Dichloroethene	ND (0.0082)		8260B Low		1	12/11/17 16:53	C7L0151	CL71129
trans-1,3-Dichloropropene	ND (0.0082)		8260B Low		1	12/11/17 16:53	C7L0151	CL71129
Trichloroethene	ND (0.0082)		8260B Low		1	12/11/17 16:53	C7L0151	CL71129
Trichlorofluoromethane	ND (0.0082)		8260B Low		1	12/11/17 16:53	C7L0151	CL71129
Vinyl Acetate	ND (0.0082)		8260B Low		1	12/11/17 16:53	C7L0151	CL71129
Vinyl Chloride	ND (0.0164)		8260B Low		1	12/11/17 16:53	C7L0151	CL71129
Xylene O	ND (0.0082)		8260B Low		1	12/11/17 16:53	C7L0151	CL71129
Xylene P,M	ND (0.0164)		8260B Low		1	12/11/17 16:53	C7L0151	CL71129
Xylenes (Total)	ND (0.0164)		8260B Low		1	12/11/17 16:53		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	115 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	92 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	110 %		70-130
<i>Surrogate: Toluene-d8</i>	102 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-562 0-2ft  
 Date Sampled: 12/08/17 09:20  
 Percent Solids: 85  
 Initial Volume: 19.2  
 Final Volume: 1  
 Extraction Method: 3546

ESS Laboratory Work Order: 1712222  
 ESS Laboratory Sample ID: 1712222-02  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: SMR  
 Prepared: 12/11/17 13:00

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	1150 (215)		8100M		5	12/13/17 6:22	C7L0165	CL71116
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		90 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-562 0-2ft  
 Date Sampled: 12/08/17 09:20  
 Percent Solids: 85  
 Initial Volume: 14.9  
 Final Volume: 0.5  
 Extraction Method: 3546

ESS Laboratory Work Order: 1712222  
 ESS Laboratory Sample ID: 1712222-02  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: TJ  
 Prepared: 12/11/17 12:30

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	0.887 (0.396)		8270D		1	12/12/17 18:59	C7L0159	CL71118
Acenaphthene	ND (0.396)		8270D		1	12/12/17 18:59	C7L0159	CL71118
Acenaphthylene	5.64 (0.396)		8270D		1	12/12/17 18:59	C7L0159	CL71118
Anthracene	3.36 (0.396)		8270D		1	12/12/17 18:59	C7L0159	CL71118
Benzo(a)anthracene	7.54 (0.396)		8270D		1	12/12/17 18:59	C7L0159	CL71118
Benzo(a)pyrene	6.75 (0.199)		8270D		1	12/12/17 18:59	C7L0159	CL71118
Benzo(b)fluoranthene	9.38 (3.96)		8270D		10	12/13/17 16:38	C7L0159	CL71118
Benzo(g,h,i)perylene	5.87 (0.396)		8270D		1	12/12/17 18:59	C7L0159	CL71118
Benzo(k)fluoranthene	5.75 (3.96)		8270D		10	12/13/17 16:38	C7L0159	CL71118
Chrysene	7.71 (0.199)		8270D		1	12/12/17 18:59	C7L0159	CL71118
Dibenzo(a,h)Anthracene	3.40 (0.199)		8270D		1	12/12/17 18:59	C7L0159	CL71118
Fluoranthene	9.50 (0.396)		8270D		1	12/12/17 18:59	C7L0159	CL71118
Fluorene	ND (0.396)		8270D		1	12/12/17 18:59	C7L0159	CL71118
Indeno(1,2,3-cd)Pyrene	5.71 (0.396)		8270D		1	12/12/17 18:59	C7L0159	CL71118
Naphthalene	1.59 (0.396)		8270D		1	12/12/17 18:59	C7L0159	CL71118
Phenanthrene	4.40 (0.396)		8270D		1	12/12/17 18:59	C7L0159	CL71118
Pyrene	14.5 (3.96)		8270D		10	12/13/17 16:38	C7L0159	CL71118

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	64 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	81 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	80 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	79 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-562 0-2ft  
Date Sampled: 12/08/17 09:20  
Percent Solids: 85

ESS Laboratory Work Order: 1712222  
ESS Laboratory Sample ID: 1712222-02  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	37.3 (11.3)		9014		10	EEM	12/14/17 11:55	mg/kg dry	CL71417



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-563 0-2ft  
Date Sampled: 12/08/17 09:55  
Percent Solids: 81

ESS Laboratory Work Order: 1712222  
ESS Laboratory Sample ID: 1712222-03  
Sample Matrix: Soil  
Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (2.21)		6020A		20	NAR	12/13/17 15:45	2.22	100	CL71217
Arsenic	10.4 (2.77)		6010C		1	KJK	12/16/17 15:53	2.22	100	CL71217
Beryllium	0.49 (0.12)		6010C		1	KJK	12/13/17 23:49	2.22	100	CL71217
Cadmium	ND (0.55)		6010C		1	KJK	12/13/17 23:49	2.22	100	CL71217
Chromium	9.21 (1.11)		6010C		1	KJK	12/13/17 23:49	2.22	100	CL71217
Copper	92.9 (2.77)		6010C		1	KJK	12/16/17 0:04	2.22	100	CL71217
Lead	44.4 (5.54)		6010C		1	KJK	12/13/17 23:49	2.22	100	CL71217
Mercury	0.385 (0.039)		7471B		1	MJV	12/13/17 12:37	0.63	40	CL71218
Nickel	7.82 (2.77)		6010C		1	KJK	12/13/17 23:49	2.22	100	CL71217
Selenium	ND (2.21)		6020A		20	NAR	12/13/17 15:45	2.22	100	CL71217
Silver	ND (0.55)		6010C		1	KJK	12/13/17 23:49	2.22	100	CL71217
Thallium	ND (2.21)		6020A		20	NAR	12/13/17 15:45	2.22	100	CL71217
Zinc	25.5 (2.77)		6010C		1	KJK	12/13/17 23:49	2.22	100	CL71217





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-563 0-2ft  
 Date Sampled: 12/08/17 09:55  
 Percent Solids: 81  
 Initial Volume: 7.1  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1712222  
 ESS Laboratory Sample ID: 1712222-03  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0043)		8260B Low		1	12/11/17 17:18	C7L0151	CL71129
1,1,1-Trichloroethane	ND (0.0043)		8260B Low		1	12/11/17 17:18	C7L0151	CL71129
1,1,2,2-Tetrachloroethane	ND (0.0043)		8260B Low		1	12/11/17 17:18	C7L0151	CL71129
1,1,2-Trichloroethane	ND (0.0043)		8260B Low		1	12/11/17 17:18	C7L0151	CL71129
1,1-Dichloroethane	ND (0.0043)		8260B Low		1	12/11/17 17:18	C7L0151	CL71129
1,1-Dichloroethene	ND (0.0043)		8260B Low		1	12/11/17 17:18	C7L0151	CL71129
1,1-Dichloropropene	ND (0.0043)		8260B Low		1	12/11/17 17:18	C7L0151	CL71129
1,2,3-Trichlorobenzene	ND (0.0043)		8260B Low		1	12/11/17 17:18	C7L0151	CL71129
1,2,3-Trichloropropane	ND (0.0043)		8260B Low		1	12/11/17 17:18	C7L0151	CL71129
1,2,4-Trichlorobenzene	ND (0.0043)		8260B Low		1	12/11/17 17:18	C7L0151	CL71129
1,2,4-Trimethylbenzene	ND (0.0043)		8260B Low		1	12/11/17 17:18	C7L0151	CL71129
1,2-Dibromo-3-Chloropropane	ND (0.0043)		8260B Low		1	12/11/17 17:18	C7L0151	CL71129
1,2-Dibromoethane	ND (0.0043)		8260B Low		1	12/11/17 17:18	C7L0151	CL71129
1,2-Dichlorobenzene	ND (0.0043)		8260B Low		1	12/11/17 17:18	C7L0151	CL71129
1,2-Dichloroethane	ND (0.0043)		8260B Low		1	12/11/17 17:18	C7L0151	CL71129
1,2-Dichloropropane	ND (0.0043)		8260B Low		1	12/11/17 17:18	C7L0151	CL71129
1,3,5-Trimethylbenzene	ND (0.0043)		8260B Low		1	12/11/17 17:18	C7L0151	CL71129
1,3-Dichlorobenzene	ND (0.0043)		8260B Low		1	12/11/17 17:18	C7L0151	CL71129
1,3-Dichloropropane	ND (0.0043)		8260B Low		1	12/11/17 17:18	C7L0151	CL71129
1,4-Dichlorobenzene	ND (0.0043)		8260B Low		1	12/11/17 17:18	C7L0151	CL71129
1,4-Dioxane	ND (0.0866)		8260B Low		1	12/11/17 17:18	C7L0151	CL71129
1-Chlorohexane	ND (0.0043)		8260B Low		1	12/11/17 17:18	C7L0151	CL71129
2,2-Dichloropropane	ND (0.0043)		8260B Low		1	12/11/17 17:18	C7L0151	CL71129
2-Butanone	ND (0.0433)		8260B Low		1	12/11/17 17:18	C7L0151	CL71129
2-Chlorotoluene	ND (0.0043)		8260B Low		1	12/11/17 17:18	C7L0151	CL71129
2-Hexanone	ND (0.0433)		8260B Low		1	12/11/17 17:18	C7L0151	CL71129
4-Chlorotoluene	ND (0.0043)		8260B Low		1	12/11/17 17:18	C7L0151	CL71129
4-Isopropyltoluene	ND (0.0043)		8260B Low		1	12/11/17 17:18	C7L0151	CL71129
4-Methyl-2-Pentanone	ND (0.0433)		8260B Low		1	12/11/17 17:18	C7L0151	CL71129
Acetone	ND (0.0433)		8260B Low		1	12/11/17 17:18	C7L0151	CL71129
Benzene	ND (0.0043)		8260B Low		1	12/11/17 17:18	C7L0151	CL71129
Bromobenzene	ND (0.0043)		8260B Low		1	12/11/17 17:18	C7L0151	CL71129



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-563 0-2ft  
 Date Sampled: 12/08/17 09:55  
 Percent Solids: 81  
 Initial Volume: 7.1  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1712222  
 ESS Laboratory Sample ID: 1712222-03  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0043)		8260B Low		1	12/11/17 17:18	C7L0151	CL71129
Bromodichloromethane	ND (0.0043)		8260B Low		1	12/11/17 17:18	C7L0151	CL71129
Bromoform	ND (0.0043)		8260B Low		1	12/11/17 17:18	C7L0151	CL71129
Bromomethane	ND (0.0087)		8260B Low		1	12/11/17 17:18	C7L0151	CL71129
Carbon Disulfide	ND (0.0043)		8260B Low		1	12/11/17 17:18	C7L0151	CL71129
Carbon Tetrachloride	ND (0.0043)		8260B Low		1	12/11/17 17:18	C7L0151	CL71129
Chlorobenzene	ND (0.0043)		8260B Low		1	12/11/17 17:18	C7L0151	CL71129
Chloroethane	ND (0.0087)		8260B Low		1	12/11/17 17:18	C7L0151	CL71129
Chloroform	ND (0.0043)		8260B Low		1	12/11/17 17:18	C7L0151	CL71129
Chloromethane	ND (0.0087)		8260B Low		1	12/11/17 17:18	C7L0151	CL71129
cis-1,2-Dichloroethene	ND (0.0043)		8260B Low		1	12/11/17 17:18	C7L0151	CL71129
cis-1,3-Dichloropropene	ND (0.0043)		8260B Low		1	12/11/17 17:18	C7L0151	CL71129
Dibromochloromethane	ND (0.0043)		8260B Low		1	12/11/17 17:18	C7L0151	CL71129
Dibromomethane	ND (0.0043)		8260B Low		1	12/11/17 17:18	C7L0151	CL71129
Dichlorodifluoromethane	ND (0.0087)		8260B Low		1	12/11/17 17:18	C7L0151	CL71129
Diethyl Ether	ND (0.0043)		8260B Low		1	12/11/17 17:18	C7L0151	CL71129
Di-isopropyl ether	ND (0.0043)		8260B Low		1	12/11/17 17:18	C7L0151	CL71129
Ethyl tertiary-butyl ether	ND (0.0043)		8260B Low		1	12/11/17 17:18	C7L0151	CL71129
Ethylbenzene	ND (0.0043)		8260B Low		1	12/11/17 17:18	C7L0151	CL71129
Hexachlorobutadiene	ND (0.0043)		8260B Low		1	12/11/17 17:18	C7L0151	CL71129
Isopropylbenzene	ND (0.0043)		8260B Low		1	12/11/17 17:18	C7L0151	CL71129
Methyl tert-Butyl Ether	ND (0.0043)		8260B Low		1	12/11/17 17:18	C7L0151	CL71129
Methylene Chloride	ND (0.0216)		8260B Low		1	12/11/17 17:18	C7L0151	CL71129
Naphthalene	ND (0.0043)		8260B Low		1	12/11/17 17:18	C7L0151	CL71129
n-Butylbenzene	ND (0.0043)		8260B Low		1	12/11/17 17:18	C7L0151	CL71129
n-Propylbenzene	ND (0.0043)		8260B Low		1	12/11/17 17:18	C7L0151	CL71129
sec-Butylbenzene	ND (0.0043)		8260B Low		1	12/11/17 17:18	C7L0151	CL71129
Styrene	ND (0.0043)		8260B Low		1	12/11/17 17:18	C7L0151	CL71129
tert-Butylbenzene	ND (0.0043)		8260B Low		1	12/11/17 17:18	C7L0151	CL71129
Tertiary-amyl methyl ether	ND (0.0043)		8260B Low		1	12/11/17 17:18	C7L0151	CL71129
Tetrachloroethene	ND (0.0043)		8260B Low		1	12/11/17 17:18	C7L0151	CL71129
Tetrahydrofuran	ND (0.0043)		8260B Low		1	12/11/17 17:18	C7L0151	CL71129



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-563 0-2ft  
 Date Sampled: 12/08/17 09:55  
 Percent Solids: 81  
 Initial Volume: 7.1  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1712222  
 ESS Laboratory Sample ID: 1712222-03  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0043)		8260B Low		1	12/11/17 17:18	C7L0151	CL71129
trans-1,2-Dichloroethene	ND (0.0043)		8260B Low		1	12/11/17 17:18	C7L0151	CL71129
trans-1,3-Dichloropropene	ND (0.0043)		8260B Low		1	12/11/17 17:18	C7L0151	CL71129
Trichloroethene	ND (0.0043)		8260B Low		1	12/11/17 17:18	C7L0151	CL71129
Trichlorofluoromethane	ND (0.0043)		8260B Low		1	12/11/17 17:18	C7L0151	CL71129
Vinyl Acetate	ND (0.0043)		8260B Low		1	12/11/17 17:18	C7L0151	CL71129
Vinyl Chloride	ND (0.0087)		8260B Low		1	12/11/17 17:18	C7L0151	CL71129
Xylene O	ND (0.0043)		8260B Low		1	12/11/17 17:18	C7L0151	CL71129
Xylene P,M	ND (0.0087)		8260B Low		1	12/11/17 17:18	C7L0151	CL71129
Xylenes (Total)	ND (0.0087)		8260B Low		1	12/11/17 17:18		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	112 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	88 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	109 %		70-130
<i>Surrogate: Toluene-d8</i>	106 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-563 0-2ft  
Date Sampled: 12/08/17 09:55  
Percent Solids: 81  
Initial Volume: 19.4  
Final Volume: 1  
Extraction Method: 3546

ESS Laboratory Work Order: 1712222  
ESS Laboratory Sample ID: 1712222-03  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: SMR  
Prepared: 12/11/17 13:00

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	203 (44.3)		8100M		1	12/12/17 21:30	C7L0165	CL71116
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		81 %		40-140				



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-563 0-2ft  
Date Sampled: 12/08/17 09:55  
Percent Solids: 81  
Initial Volume: 14.5  
Final Volume: 0.5  
Extraction Method: 3546

ESS Laboratory Work Order: 1712222  
ESS Laboratory Sample ID: 1712222-03  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: TJ  
Prepared: 12/11/17 12:30

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.423)		8270D		1	12/12/17 19:34	C7L0159	CL71118
Acenaphthene	ND (0.423)		8270D		1	12/12/17 19:34	C7L0159	CL71118
Acenaphthylene	<b>0.703</b> (0.423)		8270D		1	12/12/17 19:34	C7L0159	CL71118
Anthracene	<b>0.437</b> (0.423)		8270D		1	12/12/17 19:34	C7L0159	CL71118
Benzo(a)anthracene	<b>1.42</b> (0.423)		8270D		1	12/12/17 19:34	C7L0159	CL71118
Benzo(a)pyrene	<b>1.29</b> (0.212)		8270D		1	12/12/17 19:34	C7L0159	CL71118
Benzo(b)fluoranthene	<b>1.16</b> (0.423)		8270D		1	12/12/17 19:34	C7L0159	CL71118
Benzo(g,h,i)perylene	<b>1.26</b> (0.423)		8270D		1	12/12/17 19:34	C7L0159	CL71118
Benzo(k)fluoranthene	<b>1.18</b> (0.423)		8270D		1	12/12/17 19:34	C7L0159	CL71118
Chrysene	<b>1.86</b> (0.212)		8270D		1	12/12/17 19:34	C7L0159	CL71118
Dibenzo(a,h)Anthracene	<b>0.689</b> (0.212)		8270D		1	12/12/17 19:34	C7L0159	CL71118
Fluoranthene	<b>1.90</b> (0.423)		8270D		1	12/12/17 19:34	C7L0159	CL71118
Fluorene	ND (0.423)		8270D		1	12/12/17 19:34	C7L0159	CL71118
Indeno(1,2,3-cd)Pyrene	<b>1.09</b> (0.423)		8270D		1	12/12/17 19:34	C7L0159	CL71118
Naphthalene	ND (0.423)		8270D		1	12/12/17 19:34	C7L0159	CL71118
Phenanthrene	<b>1.65</b> (0.423)		8270D		1	12/12/17 19:34	C7L0159	CL71118
Pyrene	<b>2.35</b> (0.423)		8270D		1	12/12/17 19:34	C7L0159	CL71118

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: 1,2-Dichlorobenzene-d4	59 %		30-130
Surrogate: 2-Fluorobiphenyl	74 %		30-130
Surrogate: Nitrobenzene-d5	72 %		30-130
Surrogate: p-Terphenyl-d14	89 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-563 0-2ft  
Date Sampled: 12/08/17 09:55  
Percent Solids: 81

ESS Laboratory Work Order: 1712222  
ESS Laboratory Sample ID: 1712222-03  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	1.51 (1.17)		9014		1	EEM	12/14/17 11:55	mg/kg dry	CL71417





## CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-564 0-2ft  
Date Sampled: 12/08/17 10:20  
Percent Solids: 84

ESS Laboratory Work Order: 1712222  
ESS Laboratory Sample ID: 1712222-04  
Sample Matrix: Soil  
Units: mg/kg dry

Extraction Method: 3050B

### Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (1.77)		6020A		20	NAR	12/13/17 16:02	2.69	100	CL71217
Arsenic	7.02 (2.22)		6010C		1	KJK	12/16/17 15:57	2.69	100	CL71217
Beryllium	0.52 (0.10)		6010C		1	KJK	12/14/17 0:06	2.69	100	CL71217
Cadmium	ND (0.44)		6010C		1	KJK	12/14/17 0:06	2.69	100	CL71217
Chromium	11.7 (0.89)		6010C		1	KJK	12/14/17 0:06	2.69	100	CL71217
Copper	19.6 (2.22)		6010C		1	KJK	12/16/17 0:08	2.69	100	CL71217
Lead	38.4 (4.43)		6010C		1	KJK	12/14/17 0:06	2.69	100	CL71217
Mercury	0.041 (0.034)		7471B		1	MJV	12/13/17 12:39	0.7	40	CL71218
Nickel	13.3 (2.22)		6010C		1	KJK	12/14/17 0:06	2.69	100	CL71217
Selenium	ND (1.77)		6020A		20	NAR	12/13/17 16:02	2.69	100	CL71217
Silver	ND (0.44)		6010C		1	KJK	12/14/17 0:06	2.69	100	CL71217
Thallium	ND (1.77)		6020A		20	NAR	12/13/17 16:02	2.69	100	CL71217
Zinc	46.0 (2.22)		6010C		1	KJK	12/14/17 0:06	2.69	100	CL71217



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-564 0-2ft  
Date Sampled: 12/08/17 10:20  
Percent Solids: 84  
Initial Volume: 5.7  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1712222  
ESS Laboratory Sample ID: 1712222-04  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0052)		8260B Low		1	12/11/17 17:44	C7L0151	CL71129
1,1,1-Trichloroethane	ND (0.0052)		8260B Low		1	12/11/17 17:44	C7L0151	CL71129
1,1,2,2-Tetrachloroethane	ND (0.0052)		8260B Low		1	12/11/17 17:44	C7L0151	CL71129
1,1,2-Trichloroethane	ND (0.0052)		8260B Low		1	12/11/17 17:44	C7L0151	CL71129
1,1-Dichloroethane	ND (0.0052)		8260B Low		1	12/11/17 17:44	C7L0151	CL71129
1,1-Dichloroethene	ND (0.0052)		8260B Low		1	12/11/17 17:44	C7L0151	CL71129
1,1-Dichloropropene	ND (0.0052)		8260B Low		1	12/11/17 17:44	C7L0151	CL71129
1,2,3-Trichlorobenzene	ND (0.0052)		8260B Low		1	12/11/17 17:44	C7L0151	CL71129
1,2,3-Trichloropropane	ND (0.0052)		8260B Low		1	12/11/17 17:44	C7L0151	CL71129
1,2,4-Trichlorobenzene	ND (0.0052)		8260B Low		1	12/11/17 17:44	C7L0151	CL71129
1,2,4-Trimethylbenzene	ND (0.0052)		8260B Low		1	12/11/17 17:44	C7L0151	CL71129
1,2-Dibromo-3-Chloropropane	ND (0.0052)		8260B Low		1	12/11/17 17:44	C7L0151	CL71129
1,2-Dibromoethane	ND (0.0052)		8260B Low		1	12/11/17 17:44	C7L0151	CL71129
1,2-Dichlorobenzene	ND (0.0052)		8260B Low		1	12/11/17 17:44	C7L0151	CL71129
1,2-Dichloroethane	ND (0.0052)		8260B Low		1	12/11/17 17:44	C7L0151	CL71129
1,2-Dichloropropane	ND (0.0052)		8260B Low		1	12/11/17 17:44	C7L0151	CL71129
1,3,5-Trimethylbenzene	ND (0.0052)		8260B Low		1	12/11/17 17:44	C7L0151	CL71129
1,3-Dichlorobenzene	ND (0.0052)		8260B Low		1	12/11/17 17:44	C7L0151	CL71129
1,3-Dichloropropane	ND (0.0052)		8260B Low		1	12/11/17 17:44	C7L0151	CL71129
1,4-Dichlorobenzene	ND (0.0052)		8260B Low		1	12/11/17 17:44	C7L0151	CL71129
1,4-Dioxane	ND (0.105)		8260B Low		1	12/11/17 17:44	C7L0151	CL71129
1-Chlorohexane	ND (0.0052)		8260B Low		1	12/11/17 17:44	C7L0151	CL71129
2,2-Dichloropropane	ND (0.0052)		8260B Low		1	12/11/17 17:44	C7L0151	CL71129
2-Butanone	ND (0.0523)		8260B Low		1	12/11/17 17:44	C7L0151	CL71129
2-Chlorotoluene	ND (0.0052)		8260B Low		1	12/11/17 17:44	C7L0151	CL71129
2-Hexanone	ND (0.0523)		8260B Low		1	12/11/17 17:44	C7L0151	CL71129
4-Chlorotoluene	ND (0.0052)		8260B Low		1	12/11/17 17:44	C7L0151	CL71129
4-Isopropyltoluene	ND (0.0052)		8260B Low		1	12/11/17 17:44	C7L0151	CL71129
4-Methyl-2-Pentanone	ND (0.0523)		8260B Low		1	12/11/17 17:44	C7L0151	CL71129
Acetone	ND (0.0523)		8260B Low		1	12/11/17 17:44	C7L0151	CL71129
Benzene	ND (0.0052)		8260B Low		1	12/11/17 17:44	C7L0151	CL71129
Bromobenzene	ND (0.0052)		8260B Low		1	12/11/17 17:44	C7L0151	CL71129



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-564 0-2ft  
 Date Sampled: 12/08/17 10:20  
 Percent Solids: 84  
 Initial Volume: 5.7  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1712222  
 ESS Laboratory Sample ID: 1712222-04  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0052)		8260B Low		1	12/11/17 17:44	C7L0151	CL71129
Bromodichloromethane	ND (0.0052)		8260B Low		1	12/11/17 17:44	C7L0151	CL71129
Bromoform	ND (0.0052)		8260B Low		1	12/11/17 17:44	C7L0151	CL71129
Bromomethane	ND (0.0105)		8260B Low		1	12/11/17 17:44	C7L0151	CL71129
Carbon Disulfide	ND (0.0052)		8260B Low		1	12/11/17 17:44	C7L0151	CL71129
Carbon Tetrachloride	ND (0.0052)		8260B Low		1	12/11/17 17:44	C7L0151	CL71129
Chlorobenzene	ND (0.0052)		8260B Low		1	12/11/17 17:44	C7L0151	CL71129
Chloroethane	ND (0.0105)		8260B Low		1	12/11/17 17:44	C7L0151	CL71129
Chloroform	ND (0.0052)		8260B Low		1	12/11/17 17:44	C7L0151	CL71129
Chloromethane	ND (0.0105)		8260B Low		1	12/11/17 17:44	C7L0151	CL71129
cis-1,2-Dichloroethene	ND (0.0052)		8260B Low		1	12/11/17 17:44	C7L0151	CL71129
cis-1,3-Dichloropropene	ND (0.0052)		8260B Low		1	12/11/17 17:44	C7L0151	CL71129
Dibromochloromethane	ND (0.0052)		8260B Low		1	12/11/17 17:44	C7L0151	CL71129
Dibromomethane	ND (0.0052)		8260B Low		1	12/11/17 17:44	C7L0151	CL71129
Dichlorodifluoromethane	ND (0.0105)		8260B Low		1	12/11/17 17:44	C7L0151	CL71129
Diethyl Ether	ND (0.0052)		8260B Low		1	12/11/17 17:44	C7L0151	CL71129
Di-isopropyl ether	ND (0.0052)		8260B Low		1	12/11/17 17:44	C7L0151	CL71129
Ethyl tertiary-butyl ether	ND (0.0052)		8260B Low		1	12/11/17 17:44	C7L0151	CL71129
Ethylbenzene	ND (0.0052)		8260B Low		1	12/11/17 17:44	C7L0151	CL71129
Hexachlorobutadiene	ND (0.0052)		8260B Low		1	12/11/17 17:44	C7L0151	CL71129
Isopropylbenzene	ND (0.0052)		8260B Low		1	12/11/17 17:44	C7L0151	CL71129
Methyl tert-Butyl Ether	ND (0.0052)		8260B Low		1	12/11/17 17:44	C7L0151	CL71129
Methylene Chloride	ND (0.0262)		8260B Low		1	12/11/17 17:44	C7L0151	CL71129
Naphthalene	ND (0.0052)		8260B Low		1	12/11/17 17:44	C7L0151	CL71129
n-Butylbenzene	ND (0.0052)		8260B Low		1	12/11/17 17:44	C7L0151	CL71129
n-Propylbenzene	ND (0.0052)		8260B Low		1	12/11/17 17:44	C7L0151	CL71129
sec-Butylbenzene	ND (0.0052)		8260B Low		1	12/11/17 17:44	C7L0151	CL71129
Styrene	ND (0.0052)		8260B Low		1	12/11/17 17:44	C7L0151	CL71129
tert-Butylbenzene	ND (0.0052)		8260B Low		1	12/11/17 17:44	C7L0151	CL71129
Tertiary-amyl methyl ether	ND (0.0052)		8260B Low		1	12/11/17 17:44	C7L0151	CL71129
Tetrachloroethene	ND (0.0052)		8260B Low		1	12/11/17 17:44	C7L0151	CL71129
Tetrahydrofuran	ND (0.0052)		8260B Low		1	12/11/17 17:44	C7L0151	CL71129



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-564 0-2ft  
 Date Sampled: 12/08/17 10:20  
 Percent Solids: 84  
 Initial Volume: 5.7  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1712222  
 ESS Laboratory Sample ID: 1712222-04  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0052)		8260B Low		1	12/11/17 17:44	C7L0151	CL71129
trans-1,2-Dichloroethene	ND (0.0052)		8260B Low		1	12/11/17 17:44	C7L0151	CL71129
trans-1,3-Dichloropropene	ND (0.0052)		8260B Low		1	12/11/17 17:44	C7L0151	CL71129
Trichloroethene	ND (0.0052)		8260B Low		1	12/11/17 17:44	C7L0151	CL71129
Trichlorofluoromethane	ND (0.0052)		8260B Low		1	12/11/17 17:44	C7L0151	CL71129
Vinyl Acetate	ND (0.0052)		8260B Low		1	12/11/17 17:44	C7L0151	CL71129
Vinyl Chloride	ND (0.0105)		8260B Low		1	12/11/17 17:44	C7L0151	CL71129
Xylene O	ND (0.0052)		8260B Low		1	12/11/17 17:44	C7L0151	CL71129
Xylene P,M	ND (0.0105)		8260B Low		1	12/11/17 17:44	C7L0151	CL71129
Xylenes (Total)	ND (0.0105)		8260B Low		1	12/11/17 17:44		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	116 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	92 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	111 %		70-130
<i>Surrogate: Toluene-d8</i>	100 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-564 0-2ft  
 Date Sampled: 12/08/17 10:20  
 Percent Solids: 84  
 Initial Volume: 19.1  
 Final Volume: 1  
 Extraction Method: 3546

ESS Laboratory Work Order: 1712222  
 ESS Laboratory Sample ID: 1712222-04  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: SMR  
 Prepared: 12/11/17 13:00

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	ND (43.7)		8100M		1	12/12/17 22:05	C7L0165	CL71116
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		85 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-564 0-2ft  
Date Sampled: 12/08/17 10:20  
Percent Solids: 84  
Initial Volume: 14.1  
Final Volume: 0.5  
Extraction Method: 3546

ESS Laboratory Work Order: 1712222  
ESS Laboratory Sample ID: 1712222-04  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: TJ  
Prepared: 12/11/17 12:30

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.422)		8270D		1	12/12/17 20:09	C7L0159	CL71118
Acenaphthene	ND (0.422)		8270D		1	12/12/17 20:09	C7L0159	CL71118
Acenaphthylene	ND (0.422)		8270D		1	12/12/17 20:09	C7L0159	CL71118
Anthracene	ND (0.422)		8270D		1	12/12/17 20:09	C7L0159	CL71118
<b>Benzo(a)anthracene</b>	<b>0.654</b> (0.422)		8270D		1	12/12/17 20:09	C7L0159	CL71118
<b>Benzo(a)pyrene</b>	<b>0.492</b> (0.212)		8270D		1	12/12/17 20:09	C7L0159	CL71118
Benzo(b)fluoranthene	ND (0.422)		8270D		1	12/12/17 20:09	C7L0159	CL71118
Benzo(g,h,i)perylene	ND (0.422)		8270D		1	12/12/17 20:09	C7L0159	CL71118
<b>Benzo(k)fluoranthene</b>	<b>0.439</b> (0.422)		8270D		1	12/12/17 20:09	C7L0159	CL71118
<b>Chrysene</b>	<b>0.725</b> (0.212)		8270D		1	12/12/17 20:09	C7L0159	CL71118
<b>Dibenzo(a,h)Anthracene</b>	<b>0.219</b> (0.212)		8270D		1	12/12/17 20:09	C7L0159	CL71118
<b>Fluoranthene</b>	<b>1.02</b> (0.422)		8270D		1	12/12/17 20:09	C7L0159	CL71118
Fluorene	ND (0.422)		8270D		1	12/12/17 20:09	C7L0159	CL71118
Indeno(1,2,3-cd)Pyrene	ND (0.422)		8270D		1	12/12/17 20:09	C7L0159	CL71118
Naphthalene	ND (0.422)		8270D		1	12/12/17 20:09	C7L0159	CL71118
<b>Phenanthrene</b>	<b>1.37</b> (0.422)		8270D		1	12/12/17 20:09	C7L0159	CL71118
<b>Pyrene</b>	<b>1.38</b> (0.422)		8270D		1	12/12/17 20:09	C7L0159	CL71118

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	78 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	91 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	94 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	99 %		30-130





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-564 0-2ft  
Date Sampled: 12/08/17 10:20  
Percent Solids: 84

ESS Laboratory Work Order: 1712222  
ESS Laboratory Sample ID: 1712222-04  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	1.29 (1.18)		9014		1	EEM	12/14/17 11:55	mg/kg dry	CL71417



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-565 0-2ft  
Date Sampled: 12/08/17 11:00  
Percent Solids: 83

ESS Laboratory Work Order: 1712222  
ESS Laboratory Sample ID: 1712222-05  
Sample Matrix: Soil  
Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (1.88)		6020A		20	NAR	12/13/17 16:08	2.57	100	CL71217
<b>Arsenic</b>	<b>14.5</b> (2.35)		6010C		1	KJK	12/16/17 16:01	2.57	100	CL71217
Beryllium	ND (0.10)		6010C		1	KJK	12/14/17 0:10	2.57	100	CL71217
Cadmium	ND (0.47)		6010C		1	KJK	12/14/17 0:10	2.57	100	CL71217
<b>Chromium</b>	<b>9.33</b> (0.94)		6010C		1	KJK	12/14/17 0:10	2.57	100	CL71217
<b>Copper</b>	<b>33.2</b> (2.35)		6010C		1	KJK	12/16/17 0:12	2.57	100	CL71217
<b>Lead</b>	<b>51.3</b> (4.70)		6010C		1	KJK	12/14/17 0:10	2.57	100	CL71217
<b>Mercury</b>	<b>0.077</b> (0.024)		7471B		1	MJV	12/13/17 12:41	1.01	40	CL71218
<b>Nickel</b>	<b>7.97</b> (2.35)		6010C		1	KJK	12/14/17 0:10	2.57	100	CL71217
Selenium	ND (1.88)		6020A		20	NAR	12/13/17 16:08	2.57	100	CL71217
Silver	ND (0.47)		6010C		1	KJK	12/14/17 0:10	2.57	100	CL71217
Thallium	ND (1.88)		6020A		20	NAR	12/13/17 16:08	2.57	100	CL71217
<b>Zinc</b>	<b>12.4</b> (2.35)		6010C		1	KJK	12/14/17 0:10	2.57	100	CL71217



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-565 0-2ft  
 Date Sampled: 12/08/17 11:00  
 Percent Solids: 83  
 Initial Volume: 5.2  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1712222  
 ESS Laboratory Sample ID: 1712222-05  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0058)		8260B Low		1	12/11/17 23:38	C7L0151	CL71129
1,1,1-Trichloroethane	ND (0.0058)		8260B Low		1	12/11/17 23:38	C7L0151	CL71129
1,1,2,2-Tetrachloroethane	ND (0.0058)		8260B Low		1	12/11/17 23:38	C7L0151	CL71129
1,1,2-Trichloroethane	ND (0.0058)		8260B Low		1	12/11/17 23:38	C7L0151	CL71129
1,1-Dichloroethane	ND (0.0058)		8260B Low		1	12/11/17 23:38	C7L0151	CL71129
1,1-Dichloroethene	ND (0.0058)		8260B Low		1	12/11/17 23:38	C7L0151	CL71129
1,1-Dichloropropene	ND (0.0058)		8260B Low		1	12/11/17 23:38	C7L0151	CL71129
1,2,3-Trichlorobenzene	ND (0.0058)		8260B Low		1	12/11/17 23:38	C7L0151	CL71129
1,2,3-Trichloropropane	ND (0.0058)		8260B Low		1	12/11/17 23:38	C7L0151	CL71129
1,2,4-Trichlorobenzene	ND (0.0058)		8260B Low		1	12/11/17 23:38	C7L0151	CL71129
1,2,4-Trimethylbenzene	ND (0.0058)		8260B Low		1	12/11/17 23:38	C7L0151	CL71129
1,2-Dibromo-3-Chloropropane	ND (0.0058)		8260B Low		1	12/11/17 23:38	C7L0151	CL71129
1,2-Dibromoethane	ND (0.0058)		8260B Low		1	12/11/17 23:38	C7L0151	CL71129
1,2-Dichlorobenzene	ND (0.0058)		8260B Low		1	12/11/17 23:38	C7L0151	CL71129
1,2-Dichloroethane	ND (0.0058)		8260B Low		1	12/11/17 23:38	C7L0151	CL71129
1,2-Dichloropropane	ND (0.0058)		8260B Low		1	12/11/17 23:38	C7L0151	CL71129
1,3,5-Trimethylbenzene	ND (0.0058)		8260B Low		1	12/11/17 23:38	C7L0151	CL71129
1,3-Dichlorobenzene	ND (0.0058)		8260B Low		1	12/11/17 23:38	C7L0151	CL71129
1,3-Dichloropropane	ND (0.0058)		8260B Low		1	12/11/17 23:38	C7L0151	CL71129
1,4-Dichlorobenzene	ND (0.0058)		8260B Low		1	12/11/17 23:38	C7L0151	CL71129
1,4-Dioxane	ND (0.116)		8260B Low		1	12/11/17 23:38	C7L0151	CL71129
1-Chlorohexane	ND (0.0058)		8260B Low		1	12/11/17 23:38	C7L0151	CL71129
2,2-Dichloropropane	ND (0.0058)		8260B Low		1	12/11/17 23:38	C7L0151	CL71129
2-Butanone	ND (0.0581)		8260B Low		1	12/11/17 23:38	C7L0151	CL71129
2-Chlorotoluene	ND (0.0058)		8260B Low		1	12/11/17 23:38	C7L0151	CL71129
2-Hexanone	ND (0.0581)		8260B Low		1	12/11/17 23:38	C7L0151	CL71129
4-Chlorotoluene	ND (0.0058)		8260B Low		1	12/11/17 23:38	C7L0151	CL71129
4-Isopropyltoluene	ND (0.0058)		8260B Low		1	12/11/17 23:38	C7L0151	CL71129
4-Methyl-2-Pentanone	ND (0.0581)		8260B Low		1	12/11/17 23:38	C7L0151	CL71129
Acetone	ND (0.0581)		8260B Low		1	12/11/17 23:38	C7L0151	CL71129
Benzene	ND (0.0058)		8260B Low		1	12/11/17 23:38	C7L0151	CL71129
Bromobenzene	ND (0.0058)		8260B Low		1	12/11/17 23:38	C7L0151	CL71129



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-565 0-2ft  
 Date Sampled: 12/08/17 11:00  
 Percent Solids: 83  
 Initial Volume: 5.2  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1712222  
 ESS Laboratory Sample ID: 1712222-05  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0058)		8260B Low		1	12/11/17 23:38	C7L0151	CL71129
Bromodichloromethane	ND (0.0058)		8260B Low		1	12/11/17 23:38	C7L0151	CL71129
Bromoform	ND (0.0058)		8260B Low		1	12/11/17 23:38	C7L0151	CL71129
Bromomethane	ND (0.0116)		8260B Low		1	12/11/17 23:38	C7L0151	CL71129
Carbon Disulfide	ND (0.0058)		8260B Low		1	12/11/17 23:38	C7L0151	CL71129
Carbon Tetrachloride	ND (0.0058)		8260B Low		1	12/11/17 23:38	C7L0151	CL71129
Chlorobenzene	ND (0.0058)		8260B Low		1	12/11/17 23:38	C7L0151	CL71129
Chloroethane	ND (0.0116)		8260B Low		1	12/11/17 23:38	C7L0151	CL71129
Chloroform	ND (0.0058)		8260B Low		1	12/11/17 23:38	C7L0151	CL71129
Chloromethane	ND (0.0116)		8260B Low		1	12/11/17 23:38	C7L0151	CL71129
cis-1,2-Dichloroethene	ND (0.0058)		8260B Low		1	12/11/17 23:38	C7L0151	CL71129
cis-1,3-Dichloropropene	ND (0.0058)		8260B Low		1	12/11/17 23:38	C7L0151	CL71129
Dibromochloromethane	ND (0.0058)		8260B Low		1	12/11/17 23:38	C7L0151	CL71129
Dibromomethane	ND (0.0058)		8260B Low		1	12/11/17 23:38	C7L0151	CL71129
Dichlorodifluoromethane	ND (0.0116)		8260B Low		1	12/11/17 23:38	C7L0151	CL71129
Diethyl Ether	ND (0.0058)		8260B Low		1	12/11/17 23:38	C7L0151	CL71129
Di-isopropyl ether	ND (0.0058)		8260B Low		1	12/11/17 23:38	C7L0151	CL71129
Ethyl tertiary-butyl ether	ND (0.0058)		8260B Low		1	12/11/17 23:38	C7L0151	CL71129
Ethylbenzene	ND (0.0058)		8260B Low		1	12/11/17 23:38	C7L0151	CL71129
Hexachlorobutadiene	ND (0.0058)		8260B Low		1	12/11/17 23:38	C7L0151	CL71129
Isopropylbenzene	ND (0.0058)		8260B Low		1	12/11/17 23:38	C7L0151	CL71129
Methyl tert-Butyl Ether	ND (0.0058)		8260B Low		1	12/11/17 23:38	C7L0151	CL71129
Methylene Chloride	ND (0.0290)		8260B Low		1	12/11/17 23:38	C7L0151	CL71129
Naphthalene	ND (0.0058)		8260B Low		1	12/11/17 23:38	C7L0151	CL71129
n-Butylbenzene	ND (0.0058)		8260B Low		1	12/11/17 23:38	C7L0151	CL71129
n-Propylbenzene	ND (0.0058)		8260B Low		1	12/11/17 23:38	C7L0151	CL71129
sec-Butylbenzene	ND (0.0058)		8260B Low		1	12/11/17 23:38	C7L0151	CL71129
Styrene	ND (0.0058)		8260B Low		1	12/11/17 23:38	C7L0151	CL71129
tert-Butylbenzene	ND (0.0058)		8260B Low		1	12/11/17 23:38	C7L0151	CL71129
Tertiary-amyl methyl ether	ND (0.0058)		8260B Low		1	12/11/17 23:38	C7L0151	CL71129
Tetrachloroethene	ND (0.0058)		8260B Low		1	12/11/17 23:38	C7L0151	CL71129
Tetrahydrofuran	ND (0.0058)		8260B Low		1	12/11/17 23:38	C7L0151	CL71129



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-565 0-2ft  
 Date Sampled: 12/08/17 11:00  
 Percent Solids: 83  
 Initial Volume: 5.2  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1712222  
 ESS Laboratory Sample ID: 1712222-05  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0058)		8260B Low		1	12/11/17 23:38	C7L0151	CL71129
trans-1,2-Dichloroethene	ND (0.0058)		8260B Low		1	12/11/17 23:38	C7L0151	CL71129
trans-1,3-Dichloropropene	ND (0.0058)		8260B Low		1	12/11/17 23:38	C7L0151	CL71129
Trichloroethene	ND (0.0058)		8260B Low		1	12/11/17 23:38	C7L0151	CL71129
Trichlorofluoromethane	ND (0.0058)		8260B Low		1	12/11/17 23:38	C7L0151	CL71129
Vinyl Acetate	ND (0.0058)		8260B Low		1	12/11/17 23:38	C7L0151	CL71129
Vinyl Chloride	ND (0.0116)		8260B Low		1	12/11/17 23:38	C7L0151	CL71129
Xylene O	ND (0.0058)		8260B Low		1	12/11/17 23:38	C7L0151	CL71129
Xylene P,M	ND (0.0116)		8260B Low		1	12/11/17 23:38	C7L0151	CL71129
Xylenes (Total)	ND (0.0116)		8260B Low		1	12/11/17 23:38		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	97 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	93 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	97 %		70-130
<i>Surrogate: Toluene-d8</i>	103 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-565 0-2ft  
 Date Sampled: 12/08/17 11:00  
 Percent Solids: 83  
 Initial Volume: 19.1  
 Final Volume: 1  
 Extraction Method: 3546

ESS Laboratory Work Order: 1712222  
 ESS Laboratory Sample ID: 1712222-05  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: SMR  
 Prepared: 12/11/17 13:00

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	234 (44.3)		8100M		1	12/12/17 22:41	C7L0165	CL71116
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		87 %		40-140				





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-565 0-2ft  
Date Sampled: 12/08/17 11:00  
Percent Solids: 83  
Initial Volume: 14.1  
Final Volume: 0.5  
Extraction Method: 3546

ESS Laboratory Work Order: 1712222  
ESS Laboratory Sample ID: 1712222-05  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: TJ  
Prepared: 12/11/17 12:30

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.428)		8270D		1	12/12/17 20:44	C7L0159	CL71118
Acenaphthene	ND (0.428)		8270D		1	12/12/17 20:44	C7L0159	CL71118
Acenaphthylene	<b>0.957</b> (0.428)		8270D		1	12/12/17 20:44	C7L0159	CL71118
Anthracene	<b>0.834</b> (0.428)		8270D		1	12/12/17 20:44	C7L0159	CL71118
Benzo(a)anthracene	<b>1.74</b> (0.428)		8270D		1	12/12/17 20:44	C7L0159	CL71118
Benzo(a)pyrene	<b>0.733</b> (0.215)		8270D		1	12/12/17 20:44	C7L0159	CL71118
Benzo(b)fluoranthene	<b>2.35</b> (0.428)		8270D		1	12/12/17 20:44	C7L0159	CL71118
Benzo(g,h,i)perylene	<b>1.40</b> (0.428)		8270D		1	12/12/17 20:44	C7L0159	CL71118
Benzo(k)fluoranthene	<b>1.50</b> (0.428)		8270D		1	12/12/17 20:44	C7L0159	CL71118
Chrysene	<b>2.55</b> (0.215)		8270D		1	12/12/17 20:44	C7L0159	CL71118
Dibenzo(a,h)Anthracene	<b>0.788</b> (0.215)		8270D		1	12/12/17 20:44	C7L0159	CL71118
Fluoranthene	<b>2.80</b> (0.428)		8270D		1	12/12/17 20:44	C7L0159	CL71118
Fluorene	ND (0.428)		8270D		1	12/12/17 20:44	C7L0159	CL71118
Indeno(1,2,3-cd)Pyrene	<b>1.34</b> (0.428)		8270D		1	12/12/17 20:44	C7L0159	CL71118
Naphthalene	ND (0.428)		8270D		1	12/12/17 20:44	C7L0159	CL71118
Phenanthrene	<b>1.71</b> (0.428)		8270D		1	12/12/17 20:44	C7L0159	CL71118
Pyrene	<b>3.10</b> (0.428)		8270D		1	12/12/17 20:44	C7L0159	CL71118

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	68 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	83 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	83 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	92 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-565 0-2ft  
Date Sampled: 12/08/17 11:00  
Percent Solids: 83

ESS Laboratory Work Order: 1712222  
ESS Laboratory Sample ID: 1712222-05  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	25.5 (1.12)		9014		1	EEM	12/14/17 11:55	mg/kg dry	CL71417



## CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: BD-120817  
 Date Sampled: 12/08/17 00:00  
 Percent Solids: 76

ESS Laboratory Work Order: 1712222  
 ESS Laboratory Sample ID: 1712222-06  
 Sample Matrix: Soil  
 Units: mg/kg dry

Extraction Method: 3050B

### Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (2.57)		6020A		20	NAR	12/13/17 16:14	2.05	100	CL71217
<b>Arsenic</b>	<b>15.7</b> (6.42)		6010C		2	KJK	12/16/17 16:05	2.05	100	CL71217
Beryllium	ND (0.14)		6010C		1	KJK	12/14/17 0:14	2.05	100	CL71217
Cadmium	ND (0.64)		6010C		1	KJK	12/14/17 0:14	2.05	100	CL71217
<b>Chromium</b>	<b>8.52</b> (1.28)		6010C		1	KJK	12/14/17 0:14	2.05	100	CL71217
<b>Copper</b>	<b>35.2</b> (3.21)		6010C		1	KJK	12/16/17 0:16	2.05	100	CL71217
<b>Lead</b>	<b>44.6</b> (6.42)		6010C		1	KJK	12/14/17 0:14	2.05	100	CL71217
<b>Mercury</b>	<b>0.102</b> (0.024)		7471B		1	MJV	12/13/17 12:43	1.1	40	CL71218
<b>Nickel</b>	<b>8.88</b> (3.21)		6010C		1	KJK	12/14/17 0:14	2.05	100	CL71217
Selenium	ND (2.57)		6020A		20	NAR	12/13/17 16:14	2.05	100	CL71217
Silver	ND (0.64)		6010C		1	KJK	12/14/17 0:14	2.05	100	CL71217
Thallium	ND (2.57)		6020A		20	NAR	12/13/17 16:14	2.05	100	CL71217
<b>Zinc</b>	<b>8.62</b> (3.21)		6010C		1	KJK	12/14/17 0:14	2.05	100	CL71217



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: BD-120817  
 Date Sampled: 12/08/17 00:00  
 Percent Solids: 76  
 Initial Volume: 9.9  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1712222  
 ESS Laboratory Sample ID: 1712222-06  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0033)		8260B Low		1	12/11/17 18:10	C7L0151	CL71129
1,1,1-Trichloroethane	ND (0.0033)		8260B Low		1	12/11/17 18:10	C7L0151	CL71129
1,1,2,2-Tetrachloroethane	ND (0.0033)		8260B Low		1	12/11/17 18:10	C7L0151	CL71129
1,1,2-Trichloroethane	ND (0.0033)		8260B Low		1	12/11/17 18:10	C7L0151	CL71129
1,1-Dichloroethane	ND (0.0033)		8260B Low		1	12/11/17 18:10	C7L0151	CL71129
1,1-Dichloroethene	ND (0.0033)		8260B Low		1	12/11/17 18:10	C7L0151	CL71129
1,1-Dichloropropene	ND (0.0033)		8260B Low		1	12/11/17 18:10	C7L0151	CL71129
1,2,3-Trichlorobenzene	ND (0.0033)		8260B Low		1	12/11/17 18:10	C7L0151	CL71129
1,2,3-Trichloropropane	ND (0.0033)		8260B Low		1	12/11/17 18:10	C7L0151	CL71129
1,2,4-Trichlorobenzene	ND (0.0033)		8260B Low		1	12/11/17 18:10	C7L0151	CL71129
1,2,4-Trimethylbenzene	ND (0.0033)		8260B Low		1	12/11/17 18:10	C7L0151	CL71129
1,2-Dibromo-3-Chloropropane	ND (0.0033)		8260B Low		1	12/11/17 18:10	C7L0151	CL71129
1,2-Dibromoethane	ND (0.0033)		8260B Low		1	12/11/17 18:10	C7L0151	CL71129
1,2-Dichlorobenzene	ND (0.0033)		8260B Low		1	12/11/17 18:10	C7L0151	CL71129
1,2-Dichloroethane	ND (0.0033)		8260B Low		1	12/11/17 18:10	C7L0151	CL71129
1,2-Dichloropropane	ND (0.0033)		8260B Low		1	12/11/17 18:10	C7L0151	CL71129
1,3,5-Trimethylbenzene	ND (0.0033)		8260B Low		1	12/11/17 18:10	C7L0151	CL71129
1,3-Dichlorobenzene	ND (0.0033)		8260B Low		1	12/11/17 18:10	C7L0151	CL71129
1,3-Dichloropropane	ND (0.0033)		8260B Low		1	12/11/17 18:10	C7L0151	CL71129
1,4-Dichlorobenzene	ND (0.0033)		8260B Low		1	12/11/17 18:10	C7L0151	CL71129
1,4-Dioxane	ND (0.0664)		8260B Low		1	12/11/17 18:10	C7L0151	CL71129
1-Chlorohexane	ND (0.0033)		8260B Low		1	12/11/17 18:10	C7L0151	CL71129
2,2-Dichloropropane	ND (0.0033)		8260B Low		1	12/11/17 18:10	C7L0151	CL71129
2-Butanone	ND (0.0332)		8260B Low		1	12/11/17 18:10	C7L0151	CL71129
2-Chlorotoluene	ND (0.0033)		8260B Low		1	12/11/17 18:10	C7L0151	CL71129
2-Hexanone	ND (0.0332)		8260B Low		1	12/11/17 18:10	C7L0151	CL71129
4-Chlorotoluene	ND (0.0033)		8260B Low		1	12/11/17 18:10	C7L0151	CL71129
4-Isopropyltoluene	ND (0.0033)		8260B Low		1	12/11/17 18:10	C7L0151	CL71129
4-Methyl-2-Pentanone	ND (0.0332)		8260B Low		1	12/11/17 18:10	C7L0151	CL71129
Acetone	ND (0.0332)		8260B Low		1	12/11/17 18:10	C7L0151	CL71129
Benzene	ND (0.0033)		8260B Low		1	12/11/17 18:10	C7L0151	CL71129
Bromobenzene	ND (0.0033)		8260B Low		1	12/11/17 18:10	C7L0151	CL71129



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: BD-120817  
 Date Sampled: 12/08/17 00:00  
 Percent Solids: 76  
 Initial Volume: 9.9  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1712222  
 ESS Laboratory Sample ID: 1712222-06  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0033)		8260B Low		1	12/11/17 18:10	C7L0151	CL71129
Bromodichloromethane	ND (0.0033)		8260B Low		1	12/11/17 18:10	C7L0151	CL71129
Bromoform	ND (0.0033)		8260B Low		1	12/11/17 18:10	C7L0151	CL71129
Bromomethane	ND (0.0066)		8260B Low		1	12/11/17 18:10	C7L0151	CL71129
Carbon Disulfide	ND (0.0033)		8260B Low		1	12/11/17 18:10	C7L0151	CL71129
Carbon Tetrachloride	ND (0.0033)		8260B Low		1	12/11/17 18:10	C7L0151	CL71129
Chlorobenzene	ND (0.0033)		8260B Low		1	12/11/17 18:10	C7L0151	CL71129
Chloroethane	ND (0.0066)		8260B Low		1	12/11/17 18:10	C7L0151	CL71129
Chloroform	ND (0.0033)		8260B Low		1	12/11/17 18:10	C7L0151	CL71129
Chloromethane	ND (0.0066)		8260B Low		1	12/11/17 18:10	C7L0151	CL71129
cis-1,2-Dichloroethene	ND (0.0033)		8260B Low		1	12/11/17 18:10	C7L0151	CL71129
cis-1,3-Dichloropropene	ND (0.0033)		8260B Low		1	12/11/17 18:10	C7L0151	CL71129
Dibromochloromethane	ND (0.0033)		8260B Low		1	12/11/17 18:10	C7L0151	CL71129
Dibromomethane	ND (0.0033)		8260B Low		1	12/11/17 18:10	C7L0151	CL71129
Dichlorodifluoromethane	ND (0.0066)		8260B Low		1	12/11/17 18:10	C7L0151	CL71129
Diethyl Ether	ND (0.0033)		8260B Low		1	12/11/17 18:10	C7L0151	CL71129
Di-isopropyl ether	ND (0.0033)		8260B Low		1	12/11/17 18:10	C7L0151	CL71129
Ethyl tertiary-butyl ether	ND (0.0033)		8260B Low		1	12/11/17 18:10	C7L0151	CL71129
Ethylbenzene	ND (0.0033)		8260B Low		1	12/11/17 18:10	C7L0151	CL71129
Hexachlorobutadiene	ND (0.0033)		8260B Low		1	12/11/17 18:10	C7L0151	CL71129
Isopropylbenzene	ND (0.0033)		8260B Low		1	12/11/17 18:10	C7L0151	CL71129
Methyl tert-Butyl Ether	ND (0.0033)		8260B Low		1	12/11/17 18:10	C7L0151	CL71129
Methylene Chloride	ND (0.0166)		8260B Low		1	12/11/17 18:10	C7L0151	CL71129
Naphthalene	ND (0.0033)		8260B Low		1	12/11/17 18:10	C7L0151	CL71129
n-Butylbenzene	ND (0.0033)		8260B Low		1	12/11/17 18:10	C7L0151	CL71129
n-Propylbenzene	ND (0.0033)		8260B Low		1	12/11/17 18:10	C7L0151	CL71129
sec-Butylbenzene	ND (0.0033)		8260B Low		1	12/11/17 18:10	C7L0151	CL71129
Styrene	ND (0.0033)		8260B Low		1	12/11/17 18:10	C7L0151	CL71129
tert-Butylbenzene	ND (0.0033)		8260B Low		1	12/11/17 18:10	C7L0151	CL71129
Tertiary-amyl methyl ether	ND (0.0033)		8260B Low		1	12/11/17 18:10	C7L0151	CL71129
Tetrachloroethene	ND (0.0033)		8260B Low		1	12/11/17 18:10	C7L0151	CL71129
Tetrahydrofuran	ND (0.0033)		8260B Low		1	12/11/17 18:10	C7L0151	CL71129



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: BD-120817  
 Date Sampled: 12/08/17 00:00  
 Percent Solids: 76  
 Initial Volume: 9.9  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1712222  
 ESS Laboratory Sample ID: 1712222-06  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0033)		8260B Low		1	12/11/17 18:10	C7L0151	CL71129
trans-1,2-Dichloroethene	ND (0.0033)		8260B Low		1	12/11/17 18:10	C7L0151	CL71129
trans-1,3-Dichloropropene	ND (0.0033)		8260B Low		1	12/11/17 18:10	C7L0151	CL71129
Trichloroethene	ND (0.0033)		8260B Low		1	12/11/17 18:10	C7L0151	CL71129
Trichlorofluoromethane	ND (0.0033)		8260B Low		1	12/11/17 18:10	C7L0151	CL71129
Vinyl Acetate	ND (0.0033)		8260B Low		1	12/11/17 18:10	C7L0151	CL71129
Vinyl Chloride	ND (0.0066)		8260B Low		1	12/11/17 18:10	C7L0151	CL71129
Xylene O	ND (0.0033)		8260B Low		1	12/11/17 18:10	C7L0151	CL71129
Xylene P,M	ND (0.0066)		8260B Low		1	12/11/17 18:10	C7L0151	CL71129
Xylenes (Total)	ND (0.0066)		8260B Low		1	12/11/17 18:10		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	117 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	88 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	112 %		70-130
<i>Surrogate: Toluene-d8</i>	105 %		70-130





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: BD-120817  
 Date Sampled: 12/08/17 00:00  
 Percent Solids: 76  
 Initial Volume: 19.9  
 Final Volume: 1  
 Extraction Method: 3546

ESS Laboratory Work Order: 1712222  
 ESS Laboratory Sample ID: 1712222-06  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: SMR  
 Prepared: 12/11/17 13:00

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	708 (231)		8100M		5	12/13/17 6:58	C7L0165	CL71116
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		93 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: BD-120817  
Date Sampled: 12/08/17 00:00  
Percent Solids: 76  
Initial Volume: 14.8  
Final Volume: 0.5  
Extraction Method: 3546

ESS Laboratory Work Order: 1712222  
ESS Laboratory Sample ID: 1712222-06  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: TJ  
Prepared: 12/11/17 12:30

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	1.57 (0.444)		8270D		1	12/12/17 21:19	C7L0159	CL71118
Acenaphthene	ND (0.444)		8270D		1	12/12/17 21:19	C7L0159	CL71118
Acenaphthylene	4.48 (0.444)		8270D		1	12/12/17 21:19	C7L0159	CL71118
Anthracene	4.44 (0.444)		8270D		1	12/12/17 21:19	C7L0159	CL71118
Benzo(a)anthracene	6.90 (0.444)		8270D		1	12/12/17 21:19	C7L0159	CL71118
Benzo(a)pyrene	2.60 (0.223)		8270D		1	12/12/17 21:19	C7L0159	CL71118
Benzo(b)fluoranthene	7.77 (0.444)		8270D		1	12/12/17 21:19	C7L0159	CL71118
Benzo(g,h,i)perylene	4.99 (0.444)		8270D		1	12/12/17 21:19	C7L0159	CL71118
Benzo(k)fluoranthene	6.78 (0.444)		8270D		1	12/12/17 21:19	C7L0159	CL71118
Chrysene	8.66 (0.223)		8270D		1	12/12/17 21:19	C7L0159	CL71118
Dibenzo(a,h)Anthracene	2.92 (0.223)		8270D		1	12/12/17 21:19	C7L0159	CL71118
Fluoranthene	10.4 (0.444)		8270D		1	12/12/17 21:19	C7L0159	CL71118
Fluorene	ND (0.444)		8270D		1	12/12/17 21:19	C7L0159	CL71118
Indeno(1,2,3-cd)Pyrene	5.13 (0.444)		8270D		1	12/12/17 21:19	C7L0159	CL71118
Naphthalene	2.47 (0.444)		8270D		1	12/12/17 21:19	C7L0159	CL71118
Phenanthrene	5.14 (0.444)		8270D		1	12/12/17 21:19	C7L0159	CL71118
Pyrene	10.6 (0.444)		8270D		1	12/12/17 21:19	C7L0159	CL71118

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	77 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	91 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	91 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	84 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: BD-120817  
Date Sampled: 12/08/17 00:00  
Percent Solids: 76

ESS Laboratory Work Order: 1712222  
ESS Laboratory Sample ID: 1712222-06  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	69.3 (12.1)		9014		10	EEM	12/14/17 11:55	mg/kg dry	CL71417



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-566 0-2ft  
Date Sampled: 12/08/17 11:45  
Percent Solids: 73

ESS Laboratory Work Order: 1712222  
ESS Laboratory Sample ID: 1712222-07  
Sample Matrix: Soil  
Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (2.42)		6020A		20	NAR	12/13/17 16:20	2.28	100	CL71217
<b>Arsenic</b>	<b>11.9</b> (6.04)		6010C		2	KJK	12/16/17 16:09	2.28	100	CL71217
<b>Beryllium</b>	<b>0.37</b> (0.13)		6010C		1	KJK	12/14/17 0:18	2.28	100	CL71217
Cadmium	ND (0.60)		6010C		1	KJK	12/14/17 0:18	2.28	100	CL71217
<b>Chromium</b>	<b>8.55</b> (1.21)		6010C		1	KJK	12/14/17 0:18	2.28	100	CL71217
<b>Copper</b>	<b>58.1</b> (3.02)		6010C		1	KJK	12/16/17 0:20	2.28	100	CL71217
<b>Lead</b>	<b>486</b> (6.04)		6010C		1	KJK	12/14/17 0:18	2.28	100	CL71217
<b>Mercury</b>	<b>0.453</b> (0.042)		7471B		1	MJV	12/13/17 12:45	0.65	40	CL71218
<b>Nickel</b>	<b>7.69</b> (3.02)		6010C		1	KJK	12/14/17 0:18	2.28	100	CL71217
Selenium	ND (2.42)		6020A		20	NAR	12/13/17 16:20	2.28	100	CL71217
Silver	ND (0.60)		6010C		1	KJK	12/14/17 0:18	2.28	100	CL71217
Thallium	ND (2.42)		6020A		20	NAR	12/13/17 16:20	2.28	100	CL71217
<b>Zinc</b>	<b>69.5</b> (3.02)		6010C		1	KJK	12/14/17 0:18	2.28	100	CL71217



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-566 0-2ft  
 Date Sampled: 12/08/17 11:45  
 Percent Solids: 73  
 Initial Volume: 5  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1712222  
 ESS Laboratory Sample ID: 1712222-07  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0069)		8260B Low		1	12/11/17 18:35	C7L0151	CL71129
1,1,1-Trichloroethane	ND (0.0069)		8260B Low		1	12/11/17 18:35	C7L0151	CL71129
1,1,2,2-Tetrachloroethane	ND (0.0069)		8260B Low		1	12/11/17 18:35	C7L0151	CL71129
1,1,2-Trichloroethane	ND (0.0069)		8260B Low		1	12/11/17 18:35	C7L0151	CL71129
1,1-Dichloroethane	ND (0.0069)		8260B Low		1	12/11/17 18:35	C7L0151	CL71129
1,1-Dichloroethene	ND (0.0069)		8260B Low		1	12/11/17 18:35	C7L0151	CL71129
1,1-Dichloropropene	ND (0.0069)		8260B Low		1	12/11/17 18:35	C7L0151	CL71129
1,2,3-Trichlorobenzene	ND (0.0069)		8260B Low		1	12/11/17 18:35	C7L0151	CL71129
1,2,3-Trichloropropane	ND (0.0069)		8260B Low		1	12/11/17 18:35	C7L0151	CL71129
1,2,4-Trichlorobenzene	ND (0.0069)		8260B Low		1	12/11/17 18:35	C7L0151	CL71129
1,2,4-Trimethylbenzene	ND (0.0069)		8260B Low		1	12/11/17 18:35	C7L0151	CL71129
1,2-Dibromo-3-Chloropropane	ND (0.0069)		8260B Low		1	12/11/17 18:35	C7L0151	CL71129
1,2-Dibromoethane	ND (0.0069)		8260B Low		1	12/11/17 18:35	C7L0151	CL71129
1,2-Dichlorobenzene	ND (0.0069)		8260B Low		1	12/11/17 18:35	C7L0151	CL71129
1,2-Dichloroethane	ND (0.0069)		8260B Low		1	12/11/17 18:35	C7L0151	CL71129
1,2-Dichloropropane	ND (0.0069)		8260B Low		1	12/11/17 18:35	C7L0151	CL71129
1,3,5-Trimethylbenzene	ND (0.0069)		8260B Low		1	12/11/17 18:35	C7L0151	CL71129
1,3-Dichlorobenzene	ND (0.0069)		8260B Low		1	12/11/17 18:35	C7L0151	CL71129
1,3-Dichloropropane	ND (0.0069)		8260B Low		1	12/11/17 18:35	C7L0151	CL71129
1,4-Dichlorobenzene	ND (0.0069)		8260B Low		1	12/11/17 18:35	C7L0151	CL71129
1,4-Dioxane	ND (0.138)		8260B Low		1	12/11/17 18:35	C7L0151	CL71129
1-Chlorohexane	ND (0.0069)		8260B Low		1	12/11/17 18:35	C7L0151	CL71129
2,2-Dichloropropane	ND (0.0069)		8260B Low		1	12/11/17 18:35	C7L0151	CL71129
2-Butanone	ND (0.0689)		8260B Low		1	12/11/17 18:35	C7L0151	CL71129
2-Chlorotoluene	ND (0.0069)		8260B Low		1	12/11/17 18:35	C7L0151	CL71129
2-Hexanone	ND (0.0689)		8260B Low		1	12/11/17 18:35	C7L0151	CL71129
4-Chlorotoluene	ND (0.0069)		8260B Low		1	12/11/17 18:35	C7L0151	CL71129
4-Isopropyltoluene	ND (0.0069)		8260B Low		1	12/11/17 18:35	C7L0151	CL71129
4-Methyl-2-Pentanone	ND (0.0689)		8260B Low		1	12/11/17 18:35	C7L0151	CL71129
Acetone	ND (0.0689)		8260B Low		1	12/11/17 18:35	C7L0151	CL71129
Benzene	ND (0.0069)		8260B Low		1	12/11/17 18:35	C7L0151	CL71129
Bromobenzene	ND (0.0069)		8260B Low		1	12/11/17 18:35	C7L0151	CL71129



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-566 0-2ft  
 Date Sampled: 12/08/17 11:45  
 Percent Solids: 73  
 Initial Volume: 5  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1712222  
 ESS Laboratory Sample ID: 1712222-07  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0069)		8260B Low		1	12/11/17 18:35	C7L0151	CL71129
Bromodichloromethane	ND (0.0069)		8260B Low		1	12/11/17 18:35	C7L0151	CL71129
Bromoform	ND (0.0069)		8260B Low		1	12/11/17 18:35	C7L0151	CL71129
Bromomethane	ND (0.0138)		8260B Low		1	12/11/17 18:35	C7L0151	CL71129
Carbon Disulfide	ND (0.0069)		8260B Low		1	12/11/17 18:35	C7L0151	CL71129
Carbon Tetrachloride	ND (0.0069)		8260B Low		1	12/11/17 18:35	C7L0151	CL71129
Chlorobenzene	ND (0.0069)		8260B Low		1	12/11/17 18:35	C7L0151	CL71129
Chloroethane	ND (0.0138)		8260B Low		1	12/11/17 18:35	C7L0151	CL71129
Chloroform	ND (0.0069)		8260B Low		1	12/11/17 18:35	C7L0151	CL71129
Chloromethane	ND (0.0138)		8260B Low		1	12/11/17 18:35	C7L0151	CL71129
cis-1,2-Dichloroethene	ND (0.0069)		8260B Low		1	12/11/17 18:35	C7L0151	CL71129
cis-1,3-Dichloropropene	ND (0.0069)		8260B Low		1	12/11/17 18:35	C7L0151	CL71129
Dibromochloromethane	ND (0.0069)		8260B Low		1	12/11/17 18:35	C7L0151	CL71129
Dibromomethane	ND (0.0069)		8260B Low		1	12/11/17 18:35	C7L0151	CL71129
Dichlorodifluoromethane	ND (0.0138)		8260B Low		1	12/11/17 18:35	C7L0151	CL71129
Diethyl Ether	ND (0.0069)		8260B Low		1	12/11/17 18:35	C7L0151	CL71129
Di-isopropyl ether	ND (0.0069)		8260B Low		1	12/11/17 18:35	C7L0151	CL71129
Ethyl tertiary-butyl ether	ND (0.0069)		8260B Low		1	12/11/17 18:35	C7L0151	CL71129
Ethylbenzene	ND (0.0069)		8260B Low		1	12/11/17 18:35	C7L0151	CL71129
Hexachlorobutadiene	ND (0.0069)		8260B Low		1	12/11/17 18:35	C7L0151	CL71129
Isopropylbenzene	ND (0.0069)		8260B Low		1	12/11/17 18:35	C7L0151	CL71129
Methyl tert-Butyl Ether	ND (0.0069)		8260B Low		1	12/11/17 18:35	C7L0151	CL71129
Methylene Chloride	ND (0.0344)		8260B Low		1	12/11/17 18:35	C7L0151	CL71129
Naphthalene	ND (0.0069)		8260B Low		1	12/11/17 18:35	C7L0151	CL71129
n-Butylbenzene	ND (0.0069)		8260B Low		1	12/11/17 18:35	C7L0151	CL71129
n-Propylbenzene	ND (0.0069)		8260B Low		1	12/11/17 18:35	C7L0151	CL71129
sec-Butylbenzene	ND (0.0069)		8260B Low		1	12/11/17 18:35	C7L0151	CL71129
Styrene	ND (0.0069)		8260B Low		1	12/11/17 18:35	C7L0151	CL71129
tert-Butylbenzene	ND (0.0069)		8260B Low		1	12/11/17 18:35	C7L0151	CL71129
Tertiary-amyl methyl ether	ND (0.0069)		8260B Low		1	12/11/17 18:35	C7L0151	CL71129
Tetrachloroethene	ND (0.0069)		8260B Low		1	12/11/17 18:35	C7L0151	CL71129
Tetrahydrofuran	ND (0.0069)		8260B Low		1	12/11/17 18:35	C7L0151	CL71129





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-566 0-2ft  
 Date Sampled: 12/08/17 11:45  
 Percent Solids: 73  
 Initial Volume: 5  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1712222  
 ESS Laboratory Sample ID: 1712222-07  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0069)		8260B Low		1	12/11/17 18:35	C7L0151	CL71129
trans-1,2-Dichloroethene	ND (0.0069)		8260B Low		1	12/11/17 18:35	C7L0151	CL71129
trans-1,3-Dichloropropene	ND (0.0069)		8260B Low		1	12/11/17 18:35	C7L0151	CL71129
Trichloroethene	ND (0.0069)		8260B Low		1	12/11/17 18:35	C7L0151	CL71129
Trichlorofluoromethane	ND (0.0069)		8260B Low		1	12/11/17 18:35	C7L0151	CL71129
Vinyl Acetate	ND (0.0069)		8260B Low		1	12/11/17 18:35	C7L0151	CL71129
Vinyl Chloride	ND (0.0138)		8260B Low		1	12/11/17 18:35	C7L0151	CL71129
Xylene O	ND (0.0069)		8260B Low		1	12/11/17 18:35	C7L0151	CL71129
Xylene P,M	ND (0.0138)		8260B Low		1	12/11/17 18:35	C7L0151	CL71129
Xylenes (Total)	ND (0.0138)		8260B Low		1	12/11/17 18:35		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	120 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	93 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	113 %		70-130
<i>Surrogate: Toluene-d8</i>	102 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-566 0-2ft  
 Date Sampled: 12/08/17 11:45  
 Percent Solids: 73  
 Initial Volume: 19.5  
 Final Volume: 1  
 Extraction Method: 3546

ESS Laboratory Work Order: 1712222  
 ESS Laboratory Sample ID: 1712222-07  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: SMR  
 Prepared: 12/11/17 13:00

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	4920 (495)		8100M		10	12/13/17 7:34	C7L0165	CL71116
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		132 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-566 0-2ft  
Date Sampled: 12/08/17 11:45  
Percent Solids: 73  
Initial Volume: 14  
Final Volume: 0.5  
Extraction Method: 3546

ESS Laboratory Work Order: 1712222  
ESS Laboratory Sample ID: 1712222-07  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: TJ  
Prepared: 12/11/17 12:30

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	6.52 (0.492)		8270D		1	12/12/17 21:55	C7L0159	CL71118
Acenaphthene	2.71 (0.492)		8270D		1	12/12/17 21:55	C7L0159	CL71118
Acenaphthylene	40.6 (4.92)		8270D		10	12/13/17 17:13	C7L0159	CL71118
Anthracene	25.6 (4.92)		8270D		10	12/13/17 17:13	C7L0159	CL71118
Benzo(a)anthracene	74.5 (4.92)		8270D		10	12/13/17 17:13	C7L0159	CL71118
Benzo(a)pyrene	43.7 (2.47)		8270D		10	12/13/17 17:13	C7L0159	CL71118
Benzo(b)fluoranthene	31.6 (4.92)		8270D		10	12/13/17 17:13	C7L0159	CL71118
Benzo(g,h,i)perylene	11.5 (0.492)		8270D		1	12/12/17 21:55	C7L0159	CL71118
Benzo(k)fluoranthene	33.4 (4.92)		8270D		10	12/13/17 17:13	C7L0159	CL71118
Chrysene	61.7 (2.47)		8270D		10	12/13/17 17:13	C7L0159	CL71118
Dibenzo(a,h)Anthracene	8.75 (0.247)		8270D		1	12/12/17 21:55	C7L0159	CL71118
Fluoranthene	110 (4.92)		8270D		10	12/13/17 17:13	C7L0159	CL71118
Fluorene	3.26 (0.492)		8270D		1	12/12/17 21:55	C7L0159	CL71118
Indeno(1,2,3-cd)Pyrene	12.2 (0.492)		8270D		1	12/12/17 21:55	C7L0159	CL71118
Naphthalene	10.8 (0.492)		8270D		1	12/12/17 21:55	C7L0159	CL71118
Phenanthrene	47.9 (4.92)		8270D		10	12/13/17 17:13	C7L0159	CL71118
Pyrene	161 (49.2)		8270D		100	12/13/17 17:48	C7L0159	CL71118

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	74 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	85 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	91 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	60 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-566 0-2ft  
Date Sampled: 12/08/17 11:45  
Percent Solids: 73

ESS Laboratory Work Order: 1712222  
ESS Laboratory Sample ID: 1712222-07  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	10.1 (1.32)		9014		1	EEM	12/14/17 11:55	mg/kg dry	CL71417



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-567 0-2ft  
Date Sampled: 12/08/17 12:00  
Percent Solids: 90

ESS Laboratory Work Order: 1712222  
ESS Laboratory Sample ID: 1712222-08  
Sample Matrix: Soil  
Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (1.84)		6020A		20	NAR	12/13/17 16:26	2.41	100	CL71217
Arsenic	ND (4.61)		6010C		2	KJK	12/16/17 16:13	2.41	100	CL71217
<b>Beryllium</b>	<b>0.25</b> (0.10)		6010C		1	KJK	12/14/17 0:22	2.41	100	CL71217
<b>Cadmium</b>	<b>0.56</b> (0.46)		6010C		1	KJK	12/14/17 0:22	2.41	100	CL71217
<b>Chromium</b>	<b>5.67</b> (0.92)		6010C		1	KJK	12/14/17 0:22	2.41	100	CL71217
<b>Copper</b>	<b>25.3</b> (2.30)		6010C		1	KJK	12/16/17 0:24	2.41	100	CL71217
<b>Lead</b>	<b>101</b> (4.61)		6010C		1	KJK	12/14/17 0:22	2.41	100	CL71217
<b>Mercury</b>	<b>0.180</b> (0.030)		7471B		1	MJV	12/13/17 12:47	0.74	40	CL71218
<b>Nickel</b>	<b>7.66</b> (2.30)		6010C		1	KJK	12/14/17 0:22	2.41	100	CL71217
Selenium	ND (1.84)		6020A		20	NAR	12/13/17 16:26	2.41	100	CL71217
Silver	ND (0.46)		6010C		1	KJK	12/14/17 0:22	2.41	100	CL71217
Thallium	ND (1.84)		6020A		20	NAR	12/13/17 16:26	2.41	100	CL71217
<b>Zinc</b>	<b>74.3</b> (2.30)		6010C		1	KJK	12/14/17 0:22	2.41	100	CL71217



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-567 0-2ft  
 Date Sampled: 12/08/17 12:00  
 Percent Solids: 90  
 Initial Volume: 8  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1712222  
 ESS Laboratory Sample ID: 1712222-08  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0035)		8260B Low		1	12/11/17 19:00	C7L0151	CL71129
1,1,1-Trichloroethane	ND (0.0035)		8260B Low		1	12/11/17 19:00	C7L0151	CL71129
1,1,2,2-Tetrachloroethane	ND (0.0035)		8260B Low		1	12/11/17 19:00	C7L0151	CL71129
1,1,2-Trichloroethane	ND (0.0035)		8260B Low		1	12/11/17 19:00	C7L0151	CL71129
1,1-Dichloroethane	ND (0.0035)		8260B Low		1	12/11/17 19:00	C7L0151	CL71129
1,1-Dichloroethene	ND (0.0035)		8260B Low		1	12/11/17 19:00	C7L0151	CL71129
1,1-Dichloropropene	ND (0.0035)		8260B Low		1	12/11/17 19:00	C7L0151	CL71129
1,2,3-Trichlorobenzene	ND (0.0035)		8260B Low		1	12/11/17 19:00	C7L0151	CL71129
1,2,3-Trichloropropane	ND (0.0035)		8260B Low		1	12/11/17 19:00	C7L0151	CL71129
1,2,4-Trichlorobenzene	ND (0.0035)		8260B Low		1	12/11/17 19:00	C7L0151	CL71129
1,2,4-Trimethylbenzene	ND (0.0035)		8260B Low		1	12/11/17 19:00	C7L0151	CL71129
1,2-Dibromo-3-Chloropropane	ND (0.0035)		8260B Low		1	12/11/17 19:00	C7L0151	CL71129
1,2-Dibromoethane	ND (0.0035)		8260B Low		1	12/11/17 19:00	C7L0151	CL71129
1,2-Dichlorobenzene	ND (0.0035)		8260B Low		1	12/11/17 19:00	C7L0151	CL71129
1,2-Dichloroethane	ND (0.0035)		8260B Low		1	12/11/17 19:00	C7L0151	CL71129
1,2-Dichloropropane	ND (0.0035)		8260B Low		1	12/11/17 19:00	C7L0151	CL71129
1,3,5-Trimethylbenzene	ND (0.0035)		8260B Low		1	12/11/17 19:00	C7L0151	CL71129
1,3-Dichlorobenzene	ND (0.0035)		8260B Low		1	12/11/17 19:00	C7L0151	CL71129
1,3-Dichloropropane	ND (0.0035)		8260B Low		1	12/11/17 19:00	C7L0151	CL71129
1,4-Dichlorobenzene	ND (0.0035)		8260B Low		1	12/11/17 19:00	C7L0151	CL71129
1,4-Dioxane	ND (0.0694)		8260B Low		1	12/11/17 19:00	C7L0151	CL71129
1-Chlorohexane	ND (0.0035)		8260B Low		1	12/11/17 19:00	C7L0151	CL71129
2,2-Dichloropropane	ND (0.0035)		8260B Low		1	12/11/17 19:00	C7L0151	CL71129
2-Butanone	ND (0.0347)		8260B Low		1	12/11/17 19:00	C7L0151	CL71129
2-Chlorotoluene	ND (0.0035)		8260B Low		1	12/11/17 19:00	C7L0151	CL71129
2-Hexanone	ND (0.0347)		8260B Low		1	12/11/17 19:00	C7L0151	CL71129
4-Chlorotoluene	ND (0.0035)		8260B Low		1	12/11/17 19:00	C7L0151	CL71129
4-Isopropyltoluene	ND (0.0035)		8260B Low		1	12/11/17 19:00	C7L0151	CL71129
4-Methyl-2-Pentanone	ND (0.0347)		8260B Low		1	12/11/17 19:00	C7L0151	CL71129
Acetone	ND (0.0347)		8260B Low		1	12/11/17 19:00	C7L0151	CL71129
Benzene	ND (0.0035)		8260B Low		1	12/11/17 19:00	C7L0151	CL71129
Bromobenzene	ND (0.0035)		8260B Low		1	12/11/17 19:00	C7L0151	CL71129





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-567 0-2ft  
 Date Sampled: 12/08/17 12:00  
 Percent Solids: 90  
 Initial Volume: 8  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1712222  
 ESS Laboratory Sample ID: 1712222-08  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0035)		8260B Low		1	12/11/17 19:00	C7L0151	CL71129
Bromodichloromethane	ND (0.0035)		8260B Low		1	12/11/17 19:00	C7L0151	CL71129
Bromoform	ND (0.0035)		8260B Low		1	12/11/17 19:00	C7L0151	CL71129
Bromomethane	ND (0.0069)		8260B Low		1	12/11/17 19:00	C7L0151	CL71129
Carbon Disulfide	ND (0.0035)		8260B Low		1	12/11/17 19:00	C7L0151	CL71129
Carbon Tetrachloride	ND (0.0035)		8260B Low		1	12/11/17 19:00	C7L0151	CL71129
Chlorobenzene	ND (0.0035)		8260B Low		1	12/11/17 19:00	C7L0151	CL71129
Chloroethane	ND (0.0069)		8260B Low		1	12/11/17 19:00	C7L0151	CL71129
Chloroform	ND (0.0035)		8260B Low		1	12/11/17 19:00	C7L0151	CL71129
Chloromethane	ND (0.0069)		8260B Low		1	12/11/17 19:00	C7L0151	CL71129
cis-1,2-Dichloroethene	ND (0.0035)		8260B Low		1	12/11/17 19:00	C7L0151	CL71129
cis-1,3-Dichloropropene	ND (0.0035)		8260B Low		1	12/11/17 19:00	C7L0151	CL71129
Dibromochloromethane	ND (0.0035)		8260B Low		1	12/11/17 19:00	C7L0151	CL71129
Dibromomethane	ND (0.0035)		8260B Low		1	12/11/17 19:00	C7L0151	CL71129
Dichlorodifluoromethane	ND (0.0069)		8260B Low		1	12/11/17 19:00	C7L0151	CL71129
Diethyl Ether	ND (0.0035)		8260B Low		1	12/11/17 19:00	C7L0151	CL71129
Di-isopropyl ether	ND (0.0035)		8260B Low		1	12/11/17 19:00	C7L0151	CL71129
Ethyl tertiary-butyl ether	ND (0.0035)		8260B Low		1	12/11/17 19:00	C7L0151	CL71129
Ethylbenzene	ND (0.0035)		8260B Low		1	12/11/17 19:00	C7L0151	CL71129
Hexachlorobutadiene	ND (0.0035)		8260B Low		1	12/11/17 19:00	C7L0151	CL71129
Isopropylbenzene	ND (0.0035)		8260B Low		1	12/11/17 19:00	C7L0151	CL71129
Methyl tert-Butyl Ether	ND (0.0035)		8260B Low		1	12/11/17 19:00	C7L0151	CL71129
Methylene Chloride	ND (0.0173)		8260B Low		1	12/11/17 19:00	C7L0151	CL71129
Naphthalene	ND (0.0035)		8260B Low		1	12/11/17 19:00	C7L0151	CL71129
n-Butylbenzene	ND (0.0035)		8260B Low		1	12/11/17 19:00	C7L0151	CL71129
n-Propylbenzene	ND (0.0035)		8260B Low		1	12/11/17 19:00	C7L0151	CL71129
sec-Butylbenzene	ND (0.0035)		8260B Low		1	12/11/17 19:00	C7L0151	CL71129
Styrene	ND (0.0035)		8260B Low		1	12/11/17 19:00	C7L0151	CL71129
tert-Butylbenzene	ND (0.0035)		8260B Low		1	12/11/17 19:00	C7L0151	CL71129
Tertiary-amyl methyl ether	ND (0.0035)		8260B Low		1	12/11/17 19:00	C7L0151	CL71129
Tetrachloroethene	ND (0.0035)		8260B Low		1	12/11/17 19:00	C7L0151	CL71129
Tetrahydrofuran	ND (0.0035)		8260B Low		1	12/11/17 19:00	C7L0151	CL71129



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-567 0-2ft  
 Date Sampled: 12/08/17 12:00  
 Percent Solids: 90  
 Initial Volume: 8  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1712222  
 ESS Laboratory Sample ID: 1712222-08  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0035)		8260B Low		1	12/11/17 19:00	C7L0151	CL71129
trans-1,2-Dichloroethene	ND (0.0035)		8260B Low		1	12/11/17 19:00	C7L0151	CL71129
trans-1,3-Dichloropropene	ND (0.0035)		8260B Low		1	12/11/17 19:00	C7L0151	CL71129
Trichloroethene	ND (0.0035)		8260B Low		1	12/11/17 19:00	C7L0151	CL71129
Trichlorofluoromethane	ND (0.0035)		8260B Low		1	12/11/17 19:00	C7L0151	CL71129
Vinyl Acetate	ND (0.0035)		8260B Low		1	12/11/17 19:00	C7L0151	CL71129
Vinyl Chloride	ND (0.0069)		8260B Low		1	12/11/17 19:00	C7L0151	CL71129
Xylene O	ND (0.0035)		8260B Low		1	12/11/17 19:00	C7L0151	CL71129
Xylene P,M	ND (0.0069)		8260B Low		1	12/11/17 19:00	C7L0151	CL71129
Xylenes (Total)	ND (0.0069)		8260B Low		1	12/11/17 19:00		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	118 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	95 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	112 %		70-130
<i>Surrogate: Toluene-d8</i>	100 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-567 0-2ft  
 Date Sampled: 12/08/17 12:00  
 Percent Solids: 90  
 Initial Volume: 20.6  
 Final Volume: 1  
 Extraction Method: 3546

ESS Laboratory Work Order: 1712222  
 ESS Laboratory Sample ID: 1712222-08  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: SMR  
 Prepared: 12/11/17 13:00

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	192 (189)		8100M		5	12/13/17 8:09	C7L0165	CL71116
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		95 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-567 0-2ft  
Date Sampled: 12/08/17 12:00  
Percent Solids: 90  
Initial Volume: 14.9  
Final Volume: 0.5  
Extraction Method: 3546

ESS Laboratory Work Order: 1712222  
ESS Laboratory Sample ID: 1712222-08  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: TJ  
Prepared: 12/11/17 12:30

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.372)		8270D		1	12/12/17 22:30	C7L0159	CL71118
Acenaphthene	ND (0.372)		8270D		1	12/12/17 22:30	C7L0159	CL71118
Acenaphthylene	<b>0.695</b> (0.372)		8270D		1	12/12/17 22:30	C7L0159	CL71118
Anthracene	<b>0.551</b> (0.372)		8270D		1	12/12/17 22:30	C7L0159	CL71118
Benzo(a)anthracene	<b>2.03</b> (0.372)		8270D		1	12/12/17 22:30	C7L0159	CL71118
Benzo(a)pyrene	<b>1.93</b> (0.187)		8270D		1	12/12/17 22:30	C7L0159	CL71118
Benzo(b)fluoranthene	<b>1.87</b> (0.372)		8270D		1	12/12/17 22:30	C7L0159	CL71118
Benzo(g,h,i)perylene	<b>1.28</b> (0.372)		8270D		1	12/12/17 22:30	C7L0159	CL71118
Benzo(k)fluoranthene	<b>1.25</b> (0.372)		8270D		1	12/12/17 22:30	C7L0159	CL71118
Chrysene	<b>1.91</b> (0.187)		8270D		1	12/12/17 22:30	C7L0159	CL71118
Dibenzo(a,h)Anthracene	<b>0.711</b> (0.187)		8270D		1	12/12/17 22:30	C7L0159	CL71118
Fluoranthene	<b>2.95</b> (0.372)		8270D		1	12/12/17 22:30	C7L0159	CL71118
Fluorene	ND (0.372)		8270D		1	12/12/17 22:30	C7L0159	CL71118
Indeno(1,2,3-cd)Pyrene	<b>1.20</b> (0.372)		8270D		1	12/12/17 22:30	C7L0159	CL71118
Naphthalene	ND (0.372)		8270D		1	12/12/17 22:30	C7L0159	CL71118
Phenanthrene	<b>1.09</b> (0.372)		8270D		1	12/12/17 22:30	C7L0159	CL71118
Pyrene	<b>2.71</b> (0.372)		8270D		1	12/12/17 22:30	C7L0159	CL71118

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	68 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	84 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	84 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	80 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-567 0-2ft  
Date Sampled: 12/08/17 12:00  
Percent Solids: 90

ESS Laboratory Work Order: 1712222  
ESS Laboratory Sample ID: 1712222-08  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	ND (1.02)		9014		1	EEM	12/14/17 11:55	mg/kg dry	CL71417



## CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-568 0-2ft  
 Date Sampled: 12/08/17 12:30  
 Percent Solids: 89

ESS Laboratory Work Order: 1712222  
 ESS Laboratory Sample ID: 1712222-09  
 Sample Matrix: Soil  
 Units: mg/kg dry

Extraction Method: 3050B

### Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (1.75)		6020A		20	NAR	12/13/17 16:31	2.58	100	CL71217
Arsenic	<b>4.30</b> (2.18)		6010C		1	KJK	12/16/17 16:17	2.58	100	CL71217
Beryllium	<b>0.25</b> (0.10)		6010C		1	KJK	12/14/17 0:26	2.58	100	CL71217
Cadmium	ND (0.44)		6010C		1	KJK	12/14/17 0:26	2.58	100	CL71217
Chromium	<b>9.47</b> (0.87)		6010C		1	KJK	12/14/17 0:26	2.58	100	CL71217
Copper	<b>20.2</b> (2.18)		6010C		1	KJK	12/16/17 0:28	2.58	100	CL71217
Lead	<b>89.0</b> (4.37)		6010C		1	KJK	12/14/17 0:26	2.58	100	CL71217
Mercury	<b>0.072</b> (0.036)		7471B		1	MJV	12/13/17 12:49	0.62	40	CL71218
Nickel	<b>9.53</b> (2.18)		6010C		1	KJK	12/14/17 0:26	2.58	100	CL71217
Selenium	ND (1.75)		6020A		20	NAR	12/13/17 16:31	2.58	100	CL71217
Silver	ND (0.44)		6010C		1	KJK	12/14/17 0:26	2.58	100	CL71217
Thallium	ND (1.75)		6020A		20	NAR	12/13/17 16:31	2.58	100	CL71217
Zinc	<b>64.3</b> (2.18)		6010C		1	KJK	12/14/17 0:26	2.58	100	CL71217





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-568 0-2ft  
 Date Sampled: 12/08/17 12:30  
 Percent Solids: 89  
 Initial Volume: 8.7  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1712222  
 ESS Laboratory Sample ID: 1712222-09  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0032)		8260B Low		1	12/11/17 19:25	C7L0151	CL71129
1,1,1-Trichloroethane	ND (0.0032)		8260B Low		1	12/11/17 19:25	C7L0151	CL71129
1,1,2,2-Tetrachloroethane	ND (0.0032)		8260B Low		1	12/11/17 19:25	C7L0151	CL71129
1,1,2-Trichloroethane	ND (0.0032)		8260B Low		1	12/11/17 19:25	C7L0151	CL71129
1,1-Dichloroethane	ND (0.0032)		8260B Low		1	12/11/17 19:25	C7L0151	CL71129
1,1-Dichloroethene	ND (0.0032)		8260B Low		1	12/11/17 19:25	C7L0151	CL71129
1,1-Dichloropropene	ND (0.0032)		8260B Low		1	12/11/17 19:25	C7L0151	CL71129
1,2,3-Trichlorobenzene	ND (0.0032)		8260B Low		1	12/11/17 19:25	C7L0151	CL71129
1,2,3-Trichloropropane	ND (0.0032)		8260B Low		1	12/11/17 19:25	C7L0151	CL71129
1,2,4-Trichlorobenzene	ND (0.0032)		8260B Low		1	12/11/17 19:25	C7L0151	CL71129
1,2,4-Trimethylbenzene	ND (0.0032)		8260B Low		1	12/11/17 19:25	C7L0151	CL71129
1,2-Dibromo-3-Chloropropane	ND (0.0032)		8260B Low		1	12/11/17 19:25	C7L0151	CL71129
1,2-Dibromoethane	ND (0.0032)		8260B Low		1	12/11/17 19:25	C7L0151	CL71129
1,2-Dichlorobenzene	ND (0.0032)		8260B Low		1	12/11/17 19:25	C7L0151	CL71129
1,2-Dichloroethane	ND (0.0032)		8260B Low		1	12/11/17 19:25	C7L0151	CL71129
1,2-Dichloropropane	ND (0.0032)		8260B Low		1	12/11/17 19:25	C7L0151	CL71129
1,3,5-Trimethylbenzene	ND (0.0032)		8260B Low		1	12/11/17 19:25	C7L0151	CL71129
1,3-Dichlorobenzene	ND (0.0032)		8260B Low		1	12/11/17 19:25	C7L0151	CL71129
1,3-Dichloropropane	ND (0.0032)		8260B Low		1	12/11/17 19:25	C7L0151	CL71129
1,4-Dichlorobenzene	ND (0.0032)		8260B Low		1	12/11/17 19:25	C7L0151	CL71129
1,4-Dioxane	ND (0.0648)		8260B Low		1	12/11/17 19:25	C7L0151	CL71129
1-Chlorohexane	ND (0.0032)		8260B Low		1	12/11/17 19:25	C7L0151	CL71129
2,2-Dichloropropane	ND (0.0032)		8260B Low		1	12/11/17 19:25	C7L0151	CL71129
2-Butanone	ND (0.0324)		8260B Low		1	12/11/17 19:25	C7L0151	CL71129
2-Chlorotoluene	ND (0.0032)		8260B Low		1	12/11/17 19:25	C7L0151	CL71129
2-Hexanone	ND (0.0324)		8260B Low		1	12/11/17 19:25	C7L0151	CL71129
4-Chlorotoluene	ND (0.0032)		8260B Low		1	12/11/17 19:25	C7L0151	CL71129
4-Isopropyltoluene	ND (0.0032)		8260B Low		1	12/11/17 19:25	C7L0151	CL71129
4-Methyl-2-Pentanone	ND (0.0324)		8260B Low		1	12/11/17 19:25	C7L0151	CL71129
Acetone	ND (0.0324)		8260B Low		1	12/11/17 19:25	C7L0151	CL71129
Benzene	ND (0.0032)		8260B Low		1	12/11/17 19:25	C7L0151	CL71129
Bromobenzene	ND (0.0032)		8260B Low		1	12/11/17 19:25	C7L0151	CL71129



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-568 0-2ft  
Date Sampled: 12/08/17 12:30  
Percent Solids: 89  
Initial Volume: 8.7  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1712222  
ESS Laboratory Sample ID: 1712222-09  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0032)		8260B Low		1	12/11/17 19:25	C7L0151	CL71129
Bromodichloromethane	ND (0.0032)		8260B Low		1	12/11/17 19:25	C7L0151	CL71129
Bromoform	ND (0.0032)		8260B Low		1	12/11/17 19:25	C7L0151	CL71129
Bromomethane	ND (0.0065)		8260B Low		1	12/11/17 19:25	C7L0151	CL71129
Carbon Disulfide	ND (0.0032)		8260B Low		1	12/11/17 19:25	C7L0151	CL71129
Carbon Tetrachloride	ND (0.0032)		8260B Low		1	12/11/17 19:25	C7L0151	CL71129
Chlorobenzene	ND (0.0032)		8260B Low		1	12/11/17 19:25	C7L0151	CL71129
Chloroethane	ND (0.0065)		8260B Low		1	12/11/17 19:25	C7L0151	CL71129
Chloroform	ND (0.0032)		8260B Low		1	12/11/17 19:25	C7L0151	CL71129
Chloromethane	ND (0.0065)		8260B Low		1	12/11/17 19:25	C7L0151	CL71129
cis-1,2-Dichloroethene	ND (0.0032)		8260B Low		1	12/11/17 19:25	C7L0151	CL71129
cis-1,3-Dichloropropene	ND (0.0032)		8260B Low		1	12/11/17 19:25	C7L0151	CL71129
Dibromochloromethane	ND (0.0032)		8260B Low		1	12/11/17 19:25	C7L0151	CL71129
Dibromomethane	ND (0.0032)		8260B Low		1	12/11/17 19:25	C7L0151	CL71129
Dichlorodifluoromethane	ND (0.0065)		8260B Low		1	12/11/17 19:25	C7L0151	CL71129
Diethyl Ether	ND (0.0032)		8260B Low		1	12/11/17 19:25	C7L0151	CL71129
Di-isopropyl ether	ND (0.0032)		8260B Low		1	12/11/17 19:25	C7L0151	CL71129
Ethyl tertiary-butyl ether	ND (0.0032)		8260B Low		1	12/11/17 19:25	C7L0151	CL71129
Ethylbenzene	ND (0.0032)		8260B Low		1	12/11/17 19:25	C7L0151	CL71129
Hexachlorobutadiene	ND (0.0032)		8260B Low		1	12/11/17 19:25	C7L0151	CL71129
Isopropylbenzene	ND (0.0032)		8260B Low		1	12/11/17 19:25	C7L0151	CL71129
Methyl tert-Butyl Ether	ND (0.0032)		8260B Low		1	12/11/17 19:25	C7L0151	CL71129
Methylene Chloride	ND (0.0162)		8260B Low		1	12/11/17 19:25	C7L0151	CL71129
Naphthalene	ND (0.0032)		8260B Low		1	12/11/17 19:25	C7L0151	CL71129
n-Butylbenzene	ND (0.0032)		8260B Low		1	12/11/17 19:25	C7L0151	CL71129
n-Propylbenzene	ND (0.0032)		8260B Low		1	12/11/17 19:25	C7L0151	CL71129
sec-Butylbenzene	ND (0.0032)		8260B Low		1	12/11/17 19:25	C7L0151	CL71129
Styrene	ND (0.0032)		8260B Low		1	12/11/17 19:25	C7L0151	CL71129
tert-Butylbenzene	ND (0.0032)		8260B Low		1	12/11/17 19:25	C7L0151	CL71129
Tertiary-amyl methyl ether	ND (0.0032)		8260B Low		1	12/11/17 19:25	C7L0151	CL71129
Tetrachloroethene	ND (0.0032)		8260B Low		1	12/11/17 19:25	C7L0151	CL71129
Tetrahydrofuran	ND (0.0032)		8260B Low		1	12/11/17 19:25	C7L0151	CL71129



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-568 0-2ft  
 Date Sampled: 12/08/17 12:30  
 Percent Solids: 89  
 Initial Volume: 8.7  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1712222  
 ESS Laboratory Sample ID: 1712222-09  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0032)		8260B Low		1	12/11/17 19:25	C7L0151	CL71129
trans-1,2-Dichloroethene	ND (0.0032)		8260B Low		1	12/11/17 19:25	C7L0151	CL71129
trans-1,3-Dichloropropene	ND (0.0032)		8260B Low		1	12/11/17 19:25	C7L0151	CL71129
Trichloroethene	ND (0.0032)		8260B Low		1	12/11/17 19:25	C7L0151	CL71129
Trichlorofluoromethane	ND (0.0032)		8260B Low		1	12/11/17 19:25	C7L0151	CL71129
Vinyl Acetate	ND (0.0032)		8260B Low		1	12/11/17 19:25	C7L0151	CL71129
Vinyl Chloride	ND (0.0065)		8260B Low		1	12/11/17 19:25	C7L0151	CL71129
Xylene O	ND (0.0032)		8260B Low		1	12/11/17 19:25	C7L0151	CL71129
Xylene P,M	ND (0.0065)		8260B Low		1	12/11/17 19:25	C7L0151	CL71129
Xylenes (Total)	ND (0.0065)		8260B Low		1	12/11/17 19:25		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	120 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	94 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	112 %		70-130
<i>Surrogate: Toluene-d8</i>	99 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-568 0-2ft  
Date Sampled: 12/08/17 12:30  
Percent Solids: 89  
Initial Volume: 20.3  
Final Volume: 1  
Extraction Method: 3546

ESS Laboratory Work Order: 1712222  
ESS Laboratory Sample ID: 1712222-09  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: SMR  
Prepared: 12/11/17 13:00

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	504 (194)		8100M		5	12/13/17 8:45	C7L0165	CL71116
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		95 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-568 0-2ft  
 Date Sampled: 12/08/17 12:30  
 Percent Solids: 89  
 Initial Volume: 15.1  
 Final Volume: 0.5  
 Extraction Method: 3546

ESS Laboratory Work Order: 1712222  
 ESS Laboratory Sample ID: 1712222-09  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: TJ  
 Prepared: 12/11/17 12:30

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.373)		8270D		1	12/12/17 23:05	C7L0159	CL71118
Acenaphthene	ND (0.373)		8270D		1	12/12/17 23:05	C7L0159	CL71118
Acenaphthylene	<b>0.887</b> (0.373)		8270D		1	12/12/17 23:05	C7L0159	CL71118
Anthracene	<b>1.21</b> (0.373)		8270D		1	12/12/17 23:05	C7L0159	CL71118
Benzo(a)anthracene	<b>3.15</b> (0.373)		8270D		1	12/12/17 23:05	C7L0159	CL71118
Benzo(a)pyrene	<b>2.64</b> (0.187)		8270D		1	12/12/17 23:05	C7L0159	CL71118
Benzo(b)fluoranthene	<b>1.96</b> (0.373)		8270D		1	12/12/17 23:05	C7L0159	CL71118
Benzo(g,h,i)perylene	<b>1.62</b> (0.373)		8270D		1	12/12/17 23:05	C7L0159	CL71118
Benzo(k)fluoranthene	<b>2.44</b> (0.373)		8270D		1	12/12/17 23:05	C7L0159	CL71118
Chrysene	<b>2.93</b> (0.187)		8270D		1	12/12/17 23:05	C7L0159	CL71118
Dibenzo(a,h)Anthracene	<b>0.968</b> (0.187)		8270D		1	12/12/17 23:05	C7L0159	CL71118
Fluoranthene	<b>5.56</b> (0.373)		8270D		1	12/12/17 23:05	C7L0159	CL71118
Fluorene	ND (0.373)		8270D		1	12/12/17 23:05	C7L0159	CL71118
Indeno(1,2,3-cd)Pyrene	<b>1.58</b> (0.373)		8270D		1	12/12/17 23:05	C7L0159	CL71118
Naphthalene	ND (0.373)		8270D		1	12/12/17 23:05	C7L0159	CL71118
Phenanthrene	<b>3.67</b> (0.373)		8270D		1	12/12/17 23:05	C7L0159	CL71118
Pyrene	<b>4.89</b> (0.373)		8270D		1	12/12/17 23:05	C7L0159	CL71118

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	61 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	75 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	77 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	69 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-568 0-2ft  
Date Sampled: 12/08/17 12:30  
Percent Solids: 89

ESS Laboratory Work Order: 1712222  
ESS Laboratory Sample ID: 1712222-09  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	ND (1.11)		9014		1	EEM	12/14/17 11:55	mg/kg dry	CL71417





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-569 0-2ft  
Date Sampled: 12/08/17 12:45  
Percent Solids: 86

ESS Laboratory Work Order: 1712222  
ESS Laboratory Sample ID: 1712222-10  
Sample Matrix: Soil  
Units: mg/kg dry

Extraction Method: 3050B

**Total Metals**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (1.71)		6020A		20	NAR	12/13/17 16:37	2.72	100	CL71217
Arsenic	4.37 (2.14)		6010C		1	KJK	12/16/17 16:21	2.72	100	CL71217
Beryllium	0.32 (0.09)		6010C		1	KJK	12/14/17 0:30	2.72	100	CL71217
Cadmium	ND (0.43)		6010C		1	KJK	12/14/17 0:30	2.72	100	CL71217
Chromium	9.04 (0.85)		6010C		1	KJK	12/14/17 0:30	2.72	100	CL71217
Copper	16.0 (2.14)		6010C		1	KJK	12/16/17 0:45	2.72	100	CL71217
Lead	12.8 (4.27)		6010C		1	KJK	12/14/17 0:30	2.72	100	CL71217
Mercury	ND (0.034)		7471B		1	MJV	12/13/17 12:51	0.68	40	CL71218
Nickel	9.76 (2.14)		6010C		1	KJK	12/14/17 0:30	2.72	100	CL71217
Selenium	ND (1.71)		6020A		20	NAR	12/13/17 16:37	2.72	100	CL71217
Silver	ND (0.43)		6010C		1	KJK	12/14/17 0:30	2.72	100	CL71217
Thallium	ND (1.71)		6020A		20	NAR	12/13/17 16:37	2.72	100	CL71217
Zinc	28.1 (2.14)		6010C		1	KJK	12/14/17 0:30	2.72	100	CL71217



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-569 0-2ft  
 Date Sampled: 12/08/17 12:45  
 Percent Solids: 86  
 Initial Volume: 9.4  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1712222  
 ESS Laboratory Sample ID: 1712222-10  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0031)		8260B Low		1	12/11/17 19:51	C7L0151	CL71129
1,1,1-Trichloroethane	ND (0.0031)		8260B Low		1	12/11/17 19:51	C7L0151	CL71129
1,1,2,2-Tetrachloroethane	ND (0.0031)		8260B Low		1	12/11/17 19:51	C7L0151	CL71129
1,1,2-Trichloroethane	ND (0.0031)		8260B Low		1	12/11/17 19:51	C7L0151	CL71129
1,1-Dichloroethane	ND (0.0031)		8260B Low		1	12/11/17 19:51	C7L0151	CL71129
1,1-Dichloroethene	ND (0.0031)		8260B Low		1	12/11/17 19:51	C7L0151	CL71129
1,1-Dichloropropene	ND (0.0031)		8260B Low		1	12/11/17 19:51	C7L0151	CL71129
1,2,3-Trichlorobenzene	ND (0.0031)		8260B Low		1	12/11/17 19:51	C7L0151	CL71129
1,2,3-Trichloropropane	ND (0.0031)		8260B Low		1	12/11/17 19:51	C7L0151	CL71129
1,2,4-Trichlorobenzene	ND (0.0031)		8260B Low		1	12/11/17 19:51	C7L0151	CL71129
1,2,4-Trimethylbenzene	ND (0.0031)		8260B Low		1	12/11/17 19:51	C7L0151	CL71129
1,2-Dibromo-3-Chloropropane	ND (0.0031)		8260B Low		1	12/11/17 19:51	C7L0151	CL71129
1,2-Dibromoethane	ND (0.0031)		8260B Low		1	12/11/17 19:51	C7L0151	CL71129
1,2-Dichlorobenzene	ND (0.0031)		8260B Low		1	12/11/17 19:51	C7L0151	CL71129
1,2-Dichloroethane	ND (0.0031)		8260B Low		1	12/11/17 19:51	C7L0151	CL71129
1,2-Dichloropropane	ND (0.0031)		8260B Low		1	12/11/17 19:51	C7L0151	CL71129
1,3,5-Trimethylbenzene	ND (0.0031)		8260B Low		1	12/11/17 19:51	C7L0151	CL71129
1,3-Dichlorobenzene	ND (0.0031)		8260B Low		1	12/11/17 19:51	C7L0151	CL71129
1,3-Dichloropropane	ND (0.0031)		8260B Low		1	12/11/17 19:51	C7L0151	CL71129
1,4-Dichlorobenzene	ND (0.0031)		8260B Low		1	12/11/17 19:51	C7L0151	CL71129
1,4-Dioxane	ND (0.0618)		8260B Low		1	12/11/17 19:51	C7L0151	CL71129
1-Chlorohexane	ND (0.0031)		8260B Low		1	12/11/17 19:51	C7L0151	CL71129
2,2-Dichloropropane	ND (0.0031)		8260B Low		1	12/11/17 19:51	C7L0151	CL71129
2-Butanone	ND (0.0309)		8260B Low		1	12/11/17 19:51	C7L0151	CL71129
2-Chlorotoluene	ND (0.0031)		8260B Low		1	12/11/17 19:51	C7L0151	CL71129
2-Hexanone	ND (0.0309)		8260B Low		1	12/11/17 19:51	C7L0151	CL71129
4-Chlorotoluene	ND (0.0031)		8260B Low		1	12/11/17 19:51	C7L0151	CL71129
4-Isopropyltoluene	ND (0.0031)		8260B Low		1	12/11/17 19:51	C7L0151	CL71129
4-Methyl-2-Pentanone	ND (0.0309)		8260B Low		1	12/11/17 19:51	C7L0151	CL71129
Acetone	ND (0.0309)		8260B Low		1	12/11/17 19:51	C7L0151	CL71129
Benzene	ND (0.0031)		8260B Low		1	12/11/17 19:51	C7L0151	CL71129
Bromobenzene	ND (0.0031)		8260B Low		1	12/11/17 19:51	C7L0151	CL71129



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-569 0-2ft  
 Date Sampled: 12/08/17 12:45  
 Percent Solids: 86  
 Initial Volume: 9.4  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1712222  
 ESS Laboratory Sample ID: 1712222-10  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0031)		8260B Low		1	12/11/17 19:51	C7L0151	CL71129
Bromodichloromethane	ND (0.0031)		8260B Low		1	12/11/17 19:51	C7L0151	CL71129
Bromoform	ND (0.0031)		8260B Low		1	12/11/17 19:51	C7L0151	CL71129
Bromomethane	ND (0.0062)		8260B Low		1	12/11/17 19:51	C7L0151	CL71129
Carbon Disulfide	ND (0.0031)		8260B Low		1	12/11/17 19:51	C7L0151	CL71129
Carbon Tetrachloride	ND (0.0031)		8260B Low		1	12/11/17 19:51	C7L0151	CL71129
Chlorobenzene	ND (0.0031)		8260B Low		1	12/11/17 19:51	C7L0151	CL71129
Chloroethane	ND (0.0062)		8260B Low		1	12/11/17 19:51	C7L0151	CL71129
Chloroform	ND (0.0031)		8260B Low		1	12/11/17 19:51	C7L0151	CL71129
Chloromethane	ND (0.0062)		8260B Low		1	12/11/17 19:51	C7L0151	CL71129
cis-1,2-Dichloroethene	ND (0.0031)		8260B Low		1	12/11/17 19:51	C7L0151	CL71129
cis-1,3-Dichloropropene	ND (0.0031)		8260B Low		1	12/11/17 19:51	C7L0151	CL71129
Dibromochloromethane	ND (0.0031)		8260B Low		1	12/11/17 19:51	C7L0151	CL71129
Dibromomethane	ND (0.0031)		8260B Low		1	12/11/17 19:51	C7L0151	CL71129
Dichlorodifluoromethane	ND (0.0062)		8260B Low		1	12/11/17 19:51	C7L0151	CL71129
Diethyl Ether	ND (0.0031)		8260B Low		1	12/11/17 19:51	C7L0151	CL71129
Di-isopropyl ether	ND (0.0031)		8260B Low		1	12/11/17 19:51	C7L0151	CL71129
Ethyl tertiary-butyl ether	ND (0.0031)		8260B Low		1	12/11/17 19:51	C7L0151	CL71129
Ethylbenzene	ND (0.0031)		8260B Low		1	12/11/17 19:51	C7L0151	CL71129
Hexachlorobutadiene	ND (0.0031)		8260B Low		1	12/11/17 19:51	C7L0151	CL71129
Isopropylbenzene	ND (0.0031)		8260B Low		1	12/11/17 19:51	C7L0151	CL71129
Methyl tert-Butyl Ether	ND (0.0031)		8260B Low		1	12/11/17 19:51	C7L0151	CL71129
Methylene Chloride	ND (0.0154)		8260B Low		1	12/11/17 19:51	C7L0151	CL71129
Naphthalene	ND (0.0031)		8260B Low		1	12/11/17 19:51	C7L0151	CL71129
n-Butylbenzene	ND (0.0031)		8260B Low		1	12/11/17 19:51	C7L0151	CL71129
n-Propylbenzene	ND (0.0031)		8260B Low		1	12/11/17 19:51	C7L0151	CL71129
sec-Butylbenzene	ND (0.0031)		8260B Low		1	12/11/17 19:51	C7L0151	CL71129
Styrene	ND (0.0031)		8260B Low		1	12/11/17 19:51	C7L0151	CL71129
tert-Butylbenzene	ND (0.0031)		8260B Low		1	12/11/17 19:51	C7L0151	CL71129
Tertiary-amyl methyl ether	ND (0.0031)		8260B Low		1	12/11/17 19:51	C7L0151	CL71129
Tetrachloroethene	ND (0.0031)		8260B Low		1	12/11/17 19:51	C7L0151	CL71129
Tetrahydrofuran	ND (0.0031)		8260B Low		1	12/11/17 19:51	C7L0151	CL71129



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-569 0-2ft  
Date Sampled: 12/08/17 12:45  
Percent Solids: 86  
Initial Volume: 9.4  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1712222  
ESS Laboratory Sample ID: 1712222-10  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0031)		8260B Low		1	12/11/17 19:51	C7L0151	CL71129
trans-1,2-Dichloroethene	ND (0.0031)		8260B Low		1	12/11/17 19:51	C7L0151	CL71129
trans-1,3-Dichloropropene	ND (0.0031)		8260B Low		1	12/11/17 19:51	C7L0151	CL71129
Trichloroethene	ND (0.0031)		8260B Low		1	12/11/17 19:51	C7L0151	CL71129
Trichlorofluoromethane	ND (0.0031)		8260B Low		1	12/11/17 19:51	C7L0151	CL71129
Vinyl Acetate	ND (0.0031)		8260B Low		1	12/11/17 19:51	C7L0151	CL71129
Vinyl Chloride	ND (0.0062)		8260B Low		1	12/11/17 19:51	C7L0151	CL71129
Xylene O	ND (0.0031)		8260B Low		1	12/11/17 19:51	C7L0151	CL71129
Xylene P,M	ND (0.0062)		8260B Low		1	12/11/17 19:51	C7L0151	CL71129
Xylenes (Total)	ND (0.0062)		8260B Low		1	12/11/17 19:51		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	127 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	97 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	116 %		70-130
<i>Surrogate: Toluene-d8</i>	98 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-569 0-2ft  
Date Sampled: 12/08/17 12:45  
Percent Solids: 86  
Initial Volume: 19.1  
Final Volume: 1  
Extraction Method: 3546

ESS Laboratory Work Order: 1712222  
ESS Laboratory Sample ID: 1712222-10  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: SMR  
Prepared: 12/11/17 13:00

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	ND (42.6)		8100M		1	12/12/17 23:17	C7L0165	CL71116
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		85 %		40-140				



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-569 0-2ft  
 Date Sampled: 12/08/17 12:45  
 Percent Solids: 86  
 Initial Volume: 14.1  
 Final Volume: 0.5  
 Extraction Method: 3546

ESS Laboratory Work Order: 1712222  
 ESS Laboratory Sample ID: 1712222-10  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: TJ  
 Prepared: 12/11/17 12:30

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	ND (0.411)		8270D		1	12/12/17 23:40	C7L0159	CL71118
Acenaphthene	ND (0.411)		8270D		1	12/12/17 23:40	C7L0159	CL71118
Acenaphthylene	ND (0.411)		8270D		1	12/12/17 23:40	C7L0159	CL71118
Anthracene	ND (0.411)		8270D		1	12/12/17 23:40	C7L0159	CL71118
Benzo(a)anthracene	ND (0.411)		8270D		1	12/12/17 23:40	C7L0159	CL71118
Benzo(a)pyrene	ND (0.206)		8270D		1	12/12/17 23:40	C7L0159	CL71118
Benzo(b)fluoranthene	ND (0.411)		8270D		1	12/12/17 23:40	C7L0159	CL71118
Benzo(g,h,i)perylene	ND (0.411)		8270D		1	12/12/17 23:40	C7L0159	CL71118
Benzo(k)fluoranthene	ND (0.411)		8270D		1	12/12/17 23:40	C7L0159	CL71118
Chrysene	ND (0.206)		8270D		1	12/12/17 23:40	C7L0159	CL71118
Dibenzo(a,h)Anthracene	ND (0.206)		8270D		1	12/12/17 23:40	C7L0159	CL71118
Fluoranthene	ND (0.411)		8270D		1	12/12/17 23:40	C7L0159	CL71118
Fluorene	ND (0.411)		8270D		1	12/12/17 23:40	C7L0159	CL71118
Indeno(1,2,3-cd)Pyrene	ND (0.411)		8270D		1	12/12/17 23:40	C7L0159	CL71118
Naphthalene	ND (0.411)		8270D		1	12/12/17 23:40	C7L0159	CL71118
Phenanthrene	ND (0.411)		8270D		1	12/12/17 23:40	C7L0159	CL71118
Pyrene	ND (0.411)		8270D		1	12/12/17 23:40	C7L0159	CL71118

	<u>%Recovery</u>	<u>Qualifier</u>	<u>Limits</u>
Surrogate: 1,2-Dichlorobenzene-d4	68 %		30-130
Surrogate: 2-Fluorobiphenyl	76 %		30-130
Surrogate: Nitrobenzene-d5	76 %		30-130
Surrogate: p-Terphenyl-d14	82 %		30-130





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-569 0-2ft  
Date Sampled: 12/08/17 12:45  
Percent Solids: 86

ESS Laboratory Work Order: 1712222  
ESS Laboratory Sample ID: 1712222-10  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	ND (1.14)		9014		1	EEM	12/14/17 11:55	mg/kg dry	CL71417



## CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-570 0-2ft  
Date Sampled: 12/08/17 13:15  
Percent Solids: 75

ESS Laboratory Work Order: 1712222  
ESS Laboratory Sample ID: 1712222-11  
Sample Matrix: Soil  
Units: mg/kg dry

Extraction Method: 3050B

### Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Antimony	ND (2.48)		6020A		20	NAR	12/13/17 16:43	2.16	100	CL71217
<b>Arsenic</b>	<b>28.1</b> (3.10)		6010C		1	KJK	12/16/17 16:25	2.16	100	CL71217
Beryllium	ND (0.14)		6010C		1	KJK	12/14/17 0:34	2.16	100	CL71217
<b>Cadmium</b>	<b>1.21</b> (0.62)		6010C		1	KJK	12/14/17 0:34	2.16	100	CL71217
<b>Chromium</b>	<b>41.4</b> (1.24)		6010C		1	KJK	12/14/17 0:34	2.16	100	CL71217
<b>Copper</b>	<b>140</b> (3.10)		6010C		1	KJK	12/16/17 0:48	2.16	100	CL71217
<b>Lead</b>	<b>146</b> (6.20)		6010C		1	KJK	12/14/17 0:34	2.16	100	CL71217
<b>Mercury</b>	<b>0.282</b> (0.038)		7471B		1	MJV	12/13/17 12:53	0.7	40	CL71218
<b>Nickel</b>	<b>38.9</b> (3.10)		6010C		1	KJK	12/14/17 0:34	2.16	100	CL71217
Selenium	ND (2.48)		6020A		20	NAR	12/13/17 16:43	2.16	100	CL71217
Silver	ND (6.20)		6010C		10	KJK	12/14/17 17:34	2.16	100	CL71217
Thallium	ND (2.48)		6020A		20	NAR	12/13/17 16:43	2.16	100	CL71217
<b>Zinc</b>	<b>221</b> (3.10)		6010C		1	KJK	12/14/17 0:34	2.16	100	CL71217



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-570 0-2ft  
Date Sampled: 12/08/17 13:15  
Percent Solids: 75  
Initial Volume: 8.5  
Final Volume: 10  
Extraction Method: 5035

ESS Laboratory Work Order: 1712222  
ESS Laboratory Sample ID: 1712222-11  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0039)		8260B Low		1	12/11/17 20:16	C7L0151	CL71129
1,1,1-Trichloroethane	ND (0.0039)		8260B Low		1	12/11/17 20:16	C7L0151	CL71129
1,1,2,2-Tetrachloroethane	ND (0.0039)		8260B Low		1	12/11/17 20:16	C7L0151	CL71129
1,1,2-Trichloroethane	ND (0.0039)		8260B Low		1	12/11/17 20:16	C7L0151	CL71129
1,1-Dichloroethane	ND (0.0039)		8260B Low		1	12/11/17 20:16	C7L0151	CL71129
1,1-Dichloroethene	ND (0.0039)		8260B Low		1	12/11/17 20:16	C7L0151	CL71129
1,1-Dichloropropene	ND (0.0039)		8260B Low		1	12/11/17 20:16	C7L0151	CL71129
1,2,3-Trichlorobenzene	ND (0.0039)		8260B Low		1	12/11/17 20:16	C7L0151	CL71129
1,2,3-Trichloropropane	ND (0.0039)		8260B Low		1	12/11/17 20:16	C7L0151	CL71129
1,2,4-Trichlorobenzene	ND (0.0039)		8260B Low		1	12/11/17 20:16	C7L0151	CL71129
1,2,4-Trimethylbenzene	ND (0.0039)		8260B Low		1	12/11/17 20:16	C7L0151	CL71129
1,2-Dibromo-3-Chloropropane	ND (0.0039)		8260B Low		1	12/11/17 20:16	C7L0151	CL71129
1,2-Dibromoethane	ND (0.0039)		8260B Low		1	12/11/17 20:16	C7L0151	CL71129
1,2-Dichlorobenzene	ND (0.0039)		8260B Low		1	12/11/17 20:16	C7L0151	CL71129
1,2-Dichloroethane	ND (0.0039)		8260B Low		1	12/11/17 20:16	C7L0151	CL71129
1,2-Dichloropropane	ND (0.0039)		8260B Low		1	12/11/17 20:16	C7L0151	CL71129
1,3,5-Trimethylbenzene	ND (0.0039)		8260B Low		1	12/11/17 20:16	C7L0151	CL71129
1,3-Dichlorobenzene	ND (0.0039)		8260B Low		1	12/11/17 20:16	C7L0151	CL71129
1,3-Dichloropropane	ND (0.0039)		8260B Low		1	12/11/17 20:16	C7L0151	CL71129
1,4-Dichlorobenzene	ND (0.0039)		8260B Low		1	12/11/17 20:16	C7L0151	CL71129
1,4-Dioxane	ND (0.0788)		8260B Low		1	12/11/17 20:16	C7L0151	CL71129
1-Chlorohexane	ND (0.0039)		8260B Low		1	12/11/17 20:16	C7L0151	CL71129
2,2-Dichloropropane	ND (0.0039)		8260B Low		1	12/11/17 20:16	C7L0151	CL71129
2-Butanone	ND (0.0394)		8260B Low		1	12/11/17 20:16	C7L0151	CL71129
2-Chlorotoluene	ND (0.0039)		8260B Low		1	12/11/17 20:16	C7L0151	CL71129
2-Hexanone	ND (0.0394)		8260B Low		1	12/11/17 20:16	C7L0151	CL71129
4-Chlorotoluene	ND (0.0039)		8260B Low		1	12/11/17 20:16	C7L0151	CL71129
4-Isopropyltoluene	ND (0.0039)		8260B Low		1	12/11/17 20:16	C7L0151	CL71129
4-Methyl-2-Pentanone	ND (0.0394)		8260B Low		1	12/11/17 20:16	C7L0151	CL71129
Acetone	ND (0.0394)		8260B Low		1	12/11/17 20:16	C7L0151	CL71129
Benzene	ND (0.0039)		8260B Low		1	12/11/17 20:16	C7L0151	CL71129
Bromobenzene	ND (0.0039)		8260B Low		1	12/11/17 20:16	C7L0151	CL71129



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-570 0-2ft  
 Date Sampled: 12/08/17 13:15  
 Percent Solids: 75  
 Initial Volume: 8.5  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1712222  
 ESS Laboratory Sample ID: 1712222-11  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0039)		8260B Low		1	12/11/17 20:16	C7L0151	CL71129
Bromodichloromethane	ND (0.0039)		8260B Low		1	12/11/17 20:16	C7L0151	CL71129
Bromoform	ND (0.0039)		8260B Low		1	12/11/17 20:16	C7L0151	CL71129
Bromomethane	ND (0.0079)		8260B Low		1	12/11/17 20:16	C7L0151	CL71129
Carbon Disulfide	ND (0.0039)		8260B Low		1	12/11/17 20:16	C7L0151	CL71129
Carbon Tetrachloride	ND (0.0039)		8260B Low		1	12/11/17 20:16	C7L0151	CL71129
Chlorobenzene	ND (0.0039)		8260B Low		1	12/11/17 20:16	C7L0151	CL71129
Chloroethane	ND (0.0079)		8260B Low		1	12/11/17 20:16	C7L0151	CL71129
Chloroform	ND (0.0039)		8260B Low		1	12/11/17 20:16	C7L0151	CL71129
Chloromethane	ND (0.0079)		8260B Low		1	12/11/17 20:16	C7L0151	CL71129
cis-1,2-Dichloroethene	ND (0.0039)		8260B Low		1	12/11/17 20:16	C7L0151	CL71129
cis-1,3-Dichloropropene	ND (0.0039)		8260B Low		1	12/11/17 20:16	C7L0151	CL71129
Dibromochloromethane	ND (0.0039)		8260B Low		1	12/11/17 20:16	C7L0151	CL71129
Dibromomethane	ND (0.0039)		8260B Low		1	12/11/17 20:16	C7L0151	CL71129
Dichlorodifluoromethane	ND (0.0079)		8260B Low		1	12/11/17 20:16	C7L0151	CL71129
Diethyl Ether	ND (0.0039)		8260B Low		1	12/11/17 20:16	C7L0151	CL71129
Di-isopropyl ether	ND (0.0039)		8260B Low		1	12/11/17 20:16	C7L0151	CL71129
Ethyl tertiary-butyl ether	ND (0.0039)		8260B Low		1	12/11/17 20:16	C7L0151	CL71129
Ethylbenzene	ND (0.0039)		8260B Low		1	12/11/17 20:16	C7L0151	CL71129
Hexachlorobutadiene	ND (0.0039)		8260B Low		1	12/11/17 20:16	C7L0151	CL71129
Isopropylbenzene	ND (0.0039)		8260B Low		1	12/11/17 20:16	C7L0151	CL71129
Methyl tert-Butyl Ether	ND (0.0039)		8260B Low		1	12/11/17 20:16	C7L0151	CL71129
Methylene Chloride	ND (0.0197)		8260B Low		1	12/11/17 20:16	C7L0151	CL71129
Naphthalene	ND (0.0039)		8260B Low		1	12/11/17 20:16	C7L0151	CL71129
n-Butylbenzene	ND (0.0039)		8260B Low		1	12/11/17 20:16	C7L0151	CL71129
n-Propylbenzene	ND (0.0039)		8260B Low		1	12/11/17 20:16	C7L0151	CL71129
sec-Butylbenzene	ND (0.0039)		8260B Low		1	12/11/17 20:16	C7L0151	CL71129
Styrene	ND (0.0039)		8260B Low		1	12/11/17 20:16	C7L0151	CL71129
tert-Butylbenzene	ND (0.0039)		8260B Low		1	12/11/17 20:16	C7L0151	CL71129
Tertiary-amyl methyl ether	ND (0.0039)		8260B Low		1	12/11/17 20:16	C7L0151	CL71129
Tetrachloroethene	ND (0.0039)		8260B Low		1	12/11/17 20:16	C7L0151	CL71129
Tetrahydrofuran	ND (0.0039)		8260B Low		1	12/11/17 20:16	C7L0151	CL71129



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-570 0-2ft  
 Date Sampled: 12/08/17 13:15  
 Percent Solids: 75  
 Initial Volume: 8.5  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1712222  
 ESS Laboratory Sample ID: 1712222-11  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0039)		8260B Low		1	12/11/17 20:16	C7L0151	CL71129
trans-1,2-Dichloroethene	ND (0.0039)		8260B Low		1	12/11/17 20:16	C7L0151	CL71129
trans-1,3-Dichloropropene	ND (0.0039)		8260B Low		1	12/11/17 20:16	C7L0151	CL71129
Trichloroethene	ND (0.0039)		8260B Low		1	12/11/17 20:16	C7L0151	CL71129
Trichlorofluoromethane	ND (0.0039)		8260B Low		1	12/11/17 20:16	C7L0151	CL71129
Vinyl Acetate	ND (0.0039)		8260B Low		1	12/11/17 20:16	C7L0151	CL71129
Vinyl Chloride	ND (0.0079)		8260B Low		1	12/11/17 20:16	C7L0151	CL71129
Xylene O	ND (0.0039)		8260B Low		1	12/11/17 20:16	C7L0151	CL71129
Xylene P,M	ND (0.0079)		8260B Low		1	12/11/17 20:16	C7L0151	CL71129
Xylenes (Total)	ND (0.0079)		8260B Low		1	12/11/17 20:16		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	122 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	91 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	113 %		70-130
<i>Surrogate: Toluene-d8</i>	104 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: GZ-SS-570 0-2ft  
 Date Sampled: 12/08/17 13:15  
 Percent Solids: 75  
 Initial Volume: 19.8  
 Final Volume: 1  
 Extraction Method: 3546

ESS Laboratory Work Order: 1712222  
 ESS Laboratory Sample ID: 1712222-11  
 Sample Matrix: Soil  
 Units: mg/kg dry  
 Analyst: SMR  
 Prepared: 12/11/17 13:00

**8100M Total Petroleum Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	585 (47.4)		8100M		1	12/12/17 23:53	C7L0165	CL71116
		<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>				
<i>Surrogate: O-Terphenyl</i>		101 %		40-140				





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-570 0-2ft  
Date Sampled: 12/08/17 13:15  
Percent Solids: 75  
Initial Volume: 14.2  
Final Volume: 0.5  
Extraction Method: 3546

ESS Laboratory Work Order: 1712222  
ESS Laboratory Sample ID: 1712222-11  
Sample Matrix: Soil  
Units: mg/kg dry  
Analyst: TJ  
Prepared: 12/11/17 12:30

**8270D Polynuclear Aromatic Hydrocarbons**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2-Methylnaphthalene	1.11 (0.471)		8270D		1	12/13/17 0:16	C7L0159	CL71118
Acenaphthene	ND (0.471)		8270D		1	12/13/17 0:16	C7L0159	CL71118
Acenaphthylene	3.62 (0.471)		8270D		1	12/13/17 0:16	C7L0159	CL71118
Anthracene	2.91 (0.471)		8270D		1	12/13/17 0:16	C7L0159	CL71118
Benzo(a)anthracene	6.18 (0.471)		8270D		1	12/13/17 0:16	C7L0159	CL71118
Benzo(a)pyrene	4.76 (0.236)		8270D		1	12/13/17 0:16	C7L0159	CL71118
Benzo(b)fluoranthene	3.52 (0.471)		8270D		1	12/13/17 0:16	C7L0159	CL71118
Benzo(g,h,i)perylene	2.78 (0.471)		8270D		1	12/13/17 0:16	C7L0159	CL71118
Benzo(k)fluoranthene	3.64 (0.471)		8270D		1	12/13/17 0:16	C7L0159	CL71118
Chrysene	6.19 (0.236)		8270D		1	12/13/17 0:16	C7L0159	CL71118
Dibenzo(a,h)Anthracene	1.55 (0.236)		8270D		1	12/13/17 0:16	C7L0159	CL71118
Fluoranthene	8.13 (0.471)		8270D		1	12/13/17 0:16	C7L0159	CL71118
Fluorene	1.23 (0.471)		8270D		1	12/13/17 0:16	C7L0159	CL71118
Indeno(1,2,3-cd)Pyrene	2.43 (0.471)		8270D		1	12/13/17 0:16	C7L0159	CL71118
Naphthalene	2.19 (0.471)		8270D		1	12/13/17 0:16	C7L0159	CL71118
Phenanthrene	14.4 (4.71)		8270D		10	12/13/17 18:22	C7L0159	CL71118
Pyrene	13.7 (4.71)		8270D		10	12/13/17 18:22	C7L0159	CL71118

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	65 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	83 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	79 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	79 %		30-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-SS-570 0-2ft  
Date Sampled: 12/08/17 13:15  
Percent Solids: 75

ESS Laboratory Work Order: 1712222  
ESS Laboratory Sample ID: 1712222-11  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	19.2 (1.31)		9014		1	EEM	12/14/17 11:55	mg/kg dry	CL71417



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: TB-120817  
 Date Sampled: 12/08/17 00:00  
 Percent Solids: N/A  
 Initial Volume: 5  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1712222  
 ESS Laboratory Sample ID: 1712222-12  
 Sample Matrix: Solid  
 Units: mg/kg wet  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0050)		8260B Low		1	12/11/17 15:36	C7L0151	CL71129
1,1,1-Trichloroethane	ND (0.0050)		8260B Low		1	12/11/17 15:36	C7L0151	CL71129
1,1,2,2-Tetrachloroethane	ND (0.0050)		8260B Low		1	12/11/17 15:36	C7L0151	CL71129
1,1,2-Trichloroethane	ND (0.0050)		8260B Low		1	12/11/17 15:36	C7L0151	CL71129
1,1-Dichloroethane	ND (0.0050)		8260B Low		1	12/11/17 15:36	C7L0151	CL71129
1,1-Dichloroethene	ND (0.0050)		8260B Low		1	12/11/17 15:36	C7L0151	CL71129
1,1-Dichloropropene	ND (0.0050)		8260B Low		1	12/11/17 15:36	C7L0151	CL71129
1,2,3-Trichlorobenzene	ND (0.0050)		8260B Low		1	12/11/17 15:36	C7L0151	CL71129
1,2,3-Trichloropropane	ND (0.0050)		8260B Low		1	12/11/17 15:36	C7L0151	CL71129
1,2,4-Trichlorobenzene	ND (0.0050)		8260B Low		1	12/11/17 15:36	C7L0151	CL71129
1,2,4-Trimethylbenzene	ND (0.0050)		8260B Low		1	12/11/17 15:36	C7L0151	CL71129
1,2-Dibromo-3-Chloropropane	ND (0.0050)		8260B Low		1	12/11/17 15:36	C7L0151	CL71129
1,2-Dibromoethane	ND (0.0050)		8260B Low		1	12/11/17 15:36	C7L0151	CL71129
1,2-Dichlorobenzene	ND (0.0050)		8260B Low		1	12/11/17 15:36	C7L0151	CL71129
1,2-Dichloroethane	ND (0.0050)		8260B Low		1	12/11/17 15:36	C7L0151	CL71129
1,2-Dichloropropane	ND (0.0050)		8260B Low		1	12/11/17 15:36	C7L0151	CL71129
1,3,5-Trimethylbenzene	ND (0.0050)		8260B Low		1	12/11/17 15:36	C7L0151	CL71129
1,3-Dichlorobenzene	ND (0.0050)		8260B Low		1	12/11/17 15:36	C7L0151	CL71129
1,3-Dichloropropane	ND (0.0050)		8260B Low		1	12/11/17 15:36	C7L0151	CL71129
1,4-Dichlorobenzene	ND (0.0050)		8260B Low		1	12/11/17 15:36	C7L0151	CL71129
1,4-Dioxane	ND (0.100)		8260B Low		1	12/11/17 15:36	C7L0151	CL71129
1-Chlorohexane	ND (0.0050)		8260B Low		1	12/11/17 15:36	C7L0151	CL71129
2,2-Dichloropropane	ND (0.0050)		8260B Low		1	12/11/17 15:36	C7L0151	CL71129
2-Butanone	ND (0.0500)		8260B Low		1	12/11/17 15:36	C7L0151	CL71129
2-Chlorotoluene	ND (0.0050)		8260B Low		1	12/11/17 15:36	C7L0151	CL71129
2-Hexanone	ND (0.0500)		8260B Low		1	12/11/17 15:36	C7L0151	CL71129
4-Chlorotoluene	ND (0.0050)		8260B Low		1	12/11/17 15:36	C7L0151	CL71129
4-Isopropyltoluene	ND (0.0050)		8260B Low		1	12/11/17 15:36	C7L0151	CL71129
4-Methyl-2-Pentanone	ND (0.0500)		8260B Low		1	12/11/17 15:36	C7L0151	CL71129
Acetone	ND (0.0500)		8260B Low		1	12/11/17 15:36	C7L0151	CL71129
Benzene	ND (0.0050)		8260B Low		1	12/11/17 15:36	C7L0151	CL71129
Bromobenzene	ND (0.0050)		8260B Low		1	12/11/17 15:36	C7L0151	CL71129



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: TB-120817  
 Date Sampled: 12/08/17 00:00  
 Percent Solids: N/A  
 Initial Volume: 5  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1712222  
 ESS Laboratory Sample ID: 1712222-12  
 Sample Matrix: Solid  
 Units: mg/kg wet  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromochloromethane	ND (0.0050)		8260B Low		1	12/11/17 15:36	C7L0151	CL71129
Bromodichloromethane	ND (0.0050)		8260B Low		1	12/11/17 15:36	C7L0151	CL71129
Bromoform	ND (0.0050)		8260B Low		1	12/11/17 15:36	C7L0151	CL71129
Bromomethane	ND (0.0100)		8260B Low		1	12/11/17 15:36	C7L0151	CL71129
Carbon Disulfide	ND (0.0050)		8260B Low		1	12/11/17 15:36	C7L0151	CL71129
Carbon Tetrachloride	ND (0.0050)		8260B Low		1	12/11/17 15:36	C7L0151	CL71129
Chlorobenzene	ND (0.0050)		8260B Low		1	12/11/17 15:36	C7L0151	CL71129
Chloroethane	ND (0.0100)		8260B Low		1	12/11/17 15:36	C7L0151	CL71129
Chloroform	ND (0.0050)		8260B Low		1	12/11/17 15:36	C7L0151	CL71129
Chloromethane	ND (0.0100)		8260B Low		1	12/11/17 15:36	C7L0151	CL71129
cis-1,2-Dichloroethene	ND (0.0050)		8260B Low		1	12/11/17 15:36	C7L0151	CL71129
cis-1,3-Dichloropropene	ND (0.0050)		8260B Low		1	12/11/17 15:36	C7L0151	CL71129
Dibromochloromethane	ND (0.0050)		8260B Low		1	12/11/17 15:36	C7L0151	CL71129
Dibromomethane	ND (0.0050)		8260B Low		1	12/11/17 15:36	C7L0151	CL71129
Dichlorodifluoromethane	ND (0.0100)		8260B Low		1	12/11/17 15:36	C7L0151	CL71129
Diethyl Ether	ND (0.0050)		8260B Low		1	12/11/17 15:36	C7L0151	CL71129
Di-isopropyl ether	ND (0.0050)		8260B Low		1	12/11/17 15:36	C7L0151	CL71129
Ethyl tertiary-butyl ether	ND (0.0050)		8260B Low		1	12/11/17 15:36	C7L0151	CL71129
Ethylbenzene	ND (0.0050)		8260B Low		1	12/11/17 15:36	C7L0151	CL71129
Hexachlorobutadiene	ND (0.0050)		8260B Low		1	12/11/17 15:36	C7L0151	CL71129
Isopropylbenzene	ND (0.0050)		8260B Low		1	12/11/17 15:36	C7L0151	CL71129
Methyl tert-Butyl Ether	ND (0.0050)		8260B Low		1	12/11/17 15:36	C7L0151	CL71129
Methylene Chloride	ND (0.0250)		8260B Low		1	12/11/17 15:36	C7L0151	CL71129
Naphthalene	ND (0.0050)		8260B Low		1	12/11/17 15:36	C7L0151	CL71129
n-Butylbenzene	ND (0.0050)		8260B Low		1	12/11/17 15:36	C7L0151	CL71129
n-Propylbenzene	ND (0.0050)		8260B Low		1	12/11/17 15:36	C7L0151	CL71129
sec-Butylbenzene	ND (0.0050)		8260B Low		1	12/11/17 15:36	C7L0151	CL71129
Styrene	ND (0.0050)		8260B Low		1	12/11/17 15:36	C7L0151	CL71129
tert-Butylbenzene	ND (0.0050)		8260B Low		1	12/11/17 15:36	C7L0151	CL71129
Tertiary-amyl methyl ether	ND (0.0050)		8260B Low		1	12/11/17 15:36	C7L0151	CL71129
Tetrachloroethene	ND (0.0050)		8260B Low		1	12/11/17 15:36	C7L0151	CL71129
Tetrahydrofuran	ND (0.0050)		8260B Low		1	12/11/17 15:36	C7L0151	CL71129



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility  
 Client Sample ID: TB-120817  
 Date Sampled: 12/08/17 00:00  
 Percent Solids: N/A  
 Initial Volume: 5  
 Final Volume: 10  
 Extraction Method: 5035

ESS Laboratory Work Order: 1712222  
 ESS Laboratory Sample ID: 1712222-12  
 Sample Matrix: Solid  
 Units: mg/kg wet  
 Analyst: MEK

**5035/8260B Volatile Organic Compounds / Low Level**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Toluene	ND (0.0050)		8260B Low		1	12/11/17 15:36	C7L0151	CL71129
trans-1,2-Dichloroethene	ND (0.0050)		8260B Low		1	12/11/17 15:36	C7L0151	CL71129
trans-1,3-Dichloropropene	ND (0.0050)		8260B Low		1	12/11/17 15:36	C7L0151	CL71129
Trichloroethene	ND (0.0050)		8260B Low		1	12/11/17 15:36	C7L0151	CL71129
Trichlorofluoromethane	ND (0.0050)		8260B Low		1	12/11/17 15:36	C7L0151	CL71129
Vinyl Acetate	ND (0.0050)		8260B Low		1	12/11/17 15:36	C7L0151	CL71129
Vinyl Chloride	ND (0.0100)		8260B Low		1	12/11/17 15:36	C7L0151	CL71129
Xylene O	ND (0.0050)		8260B Low		1	12/11/17 15:36	C7L0151	CL71129
Xylene P,M	ND (0.0100)		8260B Low		1	12/11/17 15:36	C7L0151	CL71129
Xylenes (Total)	ND (0.0100)		8260B Low		1	12/11/17 15:36		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichloroethane-d4</i>	108 %		70-130
<i>Surrogate: 4-Bromofluorobenzene</i>	95 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	106 %		70-130
<i>Surrogate: Toluene-d8</i>	100 %		70-130



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1712222

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
<b>Total Metals</b>										
<b>Batch CL71217 - 3050B</b>										
<b>Blank</b>										
Antimony	ND	0.50	mg/kg wet							
Arsenic	ND	2.50	mg/kg wet							
Beryllium	ND	0.11	mg/kg wet							
Cadmium	ND	0.50	mg/kg wet							
Chromium	ND	1.00	mg/kg wet							
Copper	ND	2.50	mg/kg wet							
Lead	ND	5.00	mg/kg wet							
Nickel	ND	2.50	mg/kg wet							
Selenium	ND	0.50	mg/kg wet							
Silver	ND	0.50	mg/kg wet							
Thallium	ND	0.50	mg/kg wet							
Zinc	ND	2.50	mg/kg wet							
<b>LCS</b>										
Antimony	61.8	4.31	mg/kg wet	48.00		129	0-238			
Arsenic	138	8.62	mg/kg wet	123.0		112	80-120			
Beryllium	179	0.38	mg/kg wet	192.0		93	80-120			
Cadmium	193	1.72	mg/kg wet	224.0		86	80-120			
Chromium	174	3.45	mg/kg wet	179.0		97	80-120			
Copper	84.1	8.62	mg/kg wet	78.90		107	80-120			
Lead	140	17.2	mg/kg wet	145.0		97	80-120			
Nickel	127	8.62	mg/kg wet	143.0		89	80-120			
Selenium	43.8	4.31	mg/kg wet	42.40		103	80-120			
Silver	70.7	1.72	mg/kg wet	81.60		87	80-120			
Thallium	55.6	4.31	mg/kg wet	52.00		107	80-120			
Zinc	677	8.62	mg/kg wet	770.0		88	80-120			
<b>LCS</b>										
Arsenic	166	8.47	mg/kg wet	147.0		113	80-120			
<b>LCS Dup</b>										
Antimony	60.0	4.31	mg/kg wet	48.00		125	0-238	3	30	
Arsenic	135	8.62	mg/kg wet	123.0		110	80-120	2	20	
Beryllium	177	0.38	mg/kg wet	192.0		92	80-120	1	20	
Cadmium	192	1.72	mg/kg wet	224.0		86	80-120	0.8	20	
Chromium	173	3.45	mg/kg wet	179.0		97	80-120	0.3	20	
Copper	83.8	8.62	mg/kg wet	78.90		106	80-120	0.4	20	
Lead	138	17.2	mg/kg wet	145.0		95	80-120	2	20	
Nickel	128	8.62	mg/kg wet	143.0		89	80-120	0.1	20	
Selenium	43.7	4.31	mg/kg wet	42.40		103	80-120	0.3	30	
Silver	70.0	1.72	mg/kg wet	81.60		86	80-120	0.9	20	
Thallium	54.2	4.31	mg/kg wet	52.00		104	80-120	2	30	
Zinc	698	8.62	mg/kg wet	770.0		91	80-120	3	20	
<b>LCS Dup</b>										
Arsenic	172	8.62	mg/kg wet	147.0		117	80-120	4	20	
<b>Batch CL71218 - 7471B</b>										





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1712222

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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**Total Metals**

**Batch CL71218 - 7471B**

<b>Blank</b>										
Mercury	ND	0.033	mg/kg wet							
<b>LCS</b>										
Mercury	19.5	1.90	mg/kg wet	17.80		109	80-120			
<b>LCS Dup</b>										
Mercury	18.1	1.87	mg/kg wet	17.80		101	80-120	8	20	

**5035/8260B Volatile Organic Compounds / Low Level**

**Batch CL71129 - 5035**

<b>Blank</b>										
1,1,1,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,1-Trichloroethane	ND	0.0050	mg/kg wet							
1,1,2,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,2-Trichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethene	ND	0.0050	mg/kg wet							
1,1-Dichloropropene	ND	0.0050	mg/kg wet							
1,2,3-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,3-Trichloropropane	ND	0.0050	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,4-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,2-Dibromo-3-Chloropropane	ND	0.0050	mg/kg wet							
1,2-Dibromoethane	ND	0.0050	mg/kg wet							
1,2-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,2-Dichloroethane	ND	0.0050	mg/kg wet							
1,2-Dichloropropane	ND	0.0050	mg/kg wet							
1,3,5-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,3-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,3-Dichloropropane	ND	0.0050	mg/kg wet							
1,4-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,4-Dioxane	ND	0.100	mg/kg wet							
1-Chlorohexane	ND	0.0050	mg/kg wet							
2,2-Dichloropropane	ND	0.0050	mg/kg wet							
2-Butanone	ND	0.0500	mg/kg wet							
2-Chlorotoluene	ND	0.0050	mg/kg wet							
2-Hexanone	ND	0.0500	mg/kg wet							
4-Chlorotoluene	ND	0.0050	mg/kg wet							
4-Isopropyltoluene	ND	0.0050	mg/kg wet							
4-Methyl-2-Pentanone	ND	0.0500	mg/kg wet							
Acetone	ND	0.0500	mg/kg wet							
Benzene	ND	0.0050	mg/kg wet							
Bromobenzene	ND	0.0050	mg/kg wet							
Bromochloromethane	ND	0.0050	mg/kg wet							
Bromodichloromethane	ND	0.0050	mg/kg wet							



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1712222

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CL71129 - 5035**

Bromoform	ND	0.0050	mg/kg wet							
Bromomethane	ND	0.0100	mg/kg wet							
Carbon Disulfide	ND	0.0050	mg/kg wet							
Carbon Tetrachloride	ND	0.0050	mg/kg wet							
Chlorobenzene	ND	0.0050	mg/kg wet							
Chloroethane	ND	0.0100	mg/kg wet							
Chloroform	ND	0.0050	mg/kg wet							
Chloromethane	ND	0.0100	mg/kg wet							
cis-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
cis-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Dibromochloromethane	ND	0.0050	mg/kg wet							
Dibromomethane	ND	0.0050	mg/kg wet							
Dichlorodifluoromethane	ND	0.0100	mg/kg wet							
Diethyl Ether	ND	0.0050	mg/kg wet							
Di-isopropyl ether	ND	0.0050	mg/kg wet							
Ethyl tertiary-butyl ether	ND	0.0050	mg/kg wet							
Ethylbenzene	ND	0.0050	mg/kg wet							
Hexachlorobutadiene	ND	0.0050	mg/kg wet							
Isopropylbenzene	ND	0.0050	mg/kg wet							
Methyl tert-Butyl Ether	ND	0.0050	mg/kg wet							
Methylene Chloride	ND	0.0250	mg/kg wet							
Naphthalene	ND	0.0050	mg/kg wet							
n-Butylbenzene	ND	0.0050	mg/kg wet							
n-Propylbenzene	ND	0.0050	mg/kg wet							
sec-Butylbenzene	ND	0.0050	mg/kg wet							
Styrene	ND	0.0050	mg/kg wet							
tert-Butylbenzene	ND	0.0050	mg/kg wet							
Tertiary-amyl methyl ether	ND	0.0050	mg/kg wet							
Tetrachloroethene	ND	0.0050	mg/kg wet							
Tetrahydrofuran	ND	0.0050	mg/kg wet							
Toluene	ND	0.0050	mg/kg wet							
trans-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
trans-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Trichloroethene	ND	0.0050	mg/kg wet							
Trichlorofluoromethane	ND	0.0050	mg/kg wet							
Vinyl Acetate	ND	0.0050	mg/kg wet							
Vinyl Chloride	ND	0.0100	mg/kg wet							
Xylene O	ND	0.0050	mg/kg wet							
Xylene P,M	ND	0.0100	mg/kg wet							
Xylenes (Total)	ND	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	0.0529		mg/kg wet	0.05000		106	70-130			
Surrogate: 4-Bromofluorobenzene	0.0478		mg/kg wet	0.05000		96	70-130			
Surrogate: Dibromofluoromethane	0.0525		mg/kg wet	0.05000		105	70-130			
Surrogate: Toluene-d8	0.0499		mg/kg wet	0.05000		100	70-130			

**LCS**



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1712222

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CL71129 - 5035**

1,1,1,2-Tetrachloroethane	0.0459	0.0050	mg/kg wet	0.05000		92	70-130			
1,1,1-Trichloroethane	0.0518	0.0050	mg/kg wet	0.05000		104	70-130			
1,1,2,2-Tetrachloroethane	0.0428	0.0050	mg/kg wet	0.05000		86	70-130			
1,1,2-Trichloroethane	0.0454	0.0050	mg/kg wet	0.05000		91	70-130			
1,1-Dichloroethane	0.0444	0.0050	mg/kg wet	0.05000		89	70-130			
1,1-Dichloroethene	0.0451	0.0050	mg/kg wet	0.05000		90	70-130			
1,1-Dichloropropene	0.0474	0.0050	mg/kg wet	0.05000		95	70-130			
1,2,3-Trichlorobenzene	0.0471	0.0050	mg/kg wet	0.05000		94	70-130			
1,2,3-Trichloropropane	0.0452	0.0050	mg/kg wet	0.05000		90	70-130			
1,2,4-Trichlorobenzene	0.0461	0.0050	mg/kg wet	0.05000		92	70-130			
1,2,4-Trimethylbenzene	0.0466	0.0050	mg/kg wet	0.05000		93	70-130			
1,2-Dibromo-3-Chloropropane	0.0435	0.0050	mg/kg wet	0.05000		87	70-130			
1,2-Dibromoethane	0.0446	0.0050	mg/kg wet	0.05000		89	70-130			
1,2-Dichlorobenzene	0.0460	0.0050	mg/kg wet	0.05000		92	70-130			
1,2-Dichloroethane	0.0498	0.0050	mg/kg wet	0.05000		100	70-130			
1,2-Dichloropropane	0.0439	0.0050	mg/kg wet	0.05000		88	70-130			
1,3,5-Trimethylbenzene	0.0462	0.0050	mg/kg wet	0.05000		92	70-130			
1,3-Dichlorobenzene	0.0451	0.0050	mg/kg wet	0.05000		90	70-130			
1,3-Dichloropropane	0.0451	0.0050	mg/kg wet	0.05000		90	70-130			
1,4-Dichlorobenzene	0.0454	0.0050	mg/kg wet	0.05000		91	70-130			
1,4-Dioxane	0.794	0.100	mg/kg wet	1.000		79	70-130			
1-Chlorohexane	0.0362	0.0050	mg/kg wet	0.05000		72	70-130			
2,2-Dichloropropane	0.0500	0.0050	mg/kg wet	0.05000		100	70-130			
2-Butanone	0.222	0.0500	mg/kg wet	0.2500		89	70-130			
2-Chlorotoluene	0.0455	0.0050	mg/kg wet	0.05000		91	70-130			
2-Hexanone	0.184	0.0500	mg/kg wet	0.2500		74	70-130			
4-Chlorotoluene	0.0454	0.0050	mg/kg wet	0.05000		91	70-130			
4-Isopropyltoluene	0.0451	0.0050	mg/kg wet	0.05000		90	70-130			
4-Methyl-2-Pentanone	0.192	0.0500	mg/kg wet	0.2500		77	70-130			
Acetone	0.224	0.0500	mg/kg wet	0.2500		90	70-130			
Benzene	0.0443	0.0050	mg/kg wet	0.05000		89	70-130			
Bromobenzene	0.0459	0.0050	mg/kg wet	0.05000		92	70-130			
Bromochloromethane	0.0451	0.0050	mg/kg wet	0.05000		90	70-130			
Bromodichloromethane	0.0523	0.0050	mg/kg wet	0.05000		105	70-130			
Bromoform	0.0492	0.0050	mg/kg wet	0.05000		98	70-130			
Bromomethane	0.0433	0.0100	mg/kg wet	0.05000		87	70-130			
Carbon Disulfide	0.0472	0.0050	mg/kg wet	0.05000		94	70-130			
Carbon Tetrachloride	0.0500	0.0050	mg/kg wet	0.05000		100	70-130			
Chlorobenzene	0.0438	0.0050	mg/kg wet	0.05000		88	70-130			
Chloroethane	0.0441	0.0100	mg/kg wet	0.05000		88	70-130			
Chloroform	0.0473	0.0050	mg/kg wet	0.05000		95	70-130			
Chloromethane	0.0449	0.0100	mg/kg wet	0.05000		90	70-130			
cis-1,2-Dichloroethene	0.0444	0.0050	mg/kg wet	0.05000		89	70-130			
cis-1,3-Dichloropropene	0.0444	0.0050	mg/kg wet	0.05000		89	70-130			
Dibromochloromethane	0.0437	0.0050	mg/kg wet	0.05000		87	70-130			

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1712222

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CL71129 - 5035**

Dibromomethane	0.0449	0.0050	mg/kg wet	0.05000		90	70-130			
Dichlorodifluoromethane	0.0430	0.0100	mg/kg wet	0.05000		86	70-130			
Diethyl Ether	0.0456	0.0050	mg/kg wet	0.05000		91	70-130			
Di-isopropyl ether	0.0423	0.0050	mg/kg wet	0.05000		85	70-130			
Ethyl tertiary-butyl ether	0.0446	0.0050	mg/kg wet	0.05000		89	70-130			
Ethylbenzene	0.0439	0.0050	mg/kg wet	0.05000		88	70-130			
Hexachlorobutadiene	0.0492	0.0050	mg/kg wet	0.05000		98	70-130			
Isopropylbenzene	0.0432	0.0050	mg/kg wet	0.05000		86	70-130			
Methyl tert-Butyl Ether	0.0459	0.0050	mg/kg wet	0.05000		92	70-130			
Methylene Chloride	0.0485	0.0250	mg/kg wet	0.05000		97	70-130			
Naphthalene	0.0389	0.0050	mg/kg wet	0.05000		78	70-130			
n-Butylbenzene	0.0447	0.0050	mg/kg wet	0.05000		89	70-130			
n-Propylbenzene	0.0454	0.0050	mg/kg wet	0.05000		91	70-130			
sec-Butylbenzene	0.0365	0.0050	mg/kg wet	0.05000		73	70-130			
Styrene	0.0394	0.0050	mg/kg wet	0.05000		79	70-130			
tert-Butylbenzene	0.0459	0.0050	mg/kg wet	0.05000		92	70-130			
Tertiary-amyl methyl ether	0.0441	0.0050	mg/kg wet	0.05000		88	70-130			
Tetrachloroethene	0.0421	0.0050	mg/kg wet	0.05000		84	70-130			
Tetrahydrofuran	0.0354	0.0050	mg/kg wet	0.05000		71	70-130			
Toluene	0.0445	0.0050	mg/kg wet	0.05000		89	70-130			
trans-1,2-Dichloroethene	0.0437	0.0050	mg/kg wet	0.05000		87	70-130			
trans-1,3-Dichloropropene	0.0447	0.0050	mg/kg wet	0.05000		89	70-130			
Trichloroethene	0.0451	0.0050	mg/kg wet	0.05000		90	70-130			
Trichlorofluoromethane	0.0490	0.0050	mg/kg wet	0.05000		98	70-130			
Vinyl Acetate	0.0386	0.0050	mg/kg wet	0.05000		77	70-130			
Vinyl Chloride	0.0470	0.0100	mg/kg wet	0.05000		94	70-130			
Xylene O	0.0449	0.0050	mg/kg wet	0.05000		90	70-130			
Xylene P,M	0.0872	0.0100	mg/kg wet	0.1000		87	70-130			
Xylenes (Total)	0.132	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	0.0547		mg/kg wet	0.05000		109	70-130			
Surrogate: 4-Bromofluorobenzene	0.0512		mg/kg wet	0.05000		102	70-130			
Surrogate: Dibromofluoromethane	0.0542		mg/kg wet	0.05000		108	70-130			
Surrogate: Toluene-d8	0.0496		mg/kg wet	0.05000		99	70-130			

**LCS Dup**

1,1,1,2-Tetrachloroethane	0.0551	0.0050	mg/kg wet	0.05000		110	70-130	18	25	
1,1,1-Trichloroethane	0.0609	0.0050	mg/kg wet	0.05000		122	70-130	16	25	
1,1,2,2-Tetrachloroethane	0.0509	0.0050	mg/kg wet	0.05000		102	70-130	17	25	
1,1,2-Trichloroethane	0.0528	0.0050	mg/kg wet	0.05000		106	70-130	15	25	
1,1-Dichloroethane	0.0514	0.0050	mg/kg wet	0.05000		103	70-130	14	25	
1,1-Dichloroethene	0.0536	0.0050	mg/kg wet	0.05000		107	70-130	17	25	
1,1-Dichloropropene	0.0564	0.0050	mg/kg wet	0.05000		113	70-130	17	25	
1,2,3-Trichlorobenzene	0.0530	0.0050	mg/kg wet	0.05000		106	70-130	12	25	
1,2,3-Trichloropropane	0.0545	0.0050	mg/kg wet	0.05000		109	70-130	19	25	
1,2,4-Trichlorobenzene	0.0519	0.0050	mg/kg wet	0.05000		104	70-130	12	25	
1,2,4-Trimethylbenzene	0.0541	0.0050	mg/kg wet	0.05000		108	70-130	15	25	



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
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ESS Laboratory Work Order: 1712222

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CL71129 - 5035**

1,2-Dibromo-3-Chloropropane	0.0514	0.0050	mg/kg wet	0.05000		103	70-130	17	25	
1,2-Dibromoethane	0.0548	0.0050	mg/kg wet	0.05000		110	70-130	20	25	
1,2-Dichlorobenzene	0.0531	0.0050	mg/kg wet	0.05000		106	70-130	14	25	
1,2-Dichloroethane	0.0573	0.0050	mg/kg wet	0.05000		115	70-130	14	25	
1,2-Dichloropropane	0.0518	0.0050	mg/kg wet	0.05000		104	70-130	16	25	
1,3,5-Trimethylbenzene	0.0540	0.0050	mg/kg wet	0.05000		108	70-130	15	25	
1,3-Dichlorobenzene	0.0534	0.0050	mg/kg wet	0.05000		107	70-130	17	25	
1,3-Dichloropropane	0.0554	0.0050	mg/kg wet	0.05000		111	70-130	20	25	
1,4-Dichlorobenzene	0.0506	0.0050	mg/kg wet	0.05000		101	70-130	11	25	
1,4-Dioxane	0.931	0.100	mg/kg wet	1.000		93	70-130	16	20	
1-Chlorohexane	0.0453	0.0050	mg/kg wet	0.05000		91	70-130	22	25	
2,2-Dichloropropane	0.0583	0.0050	mg/kg wet	0.05000		117	70-130	15	25	
2-Butanone	0.263	0.0500	mg/kg wet	0.2500		105	70-130	17	25	
2-Chlorotoluene	0.0522	0.0050	mg/kg wet	0.05000		104	70-130	14	25	
2-Hexanone	0.227	0.0500	mg/kg wet	0.2500		91	70-130	21	25	
4-Chlorotoluene	0.0533	0.0050	mg/kg wet	0.05000		107	70-130	16	25	
4-Isopropyltoluene	0.0527	0.0050	mg/kg wet	0.05000		105	70-130	16	25	
4-Methyl-2-Pentanone	0.230	0.0500	mg/kg wet	0.2500		92	70-130	18	25	
Acetone	0.265	0.0500	mg/kg wet	0.2500		106	70-130	17	25	
Benzene	0.0518	0.0050	mg/kg wet	0.05000		104	70-130	16	25	
Bromobenzene	0.0532	0.0050	mg/kg wet	0.05000		106	70-130	15	25	
Bromochloromethane	0.0519	0.0050	mg/kg wet	0.05000		104	70-130	14	25	
Bromodichloromethane	0.0607	0.0050	mg/kg wet	0.05000		121	70-130	15	25	
Bromoform	0.0603	0.0050	mg/kg wet	0.05000		121	70-130	20	25	
Bromomethane	0.0523	0.0100	mg/kg wet	0.05000		105	70-130	19	25	
Carbon Disulfide	0.0552	0.0050	mg/kg wet	0.05000		110	70-130	16	25	
Carbon Tetrachloride	0.0576	0.0050	mg/kg wet	0.05000		115	70-130	14	25	
Chlorobenzene	0.0530	0.0050	mg/kg wet	0.05000		106	70-130	19	25	
Chloroethane	0.0519	0.0100	mg/kg wet	0.05000		104	70-130	16	25	
Chloroform	0.0548	0.0050	mg/kg wet	0.05000		110	70-130	15	25	
Chloromethane	0.0533	0.0100	mg/kg wet	0.05000		107	70-130	17	25	
cis-1,2-Dichloroethene	0.0520	0.0050	mg/kg wet	0.05000		104	70-130	16	25	
cis-1,3-Dichloropropene	0.0522	0.0050	mg/kg wet	0.05000		104	70-130	16	25	
Dibromochloromethane	0.0532	0.0050	mg/kg wet	0.05000		106	70-130	19	25	
Dibromomethane	0.0524	0.0050	mg/kg wet	0.05000		105	70-130	16	25	
Dichlorodifluoromethane	0.0498	0.0100	mg/kg wet	0.05000		100	70-130	15	25	
Diethyl Ether	0.0549	0.0050	mg/kg wet	0.05000		110	70-130	19	25	
Di-isopropyl ether	0.0500	0.0050	mg/kg wet	0.05000		100	70-130	17	25	
Ethyl tertiary-butyl ether	0.0529	0.0050	mg/kg wet	0.05000		106	70-130	17	25	
Ethylbenzene	0.0537	0.0050	mg/kg wet	0.05000		107	70-130	20	25	
Hexachlorobutadiene	0.0567	0.0050	mg/kg wet	0.05000		113	70-130	14	25	
Isopropylbenzene	0.0510	0.0050	mg/kg wet	0.05000		102	70-130	17	25	
Methyl tert-Butyl Ether	0.0548	0.0050	mg/kg wet	0.05000		110	70-130	18	25	
Methylene Chloride	0.0559	0.0250	mg/kg wet	0.05000		112	70-130	14	25	
Naphthalene	0.0456	0.0050	mg/kg wet	0.05000		91	70-130	16	25	

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1712222

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Low Level

**Batch CL71129 - 5035**

n-Butylbenzene	0.0521	0.0050	mg/kg wet	0.05000		104	70-130	15	25	
n-Propylbenzene	0.0536	0.0050	mg/kg wet	0.05000		107	70-130	16	25	
sec-Butylbenzene	0.0424	0.0050	mg/kg wet	0.05000		85	70-130	15	25	
Styrene	0.0480	0.0050	mg/kg wet	0.05000		96	70-130	20	25	
tert-Butylbenzene	0.0546	0.0050	mg/kg wet	0.05000		109	70-130	17	25	
Tertiary-amyl methyl ether	0.0526	0.0050	mg/kg wet	0.05000		105	70-130	18	25	
Tetrachloroethene	0.0519	0.0050	mg/kg wet	0.05000		104	70-130	21	25	
Tetrahydrofuran	0.0442	0.0050	mg/kg wet	0.05000		88	70-130	22	25	
Toluene	0.0521	0.0050	mg/kg wet	0.05000		104	70-130	16	25	
trans-1,2-Dichloroethene	0.0524	0.0050	mg/kg wet	0.05000		105	70-130	18	25	
trans-1,3-Dichloropropene	0.0523	0.0050	mg/kg wet	0.05000		105	70-130	16	25	
Trichloroethene	0.0520	0.0050	mg/kg wet	0.05000		104	70-130	14	25	
Trichlorofluoromethane	0.0571	0.0050	mg/kg wet	0.05000		114	70-130	15	25	
Vinyl Acetate	0.0464	0.0050	mg/kg wet	0.05000		93	70-130	18	25	
Vinyl Chloride	0.0546	0.0100	mg/kg wet	0.05000		109	70-130	15	25	
Xylene O	0.0549	0.0050	mg/kg wet	0.05000		110	70-130	20	25	
Xylene P,M	0.108	0.0100	mg/kg wet	0.1000		108	70-130	21	25	
Xylenes (Total)	0.163	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	0.0543		mg/kg wet	0.05000		109	70-130			
Surrogate: 4-Bromofluorobenzene	0.0535		mg/kg wet	0.05000		107	70-130			
Surrogate: Dibromofluoromethane	0.0540		mg/kg wet	0.05000		108	70-130			
Surrogate: Toluene-d8	0.0520		mg/kg wet	0.05000		104	70-130			

8100M Total Petroleum Hydrocarbons

**Batch CL71116 - 3546**

<b>Blank</b>										
Decane (C10)	ND	0.2	mg/kg wet							
Docosane (C22)	ND	0.2	mg/kg wet							
Dodecane (C12)	ND	0.2	mg/kg wet							
Eicosane (C20)	ND	0.2	mg/kg wet							
Hexacosane (C26)	ND	0.2	mg/kg wet							
Hexadecane (C16)	ND	0.2	mg/kg wet							
Nonadecane (C19)	ND	0.2	mg/kg wet							
Nonane (C9)	ND	0.2	mg/kg wet							
Octacosane (C28)	ND	0.2	mg/kg wet							
Octadecane (C18)	ND	0.2	mg/kg wet							
Tetracosane (C24)	ND	0.2	mg/kg wet							
Tetradecane (C14)	ND	0.2	mg/kg wet							
Total Petroleum Hydrocarbons	ND	35.0	mg/kg wet							
Triacontane (C30)	ND	0.2	mg/kg wet							

Surrogate: O-Terphenyl	4.65		mg/kg wet	5.000		93	40-140			
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<b>LCS</b>										
Decane (C10)	2.0	0.2	mg/kg wet	2.500		81	40-140			
Docosane (C22)	2.3	0.2	mg/kg wet	2.500		92	40-140			





CERTIFICATE OF ANALYSIS

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8100M Total Petroleum Hydrocarbons

**Batch CL71116 - 3546**

Dodecane (C12)	2.2	0.2	mg/kg wet	2.500		88	40-140			
Eicosane (C20)	2.3	0.2	mg/kg wet	2.500		91	40-140			
Hexacosane (C26)	2.3	0.2	mg/kg wet	2.500		92	40-140			
Hexadecane (C16)	2.2	0.2	mg/kg wet	2.500		90	40-140			
Nonadecane (C19)	2.4	0.2	mg/kg wet	2.500		97	40-140			
Nonane (C9)	1.6	0.2	mg/kg wet	2.500		64	30-140			
Octacosane (C28)	2.3	0.2	mg/kg wet	2.500		92	40-140			
Octadecane (C18)	2.2	0.2	mg/kg wet	2.500		88	40-140			
Tetracosane (C24)	2.3	0.2	mg/kg wet	2.500		92	40-140			
Tetradecane (C14)	2.2	0.2	mg/kg wet	2.500		87	40-140			
Total Petroleum Hydrocarbons	31.2	35.0	mg/kg wet	35.00		89	40-140			
Triacontane (C30)	2.3	0.2	mg/kg wet	2.500		92	40-140			

Surrogate: O-Terphenyl	4.64		mg/kg wet	5.000		93	40-140			
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**LCS Dup**

Decane (C10)	1.8	0.2	mg/kg wet	2.500		72	40-140	12	25	
Docosane (C22)	2.3	0.2	mg/kg wet	2.500		93	40-140	0.6	25	
Dodecane (C12)	2.0	0.2	mg/kg wet	2.500		81	40-140	7	25	
Eicosane (C20)	2.3	0.2	mg/kg wet	2.500		91	40-140	0.2	25	
Hexacosane (C26)	2.3	0.2	mg/kg wet	2.500		93	40-140	0.7	25	
Hexadecane (C16)	2.2	0.2	mg/kg wet	2.500		87	40-140	3	25	
Nonadecane (C19)	2.4	0.2	mg/kg wet	2.500		96	40-140	0.8	25	
Nonane (C9)	1.3	0.2	mg/kg wet	2.500		54	30-140	17	25	
Octacosane (C28)	2.3	0.2	mg/kg wet	2.500		93	40-140	0.9	25	
Octadecane (C18)	2.2	0.2	mg/kg wet	2.500		86	40-140	2	25	
Tetracosane (C24)	2.3	0.2	mg/kg wet	2.500		93	40-140	0.7	25	
Tetradecane (C14)	2.1	0.2	mg/kg wet	2.500		83	40-140	5	25	
Total Petroleum Hydrocarbons	30.4	35.0	mg/kg wet	35.00		87	40-140	3	25	
Triacontane (C30)	2.3	0.2	mg/kg wet	2.500		93	40-140	0.8	25	

Surrogate: O-Terphenyl	4.49		mg/kg wet	5.000		90	40-140			
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8270D Polynuclear Aromatic Hydrocarbons

**Batch CL71118 - 3546**

<b>Blank</b>										
2-Methylnaphthalene	ND	0.333	mg/kg wet							
Acenaphthene	ND	0.333	mg/kg wet							
Acenaphthylene	ND	0.333	mg/kg wet							
Anthracene	ND	0.333	mg/kg wet							
Benzo(a)anthracene	ND	0.333	mg/kg wet							
Benzo(a)pyrene	ND	0.167	mg/kg wet							
Benzo(b)fluoranthene	ND	0.333	mg/kg wet							
Benzo(g,h,i)perylene	ND	0.333	mg/kg wet							
Benzo(k)fluoranthene	ND	0.333	mg/kg wet							
Chrysene	ND	0.167	mg/kg wet							



CERTIFICATE OF ANALYSIS

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**Quality Control Data**

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8270D Polynuclear Aromatic Hydrocarbons

**Batch CL71118 - 3546**

Dibenzo(a,h)Anthracene	ND	0.167	mg/kg wet							
Fluoranthene	ND	0.333	mg/kg wet							
Fluorene	ND	0.333	mg/kg wet							
Indeno(1,2,3-cd)Pyrene	ND	0.333	mg/kg wet							
Naphthalene	ND	0.333	mg/kg wet							
Phenanthrene	ND	0.333	mg/kg wet							
Pyrene	ND	0.333	mg/kg wet							
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	<i>2.67</i>		mg/kg wet	<i>3.333</i>		<i>80</i>	<i>30-130</i>			
<i>Surrogate: 2-Fluorobiphenyl</i>	<i>2.96</i>		mg/kg wet	<i>3.333</i>		<i>89</i>	<i>30-130</i>			
<i>Surrogate: Nitrobenzene-d5</i>	<i>3.19</i>		mg/kg wet	<i>3.333</i>		<i>96</i>	<i>30-130</i>			
<i>Surrogate: p-Terphenyl-d14</i>	<i>3.90</i>		mg/kg wet	<i>3.333</i>		<i>117</i>	<i>30-130</i>			

**LCS**

2-Methylnaphthalene	2.79	0.333	mg/kg wet	3.333		84	40-140			
Acenaphthene	2.96	0.333	mg/kg wet	3.333		89	40-140			
Acenaphthylene	3.01	0.333	mg/kg wet	3.333		90	40-140			
Anthracene	3.23	0.333	mg/kg wet	3.333		97	40-140			
Benzo(a)anthracene	3.25	0.333	mg/kg wet	3.333		97	40-140			
Benzo(a)pyrene	3.28	0.167	mg/kg wet	3.333		98	40-140			
Benzo(b)fluoranthene	3.48	0.333	mg/kg wet	3.333		104	40-140			
Benzo(g,h,i)perylene	3.31	0.333	mg/kg wet	3.333		99	40-140			
Benzo(k)fluoranthene	3.12	0.333	mg/kg wet	3.333		94	40-140			
Chrysene	3.18	0.167	mg/kg wet	3.333		95	40-140			
Dibenzo(a,h)Anthracene	3.42	0.167	mg/kg wet	3.333		103	40-140			
Fluoranthene	3.20	0.333	mg/kg wet	3.333		96	40-140			
Fluorene	2.98	0.333	mg/kg wet	3.333		89	40-140			
Indeno(1,2,3-cd)Pyrene	3.39	0.333	mg/kg wet	3.333		102	40-140			
Naphthalene	2.98	0.333	mg/kg wet	3.333		89	40-140			
Phenanthrene	3.08	0.333	mg/kg wet	3.333		92	40-140			
Pyrene	3.33	0.333	mg/kg wet	3.333		100	40-140			
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	<i>2.92</i>		mg/kg wet	<i>3.333</i>		<i>88</i>	<i>30-130</i>			
<i>Surrogate: 2-Fluorobiphenyl</i>	<i>3.40</i>		mg/kg wet	<i>3.333</i>		<i>102</i>	<i>30-130</i>			
<i>Surrogate: Nitrobenzene-d5</i>	<i>3.52</i>		mg/kg wet	<i>3.333</i>		<i>106</i>	<i>30-130</i>			
<i>Surrogate: p-Terphenyl-d14</i>	<i>3.69</i>		mg/kg wet	<i>3.333</i>		<i>111</i>	<i>30-130</i>			

**LCS Dup**

2-Methylnaphthalene	2.87	0.333	mg/kg wet	3.333		86	40-140	3	30	
Acenaphthene	2.88	0.333	mg/kg wet	3.333		86	40-140	3	30	
Acenaphthylene	2.93	0.333	mg/kg wet	3.333		88	40-140	3	30	
Anthracene	3.17	0.333	mg/kg wet	3.333		95	40-140	2	30	
Benzo(a)anthracene	3.16	0.333	mg/kg wet	3.333		95	40-140	3	30	
Benzo(a)pyrene	3.23	0.167	mg/kg wet	3.333		97	40-140	2	30	
Benzo(b)fluoranthene	3.32	0.333	mg/kg wet	3.333		100	40-140	5	30	
Benzo(g,h,i)perylene	3.21	0.333	mg/kg wet	3.333		96	40-140	3	30	
Benzo(k)fluoranthene	3.19	0.333	mg/kg wet	3.333		96	40-140	2	30	
Chrysene	3.09	0.167	mg/kg wet	3.333		93	40-140	3	30	
Dibenzo(a,h)Anthracene	3.33	0.167	mg/kg wet	3.333		100	40-140	3	30	



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1712222

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
<b>8270D Polynuclear Aromatic Hydrocarbons</b>										
<b>Batch CL71118 - 3546</b>										
Fluoranthene	3.19	0.333	mg/kg wet	3.333		96	40-140	0.04	30	
Fluorene	2.99	0.333	mg/kg wet	3.333		90	40-140	0.4	30	
Indeno(1,2,3-cd)Pyrene	3.29	0.333	mg/kg wet	3.333		99	40-140	3	30	
Naphthalene	2.98	0.333	mg/kg wet	3.333		89	40-140	0.09	30	
Phenanthrene	3.02	0.333	mg/kg wet	3.333		91	40-140	2	30	
Pyrene	3.20	0.333	mg/kg wet	3.333		96	40-140	4	30	
Surrogate: 1,2-Dichlorobenzene-d4	2.77		mg/kg wet	3.333		83	30-130			
Surrogate: 2-Fluorobiphenyl	3.13		mg/kg wet	3.333		94	30-130			
Surrogate: Nitrobenzene-d5	3.28		mg/kg wet	3.333		98	30-130			
Surrogate: p-Terphenyl-d14	3.46		mg/kg wet	3.333		104	30-130			

Classical Chemistry

<b>Batch CL71417 - TCN Prep</b>										
<b>Blank</b>										
Total Cyanide	ND	1.00	mg/kg wet							
<b>LCS</b>										
Total Cyanide	5.00	1.00	mg/kg wet	5.015		100	90-110			
<b>Reference</b>										
Total Cyanide	50.3	4.97	mg/kg wet	48.40		104	36.1577-206.6 12			
<b>Reference</b>										
Total Cyanide	50.1	4.93	mg/kg wet	48.40		104	36.1577-206.6 12			



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1712222

**Notes and Definitions**

- U Analyte included in the analysis, but not detected
- IM Internal Standard(s) outside of criteria due to matrix (UCM/coelution is present) (IM).
- D Diluted.
- CD- Continuing Calibration %Diff/Drift is below control limit (CD-).
- ND Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference
- MDL Method Detection Limit
- MRL Method Reporting Limit
- LOD Limit of Detection
- LOQ Limit of Quantitation
- DL Detection Limit
- I/V Initial Volume
- F/V Final Volume
- § Subcontracted analysis; see attached report
- 1 Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
- 2 Range result excludes concentrations of target analytes eluting in that range.
- 3 Range result excludes the concentration of the C9-C10 aromatic range.
- Avg Results reported as a mathematical average.
- NR No Recovery
- [CALC] Calculated Analyte
- SUB Subcontracted analysis; see attached report
- RL Reporting Limit
- EDL Estimated Detection Limit



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1712222

**ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS**

**ENVIRONMENTAL**

Rhode Island Potable and Non Potable Water: LAI00179

<http://www.health.ri.gov/find/labs/analytical/ESS.pdf>

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750

[http://www.ct.gov/dph/lib/dph/environmental\\_health/environmental\\_laboratories/pdf/OutofStateCommercialLaboratories.pdf](http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf)

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002

<http://www.maine.gov/dhhs/meecd/environmental-health/dwp/partners/labCert.shtml>

Massachusetts Potable and Non Potable Water: M-RI002

<http://public.dep.state.ma.us/Labcert/Labcert.aspx>

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424

<http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm>

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313

<http://www.wadsworth.org/labcert/elap/comm.html>

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006

[http://datamine2.state.nj.us/DEP\\_OPRA/OpraMain/pi\\_main?mode=pi\\_by\\_site&sort\\_order=PI\\_NAMEA&Select+a+Site:=58715](http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715)

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752

<http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx>

## ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Providence, RI - GZA/HDM

ESS Project ID: 1712222

Date Received: 12/8/2017

Project Due Date: 12/15/2017

Days for Project: 5 Day

Shipped/Delivered Via: \_\_\_\_\_ Client \_\_\_\_\_

1. Air bill manifest present?  No  
Air No.: \_\_\_\_\_ NA \_\_\_\_\_

2. Were custody seals present?  No

3. Is radiation count <100 CPM?  Yes

4. Is a Cooler Present?  Yes  
Temp: 3.9 Iced with: Ice

5. Was COC signed and dated by client?  Yes

6. Does COC match bottles?  Yes

7. Is COC complete and correct?  Yes

8. Were samples received intact?  Yes

9. Were labs informed about **short holds & rushes**? Yes / No / NA

10. Were any analyses received outside of hold time? Yes / No

11. Any Subcontracting needed? Yes  No  
ESS Sample IDs: \_\_\_\_\_  
Analysis: \_\_\_\_\_  
TAT: \_\_\_\_\_

12. Were VOAs received?  Yes / No  
a. Air bubbles in aqueous VOAs?  Yes / No  
b. Does methanol cover soil completely?  Yes / No / NA

13. Are the samples properly preserved?  Yes / No  
a. If metals preserved upon receipt: Date: 12/8/17 Time: \_\_\_\_\_ By: \_\_\_\_\_  
b. Low Level VOA vials frozen: Date: 12/8/17 Time: 1538 By: [Signature]

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes /  No  
a. Was there a need to contact the client? Yes / No  
Who was contacted? \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_ By: \_\_\_\_\_

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
01	189370	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
01	189381	Yes	NA	Yes	2 oz. Jar - Unpres	NP	
01	189393	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
01	189416	Yes	NA	Yes	VOA Vial - Other	Other	
01	189417	Yes	NA	Yes	VOA Vial - Other	Other	
02	189369	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
02	189380	Yes	NA	Yes	2 oz. Jar - Unpres	NP	
02	189392	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
02	189414	Yes	NA	Yes	VOA Vial - Other	Other	
02	189415	Yes	NA	Yes	VOA Vial - Other	Other	
03	189368	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
03	189379	Yes	NA	Yes	2 oz. Jar - Unpres	NP	
03	189391	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
03	189412	Yes	NA	Yes	VOA Vial - Other	Other	
03	189413	Yes	NA	Yes	VOA Vial - Other	Other	
04	189367	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
04	189378	Yes	NA	Yes	2 oz. Jar - Unpres	NP	
04	189390	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
04	189410	Yes	NA	Yes	VOA Vial - Other	Other	
04	189411	Yes	NA	Yes	VOA Vial - Other	Other	
05	189366	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
05	189377	Yes	NA	Yes	2 oz. Jar - Unpres	NP	
05	189389	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
05	189408	Yes	NA	Yes	VOA Vial - Other	Other	



## ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Providence, RI - GZAVHDM

ESS Project ID: 1712222  
Date Received: 12/8/2017

05	189409	Yes	NA	Yes	VOA Vial - Other	Other
06	189365	Yes	NA	Yes	8 oz. Jar - Unpres	NP
06	189376	Yes	NA	Yes	2 oz. Jar - Unpres	NP
06	189388	Yes	NA	Yes	VOA Vial - Methanol	MeOH
06	189406	Yes	NA	Yes	VOA Vial - Other	Other
06	189407	Yes	NA	Yes	VOA Vial - Other	Other
07	189364	Yes	NA	Yes	8 oz. Jar - Unpres	NP
07	189375	Yes	NA	Yes	2 oz. Jar - Unpres	NP
07	189387	Yes	NA	Yes	VOA Vial - Methanol	MeOH
07	189404	Yes	NA	Yes	VOA Vial - Other	Other
07	189405	Yes	NA	Yes	VOA Vial - Other	Other
08	189363	Yes	NA	Yes	8 oz. Jar - Unpres	NP
08	189374	Yes	NA	Yes	2 oz. Jar - Unpres	NP
08	189386	Yes	NA	Yes	VOA Vial - Methanol	MeOH
08	189402	Yes	NA	Yes	VOA Vial - Other	Other
08	189403	Yes	NA	Yes	VOA Vial - Other	Other
09	189362	Yes	NA	Yes	8 oz. Jar - Unpres	NP
09	189373	Yes	NA	Yes	2 oz. Jar - Unpres	NP
09	189385	Yes	NA	Yes	VOA Vial - Methanol	MeOH
09	189400	Yes	NA	Yes	VOA Vial - Other	Other
09	189401	Yes	NA	Yes	VOA Vial - Other	Other
10	189361	Yes	NA	Yes	8 oz. Jar - Unpres	NP
10	189372	Yes	NA	Yes	2 oz. Jar - Unpres	NP
10	189384	Yes	NA	Yes	VOA Vial - Methanol	MeOH
10	189398	Yes	NA	Yes	VOA Vial - Other	Other
10	189399	Yes	NA	Yes	VOA Vial - Other	Other
11	189360	Yes	NA	Yes	8 oz. Jar - Unpres	NP
11	189371	Yes	NA	Yes	2 oz. Jar - Unpres	NP
11	189383	Yes	NA	Yes	VOA Vial - Methanol	MeOH
11	189396	Yes	NA	Yes	VOA Vial - Other	Other
11	189397	Yes	NA	Yes	VOA Vial - Other	Other
12	189382	Yes	NA	Yes	VOA Vial - Methanol	MeOH
12	189394	Yes	NA	Yes	VOA Vial - Other	Other
12	189395	Yes	NA	Yes	VOA Vial - Other	Other

**2nd Review**

Are barcode labels on correct containers?

Yes / No

Completed

By: 

Date & Time: 12/8/17 1530

Reviewed

By: 

Date & Time: 12/8/17 1539

Delivered

By: 

Date & Time: 12/8/17 1539





## CERTIFICATE OF ANALYSIS

Sarah McLeod  
GZA GeoEnvironmental, Inc.  
530 Broadway  
Providence, RI 02909

**RE: Former Tidewater Facility (05.0043654.00)**  
**ESS Laboratory Work Order Number: 1712473**

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.



Laurel Stoddard  
Laboratory Director

**REVIEWED***By ESS Laboratory at 10:16 am, Dec 28, 2017***Analytical Summary**

The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1712473

**SAMPLE RECEIPT**

The following samples were received on December 20, 2017 for the analyses specified on the enclosed Chain of Custody Record.

<b>Lab Number</b>	<b>Sample Name</b>	<b>Matrix</b>	<b>Analysis</b>
1712473-01	GZ-TP-534 - 0-1ft	Soil	9014
1712473-02	GZ-TP-534 - 2-3ft	Soil	9014
1712473-03	GZ-TP-548 - 1-2ft	Soil	9014
1712473-04	GZ-TP-548 - 3-4ft	Soil	9014
1712473-05	GZ-TP-535A - 0-1ft	Soil	9014
1712473-06	GZ-TP-535A - 1-2ft	Soil	9014
1712473-07	GZ-TP-536 - 0-1ft	Soil	9014
1712473-08	GZ-TP-536 - 1-2ft	Soil	9014
1712473-09	GZ-TP-538 - 0-1ft	Soil	9014
1712473-10	GZ-TP-538 - 1-2ft	Soil	9014
1712473-11	GZ-TP-537 - 1-2ft	Soil	9014
1712473-12	GZ-TP-537 - 2-3ft	Soil	9014
1712473-13	GZ-TP-543 - 1-2ft	Soil	9014
1712473-14	GZ-TP-543 - 2-3ft	Soil	9014
1712473-15	GZ-TP-542 - 1-2ft	Soil	9014
1712473-16	GZ-TP-542 - 2-3ft	Soil	9014
1712473-17	GZ-TP-547 - 1-2ft	Soil	9014
1712473-18	GZ-TP-547 - 2-3ft	Soil	9014
1712473-19	GZ-TP-546 - 0-0.5ft	Soil	9014
1712473-20	GZ-TP-546 - 1-2ft	Soil	9014



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1712473

**PROJECT NARRATIVE**

**No unusual observations noted.**

**End of Project Narrative.**

**DATA USABILITY LINKS**

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[Definitions of Quality Control Parameters](#)

[Semivolatile Organics Internal Standard Information](#)

[Semivolatile Organics Surrogate Information](#)

[Volatile Organics Internal Standard Information](#)

[Volatile Organics Surrogate Information](#)

[EPH and VPH Alkane Lists](#)





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1712473

**CURRENT SW-846 METHODOLOGY VERSIONS**

**Analytical Methods**

- 1010A - Flashpoint
- 6010C - ICP
- 6020A - ICP MS
- 7010 - Graphite Furnace
- 7196A - Hexavalent Chromium
- 7470A - Aqueous Mercury
- 7471B - Solid Mercury
- 8011 - EDB/DBCP/TCP
- 8015C - GRO/DRO
- 8081B - Pesticides
- 8082A - PCB
- 8100M - TPH
- 8151A - Herbicides
- 8260B - VOA
- 8270D - SVOA
- 8270D SIM - SVOA Low Level
- 9014 - Cyanide
- 9038 - Sulfate
- 9040C - Aqueous pH
- 9045D - Solid pH (Corrosivity)
- 9050A - Specific Conductance
- 9056A - Anions (IC)
- 9060A - TOC
- 9095B - Paint Filter
- MADEP 04-1.1 - EPH / VPH

**Prep Methods**

- 3005A - Aqueous ICP Digestion
- 3020A - Aqueous Graphite Furnace / ICP MS Digestion
- 3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
- 3060A - Solid Hexavalent Chromium Digestion
- 3510C - Separatory Funnel Extraction
- 3520C - Liquid / Liquid Extraction
- 3540C - Manual Soxhlet Extraction
- 3541 - Automated Soxhlet Extraction
- 3546 - Microwave Extraction
- 3580A - Waste Dilution
- 5030B - Aqueous Purge and Trap
- 5030C - Aqueous Purge and Trap
- 5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-TP-534 - 0-1ft  
Date Sampled: 12/19/17 08:20  
Percent Solids: 81

ESS Laboratory Work Order: 1712473  
ESS Laboratory Sample ID: 1712473-01  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	8.30 (1.23)		9014		1	EEM	12/26/17 11:55	mg/kg dry	CL72607



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-TP-534 - 2-3ft  
Date Sampled: 12/19/17 08:22  
Percent Solids: 92

ESS Laboratory Work Order: 1712473  
ESS Laboratory Sample ID: 1712473-02  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	ND (1.03)		9014		1	EEM	12/26/17 11:55	mg/kg dry	CL72607



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-TP-548 - 1-2ft  
Date Sampled: 12/19/17 08:34  
Percent Solids: 84

ESS Laboratory Work Order: 1712473  
ESS Laboratory Sample ID: 1712473-03  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	1.75 (1.10)		9014		1	EEM	12/26/17 11:55	mg/kg dry	CL72607



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-TP-548 - 3-4ft  
Date Sampled: 12/19/17 08:32  
Percent Solids: 68

ESS Laboratory Work Order: 1712473  
ESS Laboratory Sample ID: 1712473-04  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	ND (1.45)		9014		1	EEM	12/26/17 11:55	mg/kg dry	CL72607



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-TP-535A - 0-1ft  
Date Sampled: 12/19/17 08:55  
Percent Solids: 87

ESS Laboratory Work Order: 1712473  
ESS Laboratory Sample ID: 1712473-05  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	ND (1.07)		9014		1	EEM	12/26/17 11:55	mg/kg dry	CL72607





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-TP-535A - 1-2ft  
Date Sampled: 12/19/17 08:58  
Percent Solids: 72

ESS Laboratory Work Order: 1712473  
ESS Laboratory Sample ID: 1712473-06  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	ND (1.33)		9014		1	EEM	12/26/17 11:55	mg/kg dry	CL72607



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-TP-536 - 0-1ft  
Date Sampled: 12/19/17 09:18  
Percent Solids: 88

ESS Laboratory Work Order: 1712473  
ESS Laboratory Sample ID: 1712473-07  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	ND (1.05)		9014		1	EEM	12/26/17 11:55	mg/kg dry	CL72607



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-TP-536 - 1-2ft  
Date Sampled: 12/19/17 09:20  
Percent Solids: 87

ESS Laboratory Work Order: 1712473  
ESS Laboratory Sample ID: 1712473-08  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	2.94 (1.15)		9014		1	EEM	12/26/17 11:55	mg/kg dry	CL72607



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-TP-538 - 0-1ft  
Date Sampled: 12/19/17 09:35  
Percent Solids: 91

ESS Laboratory Work Order: 1712473  
ESS Laboratory Sample ID: 1712473-09  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	10.8 (1.02)		9014		1	EEM	12/26/17 11:55	mg/kg dry	CL72607



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-TP-538 - 1-2ft  
Date Sampled: 12/19/17 09:38  
Percent Solids: 89

ESS Laboratory Work Order: 1712473  
ESS Laboratory Sample ID: 1712473-10  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	3.76 (1.07)		9014		1	EEM	12/26/17 11:55	mg/kg dry	CL72607



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-TP-537 - 1-2ft  
Date Sampled: 12/19/17 09:50  
Percent Solids: 86

ESS Laboratory Work Order: 1712473  
ESS Laboratory Sample ID: 1712473-11  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	5.62 (1.13)		9014		1	EEM	12/26/17 11:55	mg/kg dry	CL72607





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-TP-537 - 2-3ft  
Date Sampled: 12/19/17 09:52  
Percent Solids: 90

ESS Laboratory Work Order: 1712473  
ESS Laboratory Sample ID: 1712473-12  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	6.75 (1.08)		9014		1	EEM	12/26/17 11:55	mg/kg dry	CL72607



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-TP-543 - 1-2ft  
Date Sampled: 12/19/17 10:20  
Percent Solids: 88

ESS Laboratory Work Order: 1712473  
ESS Laboratory Sample ID: 1712473-13  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	10.9 (1.05)		9014		1	EEM	12/26/17 11:55	mg/kg dry	CL72607



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-TP-543 - 2-3ft  
Date Sampled: 12/19/17 10:24  
Percent Solids: 78

ESS Laboratory Work Order: 1712473  
ESS Laboratory Sample ID: 1712473-14  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	9.17 (1.24)		9014		1	EEM	12/26/17 11:55	mg/kg dry	CL72607



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-TP-542 - 1-2ft  
Date Sampled: 12/19/17 10:32  
Percent Solids: 90

ESS Laboratory Work Order: 1712473  
ESS Laboratory Sample ID: 1712473-15  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	ND (1.10)		9014		1	EEM	12/26/17 11:55	mg/kg dry	CL72607



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-TP-542 - 2-3ft  
Date Sampled: 12/19/17 10:35  
Percent Solids: 92

ESS Laboratory Work Order: 1712473  
ESS Laboratory Sample ID: 1712473-16  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	ND (0.99)		9014		1	EEM	12/26/17 11:55	mg/kg dry	CL72607



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-TP-547 - 1-2ft  
Date Sampled: 12/19/17 10:55  
Percent Solids: 91

ESS Laboratory Work Order: 1712473  
ESS Laboratory Sample ID: 1712473-17  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	41.9 (10.3)		9014		10	EEM	12/26/17 11:55	mg/kg dry	CL72607





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-TP-547 - 2-3ft  
Date Sampled: 12/19/17 10:58  
Percent Solids: 90

ESS Laboratory Work Order: 1712473  
ESS Laboratory Sample ID: 1712473-18  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	123 (27.5)		9014		25	EEM	12/26/17 11:55	mg/kg dry	CL72607



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-TP-546 - 0-0.5ft  
Date Sampled: 12/19/17 12:00  
Percent Solids: 86

ESS Laboratory Work Order: 1712473  
ESS Laboratory Sample ID: 1712473-19  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	696 (55.4)		9014		50	EEM	12/26/17 11:55	mg/kg dry	CL72607



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-TP-546 - 1-2ft  
Date Sampled: 12/19/17 12:02  
Percent Solids: 93

ESS Laboratory Work Order: 1712473  
ESS Laboratory Sample ID: 1712473-20  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	252 (26.4)		9014		25	EEM	12/26/17 11:55	mg/kg dry	CL72607



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1712473

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
<b>Classical Chemistry</b>										
<b>Batch CL72607 - TCN Prep</b>										
<b>Blank</b>										
Total Cyanide	ND	1.00	mg/kg wet							
<b>LCS</b>										
Total Cyanide	4.96	1.00	mg/kg wet	5.015		99	90-110			
<b>Reference</b>										
Total Cyanide	48.6	4.92	mg/kg wet	48.40		100	36.1577-206.6 12			
<b>Reference</b>										
Total Cyanide	48.7	4.88	mg/kg wet	48.40		101	36.1577-206.6 12			



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1712473

**Notes and Definitions**

- U Analyte included in the analysis, but not detected
- D Diluted.
- ND Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference
- MDL Method Detection Limit
- MRL Method Reporting Limit
- LOD Limit of Detection
- LOQ Limit of Quantitation
- DL Detection Limit
- I/V Initial Volume
- F/V Final Volume
- § Subcontracted analysis; see attached report
- 1 Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
- 2 Range result excludes concentrations of target analytes eluting in that range.
- 3 Range result excludes the concentration of the C9-C10 aromatic range.
- Avg Results reported as a mathematical average.
- NR No Recovery
- [CALC] Calculated Analyte
- SUB Subcontracted analysis; see attached report
- RL Reporting Limit
- EDL Estimated Detection Limit



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1712473

**ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS**

**ENVIRONMENTAL**

Rhode Island Potable and Non Potable Water: LAI00179

<http://www.health.ri.gov/find/labs/analytical/ESS.pdf>

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750

[http://www.ct.gov/dph/lib/dph/environmental\\_health/environmental\\_laboratories/pdf/OutofStateCommercialLaboratories.pdf](http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf)

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002

<http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml>

Massachusetts Potable and Non Potable Water: M-RI002

<http://public.dep.state.ma.us/Labcert/Labcert.aspx>

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424

<http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm>

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313

<http://www.wadsworth.org/labcert/elap/comm.html>

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006

[http://datamine2.state.nj.us/DEP\\_OPRA/OpraMain/pi\\_main?mode=pi\\_by\\_site&sort\\_order=PI\\_NAMEA&Select+a+Site:=58715](http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715)

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752

<http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx>



## ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Providence, RI - GZA/HDM

ESS Project ID: 1712473

Date Received: 12/20/2017

Project Due Date: 12/28/2017

Days for Project: 5 Day

Shipped/Delivered Via: Client

1. Air bill manifest present?  No  
Air No.: NA
2. Were custody seals present?  No
3. Is radiation count <100 CPM?  Yes
4. Is a Cooler Present?  Yes  
Temp: 4.9 Iced with: Ice
5. Was COC signed and dated by client?  Yes

6. Does COC match bottles?  Yes
7. Is COC complete and correct?  Yes
8. Were samples received intact?  Yes
9. Were labs informed about **short holds & rushes**? Yes / No /  NA
10. Were any analyses received outside of hold time? Yes /  No

11. Any Subcontracting needed? Yes /  No  
ESS Sample IDs: \_\_\_\_\_  
Analysis: \_\_\_\_\_  
TAT: \_\_\_\_\_

12. Were VOAs received? Yes /  No  
a. Air bubbles in aqueous VOAs? Yes / No  
b. Does methanol cover soil completely? Yes / No / NA

13. Are the samples properly preserved?  Yes / No  
a. If metals preserved upon receipt: Date: \_\_\_\_\_ Time: \_\_\_\_\_ By: \_\_\_\_\_  
b. Low Level VOA vials frozen: Date: \_\_\_\_\_ Time: \_\_\_\_\_ By: \_\_\_\_\_

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes /  No  
a. Was there a need to contact the client? Yes / No  
Who was contacted? \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_ By: \_\_\_\_\_

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
01	192243	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
02	192242	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
03	192241	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
04	192240	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
05	192239	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
06	192238	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
07	192237	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
08	192236	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
09	192235	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
10	192234	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
11	192233	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
12	192232	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
13	192231	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
14	192230	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
15	192229	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
16	192228	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
17	192227	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
18	192226	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
19	192225	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
20	192224	Yes	NA	Yes	8 oz. Jar - Unpres	NP	

2nd Review  
Are barcode labels on correct containers?  Yes / No

# ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Providence, RI - GZA/HDM

ESS Project ID: 1712473

Date Received: 12/20/2017

Completed By: [Signature] Date & Time: 12/20/17 1526

Reviewed By: [Signature] Date & Time: 12/20/17 1622

Delivered By: [Signature] Date & Time: 12/20/17 1622







## CERTIFICATE OF ANALYSIS

Sarah McLeod  
GZA GeoEnvironmental, Inc.  
530 Broadway  
Providence, RI 02909

**RE: Former Tidewater Facility (05.0043654.00)**  
**ESS Laboratory Work Order Number: 1712474**

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.



Laurel Stoddard  
Laboratory Director

**REVIEWED****By ESS Laboratory at 10:18 am, Dec 28, 2017****Analytical Summary**

The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.



## CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1712474

## SAMPLE RECEIPT

The following samples were received on December 20, 2017 for the analyses specified on the enclosed Chain of Custody Record.

Lab Number	Sample Name	Matrix	Analysis
1712474-01	GZ-TP-545 0-1ft	Soil	9014
1712474-02	GZ-TP-545 1-2ft	Soil	9014
1712474-03	GZ-TP-544 0-0.5ft	Soil	9014
1712474-04	GZ-TP-544 1-2ft	Soil	9014
1712474-05	GZ-TP-541 0-1ft	Soil	9014
1712474-06	GZ-TP-541 1-2ft	Soil	9014
1712474-07	GZ-TP-532 0-1ft	Soil	9014
1712474-08	GZ-TP-532 1-2ft	Soil	9014
1712474-09	GZ-TP-540 0-0.5ft	Soil	9014
1712474-10	GZ-TP-540 1-2ft	Soil	9014
1712474-11	GZ-TP-533 0-1ft	Soil	9014
1712474-12	GZ-TP-533 1-2ft	Soil	9014
1712474-13	GZ-TP-539 0-0.5ft	Soil	9014
1712474-14	GZ-TP-539 3.5-4ft	Soil	9014





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1712474

**PROJECT NARRATIVE**

**No unusual observations noted.**

**End of Project Narrative.**

**DATA USABILITY LINKS**

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[Definitions of Quality Control Parameters](#)

[Semivolatile Organics Internal Standard Information](#)

[Semivolatile Organics Surrogate Information](#)

[Volatile Organics Internal Standard Information](#)

[Volatile Organics Surrogate Information](#)

[EPH and VPH Alkane Lists](#)



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1712474

**CURRENT SW-846 METHODOLOGY VERSIONS**

**Analytical Methods**

- 1010A - Flashpoint
- 6010C - ICP
- 6020A - ICP MS
- 7010 - Graphite Furnace
- 7196A - Hexavalent Chromium
- 7470A - Aqueous Mercury
- 7471B - Solid Mercury
- 8011 - EDB/DBCP/TCP
- 8015C - GRO/DRO
- 8081B - Pesticides
- 8082A - PCB
- 8100M - TPH
- 8151A - Herbicides
- 8260B - VOA
- 8270D - SVOA
- 8270D SIM - SVOA Low Level
- 9014 - Cyanide
- 9038 - Sulfate
- 9040C - Aqueous pH
- 9045D - Solid pH (Corrosivity)
- 9050A - Specific Conductance
- 9056A - Anions (IC)
- 9060A - TOC
- 9095B - Paint Filter
- MADEP 04-1.1 - EPH / VPH

**Prep Methods**

- 3005A - Aqueous ICP Digestion
- 3020A - Aqueous Graphite Furnace / ICP MS Digestion
- 3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
- 3060A - Solid Hexavalent Chromium Digestion
- 3510C - Separatory Funnel Extraction
- 3520C - Liquid / Liquid Extraction
- 3540C - Manual Soxhlet Extraction
- 3541 - Automated Soxhlet Extraction
- 3546 - Microwave Extraction
- 3580A - Waste Dilution
- 5030B - Aqueous Purge and Trap
- 5030C - Aqueous Purge and Trap
- 5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-TP-545 0-1ft  
Date Sampled: 12/19/17 12:10  
Percent Solids: 76

ESS Laboratory Work Order: 1712474  
ESS Laboratory Sample ID: 1712474-01  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	209 (66.0)		9014		50	EEM	12/21/17 10:55	mg/kg dry	CL72118



## CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-TP-545 1-2ft  
Date Sampled: 12/19/17 12:12  
Percent Solids: 81

ESS Laboratory Work Order: 1712474  
ESS Laboratory Sample ID: 1712474-02  
Sample Matrix: Soil

### Classical Chemistry

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	ND (1.18)		9014		1	EEM	12/21/17 10:55	mg/kg dry	CL72118



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-TP-544 0-0.5ft  
Date Sampled: 12/19/17 12:32  
Percent Solids: 83

ESS Laboratory Work Order: 1712474  
ESS Laboratory Sample ID: 1712474-03  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	134 (30.0)		9014		25	EEM	12/21/17 10:55	mg/kg dry	CL72118



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-TP-544 1-2ft  
Date Sampled: 12/19/17 12:30  
Percent Solids: 85

ESS Laboratory Work Order: 1712474  
ESS Laboratory Sample ID: 1712474-04  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	2.29 (1.13)		9014		1	EEM	12/21/17 10:55	mg/kg dry	CL72118





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-TP-541 0-1ft  
Date Sampled: 12/19/17 12:42  
Percent Solids: 87

ESS Laboratory Work Order: 1712474  
ESS Laboratory Sample ID: 1712474-05  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	102 (26.6)		9014		25	EEM	12/21/17 10:55	mg/kg dry	CL72118



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-TP-541 1-2ft  
Date Sampled: 12/19/17 12:45  
Percent Solids: 85

ESS Laboratory Work Order: 1712474  
ESS Laboratory Sample ID: 1712474-06  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	12.1 (1.07)		9014		1	EEM	12/21/17 10:55	mg/kg dry	CL72118



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-TP-532 0-1ft  
Date Sampled: 12/19/17 12:52  
Percent Solids: 84

ESS Laboratory Work Order: 1712474  
ESS Laboratory Sample ID: 1712474-07  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	1.80 (1.19)		9014		1	EEM	12/21/17 10:55	mg/kg dry	CL72118



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-TP-532 1-2ft  
Date Sampled: 12/19/17 12:50  
Percent Solids: 91

ESS Laboratory Work Order: 1712474  
ESS Laboratory Sample ID: 1712474-08  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	ND (1.01)		9014		1	EEM	12/21/17 10:55	mg/kg dry	CL72118



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-TP-540 0-0.5ft  
Date Sampled: 12/19/17 13:10  
Percent Solids: 85

ESS Laboratory Work Order: 1712474  
ESS Laboratory Sample ID: 1712474-09  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	1.09 (1.08)		9014		1	EEM	12/21/17 10:55	mg/kg dry	CL72118



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-TP-540 1-2ft  
Date Sampled: 12/19/17 13:12  
Percent Solids: 82

ESS Laboratory Work Order: 1712474  
ESS Laboratory Sample ID: 1712474-10  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	1.88 (1.14)		9014		1	EEM	12/21/17 10:55	mg/kg dry	CL72118





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-TP-533 0-1ft  
Date Sampled: 12/19/17 13:45  
Percent Solids: 42

ESS Laboratory Work Order: 1712474  
ESS Laboratory Sample ID: 1712474-11  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	10.4 (2.30)		9014		1	EEM	12/21/17 10:55	mg/kg dry	CL72118



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-TP-533 1-2ft  
Date Sampled: 12/19/17 13:48  
Percent Solids: 76

ESS Laboratory Work Order: 1712474  
ESS Laboratory Sample ID: 1712474-12  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	6.77 (1.31)		9014		1	EEM	12/21/17 10:55	mg/kg dry	CL72118



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-TP-539 0-0.5ft  
Date Sampled: 12/20/17 11:58  
Percent Solids: 83

ESS Laboratory Work Order: 1712474  
ESS Laboratory Sample ID: 1712474-13  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	571 (55.2)		9014		50	EEM	12/21/17 10:55	mg/kg dry	CL72118



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility  
Client Sample ID: GZ-TP-539 3.5-4ft  
Date Sampled: 12/20/17 12:00  
Percent Solids: 83

ESS Laboratory Work Order: 1712474  
ESS Laboratory Sample ID: 1712474-14  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Total Cyanide	39.1 (5.82)		9014		5	EEM	12/21/17 10:55	mg/kg dry	CL72118



*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
 Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1712474

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Classical Chemistry										
<b>Batch CL72118 - TCN Prep</b>										
<b>Blank</b>										
Total Cyanide	ND	1.00	mg/kg wet							
<b>LCS</b>										
Total Cyanide	5.04	1.00	mg/kg wet	5.015		100	90-110			
<b>Reference</b>										
Total Cyanide	49.6	4.89	mg/kg wet	48.40		102	36.1577-206.6 12			
<b>Reference</b>										
Total Cyanide	50.9	4.92	mg/kg wet	48.40		105	36.1577-206.6 12			



## CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1712474

### Notes and Definitions

- U Analyte included in the analysis, but not detected
- D Diluted.
- ND Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference
- MDL Method Detection Limit
- MRL Method Reporting Limit
- LOD Limit of Detection
- LOQ Limit of Quantitation
- DL Detection Limit
- I/V Initial Volume
- F/V Final Volume
- § Subcontracted analysis; see attached report
- 1 Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
- 2 Range result excludes concentrations of target analytes eluting in that range.
- 3 Range result excludes the concentration of the C9-C10 aromatic range.
- Avg Results reported as a mathematical average.
- NR No Recovery
- [CALC] Calculated Analyte
- SUB Subcontracted analysis; see attached report
- RL Reporting Limit
- EDL Estimated Detection Limit





*CERTIFICATE OF ANALYSIS*

Client Name: GZA GeoEnvironmental, Inc.  
Client Project ID: Former Tidewater Facility

ESS Laboratory Work Order: 1712474

**ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS**

**ENVIRONMENTAL**

Rhode Island Potable and Non Potable Water: LAI00179

<http://www.health.ri.gov/find/labs/analytical/ESS.pdf>

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750

[http://www.ct.gov/dph/lib/dph/environmental\\_health/environmental\\_laboratories/pdf/OutofStateCommercialLaboratories.pdf](http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf)

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002

<http://www.maine.gov/dhhs/meecd/environmental-health/dwp/partners/labCert.shtml>

Massachusetts Potable and Non Potable Water: M-RI002

<http://public.dep.state.ma.us/Labcert/Labcert.aspx>

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424

<http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm>

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313

<http://www.wadsworth.org/labcert/elap/comm.html>

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006

[http://datamine2.state.nj.us/DEP\\_OPRA/OpraMain/pi\\_main?mode=pi\\_by\\_site&sort\\_order=PI\\_NAMEA&Select+a+Site:=58715](http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715)

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752

<http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx>

## ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Providence, RI - GZA/HDM

ESS Project ID: 1712474

Shipped/Delivered Via: Client

Date Received: 12/20/2017

Project Due Date: 12/28/2017

Days for Project: 5 Day

- |  |  |
|--|--|
| <p>1. Air bill manifest present? <input type="checkbox"/> No<br/>Air No.: <u>NA</u></p> <p>2. Were custody seals present? <input type="checkbox"/> No</p> <p>3. Is radiation count &lt;100 CPM? <input type="checkbox"/> Yes</p> <p>4. Is a Cooler Present? <input type="checkbox"/> Yes<br/>Temp: <u>4.9</u> Iced with: <u>Ice</u></p> <p>5. Was COC signed and dated by client? <input type="checkbox"/> Yes</p> | <p>6. Does COC match bottles? <input type="checkbox"/> Yes</p> <p>7. Is COC complete and correct? <input type="checkbox"/> Yes</p> <p>8. Were samples received intact? <input type="checkbox"/> Yes</p> <p>9. Were labs informed about <u>short holds &amp; rushes</u>? Yes / No / <input checked="" type="checkbox"/> NA</p> <p>10. Were any analyses received outside of hold time? Yes / <input checked="" type="checkbox"/> No</p> |
|--|--|

- |  |  |
|--|--|
| <p>11. Any Subcontracting needed? Yes <input checked="" type="checkbox"/> No</p> <p>ESS Sample IDs: _____</p> <p>Analysis: _____</p> <p>TAT: _____</p> | <p>12. Were VOAs received? Yes <input checked="" type="checkbox"/> No</p> <p>a. Air bubbles in aqueous VOAs? Yes / No</p> <p>b. Does methanol cover soil completely? Yes / No / NA</p> |
|--|--|

13. Are the samples properly preserved?  Yes / No
- a. If metals preserved upon receipt: Date: \_\_\_\_\_ Time: \_\_\_\_\_ By: \_\_\_\_\_
- b. Low Level VOA vials frozen: Date: \_\_\_\_\_ Time: \_\_\_\_\_ By: \_\_\_\_\_

Sample Receiving Notes:

\_\_\_\_\_

\_\_\_\_\_

14. Was there a need to contact Project Manager? Yes /  No
- a. Was there a need to contact the client? Yes / No
- Who was contacted? \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_ By: \_\_\_\_\_

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
01	192263	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
02	192262	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
03	192261	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
04	192260	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
05	192259	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
06	192258	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
07	192257	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
08	192256	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
09	192255	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
10	192254	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
11	192253	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
12	192252	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
13	192251	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
14	192250	Yes	NA	Yes	8 oz. Jar - Unpres	NP	

2nd Review  
Are barcode labels on correct containers?  Yes / No

Completed By: [Signature] Date & Time: 12/20/17 1520

Reviewed By: [Signature] Date & Time: 12/20/17 1620

Delivered

# ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Providence, RI - GZA/HDM

ESS Project ID: 1712474

By: \_\_\_\_\_

*[Handwritten Signature]*

12/20/17

Date Received: 12/20/2017

1620

ESS Laboratory

Division of Thielsch Engineering, Inc.  
 185 Frances Avenue, Cranston RI 02910  
 Tel. (401) 461-7181 Fax (401) 461-4486  
 www.esslaboratory.com

CHAIN OF CUSTODY

ESS Lab # 1712474

Reporting Limits RIDEM R-DEC and GB Leachability

Electronic  Limit Checker  Standard Excel  
 Deliverables  Other (Please Specify →)

Turn Time 5-Day Rush

Regulatory State Rhode Island

Is this project for any of the following?:  
 OCT RCP  MA MCP  RGP

Company Name GZA Project # 05.0043654.00 Project Name Former Tidewater Facility

Contact Person Sean Connolly Address 530 Broadway

City Providence State RI Zip Code 02909 PO # 43654

Telephone Number 401-421-4140 FAX Number - Email Address sean.connolly@gza.com

ESS Lab ID	Collection Date	Collection Time	Sample Type	Sample Matrix	Sample ID	Analysis														
1	12/19/17	1210	Grab	Soil	G2-TP-545 (0-1')	X														
2	12/19/17	1212	Grab	Soil	G2-TP-545 (1-2')	X														
3	12/19/17	1232	Grab	Soil	G2-TP-544 (0-0.5')	X														
4	12/19/17	1230	Grab	Soil	G2-TP-544 (1-2')	X														
5	12/19/17	1242	Grab	Soil	G2-TP-541 (0-1')	X														
6	12/19/17	1245	Grab	Soil	G2-TP-541 (1-2')	X														
7	12/19/17	1252	Grab	Soil	G2-TP-532 (0-1')	X														
8	12/19/17	1250	Grab	Soil	G2-TP-532 (1-2')	X														
9	12/19/17	1310	Grab	Soil	G2-TP-540 (0-0.5')	X														
10	12/19/17	1312	Grab	Soil	G2-TP-540 (1-2')	X														

Total Cyanide

**Laboratory Use Only**

Cooler Present: yes

Seals Intact: yes

Cooler Temperature: 4.9 °C 10 °F

Sampled by: Sean Connolly, Sarah McLeod, Erik Beloff

Comments: Please specify "Other" preservative and containers types in this space

NGRID rates apply

Please email sarah.mcleod@gza.com also

Relinquished by: (Signature, Date & Time) <u>Sean Connolly</u> 12/20/17 1320	Received By: (Signature, Date & Time) <u>[Signature]</u> 12/20/17 1320	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)
Relinquished by: (Signature, Date & Time)	Received By: (Signature, Date & Time)	Relinquished By: (Signature, Date & Time)	Received By: (Signature, Date & Time)







## **APPENDIX F**

### **GEOTECHNICAL LABORATORY RESULTS**





195 Frances Avenue  
 Cranston RI, 02910  
 Phone: (401)-467-6454  
 Fax: (401)-467-2398  
<http://www.thielsch.com>

Client Information:  
 GZA GeoEnvironmental  
 Providence, RI  
 PM: Matthew Page  
 Assigned By: Kayla Newton  
 Collected By: Kayla Newton

Laboratory Information  
 Project Name:  
**Tidewater LDI**  
**Pawtucket, RI**  
 GZA Project Number: 03.0043654.00  
 Report Date: 01.16.18

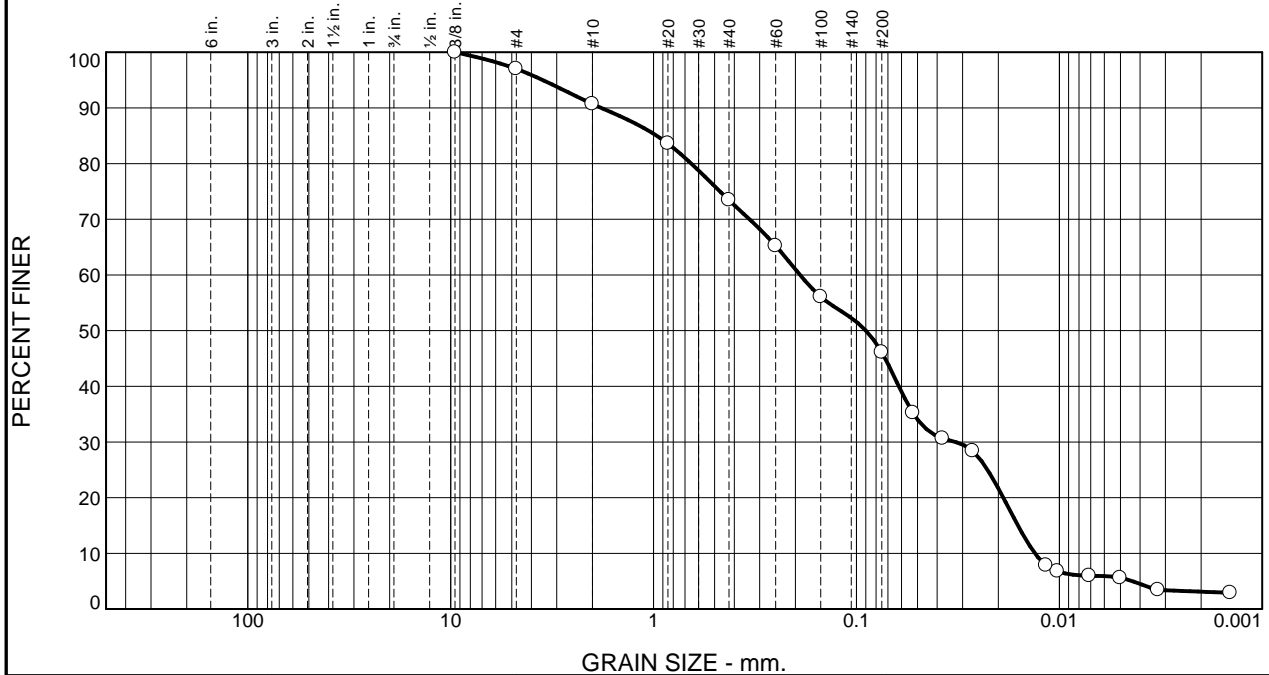
### LABORATORY TESTING DATA SHEET

Boring ID	Sample No.	Depth (ft)	Laboratory No.	Identification Tests								Dry unit wt. pcf	Torvane or Type Test	$\bar{\sigma}_c$ psf	Failure Criteria	pH	Chloride (mg/kg)	Sulfate (mg/kg)	Electrical Resist. As Received Mohm-cm	Laboratory Log and Soil Description	
				Water Content %	LL %	PL %	Gravel %	Sand %	Fines %	Org. %											
GZ-WB-501	S-1	5-7	U-1	Average Total Unit Weight (5-7') = 87.7 pcf																	
		5.4	W-1a	100.5																Black f-c SAND and Organic SILT (Disturbed with little root matter)	
		5.5-5.7										Corrosivity			7.71	4340	1050.0	0.0002	Corrosivity Testing		
		5.7-6	L-1, S-1	94.1	80	35	3.0	50.9	46.1	22.3		Limits/ Hydrometer							Black f-c SAND and Organic SILT, trace fine Gravel		
		6	W-1b	77.1								Tv = 0.06 tsf							Black Organic SILT and f-c SAND. One 3/8" root		

Reviewed By Matthew J. Kober

Date Reviewed 01.19.18

# Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	3.0	6.3	17.3	27.3	43.0	3.1

Test Results (D7928 & ASTM D 1140)			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
0.375"	100.0		
#4	97.0		
#10	90.7		
#20	83.6		
#40	73.4		
#60	65.2		
#100	56.1		
#200	46.1		
0.0527 mm.	35.2		
0.0376 mm.	30.7		
0.0268 mm.	28.4		
0.0116 mm.	7.8		
0.0102 mm.	6.8		
0.0071 mm.	6.0		
0.0050 mm.	5.6		
0.0033 mm.	3.4		
0.0014 mm.	2.9		

\* (no specification provided)

**Material Description**

Black f-c SAND and Organic SILT, trace fine Gravel

**Atterberg Limits (ASTM D 4318)**

PL= 35                      LL= 80                      PI= 45

**Classification**

USCS (D 2487)= SC                      AASHTO (M 145)= A-8

**Coefficients**

D<sub>90</sub>= 1.8093                      D<sub>85</sub>= 0.9644                      D<sub>60</sub>= 0.1898  
D<sub>50</sub>= 0.0898                      D<sub>30</sub>= 0.0325                      D<sub>15</sub>= 0.0160  
D<sub>10</sub>= 0.0132                      C<sub>u</sub>= 14.38                      C<sub>c</sub>= 0.42

**Remarks**

Date Received: 12/14/17                      Date Tested: 1/5/17

Tested By: JAL

Checked By: Matthew Colman P.E.

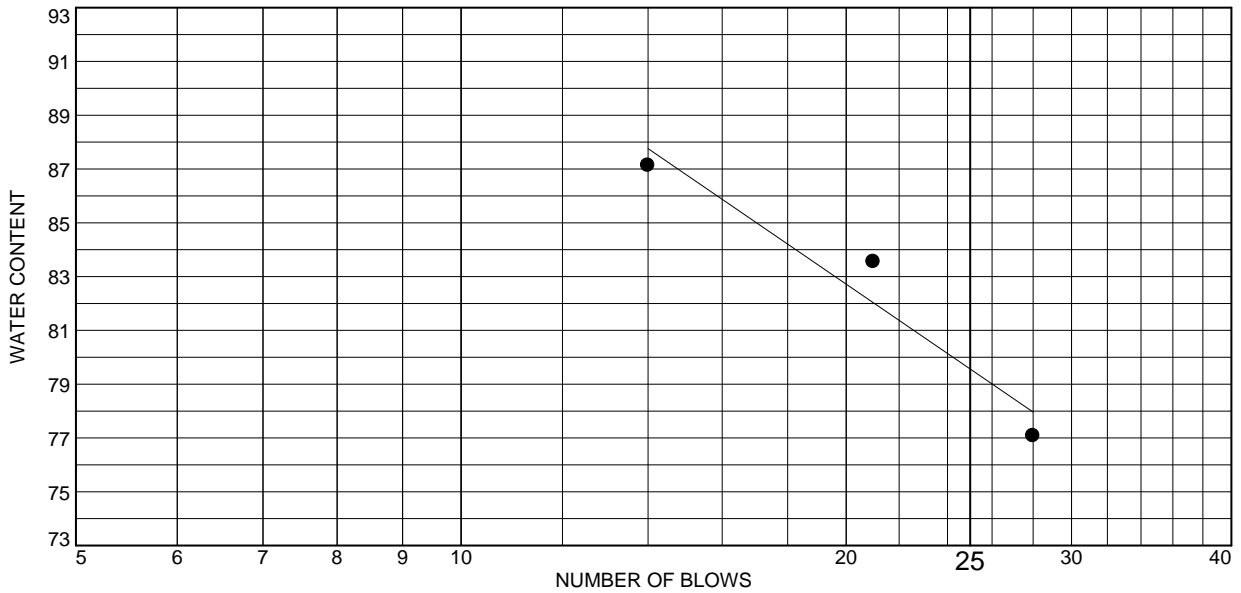
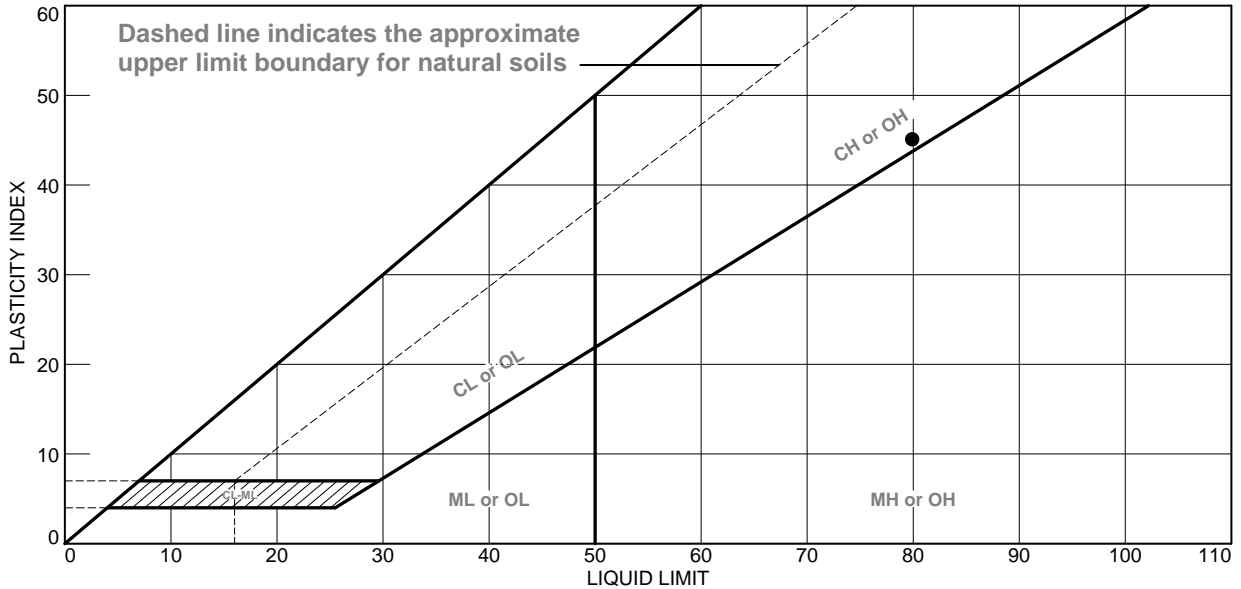
Title: Laboratory Manager

Source of Sample: Tubes                      Depth: 5-7'  
Sample Number: GZ-WB-501 / S-1

Date Sampled:

<b>Thielsch Engineering Inc.</b>  <b>Cranston, RI</b>	<b>Client:</b> GZA GeoEnvironmental <b>Project:</b> Tidewater LDI Pawtucket, RI <b>Project No:</b> 03.0043654.00
<b>Figure</b> T-1	

# LIQUID AND PLASTIC LIMITS TEST REPORT



MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
● Black f-c SAND and Organic SILT, trace fine Gravel	80	35	45	73.4	46.1	SC

**Project No.** 03.0043654.00 **Client:** GZA GeoEnvironmental  
**Project:** Tidewater LDI  
 Pawtucket, RI  
**Source of Sample:** Tubes **Depth:** 5-7'  
**Sample Number:** GZ-WB-501 / S-1

**Thielsch Engineering Inc.**  
**Cranston, RI**

**Remarks:**

**Figure** L-1

**Tested By:** JAL **Checked By:** MJC



*CERTIFICATE OF ANALYSIS*

Matthew Colman  
Thielsch Engineering, Inc.  
195 Frances Avenue  
Cranston, RI 02910

**RE: Tidewater LDI (03.0043654.00)**  
**ESS Laboratory Work Order Number: 1801186**

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard  
Laboratory Director

**REVIEWED**  
*By ESS Laboratory at 11:42 am, Jan 19, 2018*

**Analytical Summary**

The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.



*CERTIFICATE OF ANALYSIS*

Client Name: Thielsch Engineering, Inc.  
Client Project ID: Tidewater LDI

ESS Laboratory Work Order: 1801186

**SAMPLE RECEIPT**

The following samples were received on January 12, 2018 for the analyses specified on the enclosed Chain of Custody Record.

**The client did not deliver the samples in a cooler.**

<u>Lab Number</u>	<u>Sample Name</u>	<u>Matrix</u>	<u>Analysis</u>
1801186-01	GZ-WB-501 S-1 5-7	Soil	9038, 9045, 9050A, 9250



*CERTIFICATE OF ANALYSIS*

Client Name: Thielsch Engineering, Inc.  
Client Project ID: Tidewater LDI

ESS Laboratory Work Order: 1801186

**PROJECT NARRATIVE**

**No unusual observations noted.**

**End of Project Narrative.**

**DATA USABILITY LINKS**

*To ensure you are viewing the most current version of the documents below, please clear your internet cookies for [www.ESSLaboratory.com](http://www.ESSLaboratory.com). Consult your IT Support personnel for information on how to clear your internet cookies.*

[Definitions of Quality Control Parameters](#)

[Semivolatile Organics Internal Standard Information](#)

[Semivolatile Organics Surrogate Information](#)

[Volatile Organics Internal Standard Information](#)

[Volatile Organics Surrogate Information](#)

[EPH and VPH Alkane Lists](#)





*CERTIFICATE OF ANALYSIS*

Client Name: Thielsch Engineering, Inc.  
Client Project ID: Tidewater LDI

ESS Laboratory Work Order: 1801186

**CURRENT SW-846 METHODOLOGY VERSIONS**

**Analytical Methods**

- 1010A - Flashpoint
- 6010C - ICP
- 6020A - ICP MS
- 7010 - Graphite Furnace
- 7196A - Hexavalent Chromium
- 7470A - Aqueous Mercury
- 7471B - Solid Mercury
- 8011 - EDB/DBCP/TCP
- 8015C - GRO/DRO
- 8081B - Pesticides
- 8082A - PCB
- 8100M - TPH
- 8151A - Herbicides
- 8260B - VOA
- 8270D - SVOA
- 8270D SIM - SVOA Low Level
- 9014 - Cyanide
- 9038 - Sulfate
- 9040C - Aqueous pH
- 9045D - Solid pH (Corrosivity)
- 9050A - Specific Conductance
- 9056A - Anions (IC)
- 9060A - TOC
- 9095B - Paint Filter
- MADEP 04-1.1 - EPH / VPH

**Prep Methods**

- 3005A - Aqueous ICP Digestion
- 3020A - Aqueous Graphite Furnace / ICP MS Digestion
- 3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
- 3060A - Solid Hexavalent Chromium Digestion
- 3510C - Separatory Funnel Extraction
- 3520C - Liquid / Liquid Extraction
- 3540C - Manual Soxhlet Extraction
- 3541 - Automated Soxhlet Extraction
- 3546 - Microwave Extraction
- 3580A - Waste Dilution
- 5030B - Aqueous Purge and Trap
- 5030C - Aqueous Purge and Trap
- 5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.



*CERTIFICATE OF ANALYSIS*

Client Name: Thielsch Engineering, Inc.  
Client Project ID: Tidewater LDI

ESS Laboratory Work Order: 1801186

**Classical Chemistry**

Client Sample ID: GZ-WB-501 S-1 5-7  
Date Sampled: 01/12/18 09:30  
Percent Solids: 52

ESS Laboratory Sample ID: 1801186-01  
Sample Matrix: Soil

<u>Analyte</u>		<u>Results</u>	<u>Units</u>	<u>MRL</u>	<u>Method</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>
Chloride	WL	<b>4340</b>	mg/kg dry	286	9250	5	JLK	01/17/18 19:09
Corrosivity (pH)		<b>7.71</b>	S.U.	N/A	9045	1	CCP	01/12/18 21:04
Corrosivity (pH) Sample Temp		<b>Soil pH measured in water at 22.8 °C.</b>						
Resistivity	WL	<b>0.0002</b>	Mohms-cm	N/A	9050A	1	JLK	01/17/18 21:50
Sulfate	WL	<b>1050</b>	mg/kg dry	191	9038	2	JLK	01/17/18 18:00



*CERTIFICATE OF ANALYSIS*

Client Name: Thielsch Engineering, Inc.  
Client Project ID: Tidewater LDI

ESS Laboratory Work Order: 1801186

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
---------	--------	-----	-------	-------------	---------------	------	-------------	-----	-----------	-----------

Classical Chemistry

**Batch CA81724 - General Preparation**

**Blank**

Chloride	ND	3	mg/kg wet							
----------	----	---	-----------	--	--	--	--	--	--	--

**LCS**

Chloride	31		mg/L	30.00		102	90-110			
----------	----	--	------	-------	--	-----	--------	--	--	--

**Batch CA81726 - General Preparation**

**Blank**

Sulfate	ND	5	mg/kg wet							
---------	----	---	-----------	--	--	--	--	--	--	--

**LCS**

Sulfate	10		mg/L	9.988		96	80-120			
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*CERTIFICATE OF ANALYSIS*

Client Name: Thielsch Engineering, Inc.

Client Project ID: Tidewater LDI

ESS Laboratory Work Order: 1801186

**Notes and Definitions**

- Z-10 Soil pH measured in water at 22.8 °C.
- WL Results obtained from a deionized water leach of the sample.
- U Analyte included in the analysis, but not detected
- D Diluted.
- ND Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference
- MDL Method Detection Limit
- MRL Method Reporting Limit
- LOD Limit of Detection
- LOQ Limit of Quantitation
- DL Detection Limit
- I/V Initial Volume
- F/V Final Volume
- § Subcontracted analysis; see attached report
- 1 Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
- 2 Range result excludes concentrations of target analytes eluting in that range.
- 3 Range result excludes the concentration of the C9-C10 aromatic range.
- Avg Results reported as a mathematical average.
- NR No Recovery
- [CALC] Calculated Analyte
- SUB Subcontracted analysis; see attached report
- RL Reporting Limit
- EDL Estimated Detection Limit



*CERTIFICATE OF ANALYSIS*

Client Name: Thielsch Engineering, Inc.  
Client Project ID: Tidewater LDI

ESS Laboratory Work Order: 1801186

**ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS**

**ENVIRONMENTAL**

Rhode Island Potable and Non Potable Water: LAI00179

<http://www.health.ri.gov/find/labs/analytical/ESS.pdf>

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750

[http://www.ct.gov/dph/lib/dph/environmental\\_health/environmental\\_laboratories/pdf/OutOfStateCommercialLaboratories.pdf](http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutOfStateCommercialLaboratories.pdf)

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002

<http://www.maine.gov/dhhs/meecd/environmental-health/dwp/partners/labCert.shtml>

Massachusetts Potable and Non Potable Water: M-RI002

<http://public.dep.state.ma.us/Labcert/Labcert.aspx>

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424

<http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm>

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313

<http://www.wadsworth.org/labcert/elap/comm.html>

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006

[http://datamine2.state.nj.us/DEP\\_OPRA/OpraMain/pi\\_main?mode=pi\\_by\\_site&sort\\_order=PI\\_NAMEA&Select+a+Site:=58715](http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715)

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752

<http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx>

## ESS Laboratory Sample and Cooler Receipt Checklist

Client: Thielsch Engineering, Inc - ESS/DS  
 Shipped/Delivered Via: \_\_\_\_\_ Client \_\_\_\_\_

ESS Project ID: 1801186  
 Date Received: 1/12/2018  
 Project Due Date: 1/19/2018  
 Days for Project: 5 Day

- 1. Air bill manifest present?  No  
Air No.: NA
- 2. Were custody seals present?  No
- 3. Is radiation count <100 CPM?  Yes
- 4. Is a Cooler Present?  No  
Temp: 22.6 Iced with: None
- 5. Was COC signed and dated by client?  Yes

- 6. Does COC match bottles?  Yes
- 7. Is COC complete and correct?  Yes
- 8. Were samples received intact?  Yes
- 9. Were labs informed about **short holds & rushes**?  Yes  No / NA
- 10. Were any analyses received outside of hold time? Yes  No

11. Any Subcontracting needed? Yes  No  
 ESS Sample IDs: \_\_\_\_\_  
 Analysis: \_\_\_\_\_  
 TAT: \_\_\_\_\_

12. Were VOAs received? Yes /  No  
 a. Air bubbles in aqueous VOAs? Yes / No  
 b. Does methanol cover soil completely? Yes / No / NA

13. Are the samples properly preserved?  Yes / No  
 a. If metals preserved upon receipt: Date: \_\_\_\_\_ Time: \_\_\_\_\_ By: \_\_\_\_\_  
 b. Low Level VOA vials frozen: Date: \_\_\_\_\_ Time: \_\_\_\_\_ By: \_\_\_\_\_

Sample Receiving Notes:  
 \_\_\_\_\_  
 \_\_\_\_\_

14. Was there a need to contact Project Manager? Yes /  No  
 a. Was there a need to contact the client? Yes / No  
 Who was contacted? \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_ By: \_\_\_\_\_

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
01	195335	Yes	NA	Yes	8 oz. Jar - Unpres	NP	

2nd Review  
 Are barcode labels on correct containers?  Yes / No

Completed By: [Signature] Date & Time: 1/12/18 0949  
 Reviewed By: [Signature] Date & Time: 1/12/18 1417  
 Delivered By: [Signature] 1/12/18 1422







195 Frances Avenue  
 Cranston RI, 02910  
 Phone: (401)-467-6454  
 Fax: (401)-467-2398  
<http://www.thielsch.com>

Client Information:  
 GZA GeoEnvironmental  
 Providence, RI  
 PM: Matthew Page  
 Assigned By: Kayla Newton  
 Collected By: Kayla Newton

Laboratory Information  
 Project Name:  
**Tidewater LDI  
 Pawtucket, RI**  
 GZA Project Number: 03.0043654.00  
 Report Date: 01.16.18

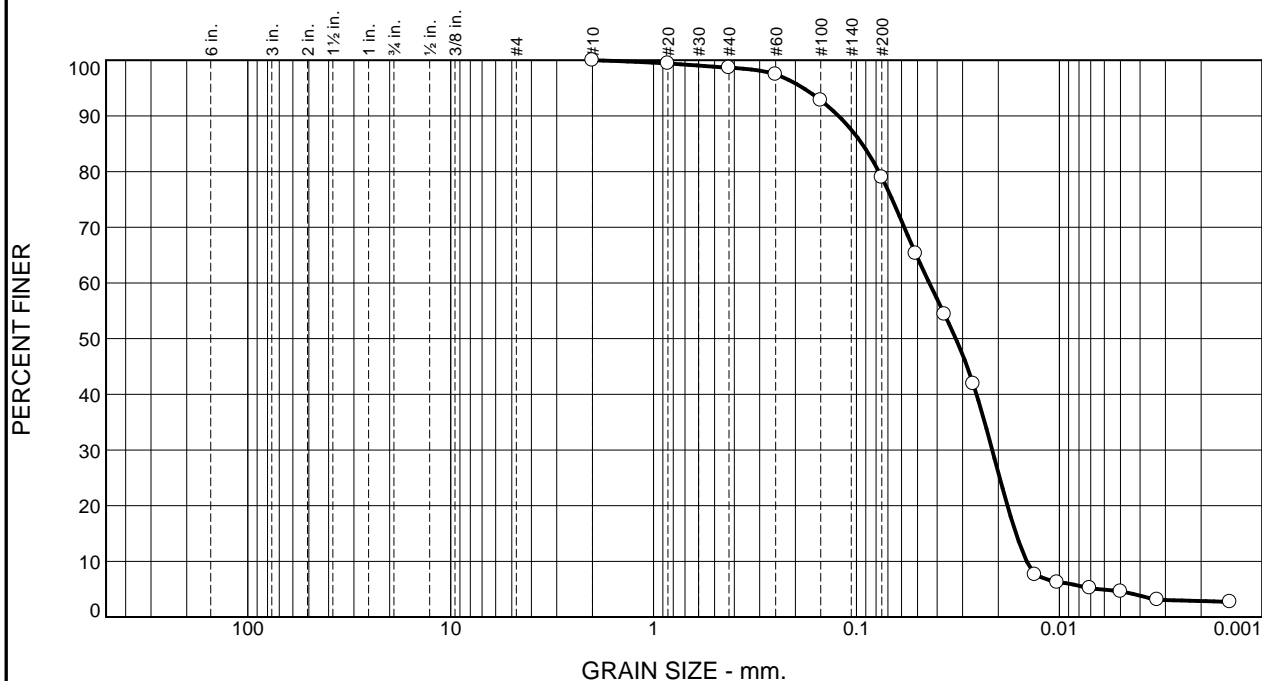
### LABORATORY TESTING DATA SHEET

Boring ID	Sample No.	Depth (ft)	Laboratory No.	Identification Tests								Dry unit wt. pcf	Torvane or Type Test	$\bar{\sigma}_c$ psf	Failure Criteria	$\sigma_1 - \sigma_3$ or $\tau$ psf	Strain %	EST Internal Friction Angle	Permeability cm/sec	Laboratory Log and Soil Description	
				Water Content %	LL %	PL %	Gravel %	Sand %	Fines %	Org. %											
GZ-WB-502	S-1	5-7	T-2	Average Total Unit Weight (5-7') = 76.1 pcf																	
		5.0-5.3																		Disturbed Sample	
		5.3	W-2a	146.1								Tv = 0.05 tsf								Black Organic SILT & fine SAND	
		5.4-5.9		Saved																	Sample Saved
		5.9-6.4	CIU-2	136.2							35.1	CIU	1008	$\sigma_1 - \sigma_3$ Max	667	15.9				Black Organic SILT, some fine Sand	
		6.4-6.9	L-2, S-2	132.1	112	39	0.0	21.0	79.0	11.6		Hydrometer, Limits								Black Organic SILT, some fine Sand	
		6.9	W-2b	127.0								Tv = 0.05 tsf								Black Organic SILT, some fine Sand	
		6.9-7.2																			

Reviewed By Matthew J. Kaban

Date Reviewed 01.19.18

# Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	1.3	19.7	76.1	2.9

Test Results (D7928 & ASTM D 1140)			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#10	100.0		
#20	99.4		
#40	98.7		
#60	97.4		
#100	92.8		
#200	79.0		
0.0511 mm.	65.3		
0.0368 mm.	54.4		
0.0266 mm.	41.9		
0.0132 mm.	7.6		
0.0102 mm.	6.2		
0.0071 mm.	5.2		
0.0050 mm.	4.6		
0.0033 mm.	3.1		
0.0014 mm.	2.7		

\* (no specification provided)

**Material Description**

Black Organic SILT, some fine Sand

**Atterberg Limits (ASTM D 4318)**

PL= 39                      LL= 112                      PI= 73

**Classification**

USCS (D 2487)= OH                      AASHTO (M 145)= A-8

**Coefficients**

D<sub>90</sub>= 0.1225                      D<sub>85</sub>= 0.0939                      D<sub>60</sub>= 0.0438  
D<sub>50</sub>= 0.0324                      D<sub>30</sub>= 0.0214                      D<sub>15</sub>= 0.0164  
D<sub>10</sub>= 0.0145                      C<sub>u</sub>= 3.02                      C<sub>c</sub>= 0.72

Remarks

Date Received: 12/14/17                      Date Tested: 1/5/17

Tested By: JAL

Checked By: Matthew Colman P.E.

Title: Laboratory Manager

Source of Sample: Tubes                      Depth: 5-7'  
Sample Number: GZ-WB-502 / S-1

Date Sampled:

**Thielsch Engineering Inc.**

**Cranston, RI**

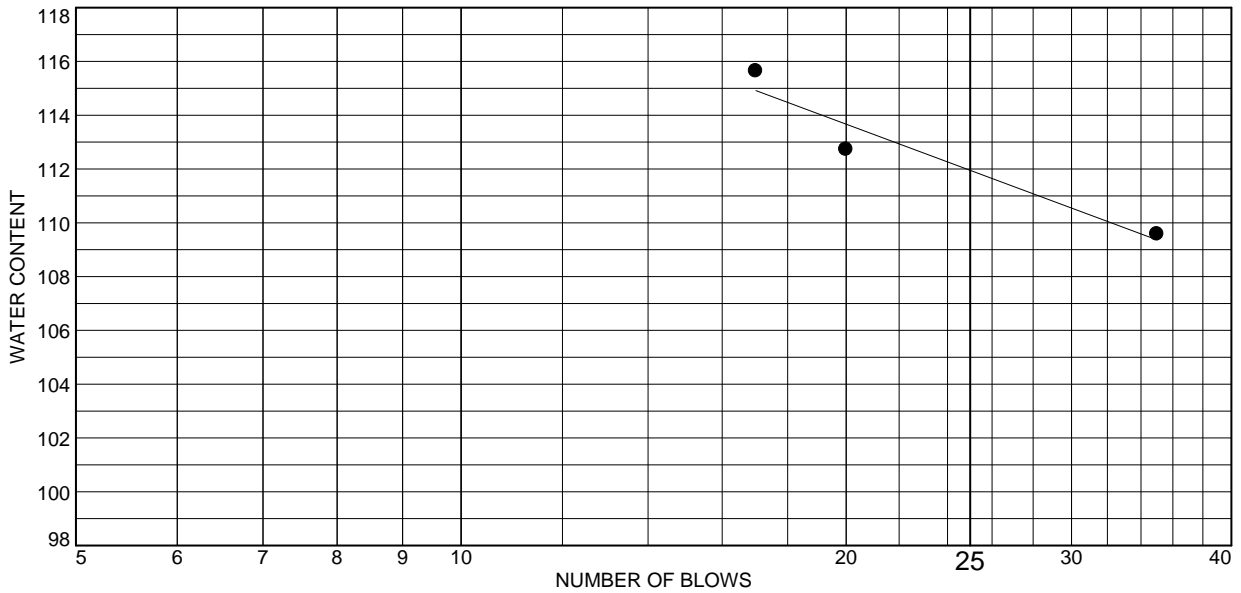
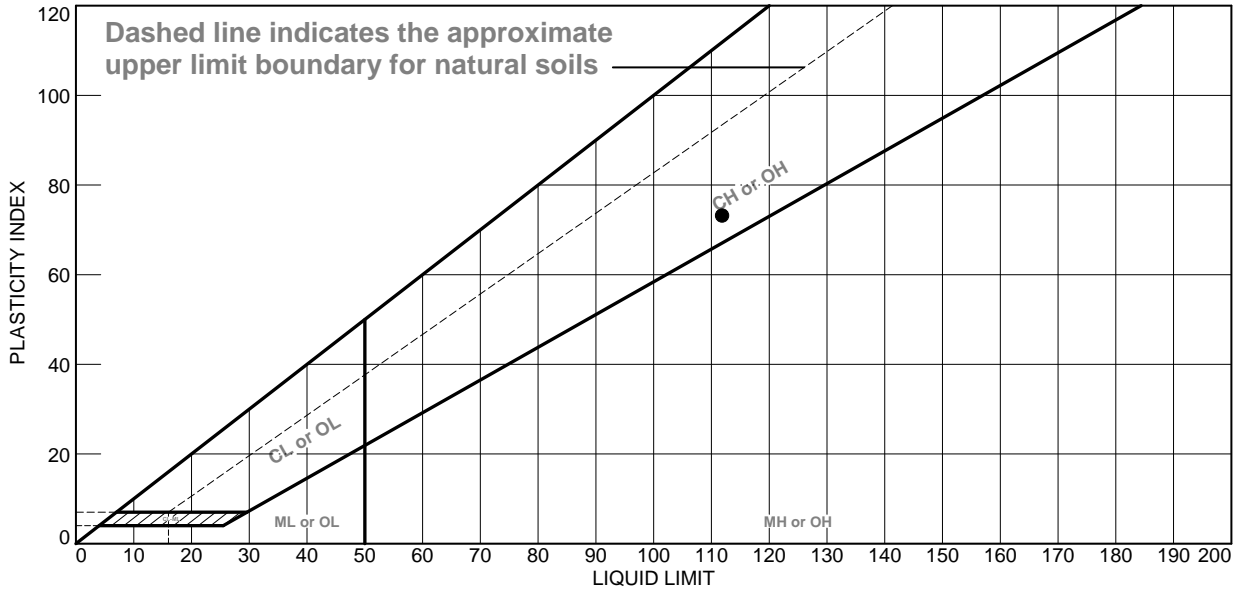
Client: GZA GeoEnvironmental

Project: Tidewater LDI  
Pawtucket, RI

Project No: 03.0043654.00

Figure T-2

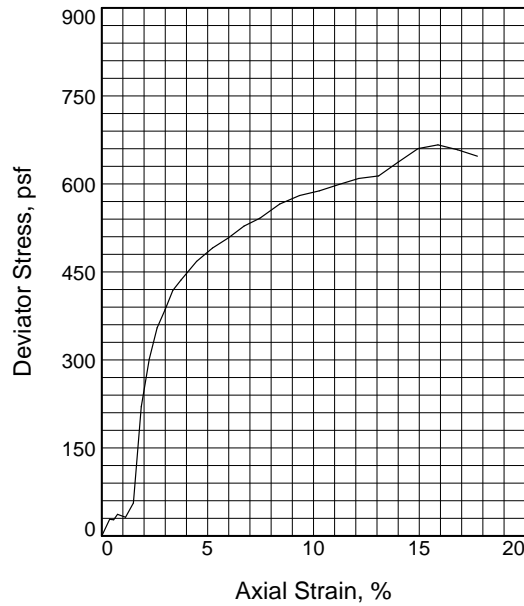
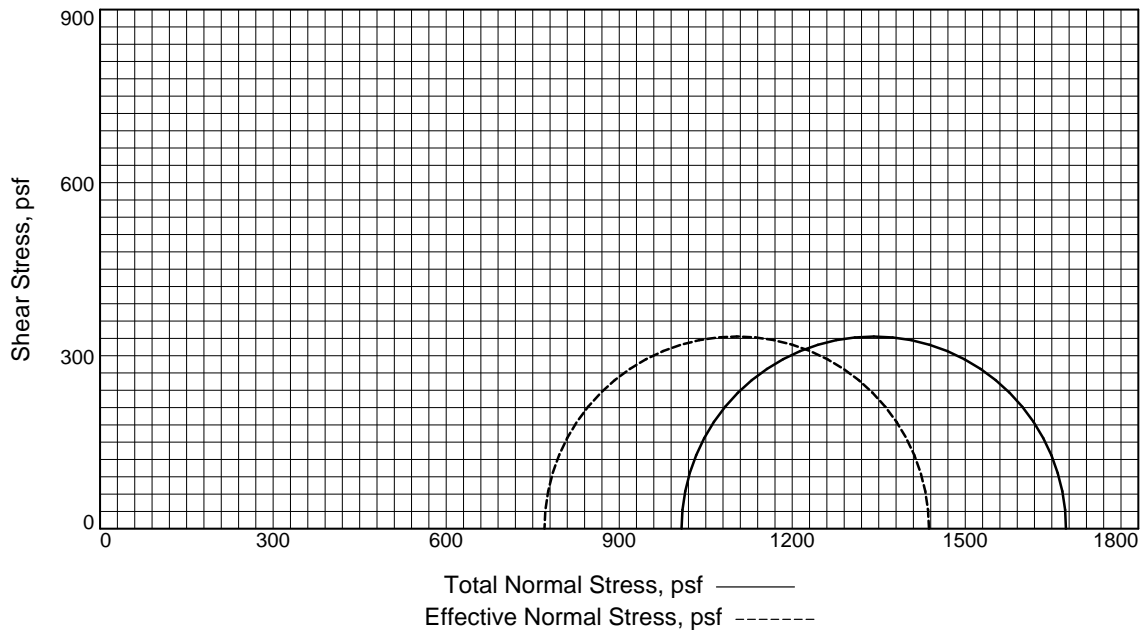
# LIQUID AND PLASTIC LIMITS TEST REPORT



MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
● Black Organic SILT, some fine Sand	112	39	73	98.7	79.0	OH

<b>Project No.</b> 03.0043654.00 <b>Client:</b> GZA GeoEnvironmental <b>Project:</b> Tidewater LDI Pawtucket, RI <b>Source of Sample:</b> Tubes <b>Depth:</b> 5-7' <b>Sample Number:</b> GZ-WB-502 / S-1	<b>Remarks:</b>   
<b>Thielsch Engineering Inc.</b>  <b>Cranston, RI</b>	
<b>Figure</b> L-2	

**Tested By:** JAL \_\_\_\_\_ **Checked By:** MJC \_\_\_\_\_



Sample No.		1
Initial	Water Content, %	136.2
	Dry Density, pcf	35.1
	Saturation, %	100.1
	Void Ratio	3.2667
	Diameter, in.	2.80
	Height, in.	5.71
At Test	Water Content, %	104.2
	Dry Density, pcf	42.8
	Saturation, %	100.0
	Void Ratio	2.5018
	Diameter, in.	2.62
	Height, in.	5.35
Strain rate, in./min.		0.003
Eff. Cell Pressure, psf		1008
Fail. Stress, psf		667
Excess Pore Pr., psf		238
Strain, %		15.9
Ult. Stress, psf		637
Excess Pore Pr., psf		184
Strain, %		14.0
$\bar{\sigma}_1$ Failure, psf		1437
$\bar{\sigma}_3$ Failure, psf		770

**Type of Test:**

CU with Pore Pressures

**Sample Type:** Tube Sample

**Description:** Black Organic SILT, some fine Sand

LL= 112      PL= 39      PI= 73

**Assumed Specific Gravity=** 2.4

**Remarks:** CIU Test Depth: 5.9 to 6.4'

**Client:** GZA GeoEnvironmental

**Project:** Tidewater LDI  
Pawtucket, RI

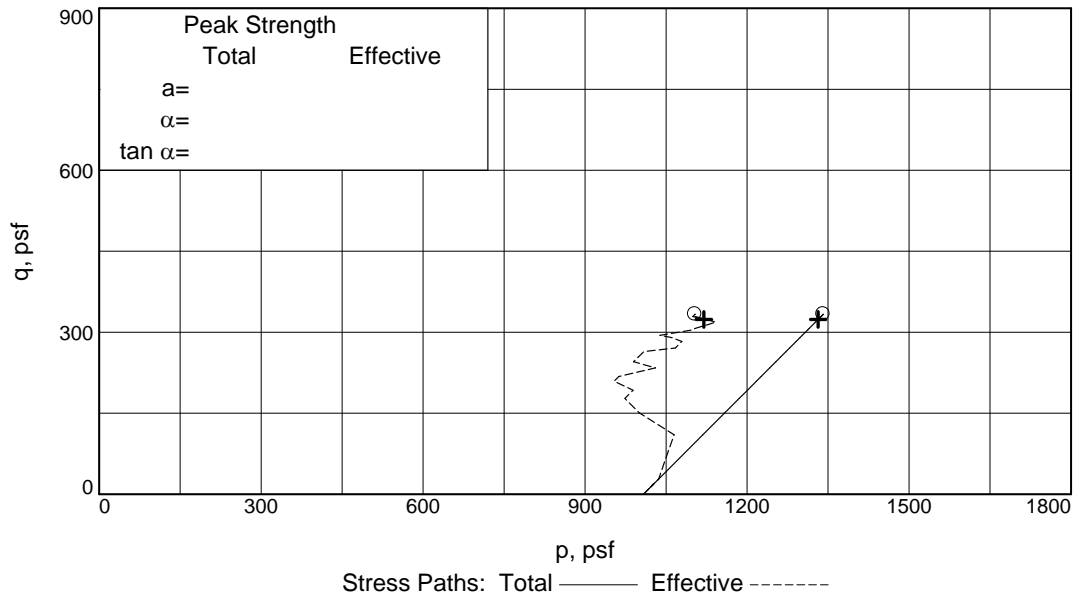
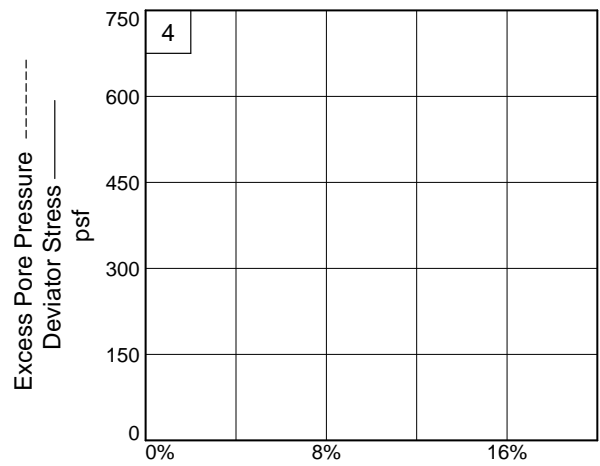
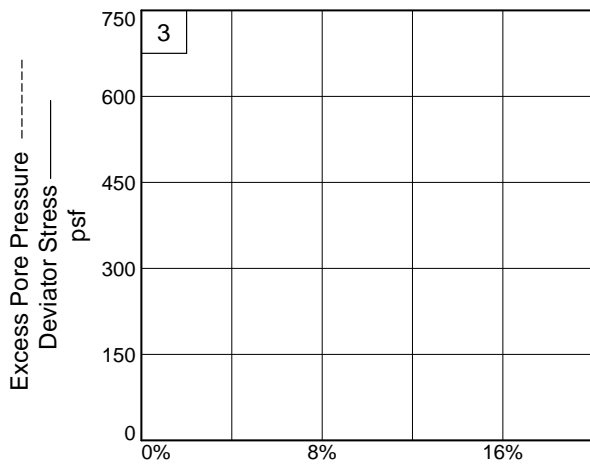
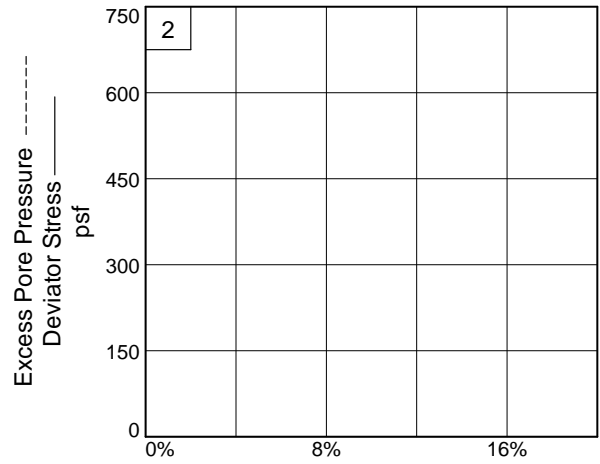
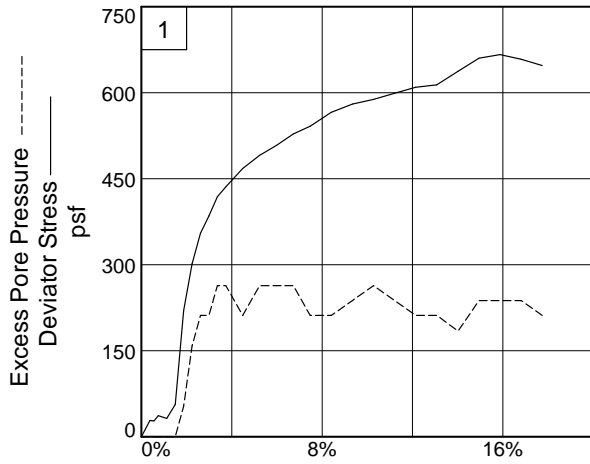
**Source of Sample:** Tubes      **Depth:** 5-7'

**Sample Number:** GZ-WB-502 / S-1

**Proj. No.:** 03.0043654.00      **Date Sampled:**

TRIAXIAL SHEAR TEST REPORT  
Thielsch Engineering Inc.  
Cranston, RI

Figure CIU-2



**Client:** GZA GeoEnvironmental

**Project:** Tidewater LDI

**Source of Sample:** Tubes

**Depth:** 5-7'

**Sample Number:** GZ-WB-502 / S-1

**Project No.:** 03.0043654.00

**Figure** CIU-2

**Thielsch Engineering Inc.**

Tested By: SA \_\_\_\_\_

Checked By: MJC \_\_\_\_\_





195 Frances Avenue  
 Cranston RI, 02910  
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Client Information:  
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 Assigned By: Kayla Newton  
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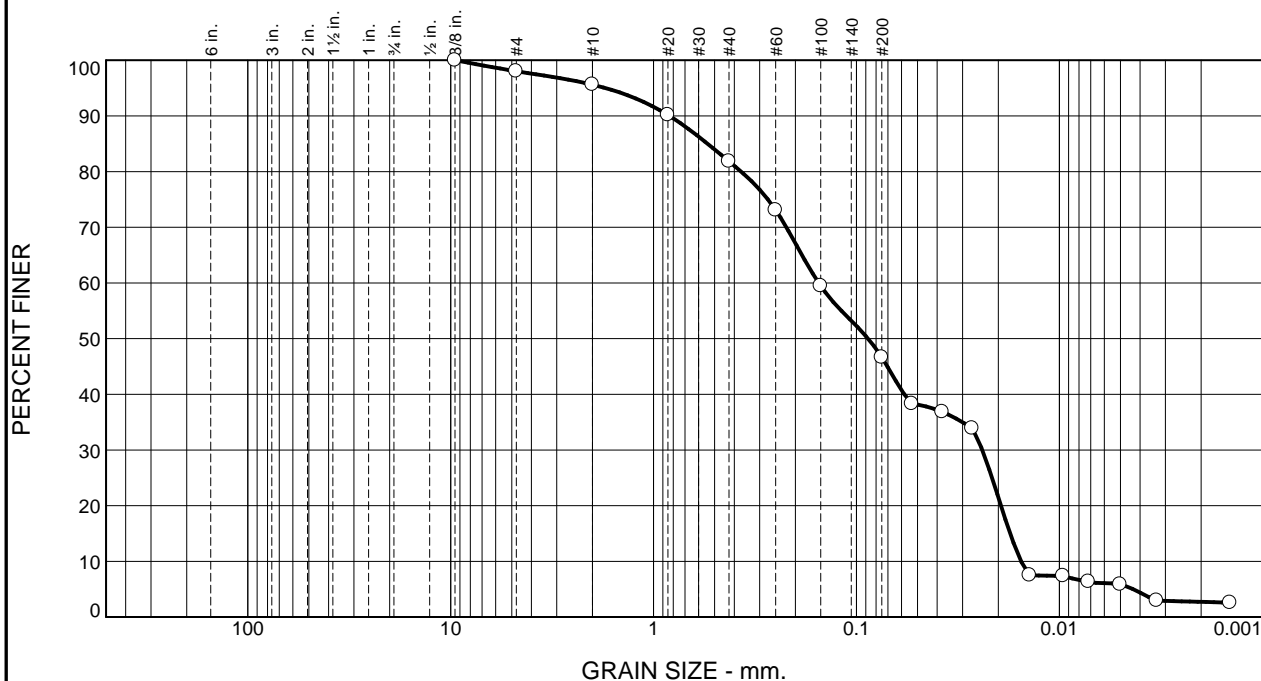
### LABORATORY TESTING DATA SHEET

Boring ID	Sample No.	Depth (ft)	Laboratory No.	Identification Tests								Dry unit wt. pcf	Torrane or Type Test	$\bar{\sigma}_c$ psf	Failure Criteria	$\sigma_1 - \sigma_3$ or $\tau$ psf	Strain %	EST Internal Friction Angle	Permeability cm/sec	Laboratory Log and Soil Description	
				Water Content %	LL %	PL %	Gravel %	Sand %	Fines %	Org. %											
GZ-WB-502	S-2	9-11	T-3	Average Total Unit Weight (9-11') = 75.2 pcf																	
		9.0-9.2																		Disturbed Sample	
		9.2	W-3a	199.0								Tv = 0.06 tsf								Black f-m SAND and Organic SILT, trace fine Gravel	
		9.3-9.5	L-3	162.9	143	45						Limits								Black f-m SAND and Organic SILT, trace fine Gravel	
		9.5-10.0	CIU-3	104.5							43.3	CIU	1008	$\sigma_1 - \sigma_3$ Max	980	7.9				Black f-m SAND and Organic SILT, trace fine Gravel	
		10.0-10.5		Saved																	Saved
		10.5-10.7	S-3	126.3			2.0	51.3	46.7	21.3		Hydrometer									Black f-m SAND and Organic SILT, trace fine Gravel
		10.7	W-3b	110.7																	Black f-m SAND and Organic SILT, trace fine Gravel
		10.8-10.9																			Disturbed Sample

Reviewed By Matthew J. Robson

Date Reviewed 01.19.18

# Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	2.0	2.4	13.8	35.1	44.0	2.7

Test Results (D7928 & ASTM D 1140)			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
0.375"	100.0		
#4	98.0		
#10	95.6		
#20	90.2		
#40	81.8		
#60	73.1		
#100	59.4		
#200	46.7		
0.0533 mm.	38.3		
0.0378 mm.	36.8		
0.0269 mm.	33.9		
0.0140 mm.	7.5		
0.0096 mm.	7.4		
0.0072 mm.	6.3		
0.0050 mm.	5.9		
0.0033 mm.	2.9		
0.0014 mm.	2.6		

\* (no specification provided)

**Material Description**

Black f-m SAND and Organic SILT, trace fine Gravel

**Atterberg Limits (ASTM D 4318)**

PL= 45                      LL= 143                      PI= 98

**Classification**

USCS (D 2487)= SC                      AASHTO (M 145)= A-8

**Coefficients**

D<sub>90</sub>= 0.8347                      D<sub>85</sub>= 0.5418                      D<sub>60</sub>= 0.1536  
D<sub>50</sub>= 0.0877                      D<sub>30</sub>= 0.0240                      D<sub>15</sub>= 0.0175  
D<sub>10</sub>= 0.0154                      C<sub>u</sub>= 9.96                      C<sub>c</sub>= 0.24

Remarks

---

Date Received: 12/14/17                      Date Tested: 1/5/17

Tested By: JAL

Checked By: Matthew Colman P.E.

Title: Laboratory Manager

Source of Sample: Tubes                      Depth: 9-11'  
Sample Number: GZ-WB-502 / S-2

Date Sampled:

**Thielsch Engineering Inc.**

**Cranston, RI**

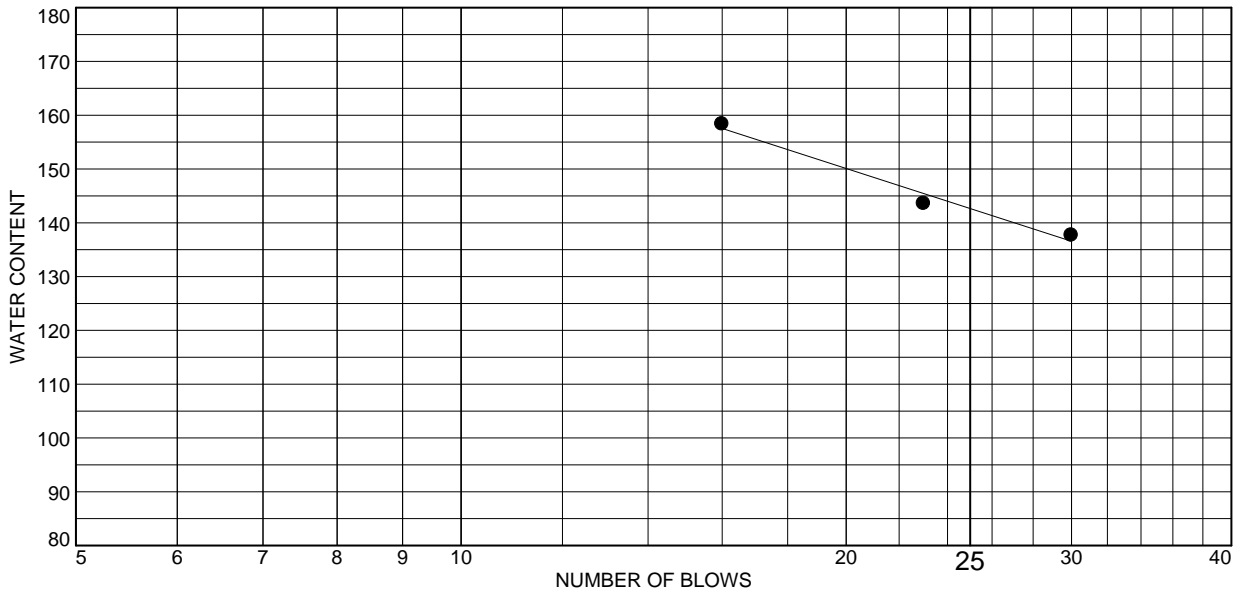
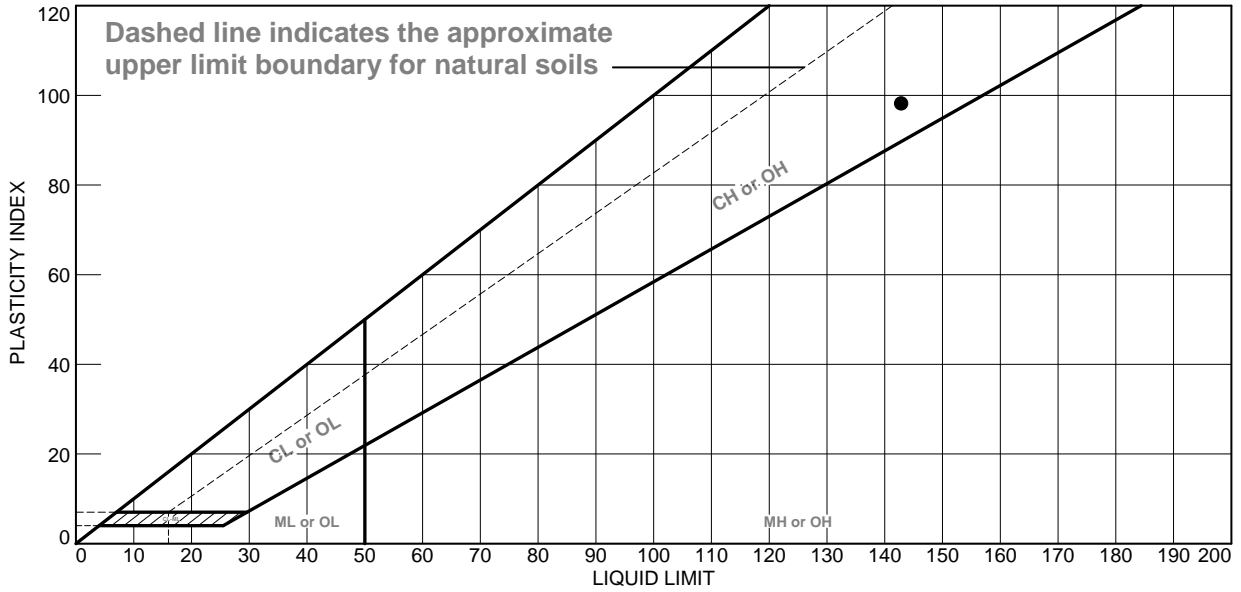
Client: GZA GeoEnvironmental

Project: Tidewater LDI  
Pawtucket, RI

Project No: 03.0043654.00

Figure T-3

# LIQUID AND PLASTIC LIMITS TEST REPORT

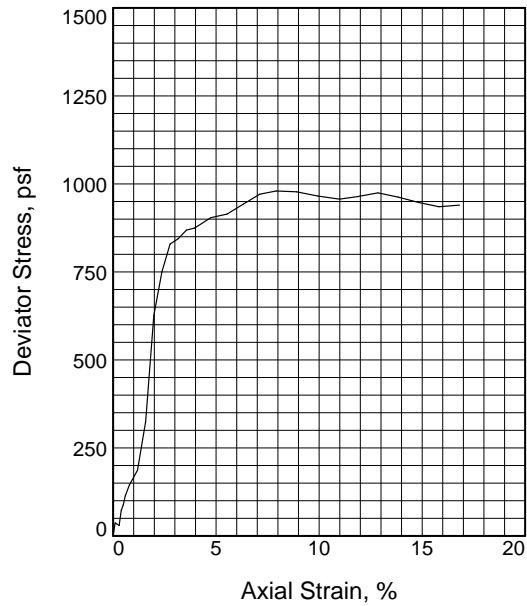
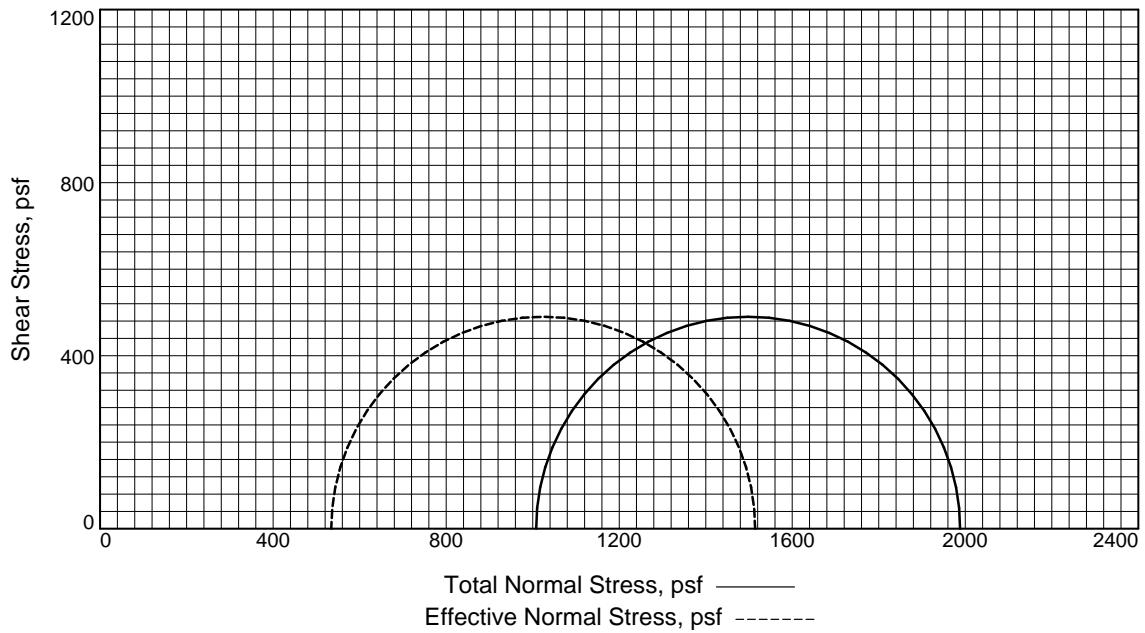


MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
● Black f-m SAND and Organic SILT, trace fine Gravel	143	45	98	81.8	46.7	SC

<b>Project No.</b> 03.0043654.00 <b>Client:</b> GZA GeoEnvironmental <b>Project:</b> Tidewater LDI Pawtucket, RI <b>Source of Sample:</b> Tubes <b>Depth:</b> 9-11' <b>Sample Number:</b> GZ-WB-502 / S-2	<b>Remarks:</b>   
<b>Thielsch Engineering Inc.</b>  <b>Cranston, RI</b>	

Figure L-3

Tested By: JAL Checked By: MJC



Sample No.		1
Initial	Water Content, %	104.5
	Dry Density, pcf	43.3
	Saturation, %	98.9
	Void Ratio	2.7482
	Diameter, in.	2.81
	Height, in.	5.39
At Test	Water Content, %	80.3
	Dry Density, pcf	52.6
	Saturation, %	100.0
	Void Ratio	2.0876
	Diameter, in.	2.63
	Height, in.	5.06
Strain rate, in./min.		0.003
Eff. Cell Pressure, psf		1008
Fail. Stress, psf		980
Excess Pore Pr., psf		474
Strain, %		7.9
Ult. Stress, psf		947
Excess Pore Pr., psf		330
Strain, %		14.8
$\bar{\sigma}_1$ Failure, psf		1514
$\bar{\sigma}_3$ Failure, psf		534

**Type of Test:**

CU with Pore Pressures

**Sample Type:** Tube Sample

**Description:** Black f-m SAND and Organic SILT, trace fine Gravel

**LL=** 143      **PL=** 45      **PI=** 98

**Assumed Specific Gravity=** 2.6

**Remarks:** CIU Test Depth: 9.5 to 10.0'

**Client:** GZA GeoEnvironmental

**Project:** Tidewater LDI  
Pawtucket, RI

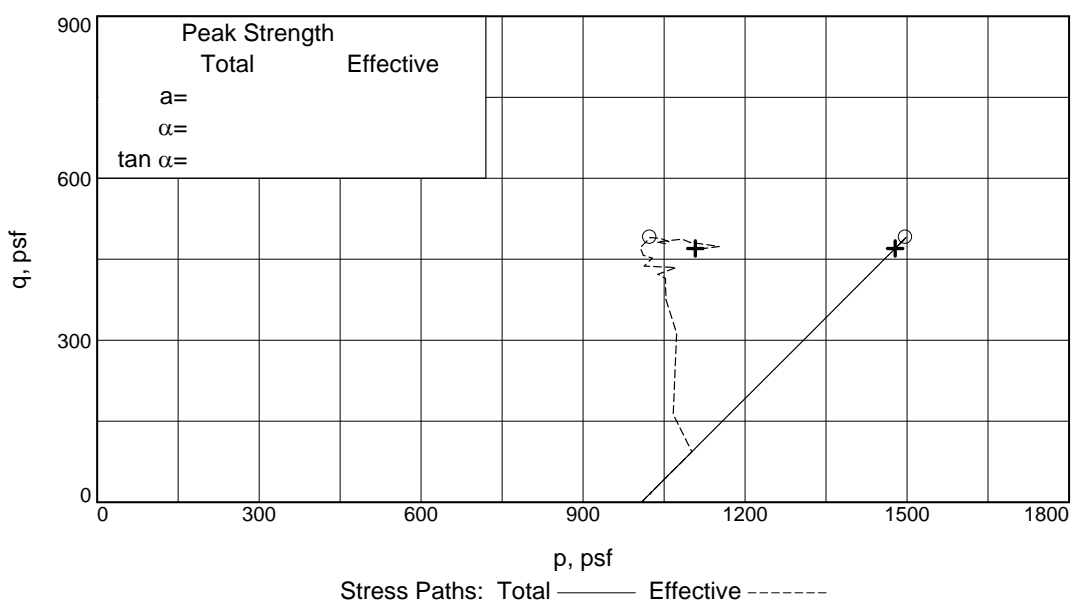
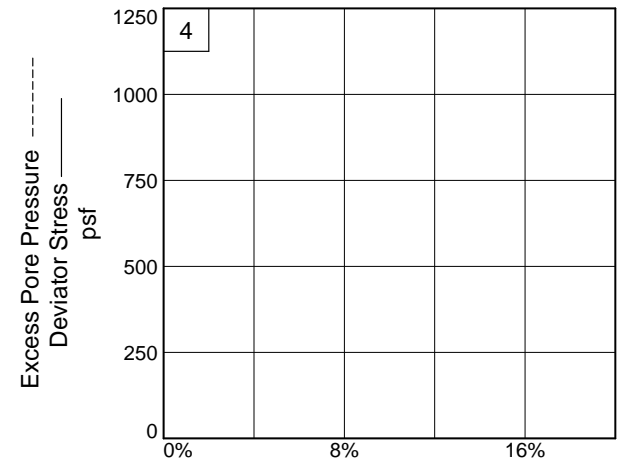
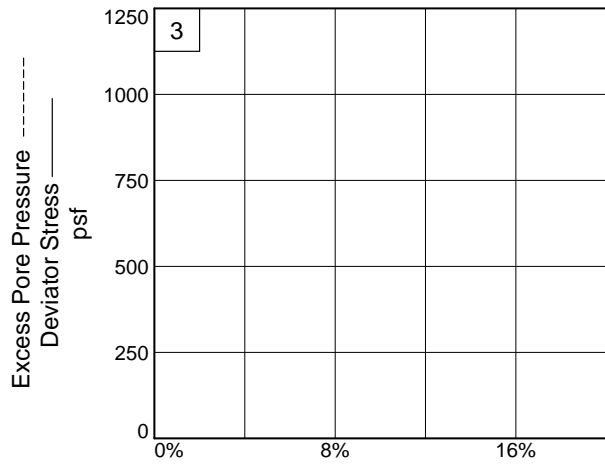
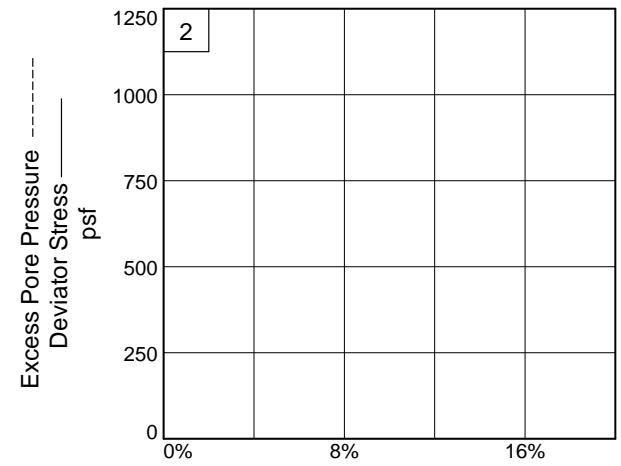
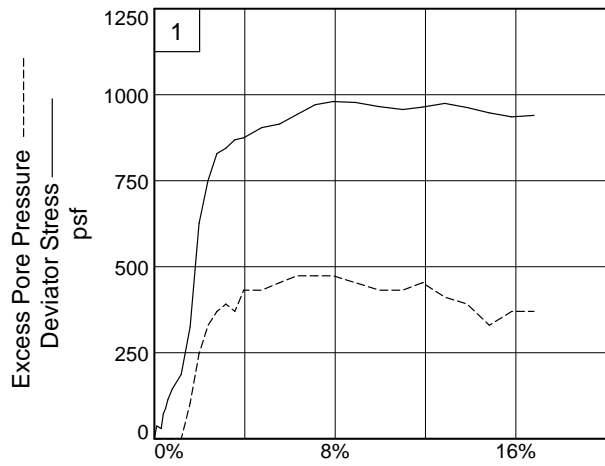
**Source of Sample:** Tubes      **Depth:** 9-11'

**Sample Number:** GZ-WB-502 / S-2

**Proj. No.:** 03.0043654.00      **Date Sampled:**

TRIAXIAL SHEAR TEST REPORT  
Thielsch Engineering Inc.  
Cranston, RI

**Figure** CIU-3



Client: GZA GeoEnvironmental  
 Project: Tidewater LDI  
 Source of Sample: Tubes  
 Project No.: 03.0043654.00

Depth: 9-11'      Sample Number: GZ-WB-502 / S-2  
 Figure CIU-3

**Thielsch Engineering Inc.**

Tested By: SA \_\_\_\_\_ Checked By: MJC \_\_\_\_\_



195 Frances Avenue  
 Cranston RI, 02910  
 Phone: (401)-467-6454  
 Fax: (401)-467-2398  
<http://www.thielsch.com>

Client Information:  
 GZA GeoEnvironmental  
 Providence, RI  
 PM: Matthew Page  
 Assigned By: Kayla Newton  
 Collected By: Kayla Newton

Laboratory Information  
 Project Name:  
**Tidewater LDI  
 Pawtucket, RI**  
 GZA Project Number: 03.0043654.00  
 Report Date: 01.16.18

### LABORATORY TESTING DATA SHEET

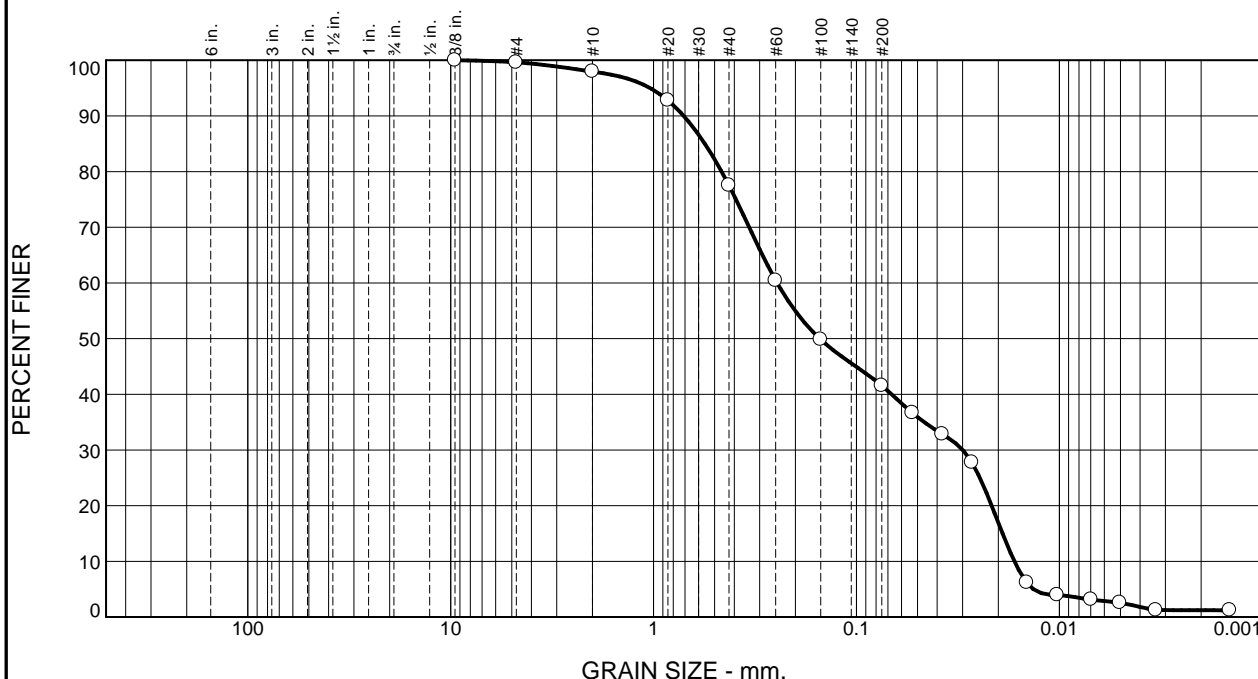
Boring ID	Sample No.	Depth (ft)	Laboratory No.	Identification Tests								Dry unit wt. pcf	Torvane or Type Test	$\bar{\sigma}_c$ psf	Failure Criteria	$\sigma_1 - \sigma_3$ or $\tau$ psf	Strain %	EST Internal Friction Angle	Permeability cm/sec	Laboratory Log and Soil Description	
				Water Content %	LL %	PL %	Gravel %	Sand %	Fines %	Org. %											
GZ-WB-503	S-1	5-7	T-4	Average Total Unit Weight (5-7') = 79.7 pcf																	
		5.0-5.2																		Disturbed	
		5.2	W-4a	86.2								Tv = 0.045 tsf								Black f-m SAND and Organic SILT, trace fine Gravel	
		5.3-5.5	S-4	94.5			0.4	58.1	41.5	15.1		Hydrometer								Black f-m SAND and Organic SILT, trace fine Gravel	
		5.5-6.0		Saved																	Saved
		6.0-6.5	CIU-4	165.5							28.6	CIU	1008	$\sigma_1 - \sigma_3$ Max	587	11.6				Black f-m SAND and Organic SILT, trace fine Gravel	
		6.5-6.7	L-4	153.8	157	49						Limits								Black f-m SAND and Organic SILT, trace fine Gravel	
		10.8-10.9	W-4b	127.3																Black f-m SAND and Organic SILT, trace fine Gravel	

Reviewed By Matthew J. Kober

Date Reviewed 01.19.18



# Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.4	1.6	20.5	36.0	40.3	1.2

Test Results (D7928 & ASTM D 1140)			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
0.375"	100.0		
#4	99.6		
#10	98.0		
#20	92.8		
#40	77.5		
#60	60.4		
#100	49.8		
#200	41.5		
0.0530 mm.	36.7		
0.0377 mm.	32.8		
0.0270 mm.	27.7		
0.0145 mm.	6.2		
0.0102 mm.	4.0		
0.0070 mm.	3.1		
0.0050 mm.	2.5		
0.0033 mm.	1.2		
0.0014 mm.	1.2		

\* (no specification provided)

**Material Description**

Black f-m SAND and Organic SILT, trace fine Gravel

**Atterberg Limits (ASTM D 4318)**

PL= 49                      LL= 157                      PI= 108

**Classification**

USCS (D 2487)= SC                      AASHTO (M 145)= A-8

**Coefficients**

D<sub>90</sub>= 0.7101                      D<sub>85</sub>= 0.5588                      D<sub>60</sub>= 0.2461  
D<sub>50</sub>= 0.1516                      D<sub>30</sub>= 0.0299                      D<sub>15</sub>= 0.0190  
D<sub>10</sub>= 0.0166                      C<sub>u</sub>= 14.78                      C<sub>c</sub>= 0.22

Remarks

Date Received: 12/14/17                      Date Tested: 1/5/18

Tested By: JAL

Checked By: Matthew Colman P.E.

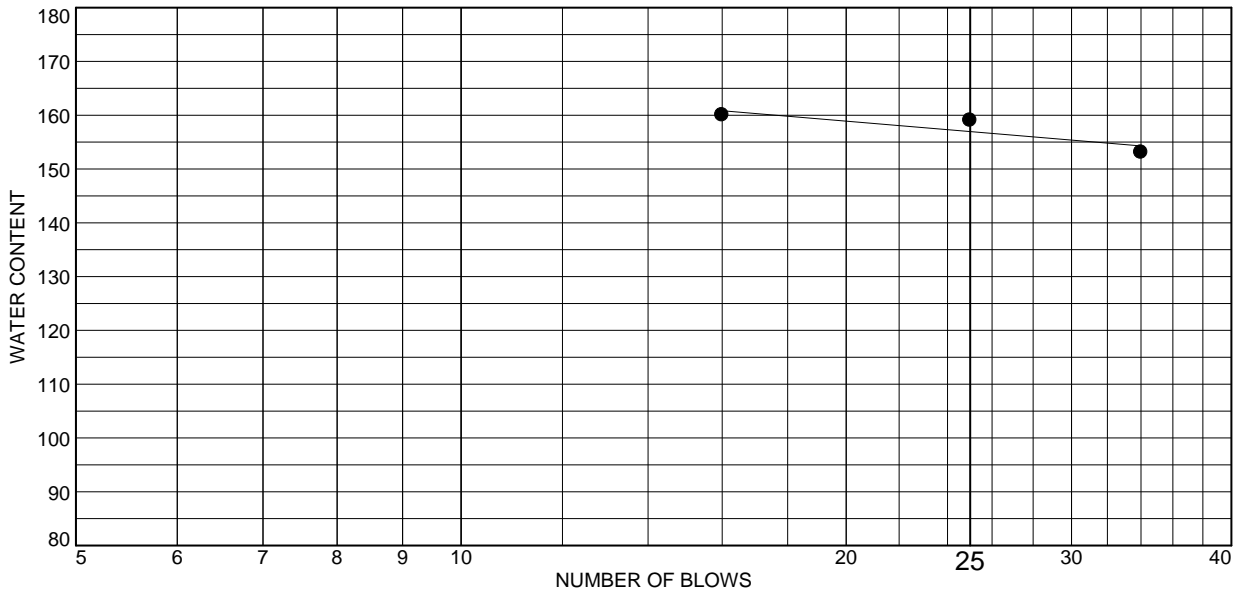
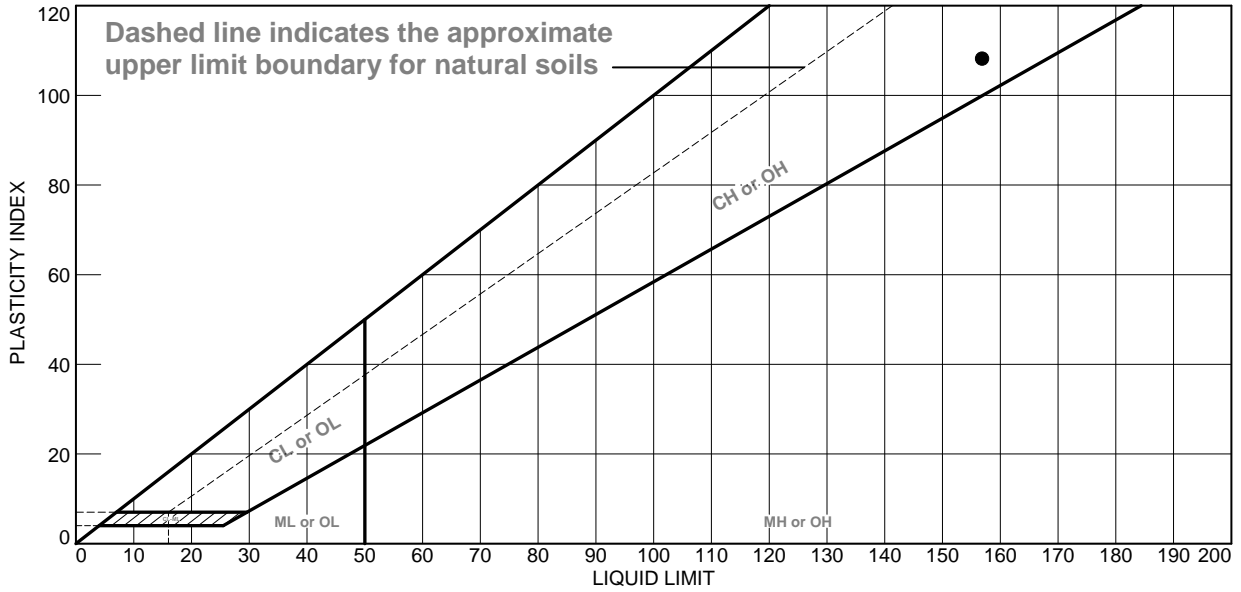
Title: Laboratory Manager

Source of Sample: Tubes                      Depth: 5-7'  
Sample Number: GZ-WB-503 / S-1

Date Sampled:

<b>Thielsch Engineering Inc.</b>  <b>Cranston, RI</b>	<b>Client:</b> GZA GeoEnvironmental <b>Project:</b> Tidewater LDI Pawtucket, RI <b>Project No:</b> 03.0043654.00
<b>Figure</b> T-4	

# LIQUID AND PLASTIC LIMITS TEST REPORT



MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
● Black f-m SAND and Organic SILT, trace fine Gravel	157	49	108	77.5	41.5	SC

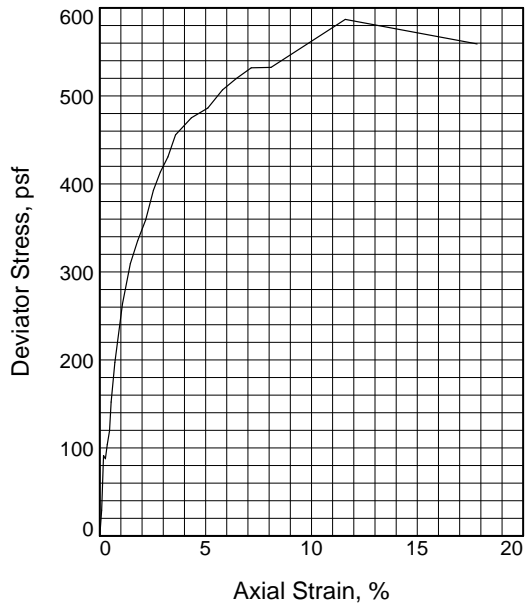
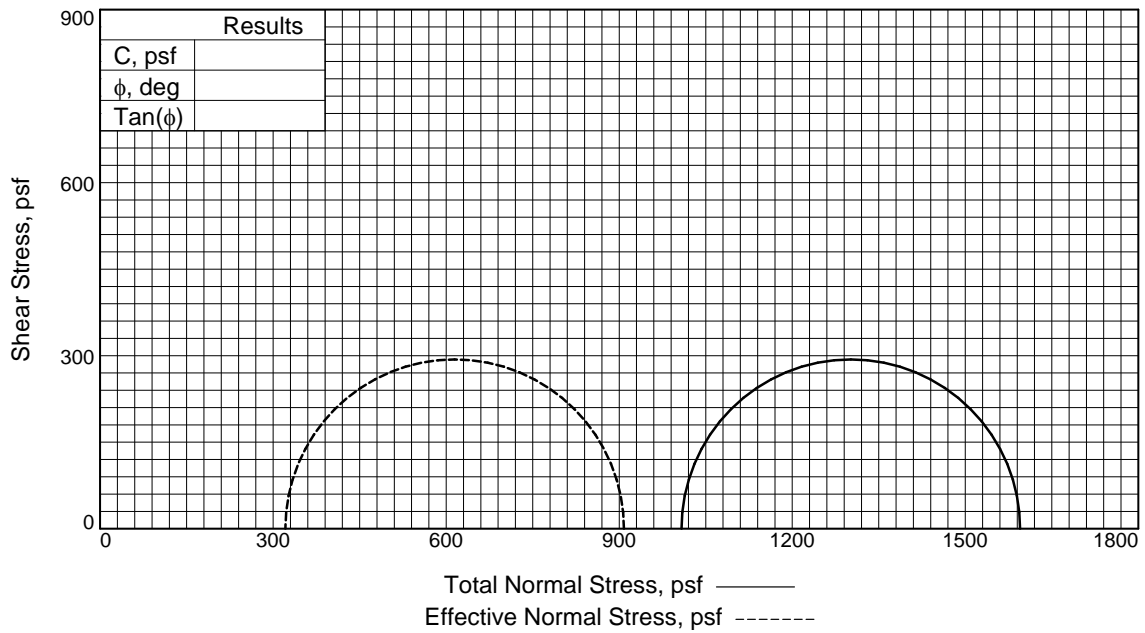
**Project No.** 03.0043654.00 **Client:** GZA GeoEnvironmental  
**Project:** Tidewater LDI  
 Pawtucket, RI  
**Source of Sample:** Tubes **Depth:** 5-7'  
**Sample Number:** GZ-WB-503 / S-1

**Thielsch Engineering Inc.**  
 Cranston, RI

**Remarks:**

**Figure** L-4

**Tested By:** JAL **Checked By:** MJC



Sample No.	1	
Initial	Water Content, %	165.5
	Dry Density, pcf	28.6
	Saturation, %	91.9
	Void Ratio	4.6846
	Diameter, in.	2.83
	Height, in.	6.00
At Test	Water Content, %	137.4
	Dry Density, pcf	35.5
	Saturation, %	100.0
	Void Ratio	3.5718
	Diameter, in.	2.63
	Height, in.	5.59
Strain rate, in./min.	0.001	
Eff. Cell Pressure, psf	1008	
Fail. Stress, psf	587	
Excess Pore Pr., psf	687	
Strain, %	11.6	
Ult. Stress, psf	456	
Excess Pore Pr., psf	396	
Strain, %	3.6	
$\bar{\sigma}_1$ Failure, psf	908	
$\bar{\sigma}_3$ Failure, psf	321	

**Type of Test:**

CU with Pore Pressures

**Sample Type:** Tube Sample

**Description:** Black f-m SAND and Organic SILT, trace fine Gravel

**LL= 157      PL= 49      PI= 108**

**Assumed Specific Gravity= 2.6**

**Remarks:** CIU Test Depth: 6.0 to 6.5'.

**Client:** GZA GeoEnvironmental

**Project:** Tidewater LDI  
Pawtucket, RI

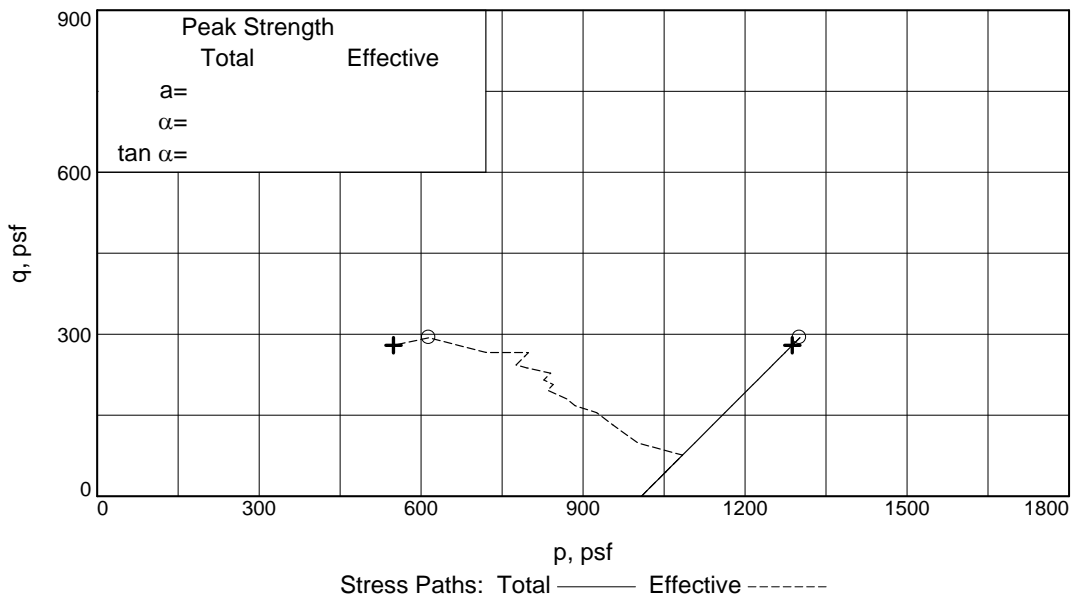
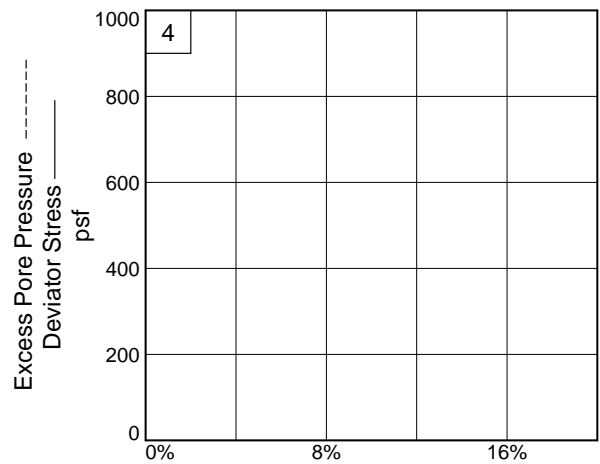
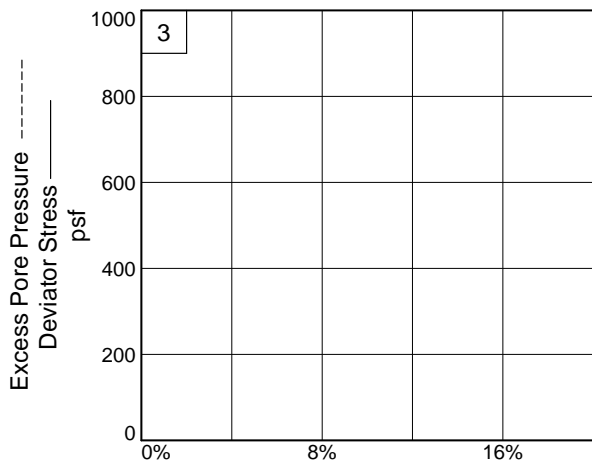
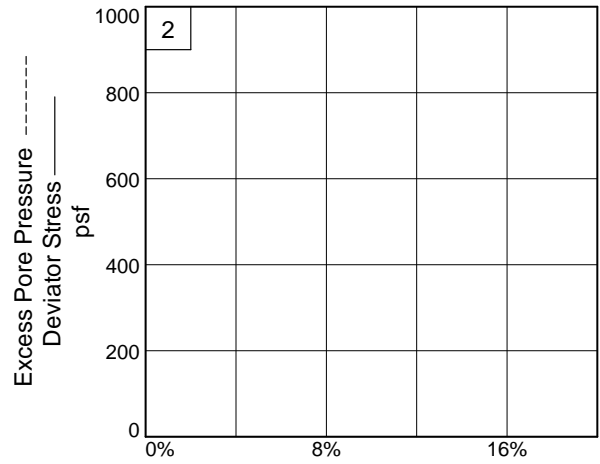
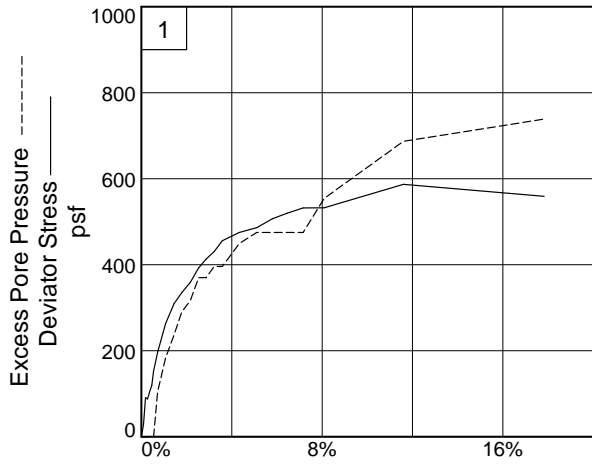
**Source of Sample:** Tubes      **Depth:** 5-7'

**Sample Number:** GZ-WB-503 / S-1

**Proj. No.:** 03.0043654.00      **Date Sampled:**

TRIAXIAL SHEAR TEST REPORT  
Thielsch Engineering Inc.  
Cranston, RI

**Figure** CIU-4



**Client:** GZA GeoEnvironmental

**Project:** Tidewater LDI

**Source of Sample:** Tubes

**Depth:** 5-7'

**Sample Number:** GZ-WB-503 / S-1

**Project No.:** 03.0043654.00

**Figure** CIU-4

**Thielsch Engineering Inc.**

Tested By: SA \_\_\_\_\_

Checked By: MJC \_\_\_\_\_

## LABORATORY TESTING DATA SHEET

*Matthew Page*

Project Name Tidewater LDI  
 Project No. 03.0043654.00  
 Project Manager Dave Rusczyk / Matthew Page

Location Pawtucket, RI  
 Assigned By Kayla Newton  
 Report Date 01.24.18

Reviewed By \_\_\_\_\_  
 Date Reviewed 01.25.18

Boring/ Test Pit No.	Sample No.	Depth ft.	Lab No.	Identification Tests							Corrosivity				Laboratory Log and Soil Description	
				Water Content %	LL %	PL %	Gravel %	Sand %	Fines (<#200) %	Org. %	pH	Sulfate (mg/kg)	Chloride (mg/kg)	Resistivity (Mohms-cm)		
GZ-BW-501	S-6	10-12	5									6.70	565	3510	0.0006	Analytical Testing Only
GZ-BW-501	S-9	16-18	6				6.0	66.8	27.2							Gray f-c SAND, some Silt, trace fine Gravel
GZ-BK-501	S-8	14-16	7				0.0	25.1	74.9							Dark Gray Organic SILT, some f-m Sand
GZ-BW-502	S-7	20-22	8									6.81	190	1720	0.0005	Analytical Testing Only
GZ-BK-502	S-4	6-8	9									6.92	70	ND	0.010	Analytical Testing Only
GZ-BK-502	S-29	56-58	10				0.0	52.6	47.4							Brown fine SAND and SILT
GZ-BW-503	S-4	9-10	11									6.80	534	3230	0.0002	Analytical Testing Only
GZ-BW-503	S-10	36.5-38.5	12				0.0	10.2	89.8							Brown SILT, little fine Sand
GZ-BW-504A	S-7	21-22	13				56.6	38.7	4.7							Brown f-c GRAVEL and f-c SAND, trace Silt
GZ-WB-505	S-18	34-36	14				8.2	74.2	17.6							Brown f-m SAND, little Silt, and trace fine Gravel
GZ-BW-506	S-5	10-12	15									7.16	618	2420	0.0002	Analytical Testing Only
GZ-BW-507	S-4	8-10	16									7.15	306	1340	0.0004	Analytical Testing Only
GZ-BW-509	S-4	6-8	17									7.68	260	36	0.001	Analytical Testing Only



195 Frances Avenue  
 Cranston, RI 02910

401-467-6454

## LABORATORY TESTING DATA SHEET

*Matthew Page*

Project Name Tidewater LDI  
 Project No. 03.0043654.00  
 Project Manager Dave Rusczyk / Matthew Page

Location Pawtucket, RI  
 Assigned By Kayla Newton  
 Report Date 01.24.18

Reviewed By \_\_\_\_\_  
 Date Reviewed 01.25.18

Boring/ Test Pit No.	Sample No.	Depth ft.	Lab No.	Identification Tests							Corrosivity				Laboratory Log and Soil Description
				Water Content %	LL %	PL %	Gravel %	Sand %	Fines (<#200) %	Org. %	pH	Sulfate (mg/kg)	Chloride (mg/kg)	Resistivity (Mohms-cm)	
GZ-BW-509	S-11	43-45	18				37.5	53.7	8.8						Brown f-c SAND and f-c GRAVEL, trace Silt
GZ-BK-510	S-13	24-26	19				51.2	39.3	9.5						Brown f-c GRAVEL and f-c SAND, trace Silt
GZ-BW-511	S-4	11-13	20								6.63	500	2570	0.0002	Analytical Testing Only
GZ-BW-511	S-13	51-53	21				23.3	69.1	7.6						Brown f-c SAND, little fine Gravel, trace Silt
GZ-BW-512	S-3	4-6	22								4.20	140	ND	0.100	Analytical Testing Only
GZ-BW-512	S-16	66-68	23				0.0	51.3	48.7						Brown fine SAND and SILT
GZ-WB-513	S-1	4-5	24								1.48	2440	ND	0.0001	Analytical Testing Only

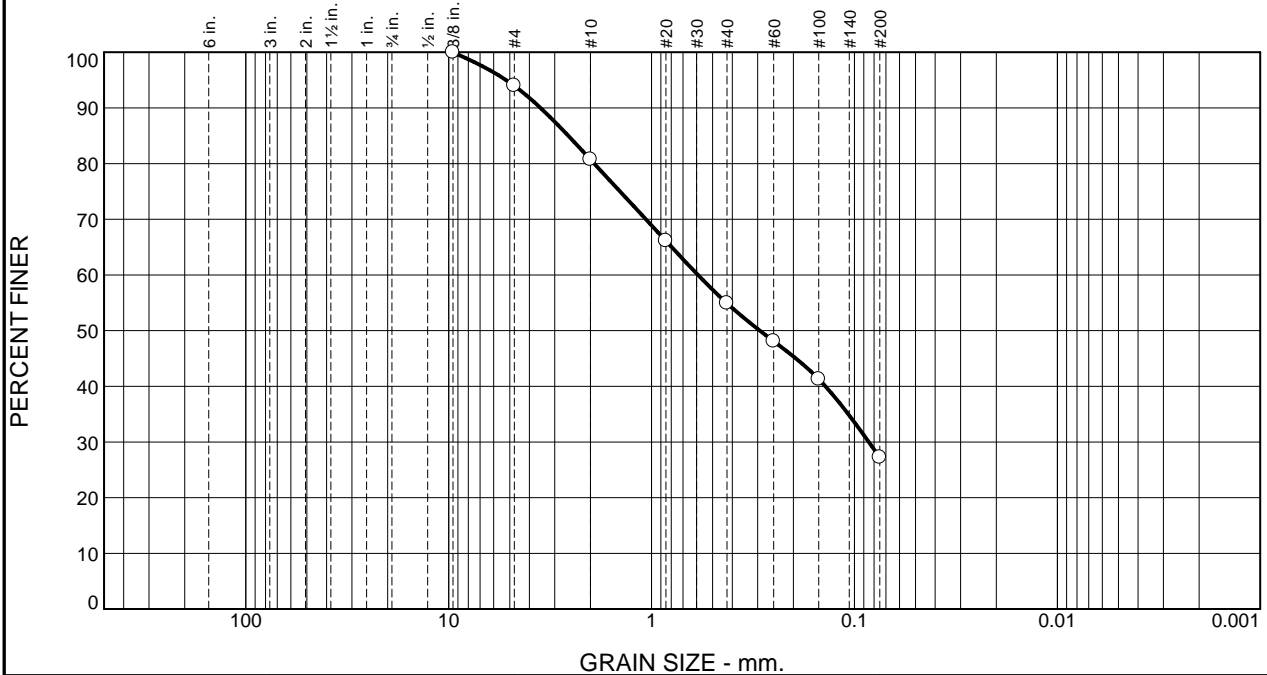


195 Frances Avenue  
 Cranston, RI 02910

401-467-6454



# Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	6.0	13.3	25.8	27.7	27.2	

Test Results (D6913 & ASTM D 1140)			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
0.375"	100.0		
#4	94.0		
#10	80.7		
#20	66.1		
#40	54.9		
#60	48.1		
#100	41.3		
#200	27.2		

\* (no specification provided)

**Material Description**

Gray f-c SAND, some Silt, trace fine Gravel

**Atterberg Limits (ASTM D 4318)**

PL= NP                      LL= NV                      PI= NP

**Classification**

USCS (D 2487)= SM                      AASHTO (M 145)= A-2-4(0)

**Coefficients**

D<sub>90</sub>= 3.5260                      D<sub>85</sub>= 2.5736                      D<sub>60</sub>= 0.5905  
D<sub>50</sub>= 0.2926                      D<sub>30</sub>= 0.0850                      D<sub>15</sub>=  
D<sub>10</sub>=                                      C<sub>u</sub>=                                      C<sub>c</sub>=

Remarks

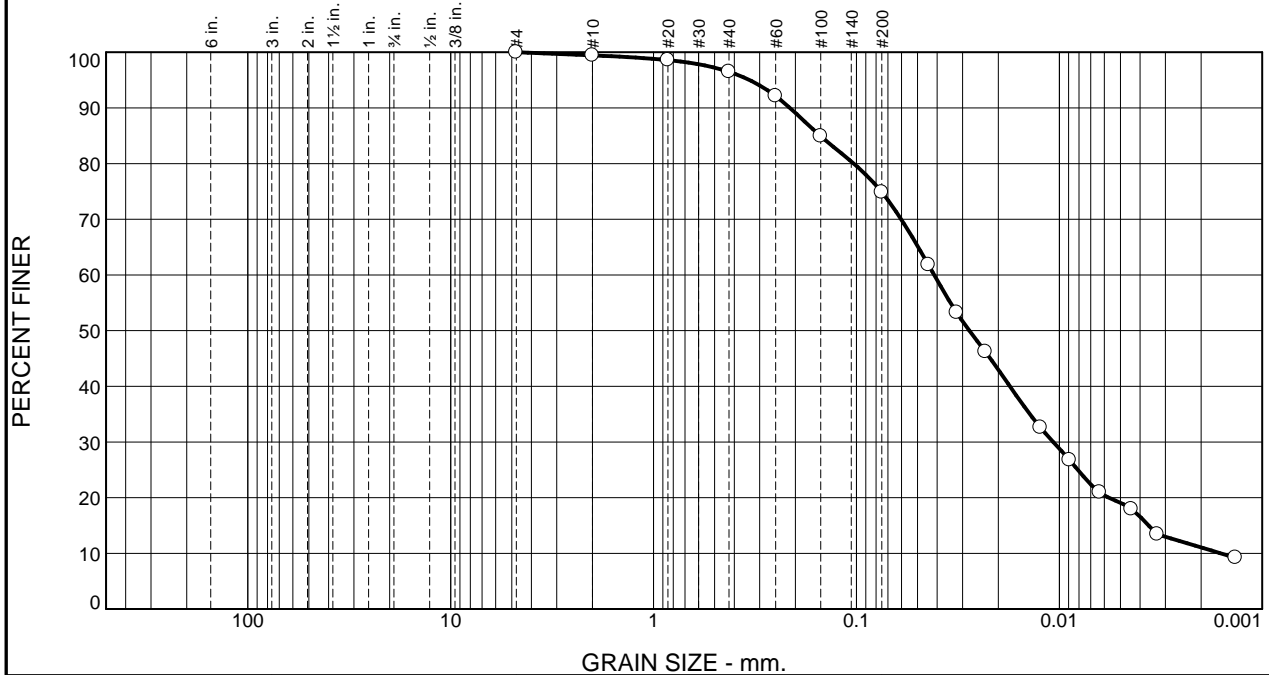
Date Received: 01.14.18                      Date Tested: 01.17.18  
Tested By: RR / JAL  
Checked By: Matthew Colman P.E.  
Title: Laboratory Manager

Source of Sample: Borings                      Depth: 16-18'  
Sample Number: GZ-BW-501 / S-9

Date Sampled:

<b>Thielsch Engineering Inc.</b>  <b>Cranston, RI</b>	<b>Client:</b> GZA GeoEnvironmental <b>Project:</b> Tidewater LDI Pawtucket, RI <b>Project No:</b> 03.0043654.00
<b>Figure</b> S-6	

# Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.6	2.9	21.6	63.8	11.1

Test Results (D7928 & ASTM D 1140)			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#4	100.0		
#10	99.4		
#20	98.6		
#40	96.5		
#60	92.1		
#100	84.9		
#200	74.9		
0.0442 mm.	61.8		
0.0321 mm.	53.2		
0.0231 mm.	46.2		
0.0124 mm.	32.6		
0.0089 mm.	26.8		
0.0063 mm.	21.0		
0.0044 mm.	17.9		
0.0033 mm.	13.4		
0.0014 mm.	9.2		

\* (no specification provided)

**Material Description**

Dark Gray Organic SILT, some f-m SAND

**Atterberg Limits (ASTM D 4318)**

PL=                      LL=                      PI=

**Classification**

USCS (D 2487)= OH                      AASHTO (M 145)= A-8

**Coefficients**

D<sub>90</sub>= 0.2129                      D<sub>85</sub>= 0.1509                      D<sub>60</sub>= 0.0414  
D<sub>50</sub>= 0.0278                      D<sub>30</sub>= 0.0107                      D<sub>15</sub>= 0.0036  
D<sub>10</sub>= 0.0016                      C<sub>u</sub>= 25.87                      C<sub>c</sub>= 1.73

Remarks

Date Received: 1/14/18                      Date Tested: 1/22/18

Tested By: JAL

Checked By: Matthew Colman P.E.

Title: Laboratory Manager

Source of Sample: Borings                      Depth: 14-16'  
Sample Number: GZ-BK-501 / S-8

Date Sampled:

**Thielsch Engineering Inc.**

**Cranston, RI**

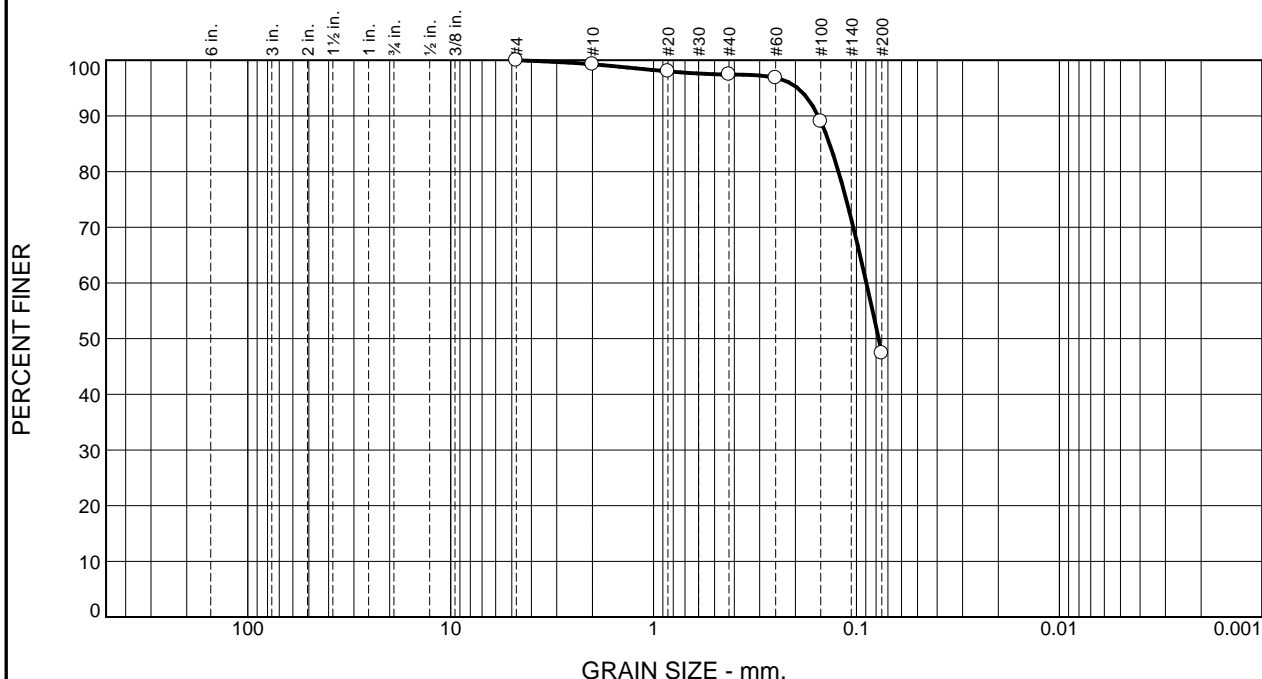
Client: GZA GeoEnvironmental

Project: Tidewater LDI  
Pawtucket, RI

Project No: 03.0043654.00

Figure S-7

# Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.7	1.9	50.0	47.4	

Test Results (D6913 & ASTM D 1140)			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#4	100.0		
#10	99.3		
#20	98.0		
#40	97.4		
#60	96.8		
#100	89.0		
#200	47.4		

\* (no specification provided)

**Material Description**

Brown fine SAND and SILT

**Atterberg Limits (ASTM D 4318)**

PL= NP                      LL= NV                      PI= NP

**Classification**

USCS (D 2487)= SM                      AASHTO (M 145)= A-4(0)

**Coefficients**

D<sub>90</sub>= 0.1544                      D<sub>85</sub>= 0.1357                      D<sub>60</sub>= 0.0894  
D<sub>50</sub>= 0.0777                      D<sub>30</sub>=                                      D<sub>15</sub>=  
D<sub>10</sub>=                                      C<sub>u</sub>=                                      C<sub>c</sub>=

**Remarks**

Material was visually checked for plasticity and appeared non-plastic.

Date Received: 01.14.18                      Date Tested: 01.17.18  
Tested By: RR / JAL  
Checked By: Matthew Colman P.E.  
Title: Laboratory Manager

Source of Sample: Borings                      Depth: 56-58'  
Sample Number: GZ-BK-502 / S-29

Date Sampled:

**Thielsch Engineering Inc.**

**Cranston, RI**

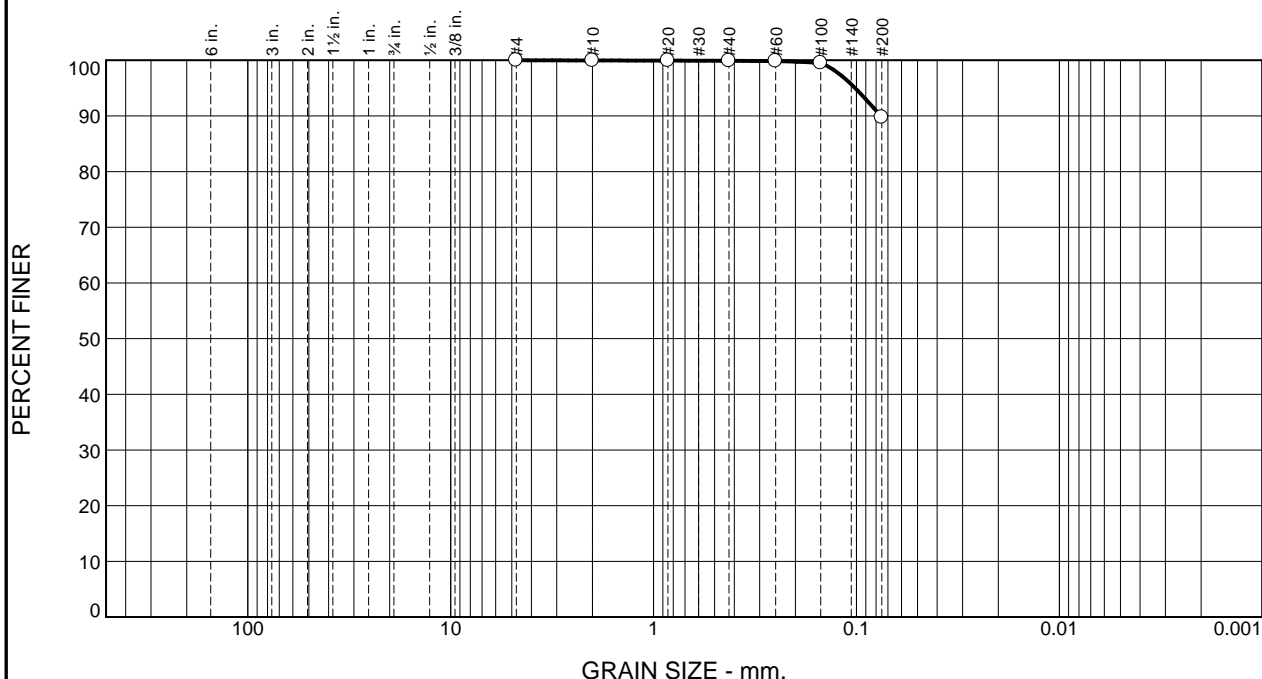
Client: GZA GeoEnvironmental

Project: Tidewater LDI  
Pawtucket, RI

Project No: 03.0043654.00

Figure S-10

# Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.1	10.1	89.8	

Test Results (D6913 & ASTM D 1140)			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#4	100.0		
#10	100.0		
#20	99.9		
#40	99.9		
#60	99.9		
#100	99.5		
#200	89.8		

\* (no specification provided)

**Material Description**

Brown SILT, little fine Sand

**Atterberg Limits (ASTM D 4318)**

PL= NP                      LL= NV                      PI= NP

**Classification**

USCS (D 2487)= ML                      AASHTO (M 145)= A-4(0)

**Coefficients**

D<sub>90</sub>= 0.0760                      D<sub>85</sub>=                      D<sub>60</sub>=  
D<sub>50</sub>=                      D<sub>30</sub>=                      D<sub>15</sub>=  
D<sub>10</sub>=                      C<sub>u</sub>=                      C<sub>c</sub>=

**Remarks**

Material was visually checked for plasticity and appeared non-plastic. Sample contained standing water.

---

Date Received: 01.14.18                      Date Tested: 01.17.18

Tested By: RR / JAL

Checked By: Matthew Colman P.E.

Title: Laboratory Manager

Source of Sample: Borings                      Depth: 36.5-38.5'  
Sample Number: GZ-BW-503 / S-10

Date Sampled:

**Thielsch Engineering Inc.**

**Cranston, RI**

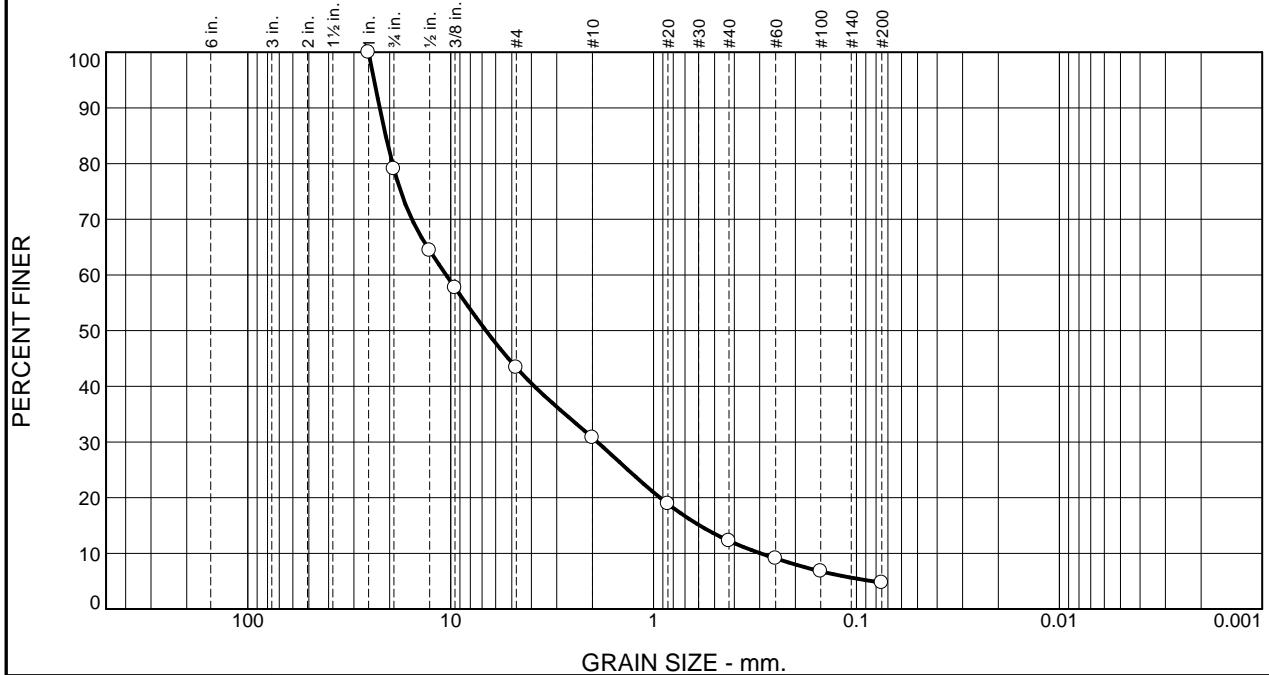
Client: GZA GeoEnvironmental

Project: Tidewater LDI  
Pawtucket, RI

Project No: 03.0043654.00

Figure S-12

# Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	20.9	35.7	12.6	18.5	7.6	4.7	

Test Results (D6913 & ASTM D 1140)			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1"	100.0		
0.75"	79.1		
0.5"	64.4		
0.375"	57.7		
#4	43.4		
#10	30.8		
#20	18.9		
#40	12.3		
#60	9.1		
#100	6.8		
#200	4.7		

\* (no specification provided)

**Material Description**

Brown f-c GRAVEL and f-c SAND, trace Silt

**Atterberg Limits (ASTM D 4318)**

PL= NP                      LL= NV                      PI= NP

**Classification**

USCS (D 2487)= GW                      AASHTO (M 145)= A-1-a

**Coefficients**

D<sub>90</sub>= 22.3744                      D<sub>85</sub>= 20.8962                      D<sub>60</sub>= 10.5326  
D<sub>50</sub>= 6.6984                      D<sub>30</sub>= 1.8930                      D<sub>15</sub>= 0.5921  
D<sub>10</sub>= 0.2968                      C<sub>u</sub>= 35.48                      C<sub>c</sub>= 1.15

Remarks


---

Date Received: 01.14.18                      Date Tested: 01.17.18

Tested By: RR / JAL

Checked By: Matthew Colman P.E.

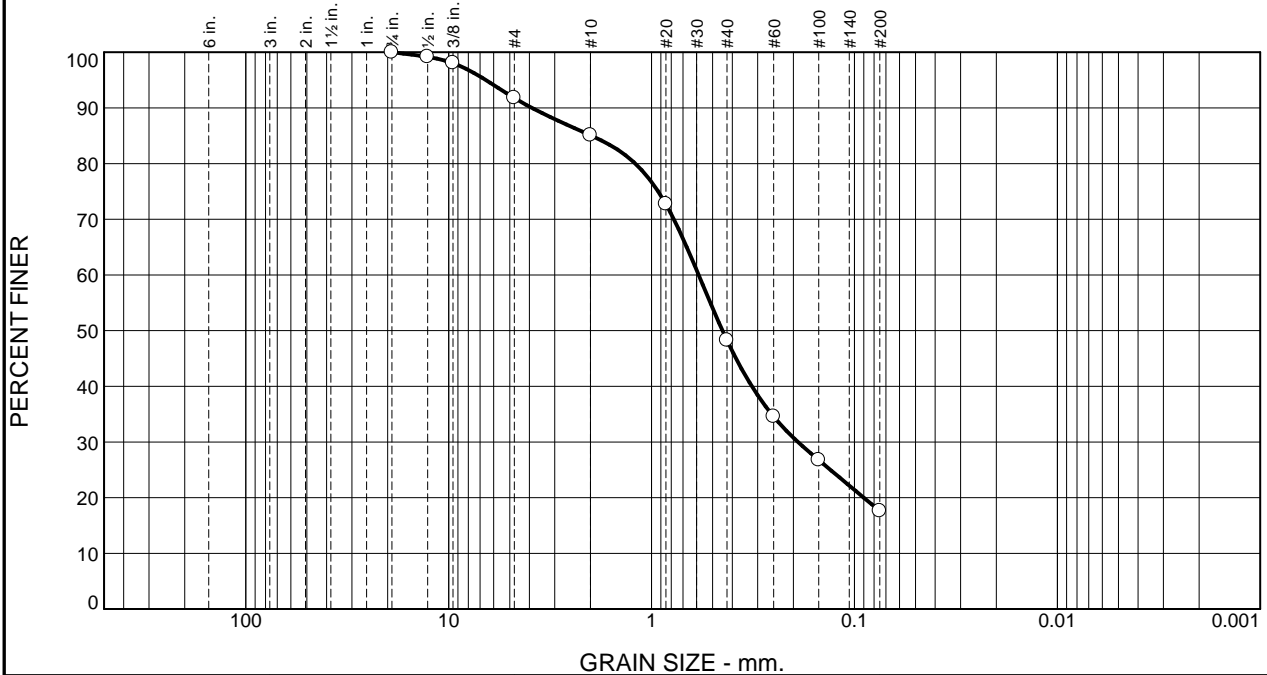
Title: Laboratory Manager

Source of Sample: Borings                      Depth: 21-22'  
Sample Number: GZ-BW-504a / S-7

Date Sampled:

<b>Thielsch Engineering Inc.</b>  <b>Cranston, RI</b>	<b>Client:</b> GZA GeoEnvironmental <b>Project:</b> Tidewater LDI Pawtucket, RI <b>Project No:</b> 03.0043654.00
<b>Figure</b> S-13	

# Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	8.2	6.7	36.8	30.7	17.6	

Test Results (D6913 & ASTM D 1140)			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
0.75"	100.0		
0.5"	99.2		
0.375"	98.1		
#4	91.8		
#10	85.1		
#20	72.7		
#40	48.3		
#60	34.5		
#100	26.8		
#200	17.6		

\* (no specification provided)

**Material Description**

Brown f-m SAND, little Silt, trace fine Gravel

**Atterberg Limits (ASTM D 4318)**

PL= NP                      LL= NV                      PI= NP

**Classification**

USCS (D 2487)= SM                      AASHTO (M 145)= A-1-b

**Coefficients**

D<sub>90</sub>= 3.8833                      D<sub>85</sub>= 1.9801                      D<sub>60</sub>= 0.5860  
D<sub>50</sub>= 0.4472                      D<sub>30</sub>= 0.1900                      D<sub>15</sub>=  
D<sub>10</sub>=                                      C<sub>u</sub>=                                      C<sub>c</sub>=

Remarks

Date Received: 01.14.18                      Date Tested: 01.17.18

Tested By: RR / JAL

Checked By: Matthew Colman P.E.

Title: Laboratory Manager

Source of Sample: Borings                      Depth: 34-36'  
Sample Number: GZ-BW-505 / S-18

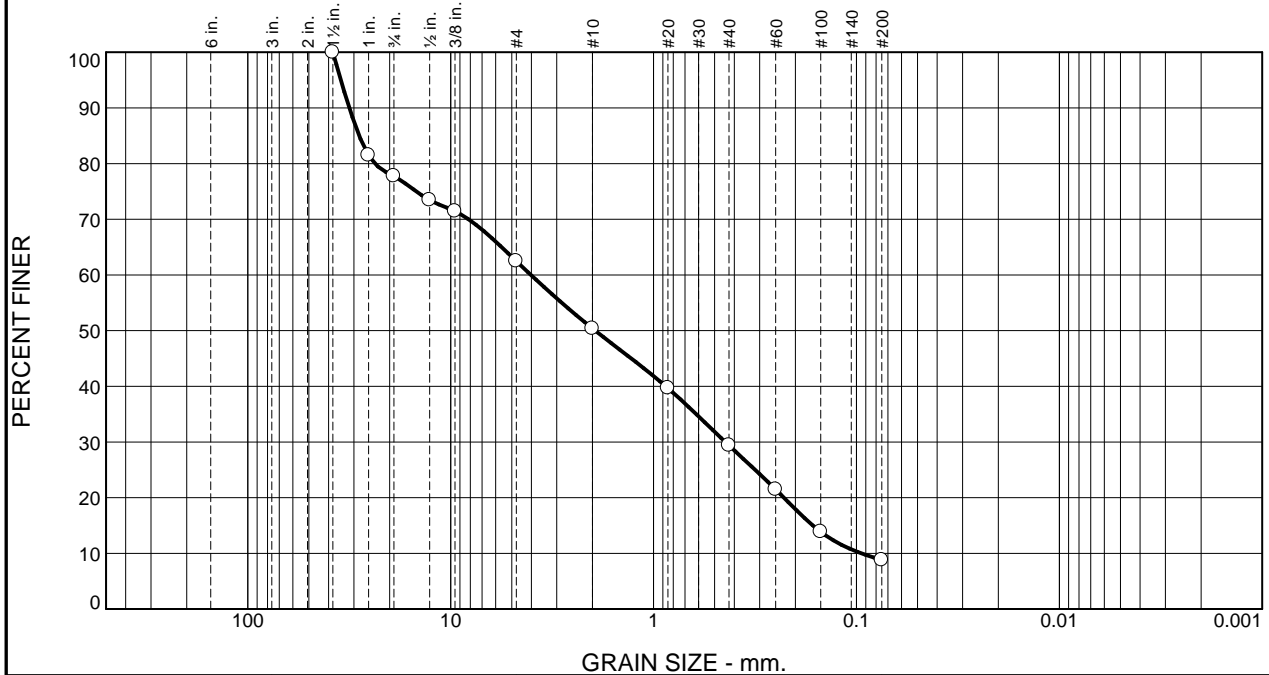
Date Sampled:

<b>Thielsch Engineering Inc.</b>  <b>Cranston, RI</b>	<b>Client:</b> GZA GeoEnvironmental <b>Project:</b> Tidewater LDI Pawtucket, RI <b>Project No:</b> 03.0043654.00
---	---

Figure S-14



# Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	22.3	15.2	12.1	21.0	20.6	8.8	

Test Results (D6913 & ASTM D 1140)			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1.5"	100.0		
1"	81.5		
0.75"	77.7		
0.5"	73.5		
0.375"	71.4		
#4	62.5		
#10	50.4		
#20	39.7		
#40	29.4		
#60	21.5		
#100	13.9		
#200	8.8		

\* (no specification provided)

**Material Description**

Brown f-c SAND and f-c GRAVEL, trace Silt

**Atterberg Limits (ASTM D 4318)**

PL= NP                      LL= NV                      PI= NP

**Classification**

USCS (D 2487)= SP-SM    AASHTO (M 145)= A-1-a

**Coefficients**

D<sub>90</sub>= 31.5920      D<sub>85</sub>= 28.2428      D<sub>60</sub>= 4.0222  
D<sub>50</sub>= 1.9398      D<sub>30</sub>= 0.4429      D<sub>15</sub>= 0.1641  
D<sub>10</sub>= 0.0945      C<sub>u</sub>= 42.55      C<sub>c</sub>= 0.52

Remarks


---

Date Received: 01.14.18      Date Tested: 01.17.18

Tested By: RR / JAL

Checked By: Matthew Colman P.E.

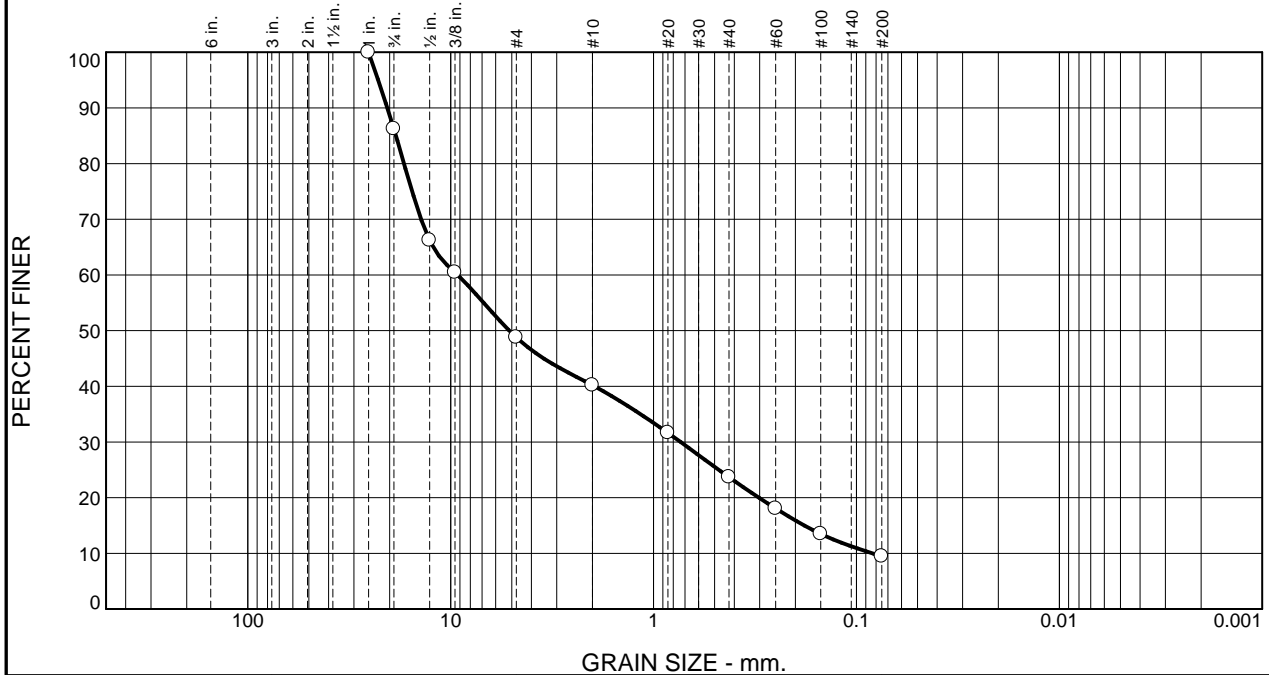
Title: Laboratory Manager

Source of Sample: Borings      Depth: 43-45'  
Sample Number: GZ-BW-509 / S-11

Date Sampled:

<b>Thielsch Engineering Inc.</b>  <b>Cranston, RI</b>	<b>Client:</b> GZA GeoEnvironmental <b>Project:</b> Tidewater LDI Pawtucket, RI <b>Project No:</b> 03.0043654.00
<b>Figure</b> S-18	

# Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	13.8	37.4	8.6	16.5	14.2	9.5	

Test Results (D6913 & ASTM D 1140)			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1"	100.0		
0.75"	86.2		
0.5"	66.2		
0.375"	60.4		
#4	48.8		
#10	40.2		
#20	31.6		
#40	23.7		
#60	18.1		
#100	13.5		
#200	9.5		

\* (no specification provided)

**Material Description**

Brown f-c GRAVEL and f-c SAND, trace Silt

**Atterberg Limits (ASTM D 4318)**

PL= NP                      LL= NV                      PI= NP

**Classification**

USCS (D 2487)= GP-GM    AASHTO (M 145)= A-1-a

**Coefficients**

D<sub>90</sub>= 20.5187      D<sub>85</sub>= 18.6168      D<sub>60</sub>= 9.2453  
D<sub>50</sub>= 5.1414      D<sub>30</sub>= 0.7359      D<sub>15</sub>= 0.1807  
D<sub>10</sub>= 0.0834      C<sub>u</sub>= 110.86      C<sub>c</sub>= 0.70

Remarks


---

Date Received: 01.14.18      Date Tested: 01.17.18

Tested By: RR / JAL

Checked By: Matthew Colman P.E.

Title: Laboratory Manager

Source of Sample: Borings      Depth: 24-26'  
Sample Number: GZ-BK-510 / S-13

Date Sampled:

**Thielsch Engineering Inc.**

**Cranston, RI**

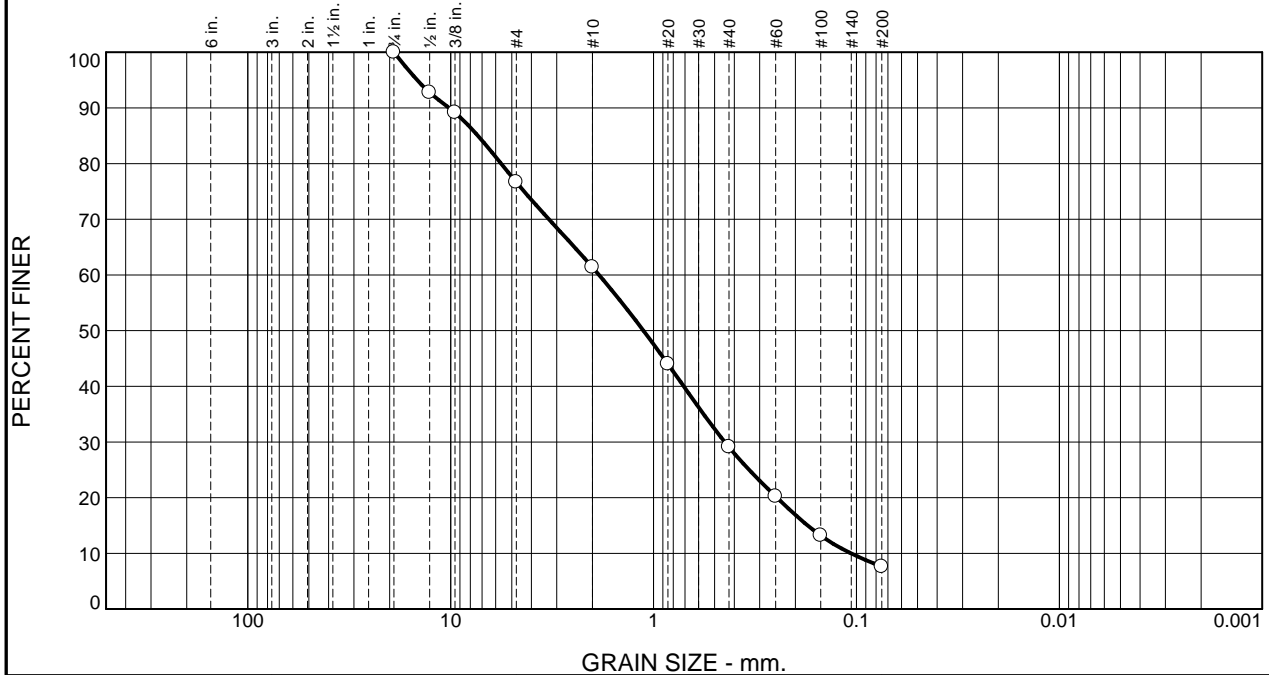
Client: GZA GeoEnvironmental

Project: Tidewater LDI  
Pawtucket, RI

Project No: 03.0043654.00

Figure S-19

# Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	23.3	15.3	32.3	21.5	7.6	

Test Results (D6913 & ASTM D 1140)			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
0.75"	100.0		
0.5"	92.8		
0.375"	89.1		
#4	76.7		
#10	61.4		
#20	44.0		
#40	29.1		
#60	20.2		
#100	13.2		
#200	7.6		

\* (no specification provided)

**Material Description**

Brown f-c SAND, little fine Gravel, trace Silt

**Atterberg Limits (ASTM D 4318)**

PL= NP                      LL= NV                      PI= NP

**Classification**

USCS (D 2487)= SW-SM    AASHTO (M 145)= A-1-b

**Coefficients**

D<sub>90</sub>= 10.1799            D<sub>85</sub>= 7.3418            D<sub>60</sub>= 1.8572  
D<sub>50</sub>= 1.1220            D<sub>30</sub>= 0.4456            D<sub>15</sub>= 0.1741  
D<sub>10</sub>= 0.1063            C<sub>u</sub>= 17.46                C<sub>c</sub>= 1.01

Remarks

Date Received: 01.14.18            Date Tested: 01.17.18

Tested By: RR / JAL

Checked By: Matthew Colman P.E.

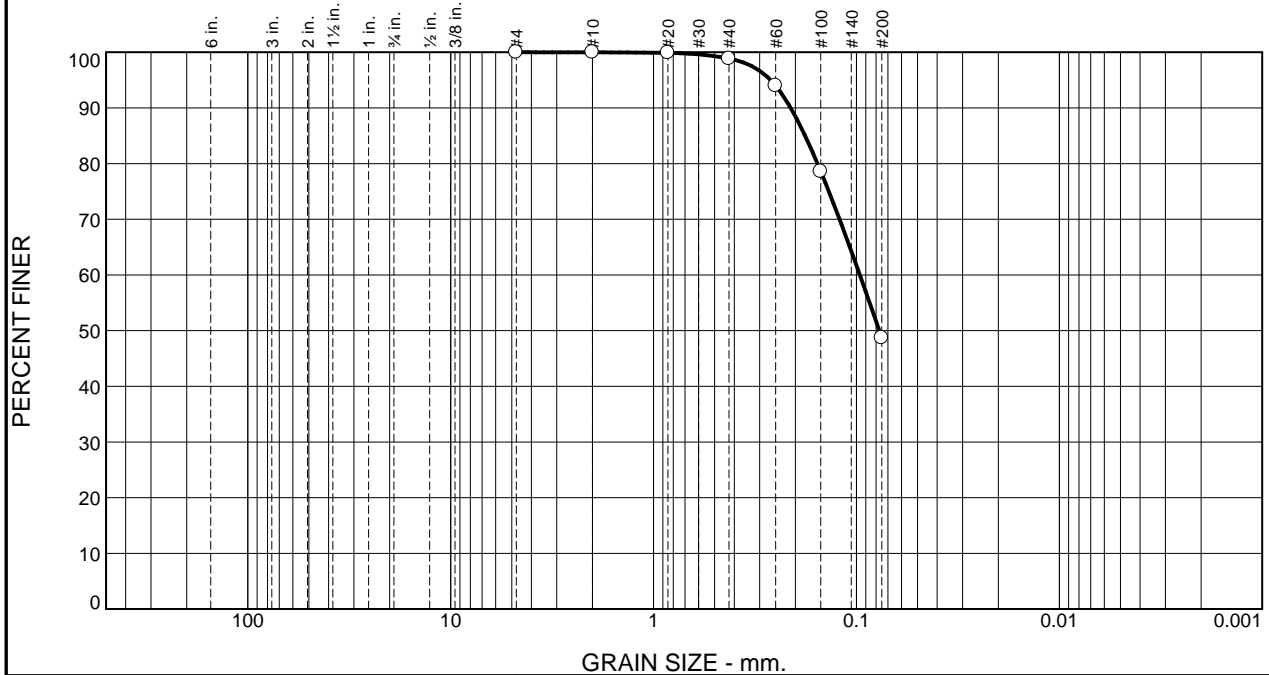
Title: Laboratory Manager

Source of Sample: Borings            Depth: 51-53'  
Sample Number: GZ-BW-511 / S-13

Date Sampled:

<b>Thielsch Engineering Inc.</b>  <b>Cranston, RI</b>	<b>Client:</b> GZA GeoEnvironmental <b>Project:</b> Tidewater LDI Pawtucket, RI <b>Project No:</b> 03.0043654.00
<b>Figure</b> S-21	

# Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	1.2	50.1	48.7	

Test Results (D6913 & ASTM D 1140)			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#4	100.0		
#10	100.0		
#20	99.9		
#40	98.8		
#60	94.0		
#100	78.6		
#200	48.7		

\* (no specification provided)

**Material Description**

Brown fine SAND and SILT

**Atterberg Limits (ASTM D 4318)**

PL= NP                      LL= NV                      PI= NP

**Classification**

USCS (D 2487)= SM                      AASHTO (M 145)= A-4(0)

**Coefficients**

D<sub>90</sub>= 0.2110                      D<sub>85</sub>= 0.1792                      D<sub>60</sub>= 0.0963  
D<sub>50</sub>= 0.0772                      D<sub>30</sub>=                                      D<sub>15</sub>=  
D<sub>10</sub>=                                      C<sub>u</sub>=                                      C<sub>c</sub>=

**Remarks**

Material was visually checked for plasticity and appeared non-plastic.

Date Received: 01.14.18                      Date Tested: 01.17.18  
Tested By: RR / JAL  
Checked By: Matthew Colman P.E.  
Title: Laboratory Manager

Source of Sample: Borings                      Depth: 66-68'  
Sample Number: GZ-BW-512 / S-16

Date Sampled:

<b>Thielsch Engineering Inc.</b>  <b>Cranston, RI</b>	<b>Client:</b> GZA GeoEnvironmental <b>Project:</b> Tidewater LDI Pawtucket, RI <b>Project No:</b> 03.0043654.00
<b>Figure</b> S-23	



*CERTIFICATE OF ANALYSIS*

Matthew Colman  
Thielsch Engineering, Inc.  
195 Frances Avenue  
Cranston, RI 02910

**RE: Tidewater LDI (03.0043654.00)**  
**ESS Laboratory Work Order Number: 1801247**

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard  
Laboratory Director

**REVIEWED**  
*By ESS Laboratory at 1:37 pm, Jan 22, 2018*

**Analytical Summary**

The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.



*CERTIFICATE OF ANALYSIS*

Client Name: Thielsch Engineering, Inc.  
Client Project ID: Tidewater LDI

ESS Laboratory Work Order: 1801247

**SAMPLE RECEIPT**

The following samples were received on January 15, 2018 for the analyses specified on the enclosed Chain of Custody Record.

**The client did not deliver the samples in a cooler.**

<u>Lab Number</u>	<u>Sample Name</u>	<u>Matrix</u>	<u>Analysis</u>
1801247-01	GZ-WB-501 S-6 10-12	Soil	9038, 9045, 9050A, 9250
1801247-02	GZ-WB-502 S-7 20-22	Soil	9038, 9045, 9050A, 9250
1801247-03	GZ-BK-502 S-4 6-8	Soil	9038, 9045, 9050A, 9250
1801247-04	GZ-WB-503 S-4 9-10	Soil	9038, 9045, 9050A, 9250
1801247-05	GZ-WB-506 S-5 10-12	Soil	9038, 9045, 9050A, 9250
1801247-06	GZ-WB-507 S-4 8-10	Soil	9038, 9045, 9050A, 9250
1801247-07	GZ-WB-509 S-4 6-8	Soil	9038, 9045, 9050A, 9250
1801247-08	GZ-WB-511 S-4 11-13	Soil	9038, 9045, 9050A, 9250
1801247-09	GZ-WB-512 S-3 4-6	Soil	9038, 9045, 9050A, 9250
1801247-10	GZ-WB-513 S-1 4-5	Soil	9038, 9045, 9050A, 9250





*CERTIFICATE OF ANALYSIS*

Client Name: Thielsch Engineering, Inc.  
Client Project ID: Tidewater LDI

ESS Laboratory Work Order: 1801247

**PROJECT NARRATIVE**

**No unusual observations noted.**

**End of Project Narrative.**

**DATA USABILITY LINKS**

*To ensure you are viewing the most current version of the documents below, please clear your internet cookies for [www.ESSLaboratory.com](http://www.ESSLaboratory.com). Consult your IT Support personnel for information on how to clear your internet cookies.*

[Definitions of Quality Control Parameters](#)

[Semivolatile Organics Internal Standard Information](#)

[Semivolatile Organics Surrogate Information](#)

[Volatile Organics Internal Standard Information](#)

[Volatile Organics Surrogate Information](#)

[EPH and VPH Alkane Lists](#)



*CERTIFICATE OF ANALYSIS*

Client Name: Thielsch Engineering, Inc.  
Client Project ID: Tidewater LDI

ESS Laboratory Work Order: 1801247

**CURRENT SW-846 METHODOLOGY VERSIONS**

**Analytical Methods**

- 1010A - Flashpoint
- 6010C - ICP
- 6020A - ICP MS
- 7010 - Graphite Furnace
- 7196A - Hexavalent Chromium
- 7470A - Aqueous Mercury
- 7471B - Solid Mercury
- 8011 - EDB/DBCP/TCP
- 8015C - GRO/DRO
- 8081B - Pesticides
- 8082A - PCB
- 8100M - TPH
- 8151A - Herbicides
- 8260B - VOA
- 8270D - SVOA
- 8270D SIM - SVOA Low Level
- 9014 - Cyanide
- 9038 - Sulfate
- 9040C - Aqueous pH
- 9045D - Solid pH (Corrosivity)
- 9050A - Specific Conductance
- 9056A - Anions (IC)
- 9060A - TOC
- 9095B - Paint Filter
- MADEP 04-1.1 - EPH / VPH

**Prep Methods**

- 3005A - Aqueous ICP Digestion
- 3020A - Aqueous Graphite Furnace / ICP MS Digestion
- 3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
- 3060A - Solid Hexavalent Chromium Digestion
- 3510C - Separatory Funnel Extraction
- 3520C - Liquid / Liquid Extraction
- 3540C - Manual Soxhlet Extraction
- 3541 - Automated Soxhlet Extraction
- 3546 - Microwave Extraction
- 3580A - Waste Dilution
- 5030B - Aqueous Purge and Trap
- 5030C - Aqueous Purge and Trap
- 5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.



*CERTIFICATE OF ANALYSIS*

Client Name: Thielsch Engineering, Inc.  
Client Project ID: Tidewater LDI  
Client Sample ID: GZ-WB-501 S-6 10-12  
Date Sampled: 01/15/18 16:30  
Percent Solids: 50

ESS Laboratory Work Order: 1801247  
ESS Laboratory Sample ID: 1801247-01  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Chloride	WL 3510 (304)		9250		5	JLK	01/17/18 19:12	mg/kg dry	CA81724
Corrosivity (pH)	6.70 (N/A)		9045		1	JLK	01/15/18 21:22	S.U.	CA81540
Corrosivity (pH) Sample Temp	Soil pH measured in water at 19.9 °C.								
Resistivity	WL 0.0006 (N/A)		9050A		1	JLK	01/17/18 21:50	Mohms-cm	CA81729
Sulfate	WL 565 (101)		9038		1	JLK	01/17/18 18:00	mg/kg dry	CA81726



*CERTIFICATE OF ANALYSIS*

Client Name: Thielsch Engineering, Inc.  
Client Project ID: Tidewater LDI  
Client Sample ID: GZ-WB-502 S-7 20-22  
Date Sampled: 01/15/18 16:30  
Percent Solids: 67

ESS Laboratory Work Order: 1801247  
ESS Laboratory Sample ID: 1801247-02  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Chloride	WL 1720 (89)		9250		2	JLK	01/17/18 19:13	mg/kg dry	CA81724
Corrosivity (pH)	6.81 (N/A)		9045		1	JLK	01/15/18 21:22	S.U.	CA81540
Corrosivity (pH) Sample Temp	Soil pH measured in water at 19.7 °C.								
Resistivity	WL 0.0005 (N/A)		9050A		1	JLK	01/17/18 21:50	Mohms-cm	CA81729
Sulfate	WL 190 (74)		9038		1	JLK	01/17/18 18:00	mg/kg dry	CA81726



*CERTIFICATE OF ANALYSIS*

Client Name: Thielsch Engineering, Inc.  
Client Project ID: Tidewater LDI  
Client Sample ID: GZ-BK-502 S-4 6-8  
Date Sampled: 01/15/18 16:30  
Percent Solids: 82

ESS Laboratory Work Order: 1801247  
ESS Laboratory Sample ID: 1801247-03  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Chloride	WL ND (36)		9250		1	JLK	01/17/18 18:43	mg/kg dry	CA81724
Corrosivity (pH)	6.92 (N/A)		9045		1	JLK	01/15/18 21:22	S.U.	CA81540
Corrosivity (pH) Sample Temp	Soil pH measured in water at 19.7 °C.								
Resistivity	WL 0.010 (N/A)		9050A		1	JLK	01/17/18 21:50	Mohms-cm	CA81729
Sulfate	WL 70 (60)		9038		1	JLK	01/17/18 18:00	mg/kg dry	CA81726



*CERTIFICATE OF ANALYSIS*

Client Name: Thielsch Engineering, Inc.  
Client Project ID: Tidewater LDI  
Client Sample ID: GZ-WB-503 S-4 9-10  
Date Sampled: 01/15/18 16:30  
Percent Solids: 72

ESS Laboratory Work Order: 1801247  
ESS Laboratory Sample ID: 1801247-04  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Chloride	WL 3230 (208)		9250		5	JLK	01/17/18 19:14	mg/kg dry	CA81724
Corrosivity (pH)	6.80 (N/A)		9045		1	JLK	01/15/18 21:22	S.U.	CA81540
Corrosivity (pH) Sample Temp	Soil pH measured in water at 19.7 °C.								
Resistivity	WL 0.0002 (N/A)		9050A		1	JLK	01/17/18 21:50	Mohms-cm	CA81729
Sulfate	WL 534 (138)		9038		2	JLK	01/17/18 18:00	mg/kg dry	CA81726





*CERTIFICATE OF ANALYSIS*

Client Name: Thielsch Engineering, Inc.  
Client Project ID: Tidewater LDI  
Client Sample ID: GZ-WB-506 S-5 10-12  
Date Sampled: 01/15/18 16:30  
Percent Solids: 83

ESS Laboratory Work Order: 1801247  
ESS Laboratory Sample ID: 1801247-05  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Chloride	WL 2420 (181)		9250		5	JLK	01/17/18 19:15	mg/kg dry	CA81724
Corrosivity (pH)	7.16 (N/A)		9045		1	JLK	01/15/18 21:22	S.U.	CA81540
Corrosivity (pH) Sample Temp	Soil pH measured in water at 19.9 °C.								
Resistivity	WL 0.0002 (N/A)		9050A		1	JLK	01/17/18 21:50	Mohms-cm	CA81729
Sulfate	WL 618 (121)		9038		2	JLK	01/17/18 18:00	mg/kg dry	CA81726



*CERTIFICATE OF ANALYSIS*

Client Name: Thielsch Engineering, Inc.  
Client Project ID: Tidewater LDI  
Client Sample ID: GZ-WB-507 S-4 8-10  
Date Sampled: 01/15/18 16:30  
Percent Solids: 91

ESS Laboratory Work Order: 1801247  
ESS Laboratory Sample ID: 1801247-06  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Chloride	WL 1340 (66)		9250		2	JLK	01/17/18 19:21	mg/kg dry	CA81724
Corrosivity (pH)	7.15 (N/A)		9045		1	JLK	01/15/18 21:22	S.U.	CA81540
Corrosivity (pH) Sample Temp	Soil pH measured in water at 20.1 °C.								
Resistivity	WL 0.0004 (N/A)		9050A		1	JLK	01/17/18 21:50	Mohms-cm	CA81729
Sulfate	WL 306 (55)		9038		1	JLK	01/17/18 18:00	mg/kg dry	CA81726



*CERTIFICATE OF ANALYSIS*

Client Name: Thielsch Engineering, Inc.  
Client Project ID: Tidewater LDI  
Client Sample ID: GZ-WB-509 S-4 6-8  
Date Sampled: 01/15/18 16:30  
Percent Solids: 90

ESS Laboratory Work Order: 1801247  
ESS Laboratory Sample ID: 1801247-07  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Chloride	WL 36 (33)		9250		1	JLK	01/17/18 18:52	mg/kg dry	CA81724
Corrosivity (pH)	7.68 (N/A)		9045		1	JLK	01/15/18 21:22	S.U.	CA81540
Corrosivity (pH) Sample Temp	Soil pH measured in water at 20.2 °C.								
Resistivity	WL 0.001 (N/A)		9050A		1	JLK	01/17/18 21:50	Mohms-cm	CA81729
Sulfate	WL 260 (55)		9038		1	JLK	01/17/18 18:00	mg/kg dry	CA81726



*CERTIFICATE OF ANALYSIS*

Client Name: Thielsch Engineering, Inc.  
Client Project ID: Tidewater LDI  
Client Sample ID: GZ-WB-511 S-4 11-13  
Date Sampled: 01/15/18 16:30  
Percent Solids: 75

ESS Laboratory Work Order: 1801247  
ESS Laboratory Sample ID: 1801247-08  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Chloride	WL 2570 (198)		9250		5	JLK	01/17/18 19:22	mg/kg dry	CA81724
Corrosivity (pH)	6.63 (N/A)		9045		1	JLK	01/15/18 21:22	S.U.	CA81540
Corrosivity (pH) Sample Temp	Soil pH measured in water at 20 °C.								
Resistivity	WL 0.0002 (N/A)		9050A		1	JLK	01/17/18 21:50	Mohms-cm	CA81729
Sulfate	WL 500 (132)		9038		2	JLK	01/17/18 18:00	mg/kg dry	CA81726



*CERTIFICATE OF ANALYSIS*

Client Name: Thielsch Engineering, Inc.  
Client Project ID: Tidewater LDI  
Client Sample ID: GZ-WB-512 S-3 4-6  
Date Sampled: 01/15/18 16:30  
Percent Solids: 95

ESS Laboratory Work Order: 1801247  
ESS Laboratory Sample ID: 1801247-09  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Chloride	WL ND (32)		9250		1	JLK	01/17/18 18:54	mg/kg dry	CA81724
Corrosivity (pH)	4.20 (N/A)		9045		1	JLK	01/15/18 21:22	S.U.	CA81540
Corrosivity (pH) Sample Temp	Soil pH measured in water at 20 °C.								
Resistivity	WL 0.100 (N/A)		9050A		1	JLK	01/17/18 21:50	Mohms-cm	CA81729
Sulfate	WL 140 (53)		9038		1	JLK	01/17/18 18:00	mg/kg dry	CA81726



*CERTIFICATE OF ANALYSIS*

Client Name: Thielsch Engineering, Inc.  
Client Project ID: Tidewater LDI  
Client Sample ID: GZ-WB-513 S-1 4-5  
Date Sampled: 01/15/18 16:30  
Percent Solids: 67

ESS Laboratory Work Order: 1801247  
ESS Laboratory Sample ID: 1801247-10  
Sample Matrix: Soil

**Classical Chemistry**

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Chloride	WL ND (45)		9250		1	JLK	01/17/18 18:55	mg/kg dry	CA81724
Corrosivity (pH)	1.48 (N/A)		9045		1	JLK	01/15/18 21:22	S.U.	CA81540
Corrosivity (pH) Sample Temp	Soil pH measured in water at 19.9 °C.								
Resistivity	WL 0.0001 (N/A)		9050A		1	JLK	01/17/18 21:50	Mohms-cm	CA81729
Sulfate	WL 2440 (743)		9038		10	JLK	01/17/18 18:00	mg/kg dry	CA81726





*CERTIFICATE OF ANALYSIS*

Client Name: Thielsch Engineering, Inc.  
Client Project ID: Tidewater LDI

ESS Laboratory Work Order: 1801247

**Quality Control Data**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
---------	--------	-----	-------	-------------	---------------	------	-------------	-----	-----------	-----------

Classical Chemistry

**Batch CA81724 - General Preparation**

**Blank**

Chloride	ND	3	mg/kg wet							
----------	----	---	-----------	--	--	--	--	--	--	--

**LCS**

Chloride	31		mg/L	30.00		102	90-110			
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**Batch CA81726 - General Preparation**

**Blank**

Sulfate	ND	5	mg/kg wet							
---------	----	---	-----------	--	--	--	--	--	--	--

**LCS**

Sulfate	10		mg/L	9.988		96	80-120			
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*CERTIFICATE OF ANALYSIS*

Client Name: Thielsch Engineering, Inc.  
Client Project ID: Tidewater LDI

ESS Laboratory Work Order: 1801247

**Notes and Definitions**

- Z-10d Soil pH measured in water at 20.2 °C.
- Z-10c Soil pH measured in water at 20.1 °C.
- Z-10b Soil pH measured in water at 20 °C.
- Z-10a Soil pH measured in water at 19.9 °C.
- Z-10 Soil pH measured in water at 19.7 °C.
- WL Results obtained from a deionized water leach of the sample.
- U Analyte included in the analysis, but not detected
- D Diluted.
- ND Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference
- MDL Method Detection Limit
- MRL Method Reporting Limit
- LOD Limit of Detection
- LOQ Limit of Quantitation
- DL Detection Limit
- I/V Initial Volume
- F/V Final Volume
- § Subcontracted analysis; see attached report
- 1 Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
- 2 Range result excludes concentrations of target analytes eluting in that range.
- 3 Range result excludes the concentration of the C9-C10 aromatic range.
- Avg Results reported as a mathematical average.
- NR No Recovery
- [CALC] Calculated Analyte
- SUB Subcontracted analysis; see attached report
- RL Reporting Limit
- EDL Estimated Detection Limit



*CERTIFICATE OF ANALYSIS*

Client Name: Thielsch Engineering, Inc.  
Client Project ID: Tidewater LDI

ESS Laboratory Work Order: 1801247

**ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS**

**ENVIRONMENTAL**

Rhode Island Potable and Non Potable Water: LAI00179

<http://www.health.ri.gov/find/labs/analytical/ESS.pdf>

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750

[http://www.ct.gov/dph/lib/dph/environmental\\_health/environmental\\_laboratories/pdf/OutOfStateCommercialLaboratories.pdf](http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutOfStateCommercialLaboratories.pdf)

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002

<http://www.maine.gov/dhhs/meecd/environmental-health/dwp/partners/labCert.shtml>

Massachusetts Potable and Non Potable Water: M-RI002

<http://public.dep.state.ma.us/Labcert/Labcert.aspx>

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424

<http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm>

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313

<http://www.wadsworth.org/labcert/elap/comm.html>

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006

[http://datamine2.state.nj.us/DEP\\_OPRA/OpraMain/pi\\_main?mode=pi\\_by\\_site&sort\\_order=PI\\_NAMEA&Select+a+Site:=58715](http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715)

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752

<http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx>

## ESS Laboratory Sample and Cooler Receipt Checklist

Client: Thielsch Engineering, Inc - ESS/DS  
 Shipped/Delivered Via: \_\_\_\_\_ Client \_\_\_\_\_

ESS Project ID: 1801247  
 Date Received: 1/15/2018  
 Project Due Date: 1/22/2018  
 Days for Project: 5 Day

- |   |  |
|---|--|
| 1. Air bill manifest present? <input type="checkbox"/> No<br>Air No.: <u>NA</u><br>2. Were custody seals present? <input type="checkbox"/> No<br>3. Is radiation count <100 CPM? <input type="checkbox"/> Yes<br>4. Is a Cooler Present? <input type="checkbox"/> No<br>Temp: <u>21.1</u> Iced with: <u>None</u><br>5. Was COC signed and dated by client? <input type="checkbox"/> Yes | 6. Does COC match bottles? <input type="checkbox"/> Yes<br>7. Is COC complete and correct? <input type="checkbox"/> Yes<br>8. Were samples received intact? <input type="checkbox"/> Yes<br>9. Were labs informed about short holds & rushes? <input checked="" type="checkbox"/> Yes / No / NA<br>10. Were any analyses received outside of hold time? <input checked="" type="checkbox"/> Yes / No |
|---|--|

- |   |  |
|---|--|
| 11. Any Subcontracting needed? <input checked="" type="checkbox"/> Yes / No<br>ESS Sample IDs: _____<br>Analysis: _____<br>TAT: _____ | 12. Were VOAs received? <input checked="" type="checkbox"/> Yes / No<br>a. Air bubbles in aqueous VOAs? <input checked="" type="checkbox"/> Yes / No / NA<br>b. Does methanol cover soil completely? <input checked="" type="checkbox"/> Yes / No / NA |
|---|--|

13. Are the samples properly preserved?  Yes / No
- a. If metals preserved upon receipt: Date: \_\_\_\_\_ Time: \_\_\_\_\_ By: \_\_\_\_\_
- b. Low Level VOA vials frozen: Date: \_\_\_\_\_ Time: \_\_\_\_\_ By: \_\_\_\_\_

Sample Receiving Notes:

\_\_\_\_\_

\_\_\_\_\_

14. Was there a need to contact Project Manager?  Yes / No
- a. Was there a need to contact the client?  Yes / No
- Who was contacted? \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_ By: \_\_\_\_\_

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
01	195843	Yes	NA	Yes	Driller Jar	NP	
02	195842	Yes	NA	Yes	Driller Jar	NP	
03	195841	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
04	195849	Yes	NA	Yes	Driller Jar	NP	
05	195848	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
06	195847	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
07	195846	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
08	195845	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
09	195844	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
10	195840	Yes	NA	Yes	Driller Jar	NP	

2nd Review  
 Are barcode labels on correct containers?  Yes / No

Completed By: [Signature] Date & Time: 1/15/18 1729

Reviewed By: [Signature] Date & Time: 1/15/18 1735

Delivered By: [Signature] Date & Time: 1/15/18 1735

# ESS Laboratory

Division of Thielsch Engineering, Inc.  
 185 Frances Avenue, Cranston, RI 02910-2211  
 Tel. (401) 461-7181 Fax (401) 461-4486  
 www.esslaboratory.com

## CHAIN OF CUSTODY

ESS LAB PROJECT ID  
 1801247

Turn Time  Standard  Rush  Approved By: \_\_\_\_\_  
 Reporting Limits - \_\_\_\_\_  
 State where samples were collected: **RI**  
 Is this project for any of the following: (please circle)  
**MA-MCP CT-RCP RGP DOD** Other \_\_\_\_\_  
 Electronic Deliverable Yes  No   
 Format: Excel  Access  PDF  Other \_\_\_\_\_

Project Manager: Matthew Colman  
 Company: Thielsch Engineering  
 Address: 195 Frances Ave  
 Cranston, RI 02910  
 Project # **03.0043654.00**  
 Project Name: Tidewater LDI  
 Contract Pricing  x \_\_\_\_\_  
 Special Pricing WO#: \_\_\_\_\_

ESS Lab Sample ID	Date	Collection Time	Grab -G Composite-C	Matrix	Sample Identification			# of Container	Analysis				Comment #
									pH	Sulfate	Chloride	Resistivity	
1	01.15.18	1630	G	S	GZ-WB-501	S-6	10-12	1	X	X	X	X	
2	01.15.18	1630	G	S	GZ-WB-502	S-7	20-22	1	X	X	X	X	
3	01.15.18	1630	G	S	GZ-BK-502	S-4	6-8	1	X	X	X	X	
4	01.15.18	1630	G	S	GZ-WB-503	S-4	9-10	1	X	X	X	X	
5	01.15.18	1630	G	S	GZ-WB-506	S-5	10-12	1	X	X	X	X	
6	01.15.18	1630	G	S	GZ-WB-507	S-4	8-10	1	X	X	X	X	
7	01.15.18	1630	G	S	GZ-WB-509	S-4	6-8	1	X	X	X	X	
8	01.15.18	1630	G	S	GZ-WB-511	S-4	11-13	1	X	X	X	X	
9	01.15.18	1630	G	S	GZ-WB-512	S-3	4-6	1	X	X	X	X	
10	01.15.18	1630	G	S	GZ-WB-513	S-1	4-5	1	X	X	X	X	

Preservation Code: 1-NP, 2-HCl, 3-H2SO4, 4-HNO3, 5-NaOH, 6-MeOH, 7-Asorbic Acid, 8-ZnAct, 9-\_\_\_\_\_

Container Type: P-Poly G-Glass AG-Amber Glass S-Sterile V-VOA

Matrix: S-Soil SD-Solid D-Sludge WW-Wastewater GW-Groundwater SW-Surface Water DW-Drinking Water O-Oil W-Wipes F-Filter

Cooler Present  Yes  No  
 Seals Intact  Yes  No NA: \_\_\_\_\_  
 Cooler Temperature: 21.1 w/ ice  
 Sampled by: GZA - S. Connolly / R. Roth  
 Comments: Please send report to: MColman@thielsch.com

Relinquished by: (Signature) <i>[Signature]</i>	Date/Time 01/15/18	Received by: (Signature) <i>[Signature]</i>	Date/Time 1/15/18 1645	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time	Relinquished by: (Signature)	Date/Time	Received by: (Signature)

Please E-mail all changes to Chain of Custody in writing.

1501247

SOILS LABORATORY TESTING ASSIGNMENT SHEET



195 Frances Ave., Cranston, RI 02910  
401-467-6454

Project Name Tidewater LDI  
Project No. 43654.00  
Project Manager Dave Rusczyk & Matt Page  
Date Received [Signature] (by 09/24/01) 01.14.18

Client Company GZA GeoEnvironmental  
Site Location Tidewater  
Assigned By \_\_\_\_\_  
Date Assigned \_\_\_\_\_

Collected By Sean Connolly  
Date Required \_\_\_\_\_

Sample Information				Lab No.	Identification Tests										Permeability			Compaction			Corrosivity					Soil Strength					Shears			Consol.		Notes			
Boring/ Test Pit No.	Sample No.	Depth Ft.	Material Source		Water Cont. %	LL & PL %	OD LL	Org. %	Bulk	Maine Class.	Sieve -200 %	Hyd -2µ %	G <sub>s</sub>	Tube Den- sity	Stone	Sand	Clay	Mod	Std.	CBR	pH	Sulfate	Chloride	Resist	GTL Resist	Tor- van e	Un- con- fined	UU	CIU	CID	Clay Shear	Clay Shear vs liner	Sand Shear	Sand Shear vs liner	Stand ard		E.O.P.		
					D2216	D4318	D4318	D2974				D422	D854		D2434	D2434	D5094	D1557	D698	D1883	ESS	ESS	ESS	ESS	G57		D2166	D2850	D4767	D7181	D3080	D5321	D3080	D5321	D2435		D2435		
GZ-BW-501	S-6	10-12		5																	X	X	X	X															
GZ-BW-501	S-9	16-18		6						X																													
GZ-BK-501	S-8	14-16		7							X																												
GZ-BW-502	S-7	20-22		8																	X	X	X	X															
GZ-BK-502	S-4	6-8		9																	X	X	X	X															
GZ-BK-502	S-29	56-58		10						X																													
GZ-BW-503	S-4	9-10		11																	X	X	X	X															
GZ-BW-503	S-10	36.5-36.5		12						X																													
GZ-BW-504A	S-7	21-22		13						X																													
GZ-BW-505	S-18	34-36		14						X																													
GZ-BW-506	S-5	10-12		15																	X	X	X	X															
GZ-BW-507	S-4	8-10		16																	X	X	X	X															
GZ-BW-509	S-4	6-8		17																	X	X	X	X															
GZ-BW-509	S-11	43-45		18						X																													
GZ-BK-510	S-13	24-26		19						X																													
GZ-BW-511	S-4	11-13		20																	X	X	X	X															
GZ-BW-511	S-13	51-53		21						X																													
GZ-BW-512	S-3	4-6		22																	X	X	X	X															
GZ-BW-512	S-16	66-68		23						X																													
GZ-BW-513	S-1	4-5		24																	X	X	X	X															

Notes: \_\_\_\_\_





## **APPENDIX G**

### **GROUNDWATER MODELING RESULTS**

## APPENDIX G GROUNDWATER MODELING RESULTS

### INTRODUCTION

GZA developed and calibrated a three-dimensional numerical groundwater flow model for the area surrounding the Former Tidewater Facility (Site) to evaluate potential variations to groundwater flow conditions following the completion of the proposed remedial activities (e.g., containment wall installation, impermeable cap placement). The model was developed using the United States Department of Defense Groundwater Modeling System (GMS), Version 10.1.3, produced by the Environmental Modeling Research Laboratory (EMRL) of Brigham Young University. GMS incorporates the United States Geological Survey modular, finite difference groundwater flow solution known as MODFLOW-2005. Within the model, the equations governing groundwater flow are numerically solved for a point located at the center of each grid block within a three-dimensional numerical grid.

The numerical simulations were run assuming steady state conditions (i.e., groundwater inputs, groundwater discharge, hydraulic head and hydraulic boundary conditions are constant over time). The numerical model was calibrated assuming mid-tide conditions, where the stage of the Seekonk River was assumed to be Mean Sea Level. The model was calibrated to field-measured groundwater elevation data collected between 2011 and 2017. The groundwater elevation data at each monitoring well was averaged to represent the steady state, mid-tide groundwater flow conditions.

### MODEL DEVELOPMENT

#### Numerical Model Domain and Boundary Conditions

The horizontal footprint of the active model domain (i.e., area included in numerical simulations) was selected to adequately represent the natural hydrogeological boundary conditions surrounding the Site. The model domain and hydraulic boundary conditions included within the calibrated steady state model are shown on Figure G-1 and discussed below.

- **External Boundary:** The western model boundary was aligned to be consistent with the topographic divide located to the west of the Site. A no flow (zero flux) boundary condition was applied to the external boundary along this topographic divide, which assumes that the local groundwater divide mimics the topographic divide. While limited underflow into and out of the watershed may occur locally across this topographic divide, at least seasonally, these fluxes likely would not have a noticeable effect on the numerical simulations. The north and south model boundaries were aligned to be perpendicular to the presumed groundwater equipotential/contour lines, assuming overall groundwater flow directions towards the Seekonk River. Given that these boundaries are parallel to groundwater flow (i.e., flow does not occur across these boundaries), no flow boundary conditions were also applied to these external boundaries. These boundaries were assigned at a sufficient distance from the Site, so model boundary effects would not influence the solution of the post-remedy simulation. The eastern model extents were chosen to represent the approximate center of the Seekonk River. A no flow

boundary condition was also applied here because, based on general hydrogeologic principles, this location represents a groundwater divide due to groundwater discharging from the west and east into the Seekonk River.

- **Constant Head Boundaries:** A constant head boundary was assigned in model layer 2 to simulate the Seekonk River stage. Because the surface water in the Seekonk River has a higher density than the surrounding groundwater, the following equation was used to calculate an equivalent freshwater head for the median-tide stage (0.0 feet NAVD 88).

$$h_f = z + h_s \frac{\rho_s}{\rho_f}$$

Where:  $h_f$  = equivalent freshwater head (feet);  
 $z$  = elevation head, referenced to the water surface as a datum (feet);  
 $h_s$  = surface water (saline water) pressure head (feet);  
 $\rho_s$  = density of surface water (1.03 g/cm<sup>3</sup>); and  
 $\rho_f$  = density of fresh water (1.0 g/cm<sup>3</sup>).

A surface water depth of 3 feet (i.e., the approximate water depth adjacent to the existing bulkheads) results in an equivalent freshwater head of approximately 0.1 feet, by:

$$h_f = -3 + 3 \frac{1.03}{1.0}$$

Therefore, the constant head boundary was simulated at 0.1 feet. The constant head boundary is shown on Figure G-1.

- **Areal Recharge:** Areal groundwater recharge is intended to represent the amount of total precipitation that actually reaches the groundwater zone and excludes losses due to surface water runoff and evapotranspiration. The average annual precipitation within the model domain is approximately 47 inches (USGS, 1991; NOAA station USW00014765). Under pre-developed conditions, it has been estimated that approximately 21 to 28 inches/year and 8 to 9 inches/year of the annual precipitation recharges the groundwater system in areas of surficial glacial drift and glacial till deposits, respectively (USGS, 1991; USGS, 1997; USGS, 2006). However, in developed areas such as the area surrounding the Former Tidewater Facility, groundwater recharge rates are reduced. The calibrated recharge rates are discussed in the model calibration section further below and the recharge areas are shown on Figure G-1.
- **Drain Boundaries:** Two 24" drains are located below the groundwater table in the substation portion of the Site. Site groundwater contour plans (2011, 2013, 2015) under existing conditions indicate that both drains, or the associated bedding material, are influencing (i.e., depressing, lowering) local groundwater elevations. Therefore, drain boundaries were simulated along the alignment of these two drains. The drain elements enable groundwater to discharge from the model domain if the calculated shallow groundwater elevations are higher than the drain's invert elevation. The surveyed invert elevations at the drain outfall locations were modeled, with the

drain boundary sloping upwards 0.5 – 1.0% to the west of the outfalls (TM 970, CSO Control Alternatives Development, October 2011; Haws, 2009). The drain locations are shown on Figure G-1 and the calibrated values are presented in the model calibration section.

The surveyed outfall invert elevations for the remainder of the drains at the Site (e.g., the 48" City of Pawtucket storm drain (south of the substation) and the 24" City of Pawtucket storm sewer outfall (in the SFA)) indicate that they are above the water table.

- **Horizontal Flow Barrier (HFB) Boundaries:** The existing bulkheads along the perimeter of the Seekonk River are modeled as HFBs within the model domain. The simulated HFB alignments and extents reflect the actual bulkhead construction/conditions in the field, based on data obtained during GZA's bathymetric and shoreline survey performed on October 11 and 12, 2017. Existing bulkhead construction types were categorized as:
  - 1) Timber sheeting and timber pile supported stone wall;
  - 2) Steel sheeting and battered timber pile supported stone wall;
  - 3) Rip rap sloped revetment;
  - 4) Articulating concrete mattress;
  - 5) Outboard timber pile supported stone wall; and
  - 6) Rip rap sloped revetment supported stone wall.

The tip elevations of the existing bulkheads were assumed to range between -15 and -20 feet (NAVD 88). Horizontal flow barriers were also used to simulate existing retaining walls in the central portion of the Former Gas Plant Area (FGPA). The location of the HFBs is presented on Figure G-1 and the calibrated values for these boundaries are presented in the model calibration section.

#### Horizontal and Vertical Grid Discretization

A refined horizontal grid spacing of 10 feet x 10 feet was used in the vicinity of the Site to better simulate the alignment of the existing bulkheads (calibration model) and proposed containment wall (forecast model). The horizontal grid spacing was increased to 100 feet x 100 feet near the boundaries of the model domain. Additionally, the model grid was rotated approximately 14° west from north, to more accurately simulate the alignment of the existing bulkheads and proposed containment wall at the Site.

To adequately simulate the hydrogeologic units discussed below, the model was separated into 8 layers. The tip elevation of the entire proposed containment wall was conservatively modeled at -40 feet (NAVD 88). To facilitate the numerical simulation of the proposed containment wall, the bottom elevation of model layer 5 was set to -40 feet. The top/bottom elevations of the other model layers were selected to reflect the approximate boundaries of the hydrogeologic units based on onsite and offsite boring log information.

### Hydrogeologic Units/Hydrostratigraphy

The three-dimensional hydrostratigraphic model was simulated based on surficial and subsurface information from the following sources:

- Overburden borings performed at the Site by GZA;
- Overburden borings performed at the Site by others;
- Overburden borings performed at adjacent properties by others;
- Overburden and bedrock borings performed in the model area by the USGS;
- Historical geological information and maps published by the USGS (USGS, 1961); and
- Geological and hydrogeological information and data sets (e.g., geologic cross-sections) documented in earlier reports for the Site, such as the January 2011 *Site Investigation Data Report* prepared by GZA and the December 1996 *Remedial Investigation at the Tidewater Site Pawtucket, Rhode Island* prepared by Atlantic Environmental Services, Inc.

After reviewing these datasets, the hydrostratigraphic model included the following overburden hydrogeologic units: fill, river soft sediments, sand (outwash deposits), discontinuous silt, and glacial till.<sup>1</sup> Based on the USGS boring log information (i.e., groundwater levels in the uplands portion of the local watershed were below the bedrock surface) and to facilitate the simulation of the bedrock outcrop at the Site, the upper 50 feet of bedrock were also simulated. In addition, the sand unit was separated in two hydrogeologic units (uplands sand and sand) based on the historical USGS geological mapping of the Providence area (USGS, 1961). Within model layers 1 and 2, high hydraulic conductivity cells (500 feet/day) simulated surface water within the boundary of the Seekonk River. Therefore, the top of model layer 3 represented the river mudline, derived directly from GZA's October 2017 bathymetric survey.

GZA directly imported the boring log information into GMS. The geologic contacts were selected at each boring location to simulate the horizontal and vertical boundaries of the hydrogeologic units. The top elevation of the glacial till and the bedrock surface generally slope downwards towards the Seekonk River. As reported by the USGS (1961), the modeled thickness of the glacial outwash deposits (sand) decreased to the west of the Site. Near the western boundary of the model domain, the surficial soils are reportedly glacial till, which directly overlie bedrock (USGS, 1961). The following table summarizes the vertical distribution of the hydrogeologic units within the numerical model. The spatial distribution of the hydrogeologic units within each model layer is presented on Figures G-2 through G-5.

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<sup>1</sup> As shown on Figures G-2 through G-5, multiple hydrogeologic units are simulated within each model layer (excluding Layer 8), and certain hydrogeologic units are present in multiple model layers (e.g., sand is present in model Layers 2 through 6 at the Site). Therefore, the hydrogeologic units do not correspond to individual layers within the model.

Hydrogeologic Unit	Description	Model Layer(s)
<b>Fill</b>	Fine to coarse sand, gravel and silt. Contains bricks, organics, wood, concrete, metal, slag, and ash. Approximately 10 to 35 feet thick at the Site.	Uplands (West of Site): N/A Site: 1 – 3 Seekonk River: N/A
<b>River Soft Sediments</b>	Very loose, silt. Contains sand and gravel. Approximately 10 – 15 feet thick in the vicinity of the Site.	Uplands: N/A Site: N/A Seekonk River: 3
<b>Glacial Outwash (Sand) Deposits</b>	Glacial outwash sands and gravels with occasional silty sand and clayey sand deposits. Approximately 15 – 60 feet thick at the Site.	Uplands: 1 – 2 Site: 1 – 6 Seekonk River: 4 – 6
<b>Silt</b>	Very loose, clayey silt. Contains sand and organics. Discontinuous, approximately 2 – 10 feet thick at the Site.	Uplands: N/A Site: 2 – 4 Seekonk River: N/A
<b>Glacial Till</b>	Silt, sand, gravel and clay. Approximately 5 – 10 feet thick at the Site.	Uplands: 1 – 2 Site: 4 – 7 Seekonk River: 5 – 7
<b>Bedrock</b>	Rhode Island Formation – gray to black, fine to coarse-grained quartz arenite, shale and conglomerate (USGS, 1971).	Uplands: 2 – 8 Site: 1 – 8 (outcrop in central FGPA) Seekonk River: 7 and 8

#### HYDRAULIC CONDUCTIVITY

Hydraulic conductivity (K) testing (rising/falling head slug tests) was performed at eight monitoring wells to characterize the hydrogeological properties of fill, glacial outwash, and glacial till. At each well, the initial static water level and depth to the bottom of the well were measured. A vented pressure transducer was set to record the groundwater level data on a 1-second interval and then lowered within the well to approximately one foot from the bottom of the well. Once the water level in the monitoring well stabilized to the measured pre-test static water level, a slug (i.e., solid object used to displace water) was lowered into the well until it was fully submerged, rapidly increasing the water level within the well. The transducer monitored the water level within the well as it lowered back to near-static levels (i.e., falling head test). The slug was subsequently removed from the well, causing the water level to rapidly decrease within the well. The transducer then monitored the water level within the well as it rose back to near-static levels (i.e., rising head test).

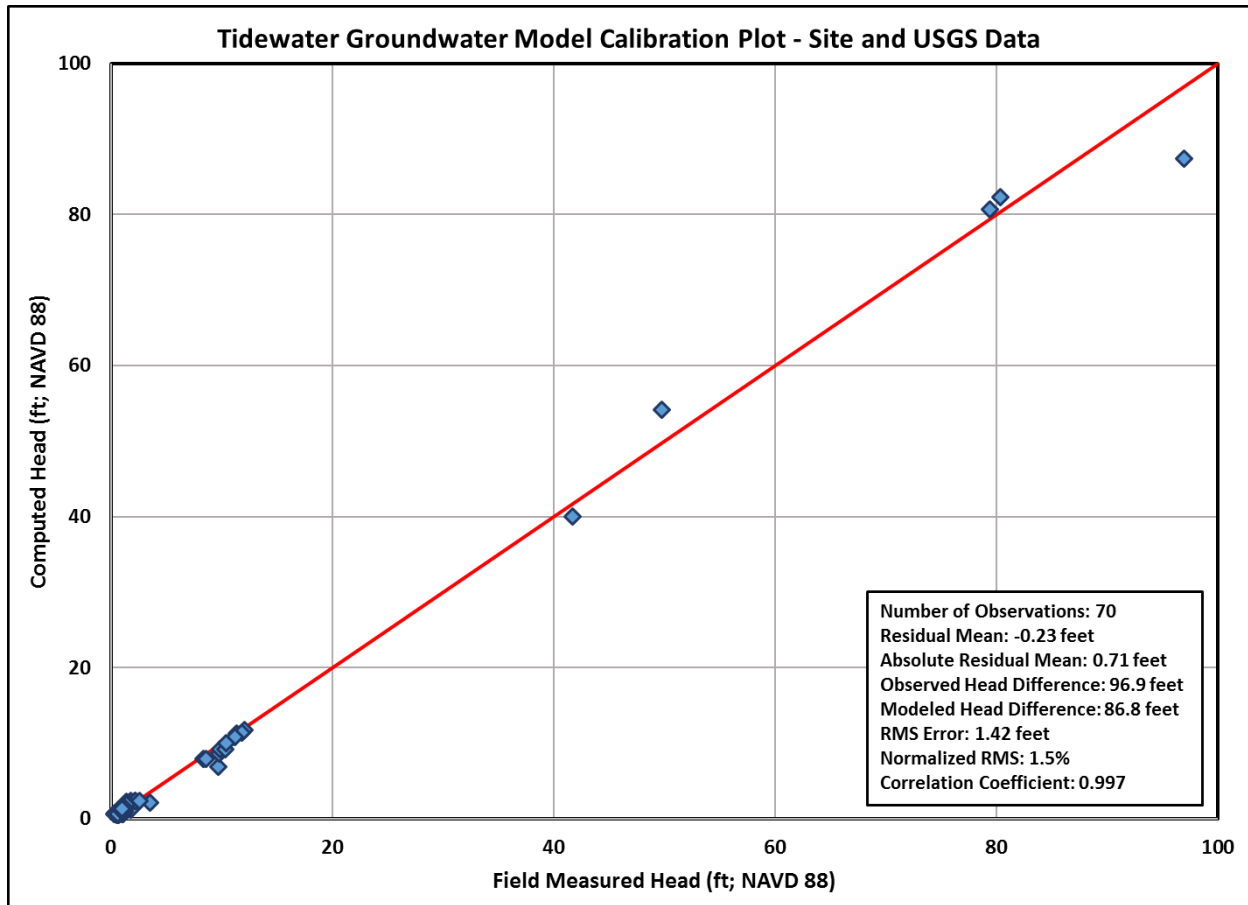
The hydraulic conductivity of the fill and native overburden soils was calculated using the Bouwer and Rice slug test solution (Bouwer and Rice, 1976) for fully and partially penetrating wells using AQTESOLV, a software package used to analyze aquifer test data. Attached Table G-1 summarizes the hydraulic conductivity testing results, along with calculated geometric mean values for each unit. A comparison of the field-measured hydraulic conductivity values (along with published literature values) and the calibrated hydraulic conductivity values used in the numerical model is presented in the following section.



## MODEL CALIBRATION

The process of adjusting the model to match observed data is referred to as model calibration. GZA used an iterative calibration process during which the hydraulic properties of the aquifer materials and the boundary conditions are varied within ranges constrained by Site-specific and published data. The numerical hydraulic head results were compared to field-measured monitoring well groundwater elevations during the calibration process. As with any numerical model, conditions simulated in this model represent one set of conditions that generally match the observed Site conditions, but do not necessarily provide a unique solution. Furthermore, numerical models and the resulting simulations of groundwater flow are dependent in part on the scale of the geologic features modeled, amount of data collected, and solution methods used. These limitations were addressed in our calibration process to the extent practical. It is noted that this model may be modified or recalibrated as additional field data is collected.

As stated previously, the numerical model represents median-tide conditions. As such, the model was calibrated to the average value of the hydraulic head data measured between 2011 and 2017 for the Site monitoring wells, as well as available groundwater elevation data for USGS monitoring wells within the model domain. Observation points used for model calibration included sixty-five (65) overburden monitoring wells at the Site and five (5) USGS monitoring wells. Refer to Figure G-1 for the locations of the observation points. The screened interval for each monitoring well was imported into GMS to calculate the simulated hydraulic head at each location. A calibration plot, which directly compares simulated hydraulic heads vs. field measured hydraulic heads and thus illustrates the overall accuracy of the numerical model, is shown below. Calculated hydraulic head contours within each of these units are presented on Figure G-6.



The tight grouping around the match line (red, 1 to 1 line) and a residual mean near zero both indicate that the calibrated model does not provide an overall bias (high or low) to the Site averaged and USGS hydraulic head data. Furthermore, the statistical results (correlation coefficient, RMS error, normalized RMS, absolute residual mean) demonstrate the accuracy of the calibrated model. In fact, a normalized RMS error of 10% or less is generally accepted as a well calibrated model. The normalized RMS error for this calibrated model is 1.5%, which is well within the generally accepted range.

The calibrated hydraulic properties assigned to the modeled hydrogeologic units based on the Site data and literature values are summarized in the following table.

Hydrogeologic Unit	Field Parameter	Modeled Parameter	
	Horizontal Hydraulic Conductivity (Kh) (ft/day)	Kh (ft/day)	Vertical Hydraulic Conductivity (Kv) (ft/day)
Surface Water	N/A	500	500
Fill	1 – 6 (1)	2	0.2
River Soft Sediments	10 <sup>-5</sup> – 10 (2)	0.7	0.07
Glacial Outwash Deposits (Sand)	7 – 38 (1)	15 – 25	1.5 – 5
Silt	10 <sup>-5</sup> – 0.3 (2)	0.08 – 0.1	0.008 – 0.01
Glacial Till	10 <sup>-4</sup> – 10 (1, 2)	1.1	0.1
Bedrock	10 <sup>-5</sup> – 10 (2)	0.05 – 0.4	0.005 – 0.04

Notes

1. Source: In-situ hydraulic conductivity tests. Results presented in Table G-1.
2. Source: Literature values presented in Freeze and Cherry, 1979.

The hydraulic boundary conditions assigned to the calibrated model are summarized in the following table.

Boundary Condition	Parameters, Values and Rationale
Constant Head	Stage (ft; NAVD 88) – the stage of the Seekonk River (equivalent freshwater head) was set to 0.1 feet (median tide).
Aerial Recharge	<p>Recharge rates – the following recharge rates were assigned according to the current ground cover within the model domain:</p> <ul style="list-style-type: none"> <li>• Large Building: 0 inches/year</li> <li>• Previously Capped Area: 2 inches/year</li> <li>• Residential/Commercial: 5 inches/year</li> <li>• Urban (Undeveloped): 9 inches/year</li> <li>• Outwash Deposits (Undeveloped): 15 – 22 inches/year</li> <li>• Athletic Fields/Parkland: 30 inches/year</li> </ul> <p>Rationale –The modeled recharge rates are consistent with published values based on research conducted in the region (USGS, 1991; USGS, 1997; and USGS, 2006).</p>
Drain boundaries (24" conc. pipes, north and south of substation)	<p>Elevation (ft; NAVD 88): -1.2 to 2.3  Conductance (ft<sup>2</sup>/day/ft): 0.4 to 0.6</p> <p>Rationale – the invert elevations of the drains were surveyed at the outfall locations along the Seekonk River (south of substation: -1.21 feet; north of substation: 0.04 feet). The slope of the drains within the model are consistent with literature values (0.5 – 1.0%). The modeled groundwater contours and simulated hydraulic heads are consistent with field data. Approximately 3 gpm discharges into these three drains within the model.</p>
Horizontal Flow Barrier (Existing Bulkheads)	<p>Hydraulic Conductivity at Site (ft/day) – 0.3 to 5 (2 * 10<sup>-3</sup> to 10<sup>-4</sup> cm/sec)  Thickness (feet) – 1</p>

Boundary Condition	Parameters, Values and Rationale
	Rationale – The modeled hydraulic conductivities reflect the actual bulkhead construction/conditions in the field and are consistent with published values (Starr et al., 1992; Freeze and Cherry, 1979).

Based on the numerical model results presented above, the calibrated steady state simulation provides a reasonable match to the observed groundwater elevation data at the Site. Consequently, the proposed remedial activities at the Site (e.g., containment wall installation, impermeable cap placement) were subsequently simulated to evaluate the effect on the local groundwater flow conditions, as discussed further below.

#### STEADY STATE MODEL RESULTS (MEDIAN TIDE CONDITIONS)

The simulated shallow groundwater flow patterns in the overburden deposits within: 1) the model domain; and 2) the vicinity of the Former Tidewater Facility are presented on Figure G-6. Consistent with the field-measured hydraulic heads, groundwater generally flows towards the east in the vicinity of the Site and eventually discharges into the Seekonk River. Similar to conditions measured in the field, the simulated groundwater elevations in the substation area are depressed, with approximately 3 gallons per minute of groundwater discharging into the two drain elements that simulate the deep drain installations, or associated bedding material. These conditions are also consistent with field measurements. As anticipated, an upward component to groundwater flow is simulated within the calibrated numerical model in the vicinity of Seekonk River (i.e., groundwater discharge area).

The hydraulic gradient is a measure of the change in hydraulic head over a specified distance (i.e., the slope of the groundwater table in the shallow overburden). In general, steeper hydraulic gradients are typically observed in aquifers containing soil with low hydraulic conductivities, and vice versa. As anticipated, a gently sloping horizontal hydraulic gradient of approximately 0.008 to 0.01 ft/ft is simulated in the fill unit in the southern portion of the Site. In the central portion of the FGPA, a steeper hydraulic gradient (approximately 0.03 to 0.05 ft/ft) is simulated due to the retaining walls and bedrock outcrop. As anticipated, the horizontal hydraulic gradient is also steeper (approximately 0.05 ft/ft) within the upper glacial till unit, near the western boundary of the model domain. These model results are in agreement with field-measured data and general hydrogeologic principles.

The calibrated model results are in overall agreement with the field-measured groundwater elevations at the Site, hydraulic properties, hydrogeologic conditions and published reports. Additionally, the groundwater flow patterns at the Site are generally consistent with conditions observed. Therefore, the calibrated model was deemed acceptable and was used to simulate bulkhead improvements at the Site to evaluate potential changes to groundwater flow conditions, as discussed in the following section.

#### FORECAST SIMULATION – POST-REMEDY (CONTAINMENT WALL AND IMPERMEABLE CAP INSTALLATION)

For the forecast numerical simulation, the following boundary conditions were revised to simulate the proposed post-remedy conditions:

- **Containment Wall:** the proposed containment wall was simulated with HFBs. The wall's alignment within the model domain is consistent with Drawing 10 of this report (as shown on Figure G-7). The modeled hydraulic conductivity of the proposed containment wall was assumed to be  $10^{-6}$  cm/sec (0.00283 feet/day), with an assumed wall thickness of 1 feet. As discussed previously, the bottom elevation of model layer 5 at the Site is -40 feet (NAVD 88), to simulate the tip elevation of the southern portion of the proposed containment wall.<sup>2</sup> Refer to the text of this report for additional information regarding the proposed containment wall.
- **Impermeable Cap:** the recharge boundary was updated to reflect the proposed impermeable cap area. Within this area, the modeled recharge rate was conservatively updated to 2 inches/year.
- **Deep drains:** the southern deep drain is anticipated to function similarly following the completion of the proposed remedy. Therefore, the corresponding drain element within the model remained unchanged for the forecast simulation. On the other hand, the northern deep drain will not penetrate the proposed containment wall and will be removed from service. Consequently, this drain element was deactivated within the forecast simulation.

The other boundary conditions (e.g., recharge, constant head) and hydraulic properties were not altered for the forecast simulation. Similar to the previously discussed steady state calibration model, median tide conditions were modeled for this numerical simulation.

The simulated shallow groundwater flow patterns at the Site for the post-remedy forecast simulation are presented on Figure G-7 (left side). In addition, the projected groundwater mounding for the post-remedy conditions are also presented on Figure G-7 (right side). These simulated shallow groundwater flow patterns are generally comparable to the calibrated, steady state model results which simulate current conditions at the Site (Figure G-6). This numerical simulation suggests that the proposed containment wall will create only a minor diversion to localized groundwater flow at the Site. In fact, the area where the projected groundwater mounding is greater than 0.5 feet only extends approximately 150 feet to the west of the proposed containment wall. The maximum projected mounding directly behind the proposed containment wall is approximately 1.3 feet.

Similar to the calibrated, steady state model, the hydraulic gradient in the southern portion of the Site ranged between approximately 0.008 and 0.01 for this simulation. The hydraulic gradient in the central portion of the FGPA was also similar between the calibrated model results and the post-remedy forecast simulation results. Overall, the consistency in the macro groundwater flow patterns, the limited mounding and the similar hydraulic gradients across the Site, suggest that that proposed containment wall will only create a minor diversion to localized groundwater flow at the Site.

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<sup>2</sup> Note that the tip elevation in the northern portion of the containment wall, where shallower glacial till was encountered during field investigation activities, is approximately -32 feet. The simulated tip elevation in this portion of the Site is conservatively modeled at -40 feet elevation. Therefore the projected modeled mounding will be conservative (high) for the forecast simulation.

## LIST OF ATTACHMENTS

Table G-1: Summary of Hydraulic Conductivity Testing Results  
Figure G-1: Model Input/Boundary Conditions  
Figure G-2: Model Hydraulic Properties (Layers 1 and 2)  
Figure G-3: Model Hydraulic Properties (Layers 3 and 4)  
Figure G-4: Model Hydraulic Properties (Layers 5 and 6)  
Figure G-5: Model Hydraulic Properties (Layers 7 and 8)  
Figure G-6: Calibration Model Results  
Figure G-7: Forecast (Post-Remedy) Model Results

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Atlantic, 1996. Remedial Investigation at the Tidewater Site Pawtucket, Rhode Island, Atlantic Environmental Services, Inc., December 30, 1996

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**Table G-1**  
**Summary of Hydraulic Conductivity Testing Results**  
**Former Tidewater Facility**  
**Pawtucket, RI**

Hydrogeologic Unit	Well ID	Horizontal Hydraulic Conductivity $K_h$ (ft/day)	Test Performed	$K_h$ - Range (ft/day)	$K_h$ - Geometric Mean (ft/day)
Fill	MW-6	1.3	Rising Head	1.3 - 5.8	2.3
		2.3	Rising Head		
		1.5	Falling Head		
		5.8	Falling Head		
Sand	MW-203	19.7	Rising Head	7.1 - 37.6	12.3
		18.3	Rising Head		
		12.7	Rising Head		
	MW-202	32.2	Rising Head		
		37.6	Rising Head		
	MW-338D	8.1	Rising Head		
		8.2	Rising Head		
		11.3	Falling Head		
		10.2	Falling Head		
	MW-335D	8.9	Rising Head		
		7.9	Rising Head		
		7.1	Falling Head		
		7.4	Falling Head		
	MW-316D	9.9	Rising Head		
		12.7	Rising Head		
		13.7	Falling Head		
11.9		Falling Head			
Silty Sand	MW-310S	2.1	Rising Head	0.1 - 2.1	0.5
		0.12	Rising Head		
Till	MW-317D	1.1	Rising Head	0.9 - 1.3	1.1
		1	Rising Head		
		0.9	Rising Head		
		1.1	Falling Head		
		1	Falling Head		
		1.3	Falling Head		

**Notes:**

1. Slug tests were performed at wells completed in an unconfined aquifer and were analyzed following the methods developed by Bower-Rice (1976). Bower, H. and Rice, R.C., 1976; A slug test for determining hydraulic conductivity of unconfined aquifers with completely or partially penetrating wells; Water Resources Research, Vo. 12, pp 423-428.
2. ft/day = feet/day
3. Hydraulic conductivity testing performed by GZA field staff.



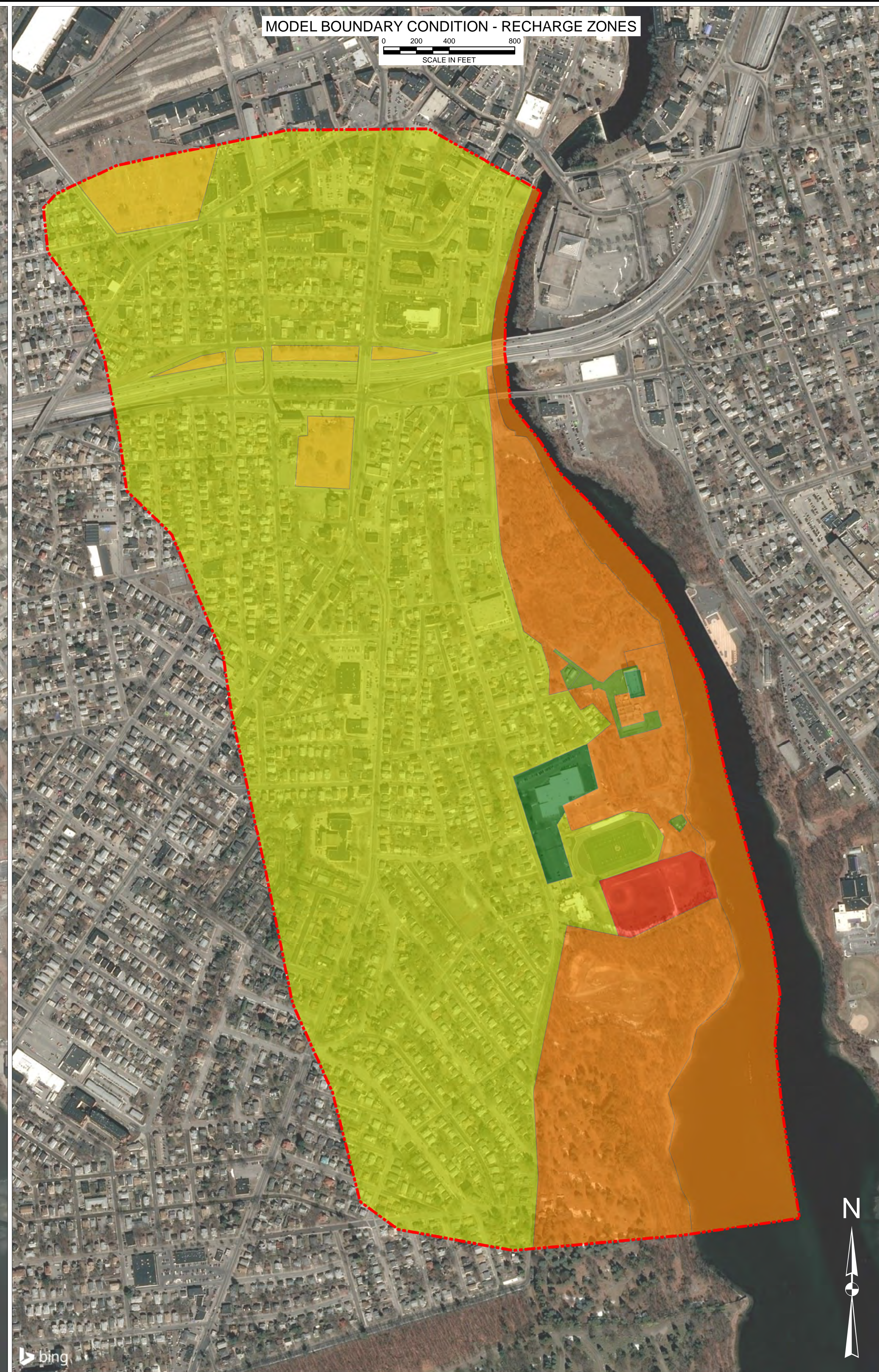
MODEL BOUNDARY CONDITIONS - CONSTANT HEAD, HFBS, DRAINS

0 200 400 800  
SCALE IN FEET



MODEL BOUNDARY CONDITION - RECHARGE ZONES

0 200 400 800  
SCALE IN FEET



LEGEND

- USGS OBSERVATION POINTS
- SITE OBSERVATION POINTS
- MODEL BOUNDARY
- STREAM
- RETAINING WALL
- DEEP DRAINS
- HORIZONTAL FLOW BOUNDARY
- REFINED GRID AREA
- CONSTANT HEAD BOUNDARY

RECHARGE ZONE

- BUILDING
- PREVIOUSLY CAPPED AREA / PAVEMENT
- RESIDENTIAL / COMMERCIAL
- URBAN UNDEVELOPED
- UNDEVELOPED OUTWASH DEPOSITS
- ATHLETIC FIELDS / PARKS

Recharge Zone	Recharge Rate (in/yr)
Building	0
Previously Capped Area	2
Residential/Commercial	5
Urban - Undeveloped	9
Undeveloped - Outwash Deposits	15 - 22
Athletic Fields/Park	30

SOURCE

- 1) THIS MAP CONTAINS THE ESRI ARCGIS ONLINE BING MAPS AERIAL LAYER PACKAGE, PUBLISHED NOVEMBER 26, 2013 BY ESRI ARCGIS SERVICES AND UPDATED MONTHLY. THIS SERVICE USES UNIFORM NATIONALLY RECOGNIZED DATUM AND CARTOGRAPHY STANDARDS AND A VARIETY OF AVAILABLE SOURCES FROM SEVERAL DATA PROVIDERS.
- 2) NUMERICAL GROUNDWATER FLOW SIMULATION PERFORMED AS STATED IN THE APPENDIX G TEXT.
- 3) REFER TO THE APPENDIX G TEXT FOR ADDITIONAL BOUNDARY CONDITION INFORMATION.

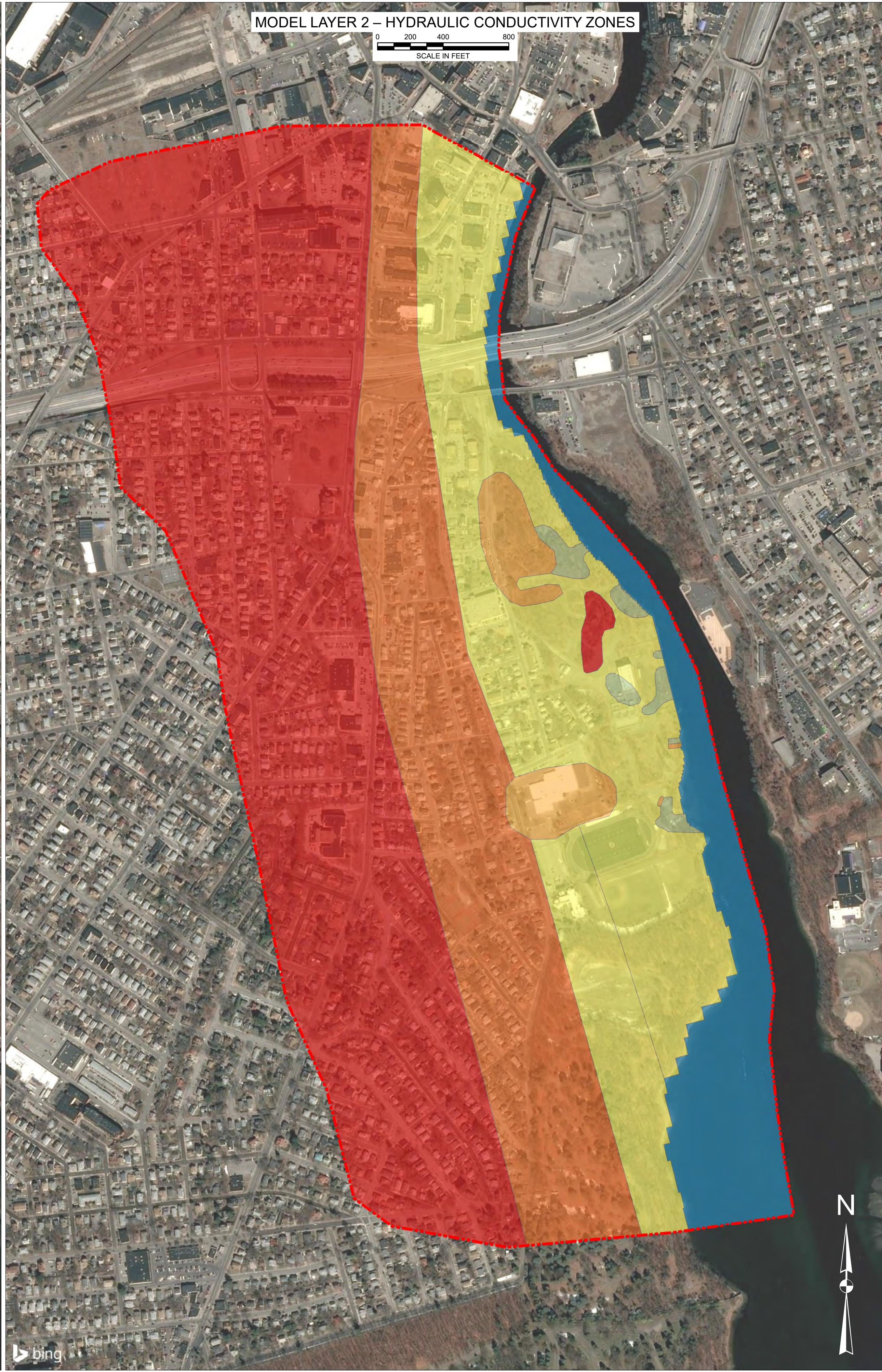
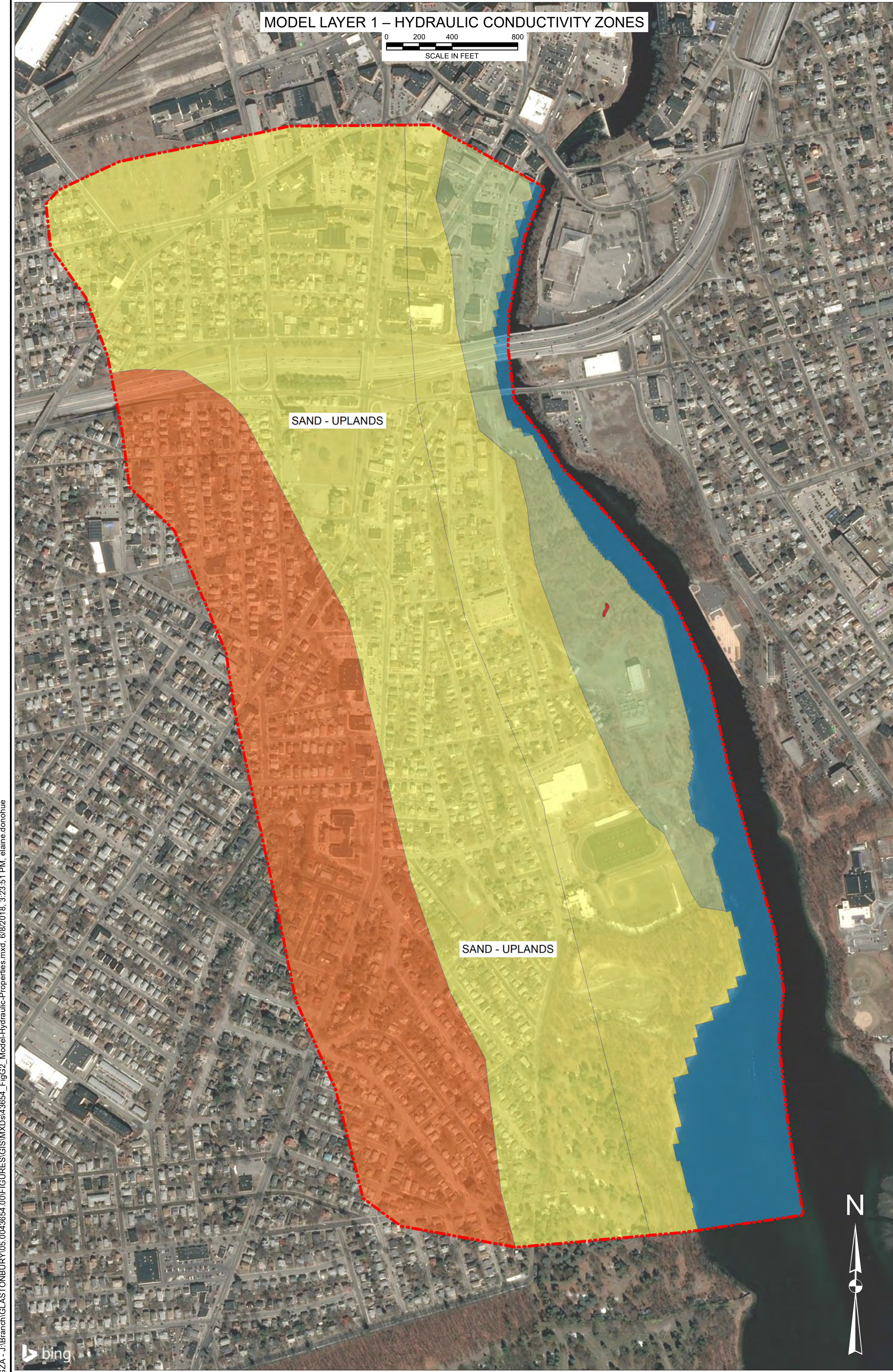
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REMEDIAL ACTION WORK PLAN  
FORMER TIDEWATER FACILITY  
PAWTUCKET, RHODE ISLAND

MODEL INPUT / BOUNDARY CONDITIONS

PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com		PREPARED FOR: nationalgrid	
PROJ MGR: DR	DESIGNED BY: JAS	REVIEWED BY: JJC	CHECKED BY: JJC
DATE: 06-08-2018	DRAWN BY: EMD	PROJECT NO: 05.0043654.00	SCALE: 1 INCH = 400 FT
		REVISION NO.	FIGURE G-1





- LEGEND**
- MODEL BOUNDARY
  - SURFACE WATER
  - SOFT SEDIMENTS
  - FILL
  - SAND
  - SILT
  - TILL
  - BEDROCK

Hydrogeologic Unit	Horizontal Hydraulic Conductivity (feet/day)	Vertical Hydraulic Conductivity (feet/day)
Surface Water	500	500
Soft Sediments	0.7	0.07
Fill	2	0.2
Sand - Uplands	2 - 5	0.2 - 0.5
Sand	15 - 25	1.5 - 5
Silt	0.08 - 0.1	0.008 - 0.01
Till	1.1	0.1
Bedrock	0.05 - 0.4	0.005 - 0.04

- SOURCE**
- 1) THIS MAP CONTAINS THE ESRI ArcGIS ONLINE BING MAPS AERIAL LAYER PACKAGE, PUBLISHED NOVEMBER 25, 2013 BY ESRI ARCSIMS SERVICES AND UPDATED MONTHLY. THIS SERVICE USES UNIFORM NATIONALLY RECOGNIZED DATUM AND CARTOGRAPHY STANDARDS AND A VARIETY OF AVAILABLE SOURCES FROM SEVERAL DATA PROVIDERS.
  - 2) NUMERICAL GROUNDWATER FLOW SIMULATION PERFORMED AS STATED IN THE APPENDIX G TEXT.
  - 3) REFER TO THE APPENDIX G TEXT FOR ADDITIONAL MODELED HYDROGEOLOGIC UNIT INFORMATION.
  - 4) THE SIMULATED HYDROGEOLOGIC UNIT BOUNDARIES ARE APPROXIMATE AND BASED UPON DATA FROM WIDELY SPACED EXPLORATIONS AND GEOLOGICAL MAPPING. THUS, THE LINES REPRESENT APPROXIMATE BOUNDARIES BETWEEN STRATA.

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FORMER TIDEWATER FACILITY  
PAWTUCKET, RHODE ISLAND**

**MODEL HYDRAULIC PROPERTIES  
(LAYERS 1 AND 2)**

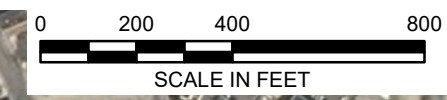
PREPARED BY: <b>GZA GeoEnvironmental, Inc.</b> Engineers and Scientists <a href="http://www.gza.com">www.gza.com</a>	PREPARED FOR: <b>nationalgrid</b>	
PROJ MGR: DR DESIGNED BY: JAS DATE: 06-08-2018	REVIEWED BY: JJC DRAWN BY: EMD PROJECT NO: 05.0043654.00	CHECKED BY: JJC SCALE: 1 INCH = 400 FT REVISION NO.

**FIGURE  
G-2**

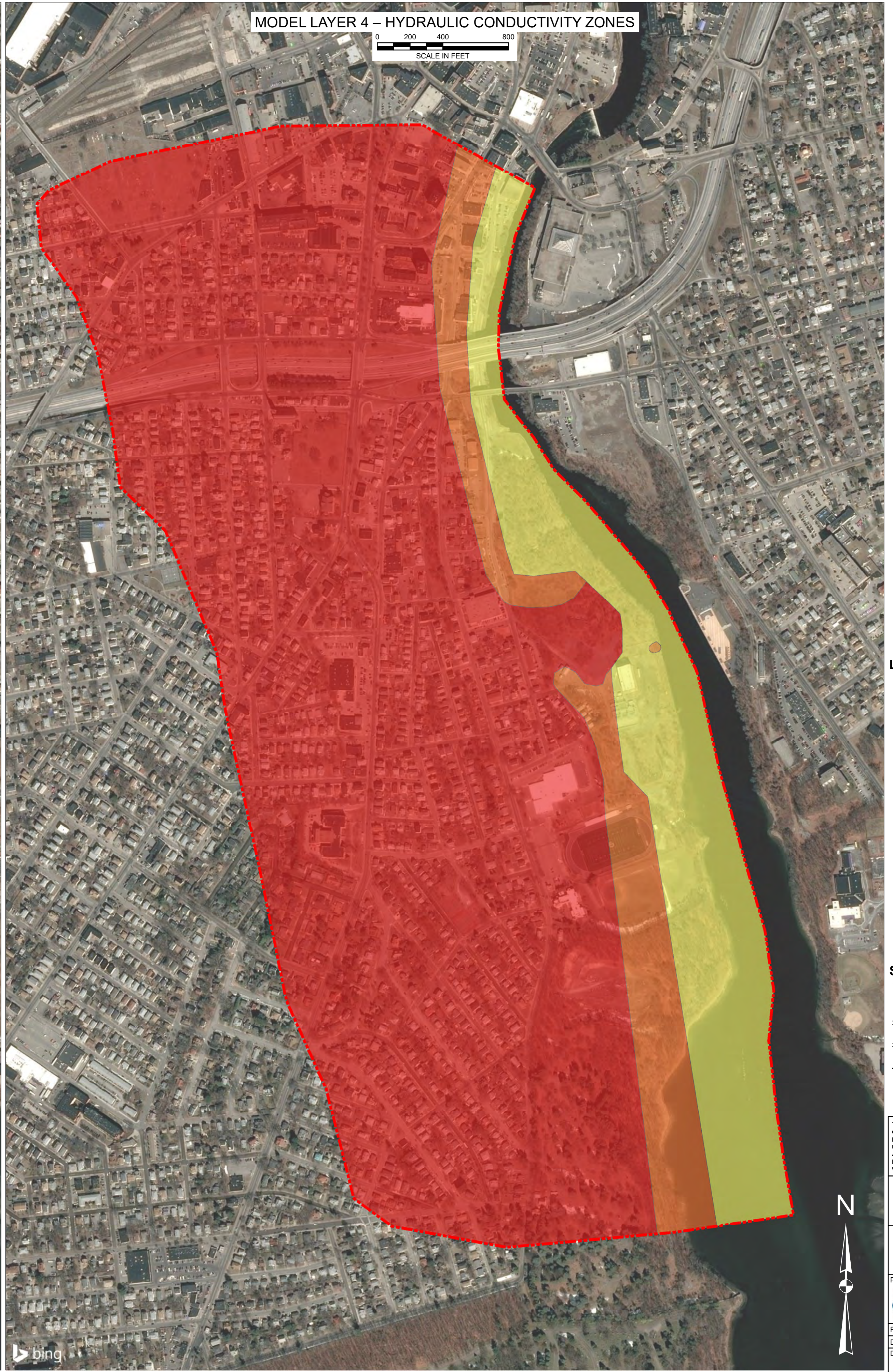
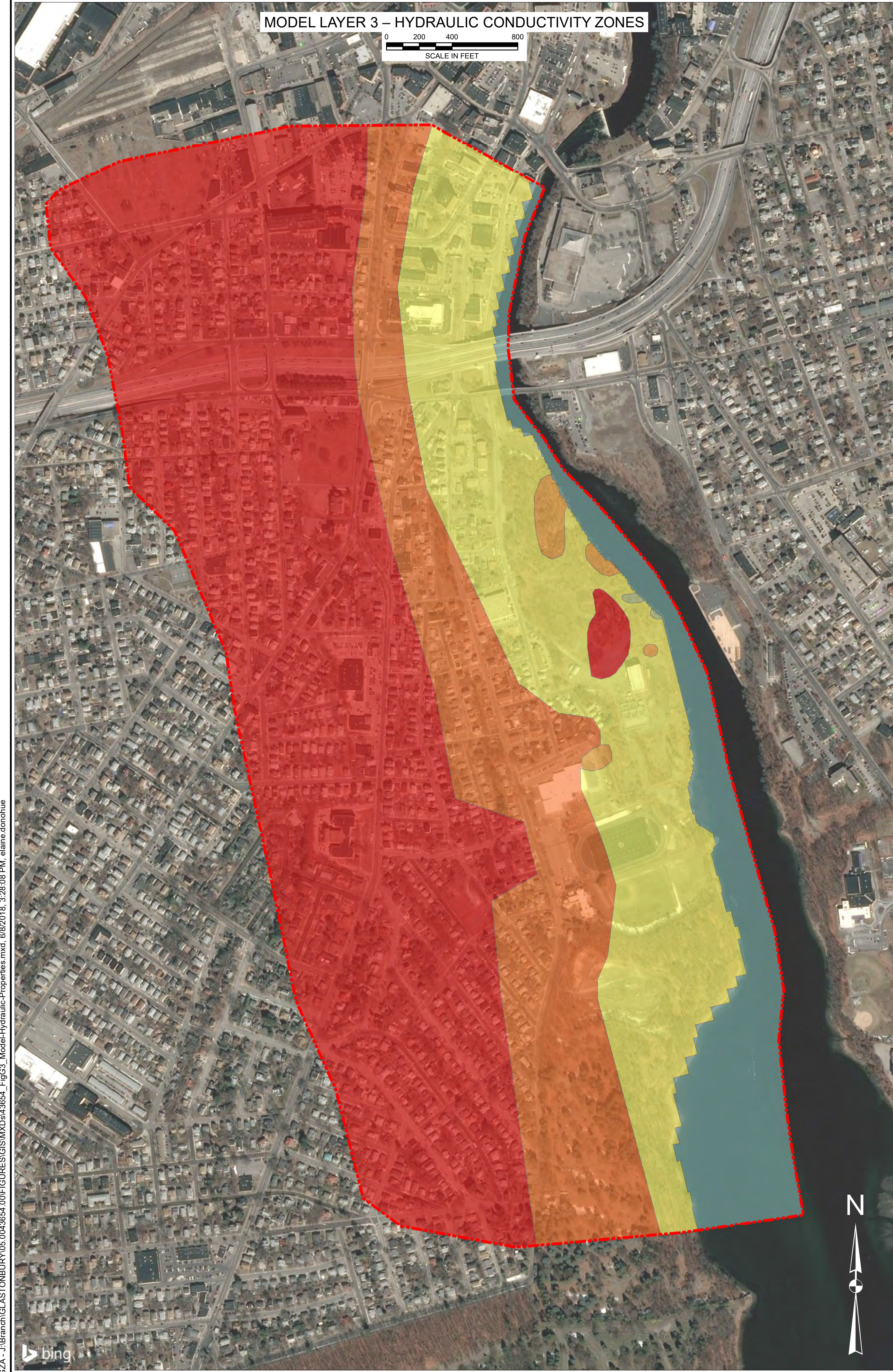
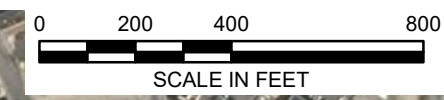
GZA - J:\Branch\GLASTONBURY\05.0043654.00\FIGURES\GIS\MXDs\3654\_Fig2\_Model-Hydraulic-Properties.mxd, 6/8/2018, 3:23:51 PM, elaine.donohue



MODEL LAYER 3 – HYDRAULIC CONDUCTIVITY ZONES



MODEL LAYER 4 – HYDRAULIC CONDUCTIVITY ZONES



LEGEND

- MODEL BOUNDARY
- HYDROGEOLOGIC UNITS**
- SURFACE WATER
- SOFT SEDIMENTS
- FILL
- SAND
- SILT
- TILL
- BEDROCK

Hydrogeologic Unit	Horizontal Hydraulic Conductivity (feet/day)	Vertical Hydraulic Conductivity (feet/day)
Surface Water	500	500
Soft Sediments	0.7	0.07
Fill	2	0.2
Sand - Uplands	2 - 5	0.2 - 0.5
Sand	15 - 25	1.5 - 5
Silt	0.08 - 0.1	0.008 - 0.01
Till	1.1	0.1
Bedrock	0.05 - 0.4	0.005 - 0.04

SOURCE

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MODEL HYDRAULIC PROPERTIES  
(LAYERS 3 AND 4)

PREPARED BY:  
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Engineers and Scientists  
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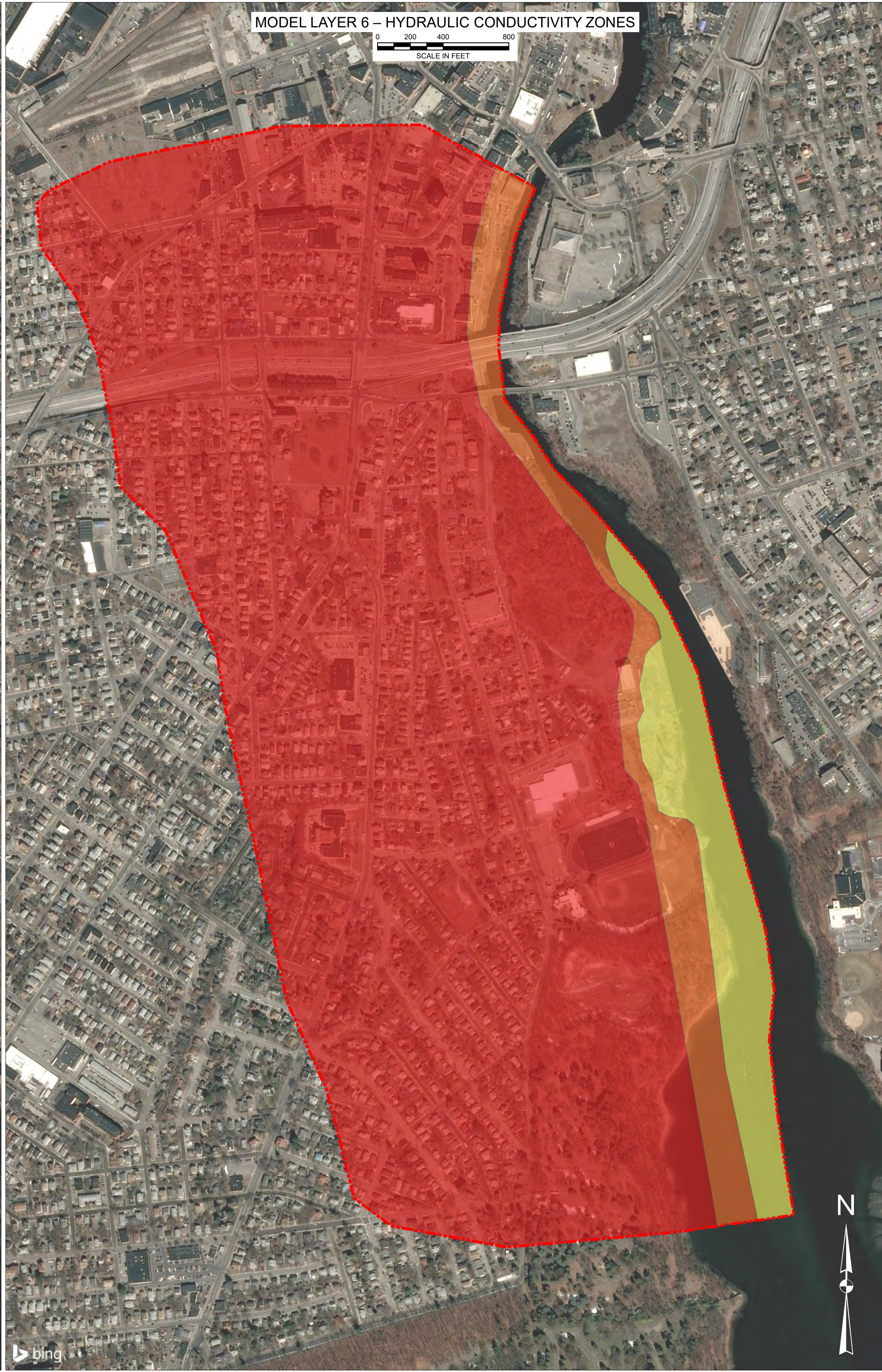
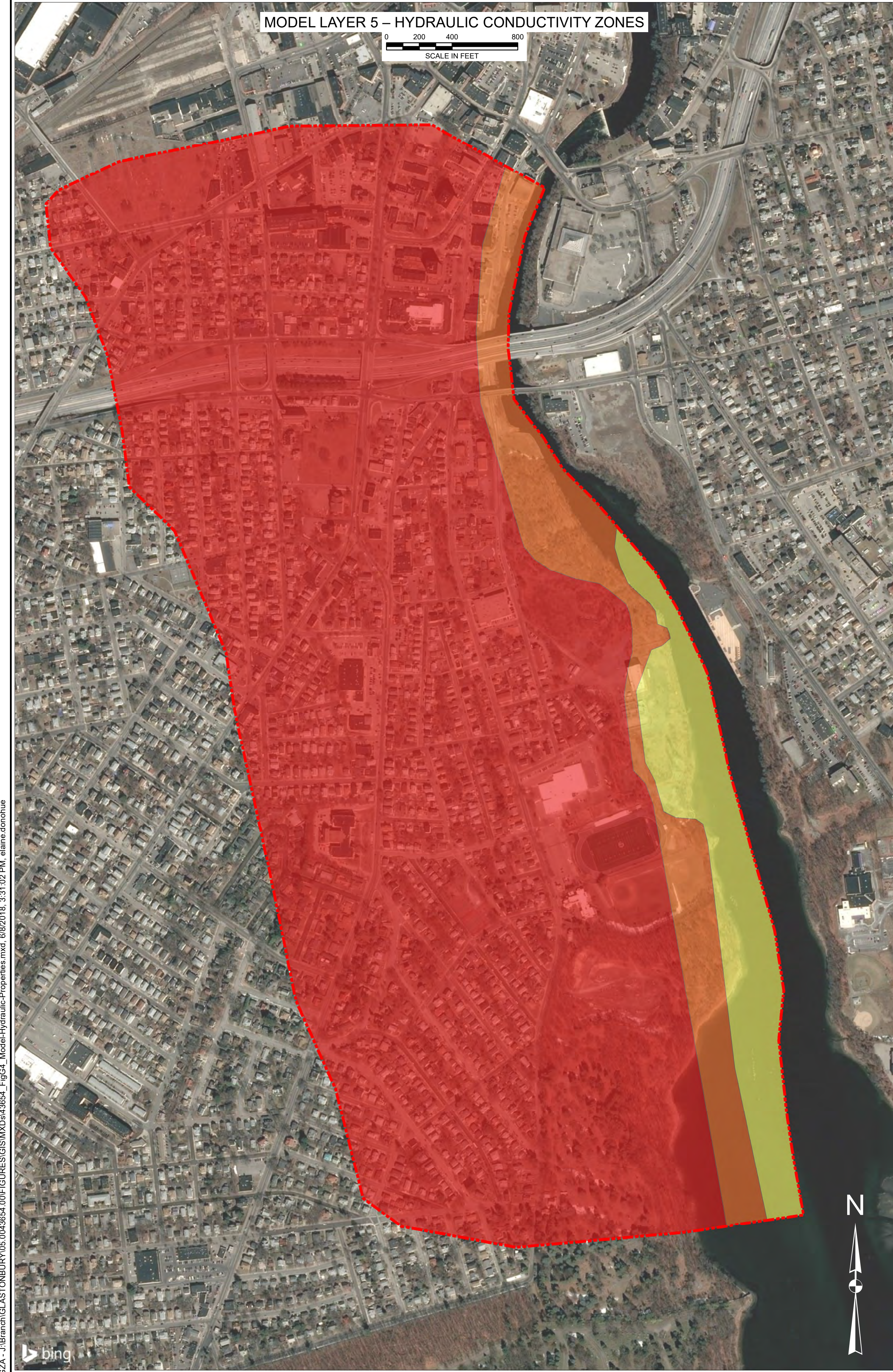
PREPARED FOR:  
 nationalgrid

PROJ MGR: DR    REVIEWED BY: JJC  
DESIGNED BY: JAS    DRAWN BY: EMD  
DATE: 06-08-2018    PROJECT NO: 05.0043654.00

CHECKED BY: JJC  
SCALE: 1 INCH = 400 FT  
REVISION NO.  
FIGURE  
G-3

GZA - J:\Branch\GLASTONBURY\05.0043654.00\FIGURES\GIS\MXDs\3854\_Fig33\_Model-Hydraulic-Properties.mxd, 6/8/2018, 3:28:08 PM, elaine.donohue





- LEGEND**
- MODEL BOUNDARY
  - HYDROGEOLOGIC UNITS**
  - SURFACE WATER
  - SOFT SEDIMENTS
  - FILL
  - SAND
  - SILT
  - TILL
  - BEDROCK

Hydrogeologic Unit	Horizontal Hydraulic Conductivity (feet/day)	Vertical Hydraulic Conductivity (feet/day)
Surface Water	500	500
Soft Sediments	0.7	0.07
Fill	2	0.2
Sand - Uplands	2 - 5	0.2 - 0.5
Sand	15 - 25	1.5 - 5
Silt	0.08 - 0.1	0.008 - 0.01
Till	1.1	0.1
Bedrock	0.05 - 0.4	0.005 - 0.04

- SOURCE**
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**REMEDIAL ACTION WORK PLAN  
FORMER TIDEWATER FACILITY  
PAWTUCKET, RHODE ISLAND**

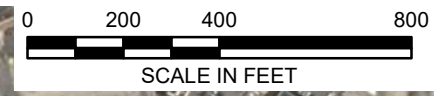
**MODEL HYDRAULIC PROPERTIES  
(LAYERS 5 AND 6)**

PREPARED BY: <b>GZA GeoEnvironmental, Inc.</b> Engineers and Scientists <a href="http://www.gza.com">www.gza.com</a>	PREPARED FOR: <b>nationalgrid</b>		
PROJ MGR: DR DESIGNED BY: JAS DATE: 06-08-2018	REVIEWED BY: JJC DRAWN BY: EMD PROJECT NO: 05.0043654.00	CHECKED BY: JJC SCALE: 1 INCH = 400 FT REVISION NO.	<b>FIGURE G-4</b>

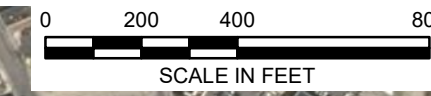
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MODEL LAYER 7 – HYDRAULIC CONDUCTIVITY ZONES



MODEL LAYER 8 – HYDRAULIC CONDUCTIVITY ZONES



LEGEND

MODEL BOUNDARY

HYDROGEOLOGIC UNITS

- SURFACE WATER
- SOFT SEDIMENTS
- FILL
- SAND
- SILT
- TILL
- BEDROCK

Hydrogeologic Unit	Horizontal Hydraulic Conductivity (feet/day)	Vertical Hydraulic Conductivity (feet/day)
Surface Water	500	500
Soft Sediments	0.7	0.07
Fill	2	0.2
Sand - Uplands	2 - 5	0.2 - 0.5
Sand	15 - 25	1.5 - 5
Silt	0.08 - 0.1	0.008 - 0.01
Till	1.1	0.1
Bedrock	0.05 - 0.4	0.005 - 0.04

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REMEDIAL ACTION WORK PLAN  
FORMER TIDEWATER FACILITY  
PAWTUCKET, RHODE ISLAND

MODEL HYDRAULIC PROPERTIES  
(LAYERS 7 AND 8)

PREPARED BY:  
**GZA** GeoEnvironmental, Inc.  
Engineers and Scientists  
www.gza.com

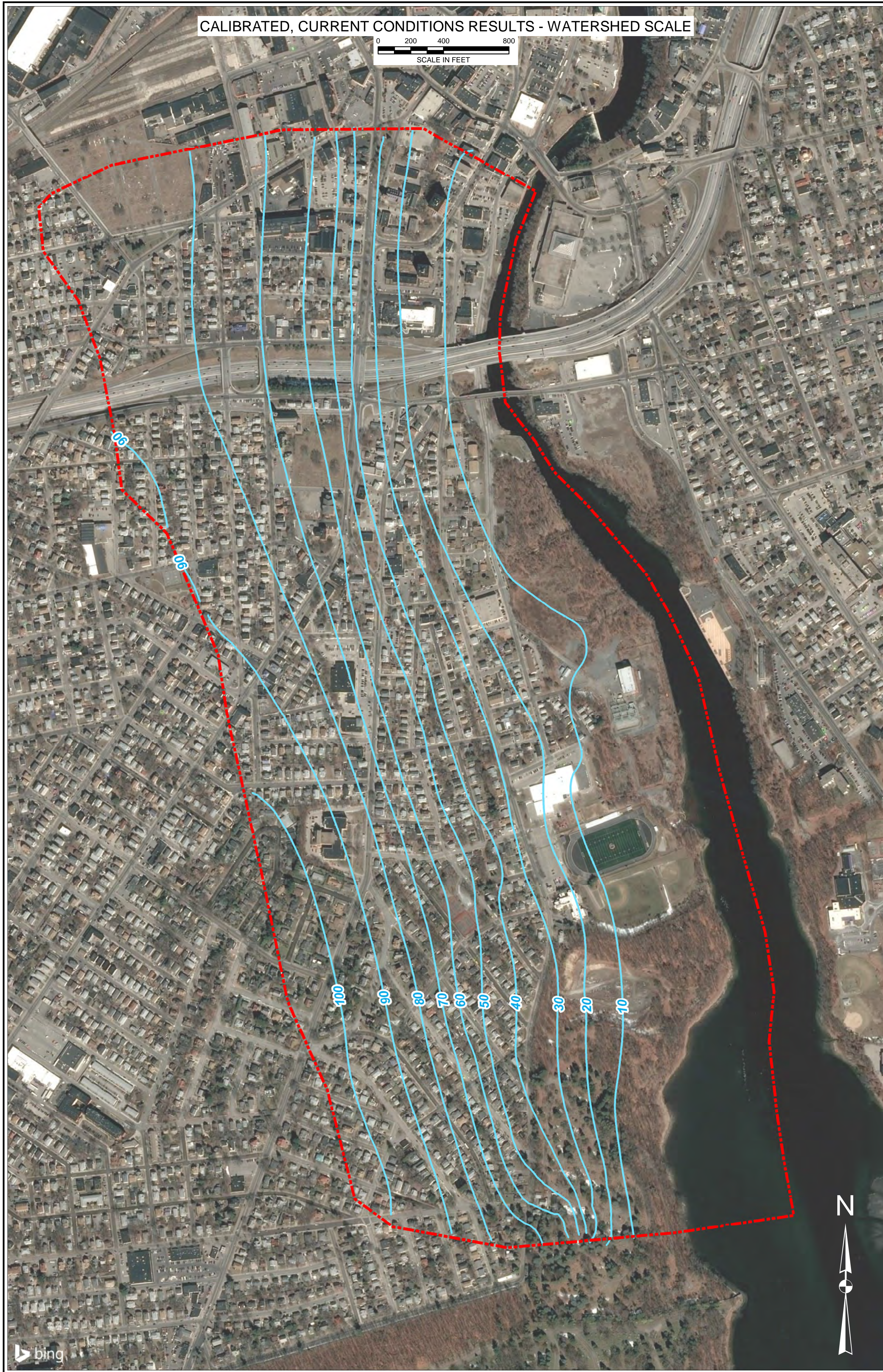
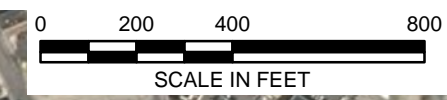
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DESIGNED BY: JAS    DRAWN BY: EMD  
DATE: 06-08-2018    PROJECT NO.: 05.0043654.00

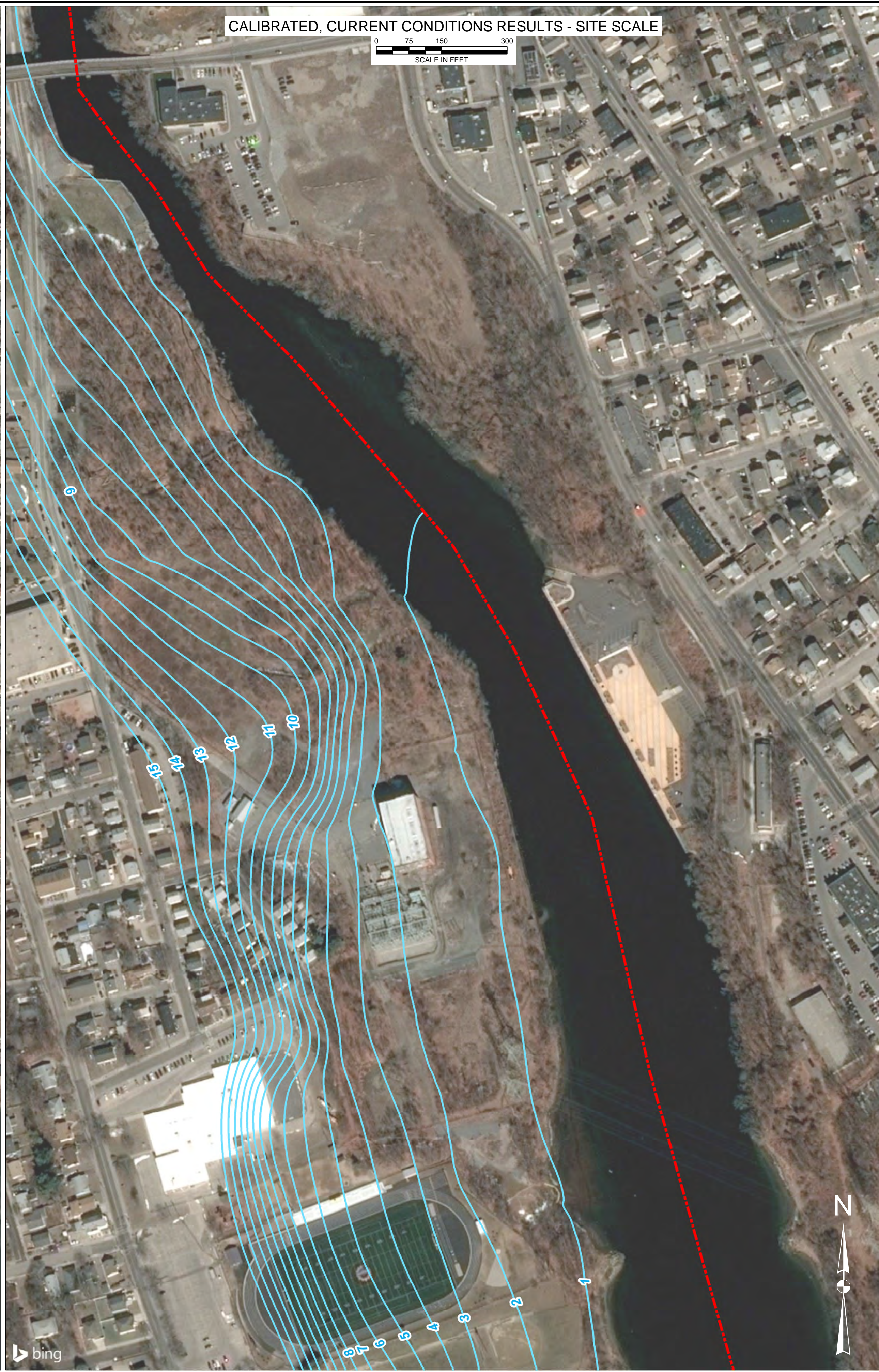
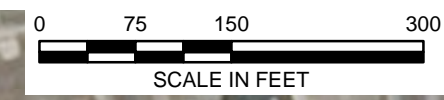
CHECKED BY: JJC  
SCALE: 1 INCH = 400 FT  
REVISION NO.:  
**FIGURE G-5**



CALIBRATED, CURRENT CONDITIONS RESULTS - WATERSHED SCALE



CALIBRATED, CURRENT CONDITIONS RESULTS - SITE SCALE



LEGEND

- - - MODEL BOUNDARY
- 2 — GROUNDWATER CONTOURS (FEET)

SOURCE

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- 3) SIMULATED GROUNDWATER ELEVATION CONTOURS ARE SHOWN IN UNITS OF FEET (NAVD 88), FOR STEADY STATE MID-TIDE CONDITIONS.
- 4) SIMULATED GROUNDWATER ELEVATION CONTOURS ARE BASED ON NUMERICAL GROUNDWATER FLOW MODEL SIMULATIONS AND MAY NOT REFLECT ACTUAL PRE-REMEDY WATER SURFACE CONDITIONS.
- 5) FLUCTUATIONS IN ACTUAL GROUNDWATER ELEVATIONS MAY OCCUR OVER TIME DUE TO RAINFALL, SEASONAL CHANGES IN THE RATE OF EVAPOTRANSPIRATION, TIDAL CYCLES, AND OTHER VARIOUS FACTORS.

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REMEDIAL ACTION WORK PLAN  
FORMER TIDEWATER FACILITY  
PAWTUCKET, RHODE ISLAND

CALIBRATION MODEL RESULTS

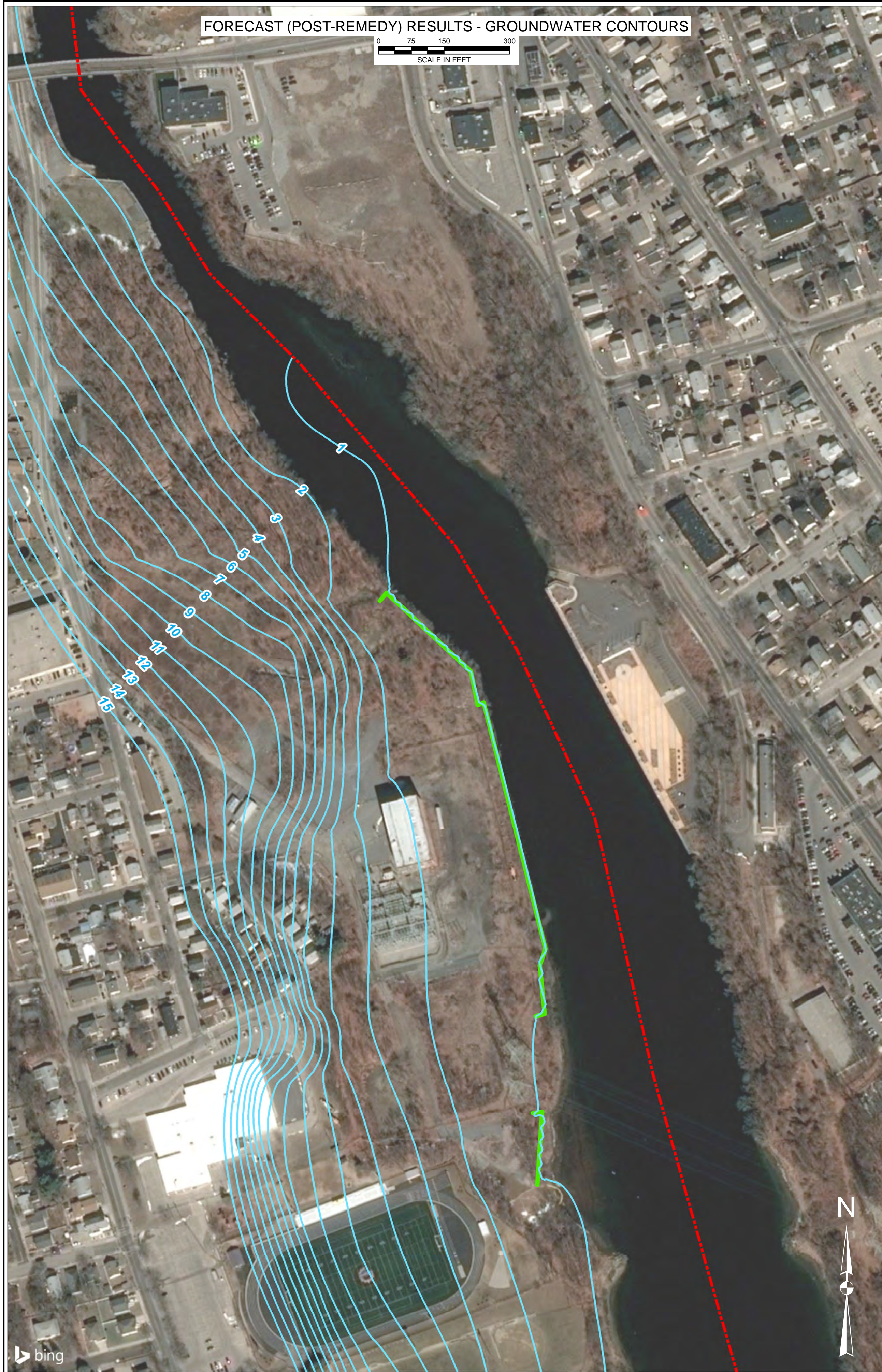
PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com		PREPARED FOR: nationalgrid	
PROJ MGR: DR	REVIEWED BY: JJC	CHECKED BY: JJC	FIGURE
DESIGNED BY: JAS	DRAWN BY: EMD	SCALE: AS NOTED	G-6
DATE: 06-08-2018	PROJECT NO: 05.0043654.00	REVISION NO:	

GZA - \\Branch\IGLASTON\BURY\05.0043654.00\FIGURES\GIS\BIMXD\05.0043654\_00\Fig06\_Calibration\_Model\_Results.mxd, 6/8/2018, 3:55:10 PM, dianne.donohue



FORECAST (POST-REMEDY) RESULTS - GROUNDWATER CONTOURS

0 75 150 300  
SCALE IN FEET



FORECAST (POST-REMEDY) RESULTS - PROJECTED MOUNDING

0 75 150 300  
SCALE IN FEET



LEGEND

- - - MODEL BOUNDARY
- FORECAST (POST-REMEDY) PROJECTED MOUNDING (FEET)
- 0.5 - 1.0
- 1.0 - 1.5
- FORECAST (POST-REMEDY) GROUNDWATER CONTOURS
- PROPOSED CONTAINMENT WALL

SOURCE

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- 6) FLUCTUATIONS IN ACTUAL GROUNDWATER ELEVATIONS MAY OCCUR OVER TIME DUE TO RAINFALL, SEASONAL CHANGES IN THE RATE OF EVAPOTRANSPIRATION, TIDAL CYCLES, AND OTHER VARIOUS FACTORS.

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REMEDIAL ACTION WORK PLAN  
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FORECAST (POST-REMEDY) MODEL RESULTS

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DATE: 06-08-2018	DRAWN BY: EMD	PROJECT NO: 05.0043654.00	SCALE: 1 INCH = 150 FT
		REVISION NO.	FIGURE G-7

GZA - \\Branch\IGLASTON\BURY\05.0043654.00\FIGURES\GIS\MXDs\43654\_FigG7\_Forecast-Model-Results.mxd, 6/8/2018, 4:07:08 PM, elaine.donohue





## **APPENDIX H**

**AIR POLLUTION CONTROL REGULATION NO.9 EVALUATION**

## APPENDIX H POTENTIAL VOLATILE EMISSIONS EVALUATION



GZA GeoEnvironmental, Inc. (GZA) performed an evaluation of predicted potential volatile emissions during implementation of the Rhode Island Department of Environmental Management (RIDEM) approved remedy at the Former Tidewater Facility Property in Pawtucket, Rhode Island (the Site). As described in this Remedial Action Workplan (RAWP), remedial activities include excavation and off-Site disposal of certain limited source area materials; installation of permeable and impermeable engineered caps; installation of a containment wall; recovery and off-Site disposal of identified non-aqueous phase liquids (NAPLs) impacts to the extent practical; natural attenuation groundwater monitoring; and placement of an Environmental Land Usage Restriction on the property records for the Site. The primary elements of the remedy requiring excavation and management of impacted materials include:

- Engineered Cap Installation which includes excavation and off-Site disposal of the area of crystallized naphthalene in the North Fill Area (earthwork);
- Containment Wall Installation (earthwork);
- Underground Tank (UGGT-1)/Raceway Vault Removal (product/residual material removal and earthwork); and
- Raceway Piping Removal (product/residual material removal and earthwork).

This evaluation of potential volatile emissions included a determination related to the applicability of the RIDEM Air Pollution Control Permits (APC) (Regulation No. 9) to these remedial construction activities. Consistent with previous discussions with RIDEM, the applicability of Regulation No. 9 was evaluated based on potential volatile emissions calculations/modeling performed in general accordance with published United States Environmental Protection Agency (EPA) guidance. This emissions modeling was developed for the specific remedial activities to be performed during this effort.

The following sections describe the emissions modeling performed for the remedial earthwork activities and the removal of the product/residual materials described above.

**As described further herein and in the attached, the results of this modeling indicate that implementation of the remedy does not have the potential to increase emissions by greater than the minimum quantities specified in Appendix A of RIDEM APC Regulation No. 9, and, therefore, a minor source permit is not required for the implementation of this remedy.**

### SOIL EXCAVATION (EARTHWORK) EMISSIONS

The earthwork emissions estimation is a two-step process. Initially, a conservative estimate of potential emissions was calculated for each earthwork activity and used to evaluate the applicability of Regulation No. 9. If the results indicate an emission potential



above the minimum quantities presented in Regulation No. 9, the results were further evaluated using predictive modeling consistent with EPA guidance.

The emissions potential of a particular analyte was calculated by conservatively assuming all of the mass of the analyte volatilizes during the associated earthwork activity. This represents the maximum amount of mass of the specific analyte in the volume of soil being excavated and managed based on the analyte concentration, soil volume disturbed, and typical bulk density.

Based on the results of the emission potential calculations for the earthwork activities, predicted emissions were calculated using modeling techniques. The predicted emissions modeling used the average concentration of detected analytes with estimated quantities. **Attachment H-1** describes these emission modeling calculations, which were based on the following EPA guidance document:

- Eklund, et al. 1997. Air Emissions from the Treatment of Soils Contaminated with Petroleum Fuels and Other Substances. Prepared for U.S. Environmental Protection Agency Office of Air and Radiation and Office of Research and Development Washington, D.C. EPA-600/R-97-116. October.

The following sections detail the potential and predicted model emissions for each remedial earthwork activity.

#### *Regrading Activities for Cap Installation*

As described in Section 11.0 of the RAWP, a new engineered cap will be installed across the majority of the Site with the exception of the wooded slopes along the western portions of the FPPA and SFA, three previously capped areas, and the substation area. Installation of the engineered cap will require significant re-grading of existing Site materials. We currently estimate the re-grading to achieve the subgrade elevations necessary for construction of the engineered cap will involve the management of approximately 22,500 cubic yards (CY) of excavated soil from across the Site. Note, this volume includes the excavation of the materials within the area of crystallized naphthalene identified in the North Fill Area. The following tables were prepared to estimate earthwork emissions from these regrading activities:

- **Table H-1A** Summary of Soil Analytical Results – Cap Installation
- **Table H-1B** Excavation Emissions Potential – Cap Installation
- **Table H-1C** Predicted Excavation Emissions – Cap Installation



## Potentials

To evaluate the excavation emissions potentials, GZA used data collected in the vicinity and depths associated with on-Site materials requiring management (excavation, transport, and backfill) to achieve the subgrade elevation for the engineered cap. The data used to perform this evaluation for these regrading activities consisted of 71 soil samples collected from across the Site at depths ranging from ground surface to 10 feet below ground surface (bgs) (**Table H-1A**). **Table H-1B** and the following present a summary of the total emissions potential (expressed in pounds) compared to RIDEM's Minimum Quantities (expressed in pounds/year) for cap installation activities.



Analyte	Average Measured Concentration in Soil (µg/g)	Maximum Measured Concentration in Soil (µg/g)	Total Excavation Emissions Potential using Average Measured Concentration (lb.)	Total Excavation Emissions Potential using Maximum Measured Concentration (lb.)	RIDEM Annual Minimum Quantity (lb.)
1,4-Dichlorobenzene	0.868	30	4.85E+01	1.65E+03	1.00E+01
2-Butanone (MEK)	22.093	750	1.23E+03	4.19E+04	4.00E+03
Acetone	22.129	750	1.24E+03	4.19E+04	2.00E+04
Benzene	0.766	30	4.28E+01	1.65E+03	1.00E+01
Bromomethane	1.512	60	8.45E+01	3.35E+03	7.00E+01
Carbon Disulfide	0.086	2.350	4.79E+00	1.31E+02	2.00E+03
Chloroform	0.751	30	4.20E+01	1.65E+03	2.00E+01
Ethylbenzene	7.533	140	4.21E+02	7.82E+03	9.00E+03
Isopropylbenzene	0.766	30	4.28E+01	1.65E+03	1.00E+03
m&p-Xylene	7.995	330	4.47E+02	1.84E+04	1.00E+03
MTBE	0.864	29.5	4.83E+01	1.65E+03	3.00E+03
Methylene Chloride	1.532	60	8.56E+01	3.35E+03	4.00E+02
Naphthalene	210.047	5,000	1.17E+04	2.79E+05	3.00E+00
o-Xylene	3.630	140	2.03E+02	7.82E+03	1.00E+03
Styrene	0.761	30	4.25E+01	1.65E+03	3.00E+03
Tetrachloroethene	0.763	30	4.26E+01	1.65E+03	2.00E+01
Toluene	1.231	30	6.88E+01	1.65E+03	3.00E+03
Trichlorofluoromethane	1.747	60	9.76E+01	3.35E+03	3.00E+03

**Note:**

Blue shading indicates calculated Total Excavation Emissions Potential exceeds RIDEM Annual Minimum Quantity defined in RIDEM APC No. 9.

GZA used both the average and maximum concentrations from the cap subgrade preparation data in order to calculate the total excavation emissions potential. This approach provides a very conservative evaluation because it assumes all the mass of the VOCs is emitted during the earthwork. As indicated (highlighted in blue) in the above summary of **Table H-1B**, 1,4-dichlorobenzene, 2-butanone, acetone, benzene,



bromomethane, chloroform, isopropylbenzene, m&p-xylene, methylene chloride, naphthalene, o-xylene, tetrachloroethene, and trichlorofluoromethane have an excavation emissions potential exceeding their respective RIDEM minimum quantity when the maximum concentration is used. 1,4-dichlorobenzene, benzene, bromomethane, chloroform, naphthalene and tetrachloroethene also have an excavation emissions potential exceeding its RIDEM minimum quantity when the average concentration is used.

### Estimated Emissions

Based on the results of the emissions potentials calculations described above, predicted emissions were calculated based on EPA consistent modeling. **Table H-1C** and the following summary provides the results of this modeling.

Analyte	Average Measured Concentration in Soil (µg/g)	Total Excavation Emissions (lb.)	RIDEM Annual Minimum Quantity (lb.)
1,4-Dichlorobenzene	0.868	3.96E-02	1.00E+01
2-Butanone (MEK)	22.093	7.37E+01	4.00E+03
Acetone	22.129	1.87E+02	2.00E+04
Benzene	0.766	2.27E+00	1.00E+01
Bromomethane	1.512	3.60E+01	7.00E+01
Carbon Disulfide	0.086	9.33E-01	2.00E+03
Chloroform	0.751	4.99E+00	2.00E+01
Ethylbenzene	7.533	2.62E+00	9.00E+03
Isopropylbenzene	0.766	1.26E-01	1.00E+03
m&p-Xylene	7.995	2.88E+00	1.00E+03
MTBE	0.864	5.07E-02	3.00E+03
Methylene Chloride	1.532	1.72E+01	4.00E+02
Naphthalene	210.047	1.80E-01	3.00E+00
o-Xylene	3.630	9.67E-01	1.00E+03
Styrene	0.761	2.01E-01	3.00E+03
Tetrachloroethene	0.763	5.06E-01	2.00E+01
Toluene	1.231	1.17E+00	3.00E+03
Trichlorofluoromethane	1.747	3.42E+01	3.00E+03

**Note:**

Red Highlighting indicates the Total Excavation Emissions exceeds RIDEM Annual Minimum Quantity defined in RIDEM APC No. 9.

The model uses the average concentration for each compound listed above, the estimated area of disturbance during the re-grading activities, an estimated average depth of re-grading, and an estimated time to complete the re-grading work to calculate the total estimated emissions for comparison to RIDEM’s Annual Minimum Quantities.

Based on these assumptions, no exceedances of RIDEM's Annual Minimum Quantities were noted. Refer to **Table H-1C**.

### *Containment Wall*



As described in Section 11.0 of the RAWP, an approximately 1,300 feet long containment wall will be installed along the eastern (downgradient) edge of the Site along the riverfront in the FPPA and portions of the FGPA and SFA. This wall will be a steel sheet pile wall and portions of the wall (approximately 580 feet) will be installed within the river to serve as a replacement for the existing deteriorated bulkheads. For the purpose of this evaluation, we have assumed that pre-excitation will be required for the upland portion of the containment wall (approximately 720-feet) and that the dimensions of the pre-excitation will be 3.5-feet wide to 20 feet below grade. Under this conservation assumption, construction of the containment wall will result in the generation of approximately 1,867 CY of impacted material.

The following tables were prepared to estimate earthwork emissions from the containment wall installation activities:

- **Table H-2A** Summary of Soil Analytical Results – Containment Wall
- **Table H-2B** Excavation Emissions Potential – Containment Wall
- **Table H-2C** Predicted Excavation Emissions – Containment Wall

### **Potentials**

To evaluate potential excavation emissions associated with the containment wall installation, GZA used data collected in the vicinity and at the depths of this proposed wall. The data used in the evaluation consisted of 15 soil samples as presented in **Table H-2A**. **Table H-2B** and the following present a summary of the total emissions potential (expressed in pounds) compared to RIDEM's Minimum Quantities (expressed in pounds/year) for containment wall installation activities on Site.



Analyte	Average Measured Concentration in Soil (µg/g)	Maximum Measured Concentration in Soil (µg/g)	Total Excavation Emissions Potential using Average Measured Concentration (lb.)	Total Excavation Emissions Potential using Maximum Measured Concentration (lb.)	RIDEM Annual Minimum Quantity (lb.)
1,4-Dichlorobenzene	1.543	12	1.29E+01	1.00E+02	1.00E+01
2-Butanone (MEK)	39.200	310	3.28E+02	2.59E+03	4.00E+03
Acetone	39.200	310	3.28E+02	2.59E+03	2.00E+04
Benzene	6.954	45	5.82E+01	3.77E+02	1.00E+01
Bromomethane	2.722	24	2.28E+01	2.01E+02	7.00E+01
Carbon Disulfide	0.051	0.130	4.23E-01	1.08E+00	2.00E+03
Chloroform	1.375	12	1.15E+01	1.00E+02	2.00E+01
Ethylbenzene	22.374	200	1.87E+02	1.67E+03	9.00E+03
Isopropylbenzene	1.376	12	1.15E+01	1.00E+02	1.00E+03
m&p-Xylene	19.936	100	1.67E+02	8.37E+02	1.00E+03
MTBE	1.543	12	1.29E+01	1.00E+02	3.00E+03
Methylene Chloride	2.763	24	2.31E+01	2.01E+02	4.00E+02
Naphthalene	3,240.31	37000	2.71E+04	3.10E+05	3.00E+00
o-Xylene	11.516	60.0	9.64E+01	5.02E+02	1.00E+03
Styrene	3.421	18.0	2.86E+01	1.51E+02	3.00E+03
Tetrachloroethene	1.375	12	1.15E+01	1.00E+02	2.00E+01
Toluene	8.409	41.5	7.04E+01	3.47E+02	3.00E+03
Trichlorofluoromethane	3.053	24	2.56E+01	2.01E+02	3.00E+03

**Note:**

Blue shading indicates calculated Total Excavation Emissions Potential exceeds RIDEM Annual Minimum Quantity defined in RIDEM APC No. 9.

Using both the average and maximum concentrations, GZA calculated total emissions potentials for all the detected VOCs with RIDEM minimum quantities. As indicated (highlighted in blue) in the above summary of **Table H-2C**, 1,4-dichlorobenzene, benzene, bromomethane, chloroform, naphthalene, and tetrachloroethene have an excavation emissions potential exceeding their respective RIDEM minimum quantity when the maximum concentration is used. 1,4-dichlorobenzene, benzene, and naphthalene also have an excavation emissions potential exceeding its RIDEM minimum quantity when the average concentration is used.

**Estimated Emissions**

Based on the results of the emissions potentials calculations described above, predicted emissions were calculated based on modeling. **Table H-2C** and the following summary provides the results of these calculations.



Analyte	Average Measured Concentration in Soil (µg/g)	Total Excavation Emissions (lb.)	RIDEM Annual Minimum Quantity (lb.)
1,4-Dichlorobenzene	1.543	1.63E-02	1.00E+01
2-Butanone (MEK)	39.200	3.03E+01	4.00E+03
Acetone	39.200	7.68E+01	2.00E+04
Benzene	6.954	4.78E+00	1.00E+01
Bromomethane	2.722	1.50E+01	7.00E+01
Carbon Disulfide	0.051	1.28E-01	2.00E+03
Chloroform	1.375	2.12E+00	2.00E+01
Ethylbenzene	22.374	1.80E+00	9.00E+03
Isopropylbenzene	1.376	5.23E-02	1.00E+03
m&p-Xylene	19.936	1.66E+00	1.00E+03
MTBE	1.543	2.62E+00	3.00E+03
Methylene Chloride	2.763	7.18E+00	4.00E+02
Naphthalene	3,240.311	6.43E-01	3.00E+00
o-Xylene	11.516	7.11E-01	1.00E+03
Styrene	3.421	2.10E-01	3.00E+03
Tetrachloroethene	1.375	2.12E-01	2.00E+01
Toluene	8.409	1.86E+00	3.00E+03
Trichlorofluoromethane	3.053	1.38E+01	3.00E+03

**Note:**

Red Highlighting indicates the Total Excavation Emissions exceeds RIDEM Annual Minimum Quantity defined in RIDEM APC No. 9.

The model uses the average concentration for each compound listed above, the estimated area of disturbance during the pre-excavation for the containment wall, an excavation depth of 20 feet, and an estimated duration for the pre-excavation work to calculate the total estimated emissions for comparison to RIDEM’s Annual Minimum Quantities. Based on these assumptions, no exceedances of RIDEM’s Annual Minimum Quantities were noted. Refer to **Table H-2C**.

**TANK/VAULTS PRODUCT REMOVAL EMISSIONS**

As described in Section 11.0 of the RAWP, remedial activities include the removal of product from three (3) structures/vaults located in the FPPA and FGPA to mitigate future human exposure and mitigate these materials from acting as an on-going source to groundwater.

The former underground storage tank (UGTT-1) is located in the center of the FGPA. The contents of UGTT-1 will be removed for off-Site disposal and the tank cleaned and removed. Based on previous investigations described in the January 2011 *SIDR*, GZA estimates the excavation will extend approximately 4 feet deep over an approximately 10



feet long by 10 feet wide area resulting in approximately 15 cy of impacted material for off-Site disposal. The contents of UGTT-1 were described to consist of a mix of water with heavy petroleum-like- “scum” on the surface. Approximately 2.5 feet of petroleum/fuel-oil-like impacted water was measured within UGTT-1. TPH fingerprinting indicated the presence of a weathered petroleum product in the boiling range of Fuel Oil No. 2/diesel.

The raceway located in the eastern portions of the FGPA and FPPA contains two (2) concrete vaults. The contents of these vaults will be removed for off-Site disposal, the vaults will be cleaned and backfilled in place. Based on previous investigations conducted in June 2010 and September 2017, the first vault is estimated to be approximately 9 feet deep over an approximately 7 feet long by 3.5 feet wide area and the second vault is estimated to be approximately 9 feet deep over an approximately 5 feet long by 5 feet wide area. During June 2010 and September 2017 investigations, contents of the concrete vaults were observed to consist of petroleum-like product. TPH fingerprinting of a nearby raceway pipe indicated the presence of a petroleum product in the boiling range of Fuel Oil No. 4. Note emissions modeled from removal of the raceway pipe are included below.

To evaluate the potential emissions from the removal of UGTT-1 and the two concrete structures/vaults, the contents were assumed to be fuel oil #2/diesel consistent with the fingerprint analysis from UGTT-1. Analytical results of the LNAPL sample collected from this well, as presented in **Table H-3A**, indicated concentrations of 1,2,4-trimethylbenzene and naphthalene.

Predicted emissions were calculated based on modeling. The predicted emissions modeling used the concentration of detected analytes from the LNAPL sample. **Attachment H-2** describes these emission modeling calculations, which were based on the following EPA guidance document (and the ideal gas law):

- Eklund, et al. 1997. Air Emissions from the Treatment of Soils Contaminated with Petroleum Fuels and Other Substances. Prepared for U.S. Environmental Protection Agency Office of Air and Radiation and Office of Research and Development Washington, D.C. EPA-600/R-97-116. October.

The following tables were prepared to estimate earthwork emissions from the removal of UGTT-1 and the 2 vaults:

- **Table H-3A** Summary of LNAPL Analytical Results – MW-210
- **Table H-3B** Predicted Excavation Emissions – Tank/Vaults

GZA modeled the emissions consistent with published EPA guidance to estimate the predicted emissions that would be generated from the activities associated with the removal of these structures. **Table H-3B** and the following summary provides the results of this model.





Analyte	Average Measured Concentration in NAPL (mg/kg)	Total Emissions from Tank and Vaults (lb.)	RIDEM Annual Minimum Quantity (lb.)
1,4-Dichlorobenzene	175	8.83E-05	1.00E+01
2-Butanone (MEK)	4500	1.27E-01	4.00E+03
Acetone	4500	2.91E-01	2.00E+04
Benzene	175	3.82E-03	1.00E+01
Bromomethane	345	9.89E-02	7.00E+01
Carbon Disulfide	175	1.28E-02	2.00E+03
Chloroform	175	9.01E-03	2.00E+01
Ethylbenzene	175	5.61E-04	9.00E+03
Isopropylbenzene	175	2.90E-04	1.00E+03
m&p-Xylene	345	1.36E-03	1.00E+03
MTBE	175	8.73E-03	3.00E+03
Methylene Chloride	345	2.82E-02	4.00E+02
Naphthalene	690	6.23E-06	3.00E+00
o-Xylene	175	5.15E-04	1.00E+03
Styrene	175	4.63E-04	3.00E+03
Tetrachloroethene	175	1.08E-03	2.00E+01
Toluene	175	1.28E-03	3.00E+03
Trichlorofluoromethane	345	4.40E-02	3.00E+03

**Note:**

Red Highlighting indicates the Total Excavation Emissions exceeds RIDEM Annual Minimum Quantity defined in RIDEM APC No.9.

The model uses the average concentration for each compound listed above, the estimated area of disturbance during the removal of the tanks/structures and associated product, an excavation depth of 4 feet for UGTT and 9 feet for the concrete vaults, and an estimated duration for the work to calculate the total estimated emissions for comparison to RIDEM's Annual Minimum Quantities. Based on these assumptions, no exceedances of RIDEM's Annual Minimum Quantities were noted. Refer to **Table H-3B**.



## RACEWAY PIPING REMOVAL/CLEANING EMISSIONS

As described in Section 11.0 of the RAWP, there is an estimated 840 feet of cast iron raceway pipe and 218 feet of wooden raceway pipe located in the eastern portions of the FGPA and FPPA. This piping and the associated product within the piping will be removed to mitigate future human exposure and mitigate these materials from acting as an on-going source to groundwater.

When modelling the 840 feet of the cast iron raceway pipe of varying size and depth, conservative assumptions were made. The assumed diameter of the cast iron piping is 1.17 feet (largest observed diameter) and assumed depth is 1 foot (calculated weighted average) resulting in approximately 36 cy of impacted material for off-Site disposal. The 218 feet of wooden raceway pipe extends approximately 2 feet deep and is approximately 1.5 feet in diameter resulting in approximately 25 cy of impacted material for off-Site disposal. Similar to the raceway vaults previously discussed, the contents of the raceway piping consisted of a petroleum-like product. TPH fingerprinting of a sample from the raceway pipe indicated the presence of a petroleum product in the boiling range of Fuel Oil No. 4.

To evaluate the emissions from the removal of the raceway piping, the contents were assumed to be comparable to observed LNAPL from the same well, MW-210, as discussed in the previous section for removal of the concrete structures. As previously discussed, the characteristics of the chromatogram for the sample of LNAPL from MW-210 indicated the presence of a petroleum product in the boiling range of fuel oil #2/diesel. Analytical results of the LNAPL sample collected from this well, as presented in **Table H-3A**, indicated concentrations of 1,2,4-trimethylbenzene and naphthalene.

Predicted emissions were calculated based on modeling. The predicted emissions modeling used the concentration of detected analytes from the LNAPL sample. **Attachment H-3** describes these emission modeling calculations, which were based on the following EPA guidance document (and the ideal gas law):

- Eklund, et al. 1997. Air Emissions from the Treatment of Soils Contaminated with Petroleum Fuels and Other Substances. Prepared for U.S. Environmental Protection Agency Office of Air and Radiation and Office of Research and Development Washington, D.C. EPA-600/R-97-116. October.

The following tables were prepared to estimate earthwork emissions from the tank/vaults removal/cleaning activities:

- **Table H-3A** Summary of LNAPL Analytical Results – MW-210
- **Table H-3C** Predicted Excavation Emissions – Cast Iron Raceway Piping
- **Table H-3D** Predicted Excavation Emissions – Wooden Raceway Piping

GZA modeled the emissions consistent with published EPA guidance to estimate the predicted emissions that would be generated from the activities associated with the removal of this raceway piping. The following summary provides combines the results of the two raceway piping models.



Analyte	Average Measured Concentration in NAPL (mg/kg)	Total Emissions from Cast Iron Piping (lb.)	Total Emissions from Wooden Pipe (lb.)	Total Emissions from Raceway Piping (lb.)	RIDEM Annual Minimum Quantity (lb.)
1,4-Dichlorobenzene	175	9.43E-05	4.02E-05	1.34E-04	1.00E+01
2-Butanone (MEK)	4500	1.36E-01	5.79E-02	1.93E-01	4.00E+03
Acetone	4500	3.11E-01	1.33E-01	4.44E-01	2.00E+04
Benzene	175	4.08E-03	1.74E-03	5.83E-03	1.00E+01
Bromomethane	345	1.06E-01	4.51E-02	1.51E-01	7.00E+01
Carbon Disulfide	175	1.36E-02	5.82E-03	1.95E-02	2.00E+03
Chloroform	175	9.62E-03	4.10E-03	1.37E-02	2.00E+01
Ethylbenzene	175	5.99E-04	2.56E-04	8.54E-04	9.00E+03
Isopropylbenzene	175	3.10E-04	1.32E-04	4.42E-04	1.00E+03
m&p-Xylene	345	1.45E-03	6.20E-04	2.07E-03	1.00E+03
MTBE	175	9.32E-03	3.98E-03	1.33E-02	3.00E+03
Methylene Chloride	345	3.01E-02	1.28E-02	4.29E-02	4.00E+02
Naphthalene	690	6.66E-06	2.84E-06	9.50E-06	3.00E+00
o-Xylene	175	5.50E-04	2.35E-04	7.85E-04	1.00E+03
Styrene	175	4.94E-04	2.11E-04	7.05E-04	3.00E+03
Tetrachloroethene	175	1.15E-03	4.92E-04	1.64E-03	2.00E+01
Toluene	175	1.36E-03	5.82E-04	1.95E-03	3.00E+03
Trichlorofluoromethane	345	4.70E-02	2.00E-02	6.70E-02	3.00E+03

**Note:**

Red Highlighting indicates the Total Excavation Emissions exceeds RIDEM Annual Minimum Quantity defined in RIDEM APC No.9.

The model uses the average concentration for each compound listed above, the estimated area of disturbance during the removal of the cast iron and wood piping and associated product, an excavation depth ranging from 0.5 to of 2 feet, and an estimated duration for the work to calculate the total estimated emissions for comparison to RIDEM’s Annual Minimum Quantities. Based on these assumptions, no exceedances of RIDEM’s Annual Minimum Quantities were noted. Refer to **Tables H-3C** and **H-3D**.

**TOTAL EMISSIONS**

The total predicted emissions associated with all of the anticipated Site remedial earthwork activities associated with installation of the engineered cap, installation of the containment wall, and the source area removals were calculated by summing predicted

emissions for each analyte. **Table H-4** and the following present a summary of the predicted total excavation emissions (expressed in pounds) compared to RIDEM's Minimum Quantities (expressed in pounds/year) published in Regulation No. 9, Appendix A. This list only includes those detected compounds for which there are minimum quantities available.



Analyte	Cap Installation Emissions (lb.)	Containment Wall Emissions (lb.)	Tank/Vault Emissions (lb.)	Cast Iron Raceway Piping Emissions (lb.)	Wooden Raceway Piping Emissions (lb.)	Total Excavation Emissions (lb.)	RIDEM Annual Minimum Quantity (lb.)
1,4-Dichlorobenzene	3.96E-02	1.63E-02	8.83E-05	9.43E-05	4.02E-05	5.62E-02	1.00E+01
2-Butanone (MEK)	7.37E+01	3.03E+01	1.27E-01	1.36E-01	5.79E-02	1.04E+02	4.00E+03
Acetone	1.87E+02	7.68E+01	2.91E-01	3.11E-01	1.33E-01	2.64E+02	2.00E+04
Benzene	2.27E+00	4.78E+00	3.82E-03	4.08E-03	1.74E-03	7.06E+00	1.00E+01
Bromomethane	3.60E+01	1.50E+01	9.89E-02	1.06E-01	4.51E-02	5.13E+01	7.00E+01
Carbon Disulfide	9.33E-01	1.28E-01	1.28E-02	1.36E-02	5.82E-03	1.09E+00	2.00E+03
Chloroform	4.99E+00	2.12E+00	9.01E-03	9.62E-03	4.10E-03	7.13E+00	2.00E+01
Ethylbenzene	2.62E+00	1.80E+00	5.61E-04	5.99E-04	2.56E-04	4.43E+00	9.00E+03
Isopropylbenzene	1.26E-01	5.23E-02	2.90E-04	3.10E-04	1.32E-04	1.79E-01	1.00E+03
m&p-Xylene	2.88E+00	1.66E+00	1.36E-03	1.45E-03	6.20E-04	4.54E+00	1.00E+03
MTBE	5.07E-02	2.62E+00	8.73E-03	9.32E-03	3.98E-03	2.70E+00	3.00E+03
Methylene Chloride	1.72E+01	7.18E+00	2.82E-02	3.01E-02	1.28E-02	2.44E+01	4.00E+02
Naphthalene	1.80E-01	6.43E-01	6.23E-06	6.66E-06	2.84E-06	8.23E-01	3.00E+00
o-Xylene	9.67E-01	7.11E-01	5.15E-04	5.50E-04	2.35E-04	1.68E+00	1.00E+03
Styrene	2.01E-01	2.10E-01	4.63E-04	4.94E-04	2.11E-04	4.12E-01	3.00E+03
Tetrachloroethene	5.06E-01	2.12E-01	1.08E-03	1.15E-03	4.92E-04	7.20E-01	2.00E+01
Toluene	1.17E+00	1.86E+00	1.28E-03	1.36E-03	5.82E-04	3.03E+00	3.00E+03
Trichlorofluoromethane	3.42E+01	1.38E+01	4.40E-02	4.70E-02	2.00E-02	4.81E+01	3.00E+03

**Note:**

Red Highlighting indicates the Total Excavation Emissions exceeds RIDEM Annual Minimum Quantity defined in RIDEM APC No. 9.

**CONCLUSION**

**The results of this predictive modeling indicate that the earthwork activities do not have the potential to increase emissions by greater than the minimum quantities as specified in Appendix A of RIDEM APC Regulation No. 9, and, therefore, a minor source permit is not required for the construction of the Former Tidewater Facility remedy.**

## ATTACHMENTS

**H-1** Soil Excavations Calculations

**H-2** Tank/Vault Removal Calculations

**H-3** Raceway Removal Calculations



## TABLES

**Table H-1A** Summary of Soil Analytical Results – Cap Installation

**Table H-1B** Excavation Emissions Potential – Cap Installation

**Table H-1C** Predicted Excavation Emissions – Cap Installation

**Table H-2A** Summary of Soil Analytical Results – Containment Wall

**Table H-2B** Excavation Emissions Potential – Containment Wall

**Table H-2C** Predicted Excavation Emissions – Containment Wall

**Table H-3A** Summary of LNAPL Analytical Results – MW-210

**Table H-3B** Predicted Excavation Emissions – Tank/Vaults

**Table H-3C** Predicted Excavation Emissions – Cast Iron Raceway Piping

**Table H-3D** Predicted Excavation Emissions – Wooden Raceway Piping

**Table H-4** Predicted Excavation Emissions Summary

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**ATTACHMENT H-1**  
**SOIL EXCAVATION EMISSIONS CALCULATIONS**

Former Tidewater Facility  
Pawtucket, Rhode Island

To estimate potential volatile emissions associated with the planned remedial soil excavations at the Former Tidewater Facility (“the Site”), GZA GeoEnvironmental, Inc. (GZA) used the following modified versions of the equations given in Appendix D of “Air Emissions from the Treatment of Soils Contaminated with Petroleum Fuels and Other Substances” (Eklund 1997):

First, the total excavation emissions potential is calculated as a benchmark:

*Total Excavation Emissions Potential:*

$$E_{Potential} = C_{i,Soil} \times S_v \times \beta$$

Where,

$E_{Potential}$  = Total Mass of Component i in a given volume of soil in grams (g);

$C_{i,Soil}$  = Concentration of Component i in the Soil in micrograms of Component i per gram of Soil (ug/g);

$\beta$  = Typical Bulk Density in grams per cubic centimeter (g/cm<sup>3</sup>) (assumed to be 1.5 g/cm<sup>3</sup> – Eklund 1997); and

$S_v$  = Total Volume of Soil Moved in cubic meters (m<sup>3</sup>).

*Average Total Emissions (detailed model):*

If the Average Total Emissions calculated by this detailed model (Eklund 1997) exceeds the calculated Total Excavation Emissions Potential, the Total Excavation Emissions Potential will be used.

$$E = E_{PS} + E_{DIFF}$$

$$E_{PS} = \frac{P_i MW 10^6 E_a S_v ExC}{R T}$$

$$E_{DIFF} = \frac{(C)(10,000)(SA)(t_v)}{\left(\frac{E_a}{K_{eq}k_g}\right) + \left(\frac{\pi t}{D_e K_{eq}}\right)^{1/2}}$$



Where,

$E$  = Total Emissions from Excavation of Soil in g;

$E_{PS}$  = Total Emissions due to Soil Pore Space Gas in g;

$E_{DIFF}$  = Total Emissions due to Diffusion in g;

$P_i$  = Partial Pressure of Component  $i$  in millimeters of mercury (mm Hg)<sup>1</sup>;

$MW$  = Molecular Weight in grams per mole (g/mol);

$10^6$  = Conversion Factor of  $\text{cm}^3/\text{m}^3$ ;

$E_a$  = Air-Filled Porosity (0.35 for wet, or compacted soil; 0.55 for dry, uncompacted soil – Eklund (1997));

$S_v$  = Total Volume of Soil Moved in  $\text{m}^3$ ;

$ExC$  = Soil-Gas to Atmosphere Exchange Constant (0.10 for wet or high-clay content soils; 0.33 for dry, sandy soils from Eklund - 1997);

$R$  = Universal Gas Constant in  $\text{mm-Hg}\cdot\text{cm}^3/\text{mol}/\text{K}$  (62,361  $\text{mm-Hg}\cdot\text{cm}^3/\text{mol}/\text{K}$ );

$T$  = Temperatures in K (assumed to be 15°C);

$C$  = Mass Loading of Component  $i$  in soil in  $\text{g}/\text{cm}^3$ ;

10,000 = Conversion Factor of square centimeters per square meter ( $\text{cm}^2/\text{m}^2$ ); and

$SA$  = Total Emitting Surface Area in square meters ( $\text{m}^2$ ). GZA assumed the Total Emitting Surface Area to be the sides and bottom of the excavation and the sides and top of the stockpile.

$D_e$  = Effective Diffusivity in Air in square centimeter per second ( $\text{cm}^2/\text{s}$ );

$K_{eq}$  = Equilibrium Coefficient;

$t_v$  = Time the Volume of Soil Moved is emitting in seconds (s) (360 s – Eklund (1997));

$k_g$  = Gas-Phase Mass Transfer Coefficient in centimeter per second (cm/s) (Default of 0.15 cm/s – Eklund (1997)); and

$t$  = Time that the Instantaneous Emission Rate approximates the Average Emission Rate over the 360 second period that Emissions from Freshly Excavated Soil are assumed to be Significant in s (60 s – Eklund (1997)).

$P_i$  is calculated by:

For this scenario, the partial pressure was estimated using Raoult's Law assuming the constituents are in a mixture with the other organic matter in the soil.

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<sup>1</sup> Note that because the impacts at the Site are primarily not separate phase, we have used the partial pressure as opposed to the vapor pressure of the pure component.

*Raoult's Law:*

$$P_i = P_i^* x_i$$

Where,

$P_i$  = Partial Pressure of the Component i in the Mixture;

$P_i^*$  = Vapor Pressure of the pure Component i; and

$x_i$  = Mole Fraction of the Component i in the Mixture (moles component/total moles).

$$x_i = \frac{10^{-6} C_{i,Mixture} MW_{Mixture}}{MW_i}$$

Where,

$10^{-6}$  = Conversion Factor of kilogram per milligram (kg/mg);

$MW_{Mixture}$  = Molecular Weight of Mixture in g/mol (assumed to be 250 g/mol);

$MW_i$  = Molecular Weight of Component i in g/mol; and

$C_{i,Mixture}$  = Concentration of Component i in the Mixture in milligrams of Component i per kilogram of Mixture (mg/kg).

$$C_{i,Mixture} = \frac{C_{i,Soil}}{TOC}$$

Where,

$C_{i,Mixture}$  = Concentration of Component i in the Mixture in milligrams of Component i per kilogram of Mixture (mg/kg);

$C_{i,Soil}$  = Concentration of Component i in the Soil in micrograms of Component i per gram of Soil (ug/g); and

$TOC$  = Fraction of Total Organic Carbon in the Soil (g/g). Because Site-specific TOC data was not available, the default value of 0.002 from the USEPA's Soil Screening Guidance: User's Guide (1996) was used to be conservative.

We've assumed a soil temperature of 15°C in our calculations. We have therefore utilized the Clausius-Clapeyron equation to calculate vapor pressures at 15°C from those in the literature (typically 25°C):

*Clausius-Clapeyron Equation:*

$$\ln\left(\frac{P_1}{P_2}\right) = \left(\frac{\Delta H_{vap}}{R}\right)\left(\frac{1}{T_2} - \frac{1}{T_1}\right)$$

Where,

$P_1$  = Vapor Pressure at a Known Point;

$P_2$  = Vapor Pressure at a Given Point;

$T_1$  = Temperature at a Known Point in Kelvin (K);

$T_2$  = Temperature at a Given Point in K;

$\Delta H_{vap}$  = Enthalpy of Vaporization of Component i in kilojoules per mole (kJ/mol); and

$R$  = Universal Gas Constant in kilojoules per Kelvin per mole (8.314E-03 kJ/K/mol).

$C$  (Mass Loading of Component i in soil in g/cm<sup>3</sup>) is calculated by:

$$C = 10^{-6} C_{i,Soil} \beta$$

Where,

$10^{-6}$  = Conversion Factor of gram per microgram (g/ug);

$C_{i,Soil}$  = Concentration of Component i in the Soil in micrograms of Component i per gram of Soil (ug/g); and

$\beta$  = Typical Bulk Density in g/m<sup>3</sup>; (assumed to be 1.5 g/m<sup>3</sup> – Eklund (1997)).

$K_{eq}$  is calculated by:

$$K_{eq} = \frac{P_i MW_i E_a}{R T C}$$

Where,

$P_i$  = Partial Pressure of the Component i in the Mixture in mm Hg;

$MW_i$  = Molecular Weight of Component i in g/mol;

$E_a$  = Air-Filled Porosity (0.35 for wet, or compacted soil; 0.55 for dry, uncompacted soil – Eklund (1997));

$R$  = Universal Gas Constant in mm-Hg\*cm<sup>3</sup>/mol/K (62,361 mm-Hg\*cm<sup>3</sup>/mol/K);

$T$  = Temperatures in K (assumed to be 15°C);

$C$  = Mass Loading of Component i in soil in g/cm<sup>3</sup>;

$D_e$  is calculated by:

$$D_e = \frac{D_a (E_a)^{3.33}}{(E_T)^2}$$

Where,

$D_a$  = Diffusivity in Air of Component i in cm<sup>2</sup>/s (Default of 0.1 was used when chemical-specific values could not be found.);

$E_a$  = Air-Filled Porosity (0.35 for wet, or compacted soil; 0.55 for dry, uncompacted soil – Eklund (1997)); and

$E_T$  = Total Porosity (0.35 for compacted soil; 0.55 for uncompacted soil – Eklund (1997)).

For impacted soils to be managed on-Site (e.g., if it is not directly loaded into a truck but is first stockpiled), an additional Total Emissions due to Soil Pore Space Gas factor will be included in the Average Total Emissions to account for the additional emissions during soil handling and stockpiling. As a conservative measure, for losses during management of materials, GZA will utilize the Total Emissions due to Soil Pore Space Gas that was calculated above for losses during excavation. This is conservative since the concentrations in the re-handled soil will be lower than in the soil during excavation.

**References:**

- Eklund, et al. 1997. Air Emissions from the Treatment of Soils Contaminated with Petroleum Fuels and Other Substances. Prepared for U.S. Environmental Protection Agency Office of Air and Radiation and Office of Research and Development Washington, D.C. EPA-600/R-97-116. October.
- RIDEM. 2009. Air Pollution Control Regulation No. 9: Air Pollution Control Permits. December.
- USEPA, 1996. Soil Screening Guidance: User's Guide. July.

**ATTACHMENT H-2**  
**TANK / VAULT REMOVAL EMISSIONS CALCULATIONS**  
**(UNDERGROUND STORAGE TANK (UGTT-1) AND RACEWAY VAULTS)**

Former Tidewater Facility  
Pawtucket, Rhode Island

To estimate the emissions from the removal of UGTT-1 and the two raceway structures/vaults at the Former Tidewater Facility (“the Site”), GZA GeoEnvironmental, Inc. (GZA) assumed that the air in the structures was in equilibrium with the non-aqueous phase liquid (NAPL) in the structures and that all of the air would be released from the structures once removal began. GZA has assumed that UGTT-1 is 10 feet long by 10 feet wide by 4 feet deep. GZA also estimates that the first raceway vault is 7 feet long by 3.5 feet wide by 9 feet deep and that the second raceway vault is 5 feet long by 5 feet wide by 9 feet deep. GZA has assumed that tank and vaults are 90% full of NAPL. These emissions were calculated using the following equations:

Total Tank/Vault (TV) Emissions:

$$E = m_{i,TV\ Headspace} = C_{i,headspace} * V_{TV\ Headspace}$$

Where,

$E$  = Total mass emitted from the Tank/Vault in grams (g);

$V_{TV\ Headspace}$  = Volume of the Tank’s/Vault’s Headspace in cubic meters (m<sup>3</sup>) (assumed to be 10% of the structures’ volumes);

$m_{i,TV\ Headspace}$  = Amount of the Component i in the Tank’s/Vault’s Headspace in g;

$C_{i,headspace}$  = Concentration of Constituent i in Tank’s/Vault’s Headspace (g/m<sup>3</sup>)

Ideal Gas Law:

$$\frac{n}{V_{TV\ Headspace}} = \frac{P_i}{R T}$$

$$C_{i,headspace} = \frac{n}{V_{TV\ Headspace}} * MW_i = \frac{P_i}{R T} MW_i$$

Where,

$P_i$  = Partial Pressure of Component i in atmospheres (atm)<sup>1</sup>;

$n$  = Amount of the Component i in the Tank’s/Vault’s Headspace in moles (mol);

$MW_i$  = Molecular Weight of the Component i in grams per mole (g/mol);

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<sup>1</sup> Note that because the impacts at the Site are generally not pure-phase, we have used the partial pressure as opposed to the vapor pressure of the pure component.



$T$  = Temperature of Mixture in Kelvin (K); and

$R$  = Universal Gas Constant in atmospheres cubic meters per Kelvin per mole (8.314E-03 atm\*m<sup>3</sup>/K/mol).

$P_i$  is calculated by:

For this scenario, the partial pressure was estimated using Raoult's Law using the constituent's concentration in NAPL.

Raoult's Law:

$$P_i = P_i^* x_i$$

Where,

$P_i$  = Partial Pressure of the Component i in the Mixture;

$P_i^*$  = Vapor Pressure of the pure Component i; and

$x_i$  = Mole Fraction of the Component i in the Mixture (moles component/total moles).

$$x_i = \frac{10^{-6} C_{i,Mixture} MW_{Mixture}}{MW_i}$$

Where,

$10^{-6}$  = Conversion Factor of kilogram per milligram (kg/mg);

$MW_{Mixture}$  = Molecular Weight of Mixture in g/mol (assumed to be 250 g/mol); and

$C_{i,Mixture}$  = Concentration of Component i in the Mixture in milligrams of Component i per kilogram of Mixture (mg/kg) (the average measured constituent concentrations in NAPL located in wells on-Site was used).

We've assumed a NAPL temperature of 15°C in our calculations. We have therefore utilized the Clausius-Clapeyron equation to calculate vapor pressures at 15°C from those in the literature (typically 25°C):

Clausius-Clapeyron Equation:

$$\ln\left(\frac{P_1}{P_2}\right) = \left(\frac{\Delta H_{vap}}{R}\right)\left(\frac{1}{T_2} - \frac{1}{T_1}\right)$$

Where,

$P_1$  = Vapor Pressure at a Known Point;

$P_2$  = Vapor Pressure at a Given Point;

$T_1$  = Temperature at a Known Point in Kelvin (K);

$T_2$  = Temperature at a Given Point in K;

$\Delta H_{vap}$  = Enthalpy of Vaporization of Component i in kilojoules per mole (kJ/mol); and  
 $R$  = Universal Gas Constant in kilojoules per Kelvin per mole (8.314E-03 kJ/K/mol).

**References:**

- Eklund, et al. 1997. Air Emissions from the Treatment of Soils Contaminated with Petroleum Fuels and Other Substances. Prepared for U.S. Environmental Protection Agency Office of Air and Radiation and Office of Research and Development Washington, D.C. EPA-600/R-97-116. October.
- RIDEM. 2009. Air Pollution Control Regulation No. 9: Air Pollution Control Permits. December.

**ATTACHMENT H-3  
RACEWAY REMOVAL EMISSIONS CALCULATIONS  
(PIPING SECTIONS)**

Former Tidewater Facility  
Pawtucket, Rhode Island

To estimate the emissions from the removal of the wooden and cast iron portions of the raceway at the Former Tidewater Facility (“the Site”), GZA GeoEnvironmental, Inc. (GZA) assumed that the air in the piping was in equilibrium with the non-aqueous phase liquid (NAPL) in the raceway and that all of the air would be released from the raceway once removal began. GZA has assumed that the raceway consists of approximately 840 linear feet (LF) of 14-inch diameter cast iron piping and 218 linear feet (LF) of 18-inch diameter wooden pipe. GZA has assumed that the raceway piping is 90% full of NAPL. All excavation to uncover the raceway piping is included in the site prep soil excavation emissions calculations. The raceway piping emissions were calculated using the following equations:

Total Raceway Emissions:

$$E = m_{i,Raceway\ Headspace} = C_{i,headspace} * V_{Raceway\ Headspace}$$

Where,

$E$  = Total mass emitted from the Raceway in grams (g);

$V_{Pipe\ Headspace}$  = Volume of the Raceways’s Headspace in cubic meters ( $m^3$ ) (assumed to be 10% of 14-inch diameter cast iron pipe and 18-inch diameter wooden pipe);

$m_{i,Raceway\ Headspace}$  = Amount of the Component  $i$  in the Raceway’s Headspace in g;

$C_{i,headspace}$  = Concentration of Constituent  $i$  in Raceway’s Headspace ( $g/m^3$ )

Ideal Gas Law:

$$\frac{n}{V_{Raceway\ Headspace}} = \frac{P_i}{R T}$$

$$C_{i,headspace} = \frac{n}{V_{Raceway\ Headspace}} * MW_i = \frac{P_i}{R T} MW_i$$

Where,

$P_i$  = Partial Pressure of Component  $i$  in atmospheres (atm)<sup>1</sup>;

$n$  = Amount of the Component  $i$  in the Raceway’s Headspace in moles (mol);

---

<sup>1</sup> Note that because the impacts at the Site are not pure-phase, we have used the partial pressure as opposed to the vapor pressure of the pure component.

$MW_i$  = Molecular Weight of the Component i in grams per mole (g/mol);

$T$  = Temperature of Mixture in Kelvin (K); and

$R$  = Universal Gas Constant in atmospheres cubic meters per Kelvin per mole (8.314E-03 atm\*m<sup>3</sup>/K/mol).

$P_i$  is calculated by:

For this scenario, the partial pressure was estimated using Raoult's Law using the constituent's concentration in NAPL.

Raoult's Law:

$$P_i = P_i^* x_i$$

Where,

$P_i$  = Partial Pressure of the Component i in the Mixture;

$P_i^*$  = Vapor Pressure of the pure Component i; and

$x_i$  = Mole Fraction of the Component i in the Mixture (moles component/total moles).

$$x_i = \frac{10^{-6} C_{i,Mixture} MW_{Mixture}}{MW_i}$$

Where,

$10^{-6}$  = Conversion Factor of kilogram per milligram (kg/mg);

$MW_{Mixture}$  = Molecular Weight of Mixture in g/mol (assumed to be 250 g/mol); and

$C_{i,Mixture}$  = Concentration of Component i in the Mixture in milligrams of Component i per kilogram of Mixture (mg/kg) (the average measured constituent concentrations in NAPL located in wells on-Site was used).

We've assumed a NAPL temperature of 15°C in our calculations. We have therefore utilized the Clausius-Clapeyron equation to calculate vapor pressures at 15°C from those in the literature (typically 25°C):

Clausius-Clapeyron Equation:

$$\ln\left(\frac{P_1}{P_2}\right) = \left(\frac{\Delta H_{vap}}{R}\right)\left(\frac{1}{T_2} - \frac{1}{T_1}\right)$$

Where,

$P_1$  = Vapor Pressure at a Known Point;

$P_2$  = Vapor Pressure at a Given Point;

$T_1$  = Temperature at a Known Point in Kelvin (K);

$T_2$  = Temperature at a Given Point in K;

$\Delta H_{vap}$  = Enthalpy of Vaporization of Component i in kilojoules per mole (kJ/mol); and  
 $R$  = Universal Gas Constant in kilojoules per Kelvin per mole (8.314E-03 kJ/K/mol).

**References:**

- Eklund, et al. 1997. Air Emissions from the Treatment of Soils Contaminated with Petroleum Fuels and Other Substances. Prepared for U.S. Environmental Protection Agency Office of Air and Radiation and Office of Research and Development Washington, D.C. EPA-600/R-97-116. October.
- RIDEM. 2009. Air Pollution Control Regulation No. 9: Air Pollution Control Permits. December.



**Table H-1A**  
 Summary of Soil Analytical Results - Cap Installation  
 Former Tidewater Facility  
 Pawtucket, RI

	Units	RIDEM GB Leachability Criteria	RIDEM Industrial/ Commercial DEC	RIDEM UCL	Average	Maximum	GZ-SS-503 (0-2') 09/21/2017	TP-505 (0-2') 9/15/2017	TP-505 (4-5') 09/15/2017	SS-42 (0-2') July 1996	GZ-SS-506 (0-2') 9/21/2017	GZ-SS-512 (0-2') 9/22/2017	GZ-SS-513 (0-2') 9/22/2017
<b>VOLATILE ORGANICS</b>													
1,2,4-Trimethylbenzene	mg/kg	NE	NE	10,000	6.316	270.0	0.00145	0.0016	0.0014	NA	0.0025	0.00265	0.00175
1,2-Dichlorobenzene	mg/kg	NE	10,000	10,000	0.868	29.5	70	0.0016	0.0014	NA	0.0025	0.00265	0.00175
1,3,5-Trimethylbenzene	mg/kg	NE	NE	10,000	2.345	100.0	0.00145	0.0016	0.0014	NA	0.0025	0.00265	0.00175
1,3-Dichlorobenzene	mg/kg	NE	10,000	10,000	0.868	29.5	0.00145	0.0016	0.0014	NA	0.0025	0.00265	0.00175
1,4-Dichlorobenzene	mg/kg	NE	240	10,000	0.868	29.5	0.00145	0.0016	0.0014	NA	0.0025	0.00265	0.00175
2-Butanone (MEK)	mg/kg	NE	10,000	10,000	22.093	750.0	0.01465	0.01595	0.01415	NA	0.02485	0.0267	0.01765
4-Isopropyltoluene	mg/kg	NE	NE	10,000	0.807	29.5	0.0036	0.0016	0.0014	NA	0.0025	0.00265	0.00175
Acetone	mg/kg	NE	10,000	10,000	22.129	750.0	0.0585	0.01595	0.01415	NA	0.02485	0.0267	0.01765
Benzene	mg/kg	4.3	200	10,000	0.766	29.5	0.00145	0.0016	0.0014	1.05	0.0025	0.00265	0.00175
Bromomethane	mg/kg	NE	2,900	10,000	1.512	60.0	0.00295	0.0032	0.00285	NA	0.00495	0.00535	0.00355
Carbon Disulfide	mg/kg	NE	NE	10,000	0.086	2.4	0.00145	0.0016	0.0014	NA	0.0025	0.00265	0.00175
Chloroform	mg/kg	NE	940	10,000	0.751	29.5	0.00145	0.0016	0.0014	NA	0.0025	0.00265	0.00175
Ethylbenzene	mg/kg	62	10,000	10,000	7.533	140.0	0.00145	0.0016	0.0014	1.05	0.0025	0.00265	0.00175
Isopropylbenzene	mg/kg	NE	10,000	10,000	0.766	29.5	0.00145	0.0016	0.0014	NA	0.0025	0.00265	0.00175
m&p-Xylene	mg/kg	NE	10,000	10,000	7.995	330.0	0.00295	0.0032	0.00285	1.05	0.00495	0.00535	0.00355
Methyl tert-butyl ether	mg/kg	100	10,000	10,000	0.864	29.5	0.00145	0.0016	0.0014	NA	0.0025	0.00265	0.00175
Methylene Chloride	mg/kg	NE	760	10,000	1.532	60.0	0.0073	0.008	0.0071	NA	0.01245	0.01335	0.0088
Naphthalene	mg/kg	NE	10,000	10,000	143.066	5,000	0.00145	0.0016	0.0014	NA	0.0025	0.00265	0.00175
n-Butylbenzene	mg/kg	NE	NE	10,000	0.906	29.5	0.00145	0.0016	0.0014	NA	0.0025	0.00265	0.00175
n-Propylbenzene	mg/kg	NE	NE	10,000	0.767	29.5	0.00145	0.0016	0.0014	NA	0.0025	0.00265	0.00175
o-Xylene	mg/kg	NE	10,000	10,000	3.630	140.0	0.00145	0.0016	0.0014	1.05	0.0025	0.00265	0.00175
sec-Butylbenzene	mg/kg	NE	NE	10,000	0.759	29.5	0.00145	0.0016	0.0014	NA	0.0025	0.00265	0.00175
Styrene	mg/kg	64	190	10,000	0.761	29.5	0.00145	0.0016	0.0014	NA	0.0025	0.00265	0.00175
Tetrachloroethene	mg/kg	4.2	110	10,000	0.763	29.5	0.00145	0.0016	0.0014	NA	0.0025	0.00265	0.00175
Tetrahydrofuran	mg/kg	NE	NE	10,000	8.211	295.0	0.00145	0.0016	0.0014	NA	0.0025	0.00265	0.00175
Toluene	mg/kg	54	10,000	10,000	1.231	29.5	0.00145	0.0016	0.0014	1.05	0.0025	0.00265	0.00175
Total Xylenes	mg/kg	NE	10,000	10,000	10.689	470.0	0.00295	0.0032	0.00285	2.10	0.00495	0.00535	0.00355
Trichlorofluoromethane	mg/kg	NE	NE	10,000	1.747	60.0	0.00145	0.0016	0.0014	NA	0.0025	0.00265	0.00175
<b>SEMI-VOLATILE ORGANICS (SVOCs)</b>													
Naphthalene	mg/kg	NE	10,000	10,000	154.793	3,720	0.182	0.325	0.162	400	0.1805	0.183	0.402

**Notes**

NE = Not Established

NA = Not Analyzed

ND = Not Detected (Detection Limit Unknown)

NFA = North Fill Area

FGPA = Former Gas Plant Area

FPPA = Former Power Plant Area

SFA = South Fill Area

Blue shading indicates compound was not detected - value shown is half the detection limit.

Red bolded and italicized text indicates the concentration exceeds the RIDEM Method 1 Industrial/Commercial Direct Exposure Criteria (I/C-DEC).

Concentrations **bolded and underlined** exceed the RIDEM Method 1 GB Leachability Criteria.

A concentration with a bold border exceeds the Upper Concentration Limit.

**Table H-1A**  
 Summary of Soil Analytical Results - Cap Installation  
 Former Tidewater Facility  
 Pawtucket, RI

	Units	RIDEM GB Leachability Criteria	RIDEM Industrial/ Commercial DEC	RIDEM UCL	GZ-SS-514 (0-2') 9/22/2017	TP-506 (1-2') 9/15/2017	TP-507 (0-2') 9/15/2017	TP-512 (0-2') 9/18/2017	TP-512 (3-4') 09/18/2017	TP-524 (0-2') 09/18/2018	TP-524 (5-6') 09/18/2017	GZ-BW-504A (0-2') 10/10/2017	GZ-BW-505 (0-2') 10/10/2017
<b>VOLATILE ORGANICS</b>													
1,2,4-Trimethylbenzene	mg/kg	NE	NE	10,000	0.00155	0.00175	0.0026	0.00205	0.0024	0.00135	0.00225	0.0025	0.0027
1,2-Dichlorobenzene	mg/kg	NE	10,000	10,000	0.00155	0.00175	0.0026	0.00205	0.0024	0.00135	0.00225	0.0025	0.0027
1,3,5-Trimethylbenzene	mg/kg	NE	NE	10,000	0.00155	0.00175	0.0026	0.00205	0.0024	0.00135	0.00225	0.0025	0.0027
1,3-Dichlorobenzene	mg/kg	NE	10,000	10,000	0.00155	0.00175	0.0026	0.00205	0.0024	0.00135	0.00225	0.0025	0.0027
1,4-Dichlorobenzene	mg/kg	NE	240	10,000	0.00155	0.00175	0.0026	0.00205	0.0024	0.00135	0.00225	0.0025	0.0027
2-Butanone (MEK)	mg/kg	NE	10,000	10,000	0.0154	0.0177	0.02595	0.02025	0.024	0.01355	0.02235	0.02525	0.02715
4-Isopropyltoluene	mg/kg	NE	NE	10,000	0.00155	0.00175	0.0026	0.00205	0.0024	0.00135	0.00225	0.0025	0.0027
Acetone	mg/kg	NE	10,000	10,000	0.0154	0.0177	0.02595	0.02025	0.024	0.01355	0.02235	0.02525	0.02715
Benzene	mg/kg	4.3	200	10,000	0.00155	0.00175	0.0026	0.00205	0.0024	0.00135	0.00225	0.0025	0.0027
Bromomethane	mg/kg	NE	2,900	10,000	0.0031	0.00355	0.0052	0.00405	0.0048	0.0027	0.00445	0.00505	0.00545
Carbon Disulfide	mg/kg	NE	NE	10,000	0.00155	0.00175	0.0026	0.00205	0.0024	0.00135	0.00225	0.0025	0.0027
Chloroform	mg/kg	NE	940	10,000	0.00155	0.00175	0.0026	0.00205	0.0024	0.00135	0.00225	0.0025	0.0027
Ethylbenzene	mg/kg	62	10,000	10,000	0.00155	0.00175	0.0026	0.00205	0.0024	0.00135	0.00225	0.0025	0.0027
Isopropylbenzene	mg/kg	NE	10,000	10,000	0.00155	0.00175	0.0026	0.00205	0.0024	0.00135	0.00225	0.0025	0.0027
m&p-Xylene	mg/kg	NE	10,000	10,000	0.0031	0.00355	0.0052	0.00405	0.0048	0.0027	0.00445	0.00505	0.00545
Methyl tert-butyl ether	mg/kg	100	10,000	10,000	0.00155	0.00175	0.0026	0.00205	0.0024	0.00135	0.00225	0.0025	0.0027
Methylene Chloride	mg/kg	NE	760	10,000	0.0077	0.00885	0.013	0.01015	0.012	0.00675	0.0112	0.0126	0.0136
Naphthalene	mg/kg	NE	10,000	10,000	0.00155	0.00175	0.0026	0.00205	0.0024	0.00135	0.00225	0.0025	0.0027
n-Butylbenzene	mg/kg	NE	NE	10,000	0.00155	0.00175	0.0026	0.00205	0.0024	0.00135	0.00225	0.0025	0.0027
n-Propylbenzene	mg/kg	NE	NE	10,000	0.00155	0.00175	0.0026	0.00205	0.0024	0.00135	0.00225	0.0025	0.0027
o-Xylene	mg/kg	NE	10,000	10,000	0.00155	0.00175	0.0026	0.00205	0.0024	0.00135	0.00225	0.0025	0.0027
sec-Butylbenzene	mg/kg	NE	NE	10,000	0.00155	0.00175	0.0026	0.00205	0.0024	0.00135	0.00225	0.0025	0.0027
Styrene	mg/kg	64	190	10,000	0.00155	0.00175	0.0026	0.00205	0.0024	0.00135	0.00225	0.0025	0.0027
Tetrachloroethene	mg/kg	4.2	110	10,000	0.00155	0.00175	0.0026	0.00205	0.0024	0.00135	0.00225	0.0025	0.0027
Tetrahydrofuran	mg/kg	NE	NE	10,000	0.00155	0.00175	0.0026	0.00205	0.0024	0.00135	0.00225	0.0025	0.0027
Toluene	mg/kg	54	10,000	10,000	0.00155	0.00175	0.0026	0.00205	0.0024	0.00135	0.00225	0.0025	0.0027
Total Xylenes	mg/kg	NE	10,000	10,000	0.0031	0.00355	0.0052	0.00405	0.0048	0.0027	0.00445	0.00505	0.00545
Trichlorofluoromethane	mg/kg	NE	NE	10,000	0.00155	0.00175	0.0026	0.00205	0.0024	0.00135	0.00225	0.0025	0.0027
<b>SEMI-VOLATILE ORGANICS (SVOCs)</b>													
Naphthalene	mg/kg	NE	10,000	10,000	0.337	0.1795	0.174	0.169	1.9	3.81	0.1905	0.705	3.24

**Notes**

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Concentrations **bolded and underlined** exceed the RIDEM Method 1 GB Leachability Criteria.

A concentration with a bold border exceeds the Upper Concentration Limit.

**Table H-1A**  
 Summary of Soil Analytical Results - Cap Installation  
 Former Tidewater Facility  
 Pawtucket, RI

	Units	RIDEM GB Leachability Criteria	RIDEM Industrial/ Commercial DEC	RIDEM UCL	GZ-BW-502 (0-2') 10/19/2017	TP-305 (2-3') 06/14/2010	TP-306 (4-5') 06/15/2010	TP-307 (1-2') 6/15/2010	TP-312 (5-6') 06/09/2010	TP-313 (0-2') 6/3/2010	TP-314 (0-2') 6/3/2010	TP-314B (2-4') 06/03/2010	TP-315 (0-2') 6/2/2010	TP-319 (0-2') 6/3/2010
<b>VOLATILE ORGANICS</b>														
1,2,4-Trimethylbenzene	mg/kg	NE	NE	10,000	0.408	0.99	50	270	0.13	0.085	0.065	0.085	0.025	20
1,2-Dichlorobenzene	mg/kg	NE	10,000	10,000	0.1165	0.0275	5.5	29.5	0.03	0.085	0.065	0.085	0.025	4.1
1,3,5-Trimethylbenzene	mg/kg	NE	NE	10,000	0.154	0.078	16	100	0.19	0.085	0.065	0.44	0.025	11
1,3-Dichlorobenzene	mg/kg	NE	10,000	10,000	0.1165	0.0275	5.5	29.5	0.03	0.085	0.065	0.085	0.025	4.1
1,4-Dichlorobenzene	mg/kg	NE	240	10,000	0.1165	0.0275	5.5	29.5	0.03	0.085	0.065	0.085	0.025	4.1
2-Butanone (MEK)	mg/kg	NE	10,000	10,000	0.585	0.7	145	750	0.8	2.15	1.65	2.2	0.65	105
4-Isopropyltoluene	mg/kg	NE	NE	10,000	0.1165	0.082	5.5	29.5	0.087	0.085	0.065	0.085	0.025	4.1
Acetone	mg/kg	NE	10,000	10,000	0.585	0.7	145	750	0.8	2.15	1.65	2.2	0.65	105
Benzene	mg/kg	4.3	200	10,000	0.203	0.085	5.5	29.5	0.03	0.085	0.065	0.085	0.025	4.1
Bromomethane	mg/kg	NE	2,900	10,000	0.1165	0.055	11	60	0.06	0.165	0.125	0.17	0.05	8
Carbon Disulfide	mg/kg	NE	NE	10,000	0.1165	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroform	mg/kg	NE	940	10,000	0.1165	0.0275	5.5	29.5	0.03	0.085	0.065	0.085	0.025	4.1
Ethylbenzene	mg/kg	62	10,000	10,000	0.0885	1.8	110	140	0.03	0.085	0.065	0.085	0.025	56
Isopropylbenzene	mg/kg	NE	10,000	10,000	0.1165	0.27	5.5	29.5	0.07	0.085	0.065	0.17	0.025	4.1
m&p-Xylene	mg/kg	NE	10,000	10,000	0.552	0.055	44	330	0.06	0.165	0.125	0.085	0.05	37
Methyl tert-butyl ether	mg/kg	100	10,000	10,000	0.1165	0.0275	5.5	29.5	0.03	0.085	0.065	0.61	0.025	4.1
Methylene Chloride	mg/kg	NE	760	10,000	0.233	0.055	11	60	0.06	0.165	0.125	0.17	0.05	8
Naphthalene	mg/kg	NE	10,000	10,000	42.1	2.9	1300	5000	0.14	0.75	3.8	0.085	0.05	1300
n-Butylbenzene	mg/kg	NE	NE	10,000	0.1165	0.078	5.5	29.5	0.38	0.085	0.065	0.17	0.025	4.1
n-Propylbenzene	mg/kg	NE	NE	10,000	0.1165	0.083	5.5	29.5	0.14	0.085	0.065	0.085	0.025	4.1
o-Xylene	mg/kg	NE	10,000	10,000	0.24	0.51	20	140	0.03	0.085	0.065	0.085	0.025	15
sec-Butylbenzene	mg/kg	NE	NE	10,000	0.1165	0.0275	5.5	29.5	0.13	0.085	0.065	0.085	0.025	4.1
Styrene	mg/kg	64	190	10,000	0.664	0.0275	5.5	29.5	0.03	0.085	0.065	0.085	0.025	4.1
Tetrachloroethene	mg/kg	4.2	110	10,000	0.1165	0.0275	5.5	29.5	0.03	0.085	0.065	0.085	0.025	4.1
Tetrahydrofuran	mg/kg	NE	NE	10,000	0.585	0.275	55	295	0.3	0.85	0.65	0.85	0.25	41
Toluene	mg/kg	54	10,000	10,000	0.515	0.082	5.5	29.5	0.03	0.085	0.065	0.085	0.025	22
Total Xylenes	mg/kg	NE	10,000	10,000	0.792	0.62	64	470	0.09	0.25	0.75	0.17	1.25	3.5
Trichlorofluoromethane	mg/kg	NE	NE	10,000	0.1165	0.055	11	60	0.06	0.165	0.125	0.17	0.05	8
<b>SEMI-VOLATILE ORGANICS (SVOCs)</b>														
Naphthalene	mg/kg	NE	10,000	10,000	250	1.7	730	3100	0.165	14	1.8	3.6	0.165	160

**Notes**

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Concentrations **bolded and underlined** exceed the RIDEM Method 1 GB Leachability Criteria.

A concentration with a bold border exceeds the Upper Concentration Limit.

**Table H-1A**  
 Summary of Soil Analytical Results - Cap Installation  
 Former Tidewater Facility  
 Pawtucket, RI

	Units	RIDEM GB Leachability Criteria	RIDEM Industrial/ Commercial DEC	RIDEM UCL	TP-321 (0-2') 6/2/2010	TP-326 (0-2') 6/4/2010	TP-365 (0-2') 6/3/2010	TP-366 (0-2') 6/4/2010	TP-366 (4-6') 06/04/2010	TP-202 (2-3.5') 2006	TP-214 (6-8') 2006	TP-221 (0-2') 2006	B-208 (0-2') 2006
<b>VOLATILE ORGANICS</b>													
1,2,4-Trimethylbenzene	mg/kg	NE	NE	10,000	0.035	0.48	0.04	0.0475	0.025	0.02145	0.0311	0.02435	0.066
1,2-Dichlorobenzene	mg/kg	NE	10,000	10,000	0.035	0.07	0.04	0.0475	0.025	NA	NA	NA	NA
1,3,5-Trimethylbenzene	mg/kg	NE	NE	10,000	0.035	0.16	0.04	0.0475	0.025	0.02145	0.0311	0.02435	0.0317
1,3-Dichlorobenzene	mg/kg	NE	10,000	10,000	0.035	0.07	0.04	0.0475	0.025	NA	NA	NA	NA
1,4-Dichlorobenzene	mg/kg	NE	240	10,000	0.035	0.07	0.04	0.0475	0.025	NA	NA	NA	NA
2-Butanone (MEK)	mg/kg	NE	10,000	10,000	0.9	1.8	1.05	1.25	0.65	NA	NA	NA	NA
4-Isopropyltoluene	mg/kg	NE	NE	10,000	0.035	0.07	0.04	0.0475	0.025	0.02145	0.0311	0.02435	0.0233
Acetone	mg/kg	NE	10,000	10,000	0.9	1.8	1.05	1.25	0.65	NA	NA	NA	NA
Benzene	mg/kg	4.3	200	10,000	0.035	0.07	0.04	0.0475	0.025	0.02145	0.0311	0.02435	0.115
Bromomethane	mg/kg	NE	2,900	10,000	0.07	0.14	0.08	0.095	0.05	0.0429	0.062	0.04875	0.0466
Carbon Disulfide	mg/kg	NE	NE	10,000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroform	mg/kg	NE	940	10,000	0.035	0.07	0.04	0.0475	0.025	0.02145	0.0311	0.02435	0.0233
Ethylbenzene	mg/kg	62	10,000	10,000	0.035	0.07	0.04	0.0475	0.025	0.02145	0.0311	0.02435	0.0233
Isopropylbenzene	mg/kg	NE	10,000	10,000	0.035	0.07	0.04	0.0475	0.025	0.02145	0.0311	0.03615	0.0233
m&p-Xylene	mg/kg	NE	10,000	10,000	0.07	0.87	0.08	0.21	0.05	0.0645	0.093	0.02435	0.0233
Methyl tert-butyl ether	mg/kg	100	10,000	10,000	0.035	0.07	0.04	0.0475	0.025	NA	NA	NA	NA
Methylene Chloride	mg/kg	NE	760	10,000	0.07	0.28	0.08	0.095	0.05	0.1075	0.1555	0.122	0.1165
Naphthalene	mg/kg	NE	10,000	10,000	0.07	1.3	1.4	0.63	0.05	0.357	0.0311	0.0263	0.382
n-Butylbenzene	mg/kg	NE	NE	10,000	0.035	0.07	0.04	0.0475	0.025	NA	NA	NA	NA
n-Propylbenzene	mg/kg	NE	NE	10,000	0.035	0.07	0.04	0.0475	0.025	0.02145	0.0311	0.02435	0.362
o-Xylene	mg/kg	NE	10,000	10,000	0.035	0.53	0.04	0.13	0.025	0.0645	0.093	0.073	0.255
sec-Butylbenzene	mg/kg	NE	NE	10,000	0.035	0.07	0.04	0.0475	0.025	0.02145	0.0311	0.02435	0.0233
Styrene	mg/kg	64	190	10,000	0.035	0.07	0.04	0.0475	0.025	0.061	0.0311	0.02435	0.0233
Tetrachloroethene	mg/kg	4.2	110	10,000	0.035	0.07	0.04	0.0475	0.025	0.02145	0.0311	0.02435	0.0233
Tetrahydrofuran	mg/kg	NE	NE	10,000	0.35	0.7	0.4	0.475	0.25	NA	NA	NA	NA
Toluene	mg/kg	54	10,000	10,000	0.035	0.56	0.04	0.11	0.025	0.026	0.0311	0.02435	0.287
Total Xylenes	mg/kg	NE	10,000	10,000	2.25	5.5	3.25	0.34	0.075	0.0645	0.093	0.073	0.255
Trichlorofluoromethane	mg/kg	NE	NE	10,000	0.07	0.14	0.08	0.095	0.05	NA	NA	NA	NA
<b>SEMI-VOLATILE ORGANICS (SVOCs)</b>													
Naphthalene	mg/kg	NE	10,000	10,000	0.165	2.4	0.165	3.4	0.165	3.6	0.082	0.103	1.04

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**Table H-1A**  
 Summary of Soil Analytical Results - Cap Installation  
 Former Tidewater Facility  
 Pawtucket, RI

	Units	RIDEM GB Leachability Criteria	RIDEM Industrial/ Commercial DEC	RIDEM UCL	B-208 (4-6') 2006	SS-29 (0-2') July 1996	TB-12 (0-2') July 1996	TB-12 (6-8') July 1996	TP-11 (6-7') July 1996	TP-15 (3-4') July 1996	GZ-BK-502 (0-2') 10/30/2017	GZ-BW-506 (0-2') 10/10/2017
<b>VOLATILE ORGANICS</b>												
1,2,4-Trimethylbenzene	mg/kg	NE	NE	10,000	0.03305	NA	NA	NA	NA	NA	0.0026	0.00205
1,2-Dichlorobenzene	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	NA	0.0026	0.00205
1,3,5-Trimethylbenzene	mg/kg	NE	NE	10,000	0.03305	NA	NA	NA	NA	NA	0.0026	0.00205
1,3-Dichlorobenzene	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	NA	0.0026	0.00205
1,4-Dichlorobenzene	mg/kg	NE	240	10,000	NA	NA	NA	NA	NA	NA	0.0026	0.00205
2-Butanone (MEK)	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	NA	0.02595	0.02065
4-Isopropyltoluene	mg/kg	NE	NE	10,000	0.03305	NA	NA	NA	NA	NA	0.0026	0.00205
Acetone	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	NA	0.02595	0.02065
Benzene	mg/kg	4.3	200	10,000	0.05	NA	NA	0.08	0.93	0.46	0.0026	0.00205
Bromomethane	mg/kg	NE	2,900	10,000	0.066	NA	NA	NA	NA	NA	0.0052	0.00415
Carbon Disulfide	mg/kg	NE	NE	10,000	NA	NA	NA	NA	NA	NA	0.0026	0.00205
Chloroform	mg/kg	NE	940	10,000	0.03305	NA	NA	NA	NA	NA	0.0026	0.00205
Ethylbenzene	mg/kg	62	10,000	10,000	0.03305	NA	NA	2.77	122	0.26	0.0026	0.00205
Isopropylbenzene	mg/kg	NE	10,000	10,000	0.03305	NA	NA	NA	NA	NA	0.0026	0.00205
m&p-Xylene	mg/kg	NE	10,000	10,000	0.099	NA	NA	4.96	46.3	0.83	0.0052	0.00415
Methyl tert-butyl ether	mg/kg	100	10,000	10,000	NA	NA	NA	NA	NA	NA	0.0026	0.00205
Methylene Chloride	mg/kg	NE	760	10,000	0.165	NA	NA	NA	NA	NA	0.01295	0.01035
Naphthalene	mg/kg	NE	10,000	10,000	0.5250	NA	NA	NA	NA	NA	0.0026	0.00205
n-Butylbenzene	mg/kg	NE	NE	10,000	NA	NA	NA	NA	NA	NA	0.0026	0.00205
n-Propylbenzene	mg/kg	NE	NE	10,000	0.03305	NA	NA	NA	NA	NA	0.0026	0.00205
o-Xylene	mg/kg	NE	10,000	10,000	0.099	NA	NA	1.08	23.8	0.67	0.0026	0.00205
sec-Butylbenzene	mg/kg	NE	NE	10,000	0.03305	NA	NA	NA	NA	NA	0.0026	0.00205
Styrene	mg/kg	64	190	10,000	0.03305	NA	NA	NA	NA	NA	0.0026	0.00205
Tetrachloroethene	mg/kg	4.2	110	10,000	0.03305	NA	NA	NA	NA	NA	0.0026	0.00205
Tetrahydrofuran	mg/kg	NE	NE	10,000	NA	NA	NA	NA	NA	NA	0.0026	0.00205
Toluene	mg/kg	54	10,000	10,000	0.089	NA	NA	0.3	0.84	0.26	0.0026	0.00205
Total Xylenes	mg/kg	NE	10,000	10,000	0.099	NA	NA	6.04	70.1	1.5	0.0052	0.00415
Trichlorofluoromethane	mg/kg	NE	NE	10,000	NA	NA	NA	NA	NA	NA	0.0026	0.00205
<b>SEMI-VOLATILE ORGANICS (SVOCs)</b>												
Naphthalene	mg/kg	NE	10,000	10,000	0.316	1	2.45	84.7	200	4.69	0.9	3.15

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**Table H-1A**  
 Summary of Soil Analytical Results - Cap Installation  
 Former Tidewater Facility  
 Pawtucket, RI

	Units	RIDEM GB Leachability Criteria	RIDEM Industrial/ Commercial DEC	RIDEM UCL	GZ-BW-507 (2-4') 10/11/2017	GZ-BW-508 (0-2') 10/18/2017	GZ-BW-509 (2-4') 10/11/2017	GZ-SB-514 (3-4') 10/18/2017	GZ-SB-515 (0-2') 10/18/2017	GZ-SB-516 (0-2') 10/30/2017	GZ-SB-516 (3-4') 10/30/2017
<b>VOLATILE ORGANICS</b>											
1,2,4-Trimethylbenzene	mg/kg	NE	NE	10,000	0.0028	0.00095	0.00215	0.0036	0.0021	0.002	0.0039
1,2-Dichlorobenzene	mg/kg	NE	10,000	10,000	0.0028	0.00095	0.00215	0.0036	0.0021	0.002	0.0039
1,3,5-Trimethylbenzene	mg/kg	NE	NE	10,000	0.0028	0.00095	0.00215	0.0036	0.0021	0.002	0.0039
1,3-Dichlorobenzene	mg/kg	NE	10,000	10,000	0.0028	0.00095	0.00215	0.0036	0.0021	0.002	0.0039
1,4-Dichlorobenzene	mg/kg	NE	240	10,000	0.0028	0.00095	0.00215	0.0036	0.0021	0.002	0.0039
2-Butanone (MEK)	mg/kg	NE	10,000	10,000	0.02815	0.00965	0.02175	0.03585	0.0212	0.0201	0.03905
4-Isopropyltoluene	mg/kg	NE	NE	10,000	0.0028	0.00095	0.00215	0.0036	0.0021	0.002	0.0039
Acetone	mg/kg	NE	10,000	10,000	0.02815	0.0229	0.02175	0.03585	0.0212	0.0201	0.03905
Benzene	mg/kg	4.3	200	10,000	0.0028	0.00095	0.00215	0.0036	0.0021	0.002	0.0039
Bromomethane	mg/kg	NE	2,900	10,000	0.00565	0.00195	0.00435	0.00715	0.00425	0.004	0.0078
Carbon Disulfide	mg/kg	NE	NE	10,000	0.0028	0.00095	0.00215	0.0036	0.0021	0.002	0.0039
Chloroform	mg/kg	NE	940	10,000	0.0028	0.00095	0.00215	0.0036	0.0021	0.002	0.0039
Ethylbenzene	mg/kg	62	10,000	10,000	0.0028	0.00095	0.00215	0.0036	0.0021	0.002	0.0039
Isopropylbenzene	mg/kg	NE	10,000	10,000	0.0028	0.00095	0.00215	0.0036	0.0021	0.002	0.0039
m&p-Xylene	mg/kg	NE	10,000	10,000	0.00565	0.00195	0.00435	0.00715	0.00425	0.004	0.0078
Methyl tert-butyl ether	mg/kg	100	10,000	10,000	0.0028	0.00095	0.00215	0.0036	0.0021	0.002	0.0039
Methylene Chloride	mg/kg	NE	760	10,000	0.0141	0.00485	0.01085	0.01795	0.0106	0.01005	0.01955
Naphthalene	mg/kg	NE	10,000	10,000	0.0028	0.00095	0.0048	0.0036	0.0021	0.0084	0.0039
n-Butylbenzene	mg/kg	NE	NE	10,000	0.0028	0.00095	0.00215	0.0036	0.0021	0.002	0.0039
n-Propylbenzene	mg/kg	NE	NE	10,000	0.0028	0.00095	0.00215	0.0036	0.0021	0.002	0.0039
o-Xylene	mg/kg	NE	10,000	10,000	0.0028	0.00095	0.00215	0.0036	0.0021	0.002	0.0039
sec-Butylbenzene	mg/kg	NE	NE	10,000	0.0028	0.00095	0.00215	0.0036	0.0021	0.002	0.0039
Styrene	mg/kg	64	190	10,000	0.0028	0.00095	0.00215	0.0036	0.0021	0.002	0.0039
Tetrachloroethene	mg/kg	4.2	110	10,000	0.0028	0.00095	0.00215	0.0036	0.0021	0.002	0.0039
Tetrahydrofuran	mg/kg	NE	NE	10,000	0.0028	0.00095	0.00215	0.0036	0.0021	0.002	0.0039
Toluene	mg/kg	54	10,000	10,000	0.0028	0.00095	0.00215	0.0036	0.0021	0.002	0.0039
Total Xylenes	mg/kg	NE	10,000	10,000	0.00565	0.461	0.00435	0.00715	0.00425	0.004	0.0078
Trichlorofluoromethane	mg/kg	NE	NE	10,000	0.0028	0.00095	0.00215	0.0036	0.0021	0.002	0.0039
<b>SEMI-VOLATILE ORGANICS (SVOCs)</b>											
Naphthalene	mg/kg	NE	10,000	10,000	2.88	2.88	1.34	1.1	23.6	24.6	1.6

**Notes**  
 NE = Not Established  
 NA = Not Analyzed  
 ND = Not Detected (Detection Limit Unknown)  
 NFA = North Fill Area  
 FGPA = Former Gas Plant Area  
 FPPA = Former Power Plant Area  
 SFA = South Fill Area  
 Blue shading indicates compound was not detected - value shown is half the detection limit.  
 Red bolded and italicized text indicates the concentration exceeds the RIDEM Method 1 Industrial/Commercial Direct Exposure  
 Concentrations **bolded and underlined** exceed the RIDEM Method 1 GB Leachability Criteria.  
 A concentration with a bold border exceeds the Upper Concentration Limit.



**Table H-1A**  
 Summary of Soil Analytical Results - Cap Installation  
 Former Tidewater Facility  
 Pawtucket, RI

	Units	RIDEM GB Leachability Criteria	RIDEM Industrial/ Commercial DEC	RIDEM UCL	GZ-SB-517 10/30/2017		TP-325 (5-6') 06/14/2010	TP-327 (1-2') 6/15/2010	TP-329 (1-2') 06/14/2010	TP-370 (0-2') 06/09/2010	TP-384C (4-5') 11/8/2010	TP-388D (8-9') 11/5/2010	MW-316D (4-6') 05/18/2010
					2-4'	4-6'							
<b>VOLATILE ORGANICS</b>													
1,2,4-Trimethylbenzene	mg/kg	NE	NE	10,000	0.00225	0.00345	3.3	9.1	2	2.7	0.06	0.04	0.035
1,2-Dichlorobenzene	mg/kg	NE	10,000	10,000	0.00225	0.00345	0.115	2.35	0.03	0.08	0.06	0.04	0.035
1,3,5-Trimethylbenzene	mg/kg	NE	NE	10,000	0.00225	0.00345	0.38	2.35	0.84	1.3	0.06	0.04	0.035
1,3-Dichlorobenzene	mg/kg	NE	10,000	10,000	0.00225	0.00345	0.115	2.35	0.03	0.08	0.06	0.04	0.035
1,4-Dichlorobenzene	mg/kg	NE	240	10,000	0.00225	0.00345	0.115	2.35	0.03	0.08	0.06	0.04	0.035
2-Butanone (MEK)	mg/kg	NE	10,000	10,000	0.0225	0.0345	2.95	60	0.8	0.33	1.5	1.05	0.9
4-Isopropyltoluene	mg/kg	NE	NE	10,000	0.00225	0.00345	0.27	2.35	1	2.1	0.06	0.04	0.035
Acetone	mg/kg	NE	10,000	10,000	0.0225	0.0345	2.95	60	0.8	2.1	1.5	1.05	0.9
Benzene	mg/kg	4.3	200	10,000	0.00225	0.00345	0.115	2.35	0.14	0.08	0.06	0.04	0.035
Bromomethane	mg/kg	NE	2,900	10,000	0.0045	0.0069	0.225	4.75	0.06	0.16	0.115	0.08	0.07
Carbon Disulfide	mg/kg	NE	NE	10,000	0.00225	0.0111	NA	2.35	NA	0.08	NA	0.04	NA
Chloroform	mg/kg	NE	940	10,000	0.00225	0.00345	0.115	2.35	0.03	0.08	0.06	0.08	0.035
Ethylbenzene	mg/kg	62	10,000	10,000	0.00225	0.00345	0.37	5.6	0.74	0.87	0.06	0.08	0.035
Isopropylbenzene	mg/kg	NE	10,000	10,000	0.00225	0.00345	0.32	2.35	0.17	0.22	0.06	0.08	0.035
m&p-Xylene	mg/kg	NE	10,000	10,000	0.0045	0.0069	0.225	4.75	1.1	0.78	0.115	0.18	0.07
Methyl tert-butyl ether	mg/kg	100	10,000	10,000	0.00225	0.00345	0.115		0.03		0.06	0.04	0.035
Methylene Chloride	mg/kg	NE	760	10,000	0.01125	0.01725	0.225	4.75	0.06	0.16	0.115	0.04	0.07
Naphthalene	mg/kg	NE	10,000	10,000	0.005	0.0105	1.2	490	2.7	5.2	0.115	0.04	0.07
n-Butylbenzene	mg/kg	NE	NE	10,000	0.00225	0.00345	0.62	2.35	0.41	0.58	0.06	0.04	0.035
n-Propylbenzene	mg/kg	NE	NE	10,000	0.00225	0.00345	0.115	2.35	0.24	0.31	0.06	0.04	0.035
o-Xylene	mg/kg	NE	10,000	10,000	0.00225	0.00345	0.77	5.1	0.57	0.82	0.06	0.04	0.035
sec-Butylbenzene	mg/kg	NE	NE	10,000	0.00225	0.00345	0.25	2.35	0.14	0.23	0.06	0.04	0.035
Styrene	mg/kg	64	190	10,000	0.00225	0.00345	0.115	2.35	0.03	0.08	0.06	0.04	0.035
Tetrachloroethene	mg/kg	4.2	110	10,000	0.00225	0.00345	0.115	2.35	0.03	0.8	0.06	0.04	0.035
Tetrahydrofuran	mg/kg	NE	NE	10,000	0.00225	0.00345	1.15	2.35	0.3	0.21	0.6	0.4	0.35
Toluene	mg/kg	54	10,000	10,000	0.00225	0.00345	0.115	2.35	0.29	0.8	0.06	0.04	0.035
Total Xylenes	mg/kg	NE	10,000	10,000	0.0045	0.0069	1.22	14.6	1.67	0.08	0.175	0.12	0.105
Trichlorofluoromethane	mg/kg	NE	NE	10,000	0.00225	0.00345	0.225	4.75	0.06	0.08	0.115	0.08	0.07
<b>SEMI-VOLATILE ORGANICS (SVOCs)</b>													
Naphthalene	mg/kg	NE	10,000	10,000	5.56	0.951	0.165	830	9.3	9	4.3	3.6	0.165

**Notes**

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FPPA = Former Power Plant Area

SFA = South Fill Area

Blue shading indicates compound was not detected - value shown is half the detection limit.

Red bolded and italicized text indicates the concentration exceeds the RIDEM Method 1 Industrial/Commercial Direct Exposure

Concentrations **bolded and underlined** exceed the RIDEM Method 1 GB Leachability Criteria.

A concentration with a bold border exceeds the Upper Concentration Limit.

**Table H-1A**  
 Summary of Soil Analytical Results - Cap Installation  
 Former Tidewater Facility  
 Pawtucket, RI

	Units	RIDEM GB Leachability Criteria	RIDEM Industrial/ Commercial DEC	RIDEM UCL	TP-108 (0-2') 2006	TP-112 (6-9') 2006	B-105 (0-2') 2006	VHB-300 (0-2')	VHB-301 (0-2')	VHB-302 (0-2')	SS-23 (0-2') July 1996	TP-4 (4-5') July 1996
<b>VOLATILE ORGANICS</b>												
1,2,4-Trimethylbenzene	mg/kg	NE	NE	10,000	0.0248	0.0391	0.03135	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	mg/kg	NE	NE	10,000	0.0248	0.0391	0.03135	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	mg/kg	NE	240	10,000	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone (MEK)	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	NA
4-Isopropyltoluene	mg/kg	NE	NE	10,000	0.0248	0.0391	0.03135	NA	NA	NA	NA	NA
Acetone	mg/kg	NE	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	mg/kg	4.3	200	10,000	0.0248	0.0436	0.03135	NA	NA	NA	NA	2.51
Bromomethane	mg/kg	NE	2,900	10,000	0.0496	0.078	0.0289	NA	NA	NA	NA	NA
Carbon Disulfide	mg/kg	NE	NE	10,000	NA	NA	NA	NA	NA	NA	NA	NA
Chloroform	mg/kg	NE	940	10,000	0.0248	0.0391	0.059	NA	NA	NA	NA	NA
Ethylbenzene	mg/kg	62	10,000	10,000	0.0248	0.0391	0.03135	NA	NA	NA	NA	31.6
Isopropylbenzene	mg/kg	NE	10,000	10,000	0.0248	0.0391	0.03135	NA	NA	NA	NA	NA
m&p-Xylene	mg/kg	NE	10,000	10,000	0.0745	NA	0.094	NA	NA	NA	NA	19.7
Methyl tert-butyl ether	mg/kg	100	10,000	10,000	NA	NA	NA	NA	NA	NA	NA	NA
Methylene Chloride	mg/kg	NE	760	10,000	0.129	0.2	0.157	NA	NA	NA	NA	NA
Naphthalene	mg/kg	NE	10,000	10,000	0.0496	0.532	0.118	NA	NA	NA	NA	NA
n-Butylbenzene	mg/kg	NE	NE	10,000	NA	NA	NA	NA	NA	NA	NA	NA
n-Propylbenzene	mg/kg	NE	NE	10,000	0.0248	0.0391	0.03135	NA	NA	NA	NA	NA
o-Xylene	mg/kg	NE	10,000	10,000	0.0745	NA	0.094	NA	NA	NA	NA	12.3
sec-Butylbenzene	mg/kg	NE	NE	10,000	0.0248	0.0391	0.03135	NA	NA	NA	NA	NA
Styrene	mg/kg	64	190	10,000	0.0248	0.0391	0.03135	NA	NA	NA	NA	NA
Tetrachloroethene	mg/kg	4.2	110	10,000	0.0248	0.0391	0.03135	NA	NA	NA	NA	NA
Tetrahydrofuran	mg/kg	NE	NE	10,000	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	mg/kg	54	10,000	10,000	0.0248	0.0845	0.03135	NA	NA	NA	NA	11.2
Total Xylenes	mg/kg	NE	10,000	10,000	0.0745	0.117	0.094	NA	NA	NA	NA	NA
Trichlorofluoromethane	mg/kg	NE	NE	10,000	NA	NA	NA	NA	NA	NA	NA	NA
<b>SEMI-VOLATILE ORGANICS (SVOCs)</b>												
Naphthalene	mg/kg	NE	10,000	10,000	0.327	13.2	0.195	0.748	3,720	511	3.7	9.74

**Notes**

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SFA = South Fill Area

Blue shading indicates compound was not detected - value shown is half the detection limit.

Red bolded and italicized text indicates the concentration exceeds the RIDEM Method 1 Industrial/Commercial Direct Exposure

Concentrations **bolded and underlined** exceed the RIDEM Method 1 GB Leachability Criteria.

A concentration with a bold border exceeds the Upper Concentration Limit.

**Table H-1A**  
 Summary of Soil Analytical Results - Cap Installation  
 Former Tidewater Facility  
 Pawtucket, RI

	Units	RIDEM GB Leachability Criteria	RIDEM Industrial/ Commercial DEC	RIDEM UCL	TP-6 (9-10') July 1996	GZ-BW-512 (2-4') 10/20/2017	GZ-BW-513 (0-2') 10/19/2017	TB-4 (0-2') July 1996
<b>VOLATILE ORGANICS</b>								
1,2,4-Trimethylbenzene	mg/kg	NE	NE	10,000	NA	0.00195	0.0037	NA
1,2-Dichlorobenzene	mg/kg	NE	10,000	10,000	NA	0.00195	0.0037	NA
1,3,5-Trimethylbenzene	mg/kg	NE	NE	10,000	NA	0.00195	0.0037	NA
1,3-Dichlorobenzene	mg/kg	NE	10,000	10,000	NA	0.00195	0.0037	NA
1,4-Dichlorobenzene	mg/kg	NE	240	10,000	NA	0.00195	0.0037	NA
2-Butanone (MEK)	mg/kg	NE	10,000	10,000	NA	0.01945	0.0371	NA
4-Isopropyltoluene	mg/kg	NE	NE	10,000	NA	0.00195	0.0037	NA
Acetone	mg/kg	NE	10,000	10,000	NA	0.01945	0.0371	NA
Benzene	mg/kg	4.3	200	10,000	0.065	0.00195	0.0532	0.0028
Bromomethane	mg/kg	NE	2,900	10,000	NA	0.0039	0.0074	NA
Carbon Disulfide	mg/kg	NE	NE	10,000	NA	0.00195	0.0037	NA
Chloroform	mg/kg	NE	940	10,000	NA	0.00195	0.0037	NA
Ethylbenzene	mg/kg	62	10,000	10,000	0.43	0.00195	0.0037	0.0028
Isopropylbenzene	mg/kg	NE	10,000	10,000	NA	0.00195	0.0037	NA
m&p-Xylene	mg/kg	NE	10,000	10,000	1.65	0.0039	0.0074	0.0028
Methyl tert-butyl ether	mg/kg	100	10,000	10,000	NA	0.00195	0.0037	NA
Methylene Chloride	mg/kg	NE	760	10,000	NA	0.00975	0.01855	NA
Naphthalene	mg/kg	NE	10,000	10,000	NA	0.00195	0.0793	NA
n-Butylbenzene	mg/kg	NE	NE	10,000	NA	0.00195	0.0037	NA
n-Propylbenzene	mg/kg	NE	NE	10,000	NA	0.00195	0.0037	NA
o-Xylene	mg/kg	NE	10,000	10,000	1.17	0.00195	0.0037	0.0028
sec-Butylbenzene	mg/kg	NE	NE	10,000	NA	0.00195	0.0037	NA
Styrene	mg/kg	64	190	10,000	NA	0.00195	0.0351	NA
Tetrachloroethene	mg/kg	4.2	110	10,000	NA	0.00195	0.0037	NA
Tetrahydrofuran	mg/kg	NE	NE	10,000	NA	0.00195	0.0037	NA
Toluene	mg/kg	54	10,000	10,000	0.9	0.00195	0.0215	0.0028
Total Xylenes	mg/kg	NE	10,000	10,000	NA	0.0039	0.0074	0.0056
Trichlorofluoromethane	mg/kg	NE	NE	10,000	NA	0.00195	0.0037	NA
<b>SEMI-VOLATILE ORGANICS (SVOCs)</b>								
Naphthalene	mg/kg	NE	10,000	10,000	2.83	0.2	516	4.85

**Notes**

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SFA = South Fill Area

Blue shading indicates compound was not detected - value shown is half the detection limit.

Red bolded and italicized text indicates the concentration exceeds the RIDEM Method 1 Industrial/Commercial Direct Exposure

Concentrations **bolded and underlined** exceed the RIDEM Method 1 GB Leachability Criteria.

A concentration with a bold border exceeds the Upper Concentration Limit.

**Table H-1B**  
 Excavation Emissions Potential - Cap Installation  
 Former Tidewater Facility  
 Pawtucket, RI

Site-Specific	
Volume of Soil - Excavation	22,500 (cy)
Volume of Soil Moved	22,500 (cy)
Volume of Soil Moved	16,905 (m <sup>3</sup> )

Constants	
Typical Bulk Density	1.5 (g/cm <sup>3</sup> )

Eklund 1997 Default

Conversion Factors	
ft/m	3.3
ft <sup>3</sup> /cy	27
g/lb	454
g/kg	1000

Analyte	Average Measured Concentration in Soil (µg/g)	Maximum Measured Concentration in Soil (µg/g)	Total Excavation Emissions Potential <sup>1</sup> (lb)	Total Excavation Emissions Potential <sup>2</sup> (lb)	RIDEM Annual Minimum Quantity (lb)
1,4-Dichlorobenzene	0.868	30	4.85E+01	1.65E+03	1.00E+01
2-Butanone (MEK)	22.093	750	1.23E+03	4.19E+04	4.00E+03
Acetone	22.129	750	1.24E+03	4.19E+04	2.00E+04
Benzene	0.766	30	4.28E+01	1.65E+03	1.00E+01
Bromomethane	1.512	60	8.45E+01	3.35E+03	7.00E+01
Carbon Disulfide	0.086	2.350	4.79E+00	1.31E+02	2.00E+03
Chloroform	0.751	30	4.20E+01	1.65E+03	2.00E+01
Ethylbenzene	7.533	140	4.21E+02	7.82E+03	9.00E+03
Isopropylbenzene	0.766	30	4.28E+01	1.65E+03	1.00E+03
m&p-Xylene	7.995	330	4.47E+02	1.84E+04	1.00E+03
MTBE	0.864	29.5	4.83E+01	1.65E+03	3.00E+03
Methylene Chloride	1.532	60	8.56E+01	3.35E+03	4.00E+02
Naphthalene	210.047	5,000	1.17E+04	2.79E+05	3.00E+00
o-Xylene	3.630	140	2.03E+02	7.82E+03	1.00E+03
Styrene	0.761	30	4.25E+01	1.65E+03	3.00E+03
Tetrachloroethene	0.763	30	4.26E+01	1.65E+03	2.00E+01
Toluene	1.231	30	6.88E+01	1.65E+03	3.00E+03
Trichlorofluoromethane	1.747	60	9.76E+01	3.35E+03	3.00E+03

Notes:

1. Total Excavation Emissions Potential based on Average Measured Concentration in Soil.
2. Total Excavation Emissions Potential based on Maximum Measured Concentration in Soil.
3. Only detected analytes with Rhode Island Department of Environmental Management (RIDEM) minimum quantity values are shown.
4. Naphthalene concentrations presented in this model are the maximum of naphthalene analyzed as a VOC or as a PAH
5. cm = centimeter; m = meter; g = gram; µg = microgram; ft = feet, lb = pound; kg = kilogram; cy = cubic yard.
6. Yellow Highlighting indicates model inputs.
7. Blue Highlighting indicates the calculated Total Excavation Emissions Potential exceeds the RIDEM Minimum Quantity.

**Table H-1C**  
 Predicted Excavation Emissions - Cap Installation  
 Former Tidewater Facility  
 Pawtucket, RI

Assumptions	
Assumed Average MW of NAPL	250 (g/mol)
Assumed NAPL Temperature	15 (°C)

Site-Specific - Cap Installation	
Excavation Average Surface Area	186,854 (ft <sup>2</sup> )
Excavation Average Depth	2.1 (ft)
Excavation Surface Area	17,492 (m <sup>2</sup> )
Pile Surface Area	17,492 (m <sup>2</sup> )
Emitting Surface Area (SA)	5.47 (m <sup>2</sup> )
Volume of Soil Moved	14,530 (cy)
Volume of Soil Moved (SV)	10,917 (m <sup>3</sup> )
Time to Excavate Soil	640 hrs

Constants		
Typical Bulk Density	1.5 (g/cm <sup>3</sup> )	Eklund 1997 Default
R	8.21E-05 (m <sup>3</sup> *atm/K/mol)	
R	8.31E-03 kJ/(K*mol)	
R	62,361 mm Hg*cm <sup>3</sup> /mol*K)	
Soil Gas to Atmosphere Exchange Constant (Dry, uncompacted Soils)	0.33 (%/100)	Eklund 1997 Default
Air-Filled Porosity (Dry, uncompacted Soils)	0.55	Eklund 1997 Default
Total Porosity (Uncompacted Soils)	0.55	Eklund 1997 Default
Gas-Phase Mass Transfer Coefficient	0.15 cm/s	Eklund 1997 Default
Time since Start of Excavation of Soil of Interest	60 s	Eklund 1997 Default
Time Period Excavated Soil are Emitting Contaminants	0.1 (hr)	Eklund 1997 Default

Analyte	Average Measured Concentration in Soil (µg/g)	Partial Pressure <sup>1</sup> (atm)	Equilibrium Coefficient	Effective Diffusivity in Air (cm <sup>2</sup> /s)	Total Excavation Emissions Potential <sup>2</sup> (lb)	Total Excavation Emissions (lb)	RIDEM Annual Minimum Quantity (lb)
1,4-Dichlorobenzene	0.868	7.29E-07	1.92E-03	3.12E-02	3.13E+01	3.96E-02	1.00E+01
2-Butanone (MEK)	22.093	2.76E-03	1.40E-01	3.65E-02	7.98E+02	7.37E+01	4.00E+03
Acetone	22.129	8.71E-03	3.54E-01	5.60E-02	7.99E+02	1.87E+02	2.00E+04
Benzene	0.766	7.87E-05	1.24E-01	4.21E-02	2.77E+01	2.27E+00	1.00E+01
Bromomethane	1.512	2.00E-03	1.94E+00	4.52E-02	5.46E+01	3.60E+01	7.00E+01
Carbon Disulfide	0.086	3.31E-05	4.57E-01	4.70E-02	3.09E+00	9.33E-01	2.00E+03
Chloroform	0.751	1.13E-04	2.79E-01	4.01E-02	2.71E+01	4.99E+00	2.00E+01
Ethylbenzene	7.533	6.68E-05	1.46E-02	3.39E-02	2.72E+02	2.62E+00	9.00E+03
Isopropylbenzene	0.766	2.83E-06	6.88E-03	2.72E-02	2.76E+01	1.26E-01	1.00E+03
m&p-Xylene	7.995	7.33E-05	1.51E-02	3.16E-02	2.89E+02	2.88E+00	1.00E+03
MTBE	0.864	1.95E-04	3.08E-01	3.64E-02	3.12E+01	5.07E-02	3.00E+03
Methylene Chloride	1.532	5.47E-04	4.70E-01	5.28E-02	5.53E+01	1.72E+01	4.00E+02
Naphthalene	210.047	3.79E-06	3.59E-05	2.66E-02	7.58E+03	1.80E-01	3.00E+00
o-Xylene	3.630	2.46E-05	1.12E-02	3.93E-02	1.31E+02	9.67E-01	1.00E+03
Styrene	0.761	5.23E-06	1.11E-02	3.21E-02	2.75E+01	2.01E-01	3.00E+03
Tetrachloroethene	0.763	8.26E-06	2.78E-02	3.25E-02	2.75E+01	5.06E-01	2.00E+01
Toluene	1.231	3.45E-05	4.00E-02	3.93E-02	4.45E+01	1.17E+00	3.00E+03
Trichlorofluoromethane	1.747	6.73E-04	8.21E-01	3.93E-02	6.31E+01	3.42E+01	3.00E+03

Notes:

- The Partial Pressure was calculated using Raoult's Law.
- If the calculated Total Excavation Emissions exceeds the Total Excavation Emissions Potential, the Total Excavation Emissions Potential was used as the Total Excavation Emissions.
1. All constants for m&p-xylene are the average of the individual constants for m-xylene and p-xylene.
- Naphthalene concentrations presented in this model are the maximum of naphthalene analyzed as a VOC or as a PAH
- Only detected analytes with RIDEM minimum quantity values are shown with Total Excavation Emissions Potentials above RIDEM minimum quantities.
- Concentration units are in µg/g, which is equal to ppm.
- MW = molecular weight; atm = atmosphere; kJ = kilojoules; mol = moles; NAPL = non-aqueous phase liquid; ppm = parts per million; mm Hg = millimeter mercury; cm = centimeter; m = meter; g = gram; µg = microgram; ft = feet, lb = pound; s = second; yr = year; hr = hour; < = less than the reporting limit; TOC = total organic carbon.
- Yellow Highlighting indicates model inputs.
- Blue Highlighting indicates the calculated Excavation Emissions Rate exceeds the Total Excavation Emissions Rate Potential.
- Red Highlighting indicates the Total Excavation Emissions exceeds the Rhode Island Department of Environmental Management (RIDEM) Minimum Quantity.

**Table H-2A**  
 Summary of Soil Analytical Results - Containment Wall  
 Former Tidewater Facility  
 Pawtucket, RI

	Units	RIDEM GB Leachability Criteria	RIDEM Industrial/ Commercial DEC	RIDEM UCL	Average	Maximum	GZ-BW-501 (0-2') 10/25/2017	GZ-BW-502 (0-2') 10/19/2017	GZ-BW-503 (2-4') 10/10/2017	GZ-BW-504A (0-2') 10/10/2017	MW-303 (14-16') 05/09/2010	TP-300 (8-9') 06/08/2010	TP-12 (8-9') July 1996
<b>VOLATILE ORGANICS (VOCs)</b>													
1,1,1,2-Tetrachloroethane	mg/kg	NE	220	10,000	#REF!	#REF!	#REF!	#REF!	0.1295	#REF!	12	0.0475	NA
1,1,1-Trichloroethane	mg/kg	160	10,000	10,000	#REF!	#REF!	#REF!	#REF!	0.1295	#REF!	12	0.0475	NA
1,1,2,2-Tetrachloroethane	mg/kg	NE	29	10,000	#REF!	#REF!	#REF!	#REF!	0.1295	#REF!	12	0.0475	NA
1,1,2-Trichloroethane	mg/kg	NE	100	10,000	#REF!	#REF!	#REF!	#REF!	0.1295	#REF!	12	0.0475	NA
1,1-Dichloroethane	mg/kg	NE	10,000	10,000	#REF!	#REF!	#REF!	#REF!	0.1295	#REF!	12	0.0475	NA
1,1-Dichloroethene	mg/kg	1	9.5	10,000	#REF!	#REF!	#REF!	#REF!	0.1295	#REF!	12	0.0475	NA
1,1-Dichloropropene	mg/kg	NE	NE	10,000	#REF!	#REF!	#REF!	#REF!	0.1295	#REF!	12	0.0475	NA
1,2,3-Trichlorobenzene	mg/kg	NE	NE	10,000	#REF!	#REF!	#REF!	#REF!	0.1295	#REF!	12	0.0475	NA
1,2,3-Trichloropropane	mg/kg	NE	NE	10,000	#REF!	#REF!	#REF!	#REF!	0.1295	#REF!	12	0.0475	NA
1,2,4-Trichlorobenzene	mg/kg	NE	10,000	10,000	#REF!	#REF!	#REF!	#REF!	0.1295	#REF!	12	0.0475	NA
1,2,4-Trimethylbenzene	mg/kg	NE	NE	10,000	9.84748	69.0	0.002	0.408	19	0.0025	69	0.14	NA
1,2-Dibromo-3-Chloropropane	mg/kg	NE	NE	10,000	3.17709	24.0	0.002	0.585	0.65	0.0025	24	0.095	NA
1,2-Dibromoethane (EDB)	mg/kg	NE	0.07	10,000	3.05347	24.0	0.002	0.1165	0.1295	0.0025	24	0.095	NA
1,2-Dichlorobenzene	mg/kg	NE	10,000	10,000	1.54253	12.0	0.002	0.1165	0.1295	0.0025	12	0.0475	NA
1,2-Dichloroethane	mg/kg	2.3	63	10,000	1.54253	12.0	0.002	0.1165	0.1295	0.0025	12	0.0475	NA
1,2-Dichloropropane	mg/kg	70	84	10,000	1.54253	12.0	0.002	0.1165	0.1295	0.0025	12	0.0475	NA
1,3,5-Trimethylbenzene	mg/kg	NE	NE	10,000	3.41676	24.0	0.002	0.154	6.47	0.0025	24	0.0475	NA
1,3-Dichlorobenzene	mg/kg	NE	10,000	10,000	1.54253	12.0	0.002	0.1165	0.1295	0.0025	12	0.0475	NA
1,3-Dichloropropane	mg/kg	NE	NE	10,000	1.54253	12.0	0.002	0.1165	0.1295	0.0025	12	0.0475	NA
1,4-Dichlorobenzene	mg/kg	NE	240	10,000	1.54253	12.0	0.002	0.1165	0.1295	0.0025	12	0.0475	NA
1,4-Dioxane	mg/kg	NE	NE	10,000	7.68414	26.0	0.04045	23.3	25.95	0.0505	12	0.0475	NA
1-Chlorohexane	mg/kg	NE	NE	10,000	0.05055	0.1	0.002	0.1165	0.1295	0.0025	NA	NA	NA
2,2-Dichloropropane	mg/kg	NE	NE	10,000	0.05055	0.1	0.002	0.1165	0.1295	0.0025	NA	NA	NA
2-Butanone (MEK)	mg/kg	NE	10,000	10,000	39.20036	310.0	0.02025	0.585	0.65	0.02525	310	1.25	NA
2-Chlorotoluene	mg/kg	NE	NE	10,000	1.54253	12.0	0.002	0.1165	0.1295	0.0025	12	0.0475	NA
2-Hexanone	mg/kg	NE	NE	10,000	39.20036	310.0	0.02025	0.585	0.65	0.02525	310	1.25	NA
4-Chlorotoluene	mg/kg	NE	NE	10,000	1.54253	12.0	0.002	0.1165	0.1295	0.0025	12	0.0475	NA
4-Isopropyltoluene	mg/kg	NE	NE	10,000	1.37592	12.0	0.002	0.1165	0.14	0.0025	12	0.0475	NA
4-Methyl-2-Pentanone (MIBK)	mg/kg	NE	10,000	10,000	39.20036	310.0	0.02025	0.585	0.65	0.02525	310	1.25	NA
Acetone	mg/kg	NE	10,000	10,000	39.20036	310.0	0.02025	0.585	0.65	0.02525	310	1.25	NA
Benzene	mg/kg	4.3	200	10,000	6.95358	45.0	0.002	0.203	34	0.0025	45	0.14	4.395
Bromobenzene	mg/kg	NE	NE	10,000	1.54253	12.0	0.002	0.1165	0.1295	0.0025	12	0.0475	NA
Bromochloromethane	mg/kg	NE	NE	10,000	1.54253	12.0	0.002	0.1165	0.1295	0.0025	12	0.0475	NA
Bromodichloromethane	mg/kg	NE	92	10,000	1.54253	12.0	0.002	0.1165	0.1295	0.0025	12	0.0475	NA
Bromoform	mg/kg	NE	720	10,000	3.05347	24.0	0.002	0.1165	0.1295	0.0025	24	0.095	NA
Bromomethane	mg/kg	NE	2,900	10,000	2.72217	24.0	0.00405	0.1165	0.1295	0.00505	24	0.095	NA
Carbon Disulfide	mg/kg	NE	NE	10,000	0.05055	0.1	0.002	0.1165	0.1295	0.0025	NA	NA	NA
Carbon Tetrachloride	mg/kg	5	44	10,000	1.54253	12.0	0.002	0.1165	0.1295	0.0025	12	0.0475	NA
Chlorobenzene	mg/kg	100	10,000	10,000	1.54253	12.0	0.002	0.1165	0.1295	0.0025	12	0.0475	NA
Chloroethane	mg/kg	NE	NE	10,000	1.54338	12.0	0.00405	0.1165	0.1295	0.00505	12	0.0475	NA
Chloroform	mg/kg	NE	940	10,000	1.37476	12.0	0.002	0.1165	0.1295	0.0025	12	0.0475	NA
Chloromethane	mg/kg	NE	NE	10,000	3.05432	24.0	0.00405	0.1165	0.1295	0.00505	24	0.095	NA
cis-1,2-Dichloroethene	mg/kg	6	10,000	10,000	1.54253	12.0	0.002	0.1165	0.1295	0.0025	12	0.0475	NA
cis-1,3-Dichloropropene	mg/kg	NE	NE	10,000	1.54253	12.0	0.002	0.1165	0.1295	0.0025	12	0.0475	NA
Dibromochloromethane	mg/kg	NE	NE	10,000	1.54253	12.0	0.002	0.1165	0.1295	0.0025	12	0.0475	NA
Dibromomethane	mg/kg	NE	NE	10,000	1.54253	12.0	0.002	0.1165	0.1295	0.0025	12	0.0475	NA
Dichlorodifluoromethane	mg/kg	NE	NE	10,000	3.05432	24.0	0.00405	0.1165	0.1295	0.00505	24	0.095	NA
Diethylether	mg/kg	NE	NE	10,000	3.05347	24.0	0.002	0.1165	0.1295	0.0025	24	0.095	NA
Di-isopropyl ether	mg/kg	NE	NE	10,000	0.05055	0.1	0.002	0.1165	0.1295	0.0025	NA	NA	NA
Ethyl tertiary-butyl ether	mg/kg	NE	NE	10,000	0.05055	0.1	0.002	0.1165	0.1295	0.0025	NA	NA	NA
Ethylbenzene	mg/kg	62	10,000	10,000	22.37361	200.0	0.002	0.0885	2.58	0.0025	200	0.22	99
Hexachlorobutadiene	mg/kg	NE	73	10,000	1.54253	12.0	0.002	0.1165	0.1295	0.0025	12	0.0475	NA



**Table H-2A**  
 Summary of Soil Analytical Results - Containment Wall  
 Former Tidewater Facility  
 Pawtucket, RI

	Units	RIDEM GB Leachability Criteria	RIDEM Industrial/ Commercial DEC	RIDEM UCL	Average	Maximum	GZ-BW-501 (0-2') 10/25/2017	GZ-BW-502 (0-2') 10/19/2017	GZ-BW-503 (2-4') 10/10/2017	GZ-BW-504A (0-2') 10/10/2017	MW-303 (14-16') 05/09/2010	TP-300 (8-9') 06/08/2010	TP-12 (8-9') July 1996
<b>VOLATILE ORGANICS (VOCs)</b>													
Isopropylbenzene	mg/kg	NE	10,000	10,000	1.37592	12.0	0.002	0.1165	0.14	0.0025	12	0.0475	NA
m&p-Xylene	mg/kg	NE	10,000	10,000	19.93641	100.0	0.00405	0.552	33.4	0.00505	100	0.095	59.2
Methyl tert-butyl ether	mg/kg	100	10,000	10,000	1.54253	12.0	0.002	0.1165	0.1295	0.0025	12	0.0475	NA
Methylene Chloride	mg/kg	NE	760	10,000	2.76271	24.0	0.0101	0.233	0.2595	0.0126	24	0.095	NA
Naphthalene	mg/kg	NE	10,000	10,000	658.11615	3,800.0	0.0096	42.1	2080	0.0025	3800	0.39	NA
n-Butylbenzene	mg/kg	NE	NE	10,000	1.55659	12.0	0.002	0.1165	0.1295	0.0025	12	0.16	NA
n-Propylbenzene	mg/kg	NE	NE	10,000	1.41826	12.0	0.002	0.1165	0.521	0.0025	12	0.0475	NA
o-Xylene	mg/kg	NE	10,000	10,000	11.51593	60.0	0.002	0.24	15.6	0.0025	60	0.0475	46.7
sec-Butylbenzene	mg/kg	NE	NE	10,000	1.36843	12.0	0.002	0.1165	0.0726	0.0025	12	0.0475	NA
Styrene	mg/kg	64	190	10,000	3.42120	18.0	0.002	0.664	18	0.0025	12	0.0475	NA
tert-Butylbenzene	mg/kg	NE	NE	10,000	1.54253	12.0	0.002	0.1165	0.1295	0.0025	12	0.0475	NA
Tertiary-amyl methyl ether	mg/kg	NE	NE	10,000	0.05055	0.1	0.002	0.1165	0.1295	0.0025	NA	NA	NA
Tetrachloroethene	mg/kg	4.2	110	10,000	1.37476	12.0	0.002	0.1165	0.1295	0.0025	12	0.0475	NA
Tetrahydrofuran	mg/kg	NE	NE	10,000	15.26459	120.0	0.002	0.585	0.65	0.0025	120	0.475	NA
Toluene	mg/kg	54	10,000	10,000	8.40890	41.5	0.002	0.515	41.5	0.0025	12	0.0475	33.5
Total Xylenes	mg/kg	NE	10,000	10,000	31.05167	160.0	0.00405	0.792	49	0.00505	160	0.1425	105.9
trans-1,2-Dichloroethene	mg/kg	92	10,000	10,000	1.54191	12.0	0.002	0.1165	0.1295	0.0025	12	0.0475	NA
trans-1,3-Dichloropropene	mg/kg	NE	NE	10,000	3.05347	24.0	0.002	0.1165	0.1295	0.0025	24	0.095	NA
Trichloroethene	mg/kg	20	520	10,000	1.54253	12.0	0.002	0.1165	0.1295	0.0025	12	0.0475	NA
Trichlorofluoromethane	mg/kg	NE	NE	10,000	3.05347	24.0	0.002	0.1165	0.1295	0.0025	24	0.095	NA
Vinyl Acetate	mg/kg	NE	NE	10,000	0.05055	0.1	0.002	0.1165	0.1295	0.0025	NA	NA	NA
Vinyl Chloride	mg/kg	NE	3	10,000	1.54338	12.0	0.00405	0.1165	0.1295	0.00505	12	0.0475	NA
<b>SEMI-VOLATILE ORGANICS (SVOCs)</b>													
Naphthalene	mg/kg	NE	10,000	10,000	3,240.31133	37,000.0	61.8	250	7230	0.705	<b>37,000</b>	10	2000

**Notes**

NE = Not Established

NA = Not Analyzed

ND = Not Detected (Detection Limit Unknown)

NFA = North Fill Area

FGPA = Former Gas Plant Area

FPPA = Former Power Plant Area

SFA = South Fill Area

Blue shading indicates compound was not detected - value shown is half the detection limit.

Red bolded and italicized text indicates the concentration exceeds the RIDEM Method 1 Industrial/Commercial Direct

Concentrations **bolded and underlined** exceed the RIDEM Method 1 GB Leachability Criteria.

A concentration with a bold border exceeds the Upper Concentration Limit.

**Table H-2A**  
 Summary of Soil Analytical Results - Containment Wall  
 Former Tidewater Facility  
 Pawtucket, RI

	Units	RIDEM GB Leachability Criteria	RIDEM Industrial/ Commercial DEC	RIDEM UCL	TP-15 (3-4') July 1996	GZ-BW-511 (2-4') 10/19/2017	TB-8 (0-2') July 1996	TB-8 (12-14') July 1996	B-101 (8-10') 2006	MW-320D (16-20') 5/7/2010	TB-6 (0-2') July 1996	TB-6 (20-22') July 1996
<b>VOLATILE ORGANICS (VOCs)</b>												
1,1,1,2-Tetrachloroethane	mg/kg	NE	220	10,000	NA	0.00225	NA	NA	NA	0.04	NA	NA
1,1,1-Trichloroethane	mg/kg	160	10,000	10,000	NA	0.00225	NA	NA	NA	0.04	NA	NA
1,1,2,2-Tetrachloroethane	mg/kg	NE	29	10,000	NA	0.00225	NA	NA	NA	0.04	NA	NA
1,1,2-Trichloroethane	mg/kg	NE	100	10,000	NA	0.00225	NA	NA	NA	0.04	NA	NA
1,1-Dichloroethane	mg/kg	NE	10,000	10,000	NA	0.00225	NA	NA	NA	0.04	NA	NA
1,1-Dichloroethene	mg/kg	1	9.5	10,000	NA	0.00225	NA	NA	NA	0.04	NA	NA
1,1-Dichloropropene	mg/kg	NE	NE	10,000	NA	0.00225	NA	NA	NA	0.04	NA	NA
1,2,3-Trichlorobenzene	mg/kg	NE	NE	10,000	NA	0.00225	NA	NA	NA	0.04	NA	NA
1,2,3-Trichloropropane	mg/kg	NE	NE	10,000	NA	0.00225	NA	NA	NA	0.04	NA	NA
1,2,4-Trichlorobenzene	mg/kg	NE	10,000	10,000	NA	0.00225	NA	NA	NA	0.04	NA	NA
1,2,4-Trimethylbenzene	mg/kg	NE	NE	10,000	NA	0.00225	NA	NA	0.03255	0.04	NA	NA
1,2-Dibromo-3-Chloropropane	mg/kg	NE	NE	10,000	NA	0.00225	NA	NA	NA	0.08	NA	NA
1,2-Dibromoethane (EDB)	mg/kg	NE	0.07	10,000	NA	0.00225	NA	NA	NA	0.08	NA	NA
1,2-Dichlorobenzene	mg/kg	NE	10,000	10,000	NA	0.00225	NA	NA	NA	0.04	NA	NA
1,2-Dichloroethane	mg/kg	2.3	63	10,000	NA	0.00225	NA	NA	NA	0.04	NA	NA
1,2-Dichloropropane	mg/kg	70	84	10,000	NA	0.00225	NA	NA	NA	0.04	NA	NA
1,3,5-Trimethylbenzene	mg/kg	NE	NE	10,000	NA	0.00225	NA	NA	0.03255	0.04	NA	NA
1,3-Dichlorobenzene	mg/kg	NE	10,000	10,000	NA	0.00225	NA	NA	NA	0.04	NA	NA
1,3-Dichloropropane	mg/kg	NE	NE	10,000	NA	0.00225	NA	NA	NA	0.04	NA	NA
1,4-Dichlorobenzene	mg/kg	NE	240	10,000	NA	0.00225	NA	NA	NA	0.04	NA	NA
1,4-Dioxane	mg/kg	NE	NE	10,000	NA	0.0447	NA	NA	NA	0.04	NA	NA
1-Chlorohexane	mg/kg	NE	NE	10,000	NA	0.00225	NA	NA	NA	NA	NA	NA
2,2-Dichloropropane	mg/kg	NE	NE	10,000	NA	0.00225	NA	NA	NA	NA	NA	NA
2-Butanone (MEK)	mg/kg	NE	10,000	10,000	NA	0.02235	NA	NA	NA	1.05	NA	NA
2-Chlorotoluene	mg/kg	NE	NE	10,000	NA	0.00225	NA	NA	NA	0.04	NA	NA
2-Hexanone	mg/kg	NE	NE	10,000	NA	0.02235	NA	NA	NA	1.05	NA	NA
4-Chlorotoluene	mg/kg	NE	NE	10,000	NA	0.00225	NA	NA	NA	0.04	NA	NA
4-Isopropyltoluene	mg/kg	NE	NE	10,000	NA	0.00225	NA	NA	0.03255	0.04	NA	NA
4-Methyl-2-Pentanone (MIBK)	mg/kg	NE	10,000	10,000	NA	0.02235	NA	NA	NA	1.05	NA	NA
Acetone	mg/kg	NE	10,000	10,000	NA	0.02235	NA	NA	NA	1.05	NA	NA
Benzene	mg/kg	4.3	200	10,000	0.46	0.00225	0.0028	2.97	0.03255	0.04	NA	10.1
Bromobenzene	mg/kg	NE	NE	10,000	NA	0.00225	NA	NA	NA	0.04	NA	NA
Bromochloromethane	mg/kg	NE	NE	10,000	NA	0.00225	NA	NA	NA	0.04	NA	NA
Bromodichloromethane	mg/kg	NE	92	10,000	NA	0.00225	NA	NA	NA	0.04	NA	NA
Bromoform	mg/kg	NE	720	10,000	NA	0.00225	NA	NA	NA	0.08	NA	NA
Bromomethane	mg/kg	NE	2,900	10,000	NA	0.00445	NA	NA	0.065	0.08	NA	NA
Carbon Disulfide	mg/kg	NE	NE	10,000	NA	0.00225	NA	NA	NA	NA	NA	NA
Carbon Tetrachloride	mg/kg	5	44	10,000	NA	0.00225	NA	NA	NA	0.04	NA	NA
Chlorobenzene	mg/kg	100	10,000	10,000	NA	0.00225	NA	NA	NA	0.04	NA	NA
Chloroethane	mg/kg	NE	NE	10,000	NA	0.00445	NA	NA	NA	0.04	NA	NA
Chloroform	mg/kg	NE	940	10,000	NA	0.00225	NA	NA	0.03255	0.04	NA	NA
Chloromethane	mg/kg	NE	NE	10,000	NA	0.00445	NA	NA	NA	0.08	NA	NA
cis-1,2-Dichloroethene	mg/kg	6	10,000	10,000	NA	0.00225	NA	NA	NA	0.04	NA	NA
cis-1,3-Dichloropropene	mg/kg	NE	NE	10,000	NA	0.00225	NA	NA	NA	0.04	NA	NA
Dibromochloromethane	mg/kg	NE	NE	10,000	NA	0.00225	NA	NA	NA	0.04	NA	NA
Dibromomethane	mg/kg	NE	NE	10,000	NA	0.00225	NA	NA	NA	0.04	NA	NA
Dichlorodifluoromethane	mg/kg	NE	NE	10,000	NA	0.00445	NA	NA	NA	0.08	NA	NA
Diethylether	mg/kg	NE	NE	10,000	NA	0.00225	NA	NA	NA	0.08	NA	NA
Di-isopropyl ether	mg/kg	NE	NE	10,000	NA	0.00225	NA	NA	NA	NA	NA	NA
Ethyl tertiary-butyl ether	mg/kg	NE	NE	10,000	NA	0.00225	NA	NA	NA	NA	NA	NA
Ethylbenzene	mg/kg	62	10,000	10,000	0.26	0.00225	0.0028	1.63	0.03255	0.04	NA	9.37
Hexachlorobutadiene	mg/kg	NE	73	10,000	NA	0.00225	NA	NA	NA	0.04	NA	NA

**Table H-2A**  
 Summary of Soil Analytical Results - Containment Wall  
 Former Tidewater Facility  
 Pawtucket, RI

	Units	RIDEM GB Leachability Criteria	RIDEM Industrial/ Commercial DEC	RIDEM UCL	TP-15 (3-4') July 1996	GZ-BW-511 (2-4') 10/19/2017	TB-8 (0-2') July 1996	TB-8 (12-14') July 1996	B-101 (8-10') 2006	MW-320D (16-20') 5/7/2010	TB-6 (0-2') July 1996	TB-6 (20-22') July 1996
<b>VOLATILE ORGANICS (VOCs)</b>												
Isopropylbenzene	mg/kg	NE	10,000	10,000	NA	0.00225	NA	NA	0.03255	0.04	NA	NA
m&p-Xylene	mg/kg	NE	10,000	10,000	0.83	0.00445	0.0028	4	NA	0.08	NA	61
Methyl tert-butyl ether	mg/kg	100	10,000	10,000	NA	0.00225	NA	NA	NA	0.04	NA	NA
Methylene Chloride	mg/kg	NE	760	10,000	NA	0.0112	NA	NA	0.163	0.08	NA	NA
Naphthalene	mg/kg	NE	10,000	10,000	NA	0.00225	NA	NA	0.461	0.08	NA	NA
n-Butylbenzene	mg/kg	NE	NE	10,000	NA	0.00225	NA	NA	NA	0.04	NA	NA
n-Propylbenzene	mg/kg	NE	NE	10,000	NA	0.00225	NA	NA	0.03255	0.04	NA	NA
o-Xylene	mg/kg	NE	10,000	10,000	0.67	0.00225	0.0028	1.3	NA	0.04	NA	25.1
sec-Butylbenzene	mg/kg	NE	NE	10,000	NA	0.00225	NA	NA	0.03255	0.04	NA	NA
Styrene	mg/kg	64	190	10,000	NA	0.00225	NA	NA	0.03255	0.04	NA	NA
tert-Butylbenzene	mg/kg	NE	NE	10,000	NA	0.00225	NA	NA	NA	0.04	NA	NA
Tertiary-amyl methyl ether	mg/kg	NE	NE	10,000	NA	0.00225	NA	NA	NA	NA	NA	NA
Tetrachloroethene	mg/kg	4.2	110	10,000	NA	0.00225	NA	NA	0.03255	0.04	NA	NA
Tetrahydrofuran	mg/kg	NE	NE	10,000	NA	0.00225	NA	NA	NA	0.4	NA	NA
Toluene	mg/kg	54	10,000	10,000	0.26	0.00225	0.0028	2.92	0.03255	0.04	NA	26.9
Total Xylenes	mg/kg	NE	10,000	10,000	1.5	0.00445	0.0056	NA	0.098	0.12	NA	86.1
trans-1,2-Dichloroethene	mg/kg	92	10,000	10,000	NA	0.00225	NA	NA	NA	0.035	NA	NA
trans-1,3-Dichloropropene	mg/kg	NE	NE	10,000	NA	0.00225	NA	NA	NA	0.08	NA	NA
Trichloroethene	mg/kg	20	520	10,000	NA	0.00225	NA	NA	NA	0.04	NA	NA
Trichlorofluoromethane	mg/kg	NE	NE	10,000	NA	0.00225	NA	NA	NA	0.08	NA	NA
Vinyl Acetate	mg/kg	NE	NE	10,000	NA	0.00225	NA	NA	NA	NA	NA	NA
Vinyl Chloride	mg/kg	NE	3	10,000	NA	0.00445	NA	NA	NA	0.04	NA	NA
<b>SEMI-VOLATILE ORGANICS (SVOCs)</b>												
Naphthalene	mg/kg	NE	10,000	10,000	4.69	1.1	3.31	40.2	12.7	0.165	120	1870

**Notes**

NE = Not Established

NA = Not Analyzed

ND = Not Detected (Detection Limit Unknown)

NFA = North Fill Area

FGPA = Former Gas Plant Area

FPPA = Former Power Plant Area

SFA = South Fill Area

Blue shading indicates compound was not detected - value shown is half the detection limit.

Red bolded and italicized text indicates the concentration exceeds the RIDEM Method 1 Industrial/Commercial Direct

Concentrations **bolded and underlined** exceed the RIDEM Method 1 GB Leachability Criteria.

A concentration with a bold border exceeds the Upper Concentration Limit.

**Table H-2B**  
 Excavation Emissions Potential - Containment Wall  
 Former Tidewater Facility  
 Pawtucket, RI

05.0043654.00

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4/26/2018

Site-Specific	
Volume of Soil - Excavation	3,370 (cy)
Volume of Soil Moved	3,370 (cy)
Volume of Soil Moved	2,533 (m <sup>3</sup> )

Constants	
Typical Bulk Density	1.5 (g/cm <sup>3</sup> )

Eklund 1997 Default

Conversion Factors	
ft/m	3.3
ft <sup>3</sup> /cy	27
g/lb	454
g/kg	1000

Analyte	Average Measured Concentration in Soil (µg/g)	Maximum Measured Concentration in Soil (µg/g)	Total Excavation Emissions Potential <sup>1</sup> (lb)	Total Excavation Emissions Potential <sup>2</sup> (lb)	RIDEM Annual Minimum Quantity (lb)
1,4-Dichlorobenzene	1.543	12	1.29E+01	1.00E+02	1.00E+01
2-Butanone (MEK)	39.200	310	3.28E+02	2.59E+03	4.00E+03
Acetone	39.200	310	3.28E+02	2.59E+03	2.00E+04
Benzene	6.954	45	5.82E+01	3.77E+02	1.00E+01
Bromomethane	2.722	24	2.28E+01	2.01E+02	7.00E+01
Carbon Disulfide	0.051	0.130	4.23E-01	1.08E+00	2.00E+03
Chloroform	1.375	12	1.15E+01	1.00E+02	2.00E+01
Ethylbenzene	22.374	200	1.87E+02	1.67E+03	9.00E+03
Isopropylbenzene	1.376	12	1.15E+01	1.00E+02	1.00E+03
m&p-Xylene	19.936	100	1.67E+02	8.37E+02	1.00E+03
MTBE	1.543	12	1.29E+01	1.00E+02	3.00E+03
Methylene Chloride	2.763	24	2.31E+01	2.01E+02	4.00E+02
Naphthalene	3,240.31	37000	2.71E+04	3.10E+05	3.00E+00
o-Xylene	11.516	60.0	9.64E+01	5.02E+02	1.00E+03
Styrene	3.421	18.0	2.86E+01	1.51E+02	3.00E+03
Tetrachloroethene	1.375	12	1.15E+01	1.00E+02	2.00E+01
Toluene	8.409	41.5	7.04E+01	3.47E+02	3.00E+03
Trichlorofluoromethane	3.053	24	2.56E+01	2.01E+02	3.00E+03

Notes:

- Total Excavation Emissions Potential based on Average Measured Concentration in Soil.
- Total Excavation Emissions Potential based on Maximum Measured Concentration in Soil.
- Only detected analytes with Rhode Island Department of Environmental Management (RIDEM) minimum quantity values are shown.
- Naphthalene concentrations presented in this model are the maximum of naphthalene analyzed as a VOC or as a PAH
- cm = centimeter; m = meter; g = gram; µg = microgram; ft = feet, lb = pound; kg = kilogram; cy = cubic yard.
- Yellow Highlighting indicates model inputs.
- Blue Highlighting indicates the calculated Total Excavation Emissions Potential exceeds the RIDEM Minimum Quantity.

**Table H-2C**  
 Predicted Excavation Emissions - Containment Wall  
 Former Tidewater Facility  
 Pawtucket, RI

Assumptions	
Assumed Average MW of NAPL	250 (g/mol)
Assumed NAPL Temperature	15 (°C)

Site-Specific - Wall Installation	
Excavation Average Surface Area	4,550 (ft <sup>2</sup> )
Excavation Average Depth	20.0 (ft)
Excavation Surface Area	913 (m <sup>2</sup> )
Pile Surface Area	913 (m <sup>2</sup> )
Emitting Surface Area (SA)	1.18 (m <sup>2</sup> )
Volume of Soil Moved	3,370 (cy)
Volume of Soil Moved (SV)	2,532 (m <sup>3</sup> )
Time to Excavate Soil	160 hrs

Constants		
Typical Bulk Density	1.5 (g/cm <sup>3</sup> )	Eklund 1997 Default
R	8.21E-05 (m <sup>3</sup> *atm/K/mol)	
R	8.31E-03 kJ/(K*mol)	
R	62,361 mm Hg*cm <sup>3</sup> /mol*K	
Soil Gas to Atmosphere Exchange Constant (Dry, uncompacted Soils)	0.33 (%/100)	Eklund 1997 Default
Air-Filled Porosity (Dry, uncompacted Soils)	0.55	Eklund 1997 Default
Total Porosity (Uncompacted Soils)	0.55	Eklund 1997 Default
Gas-Phase Mass Transfer Coefficient	0.15 cm/s	Eklund 1997 Default
Time since Start of Excavation of Soil of Interest	60 s	Eklund 1997 Default
Time Period Excavated Soil are Emitting Contaminants	0.1 (hr)	Eklund 1997 Default

Analyte	Average Measured Concentration in Soil (µg/g)	Partial Pressure <sup>1</sup> (atm)	Equilibrium Coefficient	Effective Diffusivity in Air (cm <sup>2</sup> /s)	Total Excavation Emissions Potential <sup>2</sup> (lb)	Total Excavation Emissions (lb)	RIDEM Annual Minimum Quantity (lb)
1,4-Dichlorobenzene	1.543	1.30E-06	1.92E-03	3.12E-02	1.29E+01	1.63E-02	1.00E+01
2-Butanone (MEK)	39.200	4.91E-03	1.40E-01	3.65E-02	3.28E+02	3.03E+01	4.00E+03
Acetone	39.200	1.54E-02	3.54E-01	5.60E-02	3.28E+02	7.68E+01	2.00E+04
Benzene	6.954	7.14E-04	1.24E-01	4.21E-02	5.82E+01	4.78E+00	1.00E+01
Bromomethane	2.722	3.59E-03	1.94E+00	4.52E-02	2.28E+01	1.50E+01	7.00E+01
Carbon Disulfide	0.051	1.96E-05	4.57E-01	4.70E-02	4.23E-01	1.28E-01	7.10E+01
Chloroform	1.375	2.07E-04	2.79E-01	4.01E-02	1.15E+01	2.12E+00	2.00E+01
Ethylbenzene	22.374	1.98E-04	1.46E-02	3.39E-02	1.87E+02	1.80E+00	2.10E+01
Isopropylbenzene	1.376	5.08E-06	6.88E-03	2.72E-02	1.15E+01	5.23E-02	1.00E+03
m&p-Xylene	19.936	1.83E-04	1.51E-02	3.16E-02	1.67E+02	1.66E+00	3.00E+03
MTBE	1.543	3.47E-04	3.08E-01	3.64E-02	1.29E+01	2.62E+00	3.00E+03
Methylene Chloride	2.763	9.87E-04	4.70E-01	5.28E-02	2.31E+01	7.18E+00	4.00E+02
Naphthalene	3,240.311	5.85E-05	3.59E-05	2.66E-02	2.71E+04	6.43E-01	3.00E+00
o-Xylene	11.516	7.81E-05	1.12E-02	3.93E-02	9.64E+01	7.11E-01	3.00E+03
Styrene	3.421	2.35E-05	1.11E-02	3.21E-02	2.86E+01	2.10E-01	3.00E+03
Tetrachloroethene	1.375	1.49E-05	2.78E-02	3.25E-02	1.15E+01	2.12E-01	2.00E+01
Toluene	8.409	2.35E-04	4.00E-02	3.93E-02	7.04E+01	1.86E+00	1.00E+03
Trichlorofluoromethane	3.053	1.18E-03	8.21E-01	3.93E-02	2.56E+01	1.38E+01	3.00E+03

Notes:

- The Partial Pressure was calculated using Raoult's Law.
- If the calculated Total Excavation Emissions exceeds the Total Excavation Emissions Potential, the Total Excavation Emissions Potential was used as the Total Excavation Emissions.
- All constants for m&p-xylene are the average of the individual constants for m-xylene and p-xylene.
- Naphthalene concentrations presented in this model are the maximum of naphthalene analyzed as a VOC or as a PAH
- Only detected analytes with RIDEM minimum quantity values are shown with Total Excavation Emissions Potentials above RIDEM minimum quantities.
- Concentration units are in µg/g, which is equal to ppm.
- MW = molecular weight; atm = atmosphere; kJ = kilojoules; mol = moles; NAPL = non-aqueous phase liquid; ppm = parts per million; mm Hg = millimeter mercury; cm = centimeter; m = meter; g = gram; µg = microgram; ft = feet, lb = pound; s = second; yr = year; hr = hour; < = less than the reporting limit; TOC = total organic carbon.
- Yellow Highlighting indicates model inputs.
- Red Highlighting indicates the Total Excavation Emissions exceeds the Rhode Island Department of Environmental Management (RIDEM) Minimum Quantity.

**Table H-3A**  
 Summary of LNAPL Analytical Results - MW-210  
 Former Tidewater Facility  
 Pawtucket, RI

05.0043654.00  
 1 of 1  
 4/26/2018

		Units	MW-210 LNAPL 1007-00035-001 7/2/2010
EPA 8260	<b>VOLATILE ORGANICS</b>		
	Dichlorodifluoromethane	mg/kg	345
	Chloromethane	mg/kg	345
	Vinyl chloride	mg/kg	175
	Bromomethane	mg/kg	345
	Chloroethane	mg/kg	175
	Trichlorofluoromethane	mg/kg	345
	Diethylether	mg/kg	345
	Acetone	mg/kg	4500
	1,1-Dichloroethene	mg/kg	175
	Dichloromethane	mg/kg	345
	Methyl tert-butyl ether	mg/kg	175
	trans-1,2-Dichloroethene	mg/kg	175
	1,1-Dichloroethane	mg/kg	175
	2-Butanone (MEK)	mg/kg	4500
	2,2-Dichloropropane	mg/kg	175
	cis-1,2-Dichloroethene	mg/kg	175
	Chloroform	mg/kg	175
	Bromochloromethane	mg/kg	175
	Tetrahydrofuran	mg/kg	1750
	1,1,1-Trichloroethane	mg/kg	175
	1,1-Dichloropropene	mg/kg	175
	Carbon tetrachloride	mg/kg	175
	1,2-Dichloroethane	mg/kg	175
	Benzene	mg/kg	175
	Trichloroethene	mg/kg	175
	1,2-Dichloropropane	mg/kg	175
	Bromodichloromethane	mg/kg	175
	Dibromomethane	mg/kg	175
	4-Methyl-2-pentanone (MIBK)	mg/kg	4500
	cis-1,3-Dichloropropene	mg/kg	175
	Toluene	mg/kg	175
	trans-1,3-Dichloropropene	mg/kg	345
	1,1,2-Trichloroethane	mg/kg	175
	2-Hexanone	mg/kg	4500
	1,3-Dichloropropane	mg/kg	175
	Tetrachloroethene	mg/kg	175
	Dibromochloromethane	mg/kg	175
	1,2-Dibromoethane (EDB)	mg/kg	345
	Chlorobenzene	mg/kg	175
	1,1,1,2-Tetrachloroethane	mg/kg	175
	Ethylbenzene	mg/kg	175
	m&p-Xylene	mg/kg	345
	o-Xylene	mg/kg	175
	Styrene	mg/kg	175
	Bromoform	mg/kg	345
	Isopropylbenzene	mg/kg	175
	1,1,2,2-Tetrachloroethane	mg/kg	175
	1,2,3-Trichloropropane	mg/kg	175
	Bromobenzene	mg/kg	175
	n-Propylbenzene	mg/kg	175
	2-Chlorotoluene	mg/kg	175
	1,3,5-Trimethylbenzene	mg/kg	175
	4-Chlorotoluene	mg/kg	175
	tert-Butylbenzene	mg/kg	175
	1,2,4-Trimethylbenzene	mg/kg	350
	sec-Butylbenzene	mg/kg	175
	p-Isopropyltoluene	mg/kg	175
	1,3-Dichlorobenzene	mg/kg	175
	1,4-Dichlorobenzene	mg/kg	175
n-Butylbenzene	mg/kg	175	
1,2-Dichlorobenzene	mg/kg	175	
1,2-Dibromo-3-chloropropane	mg/kg	345	
1,2,4-Trichlorobenzene	mg/kg	175	
Hexachlorobutadiene	mg/kg	175	
Naphthalene	mg/kg	690	
1,2,3-Trichlorobenzene	mg/kg	175	
EPA 8100	<b>TOTAL PETROLEUM HYDROCARBON</b>		
	Hydrocarbon Content	µg/g	25,000
EPA 8270	<b>PAHS BY GCMS</b>		
	Naphthalene	mg/kg	200
	2-Methylnaphthalene	mg/kg	200
	Acenaphthylene	mg/kg	100
	Acenaphthene	mg/kg	200
	Fluorene	mg/kg	200
	Phenanthrene	mg/kg	200
	Anthracene	mg/kg	100
	Fluoranthene	mg/kg	200
	Pyrene	mg/kg	200
	Benzo [a] Anthracene	mg/kg	100
	Chrysene	mg/kg	100
	Benzo [b] Fluoranthene	mg/kg	100
	Benzo [k] Fluoranthene	mg/kg	100
	Benzo [a] Pyrene	mg/kg	100
	Indeno [1,2,3-cd] Pyrene	mg/kg	100
Dibenzo [a,h] Anthracene	mg/kg	100	
Benzo [g,h,i] Perylene	mg/kg	100	

**Notes**

**Hydrocarbon Fingerprint:**

MW-210 LNAPL: The characteristics of the chromatogram indicates the presence of a petroleum product in the boiling range of fuel oil #2/diesel.

The phytane/ n-C18 ratio indicates that weathering has occurred.

Blue shading indicates compound was not detected - value shown is half the detection limit.



**Table H-3B**  
 Predicted Excavation Emissions - Tank/Vaults  
 Former Tidewater Facility  
 Pawtucket, RI

Assumptions	
Assumed Average MW of NAPL	250 (g/mol)
Assumed NAPL Temperature in Subsurface	15 (°C)
Assumed Tank % Filled with NAPL	90%
Assumed Volume of Concrete Storage Tank Headspace	1.11 (m <sup>3</sup> )
Assumed Volume of Concrete Vaults Headspace	1.24 (m <sup>3</sup> )
Assumed NAPL Temperature in Pipe	60 (°C)

Site-Specific Concrete Storage Tank	
Storage Tank Length	10 (ft)
Storage Tank Width	10 (ft)
Storage Tank Depth	4 (ft)

Site-Specific Concrete Vaults	
Vault 1 Excavation Surface Area	24.5 (ft <sup>2</sup> )
Vault 2 Excavation Surface Area	25 (ft <sup>2</sup> )
Excavation Average Depth	9 (ft)

Constants	
Typical Bulk Density	1.5 (g/cm <sup>3</sup> )
R	8.21E-05 (m <sup>3</sup> *atm/K/mol)
R	8.31E-03 (kJ/K/mol)
R	62,361 (mm Hg*cm <sup>3</sup> /mol/K)
Exchange Constant (Wet Soils)	0.1 (%/100)
Air-Filled Porosity (Wet or Compacted Soils)	0.35
Total Porosity	0.625 Eklund 1997 Default
Gas-Phase Mass Transfer Coefficient	0.15 cm/s Eklund 1997 Default
Excavation of Soil of Interest	60 <sup>s</sup> Eklund 1997 Default

Analyte	Average Measured Concentration in NAPL (mg/kg)	Concrete Structures Partial Pressure <sup>2</sup> (atm)	Calculated Concentration in Structures Headspace (mg/m <sup>3</sup> )	Total Emissions from Tank and Vaults (lb)	RIDEM Annual Minimum Quantity (lb)
1,4-Dichlorobenzene	175	3.16E-06	17	8.83E-05	1.00E+01
2-Butanone (MEK)	4500	9.28E-03	24,481	1.27E-01	4.00E+03
Acetone	4500	2.64E-02	56,143	2.91E-01	2.00E+04
Benzene	175	2.58E-04	737	3.82E-03	1.00E+01
Bromomethane	345	5.49E-03	19,076	9.89E-02	7.00E+01
Carbon Disulfide	175	8.84E-04	2,462	1.28E-02	2.00E+03
Chloroform	175	3.98E-04	1,736	9.01E-03	2.00E+01
Ethylbenzene	175	2.78E-05	108	5.61E-04	9.00E+03
Isopropylbenzene	175	1.27E-05	56	2.90E-04	1.00E+03
m&p-Xylene	345	6.75E-05	262	1.36E-03	1.00E+03
MTBE	175	5.22E-04	1,683	8.73E-03	3.00E+03
Methylene Chloride	345	1.75E-03	5,427	2.82E-02	4.00E+02
Naphthalene	690	2.56E-07	1	6.23E-06	3.00E+00
o-Xylene	175	2.56E-05	99	5.15E-04	1.00E+03
Styrene	175	2.34E-05	89	4.63E-04	3.00E+03
Tetrachloroethene	175	3.43E-05	208	1.08E-03	2.00E+01
Toluene	175	7.31E-05	246	1.28E-03	3.00E+03
Trichlorofluoromethane	345	1.69E-03	8,477	4.40E-02	3.00E+03

Notes:

- All constants for m&p-xylene are the average of the individual constants for m-xylene and p-xylene.
- The Partial Pressure in the Tank/Vaults was calculated using Raoult's Law and the Average Measured Concentration in NAPL.
- Only detected analytes with RIDEM minimum quantity values are shown.
- Concentration units are in mg/kg and ug/g, both of which are equal to ppm.
- MW = molecular weight; atm = atmosphere; kJ = kilojoules; mol = moles; NAPL = non-aqueous phase liquid; ppm = parts per million; mm Hg = millimeter mercury; cm = centimeter; m = meter; g = gram; ug = microgram; ft = feet, lb = pound; s = second; yr = year; hr = hour; < = less than the reporting limit (RL).
- Yellow Highlighting indicates model inputs.
- Red Highlighting indicates the Emissions Rate exceeds the Rhode Island Department of Environmental Management (RIDEM) Minimum Quantity.

**Table H-3C**  
Predicted Excavation Emissions - Cast Iron Raceway Piping  
Former Tidewater Facility  
Pawtucket, RI

Assumptions	
Assumed Average MW of NAPL	250 (g/mol)
Assumed NAPL Temperature in Subsurface	15 (°C)
Assumed Raceway % Filled with NAPL	90%
Assumed Volume of Raceway Pipe Headspace	2.51 (m <sup>3</sup> )
Assumed NAPL Temperature in Raceway	60 (°C)

Site-Specific Cast Iron Raceway Piping Totals	
Pipe Diameter	1.17 (ft)
Pipe Length	840 (ft)

Site-Specific Cast Iron Raceway Piping Details			
Pipe 1	Diameter (feet)	Depth (feet bgs)	Length (feet)
	1.17	1	22
Pipes 2	Diameter (feet)	Depth (feet bgs)	Length (feet)
	0.5	1	45
	0.5	2	45
	1.17	1	45
Pipe 3	Diameter (feet)	Depth (feet bgs)	Length (feet)
	0.67	1.5	143
Pipe 4	Diameter (feet)	Depth (feet bgs)	Length (feet)
	0.67	1	465
Pipe 5	Diameter (feet)	Depth (feet bgs)	Length (feet)
	0.67	0.5	165

Constants	
Typical Bulk Density	1.5 (g/cm <sup>3</sup> )
R	8.21E-05 (m <sup>3</sup> *atm/K/mol)
R	8.31E-03 (kJ/K/mol)
R	62,361 (mm Hg*cm <sup>3</sup> /mol/K)
Soil Gas to Atmosphere Exchange Constant (Wet Soils)	0.1 (%/100)
Air-Filled Porosity (Wet or Compacted Soils)	0.35
Total Porosity	0.625 Eklund 1997 Default
Gas-Phase Mass Transfer Coefficient	0.15 cm/s
Time since Start of Excavation of Soil of Interest	60 s

Analyte	Average Measured Concentration in NAPL (mg/kg)	Raceway Partial Pressure <sup>2</sup> (atm)	Calculated Concentration in Cast Iron Pipe Headspace (mg/m <sup>3</sup> )	Total Emissions from Cast Iron Piping (lb)	RIDEM Annual Minimum Quantity (lb)
1,4-Dichlorobenzene	175	3.16E-06	17	9.43E-05	1.00E+01
2-Butanone (MEK)	4500	9.28E-03	24,481	1.36E-01	4.00E+03
Acetone	4500	2.64E-02	56,143	3.11E-01	2.00E+04
Benzene	175	2.58E-04	737	4.08E-03	1.00E+01
Bromomethane	345	5.49E-03	19,076	1.06E-01	7.00E+01
Carbon Disulfide	175	8.84E-04	2,462	1.36E-02	2.00E+03
Chloroform	175	3.98E-04	1,736	9.62E-03	2.00E+01
Ethylbenzene	175	2.78E-05	108	5.99E-04	9.00E+03
Isopropylbenzene	175	1.27E-05	56	3.10E-04	1.00E+03
m&p-Xylene	345	6.75E-05	262	1.45E-03	1.00E+03
MTBE	175	5.22E-04	1,683	9.32E-03	3.00E+03
Methylene Chloride	345	1.75E-03	5,427	3.01E-02	4.00E+02
Naphthalene	690	2.56E-07	1	6.66E-06	3.00E+00
o-Xylene	175	2.56E-05	99	5.50E-04	1.00E+03
Styrene	175	2.34E-05	89	4.94E-04	3.00E+03
Tetrachloroethene	175	3.43E-05	208	1.15E-03	2.00E+01
Toluene	175	7.31E-05	246	1.36E-03	3.00E+03
Trichlorofluoromethane	345	1.69E-03	8,477	4.70E-02	3.00E+03

Notes:

- All constants for m&p-xylene are the average of the individual constants for m-xylene and p-xylene.
- The Partial Pressure in the Cast Iron Raceway Pipes was calculated using Raoult's Law and the Average Measured Concentration in NAPL.
- Only detected analytes with RIDEM minimum quantity values are shown.
- Concentration units are in mg/kg and ug/g, both of which are equal to ppm.
- MW = molecular weight; atm = atmosphere; kJ = kilojoules; mol = moles; NAPL = non-aqueous phase liquid; ppm = parts per million; mm Hg = millimeter mercury; cm = centimeter; m = meter; g = gram; ug = microgram; ft = feet, lb = pound; s = second; yr = year; hr = hour; < = less than the reporting limit (RL).
- Yellow Highlighting indicates model inputs.
- Red Highlighting indicates the Emissions Rate exceeds the Rhode Island Department of Environmental Management (RIDEM) Minimum Quantity.

**Table H-3D**  
 Predicted Excavation Emissions - Wooden Raceway Pipe  
 Former Tidewater Facility  
 Pawtucket, RI

Assumptions	
Assumed Average MW of NAPL	250 (g/mol)
Assumed NAPL Temperature in Subsurface	15 (°C)
Assumed Raceway % Filled with NAPL	90%
Assumed Volume of Wooden Raceway Headspace	1.07 (m <sup>3</sup> )
Assumed NAPL Temperature in Raceway	60 (°C)

Site-Specific Wooden Raceway Pipe	
Raceway Diameter	1.5 (ft)
Raceway Length	218 (ft)

Constants	
Typical Bulk Density	1.5 (g/cm <sup>3</sup> )
R	8.21E-05 (m <sup>3</sup> *atm/K/mol)
R	8.31E-03 (kJ/K/mol)
R	62,361 (mm Hg*cm <sup>3</sup> /mol/K)
Soil Gas to Atmosphere Exchange Constant (Wet Soils)	0.1 (%/100)
Air-Filled Porosity (Wet or Compacted Soils)	0.35
Total Porosity	0.625 Eklund 1997 Default
Gas-Phase Mass Transfer Coefficient	0.15 cm/s
Time since Start of Excavation of Soil of Interest	60 s

Analyte	Average Measured Concentration in NAPL (mg/kg)	Wooden Pipe Partial Pressure <sup>2</sup> (atm)	Calculated Concentration in Wooden Pipe Headspace (mg/m <sup>3</sup> )	Total Emissions from Wooden Pipe (lb)	RIDEM Annual Minimum Quantity (lb)
1,4-Dichlorobenzene	175	3.16E-06	17	4.02E-05	1.00E+01
2-Butanone (MEK)	4500	9.28E-03	24,481	5.79E-02	4.00E+03
Acetone	4500	2.64E-02	56,143	1.33E-01	2.00E+04
Benzene	175	2.58E-04	737	1.74E-03	1.00E+01
Bromomethane	345	5.49E-03	19,076	4.51E-02	7.00E+01
Carbon Disulfide	175	8.84E-04	2,462	5.82E-03	2.00E+03
Chloroform	175	3.98E-04	1,736	4.10E-03	2.00E+01
Ethylbenzene	175	2.78E-05	108	2.56E-04	9.00E+03
Isopropylbenzene	175	1.27E-05	56	1.32E-04	1.00E+03
m&p-Xylene	345	6.75E-05	262	6.20E-04	1.00E+03
MTBE	175	5.22E-04	1,683	3.98E-03	3.00E+03
Methylene Chloride	345	1.75E-03	5,427	1.28E-02	4.00E+02
Naphthalene	690	2.56E-07	1	2.84E-06	3.00E+00
o-Xylene	175	2.56E-05	99	2.35E-04	1.00E+03
Styrene	175	2.34E-05	89	2.11E-04	3.00E+03
Tetrachloroethene	175	3.43E-05	208	4.92E-04	2.00E+01
Toluene	175	7.31E-05	246	5.82E-04	3.00E+03
Trichlorofluoromethane	345	1.69E-03	8,477	2.00E-02	3.00E+03

Notes:

- All constants for m&p-xylene are the average of the individual constants for m-xylene and p-xylene.
- The Partial Pressure in the Wooden Raceway Pipe was calculated using Raoult's Law and the Average Measured Concentration in NAPL.
- Only detected analytes with RIDEM minimum quantity values are shown.
- Concentration units are in mg/kg and ug/g, both of which are equal to ppm.
- MW = molecular weight; atm = atmosphere; kJ = kilojoules; mol = moles; NAPL = non-aqueous phase liquid; ppm = parts per million; mm Hg = millimeter mercury; cm = centimeter; m = meter; g = gram; ug = microgram; ft = feet, lb = pound; s = second; yr = year; hr = hour; < = less than the reporting limit (RL).
- Yellow Highlighting indicates model inputs.
- Red Highlighting indicates the Emissions Rate exceeds the Rhode Island Department of Environmental Management (RIDEM) Minimum Quantity.

**Table H-4**  
 Predicted Excavation Emissions Summary  
 Former Tidewater Facility  
 Pawtucket, RI

Analyte	Cap Installation Emissions (lb)	Containment Wall Emissions (lb)	Tank/Vault Emissions (lb)	Cast Iron Raceway Piping Emissions (lb)	Wooden Raceway Piping Emissions (lb)	Total Excavation Emissions (lb)	RIDEM Annual Minimum Quantity (lb)
1,4-Dichlorobenzene	3.96E-02	1.63E-02	8.83E-05	9.43E-05	4.02E-05	5.62E-02	1.00E+01
2-Butanone (MEK)	7.37E+01	3.03E+01	1.27E-01	1.36E-01	5.79E-02	1.04E+02	4.00E+03
Acetone	1.87E+02	7.68E+01	2.91E-01	3.11E-01	1.33E-01	2.64E+02	2.00E+04
Benzene	2.27E+00	4.78E+00	3.82E-03	4.08E-03	1.74E-03	7.06E+00	1.00E+01
Bromomethane	3.60E+01	1.50E+01	9.89E-02	1.06E-01	4.51E-02	5.13E+01	7.00E+01
Carbon Disulfide	9.33E-01	1.28E-01	1.28E-02	1.36E-02	5.82E-03	1.09E+00	2.00E+03
Chloroform	4.99E+00	2.12E+00	9.01E-03	9.62E-03	4.10E-03	7.13E+00	2.00E+01
Ethylbenzene	2.62E+00	1.80E+00	5.61E-04	5.99E-04	2.56E-04	4.43E+00	9.00E+03
Isopropylbenzene	1.26E-01	5.23E-02	2.90E-04	3.10E-04	1.32E-04	1.79E-01	1.00E+03
m&p-Xylene	2.88E+00	1.66E+00	1.36E-03	1.45E-03	6.20E-04	4.54E+00	1.00E+03
MTBE	5.07E-02	2.62E+00	8.73E-03	9.32E-03	3.98E-03	2.70E+00	3.00E+03
Methylene Chloride	1.72E+01	7.18E+00	2.82E-02	3.01E-02	1.28E-02	2.44E+01	4.00E+02
Naphthalene	1.80E-01	6.43E-01	6.23E-06	6.66E-06	2.84E-06	8.23E-01	3.00E+00
o-Xylene	9.67E-01	7.11E-01	5.15E-04	5.50E-04	2.35E-04	1.68E+00	1.00E+03
Styrene	2.01E-01	2.10E-01	4.63E-04	4.94E-04	2.11E-04	4.12E-01	3.00E+03
Tetrachloroethene	5.06E-01	2.12E-01	1.08E-03	1.15E-03	4.92E-04	7.20E-01	2.00E+01
Toluene	1.17E+00	1.86E+00	1.28E-03	1.36E-03	5.82E-04	3.03E+00	3.00E+03
Trichlorofluoromethane	3.42E+01	1.38E+01	4.40E-02	4.70E-02	2.00E-02	4.81E+01	3.00E+03

Notes:

1. Only detected analytes with Total Excavation Emissions Potentials above RIDEM minimum quantity values are shown.
2. lb = pound; ND = Non-Detect.
3. Red Highlighting indicates the calculated Total Excavation Emissions Potential exceeds the RIDEM Minimum Quantity.



## **APPENDIX I**

### **CONTINGENCY PLAN/HEALTH AND SAFETY PLAN**

## GZA SITE-SPECIFIC HEALTH, SAFETY & ACCIDENT PREVENTION STANDARD-PLAN

1. CLIENT/SITE/PROJECT INFORMATION		
Client: National Grid		
Site Address: Tidewater and Merry Streets, Pawtucket, Rhode Island		
Site Description, Work Environment: Former MGP and Power Generation Facility, Active Natural Gas Regulator and Electrical Switching and Substation Facility.		
Job/Project #: 05.0043654.00	Job Start Date: TBD	Job Finish Date: TBD
Site is Covered by the Following Regulations:	OSHA HAZWOPER Standard <input checked="" type="checkbox"/>	Mine Safety and Health Administration <input type="checkbox"/>
2. EMERGENCY INFORMATION		
Hospital Name & Address: Memorial Hospital 111 Brewster Street, Pawtucket RI		Hospital #: 401-729-2000
Directions and Street Map of Route to Nearest Hospital Attached: <input checked="" type="checkbox"/> Yes (required)		
Fire #: 911	Ambulance #: 911	Police #: 911
<b>WorkCare Incident Intervention Services:</b>	<b>For non-emergencies, if an employee becomes hurt or sick call 888-449-7787</b>	
Other Emergency Contact(s): David Rusczyk (GZA) Jesse Edmands (National Grid) National Grid Gas National Grid Electric Pawtucket Water Board	Phone #'s: 460-250-8556 (cell) 860-858-3110 (office) 781-434-8631 (cell) 781-907-3682 (office) 1-800-640-1595 1-800-465-1212 401-729-5005	
<u>Site-Specific Emergency Preparedness/Response Procedures/Concerns:</u>		
<p>This approximately 23-acre Site was the location of the former Tidewater Manufactured Gas Plant (MGP) and the Pawtucket No. 1 Power Station. The majority of the Site is currently vacant with the exception of an active natural gas regulating station, and active switching and electrical substations. Both are owned and operated by National Grid. The Site is listed with RIDEM as a result of historic impacts associated with the former MGP and power plant operations (RIDEM Case No. 95-022). RIDEM Method 1 soil exceedances are due to the presence of total petroleum hydrocarbons (TPH), polynuclear aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs), polychlorinated biphenyls (PCBs), cyanide and certain inorganic compounds (primarily arsenic and lead) at the Site. In addition, exceedances of the Method 1 GB Groundwater Objective and Upper Concentration Limit (UCL) were noted in certain areas of the Site. Specifically, the presence of light and dense non-aqueous phase liquid (NAPL) was observed in several Site monitoring wells. Ethylbenzene, naphthalene and benzene were detected at concentrations above the GB Groundwater Objective in Site wells.</p> <p>The Site is wooded and has rough terrain proximate to riverfront. Extreme caution shall be exercised by all personnel on-Site, particularly in areas of rough and uneven terrain. Potential for exposure to poisonous plants, insects/ticks, snakes and wildlife. Caution is to be exercised, and the use of personal flotation device (PFD) while working along riverfront and over the water is mandatory. The proposed work area is throughout the Site property and within the adjacent Seekonk River. Significant utilities are present within certain areas of the Site, including overhead electric service, municipal water service, combined sewer overflow (CSO) lines and numerous underground natural gas lines.</p> <p>Potential emergencies on Site include physical injuries, heart failure, heat and cold stress. Personnel on Site will have current first aid and CPR training and will be able to respond to minor injuries while emergency response personnel are contacted for assistance. Workers will be provided with rest breaks, rest areas and water to prevent and/or minimize heat and cold stress conditions. A buddy system will be used to observe each other for signs and symptoms of heat stress or hypothermia and to administer appropriate first aid and call for help.</p>		



## GZA SITE-SPECIFIC HEALTH, SAFETY & ACCIDENT PREVENTION STANDARD-PLAN

Before start of each day's work, a Site safety briefing will be conducted by the Field Safety Officer to ensure that all Site personnel are aware of the identity of the emergency coordinator on Site and that everyone is aware of the following:

- Location and proper use of fire extinguishers
- Evacuation procedures and gathering points
- Location of emergency names and numbers

The following minimum emergency equipment shall be kept and maintained on-Site:

- Industrial first aid kit
- Fire extinguishers (one per trailer/vehicle, heavy equipment)
- Absorbent material

Incidents, near miss "good catch", and unsafe act/condition events will be documented on the GZA People-Based Safety card or by using the PBS iPhone app. In addition, incidents and near misses will be documented using the NGRID Accident/Incident investigation report, as appropriate.

### Check cell phone signal strength upon arriving at Site.

- All EHS Events (incidents, first aid, near misses, unsafe acts/conditions, fires, chemical spills, property damage, extraordinary safe behaviors) must be reported immediately to the Project Manager, and within 24hours to the EHS Event Reporting Portal at [www.kelleronline.com/portal](http://www.kelleronline.com/portal). Username gempl1; Password 4Incidents&.
- In the event of a chemical release greater than 5 gallons, site personnel will evacuate the affected area and relocate to an upwind location. The GZA Field Safety Officer and client site representative shall be contacted immediately.
- Site work shall not be conducted during severe weather, including high winds and lightning. In the event of severe weather, stop work, lower any equipment (drill rigs), and evacuate the affected area.

### 3. SUB-SURFACE WORK, UNDERGROUND UTILITY LOCATION

Will subsurface explorations be conducted as part of this work?  Yes  No

Site property ownership where underground explorations will be conducted on:

Public Access Property  Yes  No  
 Private Property  Yes  No

Have Necessary Underground Utility Notifications for Subsurface Work Been Made?  Yes  Yet to be conducted

Specify Clearance Date & Time, Dig Safe Clearance I.D. #, And Other Relevant Information:

**IMPORTANT!** For subsurface work, prior to the initiation of ground penetrating activities, GZA personnel to assess whether the underground utility clearance (UUC) process has been completed in a manner that appears acceptable, based on participation/ confirmation by other responsible parties (utility companies, subcontractor, client, owner, etc.), for the following:

Electric:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA	<input type="checkbox"/> Other _____
Fuel (gas, petroleum, steam):	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA	<input type="checkbox"/> Other _____
Communication:	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> NA	<input type="checkbox"/> Other _____
Water:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA	<input type="checkbox"/> Other _____
Sewer:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA	<input type="checkbox"/> Other _____
Other: _____	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA	<input type="checkbox"/> Other _____

Comments:

### 4. SCOPE OF WORK

Any OSHA PERMIT-REQUIRED CONFINED SPACE entry?

YES  NO

If yes, use Site Specific H&S Plan/Confined Space Entry Permit for that portion of the work

Any INDOOR fieldwork?  YES  NO

IF YES, EXPLAIN:

## GZA SITE-SPECIFIC HEALTH, SAFETY & ACCIDENT PREVENTION STANDARD-PLAN

<p>General project description, and phase(s) or work to which this H&amp;S Plan applies.</p>	<p>The work associated with this HASP consists of implementation of a RIDEM approved Site remedy. The remedy includes installation of a containment wall, demolition/removal of certain Site features, installation of impermeable and permeable engineered caps, performance of source area excavations, and well installation and decommissioning activities. The work will be performed by a contractor engaged directly by National Grid and GZA will be performing construction management and field oversight services.</p> <p>Engineered Caps – The engineered caps consist of both permeable (a geotextile fabric underlying Installation of the engineered caps will require demolition and removal of certain Site features including concrete pads, concrete foundations, fencing, exposed bedrock outcrops, and retaining walls. Non-stained concrete generated during this work will be processed and re-used as fill on-Site. Installation of the engineered caps will also require significant re-grading of the topography of the Site. Approximately 22,000 cubic yards (CY) of material will be cut and re-used as on-Site fill and an additional approximately 11,000 CY of clean fill will also be imported to achieve the subgrade elevation for the engineered caps. An additional approximately 45,000 CY of clean fill will also be imported for the caps.</p> <p>Containment Wall – An approximately 1,300-foot long containment wall will be installed along the eastern (downgradient) edge of portions of the Site. Portions of this containment wall will be installed outboard of the existing bulkhead wall within the Seekonk River and will likely be installed from a barge. Demolition and preclearing of existing bulkhead wall structures (e.g. steel sheeting and timber piling) will also be required to install the containment wall within the Seekonk River. The containment wall will consist of steel sheet pile walls with sealed interlock joints driven or vibrated into the ground using a crane mounted hammer. Pre-excavation will be required to remove potential obstructions along the alignment of the upland portions of the containment wall. Portions of the containment wall will be installed proximate to active transmission towers and overhead electrical wires.</p> <p>Source Area Excavations – Three source area excavations will be performed. The first source area excavation is proximate to an underground tank. During this source area excavation, the overlying 4-inch thick concrete pad, the tank/structure, and the impacted soils immediately adjacent to this structure will be excavated and disposed off-Site. Prior to excavation, any observed liquids (groundwater and NAPL) will be removed from the tank/structure (if present) and the interior of the tank/structure cleaned to remove any residual sludges. The second source area excavation is associated with the presence of a wooden raceway, piping and two concrete structures/vaults used to transfer petroleum. The wooden portion of the raceway is approximately 218-feet long, 18-inches wide, 6-inches deep and was observed at depths ranging from 1 to 2 feet bgs. The raceway cast iron piping is estimated to cover an approximately 840 feet and ranged in size from 6 to 14-inches in diameter at depths ranging from approximately 1 to 2.5 feet bgs. The concrete structures/vaults associated with the raceway were also observed at two locations. These raceway components and associated liquids will be removed, collected, and disposed off-Site. The third source area excavation is associated with an area of crystallized naphthalene that covers an approximate 25-foot by 30-foot area to an average depth of approximately 3 feet. This excavation will result in the generation of approximately 84 CY of impacted material for off-Site disposal.</p> <p>Certain existing monitoring wells will be abandoned during the course of the work consistent with RIDEM regulations and new 4-inch diameter recovery wells will be installed upgradient of the containment wall.</p> <p>These remedial activities are anticipated to require approximately 18-months to complete.</p>
<p>Specific Tasks Performed by GZA:</p>	<p>Oversight of remedial activities for compliance with project specifications. These oversight activities include performance of perimeter air monitoring, performance of field density tests, and collection of confirmatory soil samples.</p>

## GZA SITE-SPECIFIC HEALTH, SAFETY & ACCIDENT PREVENTION STANDARD-PLAN

Concurrent Tasks to be Performed by GZA-hired Subcontractors (List Subcontractors by Name): Refer to Individual Subcontractor HASPs for project specific tasks.	All contractors shall be contracted directly to National Grid. Contractors will be performing earthwork and demolition activities necessary to implement the RIDEM approved Site remedy.
Concurrent Tasks to be Performed by Others:	None anticipated.

<b>5. SITE-SPECIFIC OVERVIEW OF H&amp;S HAZARDS/MITIGATIONS (NOTE: Based on Hazard Assessment, Section 10)</b>	
Describe the major hazards expected to be present at the jobsite, and describe the safety measures to be implemented for worker protection. Use brief abstract statements or more detailed narrative as may be appropriate.	
<b>ON-SITE HAZARDS:</b>	<b>HAZARD MITIGATIONS:</b>
Active facility	Certain portions of the Site are active National Grid facilities (gas regulation, sub-station and power transmission). Personnel will use caution when around active heavy equipment and facilities. Keep in line of site of operators when in vicinity of equipment. Personnel will not enter active utility work zones unless authorized by NGRID.
Traffic/Pedestrians	Area needs to be appropriately marked off to inhibit pedestrians and vehicles traffic from entering the work zone. All personnel will wear reflective vests.
Slip, trip and fall scenarios.	Personnel need to use caution when moving around the Site to avoid hazards. Remove or mitigate slip/trip/fall hazards when feasible. Conduct reconnaissance of each drilling, test pit, and sampling location to identify hazards and proper mitigation prior to work.
Water Hazards	Be aware of uneven terrain, steep slopes, ground settlement, and poor bulkhead structural conditions while working near the Seekonk River. Coast Guard approved Personal Floatation Devices (PFDs) shall be worn at all times when working in and around the Seekonk River.
Construction related Hazards	Personnel will stay clear of moving heavy equipment at all times. GZA will ensure that operators of heavy equipment are aware of GZA position at all times. At a minimum, personal protective equipment (PPE) including hard hats, protective toed work boots, eye protection, and fluorescent colored reflective work vests shall be worn at all times. Nitrile inner gloves and driller's outer gloves, and hearing protection shall be worn at all times when working around the drill rig and test pits or otherwise supporting the drilling and test pitting activities. It is also recommended that Tyvek suits be worn to minimize contact with the impacted groundwater and soil during the work. Spotters will be utilized when heavy equipment movement and relocation is performed. Maintain eye contact with equipment operators when working near equipment.
Plant based Hazards	GZA will wear proper PPE and, if warranted, use poison ivy wipes to limit exposure. See attached Poison Ivy Prevention Plan.
Biting/Stinging Insects, Spiders, Lyme Disease	<p>Ticks carry Lyme (see attached Lyme Disease Prevention Plan) and other Diseases. Ticks are active above 40 degrees F. Tuck pants into long socks and apply DEET (or permethrin clothing pre-treatment is preferred) to control exposure to ticks. Check clothing for ticks frequently and use a tape-based lint roller to remove ticks that may be crawling on clothing. Check whole body immediately upon returning from field and shower.</p> <p>Be aware of intermittent seasonal reports of mosquito borne diseases, such as West Nile disease and Eastern Equine Encephalitis (EEE), and their locations relative to your field site. Use DEET or other mosquito repellent.</p> <p>Be aware of potential cavity, suspended or ground nesting bee/wasp/hornet nests. Avoid undue disturbance or approach with appropriate safety clothing protection and netting.</p>
Possible exposure to impacted soil and groundwater: TPH, VOCs, PAHs, and metals	GZA will wear proper PPE (Vinyl gloves, steel toe boots with rubber booties as necessary, and safety glasses) to further limit any exposure.

## GZA SITE-SPECIFIC HEALTH, SAFETY & ACCIDENT PREVENTION STANDARD-PLAN

Possible exposure to NAPLs	GZA will wear proper PPE (Vinyl gloves, steel toe boots with rubber booties as necessary, and safety glasses) to further limit any exposure.
Natural gas hazards	GZA will use caution when near the natural gas facility. GZA will follow direction of National Grid gas personnel.
Electrical Hazards	GZA will use caution when near the active transmission tower area. GZA will follow direction of the safety observer provided by contractor. GZA will be utilizing small generator powered electric tools for concrete sampling. GFCI protection will be utilized when operating electrically powered tools. Extention cords and equipment will be inspected for wear and tear on a daily basis; equipment will be repaired/replaced as necessary.
Other Utility Hazards (material handling)	GZA will use caution when near the various utility operations on Site. GZA will follow direction of National Grid personnel.
THA 6.02 – Pile and Sheet Pile Installations	See THA 6.02
THA 6.07 – Troxler Testing	Proper storage and transport. Use proper PPE and lifting techniques. Beware of heavy equip. activity.
THA 4.4A – Excavation/Trenching (Heavy Equip.)	Wear proper PPE (high visibility vests or shirts), hardhats, steel toed boots, hearing protection, etc. Observe exclusion controls. Beware of utilities. Make sure operators know where you are at all times.
THA 17.1 – Construction Oversight	See THA 17.01
Additional hazard and mitigations are attached and identified in the attached JHAs.	

### 6. HEALTH AND SAFETY EQUIPMENT AND CONTROLS

#### AIR MONITORING INSTRUMENTS

- PID Type: MiniRAE 3000 Lamp Energy: 10.6 eV; ppbRAE 3000 Lamp Energy: 10.6 eV
- FID Type:
- Carbon Monoxide Meter
- Hydrogen Sulfide Meter
- O<sub>2</sub>/LEL Meter
- Particulate (Dust) Dustrak Meter
- Calibration Gas Type: 100 ppm Isobutylene, multi-gas cal.
- Others: Multi-RAE 5-Gas Meter (includes HCN)

Note: Ensure instruments have been properly calibrated

#### OTHER H&S EQUIPMENT & GEAR

- Fire Extinguisher : 10lb ABC Extinguisher
- Caution Tape
- Traffic Cones or Stanchions
- Warning Signs or Placards
- Decon Buckets, Brushes, etc.
- Portable Ground Fault Interrupter (GFI)
- Lockout/Tagout Equipment
- Ventilation Equipment
- Others:

#### PERSONAL PROTECTIVE EQUIPMENT

- Respirator Type:
- Resp-Cartridge Type:
- Hardhat
- Outer Gloves Type: (as needed, protective work gloves)
- Inner Gloves Type: Nitrile gloves
- Steel-toed boots/shoes
- Coveralls Type:
- Outer Boots Type:
- Eye Protection with side shields
- Face Shield
- Traffic Vest
- Personal Flotation Device (PFD)
- Fire Retardant Clothing: As needed (coveralls)
- EH (Electrical Hazard) Rated Boots, Gloves, etc.
- Noise/Hearing Protection
- Others:

**Discuss/Clarify, as Appropriate:**

### 7. AIR MONITORING ACTION LEVELS

## GZA SITE-SPECIFIC HEALTH, SAFETY & ACCIDENT PREVENTION STANDARD-PLAN

Is air monitoring to be performed for this project? Yes  No

Make sure air monitoring instruments are in working order and have been calibrated prior to use. Depending on project-specific requirements, periodic field calibration checks may be necessary during the day of instrument use.

**ACTION LEVELS FOR OXYGEN DEFICIENCY AND EXPLOSIVE ATMOSPHERIC HAZARDS** (Action levels apply to occupied work space in general work area)

Applicable, See Below.  Not Applicable

Parameter	Response Actions for Elevated Airborne Hazards
Oxygen	<p><b>At 19.5% or below</b> – Exit area, provide adequate ventilation, or proceed to Level B, or discontinue activities</p> <p>Verify presence of adequate oxygen (approx. 12% or more) before taking readings with LEL meter.</p> <p>Note: If oxygen levels are below 12%, LEL meter readings are not valid.</p>
LEL	<p><b>Less than 10% LEL</b> – Continue working, continue to monitor LEL levels</p> <p><b>Greater than or Equal to 10% LEL</b> – Discontinue work operations and immediately withdraw from area. Resume work activities ONLY after LEL readings have been reduced to less than 10% through passive dissipation, or through active vapor control measures.</p>

**ACTION LEVELS FOR INHALATION OF TOXIC/HAZARDOUS SUBSTANCES** (Action levels are for sustained breathing zone concentrations)

Applicable, See Below.  Not Applicable

Air Quality Parameters (Check all that apply)	Remain in Level D or Modified D	Response Actions for Elevated Airborne Hazards
<input checked="" type="checkbox"/> VOCs	0 to 1 ppm	<p>1 ppm to 10 ppm: Temporarily halt work activities (5 minutes minimum) and continue to monitor levels.</p> <p>Persistently &gt; 10 ppm: halt work activities, ID source of vapors, complete corrective action to mitigate vapor emissions, continue to monitor levels, resume work if levels drop below 10 ppm. If levels persist, upgrade to level C. If sustained (1-5 minute duration) breathing zone readings register 1 ppm or greater, benzene Draeger tubes (or equivalent) will be utilized to measure benzene levels.</p>
<input type="checkbox"/> Carbon Monoxide	0 to 35 ppm	At greater than 35 ppm, exit area, provide adequate ventilation, proceed to Level B, or discontinue activities.
<input type="checkbox"/> Hydrogen Sulfide	0 to 10 ppm	At greater than 10 ppm, exit area, provide adequate ventilation, proceed to Level B, or discontinue activities
<input checked="" type="checkbox"/> Dust	0 to 1 mg/m <sup>3</sup>	PM <sub>10</sub> reading of 1 mg/m <sup>3</sup> (1,000 µg/m <sup>3</sup> ) over a 24 hour period or in the event of visible dust, implement dust control measures (i.e. water).
<input checked="" type="checkbox"/> Hydrogen Cyanide	< 2 ppm	<p>&lt; 2 ppm: Pull a dragger tube to confirm concentration level is less than 2 ppm. Continue to work and monitor if concentration is less than 2 ppm.</p> <p>&gt; 2 ppm: Stop work and move at least 25 feet upwind. Continue to monitor and only resume work if concentrations are less than 1 ppm.</p>

**SPECIAL INSTRUCTIONS/COMMENTS REGARDING AIR MONITORING:**

**IN ADDITION TO THESE WORK ZONE ACTION LEVELS, SEPARATE ACTION LEVELS HAVE BEEN ESTABLISHED FOR THE SITE PERIMETER.**

## GZA SITE-SPECIFIC HEALTH, SAFETY & ACCIDENT PREVENTION STANDARD-PLAN

### 8. H&S TRAINING/QUALIFICATIONS FOR FIELD PERSONNEL

- |  |  |
|--|--|
| <input checked="" type="checkbox"/> Project-Specific H&S Orientation (Required for All Projects/Staff) | <input type="checkbox"/> Bloodborne Pathogen Training                  |
| <input checked="" type="checkbox"/> OSHA 40-Hour HAZWOPER/8 Hour Refreshers                            | <input type="checkbox"/> Fall Protection Training                      |
| <input checked="" type="checkbox"/> Hazard Communication (for project-specific chemical products)      | <input checked="" type="checkbox"/> Trenching & Excavation             |
| <input checked="" type="checkbox"/> First Aid/CPR (at least one individual on site)                    | <input checked="" type="checkbox"/> Current Medical Clearance Letter   |
| <input checked="" type="checkbox"/> General Construction Safety Training                               | <input checked="" type="checkbox"/> Benzene Awareness                  |
| <input type="checkbox"/> Lockout/Tagout Training   | <input checked="" type="checkbox"/> OSHA Lead in Construction standard |
| <input type="checkbox"/> Electrical Safety Training  | <input type="checkbox"/>   |

**Discuss/Clarify, as needed:**

### 9. PROJECT PERSONNEL - ROLES AND RESPONSIBILITIES

#### GZA ON-SITE PERSONNEL:

Name(s)	Project Title/Assigned Role	Telephone Numbers
Sean Connolly	Site Supervisor	Work: 860-858-3127 Cell: 860-508-7273
Sean Connolly	Field Safety Officer	Work: 860-858-3127 Cell: 860-508-7273
Sean Connolly	First Aid Personnel	Work: 860-858-3127 Cell: 860-508-7273
Sarah McLeod	GZA Project Team Members	Cell: 401-302-5747
Erik Beloff	GZA Project Team Members	Cell: 401-230-3747

**Site Supervisors and Project Managers (SS/PM):** Responsibility for compliance with GZA Health and Safety programs, policies, procedures and applicable laws and regulations is shared by all GZA management and supervisory personnel. This includes the need for effective oversight and supervision of project staff necessary to control the Health and Safety aspects of GZA on-site activities.

**Site Safety Officer (SSO):** The SSO is responsible for implementation of the Site Specific Health and Safety Plan.

**First Aid Personnel:** At least one individual designated by GZA who has current training and certification in basic first aid and cardiopulmonary resuscitation (CPR) must be present during on-site activities involving multiple GZA personnel.

**GZA Project Team:** Follow instructions relayed by the HASP and GZA manager on-site.

#### OTHER PROJECT PERSONNEL:

Name	Project Title/Assigned Role	Telephone Numbers
James Clark	Associate/Principal-in-Charge	Work: 860-858-3134 Cell: 860-250-6344
David Rusczyk	Project Manager	Work: 860-858-3110 Cell: 460-250-8556
Mark Dalpe	Health and Safety Coordinator (HSC)	Work: 401-421-4140 Cell: 401-374-2305
Richard Ecord	GZA EHS Director	Work: 781-278-3809 Cell: 404-234-2834

**Principal-in-Charge:** Responsible of overall project oversight, including responsibility for Health and Safety.

**Project Manager:** Responsible for day-to-day project management, including Health and Safety.

**Health and Safety Coordinator:** General Health and Safety guidance and assistance.

**GZA EHS Director:** H & S technical and regulatory guidance, assistance regarding GZA H&S policies and procedures.



## GZA SITE-SPECIFIC HEALTH, SAFETY & ACCIDENT PREVENTION STANDARD-PLAN

### 10. HAZARD ASSESSMENT (CHECK ALL THAT APPLY)

#### A. GENERAL FIELDWORK HAZARDS

<input type="checkbox"/> Confined Space Entry (STOP – Use Confined Space Entry HASP) <input type="checkbox"/> Abandoned or vacant building/Enclosed Spaces <input checked="" type="checkbox"/> Significant Slip/Trip/Fall Hazards <input type="checkbox"/> Unsanitary/Infectious Hazards <input checked="" type="checkbox"/> Poisonous Plants <input checked="" type="checkbox"/> Biting/Stinging Insects <input checked="" type="checkbox"/> Feral Animal Hazards <input checked="" type="checkbox"/> Water/Wetlands Hazards <input type="checkbox"/> Remote Locations/Navigation/Orientation hazards <input type="checkbox"/> Heavy Traffic or Work Alongside a Roadway <input checked="" type="checkbox"/> Weather-Related Hazards <input type="checkbox"/> Motor vehicle operation Hazards <input checked="" type="checkbox"/> Heavy Equipment Hazards <input type="checkbox"/> Structural Hazards (i.e. unsafe floors/stairways/roof) <input type="checkbox"/> Demolition/Renovation <input type="checkbox"/> Presence of Pedestrians or the General Public	<input checked="" type="checkbox"/> Overhead Hazards (i.e. falling objects, overhead power lines) <input checked="" type="checkbox"/> Portable Hand Tools or Power Tools <input type="checkbox"/> Significant Ergonomic Hazards <input checked="" type="checkbox"/> Electrical Hazards (i.e. Equipment 120 Volts or Greater, Work Inside Electrical Panels, or Maintenance of Electrical Equipment) <input type="checkbox"/> Other Stored Energy Hazards (i.e. Equipment with High Pressure or Stored Chemicals) <input type="checkbox"/> Fire and/or Explosion Hazard <input checked="" type="checkbox"/> Elevated Noise Levels <input checked="" type="checkbox"/> Excavations/Test Pits <input type="checkbox"/> Explosives or Unexploded Ordinance/MEC <input checked="" type="checkbox"/> Long Distance or Overnight Travel (Employees may not drive and work in excess of 16 hours in one day without prior approval from project PIC) <input type="checkbox"/> Personal Security or High Crime Area Hazards <input type="checkbox"/> Working Alone <input type="checkbox"/> Ionizing Radiation or Non-Ionizing Radiation <input checked="" type="checkbox"/> Chemical/Exposure Hazards (See Part B for Details) <input type="checkbox"/> Other:
---	--

#### B. CHEMICAL/EXPOSURE HAZARDS

<input type="checkbox"/> No chemical hazards anticipated <input type="checkbox"/> Hydrogen Sulfide (H <sub>2</sub> S) <input checked="" type="checkbox"/> Cyanides, Hydrogen Cyanide (HCN) <input type="checkbox"/> Carbon Monoxide <input type="checkbox"/> Herbicides, Pesticide, Fungicide, Animal Poisons <input checked="" type="checkbox"/> Metals, Metal Compounds <input type="checkbox"/> Corrosives, Acids, Caustics, Strong Irritants <input checked="" type="checkbox"/> Polychlorinated Biphenyls (PCBs) <input checked="" type="checkbox"/> Polycyclic Aromatic Hydrocarbons (PAHs) <input type="checkbox"/> Compressed Gases <input type="checkbox"/> Flammable/Combustible Liquids <input type="checkbox"/> Radiation Hazards (i.e. radioactive sealed/open source, x-rays, ultra violet, infrared, radio-frequency, etc.)	<input type="checkbox"/> Methane <input type="checkbox"/> Chemicals Subject to OSHA Hazard Communication (Note: For commercial chemical products, attach MSDSs if applicable) <input checked="" type="checkbox"/> Containerized Waste, Chemicals in Piping & Process Equipment <input checked="" type="checkbox"/> Emissions from Gasoline-, Diesel-, Propane-fired Engine, Heater, Similar Equipment <input checked="" type="checkbox"/> General Work Site Airborne Dust Hazards <input checked="" type="checkbox"/> Volatile Organic Compounds (VOCs), BTEX <input type="checkbox"/> Chlorinated Organic Compounds <input checked="" type="checkbox"/> Fuel Oil, Gasoline, Petroleum Products, Waste Oil <input type="checkbox"/> Asbestos <input type="checkbox"/> Oxygen Deficiency, Asphyxiation Hazards <input checked="" type="checkbox"/> Other: Hydrogen Cyanide
---	---

## GZA SITE-SPECIFIC HEALTH, SAFETY & ACCIDENT PREVENTION STANDARD-PLAN

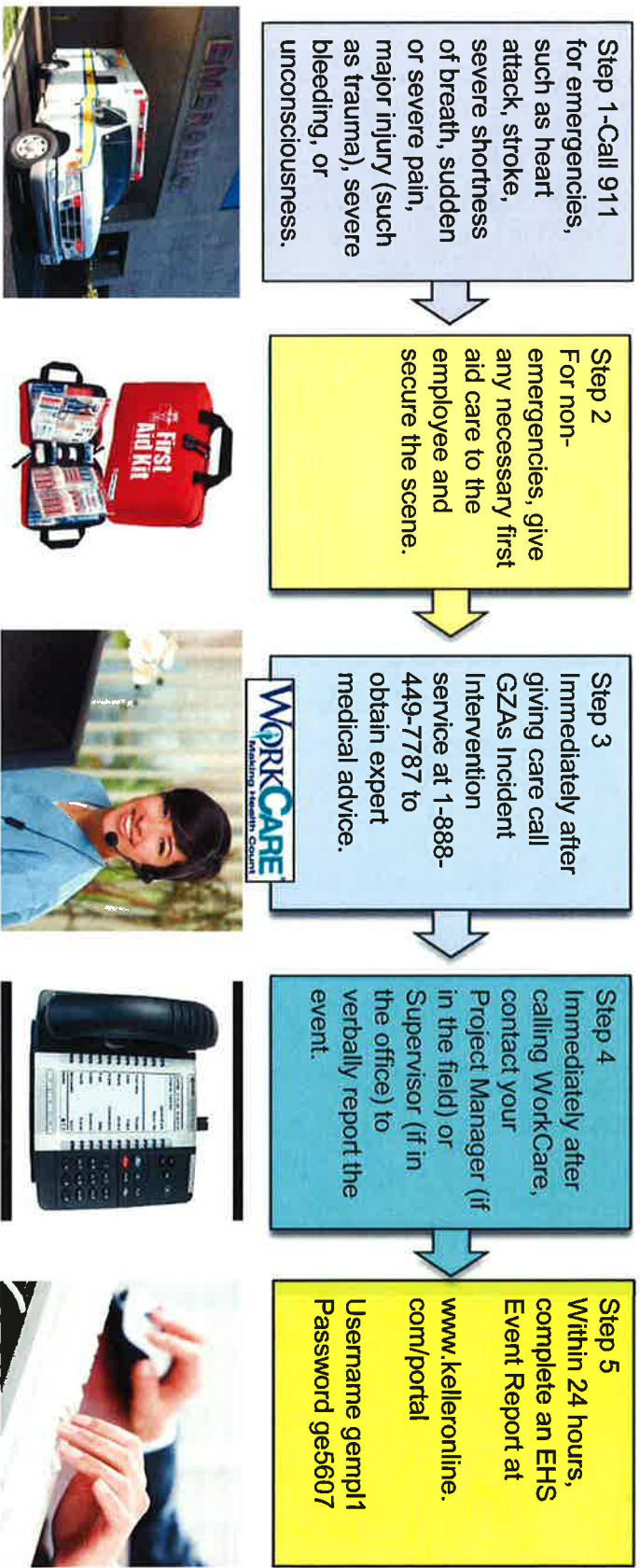
11. PLAN ACKNOWLEDGEMENT AND APPROVALS			
<b>GZA Employee Plan Acknowledgement</b>			
<i>I have read, understood, and agree to abide by the information set forth in this Safety and Accident Prevention Plan. I will follow guidance in this plan and in the GZA Health and Safety Program Manual. I understand the training and medical monitoring requirements covered by the work outlined in this plan and have met those requirements.</i>			
GZA Employee Name	GZA Employee Signature	Date	
<b>Subcontractor Employee Plan Acknowledgement</b>			
<i>GZA has prepared this plan solely for the purpose of protecting the health and safety of GZA employees. Subcontractors, visitors, and others at the site must refer to their organization's health and safety program or site-specific HASP for their protection. Subcontractor employees may use this plan for general informational purposes only. Subcontractor firms are obligated to comply with safety regulations applicable to their work, and understand this plan covers GZA activities only.</i>			
Subcontractor Employee Name	Subcontractor Employee Signatures	Date	
<b>GZA Site-Specific Health and Safety Plan Approval Signatures</b>			
<i>The following individuals indicate their acknowledgement and/or approval of the contents of this Site Specific H&amp;S Plan based on their understanding of project work activities, associated hazards and the appropriateness of health and safety measures to be implemented.</i>			
GZA Signatory	Employee Name	Employee Signature	Date
Preparer:			
EHS Reviewer:			
PIC Approval:			

**Attachments to this plan:**

1. Daily Tailgate Safety Meeting
2. Work Care Flow Chart
3. Directions to the Hospital
4. Lyme Disease and Tick Prevention Plan
5. Poison Ivy Prevention Plan
6. Incident Report Template
7. Task Hazard Analyses



# If a GZA employee or GZA-hired subcontractor employee is HURT or SICK follow these steps:





Do you know your Credit Score? View Yours for FREE!	
Excellent	750 - 840
Good	660 - 749
Fair	620 - 659
Poor	340 - 619
I Don't Know	????
<b>Find out INSTANTLY!</b>	

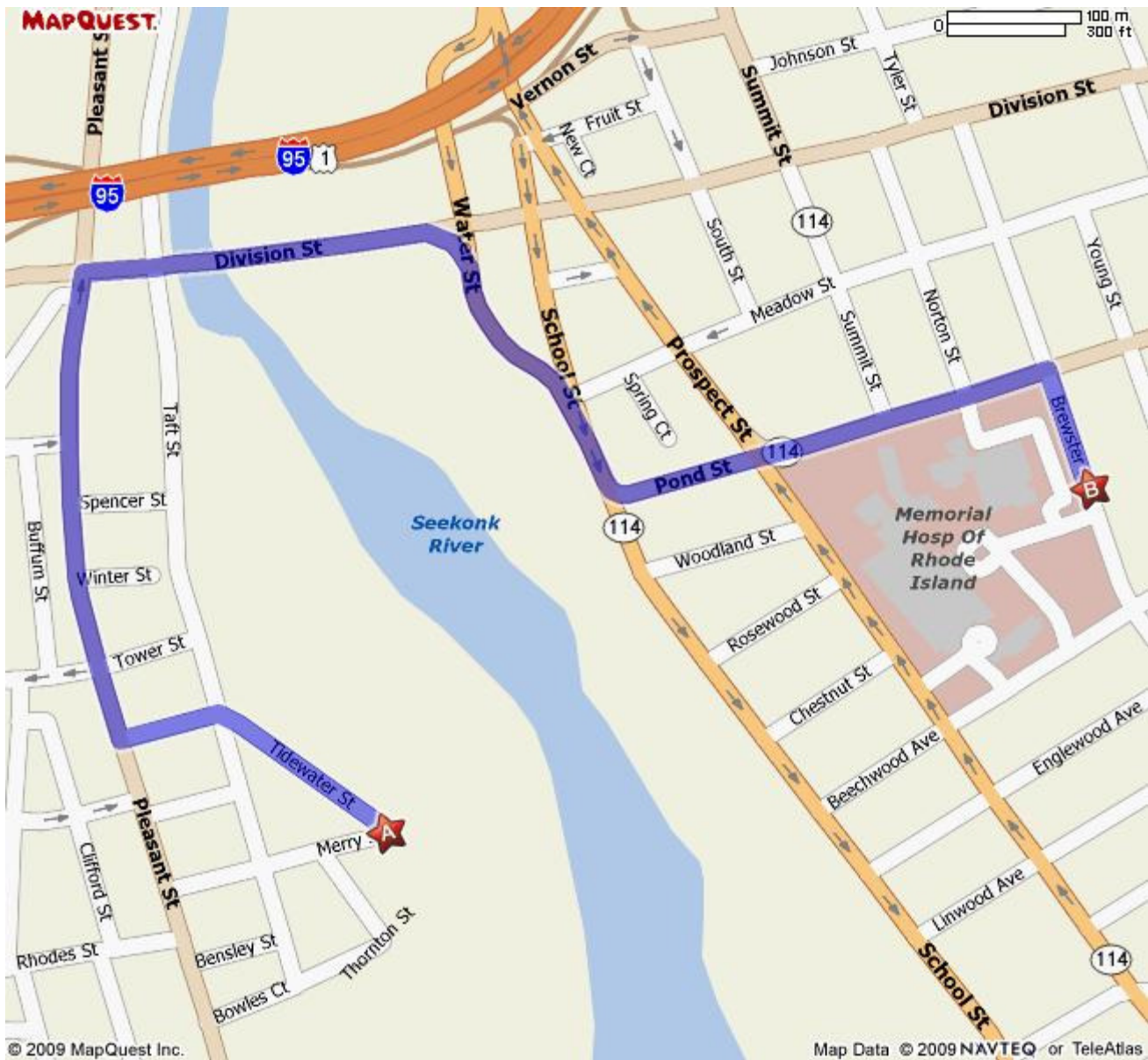
Total Time: 4 minutes    Total Distance: 1.16 miles

**A: 1 Tidewater St, Pawtucket, RI 02860-5228**

- |  |  |        |
|--|--|--------|
|  | 1: Start out going NORTHWEST on TIDEWATER ST toward TAFT ST. | 0.2 mi |
|  | 2: Turn RIGHT onto PLEASANT ST.                              | 0.3 mi |
|  | 3: Turn RIGHT onto GRACE ST.                                 | 0.0 mi |
|  | 4: GRACE ST becomes DIVISION ST.                             | 0.2 mi |
|  | 5: Turn SLIGHT RIGHT onto WATER ST.                          | 0.2 mi |
|  | 6: Turn SLIGHT RIGHT onto SCHOOL ST/RI-114 S.                | 0.0 mi |
|  | 7: Turn SLIGHT LEFT onto POND ST.                            | 0.3 mi |
|  | 8: Turn RIGHT onto BREWSTER ST.                              | 0.1 mi |
|  | 9: End at 111 Brewster St Pawtucket, RI 02860                |        |

**B: Memorial Hospital-Rhode Island: 111 Brewster St, Pawtucket, RI 02860, (401) 729-2000**

Total Time: 4 minutes    Total Distance: 1.16 miles



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Directions and maps are informational only. We make no warranties on the accuracy of their content, road conditions or route usability or expeditiousness. You assume all risk of use. MapQuest and its suppliers shall not be liable to you for any loss or delay resulting from your use of MapQuest. Your use of MapQuest means you agree to our [Terms of Use](#)



## **LYME DISEASE AND TICK EXPOSURE PREVENTION PLAN**

### **1.0 PREVENTING TICK BITES**

Black-legged ticks may be present at all times of the year, but after a significant thawing of snow in spring, they emerge ready to feed on animals and humans. This generally occurs when the temperatures are 40 degrees F or higher.

For all work outside the office, GZA requires that a Health and Safety Plan shall be prepared. This plan is site specific in nature, and especially during spring and summer it should include specific actions GZA will take to avoid tick bites. These actions could include any of the following:

1. **Know where to expect ticks.** They live in moist and humid environments, particularly in or near wooded or grassy areas. You may come into contact with ticks during outdoor activities, when walking through vegetation, or when around leaf litter or shrubs.
2. **Arrange for grassy areas to be mowed or treated when possible.** Walking through tall grass or working in areas with tall grass will likely expose you to ticks. At specific areas at fixed facilities or project sites, clients may be able to mow areas of tall grass prior to GZA's arrival at the project site. Clients may also be willing to treat areas, if asked. A single springtime application of acaricide can reduce the population of ticks that cause Lyme disease by 68-100%.
3. **Dress correctly for spotting ticks.** Long pants and a long-sleeved shirt should be worn, and pants should be tucked inside white socks. Wearing white socks will allow you to better see ticks if they are on you.
4. **Use a repellent with DEET (on skin or clothing) or permethrin (on clothing and gear).** Repellents containing 20% or more DEET (N, N-diethyl-m-toluamide) can be applied to the skin and protect you for several hours. DEET should be re-applied regularly, especially if you're sweating. Always read and follow product instructions. Products containing permethrin can be used to treat boots, clothes, and camping gear. Permethrin-treated products remain protective through several washings. Permethrin is the preferred and most effective insecticide in tick bite prevention.
5. **Take a hot shower immediately after being outdoors.** Taking a shower within two hours of coming indoors has been shown to reduce your risk of getting Lyme disease. Showering may help wash off unattached ticks and is a good opportunity to do a thorough tick check.

6. **Perform tick checks at least three times daily.** Check your body thoroughly for ticks at two times during the work shift and after being outdoors. Black-legged ticks are very small, so a hand-held or full-body mirror should be used to view all parts of your body. Take special care to check the following parts of your body:
  - a. Under the arms
  - b. In and around the ears
  - c. Inside the bellybutton
  - d. Back of the knees
  - e. In and around all head and body hair
  - f. Between your legs
  - g. Around your waist
7. **Place clothes in a dryer.** Placing clothes into a dryer on high heat for at least an hour effectively kills ticks.

## 2.0 WHAT TO DO IF YOU FIND AN ATTACHED TICK

Even if you take all the precautions listed in section 2 of this document, you may find a tick attached to your body. Taking certain actions can keep your chances of developing Lyme disease very small. These actions include:

1. **Remove the tick as soon as you find it.** Remove an attached tick with the tick removal tool supplied by GZA or with fine-tipped tweezers, as close to the skin as possible, and pulling it straight out. If you remove an attached tick within 24 hours, it is very unlikely that Lyme disease will be transferred to you from the tick.
2. **Save the tick.** If you are sure a tick has been attached for more than 24 hours, and are sure the tick is a black-legged tick, save the tick for potential testing.
3. **Call WorkCare's Incident Intervention service.** If a tick has been attached to your body for more than 24 hours, call WorkCare immediately after removing it. WorkCare has a specific medical protocol used for tick bites, and can advise you of first aid measures to take that are specific to ticks and Lyme disease. They will also be able to advise you if you need to save the tick.
4. **Be alert for fever or a rash.** Fever and a rash may be the first signs of a tick-borne illness. Incubation time prior to becoming symptomatic for some tick borne illnesses can be up to 10 days (ehrlichiosis and anaplasmosis). If you have been in areas where ticks are likely to be present, even if you do not find a tick attached to your body, call WorkCare to get additional medical advice.

## **POISON IVY PREVENTION PLAN**

### **1.0 TIPS**

- If you need help remember what is poison ivy and what is not, just remember this rhyme: "Leaves of three let it be; if it's hairy, it's a berry!"
- If you don't have any other soap available, trying washing off with dish soap (just as it cuts the grease off your dishes, it effectively cuts the urushiol oil off the skin).
- If there are trails wherever you happen to be going, stay on them. Normally, poison ivy has been cleared out from these areas, but of course there are no guarantees.
- During river paddling trips in the east, especially in the piedmont and coastal plain, poison ivy often covers large areas along the shoreline. If you need to get to shore, beat down a path through the poison ivy, then immediately return to the river and scrub off using river silt and rinse off in the river.
- If you are camping or otherwise unable to treat poison ivy with soap and water or various over the counter medications and you know you've been exposed, consult your field guide for a plant known as Jewel Weed. Jewel Weed prefers moist, alluvial areas and the juice from the broken stem of the plant is a folk remedy for poison ivy exposure. This, like most folk remedies, should be taken with a grain of salt and you should still seek proper treatment.
- If you touch poison ivy put deodorant stick on it right away if you aren't near water. This will prevent the oil from spreading anywhere else.
- A poison ivy reaction usually takes a day or two to appear, although it could take as little as a few hours or as much as 7-10 days. If you think you've been exposed to the plant, the sooner you wash your skin the better your chance of having little or no reaction.
- When in doubt, assume it's poison oak or ivy. It's better to be safe than sorry.
- Vinegar is another cleansing agent you might try after exposure to poison ivy (urushiol).

- These plants are quite common in North America: poison ivy and sumac are widespread in much of the eastern and central U.S. as well as parts of Canada, and poison oak is prevalent in California and other parts of the western U.S.
- While leaves of three leaflets are by far the most common arrangement, poison ivy leaves will occasionally display more or fewer leaflets.
- While some people experience a reaction to poison ivy the first time they have contact with it, it commonly requires several exposures to the plant before someone develops adverse effects. Thus, don't assume that you are immune to poison ivy just because you've never had problems with it before.
- If you have irritation due to exposure to one of these, use Listerine on the bad areas -- it dries it out immediately.
- Poison ivy can be an integral part of the natural environment, and deer and other animals eat or live in poison ivy. For these reasons, consider peacefully coexisting with poison ivy if you have it on your property.
- Poison ivy, poison oak, and poison sumac cannot be identified by their size. Young plants are obviously quite small, while larger ones can grow up trees 5 or 10 feet (1.5 or 3.0 m). The overall appearance of the plants can also be deceiving: they can appear either as a vine or as a shrub. Several woodland plants can be mistaken for poison ivy, poison oak, or poison sumac but when in doubt, avoid contact with a plant.

## 2.0 WARNINGS

- Mango is a close relative of Poison Ivy and contains trace amounts of urushiol. If you exhibit a very strong reaction to poison ivy you should also be careful when around mango trees or handling mangoes.
- It's important to first wash with rubbing alcohol or vinegar or at least rinse off with cool water before taking a hot shower with soap. Hot water opens pores and can speed the urushiol's entry into the skin. Rather than dissipating the oil, soap will only spread it around. Don't reenter poison ivy after you've washed with rubbing alcohol, however, as the alcohol dries your skin and removes its protective oils.

- Like any other allergic reaction, poison ivy reactions can get very serious. Contact your physician or request immediate medical assistance if you experience extreme symptoms.
- Follow the manufacturer's directions and heed product warnings when using any herbicide. These products may be harmful to humans and pets, as well as to garden plants.
- **Never burn poison ivy.** Burning can cause the oil to get into the air; from there, you can breathe it in or get it in your eyes. The smoke from burning poison ivy will cause the same reaction in your lungs that normally happens on the skin. Reactions to this kind of exposure can be far more serious than those resulting from topical contact; in fact breathing the smoke from burning poison ivy can cause death.

### **3.0 THINGS YOU'LL NEED**

- Long pants, long-sleeve shirts
- Socks and fully-enclosed shoes. Boots may be even better!
- Gloves (plastic over cotton)
- Barrier cream
- Rubbing alcohol
- Vinegar
- Soap and water - only AFTER cleansing with rubbing alcohol, vinegar, or commercial cleanser like Tecnu, or mineral spirits

## 4.0 STEPS

1. **Learn to identify poison ivy, poison oak, and poison sumac, and when you see them, avoid them at all costs.** All are woody vines or shrubs that grow independently or climb and trail up trees, fences, and other objects, and along the ground.



- **Poison Ivy:**
  - **Leaves.** Poison ivy has thin, often shiny, bright-green compound leaves. The edges of the leaves usually have large indentations at irregular intervals. The leaves occur in threes, with one leaf at the end of the stem, and two leaves opposite each other on the stem. Hence the saying, "leaves of three, leave it be." The young leaves may be orange, and in the fall the leaves turn red.
  - **Vine.** The stem is woody and in its native territory is the only native vine with aerial roots. Aerial roots are small roots that grow out of the stem and also help the vine to cling to a support. English Ivy also has aerial roots, but it is not a native plant, and its leaves are very different from those of poison ivy. The aerial roots are commonly seen on older plants growing up or over non-soil supports (stones, trees, fences, etc.). They are often reddish. The aerial roots make the main stem appear hairy, hence the saying, "hairy rope, don't be a dope."



- Flowers and berries. Depending on the time of year, the plant may have clusters of small, yellowish-green flowers (usually in June) or hard, greenish-white berries (fall). Deer and birds eat the berries, and excrete the seeds, causing new plants to sprout in new places.
- **Poison oak** grows primarily in dry areas and also has leaves of three leaflets, and while the leaves often resemble "true oak" leaves, they may take on other appearances as well. They are usually green in spring and summer, turning reddish in late summer and fall. The flowers and berries are white to yellowish-green, as in poison ivy (hence another saying, "berries white, poisonous sight").
- **Poison sumac** has leaves of 7-13 leaflets, produces a small, white or grey berry, and is found in boggy or riparian areas. *Hereafter, the article refers only to "poison ivy" for brevity, but the steps for poison oak and poison sumac are the same.*

**2. Wear long pants, long-sleeve shirts, socks, and fully-enclosed footwear when walking in poison-ivy infested areas.** Not only will covering your skin help protect you from poison ivy, but mosquitoes won't bother you as much either.

**3. Wear gloves when working where poison ivy may be present, such as when cutting down trees in the woods, mowing brush, etc.** It is recommended that you wear plastic gloves over cotton gloves because urushiol (the oil in poison ivy that is responsible for the allergic reaction) can eventually soak through cotton gloves. Not only is getting poison ivy on your hands a pain, it makes it very easy to spread to the rest of your body, so gloves are an important defense. Wearing pants and long sleeve shirts can give you more time before it has contact with your skin.

- Exercise caution not to touch your face or eyes (or other exposed skin) with hands or gloves that may have come in contact with poison ivy.

**4. Apply a barrier cream, such as Ivy Block or Stokoguard, if you know you have a good chance of exposure to poison ivy.** While no vaccine or medicine has been shown to prevent reactions to poison ivy, barrier creams containing bentoquatam seem to be effective in slowing the absorption of urushiol into the skin. Apply the cream as directed, usually about an hour before potential exposure, and thoroughly wash it off within four hours, reapplying as necessary.

**5. Watch out for poison ivy oil carried back on pets.** Even if you avoid poison ivy, your pets may not, particularly if you let them run free in the woods or in a large yard. The urushiol sticks to pets' fur but typically does not irritate them, so you won't be able to tell if they've gotten into it. Keep dogs on a leash and keep a watchful eye on all pets or farm animals when in poison ivy country. If you think there's a chance your pet may have been exposed, thoroughly wash it with a good pet shampoo. Wear plastic gloves, cover exposed skin with clothing, and wear safety goggles. Try to prevent your pet from shaking off on the first wash (this is harder than it sounds; hence the safety goggles). Wash and thoroughly rinse your pet with the shampoo and warm water three times in succession to make sure the urushiol is gone. Towel dry, and immediately launder the towel in the washing machine. Let your pet fully dry before touching it with bare skin.

**6. Be careful around streams or ponds.** If the plants are hanging into the water the oils can spread and you may be exposed without ever having seen the plant. This can be particularly serious if you swim or bathe in contaminated water.

**7. Beware latent resin.** Urushiol resin can remain active for a long time—years if kept dry—so handle potentially exposed objects with care. People commonly end up with a reaction from touching garden tools that have been left in the yard, fences from which poison ivy has recently been removed, and clothes that were exposed to urushiol but were put away before the wearer came in contact with the oil. Thoroughly wash or dispose of clothes, tools, or other objects which may have come into contact with poison ivy, and use the same caution touching dead poison ivy plants or plant parts as you would if they were alive. To wash objects, use hot, soapy water and let the clothing or object dry outside for several days.

**8. Control poison ivy manually.** Spraying poison ivy with products such as Roundup or Ortho Poison Ivy Killer is not an environmentally friendly choice, especially since such products will usually kill other nearby plants as well. If you wish to remove poison ivy by hand, make sure to dress appropriately, wear barrier cream, and follow all other necessary precautions. Manual removal can be tedious, because you must remove all parts of the plant—stems, leaves, and roots—or it may regrow.

**9. Dispose of poison ivy or exposed objects properly.** Check with your municipality to find out any local regulations on poison ivy disposal. In general, dispose of poison ivy or contaminated objects in biodegradable plastic garbage bags, and mark the bags to warn your garbage handlers. You may also bury the poison ivy remnants, a wiser choice, but be sure to bury them deep enough (at least 12 inches to be safe) to prevent regrowth.

**10. Wash exposed skin immediately.** It takes about 10-30 minutes after contact for urushiol to bind with skin, so fast cleaning may prevent a reaction. If you think your skin may have been exposed to poison ivy, clean the affected area with rubbing alcohol, and then wash it with cool water. Do this while outside, if possible, and when you are finished proceed immediately to take a hot shower using plenty of soap. Scrub under fingernails thoroughly to wash off any remaining resin.

- You can also use Tecnu Extreme or Zanfel cleanser if you know you have been exposed to poison ivy. They are both very effective at removing the urushiol, which is vital. Even if used at the first sign of itching or rash, they can reduce the effect and severity of the allergic reaction.
- See How to Treat Poison Ivy and Poison Oak for more details.

Attachment D  
**GZA INCIDENT INVESTIGATION FORM**

**CLIENT/SITE/PROJECT INFORMATION**

Client/Site Name:		
Site description:		
Site Address:		
GZA Office:		
Job/Project #:	PM:	PIC:

**DESCRIPTION OF INCIDENT**

Date/Time of Incident: \_\_\_\_\_

Type of incident: \_\_\_\_\_ Occupational Injury \_\_\_\_\_ Occupational Illness \_\_\_\_\_ Fatality \_\_\_\_\_ Property Damage  
\_\_\_\_\_ Medical Treatment \_\_\_\_\_ First Aid \_\_\_\_\_ Lost Time \_\_\_\_\_ Restricted Duty  
\_\_\_\_\_ Other \_\_\_\_\_

Description, nature and extent of injury, property damage, or other pertinent aspects of the incident:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Name(s), nature of involvement and employer of individual(s) *directly involved* in the incident (injured victim, operator of equipment causing damage, etc.) or direct observer of the incident.

1) Name \_\_\_\_\_

Nature of involvement with incident: \_\_\_\_\_

Employer \_\_\_\_\_

2) Name \_\_\_\_\_

Nature of involvement with incident: \_\_\_\_\_

Employer \_\_\_\_\_

3) Name \_\_\_\_\_

Nature of involvement with incident: \_\_\_\_\_

\_\_\_\_\_

Employer \_\_\_\_\_

Describe the type of first aid or medical treatment provided, or other accommodations and/or responses to the incident:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Describe the employee activity at the time of the incident: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Describe any tools or machinery involved: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Describe any personal protective equipment, or other safety equipment used by employee at the time of the incident:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**EXHIBITS** - Identify other exhibits accompanying this form (photos, equipment, etc.):

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**CAUSES:**

Summarize the IMMEDIATE DIRECT CAUSE(S) of the incident: \_\_\_\_\_

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Identify any CONTRIBUTORY FACTORS OR INDIRECT CAUSES of the incident: \_\_\_\_\_

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Identify possible ROOT CAUSES of the incident: \_\_\_\_\_

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**CORRECTIVE ACTIONS** - Identify immediate/short term/interim corrective actions or measures taken and dates corrected:

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**RECOMMENDATIONS** - Recommended changes in process, procedure, equipment or other recommendations, to correct a situation and/or prevent the incident from recurring in the future:

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**A. PARTICIPANTS IN THE INCIDENT INVESTIGATION - NAME OF GZA EMPLOYEE(S) FILLING OUT, OR CONTRIBUTING TO THE INFORMATION IN, THIS FORM:**

*NAME*

*ROLE/RESPONSIBILITY*

<i>NAME</i>	<i>ROLE/RESPONSIBILITY</i>
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**DISTRIBUTION**

Director of Health and Safety: Mark Malchik, Norwood

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# GZA GEOENVIRONMENTAL, INC. JOB HAZARD ANALYSIS WORKSHEET

**Job: Drilling Observations, Monitoring Well Installation Observation and Soil Sampling**

<b>Analysis By: Andrew Whitsitt</b>	<b>Reviewed By: Guy Dalton</b>	<b>Approved By: Jayanti Chatterjee , CIH</b>
<b>Date: October 2, 2011</b> <b>Revised: June 14, 2012</b>	<b>Date: June 14, 2012</b>	<b>Date: June 26, 2012</b>

## Task 4.1

### DRILLING OBSERVATIONS, MONITORING WELL INSTALLATION OBSERVATIONS, SOIL SAMPLING

#### HAZARD CONTROLS

GZA Job Tasks	Potential Hazards	Controls
<p><u>Review Related THA's –</u> 21.1 – General Outdoor Field Work</p>		
<p>Observation of Deploying of Traffic Protection Equipment by Drilling Contractor (e.g., cones, signs, etc.)</p>	<p>Personal injury due to vehicle traffic, Collisions, injuries</p>	<p>Wear high visibility vest at all times when out of vehicle.</p> <hr/> <p>Park in designated parking locations or select off-road areas that are firm and free of hazards. Directly inspect parking location on foot if necessary.</p> <hr/> <p>Use emergency flashers or other appropriate vehicle warning system as appropriate to local conditions when parking personal or GZA vehicle and/or equipment.</p> <hr/> <p>If parking outside of a designated parking area, demarcate vehicle with traffic cones or equivalent.</p> <hr/> <p>Use emergency flashers or other appropriate vehicle warning system when placing equipment.</p> <hr/> <p>Observe if police detail or other required traffic control system (if necessary) is in place.</p> <hr/> <p>Stay within the confines of the work area and do not venture outside of the demarcated work area into traffic.</p> <hr/> <p>If you observe that contractor may back into structures, vehicles, fences, etc., notify contractor immediately with pre-determined signals. Do not cross the path of the heavy equipment.</p> <hr/> <p>Stand clear of moving Drill Rig.</p>
<p>Observation of Mobilizing Drill Rig To Job Site and positioning at borehole by Drilling Contractor</p>	<p>Struck by drill rig</p>	<p>Before drilling begins, confirm that drill rig has been parked properly and securely by the drilling contractor.</p> <hr/> <p>Wear high visibility vests. Make sure that the driver can see you and is aware of your location at all times.</p> <hr/> <p>Inform the driller if it is observed that the rig is being moved with the mast raised and/or tools and other equipment on the rig are not secured and can fall over and potentially hurt personnel.</p>



# GZA GEOENVIRONMENTAL, INC. JOB HAZARD ANALYSIS WORKSHEET

**Job: Drilling Observations, Monitoring Well Installation Observation and Soil Sampling**

Analysis By: Andrew Whitsitt	Reviewed By: Guy Dalton	Approved By: Jayanti Chatterjee , CIH
Date: October 2, 2011 Revised: June 14, 2012	Date: June 14, 2012	Date: June 26, 2012

## Task 4.1

### DRILLING OBSERVATIONS, MONITORING WELL INSTALLATION OBSERVATIONS, SOIL SAMPLING

#### HAZARD CONTROLS

GZA Job Tasks	Potential Hazards	Controls
	Overhead utility	Look overhead to assess if any utilities are present and confirm with driller that they are aware of the overhead utility location and to take appropriate actions to prevent contact with the overhead utilities and to minimize any arc flash hazards. Review GZA's Electrical Safe Work Practices Program 03-3003.
Observation of drilling operations and monitoring well installations	Underground utilities	Confirm that underground utility clearance procedures have been completed in accordance with GZA Policy # 04-0301 <i>Responsibility for Utility Clearance of Exploration Locations</i> for clearing utility locations prior
	Moving machinery, rotating parts, cables, ropes, etc.	<p>Do not wear loose fitting clothing.</p> <p><b>All GZA personnel working in proximity to a drill rig will be familiarized with the location and operation of emergency kill switches prior to equipment start-up.</b> Maintain safe distance from rotating auger, drill casing, rods and cathead at all times. Observe operations from a safe distance. Persons shall not pass under or over a moving stem or auger Check that "kill" switches are present and working. Confirm with driller that daily inspection of rig has been performed prior to commencing work and no conditions were noted with the rig that would affect its proper operation.</p> <p>Do not touch or operate or assist with any rig operations and maintenance work.</p> <p>Make eye contact with operator before approaching equipment.</p> <p>Be alert and take proper precautions regarding slippery ground surfaces and similar hazards near rotating auger.</p> <p>Do not engage the driller or helper when drill is in operation. Work out prearranged signals to get their attention before approaching them.</p> <p>Confirm prior to drilling operations that driller and helper communicate and coordinate their actions and movements.</p> <p>GZA personnel are not allowed to be on the drill rig or operate a rig.</p>



# GZA GEOENVIRONMENTAL, INC. JOB HAZARD ANALYSIS WORKSHEET

**Job: Drilling Observations, Monitoring Well Installation Observation and Soil Sampling**

<b>Analysis By: Andrew Whitsitt</b>	<b>Reviewed By: Guy Dalton</b>	<b>Approved By: Jayanti Chatterjee , CIH</b>
<b>Date: October 2, 2011</b> <b>Revised: June 14, 2012</b>	<b>Date: June 14, 2012</b>	<b>Date: June 26, 2012</b>

## Task 4.1

### DRILLING OBSERVATIONS, MONITORING WELL INSTALLATION OBSERVATIONS, SOIL SAMPLING

#### HAZARD CONTROLS

GZA Job Tasks	Potential Hazards	Controls
		Wear steel toed boots, hardhat and side-shielding safety glasses/goggles.
	Falling objects, debris	Stand clear of stacked drill rods. If stack appears unstable inform driller.
	Noise	Wear appropriate hearing protection.
	Roadway/traffic hazards	Be alert at all times; never step outside traffic cones.
		Wear high visibility vests at all times.
		Be familiar with escape routes at each location.
		Follow project Traffic Control Plan. Be alert at all times and never step outside the traffic cones. Use a Police detail when necessary.
	Slips, trips and falls	Maintain clean and sanitary work area free of tripping/slipping hazards. All borings, excavations, or partially completed groundwater monitoring wells will be adequately covered and/or barricaded if left unattended for any period of time to prevent injury. Store any hand tools used for sampling in their proper storage location when not in use. Provide adequate space for each employee to work safely with sound footing. Do not perform work if adequate lighting is not available. Maintain an exit pathway away from the rig at all times.
	Cuts, bruises, shocks, lacerations, sprains and strains during tool use	When working with a driller, do not assist the drilling crew with their work. Use properly maintained tools; do not use damaged tools. Wear the proper Personal Protective Equipment based on the task being performed. Store and carry tools correctly. Use the correct tool for the job. Do not use electrical tools with damaged cords or other electrical components. Observe proper electrical safety practices. Do not use electrical tools in wet areas.



# GZA GEOENVIRONMENTAL, INC. JOB HAZARD ANALYSIS WORKSHEET

**Job: Drilling Observations, Monitoring Well Installation Observation and Soil Sampling**

<b>Analysis By: Andrew Whitsitt</b>	<b>Reviewed By: Guy Dalton</b>	<b>Approved By: Jayanti Chatterjee , CIH</b>
<b>Date: October 2, 2011</b> <b>Revised: June 14, 2012</b>	<b>Date: June 14, 2012</b>	<b>Date: June 26, 2012</b>

## Task 4.1

### DRILLING OBSERVATIONS, MONITORING WELL INSTALLATION OBSERVATIONS, SOIL SAMPLING

#### HAZARD CONTROLS

GZA Job Tasks	Potential Hazards	Controls
		Coordinate activities with driller. Allow driller to open sampling equipment (i.e., split spoons, Geoprobe sleeves, etc.)
	Fire hazards	Be familiar with emergency procedures and where fire extinguishers are present on site.
		Inform GZA subcontractor if you observe improper storage of used rags and unsafe storage of flammable/combustible liquids brought on site.
		GZA and its subcontractors, suppliers and vendors shall not smoke in the work area in GZA project sites.
		Smoking can only be in designated smoking areas away from work areas and potential fire hazard locations.
		Confirm with driller that a fire extinguisher present with rig and will be available at all times and that inspection tag is not expired.
		If driller is welding or cutting on site confirm there are no flammables or combustible materials near the vicinity of welding machines or torches (such as debris, fuels, grass/weeds, etc.). Review Site requirements for obtaining "Hot Work Permit".
		Stand well clear of welding/cutting/burning areas.
		When drilling activities encounter the presence of gas or electric, the drill crew shall immediately curtail drilling activity, shut down the drill rig and contact the Project Manager.
	Exposure to Hazardous Substances/Chemicals	Become familiar with hazards associated with hazardous commercial products used in drilling (fuels, silica sand, grout, cement, bentonite, etc.). Review Safety Data Sheets (SDSs) for such products and participate in daily safety tailgate meetings.
	Do not handle drilling chemicals.	
	Wear appropriate personal protective equipment.	
	Review hazards of chemicals that may have been used or currently are being used on site.	
	Refer to the site specific HASP for chemical hazards and the necessary precautions required for sampling.	



# GZA GEOENVIRONMENTAL, INC. JOB HAZARD ANALYSIS WORKSHEET

**Job: Drilling Observations, Monitoring Well Installation Observation and Soil Sampling**

<b>Analysis By: Andrew Whitsitt</b>	<b>Reviewed By: Guy Dalton</b>	<b>Approved By: Jayanti Chatterjee , CIH</b>
<b>Date: October 2, 2011</b> <b>Revised: June 14, 2012</b>	<b>Date: June 14, 2012</b>	<b>Date: June 26, 2012</b>

## Task 4.1

### DRILLING OBSERVATIONS, MONITORING WELL INSTALLATION OBSERVATIONS, SOIL SAMPLING

HAZARD CONTROLS		
GZA Job Tasks	Potential Hazards	Controls
		<p>Be alert for hazardous site contaminants (as indicated by odor, visual characteristics, location, and site history). Assess whether procedures and contingencies are in place for characterizing hazards and protecting workers by use of appropriate air monitoring, personal protective clothing and respiratory protection, as needed. If contamination is identified at the Site only personnel trained and medically qualified to work on hazardous sites will be permitted to proceed with the work.</p>
Sampling Soil	Exposure to chemicals	<p>Refer to the site specific HASP for chemical hazards and the necessary precautions required for sampling.</p> <p>Understand potential hazards associated with handling sample collection preservatives.</p> <p>Review and have SDS available for chemicals being brought on site, including that of sample preservatives.</p> <p>Wear appropriate PPE identified in the HASP</p> <p>Wash hands before eating and drinking. Eating and drinking are prohibited in areas of soil contamination/work area.</p>





# GZA GEOENVIRONMENTAL, INC. JOB HAZARD ANALYSIS WORKSHEET

**Job: Excavation and Trenching (Heavy Equipment)**

<b>Analysis By: Andrew Whitsitt</b>	<b>Reviewed By: Guy Dalton</b>	<b>Approved By: Jayanti Chatterjee , CIH</b>
<b>Date: September 30, 2011</b> <b>Revised: June 21, 2012</b>	<b>Date: June 21, 2012</b>	<b>Date: June 26, 2012</b>

## Task 4.4A Excavation and Trenching (Heavy Equipment)

### HAZARD CONTROLS

GZA Job Tasks	Potential Hazards	Controls
Review Related THA's – 21.1 – General Outdoor Field Work		
Pre-Planning	Overlooking hazards	Review and become familiar with the requirements of GZA Policy 03-3006, <i>Excavation Safety Policy and Procedures</i> .
Observation of Deployment of Traffic Protection Equipment and Mobilizing Equipment by contractor	Collisions, struck by injuries	Wear high visibility vest at all times when out of personal or GZA vehicle.
		Park personal or GZA vehicle in designated parking locations, or select off-road area that is firm, and without hazards. Directly inspect parking location on foot if necessary.
		If parking outside of a designated parking area, demarcate vehicle with traffic cones or equivalent.
		Use emergency flashers or other appropriate vehicle warning system as appropriate to local conditions when parking personal or GZA vehicle.
		Observe if police detail or other required traffic control system (if necessary) is in place.
		Stay within the confines of the work area and do not venture outside of the demarcated work area into traffic.
		If you observe that contractor may back into structures, vehicles, fences, etc., notify contractor immediately with pre-determined signals. Do not cross the path of the heavy equipment.
		Stand clear of moving heavy equipment.
	Overhead electrical lines	Look overhead to assess if any utilities are present and confirm with the GZA subcontractor that they are aware of the overhead utility location and to take appropriate actions to prevent contact with the overhead utilities and to minimize any arc flash hazards. Review GZA's Electrical Safe Work Practices Program 03-3003
		Stand clear of overhead lines while equipment is being mobilized.
		If the equipment contacts an overhead power line, inform any occupant and/or operator to remain in/on the rig until the line is de-energized. Summon help immediately.
Unloading equipment and materials	Strains and sprains	Use proper lifting techniques when lifting equipment. Seek assistance with heavy loads.



# GZA GEOENVIRONMENTAL, INC. JOB HAZARD ANALYSIS WORKSHEET

**Job: Excavation and Trenching (Heavy Equipment)**

<b>Analysis By: Andrew Whitsitt</b>	<b>Reviewed By: Guy Dalton</b>	<b>Approved By: Jayanti Chatterjee , CIH</b>
<b>Date: September 30, 2011</b> Revised: June 21, 2012	<b>Date: June 21, 2012</b>	<b>Date: June 26, 2012</b>

## Task 4.4A Excavation and Trenching (Heavy Equipment)

### HAZARD CONTROLS

GZA Job Tasks	Potential Hazards	Controls
		<p>GZA personnel <b>are not to</b> assist contractor with contractor's work.</p> <p>Use work gloves where appropriate to prevent hand injuries.</p> <p>Wear steel toed boots.</p> <p>Use equipment whenever possible to avoid heavy lifting.</p>
	Slips, Trip and Fall Hazards	<p>Inspect site for uneven terrain or tripping hazards; plan travel route to avoid these areas or improve the site to eliminate the hazard.</p> <p>Clear brush from work area and clear vegetation that could cause trip hazards, eye injury or obstruct sight lines.</p>
	Unstable equipment	Trailers must be counter weighted properly before unloading equipment.
Excavation operations	Struck by	<p>Stay clear of equipment at all times.</p> <p>Operators must be aware of your position on the site at all times.</p> <p>Wear high visibility reflective vests at all times while on site.</p> <p>Heed back up alarms of all equipment.</p> <p>Do not approach operating heavy equipment until eye contact is made with operator and equipment operation is stopped.</p> <p>Consult with contractor to properly maintain Site access roads to assure vehicles can safely leave and enter the Site.</p> <p>Confirm with contractor that excavating equipment are properly staged and stabilized to avoid roll overs and accidents.</p> <p>Be especially aware of and clear of the swing radius of all heavy equipment.</p> <p>Equipment buckets cannot be used to transport personnel from/into excavation.</p>
	Underground utilities; above ground piping and appurtenances	<p>Confirm that underground utility clearance procedures have been completed in accordance with GZA Policy # 04-0301 Responsibility for Utility Clearance of Exploration Locations for clearing utility locations prior to breaking ground.</p> <p>Confirm with contractor that safe distance from utilities, above ground piping and equipment are being maintained.</p>



# GZA GEOENVIRONMENTAL, INC. JOB HAZARD ANALYSIS WORKSHEET

**Job: Excavation and Trenching (Heavy Equipment)**

<b>Analysis By: Andrew Whitsitt</b>	<b>Reviewed By: Guy Dalton</b>	<b>Approved By: Jayanti Chatterjee , CIH</b>
<b>Date: September 30, 2011</b> Revised: June 21, 2012	<b>Date: June 21, 2012</b>	<b>Date: June 26, 2012</b>

## Task 4.4A Excavation and Trenching (Heavy Equipment)

### HAZARD CONTROLS

GZA Job Tasks	Potential Hazards	Controls
		Have contractor hand excavate where required to expose utilities.
		Where possible have contractor lockout and purge active utilities.
		If excavation exposes utilities, have the contractor assure that lines are properly supported.
		Require the contractor to use non-sparking tools around active gas lines and implement safe work practices.
		If any damage is caused by GZA's subcontractor during excavation to utility lines, notify utility owner. If the contractor isn't working for GZA, either the contractor or its client should contact the utility owner.
		Notify utility owner if cathodic protection (coatings, groundbeds, etc.) has been exposed.
	Collisions with workers using shovels and hand tools	GZA employees must communicate and coordinate their actions and movements.
	Falling objects, debris	Wear hardhat and safety glasses/goggles. Do not work under raised loads
	Falls into Open Excavation	Secure work zone using barricades, caution tape, etc.  DO NOT stand near edges of excavations, maintain 2' distance. Keep non-essential personnel away from the work zone.
	Hazardous Liquid Spills	Confirm with GZA sub contractor that spill control kit, including sorbents, pad booms and shovels are available on site if needed.. Have GZA subcontractor line waste loading areas with polyethylene sheeting. Immediately report any spill to the project manager.



# GZA GEOENVIRONMENTAL, INC. JOB HAZARD ANALYSIS WORKSHEET

**Job: Excavation and Trenching (Heavy Equipment)**

<b>Analysis By: Andrew Whitsitt</b>	<b>Reviewed By: Guy Dalton</b>	<b>Approved By: Jayanti Chatterjee , CIH</b>
<b>Date: September 30, 2011</b> Revised: June 21, 2012	<b>Date: June 21, 2012</b>	<b>Date: June 26, 2012</b>

## Task 4.4A Excavation and Trenching (Heavy Equipment)

### HAZARD CONTROLS

GZA Job Tasks	Potential Hazards	Controls
	Exposure to Hazardous Substances	<p>Be alert for hazardous site contaminants (as indicated by odor, visual characteristics, location, and site history). Assess whether procedures and contingencies are in place for characterizing hazards and protecting workers by use of appropriate air monitoring, personal protective clothing and respiratory protection, as needed. If contamination is identified at the Site only personnel trained and medically qualified to work on hazardous sites will be permitted to proceed with the work. Notify project manager if such conditions are encountered.</p> <p>Become familiar with hazards associated with hazardous commercial products used in construction (fuels, silica sand, grout, cement, etc.). Review Safety Data Sheets (SDSs) for such products and participate in daily safety tailgate meetings.</p>
	Noise	Wear appropriate hearing protection.
	Cave-In Hazards	<p>Excavation must be monitored by a Competent Person.</p> <p>Confirm with contractors that operators are properly trained for excavating.</p> <p>The proper sloping/shoring for the soil type must be used.</p> <p>There should be no standing water in the excavation.</p> <p>Place Spoils away from the edge of excavation as appropriate for the soil type.</p> <p>Excavations greater than 20 feet in depth must be designed by a registered professional engineer.</p> <p>Evaluate excavations at the beginning of each shift and following rain events</p> <p>DO NOT enter excavations unless absolutely necessary. The excavation must be safe to enter before entering. A means of egress (stairways, ladders or ramps) from trench excavations greater than 4 feet in depth must be positioned so that no more than 25 feet of lateral travel is required.</p>



# GZA GEOENVIRONMENTAL, INC. JOB HAZARD ANALYSIS WORKSHEET

**Job: Excavation and Trenching (Heavy Equipment)**

<b>Analysis By: Andrew Whitsitt</b>	<b>Reviewed By: Guy Dalton</b>	<b>Approved By: Jayanti Chatterjee , CIH</b>
<b>Date: September 30, 2011</b> <b>Revised: June 21, 2012</b>	<b>Date: June 21, 2012</b>	<b>Date: June 26, 2012</b>

## Task 4.4A Excavation and Trenching (Heavy Equipment)

### HAZARD CONTROLS

GZA Job Tasks	Potential Hazards	Controls
		<p>If needed to enter excavations consult with onsite Competent Person to assess if it is safe to do so. If you are the Competent Person assess if it is safe to enter excavation before doing so.</p>
	Hazardous Atmosphere	<p>Identify possible contaminants.</p> <p>Set action levels for exposure.</p> <p>Monitor air quality.</p> <p>Air monitoring equipment must be properly calibrated.</p> <p>Refer to the site specific Health and Safety Plan for the use of proper personal protective equipment (PPE) and respiratory protection.</p>
Soil Loading and Transport	Roadway/traffic hazards	<p>Be alert at all times; never step outside traffic cones.</p> <p>Wear high visibility vests at all times.</p> <p>Be familiar with escape routes at each location. Stand clear of soil loading area and always make sure the equipment operator and truck drivers know your location.</p> <p>Follow project Traffic Control Plan. Be alert at all times and never step outside the traffic cones.</p> <p>Use a Police detail when necessary.</p>
		Hazardous Material Contamination
		<p>Equipment and truck wheels, running boards, etc. must be free of loose materials before leaving Site.</p>
Handling Flammable Liquids	Fire Hazards	<p>Use only approved fuel containers for fuel, heavy duty metal cans with stable base and self closing nozzle is recommended.</p> <p>Store flammable liquids in appropriate flammable storage cabinet and containers.</p> <p>Be familiar with emergency procedures and where fire extinguishers are present on site.</p> <p>Inform GZA subcontractor if you observe improper storage of used rags and unsafe storage of flammable/combustible liquids brought on site.</p>



# GZA GEOENVIRONMENTAL, INC. JOB HAZARD ANALYSIS WORKSHEET

**Job: Excavation and Trenching (Heavy Equipment)**

<b>Analysis By: Andrew Whitsitt</b>	<b>Reviewed By: Guy Dalton</b>	<b>Approved By: Jayanti Chatterjee , CIH</b>
<b>Date: September 30, 2011</b> <b>Revised: June 21, 2012</b>	<b>Date: June 21, 2012</b>	<b>Date: June 26, 2012</b>

## Task 4.4A Excavation and Trenching (Heavy Equipment)

### HAZARD CONTROLS

GZA Job Tasks	Potential Hazards	Controls
		<p>Confirm with GZA subcontractor that fire extinguishers are present with heavy equipment and will be available at all times and that inspection tags are not expired.</p> <p>If GZA subcontractor is welding or cutting on site confirm there are no flammables or combustible materials near the vicinity of welding machines or torches (such as debris, fuels, grass/weeds, etc.). Review Site requirements for obtaining "Hot Work Permit".</p> <p>Stand well clear of welding/cutting/burning areas.</p> <p>When GZA project related subsurface activities encounter the presence of gas or electric, the operations shall immediately cease, shut down the equipment when possible and contact the Project Manager.</p>
Tool Operation	Cuts, bruises, shocks, lacerations, sprains and strains	<p>Do not use electrical tools with damaged cords or other electrical components. Use GFCI with all cords.</p> <p>Observe proper electrical safety practices.</p> <p>Tools must be properly maintained; do not use damaged tools.</p> <p>Wear proper Personal Protective Equipment</p> <p>Store and carry tools correctly.</p> <p>Use the correct tool for the job.</p> <p>Support the work piece (using clamps, vise, sawhorse, or other device). Do not hold the work piece with your hand.</p> <p>Unplug tools or remove batteries when servicing or changing bit, blades, abrasive wheels or other components.</p> <p>Protect your "off hand" from gouges, hammer blows, cutting tools, etc. Position your "off hand" to prevent injury in case of slip of the tool.</p>
General site work	Slips, trips and falls	<p>Maintain clean and sanitary work area free of tripping/slipping hazards.</p> <p>Store hand tools in their proper storage location when not in use.</p> <p>Provide adequate space for each to work safely with sound footing.</p>





# GZA GEOENVIRONMENTAL, INC. JOB HAZARD ANALYSIS WORKSHEET

**Job: Excavation and Trenching (Heavy Equipment)**

<b>Analysis By: Andrew Whitsitt</b>	<b>Reviewed By: Guy Dalton</b>	<b>Approved By: Jayanti Chatterjee , CIH</b>
<b>Date: September 30, 2011</b> Revised: June 21, 2012	<b>Date: June 21, 2012</b>	<b>Date: June 26, 2012</b>

## Task 4.4A Excavation and Trenching (Heavy Equipment)

### HAZARD CONTROLS

GZA Job Tasks	Potential Hazards	Controls
		<p>Do not perform work if adequate lighting is not available.</p> <p>Maintain an exit pathway away around equipment and work areas at all times.</p>
Soil Sampling	Cave-ins, slips, trips and falls, exposure to hazardous contamination, struck by, caught by, slips, trips and falls	<p>Unless absolutely necessary DO NOT enter excavations to sample. Work with the contractor's equipment operator to obtain sample from the excavation and sample soil from the bucket of the excavator.</p> <p>See above for controls for other physical hazards.</p>
	Exposure to chemicals	<p>Refer to the site specific HASP for chemical hazards and the necessary precautions required for sampling.</p> <p>Understand potential hazards associated with handling sample collection preservatives.</p> <p>Review and have SDSs available for chemicals being brought on site, including that of sample preservatives.</p> <p>Wear appropriate PPE identified in the HASP</p> <p>Wash hands before eating and drinking. Eating and drinking are prohibited in areas of soil contamination/work area.</p>
Securing Site	Fall into excavations	<p>Make sure excavation is secured and properly marked with caution signs.</p> <p>If excavation is to be open over night have subcontractor erect a fence or properly cover excavations to keep public out of the area and away from the excavation and the removed tank.</p>



# GZA GEOENVIRONMENTAL, INC. JOB HAZARD ANALYSIS WORKSHEET

**Job: Sampling/Logging/Survey - Test Pits and Excavations**

<b>Analysis By: Mark Dalpe</b>	<b>Reviewed By: Mark Dalpe</b>	<b>Approved By: Jayanti Chatterjee , CIH</b>
<b>Date: October 15, 2011</b> <b>Revised: June 7, 2012</b>	<b>Date: June 7, 2012</b>	<b>Date: June 28, 2012</b>

## Task 6.1 Sampling/Logging/Survey - Test Pits and Excavations

### HAZARD CONTROLS

GZA Job Tasks	Potential Hazards	Controls
<p>Review Related THA's – 4.4A Excavation and Trenching (Heavy Equipment) 21.1 General Outdoor Field Work</p>		
Observation of Test Pit Excavations by GZA	Various Physical and Chemical Hazards	Review THA 4.4A Excavation and Trenching (Heavy Equipment)
Excavation Survey	Fall into excavations; Struck by heavy equipment	Stand away from edges of excavations.
		Stay clear of equipment at all times. Do not approach operating heavy equipment until eye contact is made with operator and equipment operation is stopped
		Observer needs to be at the furthest end of the excavation from the operator and in line of sight with the operator.
Sampling and logging of soil	Cave-ins and engulfment	Never ride inside the bucket to observe the inside of the test pit excavation.
		Measuring test pit depths can be performed by attaching a tape measure to the boom of the excavator, or marking the boom.
		Observers are NOT to measure pit depths by hand from the side of the pit. Use proper retractable tape measures.
		Approach a test pit for logging from the sloped end. Never stand above vertical wall.
		Watch for cracks/fissures in the ground surface in the immediate vicinity of the test pit, which indicate imminent sidewall failure/cave-in.
		DO NOT enter excavations that are not sloped or shored properly and have not been evaluated by a Competent Person to be safe.
		Always first attempt to collect soil/water samples from the securely placed bucket of the excavator on the surface of the ground at a safe distance from the excavation. Use proper communication with operator when sampling from the bucket of the excavator.
		Assess if confined space entry procedures need to be implemented. If so follow GZA's Confined Space Entry procedures.



# GZA GEOENVIRONMENTAL, INC. JOB HAZARD ANALYSIS WORKSHEET

Job: Sampling/Logging/Survey - Test Pits and Excavations

Analysis By: Mark Dalpe	Reviewed By: Mark Dalpe	Approved By: Jayanti Chatterjee , CIH
Date: October 15, 2011 Revised: June 7, 2012	Date: June 7, 2012	Date: June 28, 2012

## Task 6.1

### Sampling/Logging/Survey - Test Pits and Excavations

#### HAZARD CONTROLS

GZA Job Tasks	Potential Hazards	Controls
		Provide appropriate means of egress if entering excavations when necessary (e.g. ladders every 25 ft., steps, etc.).
		Before entering excavation be aware of any hazards at the surface (boulders, equipment) which may fall into the excavation.
		Test pits are to backfilled soon after excavation and are not to be left open overnight unless appropriate precautions have been implemented to secure the excavation and the site.



# GZA GEOENVIRONMENTAL, INC. JOB HAZARD ANALYSIS WORKSHEET

**Job: Pile and Sheet Pile Installations**

<b>Analysis By: James Hurley</b>	<b>Reviewed By: Mark Dalpe</b>	<b>Approved By: Jayanti Chatterjee , CIH</b>
<b>Date: September 30, 2011</b> Revised: June 7, 2012	<b>Date: June 7, 2012</b>	<b>Date: June 28, 2012</b>

## Task 6.2 Pile and Sheet Pile Installations

### HAZARD CONTROLS

GZA Job Tasks	Potential Hazards	Controls
<p>Review Related THA's – 4.4.A Excavtion and Trenching (Heavy Equipment) 21.1 General Outdoor Field Work</p>		
Observation of pile installation by GZA	Struck by, caught by, run over by equipment	<p>Maintain safe distance from pile installation equipment at all times.</p> <p>Wear appropriate personal protective equipment as required by the Site Specific Health and Safety Plan when near rig and in general work area (hard hat, steel toe boots, work clothes, high visibility vest, eye and hearing protection, etc.).</p> <p>Plan an exit route when working in limited access areas.</p>
	Noise	Wear hearing protection during pile driving.
	Exposure to Hazardous Substances	<p>Workers should be familiarized with hazards associated commercial products used in pile driving (fuels, hydraulic fluid, etc.). Safety Data Sheets (SDSs) should be available for such products, and that workers should wear appropriate personal protective equipment.</p> <p>Long sleeve shirts should be worn during evaluation of creosote treated timber piles being installed.</p> <p>Diesel hammers can bleed fuel onto the timber piles causing soluble creosote to spatter.</p>
	Pile Damage or Breakage	<p>Pay attention during pile hoisting and watch for any damage or defects. Contractors need to be notified immediately when damage or defects are observed</p> <p>Maintain a safe distance from pile driving hammer during testing.</p>
	Pile Driving Crane and Other Construction Equipment	<p>Do not enter swing radius of crane. Eye contact need to be established with the crane or heavy equipment operator prior to approaching. Maintain a clear line of sight with the equipment operators at all times.</p> <p>Do not use crane treads or out-riggers as a table.</p>
		Be aware of crane and other equipment movements at all times and remain at a safe distance during re-positioning operations.



# GZA GEOENVIRONMENTAL, INC. JOB HAZARD ANALYSIS WORKSHEET

Job: Pile and Sheet Pile Installations

Analysis By: James Hurley	Reviewed By: Mark Dalpe	Approved By: Jayanti Chatterjee , CIH
Date: September 30, 2011 Revised: June 7, 2012	Date: June 7, 2012	Date: June 28, 2012

## Task 6.2 Pile and Sheet Pile Installations

### HAZARD CONTROLS

GZA Job Tasks	Potential Hazards	Controls	
		Remain clear of pile driving leads when they are being positioned, picked up, or laid down.	
	Pile Driving Hammer	Maintain a safe distance from the hydraulic hammer hoses which can be under high pressure and heat.	
	Work Over Open Water		Review and become familiar with the requirements of GZA Policy 03-3005 Working Near Water.
			Wear a PFD at all times while over water. Use appropriate fall protection when necessary.
		Never step between barges or structures over open water. Use the appropriate access in place.	
		Be aware of wet surfaces on barges and boats.	



# GZA GEOENVIRONMENTAL, INC. JOB HAZARD ANALYSIS WORKSHEET

**Job: Soil Density Testing/Troxler Testing**

<b>Analysis By: Todd Schara</b>	<b>Reviewed By: Mark Dalpe</b>	<b>Approved By: Jayanti Chatterjee , CIH</b>
<b>Date: October 10, 2011</b> <b>Revised: June 8, 2012</b>	<b>Date: June 8, 2012</b>	<b>Date: June 28, 2012</b>

## Task 6.7 Soil Density Testing/Troxler Testing

### HAZARD CONTROLS

GZA Job Tasks	Potential Hazards	Controls
<p><u>Review Related THA's –</u>            4.4A Excavation and Trenching (Heavy Equipment)            21.1 General Outdoor Field Work</p>		
<p>Federal and State requirements and training prior to using or transporting, storing, or securing the Troxler Gauge</p>	<p>Radiation exposure and violations</p>	<p>Gauges must be stored as required by the Nuclear Regulatory Commission (NRC). Posting of the storage area (radiation sticker)</p> <p>All gauge users must have a radiation safety training certificate) as well as DOT training for transporting gauge.</p> <p>Don't sign out the Troxler unless you have your exposure badge on your person and sign it out on the appropriate log.</p> <p>Prior to placing the Troxler in your vehicle take the required paperwork from inside the unit and have the paperwork visible in the cab of the vehicle (Bill of Lading, Emergency Procedures, Emergency Response Information, current leak test for the unit, copy of the GZA License). <b>PAPERWORK MUST BE IN THE CAB OF THE VEHICLE.</b></p> <p>Permanent Storage - A locked room used only for the storage of the nuclear density gauges, gauge replacement parts, sign-out sheets. The room is locked with a key lock, and keys are only issued only to authorized gauge users.</p> <p>Temporary Storage - In all locations where the unit is stored, the unit must be locked and secured from unauthorized use or removal. The unit itself (inside the case) must be locked to prevent the movement of the source rod. The unit must be stored in its case and the case itself must be locked shut. The locked case must be secured from theft by being locked inside a storage room, job locker, storage shed, room in a site trailer, room in an on-site facility, or similar location, as long as the location may be accessed by the licensed user only, and the storage location be designated specifically for storage of the Troxler unit, and not be used for storage of other materials and equipment.</p>
<p>Transporting</p>	<p>Radiation exposure and in-vehicle projectile</p>	<p>Place the Troxler in your vehicle such that it is fully secured and is as far away from the passenger compartment as possible.</p>





# GZA GEOENVIRONMENTAL, INC. JOB HAZARD ANALYSIS WORKSHEET

**Job: Soil Density Testing/Troxler Testing**

<b>Analysis By: Todd Schara</b>	<b>Reviewed By: Mark Dalpe</b>	<b>Approved By: Jayanti Chatterjee , CIH</b>
<b>Date: October 10, 2011</b> <b>Revised: June 8, 2012</b>	<b>Date: June 8, 2012</b>	<b>Date: June 28, 2012</b>

## Task 6.7 Soil Density Testing/Troxler Testing

### HAZARD CONTROLS

GZA Job Tasks	Potential Hazards	Controls
		<p>Be familiar with transportation paperwork and emergency procedures paperwork before transporting Troxlers.</p> <p>The unit must be either locked in the vehicle or securely fastened and locked to the open bed of a pickup truck.</p>
Field Security Procedures	Radiation Exposure and Security	<p>The GZA authorized user must maintain control over the gauge at all times. The gauge must never be left unattended.</p> <p>The GZA authorized user must wear exposure badge whenever working with the Troxler gauge.</p> <p>When not taking measurements, the gauge should be placed in the transportation case and returned to its permanent storage area as soon as possible.</p>
Field Work	Pre-work preparation	<p>Become familiar with excavation related hazards through review of Job Hazard Analysis (THA 4.4A) and participate in daily safety tailgate meetings.</p> <p>Communicate Job Hazard Analysis and Lessons Learned information to operator(s) prior to initiating work and throughout the project as needed.</p> <p>Wear high visibility vest on site when out of personal or GZA vehicle.</p> <p>Wear appropriate safety equipment as required by the Site Specific Health and Safety Plan when near equipment and in general work area (hard hat, steel toe boots, work clothes, high visibility vest, eye and hearing protection, etc.)</p>
	Lifting and moving the gauge	Use proper lifting techniques.
	Struck by flying objects during driving pin into soil with hammer	Secure pin with hand, focus on hammer to pin. Wear safety glasses for flying objects.
	Sprains, strains during removing pin	Use proper lifting techniques.
	Radiation exposure	<p>Keep unit flat on surface to avoid radiation exposure.</p> <p>Always maintain maximum distance from unit as possible.</p> <p>Inspect equipment for cracks and potential for leakage.</p>



# GZA GEOENVIRONMENTAL, INC. JOB HAZARD ANALYSIS WORKSHEET

**Job: Slurry Wall Installation Observations**

<b>Analysis By: Christopher Snow</b>	<b>Reviewed By: Jayanti Chatterjee, CIH</b>	<b>Approved By: Jayanti Chatterjee, CIH</b>
<b>Date: October 30, 2012</b>	<b>Date: June 12, 2012</b>	<b>Date: July 12, 2012</b>
<b>Revised: July 11, 2012</b>		

## Task 15.1 Offshore Drilling and Construction Observations

### HAZARD CONTROLS

GZA Job Tasks	Potential Hazards	Controls
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Review Related THA's –

4.1 Drilling Observation, Monitoring Well Installation Observations and Soil Sampling

4.4A Excavation and Trenching (Heavy Equipment)

Pre Launch Planning	Drowning.	Review GZA's Working Near Water Policy 03-3005. Wear US Coast guard Approved PFD.
	Getting lost or breaking down.	Communicate work schedule and check-in time with manager or other on-shore personnel. Check cell phone and or marine band radio service.
	Equipment getting inundated.	Secure vehicle and any land side equipment above tide level.
	Swamping, sinking, running aground, getting beached by tide.	Check Marine forecast and tide chart, discuss adjustments to schedule as appropriate.
	Getting lost, running aground.	Discuss with operator Navigation capabilities in case of weather (is boat equipped with radar or GPS to find home if fog sets in). Discuss with operator Navigation lights (to run after dusk) and adjustments to schedule as appropriate.
Travel to Drilling Platform (floating or jack-up barge)	Slips, falls, capsizing	Board and seat in location that will not destabilize or overload the boat, or obstruct operator's view (surfaces are slippery and may be moving). Vessel will move with tide flow. Move deliberately (surfaces are slippery and may be moving). Hold onto available hand rails.
	Getting crushed or pinched between moving vessel, or pulled overboard by line.	Understand and review with vessel operator safety procedures and follow direction. Keep hands and feet clear from pinching/crushing between boat and other dock float pier, or boat.
Working on Barge	Falling overboard.	Make sure appropriate fall prevention and rescue (throw ring, etc) is in place around perimeter.
	Getting hit by a tool or knocked overboard.	Observe and discuss drilling/construction operations safety with contractor's drilling superintendent. Agree on a safe location from which to monitor work. It should provide sufficient access to operations to observe, log samples, and review stored samples, and be away from potential casing, rod and tool mishaps. Stay clear of mooring operations, lines winches, etc. The safe place for the observer will probably change with operations since this is a very compact work area. Consider where you would move if equipment became unstable or the barge was to overturn.



# GZA GEOENVIRONMENTAL, INC. JOB HAZARD ANALYSIS WORKSHEET

**Job: Slurry Wall Installation Observations**

<b>Analysis By: Christopher Snow</b>	<b>Reviewed By: Jayanti Chatterjee, CIH</b>	<b>Approved By: Jayanti Chatterjee , CIH</b>
<b>Date: October 30, 2012</b> <b>Revised: July 11, 2012</b>	<b>Date: June 12, 2012</b>	<b>Date: July 12, 2012</b>

## Task 15.1 Offshore Drilling and Construction Observations

### HAZARD CONTROLS

GZA Job Tasks	Potential Hazards	Controls
		All equipment should be securely stowed when not in immediate use. A wake, wave or gust may cause casing rods or other items to move. Notify the contractor if you observe unsecured equipment.
	Swamping, sinking, running aground, getting beached by tide.	Be a second set of eyes for the drillers/operators noting tide level, wind, wake, equipment action/reaction and current conditions as these may impact safety.
	Getting stranded on barge, or forced to stay on barge during storm.	Make sure there is always a means to get back to shore. If a transport boat was used to get to the barge, make sure it is available if you might need to get to shore due to weather or sea conditions.
	Collision with marine traffic.	Avoiding collision and having minimum Coast Guard required lighting is the Contractor's responsibility. However, maintain situational awareness and stay alert for any nearby vessels and notify contractor if you observe lights are not working properly.  Confirm with contractor that work locations were cleared with harbor master or Coast Guard.
	Emergency Procedures	Review and follow the emergency procedures identified by the vessel operator.
	Underground Utilities/ Cables	Confirm with Contractor that they had conducted a review of the Navigation charts and checked shoreline signs.
	Overhead Electrical	Same as on shore. Review GZA's Electrical Safety Work Practices 03-3003.
Offshore Drilling/Work, Construction and other work operations	Collisions, injuries	Confirm with Drill Crew that pre-operation check of equipment have been performed and equipment is in good working order., ensuring cables, ropes and winches are properly maintained and in good condition.  Occupants shall wWear US Coast Guard approved PFDs.  Notify contractor if you observe Secure loose materials on deck of barge or in boat especially casing and rods that are not properly secured.
		Equipment maintenance hazards
	Moving machinery, rotating parts, etc.	Maintain safe distance from rotating augers and other moving parts relative to drill rig. Maintain eye contact and line of visibility with Operator of equipment. When Drill/Construction Crew is performing maintenance operations on the rigs stand clear of their work at a safe



# GZA GEOENVIRONMENTAL, INC. JOB HAZARD ANALYSIS WORKSHEET

**Job: Slurry Wall Installation Observations**

<b>Analysis By: Christopher Snow</b>	<b>Reviewed By: Jayanti Chatterjee, CIH</b>	<b>Approved By: Jayanti Chatterjee , CIH</b>
<b>Date: October 30, 2012</b> <b>Revised: July 11, 2012</b>	<b>Date: June 12, 2012</b>	<b>Date: July 12, 2012</b>

## Task 15.1 Offshore Drilling and Construction Observations

### HAZARD CONTROLS

GZA Job Tasks	Potential Hazards	Controls
		<p>Do not wear loose fitting clothing. Maintain safe distance from rotating augers and other moving parts relative to drill rig. Maintain eye contact and line of visibility with Operator of equipment.</p> <p>If you notice any machine guards are missing inform the Driller/Operator (pulleys, belts, etc.).</p> <p>Make eye contact with operator before approaching equipment.</p> <p>All personnel to be alert and take proper precautions regarding slippery surfaces and similar hazards near keep away from moving equipment (e.g., rotating auger, crane, etc.). Make eye contact with operator before approaching equipment.</p> <p>Confirm with Driller/Operator that emergency kill switches are working. Know the locations of the kill switches.</p> <p>When cathead is in use, maintain safe distance.</p> <p>Confirm with Driller/Operator that emergency kill switches are working</p> <p>Confirm that Driller/Operator and helper/laborer communicate and coordinate their actions and movements.</p> <p>Notify Driller/Operator if they leave the work area while rig/equipment is in operation. and other members of crew must be in the immediate area of the rig/equipment at all times during operation</p> <p>Do Not assist drillers with their work. Each member of crew perform his/her duties only</p>
	Falling objects, debris	Wear hardhat and safety glasses/goggles
	Drill rod stacking	Notify Drillers if you observe that drill rods are improperly stacked. Stacking should not exceed the length of 1.5 times the height of the tower.
	Manual lifting, equipment handling	<p>Use proper lifting techniques when lifting equipment (sampling coolers, etc.). Seek assistance with heavy loads when possible.</p> <p>Use work gloves where appropriate to prevent hand injuries. Use proper lifting techniques when lifting equipment (augers, rods, casing, hammers, etc.).</p> <p>Wear steel toed boots.</p>
	Noise	Wear appropriate hearing protection.



# GZA GEOENVIRONMENTAL, INC. JOB HAZARD ANALYSIS WORKSHEET

**Job: Slurry Wall Installation Observations**

<b>Analysis By: Christopher Snow</b>	<b>Reviewed By: Jayanti Chatterjee, CIH</b>	<b>Approved By: Jayanti Chatterjee, CIH</b>
<b>Date: October 30, 2012</b> <b>Revised: July 11, 2012</b>	<b>Date: June 12, 2012</b>	<b>Date: July 12, 2012</b>

## Task 15.1 Offshore Drilling and Construction Observations

### HAZARD CONTROLS

GZA Job Tasks	Potential Hazards	Controls
	Adverse Weather Conditions	<p>Assess weather conditions prior to on-site work and examine forecast for anticipated period of work.</p> <p>Dress appropriately for weather conditions (e.g., precipitation, temperature ranges over anticipated duration of field work). Assess weather conditions prior to on-site work and examine forecast for anticipated period of work.</p> <p>Use protective ointments such as sunscreen and chap stick, as appropriate to the field conditions. Dress appropriately for weather conditions (e.g., precipitation, temperature ranges over anticipated duration of field work).</p> <p>Be aware of the anticipated weather conditions prior to mobilization to the site. Unacceptable field work conditions are not precise, but may include site specific conditions, general location, extreme weather conditions (e.g., icing, lightening, excessive cold or wind), travel conditions, and other factors. Professional judgment is required, and personal assessment of safety must always be individually assessed. Use protective ointments such as sunscreen and chap stick, as appropriate to the field conditions.</p>
	Slips, trips and falls and scrapes, cuts, bruises from	<p>Maintain clean and sanitary work area free of tripping/slipping hazards. Be aware of the anticipated weather conditions prior to mobilization to the site. Unacceptable field work conditions are not precise, but may include site specific conditions, general location, extreme weather conditions (e.g., icing, lightening, excessive cold or wind), travel conditions, and other factors. Professional judgment is required, and personal assessment of safety must always be individually assessed.</p> <p>Store hand tools in their proper storage location when not in use. Maintain clean and sanitary work area free of tripping/slipping hazards.</p> <p>Provide adequate space for each employee to work safely with sound footing.</p> <p>Regularly clear any excess water/ice that may accumulate and cause a potential slip/trip hazard.</p> <p>Provide adequate lighting as needed.</p>



# GZA GEOENVIRONMENTAL, INC. JOB HAZARD ANALYSIS WORKSHEET

**Job: Slurry Wall Installation Observations**

<b>Analysis By: Christopher Snow</b>	<b>Reviewed By: Jayanti Chatterjee, CIH</b>	<b>Approved By: Jayanti Chatterjee , CIH</b>
<b>Date: October 30, 2012</b> <b>Revised: July 11, 2012</b>	<b>Date: June 12, 2012</b>	<b>Date: July 12, 2012</b>

## Task 15.1 Offshore Drilling and Construction Observations

### HAZARD CONTROLS

GZA Job Tasks	Potential Hazards	Controls	
	Hygiene	Provide adequate facilities/equipment for hand washing prior to eating (e.g., baby wipes, hand sanitizers, paper	
	Cuts, scrapes, bruises, lacerations from use of tools	Properly maintain tools; do not use damaged tools.	
		Wear eye protection	
		Store and carry tools correctly	
		Use the correct tool for the job.	
		Support the work piece (using clamps, vise, sawhorse, or other device). Do not hold the work piece with your hand.	
		Protect "off hand" from gouges, hammer blows, cutting tools, etc. Position your "off hand" to prevent injury in case of slip of the tool. Support the work piece (using clamps, vise, sawhorse, or other device). Do not hold the work piece with your hand	
		Fire hazards	Confirm that all flammable/combustible liquids are stored in proper containers. Protect "off hand" from gouges, hammer blows, cutting tools, etc. Position your "off hand" to prevent injury in case of slip of the tool.
			Confirm that Driller is disposing e of oily rags properly in covered containers.
			Confirm that that a fire extinguisher is present with rig and know its location. Dispose of oily rags properly
Observe Driller's safety rules when they are welding or using torches. Stay away from "Hot Work" operations.			
	Notify the Driller if you observe flammable/combustible materials near "Hot Work" operations. (such as debris, fuels, grass/weeds, etc.)		
	Observe "no smoking" policies		





# GZA GEOENVIRONMENTAL, INC. JOB HAZARD ANALYSIS WORKSHEET

**Job: Construction Oversight**

<b>Analysis By: Brett Engard</b>	<b>Reviewed By: Benjamin Sallemi, Ph.D.</b>	<b>Approved By: Jayanti Chatterjee , CIH</b>
<b>Date: September 19, 2011</b> <b>Revised: July 3, 2012</b>	<b>Date: July 3, 2012</b>	<b>Date: July 11, 2012</b>

## Task 17.1 Construction Oversight

### HAZARD CONTROLS

GZA Job Tasks	Potential Hazards	Controls
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Review Related THA's –

4.4A Excavation and Trenching (Heavy Equipment)

21.1 General Outdoor Field Work

<p>General Construction Oversight</p>	Slips, trips and falls	<p>Maintain clean and sanitary work area free of tripping/slipping hazards.</p> <p>Assess for adequate space to work safely with sound footing.</p> <p>Assess for adequate lighting.</p> <p>Assess that walkways and footpaths are free of obstructions.</p>
	Physical Hazards	<p>Become familiar with construction-related hazards prior to going onsite. Be cognizant of slips, trips and falls and overhead hazards of bumps, falling objects. Review related THAs noted above.</p>
	Electrical shocks	<p>Use GFCIs with all electrical power tools.</p> <p>Review GZA's Electrical Safe Work Practices program 03-3003.</p>
	Cuts, scrapes, lacerations from hand tools	<p>Know how to properly use hand tools and follow proper guarding procedures.</p>
	Struck by, caught by, run over by equipment	<p>Do not stand near or where equipment operators cannot see you. Always be in line of sight.</p> <p>Do not make sudden moves and always let the operator know of your intentions.</p> <p>Wear appropriate safety equipment as required by the Site Specific Health and Safety Plan when near heavy equipment and in general work area (hard hat, steel toe boots, work clothes, high visibility vest, eye and hearing protection, etc.).</p> <p>Understand the daily Scope of Work by participating in daily safety tailgate meetings and review the appropriate Job Hazard Analysis.</p>
	Exposure to Hazardous Substances	<p>Review the Site Specific HASP, attend and Site Specific orientation and/or training as required prior to performing work.</p> <p>Become familiar with hazards associated with hazardous commercial products used in construction (fuels, cement, epoxy, paint, sealant etc.). Review the SDSs for such products are available, and wear appropriate personal protective equipment.</p> <p>Conduct air monitoring as required by the HASP and use appropriate PPE as specified in the HASP.</p>



# GZA GEOENVIRONMENTAL, INC. JOB HAZARD ANALYSIS WORKSHEET

**Job: Construction Oversight**

Analysis By: Brett Engard	Reviewed By: Benjamin Sallemi, Ph.D.	Approved By: Jayanti Chatterjee , CIH
Date: September 19, 2011 Revised: July 3, 2012	Date: July 3, 2012	Date: July 11, 2012

## Task 17.1 Construction Oversight

### HAZARD CONTROLS

GZA Job Tasks	Potential Hazards	Controls
		<p>Be alert for hazardous site contaminants (as indicated by odor, visual characteristics, location, and site history). Become familiar with procedures and contingencies for characterizing hazards and the use of appropriate personal protective clothing and respiratory protection, as needed.</p>
Energized or Gas Powered Equipment	Personal Injury	<p>Perform equipment safety inspection daily; assess if pressure relief devices, wire ropes, hoisting equipment, hydraulic hoses, and emergency shut-off switches are in good working condition.</p> <p>If power equipment is being used, become trained in the use of the equipment by a qualified operator. Become familiar with the manufacturer's operating manual and warnings.</p> <p>Do not disable the manufacturer's built-in safety guards or do not operate if the safety mechanisms, controls or switches are disabled or are not functioning properly. Inspect the equipment for damaged or missing parts, and de-energize the equipment if it is not in use.</p> <p>Prior to refueling, turn off the equipment and allow the equipment to cool down.</p> <p>Move any loose clothing or equipment that can come in contact with moving or high temperature parts.</p> <p>Keep on hand a properly-sized and inspected fire extinguisher appropriate for the work.</p> <p>Inspect equipment for structural integrity, proper footing, tie backs, support, locked wheels, etc.</p>
Observations from elevated surfaces, man lifts, scaffolds, etc.	Fall from elevated work areas/surfaces	<p>Cordon off around the work area.</p> <p>Inspect manlifts and scaffolds being used by GZA personnel equipment for structural integrity, proper footing, tie-backs, support, locked wheels, etc.</p> <p>Use three point of contact while climbing ladders or scaffolding.</p> <p>Check for safety nets, railings, guardrails, etc. and their condition or for damage</p> <p>Use the proper fall protection system for the work being conducted (i.e. fall arrest or fall restraint). For fall arrest systems verify that swing falls and fall clearance distances are accounted for.</p> <p>Inspect body harness/lanyards used by GZA personnel for damage and missing parts.</p>



# GZA GEOENVIRONMENTAL, INC. JOB HAZARD ANALYSIS WORKSHEET

**Job: Field Sampling**

<b>Analysis By:</b> Christie Wagner	<b>Reviewed By:</b> Jayanti Chatterjee, CIH	<b>Approved By:</b> Jayanti Chatterjee, CIH
<b>Date:</b> November 4, 2011 <b>Revised:</b> July 12, 2012	<b>Date:</b> July 12, 2012	<b>Date:</b> July 12, 2012

## Task 20.11 Field Sampling

### HAZARD CONTROLS

GZA Job Tasks	Potential Hazards	Controls
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Review Related THA's –  
21.1 General Outdoor Field Work

Pre work task for site visit	Adverse Weather Conditions	Assess weather conditions prior to on-site work and examine forecast for anticipated period of work.
		Dress appropriately for weather conditions (e.g., precipitation, temperature ranges over anticipated duration of field work).
		Use protective ointments such as sunscreen and chap stick, as appropriate to the field conditions.
Conduct visual inspection of site	Dangerous Terrain	Be aware of the site terrain, watch for holes and rocks that can be tripping hazards
		Learn to identify and watch for plants such as thorn bushes and poison ivy that can either scratch you or give you a rash.
Collecting sample	Muscle strain from lifting heavy objects	Use proper lifting techniques. Use appropriate mechanical assistance and tools when possible. Wear work gloves and steel toed boots.
	Exposure to unknown sample	Be sure to treat effluent samples as unknowns and wear the proper PPE.  If there are any unusual odors/fumes coming from a sample, especially those that cause reactions in the eyes or nose, leave the area and inform a supervisor immediately.



# GZA GEOENVIRONMENTAL, INC. JOB HAZARD ANALYSIS WORKSHEET

**Job: General Outdoor Field Work**

<b>Analysis By: Anthony Zemba, CHMM</b>	<b>Reviewed By: Guy Dalton</b>	<b>Approved By: Jayanti Chatterjee , CIH</b>
<b>Date: June 25, 2012</b>	<b>Date: June 25, 2012</b>	<b>Date: July 12, 2012</b>

## Task 21.1 General Outdoor Field Work

### HAZARD CONTROLS

GZA Job Tasks	Potential Hazards	Controls
Pre-work preparation	Overlooking of potential hazards	Become familiar with project area and job site by reviewing available on-line mapping (USGS Topographic, NWI Wetland, NRCS Soil, etc.; and aerial photographs before visiting site. Understand related hazards through review of this and other Task Hazard Analyses and participate in daily safety tailgate meetings (where applicable).
		Communicate Task Hazard Analysis and Lessons Learned information to operator(s) prior to initiating work and throughout the project as needed.
Driving to site	Vehicle accidents/collisions/injuries	Perform pre-operation check of vehicle, verifying service brakes, parking brake, steering, lights, tires, horn, wipers mirrors and glass are in good condition. verify that the rig is roadworthy.
		Wear seat belts always when driving even on site.
		Secure loose materials in cab or bed of vehicle.
Working within transportation corridors or active construction sites	Collisions injuries	Keep windshields, windows and lights cleans.
		Abide by safe driving procedures.
		Backing collisions
		If possible avoid backing by using a route that allows you to pull through.
		If backing up from a parked area do a quality 360 walker.
		Wear high visibility safety vest on site when out of personal or GZA vehicle.
		Park vehicle in designated parking locations, or select off-road area that is firm, and without hazards. Directly inspect parking location on foot if necessary.
		Use emergency flashers or other appropriate vehicle warning system as appropriate to local conditions when parking vehicle.
		Use emergency flashers or other appropriate vehicle warning system when parking outside of standard parking spaces, or to stop in right-of-
		Be alert at all times; never step outside traffic cones.



# GZA GEOENVIRONMENTAL, INC. JOB HAZARD ANALYSIS WORKSHEET

**Job: General Outdoor Field Work**

<b>Analysis By: Anthony Zemba, CHMM</b>	<b>Reviewed By: Guy Dalton</b>	<b>Approved By: Jayanti Chatterjee , CIH</b>
<b>Date: June 25, 2012</b>	<b>Date: June 25, 2012</b>	<b>Date: July 12, 2012</b>

## Task 21.1 General Outdoor Field Work

### HAZARD CONTROLS

GZA Job Tasks	Potential Hazards	Controls	
		Stand clear of moving heavy equipment and away from any overhead utility lines until equipment is safely in position and parked properly and securely by the contractor.	
		Do not wear headphones or earbuds, or listen to music or talk on the phone, which may distract from work hazards.	
		Crossing Automobile traffic lanes	Wear high visibility safety vests at all times when out of vehicle and working within or adjacent to the roadway.
		Crossing Airport Movement Areas (e.g., Runways, taxiways, approaches)	Learn, know, and conform to project site Airport's, Airfield's, or Airbase's protocol for crossing movement areas (whether on foot or in vehicle).
			Work within airport movement areas or safety zones must be coordinated with the Air Traffic Control Tower.
			Vehicles to have blinking or flashing lights or beacons; pedestrians to wear high visibility safety vests.
	Crossing Railways	Using protocol, maintain communication with airport security and air traffic controllers.	
		Work within active railroad ROWs requires railroad safety training. No work can be done within the railroad traffic envelope without the permission of a railroad flagman.	
		No equipment or vehicles can cross without the permission of a railroad flagman.	
		Expect any train on any track coming from either direction at any time.	
		Working in Natural or Remote Areas	Slips, trips, fall
		Be careful when walking in heavily vegetated areas. Mind tangles of vines, thorny branches, and slippery logs and rock surfaces. Dense vegetation and especially entangled vines present trip hazards, or can mask voids, sharp objects, or other hazards beneath.	



# GZA GEOENVIRONMENTAL, INC. JOB HAZARD ANALYSIS WORKSHEET

Job: General Outdoor Field Work

Analysis By: Anthony Zemba,  
CHMM

Reviewed By: Guy Dalton

Approved By: Jayanti Chatterjee , CIH

Date: June 25, 2012

Date: June 25, 2012

Date: July 12, 2012

## Task 21.1 General Outdoor Field Work

### HAZARD CONTROLS

GZA Job Tasks	Potential Hazards	Controls
		Be vigilant for signs of cracking, shifting, fracturing, and evidence of past movement.
		Use wood mats or other stabilizing materials for equipment if soft ground conditions are present.
		Use walking stick, auger, or ski poles to steady yourself when traversing loose material or slopes.





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<b>Date: June 25, 2012</b>	<b>Date: June 25, 2012</b>	<b>Date: July 12, 2012</b>

## Task 21.1 General Outdoor Field Work

### HAZARD CONTROLS

GZA Job Tasks	Potential Hazards	Controls
		Wear proper footwear for conditions.
		Store tools in their proper storage location when not in use.
		Provide adequate lighting when necessary.
	Falls into excavations/ voids	Stand away from edges of excavations and voids. Do not attempt access without proper equipment / training. Remember that some excavations or voids may constitute a confined space and may present structural stability issues.
	Cave-ins and engulfment	DO NOT enter caves, sinkholes, excavations, and other voids or concavities that are not sloped or shored properly and have not been evaluated by a competent person to be safe.
		Stand away from edges of excavations, cliffs, dug wells, and other voids.
Watch for cracks/fissures in the ground surface in the immediate vicinity of a pit or void, which indicate imminent sidewall failure/cave-in.		
Working among hazardous biota	Plant toxins Incidental contact	Assess if confined space entry procedures need to be implemented.
		Before entering void (if required to do so and with proper training) be aware of any hazards at the surface (boulders, equipment) which may fall into the void.
		Know the appearance of poison ivy and poison sumac in all seasons, and if sensitive to these toxins, carry and use special cleaning soaps/solutions when thought to be exposed. Stock first aid kit with poison ivy/sumac cleaning soaps/solutions.
	Ticks	Ticks carry risk of Lyme's and other Diseases. Tick season is basically any field day above 40 degrees F.
		Tuck pants into long socks.
		The application of DEET (or permethrin pre-treatment) to clothing in season to control exposure to ticks is recommended.
		Check clothing for ticks frequently.



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## Task 21.1 General Outdoor Field Work

### HAZARD CONTROLS

GZA Job Tasks	Potential Hazards	Controls
		Check whole body immediately upon returning from field and shower.
	Mosquitoes	Be aware of intermittent seasonal reports of mosquito borne diseases, such as West Nile disease and Eastern Equine Encephalitis (EEE), and their locations relative to your field site. Use of DEET or other mosquito repellent is recommended.
	Stinging bees and wasps	<p>Be aware of potential cavity, suspended or ground nesting bee/wasp/hornet nests. Avoid undue disturbance or approach with appropriate safety clothing, protection and netting.</p> <p>Take appropriate precautions if allergic to bees. Carry at least two epi-pens in first aid kit as well as anti-histamines (oral and inhalers).</p> <p>Avoid areas of heavy bee activity if allergic. Avoid perfumed soaps, shampoos, deodorants, colognes, etc. that may attract bees.</p>
	Poisonous Snakes	<p>Be aware of terrain likelihood of harboring poisonous snakes in your work zone. Avoid reaching or stepping into hidden areas (such as into wood pile, rock pile, debris pile, stone wall, etc.) without pre-inspection.</p> <p>Coordinate with local hospitals to verify they have proper anti-venom in stock.</p> <p>Learn first aid procedures in case of poisonous snake bite.</p> <p>Devise an action plan and include in the site-specific HASP.</p>
	Wild Animals	<p>Do NOT handle wildlife unless properly trained to do so.</p> <p>Beware of any wild animal that shows no sign of wariness of humans.</p> <p>Do NOT attempt to feed wild animals or to help apparently injured wild animals.</p> <p>Be aware of domestic animals that may also pose a threat such as dogs off leash, bulls out to pasture, etc.</p>



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<b>Date: June 25, 2012</b>	<b>Date: June 25, 2012</b>	<b>Date: July 12, 2012</b>

## Task 21.1 General Outdoor Field Work

### HAZARD CONTROLS

GZA Job Tasks	Potential Hazards	Controls
Working in Adverse Weather Conditions	Heat / cold stress and other weather related hazards	<p>Assess weather conditions prior to on-site work and examine forecast for anticipated period of work.</p> <p>Dress appropriately for weather conditions (e.g., precipitation, temperature ranges over anticipated duration of field work). Include clothing and the presence / absence of shade when calculating a heat index.</p> <p>Schedule work day to avoid working during hottest or coldest parts of the day, to the extent practicable.</p> <p>Keep exposed skin covered in extremely cold weather.</p> <p>Recognize signs of frostbite; use warming packs and layer clothing to maintain warmth.</p> <p>Use a wicking layer of clothing against your body to keep moisture away from skin.</p> <p>Wool clothing will continue to keep you warm after it becomes wet; cotton will not.</p> <p>Use protective ointments such as sunscreen and chap stick, as appropriate to the field conditions.</p> <p>Stay hydrated in hot weather; drink fluids regularly throughout the day, even if not thirsty.</p> <p>Recognize signs of heat stress; take frequent breaks in shade when working in direct sunlight for prolonged periods.</p> <p>Be familiar with Heat index chart - add 20 degrees to chart if fully clothed and if working in direct sunlight.</p> <p>NOTE: Unacceptable field work conditions are not precise, but may include site specific conditions, general location, extreme weather conditions (e.g., icing, lightning, excessive cold or wind), travel conditions, and other factors. Professional judgment is required, and personal assessment of safety must always be individually assessed.</p>
	Working on Ice	Assess relative load bearing capacity of ice on lakes, ponds and other waterways. If unsure do not venture onto the ice.



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<b>Date: June 25, 2012</b>	<b>Date: June 25, 2012</b>	<b>Date: July 12, 2012</b>

## Task 21.1 General Outdoor Field Work

### HAZARD CONTROLS

GZA Job Tasks	Potential Hazards	Controls
		Wear proper footwear modified for traction on ice.
	Electrical storms	<p>If lightning is observed during drilling activities, work shall be suspended immediately and employees shall find suitable shelter (building or vehicle at minimum). Work will commence no sooner than 30 minutes after the last indications of lightning have been observed</p> <p>Seek shelter inside a walled building or your vehicle.</p> <p>Open picnic pavilions and under trees are not adequate shelters.</p> <p>Assess vulnerability to lightning strikes as soon as thunder is heard on the horizon. Open areas and higher elevations are more susceptible to strikes.</p> <p>Tall objects such as metal towers and flag poles may attract lightning.</p> <p>Consult internet weather radar tracking devices to learn of impending storm patterns proximal to your work area.</p>
	High Winds	<p>Avoid working at high elevations, elevated platforms, and other exposed areas during high wind conditions.</p> <p>Assess work area for equipment that may be blown down, over, or carried aloft by high winds.</p>
Working in areas without sanitary facilities	Hygiene related hazards	<p>Provide hand washing kits (e.g., baby wipes, hand sanitizers, paper towels, bottled water, etc.) to be used prior to eating and drinking.</p> <p>Have garbage bags handy to collect trash.</p>
Working in remote areas	Emergency Conditions	<p>Be familiar with onsite emergency procedures and route to nearest hospital.</p> <p>Have a first aid kit available; know its contents and how to use them.</p> <p>Carry a cell phone during all field work for emergency purposes, and confirm the nearest location of cell phone signal on site prior to start of worksite.</p>
	Disorientation	Plan your route and anticipated progress prior to field work.



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## Task 21.1 General Outdoor Field Work

### HAZARD CONTROLS

GZA Job Tasks	Potential Hazards	Controls
		<p>Have multiple navigation aids (e.g., USGS Map, compass, GPS, etc.) and know how to use them before entering field. Remember to have charged batteries and battery back-ups for electronic devices.</p> <p>Share your progress plan with office staff prior to entering the field.</p> <p>Check in with office personnel periodically to update progress.</p> <p>Review and comply with GZA's Working Alone Policy 03-1009 in advance of working alone on a project site.</p>
	Hunting	<p>Be familiar with the various game hunting seasons. Follow rules and guidelines for remaining visible to hunters.</p> <p>Try to plan work around active hunting seasons or daily peak hunting hours as warranted.</p>



## **APPENDIX J**

### **PUBLIC INVOLVEMENT PLAN**





**PUBLIC INVOLVEMENT PLAN  
FORMER TIDEWATER FACILITY AND  
FORMER POWER PLANT  
TIDEWATER AND MERRY STREETS  
PAWTUCKET, RHODE ISLAND**

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## **EXHIBITS**

### **[EXHIBIT I](#)**

COPIES OF THE NOTIFICATION PACKAGES AND LANGUAGE INCLUDED ON THE SIGNS POSTED AT THE SITE ENTRANCE GATES

### **[EXHIBIT II](#)**

CONTACT LIST

### **[EXHIBIT III](#)**

RESPONSES TO SITE-SPECIFIC COMMENTS FROM COMMUNITY INTERVIEWS

### **[EXHIBIT IV](#)**

MARCH 22, 2013 RESPONSE TO PUBLIC COMMENTS RECEIVED IN REGARDS TO PUBLIC INVOLVEMENT PLAN SUMMARY OF FINAL RIDEM-APPROVED CHANGES TO THE PUBLIC INVOLVEMENT PLAN

### **[EXHIBIT V](#)**

AUGUST 1, 2013 NOTIFICATION FROM RIDEM TO NATIONAL GRID

### **[EXHIBIT VI](#)**

AUGUST 1, 2013 NOTIFICATION FROM RIDEM TO NATIONAL GRID

### **[EXHIBIT VII](#)**

OCTOBER 15, 2013 UPDATED RESPONSE TO PUBLIC COMMENTS RECEIVED IN REGARDS TO PUBLIC INVOLVEMENT PLAN



## KEY THINGS TO REMEMBER

### WHERE TO FIND MORE INFORMATION:

- **Publicly Accessible Site File**

Files related to the former Tidewater Site are maintained at RIDEM's Office of Waste Management filed under Former Tidewater Coal Gasification Plant (Pawtucket), RIDEM Case No. 95-022. Appointments to view the files can be made by contacting RIDEM, Department of Technical and Customer Assistance, 235 Promenade Street, Providence, Rhode Island (telephone: 401-222-4700 extension 7307, <http://www.dem.ri.gov/topics/filerevw.htm>).

- **Publicly Accessible Informational Websites:**

- **RIDEM Document Listing Website:**

<http://www.dem.ri.gov/programs/benviron/waste/tide.htm>

Certain documents related to the investigation and remediation of the Former Tidewater Site are maintained at the website operated by RIDEM. The website contains publicly available submittals pertaining to the Site dating back to 2007 and documentation will continue to be posted there.

- **National Grid Document Listing and Informational Website:**

[www.tidewatersite.com](http://www.tidewatersite.com)

This website provides updates on current and proposed activities at the Site. In addition, this website includes information on the nature and history of MGPs, history of the Tidewater facility, description of the Tidewater Site and regulatory background, access to key project documents and relevant correspondence, copies of public notices about the Site, public announcements, status update archive, frequently asked questions and Site contacts.

- **Local Informational Repository—Pawtucket Public Library**

The local information repository at the Pawtucket Public Library contains copies of submittals included on the RIDEM website listed above. Electronic copies of these submittals are sent to the repository on a monthly basis. Upon request, National Grid will provide hard copies of the material for inclusion in this repository. Pawtucket Public Library hours are Monday through Thursday, 9 a.m. to 8:45 p.m.; and Friday and Saturday, 9 a.m. to 4:45 p.m. The Pawtucket Public Library is located at 13 Summer Street, Pawtucket, Rhode Island (telephone: 401-725-3714).

- **Bulletin Boards**

National Grid has installed informational bulletin boards at the end of Tidewater Street and at the end of Bowles Court. Weekly updates during the work that are submitted to RIDEM will be posted to the bulletin boards, as well as how to find all submitted documents and how to receive more information about the Site. Site contact information is also posted on the bulletin boards. During active earth disturbing activities, air monitoring data will be posted on the bulletin boards. Additionally, on a daily basis during earth disturbing activities, a color coded system will be used to indicate whether any active excavation is occurring.





**HOW TO JOIN:**

• **Mailing List**

National Grid established a mailing list for the former Tidewater Site. The list includes abutting property owners, tenants, easement holders, municipalities and any community well suppliers associated with any well head protection areas that encircle the Site, as well as people who have previously provided their mailing address to National Grid. Interested persons can be added to this list via an email request to Michele Leone at National Grid ([Michele.Leone@nationalgrid.com](mailto:Michele.Leone@nationalgrid.com)) with your name and address or by calling Michele Leone at 1-781-907-3651. National Grid will use the mailing list to announce upcoming public meetings and distribute fact sheets and other information about the Site. In addition, National Grid will use the list to distribute information regarding reports and other documents added to the repository.

• **Email Distribution List**

Interested parties have the option to receive information via email. National Grid will also email the distribution list when significant field activities begin and as planned field activities may change. Interested persons can be added to the email list through National Grid's Tidewater website or by emailing a request to Michele Leone at National Grid ([Michele.Leone@nationalgrid.com](mailto:Michele.Leone@nationalgrid.com)) with your name and email address or call Michele Leone of National at 1-781-907-3651.

• **Phone Message Network**

National Grid has established a phone message network to distribute time-sensitive information to interested parties on air monitoring results during periods of active earth disturbing activities at the Site. Sign up for the phone message alert system can be made by emailing a request to Michele Leone of National Grid ([Michele.Leone@nationalgrid.com](mailto:Michele.Leone@nationalgrid.com)) or by calling Michele Leone at 781-907-3651 with your name and phone number.

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## ACRONYMS



AST	Above-ground Storage Tank
A.P.	Assessor's Plat
AES	Atlantic Environmental Services, Inc.
AQMP	Air Quality Monitoring Plan
BVEC	Blackstone Valley Electric Company
<a href="#">DNAPL</a>	Dense Non-Aqueous Phase Liquid
EJ Focus Area	Environmental Justice Focus Area
FGPA	Former Gas Plant Area
FPPA	Former Power Plant Area
GZA	GZA GeoEnvironmental, Inc.
ICS	International Charter School
<a href="#">LNAPL</a>	Light Non-Aqueous Phase Liquid
LOR	Letter of Responsibility
MGP	Manufactured Gas Plant
<a href="#">MNA</a>	Monitored Natural Attenuation
<a href="#">NAPL</a>	Non-Aqueous Phase Liquid
National Grid	Narragansett Electric Company d/b/a National Grid
NEGC	New England Gas Company
NFA	North Fill Area
<a href="#">PAHs</a>	Polycyclic Aromatic Hydrocarbons
<a href="#">PCB</a>	Polychlorinated Biphenyls
<a href="#">PIP</a>	Public Involvement Plan
<a href="#">RAA</a>	Remedial Action Alternative
<a href="#">RAL</a>	Remedial Approval Letter
RAE	Remedial Alternative Evaluation Report
<a href="#">RDL</a>	Remedial Decision Letter
<a href="#">RAWP</a>	Remedial Action Work Plan
<a href="#">Remediation Regulations</a>	Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases
RIDEM	Rhode Island Department of Environmental Management
SFA	South Fill Area
SIDR	Site Investigation Data Report
<a href="#">SIR</a>	Site Investigation Report
SSIWP	Supplemental Site Investigation Work Plan
STRAP	Short Term Response Action Plan
<a href="#">TPH</a>	Total Petroleum Hydrocarbons
<a href="#">UCL</a>	Upper Concentration Limit
UST	Underground Storage Tank
VGC	Valley Gas Company
VHB	Vanasse Hangen Brustlin, Inc.
<a href="#">VOCs</a>	Volatile Organic Compounds
Weston	Roy F. Weston, Inc.



## GLOSSARY AND HELPFUL TERMS

Electric switching station and substation

Substations are needed wherever electricity must be converted from one voltage to another. Transmission lines carrying a high voltage come into the substation where equipment reduces (or switches) the voltage to a level suitable for local distribution.

Engineered Cap

An engineered cap is a ground surface cover (liner, pavement, clay, soil, or another engineered material) designed to limit exposure to impacted material below. Engineered caps are either impermeable or permeable.

Impermeable Engineered Cap: An impermeable engineered cap is a specific type of cap that limits water (e.g., rain, snow melt) from entering the ground. The type of cap is typically made of clay or plastic liner.

Permeable Engineered Cap: A permeable engineered cap is a specific type of cap that allows water (e.g., rain) to enter the ground beneath it. This type of cap is typically constructed using clean soil and a fabric material.

Monitored Natural Attenuation (MNA)

Monitored Natural Attenuation (MNA) refers to the reliance on natural attenuation processes to reduce contaminant levels in soil and/or groundwater to achieve site-specific remediation objectives. Natural attenuation is the process that breaks down certain compounds into different compounds by biological or chemical activity.

Natural gas regulating station

Regulating stations are used for natural gas distribution and are designed to reliably control system pressures and maintain the continuity of gas supply to the community during normal and critical demand periods.

Non-Aqueous Phase Liquid (NAPL)

Non-aqueous phase liquid (NAPL) refers to a compound present at a concentration such that it exists as a separate phase when placed in water. This definition may apply to Light Non-Aqueous Phase Liquids (LNAPL) and/or Dense Non-Aqueous Phase Liquids (DNAPL). DNAPL is denser than water and sinks below water; DNAPL is sometimes called “sinker”. Maple syrup is an example of a DNAPL. LNAPL is lighter than water and floats above water; LNAPL is sometimes called “floaters”. Examples of LNAPL are vegetable oil or paint thinner.



## GLOSSARY AND HELPFUL TERMS

Physical Containment	Physical containment refers to the installation of a subsurface barrier which is used to contain impacted groundwater and/or <a href="#">NAPL</a> . Examples of subsurface barriers include an excavated trench filled with relatively impermeable material or a sheet pile wall driven into the ground.
Polycyclic Aromatic Hydrocarbons (PAHs)	A class of chemicals substance formed by burning coal, gas, oils, and tobacco. PAHs are typically detected in shallow soils, particularly in urban environments. Sources of PAHs include burning of wood, vehicle exhaust, grilled foods, cigarette smoke, asphalt roads, and roofing products.
Polychlorinated Biphenyls (PCBs)	A manufactured chemical substance that had many uses in industrial processes and construction materials. PCBs are typically found at many former power plants and current electric substations due to their use in electrical equipment. PCBs are also commonly detected in caulk, paints, inks, dyes, grout, floor finishes, and adhesives.
Program Letter	A Program Letter is issued by RIDEM to formally put the findings of the <a href="#">Site Investigation Report (SIR)</a> out for a public comment period.
Public Involvement Plan (PIP)	A Public Involvement Plan (PIP) is an agreement between the party conducting response actions and the public about how they will share information moving forward, and how the public will be able to comment on plans for assessment and cleanup of the site. PIPs are tailored to the specific conditions presented by individual sites. The party responsible for conducting response actions at a site is also responsible for conducting public involvement activities at the site and carrying out the activities listed in the PIP during the site cleanup process. A PIP is a living document and can be amended to reflect additional issues or challenges that may arise during the site cleanup process.
Remedial Action Alternative (RAA)	A Remedial Action Alternative (RAA) is a remedial strategy that has been evaluated to potentially address soil and/or groundwater impacts at a Site. Typically, several RAAs are evaluated for a Site using comparison criteria, including cost, effectiveness, reliability and implementability. At the conclusion of the evaluation, one RAA is identified as the preferred RAA or the best fit for the final remedy (also known as “Remedial Action”).
Remedial Approval Letter (RAL)	The Remedial Approval Letter (RAL) is a formal written communication issued by RIDEM to formally approve the <a href="#">Remedial Action Work Plan (RAWP)</a> and to initiate the remedial work.



## GLOSSARY AND HELPFUL TERMS

Remedial Action Work Plan (RAWP)	A document submitted to RIDEM for review and approval which describes how the selected remedial alternative for the Site will be implemented.
Remedial Decision Letter (RDL)	The Remedial Decision Letter is a formal written communication issued by RIDEM to formally agree with the findings of <a href="#">the Site Investigation Report (SIR)</a> after a public comment period.
Remediation Regulations	Refers to the RIDEM “Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases”
Short Term Response Actions (STRA)	Any activities undertaken immediately following the discovery of a release of hazardous material in order to completely or partially contain, clean up or treat the released material and/or remove an imminent hazard if it exists.
Site Investigation Report (SIR)	A document submitted to RIDEM for review and approval which presents the history of a Site and investigation activities, describes the nature and extent of impacts based on the findings of the investigations and identifies the preferred <a href="#">Remedial Action Alternative (RAA)</a> .
Source Removal	Refers to the removal of subsurface material which may be acting a source for continued impact to soil and/or groundwater.
Source Stabilization	Refers to a remedial approach where impacts are physically bound or “stabilized” within a mass to limit further migration. An example of stabilization would be the addition of a cement-like material to soil which would lead to a “hardened” matrix and would limit the migration of impacts from that material.
Total Petroleum Hydrocarbons (TPH)	Term used to describe a large family of several hundred chemical compounds that originally come from crude oil. Crude oil is used to make petroleum products. Measurements of these compounds in soil and groundwater is commonly expressed as TPH. TPH is commonly detected in industrial/commercial areas with sources including gasoline, motor oils, and asphalt.
Upper Concentration Limit (UCL)	An upper concentration limit (UCL) is when a compound exceeds a defined numerical concentration as set forth in the <a href="#">Remediation Regulations</a> or is found in the environment as <a href="#">NAPL</a> .
Volatile Organic Compounds (VOC)	Volatile organic compounds (VOCs) are typical compounds found at MGP sites and other sites where coal, oil, refined products and other hydrocarbons were burned or used. VOCs are also found in gasoline, paint thinner and cleaning products.



## 1.00 INTRODUCTION

GZA GeoEnvironmental, Inc. (GZA), on behalf of the Narragansett Electric Company d/b/a National Grid (National Grid), has prepared this [Public Involvement Plan \(PIP\)](#) for the Former Tidewater facility located at terminus of Tidewater and Merry streets in Pawtucket, Rhode Island (herein referred to as the “Site”).



The attached [Figure 1](#) shows a Site *Locus Plan*. On March 23, 2012, the Rhode Island Department of Environmental Management (RIDEM or the “Department”) informed National Grid that the Department received a request that a formal process be set up for public participation in cleanup planning for the Site. GZA prepared this *PIP* based on the requirements of Rule 7.07 A, B, C and D of the [Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases \(Remediation Regulations, <http://www.dem.ri.gov/pubs/regs/regs/waste/remreg11.pdf>\)](#). Per Rule 7.07 (Public Involvement), this *PIP* addresses the following primary elements: 1) Public Notice, 2) Fact Sheets and Enhanced Communication, 3) Community Meetings, and 4) Information Repositories. In preparing this *PIP*, GZA considered information and comments provided to National Grid by RIDEM, members of the Tidewater Shareholders’ Group and the public. National Grid conducted interviews in June 2012 to solicit input from the community, which were used in the development of this plan. Interview questions and responses are summarized in the attached [Exhibit III](#). On November 26, 2012, a notice detailing the availability of the Draft *PIP* was distributed to abutters and interested parties to solicit public comments. On January 29, 2013, National Grid held a public meeting to discuss public comments on the Draft *PIP*. Written public comments were provided to National Grid by RIDEM via a February 21, 2013 notification letter. This September 2013 final version of the *PIP* was revised in response to comments received at the January 29, 2013 public meeting, the written public comments received in February 2013 and an email received on March 6, 2013. A notification letter dated August 1, 2013 was provided by the RIDEM concurring with National Grid’s Response to Public Comments Letter dated March 22, 2013. RIDEM requested the Response to Public Comments letter be revised for recent updates on public involvement activities at the Tidewater Site and that the *PIP* be finalized.

A [Public Involvement Plan \(PIP\)](#) is an agreement between the party conducting response actions (in this case, National Grid) and the public about how they will share information moving forward, and how the public will be able to comment on plans for assessment and cleanup of the Site. *PIPs* are tailored to the specific conditions presented by individual sites. The public involvement activities proposed at each site by the party conducting the response actions should reflect the needs of the community. The party responsible for conducting response actions at a site is also responsible for conducting public involvement activities at the site and carrying out the activities listed in the *PIP* during the site cleanup process. A *PIP* is a “living” document and can be amended to reflect additional issues or challenges that may arise during the site cleanup process.



This *PIP* addresses activities related to the investigation and cleanup of the Tidewater Site that are under the jurisdiction of RIDEM only, per the Remediation Regulations. This plan is not intended to cover Site activities relative to the day-to-day operations, including repair and maintenance of the natural gas regulating facility and electrical substation involving minor soil disturbances (i.e., fence post installation) or other uses of the property by National Grid. Activities at these facilities involving excavations of soils with the potential to create volatile emissions are covered by this *PIP*. In the event of a facilities emergency requiring immediate soil excavation (utility repair, etc.), National Grid will follow the soil management procedures prepared for the previous natural gas station regulator and electrical substation work (i.e., April 2011 *Materials Management Plan* and November 2012 *Soil Management Plan*, respectively). In addition, air monitoring will be completed during these emergency events in accordance with the September 28, 2012 air monitoring summary memorandum submitted to RIDEM to the extent practical.

The *PIP* is organized as follows:

- [Section 1.00](#) contains this introduction;
- [Section 2.00](#) includes a summary of relevant Site background information and current Site regulatory status;
- [Section 3.00](#) summarizes historic and current public involvement;
- [Section 4.00](#) describes the elements of the *PIP*; and
- [Section 5.00](#) explains how the *PIP* may be revised in the future; and
- [Section 6.00](#) describes information regarding roles and responsibilities for implementing public involvement activities; and
- [Section 7.00](#) presents a schedule for planned public involvement activities.

## 2.00 SITE DESCRIPTION

The following sections present a brief description of the Site, including historic and current uses; the Site's regulatory history and current status; an overview of investigation and remediation activities performed to date; and a description of planned remedial actions.<sup>1</sup> More details can be found on RIDEM's website (<http://www.dem.ri.gov/programs/benviron/waste/tide.htm>), National Grid's website ([www.tidewatersite.com](http://www.tidewatersite.com)), through RIDEM's Site files located at their offices or at the Pawtucket Public Library (see [Section 4.40](#) for details).

### 2.10 SITE DESCRIPTION, HISTORY, AND CURRENT USE

The Site was the location of the former Tidewater [Manufactured Gas Plant \(MGP\)](#) and the former Pawtucket No. 1 Power Station. It is listed as a "State Site" under RIDEM's

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<sup>1</sup> Note that the planned remedial activities are subject to RIDEM review and approvals.



Remediation Regulations (RIDEM Case No. 95-022). It is now largely vacant with the exception of an active [natural gas regulating station](#) located on the western portion and an [electric substation](#) on the central portion. In addition, portions of the former Power Plant are used as an [active switching station](#). A locked perimeter chain-link fence secures the Site.

The Site is situated between Taft Street, an extension of Tidewater and Thornton streets to the west, and the Seekonk River to the east, and consists of approximately 23 acres across seven separate lots. This area of Pawtucket meets the U.S. Environmental Protection Agency's definition of an Environmental Justice (EJ) Focus Area and, therefore, per the Remediation Regulations, certain enhanced communications have been included as part of this *PIP* (see [Section 4.20](#)).

The Site has been subdivided into four areas, as described below and shown in Figures 2A, Exploration Location Plan for the North Fill Area (NFA) and Former Gas Plant Area (FGPA), and 2B, Former Power Plant Area (FPPA) and South Fill Area (SFA).

- North Fill Area (NFA) (northern portions of Assessor's Plat (A.P.) 54B Lot 826) – [Figure 2A](#);
- Former Gas Plant Area (FGPA) (southern portions of A.P. 54B Lot 826 and A.P. 65B Lot 662) – [Figure 2A](#);
- Former Power Plant Area (FPPA) (A.P. 65B Lot 645) – [Figure 2B](#); and
- South Fill Area (SFA) (A.P. 65B Lots 647 and 649, portions of Lot 648 and portions of A.P. 67B Lot 11) – [Figure 2B](#).

National Grid owns the entirety of the NFA, FGPA and FPPA, as well as portions of the SFA (A.P. 65B Lots 647 and 649). The City of Pawtucket owns additional portions of the SFA (A.P. 65B Lot 648 and A.P. 67B Lot 11). The current Site layout, key features and previous exploration locations are shown in Figures 2A and 2B.

The Site is bounded to the west and northwest by residential properties (A.P. 65B Lots 613, 614, 615 and 616), the International Charter School, the Blackstone Academy Charter School, and the George W. Smith and Son, Inc. Construction Company (A.P. 54B Lot 497). It is bound to the east by the tidally-influenced Seekonk River, to the south and southwest by the Francis J. Varieur School (A.P. 65B Lot 644) and the Max Read Athletic Field (A.P. 65B Lots 646, 650 and 564 and A.P. 67B Lot 21), and to the north by undeveloped property owned by the city of Pawtucket (A.P. 54B Lot 827).

RIDEM classifies the groundwater underlying the Site as a GB resource. Groundwater classified as GB refers to groundwater resources that RIDEM has designated as not suitable for public or private drinking water use. The Site is located approximately 1.4 miles from the nearest GA-designated area, which has drinking water that RIDEM designated as suitable for public or private drinking water use. This GA-designated area is east of the Site, near Slater Park, on the opposite side of the Seekonk River. Municipal





drinking water services the Site and its surrounding area. There are no documented public drinking water supplies within a one-mile radius of the Site. The closest designated wellhead protection area is located approximately 1.2 miles north of the Site.

The Pawtucket Gas Company commenced building the Tidewater [MGP](#) in the 1880s on the northern portion of the Site. The MGP operated from the 1880s to 1968. From the 1880s until 1954, the MGP generated gas using the coal and coke. These raw materials were barged to storage areas at the Site positioned along the Seekonk River. In later years (1954 until the late-1960s), operation of the MGP was limited to producing gas to supplement natural gas during high demand periods. In 1968, the MGP facility was decommissioned. Based on available information, it appears that the majority of the above ground MGP structures and tanks were razed at that time or before. The last of the two remaining gasholders on the Site (Nos. 7 and 8) were decommissioned and removed from the Site by National Grid in 2010. A gas regulator station remains on the former gas plant portion of the Site.

In regard to the electric generation portion of the Site, in 1890, the Pawtucket Gas Company commenced building the Pawtucket No. 1 Station for power generation purposes. The No. 1 Station operated on the Site from the early-1890s until 1975. The station used coal, petroleum based products, and residual by-product tars from the MGP for electricity generation. Petroleum products were historically stored in three large (approximately 900,000 gallons each) aboveground storage tanks (AST) formerly located on the southern portion of the Site. These ASTs were removed in the 1970s. The electrical transmission towers, transformer yard, and former engine room building (which currently contains the active switching station) remain on the former power plant portion of the Site.

## 2.20 REGULATORY HISTORY

RIDEM issued a *Letter of Responsibility* (LOR) dated September 12, 1995 to Blackstone Valley Electric Company (BVEC), a predecessor of National Grid. The Site was listed as State Site #95-022 following the issuance of the LOR. Since that time, several rounds of investigation and remedial actions have been performed at the Site.

## 2.30 SITE INVESTIGATION AND REMEDIATION STATUS

Environmental investigations have been performed on the Site since 1986. These Site environmental activities have been documented in reports submitted to RIDEM. The following is a listing of the primary Site reports prepared and submitted to RIDEM. Some of these reports can be accessed on the RIDEM website (<http://www.dem.ri.gov/programs/benviron/waste/tide.htm>) or on the Tidewater/ National Grid website ([www.tidewatersite.com](http://www.tidewatersite.com)). All reports are publicly available by request and by appointment through RIDEM's site files (refer to [Section 4.40](#) and "[Key Things to Remember](#)").



- December 1986 *Work Study Plan* prepared by GZA on behalf of Valley Gas Company (VGC);
- February 1989 *Field Investigation Report* prepared by RIDEM;
- May 1988 *Investigation at the No. 1 Station Site* prepared by Roy J. Weston, Inc. (Weston) on behalf of BVEC;
- May 1991 *Underground Storage Tank Closure Completion Report*, prepared by Metcalf and Eddy, Inc. on behalf of BVEC;
- February 1993 *Site Inspection Report*, prepared by RIDEM;
- August 1995 *UST Closure Assessment*, prepared by E.R. Pickett Co., Inc. on behalf of BVEC;
- December 1996 *Remedial Investigation at the Tidewater Site, Pawtucket, RI* prepared by Atlantic Environmental Services, Inc. (AES) on behalf of BVE and VGC;
- June 1997 *Additional Background Surface-Soil Sampling, Pawtucket, RI* prepared by AES on behalf of BVEC and VGC;
- January 1998 *Tidewater Site Application for Variance, Pawtucket, RI* prepared by AES on behalf of BVEC and VGC;
- January 1998 *Addendum to Tidewater Site Additional Background Surface-Soil Sampling* prepared by AES on behalf of BVEC and VGC;
- June 2005 *Short Term Response Action Report, Tidewater Former MGP, Pawtucket, RI* prepared by Vanasse Hangen Brustlin, Inc. (VHB) on behalf of New England Gas Company (NEGC);
- January 2007 *Short Term Response Action Plan (STRAP)* prepared by GZA on behalf of National Grid (Roadway Cap and South Washout Areas);
- June 2008 *Sediment Investigation Work Plan* prepared by ARCADIS on behalf of National Grid;
- February 2009 *Polychlorinated Biphenyls (PCB) Investigation and Cleanup Plan – Pawtucket No. 1 Substation* prepared by VHB on behalf of National Grid;
- June 2009 *Sediment Data Report Former Tidewater Facility* prepared by ARCADIS and Anchor QEA, LLC. (ARCADIS/Anchor) on behalf of National Grid;
- November 2009 *Remedial Summary Report – Response to Stormwater Release* prepared by GZA on behalf of National Grid;
- November 2009 *Supplemental Site Investigation Work Plan (SSIWP)* prepared by GZA on behalf of National Grid;
- December 2009 *Short Term Response Action Plan (STRAP) – Sheen Outbreak* prepared by GZA on behalf of National Grid;
- February 2010 *Short Term Response Action Summary – Sheen Outbreak* prepared by GZA on behalf of National Grid;
- October 2010 *Short Term Response Action Closure Report, MGP-Residuals Roadway Remediation* prepared by GZA on behalf of National Grid;



- October 2010 *Supplemental Site Investigation Work Plan Addendum* prepared by GZA on behalf of National Grid;
- October 2010/January 2011 *Short Term Response Action Plan – Former Steel Process Pipe* prepared by GZA on behalf of National Grid;
- January 2011 *Site Investigation Data Report (SIDR)* prepared by GZA on behalf of National Grid;
- April 2011 *Evaluation of Applicability of Air Pollution Control Regulation No. 9 & Air Quality Monitoring Program (AQMP)* prepared by GZA on behalf of National Grid;
- July 2011 *Gasholder Nos. 7 and 8 Decommissioning and Demolition Completion Report* prepared by GZA on behalf of National Grid;
- July 2011 *Remedial Action Alternative Evaluation (RAE) Report* prepared by GZA on behalf of National Grid;
- August 2011 *Supplemental Site Investigation Work Plan Addendum* prepared by GZA on behalf of National Grid;
- September 2011 *Short Term Response Action Completion Report – Former Process Pipe Removal* prepared by GZA on behalf of National Grid;
- November 2011 *Completion Report Performance-Based PCB Remedial Activities Natural Gas Regulator Station Area Former Tidewater Facility* prepared by GZA on behalf of National Grid;
- September 2012 *Site Investigation Report Addendum* prepared by GZA on behalf of National Grid; and
- September 2012 *Summary of Air Quality Monitoring during Substation Earthwork* prepared by GZA on behalf of National Grid; and
- May 2013 *Supplemental Site Investigation Work Plan: Soil Gas Sampling and Analysis* prepared by GZA on behalf of National Grid; and
- October 2013 *Supplemental Site Investigation Report Addendum* prepared by GZA on behalf of National Grid.

The January 2011 *SIDR* combined with the July 2011 *RAE* served to complete the [Site Investigation Report \(SIR\)](#) consistent with Rule 7.00 of the [Remediation Regulations](#). The January 2011 *SIDR* presents a comprehensive summary of all relevant environmental investigations and data collected at the Site. Findings of the *SIDR* indicate that soil and groundwater impacts related to the former MGP and power generation operations remain in the environment at the Site. MGP residuals and petroleum hydrocarbon-related impacts were detected in both surface (between zero and two feet below grade) and subsurface (more than two feet below grade) soils. In general, subsurface soils located at/or below the water table exhibited more significant impact when compared to surface soils. This condition is commonly found at MGP sites. The primary constituents detected in Site soils included [polycyclic aromatic hydrocarbons \(PAHs\)](#), [petroleum hydrocarbons \(TPH\)](#) and certain inorganics, most notably arsenic and lead.

In terms of groundwater quality, dissolved phase [volatile organic compound \(VOC\)](#) GB Groundwater Objective exceedances were observed in the eastern portion of the FGPA,



FPPA and SFA. The most prevalent compounds detected in groundwater were benzene and naphthalene, which is typical of former MGP and power plant sites. Groundwater in these areas was also impacted by [TPH](#) and cyanide, and [PAHs](#) to a lesser extent. In certain areas of the Site, sporadic [Upper Concentration Limit \(UCL\)](#) exceedances in the surface soils were identified, as well as more widespread UCL exceedances in subsurface soils, particularly in the FGPA and FPPA. In addition, Light Non-Aqueous Phase Liquid ([LNAPL](#), i.e., product floating on the groundwater surface) has been observed on the eastern portion of the FGPA and FPPA, and Dense Non-Aqueous Phase Liquid ([DNAPL](#), i.e., product that sinks to the bottom of a well) has been observed on the eastern portions of the FGPA, FPPA and SFA adjacent to the riverfront within groundwater monitoring wells. A color-coded map for the Tidewater project that illustrates areas of the Site where impacts have been identified in groundwater and soils has been provided as Figure 4. This map was presented at the Community Information Session held on March 27, 2013. This map was also posted on the National Grid website ([www.tidewatersite.com](http://www.tidewatersite.com)) and the bulletin boards.

National Grid conducted soil gas sampling in accordance with the May 2013 Supplemental Site Investigation Work Plan during July and August 2013 in the interior portion of the Tidewater Site and along the perimeter of the Tidewater Site in response to public comment. The results of the interior soil gas testing are consistent with previous soil and groundwater testing at the Tidewater Site. While certain compounds were detected at low levels, none of the perimeter soil gas readings exceeded regulatory criteria established by the Connecticut Department of Energy and Environmental Protection (CTDEEP) for both residential and industrial/commercial settings. (Rhode Island does not have regulatory criteria for soil gas quality.) The results showed the closer the samples were to the boundary of the Site, the lower the concentrations of these compounds. Overall, the test results indicate that potential migration of impacted soil gas from the Tidewater Site towards neighboring properties and structures does not pose a risk to the neighbors. National Grid provided a fact sheet/summary, a figure and analytical soil gas results to RIDEM and public stakeholders describing the soil gas sampling and preliminary results on August 28, 2013 and posted this information to the Tidewater website ([www.tidewatersite.com](http://www.tidewatersite.com)). A copy of this fact sheet is included in Exhibit I. National Grid submitted a comprehensive report describing this soil gas study and the results to RIDEM in October 2013. This comprehensive report was posted on the Tidewater website ([www.tidewatersite.com](http://www.tidewatersite.com)).

Consistent with the requirements of Rule 7.04 of the Remediation Regulations, the July 2011 *RAE* identified and evaluated four potential [Remedial Action Alternatives \(RAAs\)](#):

- 1) RAA 1: No Action with [Monitored Natural Attenuation \(MNA\)](#);
- 2) RAA 2: [Engineered Cap](#), [Physical Containment](#) and [Limited Source Removal](#);
- 3) RAA 3: Source Removal / [Stabilization](#), Localized Physical Containment and Engineered Cap; and
- 4) RAA 4: Significant Source Removal and Engineered Cap.



These alternatives were developed considering:

- the potential exposure pathways and remedial objectives established for the Site;
- the Site's hydrogeologic setting;
- characteristics and extent of detected impacts;
- practical and logistical limitations;
- current and anticipated future Site use;
- technical feasibility;
- compliance with applicable regulations; and
- public concerns.

Cost effectiveness and permanency of the remedial alternative were also considered, along with the ability to address potential risks to human health and the environment, including protection of natural resources, and addressing the presence of [UCLs](#). The four RAAs were evaluated based on the following regulatory specific criteria:

- comparative effectiveness/permanency;
- comparative compliance with Remediation Regulations; and
- comparative implementability, cost, risk, implementation risk and timeliness.

In addition, the comparative analysis included technical assessments of Site-specific hydrogeological factors and consideration of other Site-specific conditions. These Site-specific conditions include current and anticipated future Site use as well as the potential impacts both on-Site and to the surrounding community during remedial implementation.

Based on this evaluation, RAA 2 was selected as the preferred alternative for the Site. This alternative involves the following components:

- installation of an engineered permeable cap across the NFA and an impermeable cap across the remainder of the Site;
- installation of a subsurface containment wall to mitigate the migration of [NAPLs](#) from the Site along the riverside of the FGPA, FPPA and portions of the SFA; and
- targeted [source removal](#) in the NFA, FGPA and the FPPA.

This alternative was selected based on its comparative ability to achieve the remedial objectives, low degree of implementation risk and relative timeliness at achieving the remedial goals.

As indicated previously, the [SIR](#) was completed with the submittal of the *RAE* to the Department in July 2011. The Department will issue a [Program Letter](#), per Rule 7.07 of the [Remediation Regulations](#), upon its review and acceptance that the Site has been adequately assessed. Following receipt of the *Program Letter*, National Grid will notify all abutting property owners, tenants, easement holders, the city of Pawtucket and other





interested parties that the investigation is complete and that RIDEM has concurred with the recommended remedial alternative. This notification will be performed consistent with [Section 4.10](#) of this *PIP* and will include a summary of the proposed remedial actions. Subsequent to this public notification and following receipt of any public comments, the Department will issue a [Remedial Decision Letter](#) formally approving the *SIR*. Following the issuance of the *Remedial Decision Letter*, National Grid will prepare and submit a [Remedial Action Work Plan \(RAWP\)](#) consistent with Rule 9.00 of the Remediation Regulations. The Department must review and approve the *RAWP* prior to implementation of the remedy through the issuance of a [Remedial Approval Letter](#). Many of the above remedial process steps will be accompanied by public meetings and comment periods. See [Section 4.30](#) and [Table 1](#) for more public involvement details regarding these remedial process steps.

### 3.00 PUBLIC INVOLVEMENT HISTORY

Consistent with the requirements of the Remediation Regulations, as well as specific requests from RIDEM and community members, National Grid has and continues to make information relative to the investigation and remediation of the Site available to the community. To date, National Grid has conducted several meetings with members of the community to solicit public feedback, answer questions and discuss concerns regarding the Tidewater site.

Per Rule 7.07A of the [Remediation Regulations](#) and as requested by RIDEM, National Grid and/or its environmental consultants performed public notifications prior to the completion of the several rounds of field investigation activities and [Short Term Response Actions](#). National Grid also completed public notifications prior to significant upgrades to the [natural gas regulating station](#) in April 2011 and to the [electrical substation](#) upgrades in August 2012. This notification process included mailing public notices to all abutting property owners, tenants, easement holders and the city of Pawtucket, which detailed information regarding the nature and timing of the proposed field activities. In addition, as part of the notification process completed in April 2010 and prior to Site investigation activities, National Grid completed public notifications per the requirements of Rule 7.07 B of the [Remediation Regulations](#) for sites located in an EJ Focus Area. Specifically, this included distribution of the following materials:

- “What is DEM?” fact sheet (provided by RIDEM);
- “Brownfield’s, Turning Bad Spaces Into Good Ones” (provided by RIDEM); and
- a Site-specific fact sheet.

Additionally, signs were clearly posted at the entrance gates at the ends of Tidewater and Merry streets, which included important Site-specific information, such as contact information and how to obtain additional information about the Site. Per the EJ Focus Area





guidance, these materials were provided in both English and Spanish. RIDEM reviewed the information distributed per the EJ Focus Area guidance prior to mailing and posting. Copies of the notification packages, which have been submitted since 2008, and information included on the signs posted at the Site entrance gates, are included in [Exhibit I](#).

Since February 2010, National Grid has prepared monthly status reports and submitted them to RIDEM, per RIDEM's request. The reports summarize the investigations and response actions completed for the Site and anticipated future response activities and schedule. RIDEM posts these status reports to its Site-specific website (<http://www.dem.ri.gov/programs/benviron/waste/tide.htm>).

During the completion of the gasholder decommissioning and demolition activities, performed in 2010, National Grid developed a Fact Sheet and circulated it by hand to abutting property residents of the neighboring apartment complex and charter schools in September 2010. The Fact Sheet included a brief history of the Site and a summary of the major activities expected to occur during the gasholder dismantling project. A copy of this Fact Sheet is included in [Exhibit I](#). In addition, a meeting was held on November 4, 2010, at the Blackstone Academy Charter School located at 334 Pleasant Street, Pawtucket, Rhode Island. Officials of the International Charter School (ICS) and Blackstone Academy Charter School, school parents, RIDEM officials, National Grid and GZA attended the meeting. A follow-up meeting was also held at the same location on December 7, 2010. These meetings included discussions on the progress and plans to complete the gas holder decommissioning and demolition activities. Concerns raised by members of the community related to air quality monitoring, dust, noise and truck traffic were also discussed and addressed as part of project completion.

Following the November 2010 meeting, RIDEM established a link on its website's homepage ([see Section 4.40](#)) for the "Former Tidewater Coal Manufactured Gas Site (Pawtucket)". This website includes electronic copies of all recently submitted documents for the Site. Because all reports are not electronically available, the site also includes instructions on how to obtain copies of all Site-related documents.

Per RIDEM's request, on November 24, 2010, National Grid also initiated the submission of weekly project updates to RIDEM. National Grid typically submits these updates electronically to RIDEM on Fridays, summarizing anticipated investigation and response actions to be performed for the following week. RIDEM then posts these updates on its website. Since April 2012, National Grid has submitted its updates on a biweekly schedule given the current low frequency of investigation and response action activities at the Site. National Grid will increase the frequency of the updates when more active activities are undertaken at the Site.

National Grid also established a public repository in May 2011 at the Pawtucket Public Library, located at 13 Summer Street, Pawtucket, Rhode Island. On a monthly basis,



electronic copies of the documents posted on RIDEM's website are provided on CD to the library repository. National Grid included a notification about the availability of documents at the public repository in the May 27, 2011 weekly update to RIDEM.

In August 2012, GZA, on behalf of National Grid, walked the neighborhood to distribute door-knob flyers informing people how to join the mailing list. This walk included the residences within the neighborhood area, as shown in the attached [Figure 3](#) – Door-to-Door Notification Area.

In September 2012, National Grid installed informational bulletin boards at the end of Tidewater Street and at the end of Bowles Court. Weekly updates submitted to RIDEM will be posted to the bulletin boards, as well as how to find all submitted documents and how to receive more information about the Site. Site contact information is also posted to the bulletin boards. During active earth disturbing activities, air monitoring data will be posted on the bulletin boards. Additionally, on a daily basis during earth disturbing activities, a color coded system will be used to indicate whether any active excavation is occurring.

In September 2012, National Grid, RIDEM and GZA conducted a meeting with interested persons regarding public concerns about the upcoming electrical substation upgrades. As a result of this meeting, GZA prepared a summary memorandum dated September 28, 2012 describing the air quality monitoring program implemented during earthwork activities associated with the electrical substation upgrade project. The memo can be found in the Information Repositories listed in [Section 4.40](#).

In October 2012, National Grid notified recipients of the mailing list in regards to several public involvement tools that have been made available. The notification announced the availability of the National Grid website ([www.tidewatersite.com](http://www.tidewatersite.com)), phone message alert system and the bulletin boards. The notification presented how to sign up for the mailing list, emailing list and the phone message alert system.

In November 2012, National Grid notified recipients of the mailing lists that the draft *PIP* was available for review and comment. The notification also presented a tentative schedule for a public meeting to discuss the draft *PIP*.

In January 2013, National Grid notified recipients of the mailing lists that the draft *PIP* meeting would be held on January 29, 2013. The purpose of this public meeting was to discuss public comments to the draft *PIP*.

The public meeting to discuss the Draft *PIP* was held on January 29, 2013 and included a presentation by National Grid and GZA on the draft *PIP* and a summary of the public involvement components. National Grid responded to written questions received to date and then responded to questions or comments from people who attended. A summary of this meeting was submitted to RIDEM on February 15, 2013. A copy of the meeting



summary is included in Exhibit IV as an attachment to the formal Response to Comments dated March 22, 2013.

National Grid received a notification letter from RIDEM on February 21, 2013 to provide written responses to written comments received by RIDEM. A formal Response to Comments Letter was submitted to RIDEM on March 22, 2013 and is included as Exhibit IV. This response to comments also included updates to comments from the public discussed at the January 29, 2013 public meeting and responses to comments received in an email on March 6, 2013.

In March 2013, recipients of the mailing lists were notified that National Grid planned to host a Community Outreach Session to be held on March 27, 2013 at the Francis J. Varieur Elementary School. An updated Fact Sheet, dated February 2013, was also included with the notification package. National Grid provided this notification and updated fact sheet in English, Spanish and Portuguese. GZA, on behalf of National Grid, walked the neighborhood to distribute door-knob notification of the proposed Community Outreach Session and the updated Fact Sheet, all provided in English, Spanish and Portuguese. This walk included the residences within the neighborhood area, as shown in the attached [Figure 3](#) – Door-to-Door Notification Area. National Grid distributed additional copies of this notification and fact sheet to the principals at the Varieur Elementary School, Blackstone Academy Charter School and International Charter School on March 6, 2013 to be sent home with the students via backpacks. In addition, National Grid, with input from the principals of the three schools and community members, developed a flyer to announce the Community Outreach Session. This flyer was translated to Spanish and Portuguese and distributed to all three schools and posted on the bulletin boards on March 20, 2013.

National Grid held a community outreach session on March 27, 2013. The intent of this session was to present information regarding the Site in an informal poster-board type setting. Posters included:

- a description of RIDEM's Site Remediation program;
- Site history;
- details regarding Site investigations;
- details regarding utility operations at the Site;
- details regarding public involvement tools;
- nature and extent of environmental impacts, including characteristics of contamination and proposed remedial approach for the Site;
- A demonstration was conducted of air monitoring equipment used during the substation upgrade project at the Tidewater Site; and
- A slideshow was shown with photographs of various areas of the Site.

The posters were staffed by National Grid and GZA representatives who answered the public's questions on a one-on-one basis. Representatives were available from RIDEM to



answer questions on the regulatory process. This community outreach session was held at the Francis J. Varieur Elementary School.

In June 2013, National Grid notified recipients of the mailing lists that a supplemental investigation work plan was available for review and comment. The work plan was developed to investigate soil gas quality in both the interior portion of the Site and along the perimeter of the Site in response to comments received by the public. The notification also presented a tentative schedule for sampling.

National Grid received a notification letter from RIDEM on August 1, 2013 to update and finalize the PIP and to update the formal response to comments that was provided to RIDEM on May 22, 2013.

#### **4.00 PUBLIC INVOLVEMENT PLAN**

This section describes the elements of the [PIP](#) to be implemented for the Site that were developed based on the applicable requirements of Rule 7.07 A, B, C and D of the [Remediation Regulations](#). This *PIP* has been prepared to establish procedures for formal public and community communications relative to the implementation of planned investigations and remedial efforts at the Site. This *PIP* is considered to be a “living” document and may be revised or amended whenever necessary during the course of the remedial process.

A contact list for National Grid, GZA and RIDEM personnel associated with the Site is presented in [Exhibit II](#), in the “[Key Things to Remember](#)” portion of this *PIP* and on the title page.

#### **4.10 PUBLIC NOTICE**

Rule 7.07A of the [Remediation Regulations](#) requires public notice at two points during the Site Investigation process:

1. Prior to conducting Site Investigation field activities at a known contaminated site; and
2. Prior to the formal departmental approval of the [SIR](#) (in the form of the [Remedial Decision Letter](#)).

As described in [Section 3.00](#), National Grid provided public notice in the form of letter mailings prior to performing Site investigation activities in 2008. With respect to the second notification step, upon receipt of a [Program Letter](#) from the Department, National Grid will provide written notification to all abutting property owners, tenants, easement holders and the City of Pawtucket. This written notification will include a brief summary



of investigation findings, a description of the proposed Site remedy, and information on where the public can access and review the [SIR](#). As part of this post-*SIR* notification process, there is a 14-day public comment period, commencing with the date of delivery of the public notice, during which the public may review RIDEM records pertaining to the Site and submit written comments regarding the technical feasibility of the preferred remedial alternative. Since the Site is located in an EJ Focus Area, this public notice will be prepared and provided in English, Spanish and Portuguese with a translation header in multiple languages stating: “This is an important notice. Please have it translated.”

National Grid established a mailing list for the former Tidewater Site. The list includes, as described in Rule 7.07A of the [Remediation Regulations](#), abutting property owners, tenants, easement holders, municipalities and any community well suppliers associated with any well head protection areas that encircle the contaminated Site. In addition, this mailing list includes members of the Tidewater Stakeholders Group, the Pawtucket Development Office and other interested parties, as well as the principals of the neighboring schools (charter schools and public school) for dissemination to teachers and parents. Interested parents can go to the Tidewater/National Grid website ([www.tidewatersite.com](http://www.tidewatersite.com)) to sign up for updates. National Grid will use the mailing list to announce upcoming public meetings and distribute fact sheets and other information about the Site. In addition, National Grid will use the list to distribute information regarding reports and other documents added to the repository. National Grid also developed a “Tidewater Environmental Project” mailing label to clearly identify correspondence related to the project.

Members of the mailing list, as well as other interested parties, have the option to receive information via email. In addition, status updates will be posted to the informational bulletin boards ([refer to Section 4.20](#)) when they are placed in the repository. National Grid will also email the distribution list when significant field activities begin and as planned field activities may change.

All written public comments related to documents submitted to RIDEM, as well as National Grid’s response, will be documented in written form. A copy of responses will be placed in the Information Repositories ([see Section 4.40](#)). In addition, GZA will send a notice announcing the availability of the summary to the Site’s mailing and email recipient lists.

#### 4.20 FACT SHEETS AND ENHANCED COMMUNICATIONS

As indicated in [Section 3.00](#), National Grid previously prepared and distributed fact sheets prior to both the Site investigation activities and initiation of the former gasholder decommissioning effort, which was completed in 2011. In addition, National Grid distributed facts sheets about the planned electrical substation upgrade project, scheduled to begin in mid-October 2012. Since the Site is located in an EJ Focus Area, these fact sheets were provided in both English and Spanish. Copies of these fact sheets are provided in [Exhibit I](#).



More recently, and consistent with the requirements of Rule 7.07B of the [Remediation Regulations](#), National Grid prepared and distributed an updated Site-specific fact sheet in March 2013. This fact sheet includes the known history of the Site, the contamination characterized at the Site (based on historical uses and existing environmental information), information about public involvement activities, the Site's status in the regulatory process and the expected path forward, and the National Grid project manager's contact information. This fact sheet was provided in English, Spanish and Portuguese; a copy is included in Exhibit I. National Grid will update this fact sheet in the event new information is developed and/or significant project milestones are achieved. These milestones will include receipt of the [Program Letter](#) from the Department, receipt of a [Remedial Decision Letter](#) from the Department, Department approval of the [RAWP](#) with a [Remedial Approval Letter](#), initiation of Site remediation and remedy completion. These fact sheets will be disseminated to those on the mailing/emailing list. Going forward, these fact sheets will continue to be provided in English, Spanish and Portuguese.

In addition, informational bulletin boards have been installed at the end of Tidewater Street and at the end of Bowles Court. The bulletin boards will include certain information distributed through the mailing list, as well as weekly updates during remedial work. National Grid will also use the bulletin boards to announce public meetings, distribute fact sheets and communicate availability of reports. Additionally, on a daily basis during earth disturbing activities, a color coded system will be used to indicate whether any active excavation is occurring. Please note that if significant vandalism to the bulletin boards occurs, National Grid will look into alternative ways to share information.

National Grid has also established a phone message network to distribute time-sensitive information to interested parties. For example, National Grid will notify members of the phone message network if there are sustained exceedances of the monitored air compounds during active earth disturbing activities.

#### 4.30 COMMUNITY MEETINGS

Per Rule 7.07C of the [Remediation Regulations](#), an Initial Community Meeting will be held. The objective of the meeting will be to:

- disseminate information regarding the Site and RIDEM's Site Remediation program;
- document public comments and concern about the investigation and remediation of the Site; and
- engage in a dialogue with the community about the Site.

It is anticipated that the initial community meeting will be held after receipt of the Department's review comments on the [SIR](#). We currently anticipate this initial community meeting will be held at the Francis J. Varieur Elementary School, located at 486 Pleasant



Street in Pawtucket, Rhode Island, or the Blackstone Valley Visitors Center Theatre, located at 175 Main Street, in Pawtucket, Rhode Island. To accommodate participants, National Grid will schedule this meeting in the evening. Per Rule 7.07C, National Grid encourages equal participation by all to create an atmosphere of constructive, open dialogue.



National Grid is also planning to arrange for a limited tour of the Site prior to the start of remediation. Given the active utility operations, such as the electrical substation and natural gas regulating station on the property, portions of the site will not be accessible to the public due to safety concerns.

In addition to the initial community meeting, National Grid will schedule subsequent community meetings in conjunction with the following project milestones:

- Preparation of the draft [\*Remedial Action Work Plan\*](#) (RAWP);
- prior to remedy implementation; and
- remedy completion.

In addition, community meetings will be held during remedy implementation. The frequency of these meetings will be determined after the final remediation schedule has been developed and approved by RIDEM. At all public meetings, translation assistance will be provided for non-English speaking individuals, upon request.

National Grid will submit a written summary of all public meetings to RIDEM in hard copy and electronic format within 20 days of the meeting. In accordance with Section 7.07C, the meeting summaries will include:

- identification of the main issues of concern to the community;
- document requests by the public for a continued dialogue (including form and frequency); and
- proposed responses to the identified community issues through action items and schedules.



**Table 1 Anticipated Public Meetings**

<b>Meeting</b>	<b>Objective</b>
Initial Community Meeting	Present the results of the <a href="#">Site Investigation Report (SIR)</a> to the public and solicit public comments in regards to the Site Investigation
Public Meeting on draft <a href="#">RAWP</a>	Solicit public comments and questions on draft <a href="#">RAWP</a>
Public Meeting prior to initiation of remedy	Solicit public questions or concerns regarding the remedy
Public Meetings on an As-Needed Basis during remedial activities	Keep the public informed and discuss any questions or concerns, and present a meeting schedule for discussion.
Public Meeting upon completion of the remedy	Solicit public questions or concerns following completion of remedial activities

#### 4.40 INFORMATION REPOSITORIES

National Grid will provide Site-specific information to the public by establishing information repositories; developing and maintaining a mailing list to distribute information about the Site; providing advance notification to the Site mailing list about Site activities; and providing and updating fact sheets. The following describes the methods by which National Grid will make Site-related investigation and remediation information available to the community. See [Table 2](#) – Communication Tools for more information.

Publicly Accessible Site File: Files related to the former Tidewater Site are maintained at RIDEM’s Office of Waste Management filed under Former Tidewater Coal Gasification Plant (Pawtucket), RIDEM Case No. 95-022. The files contain all documents pertaining to the Site. Appointments to view the files can be made by contacting RIDEM, Department of Technical and Customer Assistance, 235 Promenade Street, Providence, Rhode Island (telephone: 401-222-4700 extension 7307). Additional information regarding file reviews at RIDEM can be found at <http://www.dem.ri.gov/topics/filerevw.htm>.



Publicly Accessible Document Listing Website(s): Certain documents related to the investigation and remediation of the Former Tidewater Site are maintained at the website operated by the RIDEM. The document listing website contains publicly available submittals pertaining to the Site dating back to 2007. RIDEM-required regulatory submittals will be sent to RIDEM for subsequent posting to the website, including:

- work plans;
- sampling and field testing plans;
- technical reports and documents summarizing results and recommendations;
- relevant correspondence;
- press releases;
- public information materials;
- updates to the PIP;
- public meeting summaries;
- summaries of responses to comments received; and
- copies of public notices about the Site.

In the future, National Grid will provide simple executive summaries for major reports that are submitted to RIDEM for subsequent posting to the website. The website is accessible at <http://www.dem.ri.gov/programs/benviron/waste/tide.htm>. National Grid also submits electronic copies of documents posted on this website to the Local Information Repository on a monthly basis.

In addition to the RIDEM website, National Grid has established a website for the Site ([www.tidewatersite.com](http://www.tidewatersite.com)). This website provides the public with timely updates on current and proposed activities at the Site. The following information is included (or will be included as it is developed):

- the nature and history of MGPs;
- history of the Tidewater facility;
- description of the Tidewater Site and regulatory background;
- access to key project documents (e.g., major reports; work plans; sampling and field testing plans; technical reports; documents summarizing results and recommendations; and simple executive summaries of major reports);
- relevant correspondence;
- press releases;
- updates to the PIP;
- public meeting summaries;
- summaries of responses to comments received;
- copies of public notices about the Site;
- public announcements;
- status update archive; and
- Site contacts.



Availability of the website will be posted on RIDEM's website, on signage at the Site and disseminated through the Site mailing list. When applicable, such as during active work times and remediation activities, summaries of certain air monitoring data (e.g., total volatile organic compound screening data, dust monitoring data and analytical data) will be posted on the Tidewater/National Grid website on a weekly basis.

Local Information Repository: To provide the community with easy access to information relevant to the Site cleanup process, a local repository has been established at the following location:

Pawtucket Public Library, 13 Summer Street, Pawtucket, Rhode Island (telephone: 401-725-3714)

The local information repository contains copies of those submittals included on the RIDEM website listed above. As previously indicated, electronic copies (on a CD) of these submittals are sent to the repository on a monthly basis. National Grid provides all submittals to the repository in electronic form only. Upon request, National Grid will provide hard copies of the material for inclusion in this repository.

Pawtucket Public Library hours are Monday through Thursday, 9 a.m. to 8:45 p.m.; and Friday and Saturday, 9 a.m. to 4:45 p.m.

In addition, certain information will also be posted on the bulletin boards, including the location of the repositories, site updates and site contact information.



**Table 2 Communication Tools**

<b>COMMUNICATION TOOLS</b>		
Information Repositories	Pawtucket Public Library	13 Summer Street, Pawtucket, RI The local information repository at the Pawtucket Public Library contains copies of submittals included on the RIDEM website. Electronic copies of these submittals are sent to the repository on a monthly basis.
	National Grid Tidewater Website	<a href="http://www.tidewatersite.com">www.tidewatersite.com</a> The website provides the public with timely updates on current and proposed activities at the Site. In addition, this website includes information about the Tidewater site and a document archive for the Site.
	RIDEM Tidewater Website	<a href="http://www.dem.ri.gov/programs/benviron/waste/tide.htm">http://www.dem.ri.gov/programs/benviron/waste/tide.htm</a> Certain documents related to the investigation and remediation of the Former Tidewater Site are maintained at the website operated by RIDEM.
	RIDEM File Review	235 Promenade Street, Providence, RI Files related to the former Tidewater Site are maintained at RIDEM's Office of Waste Management filed under Former Tidewater Coal Gasification Plant (Pawtucket), RIDEM Case No. 95-022 and are available upon request.
Distribution Lists	Email List	Interested parties have the option to receive information via email. National Grid will use the email list to announce upcoming public meetings, distribute fact sheets, availability of reports and other information about the Site. National Grid will also email the distribution list when significant field activities begin and as planned field activities may change.
	Mailing List	National Grid established a mailing list for the former Tidewater Site. The list includes abutting property owners, tenants, easement holders, municipalities and any community well suppliers associated with any well head protection areas that encircle the Site, as well as parties who have previously provided their mailing address to National Grid. National Grid will use the mailing list to announce upcoming public meetings, distribute fact sheets, availability of reports and other information about the Site.
	Phone Message Alert System	National Grid has established a phone message network to distribute time-sensitive information to interested parties.
Bulletin Boards	National Grid has installed informational bulletin boards at the end of Tidewater Street and at the end of Bowles Court. Weekly updates submitted to RIDEM will be posted to the bulletin boards, as well as how to find all submitted documents and how to receive more information about the Site. Site contact information is also posted to the bulletin boards. During active earth disturbing activities, air monitoring data will be posted on the bulletin boards. Additionally, on a daily basis during earth disturbing activities, a color coded system will be used to indicate whether any active excavation is occurring.	

See the [“KEY THINGS TO REMEMBER”](#) portion of this document to find out more about these communication tools.

## **5.00 FUTURE PLAN REVIEW AND AMENDMENTS**



National Grid may revise this [PIP](#) whenever necessary during the course of the remediation process. All revisions will be subject to review and approval by the Department and members of the public. If revisions are proposed, National Grid will prepare a draft revised *PIP* for review and approval by the Department and members of the public. A final revised *PIP* will then be placed in the information repositories and a notice of its availability will be sent to the Site’s mailing and email lists. A summary sheet of all RIDEM-approved changes to the *PIP* is provided as Exhibit V.

## **6.00 RESPONSIBILITIES FOR IMPLEMENTING PUBLIC INVOLVEMENT ACTIVITIES**

In accordance with the [Remediation Regulations](#), implementation of public involvement activities as described herein is the responsibility of National Grid. GZA will be conducting public involvement activities in support of National Grid. These activities are generally those designed to provide the public with information regarding remedial response actions. They include providing copies of reports to local officials and information repositories, mailing notices of meetings and the availability of Site reports, notifying local officials and residents of any proposed environmental work on the Site and providing an update on the status of the Site to local officials and residents. GZA will also assist National Grid in obtaining and responding to public comments on proposed remedial response actions.

Joseph Martella of RIDEM is responsible for addressing situations in which RIDEM receives complaints from the community members about the manner in which the [PIP](#) activities are being conducted.

## **7.00 SCHEDULE OF PIP ACTIVITIES**

The [PIP](#) specifies the milestones during remedial response activities when public involvement activities will be conducted. [Table 3](#) provides a schedule for public involvement activities.





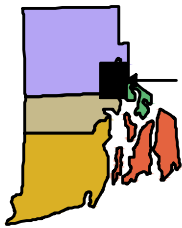
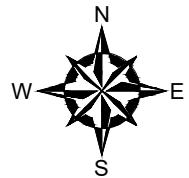
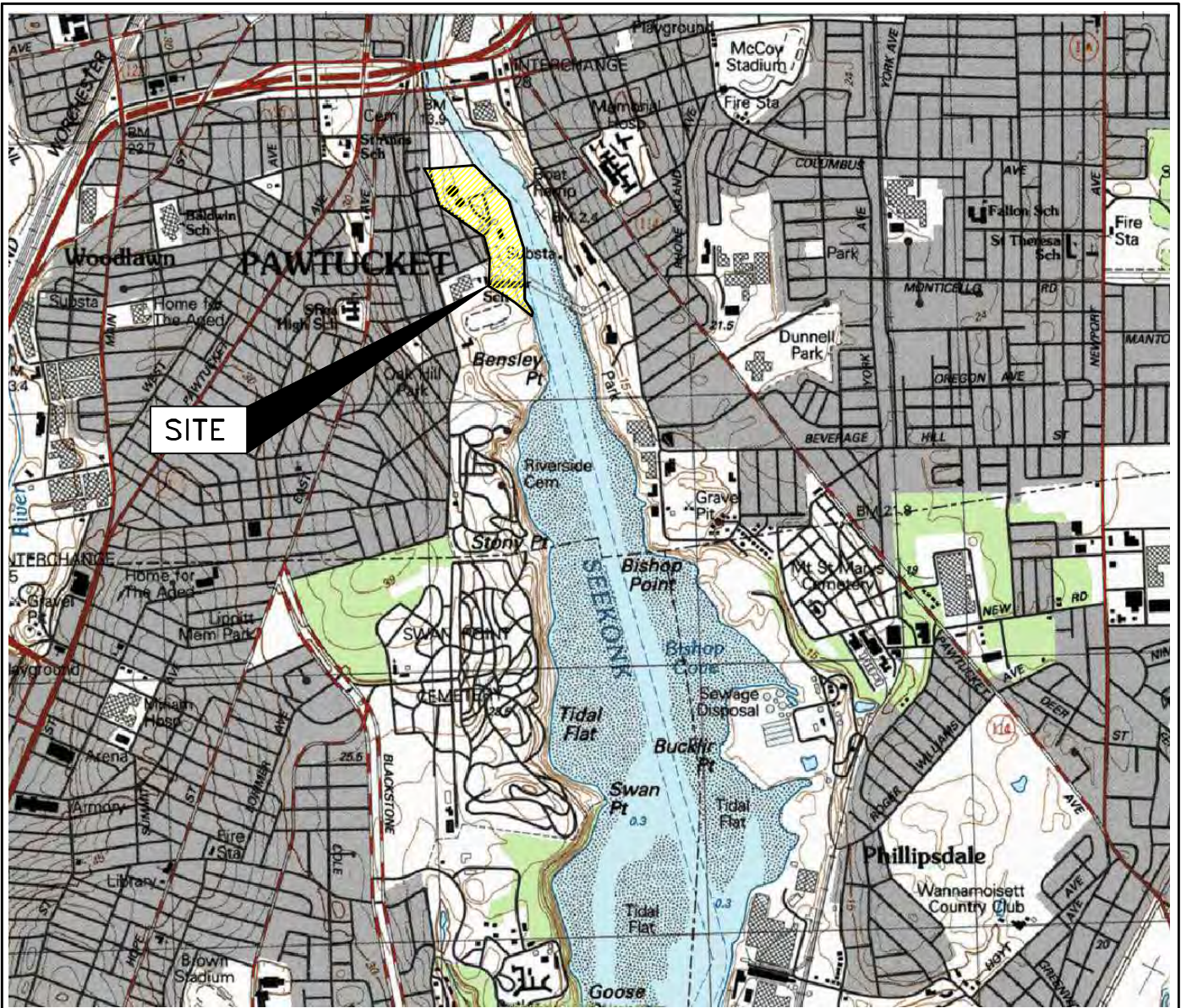
**Table 3 Schedule of Public Involvement Activities**

ACTIVITY	TIME PERIOD
Initial Community Meeting	Within 60 days of receipt of <a href="#">Program Letter</a> – during <a href="#">SIR</a> Public Comment Period
Public Meeting on DRAFT <a href="#">RAWP</a>	Within 12 months of receipt of <a href="#">Remedial Decision Letter</a>
Submit <a href="#">RAWP</a> for RIDEM Approval	Within 6 months of DRAFT RAWP Meeting
Public Meeting prior to initiation of remedy	Minimum of 30 days prior to start of remediation
Public Meetings during remediation	Meeting schedule to be presented for discussion purposes once remedial schedule is developed and approved by RIDEM
Public Meeting upon completion of the remedy	Within 30 days following completion of remediation



## **FIGURES**

© 2013 - GZA GeoEnvironmental, Inc. GZA-J:\ENV\43654.msk\CADD\GZA DWGS\43654 LOCUS PLAN.dwg [1] September 19, 2013 - 1:38pm scott.burton



□ UADRANGLE LOCATION

SOURCE:

**BASE MAP FROM THE FOLLOWING USGS QUADRANGLE MAP:  
PROVIDENCE, RHODE ISLAND (1987)**

DIGITAL TOPOGRAPHIC MAPS PROVIDED BY MAPTECH. INC.

CONTOUR ELEVATIONS REFERENCE NGVD 29,  
CONTOURS ARE SHOWN IN METERS AT 3 METER INTERVALS

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TIDEWATER FACILITY  
PAWTUCKET, RHODE ISLAND

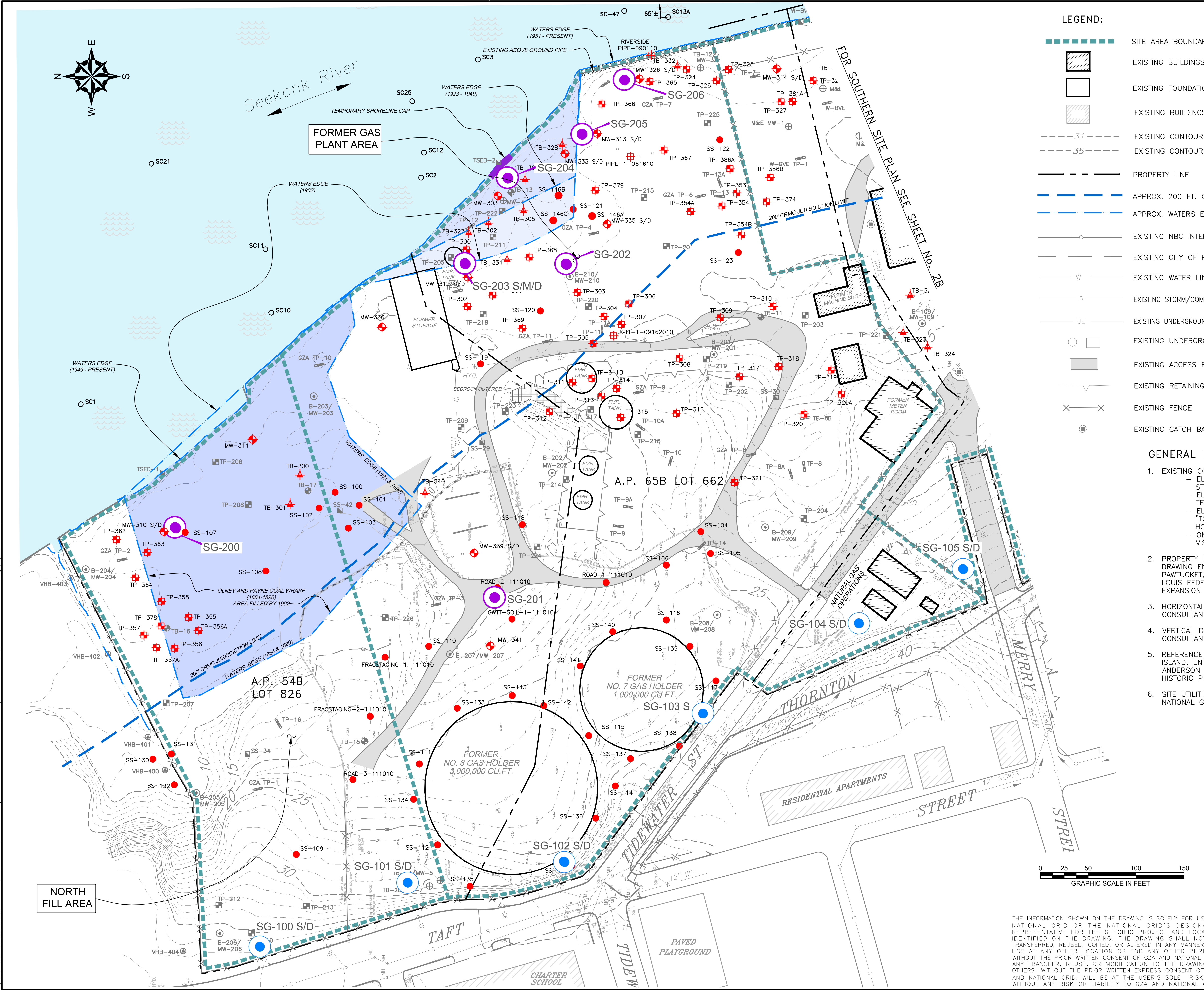
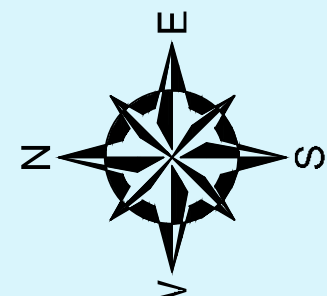
PREPARED BY:  
**GZA** GeoEnvironmental, Inc.  
Engineers and Scientists  
www.gza.com

PREPARED FOR:  
NATIONAL GRID

LOCUS PLAN

PROJ MGR: MSK	REVIEWED BY: MSK	CHECKED BY: JJC	FIGURE <b>1</b> SHEET NO. 1 OF 5
DESIGNED BY: SDN	DRAWN BY: CRD	SCALE: AS NOTED	
DATE: 2013	PROJECT NO. 43654.20	REVISION NO. 0	





**LEGEND:**

- SITE AREA BOUNDARIES
- EXISTING BUILDINGS ON-SITE
- EXISTING FOUNDATION/PAD ON-SITE
- EXISTING BUILDINGS/STRUCTURES OFF-SITE
- EXISTING CONTOUR (MINOR 1 FOOT INTERVAL)
- EXISTING CONTOUR (MAJOR 5 FOOT INTERVAL)
- PROPERTY LINE
- APPROX. 200 FT. CRMC JURISDICTION LIMIT
- APPROX. WATERS EDGE
- EXISTING NBC INTERCEPTOR SANITARY SEWER
- EXISTING CITY OF PAWTUCKET STORM DRAIN
- EXISTING WATER LINE
- EXISTING STORM/COMBINED SAN. SEWER OVERFLOW
- EXISTING UNDERGROUND ELECTRIC CABLE IN CONDUIT
- EXISTING UNDERGROUND ELECTRIC MH/STRUCTURE
- EXISTING ACCESS ROAD
- EXISTING RETAINING WALLS
- EXISTING FENCE
- EXISTING CATCH BASIN LOCATIONS

**SAMPLE LEGEND**

- ATLANTIC SURFACE SOIL SAMPLE LOCATION
- ATLANTIC SEDIMENT SAMPLE LOCATION
- WESTON/BLACKSTONE VALLEY ELECTRIC SEDIMENT SAMPLE LOCATION
- RIDEM SURFACE SOIL SAMPLE LOCATION
- MONITORING WELL/BORING (VHB) SURVEYED
- ATLANTIC TEST PIT LOCATION
- WESTON/BLACKSTONE VALLEY ELECTRIC TEST PIT LOCATION
- GZA/VALLEY GAS TEST PIT LOCATION
- ATLANTIC SOIL BORING LOCATION
- ATLANTIC MONITORING WELL LOCATION
- METCALF & EDDY MONITORING WELL LOCATION
- VHB SURFACE SOIL SAMPLE LOCATION NON-SURVEYED
- VHB TEST PIT (2006)
- GZA TEST PIT (2009)
- GZA TEST BORING LOCATION (2010)
- GZA MONITORING WELL LOCATION (2010)
- GZA TEST PIT LOCATION (2010)
- GZA SURFACE SOIL SAMPLE LOCATION (2010)
- ARCADIS SEDIMENT SAMPLE LOCATION (2008)
- GZA RESIDUAL MATERIAL SAMPLE (2010)
- GZA TEST BORING LOCATION (2011)
- PERIMETER SOIL GAS SAMPLING LOCATION
- INTERIOR SOIL GAS SAMPLING LOCATION

**GENERAL NOTES:**

1. EXISTING CONDITIONS BASE MAP DEVELOPED FROM THE FOLLOWING:
  - ELECTRONIC FILES FROM GEI CONSULTANTS, INC. (FORMERLY AES) ENTITLED "HISTORIC STRUCTURES AND SAMPLE LOCATIONS", ORIGINAL SCALE 1"=80', DATED JULY 1999
  - ELECTRONIC FILES FROM VANASSE HANGEN BRUSTLIN, INC. ENTITLED "SOIL BORING, TEST PIT AND MONITOR WELL LOCATIONS", SCALE: 1"=60', UNDATED
  - ELECTRONIC FILES FROM WELSH ASSOCIATES LAND SURVEYORS, INC. ENTITLED "TOPOGRAPHIC SURVEY (AS-BUILT), FORMER TIDEWATER FACILITY, DEMOLITION OF GAS HOLDERS NOS. 7 & 8", DATED DECEMBER 17, 2010
  - ON-SITE INVESTIGATIONS AND SURVEYS BY GZA PERSONNEL DURING VARIOUS SITE VISITS DURING 2009 AND 2010.
2. PROPERTY LINES AND LOT INFORMATION ESTABLISHED FROM INFORMATION PROVIDED ON A DRAWING ENTITLED "PERIMETER SURVEY OF LAND AT THE TIDEWATER FORMER MGP SITE IN PAWTUCKET, RHODE ISLAND FOR ATLANTIC ENVIRONMENTAL SERVICES INC." DEVELOPED BY LOUIS FEDERICI AND ASSOCIATES AND AN AUTO CAD FILE ENTITLED "MAX READ FIELD TRACK EXPANSION 2007" PROVIDED BY THE CITY OF PAWTUCKET.
3. HORIZONTAL DATUM IS BASED ON NAD 1983 FROM BASE MAPPING PROVIDED BY GEI CONSULTANTS, INC.
4. VERTICAL DATUM IS BASED ON NGVD 1929 (MSL) FROM BASE MAPPING PROVIDED BY GEI CONSULTANTS, INC.
5. REFERENCE SEWER DATA FROM SCANNED IMAGE PROVIDED BY THE CITY OF PAWTUCKET, RHODE ISLAND, ENTITLED "STUDY OF SEWERAGE FACILITIES" BY WATERMAN ENGINEERING CO. & ANDERSON NICHOLS CO. DATED NOV. 1975, ORIGINAL SCALE 1"=400' & SCANNED IMAGES OF HISTORIC PLAN & PROFILE DRAWINGS PROVIDED BY THE CITY OF PAWTUCKET, RHODE ISLAND.
6. SITE UTILITIES TAKEN FROM 1984 SANBORN MAP AND HISTORIC FIGURES PROVIDED BY NATIONAL GRID. ALL UTILITY LOCATIONS ARE APPROXIMATE AND SHOWN FOR REFERENCE ONLY.

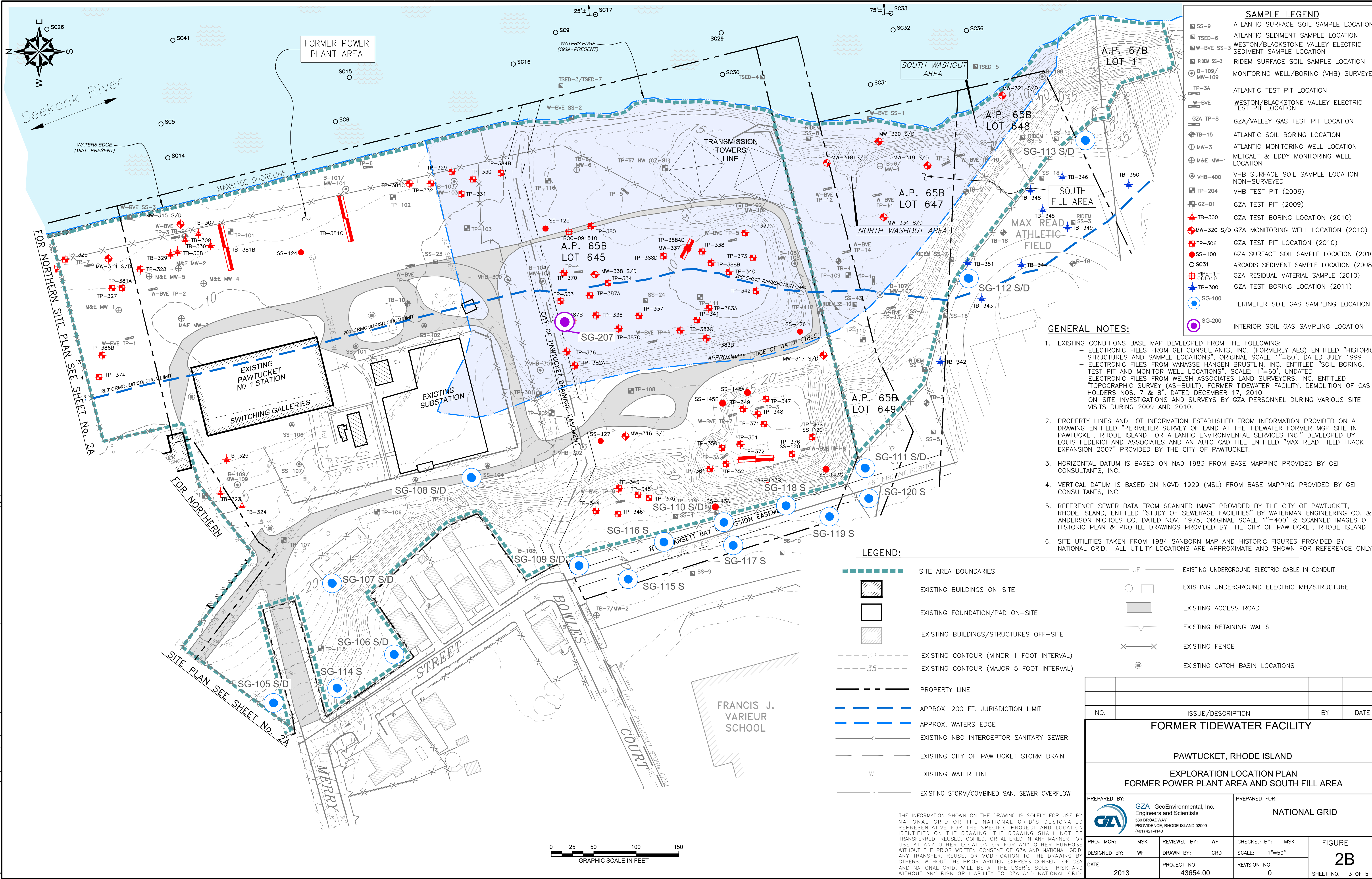


THE INFORMATION SHOWN ON THE DRAWING IS SOLELY FOR USE BY NATIONAL GRID OR THE NATIONAL GRID'S DESIGNATED REPRESENTATIVE FOR THE SPECIFIC PROJECT AND LOCATION IDENTIFIED ON THE DRAWING. THE DRAWING SHALL NOT BE TRANSFERRED, REUSED, COPIED, OR ALTERED IN ANY MANNER FOR USE AT ANY OTHER LOCATION OR FOR ANY OTHER PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF GZA AND NATIONAL GRID. ANY TRANSFER, REUSE, OR MODIFICATION TO THE DRAWING BY OTHERS, WITHOUT THE PRIOR WRITTEN EXPRESS CONSENT OF GZA AND NATIONAL GRID, WILL BE AT THE USER'S SOLE RISK AND WITHOUT ANY RISK OR LIABILITY TO GZA AND NATIONAL GRID.

NO.	ISSUE/DESCRIPTION	BY	DATE
<b>FORMER TIDEWATER FACILITY</b>			
PAWTUCKET, RHODE ISLAND			
EXPLORATION LOCATION PLAN NORTH FILL AREA AND FORMER GAS PLANT AREA			
PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists 530 BROADWAY PROVIDENCE, RHODE ISLAND 02909 (401) 421-1140		PREPARED FOR: <b>NATIONAL GRID</b>	
PROJ MGR: MSK	REVIEWED BY: WF	CHECKED BY: MSK	FIGURE
DESIGNED BY: WF	DRAWN BY: CRD	SCALE: 1"=50'	<b>2A</b>
DATE: 2013	PROJECT NO. 43654.20	REVISION NO. 0	SHEET NO. 2 OF 5

© 2010 - GZA GeoEnvironmental, Inc. GZA-ENV-03654-0001-GZA-DWSS-SUPPLEMENTAL-SITE-INVESTIGATION-REPORT-43654-00-F2A-01-13.dwg [2] September 19, 2013 9:18:13 AM [2] 2x4 from north.burton





**SAMPLE LEGEND**

SS-9	ATLANTIC SURFACE SOIL SAMPLE LOCATION
TSED-6	ATLANTIC SEDIMENT SAMPLE LOCATION
W-BVE SS-3	WESTON/BLACKSTONE VALLEY ELECTRIC SEDIMENT SAMPLE LOCATION
RIDEM SS-3	RIDEM SURFACE SOIL SAMPLE LOCATION
B-109/MW-109	MONITORING WELL/BORING (VHB) SURVEYED
TP-3A	ATLANTIC TEST PIT LOCATION
W-BVE	WESTON/BLACKSTONE VALLEY ELECTRIC TEST PIT LOCATION
GZA TP-8	GZA/VALLEY GAS TEST PIT LOCATION
TB-15	ATLANTIC SOIL BORING LOCATION
MW-3	ATLANTIC MONITORING WELL LOCATION
M&E MW-1	METCALF & EDDY MONITORING WELL LOCATION
VHB-400	VHB SURFACE SOIL SAMPLE LOCATION NON-SURVEYED
TP-204	VHB TEST PIT (2006)
GZ-01	GZA TEST PIT (2009)
TB-300	GZA TEST BORING LOCATION (2010)
MW-320 S/D	GZA MONITORING WELL LOCATION (2010)
TP-306	GZA TEST PIT LOCATION (2010)
SS-100	GZA SURFACE SOIL SAMPLE LOCATION (2010)
SC31	ARCADIS SEDIMENT SAMPLE LOCATION (2008)
PIPE-1-061610	GZA RESIDUAL MATERIAL SAMPLE (2010)
TB-300	GZA TEST BORING LOCATION (2011)
SG-100	PERIMETER SOIL GAS SAMPLING LOCATION
SG-200	INTERIOR SOIL GAS SAMPLING LOCATION

- GENERAL NOTES:**
- EXISTING CONDITIONS BASE MAP DEVELOPED FROM THE FOLLOWING:
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  - SITE UTILITIES TAKEN FROM 1984 SANBORN MAP AND HISTORIC FIGURES PROVIDED BY NATIONAL GRID. ALL UTILITY LOCATIONS ARE APPROXIMATE AND SHOWN FOR REFERENCE ONLY.

**LEGEND:**

[Dashed Green Line]	SITE AREA BOUNDARIES	[Line with 'UE']	EXISTING UNDERGROUND ELECTRIC CABLE IN CONDUIT
[Hatched Box]	EXISTING BUILDINGS ON-SITE	[Circle with 'MH']	EXISTING UNDERGROUND ELECTRIC MH/STRUCTURE
[White Box]	EXISTING FOUNDATION/PAD ON-SITE	[Grey Box]	EXISTING ACCESS ROAD
[Hatched Box]	EXISTING BUILDINGS/STRUCTURES OFF-SITE	[Line with 'R']	EXISTING RETAINING WALLS
[Dashed Line]	EXISTING CONTOUR (MINOR 1 FOOT INTERVAL)	[Line with 'X']	EXISTING FENCE
[Dashed Line]	EXISTING CONTOUR (MAJOR 5 FOOT INTERVAL)	[Circle with 'CB']	EXISTING CATCH BASIN LOCATIONS
[Solid Line]	PROPERTY LINE		
[Dashed Blue Line]	APPROX. 200 FT. JURISDICTION LIMIT		
[Dashed Blue Line]	APPROX. WATERS EDGE		
[Line with 'NBC']	EXISTING NBC INTERCEPTOR SANITARY SEWER		
[Line with 'C']	EXISTING CITY OF PAWTUCKET STORM DRAIN		
[Line with 'W']	EXISTING WATER LINE		
[Line with 'S']	EXISTING STORM/COMBINED SAN. SEWER OVERFLOW		

NO.	ISSUE/DESCRIPTION	BY	DATE
<b>FORMER TIDEWATER FACILITY</b>			
PAWTUCKET, RHODE ISLAND			
EXPLORATION LOCATION PLAN FORMER POWER PLANT AREA AND SOUTH FILL AREA			
PREPARED BY:	GZA GeoEnvironmental, Inc. Engineers and Scientists 530 BROADWAY PROVIDENCE, RHODE ISLAND 02909 (401) 421-4140		PREPARED FOR:
	NATIONAL GRID		
PROJ MGR:	MSK	REVIEWED BY:	WF
DESIGNED BY:	WF	DRAWN BY:	CRD
DATE:	2013	CHECKED BY:	MSK
		SCALE:	1"=50'
		REVISION NO.:	0
		FIGURE	2B
		SHEET NO.	3 OF 5

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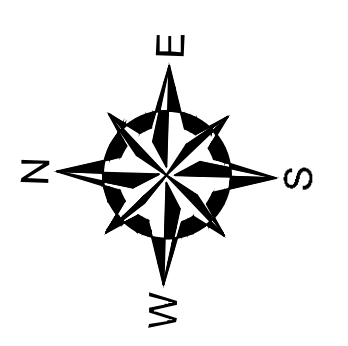


© 2010 - GZA GeoEnvironmental, Inc. GZA-11-ENV-1-3854-1.mxd GZA\_DWSA/SUPPLEMENTAL\_SITE\_INVESTIGATION\_REPORT/3854-00\_F2A-01-18-13.dwg [2B] September 18, 2013 2:43pm acsl.burton





©2011 - GZA GeoEnvironmental, Inc. GZA-A\ENR\43654.mxd\GZA\_DWG\43654.dwg\_AERIAL.DWG [P1-3] September 19, 2013 - 1:48pm esct:barbon



NOTIFICATION AREA  
 TIDEWATER SITE

- NOTE:**
1. AERIAL IMAGES OBTAINED FROM RIGIS ON AUGUST 20, 2012.
  2. THE OAK HILL NURSING HOME LOCATED AT 577 PLEASANT STREET WAS ADDED TO THE DOOR TO DOOR NOTIFICATION AREA IN MARCH 2013.



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NO.	ISSUE/DESCRIPTION	BY	DATE

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NATIONAL GRID  
TIDEWATER FACILITY  
PAWTUCKET, RHODE ISLAND

**PUBLIC INFORMATION PLAN**  
**AERIAL IMAGE**  
**DOOR TO DOOR NOTIFICATION**

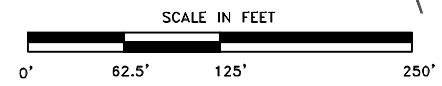
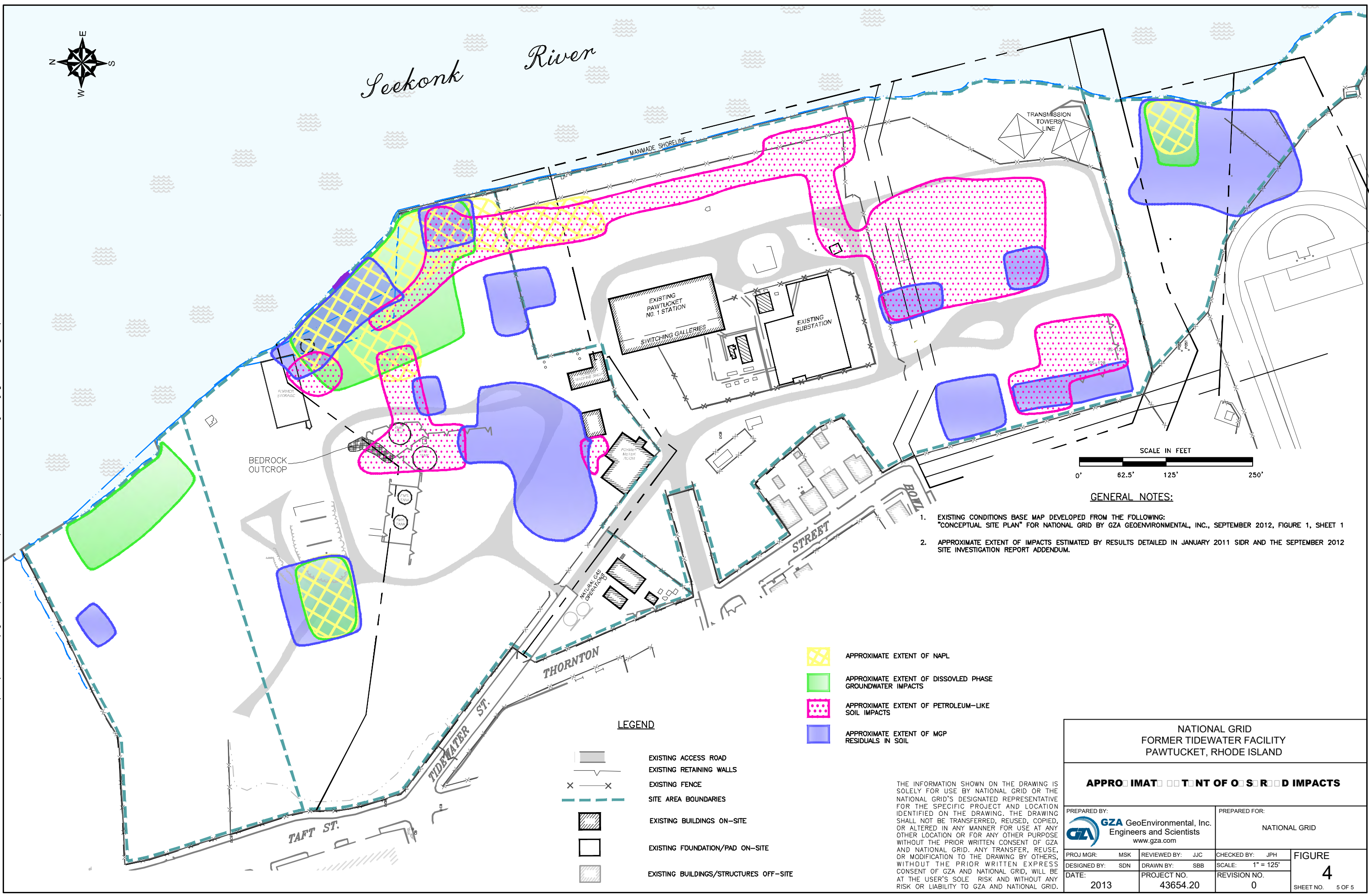
PREPARED BY: <b>GZA GeoEnvironmental, Inc.</b> Engineers and Scientists www.gza.com	PREPARED FOR: <b>nationalgrid</b>
PROJ MGR: MK DESIGNED BY: SDN DATE: 2013	REVIEWED BY: MSK DRAWN BY: CRB PROJECT NO.: 43654.20
CHECKED BY: JJC SCALE: 1" = 100' REVISION NO.: 0	FIGURE <b>3</b> SHEET NO. 4 OF 5



©2011 - GZA GeoEnvironmental, Inc. GZA-J:\ENV\43654-20\Figures\43654-20\_Conceptual Plan for Public Meetings.dwg [VERSION-2] September 19, 2013 - 1:54pm scott.burton



Seekonk River



**GENERAL NOTES:**

1. EXISTING CONDITIONS BASE MAP DEVELOPED FROM THE FOLLOWING: "CONCEPTUAL SITE PLAN" FOR NATIONAL GRID BY GZA GEOENVIRONMENTAL, INC., SEPTEMBER 2012, FIGURE 1, SHEET 1
2. APPROXIMATE EXTENT OF IMPACTS ESTIMATED BY RESULTS DETAILED IN JANUARY 2011 SIDR AND THE SEPTEMBER 2012 SITE INVESTIGATION REPORT ADDENDUM.

- APPROXIMATE EXTENT OF NAPL
- APPROXIMATE EXTENT OF DISSOLVED PHASE GROUNDWATER IMPACTS
- APPROXIMATE EXTENT OF PETROLEUM-LIKE SOIL IMPACTS
- APPROXIMATE EXTENT OF MGP RESIDUALS IN SOIL

**LEGEND**

- EXISTING ACCESS ROAD
- EXISTING RETAINING WALLS
- EXISTING FENCE
- SITE AREA BOUNDARIES
- EXISTING BUILDINGS ON-SITE
- EXISTING FOUNDATION/PAD ON-SITE
- EXISTING BUILDINGS/STRUCTURES OFF-SITE

THE INFORMATION SHOWN ON THE DRAWING IS SOLELY FOR USE BY NATIONAL GRID OR THE NATIONAL GRID'S DESIGNATED REPRESENTATIVE FOR THE SPECIFIC PROJECT AND LOCATION IDENTIFIED ON THE DRAWING. THE DRAWING SHALL NOT BE TRANSFERRED, REUSED, COPIED, OR ALTERED IN ANY MANNER FOR USE AT ANY OTHER LOCATION OR FOR ANY OTHER PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF GZA AND NATIONAL GRID. ANY TRANSFER, REUSE, OR MODIFICATION TO THE DRAWING BY OTHERS, WITHOUT THE PRIOR WRITTEN EXPRESS CONSENT OF GZA AND NATIONAL GRID, WILL BE AT THE USER'S SOLE RISK AND WITHOUT ANY RISK OR LIABILITY TO GZA AND NATIONAL GRID.

<p>NATIONAL GRID FORMER TIDEWATER FACILITY PAWTUCKET, RHODE ISLAND</p>			
<p><b>APPROXIMATE EXTENT OF ENVIRONMENTAL IMPACTS</b></p>			
<p>PREPARED BY:  <b>GZA GeoEnvironmental, Inc.</b> Engineers and Scientists www.gza.com</p>		<p>PREPARED FOR: NATIONAL GRID</p>	
<p>PROJ MGR: MSK</p>	<p>REVIEWED BY: JJC</p>	<p>CHECKED BY: JPH</p>	<p><b>FIGURE</b> <b>4</b></p>
<p>DESIGNED BY: SDN</p>	<p>DRAWN BY: SBB</p>	<p>SCALE: 1" = 125'</p>	
<p>DATE: 2013</p>	<p>PROJECT NO. 43654.20</p>	<p>REVISION NO. 0</p>	<p>SHEET NO. 5 OF 5</p>



## **EXHIBIT I**

**COPIES OF THE NOTIFICATION PACKAGES AND LANGUAGE INCLUDED ON THE  
SIGNS POSTED AT THE SITE ENTRANCE GATES**

# NOTICE

This property is being investigated and managed in accordance with the  
Rhode Island Department of Environmental Management (RIDEM)  
Regulations

If You Have Any Questions, Please Contact:

Joseph Martella

R.I. Department of Environment Management

(Office of Waste Management)

235 Promenade Street

Providence, RI 02908-5767

Arrangement to Review RIDEM Records

May be Made by Calling

401-222-2797 ext. 7109

# AVISO

Esta Caracteristica Se Esta Investigando Y Se Esta Manejando De Acuerdo Con El Departamento De Gestion Ambientalde Rhode Island (RIDEM)

Si Usted Tiene Culquier Pregunta

Satisfice El Contacto:

Joseph Martella

Departamento De Gestion

Ambientalde Rhode Island

(Oficina De La Gestion De Desechnos)

235 Promenade Street

Providence, RI 02908-5767

Las Medidas A Los Expedientes De La Revision

RIDEM Pueden Ser Tomadas Liamando

401-222-2797 ext. 7102



Mr. Raymond P. Adam Jr.  
20 Thornton Street  
Pawtucket, Rhode Island 02860

ARCADIS  
100 Cummings Center  
Suite 135-P  
Beverly  
Massachusetts 01915  
Tel 978.921.0442  
Fax 978.921.0939  
[www.arcadis-us.com](http://www.arcadis-us.com)

Subject:

Notice to Abutter  
Sediment Sampling  
Tidewater Manufactured Gas Plant (MGP)  
& Pawtucket No. 1 Power Station Site  
Pawtucket, Rhode Island  
RIDEM Case No. 95-022

INDUSTRIAL

Date:  
June 30, 2008

Dear Abutter:

Contact:  
Mark Mahoney

The purpose of this is to notify you that The Narragansett Electric Company d/b/a National Grid (National Grid) will be conducting sediment coring in the Seekonk River adjacent to the former Tidewater Manufactured Gas Plant (MGP) and the Pawtucket No. 1 Power Station Site located at the ends of Tidewater and Merry Streets in Pawtucket, Rhode Island. This notice is being provided to abutting property owners and tenants in accordance with requirements established in the Rhode Island Department of Environmental Management's (RIDEM) Rules and Regulation for the Investigation and Remediation of Hazardous Materials (Remediation Regulations). Should you be an owner of property that is leased, we request that you provide a copy of this letter to your tenants.

Phone:  
978.921.0042

Email:  
Mark.Mahoney@Arcadis-US.com

Our ref:  
B000036697

The purpose of the upcoming sampling is to investigate sediment conditions along the Seekonk River which may have been impacted by the historical operation of the adjacent Site as a manufactured gas plant. The proposed work is projected to take 2 to 3 weeks, with an estimated start date of July 7, 2008. These investigation activities will be conducted in accordance with RIDEM's Remediation Regulations and will be performed by ARCADIS on behalf of National Grid.

Imagine the result

If you would like more information, please contact Michele Leone of National Grid at 508-389-4296.

Sincerely,

A handwritten signature in blue ink, appearing to read "Mark T. Mahoney". The signature is fluid and cursive, with a long horizontal stroke at the bottom.

Mark T. Mahoney  
Vice President

Copies:

Michele Leone, National Grid  
Joseph Martella, RIDEM



This is an important notice. Please have it translated.

Este é um aviso importante. Queira mandá-lo traduzir.  
Este es un aviso importante. Sírvase mandarlo traducir.  
Avis important. Veuillez traduire immédiatement.

ĐÂY LÀ MỘT BẢN THÔNG CÁO QUAN TRỌNG  
XIN VUI LÒNG CHO DỊCH LẠI THÔNG CÁO ẤY  
Questa è un' informazione importante,  
si prega di tradurla.

Это очень важное сообщение.  
Пожалуйста, попросите чтобы  
вам его перевели.

April 16, 2009

File No. 05.0043654.00-C



«AddressBlock»

Re: Notice to Abutter  
Environmental Site Investigation  
Former Tidewater Facility  
Pawtucket, Rhode Island  
RIDEM Case No. 95-022

530 Broadway  
Providence  
Rhode Island  
02909  
401-421-4140  
Fax: 401-751-8613  
<http://www.gza.com>

Dear Abutter:

The purpose of this letter is to notify you that The Narragansett Electric Company d/b/a National Grid (National Grid) will be conducting environmental investigation activities at the former Tidewater Manufactured Gas Plant (MGP) and the former Pawtucket No. 1 Power Station Site located at the ends of Tidewater and Merry Streets in Pawtucket, Rhode Island. This notice is being provided to abutting property owners and tenants in accordance with requirements established in the Rhode Island Department of Environmental Management's (RIDEM) *Rules and Regulation for the Investigation and Remediation of Hazardous Materials* (Remediation Regulations). Should you be an owner of property that is leased, we request that you provide a copy of this letter to your tenants.

The purpose of the upcoming investigation is to further investigate impacts associated with the historical use of the Site. The investigation will include surface soil sampling, subsurface soil sampling (via soil borings and test pits) and groundwater sampling (via monitoring wells). The field activities are scheduled to commence on or about May 3, 2010, and will occur over an approximate 2 to 3 month period. These investigation activities will be conducted in accordance with RIDEM's Remediation Regulations and will be performed by GZA GeoEnvironmental, Inc. (GZA) on behalf of National Grid.

If you would like more information or have any questions, please contact Michele Leone of National Grid at 781-907-3651.

Very truly yours,

GZA GeoEnvironmental, Inc.

Margaret S. Kilpatrick  
Senior Project Manager

cc: Joe Martella, RIDEM  
Michele Leone, National Grid

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Пожалуйста, попросите чтобы  
вам его перевели.



16 de abril de 2010  
No. del archivo. 05.0043654.00-C

«AddressBlock»

Re: Aviso al los vecinos  
Investigación ambiental del sitio  
de la Antigua Planta de Gas Tidewater  
Pawtucket, Rhode Island  
No. del caso de RIDEM. 95-022

530 Broadway  
Providence  
Rhode Island  
02909  
401-421-4140  
Fax: 401-751-8613  
<http://www.gza.com>

Estimado vecino:

El propósito de esta carta es notificarle que la Compañía Eléctrica Narragansett, haciendo negocios bajo el nombre National Grid, realizará actividades de investigación ambiental en la planta anteriormente llamada Tidewater Manufactured Gas Plant (MGP) como así también en la planta anteriormente llamada Pawtucket. No. 1 Power Station Site, ambas situadas al final de las calles Tidewater y Merry en Pawtucket, Rhode Island. Conforme con los requisitos establecidos en las Reglas y Regulaciones para la Investigación y la Remediación de Materiales Peligrosos (Regulaciones sobre la Remediación) (Rhode Island Department of Environmental Management's (RIDEM) Rules and Regulation for the Investigation and Remediation of Hazardous Materials), este aviso se proporciona a los dueños y a los arrendatarios de propiedades linderas. Si usted es el dueño de una propiedad que está siendo arrendada le solicitamos que proporcione una copia de esta carta a sus arrendatarios.

El propósito de la investigación a realizarse próximamente es investigar más detalladamente los impactos asociados al uso histórico del lugar. La investigación incluirá el muestreo superficial del suelo, el muestreo subsuperficie del suelo (por medio de perforaciones del suelo y trincheras de prueba) y el muestreo del agua subterránea (vía la supervisión de pozos). Las actividades de campo están programadas para comenzar aproximadamente el 3 de mayo de 2010, y transcurrirán en un período aproximado de 2 a 3 meses. Estas actividades de investigación serán conducidas de acuerdo con las regulaciones de la remediación de RIDEM y realizadas por GZA GeoEnvironmental, Inc. (GZA) en nombre de National Grid.

Si usted necesita más información o tiene preguntas, por favor contacte a Michele Leone de la National Grid en 781-907-3651.

Sinceramente suya,

GZA GeoEnvironmental, Inc.

Margaret S. Kilpatrick  
Directora Principal de Proyecto

cc: Joe Martella, RIDEM  
Michele Leone, National Grid

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Avis important. Veuillez traduire immédiatement.

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XIN VUI LÒNG CHO DỊCH LẠI THÔNG CÁO ẤY  
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si prega di tradurla.

Это очень важное сообщение.  
Пожалуйста, попросите чтобы  
вам его перевели.

## **Tidewater Site Fact Sheet; March 2010**

### **Former Tidewater MGP and Electric Generation Site**

#### **Background**

From the 1880's through roughly the 1970's, a manufactured gas plant (MGP) and electric generation facility operated adjacent to the Seekonk River at the end of Merry and Tidewater streets in Pawtucket, Rhode Island. The Tidewater MGP used industrial processes to produce gas from coal and oil. The gas was used primarily for the same purposes that natural gas is used today. MGPs, which were common throughout the northeast before the region's natural gas pipelines were built, often yielded by-products of the gas production process such as tars, sludges and oils. The Tidewater electric generation facility used coal, oil, tar and other substances to produce electricity. Some of these substances have remained in the environment at facilities such as these after they were closed down.

The gas manufacturing and electric generating operations at the Tidewater facility were terminated in 1968 and 1975, respectively. Today, National Grid continues to operate a natural gas regulating and interchange station on the north portion of the property and an electrical substation and switch house on the south portion of the property.

#### **Site Evaluation**

National Grid has previously conducted environmental assessment activities at the former Tidewater Site and surrounding properties, including the Francis J. Varieur School and Max Read Field. The assessment included evaluating soil, groundwater and sediments for MGP and electric generation by-products. The evaluation indicated that residuals are present and are mainly detected on National Grid property and a portion of a fenced, wooded City-owned property located south of the National Grid property.

Data from the previous assessments indicate that the substances detected on the school and surrounding properties are below the Rhode Island Department of Environmental Management's (RIDEM's) residential standards and/or are representative of background concentrations found in the Pawtucket area. A limited area with an exceedance of RIDEM's standards was found below more than two feet of clean fill on the far eastern portion of Max Read Field. This area poses no risk to the general public. All other portions of the school and athletic fields were not impacted by the former MGP and electric generation operations.

#### **Next Steps**

National Grid is working with GZA GeoEnvironmental, Inc. (GZA), an environmental consulting firm from Providence, Rhode Island, and RIDEM on an environmental assessment and remediation program for the Tidewater Site. National Grid plans to perform additional environmental assessment activities this spring to gather sufficient data to develop remedial alternatives at the Site. The activities to be conducted this spring will include the collection of surface and subsurface soil samples via test pits and soil borings, the installation of groundwater monitoring wells, and the collection of groundwater samples. The test pits will be excavated using a rubber-tired backhoe and the soil borings will be advanced using a truck-mounted drill rig. All activities will be limited to the National Grid properties, will take place during normal working hours, and should have no impact beyond the Site property boundaries. Air monitoring of the work areas will be conducted during these activities.

In addition, National Grid will begin activities related to the demolition of the two former gas holder structures this spring. The initial activities will include removal and treatment of water from the holders. Following the dewatering activities, National Grid anticipates demolishing the holder structures in the summer and fall of 2010.

#### **Schedule**

These assessment activities are anticipated to begin in April and will likely take two to three months to complete. The holder demolition activities are anticipated to begin in the summer of 2010 and take approximately 4 months to complete.

#### **Questions and Comments**

If you would like more information on National Grid's activities at the site, please contact Michele Leone from National Grid at 781-907-3651.

## **Sitio del las antiguas planta de gas (MGP) y planta de generación eléctrica**

### **Antecedentes**

Desde 1880 hasta aproximadamente 1970 operaron en la vecindad del río Seekonk, al final de las calles Merry y Tidewater en Pawtucket, Rhode Island, una planta de gas y una planta de generación eléctrica. La planta de gas Tidewater, mediante procesos industriales, producía gas usando carbón y petróleo. Este gas se utilizaba para los mismos propósitos que el gas natural se usa en la actualidad. Las plantas de gas, o MGP, las que eran comunes en la región noroeste antes de la construcción de las redes de gas, frecuentemente producían subproductos tales como alquitrán, fangos y aceites. La planta de generación eléctrica Tidewater utilizaba carbón, petróleo, alquitrán y otras sustancias para producir electricidad. Algunas de estas sustancias han quedado en el medio ambiente, lo que es típico en este tipo de plantas y posteriormente a su desactivación.

La planta de generación de gas dejó de operar en 1968, mientras que la planta generadora de electricidad dejó de operar en 1975. En la actualidad, National Grid continúa operando una estación de intercambio y regulación de gas, en la parte norte de la propiedad, mientras que en la parte sur de la propiedad opera una sub-estación eléctrica y una estación interruptora.

### **Evaluación del sitio**

National Grid condujo previamente actividades de evaluación ambiental en el sitio anteriormente ocupado por Tidewater y en las propiedades linderas, incluyendo la Escuela Francis J. Varieur y el Campo de Deportes Max Read. Estas actividades incluyeron evaluaciones del suelo, del agua subterránea y de sedimentos, en busca de sub-productos generados por la MGP y la generación de electricidad. La evaluación indica la presencia de residuos, mayormente en el terreno perteneciente National Grid y en una porción de la propiedad arbolada y alambrada que pertenece a la Ciudad y que está situada al sur del terreno perteneciente a National Grid.

Información recolectada en la evaluación ambiental previamente realizada indica que las sustancias detectadas en la Escuela y las propiedades linderas están por debajo de los valores estándares para zonas residenciales del Departamento de Manejo Ambiental de Rhode Island (Rhode Island Department of Environmental Management, RIDEM) y/o son representativas de las concentraciones normales características de la zona de Pawtucket. Un área limitada, con valores que exceden los valores estándares de RIDEM, se encontró a una profundidad de más de dos pies, bajo una capa de suelo de relleno no contaminado, en la porción más alejada de la zona este del Campo de Deportes Max Read. Esta zona no posee riesgo para el público general. Las zonas restantes de la Escuela y del Campos de Deporte no han sido impactadas por las antiguas planta de gas MGP y planta de generación eléctrica.

### **Próximos Pasos**

National Grid está trabajando conjuntamente con GZA GeoEnvironmental, Inc. (GZA), una consultora ambiental localizada en Providence, Rhode Island y RIDEM, en un asesoramiento ambiental y un programa de remediación para el sitio de Tidewater. Esta primavera, National Grid planea realizar estudios ambientales adicionales con el objetivo de obtener datos suficientes para desarrollar alternativas de remediación en el lugar. Las actividades a ser realizadas esta primavera incluirán muestreos superficiales y sub-superficiales del suelo usando perforaciones del suelo y trincheras de prueba, la instalación de pozos de monitoreo de agua subterránea, y la colección de muestras de agua subterránea. Las trincheras de prueba serán excavadas usando una retroexcavadora, mientras que las perforaciones del suelo serán realizadas usando una excavadora montada en un camión. Todas estas actividades serán realizadas dentro de la propiedad de National Grid, tomarán lugar en horarios de trabajo normales, y no deberían tener impacto fuera de los límites del lugar. Durante estas actividades se realizaran monitoreos de la calidad del aire.

Adicionalmente, esta primavera, National Grid comenzará a demoler dos antiguos contenedores de gas. Las actividades iniciales incluirán el tratamiento y remoción del agua de los contenedores. Seguidamente de las actividades relacionadas con la remoción del agua, National Grid anticipa que la demolición de las estructuras de los contenedores de gas será realizada en el verano del 2010.

### **Programa de Actividades**

Se anticipa que estas actividades de evaluación comenzarán en abril y probablemente se completarán en el transcurso de dos hasta tres meses. Se anticipa que las actividades relacionadas con la demolición de los contenedores de gas comenzaran en el verano del 2010 y se completaran en aproximadamente 4 meses.

### **Preguntas y Comentarios**

Si usted necesita más información con respecto a las actividades de National Grid en el Sitio, por favor contacte a Michele Leone de la National Grid en 781-907-3651.

# B R O W N F I E L D S :



Turning  
**bad** spaces  
into  
**good** ones

How  
**communities**  
can get  
involved



---

# What is inside this booklet:



	<b>Page</b>
<b>What is a Brownfield?</b>	1
Why can Brownfields be dangerous places?	
<b>Chemicals</b>	2
Where did the chemicals come from?	
When is a chemical dangerous?	
Testing chemical levels—how much do they find?	
<b>Standards for chemicals: how much is too much?</b>	3
What happens if a test is too high?	
How to understand standards	
<b>What is risk?</b>	4
Questions to ask about risk	
<b>You can get involved</b>	5
Residents know some important history	
Get involved when the city or developer is planning the cleanup	
Get involved with the cleanup plans	
Questions to ask about the cleanup	
<b>What to expect during cleanup</b>	6
Trucks	
What streets will the trucks use?	
How much traffic and how messy?	
How long will the cleanup take?	
Children and Brownfields	
<b>Take action: write letters</b>	8
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# What is a Brownfield?

This booklet is about unused or abandoned (*a BAN dund*) buildings and places called **Brownfields**. They are dirty, sometimes dangerous places in neighborhoods. Usually Brownfields are places where old factories or other businesses were. Many times they are very messy and trashy places.

Brownfields can have all kinds of dangers – mess, falling down buildings and even dangerous, **toxic** (*Tok sick*) chemicals. Toxic means these chemicals are dangerous to human health. When a Brownfield is cleaned up, neighborhoods are better places in so many ways.

All around the country Brownfields are being cleaned

up and **redeveloped** (*re da VEL upt*) – turned into better, cleaner places – new businesses, parks and other uses. This booklet will explain what you need to know to get involved and ask good questions about Brownfield **reuse and redevelopment**.

The more you know about a Brownfield site then the more you can take part in planning. For example, let's say a Brownfield site is going to be redeveloped into a school with a community playground. Residents can get involved to help decide:



- **Is this plan for redevelopment and reuse good for the neighborhood?**
- **Is the new place going to be safe for neighborhood people?**



## Why can Brownfields be dangerous places?

### #1 Dangers you can see

There are two kinds of dangers or **risks** at Brownfield sites – things you can see, and things you can't see. Things you can see, like broken windows and glass, rotted wood floors, rusty nails and pipes, and old barrels, are a problem. All of these things are dangerous. Children playing

at an old Brownfield site have the most risk to get hurt. They can find old underground storage tanks, and they can fall in.

### #2 Dangers you can't see

Chemicals can be at a Brownfield and you can't see them. **Some chemicals can be dangerous to human health**. They can be toxic. Toxic chemicals can make people sick if they eat them, breathe them or get them on their skin.

# Chemicals

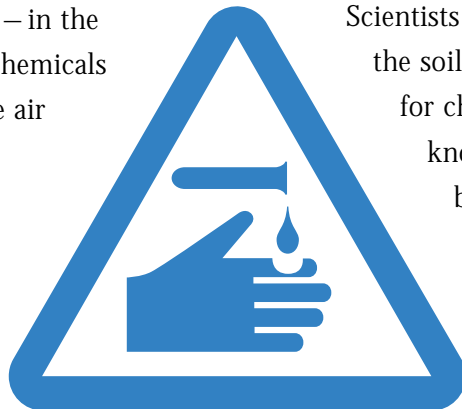
## Where did the chemicals come from?

Sometimes when factories or businesses left a place, they left chemicals in pipes, barrels and buried oil tanks. These can leak. When they leak (or *leach*) into the ground, the chemicals can get into the soil and into well water and river water. Scientists test to see if the soil and water are safe.

## When is a chemical dangerous?

Think of this: **chemicals are everywhere and in everything we eat and drink.** Our own bodies are made up of chemicals. And most chemicals are natural and safe. **But some chemicals, in the right amounts, can be dangerous.**

Old businesses can leave behind dangerous chemicals. For example, an old dry cleaning business can leave dangerous **VOCs**—volatile (*vo la TILE*) organic compounds—in the ground. VOCs are chemicals that can get into the air that we breathe.



## Testing chemical levels—how much do they find?

If chemicals are in everything, how do the experts know what to test for?

Scientists often will test the soil and the water for chemicals. If they know what type of business was

there before, this will help scientists decide what to test for. Some of these tests are **very expensive**. So, they do the basic tests first. They may do more tests after they look at the first results.

To do the tests scientists dig holes, or **test wells**, into the ground and take samples of the water in the ground.

Understanding chemicals		
Chemical Tested	Everyday/Household Use	Business/Industry Use
Pesticides . . . . .	Roach powder . . . . . Rat poison	Farming or chemical company
VOC's . . . . .	Gasoline . . . . . Dry cleaners Moth balls	Oil refinery
Semi-volatiles . . . . .	Soot . . . . .	Incinerators
Metals . . . . .	Batteries . . . . . Thermometers	Jewelry or plating company

▲ This chart shows some of the kinds of chemicals that may be at a Brownfield site. In the *left* column is the name of the chemical. In the *middle* column you see how we use that chemical everyday, even at home. The *right* column shows what kinds of big businesses use these chemicals. This chart shows that there are many ways to use chemicals.

# Standards for chemicals: how much is too much?

When scientists test a Brownfield site (the ground or the water) they want to find out **how much** of a chemical there is. The government sets safe amounts or levels for chemicals. The safe level is called a **standard**. If they find a level that is **higher than** the safe standard, then they make plans to do something to keep people safe.

## What happens if a test is too high?

If the level is too high, scientists take action in different ways. Depending on the risk, they will do some or all of the following:

- Remove the contamination
- Cover it up
- Fence in the area
- Plant trees and grass
- Teach people about how to use an area
- Do more tests

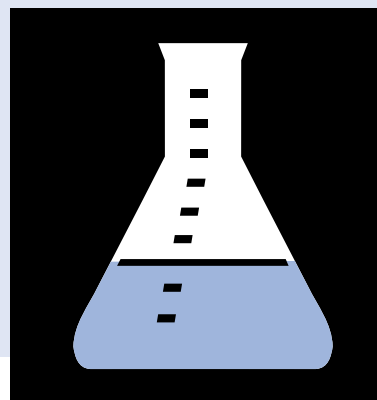
Each Brownfield site is different, but the list above will give you a good idea of the kinds of actions that a contaminated site may need.

## How to understand standards



### Here is an example of a “standard.”

Let's say soil at a Brownfield site was tested for **lead**. The test level was **3,500 ppm** (parts per million). The EPA (Federal Environmental Protection Agency) action level is **400 ppm**. So, the level is **higher than the standard** (3,500 ppm is higher than 400 ppm). This means something needs to be done to be sure people can be safe at or near this Brownfield site.



# What is risk?

There is no such thing as living in a world with no risks. Even crossing the street can be risky. The important question is “**What is an acceptable risk?**” “**What is a risk I am willing to take?**”

Sometimes it’s hard to know what is a risk? Who is at risk? For example if children are playing in a crumbling building this can be a **high risk**. Children can fall, get cut or get seriously hurt. Another example is if the air is filled with dust. This may be risky for people with asthma or older people.



## Questions to ask about risk

- Is there a risk?
- Who is most at risk?
- What is the acceptable standard for this chemical?
- Is this standard for a normal size man or woman?
- Is this standard for a child?
- When can this chemical make me unhealthy?
- What could happen to me or my children?
- What about pregnant women?
- How would I know if I am sick from this chemical?
- If you say this level is safe here, does that mean this level is safe for every other place in the country?
- How can I protect myself – minimize the risk (keep the risk low)?
- How can I learn more about this risk? Who can I talk to?
- Is there something I can read?



**Remember! There is no such thing as living in a world with no risks. The important thing is to understand what the risks are.**

*Go to the back page of this booklet for a list of agencies and phone numbers you can use.*

## An example of standards

The safe standard dose of aspirin for the average adult is 2 aspirin every 4 hours. Some adults can take even more than 2 aspirin safely. But if you are a small child, 2 aspirin is way too much. The standard for adults (2 aspirin) is not **the standard** for children.



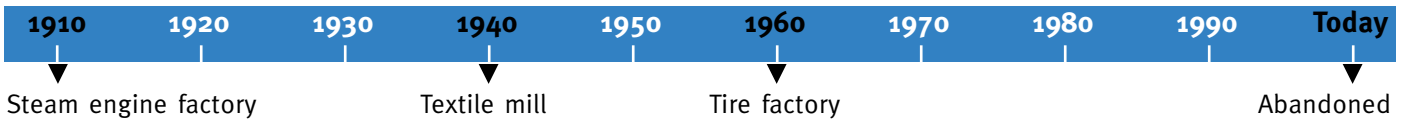
# You can get involved

## Residents know some important history

The past history of a site is important. Talk to the people

who have lived in the neighborhood for a long time. Maybe you are one of those people! People who worked in the facto-

ries and businesses may know what kinds of chemicals were used. This information will help the planners and scientists.



**B**rownfields get **redeveloped** into all kinds of different spaces – schools, businesses, playgrounds. Community people can help decide if the plan to build is a good one. As a resident, you can help decide:

- **Is this plan for redevelopment and reuse good for the neighborhood?**
- **Is the new place going to be safe for neighborhood people?**

There are 2 important times you can get involved with a Brownfield site:

### 1. Get involved when the city or developer is *planning* to cleanup, reuse or build something new at a Brownfield.

For example, a developer is planning to build a new business on an old brownfield site. It will have lots of hills and driveways to make it pretty. The developers think only adults will go to the business site. They want to follow cleanup standards for adults.

**But** neighborhood people know that the hills may attract lots of neighborhood children. This can be dangerous for kids. **The cleanup standards for adults may not be safe for children.** So you can give the developers good information. For example, you could ask them to make the land less inviting for kids.

Call or write your elected officials (*see sample letter and phone calls on pages 8 and 9*). Ask:

- **What is happening with this site?**
- **Are there plans to develop it?**
- **What are the plans?**
- **Will you hold any public meetings to talk about plans?**



## 2. Get involved with the cleanup plans.

The scientists and the contractors may schedule local meetings so that you can come and see and hear about the plans for cleanup. This is one of the times that you and your neighbors can be the most help and have the biggest impact. You can help decide if the plans for cleanup are good.



## Questions to ask about Brownfields cleanup in your neighborhood

**We have already talked about contamination and risk questions on page 4.**

- When will the job start? How will you tell the neighborhood?
- Will there be a lot of noise during the cleanup?
- Will any of the waste be treated on the site? Will any chemicals be released during cleanup?
- Is it safe to truck it through the neighborhood?
- Where is the waste being taken?
- What if some of it spills out?
- Will the site be dusty during cleanup?
- What is being done about dust control? Is the dust dangerous?
- Will the chemicals smell? Will the fumes be toxic?
- Who do I complain to if I see something I think is wrong?
- What kind of signs will be posted while the work is going on?
- Will the signs be in different languages? Will they have pictures?
- Will there be guards at the street crossings to help with the truck traffic?
- Will there be a night watchman at the place where the work is being done?
- Will the site be fenced off?

# What to expect during cleanup

Abandoned cars, used tires and other trash will need to be hauled away. Buildings and structures need to be taken down. Also, old fencing, asphalt parking lots and unused railroad lines will be removed. Metals, glass, boilers, old machinery and any of the

wooden pieces of the building will also be put into dumpsters and taken away to a landfill.

### Trucks

Machines will be digging holes and loading trucks. Large trucks will be traveling back and forth



over the local roads. So you want to know what is the time of day and what days of the week will they be working. Usually the contractor wants to start around **6:30 or 7:00 am** and work until **3:30 or 4:00 pm**. Unless there is a real rush to get the work done, they will work Monday-Friday. So you might ask the question, **“Do you plan to work any overtime on this project?”**

### **What streets will the trucks use?**

Find out what roads the trucks will be using. The people who plan these projects aren't always aware of the kinds of traffic that happen in your neighborhood. You know the local roads – where people walk and drive, and where children play. Maybe there are elderly or sick people on some streets. Usually the truck drivers have more than one choice about what roads they use. You can give them good information about the best routes.



### **How much truck traffic and how messy?**

The contractor should have an idea about how much dirt he needs to take out and bring in. So he can figure out roughly how many loads there will be – 1 truck per hour, 10 trucks per hour or something in between.

Trucks can get dirty. Ask, **“Are you going to have a wash down place for the trucks leaving the job?”** A wash down is a platform that the contractor builds and the trucks ride up on it. While the truck is on the platform, workers with hoses spray high-pressure water to clean the trucks before they go out onto the neighborhood roads. This keeps the mud on the job and keeps your neighborhood clean.

### **How long will the cleanup take?**

Most of the time the developers have a good idea how long the project will take before they

begin. But sometimes they are surprised by the things they find. Although the developers may not be able to give you an exact answer about when the job will be done, they should be able to give a best guess for an ending date.

### **Children and Brownfields**

Talk to your children about Brownfields and cleanup. Explain the dangers of playing at or near the site. **Remember truck drivers cannot see every spot around their trucks.** Tell your children:

- **Be extra careful when you cross streets.**
- **Don't play near the Brownfield.**



**Older people** should also be more careful. If you know of an older person in the neighborhood let them know that the noise and dust will only be temporary.

# Take action: write letters

This is a sample letter you can use to write to officials about a Brownfield site.

Turn to the back page to find the names and addresses of agencies and people.



To \_\_\_\_\_ (write name here)  
\_\_\_\_\_ (include address)

Date \_\_\_\_\_

Dear Mr./Ms. (write name here),

I am a resident of \_\_\_\_\_ Street and I am writing to express my concern about the traffic around the Valley Mills cleanup. The trucks begin at about 6:30 in the morning during the week. This is a **problem** for a number of reasons. We have older people living on this street, and children are also walking to school between 7:30 and 8:30 am.

I would like to **request** that two things happen. I believe the trucks should not start until 9:00 and stop at 4:30. Also, I believe Pine Street would be a better traffic pattern for the trucks entering and leaving the site.

I am eager to see the site cleaned up. But I am equally concerned that this cleanup is done in the best way for our neighborhood. Please call me at \_\_\_\_\_ (your phone number) or write to me at \_\_\_\_\_ (your address).

Thank you for your time.

Sincerely,

\_\_\_\_\_ (your signature)

\_\_\_\_\_ (Print your name clearly here)

◀ **1st paragraph:**  
What is the problem?

◀ **2nd paragraph:**  
What are you asking for?

◀ **3rd paragraph:**  
How can someone get in touch with you?

# Take action: make phone calls

## Phone call #1: Talking about truck traffic during the cleanup.

Turn to the back page to find the names and phone numbers of agencies and people.

**Resident:** Hello. I would like to speak to someone about the clean up of Valley Mills. I live in the neighborhood.

**Operator:** Just a minute please. I'll transfer you.

**Planner:** Hello. Can I help you.

**Resident:** Yes. I am calling about the truck traffic at the cleanup site of Valley Mills. My name is \_\_\_\_\_. I live in the neighborhood ◀ Say who you are. and I would like to talk about the truck traffic.

**Planner:** What seems to be the problem?

**Resident:** I think the trucks are starting too early in the morning and causing ◀ What is the problem? problems for older people. The trucks begin coming out of the site at 6:30 in the morning. This is much too early for this neighborhood. We have many older people living here and this traffic is a problem. I want the planners to ◀ What are you asking for? know that I am calling to say that the trucks should not start until 8:00 in the morning.

**Planner:** I will give the traffic manager your message.

**Resident:** Thank you. And who is the traffic manager? Could you please spell her name for me. Before we hang up I would like ◀ Get the person's name (write it down) your name. Please spell it for me. Also I would like to give you my name and phone number. I would like someone to call me back. (Give your name, spell it and phone number.)

Thank you very much and I will wait to hear from \_\_\_\_\_ (the traffic manager's name).



## Phone call #2: Finding out if there are any plans for a Brownfield site near you.

**Resident:** Hello. I would like to speak to someone about the empty building and vacant lot on Mills Street I live in the neighborhood.

**Operator:** Just a minute please. I'll transfer you.

**Planner:** Hello. Can I help you?

**Resident:** Yes. I am calling about the empty building and vacant lot on Mills Street. My name is \_\_\_\_\_. I live in the neighbor- ◀ Say who you are. hood and I would like to know if the city has any plans to redevelop or reuse this land. Who would know about this land? ◀ What are you asking for?

**Planner:** You will need to speak with Ms. James. Her phone number is \_\_\_\_\_.

**Resident:** Thank you. And can I have your name, please? ◀ Get the person's name (write it down)



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# Where to call or write

Here are some important phone numbers you can call to get more information about Brownfields in your neighborhood.

## **City of Providence, Department of Planning & Development**

400 Westminster St., Providence, RI 02903  
(401) 351-4300

The Providence Department of Planning and Development reviews proposals and prepares re-development plans. Residents can contact the Department to review and get involved with redevelopment plans for their neighborhood. The Department also gives low interest loans for economic development projects.

## **Rhode Island Department of Environmental Management (RI DEM) Office of Waste Management**

235 Promenade St., Providence, RI 02908  
(401) 222-2797

The Rhode Island Department of Environmental Management (RI DEM) is a state agency responsible for regulating Brownfields reuse and redevelopment. RI DEM directs soil, air and water testing at Brownfields sites, and the agency reviews any plan for the future use. It also makes sure that contractors doing work at Brownfields follow all laws. RI DEM helps make legal agreements with developers of Brownfields sites.

## **Rhode Island Department of Health Office of Environmental Health Risk Assessment**

Three Capitol Hill, Providence, RI 02908  
(401) 222-4948

The Rhode Island Department of Health, Office of Environmental Health Risk Assessment provides information on the health effects of chemicals in people's homes, workplaces, or neighborhoods.

## **Environmental Protection Agency (EPA)**

US EPA-NE, One Congress St., Boston, MA 02114-2023  
1-800-EPA-REG1 (1-800-372-7341)

The EPA Brownfields Team provides a variety of technical and financial support involving the assessment and cleanup of Brownfields properties. Activities include community outreach; funding for assessments, job training and revolving loan funds; and expertise in hazardous materials.

## **Agency for Toxic Substances and Disease Registry (ATSDR)**

Office of Urban Affairs, 1600 Clifton Rd, Atlanta, GA 30333  
1-888-42-ATSDR (1-888-422-8737)

*in Boston:* ATSDR Region 1, US EPA-NE, One Congress St., Suite 1100 (HBT), Boston, MA 02114-2023  
(617) 918-1495

ATSDR is the main federal public health agency that deals with hazardous waste issues. ATSDR gives states and others advice about what could be the health problems from chemicals and toxic sites.

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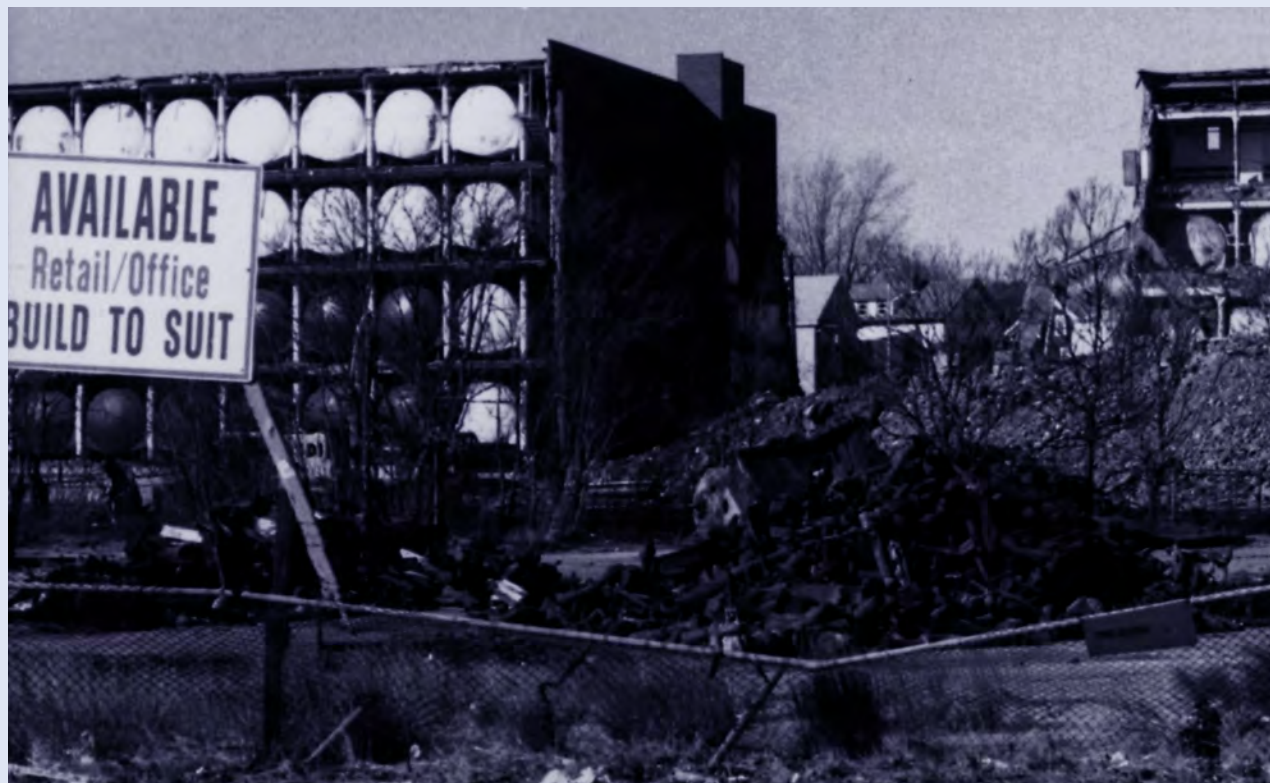
**This project would like to thank** The Providence Plan and the following community residents who took such an active role in this booklet's development. They are: Angela Burgio, Joseph H. Burgio, Carlos Corchado, Marisa Corchado, Mayra Corchado, William O'Brien, David G. Sifuentes, Rosa Solis, Victor Solis, and J. Taylor.

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# LOS TERRENOS BALDIOS:



Convertiendo  
lugares malos  
en lugares  
buenos

Cómo pueden  
participar  
las  
comunidades

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# Qué es un terreno baldío?

Esta guía es sobre edificios sin uso o abandonados y sitios en la ciudad llamados **terrenos baldíos**. Son lugares sucios y a veces peligrosos en su vecindario. Usualmente los terrenos baldíos son los lugares en donde funcionaban fábricas u otras industrias. Muchas veces son lugares muy sucios y llenos de basura.

Los terrenos baldíos pueden estar llenos de cosas peligrosas — suciedad, edificios en ruinas y aún sustancias químicas peligrosas y **tóxicas** (*tóc-si-cas*). Tóxico significa que esas sustancias químicas son peligrosas para la salud de los seres humanos. Cuando se limpia un terreno baldío, el vecindario se convierte en un lugar mejor.

Por todo el país se están

limpiando los terrenos baldíos y se los **reurbaniza** (convierte) en lugares mejores y más limpios — por ejemplo nuevas industrias, parques o se les da otros usos. Esta guía le explicará qué es lo que usted necesita hacer para participar (ayudar) y hacer buenas preguntas sobre el **nuevo uso** y la **nueva urbanización** de los terrenos baldíos.

Mientras usted sepa más sobre terrenos baldíos usted podrá participar en la planificación y mejora de esos lugares. Por ejemplo, supongamos que el terreno baldío será urbanizado nuevamente y se edificará una escuela con un lugar de juegos para toda la comunidad. Los vecinos pueden



participar y ayudar a decidir:

- **¿Es el plan de urbanizar nuevamente y usar los terrenos de nuevo es bueno para el vecindario?**
- **¿Será el nuevo lugar seguro para la gente del vecindario?**

## ¿Por qué los terrenos baldíos pueden ser lugares peligrosos?



### #1 Peligros que usted puede ver

Hay dos tipos de **riesgos** en los lugares baldíos — cosas que usted puede ver y cosas que usted no puede ver. Las cosas que usted puede ver, como las ventanas y vidrios rotos, los pisos de madera podrida, los clavos y las cañerías oxidadas y los antiguos barriles son un problema. Todas esas cosas son peligrosas. Los niños que juegan en un terreno baldío viejo corren un gran riesgo. Pueden encontrar, bajo tierra, tanques de

almacenamiento y caer dentro de ellos.

### #2 Peligros que usted no puede ver

Un terreno baldío puede tener sustancias químicas que usted no ve. **Algunas sustancias químicas pueden ser peligrosas para la salud de los seres humanos.** Las sustancias químicas pueden ser tóxicas y pueden producir enfermedades si las personas ingieren, respiran o tienen contacto con ellas.

# Las sustancias químicas

## ¿De dónde vienen las sustancias químicas?

Algunas veces las antiguas fábricas o negocios dejaron en el lugar que abandonaron químicos en las cañerías, barriles y tanques de petróleo enterrados, estos pueden tener un escape. Cuando tienen un escape (o *gotean*) en el suelo, los químicos pueden entrar en el terreno y dentro del agua de pozos y de ríos. Los científicos (investigadores) analizan para ver si el agua y el suelo son seguros.

## ¿Cuándo es una sustancia química peligrosa?

Piense lo siguiente: **las sustancias químicas están en todas partes y en todo lo que nosotros comemos y bebemos.** Nuestros cuerpos tienen sustancias químicas. La mayoría de estos químicos son naturales y seguros. **Pero algunos químicos, en cantidades diferentes, pueden ser peligrosos.**

Los negocios antiguos pueden dejar residuos químicos peligrosos. Por ejemplo, un antiguo negocio de limpieza en seco puede dejar peligrosos residuos de **COV** (compuestos orgánicos volátiles) en el suelo.



Comprendiendo las sustancias químicas		
Químico analizado	Uso común Uso en la casa	Uso en la industria o negocios de:
Pesticidas . . . . .	. . . Polvo para cucarachas Veneno para ratas	. . . Agricultura o Cías químicas
COV . . . . .	. . . Gasolina . . . . . Limpiadores en seco Bolitas de naftalina	. . . Refinería de petróleo
Semi-volátiles . . . . .	. . . Hollín . . . . .	. . . Incineradores
Metales . . . . .	. . . Baterías . . . . . Termómetros	. . . Cías de enchapado

▲ Este gráfico demuestra algunas de las clases de químicos que se pueden encontrar en un terreno baldío. En la columna de la *izquierda* se encuentra el nombre de la sustancia química, en la columna del *medio* usted podrá ver el uso diario del químico, aún en el hogar. La columna de la *derecha* muestra qué tipo de grandes industrias usan estos químicos. Este gráfico indica que hay varias formas de usar las sustancias químicas.

Los COV son sustancias químicas que pueden estar en el aire que respiramos.

## Cuando analizan los niveles de los químicos ¿qué cantidad encuentran?

Si los químicos están en todos lados ¿cómo saben los expertos lo que tienen que analizar?

Los científicos, usualmente, analizan el terreno y el agua

para descubrir químicos. Si ellos saben qué tipo de industria estaba ahí antes, eso ayudará a los científicos a decidir qué es lo que tienen que analizar. Algunos de esos análisis son **muy caros**. Por lo tanto ellos primero hacen el análisis básico. Se harán más análisis después de obtener los primeros resultados.

Para hacer los análisis, los científicos cavan hoyos, o **pozos**, dentro de la tierra y toman muestras del agua dentro de la tierra.



# El estándar para sustancias químicas: ¿cuánto es demasiado?

Cuando los científicos analizan el terreno baldío (la tierra o el agua) quieren saber **los niveles** de químicos que hay. El gobierno establece cuales son las cantidades o niveles seguros para los químicos. El nivel seguro es llamado **estándar**. Si ellos encuentran un nivel que es mayor al estándar, planifican hacer algo para mantener segura a la gente.

## ¿Qué pasa si el análisis es muy alto?

Si el nivel es muy alto los científicos toman acciones en diferentes formas. Dependiendo del riesgo pueden hacer lo siguiente:

- Remover la contaminación
- Cubrirla
- Cercar el área
- Plantar árboles y césped
- Enseñarle a la gente cómo usar el área
- Hacer más análisis

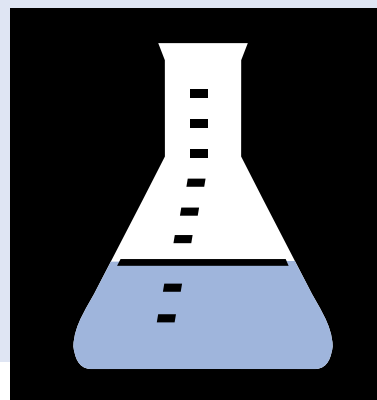
Cada terreno baldío es diferente, pero la lista mencionada le da a usted una buena idea del tipo de acciones a seguir en un lugar contaminado.



## Cómo entender el estándar

### Veamos un ejemplo de “estándar”

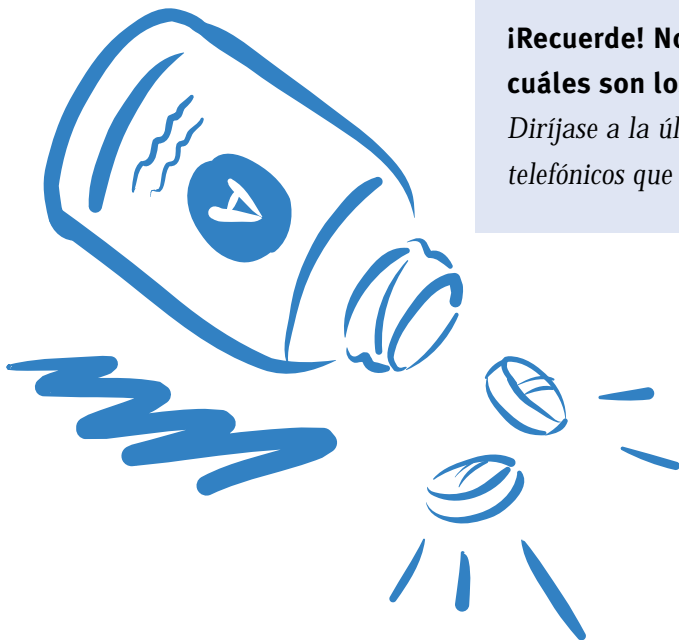
Digamos que la tierra de un terreno baldío fue analizada para saber si contenía plomo. El nivel de análisis fue de **3.500 ppm** (partes por millón). El nivel de acción de la Agencia Federal de Protección al Medio Ambiente (EPA, sus siglas en inglés) es de **400 ppm**. Por lo tanto el nivel es **mayor que el estándar** seguro (3.500 ppm es mayor que 400 ppm). Esto significa que se necesita hacer algo para asegurarse que la gente esté segura en el terreno baldío o cerca de él.



# ¿Qué es riesgo?

No hay ninguna cosa en el mundo que no tenga riesgos. Aún el cruzar la calle puede ser riesgoso. La pregunta importante es “¿Qué es un riesgo aceptable?”. “¿Qué es un riesgo que estoy dispuesto a aceptar?”.

A veces es difícil saber qué es un riesgo y quién está en riesgo. Por ejemplo si los niños están jugando en un edificio en ruinas eso puede ser un **gran riesgo**. Los niños se pueden caer, cortarse o lesionarse seriamente. Otro ejemplo es si el aire está lleno de polvo. Eso puede ser riesgoso para la gente con asma o para la gente mayor.



## Preguntas para hacer acerca de un riesgo

- ¿Hay riesgo?
- ¿Quién está más en riesgo?
- ¿Cuál es el nivel estándar aceptable para este químico?
- ¿Cuál es el riesgo estándar para la talla de un hombre o mujer normal?
- ¿Cuál es el riesgo estándar para un niño?
- ¿Cuándo es una sustancia química insalubre?
- ¿Qué me puede suceder a mí o a mis hijos?
- ¿Qué pasa con mujeres embarazadas?
- ¿Cómo sabré si me he enfermado debido a este químico?
- Si usted dice que aquí el nivel es seguro aquí, ¿esto quiere decir que el nivel es seguro en otros lugares del país?
- ¿Cómo me puedo proteger o minimizar el riesgo (mantener bajo el riesgo)?
- ¿Cómo puedo aprender más sobre este riesgo? ¿Con quién puedo hablar?
- ¿Hay algo que yo pueda leer?



**¡Recuerde! No existe un mundo sin riesgos. Lo importante es saber cuáles son los riesgos.**

*Diríjase a la última página para ver una lista de agencias y números telefónicos que puede utilizar.*

### Un ejemplo de estándares

La dosis estándar segura de la aspirina para el adulto promedio es de 2 aspirinas cada 4 horas. De hecho, ciertos adultos pueden tomar más de dos aspirinas y estar seguros. Pero si es un niño pequeño, 2 aspirinas es mucho. La dosis estándar segura (de 2 aspirinas) no es la dosis **estándar** para los niños.

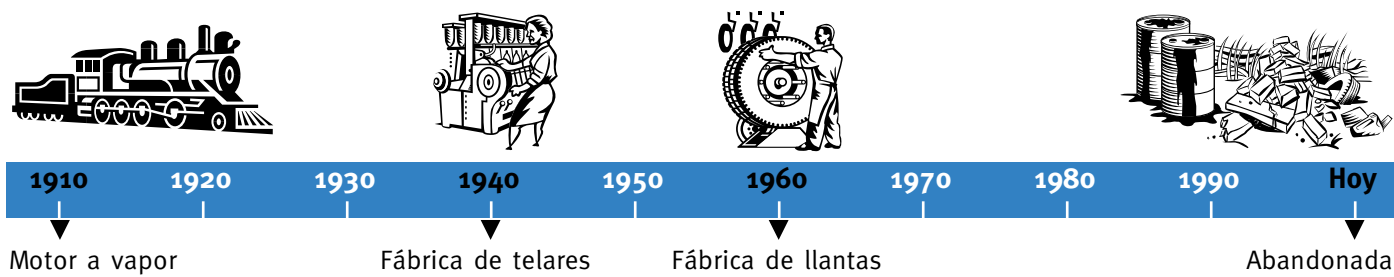
# Usted puede participar

## Los residentes conocen una historia importante

El pasado histórico de un lugar es importante. Hable con la gente

que ha vivido por un largo tiempo en el vecindario. Quizás usted es una de esas personas! La gente que trabajó en esas fábricas o

industrias pueden saber qué tipos de químicos se usaron. Esta información ayudará a los planificadores y a los científicos.



Los terrenos baldíos se reurbanizan en todo tipo de lugares – escuelas, negocios, lugares de juego. La gente de la comunidad puede ayudar a decidir si es bueno el plan de construcción. Como residente, usted puede ayudar a decidir:

- ¿Es este plan para la reurbanización bueno para la comunidad?
- ¿Será seguro el nuevo lugar para la gente del vecindario?

Hay 2 momentos importantes en los cuales usted puede participar en un terreno baldío:

## 1. Participe cuando la ciudad o los urbanizadores están planificando limpiar, reusar o construir algo nuevo en el sitio baldío.

Por ejemplo, digamos que los urbanizadores piensan construir una nueva industria en un terreno baldío viejo. Para ser atractivo tendrá muchas lomas y entradas de autos. Los planificadores piensan que sólo los adultos irán al área industrial. Quieren seguir los

estandares de limpieza para los adultos.

Pero la gente del vecindario sabe que las lomas pueden atraer a muchos niños del vecindario. Este puede ser peligroso para los niños. Puede ser que los estandares de limpieza para los adultos no son seguros para los niños. Pida a los planificadores que no hagan el lugar tentador para los niños.

Llame o escriba a sus funcionarios electos (vea los ejemplos de la carta y de llamadas telefónicas en las páginas 8 y 9). Pregunte:

- ¿Qué está pasando con el lugar?
- ¿Hay planes de urbanizarlo?
- ¿Cuáles son los planes?
- ¿Usted llamará a reuniones públicas para hablar sobre los planes?



## 2. Participe cuando empiecen los planes de limpieza

Puede ser que los científicos y los contratistas propongan un calendario con reuniones locales, por lo tanto usted podrá ir, ver y escuchar sobre los planes para la limpieza. Este es el momento en que usted y sus vecinos pueden ser de gran ayuda y tener el mayor impacto. Usted puede ayudar a decidir si los planes de limpieza son buenos.



## Preguntas que pueda hacer sobre la limpieza del terreno baldío en su vecindario

**Ya hemos hablado sobre la contaminación y preguntas sobre el riesgo. Vea la página 4.**

- ¿Cuándo empezará el trabajo? ¿Cómo usted notificará al vecindario?
- ¿Habrá mucho ruido durante la limpieza?
- ¿Algunos de esos desperdicios serán tratados en el lugar? ¿Va a haber emanaciones de químicos durante la limpieza?
- ¿Es seguro transportarlos en camiones por el vecindario?
- ¿Adónde se llevan los desperdicios?
- ¿Qué sucede si hay un derrame de algún desperdicio?
- ¿Durante la limpieza habrá mucho polvo en el lugar?
- ¿Qué se está haciendo para controlar el polvo? ¿Es peligroso el polvo?
- ¿Los químicos emitirán olores? ¿Los gases serán tóxicos?
- ¿A quién reclamo si veo algo que creo que es incorrecto?
- ¿Qué tipos de letreros serán colocados cuando empiece el trabajo?
- ¿Los letreros serán en diferentes idiomas? ¿Tendrán dibujos?
- ¿Habrá guardianes en los cruces de las calles para ayudar con el tránsito de los camiones?
- ¿Habrá guardianes de noche en el lugar en donde se está trabajando?
- ¿El lugar será cercado?

# Qué esperar durante la limpieza

Los autos abandonados, las llantas usadas y otra basura tendrá que ser transportada a otro lado. Se necesitará demoler los edificios y las estructuras. También se tendrá que remover las antiguas cercas, el asfalto de los lugares de estacionamiento y los carriles de tren abandonados. Los metales, vidrios,

calderas y maquinarias antiguas o cualquiera de las partes de madera del edificio serán puestas dentro de un recipiente para desperdicios y se los llevará a un basurero.

### Camiones

Las máquinas excavarán hoyos y cargarán camiones. Camiones



grandes viajarán de ida y de vuelta sobre los caminos locales. Por lo tanto usted necesita saber durante qué horas del día y qué días de la semana estarán trabajando. Usualmente el contratista desea empezar alrededor de **6:30 ó 7:00 am** y trabajar hasta las **3:30 ó 4:00 pm**. Si no existe un apuro real para terminar el trabajo, ellos trabajarán de lunes a viernes. Entonces usted puede preguntar: **“Planea usted trabajar tiempo extra en este proyecto?”**.

**¿Qué calles usarán los camiones?**

Averigüe qué caminos usarán los camiones. La gente que planea este proyecto no siempre está consciente del tipo de tráfico que hay en su vecindario. Usted conoce los caminos locales – por donde la gente camina y conduce y en dónde juegan los niños. Quizás hay personas ancianas o enfermas en algunas calles. Usualmente los conductores de camiones tienen más de una posibilidad para elegir la ruta que pueden usar. Usted puede informarles de las rutas mejores.



**¿Cuánto tránsito de camiones habrá y cuán sucio será?**

El contratista deberá tener una idea sobre cuánta tierra necesita sacar y traer. Por lo tanto él puede calcular aproximadamente cuántas cargas habrá: 1 camión por hora, 10 camiones por hora o entre 1 ó 10 camiones por hora.

Los camiones se ensucian. Pregunte, **“Habrá un lavadero para los camiones que salen del área del trabajo?”**. Un lavadero es una plataforma que el contratista construye y por la cual los camiones pasan. Mientras el camión está sobre la plataforma, los trabajadores provistos con mangueras de alta presión lanzan agua para lavar al camión antes de salir a rodar por los caminos del vecindario. Esto mantiene el barro en el trabajo y mantiene limpio a su vecindario.

**¿Cuánto tiempo tomará la limpieza?**

La mayoría de los urbanizadores, antes de empezar el proyecto, tienen una buena idea de cuánto se demorarán. Pero a veces tienen

sorpresas por las cosas que encuentran. Aunque los planificadores no puedan darle a usted una respuesta exacta sobre cuándo se acabará el trabajo, ellos podrán darle un cálculo estimado de la fecha de terminación.

**Los niños y los terrenos baldíos**

Hable con sus niños sobre los terrenos baldíos y su limpieza. Explique los peligros de jugar en el lugar o cerca de él y los peligros de los camiones. Recuerde que los conductores de los camiones no pueden ver cada lugar alrededor de sus camiones. Dígale a sus niños que:

- **Sean más cuidadosos cuando crucen la calle.**
- **No jueguen cerca del terreno baldío.**



También **la gente de edad** tiene que ser más cuidadosa. Si usted conoce a una persona de edad en el vecindario, hágale saber que el ruido y el polvo sólo será transitorio.



# Tome acción: escriba cartas

Este es un ejemplo de una carta que usted puede escribir a los funcionarios sobre el terreno baldío. Diríjase a la última página para ver una lista de agencias y números telefónicos.

A \_\_\_\_\_ (escriba el nombre)  
 \_\_\_\_\_ (incluya domicilio)

Fecha \_\_\_\_\_

Estimado Sr./Estimada Sra. (escriba el nombre):

Yo vivo en la calle \_\_\_\_\_ y le escribo para expresar mi preocupación sobre el tráfico de la limpieza de las fábricas Valley. Los camiones comienzan a transitar durante la semana cerca de las 6:30 Hs. en la mañana. Este es un **problema** por varias razones. Tenemos ancianos viviendo en esta calle y también tenemos a niños caminando entre las 7:30 y las 8:30 am.

Quisiera pedirle dos cosas. Creo que los camiones no deben empezar a transitar hasta las 9:00 y parar a las 4:30. También creo que la calle Pine sería una buena ruta para los camiones que entran y salen del lugar.

Estoy ansioso por ver este lugar limpio. Pero también me preocupa que esta limpieza sea hecha en la mejor forma para mi vecindario. Por favor llámeme al \_\_\_\_\_ (su número de teléfono) o escíbame a \_\_\_\_\_ (su domicilio).

Gracias por su atención.

Atentamente,

\_\_\_\_\_ (su firma)

\_\_\_\_\_ (escribid su nombre claramente aqui)



◀ **1er párrafo:**  
¿Cuál es el problema?

◀ **2do párrafo:**  
¿Qué está pidiendo?

◀ **3er párrafo:**  
¿Como pueden ponerse en contacto con usted?

# Tome acción: haga llamadas

## Llamada telefónica #1: Haciendo un reclamo sobre problemas de tráfico de camiones durante la limpieza.

Diríjase a la última página para ver una lista de agencias y números telefónicos.

*Vecino:* Hola. Quisiera hablar con alguien sobre la limpieza de las fábricas Valley. Yo vivo en el vecindario.

*Operador:* Un minuto por favor. Transferiré su llamada.

*Planificador:* Hola. ¿en qué puedo ayudarle?

*Vecino:* Estoy llamando por el tráfico de camiones en el sitio de limpieza de las fábricas Valley. Yo vivo en el vecindario y quisiera **◀ Identifíquese** hablar sobre el tránsito de los camiones.

*Planificador:* ¿Cuál es el problema?

*Vecino:* Pienso que los camiones comienzan a transitar muy temprano en la mañana **◀ ¿Cuál es el problema?** y están causando problemas a las personas de edad. Los camiones comienzan a salir a las 6:30 de la mañana del terreno. Es muy temprano para el vecindario. Nosotros tenemos a muchos ancianos viviendo acá y este tráfico es un problema. Quisiera que los planificadores supieran de **◀ ¿Qué está pidiendo?** que estoy llamando para decirles que los camiones no deberían empezar hasta las 8:00 de la mañana.

*Planificador:* Bueno, le daré su mensaje al administrador del tráfico.

*Vecino:* Gracias. ¿Quién es el administrador del tráfico? ¿Me podría. deletrear su nombre.? Antes de colgar, quisiera su nombre y también **◀ Anote el nombre y escríbalo** quisiera darle a usted mi nombre y mi número de teléfono. Le agradecería si alguien me puede llamar. (De su nombre, deletréelo y de su número de teléfono.)

Muchas gracias y espero la llamada \_\_\_\_\_



(nombre del administrador del tráfico).

## Llamada telefónica #2: Averiguando si hay planes para un sitio baldío cerca de su vecindario.

*Vecino:* Hola. Quisiera hablar con alguien sobre el edificio vacío y el terreno baldío en la calle Fábricas. Yo vivo en el vecindario.

*Operador:* Un minuto por favor. Transferiré su llamada.

*Planificador:* Hola. ¿En qué puedo ayudarle?

*Vecino:* Estoy llamando sobre el edificio vacío y el terreno baldío en la calle **◀ Identifíquese** Fábricas. Vivo en la vecindad y quisiera saber si la municipalidad tiene algún plan para reurbanizarlo o reusar ese terreno. ¿Quién **◀ ¿Qué está pidiendo?** es la persona que podría darme esta información?

*Planificador:* Necesitará hablar con Srta. Rios. Su número de teléfono es \_\_\_\_\_.

*Vecino:* Gracias. ¿Me podría **◀ Anote el nombre y escríbalo** dar su nombre, por favor?

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# ¿Dónde llamar o escribir?

**En esta página encontrará números de teléfono importantes así usted puede obtener más información acerca de los terrenos baldíos de su vecindario.**

## **Ciudad de Providence, Departamento de Planificación y Desarrollo**

400 Westminster St., Providence, RI 02903  
(401) 351-4300

El Departamento de Planificación y Desarrollo hace la revisión de las propuestas y prepara los planes para el desarrollo. Los residentes pueden contactar al Departamento para revisar y asistir con los planes de desarrollo para el vecindario. El Departamento también da préstamos con bajos intereses para el desarrollo económico de proyectos.

## **Departamento de Medio Ambiente de Rhode Island (RI DEM) Oficina de Administración de Desperdicios (Waste Management en inglés)**

235 Promenade St., Providence, RI 02908  
(401) 222-2797

El Departamento de Medio Ambiente de Rhode Island (RI DEM – siglas en inglés) es una agencia estatal responsable por la regulación, el reuso y redesarrollo de los terrenos baldíos. RI DEM inspecciona el análisis de la tierra, aire y agua en los terrenos baldíos y la agencia revisa los planes para los futuros usos de estos terrenos. También asegura que el contratista trabaja siguiendo las leyes o reglamentos. RI DEM ayuda a hacer arreglos legales con las personas a cargo del desarrollo de los terrenos baldíos.

## **Departamento de Salud Pública de Rhode Island Oficina de Evaluación de Riesgos de salud del medio ambiente**

Three Capitol Hill, Providence, RI 02908  
(401) 222-4948

El Departamento de Salud Pública de Rhode Island – Oficina de Evaluación de Riesgos de salud del medio ambiente provee información sobre los efectos de las sustancias químicas en la salud de la población en sus casas, lugares de trabajos o vecindario.

## **Agencia de Protección del Medio Ambiente (EPA)**

US EPA-NE, One Congress St., Boston, MA 02114-2023  
1-800-EPA-REG1 (1-800-372-7341)

El equipo de EPA (siglas en inglés) para los terrenos baldíos provee una variedad de ayuda técnica y financiera incluyendo la evaluación y limpieza de las propiedades de terrenos baldíos. Las actividades incluyen contactar a la comunidad, tratar de generar dinero para la evaluación, entrenamiento para trabajos y conseguir fondos para préstamos y experiencia con materiales peligrosos.

## **Agencia de Sustancias Tóxicas y Registro de Enfermedades (ATSDR)**

Office of Urban Affairs, 1600 Clifton Rd, Atlanta, GA 30333  
1-888-42-ATSDR (1-888-422-8737)  
*en Boston:* ATSDR Region 1, US EPA-NE, One Congress St., Suite 1100 (HBT), Boston, MA 02114-2023  
(617) 918-1495

ATSDR es la principal agencia federal de salud pública que se dedica a los asuntos de desperdicios peligrosos. ATSDR aconseja a los estados y otras entidades acerca de cuáles pueden ser los problemas de salud derivados de los lugares con químicos y sustancias tóxicas.

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**Este proyecto quiere agradecer** al Plan de Providence y a los residentes de las siguientes comunidades quienes tuvieron un rol muy importante en el desarrollo de este librito. Ellos son: Angela Burgio, Joseph H. Burgio, Carlos Corchado, Marisa Corchado, Mayra Corchado, William O'Brien, David G. Sifuentes, Rosa Solis, Victor Solis, y J. Taylor.

**La asistencia técnica** para este proyecto fue provista por Christina Zarcadoulas, investigación y desarrollo del librito; Eva Anderson, diseño; Miguel Rojas traducción; y Alyson McCann, URI

Home\*A\*Syst; en colaboración con el Departamento de Salud Pública de Rhode Island – Oficina de Evaluación de Riesgos de salud del medio ambiente.

**Asistencia Federal:** ATSDR proveyó 69% del total del costo del proyecto, contribución federal \$ 63.220. El Departamento de Salud Pública de Rhode Island proveyó 31% del costo total y contribución interna de \$ 27.924 (1997 Omnibus Consolidated Appropriations Act Section 507).



## ***Rhode Island Department of Environmental Management***

### **Working to Protect Rhode Island's Environment**

#### **Who We Are....**

The Rhode Island Department of Environmental Management (DEM) is the state agency responsible for preserving the quality of Rhode Island's environment for you and everyone who calls Rhode Island home. Our main office is conveniently located in Providence. We help protect the **AIR** you breathe, the **LAND** your homes, businesses and schools are built on, and the **WATER** you use for swimming and fishing.

#### **What We Do....**

DEM takes citizen complaints about pollution seriously and is committed to responding to complaints as quickly as possible. By contacting us, your complaint can be addressed and the investigation process can begin. Or maybe you don't have a complaint – maybe you have a question or need information about something happening in your neighborhood. We can help.

DEM receives complaints and questions about many subjects, including: illegal dumping, odor complaints from industrial facilities, illegal discharges into streams/rivers, dust problems, and similar threats to public health and the environment.

#### **How We Can Help You....**

DEM encourages your participation in helping us protect the environment and health of your community. We are here to answer your questions and investigate your complaints. Are you looking for information about a particular pollutant such as mercury or exterior lead paint?

Or maybe you are interested in learning more about a piece of property under construction near your home, or how to properly dispose of used oil? Are you concerned about illegal dumping or strange odors in your neighborhood?

We are here to serve you – please do not hesitate to contact us if you have questions, need to file a complaint about something happening in your community, or want more information about the many programs DEM runs that may directly impact you or your neighborhood. You can raise an issue anonymously or leave your name to get follow-up information.

#### ***VISIT OR CALL US:***

##### **IN PERSON:**

MONDAY-FRIDAY, 8:30 AM-4:00 PM  
235 PROMENADE STREET PROVIDENCE, RI  
(2<sup>nd</sup> FLOOR INFORMATION DESK)

##### **AT OUR WEB SITE:**

[www.dem.ri.gov](http://www.dem.ri.gov)

#### **STILL HAVE QUESTIONS? CALL US:**

GENERAL INFORMATION: **401-222-6800**  
TDD LINE: **401-222-4462**

NEED TO FILE A COMPLAINT?  
**401-222-1360**

AFTER HOURS  
EMERGENCIES/COMPLAINTS:  
**401-222-3070**

STILL DON'T KNOW WHO TO CALL?  
TRY DEM'S OFFICE OF TECHNICAL & CUSTOMER  
ASSISTANCE:  
**401-222-6822**





**Rhode Island Department of Environmental Management**  
**Office of Waste Management**  
**State Site Remediation & Brownfields Program**

**Who We Are....**

The Rhode Island Department of Environmental Management's (DEM) Office of Waste Management (OWM) Site Remediation & Brownfields Program was established to provide fair, comprehensive and consistent regulation of the investigation and remediation of hazardous waste and hazardous material releases, implemented in a timely and cost-effective manner. The program is designed to determine if a site poses a threat to human health and the environment and evaluate whether or not proposed remedies effectively provide protection.

This program also supports the redevelopment and reuse of contaminated sites through the Brownfields program. Sites are identified, evaluated, cleaned up and brought back to beneficial reuse in Rhode Island communities.

**What We Do....**

OWM's Site Remediation & Brownfields Program regulates and provides technical oversight for the investigation and remediation of releases of hazardous waste and/or hazardous materials to the environment; ensures that those investigations and remedial activities are conducted in a consistent manner that adequately protects human health and the environment; and enforces regulations regarding the proper disposal of abandoned hazardous wastes and hazardous materials.

**The Process ....**

Cleaning a contaminated site requires investigation, planning and action. The *Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases*

(<http://www.dem.ri.gov/pubs/regs/regs/waste/remreg04.pdf>) define the specific documents that are needed, or may be needed, as part of that process:

- Notification of Release;
- Site Investigation Work Plan (SIWP);
- Public Notice of Investigation;
- Site Investigation Report (SIR);
- Public Notice of Completed Site Investigation & Public Comment Period on Technical Feasibility of Proposed Remedy;
- Remedial Action Work Plan (RAWP);
- Remedial Action;
- Closure Report; and, if applicable,
- Environmental Land Usage Restriction (ELUR).

We are here to serve you – please do not hesitate to contact us if you have any questions or would like more information about one of the properties within the program that may directly impact you or your neighborhood. Under the Freedom of Information Act you have a right to review site files.

**FOR MORE INFORMATION CONTACT US:**

**AT OUR WEB SITES:**

<http://www.dem.ri.gov>

<http://www.dem.ri.gov/brownfields/default.htm>

**STILL HAVE QUESTIONS?**

**CALL OR EMAIL US:**

GENERAL INFORMATION: **401-222-2797**

TDD LINE: **401-222-4462**

Email: [brownfields@dem.ri.gov](mailto:brownfields@dem.ri.gov)



This is an important notice. Please have it translated.

Este é um aviso importante. Queira mandá-lo traduzir.  
Este es un aviso importante. Sírvase mandarlo traducir.  
Avis important. Veuillez traduire immédiatement.

ĐÂY LÀ MỘT BẢN THÔNG CÁO QUAN TRỌNG  
XIN VUI LÒNG CHO DỊCH LẠI THÔNG CÁO ẤY  
Questa è un' informazione importante,  
si prega di tradurla.

Это очень важное сообщение.  
Пожалуйста, попросите чтобы  
вам его перевели.

## Tidewater Site Fact Sheet; September 2010 Holder Dismantling Project

### *Former Tidewater MGP and Electric Generation Site*

#### Background

From the 1880's through roughly the 1970's, a manufactured gas plant (MGP) and electric generation facility operated adjacent to the Seekonk River at the end of Merry and Tidewater streets in Pawtucket, Rhode Island. The Tidewater MGP used industrial processes to produce gas from coal and oil. The gas was used primarily for the same purposes that natural gas is used today. This manufactured gas was stored in large steel holders for subsequent distribution to the neighboring community. Two of these former gas holders are located on the northwest side of the site adjacent to Tidewater Street. These holders contain a relatively small amount of sludge, which was a by-product of the former gas storage, and rainwater, which has accumulated over the past several years.

#### Holder Dismantling Project

As part of National Grid's plan for addressing the former MGP site, these former gas holders are currently being dismantled. This holder dismantling work is being performed consistent with all applicable Rhode Island Department of Environmental Management (RIDEM), City of Pawtucket, and Occupational Safety and Health Administration (OSHA) requirements. This project is being conducted on behalf of National Grid by T Ford Company, Inc. under the supervision of GZA GeoEnvironmental, Inc.

This holder dismantling project consists of the following primary steps:

- Removal of accumulated stormwater from the holders. This step was completed in July 2010.
- Removal of loose/flaking paint and asbestos containing materials from the exterior of the holders. This work was initiated in August 2010 and is anticipated to be complete in late September 2010.
- Removal, processing for transport, and off-site disposal of sludge by-products that have accumulated in the bottom of the holders. Water from the processing of the sludge is being treated on-site and discharged to the Seekonk River under an approved RIDEM permit. This work was also initiated in August 2010 and is anticipated to be completed in early October 2010.
- Dismantling and off-site disposal of the steel tank structures. The steel holders will be cut into small pieces by large shears. The steel will then be loaded onto trucks and shipped off-site for recycling. No explosives will be used. This effort is currently expected to be initiated in late September 2010 and be complete by mid to late December 2010.

National Grid is taking steps to minimize any inconvenience to the neighboring community from this project. In addition to all the required on-site worker health and safety measures, this project includes several measures designed specifically to address the neighboring community and limit any inconveniences to the extent practical. These measures include:

- Operation of a real-time, state of the art perimeter air monitoring system that detects both particulates and chemical compounds in the air at the project boundaries. In the event unacceptable air quality levels are even approached, the system alerts on-site personnel and either work is stopped or other air quality safeguards are implemented. This perimeter monitoring system operates 24 hours per day, 7 days a week.
- Monitoring of noise at the work zone perimeter to ensure that noise levels are within acceptable levels.
- Operation of foams and fragrance enhanced mister units to mitigate nuisance odors, which are primarily related to the handling of the sludge contained in the bottom of the holders. On-site personnel are routinely evaluating these odors (both on and off-site) and are making adjustments to these odor control measures. Once the sludge disposal work is complete (currently anticipated by early October 2010), the potential for nuisance odors should be significantly reduced.
- Routinely sprinkling water over the surface of the work area and unpaved site roadways to control dust migration.
- Restricting access to the site with fencing and having security personnel on site 24 hour, 7 days a week.
- Coordinating truck traffic so as not to interfere with the neighboring school/community.

Schedule - As described above, the holder dismantling activities are currently anticipated to be complete by late December 2010. The sludge handling and disposal activity, which could be the primary cause of potential nuisance odors, is scheduled to be complete by early October 2010.

Questions and Comments - If you would like more information on National Grid's activities at the site, please contact Michele Leone from National Grid at 781-907-3651.



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### **Ficha Técnica del Sitio Tidewater, Septiembre 2010 Proyecto de Desmantelamiento de los Tanques de Gas**

#### **Antigua Tidewater Planta de Gas (MGP) y Sitio de Generación Eléctrica**

##### **Antecedentes**

Desde 1880 hasta aproximadamente 1970 operaron en la vecindad del río Seekonk, al final de las calles Merry y Tidewater en Pawtucket, Rhode Island una planta de gas (MGP) y una planta de generación eléctrica. La planta de gas Tidewater, mediante procesos industriales, produjo gas usando carbón y petróleo. Este gas se utilizó para los mismos propósitos que el gas natural se usa en la actualidad. El gas manufacturado era almacenado en tanques de metal de gran tamaño para su posterior distribución en la comunidad vecina. Dos de estos viejos tanques de gas están situados al noroeste del sitio vecino a la calle Tidewater. Estos tanques contienen una cantidad relativamente pequeña de fango, el cual es un subproducto del almacenamiento de gas junto con agua de lluvia y se ha acumulado en los últimos años.

##### **Proyecto de desmantelamiento de los tanques**

Como parte del plan de National Grid para el antiguo sitio MPG estos antiguos tanques de gas están siendo desmantelados. Este proyecto se realiza siguiendo todos los requerimientos del Departamento de Manejo Ambiental de Rhode Island (Rhode Island Department of Environmental Management, RIDEM), ciudad de Pawtucket y Seguridad Ocupacional y Administración de Salud (Occupational Safety and Health Administration, OSHA) aplicables al caso. Este proyecto está siendo conducido en nombre de National Grid por la compañía T Ford bajo la supervisión de GZA Environmental, Inc.

El proyecto de desmantelamiento de los tanques consiste en los siguientes pasos

- Remoción del agua pluvial acumulada en los tanques. Este paso fue completado en julio de 2010.
- Remoción de pintura suelta o en escamas y de material con contenido de asbestos del exterior de los tanques. Este trabajo fue iniciado en agosto del 2010 y se anticipa que será completado a principios de octubre del 2010.
- Remoción, procesado para transporte y depósito fuera de sitio de los fangos subproductos acumulados en el fondo de los tanques. El agua producto del procesado de los fangos es tratada en el sitio y descargada en el río Seekonk con la aprobación de RIDEM. Este proceso fue iniciado en agosto del 2010 y se anticipa que será completado al principio de octubre del 2010.
- Desmantelamiento y depósito fuera del lugar de las estructuras metálicas de los tanques. Los tanques metálicos serán cortados en pedazos pequeños usando grandes hojas cortantes. El metal será entonces cargado en camiones y transportado fuera del lugar para ser reciclado. Este trabajo será realizado sin utilizar explosivos. Se prevé que este proceso se iniciara a fines de septiembre y que se finalizara aproximadamente entre mediados y finales de diciembre del 2010.

National Grid está tomando todas las medidas necesarias para minimizar los inconvenientes producidos en la comunidad aledaña. Además de todas las medidas relacionadas al bienestar y la seguridad de los trabajadores en el sitio, este proyecto incluye varias medidas designadas especialmente con el objetivo de limitar los inconvenientes producidos a la comunidad, en la medida de lo posible. Estas medidas incluyen:

- Operación de un sistema de monitoreo de aire de vanguardia en tiempo real. Este sistema detecta tanto partículas como compuestos químicos en el aire de los límites del proyecto. En el caso de producirse niveles cercanos a niveles inaceptables el sistema alertará al personal del sitio y consecuentemente los trabajos serán detenidos o nuevas medidas para salvaguardar el nivel de la calidad del aire serán implementadas. Este sistema de monitoreo del perímetro de la obra operará las 24 horas del día los 7 días de la semana.
- Monitoreo del nivel del ruido en el perímetro de la obra para asegurar que el nivel de ruido esté dentro de niveles aceptables.
- Operación de unidades de espumas y atomizadores de fragancias con el objetivo de mitigar olores molestos, los que están relacionados principalmente con el manejo de los fangos contenidos en el fondo de los tanques. El personal de la obra estará constantemente monitoreando estos olores (tanto dentro del perímetro de la obra como fuera de ella) y ajustando las medidas para controlarlos. Una vez que el proceso de eliminación de los fangos sean completado (lo que se anticipa que sucederá aproximadamente a principios de octubre), la probabilidad de ocurrencia de olores molestos se verá reducida en forma considerable.
- Rociado frecuente de la superficie de trabajo y de los caminos sin pavimentar de la obra con agua para reducir la migración de polvo.
- Restricción del acceso a la obra mediante cercos y teniendo personal de seguridad en la obra las 24 horas del día, los 7 días de la semana.
- Coordinación del tráfico de camiones de modo de no interferir con las actividades de las escuelas y comunidades vecinas.

##### **Programa de Actividades**

Como fue descrito más arriba se anticipa que las actividades de desmantelamiento de los tanques serán completadas a fines de diciembre del 2010. Las actividades relacionadas con los fangos, las cuales podrían causar olores molestos, están programadas para ser finalizadas a principios de octubre del 2010.

##### **Preguntas y Comentarios**

Si usted necesita más información con respecto a las actividades de National Grid en el Sitio, por favor contacte a Michele Leone de la National Grid en 781-907-3651.

April 27, 2011  
File No. 05.0043654.30-C

Patterson Realty Corp.  
PO Box 1668  
Pawtucket, RI 02860

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вам его перевели.

Re: Notice to Abutter 54B 95  
Proposed System Upgrade Activities  
Natural Gas Regulator Station  
Former Tidewater Facility  
Pawtucket, Rhode Island

Dear Abutter:

The purpose of this letter is to notify you that National Grid will be conducting system upgrade activities to the existing natural gas regulator station at the former Tidewater facility located at the end of Tidewater Street in Pawtucket, Rhode Island.

The facility upgrades, which have been approved by the Rhode Island Public Utility Commission (RIPUC), will consist of:

- the relocation of an existing overhead 16-inch gas main to below ground;
- shallow excavation work within the fenced natural gas station area to properly abandon existing facilities;
- removal of limited areas of impacted concrete and surface soils;
- general renovation of the buildings;
- replacement of the security fence surrounding the regulator station area; and
- updating of all the equipment including electronic and communication services within the buildings.

The work will begin in early **May 2011** and is expected to take approximately **four months**. Work will generally take place from **7:00 a.m. – 4:00 p.m., Monday to Friday**. We apologize in advance for any inconvenience, but this project is part of our commitment to provide continuous improvements and keep the natural gas delivery system safe and reliable.

If you would like more information or have any questions, please contact Paul Stasiuk at 401-784-7991. Should you be an owner of property that is leased, we request that you provide a copy of this letter to your tenants.

Very truly yours,

Paul Stasiuk  
Coordinator, Community Relations

cc: Joe Martella, RIDEM  
Michele Leone, National Grid

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August 1, 2011  
File No. 05.0043654.00-C



International Charter School  
Attn: Dr. Julie Nora, Director  
334 Pleasant Street  
Pawtucket, Rhode Island 02860

530 Broadway  
Providence  
Rhode Island  
02909  
401-421-4140  
Fax: 401-751-8613  
<http://www.gza.com>

Re: Notice to Abutter  
Short Term Response Action – Pipe Removal  
Former Tidewater Facility  
Pawtucket, Rhode Island  
RIDEM Case No. 95-022

Dear Abutter:

The purpose of this letter is to notify you that The Narragansett Electric Company d/b/a National Grid (National Grid) will be conducting limited response activities at the former Tidewater Manufactured Gas Plant (MGP) and the former Pawtucket No. 1 Power Station Site located at the ends of Tidewater and Merry Streets in Pawtucket, Rhode Island. This notice is being provided to abutting property owners and tenants in accordance with requirements established in the Rhode Island Department of Environmental Management's (RIDEM) Rules and Regulation for the Investigation and Remediation of Hazardous Materials (Remediation Regulations). Should you be an owner of property that is leased, we request that you provide a copy of this letter to your tenants.

The proposed limited response actions are being completed to address an above ground portion of a former steel process pipe located along the Seekonk River associated with former Manufactured Gas Plant (MGP) facility operations. Certain sections of the piping are in disrepair and contain residual coal tar-like material. These coal tar-like materials have been observed on the ground surface and river embankment beneath this piping which may be contributing to intermittent sheen outbreaks recently observed along a limited portion of the Seekonk River adjacent to the Site. In an effort to mitigate these conditions, National Grid proposes to complete certain response activities. Specifically, these activities will involve: (1) the removal and off-Site disposal of a 150-foot section of above grade process piping; and (2) the removal and off-Site disposal of a limited volume of impacted soil (approximately 1 cubic yard) located proximate to the process pipe. In addition, residual, hardened coal tar-like material located on the river embankment will be manually removed and containerized in drums with the removed surface soil described above for off-Site transport to a licensed receiving facility for disposal. The proposed field activities are scheduled to commence on or about August 22, 2011, and it is estimated that the project will take approximately 1 week to complete.

The proposed activities are further detailed in a *Short Term Response Action Plan* (STRAP) submitted to the Rhode Island Department of Environmental Management (RIDEM) in October 2010 (Revised January 2011) and *Evaluation of Applicability of Air Pollution Control Regulation No. 9, Proposed Above Ground Former Processing Pipe Removal* submitted to RIDEM's Office of Air Resources in July 2011. There is a 14-day comment period, commencing with the date of delivery of this notice, during which the public may review RIDEM records pertaining to this property and submit written comments regarding the proposed limited response activities described

herein. Copies of the submittals referenced above can be obtained on RIDEM's website (<http://www.dem.ri.gov/programs/benviron/waste/tide.htm>). The proposed limited response actions will be conducted in accordance with RIDEM's Remediation Regulations and will be performed by GZA GeoEnvironmental, Inc. (GZA) on behalf of National Grid.

If you would like more information or have any questions, please contact Michele Leone of National Grid at 781-907-3651.

Very truly yours,

GZA GeoEnvironmental, Inc.



Margaret S. Kilpatrick, P.E.  
Senior Project Manager



James J. Clark, P.E.  
Principal

MSK/JJC:tja

cc: Joe Martella, RIDEM  
Michele Leone, National Grid



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October 21, 2011  
File No. 05.0043654.00-C



City of Pawtucket  
137 Roosevelt Avenue  
Pawtucket, Rhode Island 02860

530 Broadway  
Providence  
Rhode Island  
02909  
401-421-4140  
Fax: 401-751-8613  
<http://www.gza.com>

Re: Notice to Abutter  
Supplemental Site Investigation Work Plan Addendum – Max Read Field  
Former Tidewater Facility  
Pawtucket, Rhode Island  
RIDEM Case No. 95-022

Dear Abutter:

The purpose of this letter is to notify you that The Narragansett Electric Company d/b/a National Grid (National Grid) will be conducting additional environmental investigation activities associated with the former Tidewater Manufactured Gas Plant (MGP) and the former Pawtucket No. 1 Power Station Site located at the ends of Tidewater and Merry Streets in Pawtucket, Rhode Island. This notice is being provided to abutting property owners and tenants in accordance with requirements established in the Rhode Island Department of Environmental Management's (RIDEM) Rules and Regulation for the Investigation and Remediation of Hazardous Materials (Remediation Regulations). Should you be an owner of property that is leased, we request that you provide a copy of this letter to your tenants.

The purpose of the upcoming additional subsurface investigation is to further investigate certain data gaps identified following completion of recent Site investigation activities at the Site. Specifically, the proposed investigation is being completed to address the visual observations of fill materials proximate to the eastern boundary of the Max Read Field. The investigation will include advancement of up to 5 test boring locations using a direct-push Geoprobe® rig. The field activities are scheduled to commence on or about November 7, 2011, and will occur over an approximate 2 to 3 day period.

The proposed activities are further detailed in a *Supplemental Site Investigation Work Plan* (SSIWP) *Addendum* submitted to the Rhode Island Department of Environmental Management (RIDEM) in August 2011. There is a 14-day comment period, commencing with the date of delivery of this notice, during which the public may review RIDEM records pertaining to this property and submit written comments regarding the proposed investigation activities described herein. Copies of the submittal referenced above can be obtained on RIDEM's website (<http://www.dem.ri.gov/programs/benviron/waste/tide.htm>). These investigation activities will be conducted in accordance with RIDEM's Remediation Regulations and will be performed by GZA GeoEnvironmental, Inc. (GZA) on behalf of National Grid.

If you would like more information or have any questions, please contact Michele Leone of National Grid at 781-907-3651.

Very truly yours,

GZA GEOENVIRONMENTAL, INC.



Margaret S. Kilpatrick, P.E.  
Senior Project Manager



James J. Clark, P.E.  
Principal

MSK/JJC:tja

cc: Joe Martella, RIDEM  
Michele Leone, National Grid

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August 10, 2012  
GZA File No. 05.0043654.00



530 Broadway  
Providence  
Rhode Island  
02909  
401-421-4140  
Fax: 401-751-8613  
<http://www.gza.com>

Re: Notice to Abutter and Interested Parties  
Proposed Electrical Substation Upgrades  
Former Tidewater Facility  
Pawtucket, Rhode Island  
RIDEM Case No. 95-022

To Abutter and/or Interested Parties:

The purpose of this letter is to notify you that The Narragansett Electric Company d/b/a National Grid (National Grid) intends to complete certain upgrades to the Pawtucket No. 1 Substation at the Tidewater Site located at the ends of Tidewater and Merry Streets in Pawtucket, Rhode Island. This notice is being provided to abutting property owners, neighboring residents and interested parties, consistent with previous notices for these types of facility upgrades and with our discussions with members of the public at the Community Interviews held at the Blackstone Valley Visitor Center on June 19 and 20, 2012. Should you be an owner of property that is leased, we request that you provide a copy of this letter to your tenants.

The electrical substation upgrades will require limited earthwork within and proximate to the fenced substation area to allow for installation of new electrical conduit, cable and/or appurtenances. Upgrades of certain electrical equipment will also take place within the substation yard and associated building. The proposed substation upgrades are necessary to allow for National Grid to continue providing reliable service to the electric customers of Rhode Island. As these proposed upgrades will require some limited disturbance of soil at the Site, National Grid will perform air monitoring consistent with a RIDEM approved plan during the excavation activities. A fact sheet is attached to this notice with more detailed information regarding the proposed earthwork and air monitoring program. The excavation work associated with the utility upgrade project is expected to be conducted over an approximate eight week period during this six month reconstruction project. The project is anticipated to begin on September 4, 2012, with the earthwork being completed between late September and December 2012.

If you would like more information or have any questions, please contact Michele Leone of National Grid at 781-907-3651.

Very truly yours,

GZA GeoEnvironmental, Inc.

A handwritten signature in blue ink, appearing to read 'M. Kilpatrick', is written over a faint, light blue circular stamp or watermark.

Margaret S. Kilpatrick, P.E.  
Senior Project Manager

cc: Joe Martella, RIDEM  
Michele Leone, National Grid

Attachment: Tidewater Site Fact Sheet – Electrical Substation Upgrades

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10 de Agosto, 2012  
GZA File No. 05.0043654.00

Re: Aviso a Colindantes y Partes Interesadas  
Mejoras Propuestas a la Subestación Eléctrica  
Antigua Facilidad de Tidewater  
Pawtucket, Rhode Island  
RIDEM Case No. 95-022



Aviso a Colindantes y/o Partes Interesadas:

530 Broadway  
Providence  
Rhode Island  
02909  
401-421-4140  
Fax: 401-751-8613  
<http://www.gza.com>

El propósito de la presente es notificarles que The Narragansett Electric Company, d/b/a National Grid (National Grid), intenta completar ciertas mejoras á la Subestación Pawtucket No. 1 en Tidewater localizada al final de las calles Tidewater y Merry en Pawtucket, Rhode Island. Esta noticia es provista á todos los dueños de propiedades colindantes, residentes vecinos y personas interesadas consistente con avisos previos con este tipo de mejoras á facilidades y con nuestras discusiones con miembros del público durante Entrevistas Comunales mantenidas en el Blackstone Valley Visitor Center durante el 19 y 20 de Junio, 2012. Si usted es el dueño de una propiedad, le pedimos que provea una copia de esta carta a todos sus inquilinos.

Las mejoras a la subestación eléctrica requerirán cierto trabajo de terreno dentro y en la proximidad del área vallada permitiendo la instalación de conductos eléctricos nuevos, cables y/o accesorios. Cierta equipo eléctrico será también mejorado dentro del terreno de la subestación y los edificios asociados. Estas mejoras son necesarias para permitir que National Grid continúe proveyendo un servicio confiable a los clientes de Rhode Island. A medida que las mejoras propuestas crearan cierta, limitada, perturbación del terreno en el lugar, National Grid conducirá monitoreo de aire consistente con un plan que es RIDEM-aprobado durante las actividades de excavación. Se adiciona una hoja de especificaciones conteniendo información más detallada relativa al trabajo de suelos propuesto así como el programa de monitoreo de aire. Se espera que el trabajo de excavación asociado con las mejoras de la utilidad tome, aproximadamente, un periodo de ocho semanas durante los seis meses del proyecto de reconstrucción. Se anticipa que el proyecto empezara en 4 de Septiembre, 2012 habiendo completado el trabajo de suelos entre finales de Septiembre y Diciembre 2012.

Si requiere más información o tiene preguntas adicionales, por favor contacte Michele Leone de National Grid al 781-907-3651.

Respetuosamente suyo,

GZA GEOENVIRONMENTAL, INC.

A handwritten signature in blue ink, appearing to read 'Margaret S. Kilpatrick', is written over a faint, light blue circular stamp or watermark.

Margaret S. Kilpatrick, P.E.  
Senior Project Manager

cc: Joe Martella, RIDEM  
Michele Leone, National Grid

Adición: Tidewater Hoja de Especificaciones – Mejoras Subestación Eléctrica

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## Tidewater Site Fact Sheet – Electrical Substation Upgrades

### Former Tidewater MGP and Electric Generation Site

#### Background

From the 1880s through approximately the 1970s, a manufactured gas plant (MGP) and electric generation facility operated adjacent to the Seekonk River at the end of Merry and Tidewater streets in Pawtucket, Rhode Island. The Tidewater MGP used industrial processes to produce gas from coal and oil. The gas produced was used primarily for the same purposes that natural gas is used today (heating, cooking, etc.). MGPs, which were common throughout the northeast before the region's natural gas pipelines were built, often yielded by-products of the gas production process such as tars, sludges and oils. The Tidewater electric generation facility formerly used coal, oil, tar and other substances to produce electricity. Some of these substances have remained in the environment at facilities such as these after they were closed down.

The gas manufacturing and electric generating operations at the Tidewater facility were terminated in 1968 and 1975, respectively. Today, National Grid continues to operate a natural gas regulating and interchange station on the north portion of the property and an electrical substation and switch house on the south portion of the property. These facilities serve to provide essential gas and electrical service to customers in Rhode Island. Figure 1, Site Plan, shows the location of these features. The location of the electrical substation is depicted on Figure 1.

#### Proposed Electrical Substation Upgrades

As part of facility upgrades, National Grid intends to complete certain reconstruction activities associated with the Pawtucket No. 1 Substation located in the central portion of the Site. The proposed work will occur within the southern fenced area of the existing substation and in the access/parking area immediately east and outside of the fenced portion of the substation. Figure 2, Proposed Substation Upgrades and Pre-Characterization Sampling, shows the location of these features. The reconstruction activities will require limited earthwork to install new underground cables, conduits and other facility utilities and properly abandon certain existing system features. These limited earthwork activities are anticipated to result in the temporary displacement of approximately 160 cubic-yards of soil. The majority of these excavated materials will be reused to backfill the trenches. A limited amount of excess materials may be transported off-Site for disposal. As part of the substation reconstruction earthwork, soils excavated during conduit installation work and miscellaneous shallow excavation activities will be temporarily placed in a working stockpile on plastic sheeting adjacent to the excavation for subsequent reuse as backfill. Temporary soil stockpiles will also be placed on and covered with plastic sheeting, or placed within watertight, covered roll-off containers.

#### Pre-characterization Sampling

Based on testing performed on soil samples collected within the electrical substation and proposed excavation areas, it is anticipated that excavated materials will likely exhibit low levels of polynuclear aromatic hydrocarbons (PAHs), inorganics (metals), total petroleum hydrocarbon (TPH), and cyanide. PAHs and arsenic were detected in soil at concentrations in excess of RIDEM's Method 1 Industrial/Commercial Direct Exposure Criteria (I/C-DEC). No Volatile Organic Compounds (VOCs) were detected above the Method 1 I/C-DEC, with results of most VOC compounds being non-detect. Overall, the quality of the materials in this area of the Site is consistent with that of typical urban fill that is commonly found in industrialized, urban areas.

#### Air Quality Monitoring

While the soil data collected in the area of planned excavation suggest the potential for air quality impacts associated with this work is relatively low, National Grid will monitor air quality during these activities to confirm. As described below, in the unlikely event impacts are detected above RIDEM-approved threshold levels, certain controls will be put in place to address detections.

This air monitoring will be performed as described in GZA's February 20, 2012 *Evaluation of Applicability of Air Pollution Control Regulation No. 9* submittal to the RIDEM Office of Air Resources and GZA's subsequent correspondence with RIDEM dated June 14, 2012 and July 27, 2012. On July 5, 2012, RIDEM issued a letter stating that an air permit for these proposed earthwork activities would not be required.

During the proposed substation earthwork activities, GZA will perform real-time air monitoring for total VOCs, and particulate dust within the work zone and at the property line as described in the above referenced submittals and correspondence which were reviewed and approved by RIDEM. Specific monitoring for benzene will also be conducted in the event total VOCs are detected above threshold levels. Real-time air monitoring will utilize hand held instruments so field personnel can alter locations based on the activity being performed and changing wind directions. Readings will be



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### Tidewater Site Fact Sheet – Electrical Substation Upgrades

#### Former Tidewater MGP and Electric Generation Site

collected both within the work zone itself as well as at certain locations along the Site perimeter. Field personnel will select the appropriate monitoring location reading depending on activities being performed and wind direction. The following table presents the real-time monitoring action levels for the work zone perimeter and property line. Figure 1, Site Plan, shows the property line air monitoring locations (S1 through S5) that will be monitored during the work.

Compound	Work Zone Perimeter	Property Line
Total Volatile Organic Compounds (TVOC)	1.0 ppm	0.1 ppm
Respirable Particulate Dust (PM10)	1,000 ug/m3	150 ug/m3

In the event these real time action levels are exceeded at sustainable levels within the work zone or at the property line (*i.e.*, in excess of the respective action levels for a period of 5 minutes), GZA will immediately identify the likely cause, and the Contractor shall implement appropriate engineering controls and/or modify work practices to address the action level exceedances. The following table presents the actions that will be undertaken if a sustained exceedance of either respirable dust or TVOC is encountered.

Compound	Immediate Actions in Event of a Sustained Exceedance of Action Levels
Total Volatile Organic Compounds (TVOC)	<ol style="list-style-type: none"> <li>Evaluate the likely source of sustained readings (<i>i.e.</i> truck emissions, moisture in the area, off-site source, actual work, etc.)</li> <li>If determined that the source is the actual work, Contractor shall immediately implement appropriate engineering controls and/or modify work practices to address exceedances.</li> <li>Immediately deploy summa canisters in both an upgradient and downgradient location and submit for laboratory analysis when the work day is complete.</li> </ol>
Respirable Particulate Dust (PM10)	<ol style="list-style-type: none"> <li>Evaluate the source of sustained readings (<i>i.e.</i> earthwork, heavy wind, off-Site source, etc.)</li> <li>If determined that the source is the actual work, Contractor shall immediately implement appropriate engineering controls (<i>e.g.</i>, application of water, etc.) and/or modify work practices to address the exceedances.</li> </ol>

Certain air monitoring data (*i.e.*, volatile organic compound screening data, , dust monitoring data and analytical data) will be posted on the bulletin boards to be located at the end of Tidewater Street and the end of Bowles Court, pending City approval.

#### Schedule

The overall reconstruction project is anticipated to take approximately six months to complete and is currently scheduled to begin on September 10, 2012. The excavation work and monitoring described above is expected to be conducted over an approximately eight week period (late September and December 2012) during this six month reconstruction project.

#### Questions and Comments

If you would like more information on National Grid’s activities at the site, please contact Michele Leone from National Grid at 781-907-3651.

*If you are interested in signing up for the Tidewater mailing list for future announcements about the Site, please contact Michele Leone at the phone number above or Michele.leone@nationalgrid.com.*

#### Attachments

- Figure 1 Site Plan
- Figure 2 Substation Upgrades and Pre-Characterization Sampling

## Tidewater Hoja de Especificaciones – Mejorías Subestación Eléctrica

### Anterior Tidewater MGP y la Generacion Electrica Situan

#### Historial

Desde los años 1880 y a través, aproximadamente, los años de 1970, una planta de gas manufacturado (MGP) y una facilidad de generación eléctrica operaban adyacente al Río Seekonk al final de las calles Merry y Tidewater en Pawtucket, Rhode Island. La Tidewater MGP usaba procesos industriales para producir gas de carbón y aceite. El gas producido se usaba, primariamente, para los mismos propósitos que el gas natural se usa hoy en día (calefacción, cocina, etc.). MGPs que eran muy comunes en el noreste antes de que las líneas de gas natural de la región fueran construidas, a menudo rendían productos secundarios al proceso de producción de gas así como alquitrán, sedimentos, y aceites. La facilidad de generación eléctrica Tidewater usaba carbón, aceite, alquitrán y otras sustancias para producir electricidad. Algunas de estas sustancias se han mantenido en el ambiente en facilidades como esta tipa después de cerrar.

La producción de gas y las operaciones de generación eléctrica en la facilidad de Tidewater fueron terminadas en 1968 y 1975, respectivamente. Hoy en día, la National Grid continúa operando una estación reguladora de gas natural y una estación de intercambio en la porción sur de la propiedad. Estas facilidades proveen gas y servicio eléctrico esencial a los clientes localizados en Rhode Island. La Figura 1, Site Plan, muestra la localidad.

#### Propuesta de mejoras a la Subestación Eléctrica

Como parte de las mejoras a la facilidad, la National Grid intenta completar ciertas actividades de reconstrucción asociadas con la Subestación Pawtucket No. 1 localizada en la porción central del sitio. El trabajo propuesto será confinado al área sur de la existente subestación y en el área de parqueo/acceso inmediatamente al Este y fuera del área cercada de la subestación. La Figura 2, *Proposed Substation Upgrades and Pre-Characterization Sampling*, muestra la localidad. Las actividades de reconstrucción demandan cierto trabajo de suelos para instalar nuevos cables subterráneos, conductos, otras utilidades y el abandono apropiado de ciertos sistemas existentes. Se anticipa que el resultado de estas actividades de suelos será el desplazamiento de aproximadamente 160 yardas-cubicas de suelo. La mayoría de esos materiales excavados será reusado para rellenar las trincheras. Una cantidad limitada de materiales en exceso podría ser transportada fuera del lugar para su disposición. Como parte de la reconstrucción, los suelos excavados durante la instalación de los conductos y actividades múltiples de excavación ligera serán almacenados temporalmente sobre hojas de plástico adyacente al sitio de excavación para su uso subsecuente como relleno. Temporalmente, cierta cantidad de suelo también será almacenado sobre y cubierto con hojas de plástico o almacenado en contenedores a prueba de agua.

#### Muestreo de Pre-Characterización

Basado en exámenes realizados en las muestras de suelo recogidas dentro de la subestación eléctrica y las áreas de excavación propuesta se anticipa que los materiales excavados presentaran niveles bajos de *polynuclear aromatic hydrocarbons* (PAHs), inorganicos (metales), hidrocarburos petroléos total (TPH) y cianuro. Ciertos de estos componentes (PAHs y arsenico) fueron detectados en el suelo a concentraciones en exceso de RIDEM Method 1 Industrial/Commercial Direct Exposure Criteria (I/C-DEC). Componentes Volátiles Orgánicos (VOCs) por encima del *Method 1* I/C-DEC no fueron detectados. Generalmente, la calidad de los materiales en esta área es consistente con el relleno urbano.

#### Monitoreo de la Calidad de Aire

Mientras que los datos de suelo recopilados en el área de excavación planeada sugieren que el impacto potencial a la calidad de aire asociado con este trabajo es relativamente bajo, National Grid monitoreará la calidad de aire durante estas actividades para confirmación. Como se describe a continuación, en la improbable posibilidad de detectar impacto por encima niveles aprobados por RIDEM, ciertos controles serán instalados para detectar o el trabajo será detenido hasta que la situación está mejorada.

El monitoreo de aire será implementado de acuerdo al proceso descrito en el informe de GZA de 20 Febrero, 2012, *Evaluation of Applicability of Air Pollution Control Regulation No. 9*, enviado a la RIDEM Office of Air Resources y correspondencia subsecuente entre GZA y RIDEM de fecha el 14 de Junio, 2012 y el 27 de Julio 2012. En la fecha de 5 Julio, 2012, RIDEM publicó una carta indicando que un permiso para estas actividades propuestas no sería requerido.

## Tidewater Hoja de Especificaciones – Mejorías Subestación Eléctrica

### Anterior Tidewater MGP y la Generacion Electrica Situan

Durante las actividades de excavación propuestas en la subestación, GZA implementará monitoreo de aire a tiempo real por VOCs y polvo particular en la zona de trabajo y en la línea de la propiedad como descrito en el material referenciado y correspondencia que fueron revisados y aprobados por RIDEM. El monitoreo específico por benzina también será conducido en el evento que los niveles de VOC's sean detectados por encima de los niveles de umbral. El monitoreo de aire a tiempo real utilizará instrumentos de mano de manera que los ingenieros puedan alterar localidades basado en la actividad del momento y cambios en la dirección del viento. Los datos serán adquiridos tanto en el área de trabajo mismo así como en ciertas localidades alrededor del perímetro del sitio. Los ingenieros determinarán la localidad de monitoreo adecuada dependiendo en la actividad y la dirección del viento.

La tabla siguiente representa el monitoreo a tiempo real y niveles de acción para el perímetro de la zona y la línea de propiedad. La Figura 1, Site Plan, muestra las localidades de monitoreo de aire (S1 a S4) usadas durante el trabajo

Compuestos	Perimetro de la Zona	Línea de Propiedad
Total Componentes Volátiles Orgánicos (Volatile Organic Compounds) (TVOC)	1.0 ppm	0.1 ppm
Respirable Particulate Dust (PM10)	1,000 ug/m3	150 ug/m3

En el evento que estos niveles de acción a tiempo real excedan niveles sustentables dentro de la zona de trabajo o la línea de propiedad (i.e., en exceso de respectivo niveles de acción por un periodo de cinco minutos), GZA identificará inmediatamente la causa posible, el Contratista implementará los controles apropiados, modificará los métodos de trabajo y/o parará el trabajo inmediatamente. La siguiente tabla presenta las acciones que se tomaran si se encuentra un exceso sostenido de TVOC o polvo respirable.

Compuesto	Acciones inmediatas en el evento de niveles de acción mantenidos excesivos,
Total Volatile Organic Compounds (TVOC)	<ol style="list-style-type: none"> <li>1. Evaluar la causa posible de las lecturas sostenidas. (i.e. emisiones de los camiones, humedad en el área, fuente fuera del lugar, trabajo actual, etc.)</li> <li>2. Si se determinan que la causa es el trabajo actual, el Contratista implementara los controles de ingeniería apropiados, modificara las practicas de trabajo y/o detendrá el trabajo. Desplegar inmediatamente contenedores SUMMA® en las gradientes alta y baja para someter a un análisis de laboratorio cuando el día concluya.</li> </ol>
Respirable Particulate Dust (PM10)	<ol style="list-style-type: none"> <li>1. Evaluar la fuente de la lectura sostenida. (i.e. excavación, vientos altos, fuente fuera de sitio, etc.)</li> <li>2. Si se determinan que la causa es el trabajo actual, el Contratista implementará los controles de ingeniería apropiados, (aplicación de agua) modificara las practicas de trabajo y/o detendrá el trabajo.</li> </ol>

Ciertos datos de monitoreo de aire (i.e., compuestos orgánicos volátiles, monitoreo de polvo y datos analíticos) serán publicados en los boletines de información localizados al final de la calle Tidewater y el final de la calle Bowles Court, dependiendo la aprobación de la ciudad.

### Horario

Se anticipa que el proyecto en general tome aproximadamente seis meses para cumplir y está programado a empezar en el 10 de Septiembre, 2012. Se espera que el trabajo de excavación y monitoreo previamente descrito tenga una duración de aproximadamente ocho semanas (final de Septiembre y Diciembre 2012) durante los seis meses del proyecto de reconstrucción.

### Preguntas y Comentarios

Si requiere más información o tiene preguntas adicionales, por favor contacte Michele Leone de National Grid al 781-907-3651.

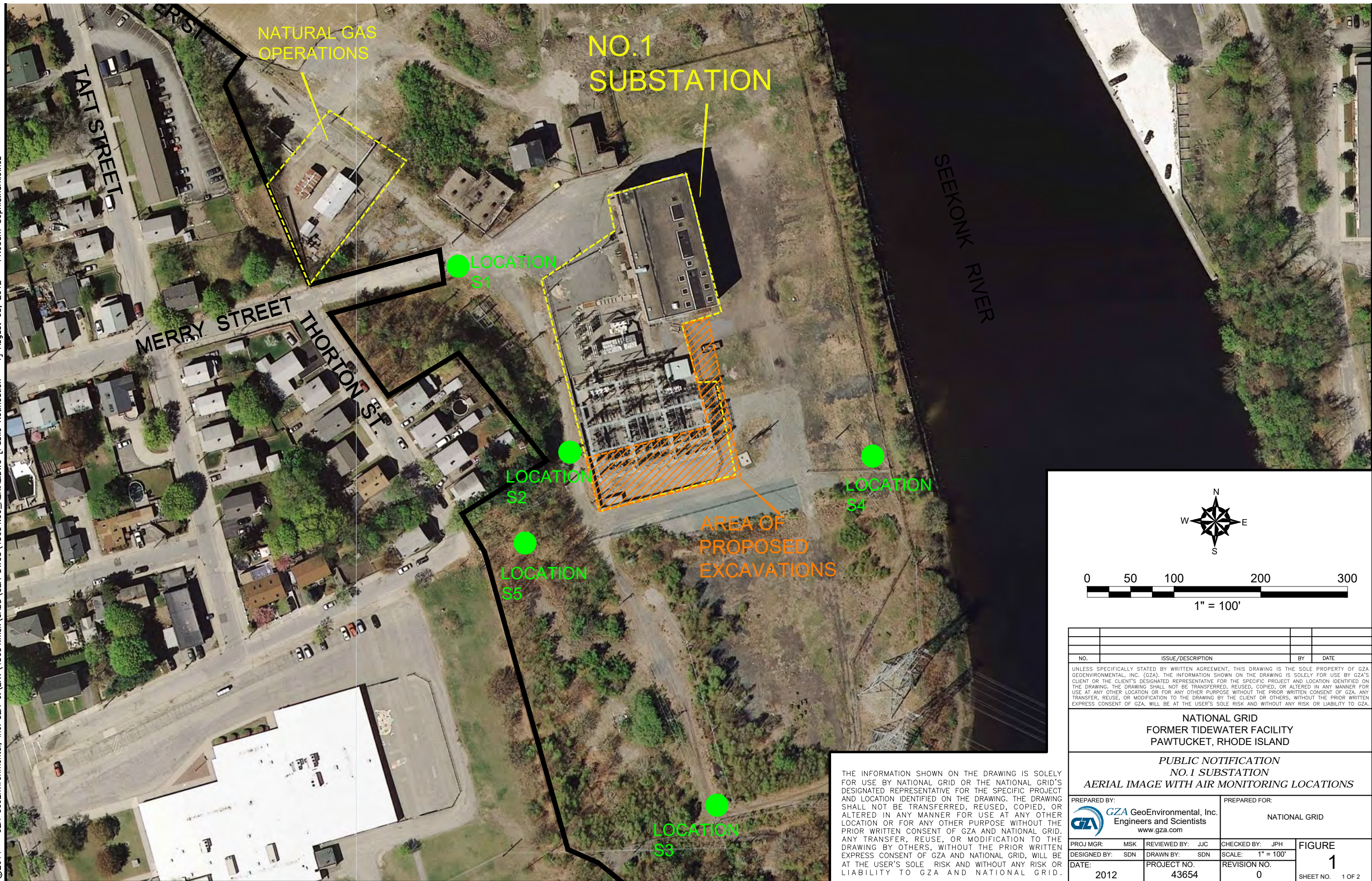
*Si esta interesado a inscribirse para la lista de envío de Tidewater para futuros anuncios acerca del Sitio, visita por favor contáctese con Michele.leone@nationalgrid.com.*

### Adiciones:

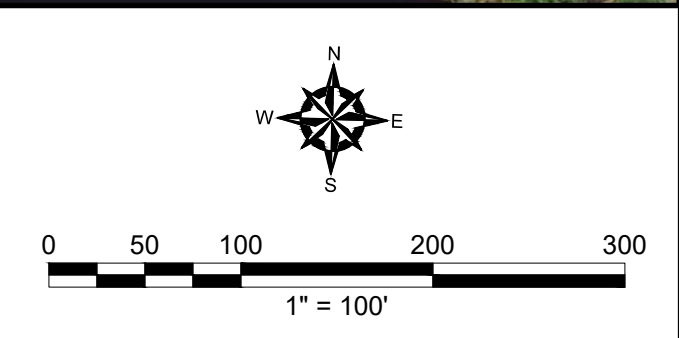
Figure 1                      Site Plan  
 Figure 2                      Substation Upgrades and Pre-Characterization Sampling



©2011 - GZA GeoEnvironmental, Inc. GZA-J:\ENV\43654.msk\CADD\GZA DWGS\43654.00\_AERIAL.DWG [Public Notification - 1] August 03, 2012 - 11:03am Sophia.narkiewicz



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**NATIONAL GRID  
FORMER TIDEWATER FACILITY  
PAWTUCKET, RHODE ISLAND**

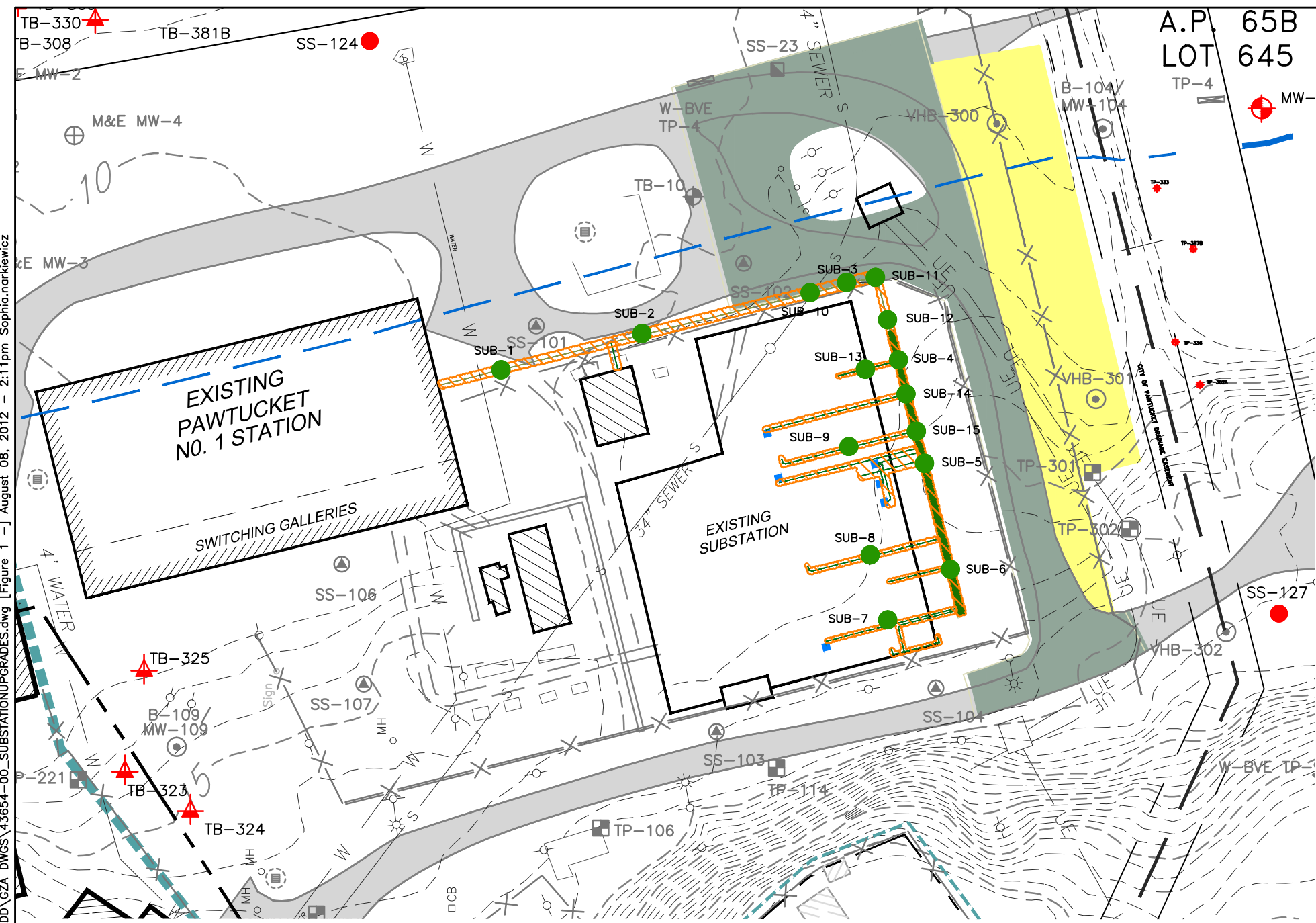
**PUBLIC NOTIFICATION  
NO. 1 SUBSTATION  
AERIAL IMAGE WITH AIR MONITORING LOCATIONS**

PREPARED BY: <b>GZA GeoEnvironmental, Inc.</b> Engineers and Scientists www.gza.com	PREPARED FOR:  NATIONAL GRID
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PROJ. MGR: MSK	REVIEWED BY: JJC	CHECKED BY: JPH	FIGURE <b>1</b> SHEET NO. 1 OF 2
DESIGNED BY: SDN	DRAWN BY: SDN	SCALE: 1" = 100'	
DATE: 2012	PROJECT NO. 43654	REVISION NO. 0	



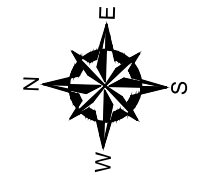
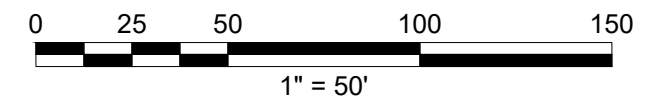
© 2011 - GZA GeoEnvironmental, Inc. GZA-J:\ENV\43654.msk\CADD\GZA DWCS\43654-00\_SUBSTATIONUPGRADES.dwg [Figure 1 -] August 08, 2012 - 2:11pm Sophia.narkiewicz



A.P. 65B  
LOT 645

**GENERAL NOTES:**

- EXISTING CONDITIONS BASE MAP DEVELOPED FROM THE FOLLOWING:
  - ELECTRONIC FILES FROM GEI CONSULTANTS, INC. (FORMERLY AES) ENTITLED "HISTORIC STRUCTURES AND SAMPLE LOCATIONS", ORIGINAL SCALE 1"=80', DATED JULY 1999
  - ELECTRONIC FILES FROM VANASSE HANGEN BRUSTLIN, INC. ENTITLED "SOIL BORING, TEST PIT AND MONITOR WELL LOCATIONS", SCALE: 1"=60', UNDATED
  - ELECTRONIC FILES FROM WELSH ASSOCIATES LAND SURVEYORS, INC. ENTITLED "TOPOGRAPHIC SURVEY (AS-BUILT), FORMER TIDEWATER FACILITY, DEMOLITION OF GAS HOLDERS NOS. 7 & 8", DATED DECEMBER 17, 2010
  - ON-SITE INVESTIGATIONS AND SURVEYS BY GZA PERSONNEL DURING VARIOUS SITE VISITS DURING 2009 AND 2010.
- PROPERTY LINES AND LOT INFORMATION ESTABLISHED FROM INFORMATION PROVIDED ON A DRAWING ENTITLED "PERIMETER SURVEY OF LAND AT THE TIDEWATER FORMER MGP SITE IN PAWTUCKET, RHODE ISLAND FOR ATLANTIC ENVIRONMENTAL SERVICES INC." DEVELOPED BY LOUIS FEDERICI AND ASSOCIATES AND AN AUTO CAD FILE ENTITLED "MAX READ FIELD TRACK EXPANSION 2007" PROVIDED BY THE CITY OF PAWTUCKET.
- HORIZONTAL DATUM IS BASED ON NAD 1983 FROM BASE MAPPING PROVIDED BY GEI CONSULTANTS, INC.
- VERTICAL DATUM IS BASED ON NGVD 1929 (MSL) FROM BASE MAPPING PROVIDED BY GEI CONSULTANTS, INC.
- REFERENCE SEWER DATA FROM SCANNED IMAGE PROVIDED BY THE CITY OF PAWTUCKET, RHODE ISLAND, ENTITLED "STUDY OF SEWERAGE FACILITIES" BY WATERMAN ENGINEERING CO. & ANDERSON NICHOLS CO. DATED NOV. 1975, ORIGINAL SCALE 1"=400' & SCANNED IMAGES OF HISTORIC PLAN & PROFILE DRAWINGS PROVIDED BY THE CITY OF PAWTUCKET, RHODE ISLAND.
- SITE UTILITIES TAKEN FROM 1984 SANBORN MAP AND HISTORIC FIGURES PROVIDED BY NATIONAL GRID. ALL UTILITY LOCATIONS ARE APPROXIMATE AND SHOWN FOR REFERENCE ONLY.
- PROPOSED CONDUIT, HANDHOLES, TRENCHES AND CCTV LOCATIONS AND EXCAVATIONS DEVELOPED FROM PLAN PROVIDED BY TRC, INC., ENTITLED "PAWTUCKET 1 SUBSTATION NO. 107, PAWTUCKET, RHODE ISLAND, 115KV BUS STRUCTURE CONDUIT PLAN," DATED 09/30/2011, ORIGINAL SCALE 1"=8', DRAWING NO. H-90869-4A, REV A.



**LEGEND:**

	PROPERTY LINE		APPROXIMATE AREA OF ROADWAY AND PARKING AREA CAP (20 MIL GEOMEMBRANE OVERLAIN BY 2-3-INCHES OF BEDDING SAND AND A 6-9 INCH LIFT OF PROCESSED MATERIAL)		PRE-CHARACTERIZATION SOIL SAMPLING LOCATION
	APPROX. 200 FT. JURISDICTION LIMIT		APPROXIMATE AREA OF LOW LYING CAP (20 MIL GEOMEMBRANE OVERLAIN BY 3-INCHES OF BEDDING SAND AND A 3-INCH LIFT OF TRAP ROCK)		PROPOSED SOIL EXCAVATIONS
	EXISTING BUILDINGS ON-SITE		EXISTING UNDERGROUND ELECTRIC CABLE IN CONDUIT		
	EXISTING NBC INTERCEPTOR SANITARY SEWER		EXISTING UNDERGROUND ELECTRIC MH/STRUCTURE		
	EXISTING CITY OF PAWTUCKET STORM DRAIN		EXISTING STORM/COMBINED SAN. SEWER OVERFLOW		
	EXISTING WATER LINE		EXISTING CATCH BASIN LOCATIONS		
	EXISTING CONTOUR (MINOR 1 FOOT INTERVAL)		EXISTING ACCESS ROAD		
	EXISTING CONTOUR (MAJOR 5 FOOT INTERVAL)		EXISTING RETAINING WALLS		
			EXISTING FENCE		

NO.	ISSUE/DESCRIPTION	BY	DATE

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**NATIONAL GRID  
FORMER TIDEWATER FACILITY  
PAWTUCKET, RHODE ISLAND**

**PUBLIC NOTIFICATION  
NO. 1 SUBSTATION  
SUBSTATION UPGRADES AND  
PRE-CHARACTERIZATION SAMPLING LOCATIONS**

PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com	PREPARED FOR: NATIONAL GRID
PROJ MGR: MSK DESIGNED BY: SDN DATE: 2012	REVIEWED BY: JJC DRAWN BY: SDN PROJECT NO. 43654
CHECKED BY: JPH SCALE: 1" = 40'	REVISION NO. 0

FIGURE 2  
SHEET NO. 2 OF 2

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Este es un aviso importante. Sírvase mandarlo traducir.  
Avis important. Veuillez traduire immédiatement.

ĐÂY LÀ MỘT BẢN THÔNG CÁO QUAN TRỌNG  
XIN VUI LÒNG CHO DỊCH LẠI THÔNG CÁO ẤY  
Questa è un' informazione importante,  
si prega di tradurla.

Это очень важное сообщение.  
Пожалуйста, попросите чтобы  
вам его перевели.

November 26, 2012  
GZA File No. 05.0043654.20



530 Broadway  
Providence  
Rhode Island  
02909  
401-421-4140  
Fax: 401-751-8613  
<http://www.gza.com>

Re: Notice to Abutter and Interested Parties  
DRAFT Public Involvement Plan  
Former Tidewater Facility  
Pawtucket, Rhode Island  
RIDEM Case No. 95-022

To Abutter and/or Interested Parties:

On behalf of The Narragansett Electric Company d/b/a National Grid (National Grid), GZA GeoEnvironmental, Inc. (GZA) has prepared this letter to inform you of the availability of the draft Public Involvement Plan (PIP) for the Tidewater Site located at the ends of Tidewater and Merry Streets in Pawtucket, Rhode Island. This notice is being provided to abutting property owners, neighboring residents and interested parties consistent with previous notices. Should you be an owner of property that is leased, we request that you provide a copy of this letter to your tenants.

A Public Involvement Plan (PIP) is an agreement between the party conducting response actions (in this case, National Grid) and the public about how they will share information moving forward, and how the public will be able to comment on plans for assessment and cleanup of the Tidewater Site. A PIP is a “living” document and can be amended to reflect additional issues or challenges that may arise during the site cleanup process.

A draft of the PIP has been submitted to the Rhode Island Department of Environmental Management (RIDEM) on November 26, 2012 for review and comment. A copy of this document can be obtained from the following information repositories:

- RIDEM publicly available website: <http://www.dem.ri.gov/programs/benviron/waste/tide.htm>
- National Grid publicly available website: [www.tidewatersite.com](http://www.tidewatersite.com)
- Publicly Accessible Site File at RIDEM's Office of Waste Management filed under Former Tidewater Coal Gasification Plant (Pawtucket), RIDEM Case No. 95-022. Appointments to view the files can be made by contacting RIDEM, Department of Technical and Customer Assistance, 235 Promenade Street, Providence, Rhode Island (telephone: 401-222-4700 extension 7307, <http://www.dem.ri.gov/topics/filerevw.htm>).

National Grid currently plans to schedule a public meeting during the week of January 14, 2013 to discuss comments to the draft PIP. If you have comments regarding the draft PIP, please submit them in writing prior to the public meeting to:

Joseph Martella  
R.I. Department of Environmental Management  
Office of Waste Management  
235 Promenade Street  
Providence, RI 02908-5767

Details regarding the public meeting, including date, time and venue, will be posted to the RIDEM (<http://www.dem.ri.gov/programs/benviron/waste/tide.htm>) and National Grid Tidewater ([www.tidewatersite.com](http://www.tidewatersite.com)) websites, as well as mailed and emailed to those parties on the Tidewater



mailing list. Interested persons can be added to this mailing list via an email request to Michele Leone at National Grid ([Michele.Leone@nationalgrid.com](mailto:Michele.Leone@nationalgrid.com)) with your name and address or by calling Michele Leone at 1-781-907-3651.

If you would like more information or have any questions, please contact Michele Leone of National Grid at 781-907-3651.

Very truly yours,

GZA GeoEnvironmental, Inc.

A handwritten signature in blue ink, appearing to read "Margaret S. Kilpatrick". The signature is fluid and cursive, with a large initial "M" and "K".

Margaret S. Kilpatrick, P.E.  
Senior Project Manager

cc: Joe Martella, RIDEM  
Elizabeth Stone, RIDEM  
Michele Leone, National Grid

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ĐÂY LÀ MỘT BẢN THÔNG CÁO QUAN TRỌNG  
XIN VUI LÒNG CHO DỊCH LẠI THÔNG CÁO ẤY  
Questa è un' informazione importante,  
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Это очень важное сообщение.  
Пожалуйста, попросите чтобы  
вам его перевели.

Noviembre 26, 2012  
GZA File No. 05.0043654.20



530 Broadway  
Providence  
Rhode Island  
02909  
401-421-4140  
Fax: 401-751-8613  
<http://www.gza.com>

Re: Aviso a Colindantes y Partes Interesadas  
BORRADOR Plan Público de Participación  
Antigua Facilidad de Tidewater (Sitio)  
Pawtucket, Rhode Island  
RIDEM Case No. 95-022

Aviso a Colindantes y/o Partes Interesadas:

En nombre de Narragansett Electric Company d/b/a National Grid, GZA, ha preparado esta carta para informarles de la disponibilidad del borrador del Plan Público de Participación (PIP) para el Sitio de Tidewater localizado al final de las calles Tidewater y Merry en Pawtucket, Rhode Island. Esta nota está siendo provista a todos los dueños de propiedades colindantes, residentes y partes interesadas y que es consistente con notas previas. Si usted es un dueño de propiedad que es alquilada, requerimos que provean una copia de esta carta a sus inquilinos.

Este Plan (PIP) es en acuerdo con la parte que conduce las acciones y el público, acerca de como compartirán información y cómo el público estará disponible a comentar en los planes para limpieza del Sitio Tidewater. El PIP es un documento "vivo" y puede tener enmiendas para reflejar puntos adicionales o desafíos que puedan presentarse durante el proceso de limpieza.

El borrador del PIP ha sido sometido al Rhode Island Department of Environmental Management (RIDEM) en Noviembre 26, 2012 para revisión y comentarios. Una copia de este documento puede ser obtenido en los siguientes links:

- RIDEM sitio web público:  
<http://www.dem.ri.gov/programs/benviron/waste/tide.htm>
- National Grid disponible en el sitio web público: [www.tidewatersite.com](http://www.tidewatersite.com)
- Archivo público en site RIDEMs, Office of Waste Management filed under Former Tidewater Coal Gasification Plant (Pawtucket), RIDEM Case No. 95-022. Cita para examinar el archivo comunicarse al RIDEM, Department of Technical and Customer Assistance, 235 Promenade Street, Providence, Rhode Island (401-222-4700 extension 7307, <http://www.dem.ri.gov/topics/filerevw.htm>)

National Grid planea actualmente programar una reunión pública durante la semana de Enero 14, 2013 para discutir los comentarios al borrador del PIP.

Si usted tiene comentarios con relación al mismo, por favor envíelos por escrito antes de la reunión mencionada a:

Joseph Martella  
R.I. Department of Environmental Management  
Office of Waste Management  
235 Promenade Street  
Providence, RI 02908-5767



Detalles relacionados con la reunión pública, incluyendo fecha, hora y dirección, serán puestas en el RIDEM (<http://www.dem.ri.gov/programs/benviron/waste/tide.htm>) y en el National Grid Tidewater ([www.tidewatersite.com](http://www.tidewatersite.com)) redes, así como correos y correos electrónicos a aquellas partes que figuran en la lista del Tidewater.

Personas interesadas pueden ser agregadas a esta lista vía correo electrónico a Michele Leone en el National Grid ([Michele.Leone@nationalgrid.com](mailto:Michele.Leone@nationalgrid.com)) con su nombre y dirección o llamando a Michele Leone al 1-781-907-3651.

Si le gustaría más información, o tiene alguna pregunta, por favor contacte a Michel Leone del National Grid al 781-907-3651.

Atentamente,

GZA GEOENVIRONMENTAL, INC.

A handwritten signature in blue ink, appearing to read 'Margaret S. Kilpatrick', is written over a light blue horizontal line.

Margaret S. Kilpatrick, P.E.  
Senior Project Manager

cc: Joe Martella, RIDEM  
Elizabeth Stone, RIDEM  
Michele Leone, National Grid

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This is an important notice. Please have it translated.

Este é um aviso importante. Queira mandá-lo traduzir.  
Este es un aviso importante. Sírvase mandarlo traducir.  
Avis important. Veuillez traduire immédiatement.

ĐÂY LÀ MỘT BẢN THÔNG CÁO QUAN TRỌNG  
XIN VUI LÒNG CHO DỊCH LẠI THÔNG CÁO ẤY  
Questa è un' informazione importante,  
si prega di tradurla.

Это очень важное сообщение.  
Пожалуйста, попросите чтобы  
вам его перевели.

January 14, 2013  
GZA File No. 05.0043654.20



530 Broadway  
Providence  
Rhode Island  
02909  
401-421-4140  
Fax: 401-751-8613  
<http://www.gza.com>

Re: Notice to Abutters and Interested Parties  
Public Meeting to Discuss DRAFT Public Involvement Plan  
Former Tidewater Facility  
Pawtucket, Rhode Island  
RIDEM Case No. 95-022

To Abutters and/or Interested Parties:

On behalf of The Narragansett Electric Company d/b/a National Grid (National Grid), GZA GeoEnvironmental, Inc. (GZA) has prepared this letter to inform you of a public meeting for the Tidewater Site to be held on **Tuesday, January 29<sup>th</sup> at 6 pm at the Francis J. Varieur Elementary School located at 486 Pleasant Street, Pawtucket, Rhode Island.**

The purpose of this public meeting will be to discuss public comments to the draft Public Involvement Plan (PIP). A PIP is an agreement between the party conducting response actions (in this case, National Grid) and the public about how information will be shared and how the public will be able to provide comments on plans for assessment and cleanup. A PIP is a “living” document and can be amended to reflect additional issues or challenges that may arise during the site cleanup process.

National Grid submitted the draft PIP to the Rhode Island Department of Environmental Management (RIDEM) on November 26, 2012 for review and comment. In addition, on November 27, 2012, National Grid issued a letter notifying abutters and interested parties that the draft PIP was available for review and comment. As described in this letter, a copy of the draft PIP can be obtained from the following information repositories:

- RIDEM publicly available website: <http://www.dem.ri.gov/programs/benviron/waste/tide.htm>
- National Grid publicly available website: [www.tidewatersite.com](http://www.tidewatersite.com)
- Publicly Accessible Site File at RIDEM’s Office of Waste Management filed under Former Tidewater Coal Gasification Plant (Pawtucket), RIDEM Case No. 95-022. Appointments to view the files can be made by contacting RIDEM, Department of Technical and Customer Assistance, 235 Promenade Street, Providence, Rhode Island (telephone: 401-222-4700 extension 7307, <http://www.dem.ri.gov/topics/filerevw.htm>).

Again, the public meeting will be held on Tuesday January 29, 2013 between the hours of 6:00 PM and 8:00 PM at the Francis J. Varieur Elementary School. Representatives of RIDEM, National Grid and GZA will attend the meeting to discuss comments on the draft PIP. This notice is being provided to abutting property owners, neighboring residents and interested parties on our mailing list. Should you be an owner of property that is leased, we request that you provide a copy of this letter to your tenants.

If you would like more information or have any questions, please contact Michele Leone of National Grid at 781-907-3651 or [michele.leone@nationalgrid.com](mailto:michele.leone@nationalgrid.com)

Very truly yours,

GZA GeoEnvironmental, Inc.

A handwritten signature in blue ink, appearing to read 'M. Kilpatrick', is written over a faint, light blue circular stamp or watermark.

Margaret S. Kilpatrick, P.E.  
Senior Project Manager

cc: Joe Martella and Elizabeth Stone, RIDEM  
Michele Leone, National Grid



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Это очень важное сообщение.  
Пожалуйста, попросите чтобы  
вам его перевели.

14 de Enero 2013  
GZA File No. 05.0043654.20



530 Broadway  
Providence  
Rhode Island  
02909  
401-421-4140  
Fax: 401-751-8613  
<http://www.gza.com>

Re: Notificación a partes interesadas  
Reunión pública para discutir el borrador del plan de Involucramiento  
Former Tidewater Facility  
Pawtucket, Rhode Island  
RIDEM Case No. 95-022

A asociados y/o partes interesadas

En nombre de la compañía Narragement Electric d/b/a National Grid, GZA GeoEnvironmental, Inc. (GZA) ha preparado esta carta para informarles de una reunión pública para el Sitio Tidewater a ser sostenida **el Martes Enero 29 a las 6 pm en el colegio Francis J. Variour Elementary, localizado en 486 Pleasant Street, Pawtucket, Rhode Island.**

El propósito de esta reunión será para discutir públicamente los comentarios del Plan de Involucramiento (PIP). El PIP es un acuerdo entre la parte conductor de respuestas de acción (en este caso National Grid) y el público, acerca de cómo será compartida la información y cómo el público estará disponible a proveer comentarios en los planes para asesoramiento y limpieza. A PIP es un documento “vivo” y puede ser modificado para reflejar comentarios y puntos adicionales o desafíos que puedan surgir durante el proceso de limpieza.

National Grid ha sometido el borrador de PIP al departamento de Medio ambiente de Rhode Island (RIDEM en noviembre 26, 2012, para revisión y comentarios. En adición, en Noviembre 27, 2012, National Grid hizo una carta notificando a los socios y partes interesadas sobre el borrador PIP que estaba disponible para revisión y comentarios. Como se describe en esta carta, una copia del borrador PIP puede obtenerse de los siguientes centros de información:

- RIDEM sitio disponible en la web: <http://www.dem.ri.gov/programs/benviron/waste/tide.htm>
- National Grid sitio disponible en la web: [www.tidewatersite.com](http://www.tidewatersite.com)
- El archive public en las oficinas de RIDEM archivado bajo el antiguo Tidewater Caso No. 95-022. Citas par aver los archives pueden ser hechas contactando el departamento técnico y servicio al cliente de RIDEM, 235 Promenade Street Providence, Rhode Island (teléfono 401-222-4700 extensión 7307, <http://www.dem.ri.gov/topics/filerevw.htm>).

Una vez más, la reunión pública será sostenida Martes Enero 29 a las 6 pm en el colegio Francis J. Variour Elementary, localizado en 486 Pleasant, Pawtucket, Rhode Island. Representantes de RIDEM, National Grid y GZA estarán presentes en la reunión para discutir los comentarios al borrador PIP. Esta notificación está siendo provista a los asociados dueños, residentes de barrio Street y partes interesadas de nuestra lista de correos. Si usted es dueño de una propiedad que está siendo alquilada, le requerimos que provea una copia de esta carta a sus inquilinos.

Si necesitan más información o tienen alguna pregunta, por favor contactar a Michele Leone al 781-907-3651 r [michele.leone@nationalgrid.com](mailto:michele.leone@nationalgrid.com)

Atentamente,

GZA GeoEnvironmental, Inc.

A handwritten signature in blue ink, appearing to read 'M. Kilpatrick', is written over a faint, illegible stamp or background.

Margaret S. Kilpatrick, P.E.  
Senior Project Manager

cc: Joe Martella and Elizabeth Stone, RIDEM  
Michele Leone, National Grid

**GZA**  
**GeoEnvironmental, Inc.**

*Engineers and  
Scientists*

March 4, 2013

GZA File No. 05.0043654.20



Re: Notice to Abutters and Interested Parties  
Community Outreach Session  
Former Tidewater Facility  
Pawtucket, Rhode Island  
RIDEM Case No. 95-022

To Abutters and/or Interested Parties:

On behalf of The Narragansett Electric Company d/b/a National Grid (National Grid), GZA GeoEnvironmental, Inc. (GZA) has prepared this letter to inform you of a community outreach session for the Tidewater Site to be held on **Wednesday, March 27<sup>th</sup>, from 6:30 p.m. to 8:30 p.m., at the Francis J. Varietur Elementary School located at 486 Pleasant Street, Pawtucket, Rhode Island.** This notice is being provided to abutting property owners, neighboring residents and interested parties on our mailing list. Should you be an owner of property that is leased, we request that you provide a copy of this letter to your tenants.

This community outreach session is part of National Grid's efforts to keep people informed of environmental activities at the Tidewater Site. The session format will be informal, featuring informational poster boards on a variety of Site-related topics, including history of the Tidewater Site, findings of the investigations, demonstrations of certain field equipment, description of current National Grid operations at the property, etc. Each poster board will be staffed by a representative from National Grid and/or GZA to answer questions. Representatives of the Rhode Island Department of Environmental Management (RIDEM) will also be present to answer questions from the public.

If you would like more information or have any questions, please contact Michele Leone of National Grid at 781-907-3651 or [michele.leone@nationalgrid.com](mailto:michele.leone@nationalgrid.com). To request a live translator for the session, please contact Michele by March 18<sup>th</sup>.

Very truly yours,

GZA GeoEnvironmental, Inc.

A handwritten signature in blue ink, appearing to read 'Margaret S. Kilpatrick', is written over a light blue circular stamp.

Margaret S. Kilpatrick, P.E.  
Senior Project Manager

cc: Joe Martella and Elizabeth Stone, RIDEM  
Michele Leone, National Grid

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## SAFETY AND SECURITY FIRST

### The Former Tidewater MGP and Electric Generation Site

Over the last several years, National Grid has worked under the direction of the Rhode Island Department of Environmental Management (RIDEM) to conduct environmental assessments at the former Tidewater Site and surrounding properties. These properties include eastern portions of the Max Read Athletic Field owned by the City of Pawtucket.

We know the community near the Tidewater Site, as well as parents and teachers at Varietur and other nearby schools, are concerned about byproducts created by a manufactured gas plant (MGP) that operated at the Site from the 1880s through the 1960s – and want to know more about how National Grid plans to remediate those byproducts. National Grid will continue to distribute these types of fact sheets in the community as part of the company's efforts to keep people informed of environmental activities at the Site.

### Completing Excavations Associated With Electrical Substation Work

National Grid has completed the majority of excavations associated with work designed to upgrade the existing electrical substation that operates on the Tidewater Site. Because assessments identified the presence of a small amount of contamination in soil on the Site, National Grid took steps to protect the health and safety of workers and the general public during the excavation work. These steps included:

- Installing informational bulletin boards at the ends of Tidewater Street and Bowles Court.
- Developing a color-coded system to notify residents and parents whether National Grid was conducting excavation activities on any given day. This information was posted daily to the bulletin boards.
- Monitoring the air for compounds and dust during active excavation activities at six locations around the perimeter of the Tidewater Site, including one fixed location near the residences on Thorton Street. National Grid posted the air monitoring data to the bulletin boards weekly.
- Implementing a phone message alert system to communicate time-sensitive information to interested parties, such as if air quality readings exceeded the project's conservative limits during earthwork activities.



*The majority of excavation associated with upgrading the existing Tidewater electrical substation is complete.*

### RIDEM Considering National Grid's Recommended Remedial Option

National Grid submitted a Remedial Alternative Evaluation (RAE) to RIDEM in July 2011 comparing four options for the Tidewater Site. We recommended moving forward with one of the options, which would involve:

- Installing two ground coverings, called engineered caps, across the site.
- Installing an underground steel wall to protect the Seekonk River from the possible movement of NAPLs. NAPLs are liquids that don't mix well with water, like vegetable oil.
- Removing MGP residuals from select areas of the Site.

The next step is for RIDEM to review the recommended National Grid plan.

### Implementing the First-of-Its-Kind Public Involvement Plan (PIP) in Rhode Island

Throughout our work at the Tidewater Site, both now and in the future, we're committed to sharing information. Many of the communications activities we've undertaken have been incorporated into the state's first Public Involvement Plan (PIP). A PIP is an agreement between a party conducting remediation activities and the public on how information will be shared with the community. It also addresses how the public can comment on plans for the Site. PIPs are tailored to specific sites. A PIP can be updated to reflect additional issues or challenges that may arise during the remedial process. Elements of National Grid's PIP for the Tidewater Site:

<p><b>Public Notice</b></p> <ul style="list-style-type: none"> <li>• Mailing list to announce public meetings, distribute fact sheets, etc.</li> <li>• Optional email list           <ul style="list-style-type: none"> <li>- Sign up at <a href="http://www.tidewatersite.com">www.tidewatersite.com</a></li> <li>- Or, send request to National Grid (see below contact information)</li> </ul> </li> </ul>	<p><b>Fact Sheets and Enhanced Communications</b></p> <ul style="list-style-type: none"> <li>• Fact sheets to communicate new information and/or achievement of significant milestones</li> <li>• Informational Bulletin Boards (placed at the ends of Tidewater Street and Bowles Court)</li> <li>• Phone Message Alert System</li> </ul>
<p><b>Community Meetings</b></p> <ul style="list-style-type: none"> <li>• Encourages participation by all to create an atmosphere of constructive, open dialogue</li> </ul>	<p><b>Information Repositories</b></p> <ul style="list-style-type: none"> <li>• Publicly Accessible Site File</li> <li>• RIDEM Case No. 95-022:           <ul style="list-style-type: none"> <li>- <a href="http://www.dem.ri.gov/topics/filerevw.htm">http://www.dem.ri.gov/topics/filerevw.htm</a></li> </ul> </li> <li>• Websites:           <ul style="list-style-type: none"> <li>- <a href="http://www.tidewatersite.com">www.tidewatersite.com</a></li> <li>- <a href="http://www.dem.ri.gov/programs/benviron/waste/tide.htm">http://www.dem.ri.gov/programs/benviron/waste/tide.htm</a></li> </ul> </li> <li>• Local Information: Repository           <ul style="list-style-type: none"> <li>- Pawtucket Library (13 Summer St.)</li> </ul> </li> <li>• Bulletin Boards: Tidewater Street and Bowles Court</li> </ul>

### Community Information Session Planned for March 2013

National Grid is working with RIDEM and GZA GeoEnvironmental, Inc. (GZA), an environmental consulting firm in Providence, to finalize the PIP and a remedial program for the Tidewater Site. National Grid will hold a community outreach session in March 2013 to present information about the Site. Following this session, National Grid and RIDEM will hold the initial community meeting within 60 days after RIDEM issues a Program Letter to National Grid for the Site. The Program Letter formally puts the findings of the Site Investigation Report (SIR) out for a public comment period.

ACTIVITY	TIME PERIOD
Community Outreach Session	Within 60 days of Draft PIP Meeting
Initial Community Meeting	Within 60 days of receipt of Program Letter from RIDEM – during Site Investigation Report (SIR) public comment period
Public Meeting on DRAFT Remedial Action Approval Plan (RAWP)	Within 12 months of receipt of Remedial Decision Letter
Submit RAWP for RIDEM approval	Within 6 months of DRAFT RAWP Meeting
Public Meeting prior to start of project	Minimum of 30 days prior to start of work
Public Meetings during remediation	Meeting schedule to be presented for discussion purposes once remedial schedule is developed and approved by RIDEM
Public Meeting upon completion of the project	Within 30 days following completion of remediation

#### If You Have Questions and Comments

For more information on National Grid's activities at the site, please contact Michele Leone at 781-907-3651 or [michele.leone@nationalgrid.com](mailto:michele.leone@nationalgrid.com) or visit our website at [www.tidewatersite.com](http://www.tidewatersite.com)

4 de marzo, 2013

Expediente GZA No. 05.0043654.20



Ref: Aviso a personas aledañas o partes interesadas  
Sesión de información a la comunidad  
sobre lo que anteriormente fueron las instalaciones Tidewater  
Pawtucket, Rhode Island  
Caso de RIDEM No. 95-022

A personas aledañas y/o partes interesadas:

530 Broadway  
Providence  
Rhode Island  
02909  
401-421-4140  
Fax: 401-751-8613  
<http://www.gza.com>

A nombre de The Narragansett Electric Company, conocida empresarialmente como National Grid (National Grid), GZA GeoEnvironmental, Inc. (GZA) ha preparado esta carta para informarle que el **miércoles, 27 de marzo** se llevará a cabo una sesión de información a la comunidad con referencia al sitio conocido como Tidewater. La sesión será de **6:30pm a 8:30pm en la escuela primaria Francis J. Varieur** localizada en el **486 de la calle Pleasant, Pawtucket, Rhode Island**. Este aviso se da a conocer tanto a los dueños de propiedades aledañas, como a los residentes del vecindario y a toda parte interesada que se encuentra inscrita en nuestra lista de distribución postal. Si usted es el dueño de una propiedad que da en alquiler, le pedimos que entregue a sus inquilinos una copia de esta carta.

Esta sesión de información a la comunidad es parte del esfuerzo que National Grid está haciendo para mantener informado al público de las actividades ambientales que tienen lugar en Tidewater. El formato de la sesión es informal; se presentarán carteleras sobre una variedad de tópicos relacionados al sitio, incluyendo: la historia del sitio Tidewater y los resultados de las investigaciones, también habrá demostraciones de cierto tipo de equipo de campo así como una descripción de las operaciones actuales que National Grid está haciendo en la propiedad, etc. Cada cartelera estará a cargo de un empleado de National Grid y/o GZA para contestar cualquier pregunta que pudiera surgir. También habrá empleados del Departamento de Administración Ambiental de Rhode Island (RIDEM, por sus siglas en inglés) para contestar cualquier pregunta que el público pudiera tener.

Si desea obtener más información o desea hacer alguna pregunta, por favor comuníquese con Michele Leone en National Grid al 781-907-3651 ó [michele.leone@nationalgrid.com](mailto:michele.leone@nationalgrid.com). Para solicitar la presencia de un intérprete para la sesión, por favor comuníquese con Michele a más tardar el 18 de marzo.

Atentamente,

GZA GeoEnvironmental, Inc.

A handwritten signature in blue ink, appearing to read 'Margaret S. Kilpatrick', is written over a faint, illegible printed name.

Margaret S. Kilpatrick, P.E.  
Administradora encargada del proyecto

cc: Joe Martella y Elizabeth Stone, RIDEM  
Michele Leone, National Grid



# LA PROTECCIÓN Y SEGURIDAD SON LO PRIMERO

El Sitio Conocido Anteriormente Como Tidewater MGP y El Sitio De Producción De Electricidad



En el transcurso de los últimos años, National Grid ha trabajado bajo la dirección del Departamento de Administración Ambiental de Rhode Island (RIDEM, por sus siglas en inglés) para llevar a cabo evaluaciones ambientales en el sitio conocido anteriormente como Tidewater y las propiedades aledañas. Estas propiedades incluyen ciertas partes en la zona este del Max Read Athletic Field, el cual pertenece a la ciudad de Pawtucket.

Sabemos que la comunidad cerca del sitio de Tidewater, así como los padres y maestros en Varietur y otras escuelas cercanas, están preocupados por los subproductos generados por la planta de gas (MGP, en inglés), la cual estuvo abierta en ese sitio desde la década de 1880 hasta la década de 1960, y desean obtener más información sobre cuáles son los planes que National Grid tiene para resolver la presencia de estos subproductos. National Grid va a continuar distribuyendo estas hojas de información en la comunidad como parte de los esfuerzos de la compañía para mantener informada a las personas en lo que se refiere a las actividades ambientales que se llevan a cabo en dicho sitio.

## Completar las excavaciones relacionadas al trabajo de la subestación eléctrica

National Grid ha completado la mayor parte de las excavaciones relacionadas con el trabajo diseñado para modernizar la actual subestación eléctrica que se encuentra en el sitio de Tidewater. Debido a que cuando se hizo la evaluación se detectó la presencia de una pequeña cantidad de contaminación en el suelo del sitio, National Grid tomó los pasos necesarios para proteger la salud y seguridad de los trabajadores y del público en general durante los trabajos de excavación. Estos pasos incluyeron:

- La instalación de carteleros o boletines de información al final de la calle Tidewater y Bowles Court.
- La creación de un sistema codificado con colores para notificar a los residentes y a los padres de familia si, en un día cualquiera, National Grid estaba haciendo excavaciones. Esta información se anunciaba a diario en las carteleros de información.
- El monitoreo del aire para identificar compuestos y polvo durante las actividades de excavación en los seis lugares alrededor del perímetro del sitio Tidewater, incluyendo un lugar fijo cerca de las residencias ubicadas en la calle Thorton. National Grid colocó semanalmente en los boletines la información del monitoreo del aire.
- La implementación de un sistema telefónico de mensajes de alerta para comunicar a personas claves la información que debe saberse de inmediato; por ejemplo: si la lectura de la calidad del aire durante las actividades de



Ya ha concluido la mayor parte de las excavaciones relacionadas a la modernización de la subestación eléctrica Tidewater.

excavación excede los límites conservadores establecidos para el proyecto.

## La manera en la que RIDEM tomará en cuenta la recomendación del plan de remediación presentado por National Grid

En julio, 2011, National Grid le presentó a RIDEM una Evaluación de Remediación Alterna (RAE, en inglés), en donde comparaba cuatro opciones para el sitio de Tidewater. Recomendamos seguir adelante con una de las opciones, la cual incluiría:

- Instalar en todo el sitio dos cubiertas de suelo, conocidas como capas fabricadas.
- Instalar una pared subterránea para proteger al río Seekonk de posibles movimientos de NAPL [fase de líquidos no acuosos]. Los NAPL son líquidos que no se mezclan muy bien con el agua, como por ejemplo: el aceite vegetal.
- Remover los residuos de MGP de áreas seleccionadas del sitio.

El próximo paso de RIDEM es revisar el plan recomendado por National Grid.

## La implementación del Plan de Participación del Público (PIP, en inglés), el primero en su tipo en Rhode Island

Nos comprometemos a compartir información durante el transcurso de nuestro trabajo en el sitio de Tidewater, tanto ahora como en el futuro. Muchas de las actividades de comunicación que hemos tenido las hemos incorporado al Plan de Participación del Público (PIP), el primero en el Estado. Un PIP es un acuerdo entre el público y la parte que está llevando

a cabo actividades de remediación sobre la manera en que la información se compartirá con la comunidad. También incluye la forma en la que el público puede presentar comentarios relacionados al plan que se tiene para el sitio. Cada PIP se redacta específicamente para un lugar. Un PIP se puede poner al día para que contenga los temas o retos adicionales que pudieran surgir durante el proceso de remediación.

Elementos del PIP de National Grid para el sitio de Tidewater:

<p><b>Notificación pública</b></p> <ul style="list-style-type: none"> <li>• Una lista de distribución postal para anunciar reuniones públicas, distribuir hojas de información, etc.</li> <li>• Lista opcional de correos electrónicos:             <ul style="list-style-type: none"> <li>- Inscríbese en <a href="http://www.tidewatersite.com">www.tidewatersite.com</a></li> <li>- También puede solicitar inscripción a National Grid (vea la información de contacto que a continuación se indica.)</li> </ul> </li> </ul>	<p><b>Hojas de información y aumento en la comunicación</b></p> <ul style="list-style-type: none"> <li>• Hojas de información para comunicar nueva información y/o el logro de acontecimientos importantes.</li> <li>• Información en boletines de información (colocados al final de la calle Tidewater y Bowles Court)</li> <li>• Un sistema telefónico de mensajes de alerta.</li> </ul>
<p><b>Reuniones comunitarias</b></p> <ul style="list-style-type: none"> <li>• Alienta la participación de todos para crear una atmósfera constructiva, abierta al diálogo.</li> </ul>	<p><b>Depositarios de información:</b></p> <ul style="list-style-type: none"> <li>• Acceso al público del expediente del sitio             <ul style="list-style-type: none"> <li>- RIDEM, Caso No. 95-022</li> <li>- <a href="http://www.dem.ri.gov/topics/filerevw.htm">http://www.dem.ri.gov/topics/filerevw.htm</a></li> </ul> </li> <li>• Sitios en la red             <ul style="list-style-type: none"> <li>- <a href="http://www.tidewatersite.com">www.tidewatersite.com</a></li> <li>- <a href="http://www.dem.ri.gov/programs/benviron/waste/tide.htm">http://www.dem.ri.gov/programs/benviron/waste/tide.htm</a></li> </ul> </li> <li>• Depositario local de la información             <ul style="list-style-type: none"> <li>- Biblioteca de Pawtucket (13 calle Summer)</li> </ul> </li> <li>• Boletines de información: calle Tidewater y Bowles Court</li> </ul>

### Una sesión de información a la comunidad programada para marzo del 2013

National Grid está trabajando con RIDEM y GZA GeoEnvironmental, Inc. (GZA), esta última una compañía consultora en Providence, para finalizar el PIP del programa de remediación del sitio de Tidewater. En marzo del 2013, National Grid tendrá una sesión de información a la comunidad para presentar información sobre el lugar. Al concluir la sesión, National Grid y RIDEM tendrán la primera reunión comunitaria en los siguientes 60 días después que RIDEM le emita a National Grid una Carta del Programa para el lugar. La Carta del Programa es el medio formal por el que se da a conocer la información contenida en el Informe de Investigación del Sitio (SIR) y así iniciar el periodo de comentarios públicos.

ACTIVIDAD	PERIODO DE TIEMPO
Sesión de información a la comunidad	Dentro de 60 días de la reunión para presentar el borrador del PIP
Primera reunión comunitaria	Dentro de 60 días de haberse recibido la Carta del Programa emitida por RIDEM – durante el periodo de comentarios públicos del Informe de Investigación del Sitio (SIR)
Reunión pública sobre el BORRADOR del Plan de Aprobación de Acciones de Remediación (RAWP, en inglés)	Dentro de los 12 meses de recibirse la Carta de Decisión de la Remediación
Se presenta el RAWP a RIDEM para su aprobación	Dentro de los 6 meses de la reunión sobre el BORRADOR de RAWP
Reunión pública antes de comenzar el proyecto	En un mínimo de 30 días antes de que comiencen los trabajos.
Reunión pública durante la remediación	Reunión programada a presentarse con propósitos de conversaciones una vez que RIDEM haya establecido y aprobado el horario de remediaciones
Reunión pública al completarse el proyecto	Dentro de los 30 días después de haberse completado la remediación

#### De haber preguntas o comentarios

Para obtener más información sobre las actividades de National Grid en ese lugar, por favor comuníquese con Michele Leone al 781-907-3651 ó [michele.leone@nationalgrid.com](mailto:michele.leone@nationalgrid.com) o visite nuestro sitio en la red [www.tidewatersite.com](http://www.tidewatersite.com)

04 de março de 2013

Arquivo GZA nº 05.0043654.20



Ref: Notificação aos Donos de Propriedades Vizinhas e Partes Interessadas  
Sessão de Divulgação à Comunidade  
Previamente, Tidewater Facility  
Pawtucket, Rhode Island  
Caso nº 95-022 RIDEM

Aos donos de propriedades vizinhas e/ou partes interessadas:

Em nome da Companhia Elétrica Narragansett, sob o nome comercial National Grid (National Grid), a GZA GeoEnvironmental, Inc. (GZA) preparou esta carta para informá-los sobre uma sessão de divulgação à comunidade em Tidewater Site a ser realizada na **quarta-feira, 27 de março, das 18:30h às 20:30h, na Francis J. Varieur Elementary School, localizada em 486 Pleasant Street, Pawtucket, Rhode Island.** Esta notificação está sendo fornecida a donos de propriedades vizinhas, residentes das vizinhanças e partes interessadas da nossa lista de divulgação. Caso você seja dono de uma propriedade que esteja alugada, solicitamos que forneça uma cópia desta carta aos seus inquilinos.

Esta sessão de divulgação à comunidade faz parte dos esforços da National Grid para manter as pessoas informadas sobre as atividades ambientais em Tidewater Site. O formato da sessão será informal, apresentando cartazes informativos sobre uma variedade de tópicos relacionados ao local, inclusive a história de Tidewater Site, os resultados das investigações, demonstrações de certos equipamentos do campo, descrição de operações atuais da National Grid na propriedade, etc. Para cada cartaz haverá um representante da National Grid e/ou da GZA para responder perguntas. Representantes do Departamento de Gestão Ambiental de Rhode Island (sigla em inglês, RIDEM) também estarão presentes para responder perguntas do público.

Caso queira mais informações ou tenha alguma dúvida, por favor, entre em contato com Michele Leone da National Grid pelo telefone 781-907-3651 ou [michele.leone@nationalgrid.com](mailto:michele.leone@nationalgrid.com). Para solicitar um intérprete para a sessão, por favor, entre em contato com a Michele até 18 de março.

Sinceramente,

GZA GeoEnvironmental, Inc.

A handwritten signature in blue ink, appearing to read 'Margaret S. Kilpatrick', is written over a light blue circular stamp or watermark.

Margaret S. Kilpatrick, P.E.  
Gerente Sênior de Projetos

cc: Joe Martella e Elizabeth Stone, RIDEM  
Michele Leone, National Grid

# SEGURANÇA EM PRIMEIRO LUGAR

o antigo Tidewater MGP e Electric Generation Site



Nos últimos anos, a National Grid tem trabalhado sob a direção do Departamento de Gestão Ambiental de Rhode Island (sigla em inglês, RIDEM) para conduzir avaliações ambientais no antigo Tidewater Site e nas propriedades vizinhas. Estas propriedades incluem porções a leste do Campo Atlético Max Read, de propriedade da Cidade de Pawtucket.

Sabemos que a comunidade próxima a Tidewater Site, assim como pais e professores em Varietur e outras escolas próximas, estão preocupados com os subprodutos criados por uma fábrica de gás manufaturado (sigla em inglês, MGP) que operou no local de 1880 até a década de 60, e querem saber mais sobre como a National Grid planeja remediar estes subprodutos. A National Grid continuará a distribuir estes tipos de boletins informativos na comunidade, como parte dos esforços da empresa para manter as pessoas informadas sobre as atividades ambientais no local.

## Conclusão das escavações associadas à obra da subestação elétrica

A National Grid concluiu a maior parte das escavações associadas à obra destinada a atualizar a subestação elétrica existente que opera em Tidewater Site. Uma vez que as avaliações identificaram a presença de uma pequena quantidade de contaminação no solo no local, a National Grid tomou medidas para proteger a saúde e a segurança dos trabalhadores e do público em geral durante o trabalho de escavação. Estas medidas incluíram:

- Instalação de quadros de boletins informativos nos finais da Tidewater Street e Bowles Court.
- Desenvolvimento de um sistema de codificação por cores para notificar os residentes e pais se a National Grid estava conduzindo atividades de escavação em qualquer dia. Esta informação era colocada diariamente nos quadros de boletins.
- Monitoramento do ar para compostos e pó durante as atividades de escavação em seis locais ao redor do perímetro de Tidewater Site, inclusive um local fixo perto das residências na Thornton Street. A National Grid colocou os dados sobre o monitoramento do ar nos quadros de boletins semanalmente.
- Implementação de um sistema de alerta de mensagens por telefone para comunicar informações urgentes às partes interessadas, como, por exemplo, se as leituras da qualidade do ar excedessem os limites conservadores do projeto durante as atividades de terraplenagem.



*A maior parte das escavações associadas à atualização da subestação elétrica existente de Tidewater está concluída.*

## RIDEM considerando a opção corretiva recomendada da National Grid

A National Grid submeteu uma Remedial Alternative Evaluation (RAE) – Avaliação Alternativa Corretiva ao RIDEM em julho de 2011, comparando quatro opções para Tidewater Site. Recomendamos prosseguir com uma das opções, que envolveria:

- Instalação de duas coberturas do solo, chamadas “engineered caps”, pelo site.
- Instalação de uma parede subterrânea para proteger o Rio Seekonk do possível movimento de NAPLs. NAPLs são líquidos que não se misturam bem com a água, como óleo vegetal.
- Remoção dos resíduos de MGP de áreas seletas do Site.

A próxima etapa é o RIDEM analisar o plano recomendado da National Grid.

## Implementação do Plano de Envolvimento Público (sigla em inglês, PIP), o primeiro deste tipo em Rhode Island

Por todo o nosso trabalho em Tidewater Site, agora e no futuro, nos comprometemos a compartilhar as informações. Muitas das atividades de comunicação que assumimos têm sido incorporadas ao primeiro Plano de Envolvimento Público (sigla em inglês, PIP) do estado. Um PIP é um acordo entre uma parte conduzindo atividades de remediação e o público sobre como as informações serão compartilhadas com a comunidade. Ele também aborda como o público pode comentar sobre os planos para o Site. Os PIPs são adaptados para locais específicos. Um PIP pode ser atualizado para refletir problemas ou desafios adicionais que possam surgir durante o processo corretivo.



Elementos do PIP da National Grid para Tidewater Site:

<p><b>Notificação pública:</b></p> <ul style="list-style-type: none"> <li>• Lista de divulgação para anunciar reuniões públicas, distribuir boletins informativos, etc.</li> <li>• Lista opcional de e-mail           <ul style="list-style-type: none"> <li>- Inscreva-se em <a href="http://www.tidewatersite.com">www.tidewatersite.com</a></li> <li>- Ou, envie solicitação à National Grid (veja informações de contato abaixo)</li> </ul> </li> </ul>	<p><b>Boletins informativos e comunicações avançadas:</b></p> <ul style="list-style-type: none"> <li>• Boletins informativos para comunicar novas informações e/ou conquista de marcos significativos</li> <li>• Quadros de boletins informativos (colocados no final da Tidewater Street e Bowles Court)</li> <li>• Sistema de alerta de mensagens por telefone</li> </ul>
<p><b>Reuniões com a comunidade:</b></p> <ul style="list-style-type: none"> <li>• Incentiva a participação de todos para criar uma atmosfera de diálogo aberto e construtivo</li> </ul>	<p><b>Repositórios de informações:</b></p> <ul style="list-style-type: none"> <li>• Arquivo do Site acessível publicamente           <ul style="list-style-type: none"> <li>- Caso nº 95-022 RIDEM</li> <li>- <a href="http://www.dem.ri.gov/topics/filerevw.htm">http://www.dem.ri.gov/topics/filerevw.htm</a></li> </ul> </li> <li>• Websites           <ul style="list-style-type: none"> <li>- <a href="http://www.tidewatersite.com">www.tidewatersite.com</a></li> <li>- <a href="http://www.dem.ri.gov/programs/benviron/waste/tide.htm">http://www.dem.ri.gov/programs/benviron/waste/tide.htm</a></li> </ul> </li> <li>• Repositório local de informações           <ul style="list-style-type: none"> <li>- Pawtucket Library (13 Summer St.)</li> </ul> </li> <li>• Quadros de boletins: Tidewater Street e Bowles Court</li> </ul>

### Sessão de informações à comunidade planejada para março de 2013

A National Grid está trabalhando com o RIDEM e a GZA GeoEnvironmental, Inc. (GZA), uma firma de consultoria ambiental em Providence, para finalizar o PIP e um programa corretivo para Tidewater Site. A National Grid realizará uma sessão de divulgação à comunidade em março de 2013 para apresentar as informações sobre o Site. Após esta sessão, a National Grid e o RIDEM realizarão uma reunião inicial com a comunidade dentro de 60 dias após o RIDEM emitir uma Carta do Programa à National Grid para o Site. A Carta do Programa divulga formalmente os resultados do Site Investigation Report (SIR) (Relatório de Investigação do Site) para um período para comentário público.

ATIVIDADE	PERÍODO DE TEMPO
Sessão de divulgação à comunidade	Dentro de 60 dias da reunião da Minuta do PIP
Reunião inicial com a comunidade	Dentro de 60 dias do recebimento da Carta do Programa do RIDEM– durante o período para comentários públicos relativo ao Relatório de Investigação do Site (SIR)
Reunião pública sobre a Minuta do Plano de Aprovação da Ação Corretiva (sigla em inglês, RAWP)	Dentro de 12 meses do recebimento da Carta de Decisão Corretiva
Submeter RAWP para aprovação do RIDEM	Dentro de 6 meses da Reunião da Minuta do RAWP
Reunião pública antes de iniciar o projeto	Mínimo de 30 dias antes do começo da obra
Reuniões públicas durante a remediação	Programação da reunião a ser apresentada para fins de discussão quando a programação corretiva estiver desenvolvida e aprovada pelo RIDEM
Reunião pública quando da conclusão do projeto	Dentro de 30 dias após a conclusão da remediação

#### Se você tem dúvidas e comentários

Para obter mais informações sobre as atividades da National Grid no local, por favor, entre em contato com Michele Leone pelo telefone 781-907-3651 ou [michele.leone@nationalgrid.com](mailto:michele.leone@nationalgrid.com), ou visite nosso website em [www.tidewatersite.com](http://www.tidewatersite.com).



This is an important notice. Please have it translated.

Este é um aviso importante. Queira mandá-lo traduzir.  
Este es un aviso importante. Sírvase mandarlo traducir.  
Avis important. Veuillez traduire immédiatement.

ĐÂY LÀ MỘT BẢN THÔNG CÁO QUAN TRỌNG  
XIN VUI LÒNG CHO DỊCH LẠI THÔNG CÁO ẤY  
Questa è un' informazione importante,  
si prega di tradurla.

Это очень важное сообщение.  
Пожалуйста, попросите чтобы  
вам его перевели.

June 13, 2013  
File No. 05.0043654.00-C



Re: Notice to Abutter  
Supplemental Site Investigation Work Plan Addendum – Soil Gas Quality  
Former Tidewater Facility  
Pawtucket, Rhode Island  
RIDEM Case No. 95-022

530 Broadway  
Providence  
Rhode Island  
02909  
401-421-4140  
Fax: 401-751-8613  
<http://www.gza.com>

Dear Abutter:

The purpose of this letter is to notify you that The Narragansett Electric Company d/b/a National Grid (National Grid) will be conducting additional environmental testing activities associated with the former Tidewater Manufactured Gas Plant (MGP) and the former Pawtucket No. 1 Power Station Site located at the ends of Tidewater and Merry Streets in Pawtucket, Rhode Island. This notice is being provided to abutting property owners, tenants and members of the Tidewater Site mailing list in accordance with requirements established in the Rhode Island Department of Environmental Management's (RIDEM) Rules and Regulation for the Investigation and Remediation of Hazardous Materials (Remediation Regulations). Should you be an owner of property that is leased, we request that you provide a copy of this letter to your tenants.

National Grid is going to test the air beneath the ground at the Site. We will insert about 23 probes into the ground on the property. In certain areas along the western portion of the property, the probes will be installed outside of the existing fence line on National Grid property. The samples will be collected in enclosed air sampling canisters. We will then test and analyze the air samples. Analysis of the air samples will be completed off-Site at a licensed laboratory.

Contractors will begin installing probes on or about July 1, 2013. It will take approximately 4 to 5 days to install the probes and another 2 to 3 days to collect the samples. The results of the evaluation will be submitted to RIDEM and posted to the Tidewater and RIDEM websites (<http://www.tidewatersite.com> and <http://www.dem.ri.gov/programs/benviron/waste/tide.htm>).

The proposed activities are further detailed in a *Supplemental Site Investigation Work Plan (SSIWP) Addendum* submitted to RIDEM in May 2013. There is a 14-day comment period, commencing with the date of delivery of this notice, during which the public may review RIDEM records pertaining to this property and submit written comments regarding the proposed investigation activities described herein. These activities will be conducted in accordance with RIDEM's Remediation Regulations and will be performed by GZA GeoEnvironmental, Inc. (GZA) on behalf of National Grid.

If you would like more information or have any questions, please contact Michele Leone of National Grid at 781-907-3651.

Very truly yours,

GZA GEOENVIRONMENTAL, INC.

A handwritten signature in blue ink, appearing to read 'MSK', is written over a light blue horizontal line.

Margaret S. Kilpatrick, P.E.  
Senior Project Manager

A handwritten signature in blue ink, appearing to read 'James J. Clark', is written over a light blue horizontal line.

James J. Clark, P.E.  
Principal

MSK/JJC:tja

cc: Joe Martella, RIDEM  
Michele Leone, National Grid

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Avis important. Veuillez traduire immédiatement.

ĐÂY LÀ MỘT BẢN THÔNG CÁO QUAN TRỌNG  
XIN VUI LÒNG CHO DỊCH LẠI THÔNG CÁO ẤY  
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si prega di tradurla.

Это очень важное сообщение.  
Пожалуйста, попросите чтобы  
вам его перевели.

13 de junio, 2013

Archivo No. 05.0043654.00-C



Ref. Aviso a vecinos aledaños  
Agregado del plan de trabajo de investigación adicional del sitio – Calidad del gas en el suelo  
Instalaciones conocidas anteriormente como Tidewater  
Pawtucket, Rhode Island  
RIDEM Caso No. 95-022

530 Broadway  
Providence  
Rhode Island  
02909  
401-421-4140  
Fax: 401-751-8613  
<http://www.gza.com>

Estimado vecino aledaño:

El propósito de esta carta es para informarle que The Narragansett Electric Company, conocida también como National Grid (National Grid), estará llevando a cabo otras actividades de evaluación con respecto a los lugares anteriormente conocidos como Tidewater Manufactured Gas Plant (MGP, por sus siglas en inglés) y la Pawtucket Planta de Energía No. 1, localizadas al final de las calles Tidewater y Merry en Pawtucket, Rhode Island. Para cumplir con los requisitos establecidos por el Departamento de Control Ambiental de Rhode Island (RIDEM) en su emisión de Reglas y Regulaciones para la Investigación y Remediación de Materiales Peligrosos (Regulaciones de Remediación), se envía este aviso a todos los dueños de propiedades aledañas, inquilinos y miembros de la lista de contactos por correo. Si usted fuera dueño de alguna propiedad que está en arrendamiento, le pedimos que entregue una copia de esta carta a sus inquilinos.

National Grid va a analizar el aire que se encuentra debajo del suelo en el sitio en cuestión. Se instalarán como 23 sondas en el suelo de la propiedad. En algunas áreas localizadas en la parte oeste de la propiedad, las sondas se instalarán fuera de la actual línea de la barda de la propiedad de National Grid. Las muestras se guardarán en contenedores cerrados para muestras de aire. Luego examinaremos y analizaremos las muestras de aire. El análisis de las muestras de aire se llevará a cabo en otro lugar, es decir, en un laboratorio autorizado.

Los contratistas comenzarán a instalar las sondas como para el 1 de julio, 2013. La instalación de las sondas les tomará aproximadamente de 4 a 5 días y coleccionar las muestras les llevará de 2 a 3 días. Los resultados de la evaluación serán presentados a RIDEM y se darán a conocer en los sitios cibernéticos de Tidewater y RIDEM (<http://www.tidewatersite.com> y <http://www.dem.ri.gov/programs/benviron/waste/tide.htm>)

Las actividades que se proponen están más detalladas en la publicación *Supplemental Site Investigation Work Plan (SSIWP) Addendum* presentado a RIDEM en mayo, 2013. Habrá un periodo de 14 días para comentarios, el cual comenzará en la fecha en que se entregue este aviso; durante ese periodo, el público puede revisar los archivos que RIDEM tiene con respecto a esta propiedad y podrá presentar comentarios escritos con respecto a las actividades de investigación que se proponen y que se describen aquí. Estas actividades se harán de acuerdo a las Regulaciones de Remediación de RIDEM y, a nombre de National Grid, serán llevadas a cabo por GZA GeoEnvironmental, Inc. (GZA).

Si usted desea obtener más información o desea hacer alguna pregunta, por favor comuníquese con Michele Leone de National Grid al 781-907-3651.

Muy atentamente,

GZA GEOENVIRONMENTAL, INC

Margaret S. Kilpatrick, P. E.  
Administradora encargada del proyecto

James J. Clark, P. E.  
Encargado

Cc: Joe Martella, RIDEM  
Michele Leone, National Grid

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вам его перевели.

13 de junho de 2013  
Arquivo nº 05.0043654.00-C



530 Broadway  
Providence  
Rhode Island  
02909  
401-421-4140  
Fax: 401-751-8613  
<http://www.gza.com>

Ref: Notificação aos donos de propriedades adjacentes  
Adendo ao Plano de Trabalho de Investigação Complementar no Local – Qualidade do Gás do Solo  
Previamente Tidewater Facility  
Pawtucket, Rhode Island  
Caso nº 95-022 RIDEM

Prezados donos de propriedades adjacentes,

O objetivo desta carta é notificá-los de que a Companhia Elétrica Narragansett, sob o nome comercial National Grid (National Grid) estará conduzindo atividades adicionais de testes ambientais associadas à antiga Fábrica de Gás Manufaturado Tidewater (sigla em inglês, MGP) e ao antigo local da Central Elétrica Pawtucket Nº 1, localizados no final das ruas Tidewater e Merry em Pawtucket, Rhode Island. Esta notificação está sendo enviada aos donos das propriedades adjacentes, inquilinos e membros da lista de mala direta da Tidewater Site, de acordo com os requisitos estabelecidos nas Regras e regulamentação para a investigação e remediação de materiais perigosos (Regulamentações de Remediação) do Departamento de Gestão Ambiental de Rhode Island (sigla em inglês, RIDEM). Caso seja dono de uma propriedade que está alugada, solicitamos que forneça uma cópia desta carta aos seus inquilinos.

A National Grid vai testar o ar sob o solo no local. Inseriremos cerca de 23 sondas no solo na propriedade. Em certas áreas ao longo da parte oeste da propriedade, as sondas serão instaladas fora da linha da cerca existente na propriedade da National Grid. As amostras serão coletadas em recipientes fechados para a amostragem de ar. Então, testaremos e analisaremos as amostras de ar. A análise das amostras de ar será concluída fora do local em um laboratório licenciado.

Os empreiteiros começarão a instalar as sondas em 1º de julho de 2013 ou próximo a esta data. Levará aproximadamente 4 a 5 dias para que as sondas sejam instaladas e outros 2 a 3 dias para a coleta das amostras. Os resultados da avaliação serão apresentados ao RIDEM e publicados nos sites da Tidewater e da RIDEM (<http://www.tidewatersite.com> e <http://www.dem.ri.gov/programs/benviron/waste/tide.htm>).

As atividades propostas estão mais detalhadas em um *Adendo ao Plano de Trabalho de Investigação Complementar no Local* (sigla em inglês, SSIWP) apresentado ao RIDEM em maio de 2013. Há um período de 14 dias para comentários, começando a partir da data da entrega desta notificação, durante o qual o público pode analisar os registros do RIDEM referentes a esta propriedade e apresentar comentários por escrito relativos às atividades propostas de investigação aqui descritas. Estas atividades serão conduzidas de acordo com as Regulamentações de Remediação do RIDEM e serão executadas pela GZA GeoEnvironmental, Inc. (GZA), em nome da National Grid.

Caso queiram mais informações ou tenham alguma dúvida, por favor, entrem em contato com Michele Leone da National Grid pelo telefone 781-907-3651.

Sinceramente,

GZA GEOENVIRONMENTAL, INC.

Margaret S. Kilpatrick, P.E.  
Gerente Sênior de Projetos

James J. Clark, P.E.  
Diretor

cc: Joe Martella, RIDEM  
Michele Leone, National Grid

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## TIDEWATER SITE

### Assessing the Quality of Soil Gas Near Neighboring Properties

Recently, National Grid completed additional environmental tests, specifically sampling and analyzing the air beneath the ground at the Former Tidewater Manufactured Gas Plant (MGP) and Electric Generation Site. These "soil gas" tests, conducted in response to community requests and under the direction of the Rhode Island Department of Environmental Management (RIDEM), measure the level of contaminants present in air below the ground.

The purpose of the testing was to measure the quality of soil gas at interior Site locations and along the property's western boundary in order to assess the quality of soil gas near neighboring properties. As described below, the testing results do not indicate any concerns related to migration of soil gas from the Tidewater Site.

#### The Testing Process

GZA GeoEnvironmental, Inc. (GZA), on behalf of National Grid, conducted the activities consistent with the *Supplemental Site Investigation Work Plan (SSIWP)*, which was submitted to RIDEM in May 2013. Forty-one soil gas probes were installed into the ground on the property between July 8th and 11th, and on August 22nd, 2013. In certain areas along the western portion of the property, the probes were installed outside of the existing fence line, but still on National Grid property. (Probe locations are shown on Figure 1 – Supplemental Site Investigations, Soil Gas Locations, which is posted on the Tidewater website at [www.tidewatersite.com/wp-content/uploads/2012/08/Figure-1.pdf](http://www.tidewatersite.com/wp-content/uploads/2012/08/Figure-1.pdf).)

During the collection of soil gas samples, 10 samples of air were also collected near the probe locations to measure background contaminant levels in the surrounding air. Five air samples were collected at the bulletin board located on Tidewater Street and another five at the bulletin board located at the end of Bowles Court.

After installing the probes, air was vacuumed from them into specially designed, sealed containers. Samples were then sent to a licensed laboratory for testing.

#### The Test Results

The results of the interior soil gas testing are consistent with previous soil and groundwater testing at the Tidewater Site. While certain compounds were detected at low levels, none of



*The results of the interior soil gas testing are consistent with previous soil and groundwater testing at the Tidewater Site. None of the perimeter soil gas readings exceeded regulatory criteria established by the Connecticut Department of Energy and Environmental Protection, which RIDEM uses.*

the 32 perimeter soil gas readings exceeded regulatory criteria established by the Connecticut Department of Energy and Environmental Protection (CTDEEP) for both residential and industrial/commercial settings. (Rhode Island does not have regulatory criteria for soil gas quality.) The results showed the closer the samples got to the boundary of the Site, the lower the concentrations of these compounds.

Results of the background air testing are summarized in Table 1 (Summary of Ambient Air Sampling), which is posted on the Tidewater website at [www.tidewatersite.com/wp-content/uploads/2012/08/Tables-08282013.pdf](http://www.tidewatersite.com/wp-content/uploads/2012/08/Tables-08282013.pdf), along with Table 2 (Summary of Perimeter Soil Gas Sampling), Table 3 (Summary of Interior Soil Gas Sampling) and Table 4 (Summary of QA/QC Sampling).

#### Next Steps

National Grid is committed to keeping neighbors, the nearby schools and parents informed about our activities at the Former Tidewater MGP and Electric Generation Site. The results of this testing do not suggest any concerns related to migration of soil gas from the Tidewater Site to the neighboring community. We are currently preparing a comprehensive report describing this soil gas study and the results. We anticipate submitting this report to RIDEM in mid- to late September 2013. This comprehensive report will also be posted on the Tidewater website ([www.tidewatersite.com](http://www.tidewatersite.com)).

#### Questions and Comments

If you would like more information on National Grid's activities at the Site, or would like to sign up for the Tidewater mailing list for future announcements, please contact Michele Leone from National Grid at 781-907-3651 or [michele.leone@nationalgrid.com](mailto:michele.leone@nationalgrid.com).



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## TIDEWATER SITE

Avaliando a qualidade do gás no solo perto das propriedades vizinhas

Recentemente, a National Grid concluiu testes ambientais adicionais, especificamente tirando amostras e analisando o ar sob o solo das antigas instalações da Tidewater Manufactured Gas Plant (MGP) e Electric Generation. Estes testes de “gás no solo”, conduzidos em atenção a solicitações da comunidade e sob a direção do Departamento de Gestão Ambiental de Rhode Island (RIDEM), medem o nível de contaminantes no ar sob o solo.

O objetivo do teste era medir a qualidade do gás no solo em locais no interior das instalações e ao longo da divisa oeste da propriedade a fim de avaliar a qualidade do gás no solo perto de propriedades vizinhas. Conforme descrito abaixo, os resultados do teste não indicaram nenhuma preocupação relacionada à migração do gás no solo da Tidewater.

### O processo do teste

A GZA GeoEnvironmental, Inc. (GZA), representando a National Grid, conduziu as atividades de modo consistente com o Adendo ao Plano de Trabalho de Investigação Complementar no Local, que foi apresentado ao RIDEM em maio de 2013. Foram instaladas 41 sondas para gás no solo da propriedade entre 8 e 11 de julho e em 22 de agosto de 2013. Em certas áreas ao longo da parte oeste da propriedade, as sondas foram instaladas fora da linha da cerca existente, mas ainda na propriedade da National Grid (os locais das sondas são mostrados na Figura 1 – Investigações Complementares no Local, Gás no Solo, que está publicada no site da Tidewater em [www.tidewatersite.com/wp-content/uploads/2012/08/Figure-1.pdf](http://www.tidewatersite.com/wp-content/uploads/2012/08/Figure-1.pdf)).

Durante a coleta das amostras do gás no solo, 10 amostras de ar também foram coletadas perto dos locais das sondas para medir os níveis de contaminação ambiental no ar circundante. Foram coletadas cinco amostras de ar em cada um dos quadros de boletins informativos localizados na Tidewater Street e no fim da Bowles Court.

Após a instalação das sondas, o ar foi aspirado para receptáculos vedados e especialmente projetados. As amostras foram então enviadas para um laboratório licenciado para testes.



*Os resultados do teste de gás no solo são consistentes com os testes anteriores do solo e da água subterrânea nas instalações da Tidewater. Nenhuma das leituras de gás no solo do perímetro excedeu os critérios normativos estabelecidos pelo Departamento de Energia e Proteção Ambiental de Connecticut, que o RIDEM usa.*

### Os resultados do teste

Os resultados do teste de gás no solo são consistentes com testes anteriores do solo e da água subterrânea nas instalações da Tidewater. Embora certos compostos tenham sido detectados em níveis baixos, nenhuma das 32 leituras de gás no solo do perímetro excedeu os critérios normativos estabelecidos pelo Departamento de Energia e Proteção Ambiental de Connecticut para ambientes residenciais e industriais/comerciais (Rhode Island não tem critérios normativos para a qualidade de gás no solo). Os resultados mostraram que, quanto mais perto da divisa das instalações, mais baixas as concentrações destes compostos nas amostras.

Os resultados dos testes de ar ambiental estão resumidos na Tabela 1 (Resumo da amostragem do ar ambiental), que está publicada no website da Tidewater em [www.tidewatersite.com/wp-content/uploads/2012/08/Tables-08282013.pdf](http://www.tidewatersite.com/wp-content/uploads/2012/08/Tables-08282013.pdf), junto com a Tabela 2 (Resumo da amostragem de gás no solo do perímetro), Tabela 3 (Resumo da amostragem de gás no solo) e Tabela 4 (Resumo da amostragem QA/QC – garantia de qualidade e controle de qualidade).

### Próximos passos

A National Grid compromete-se a manter os vizinhos, as escolas próximas e os pais informados a respeito das nossas atividades nas antigas instalações da Tidewater Manufactured Gas Plant (MGP) e Electric Generation. Os resultados deste



teste não sugerem quaisquer preocupações relacionadas à migração de gás no solo da Tidewater para a comunidade vizinha. Estamos preparando atualmente um relatório abrangente descrevendo este estudo do gás no solo e os resultados. Esperamos apresentar este relatório ao RIDEM do meio ao fim de setembro de 2013. Este relatório abrangente também será publicado no website da Tidewater ([www.tidewatersite.com](http://www.tidewatersite.com)).

#### Perguntas e Comentários

Se você gostaria de obter mais informações sobre as atividades da National Grid no local, ou gostaria de subscrever à lista de correspondência da Tidewater para futuras comunicações, por favor, entre em contato com Michele Leone da National Grid pelo telefone 781-907-3651 ou [michele.leone@nationalgrid.com](mailto:michele.leone@nationalgrid.com).

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## FÁBRICA TIDEWATER

### Evaluación de la calidad del gas del suelo cerca de propiedades vecinas

Recientemente, National Grid finalizó las pruebas ambientales adicionales, que constaron específicamente de la toma de muestras y el análisis del aire debajo del suelo en las antiguas instalaciones del Sitio Tidewater Manufactured Gas Plant (MGP) and Electric Generation Site. Estas pruebas de “gas del suelo”, llevadas a cabo en respuesta a los pedidos de la comunidad y bajo la dirección del Departamento de Gestión Ambiental de Rhode Island (RIDEM, por sus siglas en inglés), miden el nivel de contaminación presente en el aire debajo del suelo.

El objetivo de la prueba era medir la calidad del gas del suelo en el interior de la fábrica y a lo largo del límite oeste de la propiedad, a fin de evaluar la calidad del gas del suelo cerca de las propiedades vecinas. Como se indica a continuación, los resultados de las pruebas no presentan ningún indicio de fugas de gas del suelo del Sitio Tidewater.

#### El proceso de prueba

GZA GeoEnvironmental, Inc (GZA), en nombre de National Grid, llevó a cabo las actividades de acuerdo con el Plan de Trabajo de Investigación Complementario en el Sitio (SSIWP, por sus siglas en inglés), el cual fue presentado ante el RIDEM en mayo de 2013. Se instalaron en el suelo de la propiedad 41 sondas de gas del suelo entre el 8 y el 11 de Julio, y el 22 de agosto de 2013. En determinadas áreas a lo largo de la zona oeste de la propiedad, las sondas se instalaron por fuera del alambrado existente, pero aún en propiedad de National Grid. (Las zonas de las sondas se muestran en la Figura 1: Investigaciones complementarias en el Sitio, zonas de gas del suelo. La figura se encuentra publicada en el sitio web de Tidewater [www.tidewatersite.com/wp-content/uploads/2012/08/Figure-1.pdf](http://www.tidewatersite.com/wp-content/uploads/2012/08/Figure-1.pdf)).

Durante la recolección de muestras de gas del suelo, también se tomaron 10 muestras de aire cerca de las zonas de las sondas para medir los niveles básicos de contaminación en el ambiente. Se tomaron 5 muestras de aire en el tablero de anuncios ubicado en la calle Tidewater Street y otras cinco en el tablero de anuncios ubicado al final de Bowles Court.

Luego de instalar las sondas, el aire se extrajo por aspiración de las sondas y se colocó en recipientes especialmente



*Los resultados de las pruebas de gas del interior del suelo concuerdan con las pruebas de suelo y agua subterránea que se realizaron anteriormente en el Sitio de Tidewater. Ninguna de las lecturas de gas del suelo en el perímetro excedió los criterios regulatorios establecidos por el Departamento de Energía y Protección del Medio Ambiente de Connecticut, las cuales el RIDEM utiliza.*

diseñados y sellados. Después de esto, las muestras se enviaron a un laboratorio autorizado para realizar las pruebas.

#### Los resultados de las pruebas

Los resultados de las pruebas de gas del interior del suelo concuerdan con las pruebas de suelo y agua subterránea que se realizaron anteriormente en el Sitio de Tidewater. Si bien se detectaron niveles bajos de algunos compuestos, ninguna de las 32 lecturas de gas del suelo en el perímetro excedió los criterios regulatorios establecidos por el Departamento de Energía y Protección del Medio Ambiente (CTDEEP) para zonas residenciales e industriales/comerciales. (Rhode Island no tiene un criterio regulatorio para evaluar la calidad de gas del suelo). Los resultados mostraron que mientras más cerca se encontraban las muestras del límite del Sitio, menos concentración de estos compuestos presentaban.

Los resultados de las muestras básicas de aire se encuentran resumidos en la Tabla 1 (Resumen de muestras de aire ambiente), publicada en el sitio web [www.tidewatersite.com/wp-content/uploads/2012/08/Tables-08282013.pdf](http://www.tidewatersite.com/wp-content/uploads/2012/08/Tables-08282013.pdf), junto con la Tabla 2 (Resumen de muestras de gas del interior del suelo en el perímetro), en la Tabla 3 (Resumen de muestras de gas del interior del suelo) y en la Tabla 4 (Resumen de muestras de control de calidad).

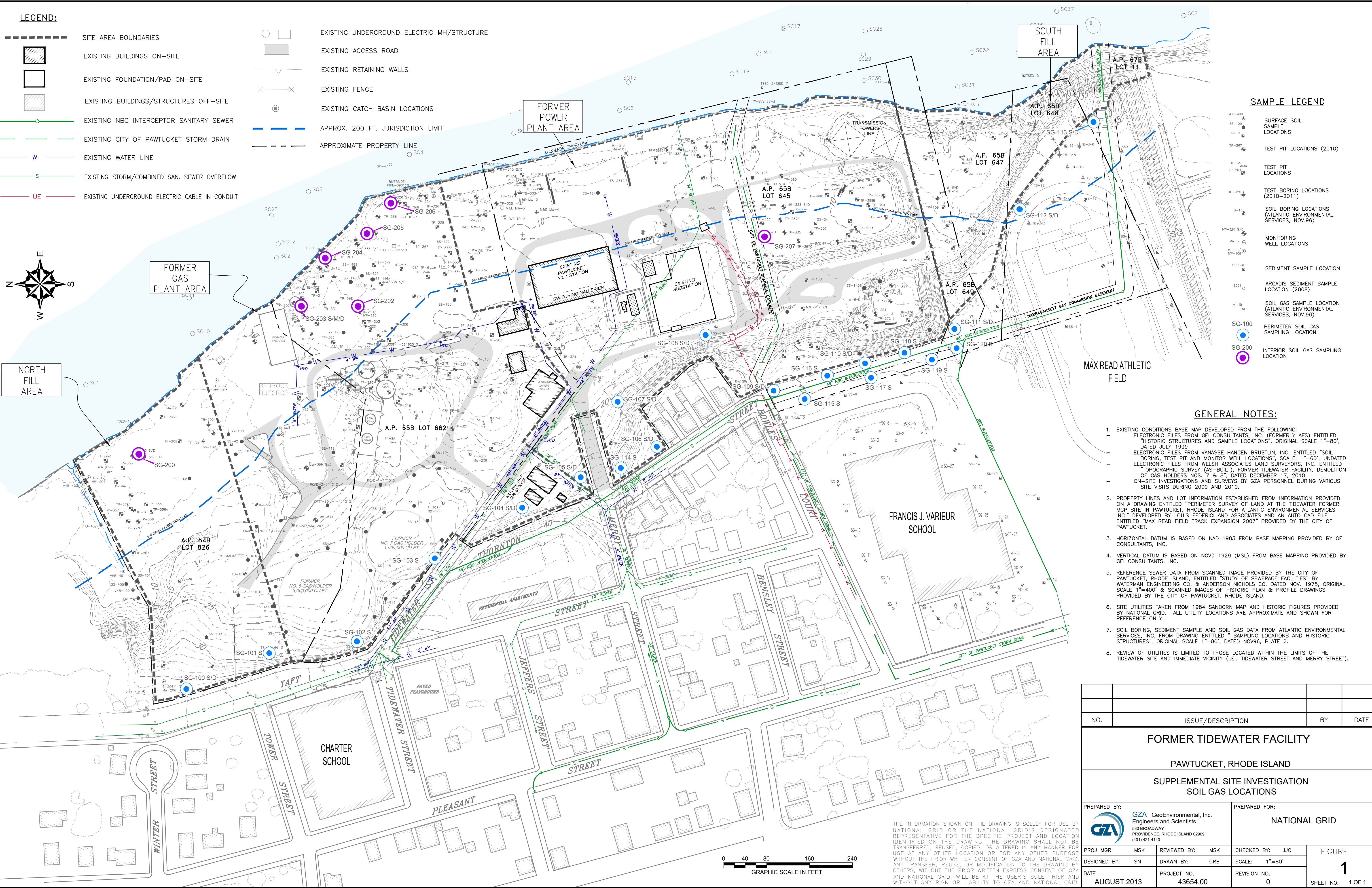
## Siguientes pasos

El compromiso de National Grid es mantener informados a los vecinos, a las escuelas cercanas y a los padres acerca de nuestras actividades en el antiguo Sitio Tidewater MGP and Electric Generation Site. Los resultados de estas pruebas no presentan indicios de fugas de gas del suelo del Sitio Tidewater hacia la comunidad vecina. Actualmente, estamos realizando un informe exhaustivo que describe este estudio de gas del suelo y los resultados. Prevemos la entrega del informe al RIDEM entre mediados y fines de septiembre de 2013. Este informe también estará disponible en el sitio web de Tidewater ([www.tidewatersite.com](http://www.tidewatersite.com)).

## Preguntas y comentarios

Para obtener más información sobre las actividades que realiza National Grid en el Sitio o para suscribirse a la lista de correo de Tidewater para recibir futuros anuncios, comuníquese con Michele Leone de National Grid al 781-907-3651 o escriba a [michele.leone@nationalgrid.com](mailto:michele.leone@nationalgrid.com).





- LEGEND:**
- SITE AREA BOUNDARIES
  - ▨ EXISTING BUILDINGS ON-SITE
  - EXISTING FOUNDATION/PAD ON-SITE
  - ▨ EXISTING BUILDINGS/STRUCTURES OFF-SITE
  - EXISTING NBC INTERCEPTOR SANITARY SEWER
  - EXISTING CITY OF PAWTUCKET STORM DRAIN
  - W— EXISTING WATER LINE
  - S— EXISTING STORM/COMBINED SAN. SEWER OVERFLOW
  - UE— EXISTING UNDERGROUND ELECTRIC CABLE IN CONDUIT
  - EXISTING UNDERGROUND ELECTRIC MH/STRUCTURE
  - ▭ EXISTING ACCESS ROAD
  - EXISTING RETAINING WALLS
  - X— EXISTING FENCE
  - EXISTING CATCH BASIN LOCATIONS
  - APPROX. 200 FT. JURISDICTION LIMIT
  - APPROXIMATE PROPERTY LINE

- SAMPLE LEGEND**
- VHB-400 SURFACE SOIL SAMPLE LOCATIONS
  - SS-100 TEST PIT LOCATIONS (2010)
  - TP-367 TEST PIT LOCATIONS
  - TP-34 TEST PIT LOCATIONS
  - TP-204 TEST PIT LOCATIONS
  - TB-205 TEST BORING LOCATIONS (2010-2011)
  - TB-15 TEST BORING LOCATIONS (ATLANTIC ENVIRONMENTAL SERVICES, NOV.96)
  - MW-320 S/D MONITORING WELL LOCATIONS
  - MW-3 MONITORING WELL LOCATIONS
  - B-159 MONITORING WELL LOCATIONS
  - MW-109 MONITORING WELL LOCATIONS
  - TS2D-6 SEDIMENT SAMPLE LOCATION
  - SC21 ARCADIS SEDIMENT SAMPLE LOCATION (2008)
  - SC-15 SOIL BORING LOCATIONS (ATLANTIC ENVIRONMENTAL SERVICES, NOV.96)
  - SG-100 PERIMETER SOIL GAS SAMPLING LOCATION
  - SG-200 INTERIOR SOIL GAS SAMPLING LOCATION

- GENERAL NOTES:**
- EXISTING CONDITIONS BASE MAP DEVELOPED FROM THE FOLLOWING: ELECTRONIC FILES FROM GEI CONSULTANTS, INC. (FORMERLY AES) ENTITLED "HISTORIC STRUCTURES AND SAMPLE LOCATIONS", ORIGINAL SCALE 1"=80', DATED JULY 1999. ELECTRONIC FILES FROM VANASSE HANGEN BRUSTLIN, INC. ENTITLED "SOIL BORING, TEST PIT AND MONITOR WELL LOCATIONS", SCALE: 1"=60', UNDATED. ELECTRONIC FILES FROM WELSH ASSOCIATES LAND SURVEYORS, INC. ENTITLED "TOPOGRAPHIC SURVEY (AS-BUILT), FORMER TIDEWATER FACILITY, DEMOLITION OF GAS HOLDERS NOS. 7 & 8", DATED DECEMBER 17, 2010. ON-SITE INVESTIGATIONS AND SURVEYS BY GZA PERSONNEL DURING VARIOUS SITE VISITS DURING 2009 AND 2010.
  - PROPERTY LINES AND LOT INFORMATION ESTABLISHED FROM INFORMATION PROVIDED ON A DRAWING ENTITLED "PERIMETER SURVEY OF LAND AT THE TIDEWATER FORMER MGP SITE IN PAWTUCKET, RHODE ISLAND FOR ATLANTIC ENVIRONMENTAL SERVICES INC." DEVELOPED BY LOUIS FEDERICI AND ASSOCIATES AND AN AUTO CAD FILE ENTITLED "MAX READ FIELD TRACK EXPANSION 2007" PROVIDED BY THE CITY OF PAWTUCKET.
  - HORIZONTAL DATUM IS BASED ON NAD 1983 FROM BASE MAPPING PROVIDED BY GEI CONSULTANTS, INC.
  - VERTICAL DATUM IS BASED ON NGVD 1929 (MSL) FROM BASE MAPPING PROVIDED BY GEI CONSULTANTS, INC.
  - REFERENCE SEWER DATA FROM SCANNED IMAGE PROVIDED BY THE CITY OF PAWTUCKET, RHODE ISLAND, ENTITLED "STUDY OF SEWERAGE FACILITIES" BY WATERMAN ENGINEERING CO. & ANDERSON NICHOLS CO. DATED NOV. 1975, ORIGINAL SCALE 1"=400' & SCANNED IMAGES OF HISTORIC PLAN & PROFILE DRAWINGS PROVIDED BY THE CITY OF PAWTUCKET, RHODE ISLAND.
  - SITE UTILITIES TAKEN FROM 1984 SANBORN MAP AND HISTORIC FIGURES PROVIDED BY NATIONAL GRID. ALL UTILITY LOCATIONS ARE APPROXIMATE AND SHOWN FOR REFERENCE ONLY.
  - SOIL BORING, SEDIMENT SAMPLE AND SOIL GAS DATA FROM ATLANTIC ENVIRONMENTAL SERVICES, INC. FROM DRAWING ENTITLED "SAMPLING LOCATIONS AND HISTORIC STRUCTURES", ORIGINAL SCALE 1"=80', DATED NOV96, PLATE 2.
  - REVIEW OF UTILITIES IS LIMITED TO THOSE LOCATED WITHIN THE LIMITS OF THE TIDEWATER SITE AND IMMEDIATE VICINITY (I.E., TIDEWATER STREET AND MERRY STREET).

NO.	ISSUE/DESCRIPTION	BY	DATE
<b>FORMER TIDEWATER FACILITY</b>			
PAWTUCKET, RHODE ISLAND			
SUPPLEMENTAL SITE INVESTIGATION SOIL GAS LOCATIONS			
PREPARED BY:	GZA GeoEnvironmental, Inc. Engineers and Scientists 550 BROADWAY PROVIDENCE, RHODE ISLAND 02909 (401) 421-4140	PREPARED FOR:	NATIONAL GRID
PROJ MGR:	MSK	REVIEWED BY:	MSK
DESIGNED BY:	SN	DRAWN BY:	CRB
DATE:	AUGUST 2013	PROJECT NO.:	43654.00
		CHECKED BY:	JJC
		SCALE:	1"=80'
		REVISION NO.:	0
			FIGURE <b>1</b>
			SHEET NO. 1 OF 1

THE INFORMATION SHOWN ON THE DRAWING IS SOLELY FOR USE BY NATIONAL GRID OR THE NATIONAL GRID'S DESIGNATED REPRESENTATIVE FOR THE SPECIFIC PROJECT AND LOCATION IDENTIFIED ON THE DRAWING. THE DRAWING SHALL NOT BE TRANSFERRED, REUSED, COPIED, OR ALTERED IN ANY MANNER FOR USE AT ANY OTHER LOCATION OR FOR ANY OTHER PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF GZA AND NATIONAL GRID. ANY TRANSFER, REUSE, OR MODIFICATION TO THE DRAWING BY OTHERS, WITHOUT THE PRIOR WRITTEN EXPRESS CONSENT OF GZA AND NATIONAL GRID, WILL BE AT THE USER'S SOLE RISK AND WITHOUT ANY RISK OR LIABILITY TO GZA AND NATIONAL GRID.



2013.8 - GZA GeoEnvironmental, Inc. - GZA\ENVA\43654.mxd\GZA\_DWGSS\SitePlan\Elemental\_Site\_Investigation\_Report.dwg - August 21, 2013 - 4:10pm - eocthorburn



**TABLE 1**  
**Summary of Ambient Air Sampling**  
**Former Tidewater Facility**  
**Pawtucket, Rhode Island**

EPA TO-15 Full List	2008 CT DEEP		Units	Varieur-72413	Tidewater-72513	Varieur-72513	Tidewater-72913	Varieur-72913	Tidewater-73013	Varieur-73013	Tidewater-73113	Varieur-73113	Tidewater-8113
	Residential Criteria	Industrial/Commercial Criteria		13G1044-02 Ambient Air 7/24/2013	13G1148-01 Ambient Air 7/25/2013	13G1148-02 Ambient Air 7/25/2013	13H0055-01 Ambient Air 7/29/2013	13H0055-02 Ambient Air 7/29/2013	13H0055-06 Ambient Air 7/30/2013	13H0055-07 Ambient Air 7/30/2013	13H0055-11 Ambient Air 7/31/2013	13H0055-12 Ambient Air 7/31/2013	13H0164-01 Ambient Air 8/1/2013
Acetone	378,030	500,000	µg/m <sup>3</sup>	31	12	17	18	42	33	34	31	35	26
Benzene	2,456	4,501	µg/m <sup>3</sup>	0.22	0.23	0.23	0.24	0.36	0.26	0.43	0.23	0.27	0.29
Benzyl chloride	NE	NE	µg/m <sup>3</sup>	<0.18	<0.18	<0.18	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26
Bromodichloromethane	1,340	1,340	µg/m <sup>3</sup>	<0.24	<0.12	<0.12	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Bromoform	NE	NE	µg/m <sup>3</sup>	<0.36	<0.36	<0.36	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52
Bromomethane	780	6,930	µg/m <sup>3</sup>	<0.14	<0.14	<0.14	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19
1,3-Butadiene	NE	NE	µg/m <sup>3</sup>	<0.078	<0.078	<0.078	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
2-Butanone (MEK)	377,771	500,000	µg/m <sup>3</sup>	5.7	<4.1	<4.1	<5.9	<5.9	<5.9	<5.9	<5.9	6.6	<5.9
Carbon Disulfide	NE	NE	µg/m <sup>3</sup>	<1.1	<1.1	<1.1	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6
Carbon Tetrachloride	1,300	1,300	µg/m <sup>3</sup>	0.45	0.45	0.45	0.26	0.43	0.46	0.46	0.46	0.43	0.44
Chlorobenzene	30,254	282,730	µg/m <sup>3</sup>	<0.16	<0.16	<0.16	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23
Chloroethane	378,671	500,000	µg/m <sup>3</sup>	<0.093	<0.093	<0.093	<0.13	<0.13	<0.13	0.22	<0.13	<0.13	<0.13
Chloroform	1,513	13,864	µg/m <sup>3</sup>	0.28	0.16	0.11	<0.12	0.16	<0.12	0.11	<0.12	<0.12	<0.12
Chloromethane	3,926	37,362	µg/m <sup>3</sup>	1.3	0.95	1	0.88	1	1	1.5	0.99	0.9	1.1
Cyclohexane	378,242	500,000	µg/m <sup>3</sup>	<0.12	<0.12	<0.12	<0.17	0.34	<0.17	0.29	<0.17	<0.17	<0.17
Dibromochloromethane	NE	NE	µg/m <sup>3</sup>	<0.30	<0.15	<0.15	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21
1,2-Dibromoethane (EDB)	NE	NE	µg/m <sup>3</sup>	<0.27	<0.13	<0.13	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19
1,2-Dichlorobenzene	60,527	500,000	µg/m <sup>3</sup>	<0.21	<0.21	<0.21	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
1,3-Dichlorobenzene	1,515	13,865	µg/m <sup>3</sup>	<0.21	<0.21	<0.21	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
1,4-Dichlorobenzene	18,156	33,277	µg/m <sup>3</sup>	<0.21	<0.21	<0.21	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Dichlorodifluoromethane (Freon 12)	75,770	500,000	µg/m <sup>3</sup>	2	1.2	1.2	1.1	1.7	1.4	1.4	1.8	1.8	2
1,1-Dichloroethane	15,147	141,568	µg/m <sup>3</sup>	<0.14	<0.071	<0.071	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,2-Dichloroethane	800	800	µg/m <sup>3</sup>	<0.14	<0.14	<0.14	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,1-Dichloroethylene	7,560	70,654	µg/m <sup>3</sup>	<0.14	<0.070	<0.070	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099
cis-1,2-Dichloroethylene	15,119	141,301	µg/m <sup>3</sup>	<0.14	<0.070	<0.070	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099
trans-1,2-Dichloroethylene	15,119	141,305	µg/m <sup>3</sup>	<0.14	<0.070	<0.070	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099
1,2-Dichloropropane	900	1,109	µg/m <sup>3</sup>	<0.16	<0.081	<0.081	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12
cis-1,3-Dichloropropene	900	2,774	µg/m <sup>3</sup>	<0.16	<0.080	<0.080	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
trans-1,3-Dichloropropene	900	2,774	µg/m <sup>3</sup>	<0.16	<0.080	<0.080	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
1,2-Dichloro-1,1,2,2-tetrafluoroethane (Freon 114)	NE	NE	µg/m <sup>3</sup>	<0.25	<0.25	<0.25	<0.35	<0.35	<0.35	<0.35	<0.35	<0.35	<0.35
1,4-Dioxane	NE	NE	µg/m <sup>3</sup>	<1.3	<1.3	<1.3	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8
Ethanol	NE	NE	µg/m <sup>3</sup>	8.8	4.1	4.5	6.5	25	12	9.5	11	10	8.8
Ethyl Acetate	377,762	500,000	µg/m <sup>3</sup>	1.4	0.29	0.67	0.52	6.4	0.72	0.18	0.5	<0.18	<0.18
Ethylbenzene	43,882	410,364	µg/m <sup>3</sup>	<0.15	<0.15	<0.15	<0.22	<0.22	<0.22	0.61	<0.22	<0.22	<0.22
4-Ethyltoluene	NE	NE	µg/m <sup>3</sup>	<0.17	<0.17	<0.17	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
Heptane	NE	NE	µg/m <sup>3</sup>	0.3	0.16	0.16	<0.14	0.61	<0.20	0.86	<0.20	<0.20	0.23
Hexachlorobutadiene	NE	NE	µg/m <sup>3</sup>	<0.37	<0.37	<0.37	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53
Hexane	302,386	500,000	µg/m <sup>3</sup>	<4.9	<4.9	<4.9	<7.0	12	<7.0	<7.0	<7.0	<7.0	<7.0
2-Hexanone (MBK)	NE	NE	µg/m <sup>3</sup>	0.77	0.6	0.48	0.88	0.88	1.3	0.58	1.8	1.8	1.1
Indane	NE	NE	µg/m <sup>3</sup>	<0.44	<0.44	<0.44	<0.62	<0.62	<0.62	<0.62	<0.62	<0.62	<0.62
Indene	NE	NE	µg/m <sup>3</sup>	<0.44	<0.44	<0.44	<0.63	<0.63	<0.63	<0.63	<0.63	<0.63	<0.63
Isopropanol	NE	NE	µg/m <sup>3</sup>	<3.4	<3.4	<3.4	<4.9	8.5	<4.9	<4.9	<4.9	<4.9	<4.9
Isopropylbenzene (Cumene)	29,545	54,140	µg/m <sup>3</sup>	<0.44	<0.44	<0.44	<0.62	<0.62	<0.62	<0.62	<0.62	<0.62	<0.62
Methyl tert-Butyl Ether (MTBE)	129,581	263,819	µg/m <sup>3</sup>	<0.13	<0.13	<0.13	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18
Methylene Chloride	2,269	23,554	µg/m <sup>3</sup>	2.2	6.7	2.8	4.4	6.7	5.2	3.2	1.9	<1.7	<1.7
4-Methyl-2-pentanone (MIBK)	378,459	500,000	µg/m <sup>3</sup>	<0.14	0.22	0.18	0.28	0.42	0.52	<0.20	0.67	0.68	0.4
Naphthalene	1,284	12,203	µg/m <sup>3</sup>	0.37	0.27	0.22	0.29	0.48	0.39	0.31	<0.26	<0.26	0.3
Propene	NE	NE	µg/m <sup>3</sup>	<2.4	<2.4	<2.4	<3.4	<3.4	<3.4	<3.4	<3.4	<3.4	<3.4
Styrene	45,420	425,838	µg/m <sup>3</sup>	<0.15	<0.15	<0.15	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21
1,1,2,2-Tetrachloroethane	1,400	1,386	µg/m <sup>3</sup>	<0.24	<0.12	<0.12	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Tetrachloroethylene	3,783	6,936	µg/m <sup>3</sup>	<0.24	<0.17	<0.17	<0.12	<0.17	<0.17	<0.17	0.21	<0.17	0.18
Tetrahydrofuran	605	5,814	µg/m <sup>3</sup>	<0.10	<0.10	<0.10	<0.15	0.2	<0.15	<0.15	<0.15	<0.15	<0.15
Toluene	130,246	500,000	µg/m <sup>3</sup>	0.71	0.85	0.8	0.58	1.3	0.72	2.8	0.77	1.1	0.91
1,2,4-Trichlorobenzene	1,135	11,093	µg/m <sup>3</sup>	<0.26	<0.26	<0.26	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37
1,1,1-Trichloroethane	115,135	500,000	µg/m <sup>3</sup>	<0.19	<0.096	<0.096	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14
1,1,2-Trichloroethane	1,100	1,100	µg/m <sup>3</sup>	<0.19	<0.096	<0.096	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14
Trichloroethylene	1,100	1,385	µg/m <sup>3</sup>	0.28	<0.094	<0.094	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13
Trichlorofluoromethane (Freon 11)	378,591	500,000	µg/m <sup>3</sup>	1.8	1.1	1.2	0.99	1.6	1.6	1.5	1.6	1.4	1.6
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	378,304	500,000	µg/m <sup>3</sup>	1.4	0.58	0.6	0.46	0.9	1.5	1.4	1.9	0.99	1.7
1,2,4-Trimethylbenzene	2,578	23,601	µg/m <sup>3</sup>	<0.17	<0.17	<0.17	<0.25	<0.25	<0.25	0.75	<0.25	<0.25	<0.25
1,3,5-Trimethylbenzene	2,578	23,601	µg/m <sup>3</sup>	<0.17	<0.17	<0.17	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
Vinyl Acetate	86,247	500,000	µg/m <sup>3</sup>	<2.5	<2.5	<2.5	<3.5	<3.5	<3.5	<3.5	<3.5	<3.5	<3.5
Vinyl Chloride	500	1,249	µg/m <sup>3</sup>	<0.090	<0.045	<0.045	<0.064	<0.064	<0.064	<0.064	<0.064	<0.064	<0.064
m&p-Xylene	44,967	421,609	µg/m <sup>3</sup>	<0.30	0.33	<0.30	<0.43	0.48	<0.43	1.8	<0.43	<0.43	<0.43
o-Xylene	44,967	421,609	µg/m <sup>3</sup>	<0.15	<0.15	<0.15	<0.22	<0.22	<0.22	0.74	<0.22	<0.22	<0.22

Notes:  
 NE - Not Established  
 CTDEEP residential and industrial/commercial criteria is obtained from the 2008 Connecticut Remediation Criteria: Technical Support Document Appendix J published by the CTDEEP.  
 CTDEEP Criteria is presented in the 2008 Connecticut Remediation Criteria: Technical Support Document Appendix J - Table I6 and J8 in parts per million (ppmv) with adjustments presented for analytical capabilities and maximum values. To obtain criteria in mg/m<sup>3</sup> units, ppmv criteria is multiplied by the molecular weight of the compound divided by 24.45 (a conversion factor). The mg/m<sup>3</sup> criteria is multiplied by 1000 to obtain µg/m<sup>3</sup>.



**TABLE 2**  
**Summary of Perimeter Soil Gas Sampling**  
**Former Tidewater Facility**  
**Pawtucket, Rhode Island**

	2008 CT DEEP		Units	SG-1005	SG-100D	SG-1015	SG-1025	SG-1035	SG-1045	SG-104D	SG-1055	SG-105D	SG-1065	SG-106D	SG-1075	SG-107D	SG-1085	SG-108D	SG-1095	SG-109D	SG-1105	SG-1105	SG-110D
	Residential Criteria	Industrial/Commercial Criteria		13H0055-04 Soil Gas 7/29/2013	13H0055-03 Soil Gas 7/29/2013	13H0055-08 Soil Gas 7/30/2013	13H0055-09 Soil Gas 7/30/2013	13H0055-10 Soil Gas 7/30/2013	13G1044-05 Soil Gas 7/24/2013	13G1044-04 Soil Gas 7/24/2013	13H0055-13 Soil Gas 7/31/2013	13G1148-07 Soil Gas 7/25/2013	13G1148-06 Soil Gas 7/25/2013	13G1148-05 Soil Gas 7/25/2013	13G1148-04 Soil Gas 7/25/2013	13G1148-03 Soil Gas 7/25/2013	13H0055-14 Soil Gas 7/31/2013	13H0055-15 Soil Gas 7/31/2013	13H0055-16 Soil Gas 7/31/2013	13H0055-17 Soil Gas 7/31/2013	13H0055-18 Soil Gas 7/31/2013	13H0096-01 Soil Gas 8/26/2013	13H0055-19 Soil Gas 7/31/2013
<b>EPA TO-3C</b>																							
Helium	NE	NE	%	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
<b>EPA TO-15 Full List</b>																							
Acetone	378,030	500,000	µg/m <sup>3</sup>	42	18	6	17	16	13	36	<4.8	34	16	59	37	13	42	51	16	12	47	7.5	61
Benzene	2,456	4,501	µg/m <sup>3</sup>	<0.16	<0.16	<0.16	0.23	0.24	<0.16	<0.16	1700	0.2	<0.16	0.24	<0.16	<0.16	0.69	1.8	0.48	0.19	2.7	1.9	0.38
Benzyl chloride	NE	NE	µg/m <sup>3</sup>	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26
Bromodichloromethane	1,340	1,340	µg/m <sup>3</sup>	0.37	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Bromoform	NE	NE	µg/m <sup>3</sup>	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52
Bromomethane	780	6,930	µg/m <sup>3</sup>	<0.19	<0.19	<0.19	<0.19	<0.19	0.21	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19
1,3-Butadiene	NE	NE	µg/m <sup>3</sup>	0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
2-Butanone (MEK)	377,771	500,000	µg/m <sup>3</sup>	6.7	<5.9	<5.9	<5.9	<5.9	<5.9	7.1	<5.9	6.5	<5.9	14	7.9	<5.9	8.3	6.2	<5.9	<5.9	9.2	<5.9	13
Carbon Disulfide	NE	NE	µg/m <sup>3</sup>	<1.6	18	11	<1.6	<1.6	<1.6	2.2	<1.6	<1.6	<1.6	2.1	4	<1.6	2.9	2.6	<1.6	<1.6	3.6	2.4	2.7
Carbon Tetrachloride	1,300	1,300	µg/m <sup>3</sup>	0.54	<0.16	<0.16	<0.16	<0.16	<0.16	<0.31	<0.16	0.18	<0.31	0.24	0.36	0.31	0.59	0.84	0.27	0.36	0.44	0.43	0.18
Chlorobenzene	30,254	282,730	µg/m <sup>3</sup>	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23
Chloroethane	378,671	500,000	µg/m <sup>3</sup>	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13
Chloroform	1,513	13,864	µg/m <sup>3</sup>	63	0.35	2.6	0.6	0.45	0.48	0.27	2.8	0.28	0.31	2.5	3	2.7	23	0.69	0.72	0.4			
Chloromethane	3,926	37,362	µg/m <sup>3</sup>	0.33	0.43	<0.21	<0.21	0.23	0.47	<0.21	<0.21	0.24	<0.21	0.39	<0.21	<0.21	0.27	<0.21	0.5	<0.21	1.2	1	<0.21
Cyclohexane	378,242	500,000	µg/m <sup>3</sup>	<0.17	0.33	<0.17	<0.17	<0.17	<0.17	860	0.47	<0.17	<0.17	<0.17	<0.17	<0.17	0.83	<0.17	<0.17	<0.17	0.29	<0.17	<0.17
Dibromochloromethane	NE	NE	µg/m <sup>3</sup>	<0.21	<0.21	<0.21	<0.21	<0.21	<0.43	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21
1,2-Dibromoethane (EDB)	NE	NE	µg/m <sup>3</sup>	<0.19	<0.19	<0.19	<0.19	<0.19	<0.38	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19
1,2-Dichlorobenzene	60,527	500,000	µg/m <sup>3</sup>	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
1,3-Dichlorobenzene	1,515	13,865	µg/m <sup>3</sup>	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
1,4-Dichlorobenzene	18,156	33,277	µg/m <sup>3</sup>	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	1.7
Dichlorodifluoromethane (Freon 12)	75,770	500,000	µg/m <sup>3</sup>	1.9	1.6	1.8	1.9	2.2	2.8	3.6	<0.25	1.2	1.4	2	2.1	3.3	3.7	1.6	2	1.9	1.9	2	2
1,1-Dichloroethane	15,147	141,568	µg/m <sup>3</sup>	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.43	<0.10	<0.10	<0.10
1,2-Dichloroethane	800	800	µg/m <sup>3</sup>	<0.10	<0.10	<0.10	<0.10	<0.10	<0.20	<0.10	0.8	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,1-Dichloroethylene	7,560	70,654	µg/m <sup>3</sup>	<0.099	<0.099	<0.099	<0.099	<0.099	<0.20	<0.20	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099
cis-1,2-Dichloroethylene	15,119	141,301	µg/m <sup>3</sup>	<0.099	<0.099	<0.099	<0.099	<0.099	<0.20	<0.099	0.29	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	6.5	<0.099	<0.099	27
trans-1,2-Dichloroethylene	15,119	141,305	µg/m <sup>3</sup>	<0.099	<0.099	<0.099	<0.099	<0.099	<0.20	<0.20	<0.099	<0.099	<0.099	0.18	<0.099	<0.099	<0.099	<0.099	<0.099	0.83	<0.099	<0.099	1
1,2-Dichloropropane	900	1,109	µg/m <sup>3</sup>	<0.12	<0.12	<0.12	<0.12	<0.12	<0.23	<0.23	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12
cis-1,3-Dichloropropene	900	2,774	µg/m <sup>3</sup>	<0.11	<0.11	<0.11	<0.11	<0.11	<0.23	<0.23	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
trans-1,3-Dichloropropene	900	2,774	µg/m <sup>3</sup>	<0.11	<0.11	<0.11	<0.11	<0.11	<0.23	<0.23	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
1,2-Dichloro-1,1,2,2-tetrafluoroethane (Freon 114)	NE	NE	µg/m <sup>3</sup>	<0.35	<0.35	<0.35	<0.35	<0.35	<0.35	<0.35	<0.35	<0.35	<0.35	<0.35	<0.35	<0.35	<0.35	<0.35	<0.35	<0.35	<0.35	<0.35	<0.35
1,4-Dioxane	NE	NE	µg/m <sup>3</sup>	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8
Ethanol	NE	NE	µg/m <sup>3</sup>	5.5	6.9	<3.8	4	<3.8	<3.8	4.7	<3.8	5.9	<3.8	11	4.4	<3.8	6.9	3.9	<3.8	<3.8	5.3	<3.8	12
Ethyl Acetate	377,762	500,000	µg/m <sup>3</sup>	1.1	<0.18	2.3	2.2	1.9	0.48	0.5	<0.18	0.61	<0.18	0.69	0.3	<0.18	<0.18	1.6	1	1.6	1.2	0.58	1.4
Ethylbenzene	43,882	410,364	µg/m <sup>3</sup>	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	40	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	0.42	<0.22	0.75
4-Ethyltoluene	NE	NE	µg/m <sup>3</sup>	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	35	<0.25	<0.25	<0.25	<0.25	<0.25	0.28	<0.25	<0.25	<0.25	0.5	<0.25	0.58
Heptane	NE	NE	µg/m <sup>3</sup>	0.26	<0.20	<0.20	<0.20	<0.20	<0.20	1100	<0.20	<0.20	0.48	<0.20	<0.20	0.65	1.4	<0.20	<0.20	0.25	<0.20	<0.20	0.57
Hexachlorobutadiene	NE	NE	µg/m <sup>3</sup>	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53
Hexane	302,386	500,000	µg/m <sup>3</sup>	<7.0	<7.0	<7.0	<7.0	<7.0	<7.0	2100	<7.0	<7.0	<7.0	<7.0	<7.0	<7.0	<7.0	<7.0	<7.0	<7.0	<7.0	<7.0	<7.0
2-Hexanone (MBK)	NE	NE	µg/m <sup>3</sup>	2.3	1.3	<0.20	0.33	0.34	0.58	1.5	<0.20	2.3	0.65	4.3	2.9	0.68	2.9	2	0.73	0.52	2.7	0.31	3.7
Indane																							

**TABLE 2**  
**Summary of Perimeter Soil Gas Sampling**  
 Former Tidewater Facility  
 Pawtucket, Rhode Island

	2008 CT DEEP		Units	SG-1115	SG-111D	SG-112S	SG-112D	SG-113S	SG-113D	SG-114S	SG-115S	SG-116S	SG-117S	SG-118S	SG-119S	SG-120S
	Residential Criteria	Industrial/Commercial Criteria		13H0055-20 Soil Gas 7/31/2013	13H0055-21 Soil Gas 7/31/2013	13H0164-15 Soil Gas 8/1/2013	13H0164-12 Soil Gas 8/1/2013	13H0164-02 Soil Gas 8/1/2013	13H0164-16 Soil Gas 8/1/2013	13H0996-02 Soil Gas 8/23/2013	13H0917-04 Soil Gas 8/23/2013	13H0917-05 Soil Gas 8/23/2013	13H0917-03 Soil Gas 8/22/2013	13H0996-03 Soil Gas 8/23/2013	13H0917-02 Soil Gas 8/22/2013	13H0917-01 Soil Gas 8/22/2013
<b>EPA TO-3C</b>																
Helium	NE	NE	%	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
<b>EPA TO-15 Full List</b>																
Acetone	378,030	500,000	µg/m <sup>3</sup>	24	42	26	15	20	13	12	36	23	25	26	47	52
Benzene	2,456	4,501	µg/m <sup>3</sup>	<0.16	0.23	5.8	2.2	<0.16	0.29	0.67	1.3	1.2	1.1	1.5	4.4	6.2
Benzyl chloride	NE	NE	µg/m <sup>3</sup>	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26
Bromodichloromethane	1,340	1,340	µg/m <sup>3</sup>	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Bromoform	NE	NE	µg/m <sup>3</sup>	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52
Bromomethane	780	6,930	µg/m <sup>3</sup>	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19
1,3-Butadiene	NE	NE	µg/m <sup>3</sup>	<0.11	<0.11	2.3	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
2-Butanone (MEK)	377,771	500,000	µg/m <sup>3</sup>	<5.9	6.9	<5.9	<5.9	<5.9	<5.9	<5.9	<5.9	<5.9	<5.9	<5.9	<5.9	<5.9
Carbon Disulfide	NE	NE	µg/m <sup>3</sup>	14	3.4	41	2.3	5.7	2.4	<1.6	3.1	2.1	3	3.3	8.1	7.4
Carbon Tetrachloride	1,300	1,300	µg/m <sup>3</sup>	0.36	0.44	6	5.3	0.96	2.2	<0.16	<0.16	0.36	<0.16	<0.16	0.34	1
Chlorobenzene	30,254	282,730	µg/m <sup>3</sup>	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23
Chloroethane	378,671	500,000	µg/m <sup>3</sup>	<0.13	<0.13	0.19	0.13	<0.066	<0.066	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13
Chloroform	1,513	13,864	µg/m <sup>3</sup>	0.83	1	11	1.2	1.2	0.76	2.1	1.6	0.25	0.68	1.4	35	
Chloromethane	3,926	37,362	µg/m <sup>3</sup>	0.22	<0.21	4.5	0.58	0.36	0.52	<0.21	<0.21	0.31	<0.21	0.22	0.21	<0.21
Cyclohexane	378,242	500,000	µg/m <sup>3</sup>	<0.17	<0.17	1.6	0.46	<0.17	0.34	<0.17	<0.17	<0.17	<0.17	<0.17	0.62	<0.17
Dibromochloromethane	NE	NE	µg/m <sup>3</sup>	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21
1,2-Dibromoethane (EDB)	NE	NE	µg/m <sup>3</sup>	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19
1,2-Dichlorobenzene	60,527	500,000	µg/m <sup>3</sup>	<0.30	<0.30	<0.30	0.47	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
1,3-Dichlorobenzene	1,515	13,865	µg/m <sup>3</sup>	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
1,4-Dichlorobenzene	18,156	33,277	µg/m <sup>3</sup>	<0.30	<0.30	2.4	0.72	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Dichlorodifluoromethane (Freon 12)	75,770	500,000	µg/m <sup>3</sup>	1.6	2.2	1.5	1.4	1.4	1.4	1.8	1.9	1.8	1.9	1.8	1.8	1.9
1,1-Dichloroethane	15,147	141,568	µg/m <sup>3</sup>	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.24
1,2-Dichloroethane	800	800	µg/m <sup>3</sup>	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,1-Dichloroethylene	7,560	70,654	µg/m <sup>3</sup>	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099
cis-1,2-Dichloroethylene	15,119	141,301	µg/m <sup>3</sup>	0.28	34	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	0.33
trans-1,2-Dichloroethylene	15,119	141,305	µg/m <sup>3</sup>	<0.099	0.96	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099	0.71
1,2-Dichloropropane	900	1,109	µg/m <sup>3</sup>	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12
cis-1,3-Dichloropropene	900	2,774	µg/m <sup>3</sup>	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
trans-1,3-Dichloropropene	900	2,774	µg/m <sup>3</sup>	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
1,2-Dichloro-1,1,2,2-tetrafluoroethane (Freon 114)	NE	NE	µg/m <sup>3</sup>	<0.35	<0.35	<0.35	<0.35	<0.35	<0.35	<0.35	<0.35	<0.35	<0.35	<0.35	<0.35	<0.35
1,4-Dioxane	NE	NE	µg/m <sup>3</sup>	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8
Ethanol	NE	NE	µg/m <sup>3</sup>	6.9	4.6	<3.8	<3.8	<3.8	<3.8	<3.8	<3.8	<3.8	<3.8	<3.8	<3.8	<3.8
Ethyl Acetate	377,762	500,000	µg/m <sup>3</sup>	<0.18	2.6	2.2	2.4	0.65	1.5	6.3	28	31	27	21	32	36
Ethylbenzene	43,882	410,364	µg/m <sup>3</sup>	<0.22	<0.22	17	1	0.26	0.5	0.88	1.2	0.96	1.5	5	2.8	
4-Ethyltoluene	NE	NE	µg/m <sup>3</sup>	<0.25	<0.25	2.4	0.5	0.81	0.28	0.47	0.61	1	0.56	0.65	1.4	1.1
Heptane	NE	NE	µg/m <sup>3</sup>	<0.20	0.33	1.2	<0.20	<0.20	<0.20	0.24	0.25	0.26	<0.20	0.77	0.38	
Hexachlorobutadiene	NE	NE	µg/m <sup>3</sup>	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53
Hexane	302,386	500,000	µg/m <sup>3</sup>	<7.0	<7.0	<7.0	<7.0	<7.0	<7.0	<7.0	<7.0	<7.0	<7.0	<7.0	<7.0	<7.0
2-Hexanone (MBK)	NE	NE	µg/m <sup>3</sup>	0.94	2.3	0.28	0.35	0.49	0.46	0.43	0.52	0.6	0.48	0.61	0.82	1.3
Indane	NE	NE	µg/m <sup>3</sup>	<0.62	<0.62	0.93	<0.62	<0.62	<0.62	<0.62	<0.62	1.6	<0.62	0.65	0.79	1
Indene	NE	NE	µg/m <sup>3</sup>	<0.63	<0.63	8.3	2.1	<0.63	<0.63	<0.63	<0.63	4.9	0.82	1.4	0.87	3.9
Isopropanol	NE	NE	µg/m <sup>3</sup>	<4.9	<4.9	<4.9	<4.9	<4.9	<4.9	<4.9	<4.9	<4.9	<4.9	<4.9	<4.9	<4.9
Isopropylbenzene (Cumene)	29,545	54,140	µg/m <sup>3</sup>	<0.62	<0.62	0.81	<0.62	<0.62	<0.62	<0.62	<0.62	<0.62	<0.62	<0.62	<0.62	<0.62
Methyl tert-Butyl Ether (MTBE)	129,581	263,819	µg/m <sup>3</sup>	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18
Methylene Chloride	2,269	23,554	µg/m <sup>3</sup>	7.5	<1.7	6.4	3.4	<1.7	2.2	<1.7	2.2	<1.7	2.6	<1.7	<1.7	<1.7
4-Methyl-2-pentanone (MIBK)	378,459	500,000	µg/m <sup>3</sup>	0.36	1	<0.20	<0.20	<0.20	0.27	<0.20	<0.20	<0.20	0.29	<0.20	<0.20	0.43
Naphthalene	1,284	12,203	µg/m <sup>3</sup>	1.9	1	14	16	0.82	1.4	13	10	14	12	12	11	26
Propene	NE	NE	µg/m <sup>3</sup>	<3.4	4.7	27	<3.4	<3.4	<3.4	<3.4	<3.4	<3.4	<3.4	<3.4	7.6	<3.4
Styrene	45,420	425,838	µg/m <sup>3</sup>	<0.21	<0.21	15	0.61	<0.21	1.4	0.24	0.36	1.4	0.69	0.98	3.3	7.9
1,1,2,2-Tetrachloroethane	1,400	1,386	µg/m <sup>3</sup>	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Tetrachloroethylene	3,783	6,936	µg/m <sup>3</sup>	330	650	3	<0.17	39	7.5	120	170	8	4	17	29	2000
Tetrahydrofuran	605	5,814	µg/m <sup>3</sup>	<0.15	0.29	0.22	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15
Toluene	130,246	500,000	µg/m <sup>3</sup>	0.29	0.55	11	5.3	0.26	1	4.8	13	8.8	10	22	25	
1,2,4-Trichlorobenzene	1,135	11,093	µg/m <sup>3</sup>	<0.37	<0.37	0.7	1.6	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37
1,1,1-Trichloroethane	115,135	500,000	µg/m <sup>3</sup>	0.86	3.1	0.63	5.6	1.3	1	0.56	1.5	<0.14	<0.14	<0.14	0.29	11
1,1,2-Trichloroethane	1,100	1,100	µg/m <sup>3</sup>	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14
Trichloroethylene	1,100	1,385	µg/m <sup>3</sup>	12	160	<0.13	<0.13	1.3	0.47	3						

**TABLE 3**  
**Summary of Interior Soil Gas Sampling**  
 Former Tidewater Facility  
 Pawtucket, Rhode Island

	2008 CT DEEP		Units	SG-200	SG-202	SG-203S	SG-203M	SG-203D	SG-204	SG-205	SG-206	SG-207
	Residential Criteria	Industrial/Commercial Criteria		13H0164-09 Soil Gas 8/2/2013	13H0164-05 Soil Gas 8/2/2013	13H0164-06 Soil Gas 8/2/2013	13H0164-07 Soil Gas 8/2/2013	13H0164-08 Soil Gas 8/2/2013	13H0164-10 Soil Gas 8/2/2013	13H0164-14 Soil Gas 8/1/2013	13H0164-13 Soil Gas 8/1/2013	13H0164-11 Soil Gas 8/1/2013
<b>EPA TO-3C</b>												
Helium	NE	NE	%	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
<b>EPA TO-15 Full List</b>												
Acetone	378,030	500,000	µg/m <sup>3</sup>	19	16	<190	<190	<95	<95	11	<95	8.2
Benzene	2,456	4,501	µg/m <sup>3</sup>	7.2	1.3	4000	2400	45	930	<0.16	4.9	1.8
Benzyl chloride	NE	NE	µg/m <sup>3</sup>	<0.26	<0.26	<10	<10	<5.2	<5.2	<0.26	<5.2	<0.26
Bromodichloromethane	1,340	1,340	µg/m <sup>3</sup>	<0.17	<0.17	<6.7	<6.7	<3.4	<3.4	<0.17	<3.4	<0.17
Bromoform	NE	NE	µg/m <sup>3</sup>	<0.52	<0.52	<21	<21	<10	<10	<0.52	<10	<0.52
Bromomethane	780	6,930	µg/m <sup>3</sup>	<0.19	<0.19	<7.8	<7.8	<3.9	<3.9	<0.19	<3.9	<0.19
1,3-Butadiene	NE	NE	µg/m <sup>3</sup>	<0.11	<0.11	<4.4	<4.4	<2.2	<2.2	<0.11	<2.2	<0.11
2-Butanone (MEK)	377,771	500,000	µg/m <sup>3</sup>	<5.9	<5.9	<240	<240	<120	<120	<5.9	<120	<5.9
Carbon Disulfide	NE	NE	µg/m <sup>3</sup>	2.1	17	110	<62	<31	<31	19	<31	2.6
Carbon Tetrachloride	1,300	1,300	µg/m <sup>3</sup>	0.57	<0.16	<6.3	<6.3	<3.1	<3.1	0.56	<3.1	<0.16
Chlorobenzene	30,254	282,730	µg/m <sup>3</sup>	<0.23	<0.23	<9.2	<9.2	<4.6	<4.6	<0.23	<4.6	<0.23
Chloroethane	378,671	500,000	µg/m <sup>3</sup>	0.15	<0.066	<2.6	<2.6	<1.3	<1.3	<0.066	<1.3	<0.066
Chloroform	1,513	13,864	µg/m <sup>3</sup>	11	0.5	<4.9	<4.9	<2.4	<2.4	0.66	<2.4	0.39
Chloromethane	3,926	37,362	µg/m <sup>3</sup>	0.53	0.84	<8.3	<8.3	6.9	<4.1	<0.21	<4.1	0.47
Cyclohexane	378,242	500,000	µg/m <sup>3</sup>	0.89	<0.17	15	<6.9	<3.4	<3.4	0.82	360	1.3
Dibromochloromethane	NE	NE	µg/m <sup>3</sup>	<0.21	<0.21	<8.5	<8.5	<4.3	<4.3	<0.21	<4.3	<0.21
1,2-Dibromoethane (EDB)	NE	NE	µg/m <sup>3</sup>	<0.19	<0.19	<7.7	<7.7	<3.8	<3.8	<0.19	<3.8	<0.19
1,2-Dichlorobenzene	60,527	500,000	µg/m <sup>3</sup>	<0.30	<0.30	<12	<12	<6.0	<6.0	<0.30	<6.0	<0.30
1,3-Dichlorobenzene	1,515	13,865	µg/m <sup>3</sup>	<0.30	<0.30	<12	<12	<6.0	<6.0	<0.30	<6.0	<0.30
1,4-Dichlorobenzene	18,156	33,277	µg/m <sup>3</sup>	<0.30	<0.30	<12	<12	<6.0	<6.0	<0.30	<6.0	<0.30
Dichlorodifluoromethane (Freon 12)	75,770	500,000	µg/m <sup>3</sup>	1.5	1.2	<9.9	<9.9	<4.9	<4.9	1.6	<4.9	1.5
1,1-Dichloroethane	15,147	141,568	µg/m <sup>3</sup>	<0.10	<0.10	<4.0	<4.0	<2.0	<2.0	<0.10	<2.0	<0.10
1,2-Dichloroethane	800	800	µg/m <sup>3</sup>	<0.10	<0.10	<4.0	<4.0	<2.0	<2.0	<0.10	<2.0	<0.10
1,1-Dichloroethylene	7,560	70,654	µg/m <sup>3</sup>	<0.099	<0.099	<4.0	<4.0	<2.0	<2.0	<0.099	<2.0	<0.099
cis-1,2-Dichloroethylene	15,119	141,301	µg/m <sup>3</sup>	<0.099	<0.099	<4.0	<4.0	<2.0	<2.0	<0.099	<2.0	<0.099
trans-1,2-Dichloroethylene	15,119	141,305	µg/m <sup>3</sup>	<0.099	<0.099	<4.0	<4.0	<2.0	<2.0	<0.099	<2.0	<0.099
1,2-Dichloropropane	900	1,109	µg/m <sup>3</sup>	<0.12	<0.12	<4.6	<4.6	<2.3	<2.3	<0.12	<2.3	<0.12
cis-1,3-Dichloropropene	900	2,774	µg/m <sup>3</sup>	<0.11	<0.11	<4.5	<4.5	<2.3	<2.3	<0.11	<2.3	<0.11
trans-1,3-Dichloropropene	900	2,774	µg/m <sup>3</sup>	<0.11	<0.11	<4.5	<4.5	<2.3	<2.3	<0.11	<2.3	<0.11
1,2-Dichloro-1,1,2,2-tetrafluoroethane (Freon 114)	NE	NE	µg/m <sup>3</sup>	<0.35	<0.35	<14	<14	<7.0	<7.0	<0.35	<7.0	<0.35
1,4-Dioxane	NE	NE	µg/m <sup>3</sup>	<1.8	<1.8	<72	<72	<36	<36	<1.8	<36	<1.8
Ethanol	NE	NE	µg/m <sup>3</sup>	4.1	<3.8	<150	<150	<75	<75	<3.8	<75	<3.8
Ethyl Acetate	377,762	500,000	µg/m <sup>3</sup>	0.94	<0.18	<7.2	<7.2	<3.6	<3.6	0.83	<3.6	<0.18
Ethylbenzene	43,882	410,364	µg/m <sup>3</sup>	5.3	<0.22	13000	6800	190	730	0.47	24	0.36
4-Ethyltoluene	NE	NE	µg/m <sup>3</sup>	6.6	<0.25	6000	3000	260	110	4.8	6.9	0.44
Heptane	NE	NE	µg/m <sup>3</sup>	0.3	<0.20	55	41	<4.1	7.9	0.84	360	<0.20
Hexachlorobutadiene	NE	NE	µg/m <sup>3</sup>	<0.53	<0.53	<21	<21	<11	<11	<0.53	<11	<0.53
Hexane	302,386	500,000	µg/m <sup>3</sup>	<7.0	<7.0	<280	<280	<140	<140	<7.0	390	<7.0
2-Hexanone (MBK)	NE	NE	µg/m <sup>3</sup>	0.75	0.53	<8.2	<8.2	<4.1	<4.1	<0.20	<4.1	<0.20
Indane	NE	NE	µg/m <sup>3</sup>	18	<0.62	8200	3100	570	240	5.8	<12	1.4
Indene	NE	NE	µg/m <sup>3</sup>	18	<0.63	160000	20000	8900	940	26	<13	1.2
Isopropanol	NE	NE	µg/m <sup>3</sup>	<4.9	<4.9	<200	<200	<98	<98	<4.9	<98	<4.9
Isopropylbenzene (Cumene)	29,545	54,140	µg/m <sup>3</sup>	0.67	<0.62	460	200	<12	<12	<0.62	<12	<0.62
Methyl tert-Butyl Ether (MTBE)	129,581	263,819	µg/m <sup>3</sup>	<0.18	<0.18	<7.2	<7.2	<3.6	<3.6	<0.18	<3.6	<0.18
Methylene Chloride	2,269	23,554	µg/m <sup>3</sup>	3.8	2.8	<69	<69	<35	<35	2.5	<35	2.4
4-Methyl-2-pentanone (MIBK)	378,459	500,000	µg/m <sup>3</sup>	<0.20	<0.20	<8.2	<8.2	<4.1	<4.1	<0.20	<4.1	<0.20
Naphthalene	1,284	12,203	µg/m <sup>3</sup>	140	9.4	52000	36000	8100	1300	530	8.5	370
Propene	NE	NE	µg/m <sup>3</sup>	<3.4	<3.4	<140	<140	<69	<69	<3.4	<69	<3.4
Styrene	45,420	425,838	µg/m <sup>3</sup>	30	<0.21	29000	44000	1800	820	0.55	<4.3	0.38
1,1,2,2-Tetrachloroethane	1,400	1,386	µg/m <sup>3</sup>	<0.17	<0.17	<6.9	<6.9	<3.4	<3.4	<0.17	<3.4	<0.17
Tetrachloroethylene	3,783	6,936	µg/m <sup>3</sup>	3	6	<6.8	80	100	20	9.2	13	1.5
Tetrahydrofuran	605	5,814	µg/m <sup>3</sup>	0.48	0.48	<5.9	<5.9	<2.9	<2.9	<0.15	<2.9	<0.15
Toluene	130,246	500,000	µg/m <sup>3</sup>	20	0.46	95000	100000	1300	12000	0.41	13	2.9
1,2,4-Trichlorobenzene	1,135	11,093	µg/m <sup>3</sup>	<0.37	<0.37	<15	<15	<7.4	<7.4	<0.37	<7.4	<0.37
1,1,1-Trichloroethane	115,135	500,000	µg/m <sup>3</sup>	2.5	<0.14	<5.5	<5.5	<2.7	<2.7	0.5	<2.7	0.51
1,1,2-Trichloroethane	1,100	1,100	µg/m <sup>3</sup>	<0.14	<0.14	<5.5	<5.5	<2.7	<2.7	<0.14	<2.7	<0.14
Trichloroethylene	1,100	1,385	µg/m <sup>3</sup>	<0.13	<0.13	<5.4	<5.4	<2.7	<2.7	<0.13	<2.7	<0.13
Trichlorofluoromethane (Freon 11)	378,591	500,000	µg/m <sup>3</sup>	1.6	1.2	<11	<11	<5.6	<5.6	3.8	<5.6	2.4
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	378,304	500,000	µg/m <sup>3</sup>	0.6	0.61	<15	<15	<7.7	<7.7	0.83	<7.7	0.73
1,2,4-Trimethylbenzene	2,578	23,601	µg/m <sup>3</sup>	56	0.96	57000	23000	3000	1300	15	6.3	5.7
1,3,5-Trimethylbenzene	2,578	23,601	µg/m <sup>3</sup>	57	0.36	33000	10000	1200	880	8.5	5.5	3
Vinyl Acetate	86,247	500,000	µg/m <sup>3</sup>	<3.5	<3.5	<140	<140	<70	<70	<3.5	<70	<3.5
Vinyl Chloride	500	1,249	µg/m <sup>3</sup>	<0.064	<0.064	<2.6	<2.6	<1.3	<1.3	<0.064	<1.3	<0.064
m&p-Xylene	44,967	421,609	µg/m <sup>3</sup>	48	<0.43	170000	76000	3800	6300	1.5	41	4.5
o-Xylene	44,967	421,609	µg/m <sup>3</sup>	29	0.26	84000	30000	1500	2200	1.6	22	1.4

Notes:

NE - Not Established

Red text indicates an exceedance of CTDEEP residential criteria

A bold bordered cell indicates an exceedance of CTDEEP industrial/commercial criteria.

CTDEEP residential and industrial/commercial criteria is obtained from the 2008 Connecticut Remediation Criteria: Technical Support Document Appendix J published by the CTDEEP.

CTDEEP Criteria is presented in the 2008 Connecticut Remediation Criteria: Technical Support Document Appendix J - Table J6 and J8 in parts per million (ppmv) with adjustments presented for analytical capabilities and maximum values. To obtain criteria in mg/m<sup>3</sup> units, ppmv criteria is multiplied by the molecular weight of the compound divided by 24.45 (a conversion factor). The mg/m<sup>3</sup> criteria is multiplied by 1000 to obtain µg/m<sup>3</sup>.

**TABLE 4**  
**Summary of QA/QC Sampling**  
 Former Tidewater Facility  
 Pawtucket, Rhode Island

	2008 CT DEEP		Units	SG-1005	Duplicate #1	SG-113D	Duplicate #2	SG-118S	Duplicate #3
	Residential Criteria	Industrial/Commercial Criteria		13H0055-04 Soil Gas 7/29/2013	13H0055-05 Soil Gas 7/29/2013	13H0164-16 Soil Gas 8/1/2013	13H0164-03 Soil Gas 8/1/2013	13H0996-03 Soil Gas 8/23/2013	13H0996-04 Soil Gas 8/23/2013
<b>EPA TO-3C</b>									
Helium	NE	NE	%	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
<b>EPA TO-15 Full List</b>									
Acetone	378,030	500,000	µg/m <sup>3</sup>	42	7.8	13	18	26	25
Benzene	2,456	4,501	µg/m <sup>3</sup>	<0.16	<0.16	0.29	0.32	1.5	1.5
Benzyl chloride	NE	NE	µg/m <sup>3</sup>	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26
Bromodichloromethane	1,340	1,340	µg/m <sup>3</sup>	0.37	0.36	<0.17	<0.17	<0.17	<0.17
Bromoform	NE	NE	µg/m <sup>3</sup>	<0.52	<0.52	<0.52	<0.52	<0.52	<0.52
Bromomethane	780	6,930	µg/m <sup>3</sup>	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19
1,3-Butadiene	NE	NE	µg/m <sup>3</sup>	0.11	<0.11	<0.11	<0.11	<0.11	<0.11
2-Butanone (MEK)	377,771	500,000	µg/m <sup>3</sup>	6.7	<5.9	<5.9	<5.9	<5.9	<5.9
Carbon Disulfide	NE	NE	µg/m <sup>3</sup>	<1.6	<1.6	2.4	2.1	3.3	3.2
Carbon Tetrachloride	1,300	1,300	µg/m <sup>3</sup>	0.54	0.52	2.2	2.1	<0.16	0.32
Chlorobenzene	30,254	282,730	µg/m <sup>3</sup>	<0.23	<0.23	<0.23	<0.23	<0.23	<0.23
Chloroethane	378,671	500,000	µg/m <sup>3</sup>	<0.13	<0.13	<0.066	<0.066	<0.13	<0.13
Chloroform	1,513	13,864	µg/m <sup>3</sup>	63	63	1.2	0.94	0.68	0.71
Chloromethane	3,926	37,362	µg/m <sup>3</sup>	0.33	0.21	0.52	0.63	0.22	<0.21
Cyclohexane	378,242	500,000	µg/m <sup>3</sup>	<0.17	<0.17	0.34	<0.17	<0.17	<0.17
Dibromochloromethane	NE	NE	µg/m <sup>3</sup>	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21
1,2-Dibromoethane (EDB)	NE	NE	µg/m <sup>3</sup>	<0.19	<0.19	<0.19	<0.19	<0.19	<0.19
1,2-Dichlorobenzene	60,527	500,000	µg/m <sup>3</sup>	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
1,3-Dichlorobenzene	1,515	13,865	µg/m <sup>3</sup>	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
1,4-Dichlorobenzene	18,156	33,277	µg/m <sup>3</sup>	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Dichlorodifluoromethane (Freon 12)	75,770	500,000	µg/m <sup>3</sup>	1.9	1.7	1.4	1.4	1.8	1.8
1,1-Dichloroethane	15,147	141,568	µg/m <sup>3</sup>	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,2-Dichloroethane	800	800	µg/m <sup>3</sup>	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,1-Dichloroethylene	7,560	70,654	µg/m <sup>3</sup>	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099
cis-1,2-Dichloroethylene	15,119	141,301	µg/m <sup>3</sup>	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099
trans-1,2-Dichloroethylene	15,119	141,305	µg/m <sup>3</sup>	<0.099	<0.099	<0.099	<0.099	<0.099	<0.099
1,2-Dichloropropane	900	1,109	µg/m <sup>3</sup>	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12
cis-1,3-Dichloropropene	900	2,774	µg/m <sup>3</sup>	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
trans-1,3-Dichloropropene	900	2,774	µg/m <sup>3</sup>	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
1,2-Dichloro-1,1,2,2-tetrafluoroethane (Freon 114)	NE	NE	µg/m <sup>3</sup>	<0.35	<0.35	<0.35	<0.35	<0.35	<0.35
1,4-Dioxane	NE	NE	µg/m <sup>3</sup>	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8
Ethanol	NE	NE	µg/m <sup>3</sup>	5.5	<3.8	<3.8	9	<3.8	<3.8
Ethyl Acetate	377,762	500,000	µg/m <sup>3</sup>	1.1	1.2	1.5	1.8	21	20
Ethylbenzene	43,882	410,364	µg/m <sup>3</sup>	<0.22	<0.22	0.5	0.42	1.5	1.5
4-Ethyltoluene	NE	NE	µg/m <sup>3</sup>	<0.25	<0.25	0.28	<0.25	0.65	0.68
Heptane	NE	NE	µg/m <sup>3</sup>	0.26	<0.20	<0.20	0.36	<0.20	<0.20
Hexachlorobutadiene	NE	NE	µg/m <sup>3</sup>	<0.53	<0.53	<0.53	<0.53	<0.53	<0.53
Hexane	302,386	500,000	µg/m <sup>3</sup>	<7.0	<7.0	<7.0	7.3	<7.0	<7.0
2-Hexanone (MBK)	NE	NE	µg/m <sup>3</sup>	2.3	<0.20	0.46	<0.20	0.61	0.66
Indane	NE	NE	µg/m <sup>3</sup>	<0.62	<0.62	<0.62	<0.62	0.65	0.63
Indene	NE	NE	µg/m <sup>3</sup>	<0.63	<0.63	<0.63	<0.63	1.4	1.3
Isopropanol	NE	NE	µg/m <sup>3</sup>	<4.9	<4.9	<4.9	<4.9	<4.9	<4.9
Isopropylbenzene (Cumene)	29,545	54,140	µg/m <sup>3</sup>	<0.62	<0.62	<0.62	<0.62	<0.62	<0.62
Methyl tert-Butyl Ether (MTBE)	129,581	263,819	µg/m <sup>3</sup>	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18
Methylene Chloride	2,269	23,554	µg/m <sup>3</sup>	<1.7	<1.7	2.2	2.9	2.6	<1.7
4-Methyl-2-pentanone (MIBK)	378,459	500,000	µg/m <sup>3</sup>	1	<0.20	0.27	<0.20	<0.20	<0.20
Naphthalene	1,284	12,203	µg/m <sup>3</sup>	0.33	<0.26	1.4	0.62	12	12
Propene	NE	NE	µg/m <sup>3</sup>	4.1	<3.4	<3.4	<3.4	<3.4	<3.4
Styrene	45,420	425,838	µg/m <sup>3</sup>	<0.21	<0.21	1.4	1	0.98	0.98
1,1,2,2-Tetrachloroethane	1,400	1,386	µg/m <sup>3</sup>	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Tetrachloroethylene	3,783	6,936	µg/m <sup>3</sup>	64	62	7.5	6	17	16
Tetrahydrofuran	605	5,814	µg/m <sup>3</sup>	0.25	<0.15	<0.15	<0.15	<0.15	<0.15
Toluene	130,246	500,000	µg/m <sup>3</sup>	<0.19	<0.19	1	0.98	10	9.9
1,2,4-Trichlorobenzene	1,135	11,093	µg/m <sup>3</sup>	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37
1,1,1-Trichloroethane	115,135	500,000	µg/m <sup>3</sup>	3.4	3.4	1	0.92	<0.14	<0.14
1,1,2-Trichloroethane	1,100	1,100	µg/m <sup>3</sup>	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14
Trichloroethylene	1,100	1,385	µg/m <sup>3</sup>	25	24	0.47	<0.13	<0.13	<0.13
Trichlorofluoromethane (Freon 11)	378,591	500,000	µg/m <sup>3</sup>	3.2	1.6	1.5	1.5	3.5	3.4
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	378,304	500,000	µg/m <sup>3</sup>	5	0.77	0.92	0.74	0.72	0.72
1,2,4-Trimethylbenzene	2,578	23,601	µg/m <sup>3</sup>	<0.25	<0.25	0.87	0.7	2.6	2.6
1,3,5-Trimethylbenzene	2,578	23,601	µg/m <sup>3</sup>	<0.25	<0.25	0.28	<0.25	0.65	0.65
Vinyl Acetate	86,247	500,000	µg/m <sup>3</sup>	<3.5	<3.5	<3.5	<3.5	<3.5	<3.5
Vinyl Chloride	500	1,249	µg/m <sup>3</sup>	<0.064	<0.064	<0.064	<0.064	<0.064	<0.064
m&p-Xylene	44,967	421,609	µg/m <sup>3</sup>	<0.43	<0.43	0.68	0.61	2.9	2.8
o-Xylene	44,967	421,609	µg/m <sup>3</sup>	<0.22	<0.22	0.35	0.3	1.3	1.2

Notes:  
 NE - Not Established  
 CTDEEP residential and industrial/commercial criteria is obtained from the 2008 Connecticut Remediation Criteria: Technical Support Document Appendix J published by the CTDEEP.  
 CTDEEP Criteria is presented in the 2008 Connecticut Remediation Criteria: Technical Support Document Appendix J - Table J6 and J8 in parts per million (ppmv) with adjustments presented for analytical capabilities and maximum values. To obtain criteria in mg/m<sup>3</sup> units, ppmv criteria is multiplied by the molecular weight of the compound divided by 24.45 (a conversion factor). The mg/m<sup>3</sup> criteria is multiplied by 1000 to obtain µg/m<sup>3</sup>.

# HOW TO FIND MORE INFORMATION ABOUT THE TIDEWATER SITE



- **Local Informational Repository—Pawtucket Public Library**

The local information repository at the Pawtucket Public Library contains copies of submittals included on the RIDEM website listed below. Electronic copies of these submittals are sent to the repository on a monthly basis. Upon request, National Grid will provide hard copies of the material for the library.

- **Publicly Accessible Site File**

Files related to the Tidewater Site are maintained at RIDEM, Case No. 95-022.

- **RIDEM Document Listing Website:**

<http://www.dem.ri.gov/programs/benviron/waste/tide.htm>

- **National Grid Document Listing and Informational Website:** [www.tidewatersite.com](http://www.tidewatersite.com)

- **Mailing List**

National Grid established a mailing list for the former Tidewater Site. The list includes abutting property owners, tenants, easement holders, municipalities and any other interested parties who have requested to be added to the list .

- **Email Distribution List**

Members of the mailing list, as well as other interested parties, have the option to receive information via email.

- **Phone Message Network**

National Grid has established a phone message network to distribute time-sensitive information to interested parties on air monitoring results during periods of active earth disturbing activities at the Site.

## If You Have Questions and Comments

For more information on activities at the site or to sign up for the phone/mailing/ emailing list, please contact Michele Leone at 781-907-3651 or [michele.leone@nationalgrid.com](mailto:michele.leone@nationalgrid.com) or visit the website at [www.tidewatersite.com](http://www.tidewatersite.com)





# COMO ENCONTRAR MAIS INFORMAÇÕES

## SOBRE TIDEWATER SITE



- **Repositório local de informações— Biblioteca Pública de Pawtucket**

O repositório local de informações na Biblioteca Pública de Pawtucket contém cópias das submissões incluídas no site do RIDEM relacionado abaixo. As cópias eletrônicas destas submissões são enviadas ao repositório mensalmente. Mediante solicitação, a National Grid fornecerá cópias impressas do material para a biblioteca.

- **Arquivos públicos do site**

Os arquivos relativos ao Tidewater Site são mantidos no RIDEM, Caso No 95-022.

- **Site da lista de documentos do RIDEM:** <http://www.dem.ri.gov/programs/benviron/waste/tide.htm>
- **Lista de documentos da National Grid e site informativo:** [www.tidewatersite.com](http://www.tidewatersite.com)

- **Lista para contato**

A National Grid estabeleceu uma lista de contatos para a antiga Tidewater Site. A lista inclui proprietários vizinhos, inquilinos, titulares de servidão, municipalidades e outras partes interessadas que solicitaram ser adicionadas à lista.

- **Lista de distribuição de e-mail**

Membros da lista de contato, assim como outras partes interessadas, têm a opção de receber informações por e-mail.

- **Rede de mensagens por telefone**

A National Grid estabeleceu uma rede de mensagens por telefone para distribuir informações suscetíveis ao tempo de resposta a partes interessadas sobre os resultados do controle de ar durante períodos de atividade que perturbam o terreno no Site.

### Se você tem dúvidas e comentários

Para mais informações sobre as atividades no local ou subscrever para a lista de telefone/correspondência/ email, contate Michele Leone em 781-907-3651 ou [michele.leone@nationalgrid.com](mailto:michele.leone@nationalgrid.com) ou visite o site [www.tidewatersite.com](http://www.tidewatersite.com)





# CÓMO HALLAR MÁS INFORMACIÓN SOBRE EL SITIO TIDEWATER



- **Registro informativo local: Biblioteca Pública de Pawtucket**

El depósito de información local de la Biblioteca Pública de Pawtucket tiene copias de las sumisiones incluidas en el sitio cibernético de RIDEM que se indica a continuación. Las copias electrónicas de estas sumisiones son enviadas mensualmente al depósito. De solicitarse, National Grid proveerá copias en papel del material para la biblioteca.

- **Archivo del sitio accesible al público**

Los archivos relacionados con el Sitio Tidewater se mantienen en el RIDEM, Caso No. 95-022.

- **Sitio web de los listados de documentos del RIDEM:** <http://www.dem.ri.gov/programs/benviron/waste/tide.htm>

- **Sitio web informativo y de listado de documentos de National Grid:** [www.tidewatersite.com](http://www.tidewatersite.com)

- **Lista de correo**

National Grid estableció una lista de correo para el ex Sitio Tidewater. La lista del sitio incluye propietarios de propiedades lindantes, inquilinos, tenedores de servidumbres, municipalidades y toda otra parte interesada que haya solicitado ser agregada a la lista.

- **Lista de distribución**

Los miembros de la lista de correo, así como otras partes interesadas, tienen la opción de recibir la información por correo electrónico.

- **Red de mensajes telefónicos**

National Grid estableció una red de mensajes telefónicos para distribuir información urgente a las partes interesadas sobre los resultados de las supervisión del aire durante períodos de actividades en curso que alteran la tierra en el Sitio.

## Si tiene preguntas y comentarios

Para solicitar más información sobre las actividades en el sitio o suscribirse a la lista telefónica/de correo/de correo electrónico, comuníquese con Michele Leone al 781-907-3651 o a [michele.leone@nationalgrid.com](mailto:michele.leone@nationalgrid.com), o visite el sitio web en [www.tidewatersite.com](http://www.tidewatersite.com)





# HOW TO FIND MORE INFORMATION ABOUT THE TIDEWATER SITE



- **Publicly Accessible Site File**

Files related to the Tidewater Site are maintained at RIDEM, Case No. 95-022.

- **RIDEM Document Listing Website:**  
<http://www.dem.ri.gov/programs/benviron/waste/tide.htm>
- **National Grid Document Listing and Informational Website:**  
[www.tidewatersite.com](http://www.tidewatersite.com)
- **Local Informational Repository—  
Pawtucket Public Library**

The local information repository at the Pawtucket Public Library contains digital copies of submittals.

- **Mailing List**

National Grid established a mailing list for the former Tidewater Site. The list includes abutting property owners, tenants, easement holders, municipalities and any other interested parties who have requested to be added to the list .

- **Email Distribution List**

Members of the mailing list, as well as other interested parties, have the option to receive information via email.

- **Phone Message Network**

National Grid has established a phone message network to distribute time-sensitive information to interested parties on air monitoring results during periods of active earth disturbing activities at the Site.

## If You Have Questions and Comments

For more information on activities at the site or to sign up for the phone/mailing/ emailing list, please contact Michele Leone at 781-907-3651 or [michele.leone@nationalgrid.com](mailto:michele.leone@nationalgrid.com) or visit the website at [www.tidewatersite.com](http://www.tidewatersite.com)





# COMO ENCONTRAR MAIS INFORMAÇÕES

## SOBRE TIDEWATER SITE



- **Arquivos públicos do site**

Os arquivos relativos ao Tidewater Site são mantidos no RIDEM, Caso No 95-022.

- **Site da lista de documentos do RIDEM:**  
<http://www.dem.ri.gov/programs/benviron/waste/tide.htm>

- **Lista de documentos da National Grid e site informativo:**  
[www.tidewatersite.com](http://www.tidewatersite.com)

- **Repositório local de informações—  
Biblioteca Pública de Pawtucket**

O repositório local de informações na Biblioteca Pública de Pawtucket contém cópias digitais das submissões.

- **Lista para contato**

A National Grid estabeleceu uma lista de contatos para a antiga Tidewater Site. A lista inclui proprietários vizinhos, inquilinos, titulares de servidão, municipalidades e outras partes interessadas que solicitaram ser adicionadas à lista.

- **Lista de distribuição de e-mail**

Membros da lista de contato, assim como outras partes interessadas, têm a opção de receber informações por e-mail.

- **Rede de mensagens por telefone**

A National Grid estabeleceu uma rede de mensagens por telefone para distribuir informações suscetíveis ao tempo de resposta a partes interessadas sobre os resultados do controle de ar durante períodos de atividade que perturbam o terreno no Site.

### Se você tem dúvidas e comentários

Para mais informações sobre as atividades no local ou subscrever para a lista de telefone/correspondência/ email, contate Michele Leone em 781-907-3651 ou [michele.leone@nationalgrid.com](mailto:michele.leone@nationalgrid.com) ou visite o site [www.tidewatersite.com](http://www.tidewatersite.com)





# CÓMO HALLAR MÁS INFORMACIÓN SOBRE EL SITIO TIDEWATER



- **Archivo del sitio accesible al público**

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- **Sitio web de los listados de documentos del RIDEM:** <http://www.dem.ri.gov/programs/benviron/waste/tide.htm>
- **Sitio web informativo y de listado de documentos de National Grid:** [www.tidewatersite.com](http://www.tidewatersite.com)
- **Registro informativo local: Biblioteca Pública de Pawtucket**

El registro local de información en la Biblioteca Pública de Pawtucket contiene copias digitales de las presentaciones.

- **Lista de correo**

National Grid estableció una lista de correo para el ex Sitio Tidewater. La lista del sitio incluye propietarios de propiedades lindantes, inquilinos, tenedores de servidumbres, municipalidades y toda otra parte interesada que haya solicitado ser agregada a la lista.

- **Lista de distribución**

Los miembros de la lista de correo, así como otras partes interesadas, tienen la opción de recibir la información por correo electrónico.

- **Red de mensajes telefónicos**

National Grid estableció una red de mensajes telefónicos para distribuir información urgente a las partes interesadas sobre los resultados de las supervisiones del aire durante períodos de actividades en curso que alteran la tierra en el Sitio.

## Si tiene preguntas y comentarios

Para solicitar más información sobre las actividades en el sitio o suscribirse a la lista telefónica/de correo/de correo electrónico, comuníquese con Michele Leone al 781-907-3651 o a [michele.leone@nationalgrid.com](mailto:michele.leone@nationalgrid.com), o visite el sitio web en [www.tidewatersite.com](http://www.tidewatersite.com)







**EXHIBIT II**  
CONTACT LIST

## **TIDEWATER CONTACT LIST**

Pawtucket, Rhode Island  
RIDEM Case No. 95-022

Michele Leone  
Manager, Site Investigation & Remediation, New England & Upstate New York  
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40 Sylvan Road  
Waltham, MA 02451-1120  
781-907-3651  
[michele.leone@us.ngrid.com](mailto:michele.leone@us.ngrid.com)

Lori Spangler  
Manager, Community and Customer Management  
National Grid  
40 Sylvan Road  
Waltham, MA 02451-1120  
[lori.spangler@us.ngrid.com](mailto:lori.spangler@us.ngrid.com)

Joseph Martella  
Project Manager  
RIDEM, Office of Waste Management  
235 Promenade Street  
Providence, RI 02908-5767  
(401) 222-2797 Ext. 7109  
[joseph.martella@dem.ri.gov](mailto:joseph.martella@dem.ri.gov)

Meg Kilpatrick, P.E.  
Senior Project Manager  
GZA GeoEnvironmental, Inc.  
530 Broadway  
Providence, RI 02909  
401-421-4140  
[margaret.kilpatrick@gza.com](mailto:margaret.kilpatrick@gza.com)



### **EXHIBIT III**

**RESPONSES TO SITE-SPECIFIC COMMENTS FROM COMMUNITY INTERVIEWS**

SITE-SPECIFIC COMMENTS FROM COMMUNITY INTERVIEWS  
Former Tidewater Facility  
Pawtucket, Rhode Island

**Comments Received on June 19, 2012:**

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**Meeting from 3p.m. to 3:30 p.m.:**

1. Interviewee inquired about availability of real-time air monitoring.

*Response: On a weekly basis, air monitoring data will be posted to the National Grid website ([www.tidewatersite.com](http://www.tidewatersite.com)) and on the bulletin boards located at the end of Tidewater Street and the end of Bowles Court (the previous weekly data will be posted by the end of day the following Monday). This information will also be transmitted to RIDEM to be posted to the RIDEM-maintained website on an approximately weekly basis. In the event a sustained exceedance of a perimeter threshold level is observed, activation of the phone message alert system will be conducted and this information will also be posted on the National Grid web-site and on the bulletin boards within 48 business hours of collection. See section 4.40 for more information about INFORMATION REPOSITORIES.*

2. The interviewee asked if National Grid could make real-time air monitoring data available via a website with comparisons to the Rhode Island Department of Environmental Management's (RIDEM) Ambient Air Quality Standards.

*Response: Real-time monitoring typically evaluates levels of total volatile organic compounds, benzene and dust. Real time air monitoring will employ either portable hand held field equipment or fixed monitoring stations. Use of hand held versus fixed monitoring stations will be evaluated on a case-by-case basis based on scope of the earthwork project (i.e., level of remediation) and anticipated level of soil impacts. For the majority of earthwork projects at the Site, it is anticipated that real-time air monitoring will be completed using portable hand held field instruments. These hand held field instruments do not have the ability to post this data to a community website in real time. During remedial activities when fixed air monitoring stations are warranted, such as an Air Logics or RespondFast system, data from the fixed station(s) will be transmitted via telemetry to a central polling station computer. Once at the central computer, the data is automatically compared to pre-set warning/alarms levels and is used to call cell phones, pagers, issue alerts, etc. Please note, based on our discussions with Air Logics and our understanding of the RespondFast system used by Weston Solutions, the raw data from the central polling computer is not typically fed to a publically available web-page or other portal.*

*On a weekly basis, air monitoring data will be posted to the National Grid website ([www.tidewatersite.com](http://www.tidewatersite.com)) and on the bulletin boards located at the end of Tidewater Street and the end of Bowles Court (the previous weekly data will be posted by the end of day the following Monday). This information will also be transmitted to RIDEM to be posted to the RIDEM-maintained website on an approximately weekly basis. In addition to activation of the phone*

## SITE-SPECIFIC COMMENTS FROM COMMUNITY INTERVIEWS

Former Tidewater Facility  
Pawtucket, Rhode Island

*message alert system described above, in the event a sustained exceedance of a perimeter threshold level is observed, this information will also be posted on the National Grid web-site and on the bulletin boards within 48 business hours of collection. See section 4.40 for more information about INFORMATION REPOSITORIES.*

*In addition, National Grid will collect laboratory samples in accordance with the RIDEM-approved plan. National Grid will compare this data to RIDEM's Ambient Air Quality Standards and also post it online.*

3. Interviewee suggested public meetings to keep the neighborhood informed. Interviewee would like more active attempts to meet with people in the community and more communication with the schools and students' parents. The interviewee suggested reaching out to the Varieur School principal.

*Response: National Grid/GZA will continue to provide project information to the principals of neighboring schools (charter schools and the public school) for dissemination to teachers and parents. Due to privacy concerns, schools typically do not provide lists of students and parents and their contact information to outside entities. However, interested parents can go to the Tidewater/National Grid website ([www.tidewatersite.com](http://www.tidewatersite.com)) and sign up for updates. See Section 4.10 for more information about PUBLIC NOTICE. In addition, see Table 1 for a schedule of public meetings.*

4. What is best way to obtain information about Site? Interviewee indicated email for general information, hard copies for more details and mailers for neighborhood to ensure completeness.

*Response: National Grid will maintain a site-specific mailing list for the Tidewater Site and will add email addresses to the list as requested by the community. National Grid will use the mailing list to announce public meetings and availability of reports, and distribute fact sheets. These announcements and information will also be posted on the informational bulletin boards located at the end of Tidewater Street and at the end of Bowles Court. National Grid will also make electronic copies of all reports available on National Grid's and the Rhode Island Department of Environmental Management's (RIDEM) websites, as well as at the public library. National Grid will also provide hard copies of the reports at RIDEM's office and the public library upon request. See sections 4.10 and 4.40 for more information about PUBLIC NOTICE and INFORMATION REPOSITORIES.*

5. How often should information be sent out to community about Site? Interviewee indicated that frequency depends on work being conducted. Interviewee requested "door-to-door" fliers.

*Response: National Grid performed an initial walk of the neighborhood to distribute door knob fliers with information on how to join the mailing list in August 2012. This walk covered*



SITE-SPECIFIC COMMENTS FROM COMMUNITY INTERVIEWS  
Former Tidewater Facility  
Pawtucket, Rhode Island

*residences in the neighborhood as shown on the Figure 3 of the PIP. See sections 4.10 and 4.40 for more information about PUBLIC NOTICE and INFORMATION REPOSITORIES.*

6. What locations and times would be convenient for public meetings? Interviewee indicated that night is preferred and that current location (i.e., Blackstone Valley Visitor Center Theater) works.

*Response: National Grid will schedule meetings in the evening at either the Blackstone Valley Visitor Center or Varieur Elementary School, based on availability. The preferred location is Varieur Elementary School, which is within walking distance of the Tidewater Site. See section 4.30 for more information about COMMUNITY MEETINGS.*

7. Interviewee suggested that the National Grid/Tidewater Site be clearly indicated on mailers.

*Response: National Grid developed a "Tidewater Environmental Project" mailing label to more clearly identify correspondence related to the project. See section 4.10 for more information about PUBLIC NOTICE.*

**Meeting from 4p.m. to 4:30 p.m.:**

1. Interviewee requested that the local Housing and Urban Development (HUD) agency be added to the mailing list.

*Response: National Grid will add the local HUD agency to the mailing list, as discussed during subsequent communication with the interviewee. National Grid is waiting to be provided the contact information for the specific HUD agency requested by the interviewee. National Grid will continue to work with the interviewee to obtain this information.*

2. Interviewee suggested posting information in apartment buildings adjacent to the site.

*Response: National Grid has left messages with the interviewee/property manager regarding posting information within the apartment building regarding availability of the bulletin boards and mailings. National Grid will continue to work with them to arrange for the suggested postings, if acceptable.*

3. Interviewee inquired about a site tour at some point in the process.

*Response: National Grid will try to arrange for a limited tour of the site prior to the start of remediation. Given the active utility operations, such as the electrical substation and natural gas regulating station on the property, portions of the site will not be accessible to the public due to safety concerns. During the proposed community outreach session, National Grid will also present photographs and video of various areas of the site. See section 4.30 for more information about COMMUNITY MEETINGS.*

SITE-SPECIFIC COMMENTS FROM COMMUNITY INTERVIEWS

Former Tidewater Facility  
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4. What is the best way to obtain information about site? Interviewee indicated a website should be used.

*Response: The Rhode Island Department of Environmental Management (RIDEM) will maintain all documents submitted to them regarding the Tidewater site on its website (<http://www.dem.ri.gov/programs/benviron/waste/tide.htm>). In addition, National Grid has established a Site-specific website ([www.tidewatersite.com](http://www.tidewatersite.com)) to provide information regarding the nature and history of MGPs, history and description of the Tidewater Site, and its regulatory background, site contacts and key project documents. National Grid will also post timely public updates on the current and proposed remediation activities at the site on its website. See section 4.40 for more information about INFORMATION REPOSITORIES.*

5. Which locations and times would be convenient for public meetings? Interviewee indicated that evening is best (between 6 p.m. and 7 p.m.).

*Response: National Grid will schedule meetings in the evening at either the Blackstone Valley Visitor Center or Variour Elementary School, based on availability. The preferred location is Variour Elementary School, which is within walking distance of the Tidewater Site. See section 4.30 for more information about COMMUNITY MEETINGS.*

6. Interviewee suggested a phone list for messages about the site.

*Response: National Grid will establish a phone message distribution network. National Grid will share how to join the phone message distribution network on its website ([www.tidewatersite.com](http://www.tidewatersite.com)). In addition, National Grid provided information about participating in the phone message distribution network to individuals on the mailing list in the public notice mailed in the end of October 2012. See section 4.10 for more information about PUBLIC NOTICE.*

**Meeting from 4:30 p.m. – 5:30 p.m.:**

1. Interviewee inquired about real-time air data and suggested that this data be available online.

*Response: Real-time monitoring typically evaluates levels of total volatile organic compounds, benzene and dust. Real time air monitoring will employ either portable hand held field equipment or fixed monitoring stations. Use of hand held versus fixed monitoring stations will be evaluated on a case-by-case basis based on scope of the earthwork project (i.e., level of remediation) and anticipated level of soil impacts. For the majority of earthwork projects at the Site, it is anticipated that real-time air monitoring will be completed using portable hand held field instruments. These hand held field instruments do not have the ability to post this data to a community website in real time. During remedial activities when fixed air monitoring stations are warranted, such as an Air Logics or RespondFast system, data from the fixed station(s) will be transmitted via telemetry to a central polling station computer. Once at the central*

## SITE-SPECIFIC COMMENTS FROM COMMUNITY INTERVIEWS

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*computer, the data is automatically compared to pre-set warning/alarms levels and is used to call cell phones, pagers, issue alerts, etc. Please note, based on our discussions with Air Logics and our understanding of the RespondFast system used by Weston Solutions, the raw data from the central polling computer is not typically fed to a publically available web-page or other portal.*

*On a weekly basis, air monitoring data will be posted to the National Grid website ([www.tidewatersite.com](http://www.tidewatersite.com)) and on the bulletin boards located at the end of Tidewater Street and the end of Bowles Court (the previous weekly data will be posted by the end of day the following Monday). This information will also be transmitted to RIDEM to be posted to the RIDEM-maintained website on an approximately weekly basis. In addition to activation of the community phone message alert system described above, in the event a sustained exceedance of a perimeter threshold level is observed, this information will also be posted on the National Grid web-site and on the bulletin boards within 48 business hours of collection. See section 4.40 for more information about INFORMATION REPOSITORIES.*

*In addition, National Grid will collect laboratory samples in accordance with the RIDEM-approved plan. National Grid will compare this data to RIDEM's Ambient Air Quality Standards and also post it online.*

2. What is the best way to obtain information about the site? Interviewee indicated meetings, emails and website available in multi-lingual formats.

*Response: National Grid will schedule an initial community meeting and community outreach session to present background information, and discuss site conditions and public concerns about the proposed remedial strategy. In addition, National Grid will hold subsequent community meetings during the remediation process at specified project milestones, such as the Rhode Island Department of Environmental Management's (RIDEM) approval of the Remedial Action Work Plan, prior to remedy implementation and following completion of site-wide remediation. National Grid will schedule additional community meetings during the remedial process at the request of the community. See section 4.30 for more information about COMMUNITY MEETINGS.*

*National Grid will maintain a site-specific mailing list for the Tidewater site and will add email addresses to the mailing list as requested by the community. National Grid will use the mailing list to announce public meetings and the availability of reports, and distribute fact sheets. National Grid used the current mailing list to distribute a Notification Package in August 2012 to inform the public of the upcoming electrical substation upgrade project. As part of this notification in August 2012, National Grid performed an initial walk of the neighborhood to distribute door knob flyers with information on how to join the mailing list. This walk covered*

SITE-SPECIFIC COMMENTS FROM COMMUNITY INTERVIEWS

Former Tidewater Facility  
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*residences in the neighborhood as shown on the Figure 3 of the PIP. See section 4.10 for more information about PUBLIC NOTICE.*

*RIDEM will maintain all documents submitted to them regarding the Tidewater site on its website (<http://www.dem.ri.gov/programs/benviron/waste/tide.htm>). In addition, National Grid has established a site-specific website ([www.tidewatersite.com](http://www.tidewatersite.com)) to provide information regarding the nature and history of MGPs, historic background related to Tidewater, description of the Tidewater site and its regulatory background, site contacts and key project documents. National Grid will also post timely public updates on the current and proposed remediation activities at the Site on its website. See section 4.40 for more information about INFORMATION REPOSITORIES.*

*National Grid will provide mailings, fact sheets and other communications in both English and Spanish. In addition, all mailed communications will contain a translation header in multiple languages stating: "This is an important notice. Please have it translated." Upon request, National Grid will also provide translation assistance for non-English speaking individuals during public meetings.*

3. Interviewee indicated the need to engage members of the community.

*Response: National Grid acknowledges the need to engage community members and keep them informed about the planned investigations and remedial efforts at the Tidewater Site. National Grid has prepared a public involvement plan (PIP) to establish procedures for public and community communications about the Site. National Grid performed an initial walk of the neighborhood to distribute door knob flyers with information on how to join the mailing list in August 2012. This walk covered residences in the neighborhood as shown on the Figure 3 of the PIP. We understand that the Environmental Justice League will be undertaking door-to-door efforts as well.*

4. Interviewee suggested the use of bulletin boards and phone messages to get information to the community about the Site.

*Response: National Grid has installed informational bulletin boards at the end of Tidewater Street and at the end of Bowles Court. The bulletin boards will include all information distributed through the mailing list, as well as weekly updates during remedial work. Please note that if significant vandalism to the bulletin boards occurs, National Grid will look into alternative ways to share information. National Grid will establish a phone message distribution network. National Grid will share how to join the phone message distribution network on its website ([www.tidewatersite.com](http://www.tidewatersite.com)). In addition, National Grid will provide information about participating in the phone message distribution network to individuals on the mailing list. See section 4.10 for more information about PUBLIC NOTICE.*

*See section 4.10 for more information about PUBLIC NOTICE.*

SITE-SPECIFIC COMMENTS FROM COMMUNITY INTERVIEWS

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6. Interviewee suggested the following information should be posted and available for the Site: contact information/responding to public comments/24-hour hotline.

*Response: National Grid will provide site contact information on its website and the informational bulletin boards at the end of Tidewater Street and Bowles Court. Community members can contact site representatives during normal business hours with any comments or questions. A listing of "frequently asked questions" will be maintained on National Grid's website (www.tidewatersite.com). See sections 4.10 and 4.40 for more information about PUBLIC NOTICE and INFORMATION REPOSITORIES.*

*All written public comments related to documents submitted to the Rhode Island Department of Environmental Management(RIDEM), as well as National Grid's response, will be documented in written form as required by RIDEM. National Grid will send a copy of responses to those who submitted comments and also place them in the information repository. Refer to section 4.30 for more information.*

7. Interviewee requested regular stakeholder meetings (limited group of 10 to 15 people).

*Response: National Grid will schedule an initial community meeting and community outreach session to present background information and discuss site conditions and public concerns about the proposed remedial strategy. In addition, National Grid will hold subsequent community meetings during the remediation process at specified project milestones, such as the Rhode Island Department of Environmental Management's (RIDEM) approval of the Remedial Action Work Plan, prior to remedy implementation and following completion of site-wide remediation. National Grid will schedule additional community meetings during the remedial process at the request of the community. Also, National Grid designed the public involvement plan (PIP) to involve all community members and interested parties. National Grid believes that the large number of public meetings and the commitment to schedule additional meetings on an as-needed basis pre-empts the need for smaller, stakeholder meetings. See section 4.30 for more information about COMMUNITY MEETINGS.*

8. Interviewee suggested timely communications with the community.

*Response: National Grid will post weekly updates during full-scale remedial work on the informational bulletin boards located at the end of Tidewater Street and at the end of Bowles Court, and on both the National Grid and the Rhode Island Department of Environmental Management (RIDEM) websites. See sections 4.10 and 4.40 for more information about PUBLIC NOTICE and INFORMATION REPOSITORIES.*



SITE-SPECIFIC COMMENTS FROM COMMUNITY INTERVIEWS

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9. Interviewee suggested bulletin board at the site.

*Response: National Grid has installed informational bulletin boards at the end of Tidewater Street and at the end of Bowles Court. The bulletin boards will include certain information distributed through the mailing list, as well as weekly updates during remedial work. National Grid will also use the bulletin boards to announce public meetings, distribute fact sheets and communicate availability of reports. Please note that if significant vandalism to the bulletin boards occurs, National Grid will look into alternative ways to share information. See section 4.10 for more information about PUBLIC NOTICE.*

11. Interviewee inquired about potential issues that the public needs to be concerned about with the Tidewater Site.

*Response: The primary issue on the Tidewater Site is the potential for air quality issues during remedial implementation. National Grid's selected remedy is designed to limit these air quality impacts. In addition, National Grid will monitor air quality in accordance with a Rhode Island Department of Environmental Management (RIDEM)-approved plan and will provide this information to the public, as presented in the public involvement plan (PIP). See sections 4.10 and 4.40 for more information about PUBLIC NOTICE and INFORMATION REPOSITORIES.*

12. Interviewee suggested use of color-coded maps with impacts.

*Response: National Grid will prepare a simple color-coded map, which will be available on the National Grid website and on the informational bulletin boards. This map will also be presented at the community outreach session.*

13. Interviewee requested the use of more simple, nontechnical terms in communications.

*Response: National Grid's reports and communications to the Rhode Island Department of Environmental Management (RIDEM) are technical documents and as a result, cannot necessarily be simplified. However, National Grid will make every effort to use brief and nontechnical terminology in communications to the public, including in mailings, website information and bulletin board postings. In addition, National Grid will prepare simple executive summaries for major report submittals.*

14. Which locations and times would be convenient for public meetings? Interviewee suggested that the meeting location should be in the school or the neighborhood to achieve the highest attendance and also noted that evenings work well.

*Response: National Grid will schedule meetings in the evening at either the Blackstone Valley Visitor Center or Varieur Elementary School, based on availability. The preferred location is Varieur Elementary School, which is within walking distance of the Tidewater Site. See section 4.30 for more information about COMMUNITY MEETINGS.*

SITE-SPECIFIC COMMENTS FROM COMMUNITY INTERVIEWS

Former Tidewater Facility  
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**Meeting from 5:30 p.m. to 6:30 p.m.:**

1. What is the best way to get information to people? Interviewee indicated that door to door in community would be best.

*Response: National Grid performed an initial walk of the neighborhood to distribute door knob flyers with information on how to join the mailing list in August 2012. This walk covered residences in the neighborhood as shown on the Figure 3 of the PIP. In addition, National Grid will post weekly updates during remedial work to the informational bulletin boards located at the end of Tidewater Street and at the end of Bowles Court, and on both the National Grid and the Rhode Island Department of Environmental Management (RIDEM) websites. See sections 4.10 for more information about PUBLIC NOTICE.*

2. Interviewee indicated that mail is better than email in the community.

*Response: National Grid will maintain a site-specific mailing list for the Tidewater site and will add email addresses to the list as requested by the community. National Grid will use the mailing list to announce public meetings and availability of reports, and distribute fact sheets. See section 4.10 for more information about PUBLIC NOTICE.*

3. Which locations and times would be convenient for public meetings? Interviewee indicated that the schools would be perfect since they are close and within walking distance. Interviewee also suggested meeting times in the early evening (5-6 p.m.).

*Response: National Grid will schedule meetings in the evening at either the Blackstone Valley Visitor Center or Varieur Elementary School, based on availability. The preferred location is Varieur Elementary School, which is within walking distance of the Tidewater Site. See section 4.30 for more information about COMMUNITY MEETINGS.*

4. Interviewee indicated that he is working with the Environmental Justice League in the community and suggested that door knocking is effective.

*Response: National Grid acknowledges the need to engage community members and keep them informed about the planned investigations and remedial efforts at the Tidewater site. National Grid has prepared a public involvement plan (PIP) to establish procedures for public and community communications about the site. As described in the PIP, National Grid performed an initial walk of the neighborhood to distribute door knob flyers with information on how to join the mailing list in August 2012. This walk covered residences in the neighborhood as shown on the Figure 3 of the PIP. We understand that the Environmental Justice League will be undertaking door-to-door efforts as well.*

SITE-SPECIFIC COMMENTS FROM COMMUNITY INTERVIEWS

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5. Interviewee suggested providing information on air impacts in real time.

*Response: Real-time monitoring typically evaluates levels of total volatile organic compounds, benzene and dust. Real time air monitoring will employ either portable hand held field equipment or fixed monitoring stations. Use of hand held versus fixed monitoring stations will be evaluated on a case-by-case basis based on scope of the earthwork project (i.e., level of remediation) and anticipated level of soil impacts. For the majority of earthwork projects at the Site, it is anticipated that real-time air monitoring will be completed using portable hand held field instruments. These hand held field instruments do not have the ability to post this data to a community website in real time. During remedial activities when fixed air monitoring stations are warranted, such as an Air Logics or RespondFast system, data from the fixed station(s) will be transmitted via telemetry to a central polling station computer. Once at the central computer, the data is automatically compared to pre-set warning/alarms levels and is used to call cell phones, pagers, issue alerts, etc. Please note, based on our discussions with Air Logics and our understanding of the RespondFast system used by Weston Solutions, the raw data from the central polling computer is not typically fed to a publically available web-page or other portal.*

*On a weekly basis, air monitoring data will be posted to the National Grid website ([www.tidewatersite.com](http://www.tidewatersite.com)) and on the bulletin boards located at the end of Tidewater Street and the end of Bowles Court (the previous weekly data will be posted by the end of day the following Monday). This information will also be transmitted to RIDEM to be posted to the RIDEM-maintained website on an approximately weekly basis. In addition to activation of the community phone message alert system described above, in the event a sustained exceedance of a perimeter threshold level is observed, this information will also be posted on the National Grid web-site and on the bulletin boards within 48 business hours of collection. See section 4.40 for more information about INFORMATION REPOSITORIES.*

*In addition, National Grid will collect laboratory samples in accordance with the RIDEM-approved plan. National Grid will compare this data to RIDEM's Ambient Air Quality Standards and also post it online.*

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**Comments Received on June 20, 2012:**

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**Meeting from 6p.m. to 7p.m.:**

1. What is the best way to communicate information to the public? Interviewee indicated that easy-to-understand information needs to be available via a website. Interviewee also inquired about the risks posed by the Site to the community during remedial activities.

*Response: National Grid will make every effort to use brief and nontechnical terminology in communications to the public, including in mailings, website information and bulletin board postings. In addition, National Grid will prepare simple executive summaries for major report submittals.*

*In addition, National Grid will provide easy-to-understand information on its website and make it easy to find. In addition, National Grid will make project updates available on both the website and the community bulletin boards. National Grid will also provide contact information for individuals the public can contact for additional information or with questions.*

*The primary issue on the Tidewater site is the potential for air quality issues during remedial implementation. National Grid's selected remedy is designed to limit these air quality impacts. National Grid will monitor air quality in accordance with a Rhode Island Department of Environmental Management (RIDEM)-approved plan and will provide this information to public, as presented in the public involvement plan (PIP). See sections 4.10 and 4.40 for more information about PUBLIC NOTICE and INFORMATION REPOSITORIES. In addition, National Grid may also encounter issues related to truck traffic and management of contaminated material during the remedial and implementation process. National Grid will discuss these issues further during the remedial process outreach and community meetings.*

2. Interviewee suggested installing a community bulletin board at either the Site or school.

*Response: National Grid has installed informational bulletin boards at the end of Tidewater Street and at the end of Bowles Court. The bulletin boards will include certain information distributed through the mailing list, as well as weekly updates during remedial work. National Grid will also use the bulletin boards to announce public meetings, distribute fact sheets and communicate availability of reports. See section 4.10 for more information about PUBLIC NOTICE.*

3. Interviewee inquired about availability of real-time air monitoring online.

*Response: Real-time monitoring typically evaluates levels of total volatile organic compounds, benzene and dust. Real time air monitoring will employ either portable hand held field equipment or fixed monitoring stations. Use of hand held versus fixed monitoring stations will be evaluated on a case-by-case basis based on scope of the earthwork project (i.e., level of*

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*remediation) and anticipated level of soil impacts. For the majority of earthwork projects at the Site, it is anticipated that real-time air monitoring will be completed using portable hand held field instruments. These hand held field instruments do not have the ability to post this data to a community website in real time. During remedial activities when fixed air monitoring stations are warranted, such as an Air Logics or RespondFast system, data from the fixed station(s) will be transmitted via telemetry to a central polling station computer. Once at the central computer, the data is automatically compared to pre-set warning/alarms levels and is used to call cell phones, pagers, issue alerts, etc. Please note, based on our discussions with Air Logics and our understanding of the RespondFast system used by Weston Solutions, the raw data from the central polling computer is not typically fed to a publically available web-page or other portal.*

*On a weekly basis, air monitoring data will be posted to the National Grid website ([www.tidewatersite.com](http://www.tidewatersite.com)) and on the bulletin boards located at the end of Tidewater Street and the end of Bowles Court (the previous weekly data will be posted by the end of day the following Monday). This information will also be transmitted to RIDEM to be posted to the RIDEM-maintained website on an approximately weekly basis. In addition to activation of the community phone message alert system described above, in the event a sustained exceedance of a perimeter threshold level is observed, this information will also be posted on the National Grid web-site and on the bulletin boards within 48 business hours of collection. See section 4.40 for more information about INFORMATION REPOSITORIES.*

*In addition, National Grid will collect laboratory samples in accordance with the RIDEM-approved plan. National Grid will compare this data to RIDEM's Ambient Air Quality Standards and also post it online.*

4. Should regular communications be performed during the cleanup process? Interviewee requested ongoing meetings.

*Response: National Grid will schedule an initial community meeting and community outreach session to present background information and discuss site conditions and public concerns about the proposed remedial strategy. In addition, National Grid will hold subsequent community meetings during the remediation process at specified project milestones, such as the Rhode Island Department of Environmental Management's (RIDEM) approval of the Remedial Action Work Plan, prior to remedy implementation and following completion of Site-wide remediation. National Grid will schedule additional community meetings during the remedial process at the request of the community. See section 4.30 for more information about COMMUNITY MEETINGS.*



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5. Interviewee requested color-coded map of contamination.

*Response: National Grid will prepare simple color-coded map depicting the distribution of site impacts. National Grid will make these maps available on its website and the informational bulletin boards. This map will also be presented at the community outreach session.*

**Meeting from 7p. m. to 7:20 p.m.:**

1. What is the best way to communicate information to the public? Interviewee prefers email and Internet.

*Response: National Grid will maintain a site-specific mailing list for the Tidewater site and will add email addresses to the list as requested by the community. National Grid will use the mailing list to announce public meetings and availability of reports, and distribute fact sheets. See section 4.10 for more information about PUBLIC NOTICE.*

*In addition, National Grid will establish a public website, which will include site-specific information, including timely public updates on current and future remediation activities at the site. See section 4.40 for more information about INFORMATION REPOSITORIES.*

2. Which locations and times would be convenient for public meeting? Interviewee indicated that the current venue at the Blackstone Valley Visitor Center is okay and the evenings are better.

*Response: National Grid will schedule meetings in the evening at either the Blackstone Valley Visitor Center or Varieur Elementary School, based on availability. The preferred location is Varieur Elementary School, which is within walking distance of the Tidewater Site. See section 4.30 for more information about COMMUNITY MEETINGS.*

3. Interviewee suggested flyers/mailings. Interviewee requested expansion of abutter list for mailings.

*Response: National Grid will maintain a site-specific mailing list for the Tidewater site and will add email addresses to list as requested by the community. National Grid will use the mailing list to announce public meetings and availability of reports, and distribute fact sheets. National Grid will also post these announcements and information to the informational bulletin boards located at the end of Tidewater Street and at the end of Bowles Court. National Grid performed an initial walk of the neighborhood to distribute door knob flyers with information on how to join the mailing list in August 2012. This walk covered residences in the neighborhood as shown on the Figure 3 of the PIP. See section 4.10 for more information about PUBLIC NOTICE.*

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**Meeting from 7:20 p.m. to 8:30 p.m.:**

1. Interviewee requested that on Site remedial activities be completed during hours that school is not in session.

*Response: The proposed construction schedule for the comprehensive Site remedy spans approximately two years. Because the work involves earthwork machinery, night work would require extensive lighting and involve significant noise, which would likely be unacceptable to neighboring residents. Further, if construction only took place during the summer when school is not in session, the construction schedule would triple, taking six summers to complete rather than two years.*

2. Interviewee indicated that information is hard to decipher and understand, and requested preparation of simple documents.

*Response: National Grid's reports and communications to the Rhode Island Department of Environmental Management (RIDEM) are technical documents and as a result, cannot necessarily be simplified. However, National Grid will make every effort to use brief and nontechnical terminology in communications to the public, including in mailings, website information and bulletin board postings. In addition, National Grid will prepare simple executive summaries (approximately one to two pages) for major report submittals.*

3. What is the best way to communicate information to the public? Interviewee suggested community mailings.

*Response: National Grid will maintain a site-specific mailing list for the Tidewater Site. In addition, National Grid performed an initial walk of the neighborhood to distribute door knob flyers with information on how to join the mailing list in August 2012. This walk covered residences in the neighborhood as shown on the Figure 3 of the PIP. National Grid will add email addresses to the mailing list as requested by the community and use the mailing list to announce public meetings and availability of reports, and distribute fact sheets. National Grid will also post these announcements and information on the informational bulletin boards located at the end of Tidewater Street and at the end of Bowles Court. See section 4.10 for more information about PUBLIC NOTICE.*

4. Interviewee requested community bulletin board.

*Response: National Grid installed informational bulletin boards at the end of Tidewater Street and at the end of Bowles Court. The bulletin boards will include certain information distributed through the mailing list, as well as weekly updates during remedial work. National Grid will also use the bulletin boards to announce public meetings, distribute fact sheets and communicate availability of reports. See section 4.10 for more information about PUBLIC NOTICE.*

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5. Interviewee requested means of understanding hazards. Requested Risk Characterization to possibly include:

- a. Child/adult exposure scenarios
- b. Discussion of the risks associated with different contaminants. (Interviewee expressed concern about compounds and available information on the Internet)
- c. Comparative risk to assist in explaining levels of risk to the community

*Response: National Grid will conduct remedial work at the site in a manner that limits hazards to onsite workers and off-site community members. Further, there are no complete exposure pathways for soil and groundwater impacts for offsite receptors because National Grid has secured the site with a locked chain link fence. National Grid will address potential air quality risks during implementation of the full-scale remedial approach. National Grid will provide more details about air quality and other potential risks as the process evolves and prior to implementation of full-scale remediation work.*

6. Interviewee requested map of Site/contaminants/hazards.

*Response: National Grid will prepare simple color-coded map depicting the distribution of impacts at the site. National Grid will make these maps available on its website and the informational bulletin boards. This map will also be presented at the community outreach session.*

7. Should regular communications be performed during the cleanup process? Interviewee requested regular meetings during remediation.

*Response: National Grid will hold community meetings during the remediation process at specified project milestones, such as the Rhode Island Department of Environmental Management's (RIDEM) approval of the Remedial Action Work Plan, prior to remedy implementation and following completion of site-wide remediation. National Grid will schedule additional community meetings during the remedial process at the request of the community. See section 4.30 for more information about COMMUNITY MEETINGS.*

8. Interviewee suggested special communications with the schools. Interviewee indicated that communications should be through the principals.

*Response: National Grid will continue to provide project information to the principals of neighboring schools (charter schools and the public school) for dissemination to teachers and parents. Due to privacy concerns, schools typically do not provide lists of students and parents and their contact information to outside entities. However, interested parents can go to the Tidewater/National Grid website and sign up for updates. See section 4.10 for more information about PUBLIC NOTICE.*

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9. Interviewee suggested that a vehicle be established for questions (i.e., a hotline).

*Response: National Grid will provide site contact information on its website and the information bulletin boards at the end of Tidewater Street and Bowles Court. Community members can contact site representatives during normal business hours with any comments or questions. A listing of "frequently asked questions" will be maintained on National Grid's website (www.tidewatersite.com). See sections 4.10 and 4.40 for more information about PUBLIC NOTICE and INFORMATION REPOSITORIES.*

10. Interviewee would prefer if National Grid did not hold the Community PIP Draft Meeting during the summer months.

*Response: Due to community members' vacation schedules during the summer months; National Grid is not planning the community outreach session for August or September. National Grid will likely hold the meeting in the fall.*

11. Interviewee requested that National Grid make frequently asked questions available if a hotline is used.

*Response: National Grid will provide site contact information on its website and the information bulletin boards at the end of Tidewater Street and Bowles Court. Community members can call Site contacts during normal business hours with any comments or questions. A listing of "frequently asked questions" will be maintained on National Grid's website (www.tidewatersite.com). See section 4.10 for more information about PUBLIC NOTICE.*

12. Interviewee suggested flyers on doors.

*Response: National Grid performed an initial walk of the neighborhood to distribute door knob flyers with information on how to join the mailing list in August 2012. This walk covered residences in the neighborhood as shown on the Figure 3 of the PIP. In addition, National Grid will post weekly updates during remedial work to the informational bulletin boards located at the end of Tidewater Street and at the end of Bowles Court, and on both the National Grid and Rhode Island Department of Environmental Management (RIDEM) websites. See section 4.10 for more information about PUBLIC NOTICE.*

13. Interviewee suggested use of Tidewater logo on all mailings.

*Response: National Grid developed a "Tidewater Environmental Project" mailing label to more clearly identify correspondence related to the project. See section 4.10 for more information about PUBLIC NOTICE.*

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14. Should regular communications be performed during the cleanup process? Interviewee agreed with meetings at milestones during remediation.

*Response: National Grid will hold community meetings during the remediation process at specified project milestones, such as the Rhode Island Department of Environmental Management's (RIDEM) approval of the Remedial Action Work Plan, prior to remedy implementation and following completion of site-wide remediation. National Grid will schedule additional community meetings during the remedial process at the request of the community. See section 4.30 for more information about COMMUNITY MEETINGS.*

15. Which locations and times would be convenient for public meetings? Interviewee indicated that schools may be more convenient.

*Response: National Grid will schedule meetings in the evening at either the Blackstone Valley Visitor Center or Varieur Elementary School, based on availability. The preferred location is Varieur Elementary School, which is within walking distance of the Tidewater site. See section 4.30 for more information about COMMUNITY MEETINGS.*

**Comments Received on June 27, 2012:**

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Phone Interview 10 a.m. – 10:45 a.m.

1. Interviewee indicated that it is important to engage the community – suggested door knocking in collaboration with the Environmental Justice League.

*Response: National Grid acknowledges the need to engage community members and keep them informed about the planned investigations and remedial efforts at the Tidewater Site. National Grid has prepared a public involvement plan (PIP) to establish procedures for public and community communications about the Site. As described in the PIP, National Grid performed an initial walk of the neighborhood to distribute door knob flyers with information on how to join the mailing list in August 2012. This walk covered residences in the neighborhood as shown on the Figure 3 of the PIP. We understand that the Environmental Justice League will be undertaking door-to-door efforts as well.*

2. Interviewee indicated that all documents need to be written in simple, plain language.

*Response: National Grid's reports and communications to the Rhode Island Department of Environmental Management (RIDEM) are technical documents and as a result, cannot necessarily be simplified. However, National Grid will make every effort to use brief and nontechnical terminology in communications to the public, including in mailings, website information and bulletin board postings. In addition, National Grid will prepare simple executive summaries for major report submittals.*



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3. Interviewee suggested translations in Spanish and Portuguese.

*Response: National Grid will provide mailings, fact sheets and other communications in both English and Spanish. In addition, all mailed communications will contain a translation header in multiple languages stating: "This is an important notice. Please have it translated." See section 4.20 for more information about ENHANCED COMMUNICATIONS.*

4. Which locations and times would be convenient for public meetings? Interviewee indicated evening meetings are preferable. Meeting locations should be as close to the neighborhood as possible.

*Response: National Grid will schedule meetings in the evening at either the Blackstone Valley Visitor Center or Varieur Elementary School, based on availability. The preferred location is Varieur Elementary School, which is within walking distance of the Tidewater Site. See section 4.30 for more information about COMMUNITY MEETINGS. See section 4.30 for more information about COMMUNITY MEETINGS.*

5. Interviewee suggested providing food and drink, as well as child care at meetings.

*Response: At this time, National Grid does not plan on providing food, drink, or child care at meetings.*

6. Interviewee suggested having translators at all meetings.

*Response: Upon request, National Grid will provide translation assistance for non-English speaking individuals. See section 4.30 for more information about COMMUNITY MEETINGS.*

7. Interviewee liked the bulletin board idea; thought more than two locations would be needed. Interviewee indicated that bulletin boards should include maps.

*Response: National Grid has installed informational bulletin boards at the end of Tidewater Street and at the end of Bowles Court. The bulletin boards will include certain information distributed through the mailing list, as well as weekly updates during remedial work. National Grid will also use the bulletin boards to announce public meetings, distribute fact sheets and communicate availability of reports. In addition, National Grid will post air monitoring data, color-coded maps and Site-related contact information. Please note that if significant vandalism to the bulletin boards occurs, National Grid will look into alternative ways to share information. See section 4.10 for more information about PUBLIC NOTICE.*

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8. Interviewee indicated a need to make it clear that the entire site is addressed in the same manner when it comes to public involvement and the remedy.

*Response: The Rhode Island Department of Environmental Management (RIDEM) is currently reviewing National Grid's recommended remedy for the site. The remedy addresses the entire site in a consistent manner. Similarly, National Grid's environmental monitoring and controls during remedy implementation and post-remedial monitoring will be consistent across the entire site area.*

9. Interviewee indicated that the public must not only be informed on what has happened and what will happen, but also must have a voice on how things get done...follow-through on all public comments.

*Response: All written public comments related to documents submitted to the Rhode Island Department of Environmental Management (RIDEM), as well as National Grid's response, will be documented in written form. National Grid will send a copy of responses to those who submitted comments and also place them in the information repository. In addition, GZA will send a notice announcing the availability of the summary to the Site's mailing and email recipient lists. Refer to section 4.30 for more information.*

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**EXHIBIT IV**

**MAY 22, 2013 RESPONSE TO PUBLIC COMMENTS  
RECEIVED IN REGARDS TO PUBLIC INVOLVEMENT PLAN**

March 22, 2013  
File No. 05.0043654.20-C



Mr. Joseph Martella  
Rhode Island Department of Environmental Management  
Office of Waste Management  
235 Promenade Street  
Providence, Rhode Island 02908

530 Broadway  
Providence  
Rhode Island  
02909  
401-421-4140  
Fax: 401-751-8613  
<http://www.gza.com>

Re: Response to Public Comments  
Draft Public Involvement Plan  
Former Tidewater MGP and Power Plant Site  
Pawtucket, Rhode Island  
*RIDEM Case No. 95-022*

Dear Mr. Martella:

On behalf of our client, The Narragansett Electric Company d/b/a National Grid (National Grid), GZA GeoEnvironmental, Inc. (GZA) has prepared this letter in response to written public comments to the November 26, 2012 draft Public Involvement Plan (PIP) prepared for the Former Tidewater Manufactured Gas Plant (MGP) and Power Plant Site located in Pawtucket, Rhode Island (the Site). These comments were provided to National Grid by the Rhode Island Department of Environmental Management (RIDEM) via a February 21, 2013 notification letter. As indicated in RIDEM's February 21, 2013 notification letter, RIDEM received the following written public comments to the draft PIP: 1) a letter dated January 28, 2013, from Ms. Holly Dygert; and 2) a letter dated February 12, 2013, from Ms. Amelia Rose of the Environmental Justice League of Rhode Island (EJLRI). For your convenience, the comments received are repeated below followed by National Grid's responses in *italics*. The RIDEM notification letter along with the two public comment letters is included as an attachment to this letter.

In addition, per RIDEM's February 2013 notification, attached to this letter are responses to public comments that we received during the January 29, 2013, public meeting held at the Francis Varieur Elementary School. These responses were submitted separately to RIDEM on February 15, 2013. This letter also includes updates to responses to audience comments from the January 29, 2013, meeting which were summarized in the February 15, 2013, submittal and responses to questions related to the PIP provided in an email dated March 6, 2013, from Ms. Holly Dygert. A copy of this March 6, 2013 email is also attached.

**January 28, 2013 Letter**

1. Comment: The information in the boards should be provided in the three primary languages of the community, which are English, Spanish and Portuguese. I was concerned that National Grid seemed to reject a request made during the interviews for information to be translated into both Spanish and Portuguese. I want to underscore the importance of providing information in the community's languages.

*Response: Going forward, National Grid will provide the following documents in English, Spanish and Portuguese: 1) Notification Mailings, 2) Fact Sheets and 3) Executive Summaries that will accompany future reports.*

2. Comment: I look forward to the incorporation of the color-coded alert system.

*Response: We implemented the color-coded alert system on the bulletin boards during the recent substation upgrade project. The system involves posting different color sheets to indicate when excavation is active (yellow sheet) and not active (blue sheet).*



3. Comment: I am very pleased that National Grid has proposed to create a color-coded map of Tidewater site hazards to the public as part of the PIP. Despite years of communications about the hazards on the site, the members of the stakeholder group are still unclear about concentrations of particular hazards, and where they are located. Thus, I am eager to see this map.

*Response: We are finalizing the color-coded map for the Tidewater project that illustrates areas of the Site where impacts have been identified in groundwater and soils and we will present it at the upcoming Community Information Session. The final map will also be posted on the National Grid website and the bulletin boards.*

4. Comment: In regards to the first concern, I agree with the characterization of a public involvement process laid out on page 1 of the Draft PIP, as “an agreement between the party conducting response actions and the public about how they will share information moving forward, and how the public will be able to comment on plans for assessment and cleanup of the site.” This definition identifies the public as important partner in the remediation process. Since the public’s interests vis-à-vis the remediation process diverge in important ways from those of the property owner, the public must have the ability to shape the remediation, and the precautions that are taken during the remediation process. I am concerned, however, that the Draft PIP construes public participation narrowly, as informing the public about work plans that have already been developed.

For example, on page 8, in describing the process through which a final remediation plan for the site will be determined, the Draft PIP states that RIDEM will issue a Program Letter when it has concluded that “the site has been adequately assessed” in the Site Investigation Report. The Draft PIP continues that “Following receipt of the Program Letter, National Grid will notify [various parties]... that the investigation is complete and that RIDEM has concurred with the recommended remedial alternative... Subsequent to this public notification and following receipt of any public comments, the Department will issue a Remedial Decision Letter formally approving the SIR.” In this description, the identification and approval of a remedial strategy are depicted as occurring apart from public involvement. This negates the role of the public in the decision-making process. Moreover, I believe that it is a mischaracterization of the process through which remediation strategies are determined. It is my understanding that the Program Letter solely certifies that RIDEM has determined that the proposed remedy meets the criteria for an acceptable remedy. I understand that the final determination of a remedy cannot be made until members of the community are given an opportunity to consider the proposal, and to convey their concerns to RIDEM.

The characterization of the process through which a Remedial Action Work Plan (RAWP) is identified and selected in the Draft PIP similarly neglects the role of the public. Though the text states that “Many of the above remedial process steps will be accompanied by public meetings and comment periods” (p.8), I find it disconcerting that the public’s role in shaping the remediation process is not included in National Grid’s description of the decision-making process. This view of public involvement as a process whereby National Grid officials inform the public about the remediation process carries through to other sections of the Draft PIP. For example, in the section on Community Meetings, meetings are depicted as opportunities for National Grid representatives to inform community members about the work that has been and will be undertaken in the site. Though informing the community is crucial for facilitating their



involvement in the process, it is not sufficient. The document also states that meetings will be held “in conjunction with... Departmental approval of the Remedial Action Work Plan; [and]prior to remedy implementation” (p.14). This neglects the crucial role the public will have in shaping the RAWP.

The PIP should be revised to indicate clearly that potential work plans will be presented in community meetings, and that community concerns will be solicited to ensure that the final work plans reflect the concerns and needs of the public. Opportunities for community members to comment on the proposed plans and thereby shape the remediation process should be clearly laid out in the meeting agendas, and in the scheduling of meetings (in relation to RIDEM’s final decisions about work at the site).



*Response: We are committed to providing the community with opportunities to review and comment on National Grid’s plans to remediate the Tidewater Site. National Grid will revise the PIP to include a public meeting related to the draft Remedial Action Work Plan (RAWP – the document that will be submitted to RIDEM to present the details of how the remedy will be implemented) to provide further opportunity for the public to comment on the Site remediation process. The public meeting regarding the draft RAWP will be held within 12 months of receipt of the Remedial Decision Letter (RDL – letter issued by RIDEM to formally agree with the findings of the Site Investigation Report). This meeting will be held prior to the submittal of the final RAWP to RIDEM and will provide the public an opportunity to provide comment on the remedial strategy for the Tidewater Site. The process going forward and as outlined in the PIP is intended to provide a means of effective “two-way communication” between the public and National Grid. The Initial Community Meeting (which will follow RIDEM’s review of the Site Investigation Report) will provide the public an opportunity to provide comment on the conceptual remedial strategy for the Tidewater Site. The process outlined in the PIP, which follows the requirements of the Remediation Regulations, provides the public opportunity to comment on the remedial process; however, it is noted that RIDEM is ultimately responsible for the final remedial analysis and decisions on the final remedial strategy for the Site.*

5. Comment: In regards to my second concern, one of the requests most of the interviewees made was for National Grid to make data from air monitoring available in real time to the community. While meeting with representatives from National Grid and RIDEM during the early Fall of 2012, we learned that this was not possible with the particular hand held devices being used to monitor emissions during the current electrical substation upgrade. Moreover, RIDEM representatives at the meeting seemed to concur that the small-scale nature of the work and the limited extent of contaminants in the soil did not warrant the more costly kind of air monitoring technologies that enable real-time posting of readings. I am very concerned to see that the particular scheme we agreed to for monitoring emissions and making the results available to community members during the substation upgrade is replicated in the Draft PIP. National Grid and GZA officials should be clear that the substation upgrade was classified as separate from the remediation process, which is why the work could be completed without presenting it to the public. As we look ahead to the full remediation, the particular air monitoring strategies, and techniques for communicating information about the results of that monitoring to the community, will need to be determined in conversation with the community about the particular threats posed by particular actions.

*Response: We will revise the PIP to delete the reference to posting weekly air monitoring data. Air monitoring plans for full-scale remediation of the Tidewater Site have not been developed as the final remedy for the project has not been approved by the RIDEM. The public will have an opportunity to comment and engage in a conversation about the proposed air monitoring program during the RAWP comment process described above.*

**February 12, 2013 Letter**



1. Comment: Page 2 – The draft PIP states: “This plan is not intended to cover Site activities relative to day-to-day operations of the natural gas regulating facility and electrical substation or other uses of the property by National Grid.” Since community members and parents from nearby schools have already met with GZA, RIDEM, and National Grid regarding substation upgrades and earthwork, especially with regard to improving air monitoring plans in relation to this work, which falls outside the official remediation plan, I would ask that this sentence be clarified to ensure that residents can expect to be informed and be invited to actively participate in the shaping of any plans for the site that would require disturbance to soil or otherwise create a potential public health risk. Some of these activities could be interpreted, potentially, as “day-to-day operations”, and therefore this statement should be clarified to clearly differentiate between actual day-to-day operations and other operations that are not specifically included in the remediation but will disturb soil, create potential emissions, etc.

*Response: National Grid will revise the PIP to clarify this sentence as follows: “This plan is not intended to cover Site activities relative to the day-to-day operations, including repair and maintenance of the natural gas regulating facility and electrical substation involving minor soil disturbances (i.e., fence post installation) or other uses of the property by National Grid. Activities at these facilities involving excavations of soils with the potential to create volatile emissions are covered by this PIP. In the event of a facilities emergency requiring immediate soil excavation (utility repair, etc.), National Grid will follow the soil management procedures prepared for the previous natural gas station regulator and electrical substation work (i.e., April 2011 Materials Management Plan and November 2012 Soil Management Plan, respectively). In addition, air monitoring will be completed during these emergency events in accordance with the September 28, 2012, air monitoring summary memorandum submitted to RIDEM to the extent practical.”*

2. Comment: Page 17 – The Pawtucket Public Library will serve as a repository for all of the documents and other information related to the site. I suggest posting a sign or poster at the Library itself (not just on the fence at the Tidewater site) to let the general public know that this repository exists.

*Response: Information about public repositories for the Tidewater project is posted on the bulletin boards at the end of Tidewater Street and Bowles Court. National Grid will contact the Pawtucket Public Library to inquire about the possibility of posting a sign at the Library and will do so with the Library’s permission.*

3. Comment: Page 19 – If there are revisions proposed for the PIP in the future, National Grid will prepare a revised draft for review and approval by the public and RIDEM. National Grid should prepare a summary sheet to list all of the proposed changes/revisions, as well as the final approved revisions, not simply post the proposed revised draft of the full PIP online and in the physical repository (even if the changes/revisions are highlighted in the full document). This summary sheet should be a separate document to make it easy for the public to access, read, and digest the proposed, and then approved, changes.

*Response: While future revisions to the PIP will not re-open the draft and public comment period, we will prepare and make available summary sheets of proposed and approved changes/revisions for the public.*

4. Comment: In response to concerns raised by residents living on Thornton Street, immediately adjacent to the site, regarding natural gas odors and the possibility of air impacts from the groundwater contamination, I suggest addressing these issues at the poster session National Grid is hosting in the near future. In particular, addressing the issue of vapor intrusion into homes and schools should be a top priority. EJLRI receives technical assistance through an EPA program that

assists organizations and community residents in understanding technical information related to Brownfields contamination and remediation. Upon her review of the draft remedial plan submitted to RIDEM by National Grid, our consultant from the New Jersey Institute of Technology recommended the following:

#### VAPOR INTRUSION INVESTIGATION



Some of the chemicals (volatile compounds) identified at the site have the potential to travel through the soil as vapors. These vapors may then move up through the soil into nearby buildings, contaminating indoor air. Therefore, if a vapor intrusion investigation has not been completed, a vapor intrusion investigation is recommended to determine whether the occupants of neighboring buildings are at risk for exposure to VOCs due to vapor intrusion.

We will be submitting a final version of the consultant's review at the appropriate time (when public comments are being accepted on the SIR/recommended remedial alternative), but I wanted to share this recommendation because it speaks directly to concerns raised by residents at the last meeting.

*Response: We understand that nearby neighbors are concerned about vapor intrusion. Based on a number of factors – the way groundwater is distributed and moves at the Site, the way contaminants are distributed at the Site, and the distance from off-Site buildings to the nearest Site impacts- the potential for vapor intrusion into off-Site buildings, including the residences on Thornton Street or the neighboring schools, has not been identified as a potential pathway of concern for the Tidewater Site. We say this for several reasons:*

- *The majority of soil and groundwater impacts are located at least 50 feet away from the nearest Thornton Street residences and the schools.*
- *The portion of the Site that is nearest the residences along Thornton Street is an area where historical operations did not occur and significant impacts (VOCs or others) have not been detected in this area.*
- *In addition to the distance from Site impacts, the residences along Thornton Street and all three of the schools are located hydraulically upgradient of the Site – in other words, groundwater from the Site flows “downhill” towards the river, not towards the homes on Thornton Street or the schools. Therefore, the potential for migration of Site impacts towards Thornton Street and the schools is not a concern.*

*Our conclusion is also supported by:*

- *The March 2003 proposed revisions to the Connecticut Department of Environmental Protection (CTDEP) volatilization criteria, which references vapor intrusion guidance documents prepared by US Environmental Protection Agency (EPA).<sup>1</sup> This guidance indicates that volatilization criteria are applicable to impacts within 30 feet (both depth and lateral distance) from a structure.*
- *RIDEM's guidance document entitled “Evaluation of Vapor Intrusion Potential for Proposed RI School Sites,” dated September 2012.<sup>2</sup> This RIDEM guidance document outlines a step-by-step process for evaluating the potential for vapor intrusion to migrate*

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<sup>1</sup> RIDEM has not yet developed any vapor intrusion criteria and therefore has incorporated the State of Connecticut's volatilization criteria, available here:

[http://www.ct.gov/deep/cwp/view.asp?a=2715&q=458652&deepNav\\_GID=1626](http://www.ct.gov/deep/cwp/view.asp?a=2715&q=458652&deepNav_GID=1626)

<sup>2</sup> RIDEM developed this guidance document in September 2012, available here:

<http://www.dem.ri.gov/programs/benviron/waste/pdf/skulvapr.pdf>

*from the subsurface into an existing or proposed building to be used as a school. Using this guidance document and the understanding of subsurface impacts and groundwater flow direction information, an evaluation for the potential for vapor intrusion into the off-Site schools and residences is not considered warranted.*



*Finally, National Grid's predecessor owners conducted a soil gas survey surrounding the Francis J. Varieur School in 1996. The survey consisted of 28 sampling points adjacent to the school to ascertain whether the potential existed for the migration of vapors from the surrounding soils into the school. No VOCs were detected in the samples, with the exception of two soil gas samples which detected low levels of trichloroethylene (TCE). TCE is not a contaminant associated with historic MGP and power plant operations and is not associated with the Tidewater Site. Subsequent indoor air samples were collected from within the school for TCE analysis. Those samples did not detect any TCE.*

*At this time, National Grid does not plan on having a specific poster board regarding vapor intrusion at the community outreach session. However, we will be willing to discuss the issue should anyone have any questions about vapors. In addition, we would be happy to discuss this issue further with representatives of the New Jersey Institute of Technology (NJIT) if you wish.*

*To address the question regarding natural gas odors in the neighborhood, National Grid will have a representative available from gas operations at the Community Outreach Session to discuss the natural gas odor concerns raised by the community.*

*Natural gas is typically "odorless" from the well head. Federal and State law mandates that gas must be detectable by a person with an average sense of smell. As a result, pipeline operators and in some cases distribution system operators inject a malodorous material called mercaptan, commonly referred to as "odorant". Federal law also mandates that odorant added to a pipeline must not be harmful to people, pipe or other devices. National Grid does have several Level 3 gas leaks (defined as a non-hazardous leak; periodic monitoring required) in the neighborhood. Level 3 leaks do not present a risk to public health or safety. National Grid is continuing to monitor the leaks and is adhering to the strict Federal and State standards.*

5. Comment: The draft PIP is strong overall, but lacks specifics on how to best engage parents at the local schools. Principals at the schools may not be the best, or only, individuals to notify regarding upcoming work, air monitoring results, public meeting notices, etc. In fact, they can be bottlenecks for getting information out to the wider school community. Suggestions raised at the meeting to engage the Pawtucket Schools Superintendent, the school committee, etc. are all very good, but also are not enough to get through to individual parents. Signs or posters with general information posted at the front offices of the schools adjacent to the site would be a good start (and/or at student pick-up locations), as well as providing copies of public notices to all parents via their child's backpacks, as suggested by the principal at Varieur Elementary, would also help ameliorate this problem. Not all notices need to be sent home via backpacks, but any public meeting announcements should be, as should an initial introductory letter or handout with an overview of the site history and current status, including who to contact for more information. National Grid should work with the principals at the three schools to send this introductory info sheet/letter home with all students as soon as possible.

*Response: We provide notifications to those on the mailing/email list, which includes the principals of the neighboring schools. If the principals need assistance in distributing these notifications, we would be happy to help. The best way to find out information currently is to sign-up to the Tidewater mailing/email list via the National Grid website. National Grid encourages all parents/community members to sign up so that they can receive information directly from National Grid. Any interested party is also welcome to contact National Grid's Project Manager, Michele Leone, directly at 781-907-3651.*





*With permission of the neighboring schools, National Grid will post a sign on how to obtain information regarding the Site at the front office of each school. National Grid has prepared an updated fact sheet which was distributed on March 4, 2013, through the mailing and email lists, as well as via door-to-door flyers to the neighboring community. This fact sheet included information about the former Tidewater facility, recent activities at the Site, public involvement activities and next steps for the Site. The fact sheet accompanied a notification letter regarding the date, time and place of the upcoming Community Outreach Session. National Grid distributed this notification package to the schools on March 6, 2013, to be sent home with the students via backpacks. National Grid will continue to work with the principals about sending mailing list items (flyers, fact sheets and public notifications) in multiple languages home with the students via backpacks.*

6. Comment: Lastly, I would like to ask National Grid, GZA, and RIDEM to respond to how phytoremediation might play into the overall remediation strategy for this site, and/or if this approach has been discussed at all in relation to the Tidewater Site.

*Response: We considered phytoremediation but concluded that it is not a feasible remedial alternative for the following reasons:*

- *The depth of the treatment zone is limited by the depth of the root material of the plants.*
- *The contaminants at the former Tidewater facility are located at depth greater than two feet below the ground which is too deep for phytoremediation.*
- *The nature of certain impacts at the Tidewater Site, including separate phase product (in other words, coal tar or oils), are not amenable to treatment via phytoremediation. Due to these limitations, phytoremediation is not deemed appropriate as a potential remedial alternative for the former Tidewater facility.*

**Updates to Responses to Comments from the January 29, 2013 Public Meeting**  
**Open Comments and Questions Received:**

9. Audience member requested that technical documents be translated into “everyone speak” language.

*National Grid will continue to make every effort to use brief and nontechnical terminology in communications with members of the public. In an effort to meet this request, National Grid has hired a communications consultant to assist in the preparation of documents.*

12. Audience member spoke about historical mercury spill and lasting impact on concern from neighborhood. Audience member enquired about money from court settlement and publicly available information regarding mercury spill. He requested that information about the mercury spill, as it pertains to the history of the Tidewater Site, be included on the website and presented during the poster board session.

*National Grid did not own the property when the mercury spill took place in 2004 and was not involved in the cleanup, court proceedings or settlement. Southern Union was the party solely responsible for cleanup of the mercury incident. National Grid purchased the property from Southern Union but did not acquire Southern Union’s liability for the mercury issues on the property. The mercury contamination from the 2004 spill has been cleaned up and removed from the property. In addition, the buildings have been checked for mercury and no mercury is currently stored on the property. National Grid stated that the files associated with the mercury spill are public information and can be reviewed through RIDEM.*



The audience member further requested that information on the mercury spill be posted on the National Grid website.

*National Grid explained that it was not liable for the mercury release and was not involved in the cleanup, court proceedings or settlement. Southern Union was the party solely responsible for cleanup of the mercury incident. National Grid indicated that it would consider the request and provide a formal response in the response to comments on the PIP.*



*The following additional response was prepared by RIDEM and provided to National Grid following the January 2013 public meeting. National Grid was not involved in preparation of this response or involvement in the Southern Union Case.*

*“In June 2012, the U.S. Supreme Court remanded an \$18-million sentence against the owners of New England Gas in a case that stemmed from the 2004 mercury spill at a Pawtucket housing project. The ruling puts at question the \$12 million in damages that were to have gone to Rhode Island environmental groups (the majority of which were to be managed by the Rhode Island Foundation, in order to fund grants in environmental education, remediation, conservation, and children's health). The remaining \$6 million was a fine. The Supreme Court case hinged on circumstances that require juries -- not judges -- to set penalties after criminal convictions, so the ruling does not change the 2008 conviction of Texas-based Southern Union Co. for illegal storage of the hazardous material that belonged to a former subsidiary. But the ruling means the Supreme Court remanded the case for further proceedings in US District Court (RI) consistent with this opinion. The June 2012 Supreme Court Decision can be found at <http://www.supremecourt.gov/opinions/11pdf/11-94a1b2.pdf> . The US District Court heard oral arguments in December 2012 in an attempt to determine how to properly proceed with the case from here. DEM has received no additional information on this matter from the Court since the hearing in December 2012. “ – Communications from RIDEM*

14. Audience member commented on gas smell at Thornton and Merry Streets and whether or not they are safe or being exposed to natural gas (or its additives).

*The odor that the audience member says he smelled is likely associated with mercaptan. Natural gas by itself is odorless. Mercaptan is an odorant that is added to natural gas so the gas can easily be detected. It is carried with the natural gas stream.*

*National Grid will contact its Natural Gas Division to find out more information about this concern. Representatives from National Grid will be available during the March 27, 2013 community outreach meeting to discuss public concerns regarding the natural gas operations at the Tidewater facility.*

*In addition, refer to the response above for Comment 4 of the February 12, 2013 comment letter regarding “natural gas odors.”*

15. Amelia Rose of the Environmental Justice League of Rhode Island (EJLRI) introduced herself and her agency to the audience. She indicated that EJLRI had access to funds from the US Environmental Protection Agency (USEPA) and could be used as a resource to the community. She also suggested that National Grid have a poster board regarding vapor intrusion during the Community Informational Session to educate the public.

*Refer to the response above for Comment 4 of the February 12, 2013 comment letter regarding “vapor intrusion investigation.”*

*RIDEM also added that the potential for volatilization of contaminants from the Site is not supported by the results of the recent air monitoring program (hand held field instruments) which is being followed as part of the electrical substation project.*

17. Audience member suggested that Cape Verdean be added as a language to the translation list. Also suggested that Oak Hill Nursing Home be added to the distribution list.

*National Grid understands that Cape Verdean is a dialect of Portuguese. Based on discussions with a translation service, we also understand that documents translated in Portuguese should be understood by people who speak Cape Verdean. Therefore, National Grid does not plan to provide documents in Cape Verdean. If a community member requires assistance or translation other than Spanish and Portuguese, please contact Michele Leone at National Grid.*

*National Grid has added Oak Hill Nursing Home to the door to door flyer distribution list during the March 4, 2013 mailing.*

### **March 6, 2013 Email**

(1) National Grid should develop separate communication materials for schools – and provide enough copies to give place one in each student’s backpack.

*National Grid will continue to work with the principals to get materials out to parents via backpacks. To avoid confusion in disseminating this information, National Grid will work directly with the principals and other stakeholders.*

(2) School principals want to review all of the fliers/documents that will be sent to parents before NG makes copies, translates, or finalizes the communication, to make sure they communicate effectively. Julie Nora (ICS) and Carolyn Sheehan (Blackstone Valley) made this suggestion.

*National Grid will work with the principals to ensure that they are comfortable with the documents we provide to them for distribution.*

(3) Neighbors also want to review materials before NG sends out communications to neighborhood – point person can be Amelia Rose at EJ League who can send out draft to list of neighbors and collate comments/suggestions within one week and send back to NG for finalization (worry is that the communications are too wordy and will not be read).

*National Grid is working with a communications consultant in order to make mailings more easily understood by the community in response to this concern. Given this, National Grid will not be providing drafts of our communications to the neighbors prior to distribution. We continue to appreciate the community’s input on the communications and welcome suggestions on how to further improve this process.*

(4) Hold regular meetings with a core group of residents and school personnel to give NG/GZA a chance to communicate in a smaller group setting – in addition to the larger public meetings that happen less frequently. This will help increase communication with the most committed/involved residents and school officials who will be ambassadors to other residents and the wider school community to generate their interest and involvement. Also will make larger public meetings less adversarial and more productive because it won’t be the first time people are hearing about a certain issue or proposal.

*National Grid designed the public involvement plan (PIP) to involve all community members and interested parties. National Grid believes that the large number of public meetings and the commitment to schedule additional meetings on an as-needed basis pre-empts the need for smaller, stakeholder meetings. Community members are strongly encouraged to contact Michele Leone at any time throughout the site cleanup process by calling 781-907-3651 or via email at [michele.leone@nationalgrid.com](mailto:michele.leone@nationalgrid.com) should they have questions or comments.*



(5) Translation at larger public meetings should be made available regardless of whether someone contacts NG to say they are coming to a meeting – this would help build trust with the neighborhood and principals could guarantee to parents that interpretation would be available at public meetings no matter what.



*At all public meetings, translation assistance will be provided for non-English speaking individuals, upon request. Requests can be made to Michele Leone by calling 781-907-3651 or via email at michele.leone@nationalgrid.com.*

(7) NG should create bookmarks with all relevant contact information as well as instructions for how people can get on the email/phone notification lists. These will be helpful to hand out in the neighborhood and at the schools and would be more likely to be read and communicate effectively – rather than a long letter.

*National Grid has created magnets with the requested information which will be available at the upcoming community information session.*

A bulleted summary of the proposed revisions to the PIP, as discussed above, is attached to this letter.

Should you have any questions or comments regarding the information presented herein, please do not hesitate to contact the undersigned or Michele Leone at 781-907-3651.

Very truly yours,

GZA GEOENVIRONMENTAL, INC.

A handwritten signature in blue ink, appearing to read "Margaret S. Kilpatrick".

Margaret S. Kilpatrick, P.E.  
Senior Project Manager

A handwritten signature in blue ink, appearing to read "John P. Hartley".

John P. Hartley  
Consultant/Reviewer

A handwritten signature in blue ink, appearing to read "James J. Clark".

James J. Clark, P.E.  
Principal

Attachments: February 21, 2013 Notification of Public Comments Received  
February 15, 2013 Summary of Meeting  
March 6, 2013 Email  
Summary of Proposed Revisions to PIP

CC: Ms. Michele Leone, National Grid  
Ms. Elizabeth Stone, RIDEM

**FEBRUARY 21, 2013**

NOTIFICATION OF PUBLIC COMMENTS RECEIVED



February 21, 2013

Ms. Michele V. Leone  
Manager, New England Site Investigation & Remediation  
National Grid  
40 Sylvan Road  
Waltham, MA 02451-1120

RE: Tidewater Manufactured Gas Plant (former)  
Tidewater Street  
Pawtucket, Rhode Island

Dear Ms. Leone:

On November 9, 2011, the Rhode Island Department of Environmental Management (the Department) amended the Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases, (the Remediation Regulations). The purpose of these regulations is to create an integrated program requiring reporting, investigation and remediation of contaminated sites in order to eliminate and/or control threats to human health and the environment in an efficient manner.

In the matter of the above referenced "Site" (as defined in the Industrial Property Remediation and Reuse Act), and in accordance with Rule 7.07.E (Public Involvement Plans) of the 2011 Remediation Regulations, the Department's Office of Waste Management (OWM) has received the following documents concerning public comments on the draft Public Involvement Plan (PIP):

1. Letter from Holly Dygert to the Department, Re: Tidewater Site Public Involvement Plan, dated January 27, 2013, and received via e-mail on January 28, 2013; and
2. Comments re: Draft Public Involvement Plan, Former Tidewater Facility and Former Power Plant, Tidewater and Merry Streets, Pawtucket, Rhode Island, prepared by the Environmental Justice League of Rhode Island (EJLRI), received via e-mail on February 12, 2013.

In addition, National Grid received several comments at the public meeting for the draft PIP held on January 29, 2013.

Please review these submitted comments along with those received at the public meeting and prepare written responses to each of them as appropriate. A completed document, incorporating responses all of the comments, must be submitted to the Department for review and approval.



**All correspondence regarding this Site should be sent to the attention of:**

Joseph T. Martella II – Senior Engineer  
RIDEM / Office of Waste Management  
235 Promenade Street  
Providence, RI 02908

If you have any questions regarding this letter, please contact me by telephone at (401) 222-2797 extension 7109 or by e-mail at [joseph.martella@dem.ri.gov](mailto:joseph.martella@dem.ri.gov).

Sincerely,



Joseph T. Martella II  
Senior Engineer  
Rhode Island DEM  
Office of Waste Management

Attachments: January 27, 2013, Letter from Holly Dygert to the Department;  
February 12, 2013, Comments re: Draft Public Involvement Plan

Cc: Kelly J. Owens, RIDEM.OWM  
Elizabeth Stone, RIDEM/OOD  
Barbara Morin, RIDEM/OAR  
Barney S. Heath, Pawtucket Planning & Development  
Alan Tenreiro, Chairman, Pawtucket School Committee  
Deborah Cylke, Superintendent, City of Pawtucket School Department  
Julie Nora, Ph.D, International Charter School  
Carolyn Sheehan, Blackstone Academy  
Edna Coia, Francis J. Varieur Elementary School  
Amelia Rose, EJLRI  
Margaret S. Kilpatrick, GZA

January 27, 2013

Mr. Joseph Martella II, Senior Engineer  
RIDEM Office of Waste Management  
Site Remediation Program

Re: Tidewater Site Public Involvement Plan

Dear Mr. Martella,

I am very pleased that RIDEM has implemented a public involvement mechanism to ensure that members of the community who may be exposed to hazards are involved in the remediation process. I reviewed National Grid's draft Public Involvement Plan (PIP) for the Tidewater Site, and I am also very pleased with many of the actions National Grid has proposed to take to ensure that those potentially impacted by the work at Tidewater are informed of the work. I am writing to communicate my suggestions for strengthening the proposed PIP. These suggestions are aimed, first, to optimize the ability of those who could be impacted by the site's hazards to access information about the nature of these hazards and about potential routes of exposure, and, second, to ensure that they are able to influence the process in accordance with their particular concerns.

I appreciate that National Grid solicited comments from the community through the interview process in June of 2012, and provided a synthesis of the suggestions in the *Draft PIP*. National Grid has already acted on many of these suggestions, and has integrated many of them into the proposed PIP. The community bulletin boards – with announcements and the results of weekly air monitoring – are very useful communication tools. I look forward to the incorporation of the color-coded alert system. The information in the boards should be provided in the three primary languages of the community, which are English, Spanish and Portuguese. I was concerned that National Grid seemed to reject a request made during the interviews for information to be translated into both Spanish and Portuguese. I want to underscore the importance of providing information in the community's languages.

I am very pleased that National Grid has proposed to create a color-coded map of Tidewater site hazards to the public as part of the PIP. Despite years of communications about the hazards on the site, the members of the stakeholder group are still unclear about concentrations of particular hazards, and where they are located. Thus, I am eager to see this map. I am also pleased that National Grid is proposing a Community Outreach (poster) Session, and possibly a tour of the site.

While I am generally satisfied with the strategies National Grid has proposed to convey information to the public, I have two main concerns. The first is that the *Draft PIP* largely neglects the public's role in shaping the remediation process. The second is that the particular

strategy for monitoring air quality that was agreed on for the electrical substation upgrade is included in the *Draft PIP* as the plan for the remediation.

In regards to the first concern, I agree with the characterization of a public involvement process laid out on page 1 of the *Draft PIP*, as “an agreement between the party conducting response actions and the public about how they will share information moving forward, and how the public will be able to comment on plans for assessment and cleanup of the site.” This definition identifies the public as important partner in the remediation process. Since the public’s interests vis-à-vis the remediation process diverge in important ways from those of the property owner, the public must have the ability to shape the remediation, and the precautions that are taken during the remediation process. I am concerned, however, that the *Draft PIP* construes public participation narrowly, as informing the public about work plans that have already been developed.

For example, on page 8, in describing the process through which a final remediation plan for the site will be determined, the *Draft PIP* states that RIDEM will issue a Program Letter when it has concluded that “the site has been adequately assessed” in the Site Investigation Report. The *Draft PIP* continues that “Following receipt of the Program Letter, National Grid will notify [various parties]... that the investigation is complete and that **RIDEM has concurred with the recommended remedial alternative**... Subsequent to this public notification and following receipt of any public comments, the Department will issue a Remedial Decision Letter formally approving the SIR.” In this description, the identification and approval of a remedial strategy are depicted as occurring apart from public involvement. This negates the role of the public in the decision-making process. Moreover, I believe that it is a mischaracterization of the process through which remediation strategies are determined. It is my understanding that the Program Letter solely certifies that RIDEM has determined that the proposed remedy meets the criteria for an acceptable remedy. I understand that the final determination of a remedy cannot be made until members of the community are given an opportunity to consider the proposal, and to convey their concerns to RIDEM.

The characterization of the process through which a *Remedial Action Work Plan* (RAWP) is identified and selected in the *Draft PIP* similarly neglects the role of the public. Though the text states that “Many of the above remedial process steps will be accompanied by public meetings and comment periods” (p.8), I find it disconcerting that the public’s role in shaping the remediation process is not included in National Grid’s description of the decision-making process. This view of public involvement as a process whereby National Grid officials inform the public about the remediation process carries through to other sections of the *Draft PIP*. For example, in the section on Community Meetings, meetings are depicted as opportunities for National Grid representatives to inform community members about the work that has been and will be undertaken in the site. Though informing the community is crucial for facilitating their involvement in the process, it is not sufficient. The document also states that meetings will be held “in conjunction with... Departmental approval of the *Remedial Action Work Plan*; [and]

prior to remedy implementation” (p.14). This neglects the crucial role the public will have in shaping the RAWP.

The *PIP* should be revised to indicate clearly that potential work plans will be presented in community meetings, and that community concerns will be solicited to ensure that the final work plans reflect the concerns and needs of the public. Opportunities for community members to comment on the proposed plans and thereby shape the remediation process should be clearly laid out in the meeting agendas, and in the scheduling of meetings (in relation to RIDEM’s final decisions about work at the site).

In regards to my second concern, one of the requests most of the interviewees made was for National Grid to make data from air monitoring available in real time to the community. While meeting with representatives from National Grid and RIDEM during the early Fall of 2012, we learned that this was not possible with the particular hand held devices being used to monitor emissions during the current electrical substation upgrade. Moreover, RIDEM representatives at the meeting seemed to concur that the small-scale nature of the work and the limited extent of contaminants in the soil did not warrant the more costly kind of air monitoring technologies that enable real-time posting of readings. I am very concerned to see that the particular scheme we agreed to for monitoring emissions and making the results available to community members during the substation upgrade is replicated in the *Draft PIP*. National Grid and GZA officials should be clear that the substation upgrade was classified as separate from the remediation process, which is why the work could be completed without presenting it to the public. As we look ahead to the full remediation, the particular air monitoring strategies, and techniques for communicating information about the results of that monitoring to the community, will need to be determined in conversation with the community about the particular threats posed by particular actions.

In closing, I want to reiterate my support for the PIP process that RIDEM has adopted, and that National Grid has begun to develop. I look forward to continuing to work with RIDEM and National Grid to develop an effective plan for ensuring optimal public involvement.

Sincerely,



Holly Dygert  
16 Minto Street  
Providence, RI 02908  
(401) 272-1748



**Environmental  
Justice League of  
Rhode Island**

Environmental Justice League of Rhode Island  
1192 Westminster St. Providence, RI 02909  
Tel: (401) 383-7441 Fax: (401) 941-8156  
[questions@ejlri.org](mailto:questions@ejlri.org)  
[www.ejlri.wordpress.com](http://www.ejlri.wordpress.com)

February 12, 2013

Joseph Martella, Project Manager  
RIDEM  
Office of Waste Management  
235 Promenade Street  
Providence, RI 02908

*Comments re: Draft Public Involvement Plan, Former Tidewater Facility and Former Power Plant, Tidewater and Merry Streets, Pawtucket, Rhode Island*

Dear Mr. Martella,

I am submitting the following comments on behalf of the Environmental Justice League of Rhode Island (EJLRI) regarding the draft Public Involvement Plan (PIP) prepared by GZA on behalf of their client, National Grid, the responsible party for the Tidewater Site.

I have listed a few specific comments first, followed by more general suggestions for the PIP overall.

Page 2 – The draft PIP states: “This plan is not intended to cover Site activities relative to day-to-day operations of the natural gas regulating facility and electrical substation or other uses of the property by National Grid.” Since community members and parents from nearby schools have already met with GZA, RIDEM, and National Grid regarding substation upgrades and earthwork, especially with regard to improving air monitoring plans in relation to this work, which falls outside the official remediation plan, I would ask that this sentence be clarified to ensure that residents can expect to be informed and be invited to actively participate in the shaping of any plans for the site that would require disturbance to soil or otherwise create a potential public health risk. Some of these activities could be interpreted, potentially, as “day-to-day operations”, and therefore this statement should be clarified to clearly differentiate between actual day-to-day operations and other operations that are not specifically included in the remediation but will disturb soil, create potential emissions, etc.

Page 17 – The Pawtucket Public Library will serve as a repository for all of the documents and other information related to the site. I suggest posting a sign or poster at the Library itself (not just on the fence at the Tidewater site) to let the general public know that this repository exists.

Page 19 – If there are revisions proposed for the PIP in the future, National Grid will prepare a revised draft for review and approval by the public and RIDEM. National Grid should prepare a summary sheet to list all of the proposed changes/revisions, as well as the final approved revisions, not simply post the proposed revised draft of the full PIP online and in the physical repository (even if the changes/revisions are highlighted in the full document). This summary sheet should be a separate document to make it easy for the public to access, read, and digest the proposed, and then approved, changes.



In response to concerns raised by residents living on Thornton Street, immediately adjacent to the site, regarding natural gas odors and the possibility of air impacts from the groundwater contamination, I suggest addressing these issues at the poster session National Grid is hosting in the near future. In particular, addressing the issue of vapor intrusion into homes and schools should be a top priority. EJLRI receives technical assistance through an EPA program that assists organizations and community residents in understanding technical information related to Brownfields contamination and remediation. Upon her review of the draft remedial plan submitted to RIDEM by National Grid, our consultant from the New Jersey Institute of Technology recommended the following:

#### VAPOR INTRUSION INVESTIGATION


Some of the chemicals (volatile compounds) identified at the site have the potential to travel through the soil as vapors. These vapors may then move up through the soil into nearby buildings, contaminating indoor air. Therefore, if a vapor intrusion investigation has not been completed, a vapor intrusion investigation is recommended to determine whether the occupants of neighboring buildings are at risk for exposure to VOCs due to vapor intrusion.

We will be submitting a final version of the consultant's review at the appropriate time (when public comments are being accepted on the SIR/recommended remedial alternative), but I wanted to share this recommendation because it speaks directly to concerns raised by residents at the last meeting.

The draft PIP is strong overall, but lacks specifics on how to best engage parents at the local schools. Principals at the schools may not be the best, or only, individuals to notify regarding upcoming work, air monitoring results, public meeting notices, etc. In fact, they can be bottlenecks for getting information out to the wider school community. Suggestions raised at the meeting to engage the Pawtucket Schools Superintendent, the school committee, etc. are all very good, but also are not enough to get through to individual parents. Signs or posters with general information posted at the front offices of the schools adjacent to the site would be a good start (and/or at student pick-up locations), as well as providing copies of public notices to all parents via their child's backpacks, as suggested by the principal at Varieur Elementary, would also help ameliorate this problem. Not all notices need to be sent home via backpacks, but any public meeting announcements should be, as should an initial introductory letter or handout with an overview of the site history and current status, including who to contact for more information. National Grid should work with the principals at the three schools to send this introductory info sheet/letter home with all students as soon as possible.

Lastly, I would like to ask National Grid, GZA, and RIDEM to respond to how phytoremediation might play into the overall remediation strategy for this site, and/or if this approach has been discussed at all in relation to the Tidewater Site.

Sincerely,

A handwritten signature in cursive script that reads "Amelia Rose". The signature is written in dark ink and is positioned below the word "Sincerely,".

Amelia Rose, Director

**FEBRUARY 15, 2013**

SUMMARY OF MEETING

**GZA**  
**GeoEnvironmental, Inc.**

*Engineers and  
Scientists*

February 15, 2013  
GZA File No. 05.0043654.20-C

Mr. Joseph Martella  
Rhode Island Department of Environmental Management  
Office of Waste Management  
235 Promenade Street  
Providence, Rhode Island 02908



530 Broadway  
Providence  
Rhode Island  
02909  
401-421-4140  
Fax: 401-751-8613  
<http://www.gza.com>

Re: *Meeting Summary - January 29, 2013*  
Draft Public Involvement Plan  
Former Tidewater MGP and Power Plant Site  
Pawtucket, Rhode Island  
*RIDEM Case No. 95-022*

Dear Mr. Martella:

On behalf of our client, The Narragansett Electric Company d/b/a National Grid (National Grid), GZA GeoEnvironmental Inc. (GZA) is pleased to provide the attached summary of the January 29, 2013 public meeting associated with the Former Tidewater Manufactured Gas Plant (MGP) and Power Plant Site located in Pawtucket, Rhode Island (the Site). The purpose of the public meeting was to discuss public comments to the draft Public Involvement Plan (PIP) which was submitted to the Department on November 26, 2012.

Should you have any questions or comments regarding the information presented herein, please do not hesitate to contact the undersigned or Michele Leone at 781-907-3651.

Very truly yours,

GZA GEOENVIRONMENTAL, INC.

A handwritten signature in blue ink, appearing to read 'M. Kilpatrick', is written over a faint, light blue circular stamp or watermark.

Margaret S. Kilpatrick, P.E.  
Senior Project Manager  
401-421-4140 – [margaret.kilpatrick@gza.com](mailto:margaret.kilpatrick@gza.com)

Attachment: Summary of Meeting

CC: Ms. Michele Leone, National Grid  
Ms. Elizabeth Stone, RIDEM

Summary of Meeting  
 DRAFT Public Involvement Plan (PIP)  
 Former Tidewater Facility  
 Pawtucket, Rhode Island

January 29, 2013 6 PM  
 Francis J. Varieur Elementary School  
 486 Pleasant Street  
 Pawtucket, Rhode Island

- **Introduction to Meeting – Michele Leone (National Grid Representative)**
- **Presentation of DRAFT PIP dated November 26, 2012 – Elizabeth Stone (Rhode Island Department of Environmental Management or RIDEM) and Meg Kilpatrick, P.E. (GZA GeoEnvironmental, Inc.)**

The presentation included a summary of the Draft Public Involvement Plan (PIP) for the former Tidewater Facility (the Site). The draft PIP was developed based on input from the public provided during the community interviews completed in June 2012, as well as input from RIDEM. It provides a blueprint for keeping the public informed during the site cleanup process. It also presents how the public can participate in the process and comment on the project. A PIP is a living document and can be amended to reflect additional issues or challenges that may arise during the cleanup process.

National Grid submitted a draft PIP to RIDEM on November 26, 2012. The draft PIP has four components: 1) public notice, 2) fact sheets and enhanced communications, 3) community meetings and 4) information repositories. The four components are presented in the below table.

<p><b><u>Public Notice:</u></b></p> <ul style="list-style-type: none"> <li>• Mailing List (used to announce public meetings, distribute fact sheets, information about availability of reports, etc.)</li> <li>• Email List (optional)</li> <li>• Sign up at <a href="http://www.tidewatersite.com">www.tidewatersite.com</a></li> <li>• Or, send request to National Grid</li> </ul>	<p><b><u>Fact Sheets and Enhanced Communications:</u></b></p> <ul style="list-style-type: none"> <li>• Fact Sheets (used to inform of development of new information and/or achievement of significant milestones)</li> <li>• Informational Bulletin Boards (end of Tidewater Street and Bowles Court)</li> <li>• Phone Message Alert System during excavation</li> </ul>
<p><b><u>Community Meetings:</u></b></p> <ul style="list-style-type: none"> <li>• Encourages equal participation by all to create an atmosphere of constructive, open dialogue</li> <li>• Proposed Schedule and Objective of Public Meetings</li> <li>• Evening meeting time</li> <li>• Francis J. Varieur School (preferred venue)</li> </ul>	<p><b><u>Information Repositories:</u></b></p> <ul style="list-style-type: none"> <li>• Publicly Accessible Site File: RIDEM Case No. 95-022 <a href="http://www.dem.ri.gov/topics/fileview/htm">www.dem.ri.gov/topics/fileview/htm</a></li> <li>• Publicly Accessible Websites: <a href="http://www.tidewatersite.com">www.tidewatersite.com</a> <a href="http://www.dem.ri.gov/benviron/waste/tide/htm">www.dem.ri.gov/benviron/waste/tide/htm</a></li> <li>• Local Information Repository: Pawtucket Library (13 Summer St) Bulletin Boards: Tidewater St &amp; Bowles Ct</li> </ul>

Following the public comment period for the draft PIP, National Grid will provide a response to comments and revise the PIP as necessary for submittal to RIDEM for final review and approval.

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National Grid will hold a community outreach session in March 2013 to present information about the Site in an informal poster-board type setting. Following this session, National Grid will hold the initial community meeting within 60 days after receipt of the Program Letter from RIDEM (issued following RIDEM’s formal review of the Site Investigation Report submitted by National Grid). The schedule of community meetings follows, and National Grid encourages participation by all to create an atmosphere of constructive, open dialogue.

ACTIVITY	TIME PERIOD
Community Outreach Session	Within 60 days of Draft PIP Meeting (March 2013)
Initial Community Meeting	Within 60 days of receipt of Program Letter – during SIR Public Comment Period
Public Meeting on DRAFT Remedial Action Approval Plan (RAWP)	Within 12 months of receipt of Remedial Decision Letter
Submit RAWP for RIDEM Approval	Within 6 months of DRAFT RAWP Meeting
Public Meeting prior to initiation of remedy	Minimum of 30 days prior to start of remediation
Public Meetings during remediation	Meeting schedule to be presented for discussion purposes once remedial schedule is developed and approved by RIDEM
Public Meeting upon completion of the remedy	Within 30 days following completion of remediation

A copy of the presentation associated with the January 29, 2013 Draft PIP meeting is posted on the National Grid Tidewater website ([www.tidewatersite.com](http://www.tidewatersite.com)).

**Questions and Comments Session:** *(Responses provided in italics)*

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National Grid provided a brief summary of written public comments received to date on the DRAFT PIP.

- Public requested that Portuguese (in addition to Spanish) be included as languages for documents requiring translation.

*National Grid stated that going forward, the following document types will be provided in English, Spanish and Portuguese: 1) Notification Mailings, 2) Fact Sheets and 3) brief Executive Summaries which will accompany future reports.*

- Public requested that color-coded alert system be implemented on the bulletin boards.

*National Grid stated that the color-coded alert system has been implemented on the bulletin boards during the recent excavation project. The system involves posting different color sheets to indicate when excavation is active (yellow sheet) and not active (blue sheet).*



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- Public requested color-coded map of Tidewater Site contaminants.

*National Grid stated that the color-coded map for the Tidewater project is being finalized and will be presented at the upcoming Community Information Session. The final map will also be posted on the National Grid website and the bulletin boards.*

- Public expressed concern that current Draft PIP does not take into account the public's role in providing input into the remediation process.

*National Grid reinforced that the process going forward and as outlined in the PIP is intended to provide a means of effective "two-way communications" between the public and National Grid. National Grid stated that the Initial Community Meeting (which will follow RIDEM's review of the Site Investigation Report) will provide the public an opportunity to provide comment on the conceptual remedial strategy for the Tidewater Site. In addition, National Grid indicated that the current draft of the PIP has been modified to include a public meeting on the draft Remedial Action Work Plan (RAWP – the document that will be submitted to RIDEM to present the details of how the remedy will be implemented) to further provide an opportunity for the public to comment on the Site cleanup process.*

- Public expressed concern that current Draft PIP does not consider air monitoring during the remediation of the Tidewater Site.

*National Grid stated that the air monitoring plans for full-scale remediation of the Tidewater Site have not been developed as the final remedy for the project has not been approved. National Grid stated that the public will have an opportunity to comment and present their concerns during future public meetings, which National Grid will incorporate into the air monitoring plan for the final remediation.*

Audience member relayed concern that draft PIP references weekly posting of air monitoring data and that inclusion of this language will set a precedent for future air quality monitoring.

*National Grid stated that the PIP will be modified to delete reference to the posting of weekly air monitoring data.*

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**Open Comments and Questions Received:**

1. Audience member enquired about date for the Community Outreach Session.

*The current schedule is to have the Community Outreach Session in mid to late March 2013.*

2. Audience member enquired about what March 2013 Community Outreach Session consist of.

*The Community Outreach Session will consist of an informal meeting where information will be presented on poster boards to the public. The poster boards will include a variety of topics, including such things as "What is an Manufactured Gas Plant?" history of the Tidewater Site, findings of the investigations, demonstrations of field equipment, description of current National Grid operations at the property, etc. Each poster board will be manned by a representative from National Grid and/or GZA to answer questions. RIDEM will also be present to answer questions from the public.*

3. Audience member expressed concern about when to know when things are going on at the Site; specifically, when to leave kids inside.

*Information regarding excavation at the Site is provided through the mailing/email list, posted to the bulletin boards and posted to the Tidewater websites. The National Grid website will also be updated to include the color-coded alert system information (active and no active excavation). National Grid will also inform school principals of the schedule of work.*

4. Audience member stated that he is a parent and emphasized that it is important to remember that parents have no way to obtain information about the Site.

*National Grid provides notifications to those on the mailing/email list, which includes the principals of the neighboring schools. Due to privacy issues, National Grid does not have access to student/parent information. National Grid will continue to work with the school principals in developing an effective way to communicate with the parents. The best way to find out information currently is to sign-up to the Tidewater mailing/email list via the National Grid website. National Grid requested that audience members tell other parents/community members about this and encourage them to sign up so that they can receive information directly from National Grid.*

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- Audience member stated that parents from the International Charter School want a way for the information to be communicated to the parents.

*National Grid will continue to work with the school principals in developing an effective way to communicate with the parents. National Grid encouraged parents to sign-up for the mailing and/or email lists, as well as visit the National Grid website, to obtain information.*

- Audience member stated that he/she feels that the parents have no way to determine what is going on at the site and suggested possibly implementation of additional bulletin boards.

*The bulletin boards were installed at locations proximate to the Tidewater site, as well as accessible and visible to the schools. The two site bulletin boards are located close to each of the neighboring schools. National Grid will look into the possible installation of additional bulletin boards, as well as continuing to work with the school principals in developing an effective way to communicate with the parents.*

- The principal from Blackstone Academy stated the community has various levels of technical understanding and that disseminating information about the Tidewater Site is difficult.

*In the future, National Grid will prepare simple executive summaries for major report submittals. In preparing these summaries, National Grid will make every effort to use brief and nontechnical terminology in communications to the public. In the near future, National Grid will prepare an executive summary for the recent Site Investigation Report as well as an updated Fact Sheet which will be distributed through the mailing lists, as well as placed into the information repositories. National Grid will also continue to work with the school principals in developing an effective way to communicate information to the parents.*

- Audience member stated that, as a parent, the 2- hour notice provided through the phone message alert system was not enough. In addition, notification regarding the Tidewater site needs to be provided to more parties, such as elected officials and School Committee(s). A presentation of information would be warranted.

*The mailing list established for the Tidewater project does include local elected officials as well as school representatives, including the Principals of the Blackstone Academy, International Charter School and Francis J. Varieur School, as well as the Superintendent of schools for the City of Pawtucket. National Grid would be happy to include members of the School Committee on the mailing list, upon receipt of their contact information. National Grid also is willing to meet with*

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*members of the school and local government to present information about the Tidewater site and answer any questions that they may have.*

9. Audience member requested that technical documents be translated into “everyone speak” language.

*National Grid is attempting to do this and will continue to try to produce documents that are better understood by the public.*

10. Audience member asked when RIDEM will be ready to review the Site Investigation Report (SIR).

*Joseph Martella of RIDEM provided details regarding the regulatory process under the RIDEM Remediation Regulations. He indicated that the Public Involvement Plan must be finalized and in place before RIDEM’s review of the SIR can begin.*

Audience member enquired about the timing of this review and if the spring would seem reasonable.

*RIDEM indicated that it may be possible but reiterated that PIP must be finalized before the review of the SIR begins.*

11. Audience member requested that live translators be provided at public meetings.

*National Grid would be happy to provide translators, if requested by the public in advance of the meetings. Future notifications will include language regarding the availability of translators upon request by the public.*

12. Audience member spoke about historical mercury spill and lasting impact on concern from neighborhood. Audience member enquired about money from court settlement and publicly available information regarding mercury spill. He requested that information about the mercury spill, as it pertains to the history of the Tidewater Site, be included on the website and presented during the poster board session.

*National Grid did not own the property when the mercury spill took place in 2004 and was not involved in the cleanup, court proceedings or settlement. Southern Union was the party solely responsible for cleanup of the mercury incident. National Grid purchased the property from*

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*Southern Union but did not acquire Southern Union's liability for the mercury issues on the property. The mercury contamination from the 2004 spill has been cleaned up and removed from the property. In addition, the buildings have been checked for mercury and no mercury is currently stored on-site. National Grid stated that the files associated with the mercury spill are public information and can be reviewed through RIDEM.*

The audience member further requested that information on the mercury spill be posted on the National Grid website.

*National Grid explained that it was not liable for the mercury release was not involved in the cleanup, court proceedings or settlement. Southern Union was the party solely responsible for cleanup of the mercury incident. National Grid indicated that it would consider the request and provide a formal response in the response to comments on the PIP.*

13. Audience member concerned about Tidewater flyer that he received on his door from Environmental Justice League. The flyer depicted biohazard marker and list of chemicals with associated acute health hazards. Audience member relayed information about members of his household and neighbors being diagnosed with cancer and is concerned about what he is being exposed to at his home as he lives on Thornton Street located right next to site. He stressed that he wants to know if he is safe.

*National Grid stressed that the Site is fenced and locked to keep people off of the property. Under normal site conditions, the Site is safe to the community- in other words, there is no potential for airborne contaminants. During times of excavation, when soil is dug up and moved around, there is a potential for airborne contaminants. During soil excavation, National Grid follows an air quality monitoring program which has received public input and has been reviewed and approved by RIDEM. The results of this monitoring are posted to the bulletin boards as well as the Tidewater websites. This program was followed during the recent electrical substation upgrade project. The majority of excavation associated with this project is complete, with the exception of minor fence post installations and minor excavations associated with properly decommissioning equipment. Air data from this project did not show sustained exceedances of the thresholds (defined as being held over a 5-minute time period) at any time. A few transient exceedances of the thresholds were noted during the work which were not associated with the excavation activities (i.e., transient exceedances due to weather interference (rain), movement of trash material, orange peel, etc.) .*



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Audience member asked whether there are emissions coming from the site without moving the soil? Also, audience member wanted to know about indoor air monitoring and whether or not they should be concerned about migration/volatilization into buildings on Thornton Street.

*Contaminants from the site are not getting into the air (i.e., volatilizing) from the soil and groundwater under normal conditions (i.e., no soil being moved or disturbed). The majority of surface soils at Site are indicative of urban fill – soils which would typically be found in urban or city environments and exhibit low levels of contaminants. The majority of impacts are found below the ground surface (deeper than 2 feet) in the soils, at or below the groundwater table. In addition, the majority of soil, groundwater and separate phase product (oil) impacts are found where the historical Manufactured Gas Plant and Power Plant operations took place, primarily along the river area between Winter Street and the land behind the Max Read Field. The area where the residences are located along Thornton Street are in an area where historical operations did not occur and do not have elevated levels of observed impacts. This area is also located upgradient of the site – groundwater from the Site flows “downhill” towards the river, not towards the homes on Thornton Street. Based on this information, National Grid believes that the buildings on Thornton Street are unaffected by the migration and/or volatilization from impacts on the Tidewater Site.*

*The drawbacks to indoor air testing were also discussed, as this type of testing typically will pick up standard house hold products and chemicals, such as paint, cleaners, etc., which cannot be differentiated from possible site contaminants.*

*The findings of the drilling program in Max Read Field were also discussed. Results of the explorations indicated the presence of visually impacted soil at depths greater than 2 feet in a limited area on the eastern portion of the field. The soils at depth are not accessible (i.e., they are covered with 2 feet of visually non-impacted soil which would need to be removed). The exploration program was conducted with knowledge by the City of Pawtucket and the City is aware of the findings of the investigation.*

14. Audience member commented on gas smell at Thornton and Merry Streets and whether or not they are safe or being exposed to natural gas (or its additives).

*The odor that the audience member says he smelled is likely associated with mercaptan. Natural gas by itself is odorless. Mercaptan is an odorant that is added to natural gas so the gas can easily be detected. It is carried with the natural gas stream.*

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*National Grid will contact their Natural Gas Division to find out more information about this concern.*

15. Amelia Rose of the Environmental Justice League of Rhode Island (EJLRI) introduced herself and her agency to the audience. She indicated that EJLRI had access to funds from the US Environmental Protection Agency (USEPA) and could be used as a resource to the community. She also suggested that National Grid have a poster board regarding vapor intrusion during the Community Informational Session to educate the public.

*National Grid will consider adding a poster board regarding vapor intrusion to the Community Informational Session.*

*RIDEM also added that the potential for volatilization of contaminants from the site is not supported by the results of the recent air monitoring program (hand held field instruments) which is being followed as part of the electrical substation project.*

16. Audience member commented on concern regarding interfacing with the schools and the community. They suggested providing information about the site at a 4-6<sup>th</sup> grade comprehension level. Also, they requested that National Grid inform Shea High School about the impacts on the Max Read Field as they use the athletic field for sport activities.

*National Grid will look into this request and get back to the public. In the future, National Grid will prepare simple executive summaries for major report submittals. In preparing these summaries, National Grid will make every effort to use brief and nontechnical terminology in communications to the public. In the near future, National Grid will prepare an executive summary for the recent Site Investigation Report as well as an updated Fact Sheet which will be distributed through the mailing lists, as well as placed into the information repositories. National Grid will also continue to work with the school principals in developing an effective way to communicate information to the parents. Also, National Grid will consider adding Shea High School to the mailing list.*

17. Audience member suggested that Cape Verdean be added as a language to the translation list. Also suggested that Oak Hill Nursing Home be added to the distribution list.

*National Grid will consider adding Cape Verdean to the translation list. National Grid will also consider adding Oak Hill Nursing Home to the mailing list.*

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18. Audience member enquired why this is the first Public Involvement Plan in RI and what is typically done in Massachusetts?

*RIDEM indicated that the Remediation Regulations were recently modified in November 2011 to include a formal Public Involvement process, similar to that established in Massachusetts. This is the first PIP in Rhode Island due to the recent change in the regulations. Massachusetts has had a PIP process in place for at least 20 years.*

19. Audience member inquired if the site is “safe,” why all the concern?

*RIDEM indicated that the Site is under the State’s guidance for a reason – there are soil and groundwater impacts at the site which do pose a certain level of exposure risk. RIDEM stressed that the fencing is also there for a reason – to prevent people from entering the Site. RIDEM also gave the example of different levels of exposure at the Site – i.e., on-site workers who are excavating soils (potential high exposure risk) versus people off-site at or near the fence line (low potential exposure risk).*

20. Audience member enquired if wildlife could present an exposure risk via soil disturbance (i.e., burrowing, digging) on site.

*GZA performs weekly site walks to inspect and document the conditions at the Site. There has not been evidence of significant soil disturbance by wildlife at the Site. In the future, we will continue to monitor soil disturbance.*

21. Audience member requested status on South Washout Area repair.

*The earthwork associated with the South Washout Area has not been completed. National Grid will continue to work with the City to have this work completed.*

22. Audience member enquired when the public will receive a response to comments.

*The schedule presented in the presentation was revisited. A summary of today’s meeting will be provided within 10 business days (by 2/12/2013). Written comments on the draft PIP from the public should be provided to RIDEM within 10 business days (by 2/12/2013). RIDEM indicated that an extension to the public comment period may be requested in writing. Timing for response to written comments will be based on how many comments are received.*

**MARCH 6, 2013**

EMAIL

## Margaret Kilpatrick

---

**From:** Dygert, Holly <hdygert@ric.edu>  
**Sent:** Wednesday, March 06, 2013 3:39 PM  
**To:** Leone, Michele (Michele.Leone@nationalgrid.com); Margaret Kilpatrick  
**Cc:** joseph.martella@dem.ri.gov; Amelia Rose (amelia.rose@ejlri.org); jenrossi3@gmail.com  
**Subject:** Tidewater Site communications, follow-up suggestions  
**Attachments:** PIP Recommendations Tidewater Community Group.doc

Dear Michele and Meg,

We held a meeting last week with members of the Tidewater community (school officials, parents of school children, and members of the neighborhood) to follow-up on National Grid's recent public meeting. One of the primary concerns expressed was that the language used in the outreach efforts was not accessible to most people. I personally spoke with a woman in the neighborhood who said that she keeps going to these meetings, but she doesn't understand anything that is said. I also noted that one of the attendees prefaced his comments at the meeting with, "I know I sound ignorant, but..." The school administrators, parents and residents had several suggestions of ways to make the communications more effective. We've compiled those suggestions – I am attaching the list and pasting it below.

As a college professor, I am constantly charged with translating expert knowledge into language that is accessible, often to kids coming right out of high school. I'm happy to compile a list of terms that are hard for non-specialists to understand (e.g., remedy, remediation, cap, program letter, abutter, action limits...). The list of definitions that National Grid provided in a former communication is a step in the right direction, but it would be better to replace those specialized terms with more accessible alternatives.

On a different note, can you tell me if you've been able to figure out what the source of the gas smell is that the resident at the public meeting complained about? I've heard multiple people complain about intermittent gas smells over the last couple of years.

Sincerely,

Holly Dygert

### **PIP Recommendations for the Tidewater Site March 6, 2013**

#### **Issues of concern that people would like to be addressed at the poster session:**

Gas Smells – What is this? What are potential impacts?

Differences among remedial alternatives – what options does National Grid have and why are they choosing one option over another?

What are potential future uses of this land/site after remediation? Will National Grid still own the site? Have there been discussions with City of Pawtucket?

What are the implications for neighbors' health based on what kinds of contaminants are at the site?

#### **Further Suggestions for Effectively Communicating with the Public (in preparation for the poster session):**

National Grid should develop separate communication materials for schools – and provide enough copies to give place one in each student's backpack.



School principals want to review all of the fliers/documents that will be sent to parents before NG makes copies, translates, or finalizes the communication, to make sure they communicate effectively. Julie Nora (ICS) and Carolyn Sheehan (Blackstone Valley) made this suggestion.

Neighbors also want to review materials before NG sends out communications to neighborhood – point person can be Amelia Rose at EJ League who can send out draft to list of neighbors and collate comments/suggestions within one week and send back to NG for finalization (worry is that the communications are too wordy and will not be read).

Hold regular meetings with a core group of residents and school personnel to give NG/GZA a chance to communicate in a smaller group setting – in addition to the larger public meetings that happen less frequently. This will help increase communication with the most committed/involved residents and school officials who will be ambassadors to other residents and the wider school community to generate their interest and involvement. Also will make larger public meetings less adversarial and more productive because it won't be the first time people are hearing about a certain issue or proposal.

Translation at larger public meetings should be made available regardless of whether someone contacts NG to say they are coming to a meeting – this would help build trust with the neighborhood and principals could guarantee to parents that interpretation would be available at public meetings no matter what.

Community members recommend that they be permitted to have their own poster/table at the poster session in addition to what NG/GZA are preparing.

NG should create bookmarks with all relevant contact information as well as instructions for how people can get on the email/phone notification lists. These will be helpful to hand out in the neighborhood and at the schools and would be more likely to be read and communicate effectively – rather than a long letter.

**SUMMARY OF PROPOSED CHANGES TO PIP**

## **Summary of Proposed Changes to the Public Involvement Plan (PIP)**

Based on Public Comments Received

Former Tidewater Facility

Pawtucket, Rhode Island

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- Revise to state that National Grid will provide the following in English, Spanish and Portuguese:
  - Notification Mailings
  - Fact Sheets
  - Brief Executive Summaries which will accompany future reports.
- Revise the PIP to change the time period for the public meeting related to the Remedial Action Work Plan (RAWP). As revised, the public meeting regarding the RAWP will be held on the draft version of the RAWP prior to submittal to RIDEM.
- Revise the PIP to delete the reference of posting of weekly air monitoring data.
- Clarify definition of day-to-day uses of the Site that do not fall under the jurisdiction of the PIP. Revise the sentence in the PIP to state “This plan is not intended to cover Site activities relative to the day-to-day operations, including repair and maintenance of the natural gas regulating facility and electrical substation involving minor soil disturbances (i.e., fence post installation) or other uses of the property by National Grid. Activities at these facilities involving excavations of soils with the potential to create volatile emissions are covered by this PIP. In the event of a facilities emergency requiring immediate soil excavation (utility repair, etc.), National Grid will follow the soil management procedures prepared for the previous natural gas station regulator and electrical substation work (i.e., April 2011 Materials Management Plan and November 2012 Soils Management Plan, respectively). In addition, air monitoring will be completed during these emergency events in accordance with the September 28, 2012 air monitoring summary memorandum submitted to RIDEM to the extent practical.”
- Add a summary sheet of proposed revisions and with final approved revisions as an appendix to the PIP.
- Update PIP regarding how National Grid will work with the three neighboring schools to send information (i.e., fact sheets, public notifications, flyers) home to the students.



## **EXHIBIT V**

### **SUMMARY OF RIDEM-APPROVED CHANGES TO THE PUBLIC INVOLVEMENT PLAN**

**Exhibit 5**  
**Summary of RIDEM-Approved Changes to the Public Involvement Plan (PIP)**  
Based on Public Comments Received  
Former Tidewater Facility  
Pawtucket, Rhode Island

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- Revise to state that National Grid will provide the following in English, Spanish and Portuguese:
  - Notification Mailings
  - Fact Sheets
  - Brief Executive Summaries which will accompany future reports.
- Revise the PIP to change the time period for the public meeting related to the Remedial Action Work Plan (RAWP). As revised, the public meeting regarding the RAWP will be held on the draft version of the RAWP prior to submittal to RIDEM.
- Revise the PIP to delete the reference of posting of weekly air monitoring data.
- Clarify definition of day-to-day uses of the Site that do not fall under the jurisdiction of the PIP. Revise the sentence in the PIP to state “This plan is not intended to cover Site activities relative to the day-to-day operations, including repair and maintenance of the natural gas regulating facility and electrical substation involving minor soil disturbances (i.e., fence post installation) or other uses of the property by National Grid. Activities at these facilities involving excavations of soils with the potential to create volatile emissions are covered by this PIP. In the event of a facility emergency requiring immediate soil excavation (utility repair, etc.), National Grid will follow the soil management procedures prepared for the previous natural gas station regulator and electrical substation work (i.e., April 2011 *Materials Management Plan* and November 2012 *Soil Management Plan*, respectively). In addition, air monitoring will be completed during these emergency events in accordance with the September 28, 2012 air monitoring summary memorandum submitted to RIDEM to the extent practical.”
- Add a summary sheet of proposed revisions and with final approved revisions as an exhibit to the PIP.
- Update PIP regarding how National Grid will work with the three neighboring schools to send information (i.e., fact sheets, public notifications, flyers) home to the students.
- Update the November 2012 Draft PIP with more recent public involvement and site investigation activities.





**EXHIBIT VI**

AUGUST 1, 2013 NOTIFICATION FROM RIDEM TO NATIONAL GRID



August 1, 2013

Ms. Michele V. Leone  
Manager, New England Site Investigation & Remediation  
National Grid  
40 Sylvan Road  
Waltham, MA 02451-1120

RE: Tidewater Manufactured Gas Plant (former)  
Tidewater Street  
Pawtucket, Rhode Island

Dear Ms. Leone:

On November 9, 2011, the Rhode Island Department of Environmental Management (the Department) amended the Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases, (the Remediation Regulations). The purpose of these regulations is to create an integrated program requiring reporting, investigation and remediation of contaminated sites in order to eliminate and/or control threats to human health and the environment in an efficient manner.

In the matter of the above referenced "Site" (as defined in the Industrial Property Remediation and Reuse Act), and in accordance with Rule 7.07.E (Public Involvement Plans) of the 2011 Remediation Regulations, the Department's Office of Waste Management (OWM) has received the following document concerning National Grid's response to public comments on the draft Public Involvement Plan (PIP):

- Response to Public Comments, Draft Public Involvement Plan, Former Tidewater MGP and Power Plant Site, Pawtucket, Rhode Island, RIDEM Case No. 95-022, prepared by GZA GeoEnvironmental, Inc. (GZA), and dated March 22, 2013.

The OWM has reviewed the above referenced Response to Public Comments, and concurs with the proposed changes to the PIP, as listed in that document's attachment titled "Summary of Proposed Changes to the Public Involvement Plan (PIP)." Please prepare a final version of the PIP based upon the proposed changes.

The Department acknowledges that sufficient time has passed since the submittal of the Response to Public Comments, such that some of the information provided in the responses may require updating based upon decisions and activities that have taken place since March 22, 2013. For example, National Grid's decision to perform a soil gas investigation at the site, in response to public concerns raised about potential vapor intrusion. Therefore, the Department requests that

the March 22, 2013, responses be reviewed, and where deemed necessary, that changes or corrections be made, and/or updated information be added as appropriate. This letter and the revised updated responses to public comments should be added to the Final PIP as individual exhibits. Once these items are addressed, please submit the revised Final PIP with all exhibits to the Department in both hard copy for the public file and electronic PDF format suitable for posting on the Department's Tidewater web page.

If you have any questions regarding this letter, please contact me by telephone at (401) 222-2797 extension 7109 or by e-mail at [joseph.martella@dem.ri.gov](mailto:joseph.martella@dem.ri.gov).

Sincerely,



Joseph T. Martella II  
Senior Engineer  
Rhode Island DEM  
Office of Waste Management

Cc: Kelly J. Owens, RIDEM.OWM  
Elizabeth Stone, RIDEM/OOD  
Barbara Morin, RIDEM/OAR  
Barney S. Heath, Pawtucket Planning & Development  
Alan Tenreiro, Chairman, Pawtucket School Committee  
Deborah Cylke, Superintendent, City of Pawtucket School Department  
Julie Nora, Ph.D, International Charter School  
Carolyn Sheehan, Blackstone Academy  
Edna Coia, Francis J. Variieur Elementary School  
Amelia Rose, EJLRI  
Margaret S. Kilpatrick, GZA



**EXHIBIT VII**

OCTOBER 15, 2013 UPDATED RESPONSE TO PUBLIC COMMENTS  
RECEIVED IN REGARDS TO PUBLIC INVOLVEMENT PLAN

October 15, 2013  
File No. 05.0043654.20-C

Mr. Joseph Martella  
Rhode Island Department of Environmental Management  
Office of Waste Management  
235 Promenade Street  
Providence, Rhode Island 02908



530 Broadway  
Providence  
Rhode Island  
02909  
401-421-4140  
Fax: 401-751-8613  
<http://www.gza.com>

Re: Revised Response to Public Comments  
Public Involvement Plan  
Former Tidewater MGP and Power Plant Site  
Pawtucket, Rhode Island  
*RIDEM Case No. 95-022*

Dear Mr. Martella:

On behalf of our client, The Narragansett Electric Company d/b/a National Grid (National Grid), GZA GeoEnvironmental, Inc. (GZA) has prepared this updated letter in response to written public comments to the November 26, 2012 draft Public Involvement Plan (PIP) prepared for the Former Tidewater Manufactured Gas Plant (MGP) and Power Plant Site located in Pawtucket, Rhode Island (the Site). This letter supersedes our letter dated March 22, 2013 "Response to Public Comments" and serves to address the following comments provided to National Grid:

- Notification Letter from the Rhode Island Department of Environmental Management (RIDEM) Office of Waste Management (OWM) dated February 21, 2013 which enclosed written public comments to the draft PIP:
  - A letter dated January 28, 2013, from Ms. Holly Dygert
  - A letter dated February 12, 2013 from Ms. Amelia Rose of the Environmental Justice League of Rhode Island (EJLRI);
- A letter dated February 15, 2013, from GZA, summarizing responses to comments that were received from the audience during the meeting held on January 29, 2013;
- An email dated March 6, 2013, from Ms. Holly Dygert;
- A Response to Comments letter dated March 22, 2013, from GZA, summarizing the responses to public comments received since N
- November 26, 2012; and
- Notification Letter from the RIDEM dated August 1, 2013, concurring with the March 22, 2013 Response to Comments letter and requesting the Response to Comments letter be revised for recent updates on public involvement activities at the Tidewater Site and that the PIP be finalized.

Copies of the correspondence referenced above are attached to this letter. For your convenience, the comments received are repeated below followed by National Grid's responses in *italics*.



**January 28, 2013 Letter**

1. Comment: The information in the boards should be provided in the three primary languages of the community, which are English, Spanish and Portuguese. I was concerned that National Grid seemed to reject a request made during the interviews for information to be translated into both Spanish and Portuguese. I want to underscore the importance of providing information in the community's languages.



*Response: Going forward, National Grid will provide the following documents in English, Spanish and Portuguese: 1) Notification Mailings, 2) Fact Sheets and 3) Executive Summaries that will accompany future reports.*

2. Comment: I look forward to the incorporation of the color-coded alert system.

*Response: We implemented the color-coded alert system on the bulletin boards and on the website home page ([www.tidewatersite.com](http://www.tidewatersite.com)) during the recent substation upgrade project. The system involves posting different color sheets to indicate when excavation is active (yellow sheet) and not active (blue sheet).*

3. Comment: I am very pleased that National Grid has proposed to create a color-coded map of Tidewater site hazards to the public as part of the PIP. Despite years of communications about the hazards on the site, the members of the stakeholder group are still unclear about concentrations of particular hazards, and where they are located. Thus, I am eager to see this map.

*Response: A color-coded map for the Tidewater project that illustrates areas of the Site where impacts have been identified in groundwater and soils has been finalized. It was presented at the Community Information Session held on March 27, 2013. The final map was posted on the National Grid website ([www.tidewatersite.com](http://www.tidewatersite.com)) and the bulletin boards. The map has been provided in the revised PIP as Figure 4 and is entitled "Observed Impacts".*

4. Comment: In regards to the first concern, I agree with the characterization of a public involvement process laid out on page 1 of the Draft PIP, as "an agreement between the party conducting response actions and the public about how they will share information moving forward, and how the public will be able to comment on plans for assessment and cleanup of the site." This definition identifies the public as important partner in the remediation process. Since the public's interests vis-à-vis the remediation process diverge in important ways from those of the property owner, the public must have the ability to shape the remediation, and the precautions that are taken during the remediation process. I am concerned, however, that the Draft PIP construes public participation narrowly, as informing the public about work plans that have already been developed.

For example, on page 8, in describing the process through which a final remediation plan for the site will be determined, the Draft PIP states that RIDEM will issue a Program Letter when it has concluded that "the site has been adequately assessed" in the Site Investigation Report. The Draft PIP continues that "Following receipt of the Program Letter, National Grid will notify [various parties]... that the investigation is complete and that RIDEM has concurred with the recommended remedial alternative... Subsequent to this public notification and following receipt of any public comments, the Department will issue a Remedial Decision Letter formally approving the SIR." In this description, the identification and approval of a remedial strategy are depicted as occurring apart from public involvement. This negates the role of the public in the decision-making process. Moreover, I believe that it is a mischaracterization of the process through which remediation strategies are determined. It is my understanding that the Program Letter solely certifies that RIDEM has determined that the proposed remedy meets the criteria for an acceptable remedy. I understand that the final determination of a remedy cannot be made until members of the community are given an opportunity to consider the proposal, and to convey their concerns to RIDEM.



The characterization of the process through which a Remedial Action Work Plan (RAWP) is identified and selected in the Draft PIP similarly neglects the role of the public. Though the text states that “Many of the above remedial process steps will be accompanied by public meetings and comment periods” (p.8), I find it disconcerting that the public’s role in shaping the remediation process is not included in National Grid’s description of the decision-making process. This view of public involvement as a process whereby National Grid officials inform the public about the remediation process carries through to other sections of the Draft PIP. For example, in the section on Community Meetings, meetings are depicted as opportunities for National Grid representatives to inform community members about the work that has been and will be undertaken in the site. Though informing the community is crucial for facilitating their involvement in the process, it is not sufficient. The document also states that meetings will be held “in conjunction with... Departmental approval of the Remedial Action Work Plan; [and]prior to remedy implementation” (p.14). This neglects the crucial role the public will have in shaping the RAWP.

The PIP should be revised to indicate clearly that potential work plans will be presented in community meetings, and that community concerns will be solicited to ensure that the final work plans reflect the concerns and needs of the public. Opportunities for community members to comment on the proposed plans and thereby shape the remediation process should be clearly laid out in the meeting agendas, and in the scheduling of meetings (in relation to RIDEM’s final decisions about work at the site).

*Response: We are committed to providing the community with opportunities to review and comment on National Grid’s plans to remediate the Tidewater Site. National Grid has revised the PIP to include a public meeting related to the draft Remedial Action Work Plan (RAWP – the document that will be submitted to RIDEM to present the details of how the remedy will be implemented) to provide further opportunity for the public to comment on the Site remediation process. The public meeting regarding the draft RAWP will be held within 12 months of receipt of the Remedial Decision Letter (RDL – letter issued by RIDEM to formally agree with the findings of the Site Investigation Report). This meeting will be held prior to the submittal of the final RAWP to RIDEM and will provide the public an opportunity to provide comment on the remedial strategy for the Tidewater Site. The process going forward and as outlined in the PIP is intended to provide a means of effective “two-way communication” between the public and National Grid. The Initial Community Meeting (which will follow RIDEM’s review of the Site Investigation Report) will provide the public an opportunity to provide comment on the conceptual remedial strategy for the Tidewater Site. The process outlined in the PIP, which follows the requirements of the Remediation Regulations, provides the public opportunity to comment on the remedial process; however, it is noted that RIDEM is ultimately responsible for the final remedial analysis and decisions on the final remedial strategy for the Site.*

5. Comment: In regards to my second concern, one of the requests most of the interviewees made was for National Grid to make data from air monitoring available in real time to the community. While meeting with representatives from National Grid and RIDEM during the early Fall of 2012, we learned that this was not possible with the particular hand held devices being used to monitor emissions during the current electrical substation upgrade. Moreover, RIDEM representatives at the meeting seemed to concur that the small-scale nature of the work and the limited extent of contaminants in the soil did not warrant the more costly kind of air monitoring technologies that enable real-time posting of readings. I am very concerned to see that the particular scheme we agreed to for monitoring emissions and making the results available to community members during the substation upgrade is replicated in the Draft PIP. National Grid and GZA officials should be clear that the substation upgrade was classified as separate from the remediation process, which is why the work could be completed without presenting it to the public. As we look ahead to the full remediation, the particular air monitoring strategies, and techniques for communicating information about the results of that monitoring to the community, will need to be determined in conversation with the community about the particular threats posed by particular actions.

*Response: The PIP has been revised to delete the reference to posting weekly air monitoring data. Air monitoring plans for full-scale remediation of the Tidewater Site have not been developed as the final remedy for the project has not been approved by the RIDEM. The public will have an opportunity to comment and engage in a conversation about the proposed air monitoring program during the RAWP comment process described above.*



**February 12, 2013 Letter**

1. Comment: Page 2 – The draft PIP states: “This plan is not intended to cover Site activities relative to day-to-day operations of the natural gas regulating facility and electrical substation or other uses of the property by National Grid.” Since community members and parents from nearby schools have already met with GZA, RIDEM, and National Grid regarding substation upgrades and earthwork, especially with regard to improving air monitoring plans in relation to this work, which falls outside the official remediation plan, I would ask that this sentence be clarified to ensure that residents can expect to be informed and be invited to actively participate in the shaping of any plans for the site that would require disturbance to soil or otherwise create a potential public health risk. Some of these activities could be interpreted, potentially, as “day-to-day operations”, and therefore this statement should be clarified to clearly differentiate between actual day-to-day operations and other operations that are not specifically included in the remediation but will disturb soil, create potential emissions, etc.

*Response: National Grid has revised the PIP to clarify this sentence as follows: “This plan is not intended to cover Site activities relative to the day-to-day operations, including repair and maintenance of the natural gas regulating facility and electrical substation involving minor soil disturbances (i.e., fence post installation) or other uses of the property by National Grid. Activities at these facilities involving excavations of soils with the potential to create volatile emissions are covered by this PIP. In the event of a facility emergency requiring immediate soil excavation (utility repair, etc.), National Grid will follow the soil management procedures prepared for the previous natural gas station regulator and electrical substation work (i.e., April 2011 Materials Management Plan and November 2012 Soil Management Plan, respectively). In addition, air monitoring will be completed during these emergency events in accordance with the September 28, 2012, air monitoring summary memorandum submitted to RIDEM to the extent practical.”*

2. Comment: Page 17 – The Pawtucket Public Library will serve as a repository for all of the documents and other information related to the site. I suggest posting a sign or poster at the Library itself (not just on the fence at the Tidewater site) to let the general public know that this repository exists.

*Response: Information about public repositories for the Tidewater project is posted on the bulletin boards at the end of Tidewater Street and Bowles Court. National Grid contacted the Pawtucket Public Library and posted a sign in English, Spanish and Portuguese to provide more information about the Tidewater Site. These signs were posted on October 8, 2013. Copies of the signs are provided in Exhibit I of the October 2013 PIP.*

3. Comment: Page 19 – If there are revisions proposed for the PIP in the future, National Grid will prepare a revised draft for review and approval by the public and RIDEM. National Grid should prepare a summary sheet to list all of the proposed changes/revisions, as well as the final approved revisions, not simply post the proposed revised draft of the full PIP online and in the physical repository (even if the changes/revisions are highlighted in the full document). This summary sheet should be a separate document to make it easy for the public to access, read, and digest the proposed, and then approved, changes.

*Response: While future revisions to the PIP will not re-open the formal draft and public comment period, we will prepare and make available a summary sheet of proposed and approved changes/revisions for*

*the public. A summary sheet of RIDEM-approved changes to the November 2012 Draft PIP is included as Exhibit V.*

4. Comment: In response to concerns raised by residents living on Thornton Street, immediately adjacent to the site, regarding natural gas odors and the possibility of air impacts from the groundwater contamination, I suggest addressing these issues at the poster session National Grid is hosting in the near future. In particular, addressing the issue of vapor intrusion into homes and schools should be a top priority. EJLRI receives technical assistance through an EPA program that assists organizations and community residents in understanding technical information related to Brownfields contamination and remediation. Upon her review of the draft remedial plan submitted to RIDEM by National Grid, our consultant from the New Jersey Institute of Technology recommended the following:



#### VAPOR INTRUSION INVESTIGATION

Some of the chemicals (volatile compounds) identified at the site have the potential to travel through the soil as vapors. These vapors may then move up through the soil into nearby buildings, contaminating indoor air. Therefore, if a vapor intrusion investigation has not been completed, a vapor intrusion investigation is recommended to determine whether the occupants of neighboring buildings are at risk for exposure to VOCs due to vapor intrusion.

We will be submitting a final version of the consultant's review at the appropriate time (when public comments are being accepted on the SIR/recommended remedial alternative), but I wanted to share this recommendation because it speaks directly to concerns raised by residents at the last meeting.

*Response: We understand that nearby neighbors are concerned about vapor intrusion. Based on a number of factors – the way groundwater is distributed and moves at the Site, the way contaminants are distributed at the Site, and the distance from off-Site buildings to the nearest Site impacts- the potential for vapor intrusion into off-Site buildings, including the residences on Thornton Street or the neighboring schools, has not been identified as a potential pathway of concern for the Tidewater Site.*

*In response to public concern, National Grid conducted soil gas sampling during July and August 2013 in the interior portion of the Tidewater Site and along the perimeter of the Tidewater Site. The results of the interior soil gas testing are consistent with previous soil and groundwater testing at the Tidewater Site. While certain compounds were detected at low levels, none of the perimeter soil gas readings exceeded regulatory criteria established by the Connecticut Department of Energy and Environmental Protection (CTDEEP) for both residential and industrial/commercial settings. (Rhode Island does not have regulatory criteria for soil gas quality.) The results showed the closer the samples got to the boundary of the Site, the lower the concentrations of these compounds. Overall, the test results indicate that potential migration of impacted soil gas from the Tidewater Site towards neighboring properties and structures does not pose a risk to the neighbors.*

*National Grid provided a fact sheet/summary, a figure and analytical soil gas results to RIDEM describing the soil gas sampling and preliminary results on August 28, 2013 and posted this information to the Tidewater website ([www.tidewatersite.com](http://www.tidewatersite.com)). Availability of this information was provided via email to those recipients of the Tidewater email distribution lists. A copy of this fact sheet is included in Exhibit I. National Grid submitted a comprehensive report describing this soil gas study and the results to RIDEM in October 2013. This comprehensive report was also posted on the Tidewater website ([www.tidewatersite.com](http://www.tidewatersite.com)).*



*To address the question regarding natural gas odors in the neighborhood, National Grid had representatives available from gas operations at the Community Outreach Session held on March 27, 2013 to discuss the natural gas odor concerns raised by the community.*



*Natural gas is typically "odorless" from the well head. Federal and State law mandates that gas must be detectable by a person with an average sense of smell. As a result, pipeline operators and in some cases distribution system operators inject a malodorous material called mercaptan, commonly referred to as "odorant". Federal law also mandates that odorant added to a pipeline must not be harmful to people, pipe or other devices. National Grid does have Level 3 gas leaks (defined as a non-hazardous leak; periodic monitoring required) in our gas distribution system. Level 3 leaks do not present a risk to public health or safety. National Grid monitors the leaks and is adhering to the strict Federal and State standards. In addition, a leak in the neighborhood near the Site was repaired in March 2013. If members of the neighborhood or community smell gas, they should notify National Grid immediately (1-800-640-1595) and we will investigate the odor.*

5. Comment: The draft PIP is strong overall, but lacks specifics on how to best engage parents at the local schools. Principals at the schools may not be the best, or only, individuals to notify regarding upcoming work, air monitoring results, public meeting notices, etc. In fact, they can be bottlenecks for getting information out to the wider school community. Suggestions raised at the meeting to engage the Pawtucket Schools Superintendent, the school committee, etc. are all very good, but also are not enough to get through to individual parents. Signs or posters with general information posted at the front offices of the schools adjacent to the site would be a good start (and/or at student pick-up locations), as well as providing copies of public notices to all parents via their child's backpacks, as suggested by the principal at Varieur Elementary, would also help ameliorate this problem. Not all notices need to be sent home via backpacks, but any public meeting announcements should be, as should an initial introductory letter or handout with an overview of the site history and current status, including who to contact for more information. National Grid should work with the principals at the three schools to send this introductory info sheet/letter home with all students as soon as possible.

*Response: We provide notifications to those on the mailing/email list, which includes the principals of the neighboring schools. If the principals need assistance in distributing these notifications, we would be happy to help. The best way to find out information currently is to sign-up to the Tidewater mailing/email list via the National Grid website ([www.tidewatersite.com](http://www.tidewatersite.com)). National Grid encourages all parents/community members to sign up so that they can receive information directly from National Grid. Any interested party is also welcome to contact National Grid's Project Manager, Michele Leone, directly at 781-907-3651.*

*National Grid contacted the three neighboring schools and posted a sign in English, Spanish and Portuguese to provide more information about the Tidewater Site. These signs were posted on October 8, 2013. Copies of the signs are provided in Exhibit I of the October 2013 PIP. National Grid has prepared an updated fact sheet which was distributed on March 4, 2013, through the mailing and email lists, as well as via door-to-door flyers to the neighboring community. This fact sheet included information about the former Tidewater facility, recent activities at the Site, public involvement activities and next steps for the Site. The fact sheet accompanied a notification letter regarding the date, time and place of the upcoming Community Outreach Session. National Grid distributed this notification package to the schools on March 6, 2013, to be sent home with the students via backpacks. National Grid will continue to work with the principals about sending mailing list items (flyers, fact sheets and public notifications) in multiple languages home with the students via backpacks.*

6. Comment: Lastly, I would like to ask National Grid, GZA, and RIDEM to respond to how phytoremediation might play into the overall remediation strategy for this site, and/or if this approach has been discussed at all in relation to the Tidewater Site.



*Response: We considered phytoremediation but concluded that it is not a feasible remedial alternative for the following reasons:*

- *The depth of the treatment zone is limited by the depth of the root material of the plants.*
- *The contaminants at the former Tidewater facility are located at depth greater than two feet below the ground which is too deep for phytoremediation.*
- *The nature of certain impacts at the Tidewater Site, including separate phase product (in other words, coal tar or oils), are not amenable to treatment via phytoremediation.*  
*Due to these limitations, phytoremediation is not deemed appropriate as a potential remedial alternative for the former Tidewater facility.*



**Updates to Responses to Comments from the January 29, 2013 Public Meeting**  
**Open Comments and Questions Received:**

1. Audience member requested that technical documents be translated into “everyone speak” language.

*National Grid will continue to make every effort to use brief and nontechnical terminology in communications with members of the public. In an effort to meet this request, National Grid has hired a communications consultant to assist in the preparation of documents.*

2. Audience member spoke about historical mercury spill and lasting impact on concern from neighborhood. Audience member enquired about money from court settlement and publicly available information regarding mercury spill. He requested that information about the mercury spill, as it pertains to the history of the Tidewater Site, be included on the website and presented during the poster board session.

*National Grid did not own the property when the mercury spill took place in 2004 and was not involved in the cleanup, court proceedings or settlement. Southern Union was the party solely responsible for cleanup of the mercury incident. National Grid purchased the property from Southern Union but did not acquire Southern Union’s liability for the mercury issues on the property. The mercury contamination from the 2004 spill has been cleaned up and removed from the property. In addition, the buildings have been checked for mercury and no mercury is currently stored on the property. National Grid stated that the files associated with the mercury spill are public information and can be reviewed through RIDEM.*

The audience member further requested that information on the mercury spill be posted on the National Grid website.

*National Grid explained that it was not liable for the mercury release and was not involved in the cleanup, court proceedings or settlement. Southern Union was the party solely responsible for cleanup of the mercury incident. National Grid indicated that it would consider the request and provide a formal response in the response to comments on the PIP.*

*The following additional response was prepared by RIDEM and provided to National Grid following the January 2013 public meeting. RIDEM updated this information in August 2013. National Grid was not involved in preparation of this response or involvement in the Southern Union Case.*

*“In June 2012, the U.S. Supreme Court remanded an \$18-million sentence against the owners of New England Gas in a case that stemmed from the 2004 mercury spill at a Pawtucket housing project. The ruling puts at question the \$12 million in damages that were to have gone to Rhode Island environmental groups (the majority of which were to be managed by the Rhode Island Foundation, in order to fund grants in environmental education, remediation, conservation, and children’s health). The remaining \$6*



million was a fine. The Supreme Court case hinged on circumstances that require juries -- not judges -- to set penalties after criminal convictions, so the ruling does not change the 2008 conviction of Texas-based Southern Union Co. for illegal storage of the hazardous material that belonged to a former subsidiary. But the ruling means the Supreme Court remanded the case for further proceedings in US District Court (RI) consistent with this opinion. The June 2012 Supreme Court Decision can be found at <http://www.supremecourt.gov/opinions/11pdf/11-94a1b2.pdf>. The US District Court heard oral arguments in December 2012 in an attempt to determine how to properly proceed with the case from here. On April 25, 2013, the US District Court (RI) issued a preliminary sentencing memorandum on the Southern Union penalty related to the improper storage of waste mercury at their facility in Pawtucket. Due to the June 2012 Supreme Court decision, the US District Court (RI) is limited to fining Southern Union \$500,000 or the equivalent in community service, rather than the \$6 million fine and \$12 million in charitable contributions that had previously been imposed as punishment. The Court allowed prosecutors, Southern Union and unspecified members of the greater environmental community 90 days to suggest a community service proposal valued at no more than \$500,000 and will schedule sentencing once proposals are received and reviewed. " – Communications from RIDEM

3. Audience member commented on gas smell at Thornton and Merry Streets and whether or not they are safe or being exposed to natural gas (or its additives).

*The odor that the audience member says he smelled is likely associated with mercaptan. Natural gas by itself is odorless. Mercaptan is an odorant that is added to natural gas so the gas can easily be detected. It is carried with the natural gas stream.*

*To address the question regarding natural gas odors in the neighborhood, National Grid had representatives available from gas operations at the Community Outreach Session held on March 27, 2013 to discuss the natural gas odor concerns raised by the community.*

*In addition, refer to the response above for Comment 4 of the February 12, 2013 comment letter regarding "natural gas odors."*

*If members of the neighborhood or community smell gas, they should notify National Grid immediately (1-800-640-1595) and we will investigate the odor.*

4. Amelia Rose of the Environmental Justice League of Rhode Island (EJLRI) introduced herself and her agency to the audience. She indicated that EJLRI had access to funds from the US Environmental Protection Agency (USEPA) and could be used as a resource to the community. She also suggested that National Grid have a poster board regarding vapor intrusion during the Community Informational Session to educate the public.

*Refer to the response above for Comment 4 of the February 12, 2013 comment letter regarding "vapor intrusion investigation."*

*RIDEM also added that the potential for volatilization of contaminants from the Site is not supported by the results of the recent air monitoring program (hand held field instruments) which is being followed as part of the electrical substation project.*

5. Audience member suggested that Cape Verdean be added as a language to the translation list. Also suggested that Oak Hill Nursing Home be added to the distribution list.

*National Grid understands that Cape Verdean is a dialect of Portuguese. Based on discussions with a translation service, we also understand that documents translated in Portuguese should be understood by people who speak Cape Verdean. Therefore, National Grid does not plan to provide documents in*

*Cape Verdean. If a community member requires assistance or translation other than Spanish and Portuguese, please contact Michele Leone at National Grid.*

*National Grid has added Oak Hill Nursing Home to the door to door flyer distribution list during the March 4, 2013 mailing. See Figure 3, Door-to-Door Notification for the updated distribution area.*

### **March 6, 2013 Email**

(1) National Grid should develop separate communication materials for schools – and provide enough copies to give place one in each student’s backpack.

*National Grid will continue to work with the principals to get materials out to parents via backpacks. To avoid confusion in disseminating this information, National Grid will work directly with the principals and other stakeholders.*

(2) School principals want to review all of the fliers/documents that will be sent to parents before NG makes copies, translates, or finalizes the communication, to make sure they communicate effectively. Julie Nora (ICS) and Carolyn Sheehan (Blackstone Valley) made this suggestion.

*National Grid will work with the principals to ensure that they are comfortable with the documents we provide to them for distribution.*

(3) Neighbors also want to review materials before NG sends out communications to neighborhood – point person can be Amelia Rose at EJ League who can send out draft to list of neighbors and collate comments/suggestions within one week and send back to NG for finalization (worry is that the communications are too wordy and will not be read).

*National Grid is working with a communications consultant in order to make mailings more easily understood by the community in response to this concern. Given this, National Grid will not be providing drafts of our communications to the neighbors prior to distribution. We continue to appreciate the community’s input on the communications and welcome suggestions on how to further improve this process.*

(4) Hold regular meetings with a core group of residents and school personnel to give NG/GZA a chance to communicate in a smaller group setting – in addition to the larger public meetings that happen less frequently. This will help increase communication with the most committed/involved residents and school officials who will be ambassadors to other residents and the wider school community to generate their interest and involvement. Also will make larger public meetings less adversarial and more productive because it won’t be the first time people are hearing about a certain issue or proposal.

*National Grid designed the public involvement plan (PIP) to involve all community members and interested parties. National Grid believes that the large number of public meetings and the commitment to schedule additional meetings on an as-needed basis pre-empts the need for smaller, stakeholder meetings. Community members are strongly encouraged to contact Michele Leone at any time throughout the site cleanup process by calling 781-907-3651 or via email at [michele.leone@nationalgrid.com](mailto:michele.leone@nationalgrid.com) should they have questions or comments.*

(5) Translation at larger public meetings should be made available regardless of whether someone contacts NG to say they are coming to a meeting – this would help build trust with the neighborhood and principals could guarantee to parents that interpretation would be available at public meetings no matter what.



*At all public meetings, translation assistance will be provided for non-English speaking individuals, upon request. Requests can be made to Michele Leone by calling 781-907-3651 or via email at michele.leone@nationalgrid.com.*

(6) NG should create bookmarks with all relevant contact information as well as instructions for how people can get on the email/phone notification lists. These will be helpful to hand out in the neighborhood and at the schools and would be more likely to be read and communicate effectively – rather than a long letter.

*National Grid created magnets with the requested information which were available at the Community Outreach Session held on March 27, 2013.*

A bulleted summary of the proposed revisions to the PIP, as discussed above, is included in the revised PIP as Exhibit V.

Should you have any questions or comments regarding the information presented herein, please do not hesitate to contact the undersigned or Michele Leone at 781-907-3651.

Very truly yours,

GZA GEOENVIRONMENTAL, INC.



Margaret S. Kilpatrick, P.E.  
Senior Project Manager



John P. Hartley  
Consultant/Reviewer



James J. Clark, P.E.  
Principal

Attachments: February 21, 2013 Notification of Public Comments Received  
February 15, 2013 Summary of Meeting  
March 6, 2013 Email  
March 22, 2013 Response to Comments Letter  
August 1, 2013 Notification of Concurrence of Response to Comments Received and Finalization of the PIP

CC: Ms. Michele Leone, National Grid  
Ms. Elizabeth Stone, RIDEM

**FEBRUARY 21, 2013**

NOTIFICATION OF PUBLIC COMMENTS RECEIVED





February 21, 2013

Ms. Michele V. Leone  
Manager, New England Site Investigation & Remediation  
National Grid  
40 Sylvan Road  
Waltham, MA 02451-1120

RE: Tidewater Manufactured Gas Plant (former)  
Tidewater Street  
Pawtucket, Rhode Island

Dear Ms. Leone:

On November 9, 2011, the Rhode Island Department of Environmental Management (the Department) amended the Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases, (the Remediation Regulations). The purpose of these regulations is to create an integrated program requiring reporting, investigation and remediation of contaminated sites in order to eliminate and/or control threats to human health and the environment in an efficient manner.

In the matter of the above referenced "Site" (as defined in the Industrial Property Remediation and Reuse Act), and in accordance with Rule 7.07.E (Public Involvement Plans) of the 2011 Remediation Regulations, the Department's Office of Waste Management (OWM) has received the following documents concerning public comments on the draft Public Involvement Plan (PIP):

1. Letter from Holly Dygert to the Department, Re: Tidewater Site Public Involvement Plan, dated January 27, 2013, and received via e-mail on January 28, 2013; and
2. Comments re: Draft Public Involvement Plan, Former Tidewater Facility and Former Power Plant, Tidewater and Merry Streets, Pawtucket, Rhode Island, prepared by the Environmental Justice League of Rhode Island (EJLRI), received via e-mail on February 12, 2013.

In addition, National Grid received several comments at the public meeting for the draft PIP held on January 29, 2013.

Please review these submitted comments along with those received at the public meeting and prepare written responses to each of them as appropriate. A completed document, incorporating responses all of the comments, must be submitted to the Department for review and approval.

**All correspondence regarding this Site should be sent to the attention of:**

Joseph T. Martella II – Senior Engineer  
RIDEM / Office of Waste Management  
235 Promenade Street  
Providence, RI 02908

If you have any questions regarding this letter, please contact me by telephone at (401) 222-2797 extension 7109 or by e-mail at [joseph.martella@dem.ri.gov](mailto:joseph.martella@dem.ri.gov).

Sincerely,



Joseph T. Martella II  
Senior Engineer  
Rhode Island DEM  
Office of Waste Management

Attachments: January 27, 2013, Letter from Holly Dygert to the Department;  
February 12, 2013, Comments re: Draft Public Involvement Plan

Cc: Kelly J. Owens, RIDEM.OWM  
Elizabeth Stone, RIDEM/OOD  
Barbara Morin, RIDEM/OAR  
Barney S. Heath, Pawtucket Planning & Development  
Alan Tenreiro, Chairman, Pawtucket School Committee  
Deborah Cylke, Superintendent, City of Pawtucket School Department  
Julie Nora, Ph.D, International Charter School  
Carolyn Sheehan, Blackstone Academy  
Edna Coia, Francis J. Varieur Elementary School  
Amelia Rose, EJLRI  
Margaret S. Kilpatrick, GZA

January 27, 2013

Mr. Joseph Martella II, Senior Engineer  
RIDEM Office of Waste Management  
Site Remediation Program

Re: Tidewater Site Public Involvement Plan

Dear Mr. Martella,

I am very pleased that RIDEM has implemented a public involvement mechanism to ensure that members of the community who may be exposed to hazards are involved in the remediation process. I reviewed National Grid's draft Public Involvement Plan (PIP) for the Tidewater Site, and I am also very pleased with many of the actions National Grid has proposed to take to ensure that those potentially impacted by the work at Tidewater are informed of the work. I am writing to communicate my suggestions for strengthening the proposed PIP. These suggestions are aimed, first, to optimize the ability of those who could be impacted by the site's hazards to access information about the nature of these hazards and about potential routes of exposure, and, second, to ensure that they are able to influence the process in accordance with their particular concerns.

I appreciate that National Grid solicited comments from the community through the interview process in June of 2012, and provided a synthesis of the suggestions in the *Draft PIP*. National Grid has already acted on many of these suggestions, and has integrated many of them into the proposed PIP. The community bulletin boards – with announcements and the results of weekly air monitoring – are very useful communication tools. I look forward to the incorporation of the color-coded alert system. The information in the boards should be provided in the three primary languages of the community, which are English, Spanish and Portuguese. I was concerned that National Grid seemed to reject a request made during the interviews for information to be translated into both Spanish and Portuguese. I want to underscore the importance of providing information in the community's languages.

I am very pleased that National Grid has proposed to create a color-coded map of Tidewater site hazards to the public as part of the PIP. Despite years of communications about the hazards on the site, the members of the stakeholder group are still unclear about concentrations of particular hazards, and where they are located. Thus, I am eager to see this map. I am also pleased that National Grid is proposing a Community Outreach (poster) Session, and possibly a tour of the site.

While I am generally satisfied with the strategies National Grid has proposed to convey information to the public, I have two main concerns. The first is that the *Draft PIP* largely neglects the public's role in shaping the remediation process. The second is that the particular

strategy for monitoring air quality that was agreed on for the electrical substation upgrade is included in the *Draft PIP* as the plan for the remediation.

In regards to the first concern, I agree with the characterization of a public involvement process laid out on page 1 of the *Draft PIP*, as “an agreement between the party conducting response actions and the public about how they will share information moving forward, and how the public will be able to comment on plans for assessment and cleanup of the site.” This definition identifies the public as important partner in the remediation process. Since the public’s interests vis-à-vis the remediation process diverge in important ways from those of the property owner, the public must have the ability to shape the remediation, and the precautions that are taken during the remediation process. I am concerned, however, that the *Draft PIP* construes public participation narrowly, as informing the public about work plans that have already been developed.

For example, on page 8, in describing the process through which a final remediation plan for the site will be determined, the *Draft PIP* states that RIDEM will issue a Program Letter when it has concluded that “the site has been adequately assessed” in the Site Investigation Report. The *Draft PIP* continues that “Following receipt of the Program Letter, National Grid will notify [various parties]... that the investigation is complete and that **RIDEM has concurred with the recommended remedial alternative**... Subsequent to this public notification and following receipt of any public comments, the Department will issue a Remedial Decision Letter formally approving the SIR.” In this description, the identification and approval of a remedial strategy are depicted as occurring apart from public involvement. This negates the role of the public in the decision-making process. Moreover, I believe that it is a mischaracterization of the process through which remediation strategies are determined. It is my understanding that the Program Letter solely certifies that RIDEM has determined that the proposed remedy meets the criteria for an acceptable remedy. I understand that the final determination of a remedy cannot be made until members of the community are given an opportunity to consider the proposal, and to convey their concerns to RIDEM.

The characterization of the process through which a *Remedial Action Work Plan* (RAWP) is identified and selected in the *Draft PIP* similarly neglects the role of the public. Though the text states that “Many of the above remedial process steps will be accompanied by public meetings and comment periods” (p.8), I find it disconcerting that the public’s role in shaping the remediation process is not included in National Grid’s description of the decision-making process. This view of public involvement as a process whereby National Grid officials inform the public about the remediation process carries through to other sections of the *Draft PIP*. For example, in the section on Community Meetings, meetings are depicted as opportunities for National Grid representatives to inform community members about the work that has been and will be undertaken in the site. Though informing the community is crucial for facilitating their involvement in the process, it is not sufficient. The document also states that meetings will be held “in conjunction with... Departmental approval of the *Remedial Action Work Plan*; [and]

prior to remedy implementation” (p.14). This neglects the crucial role the public will have in shaping the RAWP.

The *PIP* should be revised to indicate clearly that potential work plans will be presented in community meetings, and that community concerns will be solicited to ensure that the final work plans reflect the concerns and needs of the public. Opportunities for community members to comment on the proposed plans and thereby shape the remediation process should be clearly laid out in the meeting agendas, and in the scheduling of meetings (in relation to RIDEM’s final decisions about work at the site).

In regards to my second concern, one of the requests most of the interviewees made was for National Grid to make data from air monitoring available in real time to the community. While meeting with representatives from National Grid and RIDEM during the early Fall of 2012, we learned that this was not possible with the particular hand held devices being used to monitor emissions during the current electrical substation upgrade. Moreover, RIDEM representatives at the meeting seemed to concur that the small-scale nature of the work and the limited extent of contaminants in the soil did not warrant the more costly kind of air monitoring technologies that enable real-time posting of readings. I am very concerned to see that the particular scheme we agreed to for monitoring emissions and making the results available to community members during the substation upgrade is replicated in the *Draft PIP*. National Grid and GZA officials should be clear that the substation upgrade was classified as separate from the remediation process, which is why the work could be completed without presenting it to the public. As we look ahead to the full remediation, the particular air monitoring strategies, and techniques for communicating information about the results of that monitoring to the community, will need to be determined in conversation with the community about the particular threats posed by particular actions.

In closing, I want to reiterate my support for the PIP process that RIDEM has adopted, and that National Grid has begun to develop. I look forward to continuing to work with RIDEM and National Grid to develop an effective plan for ensuring optimal public involvement.

Sincerely,



Holly Dygert  
16 Minto Street  
Providence, RI 02908  
(401) 272-1748





**Environmental  
Justice League of  
Rhode Island**

Environmental Justice League of Rhode Island  
1192 Westminster St. Providence, RI 02909  
Tel: (401) 383-7441 Fax: (401) 941-8156  
[questions@ejlri.org](mailto:questions@ejlri.org)  
[www.ejlri.wordpress.com](http://www.ejlri.wordpress.com)

February 12, 2013

Joseph Martella, Project Manager  
RIDEM  
Office of Waste Management  
235 Promenade Street  
Providence, RI 02908

*Comments re: Draft Public Involvement Plan, Former Tidewater Facility and Former Power Plant, Tidewater and Merry Streets, Pawtucket, Rhode Island*

Dear Mr. Martella,

I am submitting the following comments on behalf of the Environmental Justice League of Rhode Island (EJLRI) regarding the draft Public Involvement Plan (PIP) prepared by GZA on behalf of their client, National Grid, the responsible party for the Tidewater Site.

I have listed a few specific comments first, followed by more general suggestions for the PIP overall.

Page 2 – The draft PIP states: “This plan is not intended to cover Site activities relative to day-to-day operations of the natural gas regulating facility and electrical substation or other uses of the property by National Grid.” Since community members and parents from nearby schools have already met with GZA, RIDEM, and National Grid regarding substation upgrades and earthwork, especially with regard to improving air monitoring plans in relation to this work, which falls outside the official remediation plan, I would ask that this sentence be clarified to ensure that residents can expect to be informed and be invited to actively participate in the shaping of any plans for the site that would require disturbance to soil or otherwise create a potential public health risk. Some of these activities could be interpreted, potentially, as “day-to-day operations”, and therefore this statement should be clarified to clearly differentiate between actual day-to-day operations and other operations that are not specifically included in the remediation but will disturb soil, create potential emissions, etc.

Page 17 – The Pawtucket Public Library will serve as a repository for all of the documents and other information related to the site. I suggest posting a sign or poster at the Library itself (not just on the fence at the Tidewater site) to let the general public know that this repository exists.

Page 19 – If there are revisions proposed for the PIP in the future, National Grid will prepare a revised draft for review and approval by the public and RIDEM. National Grid should prepare a summary sheet to list all of the proposed changes/revisions, as well as the final approved revisions, not simply post the proposed revised draft of the full PIP online and in the physical repository (even if the changes/revisions are highlighted in the full document). This summary sheet should be a separate document to make it easy for the public to access, read, and digest the proposed, and then approved, changes.

In response to concerns raised by residents living on Thornton Street, immediately adjacent to the site, regarding natural gas odors and the possibility of air impacts from the groundwater contamination, I suggest addressing these issues at the poster session National Grid is hosting in the near future. In particular, addressing the issue of vapor intrusion into homes and schools should be a top priority. EJLRI receives technical assistance through an EPA program that assists organizations and community residents in understanding technical information related to Brownfields contamination and remediation. Upon her review of the draft remedial plan submitted to RIDEM by National Grid, our consultant from the New Jersey Institute of Technology recommended the following:

#### VAPOR INTRUSION INVESTIGATION


Some of the chemicals (volatile compounds) identified at the site have the potential to travel through the soil as vapors. These vapors may then move up through the soil into nearby buildings, contaminating indoor air. Therefore, if a vapor intrusion investigation has not been completed, a vapor intrusion investigation is recommended to determine whether the occupants of neighboring buildings are at risk for exposure to VOCs due to vapor intrusion.

We will be submitting a final version of the consultant's review at the appropriate time (when public comments are being accepted on the SIR/recommended remedial alternative), but I wanted to share this recommendation because it speaks directly to concerns raised by residents at the last meeting.

The draft PIP is strong overall, but lacks specifics on how to best engage parents at the local schools. Principals at the schools may not be the best, or only, individuals to notify regarding upcoming work, air monitoring results, public meeting notices, etc. In fact, they can be bottlenecks for getting information out to the wider school community. Suggestions raised at the meeting to engage the Pawtucket Schools Superintendent, the school committee, etc. are all very good, but also are not enough to get through to individual parents. Signs or posters with general information posted at the front offices of the schools adjacent to the site would be a good start (and/or at student pick-up locations), as well as providing copies of public notices to all parents via their child's backpacks, as suggested by the principal at Varieur Elementary, would also help ameliorate this problem. Not all notices need to be sent home via backpacks, but any public meeting announcements should be, as should an initial introductory letter or handout with an overview of the site history and current status, including who to contact for more information. National Grid should work with the principals at the three schools to send this introductory info sheet/letter home with all students as soon as possible.

Lastly, I would like to ask National Grid, GZA, and RIDEM to respond to how phytoremediation might play into the overall remediation strategy for this site, and/or if this approach has been discussed at all in relation to the Tidewater Site.

Sincerely,

A handwritten signature in cursive script that reads "Amelia Rose". The signature is written in dark ink and is positioned below the word "Sincerely,".

Amelia Rose, Director

**FEBRUARY 15, 2013**

SUMMARY OF MEETING

**GZA**  
**GeoEnvironmental, Inc.**

*Engineers and  
Scientists*

February 15, 2013  
GZA File No. 05.0043654.20-C

Mr. Joseph Martella  
Rhode Island Department of Environmental Management  
Office of Waste Management  
235 Promenade Street  
Providence, Rhode Island 02908



530 Broadway  
Providence  
Rhode Island  
02909  
401-421-4140  
Fax: 401-751-8613  
<http://www.gza.com>

Re: *Meeting Summary - January 29, 2013*  
Draft Public Involvement Plan  
Former Tidewater MGP and Power Plant Site  
Pawtucket, Rhode Island  
*RIDEM Case No. 95-022*

Dear Mr. Martella:

On behalf of our client, The Narragansett Electric Company d/b/a National Grid (National Grid), GZA GeoEnvironmental Inc. (GZA) is pleased to provide the attached summary of the January 29, 2013 public meeting associated with the Former Tidewater Manufactured Gas Plant (MGP) and Power Plant Site located in Pawtucket, Rhode Island (the Site). The purpose of the public meeting was to discuss public comments to the draft Public Involvement Plan (PIP) which was submitted to the Department on November 26, 2012.

Should you have any questions or comments regarding the information presented herein, please do not hesitate to contact the undersigned or Michele Leone at 781-907-3651.

Very truly yours,

GZA GEOENVIRONMENTAL, INC.

A handwritten signature in blue ink, appearing to read "M. Kilpatrick", is written over a faint, larger version of the signature.

Margaret S. Kilpatrick, P.E.  
Senior Project Manager  
401-421-4140 – [margaret.kilpatrick@gza.com](mailto:margaret.kilpatrick@gza.com)

Attachment: Summary of Meeting

CC: Ms. Michele Leone, National Grid  
Ms. Elizabeth Stone, RIDEM

J:\ENV\43654.20\Corresp\1-29-13 Meeting Summary\43654.20 012913 Mtg Summary cvr ltr.docx

Summary of Meeting  
 DRAFT Public Involvement Plan (PIP)  
 Former Tidewater Facility  
 Pawtucket, Rhode Island

January 29, 2013 6 PM  
 Francis J. Varieur Elementary School  
 486 Pleasant Street  
 Pawtucket, Rhode Island

- **Introduction to Meeting – Michele Leone (National Grid Representative)**
- **Presentation of DRAFT PIP dated November 26, 2012 – Elizabeth Stone (Rhode Island Department of Environmental Management or RIDEM) and Meg Kilpatrick, P.E. (GZA GeoEnvironmental, Inc.)**

The presentation included a summary of the Draft Public Involvement Plan (PIP) for the former Tidewater Facility (the Site). The draft PIP was developed based on input from the public provided during the community interviews completed in June 2012, as well as input from RIDEM. It provides a blueprint for keeping the public informed during the site cleanup process. It also presents how the public can participate in the process and comment on the project. A PIP is a living document and can be amended to reflect additional issues or challenges that may arise during the cleanup process.

National Grid submitted a draft PIP to RIDEM on November 26, 2012. The draft PIP has four components: 1) public notice, 2) fact sheets and enhanced communications, 3) community meetings and 4) information repositories. The four components are presented in the below table.

<p><b><u>Public Notice:</u></b></p> <ul style="list-style-type: none"> <li>• Mailing List (used to announce public meetings, distribute fact sheets, information about availability of reports, etc.)</li> <li>• Email List (optional)</li> <li>• Sign up at <a href="http://www.tidewatersite.com">www.tidewatersite.com</a></li> <li>• Or, send request to National Grid</li> </ul>	<p><b><u>Fact Sheets and Enhanced Communications:</u></b></p> <ul style="list-style-type: none"> <li>• Fact Sheets (used to inform of development of new information and/or achievement of significant milestones)</li> <li>• Informational Bulletin Boards (end of Tidewater Street and Bowles Court)</li> <li>• Phone Message Alert System during excavation</li> </ul>
<p><b><u>Community Meetings:</u></b></p> <ul style="list-style-type: none"> <li>• Encourages equal participation by all to create an atmosphere of constructive, open dialogue</li> <li>• Proposed Schedule and Objective of Public Meetings</li> <li>• Evening meeting time</li> <li>• Francis J. Varieur School (preferred venue)</li> </ul>	<p><b><u>Information Repositories:</u></b></p> <ul style="list-style-type: none"> <li>• Publicly Accessible Site File: RIDEM Case No. 95-022 <a href="http://www.dem.ri.gov/topics/filerevw/htm">www.dem.ri.gov/topics/filerevw/htm</a></li> <li>• Publicly Accessible Websites: <a href="http://www.tidewatersite.com">www.tidewatersite.com</a> <a href="http://www.dem.ri.gov/benviron/waste/tide/htm">www.dem.ri.gov/benviron/waste/tide/htm</a></li> <li>• Local Information Repository: Pawtucket Library (13 Summer St) Bulletin Boards: Tidewater St &amp; Bowles Ct</li> </ul>

Following the public comment period for the draft PIP, National Grid will provide a response to comments and revise the PIP as necessary for submittal to RIDEM for final review and approval.



Summary of Meeting  
DRAFT Public Involvement Plan (PIP)  
Former Tidewater Facility  
Pawtucket, Rhode Island

January 29, 2013 6 PM  
Francis J. Varieur Elementary School  
486 Pleasant Street  
Pawtucket, Rhode Island

National Grid will hold a community outreach session in March 2013 to present information about the Site in an informal poster-board type setting. Following this session, National Grid will hold the initial community meeting within 60 days after receipt of the Program Letter from RIDEM (issued following RIDEM’s formal review of the Site Investigation Report submitted by National Grid). The schedule of community meetings follows, and National Grid encourages participation by all to create an atmosphere of constructive, open dialogue.

ACTIVITY	TIME PERIOD
Community Outreach Session	Within 60 days of Draft PIP Meeting (March 2013)
Initial Community Meeting	Within 60 days of receipt of Program Letter – during SIR Public Comment Period
Public Meeting on DRAFT Remedial Action Approval Plan (RAWP)	Within 12 months of receipt of Remedial Decision Letter
Submit RAWP for RIDEM Approval	Within 6 months of DRAFT RAWP Meeting
Public Meeting prior to initiation of remedy	Minimum of 30 days prior to start of remediation
Public Meetings during remediation	Meeting schedule to be presented for discussion purposes once remedial schedule is developed and approved by RIDEM
Public Meeting upon completion of the remedy	Within 30 days following completion of remediation

A copy of the presentation associated with the January 29, 2013 Draft PIP meeting is posted on the National Grid Tidewater website ([www.tidewatersite.com](http://www.tidewatersite.com)).

**Questions and Comments Session:** *(Responses provided in italics)*

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National Grid provided a brief summary of written public comments received to date on the DRAFT PIP.

- Public requested that Portuguese (in addition to Spanish) be included as languages for documents requiring translation.

*National Grid stated that going forward, the following document types will be provided in English, Spanish and Portuguese: 1) Notification Mailings, 2) Fact Sheets and 3) brief Executive Summaries which will accompany future reports.*

- Public requested that color-coded alert system be implemented on the bulletin boards.

*National Grid stated that the color-coded alert system has been implemented on the bulletin boards during the recent excavation project. The system involves posting different color sheets to indicate when excavation is active (yellow sheet) and not active (blue sheet).*

Summary of Meeting  
DRAFT Public Involvement Plan (PIP)  
Former Tidewater Facility  
Pawtucket, Rhode Island

January 29, 2013 6 PM  
Francis J. Varieur Elementary School  
486 Pleasant Street  
Pawtucket, Rhode Island

- Public requested color-coded map of Tidewater Site contaminants.

*National Grid stated that the color-coded map for the Tidewater project is being finalized and will be presented at the upcoming Community Information Session. The final map will also be posted on the National Grid website and the bulletin boards.*

- Public expressed concern that current Draft PIP does not take into account the public's role in providing input into the remediation process.

*National Grid reinforced that the process going forward and as outlined in the PIP is intended to provide a means of effective "two-way communications" between the public and National Grid. National Grid stated that the Initial Community Meeting (which will follow RIDEM's review of the Site Investigation Report) will provide the public an opportunity to provide comment on the conceptual remedial strategy for the Tidewater Site. In addition, National Grid indicated that the current draft of the PIP has been modified to include a public meeting on the draft Remedial Action Work Plan (RAWP – the document that will be submitted to RIDEM to present the details of how the remedy will be implemented) to further provide an opportunity for the public to comment on the Site cleanup process.*

- Public expressed concern that current Draft PIP does not consider air monitoring during the remediation of the Tidewater Site.

*National Grid stated that the air monitoring plans for full-scale remediation of the Tidewater Site have not been developed as the final remedy for the project has not been approved. National Grid stated that the public will have an opportunity to comment and present their concerns during future public meetings, which National Grid will incorporate into the air monitoring plan for the final remediation.*

Audience member relayed concern that draft PIP references weekly posting of air monitoring data and that inclusion of this language will set a precedent for future air quality monitoring.

*National Grid stated that the PIP will be modified to delete reference to the posting of weekly air monitoring data.*

Summary of Meeting  
DRAFT Public Involvement Plan (PIP)  
Former Tidewater Facility  
Pawtucket, Rhode Island

January 29, 2013 6 PM  
Francis J. Varieur Elementary School  
486 Pleasant Street  
Pawtucket, Rhode Island

**Open Comments and Questions Received:**

1. Audience member enquired about date for the Community Outreach Session.

*The current schedule is to have the Community Outreach Session in mid to late March 2013.*

2. Audience member enquired about what March 2013 Community Outreach Session consist of.

*The Community Outreach Session will consist of an informal meeting where information will be presented on poster boards to the public. The poster boards will include a variety of topics, including such things as "What is an Manufactured Gas Plant?" history of the Tidewater Site, findings of the investigations, demonstrations of field equipment, description of current National Grid operations at the property, etc. Each poster board will be manned by a representative from National Grid and/or GZA to answer questions. RIDEM will also be present to answer questions from the public.*

3. Audience member expressed concern about when to know when things are going on at the Site; specifically, when to leave kids inside.

*Information regarding excavation at the Site is provided through the mailing/email list, posted to the bulletin boards and posted to the Tidewater websites. The National Grid website will also be updated to include the color-coded alert system information (active and no active excavation). National Grid will also inform school principals of the schedule of work.*

4. Audience member stated that he is a parent and emphasized that it is important to remember that parents have no way to obtain information about the Site.

*National Grid provides notifications to those on the mailing/email list, which includes the principals of the neighboring schools. Due to privacy issues, National Grid does not have access to student/parent information. National Grid will continue to work with the school principals in developing an effective way to communicate with the parents. The best way to find out information currently is to sign-up to the Tidewater mailing/email list via the National Grid website. National Grid requested that audience members tell other parents/community members about this and encourage them to sign up so that they can receive information directly from National Grid.*

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- Audience member stated that parents from the International Charter School want a way for the information to be communicated to the parents.

*National Grid will continue to work with the school principals in developing an effective way to communicate with the parents. National Grid encouraged parents to sign-up for the mailing and/or email lists, as well as visit the National Grid website, to obtain information.*

- Audience member stated that he/she feels that the parents have no way to determine what is going on at the site and suggested possibly implementation of additional bulletin boards.

*The bulletin boards were installed at locations proximate to the Tidewater site, as well as accessible and visible to the schools. The two site bulletin boards are located close to each of the neighboring schools. National Grid will look into the possible installation of additional bulletin boards, as well as continuing to work with the school principals in developing an effective way to communicate with the parents.*

- The principal from Blackstone Academy stated the community has various levels of technical understanding and that disseminating information about the Tidewater Site is difficult.

*In the future, National Grid will prepare simple executive summaries for major report submittals. In preparing these summaries, National Grid will make every effort to use brief and nontechnical terminology in communications to the public. In the near future, National Grid will prepare an executive summary for the recent Site Investigation Report as well as an updated Fact Sheet which will be distributed through the mailing lists, as well as placed into the information repositories. National Grid will also continue to work with the school principals in developing an effective way to communicate information to the parents.*

- Audience member stated that, as a parent, the 2- hour notice provided through the phone message alert system was not enough. In addition, notification regarding the Tidewater site needs to be provided to more parties, such as elected officials and School Committee(s). A presentation of information would be warranted.

*The mailing list established for the Tidewater project does include local elected officials as well as school representatives, including the Principals of the Blackstone Academy, International Charter School and Francis J. Varieur School, as well as the Superintendent of schools for the City of Pawtucket. National Grid would be happy to include members of the School Committee on the mailing list, upon receipt of their contact information. National Grid also is willing to meet with*

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*members of the school and local government to present information about the Tidewater site and answer any questions that they may have.*

9. Audience member requested that technical documents be translated into “everyone speak” language.

*National Grid is attempting to do this and will continue to try to produce documents that are better understood by the public.*

10. Audience member asked when RIDEM will be ready to review the Site Investigation Report (SIR).

*Joseph Martella of RIDEM provided details regarding the regulatory process under the RIDEM Remediation Regulations. He indicated that the Public Involvement Plan must be finalized and in place before RIDEM’s review of the SIR can begin.*

Audience member enquired about the timing of this review and if the spring would seem reasonable.

*RIDEM indicated that it may be possible but reiterated that PIP must be finalized before the review of the SIR begins.*

11. Audience member requested that live translators be provided at public meetings.

*National Grid would be happy to provide translators, if requested by the public in advance of the meetings. Future notifications will include language regarding the availability of translators upon request by the public.*

12. Audience member spoke about historical mercury spill and lasting impact on concern from neighborhood. Audience member enquired about money from court settlement and publicly available information regarding mercury spill. He requested that information about the mercury spill, as it pertains to the history of the Tidewater Site, be included on the website and presented during the poster board session.

*National Grid did not own the property when the mercury spill took place in 2004 and was not involved in the cleanup, court proceedings or settlement. Southern Union was the party solely responsible for cleanup of the mercury incident. National Grid purchased the property from*



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*Southern Union but did not acquire Southern Union's liability for the mercury issues on the property. The mercury contamination from the 2004 spill has been cleaned up and removed from the property. In addition, the buildings have been checked for mercury and no mercury is currently stored on-site. National Grid stated that the files associated with the mercury spill are public information and can be reviewed through RIDEM.*

The audience member further requested that information on the mercury spill be posted on the National Grid website.

*National Grid explained that it was not liable for the mercury release was not involved in the cleanup, court proceedings or settlement. Southern Union was the party solely responsible for cleanup of the mercury incident. National Grid indicated that it would consider the request and provide a formal response in the response to comments on the PIP.*

13. Audience member concerned about Tidewater flyer that he received on his door from Environmental Justice League. The flyer depicted biohazard marker and list of chemicals with associated acute health hazards. Audience member relayed information about members of his household and neighbors being diagnosed with cancer and is concerned about what he is being exposed to at his home as he lives on Thornton Street located right next to site. He stressed that he wants to know if he is safe.

*National Grid stressed that the Site is fenced and locked to keep people off of the property. Under normal site conditions, the Site is safe to the community- in other words, there is no potential for airborne contaminants. During times of excavation, when soil is dug up and moved around, there is a potential for airborne contaminants. During soil excavation, National Grid follows an air quality monitoring program which has received public input and has been reviewed and approved by RIDEM. The results of this monitoring are posted to the bulletin boards as well as the Tidewater websites. This program was followed during the recent electrical substation upgrade project. The majority of excavation associated with this project is complete, with the exception of minor fence post installations and minor excavations associated with properly decommissioning equipment. Air data from this project did not show sustained exceedances of the thresholds (defined as being held over a 5-minute time period) at any time. A few transient exceedances of the thresholds were noted during the work which were not associated with the excavation activities (i.e., transient exceedances due to weather interference (rain), movement of trash material, orange peel, etc.) .*

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Audience member asked whether there are emissions coming from the site without moving the soil? Also, audience member wanted to know about indoor air monitoring and whether or not they should be concerned about migration/volatilization into buildings on Thornton Street.

*Contaminants from the site are not getting into the air (i.e., volatilizing) from the soil and groundwater under normal conditions (i.e., no soil being moved or disturbed). The majority of surface soils at Site are indicative of urban fill – soils which would typically be found in urban or city environments and exhibit low levels of contaminants. The majority of impacts are found below the ground surface (deeper than 2 feet) in the soils, at or below the groundwater table. In addition, the majority of soil, groundwater and separate phase product (oil) impacts are found where the historical Manufactured Gas Plant and Power Plant operations took place, primarily along the river area between Winter Street and the land behind the Max Read Field. The area where the residences are located along Thornton Street are in an area where historical operations did not occur and do not have elevated levels of observed impacts. This area is also located upgradient of the site – groundwater from the Site flows “downhill” towards the river, not towards the homes on Thornton Street. Based on this information, National Grid believes that the buildings on Thornton Street are unaffected by the migration and/or volatilization from impacts on the Tidewater Site.*

*The drawbacks to indoor air testing were also discussed, as this type of testing typically will pick up standard house hold products and chemicals, such as paint, cleaners, etc., which cannot be differentiated from possible site contaminants.*

*The findings of the drilling program in Max Read Field were also discussed. Results of the explorations indicated the presence of visually impacted soil at depths greater than 2 feet in a limited area on the eastern portion of the field. The soils at depth are not accessible (i.e., they are covered with 2 feet of visually non-impacted soil which would need to be removed). The exploration program was conducted with knowledge by the City of Pawtucket and the City is aware of the findings of the investigation.*

14. Audience member commented on gas smell at Thornton and Merry Streets and whether or not they are safe or being exposed to natural gas (or its additives).

*The odor that the audience member says he smelled is likely associated with mercaptan. Natural gas by itself is odorless. Mercaptan is an odorant that is added to natural gas so the gas can easily be detected. It is carried with the natural gas stream.*

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*National Grid will contact their Natural Gas Division to find out more information about this concern.*

15. Amelia Rose of the Environmental Justice League of Rhode Island (EJLRI) introduced herself and her agency to the audience. She indicated that EJLRI had access to funds from the US Environmental Protection Agency (USEPA) and could be used as a resource to the community. She also suggested that National Grid have a poster board regarding vapor intrusion during the Community Informational Session to educate the public.

*National Grid will consider adding a poster board regarding vapor intrusion to the Community Informational Session.*

*RIDEM also added that the potential for volatilization of contaminants from the site is not supported by the results of the recent air monitoring program (hand held field instruments) which is being followed as part of the electrical substation project.*

16. Audience member commented on concern regarding interfacing with the schools and the community. They suggested providing information about the site at a 4-6<sup>th</sup> grade comprehension level. Also, they requested that National Grid inform Shea High School about the impacts on the Max Read Field as they use the athletic field for sport activities.

*National Grid will look into this request and get back to the public. In the future, National Grid will prepare simple executive summaries for major report submittals. In preparing these summaries, National Grid will make every effort to use brief and nontechnical terminology in communications to the public. In the near future, National Grid will prepare an executive summary for the recent Site Investigation Report as well as an updated Fact Sheet which will be distributed through the mailing lists, as well as placed into the information repositories. National Grid will also continue to work with the school principals in developing an effective way to communicate information to the parents. Also, National Grid will consider adding Shea High School to the mailing list.*

17. Audience member suggested that Cape Verdean be added as a language to the translation list. Also suggested that Oak Hill Nursing Home be added to the distribution list.

*National Grid will consider adding Cape Verdean to the translation list. National Grid will also consider adding Oak Hill Nursing Home to the mailing list.*

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18. Audience member enquired why this is the first Public Involvement Plan in RI and what is typically done in Massachusetts?

*RIDEM indicated that the Remediation Regulations were recently modified in November 2011 to include a formal Public Involvement process, similar to that established in Massachusetts. This is the first PIP in Rhode Island due to the recent change in the regulations. Massachusetts has had a PIP process in place for at least 20 years.*

19. Audience member inquired if the site is “safe,” why all the concern?

*RIDEM indicated that the Site is under the State’s guidance for a reason – there are soil and groundwater impacts at the site which do pose a certain level of exposure risk. RIDEM stressed that the fencing is also there for a reason – to prevent people from entering the Site. RIDEM also gave the example of different levels of exposure at the Site – i.e., on-site workers who are excavating soils (potential high exposure risk) versus people off-site at or near the fence line (low potential exposure risk).*

20. Audience member enquired if wildlife could present an exposure risk via soil disturbance (i.e., burrowing, digging) on site.

*GZA performs weekly site walks to inspect and document the conditions at the Site. There has not been evidence of significant soil disturbance by wildlife at the Site. In the future, we will continue to monitor soil disturbance.*

21. Audience member requested status on South Washout Area repair.

*The earthwork associated with the South Washout Area has not been completed. National Grid will continue to work with the City to have this work completed.*

22. Audience member enquired when the public will receive a response to comments.

*The schedule presented in the presentation was revisited. A summary of today’s meeting will be provided within 10 business days (by 2/12/2013). Written comments on the draft PIP from the public should be provided to RIDEM within 10 business days (by 2/12/2013). RIDEM indicated that an extension to the public comment period may be requested in writing. Timing for response to written comments will be based on how many comments are received.*

**MARCH 6, 2013**

EMAIL



## Margaret Kilpatrick

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**From:** Dygert, Holly <hdygert@ric.edu>  
**Sent:** Wednesday, March 06, 2013 3:39 PM  
**To:** Leone, Michele (Michele.Leone@nationalgrid.com); Margaret Kilpatrick  
**Cc:** joseph.martella@dem.ri.gov; Amelia Rose (amelia.rose@ejlri.org); jenrossi3@gmail.com  
**Subject:** Tidewater Site communications, follow-up suggestions  
**Attachments:** PIP Recommendations Tidewater Community Group.doc

Dear Michele and Meg,

We held a meeting last week with members of the Tidewater community (school officials, parents of school children, and members of the neighborhood) to follow-up on National Grid's recent public meeting. One of the primary concerns expressed was that the language used in the outreach efforts was not accessible to most people. I personally spoke with a woman in the neighborhood who said that she keeps going to these meetings, but she doesn't understand anything that is said. I also noted that one of the attendees prefaced his comments at the meeting with, "I know I sound ignorant, but..." The school administrators, parents and residents had several suggestions of ways to make the communications more effective. We've compiled those suggestions – I am attaching the list and pasting it below.

As a college professor, I am constantly charged with translating expert knowledge into language that is accessible, often to kids coming right out of high school. I'm happy to compile a list of terms that are hard for non-specialists to understand (e.g., remedy, remediation, cap, program letter, abutter, action limits...). The list of definitions that National Grid provided in a former communication is a step in the right direction, but it would be better to replace those specialized terms with more accessible alternatives.

On a different note, can you tell me if you've been able to figure out what the source of the gas smell is that the resident at the public meeting complained about? I've heard multiple people complain about intermittent gas smells over the last couple of years.

Sincerely,

Holly Dygert

### **PIP Recommendations for the Tidewater Site March 6, 2013**

#### **Issues of concern that people would like to be addressed at the poster session:**

Gas Smells – What is this? What are potential impacts?

Differences among remedial alternatives – what options does National Grid have and why are they choosing one option over another?

What are potential future uses of this land/site after remediation? Will National Grid still own the site? Have there been discussions with City of Pawtucket?

What are the implications for neighbors' health based on what kinds of contaminants are at the site?

#### **Further Suggestions for Effectively Communicating with the Public (in preparation for the poster session):**

National Grid should develop separate communication materials for schools – and provide enough copies to give place one in each student's backpack.

School principals want to review all of the fliers/documents that will be sent to parents before NG makes copies, translates, or finalizes the communication, to make sure they communicate effectively. Julie Nora (ICS) and Carolyn Sheehan (Blackstone Valley) made this suggestion.

Neighbors also want to review materials before NG sends out communications to neighborhood – point person can be Amelia Rose at EJ League who can send out draft to list of neighbors and collate comments/suggestions within one week and send back to NG for finalization (worry is that the communications are too wordy and will not be read).

Hold regular meetings with a core group of residents and school personnel to give NG/GZA a chance to communicate in a smaller group setting – in addition to the larger public meetings that happen less frequently. This will help increase communication with the most committed/involved residents and school officials who will be ambassadors to other residents and the wider school community to generate their interest and involvement. Also will make larger public meetings less adversarial and more productive because it won't be the first time people are hearing about a certain issue or proposal.

Translation at larger public meetings should be made available regardless of whether someone contacts NG to say they are coming to a meeting – this would help build trust with the neighborhood and principals could guarantee to parents that interpretation would be available at public meetings no matter what.

Community members recommend that they be permitted to have their own poster/table at the poster session in addition to what NG/GZA are preparing.

NG should create bookmarks with all relevant contact information as well as instructions for how people can get on the email/phone notification lists. These will be helpful to hand out in the neighborhood and at the schools and would be more likely to be read and communicate effectively – rather than a long letter.

**MARCH 22, 2013**

**RESPONSE TO COMMENTS LETTER**

March 22, 2013  
File No. 05.0043654.20-C



Mr. Joseph Martella  
Rhode Island Department of Environmental Management  
Office of Waste Management  
235 Promenade Street  
Providence, Rhode Island 02908

530 Broadway  
Providence  
Rhode Island  
02909  
401-421-4140  
Fax: 401-751-8613  
<http://www.gza.com>

Re: Response to Public Comments  
Draft Public Involvement Plan  
Former Tidewater MGP and Power Plant Site  
Pawtucket, Rhode Island  
*RIDEM Case No. 95-022*

Dear Mr. Martella:

On behalf of our client, The Narragansett Electric Company d/b/a National Grid (National Grid), GZA GeoEnvironmental, Inc. (GZA) has prepared this letter in response to written public comments to the November 26, 2012 draft Public Involvement Plan (PIP) prepared for the Former Tidewater Manufactured Gas Plant (MGP) and Power Plant Site located in Pawtucket, Rhode Island (the Site). These comments were provided to National Grid by the Rhode Island Department of Environmental Management (RIDEM) via a February 21, 2013 notification letter. As indicated in RIDEM's February 21, 2013 notification letter, RIDEM received the following written public comments to the draft PIP: 1) a letter dated January 28, 2013, from Ms. Holly Dygert; and 2) a letter dated February 12, 2013, from Ms. Amelia Rose of the Environmental Justice League of Rhode Island (EJLRI). For your convenience, the comments received are repeated below followed by National Grid's responses in *italics*. The RIDEM notification letter along with the two public comment letters is included as an attachment to this letter.

In addition, per RIDEM's February 2013 notification, attached to this letter are responses to public comments that we received during the January 29, 2013, public meeting held at the Francis Varieur Elementary School. These responses were submitted separately to RIDEM on February 15, 2013. This letter also includes updates to responses to audience comments from the January 29, 2013, meeting which were summarized in the February 15, 2013, submittal and responses to questions related to the PIP provided in an email dated March 6, 2013, from Ms. Holly Dygert. A copy of this March 6, 2013 email is also attached.

**January 28, 2013 Letter**

1. Comment: The information in the boards should be provided in the three primary languages of the community, which are English, Spanish and Portuguese. I was concerned that National Grid seemed to reject a request made during the interviews for information to be translated into both Spanish and Portuguese. I want to underscore the importance of providing information in the community's languages.

*Response: Going forward, National Grid will provide the following documents in English, Spanish and Portuguese: 1) Notification Mailings, 2) Fact Sheets and 3) Executive Summaries that will accompany future reports.*

2. Comment: I look forward to the incorporation of the color-coded alert system.

*Response: We implemented the color-coded alert system on the bulletin boards during the recent substation upgrade project. The system involves posting different color sheets to indicate when excavation is active (yellow sheet) and not active (blue sheet).*



3. Comment: I am very pleased that National Grid has proposed to create a color-coded map of Tidewater site hazards to the public as part of the PIP. Despite years of communications about the hazards on the site, the members of the stakeholder group are still unclear about concentrations of particular hazards, and where they are located. Thus, I am eager to see this map.

*Response: We are finalizing the color-coded map for the Tidewater project that illustrates areas of the Site where impacts have been identified in groundwater and soils and we will present it at the upcoming Community Information Session. The final map will also be posted on the National Grid website and the bulletin boards.*

4. Comment: In regards to the first concern, I agree with the characterization of a public involvement process laid out on page 1 of the Draft PIP, as “an agreement between the party conducting response actions and the public about how they will share information moving forward, and how the public will be able to comment on plans for assessment and cleanup of the site.” This definition identifies the public as important partner in the remediation process. Since the public’s interests vis-à-vis the remediation process diverge in important ways from those of the property owner, the public must have the ability to shape the remediation, and the precautions that are taken during the remediation process. I am concerned, however, that the Draft PIP construes public participation narrowly, as informing the public about work plans that have already been developed.

For example, on page 8, in describing the process through which a final remediation plan for the site will be determined, the Draft PIP states that RIDEM will issue a Program Letter when it has concluded that “the site has been adequately assessed” in the Site Investigation Report. The Draft PIP continues that “Following receipt of the Program Letter, National Grid will notify [various parties]... that the investigation is complete and that RIDEM has concurred with the recommended remedial alternative... Subsequent to this public notification and following receipt of any public comments, the Department will issue a Remedial Decision Letter formally approving the SIR.” In this description, the identification and approval of a remedial strategy are depicted as occurring apart from public involvement. This negates the role of the public in the decision-making process. Moreover, I believe that it is a mischaracterization of the process through which remediation strategies are determined. It is my understanding that the Program Letter solely certifies that RIDEM has determined that the proposed remedy meets the criteria for an acceptable remedy. I understand that the final determination of a remedy cannot be made until members of the community are given an opportunity to consider the proposal, and to convey their concerns to RIDEM.

The characterization of the process through which a Remedial Action Work Plan (RAWP) is identified and selected in the Draft PIP similarly neglects the role of the public. Though the text states that “Many of the above remedial process steps will be accompanied by public meetings and comment periods” (p.8), I find it disconcerting that the public’s role in shaping the remediation process is not included in National Grid’s description of the decision-making process. This view of public involvement as a process whereby National Grid officials inform the public about the remediation process carries through to other sections of the Draft PIP. For example, in the section on Community Meetings, meetings are depicted as opportunities for National Grid representatives to inform community members about the work that has been and will be undertaken in the site. Though informing the community is crucial for facilitating their



involvement in the process, it is not sufficient. The document also states that meetings will be held “in conjunction with... Departmental approval of the Remedial Action Work Plan; [and]prior to remedy implementation” (p.14). This neglects the crucial role the public will have in shaping the RAWP.

The PIP should be revised to indicate clearly that potential work plans will be presented in community meetings, and that community concerns will be solicited to ensure that the final work plans reflect the concerns and needs of the public. Opportunities for community members to comment on the proposed plans and thereby shape the remediation process should be clearly laid out in the meeting agendas, and in the scheduling of meetings (in relation to RIDEM’s final decisions about work at the site).



*Response: We are committed to providing the community with opportunities to review and comment on National Grid’s plans to remediate the Tidewater Site. National Grid will revise the PIP to include a public meeting related to the draft Remedial Action Work Plan (RAWP – the document that will be submitted to RIDEM to present the details of how the remedy will be implemented) to provide further opportunity for the public to comment on the Site remediation process. The public meeting regarding the draft RAWP will be held within 12 months of receipt of the Remedial Decision Letter (RDL – letter issued by RIDEM to formally agree with the findings of the Site Investigation Report). This meeting will be held prior to the submittal of the final RAWP to RIDEM and will provide the public an opportunity to provide comment on the remedial strategy for the Tidewater Site. The process going forward and as outlined in the PIP is intended to provide a means of effective “two-way communication” between the public and National Grid. The Initial Community Meeting (which will follow RIDEM’s review of the Site Investigation Report) will provide the public an opportunity to provide comment on the conceptual remedial strategy for the Tidewater Site. The process outlined in the PIP, which follows the requirements of the Remediation Regulations, provides the public opportunity to comment on the remedial process; however, it is noted that RIDEM is ultimately responsible for the final remedial analysis and decisions on the final remedial strategy for the Site.*

5. Comment: In regards to my second concern, one of the requests most of the interviewees made was for National Grid to make data from air monitoring available in real time to the community. While meeting with representatives from National Grid and RIDEM during the early Fall of 2012, we learned that this was not possible with the particular hand held devices being used to monitor emissions during the current electrical substation upgrade. Moreover, RIDEM representatives at the meeting seemed to concur that the small-scale nature of the work and the limited extent of contaminants in the soil did not warrant the more costly kind of air monitoring technologies that enable real-time posting of readings. I am very concerned to see that the particular scheme we agreed to for monitoring emissions and making the results available to community members during the substation upgrade is replicated in the Draft PIP. National Grid and GZA officials should be clear that the substation upgrade was classified as separate from the remediation process, which is why the work could be completed without presenting it to the public. As we look ahead to the full remediation, the particular air monitoring strategies, and techniques for communicating information about the results of that monitoring to the community, will need to be determined in conversation with the community about the particular threats posed by particular actions.

*Response: We will revise the PIP to delete the reference to posting weekly air monitoring data. Air monitoring plans for full-scale remediation of the Tidewater Site have not been developed as the final remedy for the project has not been approved by the RIDEM. The public will have an opportunity to comment and engage in a conversation about the proposed air monitoring program during the RAWP comment process described above.*

**February 12, 2013 Letter**



1. Comment: Page 2 – The draft PIP states: “This plan is not intended to cover Site activities relative to day-to-day operations of the natural gas regulating facility and electrical substation or other uses of the property by National Grid.” Since community members and parents from nearby schools have already met with GZA, RIDEM, and National Grid regarding substation upgrades and earthwork, especially with regard to improving air monitoring plans in relation to this work, which falls outside the official remediation plan, I would ask that this sentence be clarified to ensure that residents can expect to be informed and be invited to actively participate in the shaping of any plans for the site that would require disturbance to soil or otherwise create a potential public health risk. Some of these activities could be interpreted, potentially, as “day-to-day operations”, and therefore this statement should be clarified to clearly differentiate between actual day-to-day operations and other operations that are not specifically included in the remediation but will disturb soil, create potential emissions, etc.

*Response: National Grid will revise the PIP to clarify this sentence as follows: “This plan is not intended to cover Site activities relative to the day-to-day operations, including repair and maintenance of the natural gas regulating facility and electrical substation involving minor soil disturbances (i.e., fence post installation) or other uses of the property by National Grid. Activities at these facilities involving excavations of soils with the potential to create volatile emissions are covered by this PIP. In the event of a facilities emergency requiring immediate soil excavation (utility repair, etc.), National Grid will follow the soil management procedures prepared for the previous natural gas station regulator and electrical substation work (i.e., April 2011 Materials Management Plan and November 2012 Soil Management Plan, respectively). In addition, air monitoring will be completed during these emergency events in accordance with the September 28, 2012, air monitoring summary memorandum submitted to RIDEM to the extent practical.”*

2. Comment: Page 17 – The Pawtucket Public Library will serve as a repository for all of the documents and other information related to the site. I suggest posting a sign or poster at the Library itself (not just on the fence at the Tidewater site) to let the general public know that this repository exists.

*Response: Information about public repositories for the Tidewater project is posted on the bulletin boards at the end of Tidewater Street and Bowles Court. National Grid will contact the Pawtucket Public Library to inquire about the possibility of posting a sign at the Library and will do so with the Library’s permission.*

3. Comment: Page 19 – If there are revisions proposed for the PIP in the future, National Grid will prepare a revised draft for review and approval by the public and RIDEM. National Grid should prepare a summary sheet to list all of the proposed changes/revisions, as well as the final approved revisions, not simply post the proposed revised draft of the full PIP online and in the physical repository (even if the changes/revisions are highlighted in the full document). This summary sheet should be a separate document to make it easy for the public to access, read, and digest the proposed, and then approved, changes.

*Response: While future revisions to the PIP will not re-open the draft and public comment period, we will prepare and make available summary sheets of proposed and approved changes/revisions for the public.*

4. Comment: In response to concerns raised by residents living on Thornton Street, immediately adjacent to the site, regarding natural gas odors and the possibility of air impacts from the groundwater contamination, I suggest addressing these issues at the poster session National Grid is hosting in the near future. In particular, addressing the issue of vapor intrusion into homes and schools should be a top priority. EJLRI receives technical assistance through an EPA program that

assists organizations and community residents in understanding technical information related to Brownfields contamination and remediation. Upon her review of the draft remedial plan submitted to RIDEM by National Grid, our consultant from the New Jersey Institute of Technology recommended the following:

#### VAPOR INTRUSION INVESTIGATION



Some of the chemicals (volatile compounds) identified at the site have the potential to travel through the soil as vapors. These vapors may then move up through the soil into nearby buildings, contaminating indoor air. Therefore, if a vapor intrusion investigation has not been completed, a vapor intrusion investigation is recommended to determine whether the occupants of neighboring buildings are at risk for exposure to VOCs due to vapor intrusion.

We will be submitting a final version of the consultant's review at the appropriate time (when public comments are being accepted on the SIR/recommended remedial alternative), but I wanted to share this recommendation because it speaks directly to concerns raised by residents at the last meeting.

*Response: We understand that nearby neighbors are concerned about vapor intrusion. Based on a number of factors – the way groundwater is distributed and moves at the Site, the way contaminants are distributed at the Site, and the distance from off-Site buildings to the nearest Site impacts- the potential for vapor intrusion into off-Site buildings, including the residences on Thornton Street or the neighboring schools, has not been identified as a potential pathway of concern for the Tidewater Site. We say this for several reasons:*

- *The majority of soil and groundwater impacts are located at least 50 feet away from the nearest Thornton Street residences and the schools.*
- *The portion of the Site that is nearest the residences along Thornton Street is an area where historical operations did not occur and significant impacts (VOCs or others) have not been detected in this area.*
- *In addition to the distance from Site impacts, the residences along Thornton Street and all three of the schools are located hydraulically upgradient of the Site – in other words, groundwater from the Site flows “downhill” towards the river, not towards the homes on Thornton Street or the schools. Therefore, the potential for migration of Site impacts towards Thornton Street and the schools is not a concern.*

*Our conclusion is also supported by:*

- *The March 2003 proposed revisions to the Connecticut Department of Environmental Protection (CTDEP) volatilization criteria, which references vapor intrusion guidance documents prepared by US Environmental Protection Agency (EPA).<sup>1</sup> This guidance indicates that volatilization criteria are applicable to impacts within 30 feet (both depth and lateral distance) from a structure.*
- *RIDEM's guidance document entitled “Evaluation of Vapor Intrusion Potential for Proposed RI School Sites,” dated September 2012.<sup>2</sup> This RIDEM guidance document outlines a step-by-step process for evaluating the potential for vapor intrusion to migrate*

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<sup>1</sup> RIDEM has not yet developed any vapor intrusion criteria and therefore has incorporated the State of Connecticut's volatilization criteria, available here:

[http://www.ct.gov/deep/cwp/view.asp?a=2715&q=458652&deepNav\\_GID=1626](http://www.ct.gov/deep/cwp/view.asp?a=2715&q=458652&deepNav_GID=1626)

<sup>2</sup> RIDEM developed this guidance document in September 2012, available here:

<http://www.dem.ri.gov/programs/benviron/waste/pdf/skulvapr.pdf>

*from the subsurface into an existing or proposed building to be used as a school. Using this guidance document and the understanding of subsurface impacts and groundwater flow direction information, an evaluation for the potential for vapor intrusion into the off-Site schools and residences is not considered warranted.*



*Finally, National Grid's predecessor owners conducted a soil gas survey surrounding the Francis J. Varieur School in 1996. The survey consisted of 28 sampling points adjacent to the school to ascertain whether the potential existed for the migration of vapors from the surrounding soils into the school. No VOCs were detected in the samples, with the exception of two soil gas samples which detected low levels of trichloroethylene (TCE). TCE is not a contaminant associated with historic MGP and power plant operations and is not associated with the Tidewater Site. Subsequent indoor air samples were collected from within the school for TCE analysis. Those samples did not detect any TCE.*

*At this time, National Grid does not plan on having a specific poster board regarding vapor intrusion at the community outreach session. However, we will be willing to discuss the issue should anyone have any questions about vapors. In addition, we would be happy to discuss this issue further with representatives of the New Jersey Institute of Technology (NJIT) if you wish.*

*To address the question regarding natural gas odors in the neighborhood, National Grid will have a representative available from gas operations at the Community Outreach Session to discuss the natural gas odor concerns raised by the community.*

*Natural gas is typically "odorless" from the well head. Federal and State law mandates that gas must be detectable by a person with an average sense of smell. As a result, pipeline operators and in some cases distribution system operators inject a malodorous material called mercaptan, commonly referred to as "odorant". Federal law also mandates that odorant added to a pipeline must not be harmful to people, pipe or other devices. National Grid does has several Level 3 gas leaks (defined as a non-hazardous leak; periodic monitoring required) in the neighborhood. Level 3 leaks do not present a risk to public health or safety. National Grid is continuing to monitor the leaks and is adhering to the strict Federal and State standards.*

5. Comment: The draft PIP is strong overall, but lacks specifics on how to best engage parents at the local schools. Principals at the schools may not be the best, or only, individuals to notify regarding upcoming work, air monitoring results, public meeting notices, etc. In fact, they can be bottlenecks for getting information out to the wider school community. Suggestions raised at the meeting to engage the Pawtucket Schools Superintendent, the school committee, etc. are all very good, but also are not enough to get through to individual parents. Signs or posters with general information posted at the front offices of the schools adjacent to the site would be a good start (and/or at student pick-up locations), as well as providing copies of public notices to all parents via their child's backpacks, as suggested by the principal at Varieur Elementary, would also help ameliorate this problem. Not all notices need to be sent home via backpacks, but any public meeting announcements should be, as should an initial introductory letter or handout with an overview of the site history and current status, including who to contact for more information. National Grid should work with the principals at the three schools to send this introductory info sheet/letter home with all students as soon as possible.

*Response: We provide notifications to those on the mailing/email list, which includes the principals of the neighboring schools. If the principals need assistance in distributing these notifications, we would be happy to help. The best way to find out information currently is to sign-up to the Tidewater mailing/email list via the National Grid website. National Grid encourages all parents/community members to sign up so that they can receive information directly from National Grid. Any interested party is also welcome to contact National Grid's Project Manager, Michele Leone, directly at 781-907-3651.*





*With permission of the neighboring schools, National Grid will post a sign on how to obtain information regarding the Site at the front office of each school. National Grid has prepared an updated fact sheet which was distributed on March 4, 2013, through the mailing and email lists, as well as via door-to-door flyers to the neighboring community. This fact sheet included information about the former Tidewater facility, recent activities at the Site, public involvement activities and next steps for the Site. The fact sheet accompanied a notification letter regarding the date, time and place of the upcoming Community Outreach Session. National Grid distributed this notification package to the schools on March 6, 2013, to be sent home with the students via backpacks. National Grid will continue to work with the principals about sending mailing list items (flyers, fact sheets and public notifications) in multiple languages home with the students via backpacks.*

6. Comment: Lastly, I would like to ask National Grid, GZA, and RIDEM to respond to how phytoremediation might play into the overall remediation strategy for this site, and/or if this approach has been discussed at all in relation to the Tidewater Site.

*Response: We considered phytoremediation but concluded that it is not a feasible remedial alternative for the following reasons:*

- *The depth of the treatment zone is limited by the depth of the root material of the plants.*
- *The contaminants at the former Tidewater facility are located at depth greater than two feet below the ground which is too deep for phytoremediation.*
- *The nature of certain impacts at the Tidewater Site, including separate phase product (in other words, coal tar or oils), are not amenable to treatment via phytoremediation. Due to these limitations, phytoremediation is not deemed appropriate as a potential remedial alternative for the former Tidewater facility.*

**Updates to Responses to Comments from the January 29, 2013 Public Meeting**  
**Open Comments and Questions Received:**

9. Audience member requested that technical documents be translated into “everyone speak” language.

*National Grid will continue to make every effort to use brief and nontechnical terminology in communications with members of the public. In an effort to meet this request, National Grid has hired a communications consultant to assist in the preparation of documents.*

12. Audience member spoke about historical mercury spill and lasting impact on concern from neighborhood. Audience member enquired about money from court settlement and publicly available information regarding mercury spill. He requested that information about the mercury spill, as it pertains to the history of the Tidewater Site, be included on the website and presented during the poster board session.

*National Grid did not own the property when the mercury spill took place in 2004 and was not involved in the cleanup, court proceedings or settlement. Southern Union was the party solely responsible for cleanup of the mercury incident. National Grid purchased the property from Southern Union but did not acquire Southern Union’s liability for the mercury issues on the property. The mercury contamination from the 2004 spill has been cleaned up and removed from the property. In addition, the buildings have been checked for mercury and no mercury is currently stored on the property. National Grid stated that the files associated with the mercury spill are public information and can be reviewed through RIDEM.*



The audience member further requested that information on the mercury spill be posted on the National Grid website.

*National Grid explained that it was not liable for the mercury release and was not involved in the cleanup, court proceedings or settlement. Southern Union was the party solely responsible for cleanup of the mercury incident. National Grid indicated that it would consider the request and provide a formal response in the response to comments on the PIP.*



*The following additional response was prepared by RIDEM and provided to National Grid following the January 2013 public meeting. National Grid was not involved in preparation of this response or involvement in the Southern Union Case.*

*“In June 2012, the U.S. Supreme Court remanded an \$18-million sentence against the owners of New England Gas in a case that stemmed from the 2004 mercury spill at a Pawtucket housing project. The ruling puts at question the \$12 million in damages that were to have gone to Rhode Island environmental groups (the majority of which were to be managed by the Rhode Island Foundation, in order to fund grants in environmental education, remediation, conservation, and children's health). The remaining \$6 million was a fine. The Supreme Court case hinged on circumstances that require juries -- not judges -- to set penalties after criminal convictions, so the ruling does not change the 2008 conviction of Texas-based Southern Union Co. for illegal storage of the hazardous material that belonged to a former subsidiary. But the ruling means the Supreme Court remanded the case for further proceedings in US District Court (RI) consistent with this opinion. The June 2012 Supreme Court Decision can be found at <http://www.supremecourt.gov/opinions/11pdf/11-94a1b2.pdf> . The US District Court heard oral arguments in December 2012 in an attempt to determine how to properly proceed with the case from here. DEM has received no additional information on this matter from the Court since the hearing in December 2012. “ – Communications from RIDEM*

14. Audience member commented on gas smell at Thornton and Merry Streets and whether or not they are safe or being exposed to natural gas (or its additives).

*The odor that the audience member says he smelled is likely associated with mercaptan. Natural gas by itself is odorless. Mercaptan is an odorant that is added to natural gas so the gas can easily be detected. It is carried with the natural gas stream.*

*National Grid will contact its Natural Gas Division to find out more information about this concern. Representatives from National Grid will be available during the March 27, 2013 community outreach meeting to discuss public concerns regarding the natural gas operations at the Tidewater facility.*

*In addition, refer to the response above for Comment 4 of the February 12, 2013 comment letter regarding “natural gas odors.”*

15. Amelia Rose of the Environmental Justice League of Rhode Island (EJLRI) introduced herself and her agency to the audience. She indicated that EJLRI had access to funds from the US Environmental Protection Agency (USEPA) and could be used as a resource to the community. She also suggested that National Grid have a poster board regarding vapor intrusion during the Community Informational Session to educate the public.

*Refer to the response above for Comment 4 of the February 12, 2013 comment letter regarding “vapor intrusion investigation.”*

*RIDEM also added that the potential for volatilization of contaminants from the Site is not supported by the results of the recent air monitoring program (hand held field instruments) which is being followed as part of the electrical substation project.*

17. Audience member suggested that Cape Verdean be added as a language to the translation list. Also suggested that Oak Hill Nursing Home be added to the distribution list.

*National Grid understands that Cape Verdean is a dialect of Portuguese. Based on discussions with a translation service, we also understand that documents translated in Portuguese should be understood by people who speak Cape Verdean. Therefore, National Grid does not plan to provide documents in Cape Verdean. If a community member requires assistance or translation other than Spanish and Portuguese, please contact Michele Leone at National Grid.*

*National Grid has added Oak Hill Nursing Home to the door to door flyer distribution list during the March 4, 2013 mailing.*

### **March 6, 2013 Email**

(1) National Grid should develop separate communication materials for schools – and provide enough copies to give place one in each student’s backpack.

*National Grid will continue to work with the principals to get materials out to parents via backpacks. To avoid confusion in disseminating this information, National Grid will work directly with the principals and other stakeholders.*

(2) School principals want to review all of the fliers/documents that will be sent to parents before NG makes copies, translates, or finalizes the communication, to make sure they communicate effectively. Julie Nora (ICS) and Carolyn Sheehan (Blackstone Valley) made this suggestion.

*National Grid will work with the principals to ensure that they are comfortable with the documents we provide to them for distribution.*

(3) Neighbors also want to review materials before NG sends out communications to neighborhood – point person can be Amelia Rose at EJ League who can send out draft to list of neighbors and collate comments/suggestions within one week and send back to NG for finalization (worry is that the communications are too wordy and will not be read).

*National Grid is working with a communications consultant in order to make mailings more easily understood by the community in response to this concern. Given this, National Grid will not be providing drafts of our communications to the neighbors prior to distribution. We continue to appreciate the community’s input on the communications and welcome suggestions on how to further improve this process.*

(4) Hold regular meetings with a core group of residents and school personnel to give NG/GZA a chance to communicate in a smaller group setting – in addition to the larger public meetings that happen less frequently. This will help increase communication with the most committed/involved residents and school officials who will be ambassadors to other residents and the wider school community to generate their interest and involvement. Also will make larger public meetings less adversarial and more productive because it won’t be the first time people are hearing about a certain issue or proposal.

*National Grid designed the public involvement plan (PIP) to involve all community members and interested parties. National Grid believes that the large number of public meetings and the commitment to schedule additional meetings on an as-needed basis pre-empts the need for smaller, stakeholder meetings. Community members are strongly encouraged to contact Michele Leone at any time throughout the site cleanup process by calling 781-907-3651 or via email at [michele.leone@nationalgrid.com](mailto:michele.leone@nationalgrid.com) should they have questions or comments.*



(5) Translation at larger public meetings should be made available regardless of whether someone contacts NG to say they are coming to a meeting – this would help build trust with the neighborhood and principals could guarantee to parents that interpretation would be available at public meetings no matter what.



*At all public meetings, translation assistance will be provided for non-English speaking individuals, upon request. Requests can be made to Michele Leone by calling 781-907-3651 or via email at michele.leone@nationalgrid.com.*

(7) NG should create bookmarks with all relevant contact information as well as instructions for how people can get on the email/phone notification lists. These will be helpful to hand out in the neighborhood and at the schools and would be more likely to be read and communicate effectively – rather than a long letter.

*National Grid has created magnets with the requested information which will be available at the upcoming community information session.*

A bulleted summary of the proposed revisions to the PIP, as discussed above, is attached to this letter.

Should you have any questions or comments regarding the information presented herein, please do not hesitate to contact the undersigned or Michele Leone at 781-907-3651.

Very truly yours,

GZA GEOENVIRONMENTAL, INC.

A handwritten signature in blue ink, appearing to read "Margaret S. Kilpatrick".

Margaret S. Kilpatrick, P.E.  
Senior Project Manager

A handwritten signature in blue ink, appearing to read "John P. Hartley".

John P. Hartley  
Consultant/Reviewer

A handwritten signature in blue ink, appearing to read "James J. Clark".

James J. Clark, P.E.  
Principal

Attachments: February 21, 2013 Notification of Public Comments Received  
February 15, 2013 Summary of Meeting  
March 6, 2013 Email  
Summary of Proposed Revisions to PIP

CC: Ms. Michele Leone, National Grid  
Ms. Elizabeth Stone, RIDEM

**FEBRUARY 21, 2013**

NOTIFICATION OF PUBLIC COMMENTS RECEIVED



February 21, 2013

Ms. Michele V. Leone  
Manager, New England Site Investigation & Remediation  
National Grid  
40 Sylvan Road  
Waltham, MA 02451-1120

RE: Tidewater Manufactured Gas Plant (former)  
Tidewater Street  
Pawtucket, Rhode Island

Dear Ms. Leone:

On November 9, 2011, the Rhode Island Department of Environmental Management (the Department) amended the Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases, (the Remediation Regulations). The purpose of these regulations is to create an integrated program requiring reporting, investigation and remediation of contaminated sites in order to eliminate and/or control threats to human health and the environment in an efficient manner.

In the matter of the above referenced "Site" (as defined in the Industrial Property Remediation and Reuse Act), and in accordance with Rule 7.07.E (Public Involvement Plans) of the 2011 Remediation Regulations, the Department's Office of Waste Management (OWM) has received the following documents concerning public comments on the draft Public Involvement Plan (PIP):

1. Letter from Holly Dygert to the Department, Re: Tidewater Site Public Involvement Plan, dated January 27, 2013, and received via e-mail on January 28, 2013; and
2. Comments re: Draft Public Involvement Plan, Former Tidewater Facility and Former Power Plant, Tidewater and Merry Streets, Pawtucket, Rhode Island, prepared by the Environmental Justice League of Rhode Island (EJLRI), received via e-mail on February 12, 2013.

In addition, National Grid received several comments at the public meeting for the draft PIP held on January 29, 2013.

Please review these submitted comments along with those received at the public meeting and prepare written responses to each of them as appropriate. A completed document, incorporating responses all of the comments, must be submitted to the Department for review and approval.



**All correspondence regarding this Site should be sent to the attention of:**

Joseph T. Martella II – Senior Engineer  
RIDEM / Office of Waste Management  
235 Promenade Street  
Providence, RI 02908

If you have any questions regarding this letter, please contact me by telephone at (401) 222-2797 extension 7109 or by e-mail at [joseph.martella@dem.ri.gov](mailto:joseph.martella@dem.ri.gov).

Sincerely,



Joseph T. Martella II  
Senior Engineer  
Rhode Island DEM  
Office of Waste Management

Attachments: January 27, 2013, Letter from Holly Dygert to the Department;  
February 12, 2013, Comments re: Draft Public Involvement Plan

Cc: Kelly J. Owens, RIDEM.OWM  
Elizabeth Stone, RIDEM/OOD  
Barbara Morin, RIDEM/OAR  
Barney S. Heath, Pawtucket Planning & Development  
Alan Tenreiro, Chairman, Pawtucket School Committee  
Deborah Cylke, Superintendent, City of Pawtucket School Department  
Julie Nora, Ph.D, International Charter School  
Carolyn Sheehan, Blackstone Academy  
Edna Coia, Francis J. Varieur Elementary School  
Amelia Rose, EJLRI  
Margaret S. Kilpatrick, GZA

January 27, 2013

Mr. Joseph Martella II, Senior Engineer  
RIDEM Office of Waste Management  
Site Remediation Program

Re: Tidewater Site Public Involvement Plan

Dear Mr. Martella,

I am very pleased that RIDEM has implemented a public involvement mechanism to ensure that members of the community who may be exposed to hazards are involved in the remediation process. I reviewed National Grid's draft Public Involvement Plan (PIP) for the Tidewater Site, and I am also very pleased with many of the actions National Grid has proposed to take to ensure that those potentially impacted by the work at Tidewater are informed of the work. I am writing to communicate my suggestions for strengthening the proposed PIP. These suggestions are aimed, first, to optimize the ability of those who could be impacted by the site's hazards to access information about the nature of these hazards and about potential routes of exposure, and, second, to ensure that they are able to influence the process in accordance with their particular concerns.

I appreciate that National Grid solicited comments from the community through the interview process in June of 2012, and provided a synthesis of the suggestions in the *Draft PIP*. National Grid has already acted on many of these suggestions, and has integrated many of them into the proposed PIP. The community bulletin boards – with announcements and the results of weekly air monitoring – are very useful communication tools. I look forward to the incorporation of the color-coded alert system. The information in the boards should be provided in the three primary languages of the community, which are English, Spanish and Portuguese. I was concerned that National Grid seemed to reject a request made during the interviews for information to be translated into both Spanish and Portuguese. I want to underscore the importance of providing information in the community's languages.

I am very pleased that National Grid has proposed to create a color-coded map of Tidewater site hazards to the public as part of the PIP. Despite years of communications about the hazards on the site, the members of the stakeholder group are still unclear about concentrations of particular hazards, and where they are located. Thus, I am eager to see this map. I am also pleased that National Grid is proposing a Community Outreach (poster) Session, and possibly a tour of the site.

While I am generally satisfied with the strategies National Grid has proposed to convey information to the public, I have two main concerns. The first is that the *Draft PIP* largely neglects the public's role in shaping the remediation process. The second is that the particular

strategy for monitoring air quality that was agreed on for the electrical substation upgrade is included in the *Draft PIP* as the plan for the remediation.

In regards to the first concern, I agree with the characterization of a public involvement process laid out on page 1 of the *Draft PIP*, as “an agreement between the party conducting response actions and the public about how they will share information moving forward, and how the public will be able to comment on plans for assessment and cleanup of the site.” This definition identifies the public as important partner in the remediation process. Since the public’s interests vis-à-vis the remediation process diverge in important ways from those of the property owner, the public must have the ability to shape the remediation, and the precautions that are taken during the remediation process. I am concerned, however, that the *Draft PIP* construes public participation narrowly, as informing the public about work plans that have already been developed.

For example, on page 8, in describing the process through which a final remediation plan for the site will be determined, the *Draft PIP* states that RIDEM will issue a Program Letter when it has concluded that “the site has been adequately assessed” in the Site Investigation Report. The *Draft PIP* continues that “Following receipt of the Program Letter, National Grid will notify [various parties]... that the investigation is complete and that **RIDEM has concurred with the recommended remedial alternative**... Subsequent to this public notification and following receipt of any public comments, the Department will issue a Remedial Decision Letter formally approving the SIR.” In this description, the identification and approval of a remedial strategy are depicted as occurring apart from public involvement. This negates the role of the public in the decision-making process. Moreover, I believe that it is a mischaracterization of the process through which remediation strategies are determined. It is my understanding that the Program Letter solely certifies that RIDEM has determined that the proposed remedy meets the criteria for an acceptable remedy. I understand that the final determination of a remedy cannot be made until members of the community are given an opportunity to consider the proposal, and to convey their concerns to RIDEM.

The characterization of the process through which a *Remedial Action Work Plan* (RAWP) is identified and selected in the *Draft PIP* similarly neglects the role of the public. Though the text states that “Many of the above remedial process steps will be accompanied by public meetings and comment periods” (p.8), I find it disconcerting that the public’s role in shaping the remediation process is not included in National Grid’s description of the decision-making process. This view of public involvement as a process whereby National Grid officials inform the public about the remediation process carries through to other sections of the *Draft PIP*. For example, in the section on Community Meetings, meetings are depicted as opportunities for National Grid representatives to inform community members about the work that has been and will be undertaken in the site. Though informing the community is crucial for facilitating their involvement in the process, it is not sufficient. The document also states that meetings will be held “in conjunction with... Departmental approval of the *Remedial Action Work Plan*; [and]

prior to remedy implementation” (p.14). This neglects the crucial role the public will have in shaping the RAWP.

The *PIP* should be revised to indicate clearly that potential work plans will be presented in community meetings, and that community concerns will be solicited to ensure that the final work plans reflect the concerns and needs of the public. Opportunities for community members to comment on the proposed plans and thereby shape the remediation process should be clearly laid out in the meeting agendas, and in the scheduling of meetings (in relation to RIDEM’s final decisions about work at the site).

In regards to my second concern, one of the requests most of the interviewees made was for National Grid to make data from air monitoring available in real time to the community. While meeting with representatives from National Grid and RIDEM during the early Fall of 2012, we learned that this was not possible with the particular hand held devices being used to monitor emissions during the current electrical substation upgrade. Moreover, RIDEM representatives at the meeting seemed to concur that the small-scale nature of the work and the limited extent of contaminants in the soil did not warrant the more costly kind of air monitoring technologies that enable real-time posting of readings. I am very concerned to see that the particular scheme we agreed to for monitoring emissions and making the results available to community members during the substation upgrade is replicated in the *Draft PIP*. National Grid and GZA officials should be clear that the substation upgrade was classified as separate from the remediation process, which is why the work could be completed without presenting it to the public. As we look ahead to the full remediation, the particular air monitoring strategies, and techniques for communicating information about the results of that monitoring to the community, will need to be determined in conversation with the community about the particular threats posed by particular actions.

In closing, I want to reiterate my support for the PIP process that RIDEM has adopted, and that National Grid has begun to develop. I look forward to continuing to work with RIDEM and National Grid to develop an effective plan for ensuring optimal public involvement.

Sincerely,



Holly Dygert  
16 Minto Street  
Providence, RI 02908  
(401) 272-1748



**Environmental  
Justice League of  
Rhode Island**

Environmental Justice League of Rhode Island  
1192 Westminster St. Providence, RI 02909  
Tel: (401) 383-7441 Fax: (401) 941-8156  
[questions@ejlri.org](mailto:questions@ejlri.org)  
[www.ejlri.wordpress.com](http://www.ejlri.wordpress.com)

February 12, 2013

Joseph Martella, Project Manager  
RIDEM  
Office of Waste Management  
235 Promenade Street  
Providence, RI 02908

*Comments re: Draft Public Involvement Plan, Former Tidewater Facility and Former Power Plant, Tidewater and Merry Streets, Pawtucket, Rhode Island*

Dear Mr. Martella,

I am submitting the following comments on behalf of the Environmental Justice League of Rhode Island (EJLRI) regarding the draft Public Involvement Plan (PIP) prepared by GZA on behalf of their client, National Grid, the responsible party for the Tidewater Site.

I have listed a few specific comments first, followed by more general suggestions for the PIP overall.

Page 2 – The draft PIP states: “This plan is not intended to cover Site activities relative to day-to-day operations of the natural gas regulating facility and electrical substation or other uses of the property by National Grid.” Since community members and parents from nearby schools have already met with GZA, RIDEM, and National Grid regarding substation upgrades and earthwork, especially with regard to improving air monitoring plans in relation to this work, which falls outside the official remediation plan, I would ask that this sentence be clarified to ensure that residents can expect to be informed and be invited to actively participate in the shaping of any plans for the site that would require disturbance to soil or otherwise create a potential public health risk. Some of these activities could be interpreted, potentially, as “day-to-day operations”, and therefore this statement should be clarified to clearly differentiate between actual day-to-day operations and other operations that are not specifically included in the remediation but will disturb soil, create potential emissions, etc.

Page 17 – The Pawtucket Public Library will serve as a repository for all of the documents and other information related to the site. I suggest posting a sign or poster at the Library itself (not just on the fence at the Tidewater site) to let the general public know that this repository exists.

Page 19 – If there are revisions proposed for the PIP in the future, National Grid will prepare a revised draft for review and approval by the public and RIDEM. National Grid should prepare a summary sheet to list all of the proposed changes/revisions, as well as the final approved revisions, not simply post the proposed revised draft of the full PIP online and in the physical repository (even if the changes/revisions are highlighted in the full document). This summary sheet should be a separate document to make it easy for the public to access, read, and digest the proposed, and then approved, changes.



In response to concerns raised by residents living on Thornton Street, immediately adjacent to the site, regarding natural gas odors and the possibility of air impacts from the groundwater contamination, I suggest addressing these issues at the poster session National Grid is hosting in the near future. In particular, addressing the issue of vapor intrusion into homes and schools should be a top priority. EJLRI receives technical assistance through an EPA program that assists organizations and community residents in understanding technical information related to Brownfields contamination and remediation. Upon her review of the draft remedial plan submitted to RIDEM by National Grid, our consultant from the New Jersey Institute of Technology recommended the following:

#### VAPOR INTRUSION INVESTIGATION


Some of the chemicals (volatile compounds) identified at the site have the potential to travel through the soil as vapors. These vapors may then move up through the soil into nearby buildings, contaminating indoor air. Therefore, if a vapor intrusion investigation has not been completed, a vapor intrusion investigation is recommended to determine whether the occupants of neighboring buildings are at risk for exposure to VOCs due to vapor intrusion.

We will be submitting a final version of the consultant's review at the appropriate time (when public comments are being accepted on the SIR/recommended remedial alternative), but I wanted to share this recommendation because it speaks directly to concerns raised by residents at the last meeting.

The draft PIP is strong overall, but lacks specifics on how to best engage parents at the local schools. Principals at the schools may not be the best, or only, individuals to notify regarding upcoming work, air monitoring results, public meeting notices, etc. In fact, they can be bottlenecks for getting information out to the wider school community. Suggestions raised at the meeting to engage the Pawtucket Schools Superintendent, the school committee, etc. are all very good, but also are not enough to get through to individual parents. Signs or posters with general information posted at the front offices of the schools adjacent to the site would be a good start (and/or at student pick-up locations), as well as providing copies of public notices to all parents via their child's backpacks, as suggested by the principal at Varieur Elementary, would also help ameliorate this problem. Not all notices need to be sent home via backpacks, but any public meeting announcements should be, as should an initial introductory letter or handout with an overview of the site history and current status, including who to contact for more information. National Grid should work with the principals at the three schools to send this introductory info sheet/letter home with all students as soon as possible.

Lastly, I would like to ask National Grid, GZA, and RIDEM to respond to how phytoremediation might play into the overall remediation strategy for this site, and/or if this approach has been discussed at all in relation to the Tidewater Site.

Sincerely,

A handwritten signature in cursive script that reads "Amelia Rose". The signature is written in black ink and is positioned below the word "Sincerely,".

Amelia Rose, Director

**FEBRUARY 15, 2013**

SUMMARY OF MEETING

**GZA**  
**GeoEnvironmental, Inc.**

*Engineers and  
Scientists*

February 15, 2013  
GZA File No. 05.0043654.20-C

Mr. Joseph Martella  
Rhode Island Department of Environmental Management  
Office of Waste Management  
235 Promenade Street  
Providence, Rhode Island 02908



530 Broadway  
Providence  
Rhode Island  
02909  
401-421-4140  
Fax: 401-751-8613  
<http://www.gza.com>

Re: *Meeting Summary - January 29, 2013*  
Draft Public Involvement Plan  
Former Tidewater MGP and Power Plant Site  
Pawtucket, Rhode Island  
*RIDEM Case No. 95-022*

Dear Mr. Martella:

On behalf of our client, The Narragansett Electric Company d/b/a National Grid (National Grid), GZA GeoEnvironmental Inc. (GZA) is pleased to provide the attached summary of the January 29, 2013 public meeting associated with the Former Tidewater Manufactured Gas Plant (MGP) and Power Plant Site located in Pawtucket, Rhode Island (the Site). The purpose of the public meeting was to discuss public comments to the draft Public Involvement Plan (PIP) which was submitted to the Department on November 26, 2012.

Should you have any questions or comments regarding the information presented herein, please do not hesitate to contact the undersigned or Michele Leone at 781-907-3651.

Very truly yours,

GZA GEOENVIRONMENTAL, INC.

A handwritten signature in blue ink, appearing to read "Margaret S. Kilpatrick".

Margaret S. Kilpatrick, P.E.  
Senior Project Manager  
401-421-4140 – [margaret.kilpatrick@gza.com](mailto:margaret.kilpatrick@gza.com)

Attachment: Summary of Meeting

CC: Ms. Michele Leone, National Grid  
Ms. Elizabeth Stone, RIDEM

Summary of Meeting  
 DRAFT Public Involvement Plan (PIP)  
 Former Tidewater Facility  
 Pawtucket, Rhode Island

January 29, 2013 6 PM  
 Francis J. Varieur Elementary School  
 486 Pleasant Street  
 Pawtucket, Rhode Island

- **Introduction to Meeting – Michele Leone (National Grid Representative)**
- **Presentation of DRAFT PIP dated November 26, 2012 – Elizabeth Stone (Rhode Island Department of Environmental Management or RIDEM) and Meg Kilpatrick, P.E. (GZA GeoEnvironmental, Inc.)**

The presentation included a summary of the Draft Public Involvement Plan (PIP) for the former Tidewater Facility (the Site). The draft PIP was developed based on input from the public provided during the community interviews completed in June 2012, as well as input from RIDEM. It provides a blueprint for keeping the public informed during the site cleanup process. It also presents how the public can participate in the process and comment on the project. A PIP is a living document and can be amended to reflect additional issues or challenges that may arise during the cleanup process.

National Grid submitted a draft PIP to RIDEM on November 26, 2012. The draft PIP has four components: 1) public notice, 2) fact sheets and enhanced communications, 3) community meetings and 4) information repositories. The four components are presented in the below table.

<p><b><u>Public Notice:</u></b></p> <ul style="list-style-type: none"> <li>• Mailing List (used to announce public meetings, distribute fact sheets, information about availability of reports, etc.)</li> <li>• Email List (optional)</li> <li>• Sign up at <a href="http://www.tidewatersite.com">www.tidewatersite.com</a></li> <li>• Or, send request to National Grid</li> </ul>	<p><b><u>Fact Sheets and Enhanced Communications:</u></b></p> <ul style="list-style-type: none"> <li>• Fact Sheets (used to inform of development of new information and/or achievement of significant milestones)</li> <li>• Informational Bulletin Boards (end of Tidewater Street and Bowles Court)</li> <li>• Phone Message Alert System during excavation</li> </ul>
<p><b><u>Community Meetings:</u></b></p> <ul style="list-style-type: none"> <li>• Encourages equal participation by all to create an atmosphere of constructive, open dialogue</li> <li>• Proposed Schedule and Objective of Public Meetings</li> <li>• Evening meeting time</li> <li>• Francis J. Varieur School (preferred venue)</li> </ul>	<p><b><u>Information Repositories:</u></b></p> <ul style="list-style-type: none"> <li>• Publicly Accessible Site File: RIDEM Case No. 95-022 <a href="http://www.dem.ri.gov/topics/filerevw/htm">www.dem.ri.gov/topics/filerevw/htm</a></li> <li>• Publicly Accessible Websites: <a href="http://www.tidewatersite.com">www.tidewatersite.com</a> <a href="http://www.dem.ri.gov/benviron/waste/tide/htm">www.dem.ri.gov/benviron/waste/tide/htm</a></li> <li>• Local Information Repository: Pawtucket Library (13 Summer St) Bulletin Boards: Tidewater St &amp; Bowles Ct</li> </ul>

Following the public comment period for the draft PIP, National Grid will provide a response to comments and revise the PIP as necessary for submittal to RIDEM for final review and approval.

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National Grid will hold a community outreach session in March 2013 to present information about the Site in an informal poster-board type setting. Following this session, National Grid will hold the initial community meeting within 60 days after receipt of the Program Letter from RIDEM (issued following RIDEM’s formal review of the Site Investigation Report submitted by National Grid). The schedule of community meetings follows, and National Grid encourages participation by all to create an atmosphere of constructive, open dialogue.

ACTIVITY	TIME PERIOD
Community Outreach Session	Within 60 days of Draft PIP Meeting (March 2013)
Initial Community Meeting	Within 60 days of receipt of Program Letter – during SIR Public Comment Period
Public Meeting on DRAFT Remedial Action Approval Plan (RAWP)	Within 12 months of receipt of Remedial Decision Letter
Submit RAWP for RIDEM Approval	Within 6 months of DRAFT RAWP Meeting
Public Meeting prior to initiation of remedy	Minimum of 30 days prior to start of remediation
Public Meetings during remediation	Meeting schedule to be presented for discussion purposes once remedial schedule is developed and approved by RIDEM
Public Meeting upon completion of the remedy	Within 30 days following completion of remediation

A copy of the presentation associated with the January 29, 2013 Draft PIP meeting is posted on the National Grid Tidewater website ([www.tidewatersite.com](http://www.tidewatersite.com)).

**Questions and Comments Session:** *(Responses provided in italics)*

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National Grid provided a brief summary of written public comments received to date on the DRAFT PIP.

- Public requested that Portuguese (in addition to Spanish) be included as languages for documents requiring translation.

*National Grid stated that going forward, the following document types will be provided in English, Spanish and Portuguese: 1) Notification Mailings, 2) Fact Sheets and 3) brief Executive Summaries which will accompany future reports.*

- Public requested that color-coded alert system be implemented on the bulletin boards.

*National Grid stated that the color-coded alert system has been implemented on the bulletin boards during the recent excavation project. The system involves posting different color sheets to indicate when excavation is active (yellow sheet) and not active (blue sheet).*



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- Public requested color-coded map of Tidewater Site contaminants.

*National Grid stated that the color-coded map for the Tidewater project is being finalized and will be presented at the upcoming Community Information Session. The final map will also be posted on the National Grid website and the bulletin boards.*

- Public expressed concern that current Draft PIP does not take into account the public's role in providing input into the remediation process.

*National Grid reinforced that the process going forward and as outlined in the PIP is intended to provide a means of effective "two-way communications" between the public and National Grid. National Grid stated that the Initial Community Meeting (which will follow RIDEM's review of the Site Investigation Report) will provide the public an opportunity to provide comment on the conceptual remedial strategy for the Tidewater Site. In addition, National Grid indicated that the current draft of the PIP has been modified to include a public meeting on the draft Remedial Action Work Plan (RAWP – the document that will be submitted to RIDEM to present the details of how the remedy will be implemented) to further provide an opportunity for the public to comment on the Site cleanup process.*

- Public expressed concern that current Draft PIP does not consider air monitoring during the remediation of the Tidewater Site.

*National Grid stated that the air monitoring plans for full-scale remediation of the Tidewater Site have not been developed as the final remedy for the project has not been approved. National Grid stated that the public will have an opportunity to comment and present their concerns during future public meetings, which National Grid will incorporate into the air monitoring plan for the final remediation.*

Audience member relayed concern that draft PIP references weekly posting of air monitoring data and that inclusion of this language will set a precedent for future air quality monitoring.

*National Grid stated that the PIP will be modified to delete reference to the posting of weekly air monitoring data.*

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**Open Comments and Questions Received:**

1. Audience member enquired about date for the Community Outreach Session.

*The current schedule is to have the Community Outreach Session in mid to late March 2013.*

2. Audience member enquired about what March 2013 Community Outreach Session consist of.

*The Community Outreach Session will consist of an informal meeting where information will be presented on poster boards to the public. The poster boards will include a variety of topics, including such things as "What is an Manufactured Gas Plant?" history of the Tidewater Site, findings of the investigations, demonstrations of field equipment, description of current National Grid operations at the property, etc. Each poster board will be manned by a representative from National Grid and/or GZA to answer questions. RIDEM will also be present to answer questions from the public.*

3. Audience member expressed concern about when to know when things are going on at the Site; specifically, when to leave kids inside.

*Information regarding excavation at the Site is provided through the mailing/email list, posted to the bulletin boards and posted to the Tidewater websites. The National Grid website will also be updated to include the color-coded alert system information (active and no active excavation). National Grid will also inform school principals of the schedule of work.*

4. Audience member stated that he is a parent and emphasized that it is important to remember that parents have no way to obtain information about the Site.

*National Grid provides notifications to those on the mailing/email list, which includes the principals of the neighboring schools. Due to privacy issues, National Grid does not have access to student/parent information. National Grid will continue to work with the school principals in developing an effective way to communicate with the parents. The best way to find out information currently is to sign-up to the Tidewater mailing/email list via the National Grid website. National Grid requested that audience members tell other parents/community members about this and encourage them to sign up so that they can receive information directly from National Grid.*

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- Audience member stated that parents from the International Charter School want a way for the information to be communicated to the parents.

*National Grid will continue to work with the school principals in developing an effective way to communicate with the parents. National Grid encouraged parents to sign-up for the mailing and/or email lists, as well as visit the National Grid website, to obtain information.*

- Audience member stated that he/she feels that the parents have no way to determine what is going on at the site and suggested possibly implementation of additional bulletin boards.

*The bulletin boards were installed at locations proximate to the Tidewater site, as well as accessible and visible to the schools. The two site bulletin boards are located close to each of the neighboring schools. National Grid will look into the possible installation of additional bulletin boards, as well as continuing to work with the school principals in developing an effective way to communicate with the parents.*

- The principal from Blackstone Academy stated the community has various levels of technical understanding and that disseminating information about the Tidewater Site is difficult.

*In the future, National Grid will prepare simple executive summaries for major report submittals. In preparing these summaries, National Grid will make every effort to use brief and nontechnical terminology in communications to the public. In the near future, National Grid will prepare an executive summary for the recent Site Investigation Report as well as an updated Fact Sheet which will be distributed through the mailing lists, as well as placed into the information repositories. National Grid will also continue to work with the school principals in developing an effective way to communicate information to the parents.*

- Audience member stated that, as a parent, the 2- hour notice provided through the phone message alert system was not enough. In addition, notification regarding the Tidewater site needs to be provided to more parties, such as elected officials and School Committee(s). A presentation of information would be warranted.

*The mailing list established for the Tidewater project does include local elected officials as well as school representatives, including the Principals of the Blackstone Academy, International Charter School and Francis J. Varieur School, as well as the Superintendent of schools for the City of Pawtucket. National Grid would be happy to include members of the School Committee on the mailing list, upon receipt of their contact information. National Grid also is willing to meet with*

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*members of the school and local government to present information about the Tidewater site and answer any questions that they may have.*

9. Audience member requested that technical documents be translated into “everyone speak” language.

*National Grid is attempting to do this and will continue to try to produce documents that are better understood by the public.*

10. Audience member asked when RIDEM will be ready to review the Site Investigation Report (SIR).

*Joseph Martella of RIDEM provided details regarding the regulatory process under the RIDEM Remediation Regulations. He indicated that the Public Involvement Plan must be finalized and in place before RIDEM’s review of the SIR can begin.*

Audience member enquired about the timing of this review and if the spring would seem reasonable.

*RIDEM indicated that it may be possible but reiterated that PIP must be finalized before the review of the SIR begins.*

11. Audience member requested that live translators be provided at public meetings.

*National Grid would be happy to provide translators, if requested by the public in advance of the meetings. Future notifications will include language regarding the availability of translators upon request by the public.*

12. Audience member spoke about historical mercury spill and lasting impact on concern from neighborhood. Audience member enquired about money from court settlement and publicly available information regarding mercury spill. He requested that information about the mercury spill, as it pertains to the history of the Tidewater Site, be included on the website and presented during the poster board session.

*National Grid did not own the property when the mercury spill took place in 2004 and was not involved in the cleanup, court proceedings or settlement. Southern Union was the party solely responsible for cleanup of the mercury incident. National Grid purchased the property from*

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*Southern Union but did not acquire Southern Union's liability for the mercury issues on the property. The mercury contamination from the 2004 spill has been cleaned up and removed from the property. In addition, the buildings have been checked for mercury and no mercury is currently stored on-site. National Grid stated that the files associated with the mercury spill are public information and can be reviewed through RIDEM.*

The audience member further requested that information on the mercury spill be posted on the National Grid website.

*National Grid explained that it was not liable for the mercury release was not involved in the cleanup, court proceedings or settlement. Southern Union was the party solely responsible for cleanup of the mercury incident. National Grid indicated that it would consider the request and provide a formal response in the response to comments on the PIP.*

13. Audience member concerned about Tidewater flyer that he received on his door from Environmental Justice League. The flyer depicted biohazard marker and list of chemicals with associated acute health hazards. Audience member relayed information about members of his household and neighbors being diagnosed with cancer and is concerned about what he is being exposed to at his home as he lives on Thornton Street located right next to site. He stressed that he wants to know if he is safe.

*National Grid stressed that the Site is fenced and locked to keep people off of the property. Under normal site conditions, the Site is safe to the community- in other words, there is no potential for airborne contaminants. During times of excavation, when soil is dug up and moved around, there is a potential for airborne contaminants. During soil excavation, National Grid follows an air quality monitoring program which has received public input and has been reviewed and approved by RIDEM. The results of this monitoring are posted to the bulletin boards as well as the Tidewater websites. This program was followed during the recent electrical substation upgrade project. The majority of excavation associated with this project is complete, with the exception of minor fence post installations and minor excavations associated with properly decommissioning equipment. Air data from this project did not show sustained exceedances of the thresholds (defined as being held over a 5-minute time period) at any time. A few transient exceedances of the thresholds were noted during the work which were not associated with the excavation activities (i.e., transient exceedances due to weather interference (rain), movement of trash material, orange peel, etc.) .*



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Audience member asked whether there are emissions coming from the site without moving the soil? Also, audience member wanted to know about indoor air monitoring and whether or not they should be concerned about migration/volatilization into buildings on Thornton Street.

*Contaminants from the site are not getting into the air (i.e., volatilizing) from the soil and groundwater under normal conditions (i.e., no soil being moved or disturbed). The majority of surface soils at Site are indicative of urban fill – soils which would typically be found in urban or city environments and exhibit low levels of contaminants. The majority of impacts are found below the ground surface (deeper than 2 feet) in the soils, at or below the groundwater table. In addition, the majority of soil, groundwater and separate phase product (oil) impacts are found where the historical Manufactured Gas Plant and Power Plant operations took place, primarily along the river area between Winter Street and the land behind the Max Read Field. The area where the residences are located along Thornton Street are in an area where historical operations did not occur and do not have elevated levels of observed impacts. This area is also located upgradient of the site – groundwater from the Site flows “downhill” towards the river, not towards the homes on Thornton Street. Based on this information, National Grid believes that the buildings on Thornton Street are unaffected by the migration and/or volatilization from impacts on the Tidewater Site.*

*The drawbacks to indoor air testing were also discussed, as this type of testing typically will pick up standard house hold products and chemicals, such as paint, cleaners, etc., which cannot be differentiated from possible site contaminants.*

*The findings of the drilling program in Max Read Field were also discussed. Results of the explorations indicated the presence of visually impacted soil at depths greater than 2 feet in a limited area on the eastern portion of the field. The soils at depth are not accessible (i.e., they are covered with 2 feet of visually non-impacted soil which would need to be removed). The exploration program was conducted with knowledge by the City of Pawtucket and the City is aware of the findings of the investigation.*

14. Audience member commented on gas smell at Thornton and Merry Streets and whether or not they are safe or being exposed to natural gas (or its additives).

*The odor that the audience member says he smelled is likely associated with mercaptan. Natural gas by itself is odorless. Mercaptan is an odorant that is added to natural gas so the gas can easily be detected. It is carried with the natural gas stream.*

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*National Grid will contact their Natural Gas Division to find out more information about this concern.*

15. Amelia Rose of the Environmental Justice League of Rhode Island (EJLRI) introduced herself and her agency to the audience. She indicated that EJLRI had access to funds from the US Environmental Protection Agency (USEPA) and could be used as a resource to the community. She also suggested that National Grid have a poster board regarding vapor intrusion during the Community Informational Session to educate the public.

*National Grid will consider adding a poster board regarding vapor intrusion to the Community Informational Session.*

*RIDEM also added that the potential for volatilization of contaminants from the site is not supported by the results of the recent air monitoring program (hand held field instruments) which is being followed as part of the electrical substation project.*

16. Audience member commented on concern regarding interfacing with the schools and the community. They suggested providing information about the site at a 4-6<sup>th</sup> grade comprehension level. Also, they requested that National Grid inform Shea High School about the impacts on the Max Read Field as they use the athletic field for sport activities.

*National Grid will look into this request and get back to the public. In the future, National Grid will prepare simple executive summaries for major report submittals. In preparing these summaries, National Grid will make every effort to use brief and nontechnical terminology in communications to the public. In the near future, National Grid will prepare an executive summary for the recent Site Investigation Report as well as an updated Fact Sheet which will be distributed through the mailing lists, as well as placed into the information repositories. National Grid will also continue to work with the school principals in developing an effective way to communicate information to the parents. Also, National Grid will consider adding Shea High School to the mailing list.*

17. Audience member suggested that Cape Verdean be added as a language to the translation list. Also suggested that Oak Hill Nursing Home be added to the distribution list.

*National Grid will consider adding Cape Verdean to the translation list. National Grid will also consider adding Oak Hill Nursing Home to the mailing list.*

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18. Audience member enquired why this is the first Public Involvement Plan in RI and what is typically done in Massachusetts?

*RIDEM indicated that the Remediation Regulations were recently modified in November 2011 to include a formal Public Involvement process, similar to that established in Massachusetts. This is the first PIP in Rhode Island due to the recent change in the regulations. Massachusetts has had a PIP process in place for at least 20 years.*

19. Audience member inquired if the site is “safe,” why all the concern?

*RIDEM indicated that the Site is under the State’s guidance for a reason – there are soil and groundwater impacts at the site which do pose a certain level of exposure risk. RIDEM stressed that the fencing is also there for a reason – to prevent people from entering the Site. RIDEM also gave the example of different levels of exposure at the Site – i.e., on-site workers who are excavating soils (potential high exposure risk) versus people off-site at or near the fence line (low potential exposure risk).*

20. Audience member enquired if wildlife could present an exposure risk via soil disturbance (i.e., burrowing, digging) on site.

*GZA performs weekly site walks to inspect and document the conditions at the Site. There has not been evidence of significant soil disturbance by wildlife at the Site. In the future, we will continue to monitor soil disturbance.*

21. Audience member requested status on South Washout Area repair.

*The earthwork associated with the South Washout Area has not been completed. National Grid will continue to work with the City to have this work completed.*

22. Audience member enquired when the public will receive a response to comments.

*The schedule presented in the presentation was revisited. A summary of today’s meeting will be provided within 10 business days (by 2/12/2013). Written comments on the draft PIP from the public should be provided to RIDEM within 10 business days (by 2/12/2013). RIDEM indicated that an extension to the public comment period may be requested in writing. Timing for response to written comments will be based on how many comments are received.*

**MARCH 6, 2013**

EMAIL

## Margaret Kilpatrick

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**From:** Dygert, Holly <hdygert@ric.edu>  
**Sent:** Wednesday, March 06, 2013 3:39 PM  
**To:** Leone, Michele (Michele.Leone@nationalgrid.com); Margaret Kilpatrick  
**Cc:** joseph.martella@dem.ri.gov; Amelia Rose (amelia.rose@ejlri.org); jenrossi3@gmail.com  
**Subject:** Tidewater Site communications, follow-up suggestions  
**Attachments:** PIP Recommendations Tidewater Community Group.doc

Dear Michele and Meg,

We held a meeting last week with members of the Tidewater community (school officials, parents of school children, and members of the neighborhood) to follow-up on National Grid's recent public meeting. One of the primary concerns expressed was that the language used in the outreach efforts was not accessible to most people. I personally spoke with a woman in the neighborhood who said that she keeps going to these meetings, but she doesn't understand anything that is said. I also noted that one of the attendees prefaced his comments at the meeting with, "I know I sound ignorant, but..." The school administrators, parents and residents had several suggestions of ways to make the communications more effective. We've compiled those suggestions – I am attaching the list and pasting it below.

As a college professor, I am constantly charged with translating expert knowledge into language that is accessible, often to kids coming right out of high school. I'm happy to compile a list of terms that are hard for non-specialists to understand (e.g., remedy, remediation, cap, program letter, abutter, action limits...). The list of definitions that National Grid provided in a former communication is a step in the right direction, but it would be better to replace those specialized terms with more accessible alternatives.

On a different note, can you tell me if you've been able to figure out what the source of the gas smell is that the resident at the public meeting complained about? I've heard multiple people complain about intermittent gas smells over the last couple of years.

Sincerely,

Holly Dygert

### **PIP Recommendations for the Tidewater Site March 6, 2013**

#### **Issues of concern that people would like to be addressed at the poster session:**

Gas Smells – What is this? What are potential impacts?

Differences among remedial alternatives – what options does National Grid have and why are they choosing one option over another?

What are potential future uses of this land/site after remediation? Will National Grid still own the site? Have there been discussions with City of Pawtucket?

What are the implications for neighbors' health based on what kinds of contaminants are at the site?

#### **Further Suggestions for Effectively Communicating with the Public (in preparation for the poster session):**

National Grid should develop separate communication materials for schools – and provide enough copies to give place one in each student's backpack.



School principals want to review all of the fliers/documents that will be sent to parents before NG makes copies, translates, or finalizes the communication, to make sure they communicate effectively. Julie Nora (ICS) and Carolyn Sheehan (Blackstone Valley) made this suggestion.

Neighbors also want to review materials before NG sends out communications to neighborhood – point person can be Amelia Rose at EJ League who can send out draft to list of neighbors and collate comments/suggestions within one week and send back to NG for finalization (worry is that the communications are too wordy and will not be read).

Hold regular meetings with a core group of residents and school personnel to give NG/GZA a chance to communicate in a smaller group setting – in addition to the larger public meetings that happen less frequently. This will help increase communication with the most committed/involved residents and school officials who will be ambassadors to other residents and the wider school community to generate their interest and involvement. Also will make larger public meetings less adversarial and more productive because it won't be the first time people are hearing about a certain issue or proposal.

Translation at larger public meetings should be made available regardless of whether someone contacts NG to say they are coming to a meeting – this would help build trust with the neighborhood and principals could guarantee to parents that interpretation would be available at public meetings no matter what.

Community members recommend that they be permitted to have their own poster/table at the poster session in addition to what NG/GZA are preparing.

NG should create bookmarks with all relevant contact information as well as instructions for how people can get on the email/phone notification lists. These will be helpful to hand out in the neighborhood and at the schools and would be more likely to be read and communicate effectively – rather than a long letter.

**SUMMARY OF PROPOSED CHANGES TO PIP**

## **Summary of Proposed Changes to the Public Involvement Plan (PIP)**

Based on Public Comments Received

Former Tidewater Facility

Pawtucket, Rhode Island

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- Revise to state that National Grid will provide the following in English, Spanish and Portuguese:
  - Notification Mailings
  - Fact Sheets
  - Brief Executive Summaries which will accompany future reports.
- Revise the PIP to change the time period for the public meeting related to the Remedial Action Work Plan (RAWP). As revised, the public meeting regarding the RAWP will be held on the draft version of the RAWP prior to submittal to RIDEM.
- Revise the PIP to delete the reference of posting of weekly air monitoring data.
- Clarify definition of day-to-day uses of the Site that do not fall under the jurisdiction of the PIP. Revise the sentence in the PIP to state “This plan is not intended to cover Site activities relative to the day-to-day operations, including repair and maintenance of the natural gas regulating facility and electrical substation involving minor soil disturbances (i.e., fence post installation) or other uses of the property by National Grid. Activities at these facilities involving excavations of soils with the potential to create volatile emissions are covered by this PIP. In the event of a facilities emergency requiring immediate soil excavation (utility repair, etc.), National Grid will follow the soil management procedures prepared for the previous natural gas station regulator and electrical substation work (i.e., April 2011 Materials Management Plan and November 2012 Soils Management Plan, respectively). In addition, air monitoring will be completed during these emergency events in accordance with the September 28, 2012 air monitoring summary memorandum submitted to RIDEM to the extent practical.”
- Add a summary sheet of proposed revisions and with final approved revisions as an appendix to the PIP.
- Update PIP regarding how National Grid will work with the three neighboring schools to send information (i.e., fact sheets, public notifications, flyers) home to the students.

**AUGUST 1, 2013**

NOTIFICATION OF CONCURRENCE OF RESPONSE TO COMMENTS RECEIVED AND  
FINALIZATION OF THE PIP



RHODE ISLAND

DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

235 Promenade Street, Providence, RI 02908-5767

TDD 401-222-4462

August 1, 2013

Ms. Michele V. Leone  
Manager, New England Site Investigation & Remediation  
National Grid  
40 Sylvan Road  
Waltham, MA 02451-1120

RE: Tidewater Manufactured Gas Plant (former)  
Tidewater Street  
Pawtucket, Rhode Island

Dear Ms. Leone:

On November 9, 2011, the Rhode Island Department of Environmental Management (the Department) amended the Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases, (the Remediation Regulations). The purpose of these regulations is to create an integrated program requiring reporting, investigation and remediation of contaminated sites in order to eliminate and/or control threats to human health and the environment in an efficient manner.

In the matter of the above referenced "Site" (as defined in the Industrial Property Remediation and Reuse Act), and in accordance with Rule 7.07.E (Public Involvement Plans) of the 2011 Remediation Regulations, the Department's Office of Waste Management (OWM) has received the following document concerning National Grid's response to public comments on the draft Public Involvement Plan (PIP):

- Response to Public Comments, Draft Public Involvement Plan, Former Tidewater MGP and Power Plant Site, Pawtucket, Rhode Island, RIDEM Case No. 95-022, prepared by GZA GeoEnvironmental, Inc. (GZA), and dated March 22, 2013.

The OWM has reviewed the above referenced Response to Public Comments, and concurs with the proposed changes to the PIP, as listed in that document's attachment titled "Summary of Proposed Changes to the Public Involvement Plan (PIP)." Please prepare a final version of the PIP based upon the proposed changes.

The Department acknowledges that sufficient time has passed since the submittal of the Response to Public Comments, such that some of the information provided in the responses may require updating based upon decisions and activities that have taken place since March 22, 2013. For example, National Grid's decision to perform a soil gas investigation at the site, in response to public concerns raised about potential vapor intrusion. Therefore, the Department requests that



the March 22, 2013, responses be reviewed, and where deemed necessary, that changes or corrections be made, and/or updated information be added as appropriate. This letter and the revised updated responses to public comments should be added to the Final PIP as individual exhibits. Once these items are addressed, please submit the revised Final PIP with all exhibits to the Department in both hard copy for the public file and electronic PDF format suitable for posting on the Department's Tidewater web page.

If you have any questions regarding this letter, please contact me by telephone at (401) 222-2797 extension 7109 or by e-mail at [joseph.martella@dem.ri.gov](mailto:joseph.martella@dem.ri.gov).

Sincerely,

A handwritten signature in black ink, appearing to read "Joseph T. Martella II". The signature is fluid and cursive, with the first name "Joseph" and last name "Martella" being the most prominent parts.

Joseph T. Martella II  
Senior Engineer  
Rhode Island DEM  
Office of Waste Management

Cc: Kelly J. Owens, RIDEM.OWM  
Elizabeth Stone, RIDEM/OOD  
Barbara Morin, RIDEM/OAR  
Barney S. Heath, Pawtucket Planning & Development  
Alan Tenreiro, Chairman, Pawtucket School Committee  
Deborah Cylke, Superintendent, City of Pawtucket School Department  
Julie Nora, Ph.D, International Charter School  
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