



**SITE INVESTIGATION REPORT
ADDENDUM
FORMER TIDEWATER FACILITY
PAWTUCKET, RHODE ISLAND**

PREPARED FOR:
RIDEM
Providence, Rhode Island

PREPARED BY:
GZA GeoEnvironmental, Inc.
Providence, Rhode Island

September 2012
File No. 43654.00

September 11, 2012
GZA File No. 05.0043654.00-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
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<http://www.gza.com>

Re: *Site Investigation Report Addendum*
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 *Site Investigation Report (SIR) Addendum* for the property located at the Former Tidewater MGP and Power Plant Site located in Pawtucket, Rhode Island (the Site).

The activities described herein were performed in general accordance with the RIDEM-approved August 2011 *Supplemental Site Investigation Work Plan (SSIWP)*. This SIR Addendum presents the results of additional investigation activities performed along the western boundary of the South Fill Area (SFA) of the former Tidewater facility to address the applicable requirements of Section 7.00 of the Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases (Remediation Regulations).

We look forward to continue to work cooperatively with RIDEM to advance this Site to compliance with the applicable regulations. 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
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401-421-4140 – margaret.kilpatrick@gza.com

A handwritten signature in blue ink, appearing to read 'John P. Hartley'.

John P. Hartley
Principal
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A handwritten signature in blue ink, appearing to read 'James J. Clark'.

James J. Clark, P.E., LEP
Principal
860-858-3134 - james.clark@gza.com

CC: Ms. Michele Leone, National Grid

Attachment: *Site Investigation Report Addendum*

TABLE OF CONTENTS

	<u>Page</u>
1.00 INTRODUCTION	1
1.10 PROJECT OBJECTIVE	1
1.20 SCOPE OF WORK	2
1.30 REPORT ORGANIZATION	2
2.00 SUPPLEMENTAL SITE INVESTIGATION PROGRAM	3
2.10 ABUTTER NOTIFICATION	3
2.20 CRMC PERMITTING	3
2.30 SOIL EXPLORATION PROGRAM	3
3.00 INVESTIGATION RESULTS	6
4.00 SUMMARY AND CONCLUSIONS	7

FIGURES

FIGURE NO. 1	LOCUS PLAN
FIGURE NO. 2	SITE PLAN

APPENDICES

APPENDIX A	LIMITATIONS
APPENDIX B	ABUTTERS NOTIFICATION
APPENDIX C	CRMC PERMIT AND APPLICATION PACKAGE
APPENDIX D	BORING LOGS
APPENDIX E	DISPOSAL MANIFEST
APPENDIX F	LABORATORY DATA REPORT



1.00 INTRODUCTION



On behalf of The Narragansett Electric Company, d/b/a National Grid (National Grid), GZA GeoEnvironmental Inc. (GZA) has prepared this *Site Investigation Report Addendum* describing additional investigation activities performed along the western boundary of the South Fill Area (SFA) of the former Tidewater facility in Pawtucket, Rhode Island (refer to Figure 1 for the Site *Locus Plan*). The former Tidewater facility encompasses approximately 23 acres and was the location of the former Tidewater Manufactured Gas Plant (MGP) and the Pawtucket No. 1 Power Station. 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 648, and portions of A.P. 67B Lot 11. These properties are collectively referred to herein as the “Site.”

This addendum describes the investigation that was performed consistent with the August 2011 *Supplemental Site Investigation Work Plan* (SSIWP), which was prepared by GZA and submitted to the Department. The SSIWP was prepared to describe the tasks necessary to further evaluate the extent of former MGP related materials present along the western boundary of the SFA. In 2010, investigations were performed consistent with the November 2009 and October 2010 SSIWPs submitted to the Department. The results of these investigations were combined with previous studies to develop a *Site Investigation Data Report* (SIDR), which was submitted to the Department in January of 2011. A *Remedial Alternative Evaluation* was also prepared and submitted to the Department on July 29, 2011. This evaluation, combined with the January 2011 SIDR, served to fulfill the requirements of Sections 7.03, 7.04, and 7.05 of the Remediation Regulations for a SIR. This report serves as an addendum to the SIR. For further information related to Site background and investigation activities, please refer to the SIR.

This report and its conclusions are subject to the Limitations presented in Appendix A and are subject to modification if subsequent information is developed by GZA or any other party.

1.10 PROJECT OBJECTIVE

The Site is located on the west side of the Seekonk River and is bound to the west by residential properties, to the south and southwest by the Francis J. Varieur School and Max Read Athletic Field, and to the north by undeveloped property owned by the City of Pawtucket. The Site is currently largely vacant with the exception of an active natural gas regulating station, an active switching station and electric substation, and two transmission towers all owned and operated by National Grid.

As presented in previous reports, the Site has been subdivided into four areas based on their geographic location, past use and/or past occupants. This report presents the results of investigations performed proximate to the western boundary of the South Fill Area (SFA). Figure 2, *Exploration Location Plan* presents the location and configuration of the area and depicts exploration locations.



Evidence of former MGP related materials was described on the log for test boring TB-18, which is located adjacent to the western limit of the SFA on A.P. 65B Lot 648 within the eastern boundary of the Max Read Field (see Figure 2). No other borings performed along the western limit of the SFA indicated the presence of former MGP related residuals. The MGP related materials at TB-18¹ included observations of purifier/tar/naphthalene-like odors and the presence of woodchips, ash and tar-like materials at approximately 2 to 27 feet below ground surface (bgs) and urban fill extending to approximately 32 feet bgs. The primary objective of the investigations described herein was to further evaluate the nature and extent of these materials along the western boundary of the SFA.

1.20 SCOPE OF WORK

The following summarizes the scope of these supplemental investigations which was performed consistent with our August 2011 SSIWP Addendum. Any deviations from the work plan were relatively minor and did not affect the generated data or the conclusions of this report.

- Performance of nine (9) additional soil borings along the western limit of the SFA to further characterize the nature and extent of previously identified MGP related materials. Soil samples were collected continuously during the performance of the borings. The samples were collected for soil classification, observation for the presence of environmental impacts, and field-screening. As described in the SSIWP, the extent of former MGP residuals was evaluated based on field observations. Analytical testing was limited to one composite sample of certain observed MGP residual material encountered during these explorations.
- Preparation of this SIR Addendum.

1.30 REPORT ORGANIZATION

This SIR Addendum is organized as follows:

- Section 1.00 provides an introduction to the project and presents the primary objective;
- Section 2.00 describes the supplemental investigations performed;
- Section 3.00 provides an evaluation of conditions encountered during the performance of these supplemental investigations; and
- Section 4.00 presents a summary of the addendum investigation results and our conclusions.

¹ Test borings performed by Atlantic Environmental Solutions (AES) in 1996

2.00 SUPPLEMENTAL SITE INVESTIGATION PROGRAM

Consistent with our August 2011 SSIWP Addendum and/or information subsequently requested by RIDEM, the scope of work for the supplemental investigation consisted of the following tasks:



- Abutter notification;
- Preparation of a Coastal Resource Management Council (CRMC) Assent modification request;
- Performance of soil borings; and
- Preparation of this SIR Addendum.

The following sections describe the scope of these activities.

2.10 ABUTTER NOTIFICATION

In accordance with Section 7.07A of the Remediation Regulations, GZA identified and subsequently provided notifications to the abutting property owners and tenants that environmental investigations were being performed at the Site. The abutter notifications were documented in a letter dated October 21, 2011, which was subsequently provided to the Department. A list of Site and abutting Site property owners and a copy of the notification is provided in Appendix B.

2.20 CRMC PERMITTING

As indicated on Figure 2, portions of the Site are within 200-feet of a coastal feature (the Seekonk River), and as such, these activities were subject to the jurisdiction of the CRMC. On August 10, 2011, a subsequent modification request to the existing CRMC “Finding of No Significant Impact” (FONSI, F2009-12-034) was submitted to CRMC to address the additional investigation activities presented in the August 2011 SSIWP Addendum. CRMC granted the request by issuing a CRMC Maintenance Assent No. A2010-10-051 dated August 11, 2011.

Copies of the FONSI modification request and the CRMC permits (F2009-12-034 and A2010-10-051 and F2009-12-034 [modified 8/11/2011]) are provided in Appendix C.

2.30 SOIL EXPLORATION PROGRAM

The following sections describe the exploration program completed in December 2011. Soil exploration locations are shown on Figure 2.

Soil Borings and Field Screening

Between December 19 and December 20, 2011, GZA observed the performance of nine (9) test borings (TB-342, TB-343, TB-344, TB-345, TB-346, TB-348, TB-349, TB-

350 and TB-351) by Geologic Drilling of Norfolk, Massachusetts. All of the borings were advanced utilizing a Geoprobe™ rig. The borings were extended to depths ranging from 12 to 32 feet bgs. Soil samples were collected continuously during the advancement of the borings at approximately 4-foot intervals with a 2-inch acetate sampler for the primary purposes of visual and olfactory classifications.



A GZA field engineer was present during all exploration activities to coordinate and document subsurface conditions, classify soils, prepare boring logs, and field-screen soil samples. Visual observations of impacted soils were noted on the boring logs in accordance with the following soil classification key, which was used consistently by our field staff.

Sheen - Iridescent petroleum-like sheen.

Stained - Used with color (*i.e.*, black or brown stained) to indicate that the soil matrix is stained a color other than the natural (non-impacted) color.

Coated - Soil grains are coated with free product however there is not sufficient free phase material present to saturate the pore spaces.

Blebs - Discrete sphericals of free product were observed but for the most part the soil matrix was not visibly contaminated or saturated. Typically this is residual product.

Saturated - The entirety of the pore space of a sample occupied by free product (rather than groundwater). Depending on viscosity, free phase saturated materials may freely drain from a soil sample.

Petroleum or Oil - Used to characterize free and/or residual product that exhibits a distinct fuel oil or diesel fuel-like odor.

Tar - Used to describe free and/or residual product that exhibits a distinct "coal tar" type odor (*e.g.*, naphthalene-like odor). Weathered tars may not exhibit an odor and are identified on a visual basis. Colors of product can be brown, black, reddish-brown, or gold.

Solid Tar - Used to describe product that is solid or semi-solid phase. The magnitude of the observed solid tar is described (*e.g.*, discrete granules or a solid layer) in the boring logs.

Purifier Material- Purifier materials are commonly identified by their distinctive blue/green color. Other colors may be present including indigo (deep blue) or brown/rust. Typically purifier materials contain wood chips, oyster or clam shells or granular material. The material may have a distinctive sulfur-like odor when freshly exposed to air.

Coal Ash /Clinker - Odorless, grey or black in color. Clinker may exhibit glazing.

GZA personnel photo-documented the soil within each interval during the advancement of the borings. Copies of the photos have not been included as an appendix to this report, but can be provided upon request. Please refer to the boring logs attached in Appendix D for a description of subsurface conditions and the results of field screening.

Fill material was classified on the boring logs by GZA personnel according to the following stratum categories: urban fill or fill. "Urban fill" is defined as soils with evidence of anthropogenic impacts (coal, brick, ash, slag, concrete or other similar material) or as soils



with evidence of material that is not native, but with no MGP-like residuals or visual or olfactory impacts. “Fill” is defined as soil with evidence of MGP residuals (i.e., coal tar odors/staining, purifier box-like odors, blue staining and/or presence of wood chips).

All soil samples recovered during the program were screened in the field for Total Volatile Organic Compounds (TVOCs) with a MiniRAE® PID equipped with a 10.6 eV lamp and hydrogen cyanide (HCN) with a GasBadge Pro® equipped with a HCN sensor and jar-head space technique. The MiniRAE® PID measures relative levels of TVOCs referenced to a benzene in-air-standard. Although the PID screening cannot be directly used to quantify TVOC concentrations or to identify individual compounds, the results can serve as a relative indicator of TVOC levels. The GasBadge Pro® measures HCN concentrations in air above background levels as compared to a set standard. The TVOC and HCN screening results are provided on the boring logs in Appendix D.

Upon achieving the desired depth, each boring was backfilled with drill cuttings to a depth approximately 2 feet below grade and backfilled with clean sand provided in bags by the drilling subcontractor to a depth coincident with the existing ground surface. Wash water (i.e., decontamination water) and spent personal protective equipment (PPE) generated during the drilling program were placed in 55-gallon drums for subsequent off-Site disposal. All investigation derived wastes (IDWs) were transported off-Site by Clean Harbors Environmental Services, Inc. (CHES) of East Providence, Rhode Island. Wash water and PPE drums were transported by CHES to their facility in Braintree, Massachusetts. Copies of shipping records for the IDWs are included in Appendix E.

Analytical Testing

As described in the SSIWP, visual observations of subsurface materials encountered were used to evaluate nature and extent of former MGP residuals. One composite sample was analyzed from TB-349 (0 to 6 feet bgs). This interval contained evidence of MGP-like residuals, including woodchips, coal tar-like coating, purifier box-like odors and blue staining. A sample of this material was analyzed for the purpose of providing data that would aid in the development of plans (soil management, health and safety) associated with potential future construction activities associated with Max Read Field. This sample was analyzed for VOCs via EPA Method 8260B, semi-volatile organic compounds (SVOCs) via EPA Method 8270C, RCRA-8 Total Metals via EPA Methods 3050B/6000/7000, total petroleum hydrocarbons (TPH) via EPA Method 8100 Modified, polychlorinated biphenyls (PCBs) via EPA Method 8082, Sulfur Content via ASTM D-4239, total cyanide via EPA Method 9012B and corrosivity (pH) via EPA Method 9045. The sample was packed in an ice chest and transported under chain-of-custody protocol to ESS Laboratory in Cranston, Rhode Island. A copy of the analytical results and chain-of-custody forms are presented in Appendix F.

Health and Safety/Air Monitoring

This investigation activity was conducted in accordance with the Site-specific Health and Safety Plan prepared by GZA. Prior to drilling operations, an exclusion zone



was set-up around the rig to limit public access to the work area. This exclusion zone was maintained and modified as needed during the work activities. Consistent with the SSIWP, during intrusive drilling operations, GZA personnel also collected periodic TVOC readings of the worker breathing zone and work zone perimeter (*i.e.*, 50 feet from the drill rig). For worker breathing zone, the TVOC action limit was set at 20 ppmv. The work zone perimeter action limit was set at 1 ppmv TVOC. Neither of these levels were triggered during the work.

3.00 INVESTIGATION RESULTS

Investigations performed during this December 2011 drilling program included the advancement of nine (9) borings along the western boundary of the SFA (TB-342, TB-343, TB-344, TB-345, TB-346, TB-348, TB-349, TB-350 and TB-351). These borings ranged in depth from 12 to 32 feet bgs. In general, the soil was identified as fills underlain by native sands. The fill thicknesses observed ranged from 5 to 28 feet, with more significant thicknesses occurring closest to the boundary of the former Tidewater facility. The fill in this area are characterized by brick fragments, slag, ash and coal fragments.

Observations of former MGP related residuals (*i.e.*, coal tar odors/staining, purifier box-like odors, blue staining and/or presence of wood chips) were noted only in explorations proximate to TB-18; specifically borings TB-345, TB-348, TB-349 and TB-351. These former MGP residuals were observed at depths ranging from 2 to 22 feet bgs. TVOC concentrations were noted in headspace screening samples from the following locations/depth intervals: TB-349 from 2 to 4 feet bgs at 25.7 ppmv and in TB-351 from 8 to 10 feet bgs at 12.5 ppmv and 10 to 12 feet bgs at 26 ppmv. TVOCs were not detected at any other depths/locations. No HCN concentrations were detected. In general, observed impacts were limited to the fill unit, however, in TB-349, slight purifier box-like odors continued into the native outwash (at approximately 6 feet bgs), and in TB-345, slight petroleum-like odors and blue staining was present (at approximately 13 feet bgs) within the native sand layer directly below the fill unit.

The limited observation of MGP related residuals in this area is consistent with previous investigations performed between 1986 and 1996² in this area of the Max Read Field. Historic explorations in this particular area included surface soil samples RIDEM SS-3, SS-16, and SS-18 and test borings TB-1, TB-18, and TB-19. These explorations locations are shown on Figure 2. Evidence of MGP residuals were only noted in TB-18.

As presented in Appendix F, results of the composite sample collected from TB-349 during the December 2011 investigation indicated the presence of elevated TPH (3,150 mg/kg), arsenic (30.7 mg/kg) and SVOCs (total SVOCs = 283.7 mg/kg). The detected

² Surface soil samples (RIDEM SS-3 and RIDEM SS-9) collected by RIDEM were collected in 1986 and all other surface soil samples and borings were performed by AES in 1996.

concentrations were indicative of the presence of MGP residuals and observations made during performance of this boring.

4.00 SUMMARY AND CONCLUSIONS

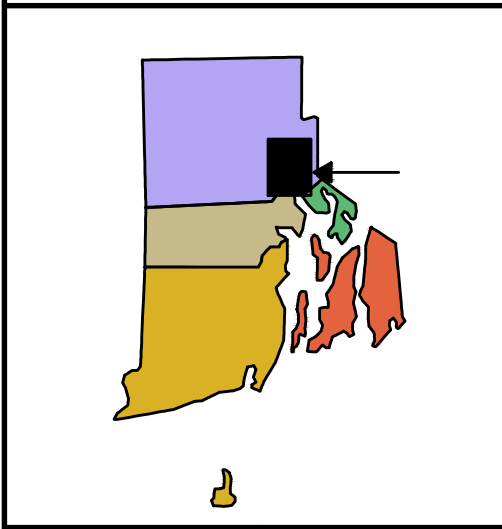
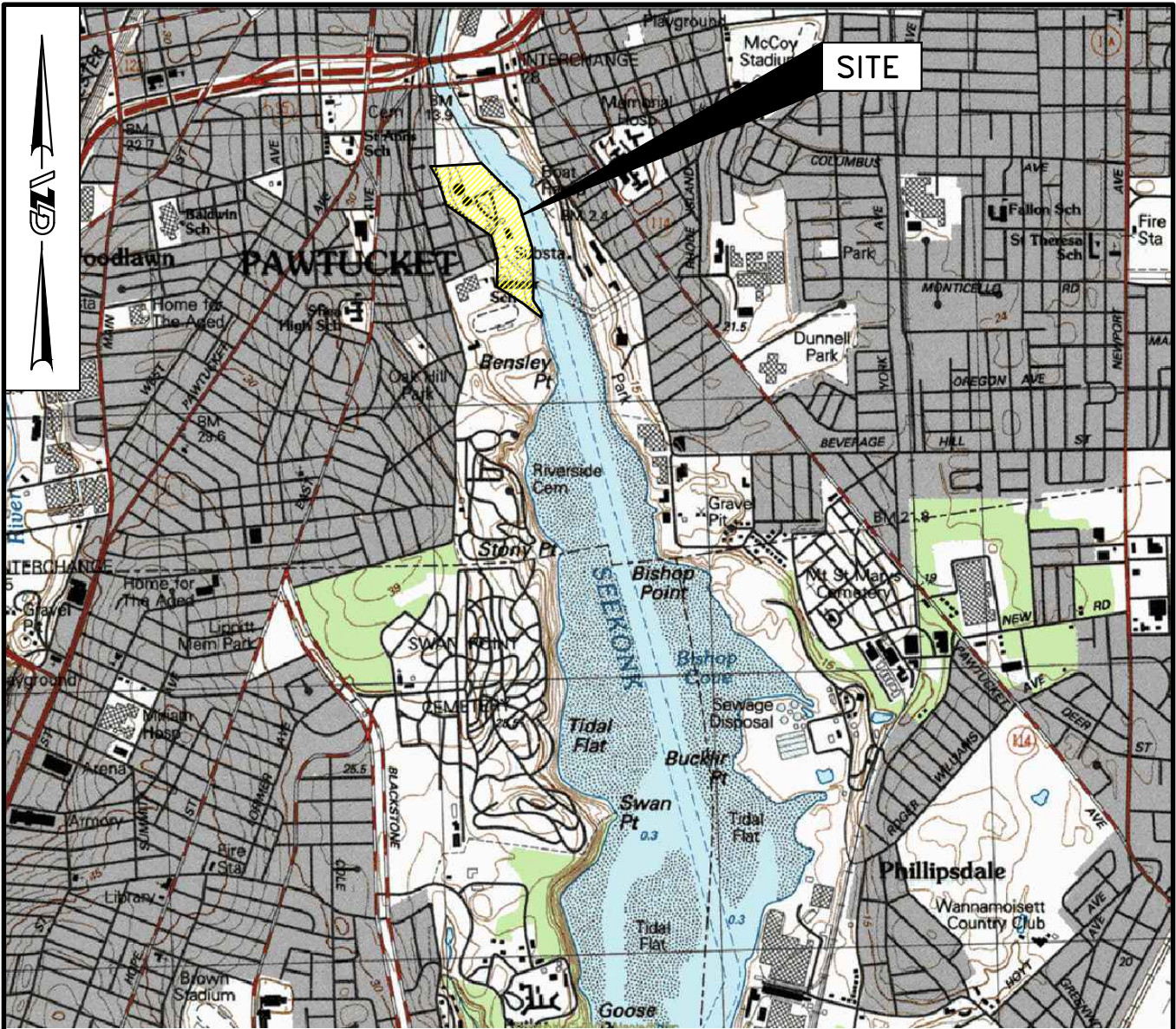


A total of nine soil borings were completed along the western limit of the SFA for the purpose of further evaluating the nature and extent of MGP residuals observed in TB-18 (test boring located proximate to the western limit of the SFA). Materials encountered during advancement of the borings were screened for visual and olfactory indicators of impact. Subsurface materials were generally identified as fill underlain by native sands. In four of the seven borings, the fill contained evidence of MGP residuals (coal tar odors/staining, purifier box-like odors, blue staining and/or presence of wood chips). Based on a review of the borings performed during this program and those completed previously, observations of MGP residuals east of the fence line between the SFA and Max Read Field are limited to an approximately 60 to 70 foot radius from TB-18 and are located at depths of greater than 2 feet below ground surface. No evidence of MGP residuals were observed in surface soils (0 to 2 feet bgs).

The observations made during this supplemental investigation program do not alter the conclusions presented in the July 2011 *Remedial Alternative Evaluation*. As described previously, the information presented herein will be of use in the development of plans associated with any future activities in this portion of Max Read Field that involve disturbance of subsurface materials.

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FIGURES

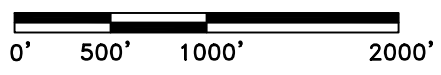


BASE MAP FROM THE FOLLOWING USGS QUADRANGLE MAP:
PROVIDENCE, RI (2001)

DIGITAL TOPOGRAPHIC MAPS PROVIDED BY MAPTECH. INC.

CONTOUR ELEVATIONS REFERENCE NGVD 29,
CONTOURS ARE SHOWN IN METERS ABOVE NVGD AT 3 METER INTERVALS

APPROXIMATE SCALE IN FEET

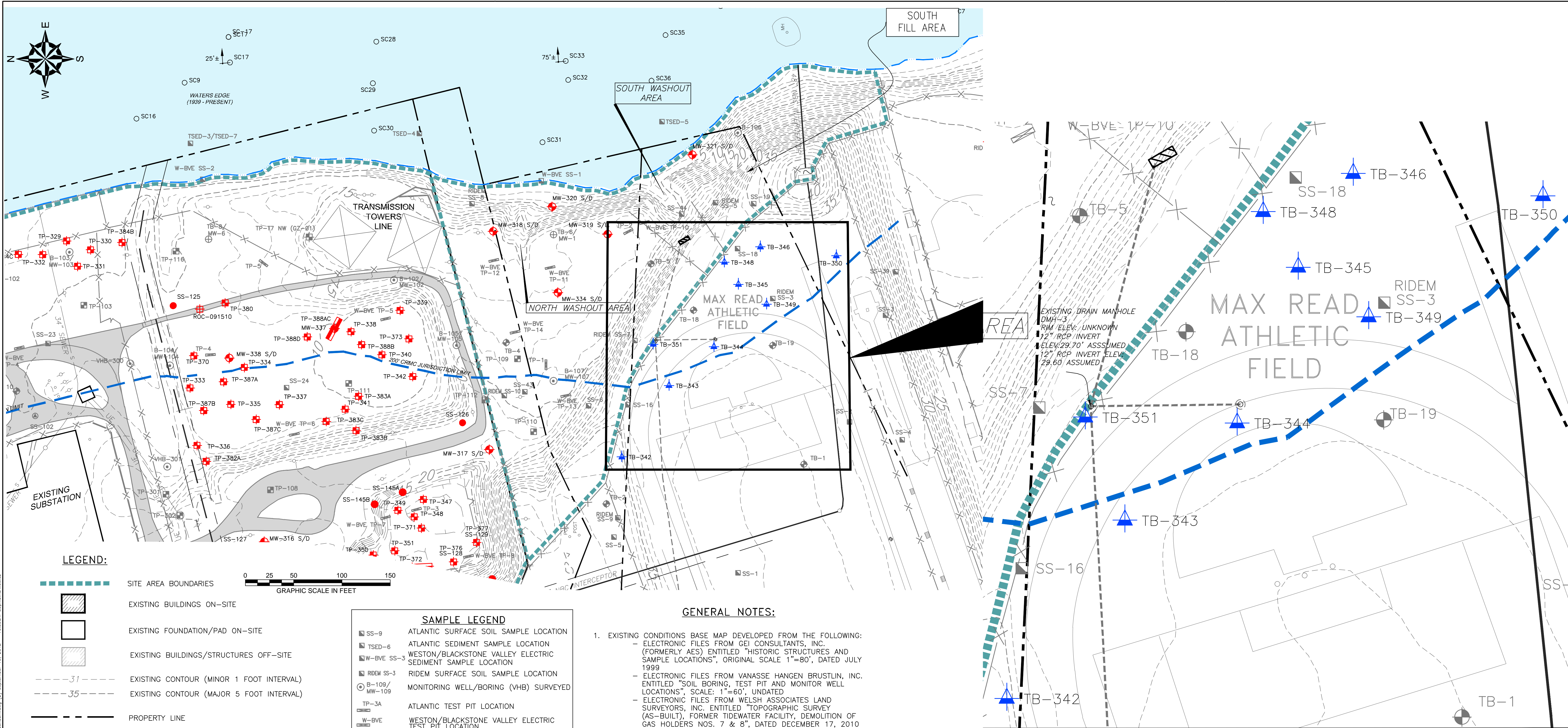


TIDEWATER FACILITY
PAWTUCKET, RHODE ISLAND

LOCUS PLAN

SEPTEMBER 2012

FIGURE NO. 1



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. 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
- EXISTING DRAINAGE LINE AND ASSOCIATED STRUCTURES

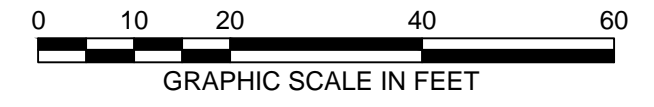


SAMPLE LEGEND

- 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)
- 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)

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.



NO.	ISSUE/DESCRIPTION	BY	DATE
FORMER TIDEWATER FACILITY			
PAWTUCKET, RHODE ISLAND			
EXPLORATION LOCATION PLAN			
PREPARED BY:		PREPARED FOR:	
GZA GeoEnvironmental, Inc. Engineers and Scientists 530 BROADWAY PROVIDENCE, RHODE ISLAND 02909 (401) 421-4140		NATIONAL GRID	
PROJ MGR:	MSK	REVIEWED BY:	MSK
DESIGNED BY:	SDN	DRAWN BY:	CRD
DATE:	MARCH 2012	PROJECT NO.:	43654.00
		REVISION NO.:	0
			FIGURE 2 SHEET NO. 2 OF 2

THE INFORMATION SHOWN ON THE DRAWING IS SOLELY FOR USE BY NATIONAL GRID OR THE CITY OF PAWTUCKET OR THEIR SPECIFIC 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 OR THE CITY OF PAWTUCKET. ANY TRANSFER, REUSE, OR MODIFICATION TO THE DRAWING BY OTHERS, WITHOUT THE PRIOR WRITTEN EXPRESS CONSENT OF GZA AND NATIONAL GRID OR THE CITY OF PAWTUCKET, WILL BE AT THE USER'S SOLE RISK AND WITHOUT ANY RISK OR LIABILITY TO GZA AND NATIONAL GRID OR THE CITY OF PAWTUCKET.

©2011 - GZA GeoEnvironmental, Inc. GZA-V-ENV-43654.mxd (GZA) GZA-V-ENV-43654-00 SITE PLAN FOR SBASSED.mxd [2] September 10, 2012 - 10:50am Sophia.nurkiewicz

APPENDIX A
LIMITATIONS

LIMITATIONS

1. This Site Investigation Report Addendum has been prepared on behalf of and for the exclusive use of The Narragansett Electric Company d/b/a National Grid (National Grid) and the City of Pawtucket (City of Pawtucket), solely for use in documenting the work completed as described herein at the Former Tidewater MGP and Power Plant Site ("Site") under the applicable provisions of the State of Rhode Island Department of Environmental Management Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases (Remediation Regulations). 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 GeoEnvironmental, Inc.(GZA) or National Grid or City of Pawtucket.
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 work described herein.
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, City of Pawtucket 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.

J:\ENV\43654.msk\Reports\Addendum to SI\Appendices\Appendix A - Limitations\43654 Limitations-Appendix A.docx

APPENDIX B

ABUTTER NOTIFICATION

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.

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

Abutters List-Site Investigation
Former Tidewater MGP Site
Pawtucket, Rhode Island

Plat	Lot	Owner(s)	Property Address	Mailing Address
65B	646	N/F City of Pawtucket	486 Pleasant Street	137 Roosevelt Avenue Pawtucket, RI 02860
65B	649	N/F National Grid	Pleasant Street	c/o Properties Dept. 40 Sylvan Road Waltham, MA 02451
65B	594	N/F City of Pawtucket	486 Pleasant Street	137 Roosevelt Avenue Pawtucket, RI 02860
67B	11	N/F City of Pawtucket	Pleasant Street	137 Roosevelt Avenue Pawtucket, RI 02860

NF = Now or formerly of

Abutters' information (names and property addresses) obtained on July 11, 2011 from "Appraisal Vision Assessor's Online Database for Pawtucket, Rhode Island," last updated June 17, 2011.

APPENDIX C

CRMC PERMIT AND APPLICATION PACKAGE



STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

COASTAL RESOURCES MANAGEMENT COUNCIL

Oliver H. Stedman Government Center
4808 Tower Hill Road, Suite 3
Wakefield, R.I. 02879-1900

(401) 783-3370
FAX: (401) 783-3767

FINDING OF NO SIGNIFICANT IMPACT
Modified 08/11/2011

August 11, 2011

Narragansett Electric Co. d/b/a National Grid
Att: Amy McKinnon
40 Sylvan Road, E3716
Waltham, MA 02451

RE: CRMC Assent No. F2009-12-034
Site: Taft Street, Pawtucket
Plat: 54|65B Lot: 826|645,647,648,649

Project Description: Perform test borings, test pits, surficial soil sampling and to install groundwater monitoring wells, at the former Tidewater Facility as show on the plans submitted to CRMC on December 11, 2009. **Modified 8/11/2011, To allow (3) additional test borings at same location.**

The Coastal Resources Management Council has reviewed your project proposal and has determined the findings of no significant impact on coastal resources. This project will expire July 1, 2016. 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.

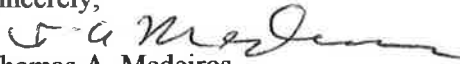
CAUTION: The limits of authorized work shall be only for that which was approved by the CRMC. Any activities or alterations which deviate from the approved plans will require a separate application and review. If the information provided to the CRMC for this review is inaccurate or did not reveal all 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. Under no circumstances will this permit authorize any work which is considered prohibited under any of the sections of the Rhode Island Coastal Resources Management Program.

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,


Thomas A. Medeiros
CRMC Engineer
Coastal Resources Management Council

/rcm



STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

COASTAL RESOURCES MANAGEMENT COUNCIL

Oliver H. Stedman Government Center
4808 Tower Hill Road, Suite 3
Wakefield, R.I. 02879-1900

(401) 783-3370
FAX: (401) 783-3767

FINDING OF NO SIGNIFICANT IMPACT

December 11, 2009

Narragansett Electric Co. d/b/a National Grid
Att: Amy McKinnon
40 Sylvan Road, E3716
Waltham, MA 02451

RE: CRMC Assent No. F2009-12-034
Site: Taft Street, Pawtucket
Plat: 54|65B Lot: 826|645,647,648,649

Project Description: Perform test borings, test pits, surficial soil sampling and to install groundwater monitoring wells, at the former Tidewater Facility as show on the plans submitted to CRMC on December 11, 2009.

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. 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 which deviate from the approved plans will require a separate application and review. 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. Under no circumstances will this permit authorize any work which is considered prohibited under any of the sections of the Rhode Island Coastal Resources Management Program.

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,

Thomas A. Medeiros
CRMC Engineer

Coastal Resources Management Council

/rcm

State of Rhode Island and Providence Plantations
COASTAL RESOURCES MANAGEMENT COUNCIL

NOTICE OF

ASSENT

CRMC Assent No.: A2009-12-034

Date: December 11, 2009

This certifies that Narragansett Electric Co. d/b/a National Grid
has permission to Perform test borings, test pits, surficial soil sampling and to install groundwater monitoring wells, at the former Tidewater
Facility as show on the plans submitted to CRMC on December 11, 2009.

situated at Taft Street
Plat No. 54|65B

Lot No. 826|645,647,648,649

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 date of issuance.

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
BORING LOGS

TEST BORING LOG

GZA
GeoEnvironmental, Inc.
Engineers and Scientists

National Grid
 Former Tidewater Facility
 Pawtucket
 Rhode Island

EXPLORATION NO.: TB-342
 SHEET: 2 of 2
 PROJECT NO: 43654.00
 REVIEWED BY: SDN/MSK

Logged By: SDN/WF
 Drilling Co.: Geologic Drilling
 Foreman: D. Jacobs

Type of Rig: GeoProbe
 Rig Model:
 Drilling Method: Direct Push

Boring Location: See Plan
 Ground Surface Elev. (ft.):
 Final Boring Depth (ft.): 16
 Date Start - Finish: 12/19/2011 - 12/19/2011

H. Datum:
 NAD 1983
 V. Datum:
 NGVD 1929

Hammer Type: None
 Hammer Weight (lb.):
 Hammer Fall (in.):
 Auger or Casing O.D./I.D Dia (in.):

Sampler Type: SS
 Sampler O.D. (in.): 2.0
 Sampler Length (in.):
 Rock Core Size:

Groundwater Depth (ft.)

Date	Time	Water Depth	Stab. Time

Depth (ft)	Sample					Sample Description Modified Burmister	Remark	Field Test Data	Stratum Description Depth (ft) Elev. (ft.)	Equipment Installed
	No.	Depth (ft.)	Pen. (in)	Rec. (in)	Blows (per 6 in.)					
20										
25										
30						End of exploration at 16 feet.	2		16 Native Sand	

REMARKS

See Log Key for explanation 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.:
TB-342

TEST BORING LOG

GZA
GeoEnvironmental, Inc.
Engineers and Scientists

National Grid
 Former Tidewater Facility
 Pawtucket
 Rhode Island

EXPLORATION NO.: TB-343
 SHEET: 2 of 2
 PROJECT NO: 43654.00
 REVIEWED BY: SDN/MSK

Logged By: SDN/WF
 Drilling Co.: Geologic Drilling
 Foreman: D. Jacobs

Type of Rig: GeoProbe
 Rig Model:
 Drilling Method: Direct Push

Boring Location: See Plan
 Ground Surface Elev. (ft.):
 Final Boring Depth (ft.): 16
 Date Start - Finish: 12/19/2011 - 12/19/2011

H. Datum:
 NAD 1983
 V. Datum:
 NGVD 1929

Hammer Type: None
 Hammer Weight (lb.):
 Hammer Fall (in.):
 Auger or Casing O.D./I.D Dia (in.):

Sampler Type: SS
 Sampler O.D. (in.): 2.0
 Sampler Length (in.):
 Rock Core Size:

Groundwater Depth (ft.)

Date	Time	Water Depth	Stab. Time

Depth (ft)	Sample					Sample Description Modified Burmister	Remark	Field Test Data	Stratum Description Depth (ft) Elev. (ft.)	Equipment Installed
	No.	Depth (ft.)	Pen. (in)	Rec. (in)	Blows (per 6 in.)					
20										
25										
30						End of exploration at 16 feet.	2	16	Native Sand	

REMARKS

See Log Key for explanation 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.:
TB-343

TEST BORING LOG

GZA
GeoEnvironmental, Inc.
Engineers and Scientists

National Grid
Former Tidewater Facility
Pawtucket
Rhode Island

EXPLORATION NO.: TB-344
SHEET: 1 of 2
PROJECT NO: 43654.00
REVIEWED BY: SDN/MSK

Logged By: SDN/WF
Drilling Co.: Geologic Drilling
Foreman: D. Jacobs

Type of Rig: GeoProbe
Rig Model:
Drilling Method: Direct Push

Boring Location: See Plan
Ground Surface Elev. (ft.):
Final Boring Depth (ft.): 28
Date Start - Finish: 12/19/2011 - 12/19/2011

H. Datum:
 NAD 1983
V. Datum:
 NGVD 1929

Hammer Type: None
Hammer Weight (lb.):
Hammer Fall (in.):
Auger or Casing O.D./I.D Dia (in.):

Sampler Type: SS
Sampler O.D. (in.): 2.0
Sampler Length (in.):
Rock Core Size:

Groundwater Depth (ft.)

Date	Time	Water Depth	Stab. Time

Depth (ft)	Sample				Sample Description Modified Burmister	Remark	Field Test Data	Stratum Description Elev. (ft.)	Equipment Installed
	No.	Depth (ft.)	Pen. (in)	Rec. (in)					
5	S-1	0-4	48	24	S-1 : (0-1") Brown Topsoil (1-8") Brown (10 YR, 4/4) fine to coarse SAND, little (-) Gravel, trace Silt, dry (8-16") Dark brown (10 YR, 3/1) fine to coarse SAND, trace (+) Gravel, trace Silt, moist (16-24") Yellowish brown (7.5 YR, 5/8) fine to coarse SAND, little Gravel, trace Silt, moist	1	ND / ND	0.16 TOPSOIL Urban Fill	No Equipment Installed
	S-2	4-8	48	40	S-2 : (0-13") Yellowish brown (7.5 YR, 5/8) fine to coarse SAND, little Gravel, trace Silt, moist (13-40") Gray (10 YR, 4/1) fine SAND, little Silt, stratified, moist	ND / ND	5.3		
	S-3	8-12	48	17	S-3 : Gray (10 YR, 4/1) fine SAND, little Silt, stratified, moist	ND / ND		Native Sand	
	S-4	12-16	48	34	S-4 : (0-13") Brown (10 YR, 4/4) fine SAND, little Silt, stratified, moist (13-34") Gray (10 YR, 5/1) fine SAND, little Silt, stratified, moist	ND / ND			

REMARKS
 1 - Soil samples screened with a 10.6eV MiniRAE photoionization detector (PID). PID values represent meter response in parts per million/volume air (ppmv) relative to benzene in air and above background readings. Soil samples are screened with a Gasbadge Pro equipped with a hydrogen cyanide sensor. The values represent meter response in parts per million/volume air (ppmv) relative to hydrogen cyanide in air and above background readings. Field data is reported as PID readings followed by HCN readings. All samples are photo documented. ND=Not Detected above background. NR=No Readings.

See Log Key for explanation 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.:
TB-344

TEST BORING LOG

GZA
GeoEnvironmental, Inc.
Engineers and Scientists

National Grid
 Former Tidewater Facility
 Pawtucket
 Rhode Island

EXPLORATION NO.: TB-344
 SHEET: 2 of 2
 PROJECT NO: 43654.00
 REVIEWED BY: SDN/MSK

Logged By: SDN/WF
 Drilling Co.: Geologic Drilling
 Foreman: D. Jacobs

Type of Rig: GeoProbe
 Rig Model:
 Drilling Method: Direct Push

Boring Location: See Plan
 Ground Surface Elev. (ft.):
 Final Boring Depth (ft.): 28
 Date Start - Finish: 12/19/2011 - 12/19/2011

H. Datum:
 NAD 1983
 V. Datum:
 NGVD 1929

Hammer Type: None
 Hammer Weight (lb.):
 Hammer Fall (in.):
 Auger or Casing O.D./I.D Dia (in.):

Sampler Type: SS
 Sampler O.D. (in.): 2.0
 Sampler Length (in.):
 Rock Core Size:

Groundwater Depth (ft.)

Date	Time	Water Depth	Stab. Time

Depth (ft)	Sample					Sample Description Modified Burmister	Remark	Field Test Data	Stratum Description Depth (ft.) Elev. (ft.)	Equipment Installed
	No.	Depth (ft.)	Pen. (in)	Rec. (in)	Blows (per 6 in.)					
20	S-5	16-20	48	23		S-5 : Gray (10 YR, 5/1) fine SAND, little Silt, stratified, moist		ND / ND	Native Sand	
	S-6	20-24	48	30		S-6 : Gray (10 YR 5/1) f SAND, little silt, stratified, wet		ND / ND		
25	S-7	24-28	48	38		S-7 : (0-29") Gray (10 YR, 5/1) fine SAND, little Silt, stratified, wet (29-38") Gray (10 YR, 5/1) SILT, some fine Sand, wet		ND / ND		
						End of exploration at 28 feet.	2		28	
30										

REMARKS

2 - Groundwater encountered at 27'.

See Log Key for explanation 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.:
TB-344

TEST BORING LOG

GZA
GeoEnvironmental, Inc.
Engineers and Scientists

National Grid
 Former Tidewater Facility
 Pawtucket
 Rhode Island

EXPLORATION NO.: TB-345
 SHEET: 2 of 2
 PROJECT NO: 43654.00
 REVIEWED BY: SDN/MSK

Logged By: SDN/WF
 Drilling Co.: Geologic Drilling
 Foreman: D. Jacobs

Type of Rig: GeoProbe
 Rig Model:
 Drilling Method: Direct Push

Boring Location: See Plan
 Ground Surface Elev. (ft.):
 Final Boring Depth (ft.): 24
 Date Start - Finish: 12/19/2011 - 12/19/2011

H. Datum:
 NAD 1983
 V. Datum:
 NGVD 1929

Hammer Type: None
 Hammer Weight (lb.):
 Hammer Fall (in.):
 Auger or Casing O.D./I.D Dia (in.):

Sampler Type: SS
 Sampler O.D. (in.): 2.0
 Sampler Length (in.):
 Rock Core Size:

Groundwater Depth (ft.)

Date	Time	Water Depth	Stab. Time

Depth (ft)	Sample					Sample Description Modified Burmister	Remark	Field Test Data	Stratum Description Elev. (ft.)	Equipment Installed
	No.	Depth (ft.)	Pen. (in)	Rec. (in)	Blows (per 6 in.)					
20	S-5	16-20	48	33		S-5 : (0-21") Yellow brown (10YR, 5/1) fine SAND, little Silt, stratified, moist (21-33") Gray (10YR, 4/1) fine SAND, little Silt, stratified, moist	ND / ND	Native Sand		
20	S-6	20-24	48	42		S-6 : Gray (10 YR, 4/1) fine SAND, little Silt, stratified, moist	ND / ND			
25						End of exploration at 24 feet.	2	24		
30										

REMARKS

2 - No groundwater encountered.

See Log Key for explanation 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.:
TB-345

TEST BORING LOG

GZA
GeoEnvironmental, Inc.
Engineers and Scientists

National Grid
 Former Tidewater Facility
 Pawtucket
 Rhode Island

EXPLORATION NO.: TB-346
 SHEET: 2 of 2
 PROJECT NO: 43654.00
 REVIEWED BY: SDN/MSK

Logged By: SDN/WF
 Drilling Co.: Geologic Drilling
 Foreman: D. Jacobs

Type of Rig: GeoProbe
 Rig Model:
 Drilling Method: Direct Push

Boring Location: See Plan
 Ground Surface Elev. (ft.):
 Final Boring Depth (ft.): 16
 Date Start - Finish: 12/19/2011 - 12/19/2011

H. Datum:
 NAD 1983
 V. Datum:
 NGVD 1929

Hammer Type: None
 Hammer Weight (lb.):
 Hammer Fall (in.):
 Auger or Casing O.D./I.D Dia (in.):

Sampler Type: SS
 Sampler O.D. (in.): 2.0
 Sampler Length (in.):
 Rock Core Size:

Groundwater Depth (ft.)

Date	Time	Water Depth	Stab. Time

Depth (ft)	Sample					Sample Description Modified Burmister	Remark	Field Test Data	Stratum Description Depth (ft) Elev. (ft.)	Equipment Installed
	No.	Depth (ft.)	Pen. (in)	Rec. (in)	Blows (per 6 in.)					
16									Native Sand	
						End of exploration at 16 feet.	2			
20										
25										
30										

REMARKS

2 - No groundwater encountered.

See Log Key for explanation 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.:
TB-346

TEST BORING LOG

GZA
GeoEnvironmental, Inc.
Engineers and Scientists

National Grid
Former Tidewater Facility
Pawtucket
Rhode Island

EXPLORATION NO.: TB-348
SHEET: 1 of 3
PROJECT NO: 43654.00
REVIEWED BY: SDN/MSK

Logged By: SDN
Drilling Co.: Geologic Drilling
Foreman: D. Jacobs

Type of Rig: GeoProbe
Rig Model:
Drilling Method: Direct Push

Boring Location: See Plan
Ground Surface Elev. (ft.):
Final Boring Depth (ft.): 32
Date Start - Finish: 12/20/2011 - 12/20/2011

H. Datum:
 NAD 1983
V. Datum:
 NGVD 1929

Hammer Type: None
Hammer Weight (lb.):
Hammer Fall (in.):
Auger or Casing O.D./I.D Dia (in.):

Sampler Type: SS
Sampler O.D. (in.): 2.0
Sampler Length (in.):
Rock Core Size:

Groundwater Depth (ft.)

Date	Time	Water Depth	Stab. Time

Depth (ft)	Sample				Sample Description Modified Burmister	Remark	Field Test Data	Stratum Description Elev. (ft.)	Equipment Installed
	No.	Depth (ft.)	Pen. (in)	Rec. (in)					
5	S-1	0-4	48	24	S-1 : (0-2") Topsoil, dry (2-9") Brown (10 YR, 4/4) fine to coarse SAND, little Gravel, trace Silt, dry (9-24") Dark brown (10 YR, 3/1) fine to coarse SAND, trace Brick, trace Gravel, trace Silt, trace Coal, moist	1	ND / ND	0.33 TOPSOIL Urban Fill	No Equipment Installed
	S-2	4-8	48	14	S-2 : 0-12") Dark brown (10 YR, 3/1) fine to coarse SAND, little Gravel, trace Silt, trace Slag, slight coal tar-like odor, moist (12-14") Light brown (10 YR, 5/6) fine to coarse SAND, little Gravel, trace Silt, moist	ND / ND	4	FILL	
	S-3	8-12	48	22	S-3 : (0-8") Light brown (10 YR, 5/6) fine to coarse SAND, little Gravel, trace Silt, trace (8-11") Black (10 YR, 2/1) fine to medium SAND, trace Gravel, trace Silt, trace Ash, trace Coal, moist (11-16.5") Light brown (10 YR, 5/6) fine to coarse SAND, little Gravel, trace Silt, moist (16.5-22") Dark brown (10 YR, 3/1) fine to coarse SAND, little (-) Silt, little (-) Gravel, band of blue staining at 11.5' bgs, slight coal tar-like odor, moist	ND / ND	12	Urban Fill	
	S-4	12-20	96	20	S-4 : Light brown (10 YR, 5/6) fine to coarse SAND, little (+) Gravel, trace Silt, moist	2	ND / ND		

REMARKS

1 - Soil samples screened with a 10.6eV MiniRAE photoionization detector (PID). PID values represent meter response in parts per million/volume air (ppmv) relative to benzene in air and above background readings. Soil samples are screened with a Gasbadge Pro equipped with a hydrogen cyanide sensor. The values represent meter response in parts per million/volume air (ppmv) relative to hydrogen cyanide in air and above background readings. Field data is reported as PID readings followed by HCN readings. All samples are photo documented. ND=Not Detected above background. NR=No Readings.

2 - Soft material 12-20 feet.

See Log Key for explanation 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.:
TB-348

TEST BORING LOG

GZA
GeoEnvironmental, Inc.
Engineers and Scientists

National Grid
 Former Tidewater Facility
 Pawtucket
 Rhode Island

EXPLORATION NO.: TB-348
 SHEET: 3 of 3
 PROJECT NO: 43654.00
 REVIEWED BY: SDN/MSK

Logged By: SDN
Drilling Co.: Geologic Drilling
Foreman: D. Jacobs

Type of Rig: GeoProbe
Rig Model:
Drilling Method: Direct Push

Boring Location: See Plan
Ground Surface Elev. (ft.):
Final Boring Depth (ft.): 32
Date Start - Finish: 12/20/2011 - 12/20/2011

H. Datum:
 NAD 1983
V. Datum:
 NGVD 1929

Hammer Type: None
Hammer Weight (lb.):
Hammer Fall (in.):
Auger or Casing O.D./I.D Dia (in.):

Sampler Type: SS
Sampler O.D. (in.): 2.0
Sampler Length (in.):
Rock Core Size:

Groundwater Depth (ft.)

Date	Time	Water Depth	Stab. Time

Depth (ft)	Sample					Sample Description Modified Burmister	Remark	Field Test Data	Depth (ft) Stratum Description Elev. (ft.)	Equipment Installed
	No.	Depth (ft.)	Pen. (in)	Rec. (in)	Blows (per 6 in.)					
35							4			
40						End of exploration at 32 feet.				
45										

REMARKS

4 - No groundwater encountered.

See Log Key for explanation 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.:
TB-348

TEST BORING LOG

GZA
GeoEnvironmental, Inc.
Engineers and Scientists

National Grid
Former Tidewater Facility
Pawtucket
Rhode Island

EXPLORATION NO.: TB-349
SHEET: 1 of 2
PROJECT NO: 43654.00
REVIEWED BY: SDN/MSK

Logged By: SDN
Drilling Co.: Geologic Drilling
Foreman: D. Jacobs

Type of Rig: GeoProbe
Rig Model:
Drilling Method: Direct Push

Boring Location: See Plan
Ground Surface Elev. (ft.):
Final Boring Depth (ft.): 16
Date Start - Finish: 12/20/2011 - 12/20/2011

H. Datum:
 NAD 1983
V. Datum:
 NGVD 1929

Hammer Type: None
Hammer Weight (lb.):
Hammer Fall (in.):
Auger or Casing O.D./I.D Dia (in.):

Sampler Type: SS
Sampler O.D. (in.): 2.0
Sampler Length (in.):
Rock Core Size:

Groundwater Depth (ft.)

Date	Time	Water Depth	Stab. Time

Depth (ft)	Sample				Sample Description Modified Burmister	Remark	Field Test Data	Stratum Description Depth (ft.) Elev. (ft.)	Equipment Installed
	No.	Depth (ft.)	Pen. (in)	Rec. (in)					
5	S-1	0-4	48	26	S-1 : (0-3") Brown Topsoil, dry (3-21") Brown (10 YR, 4/4) fine to medium SAND, little Gravel, trace silt, trace slag, trace Coal, moist (21-26") Black-blue (10 B, 2.5/1) fine to medium SAND, little Silt, trace (+) Gravel, trace woodchips, coal tar-like coating, moderate purifier box-like odor, moist	1	ND	0.5 TOPSOIL	No Equipment Installed
							/		
							25.7	FILL	
							ND		
10	S-2	4-8	48	24	S-2 : (0-6") Black blue (10 B, 2.5/1) fine to coarse SAND, trace Gravel, trace Silt, heavy blue staining, coal tar-like coating, band of blue stained woodchips at 4.5 - 5' bgs, moderate purifier box-like odor, moist (6-12") Gray (10 YR, 4/1) fine to coarse SAND, little Gravel, trace Silt, very slight purifier box-like odor, moist (12-15") Orange (5 YR, 4/6) fine to coarse SAND, little Gravel, trace (+) Silt, moist (15-19.5") Light brown (10 YR 4/1) fine to medium SAND, little Silt, little Gravel, moist (19.5-24") Dark grayish brown (10 YR, 4/2) fine SAND, trace Silt, moist	ND	ND	5 ----- Outwash	
							/		
15	S-3	8-12	48	34	S-3 : Dark grayish brown (10 YR, 4/2) fine SAND, trace (+) Silt, moist	ND	ND	8 ----- Native Sand	
							/		
	S-4	12-16	48	30	S-4 : Gray (10 YR, 5/1) fine SAND, some Silt, moist	ND	ND		

REMARKS

1 - Soil samples screened with a 10.6eV MiniRAE photoionization detector (PID). PID values represent meter response in parts per million/volume air (ppmv) relative to benzene in air and above background readings. Soil samples are screened with a Gasbadge Pro equipped with a hydrogen cyanide sensor. The values represent meter response in parts per million/volume air (ppmv) relative to hydrogen cyanide in air and above background readings. Field data is reported as PID readings followed by HCN readings. All samples are photo documented. ND=Not Detected above background. NR=No Readings.

2 - No groundwater encountered.

See Log Key for explanation 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.:
TB-349

TEST BORING LOG

GZA
GeoEnvironmental, Inc.
Engineers and Scientists

National Grid
Former Tidewater Facility
Pawtucket
Rhode Island

EXPLORATION NO.: TB-349
SHEET: 2 of 2
PROJECT NO: 43654.00
REVIEWED BY: SDN/MSK

Logged By: SDN
Drilling Co.: Geologic Drilling
Foreman: D. Jacobs

Type of Rig: GeoProbe
Rig Model:
Drilling Method: Direct Push

Boring Location: See Plan
Ground Surface Elev. (ft.):
Final Boring Depth (ft.): 16
Date Start - Finish: 12/20/2011 - 12/20/2011

H. Datum:
 NAD 1983
V. Datum:
 NGVD 1929

Hammer Type: None
Hammer Weight (lb.):
Hammer Fall (in.):
Auger or Casing O.D./I.D Dia (in.):

Sampler Type: SS
Sampler O.D. (in.): 2.0
Sampler Length (in.):
Rock Core Size:

Groundwater Depth (ft.)

Date	Time	Water Depth	Stab. Time

Depth (ft)	Sample					Sample Description Modified Burmister	Remark	Field Test Data	Stratum Description Depth (ft) Elev. (ft)	Equipment Installed
	No.	Depth (ft.)	Pen. (in)	Rec. (in)	Blows (per 6 in.)					
							2		16 Native Sand	
						End of exploration at 16 feet.				
20										
25										
30										

REMARKS

See Log Key for explanation 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.:
TB-349

TEST BORING LOG

GZA
GeoEnvironmental, Inc.
Engineers and Scientists

National Grid
Former Tidewater Facility
Pawtucket
Rhode Island

EXPLORATION NO.: TB-350
SHEET: 1 of 1
PROJECT NO: 43654.00
REVIEWED BY: SDN/MSK

Logged By: SDN
Drilling Co.: Geologic Drilling
Foreman: D. Jacobs

Type of Rig: GeoProbe
Rig Model:
Drilling Method: Direct Push

Boring Location: See Plan
Ground Surface Elev. (ft.):
Final Boring Depth (ft.): 12
Date Start - Finish: 12/20/2011 - 12/20/2011

H. Datum:
 NAD 1983
V. Datum:
 NGVD 1929

Hammer Type: None
Hammer Weight (lb.):
Hammer Fall (in.):
Auger or Casing O.D./I.D Dia (in.):

Sampler Type: SS
Sampler O.D. (in.): 2.0
Sampler Length (in.):
Rock Core Size:

Groundwater Depth (ft.)

Date	Time	Water Depth	Stab. Time

Depth (ft)	Sample				Sample Description Modified Burmister	Remark	Field Test Data	Stratum Description Elev. (ft.)	Equipment Installed
	No.	Depth (ft.)	Pen. (in)	Rec. (in)					
5	S-1	0-4	48	28	S-1 : (0-3.5") Brown Topsoil, dry (3.5-10.5") Brown (10 YR, 4/4) fine to coarse SAND, little (-) Silt, trace (+) Gravel, dry (10.5-14") Dark brown (10 YR, 3/2) fine to coarse SAND, little Silt, trace (+) Gravel, dry (14-23") Light brown (10 YR, 5/6) fine to coarse SAND, little Silt, trace (+) Gravel, dry	1	ND / ND	0.5 TOPSOIL	No Equipment Installed
	S-2	4-8	48	28	S-2 : (0-3.5") Light brown (10 YR, 5/6) fine to coarse SAND, little Silt, trace (+) Gravel, dry (3.5-7") Black (10 YR, 2/1) fine to coarse SAND, trace (+) Gravel, trace Silt, trace Slag, dry (7-23") Light brown (10 YR, 5/6) fine to coarse SAND, little Gravel, trace Silt, dry	ND / ND	Urban Fill		
	S-3	8-12	48	22	S-3 : Brown (10 YR, 5/3) fine to coarse SAND, little (+) Gravel, trace Silt, moist	ND / ND			
10	End of exploration at 12 feet.					2		12	
15									

REMARKS

1 - Soil samples screened with a 10.6eV MiniRAE photoionization detector (PID). PID values represent meter response in parts per million/volume air (ppmv) relative to benzene in air and above background readings. Soil samples are screened with a Gasbadge Pro equipped with a hydrogen cyanide sensor. The values represent meter response in parts per million/volume air (ppmv) relative to hydrogen cyanide in air and above background readings. Field data is reported as PID readings followed by HCN readings. All samples are photo documented. ND=Not Detected above background. NR=No Readings.

2 - No groundwater encountered.

See Log Key for explanation 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.:
TB-350

TEST BORING LOG

GZA
GeoEnvironmental, Inc.
Engineers and Scientists

National Grid
 Former Tidewater Facility
 Pawtucket
 Rhode Island

EXPLORATION NO.: TB-351
 SHEET: 2 of 2
 PROJECT NO: 43654.00
 REVIEWED BY: SDN/MSK

Logged By: SDN
Drilling Co.: Geologic Drilling
Foreman: D. Jacobs

Type of Rig: GeoProbe
Rig Model:
Drilling Method: Direct Push

Boring Location: See Plan
Ground Surface Elev. (ft.):
Final Boring Depth (ft.): 16
Date Start - Finish: 12/20/2011 - 12/20/2011

H. Datum:
 NAD 1983
V. Datum:
 NGVD 1929

Hammer Type: None
Hammer Weight (lb.):
Hammer Fall (in.):
Auger or Casing O.D./I.D Dia (in.):

Sampler Type: SS
Sampler O.D. (in.): 2.0
Sampler Length (in.):
Rock Core Size:

Groundwater Depth (ft.)

Date	Time	Water Depth	Stab. Time

Depth (ft)	Sample					Sample Description Modified Burmister	Remark	Field Test Data	Depth (ft) Stratum Description Elev. (ft.)	Equipment Installed
	No.	Depth (ft.)	Pen. (in)	Rec. (in)	Blows (per 6 in.)					
20								16	FILL	
25						End of exploration at 16 feet.				
30										

REMARKS

See Log Key for explanation 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.:
TB-351

APPENDIX E

DISPOSAL MANIFEST

TAK FFS117

UNIFORM HAZARDOUS WASTE MANIFEST	1. Generator ID Number RI000033366	2. Page 1 of 1	3. Emergency Response Phone (800) 453-3718	4. Manifest Tracking Number 003099866 FLE
----------------------------------	--	--------------------------	--	---

5. Generator's Name and Mailing Address Narragansett Electric company 40 Sylvan Road Waltham, MA 02451	Generator's Site Address (if different than mailing address) 200 Taft Street Pawtucket, RI 02862
Generator's Phone: (781) 907-3647 ATTN: Susan Brochu	

6. Transporter 1 Company Name Clean Harbors Environmental Services Inc	U.S. EPA ID Number MAD039322250
--	---

7. Transporter 2 Company Name	U.S. EPA ID Number
-------------------------------	--------------------

8. Designated Facility Name and Site Address Clean Harbors of Braintree Inc 1 Hill Avenue Braintree, MA 02184	U.S. EPA ID Number MAD053452637
Facility's Phone: (781) 380-7100	

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers		11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes	
		No.	Type				
X	1. HAZARDOUS WASTE LIQUID N.O.S. (BENZENE) 9. PG III	01	DM	15	G	R015	D018
	2. NON DOT REGULATED MATERIAL, (OILY DEBRIS)	01	DM	50	P	MA01	R015
	3. NON DOT REGULATED MATERIAL, (PURGEWATER)	01	DM	60	P	MA01	R015
	4.						

14. Special Handling Instructions and Additional Information
 1. **CH0752ESH IXS 5 EKG#171**
 2. **R40179RIR IXS 5**
 3. **T26781RIR IXS 5**

15. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent. I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offor's Printed/Typed Name: **AGENT FOR HARRY FRANCISCO BORTO** Signature: *[Signature]* Month: **2** Day: **13** Year: **12**

16. International Shipments Import to U.S. Export from U.S. Port of entry/exit: _____ Date leaving U.S.: _____

17. Transporter Acknowledgment of Receipt of Materials
 Transporter 1 Printed/Typed Name: **Francisco Borto** Signature: *[Signature]* Month: **2** Day: **13** Year: **12**

Transporter 2 Printed/Typed Name: _____ Signature: _____ Month: _____ Day: _____ Year: _____

18. Discrepancy **NOT A HAZARDOUS WASTE IN RI. THE WASTE DESCRIBED ON LINE 9.b.1 IS MGP EXEMPT.**

18a. Discrepancy Indication Space Quantity Type Residue Partial Rejection Full Rejection

18b. Alternate Facility (or Generator) _____ U.S. EPA ID Number _____

18c. Signature of Alternate Facility (or Generator) _____ Month: _____ Day: _____ Year: _____

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

1. H141	2. H141	3. H141	4.
----------------	----------------	----------------	----

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a
 Printed/Typed Name: **Huyen Hoang** Signature: *[Signature]* Month: **2** Day: **13** Year: **12**

APPENDIX F

LABORATORY DATA REPORT



CERTIFICATE OF ANALYSIS

Sophia Narkiewicz
GZA GeoEnvironmental, Inc.
530 Broadway
Providence, RI 02909

RE: Tidewater GH (03.0043654.13)
ESS Laboratory Work Order Number: 1112428

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 SMorrell at 3:19 pm, Jan 06, 2012

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.

ESS Laboratory certifies that the test results meet the requirements of NELAC and A2LA, except where noted within this project narrative.

Subcontracted Analyses

GDF Suez Energy of North America - West Sulfur Content
Springfield, MA



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Tidewater GH

ESS Laboratory Work Order: 1112428

SAMPLE RECEIPT

The following samples were received on December 23, 2011 for the analyses specified on the enclosed Chain of Custody Record.

The samples and analyses listed below were analyzed in accordance with the Guidelines Establishing Test Procedures for the Analysis of Pollutants, 40 CFR Part 136, as amended.

<u>Lab Number</u>	<u>SampleName</u>	<u>Matrix</u>	<u>Analysis</u>
1112428-01	TB-349 0-6ft	Soil	§, 6010B, 7471A, 8082, 8100M, 8260B, 8270C, 9014, 9045



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Tidewater GH

ESS Laboratory Work Order: 1112428

PROJECT NARRATIVE

3050B/6000/7000 Total Metals

- CL12317-BS1 Blank Spike recovery is below lower control limit (B-).
Selenium (77% @ 80-120%)
- CL12317-MS2 Matrix Spike recovery is above upper control limit (M+).
Barium (159% @ 75-125%), Lead (168% @ 75-125%)
- CL12317-MS2 Matrix Spike recovery is below lower control limit (M-).
Arsenic (36% @ 75-125%), Chromium (72% @ 75-125%), Selenium (63% @ 75-125%)
- CL12914-MS1 Matrix Spike recovery is below lower control limit (M-).
Mercury (0.3% @ 75-125%)

5035/8260B Volatile Organic Compounds / Methanol

- 1112428-01 Voa sample was preserved in house.

8270C Semi-Volatile Organic Compounds

- 1112428-01 Internal Standard(s) outside of criteria due to matrix (UCM/coelution is present) (IM).
Perylene-d12 (38% @ 50-200%)
- 1112428-01 Surrogate recovery(ies) above upper control limit (S+).
p-Terphenyl-d14 (165% @ 30-130%)
- CL12710-BLK1 Surrogate recovery(ies) above upper control limit (S+).
p-Terphenyl-d14 (161% @ 30-130%)
- CL12710-BS1 Blank Spike recovery is above upper control limit (B+).
4-Nitrophenol (134% @ 30-130%)
- CL12710-BSD1 Blank Spike recovery is above upper control limit (B+).
4-Nitrophenol (137% @ 30-130%)
- CUL0189-CCV1 Calibration required quadratic regression (Q).
2,4,6-Tribromophenol (109% @ 70-130%), Dibenzo(a,h)Anthracene (92% @ 70-130%),
Indeno(1,2,3-cd)Pyrene (96% @ 70-130%), Pentachlorophenol (106% @ 80-120%)
- CUL0194-CCV1 Calibration required quadratic regression (Q).
2,4,6-Tribromophenol (103% @ 70-130%), Dibenzo(a,h)Anthracene (89% @ 70-130%),
Indeno(1,2,3-cd)Pyrene (91% @ 70-130%), Pentachlorophenol (103% @ 80-120%)

Classical Chemistry

- CL12917-MS1 Matrix Spike recovery is above upper control limit (M+).
Total Cyanide (776% @ 75-125%)

No other observations noted.

End of Project Narrative.



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Tidewater GH

ESS Laboratory Work Order: 1112428

DATA USABILITY LINKS

[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: Tidewater GH
Client Sample ID: TB-349 0-6ft
Date Sampled: 12/20/11 13:00
Percent Solids: 86

ESS Laboratory Work Order: 1112428
ESS Laboratory Sample ID: 1112428-01
Sample Matrix: Soil
Units: mg/kg dry

All methods used are in accordance with 40 CFR 136.

3050B/6000/7000 Total Metals

<u>Analyte</u>	<u>Results (MRL)</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>
Arsenic	30.7 (2.8)	6010B		1	JP	12/28/11 19:56	2.07	100	CL12317
Barium	73.6 (2.8)	6010B		1	JP	12/28/11 19:56	2.07	100	CL12317
Cadmium	ND (0.56)	6010B		1	JP	12/28/11 19:56	2.07	100	CL12317
Chromium	16.3 (1.1)	6010B		1	JP	12/28/11 19:56	2.07	100	CL12317
Lead	147 (5.6)	6010B		1	JP	12/28/11 19:56	2.07	100	CL12317
Mercury	1.42 (0.135)	7471A		4	KJK	12/30/11 17:23	0.68	40	CL12914
Selenium	ND (5.6)	6010B		1	JP	12/28/11 19:56	2.07	100	CL12317
Silver	ND (0.56)	6010B		1	JP	12/28/11 19:56	2.07	100	CL12317



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
 Client Project ID: Tidewater GH
 Client Sample ID: TB-349 0-6ft
 Date Sampled: 12/20/11 13:00
 Percent Solids: 86
 Initial Volume: 15
 Final Volume: 15
 Extraction Method: 5035

ESS Laboratory Work Order: 1112428
 ESS Laboratory Sample ID: 1112428-01
 Sample Matrix: Soil
 Units: mg/kg dry
 Analyst: MD

All methods used are in accordance with 40 CFR 136.

5035/8260B Volatile Organic Compounds / Methanol

<u>Analyte</u>	<u>Results (MRL)</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.133)		1	12/27/11 16:18	CUL0173	CL12707
1,1,1-Trichloroethane	ND (0.0663)		1	12/27/11 16:18	CUL0173	CL12707
1,1,2,2-Tetrachloroethane	ND (0.0663)		1	12/27/11 16:18	CUL0173	CL12707
1,1,2-Trichloroethane	ND (0.0663)		1	12/27/11 16:18	CUL0173	CL12707
1,1-Dichloroethane	ND (0.0663)		1	12/27/11 16:18	CUL0173	CL12707
1,1-Dichloroethene	ND (0.0663)		1	12/27/11 16:18	CUL0173	CL12707
1,1-Dichloropropene	ND (0.0663)		1	12/27/11 16:18	CUL0173	CL12707
1,2,3-Trichlorobenzene	ND (0.0663)		1	12/27/11 16:18	CUL0173	CL12707
1,2,3-Trichloropropane	ND (0.0663)		1	12/27/11 16:18	CUL0173	CL12707
1,2,4-Trichlorobenzene	ND (0.0663)		1	12/27/11 16:18	CUL0173	CL12707
1,2,4-Trimethylbenzene	1.38 (0.0663)		1	12/27/11 16:18	CUL0173	CL12707
1,2-Dibromo-3-Chloropropane	ND (0.398)		1	12/27/11 16:18	CUL0173	CL12707
1,2-Dibromoethane	ND (0.0663)		1	12/27/11 16:18	CUL0173	CL12707
1,2-Dichlorobenzene	ND (0.0663)		1	12/27/11 16:18	CUL0173	CL12707
1,2-Dichloroethane	ND (0.0663)		1	12/27/11 16:18	CUL0173	CL12707
1,2-Dichloropropane	ND (0.0663)		1	12/27/11 16:18	CUL0173	CL12707
1,3,5-Trimethylbenzene	0.358 (0.0663)		1	12/27/11 16:18	CUL0173	CL12707
1,3-Dichlorobenzene	ND (0.0663)		1	12/27/11 16:18	CUL0173	CL12707
1,3-Dichloropropane	ND (0.0663)		1	12/27/11 16:18	CUL0173	CL12707
1,4-Dichlorobenzene	ND (0.0663)		1	12/27/11 16:18	CUL0173	CL12707
1,4-Dioxane - Screen	ND (6.63)		1	12/27/11 16:18	CUL0173	CL12707
1-Chlorohexane	ND (0.0663)		1	12/27/11 16:18	CUL0173	CL12707
2,2-Dichloropropane	ND (0.133)		1	12/27/11 16:18	CUL0173	CL12707
2-Butanone	ND (1.66)		1	12/27/11 16:18	CUL0173	CL12707
2-Chlorotoluene	ND (0.0663)		1	12/27/11 16:18	CUL0173	CL12707
2-Hexanone	ND (0.663)		1	12/27/11 16:18	CUL0173	CL12707
4-Chlorotoluene	ND (0.0663)		1	12/27/11 16:18	CUL0173	CL12707
4-Isopropyltoluene	ND (0.0663)		1	12/27/11 16:18	CUL0173	CL12707
4-Methyl-2-Pentanone	ND (0.663)		1	12/27/11 16:18	CUL0173	CL12707
Acetone	ND (1.66)		1	12/27/11 16:18	CUL0173	CL12707
Benzene	ND (0.0663)		1	12/27/11 16:18	CUL0173	CL12707



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Tidewater GH
Client Sample ID: TB-349 0-6ft
Date Sampled: 12/20/11 13:00
Percent Solids: 86
Initial Volume: 15
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 1112428
ESS Laboratory Sample ID: 1112428-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

All methods used are in accordance with 40 CFR 136.

5035/8260B Volatile Organic Compounds / Methanol

<u>Analyte</u>	<u>Results (MRL)</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Bromobenzene	ND (0.0663)		1	12/27/11 16:18	CUL0173	CL12707
Bromochloromethane	ND (0.0663)		1	12/27/11 16:18	CUL0173	CL12707
Bromodichloromethane	ND (0.0663)		1	12/27/11 16:18	CUL0173	CL12707
Bromoform	ND (0.0663)		1	12/27/11 16:18	CUL0173	CL12707
Bromomethane	ND (0.133)		1	12/27/11 16:18	CUL0173	CL12707
Carbon Disulfide	ND (0.0663)		1	12/27/11 16:18	CUL0173	CL12707
Carbon Tetrachloride	ND (0.0663)		1	12/27/11 16:18	CUL0173	CL12707
Chlorobenzene	ND (0.0663)		1	12/27/11 16:18	CUL0173	CL12707
Chloroethane	ND (0.133)		1	12/27/11 16:18	CUL0173	CL12707
Chloroform	ND (0.0663)		1	12/27/11 16:18	CUL0173	CL12707
Chloromethane	ND (0.133)		1	12/27/11 16:18	CUL0173	CL12707
cis-1,2-Dichloroethene	ND (0.0663)		1	12/27/11 16:18	CUL0173	CL12707
cis-1,3-Dichloropropene	ND (0.0663)		1	12/27/11 16:18	CUL0173	CL12707
Dibromochloromethane	ND (0.0663)		1	12/27/11 16:18	CUL0173	CL12707
Dibromomethane	ND (0.0663)		1	12/27/11 16:18	CUL0173	CL12707
Dichlorodifluoromethane	ND (0.0663)		1	12/27/11 16:18	CUL0173	CL12707
Diethyl Ether	ND (0.0663)		1	12/27/11 16:18	CUL0173	CL12707
Di-isopropyl ether	ND (0.0663)		1	12/27/11 16:18	CUL0173	CL12707
Ethyl tertiary-butyl ether	ND (0.0663)		1	12/27/11 16:18	CUL0173	CL12707
Ethylbenzene	ND (0.0663)		1	12/27/11 16:18	CUL0173	CL12707
Hexachlorobutadiene	ND (0.0663)		1	12/27/11 16:18	CUL0173	CL12707
Isopropylbenzene	ND (0.0663)		1	12/27/11 16:18	CUL0173	CL12707
Methyl tert-Butyl Ether	ND (0.0663)		1	12/27/11 16:18	CUL0173	CL12707
Methylene Chloride	ND (0.331)		1	12/27/11 16:18	CUL0173	CL12707
Naphthalene	386 (6.63)		100	12/27/11 19:16	CUL0173	CL12707
n-Butylbenzene	ND (0.0663)		1	12/27/11 16:18	CUL0173	CL12707
n-Propylbenzene	ND (0.0663)		1	12/27/11 16:18	CUL0173	CL12707
sec-Butylbenzene	ND (0.0663)		1	12/27/11 16:18	CUL0173	CL12707
Styrene	0.274 (0.0663)		1	12/27/11 16:18	CUL0173	CL12707
tert-Butylbenzene	ND (0.0663)		1	12/27/11 16:18	CUL0173	CL12707
Tertiary-amyl methyl ether	ND (0.0663)		1	12/27/11 16:18	CUL0173	CL12707



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
 Client Project ID: Tidewater GH
 Client Sample ID: TB-349 0-6ft
 Date Sampled: 12/20/11 13:00
 Percent Solids: 86
 Initial Volume: 15
 Final Volume: 15
 Extraction Method: 5035

ESS Laboratory Work Order: 1112428
 ESS Laboratory Sample ID: 1112428-01
 Sample Matrix: Soil
 Units: mg/kg dry
 Analyst: MD

All methods used are in accordance with 40 CFR 136.

5035/8260B Volatile Organic Compounds / Methanol

<u>Analyte</u>	<u>Results (MRL)</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Tetrachloroethene	ND (0.0663)		1	12/27/11 16:18	CUL0173	CL12707
Tetrahydrofuran	ND (0.663)		1	12/27/11 16:18	CUL0173	CL12707
Toluene	ND (0.0663)		1	12/27/11 16:18	CUL0173	CL12707
trans-1,2-Dichloroethene	ND (0.0663)		1	12/27/11 16:18	CUL0173	CL12707
trans-1,3-Dichloropropene	ND (0.0663)		1	12/27/11 16:18	CUL0173	CL12707
Trichloroethene	ND (0.0663)		1	12/27/11 16:18	CUL0173	CL12707
Trichlorofluoromethane	ND (0.0663)		1	12/27/11 16:18	CUL0173	CL12707
Vinyl Acetate	ND (0.331)		1	12/27/11 16:18	CUL0173	CL12707
Vinyl Chloride	ND (0.0663)		1	12/27/11 16:18	CUL0173	CL12707
Xylene O	ND (0.0663)		1	12/27/11 16:18	CUL0173	CL12707
Xylene P,M	ND (0.133)		1	12/27/11 16:18	CUL0173	CL12707
Xylenes (Total)	ND (0.199)		1	12/27/11 16:18		[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>	89 %		70-130
<i>Surrogate: Dibromofluoromethane</i>	87 %		70-130
<i>Surrogate: Toluene-d8</i>	87 %		70-130



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Tidewater GH
Client Sample ID: TB-349 0-6ft
Date Sampled: 12/20/11 13:00
Percent Solids: 86
Initial Volume: 20.8
Final Volume: 10
Extraction Method: 3540

ESS Laboratory Work Order: 1112428
ESS Laboratory Sample ID: 1112428-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: SEP
Prepared: 12/28/11 13:00

All methods used are in accordance with 40 CFR 136.

8082 Polychlorinated Biphenyls (PCB)

<u>Analyte</u>	<u>Results (MRL)</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Aroclor 1016	ND (0.0559)		1	01/03/12 18:30		CA20407
Aroclor 1221	ND (0.0559)		1	01/03/12 18:30		CA20407
Aroclor 1232	ND (0.0559)		1	01/03/12 18:30		CA20407
Aroclor 1242	ND (0.0559)		1	01/03/12 18:30		CA20407
Aroclor 1248	ND (0.0559)		1	01/03/12 18:30		CA20407
Aroclor 1254	ND (0.0559)		1	01/03/12 18:30		CA20407
Aroclor 1260	ND (0.0559)		1	01/03/12 18:30		CA20407
Aroclor 1262	ND (0.0559)		1	01/03/12 18:30		CA20407
Aroclor 1268	ND (0.0559)		1	01/03/12 18:30		CA20407

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: Decachlorobiphenyl</i>	41 %		30-150
<i>Surrogate: Decachlorobiphenyl [2C]</i>	47 %		30-150
<i>Surrogate: Tetrachloro-m-xylene</i>	34 %		30-150
<i>Surrogate: Tetrachloro-m-xylene [2C]</i>	62 %		30-150



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Tidewater GH
Client Sample ID: TB-349 0-6ft
Date Sampled: 12/20/11 13:00
Percent Solids: 86
Initial Volume: 20
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 1112428
ESS Laboratory Sample ID: 1112428-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: SEP
Prepared: 12/29/11 15:00

All methods used are in accordance with 40 CFR 136.

8100M Total Petroleum Hydrocarbons

<u>Analyte</u>	<u>Results (MRL)</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Total Petroleum Hydrocarbons	3150 (43.6)		1	12/30/11 7:42		CL12924
	<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: Tidewater GH
Client Sample ID: TB-349 0-6ft
Date Sampled: 12/20/11 13:00
Percent Solids: 86
Initial Volume: 15
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1112428
ESS Laboratory Sample ID: 1112428-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: CMT
Prepared: 12/27/11 13:30

All methods used are in accordance with 40 CFR 136.

8270C Semi-Volatile Organic Compounds

<u>Analyte</u>	<u>Results (MRL)</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1-Biphenyl	1.87 (0.387)		1	12/30/11 2:25	CUL0189	CL12710
1,2,4-Trichlorobenzene	ND (0.387)		1	12/30/11 2:25	CUL0189	CL12710
1,2-Dichlorobenzene	ND (0.387)		1	12/30/11 2:25	CUL0189	CL12710
1,3-Dichlorobenzene	ND (0.387)		1	12/30/11 2:25	CUL0189	CL12710
1,4-Dichlorobenzene	ND (0.387)		1	12/30/11 2:25	CUL0189	CL12710
2,3,4,6-Tetrachlorophenol	ND (1.94)		1	12/30/11 2:25	CUL0189	CL12710
2,4,5-Trichlorophenol	ND (0.387)		1	12/30/11 2:25	CUL0189	CL12710
2,4,6-Trichlorophenol	ND (0.387)		1	12/30/11 2:25	CUL0189	CL12710
2,4-Dichlorophenol	ND (0.387)		1	12/30/11 2:25	CUL0189	CL12710
2,4-Dimethylphenol	ND (0.387)		1	12/30/11 2:25	CUL0189	CL12710
2,4-Dinitrophenol	ND (1.94)		1	12/30/11 2:25	CUL0189	CL12710
2,4-Dinitrotoluene	ND (0.387)		1	12/30/11 2:25	CUL0189	CL12710
2,6-Dinitrotoluene	ND (0.387)		1	12/30/11 2:25	CUL0189	CL12710
2-Chloronaphthalene	ND (0.387)		1	12/30/11 2:25	CUL0189	CL12710
2-Chlorophenol	ND (0.387)		1	12/30/11 2:25	CUL0189	CL12710
2-Methylnaphthalene	32.8 (3.87)		10	12/30/11 17:46	CUL0189	CL12710
2-Methylphenol	ND (0.387)		1	12/30/11 2:25	CUL0189	CL12710
2-Nitroaniline	ND (0.387)		1	12/30/11 2:25	CUL0189	CL12710
2-Nitrophenol	ND (0.387)		1	12/30/11 2:25	CUL0189	CL12710
3,3'-Dichlorobenzidine	ND (0.776)		1	12/30/11 2:25	CUL0189	CL12710
3+4-Methylphenol	ND (0.776)		1	12/30/11 2:25	CUL0189	CL12710
3-Nitroaniline	ND (0.387)		1	12/30/11 2:25	CUL0189	CL12710
4,6-Dinitro-2-Methylphenol	ND (1.94)		1	12/30/11 2:25	CUL0189	CL12710
4-Bromophenyl-phenylether	ND (0.387)		1	12/30/11 2:25	CUL0189	CL12710
4-Chloro-3-Methylphenol	ND (0.387)		1	12/30/11 2:25	CUL0189	CL12710
4-Chloroaniline	ND (0.776)		1	12/30/11 2:25	CUL0189	CL12710
4-Chloro-phenyl-phenyl ether	ND (0.387)		1	12/30/11 2:25	CUL0189	CL12710
4-Nitroaniline	ND (0.387)		1	12/30/11 2:25	CUL0189	CL12710
4-Nitrophenol	ND (1.94)		1	12/30/11 2:25	CUL0189	CL12710
Acenaphthene	ND (0.387)		1	12/30/11 2:25	CUL0189	CL12710
Acenaphthylene	1.51 (0.387)		1	12/30/11 2:25	CUL0189	CL12710



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
 Client Project ID: Tidewater GH
 Client Sample ID: TB-349 0-6ft
 Date Sampled: 12/20/11 13:00
 Percent Solids: 86
 Initial Volume: 15
 Final Volume: 0.5
 Extraction Method: 3546

ESS Laboratory Work Order: 1112428
 ESS Laboratory Sample ID: 1112428-01
 Sample Matrix: Soil
 Units: mg/kg dry
 Analyst: CMT
 Prepared: 12/27/11 13:30

All methods used are in accordance with 40 CFR 136.

8270C Semi-Volatile Organic Compounds

<u>Analyte</u>	<u>Results (MRL)</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Acetophenone	8.23 (0.776)		1	12/30/11 2:25	CUL0189	CL12710
Aniline	ND (0.776)		1	12/30/11 2:25	CUL0189	CL12710
Anthracene	0.761 (0.387)		1	12/30/11 2:25	CUL0189	CL12710
Azobenzene	ND (0.387)		1	12/30/11 2:25	CUL0189	CL12710
Benzo(a)anthracene	3.68 (0.387)		1	12/30/11 2:25	CUL0189	CL12710
Benzo(a)pyrene	1.30 (0.194)		1	12/30/11 2:25	CUL0189	CL12710
Benzo(b)fluoranthene	4.26 (0.387)		1	12/30/11 2:25	CUL0189	CL12710
Benzo(g,h,i)perylene	0.980 (0.387)		1	12/30/11 2:25	CUL0189	CL12710
Benzo(k)fluoranthene	1.81 (0.387)		1	12/30/11 2:25	CUL0189	CL12710
Benzoic Acid	ND (1.94)		1	12/30/11 2:25	CUL0189	CL12710
Benzyl Alcohol	ND (0.387)		1	12/30/11 2:25	CUL0189	CL12710
bis(2-Chloroethoxy)methane	ND (0.387)		1	12/30/11 2:25	CUL0189	CL12710
bis(2-Chloroethyl)ether	ND (0.387)		1	12/30/11 2:25	CUL0189	CL12710
bis(2-chloroisopropyl)Ether	ND (0.387)		1	12/30/11 2:25	CUL0189	CL12710
bis(2-Ethylhexyl)phthalate	ND (0.387)		1	12/30/11 2:25	CUL0189	CL12710
Butylbenzylphthalate	ND (0.387)		1	12/30/11 2:25	CUL0189	CL12710
Carbazole	ND (0.387)		1	12/30/11 2:25	CUL0189	CL12710
Chrysene	4.75 (0.194)		1	12/30/11 2:25	CUL0189	CL12710
Dibenzo(a,h)Anthracene	0.549 (0.194)		1	12/30/11 2:25	CUL0189	CL12710
Dibenzofuran	0.610 (0.387)		1	12/30/11 2:25	CUL0189	CL12710
Diethylphthalate	ND (0.387)		1	12/30/11 2:25	CUL0189	CL12710
Dimethylphthalate	ND (0.387)		1	12/30/11 2:25	CUL0189	CL12710
Di-n-butylphthalate	ND (0.387)		1	12/30/11 2:25	CUL0189	CL12710
Di-n-octylphthalate	ND (0.387)		1	12/30/11 2:25	CUL0189	CL12710
Fluoranthene	4.07 (0.387)		1	12/30/11 2:25	CUL0189	CL12710
Fluorene	0.795 (0.387)		1	12/30/11 2:25	CUL0189	CL12710
Hexachlorobenzene	ND (0.194)		1	12/30/11 2:25	CUL0189	CL12710
Hexachlorobutadiene	ND (0.387)		1	12/30/11 2:25	CUL0189	CL12710
Hexachlorocyclopentadiene	ND (1.94)		1	12/30/11 2:25	CUL0189	CL12710
Hexachloroethane	ND (0.387)		1	12/30/11 2:25	CUL0189	CL12710
Indeno(1,2,3-cd)Pyrene	1.07 (0.387)		1	12/30/11 2:25	CUL0189	CL12710



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Tidewater GH
Client Sample ID: TB-349 0-6ft
Date Sampled: 12/20/11 13:00
Percent Solids: 86
Initial Volume: 15
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1112428
ESS Laboratory Sample ID: 1112428-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: CMT
Prepared: 12/27/11 13:30

All methods used are in accordance with 40 CFR 136.

8270C Semi-Volatile Organic Compounds

<u>Analyte</u>	<u>Results (MRL)</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Isophorone	ND (0.387)		1	12/30/11 2:25	CUL0189	CL12710
Naphthalene	198 (38.7)		100	12/30/11 17:13	CUL0189	CL12710
Nitrobenzene	0.891 (0.387)		1	12/30/11 2:25	CUL0189	CL12710
N-Nitrosodimethylamine	ND (0.387)		1	12/30/11 2:25	CUL0189	CL12710
N-Nitroso-Di-n-Propylamine	ND (0.387)		1	12/30/11 2:25	CUL0189	CL12710
N-nitrosodiphenylamine	ND (0.387)		1	12/30/11 2:25	CUL0189	CL12710
Pentachlorophenol	ND (1.94)		1	12/30/11 2:25	CUL0189	CL12710
Phenanthrene	6.37 (0.387)		1	12/30/11 2:25	CUL0189	CL12710
Phenol	ND (0.387)		1	12/30/11 2:25	CUL0189	CL12710
Pyrene	7.43 (3.87)		10	12/30/11 17:46	CUL0189	CL12710
Pyridine	ND (1.94)		1	12/30/11 2:25	CUL0189	CL12710

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	45 %		30-130
<i>Surrogate: 2,4,6-Tribromophenol</i>	83 %		30-130
<i>Surrogate: 2-Chlorophenol-d4</i>	59 %		30-130
<i>Surrogate: 2-Fluorobiphenyl</i>	66 %		30-130
<i>Surrogate: 2-Fluorophenol</i>	54 %		30-130
<i>Surrogate: Nitrobenzene-d5</i>	124 %		30-130
<i>Surrogate: Phenol-d6</i>	59 %		30-130
<i>Surrogate: p-Terphenyl-d14</i>	165 %	S+	30-130



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Tidewater GH
Client Sample ID: TB-349 0-6ft
Date Sampled: 12/20/11 13:00
Percent Solids: 86

ESS Laboratory Work Order: 1112428
ESS Laboratory Sample ID: 1112428-01
Sample Matrix: Soil

All methods used are in accordance with 40 CFR 136.

Classical Chemistry

<u>Analyte</u>	<u>Results (MRL)</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Corrosivity (pH)	2.60 (N/A)	9045		1	DPS	12/23/11 14:45	S.U.	CL12321
Corrosivity (pH) Sample Temp	Soil pH measured in water at 19.6 °C.							
Sulfur, Total, WT PCT	See Attached (N/A)							
Total Cyanide	90.5 (11.3)	9014		10	DPS	12/29/11 13:15	mg/kg dry	CL12917



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Tidewater GH

ESS Laboratory Work Order: 1112428

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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3050B/6000/7000 Total Metals

Batch CL12317 - 3050B

Blank										
Arsenic	ND	2.5	mg/kg wet							
Barium	ND	2.5	mg/kg wet							
Cadmium	ND	0.50	mg/kg wet							
Chromium	ND	1.0	mg/kg wet							
Lead	ND	5.0	mg/kg wet							
Selenium	ND	5.0	mg/kg wet							
Silver	ND	0.50	mg/kg wet							

LCS										
Arsenic	106	8.6	mg/kg wet	124.0		85	80-120			
Barium	273	8.6	mg/kg wet	316.0		87	80-120			
Cadmium	99.7	1.73	mg/kg wet	116.0		86	80-120			
Chromium	81.9	3.4	mg/kg wet	95.90		85	80-120			
Lead	123	17.2	mg/kg wet	137.0		90	80-120			
Selenium	156	17.2	mg/kg wet	202.0		77	80-120			B-
Silver	44.8	1.73	mg/kg wet	53.50		84	80-120			

LCS Dup										
Arsenic	108	9.1	mg/kg wet	124.0		87	80-120	2	20	
Barium	285	9.1	mg/kg wet	316.0		90	80-120	4	20	
Cadmium	102	1.83	mg/kg wet	116.0		88	80-120	3	20	
Chromium	84.7	3.6	mg/kg wet	95.90		88	80-120	3	20	
Lead	127	18.2	mg/kg wet	137.0		92	80-120	3	20	
Selenium	166	18.2	mg/kg wet	202.0		82	80-120	6	20	
Silver	46.3	1.83	mg/kg wet	53.50		87	80-120	3	20	

Duplicate Source: 1112428-01										
Arsenic	24.3	2.7	mg/kg dry		30.7			23	35	
Barium	72.7	2.7	mg/kg dry		73.6			1	35	
Cadmium	0.101	0.55	mg/kg dry		0.127			23	35	
Chromium	15.5	1.1	mg/kg dry		16.3			5	35	
Lead	184	5.5	mg/kg dry		147			22	35	
Selenium	ND	5.5	mg/kg dry		ND				35	
Silver	ND	0.55	mg/kg dry		ND				35	

Matrix Spike Source: 1112428-01										
Arsenic	40.7	2.8	mg/kg dry	27.69	30.7	36	75-125			M-
Barium	118	2.8	mg/kg dry	27.69	73.6	159	75-125			M+
Cadmium	12.2	0.56	mg/kg dry	13.84	0.127	87	75-125			
Chromium	36.2	1.1	mg/kg dry	27.69	16.3	72	75-125			M-
Lead	194	5.5	mg/kg dry	27.69	147	168	75-125			M+
Selenium	34.7	5.5	mg/kg dry	55.37	ND	63	75-125			M-
Silver	11.6	0.56	mg/kg dry	13.84	ND	84	75-125			

Batch CL12914 - 7471A

Blank										
Mercury	ND	0.033	mg/kg wet							

LCS										
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CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Tidewater GH

ESS Laboratory Work Order: 1112428

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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3050B/6000/7000 Total Metals

Batch CL12914 - 7471A

Mercury	17.3	1.60	mg/kg wet	15.20		114	80-120			
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LCS Dup

Mercury	15.5	1.55	mg/kg wet	15.20		102	80-120	11	20	
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Duplicate Source: 1112428-01

Mercury	1.77	0.137	mg/kg dry		1.42			22	35	
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Matrix Spike Source: 1112428-01

Mercury	1.42	0.144	mg/kg dry	0.2180	1.42	0.3	75-125			M-
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5035/8260B Volatile Organic Compounds / Methanol

Batch CL12707 - 5035

Blank

1,1,1,2-Tetrachloroethane	ND	0.100	mg/kg wet							
1,1,1-Trichloroethane	ND	0.0500	mg/kg wet							
1,1,2,2-Tetrachloroethane	ND	0.0500	mg/kg wet							
1,1,2-Trichloroethane	ND	0.0500	mg/kg wet							
1,1-Dichloroethane	ND	0.0500	mg/kg wet							
1,1-Dichloroethene	ND	0.0500	mg/kg wet							
1,1-Dichloropropene	ND	0.0500	mg/kg wet							
1,2,3-Trichlorobenzene	ND	0.0500	mg/kg wet							
1,2,3-Trichloropropane	ND	0.0500	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.0500	mg/kg wet							
1,2,4-Trimethylbenzene	ND	0.0500	mg/kg wet							
1,2-Dibromo-3-Chloropropane	ND	0.300	mg/kg wet							
1,2-Dibromoethane	ND	0.0500	mg/kg wet							
1,2-Dichlorobenzene	ND	0.0500	mg/kg wet							
1,2-Dichloroethane	ND	0.0500	mg/kg wet							
1,2-Dichloropropane	ND	0.0500	mg/kg wet							
1,3,5-Trimethylbenzene	ND	0.0500	mg/kg wet							
1,3-Dichlorobenzene	ND	0.0500	mg/kg wet							
1,3-Dichloropropane	ND	0.0500	mg/kg wet							
1,4-Dichlorobenzene	ND	0.0500	mg/kg wet							
1,4-Dioxane - Screen	ND	5.00	mg/kg wet							
1-Chlorohexane	ND	0.0500	mg/kg wet							
2,2-Dichloropropane	ND	0.100	mg/kg wet							
2-Butanone	ND	1.25	mg/kg wet							
2-Chlorotoluene	ND	0.0500	mg/kg wet							
2-Hexanone	ND	0.500	mg/kg wet							
4-Chlorotoluene	ND	0.0500	mg/kg wet							
4-Isopropyltoluene	ND	0.0500	mg/kg wet							
4-Methyl-2-Pentanone	ND	0.500	mg/kg wet							
Acetone	ND	1.25	mg/kg wet							
Benzene	ND	0.0500	mg/kg wet							
Bromobenzene	ND	0.0500	mg/kg wet							
Bromochloromethane	ND	0.0500	mg/kg wet							



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Tidewater GH

ESS Laboratory Work Order: 1112428

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 CL12707 - 5035

Bromodichloromethane	ND	0.0500	mg/kg wet							
Bromoform	ND	0.0500	mg/kg wet							
Bromomethane	ND	0.100	mg/kg wet							
Carbon Disulfide	ND	0.0500	mg/kg wet							
Carbon Tetrachloride	ND	0.0500	mg/kg wet							
Chlorobenzene	ND	0.0500	mg/kg wet							
Chloroethane	ND	0.100	mg/kg wet							
Chloroform	ND	0.0500	mg/kg wet							
Chloromethane	ND	0.100	mg/kg wet							
cis-1,2-Dichloroethene	ND	0.0500	mg/kg wet							
cis-1,3-Dichloropropene	ND	0.0500	mg/kg wet							
Dibromochloromethane	ND	0.0500	mg/kg wet							
Dibromomethane	ND	0.0500	mg/kg wet							
Dichlorodifluoromethane	ND	0.0500	mg/kg wet							
Diethyl Ether	ND	0.0500	mg/kg wet							
Di-isopropyl ether	ND	0.0500	mg/kg wet							
Ethyl tertiary-butyl ether	ND	0.0500	mg/kg wet							
Ethylbenzene	ND	0.0500	mg/kg wet							
Hexachlorobutadiene	ND	0.0500	mg/kg wet							
Isopropylbenzene	ND	0.0500	mg/kg wet							
Methyl tert-Butyl Ether	ND	0.0500	mg/kg wet							
Methylene Chloride	ND	0.250	mg/kg wet							
Naphthalene	ND	0.0500	mg/kg wet							
n-Butylbenzene	ND	0.0500	mg/kg wet							
n-Propylbenzene	ND	0.0500	mg/kg wet							
sec-Butylbenzene	ND	0.0500	mg/kg wet							
Styrene	ND	0.0500	mg/kg wet							
tert-Butylbenzene	ND	0.0500	mg/kg wet							
Tertiary-amyl methyl ether	ND	0.0500	mg/kg wet							
Tetrachloroethene	ND	0.0500	mg/kg wet							
Tetrahydrofuran	ND	0.500	mg/kg wet							
Toluene	ND	0.0500	mg/kg wet							
trans-1,2-Dichloroethene	ND	0.0500	mg/kg wet							
trans-1,3-Dichloropropene	ND	0.0500	mg/kg wet							
Trichloroethene	ND	0.0500	mg/kg wet							
Vinyl Acetate	ND	0.250	mg/kg wet							
Vinyl Chloride	ND	0.0500	mg/kg wet							
Xylene O	ND	0.0500	mg/kg wet							
Xylene P,M	ND	0.100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	2.09		mg/kg wet	2.500		84	70-130			
Surrogate: 4-Bromofluorobenzene	2.02		mg/kg wet	2.500		81	70-130			
Surrogate: Dibromofluoromethane	2.01		mg/kg wet	2.500		80	70-130			
Surrogate: Toluene-d8	2.03		mg/kg wet	2.500		81	70-130			

LCS

1,1,1,2-Tetrachloroethane	2.30	0.100	mg/kg wet	2.500		92	70-130			
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CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Tidewater GH

ESS Laboratory Work Order: 1112428

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 CL12707 - 5035

1,1,1-Trichloroethane	2.29	0.0500	mg/kg wet	2.500		91	70-130			
1,1,2,2-Tetrachloroethane	2.40	0.0500	mg/kg wet	2.500		96	70-130			
1,1,2-Trichloroethane	2.23	0.0500	mg/kg wet	2.500		89	70-130			
1,1-Dichloroethane	2.13	0.0500	mg/kg wet	2.500		85	70-130			
1,1-Dichloroethene	2.30	0.0500	mg/kg wet	2.500		92	70-130			
1,1-Dichloropropene	2.43	0.0500	mg/kg wet	2.500		97	70-130			
1,2,3-Trichlorobenzene	2.32	0.0500	mg/kg wet	2.500		93	70-130			
1,2,3-Trichloropropane	2.44	0.0500	mg/kg wet	2.500		97	70-130			
1,2,4-Trichlorobenzene	2.30	0.0500	mg/kg wet	2.500		92	70-130			
1,2,4-Trimethylbenzene	2.19	0.0500	mg/kg wet	2.500		87	70-130			
1,2-Dibromo-3-Chloropropane	2.58	0.300	mg/kg wet	2.500		103	70-130			
1,2-Dibromoethane	2.37	0.0500	mg/kg wet	2.500		95	70-130			
1,2-Dichlorobenzene	2.16	0.0500	mg/kg wet	2.500		86	70-130			
1,2-Dichloroethane	2.44	0.0500	mg/kg wet	2.500		98	70-130			
1,2-Dichloropropane	2.24	0.0500	mg/kg wet	2.500		90	70-130			
1,3,5-Trimethylbenzene	2.22	0.0500	mg/kg wet	2.500		89	70-130			
1,3-Dichlorobenzene	2.20	0.0500	mg/kg wet	2.500		88	70-130			
1,3-Dichloropropane	2.27	0.0500	mg/kg wet	2.500		91	70-130			
1,4-Dichlorobenzene	2.13	0.0500	mg/kg wet	2.500		85	70-130			
1,4-Dioxane - Screen	61.1	5.00	mg/kg wet	50.00		122	44-241			
1-Chlorohexane	2.46	0.0500	mg/kg wet	2.500		99	70-130			
2,2-Dichloropropane	2.36	0.100	mg/kg wet	2.500		95	70-130			
2-Butanone	13.5	1.25	mg/kg wet	12.50		108	70-130			
2-Chlorotoluene	2.21	0.0500	mg/kg wet	2.500		89	70-130			
2-Hexanone	11.4	0.500	mg/kg wet	12.50		91	70-130			
4-Chlorotoluene	2.12	0.0500	mg/kg wet	2.500		85	70-130			
4-Isopropyltoluene	2.08	0.0500	mg/kg wet	2.500		83	70-130			
4-Methyl-2-Pentanone	11.5	0.500	mg/kg wet	12.50		92	70-130			
Acetone	11.5	1.25	mg/kg wet	12.50		92	70-130			
Benzene	2.24	0.0500	mg/kg wet	2.500		90	70-130			
Bromobenzene	2.27	0.0500	mg/kg wet	2.500		91	70-130			
Bromochloromethane	1.99	0.0500	mg/kg wet	2.500		80	70-130			
Bromodichloromethane	2.34	0.0500	mg/kg wet	2.500		94	70-130			
Bromoform	2.45	0.0500	mg/kg wet	2.500		98	70-130			
Bromomethane	2.74	0.100	mg/kg wet	2.500		110	70-130			
Carbon Disulfide	2.25	0.0500	mg/kg wet	2.500		90	70-130			
Carbon Tetrachloride	2.40	0.0500	mg/kg wet	2.500		96	70-130			
Chlorobenzene	2.22	0.0500	mg/kg wet	2.500		89	70-130			
Chloroethane	2.44	0.100	mg/kg wet	2.500		98	70-130			
Chloroform	2.20	0.0500	mg/kg wet	2.500		88	70-130			
Chloromethane	1.90	0.100	mg/kg wet	2.500		76	70-130			
cis-1,2-Dichloroethene	2.37	0.0500	mg/kg wet	2.500		95	70-130			
cis-1,3-Dichloropropene	2.44	0.0500	mg/kg wet	2.500		98	70-130			
Dibromochloromethane	2.43	0.0500	mg/kg wet	2.500		97	70-130			
Dibromomethane	2.21	0.0500	mg/kg wet	2.500		88	70-130			



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Tidewater GH

ESS Laboratory Work Order: 1112428

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 CL12707 - 5035

Dichlorodifluoromethane	1.81	0.0500	mg/kg wet	2.500		72	70-130			
Diethyl Ether	2.54	0.0500	mg/kg wet	2.500		101	70-130			
Di-isopropyl ether	2.36	0.0500	mg/kg wet	2.500		94	70-130			
Ethyl tertiary-butyl ether	2.37	0.0500	mg/kg wet	2.500		95	70-130			
Ethylbenzene	2.22	0.0500	mg/kg wet	2.500		89	70-130			
Hexachlorobutadiene	2.57	0.0500	mg/kg wet	2.500		103	70-130			
Isopropylbenzene	1.92	0.0500	mg/kg wet	2.500		77	70-130			
Methyl tert-Butyl Ether	2.52	0.0500	mg/kg wet	2.500		101	70-130			
Methylene Chloride	2.37	0.250	mg/kg wet	2.500		95	70-130			
Naphthalene	2.92	0.0500	mg/kg wet	2.500		117	70-130			
n-Butylbenzene	2.28	0.0500	mg/kg wet	2.500		91	70-130			
n-Propylbenzene	2.22	0.0500	mg/kg wet	2.500		89	70-130			
sec-Butylbenzene	2.21	0.0500	mg/kg wet	2.500		88	70-130			
Styrene	2.22	0.0500	mg/kg wet	2.500		89	70-130			
tert-Butylbenzene	2.28	0.0500	mg/kg wet	2.500		91	70-130			
Tertiary-amyl methyl ether	2.37	0.0500	mg/kg wet	2.500		95	70-130			
Tetrachloroethene	2.02	0.0500	mg/kg wet	2.500		81	70-130			
Tetrahydrofuran	2.58	0.500	mg/kg wet	2.500		103	70-130			
Toluene	2.30	0.0500	mg/kg wet	2.500		92	70-130			
trans-1,2-Dichloroethene	2.41	0.0500	mg/kg wet	2.500		96	70-130			
trans-1,3-Dichloropropene	2.30	0.0500	mg/kg wet	2.500		92	70-130			
Trichloroethene	2.19	0.0500	mg/kg wet	2.500		88	70-130			
Vinyl Acetate	2.60	0.250	mg/kg wet	2.500		104	70-130			
Vinyl Chloride	2.28	0.0500	mg/kg wet	2.500		91	70-130			
Xylene O	2.21	0.0500	mg/kg wet	2.500		88	70-130			
Xylene P,M	4.45	0.100	mg/kg wet	5.000		89	70-130			
Surrogate: 1,2-Dichloroethane-d4	2.12		mg/kg wet	2.500		85	70-130			
Surrogate: 4-Bromofluorobenzene	2.01		mg/kg wet	2.500		80	70-130			
Surrogate: Dibromofluoromethane	1.94		mg/kg wet	2.500		77	70-130			
Surrogate: Toluene-d8	2.01		mg/kg wet	2.500		80	70-130			

LCS Dup

1,1,1,2-Tetrachloroethane	2.37	0.100	mg/kg wet	2.500		95	70-130	3	25	
1,1,1-Trichloroethane	2.35	0.0500	mg/kg wet	2.500		94	70-130	3	25	
1,1,2,2-Tetrachloroethane	2.41	0.0500	mg/kg wet	2.500		96	70-130	0.2	25	
1,1,2-Trichloroethane	2.28	0.0500	mg/kg wet	2.500		91	70-130	2	25	
1,1-Dichloroethane	2.20	0.0500	mg/kg wet	2.500		88	70-130	3	25	
1,1-Dichloroethene	2.38	0.0500	mg/kg wet	2.500		95	70-130	3	25	
1,1-Dichloropropene	2.40	0.0500	mg/kg wet	2.500		96	70-130	1	25	
1,2,3-Trichlorobenzene	2.36	0.0500	mg/kg wet	2.500		95	70-130	2	25	
1,2,3-Trichloropropane	2.32	0.0500	mg/kg wet	2.500		93	70-130	5	25	
1,2,4-Trichlorobenzene	2.35	0.0500	mg/kg wet	2.500		94	70-130	2	25	
1,2,4-Trimethylbenzene	2.24	0.0500	mg/kg wet	2.500		90	70-130	3	25	
1,2-Dibromo-3-Chloropropane	2.38	0.300	mg/kg wet	2.500		95	70-130	8	25	
1,2-Dibromoethane	2.42	0.0500	mg/kg wet	2.500		97	70-130	2	25	
1,2-Dichlorobenzene	2.20	0.0500	mg/kg wet	2.500		88	70-130	2	25	



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Tidewater GH

ESS Laboratory Work Order: 1112428

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 CL12707 - 5035

1,2-Dichloroethane	2.50	0.0500	mg/kg wet	2.500		100	70-130	3	25	
1,2-Dichloropropane	2.31	0.0500	mg/kg wet	2.500		92	70-130	3	25	
1,3,5-Trimethylbenzene	2.29	0.0500	mg/kg wet	2.500		92	70-130	3	25	
1,3-Dichlorobenzene	2.25	0.0500	mg/kg wet	2.500		90	70-130	2	25	
1,3-Dichloropropane	2.32	0.0500	mg/kg wet	2.500		93	70-130	2	25	
1,4-Dichlorobenzene	2.20	0.0500	mg/kg wet	2.500		88	70-130	4	25	
1,4-Dioxane - Screen	59.8	5.00	mg/kg wet	50.00		120	44-241	2	200	
1-Chlorohexane	2.55	0.0500	mg/kg wet	2.500		102	70-130	4	25	
2,2-Dichloropropane	2.44	0.100	mg/kg wet	2.500		97	70-130	3	25	
2-Butanone	13.3	1.25	mg/kg wet	12.50		106	70-130	2	25	
2-Chlorotoluene	2.32	0.0500	mg/kg wet	2.500		93	70-130	5	25	
2-Hexanone	11.4	0.500	mg/kg wet	12.50		91	70-130	0.02	25	
4-Chlorotoluene	2.15	0.0500	mg/kg wet	2.500		86	70-130	2	25	
4-Isopropyltoluene	2.15	0.0500	mg/kg wet	2.500		86	70-130	3	25	
4-Methyl-2-Pentanone	11.5	0.500	mg/kg wet	12.50		92	70-130	0.1	25	
Acetone	11.9	1.25	mg/kg wet	12.50		96	70-130	4	25	
Benzene	2.33	0.0500	mg/kg wet	2.500		93	70-130	4	25	
Bromobenzene	2.36	0.0500	mg/kg wet	2.500		95	70-130	4	25	
Bromochloromethane	2.04	0.0500	mg/kg wet	2.500		82	70-130	2	25	
Bromodichloromethane	2.40	0.0500	mg/kg wet	2.500		96	70-130	2	25	
Bromoform	2.51	0.0500	mg/kg wet	2.500		100	70-130	2	25	
Bromomethane	3.02	0.100	mg/kg wet	2.500		121	70-130	10	25	
Carbon Disulfide	2.32	0.0500	mg/kg wet	2.500		93	70-130	3	25	
Carbon Tetrachloride	2.49	0.0500	mg/kg wet	2.500		99	70-130	4	25	
Chlorobenzene	2.30	0.0500	mg/kg wet	2.500		92	70-130	4	25	
Chloroethane	2.53	0.100	mg/kg wet	2.500		101	70-130	4	25	
Chloroform	2.24	0.0500	mg/kg wet	2.500		89	70-130	2	25	
Chloromethane	1.92	0.100	mg/kg wet	2.500		77	70-130	0.9	25	
cis-1,2-Dichloroethene	2.44	0.0500	mg/kg wet	2.500		97	70-130	3	25	
cis-1,3-Dichloropropene	2.46	0.0500	mg/kg wet	2.500		98	70-130	0.4	25	
Dibromochloromethane	2.48	0.0500	mg/kg wet	2.500		99	70-130	2	25	
Dibromomethane	2.24	0.0500	mg/kg wet	2.500		90	70-130	1	25	
Dichlorodifluoromethane	1.90	0.0500	mg/kg wet	2.500		76	70-130	5	25	
Diethyl Ether	2.63	0.0500	mg/kg wet	2.500		105	70-130	3	25	
Di-isopropyl ether	2.40	0.0500	mg/kg wet	2.500		96	70-130	2	25	
Ethyl tertiary-butyl ether	2.43	0.0500	mg/kg wet	2.500		97	70-130	2	25	
Ethylbenzene	2.29	0.0500	mg/kg wet	2.500		92	70-130	3	25	
Hexachlorobutadiene	2.70	0.0500	mg/kg wet	2.500		108	70-130	5	25	
Isopropylbenzene	1.98	0.0500	mg/kg wet	2.500		79	70-130	3	25	
Methyl tert-Butyl Ether	2.56	0.0500	mg/kg wet	2.500		102	70-130	1	25	
Methylene Chloride	2.42	0.250	mg/kg wet	2.500		97	70-130	2	25	
Naphthalene	2.90	0.0500	mg/kg wet	2.500		116	70-130	0.9	25	
n-Butylbenzene	2.32	0.0500	mg/kg wet	2.500		93	70-130	2	25	
n-Propylbenzene	2.25	0.0500	mg/kg wet	2.500		90	70-130	2	25	
sec-Butylbenzene	2.27	0.0500	mg/kg wet	2.500		91	70-130	3	25	



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Tidewater GH

ESS Laboratory Work Order: 1112428

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 CL12707 - 5035

Styrene	2.30	0.0500	mg/kg wet	2.500		92	70-130	3	25	
tert-Butylbenzene	2.37	0.0500	mg/kg wet	2.500		95	70-130	4	25	
Tertiary-amyl methyl ether	2.38	0.0500	mg/kg wet	2.500		95	70-130	0.4	25	
Tetrachloroethene	2.11	0.0500	mg/kg wet	2.500		85	70-130	4	25	
Tetrahydrofuran	2.52	0.500	mg/kg wet	2.500		101	70-130	2	25	
Toluene	2.36	0.0500	mg/kg wet	2.500		94	70-130	3	25	
trans-1,2-Dichloroethene	2.46	0.0500	mg/kg wet	2.500		98	70-130	2	25	
trans-1,3-Dichloropropene	2.34	0.0500	mg/kg wet	2.500		93	70-130	1	25	
Trichloroethene	2.18	0.0500	mg/kg wet	2.500		87	70-130	0.4	25	
Vinyl Acetate	2.63	0.250	mg/kg wet	2.500		105	70-130	1	25	
Vinyl Chloride	2.38	0.0500	mg/kg wet	2.500		95	70-130	5	25	
Xylene O	2.30	0.0500	mg/kg wet	2.500		92	70-130	4	25	
Xylene P,M	4.63	0.100	mg/kg wet	5.000		93	70-130	4	25	
Surrogate: 1,2-Dichloroethane-d4	2.15		mg/kg wet	2.500		86	70-130			
Surrogate: 4-Bromofluorobenzene	2.07		mg/kg wet	2.500		83	70-130			
Surrogate: Dibromofluoromethane	2.00		mg/kg wet	2.500		80	70-130			
Surrogate: Toluene-d8	2.10		mg/kg wet	2.500		84	70-130			

8082 Polychlorinated Biphenyls (PCB)

Batch CA20407 - 3540

Blank										
Aroclor 1016	ND	0.0500	mg/kg wet							
Aroclor 1221	ND	0.0500	mg/kg wet							
Aroclor 1232	ND	0.0500	mg/kg wet							
Aroclor 1242	ND	0.0500	mg/kg wet							
Aroclor 1248	ND	0.0500	mg/kg wet							
Aroclor 1254	ND	0.0500	mg/kg wet							
Aroclor 1260	ND	0.0500	mg/kg wet							
Aroclor 1262	ND	0.0500	mg/kg wet							
Aroclor 1268	ND	0.0500	mg/kg wet							

Surrogate: Decachlorobiphenyl	0.0216		mg/kg wet	0.02500		86	30-150			
Surrogate: Decachlorobiphenyl [2C]	0.0206		mg/kg wet	0.02500		83	30-150			
Surrogate: Tetrachloro-m-xylene	0.0190		mg/kg wet	0.02500		76	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	0.0219		mg/kg wet	0.02500		88	30-150			

LCS										
Aroclor 1016	0.460	0.0500	mg/kg wet	0.5000		92	40-140			
Aroclor 1260	0.429	0.0500	mg/kg wet	0.5000		86	40-140			

Surrogate: Decachlorobiphenyl	0.0204		mg/kg wet	0.02500		82	30-150			
Surrogate: Decachlorobiphenyl [2C]	0.0199		mg/kg wet	0.02500		80	30-150			
Surrogate: Tetrachloro-m-xylene	0.0201		mg/kg wet	0.02500		80	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	0.0216		mg/kg wet	0.02500		86	30-150			

LCS Dup										
Aroclor 1016	0.354	0.0500	mg/kg wet	0.5000		71	40-140	26	50	



CERTIFICATE OF ANALYSIS

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Quality Control Data

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8082 Polychlorinated Biphenyls (PCB)

Batch CA20407 - 3540

Aroclor 1260	0.334	0.0500	mg/kg wet	0.5000		67	40-140	25	50	
Surrogate: Decachlorobiphenyl	0.0176		mg/kg wet	0.02500		70	30-150			
Surrogate: Decachlorobiphenyl [2C]	0.0169		mg/kg wet	0.02500		68	30-150			
Surrogate: Tetrachloro-m-xylene	0.0152		mg/kg wet	0.02500		61	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	0.0162		mg/kg wet	0.02500		65	30-150			

Matrix Spike Source: 1112428-01

Aroclor 1016	0.434	0.0573	mg/kg dry	0.5728	ND	76	40-140			
Aroclor 1260	0.327	0.0573	mg/kg dry	0.5728	ND	57	40-140			
Surrogate: Decachlorobiphenyl	0.0161		mg/kg dry	0.02864		56	30-150			
Surrogate: Decachlorobiphenyl [2C]	0.0188		mg/kg dry	0.02864		66	30-150			
Surrogate: Tetrachloro-m-xylene	0.0194		mg/kg dry	0.02864		68	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	0.0209		mg/kg dry	0.02864		73	30-150			

Matrix Spike Dup Source: 1112428-01

Aroclor 1016	0.483	0.0559	mg/kg dry	0.5590	ND	86	40-140	11	50	
Aroclor 1260	0.383	0.0559	mg/kg dry	0.5590	ND	68	40-140	16	50	
Surrogate: Decachlorobiphenyl	0.0188		mg/kg dry	0.02795		67	30-150			
Surrogate: Decachlorobiphenyl [2C]	0.0199		mg/kg dry	0.02795		71	30-150			
Surrogate: Tetrachloro-m-xylene	0.0221		mg/kg dry	0.02795		79	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	0.0252		mg/kg dry	0.02795		90	30-150			

8100M Total Petroleum Hydrocarbons

Batch CL12924 - 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	4.36		mg/kg wet	5.000		87	40-140			
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LCS										
Decane (C10)	1.7	0.2	mg/kg wet	2.500		67	40-140			
Docosane (C22)	2.0	0.2	mg/kg wet	2.500		78	40-140			



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8100M Total Petroleum Hydrocarbons

Batch CL12924 - 3546

Dodecane (C12)	1.9	0.2	mg/kg wet	2.500		77	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		78	40-140			
Hexadecane (C16)	1.9	0.2	mg/kg wet	2.500		78	40-140			
Nonadecane (C19)	2.0	0.2	mg/kg wet	2.500		78	40-140			
Nonane (C9)	1.4	0.2	mg/kg wet	2.500		55	30-140			
Octacosane (C28)	2.0	0.2	mg/kg wet	2.500		78	40-140			
Octadecane (C18)	2.0	0.2	mg/kg wet	2.500		78	40-140			
Tetracosane (C24)	2.0	0.2	mg/kg wet	2.500		78	40-140			
Tetradecane (C14)	1.9	0.2	mg/kg wet	2.500		77	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			

Surrogate: O-Terphenyl	3.80		mg/kg wet	5.000		76	40-140			
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LCS Dup

Decane (C10)	1.7	0.2	mg/kg wet	2.500		67	40-140	0.2	50	
Docosane (C22)	2.0	0.2	mg/kg wet	2.500		80	40-140	3	50	
Dodecane (C12)	2.0	0.2	mg/kg wet	2.500		79	40-140	3	50	
Eicosane (C20)	2.0	0.2	mg/kg wet	2.500		80	40-140	3	50	
Hexacosane (C26)	2.0	0.2	mg/kg wet	2.500		80	40-140	3	50	
Hexadecane (C16)	2.0	0.2	mg/kg wet	2.500		80	40-140	3	50	
Nonadecane (C19)	2.0	0.2	mg/kg wet	2.500		80	40-140	3	50	
Nonane (C9)	1.4	0.2	mg/kg wet	2.500		54	30-140	3	50	
Octacosane (C28)	2.0	0.2	mg/kg wet	2.500		81	40-140	3	50	
Octadecane (C18)	2.0	0.2	mg/kg wet	2.500		80	40-140	3	50	
Tetracosane (C24)	2.0	0.2	mg/kg wet	2.500		81	40-140	3	50	
Tetradecane (C14)	2.0	0.2	mg/kg wet	2.500		79	40-140	2	50	
Total Petroleum Hydrocarbons	26.0	37.5	mg/kg wet	35.00		74	40-140	2	50	
Triacontane (C30)	2.0	0.2	mg/kg wet	2.500		81	40-140	3	50	

Surrogate: O-Terphenyl	3.86		mg/kg wet	5.000		77	40-140			
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8270C Semi-Volatile Organic Compounds

Batch CL12710 - 3546

Blank

1,1-Biphenyl	ND	0.333	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.333	mg/kg wet							
1,2-Dichlorobenzene	ND	0.333	mg/kg wet							
1,3-Dichlorobenzene	ND	0.333	mg/kg wet							
1,4-Dichlorobenzene	ND	0.333	mg/kg wet							
2,3,4,6-Tetrachlorophenol	ND	1.67	mg/kg wet							
2,4,5-Trichlorophenol	ND	0.333	mg/kg wet							
2,4,6-Trichlorophenol	ND	0.333	mg/kg wet							
2,4-Dichlorophenol	ND	0.333	mg/kg wet							
2,4-Dimethylphenol	ND	0.333	mg/kg wet							



CERTIFICATE OF ANALYSIS

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Quality Control Data

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8270C Semi-Volatile Organic Compounds

Batch CL12710 - 3546

2,4-Dinitrophenol	ND	1.67	mg/kg wet							
2,4-Dinitrotoluene	ND	0.333	mg/kg wet							
2,6-Dinitrotoluene	ND	0.333	mg/kg wet							
2-Chloronaphthalene	ND	0.333	mg/kg wet							
2-Chlorophenol	ND	0.333	mg/kg wet							
2-Methylnaphthalene	ND	0.333	mg/kg wet							
2-Methylphenol	ND	0.333	mg/kg wet							
2-Nitroaniline	ND	0.333	mg/kg wet							
2-Nitrophenol	ND	0.333	mg/kg wet							
3,3'-Dichlorobenzidine	ND	0.667	mg/kg wet							
3+4-Methylphenol	ND	0.667	mg/kg wet							
3-Nitroaniline	ND	0.333	mg/kg wet							
4,6-Dinitro-2-Methylphenol	ND	1.67	mg/kg wet							
4-Bromophenyl-phenylether	ND	0.333	mg/kg wet							
4-Chloro-3-Methylphenol	ND	0.333	mg/kg wet							
4-Chloroaniline	ND	0.667	mg/kg wet							
4-Chloro-phenyl-phenyl ether	ND	0.333	mg/kg wet							
4-Nitroaniline	ND	0.333	mg/kg wet							
4-Nitrophenol	ND	1.67	mg/kg wet							
Acenaphthene	ND	0.333	mg/kg wet							
Acenaphthylene	ND	0.333	mg/kg wet							
Acetophenone	ND	0.667	mg/kg wet							
Aniline	ND	0.667	mg/kg wet							
Anthracene	ND	0.333	mg/kg wet							
Azobenzene	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							
Benzoic Acid	ND	1.67	mg/kg wet							
Benzyl Alcohol	ND	0.333	mg/kg wet							
bis(2-Chloroethoxy)methane	ND	0.333	mg/kg wet							
bis(2-Chloroethyl)ether	ND	0.333	mg/kg wet							
bis(2-chloroisopropyl)Ether	ND	0.333	mg/kg wet							
bis(2-Ethylhexyl)phthalate	ND	0.333	mg/kg wet							
Butylbenzylphthalate	ND	0.333	mg/kg wet							
Carbazole	ND	0.333	mg/kg wet							
Chrysene	ND	0.167	mg/kg wet							
Dibenzo(a,h)Anthracene	ND	0.167	mg/kg wet							
Dibenzofuran	ND	0.333	mg/kg wet							
Diethylphthalate	ND	0.333	mg/kg wet							
Dimethylphthalate	ND	0.333	mg/kg wet							
Di-n-butylphthalate	ND	0.333	mg/kg wet							
Di-n-octylphthalate	ND	0.333	mg/kg wet							



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8270C Semi-Volatile Organic Compounds

Batch CL12710 - 3546

Fluoranthene	ND	0.333	mg/kg wet							
Fluorene	ND	0.333	mg/kg wet							
Hexachlorobenzene	ND	0.167	mg/kg wet							
Hexachlorobutadiene	ND	0.333	mg/kg wet							
Hexachlorocyclopentadiene	ND	1.67	mg/kg wet							
Hexachloroethane	ND	0.333	mg/kg wet							
Indeno(1,2,3-cd)Pyrene	ND	0.333	mg/kg wet							
Isophorone	ND	0.333	mg/kg wet							
Naphthalene	ND	0.333	mg/kg wet							
Nitrobenzene	ND	0.333	mg/kg wet							
N-Nitrosodimethylamine	ND	0.333	mg/kg wet							
N-Nitroso-Di-n-Propylamine	ND	0.333	mg/kg wet							
N-nitrosodiphenylamine	ND	0.333	mg/kg wet							
Pentachlorophenol	ND	1.67	mg/kg wet							
Phenanthrene	ND	0.333	mg/kg wet							
Phenol	ND	0.333	mg/kg wet							
Pyrene	ND	0.333	mg/kg wet							
Pyridine	ND	1.67	mg/kg wet							
Surrogate: 1,2-Dichlorobenzene-d4	2.92		mg/kg wet	3.333		88	30-130			
Surrogate: 2,4,6-Tribromophenol	4.82		mg/kg wet	5.000		96	30-130			
Surrogate: 2-Chlorophenol-d4	4.60		mg/kg wet	5.000		92	30-130			
Surrogate: 2-Fluorobiphenyl	3.39		mg/kg wet	3.333		102	30-130			
Surrogate: 2-Fluorophenol	4.62		mg/kg wet	5.000		92	30-130			
Surrogate: Nitrobenzene-d5	3.03		mg/kg wet	3.333		91	30-130			
Surrogate: Phenol-d6	4.46		mg/kg wet	5.000		89	30-130			
Surrogate: p-Terphenyl-d14	5.36		mg/kg wet	3.333		161	30-130			S+

LCS

1,1-Biphenyl	2.80	0.333	mg/kg wet	3.333		84	40-140			
1,2,4-Trichlorobenzene	2.50	0.333	mg/kg wet	3.333		75	40-140			
1,2-Dichlorobenzene	2.60	0.333	mg/kg wet	3.333		78	40-140			
1,3-Dichlorobenzene	2.54	0.333	mg/kg wet	3.333		76	40-140			
1,4-Dichlorobenzene	2.59	0.333	mg/kg wet	3.333		78	40-140			
2,3,4,6-Tetrachlorophenol	2.95	1.67	mg/kg wet	3.333		88	30-130			
2,4,5-Trichlorophenol	3.25	0.333	mg/kg wet	3.333		97	30-130			
2,4,6-Trichlorophenol	3.07	0.333	mg/kg wet	3.333		92	30-130			
2,4-Dichlorophenol	3.19	0.333	mg/kg wet	3.333		96	30-130			
2,4-Dimethylphenol	2.99	0.333	mg/kg wet	3.333		90	30-130			
2,4-Dinitrophenol	3.08	1.67	mg/kg wet	3.333		92	30-130			
2,4-Dinitrotoluene	3.27	0.333	mg/kg wet	3.333		98	40-140			
2,6-Dinitrotoluene	3.15	0.333	mg/kg wet	3.333		95	40-140			
2-Chloronaphthalene	2.38	0.333	mg/kg wet	3.333		71	40-140			
2-Chlorophenol	2.89	0.333	mg/kg wet	3.333		87	30-130			
2-Methylnaphthalene	2.92	0.333	mg/kg wet	3.333		88	40-140			
2-Methylphenol	2.95	0.333	mg/kg wet	3.333		89	30-130			
2-Nitroaniline	2.30	0.333	mg/kg wet	3.333		69	40-140			



CERTIFICATE OF ANALYSIS

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8270C Semi-Volatile Organic Compounds

Batch CL12710 - 3546

2-Nitrophenol	3.01	0.333	mg/kg wet	3.333		90	30-130			
3,3'-Dichlorobenzidine	2.53	0.667	mg/kg wet	3.333		76	40-140			
3+4-Methylphenol	6.06	0.667	mg/kg wet	6.667		91	30-130			
3-Nitroaniline	2.94	0.333	mg/kg wet	3.333		88	40-140			
4,6-Dinitro-2-Methylphenol	3.39	1.67	mg/kg wet	3.333		102	30-130			
4-Bromophenyl-phenylether	3.26	0.333	mg/kg wet	3.333		98	40-140			
4-Chloro-3-Methylphenol	3.26	0.333	mg/kg wet	3.333		98	30-130			
4-Chloroaniline	2.26	0.667	mg/kg wet	3.333		68	40-140			
4-Chloro-phenyl-phenyl ether	2.82	0.333	mg/kg wet	3.333		85	40-140			
4-Nitroaniline	3.15	0.333	mg/kg wet	3.333		95	40-140			
4-Nitrophenol	4.46	1.67	mg/kg wet	3.333		134	30-130			B+
Acenaphthene	2.72	0.333	mg/kg wet	3.333		81	40-140			
Acenaphthylene	2.69	0.333	mg/kg wet	3.333		81	40-140			
Acetophenone	2.74	0.667	mg/kg wet	3.333		82	40-140			
Aniline	2.22	0.667	mg/kg wet	3.333		67	40-140			
Anthracene	3.20	0.333	mg/kg wet	3.333		96	40-140			
Azobenzene	2.82	0.333	mg/kg wet	3.333		85	40-140			
Benzo(a)anthracene	2.81	0.333	mg/kg wet	3.333		84	40-140			
Benzo(a)pyrene	3.11	0.167	mg/kg wet	3.333		93	40-140			
Benzo(b)fluoranthene	3.38	0.333	mg/kg wet	3.333		101	40-140			
Benzo(g,h,i)perylene	3.10	0.333	mg/kg wet	3.333		93	40-140			
Benzo(k)fluoranthene	3.02	0.333	mg/kg wet	3.333		91	40-140			
Benzoic Acid	2.35	1.67	mg/kg wet	3.333		70	40-140			
Benzyl Alcohol	1.94	0.333	mg/kg wet	3.333		58	40-140			
bis(2-Chloroethoxy)methane	2.91	0.333	mg/kg wet	3.333		87	40-140			
bis(2-Chloroethyl)ether	2.70	0.333	mg/kg wet	3.333		81	40-140			
bis(2-chloroisopropyl)Ether	2.65	0.333	mg/kg wet	3.333		80	40-140			
bis(2-Ethylhexyl)phthalate	2.89	0.333	mg/kg wet	3.333		87	40-140			
Butylbenzylphthalate	2.70	0.333	mg/kg wet	3.333		81	40-140			
Carbazole	3.51	0.333	mg/kg wet	3.333		105	40-140			
Chrysene	2.65	0.167	mg/kg wet	3.333		79	40-140			
Dibenzo(a,h)Anthracene	3.01	0.167	mg/kg wet	3.333		90	40-140			
Dibenzofuran	3.04	0.333	mg/kg wet	3.333		91	40-140			
Diethylphthalate	2.94	0.333	mg/kg wet	3.333		88	40-140			
Dimethylphthalate	2.86	0.333	mg/kg wet	3.333		86	40-140			
Di-n-butylphthalate	3.14	0.333	mg/kg wet	3.333		94	40-140			
Di-n-octylphthalate	2.89	0.333	mg/kg wet	3.333		87	40-140			
Fluoranthene	3.73	0.333	mg/kg wet	3.333		112	40-140			
Fluorene	2.90	0.333	mg/kg wet	3.333		87	40-140			
Hexachlorobenzene	3.47	0.167	mg/kg wet	3.333		104	40-140			
Hexachlorobutadiene	2.69	0.333	mg/kg wet	3.333		81	40-140			
Hexachlorocyclopentadiene	2.09	1.67	mg/kg wet	3.333		63	40-140			
Hexachloroethane	2.76	0.333	mg/kg wet	3.333		83	40-140			
Indeno(1,2,3-cd)Pyrene	2.95	0.333	mg/kg wet	3.333		89	40-140			
Isophorone	2.33	0.333	mg/kg wet	3.333		70	40-140			



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Tidewater GH

ESS Laboratory Work Order: 1112428

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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8270C Semi-Volatile Organic Compounds

Batch CL12710 - 3546

Naphthalene	2.71	0.333	mg/kg wet	3.333		81	40-140			
Nitrobenzene	2.84	0.333	mg/kg wet	3.333		85	40-140			
N-Nitrosodimethylamine	2.14	0.333	mg/kg wet	3.333		64	40-140			
N-Nitroso-Di-n-Propylamine	2.72	0.333	mg/kg wet	3.333		82	40-140			
N-nitrosodiphenylamine	3.13	0.333	mg/kg wet	3.333		94	40-140			
Pentachlorophenol	3.94	1.67	mg/kg wet	3.333		118	30-130			
Phenanthrene	3.10	0.333	mg/kg wet	3.333		93	40-140			
Phenol	2.38	0.333	mg/kg wet	3.333		72	30-130			
Pyrene	2.72	0.333	mg/kg wet	3.333		82	40-140			
Pyridine	1.71	1.67	mg/kg wet	3.333		51	40-140			
Surrogate: 1,2-Dichlorobenzene-d4	2.74		mg/kg wet	3.333		82	30-130			
Surrogate: 2,4,6-Tribromophenol	5.79		mg/kg wet	5.000		116	30-130			
Surrogate: 2-Chlorophenol-d4	4.39		mg/kg wet	5.000		88	30-130			
Surrogate: 2-Fluorobiphenyl	2.91		mg/kg wet	3.333		87	30-130			
Surrogate: 2-Fluorophenol	4.22		mg/kg wet	5.000		84	30-130			
Surrogate: Nitrobenzene-d5	2.85		mg/kg wet	3.333		85	30-130			
Surrogate: Phenol-d6	4.40		mg/kg wet	5.000		88	30-130			
Surrogate: p-Terphenyl-d14	3.38		mg/kg wet	3.333		101	30-130			

LCS Dup

1,1-Biphenyl	3.02	0.333	mg/kg wet	3.333		91	40-140	7	30	
1,2,4-Trichlorobenzene	2.56	0.333	mg/kg wet	3.333		77	40-140	3	30	
1,2-Dichlorobenzene	2.62	0.333	mg/kg wet	3.333		79	40-140	0.6	30	
1,3-Dichlorobenzene	2.61	0.333	mg/kg wet	3.333		78	40-140	3	30	
1,4-Dichlorobenzene	2.61	0.333	mg/kg wet	3.333		78	40-140	0.9	30	
2,3,4,6-Tetrachlorophenol	3.02	1.67	mg/kg wet	3.333		91	30-130	2	30	
2,4,5-Trichlorophenol	3.44	0.333	mg/kg wet	3.333		103	30-130	6	30	
2,4,6-Trichlorophenol	3.24	0.333	mg/kg wet	3.333		97	30-130	5	30	
2,4-Dichlorophenol	3.18	0.333	mg/kg wet	3.333		96	30-130	0.3	30	
2,4-Dimethylphenol	3.11	0.333	mg/kg wet	3.333		93	30-130	4	30	
2,4-Dinitrophenol	3.05	1.67	mg/kg wet	3.333		92	30-130	0.8	30	
2,4-Dinitrotoluene	3.37	0.333	mg/kg wet	3.333		101	40-140	3	30	
2,6-Dinitrotoluene	3.39	0.333	mg/kg wet	3.333		102	40-140	7	30	
2-Chloronaphthalene	2.63	0.333	mg/kg wet	3.333		79	40-140	10	30	
2-Chlorophenol	2.93	0.333	mg/kg wet	3.333		88	30-130	1	30	
2-Methylnaphthalene	2.95	0.333	mg/kg wet	3.333		89	40-140	1	30	
2-Methylphenol	2.95	0.333	mg/kg wet	3.333		89	30-130	0.02	30	
2-Nitroaniline	2.46	0.333	mg/kg wet	3.333		74	40-140	7	30	
2-Nitrophenol	3.10	0.333	mg/kg wet	3.333		93	30-130	3	30	
3,3'-Dichlorobenzidine	2.76	0.667	mg/kg wet	3.333		83	40-140	9	30	
3+4-Methylphenol	6.00	0.667	mg/kg wet	6.667		90	30-130	1	30	
3-Nitroaniline	3.09	0.333	mg/kg wet	3.333		93	40-140	5	30	
4,6-Dinitro-2-Methylphenol	3.61	1.67	mg/kg wet	3.333		108	30-130	6	30	
4-Bromophenyl-phenylether	3.57	0.333	mg/kg wet	3.333		107	40-140	9	30	
4-Chloro-3-Methylphenol	3.19	0.333	mg/kg wet	3.333		96	30-130	2	30	
4-Chloroaniline	2.32	0.667	mg/kg wet	3.333		70	40-140	3	30	



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Tidewater GH

ESS Laboratory Work Order: 1112428

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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8270C Semi-Volatile Organic Compounds

Batch CL12710 - 3546

4-Chloro-phenyl-phenyl ether	2.99	0.333	mg/kg wet	3.333		90	40-140	6	30	
4-Nitroaniline	3.53	0.333	mg/kg wet	3.333		106	40-140	11	30	
4-Nitrophenol	4.57	1.67	mg/kg wet	3.333		137	30-130	3	30	B+
Acenaphthene	2.88	0.333	mg/kg wet	3.333		87	40-140	6	30	
Acenaphthylene	2.90	0.333	mg/kg wet	3.333		87	40-140	8	30	
Acetophenone	2.79	0.667	mg/kg wet	3.333		84	40-140	2	30	
Aniline	1.99	0.667	mg/kg wet	3.333		60	40-140	11	30	
Anthracene	3.52	0.333	mg/kg wet	3.333		105	40-140	9	30	
Azobenzene	3.27	0.333	mg/kg wet	3.333		98	40-140	15	30	
Benzo(a)anthracene	3.31	0.333	mg/kg wet	3.333		99	40-140	16	30	
Benzo(a)pyrene	3.46	0.167	mg/kg wet	3.333		104	40-140	11	30	
Benzo(b)fluoranthene	3.41	0.333	mg/kg wet	3.333		102	40-140	0.9	30	
Benzo(g,h,i)perylene	3.19	0.333	mg/kg wet	3.333		96	40-140	3	30	
Benzo(k)fluoranthene	3.77	0.333	mg/kg wet	3.333		113	40-140	22	30	
Benzoic Acid	2.37	1.67	mg/kg wet	3.333		71	40-140	0.8	30	
Benzyl Alcohol	1.93	0.333	mg/kg wet	3.333		58	40-140	0.3	30	
bis(2-Chloroethoxy)methane	2.95	0.333	mg/kg wet	3.333		89	40-140	2	30	
bis(2-Chloroethyl)ether	2.82	0.333	mg/kg wet	3.333		85	40-140	4	30	
bis(2-chloroisopropyl)Ether	2.70	0.333	mg/kg wet	3.333		81	40-140	2	30	
bis(2-Ethylhexyl)phthalate	3.43	0.333	mg/kg wet	3.333		103	40-140	17	30	
Butylbenzylphthalate	3.25	0.333	mg/kg wet	3.333		97	40-140	19	30	
Carbazole	3.71	0.333	mg/kg wet	3.333		111	40-140	5	30	
Chrysene	3.06	0.167	mg/kg wet	3.333		92	40-140	14	30	
Dibenzo(a,h)Anthracene	3.07	0.167	mg/kg wet	3.333		92	40-140	2	30	
Dibenzofuran	3.20	0.333	mg/kg wet	3.333		96	40-140	5	30	
Diethylphthalate	3.15	0.333	mg/kg wet	3.333		94	40-140	7	30	
Dimethylphthalate	2.92	0.333	mg/kg wet	3.333		88	40-140	2	30	
Di-n-butylphthalate	3.41	0.333	mg/kg wet	3.333		102	40-140	8	30	
Di-n-octylphthalate	3.23	0.333	mg/kg wet	3.333		97	40-140	11	30	
Fluoranthene	3.70	0.333	mg/kg wet	3.333		111	40-140	0.8	30	
Fluorene	2.99	0.333	mg/kg wet	3.333		90	40-140	3	30	
Hexachlorobenzene	3.91	0.167	mg/kg wet	3.333		117	40-140	12	30	
Hexachlorobutadiene	2.81	0.333	mg/kg wet	3.333		84	40-140	4	30	
Hexachlorocyclopentadiene	1.97	1.67	mg/kg wet	3.333		59	40-140	6	30	
Hexachloroethane	2.86	0.333	mg/kg wet	3.333		86	40-140	3	30	
Indeno(1,2,3-cd)Pyrene	3.05	0.333	mg/kg wet	3.333		92	40-140	3	30	
Isophorone	2.40	0.333	mg/kg wet	3.333		72	40-140	3	30	
Naphthalene	2.71	0.333	mg/kg wet	3.333		81	40-140	0.1	30	
Nitrobenzene	2.95	0.333	mg/kg wet	3.333		88	40-140	4	30	
N-Nitrosodimethylamine	2.90	0.333	mg/kg wet	3.333		87	40-140	30	30	
N-Nitroso-Di-n-Propylamine	2.66	0.333	mg/kg wet	3.333		80	40-140	2	30	
N-nitrosodiphenylamine	3.49	0.333	mg/kg wet	3.333		105	40-140	11	30	
Pentachlorophenol	4.00	1.67	mg/kg wet	3.333		120	30-130	2	30	
Phenanthrene	3.32	0.333	mg/kg wet	3.333		100	40-140	7	30	
Phenol	2.42	0.333	mg/kg wet	3.333		72	30-130	1	30	



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Tidewater GH

ESS Laboratory Work Order: 1112428

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270C Semi-Volatile Organic Compounds										
Batch CL12710 - 3546										
Pyrene	3.28	0.333	mg/kg wet	3.333		98	40-140	19	30	
Pyridine	2.30	1.67	mg/kg wet	3.333		69	40-140	29	30	
Surrogate: 1,2-Dichlorobenzene-d4	2.78		mg/kg wet	3.333		84	30-130			
Surrogate: 2,4,6-Tribromophenol	6.00		mg/kg wet	5.000		120	30-130			
Surrogate: 2-Chlorophenol-d4	4.46		mg/kg wet	5.000		89	30-130			
Surrogate: 2-Fluorobiphenyl	3.13		mg/kg wet	3.333		94	30-130			
Surrogate: 2-Fluorophenol	4.18		mg/kg wet	5.000		84	30-130			
Surrogate: Nitrobenzene-d5	2.93		mg/kg wet	3.333		88	30-130			
Surrogate: Phenol-d6	4.37		mg/kg wet	5.000		87	30-130			
Surrogate: p-Terphenyl-d14	3.86		mg/kg wet	3.333		116	30-130			
Classical Chemistry										
Batch CL12321 - General Preparation										
Duplicate Source: 1112428-01										
Corrosivity (pH)	2.59		S.U.		2.60			0.4	200	
Batch CL12917 - TCN Prep										
Blank										
Total Cyanide	ND	1.00	mg/kg wet							
LCS										
Total Cyanide	5.05	1.00	mg/kg wet	5.015		101	90-110			
LCS										
Total Cyanide	19.6	1.00	mg/kg wet	20.06		98	90-110			
LCS Dup										
Total Cyanide	19.6	1.00	mg/kg wet	20.06		98	90-110	0.2	20	
Duplicate Source: 1112428-01										
Total Cyanide	85.7	10.9	mg/kg dry		90.5			5	20	
Matrix Spike Source: 1112428-01										
Total Cyanide	177	11.1	mg/kg dry	11.16	90.5	776	75-125			M+



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Tidewater GH

ESS Laboratory Work Order: 1112428

Notes and Definitions

- Z-10 Soil pH measured in water at 19.6 °C.
- Z-08 See Attached
- U Analyte included in the analysis, but not detected
- S+ Surrogate recovery(ies) above upper control limit (S+).
- Q Calibration required quadratic regression (Q).
- M+ Matrix Spike recovery is above upper control limit (M+).
- M- Matrix Spike recovery is below lower control limit (M-).
- IM Internal Standard(s) outside of criteria due to matrix (UCM/coelution is present) (IM).
- D Diluted.
- B+ Blank Spike recovery is above upper control limit (B+).
- B- Blank Spike recovery is below lower control limit (B-).
- 4 Voa sample was preserved in house.
- 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



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Tidewater GH

ESS Laboratory Work Order: 1112428

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Department of Defense (DoD) Environmental Laboratory Accreditation Program (ELAP)

A2LA Accredited: Testing Cert# 2864.01

<http://www.a2la.org/scopepdf/2864-01.pdf>

Rhode Island Potable and Non Potable Water: LAI00179

<http://www.health.ri.gov/labs/waterlabs-instate.php>

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750

http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/out_state.pdf

Maine Potable and Non Potable Water: RI0002

http://www.maine.gov/dep/blwq/topic/vessel/lab_list.pdf

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://www4.egov.nh.gov/des/nhelap/namesearch.asp>

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313

<http://www.wadsworth.org/labcert/elap/comm.html>

United States Department of Agriculture Soil Permit: S-54210

Maryland Potable Water: 301

http://www.mde.state.md.us/assets/document/WSP_labs-2009apr20.pdf

CHEMISTRY

A2LA Accredited: Testing Cert # 2864.01

Lead in Paint, Phthalates, Lead in Children's Metals Products (Including Jewelry)

<http://www.A2LA.org/dirsearchnew/newsearch.cfm>

CPSC ID# 1141

Lead Paint, Lead in Children's Metals Jewelry

<http://www.cpsc.gov/cgi-bin/labapplist.aspx>

Mt. Tom Generating Co. LLC Analytical Laboratory

15 Agawam Avenue
West Springfield, MA 01089
Phone (413) 214-6541 Fax (413) 214-6842
email-madhu.shah@gdfsuezna.com



Mass Certification - MA-00071
Conn Certification - PH-0520


Report Date January 4, 2012

Customer	Contact	Laboratory Supervisor	eMail
ESS Laboratory	E. Ouk	Madhu Shah	madhu.shah@gdfsuezna.com
Sample Description Analysis of Soil Sample			

Samples Analyzed

Enclosed are Report No(s): 31944

Thank you for your business



Madhu Shah, Laboratory Supervisor

1/4/12

Date

ALL the information contained in this report has been reviewed for accuracy and checked against all quality control requirements outlined in each applicable method.
This report may not be reproduced, except in full, without written approval from Mt. Tom Generating Co. LLC Analytical Laboratory.

Sample Analysis

Work Order 11-1826

Sample Description	Source	Taken/Time	Received
31944 1112428-01	ESS Laboratory	12/20/11	12/28/11

Parameter	Results	MDL Method	Analyzed/Time	Tech
Sulfur, %	2.37	0.10 ASTM D-4239	01/03/12	sjr

Sample and Cooler Receipt Checklist

Client: GZA GeoEnvironmental, Inc.
Client Project ID: _____
Shipped/Delivered Via: ESS Courier

ESS Project ID: 11120428
Date Project Due: 12/30/11
Days For Project: 5 Day

Items to be checked upon receipt:

- | | | | |
|--|-------------------------------|---|---|
| 1. Air Bill Manifest Present? | <input type="checkbox"/> * No | 10. Are the samples properly preserved? | <input type="checkbox"/> Yes |
| Air No.: _____ | | 11. Proper sample containers used? | <input type="checkbox"/> Yes |
| 2. Were Custody Seals Present? | <input type="checkbox"/> No | 12. Any air bubbles in the VOA vials? | <input type="checkbox"/> N/A |
| 3. Were Custody Seals Intact? | <input type="checkbox"/> N/A | 13. Holding times exceeded? | <input type="checkbox"/> No |
| 4. Is Radiation count < 100 CPM? | <input type="checkbox"/> Yes | 14. Sufficient sample volumes? | <input type="checkbox"/> Yes |
| 5. Is a cooler present? | <input type="checkbox"/> Yes | 15. Any Subcontracting needed? | <input checked="" type="checkbox"/> No |
| Cooler Temp: <u>3.6</u> | | 16. Are ESS labels on correct containers? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |
| Iced With: <u>Icepacks</u> | | 17. Were samples received intact? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |
| 6. Was COC included with samples? | <input type="checkbox"/> Yes | ESS Sample IDs: <u>OL</u> | |
| 7. Was COC signed and dated by client? | <input type="checkbox"/> Yes | Sub Lab: <u>GDF</u> | |
| 8. Does the COC match the sample | <input type="checkbox"/> Yes | Analysis: <u>Total Sulfur</u> | |
| 9. Is COC complete and correct? | <input type="checkbox"/> Yes | TAT: <u>Std</u> | |

yes
BC
12/23/11

18. Was there need to call project manager to discuss status? If yes, please explain.

Who was called?: _____ By whom? _____

Sample Number	Properly Preserved	Container Type	# of Containers	Preservative
1	Yes	8 oz Soil Jar	12	NP

Completed By: BC Date/Time: 12/23/11
Reviewed By: CD Date/Time: 12/23/11

ESS Laboratory

GDF

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

Page of

Turn Time Standard 5 minutes
 If faster than 5 days, prior approval by laboratory is required # RI DEM
 State where samples were collected from:
 MA RI CT NH NJ NY ME Other
 Is this project for any of the following: USACE Other
 MA-MCP Navy

Reporting Limits RI DEM
 Electronic Deliverable Yes No
 Format: Excel Access PDF Other

Co. Name	Project #	Project Name (20 Char. or less)	ESS LAB Sample #	Date	Collection Time	COMP	GRAB	MATRIX	Sample Identification (20 Char. or less)	Pres Code	Number of Containers	Type of Containers	Write Required Analysis											
ESS Labs			01	12/20/11	1300		X	S	112428-01	1	1	6	Total sulfur											
Contact Person	Liz Ouk																							
City	State																							
Telephone #	Fax #																							
	Address																							
	Zip																							
	PO#																							
	Email Address																							

Container Type: P-Poly G-Glass S-Sterile V-VOA Matrix: S-Soil SD-Solid D-Sludge WW-Waste Water GW-Ground Water SW-Surface Water DW-Drinking Water O-Oil W-Wipes F-Filters

Cooler Present Yes No Internal Use Only

Seals Intact Yes No NA: [] Pickup

Cooler Temp: [] Technicians

Preservation Code 1- NP, 2- HCl, 3- H₂SO₄, 4- HNO₃, 5- NaOH, 6- MeOH, 7- Asorbic Acid, 8- ZnAc₂, 9-

Sampled by:

Comments:

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time
<u> </u>	12/20/11 10:20	<u> </u>	
<u> </u>		<u> </u>	

