



engineering and constructing a better tomorrow

January 8, 2008

Mr. Joseph T. Martella II, Senior Engineer  
RIDEM Office of Waste Management  
Site Remediation Program  
235 Providence Street  
Providence, RI 02908

**RE: December 2007 Investigation Activities  
Building N Underground Storage Tanks  
Former Gorham Manufacturing Facility  
333 Adelaide Avenue, Providence, Rhode Island  
MACTEC Project No. 3650050041.09**

Dear Mr. Martella:

This letter summarizes the recent investigations conducted at the Former Gorham Manufacturing Facility, 333 Adelaide Avenue, Providence, Rhode Island (the Site) between December 13 and 17, 2007. This work was done as proposed in our Public Meeting Response to Comments dated October 22, 2007 to determine if the underground storage tanks (USTs) were still present in the vicinity of the location of former Building N of the Gorham site.

#### **WORK ACTIVITIES CONDUCTED**

Investigations were conducted to locate the former Building N foundation as well as the possible presence of two USTs. These investigations included the use of ground penetrating radar (GPR) and inductive electromagnetic (EM) methodology. On December 13, 2007, MACTEC and Northeast Geophysical services (NGS), subcontractor for MACTEC, surveyed an area surrounding the area where the former Building N once stood. The former building location was marked out on-site based on the overlay of the historic and current building locations and site features. The investigation area was then extended well beyond this area to increase the probability that the building foundation and USTs could be located. The GPR and EM methodology did not identify any UST's in the area of investigation.

On December 17, 2007, MACTEC and CleanHarbors, subcontractor for MACTEC, performed test pit excavations to further investigate the area surveyed on December 13, 2007. Three (3) test pits were executed along the historic fence line because historic records for the former Building N and USTs indicated that they were located immediately along this feature. The third test pit located the two USTs approximately 20-25 feet below the ground surface (bgs). The activities conducted to locate the former Building N and associated USTs are described in detail below.

#### **EM/GPR SURVEY**

On December 13, 2007, NGS performed an inductive electromagnetic (EM) and ground penetrating radar (GPR) survey to locate the Former Building N foundation as well as the possible presence of two underground storage tanks. NGS first performed inductive EM using an EM-61 Metal Detection System. This device is a portable time domain instrument with a coincident transmitter/receiver coil and second parallel receiver coil for depth to target estimation and rejection of surface metal response. The EM-61 was designed specifically to locate medium to large buried metal objects such as drums and tanks while being relatively insensitive to cultural features such as fences, buildings and power lines. The technique can detect a single 55-gallon drum to depths of up to twelve feet. The size and burial depth of the metal will determine the strength of the response. The use of larger EM equipment to detect anomalies at greater depths was limited due to the steep slope and terrain of the site and extensive overgrowth in the wooded area of investigation. Preliminary metal detection maps were produced on-site immediately following data collection to determine additional areas of investigation.

NGS marked out a 20 foot by 20 foot square grid on the pavement surface extending from the former Stop & Shop to the northern curbing along the edge of pavement. A survey line was also conducted between the curbing and the new chain link fence installed by the City of Providence in response to the March 2006 Consent Agreement. Access was then gained through the fence to clear the wooded triangle area located between the new fence and the top of slope/historic chain link fence existing on site. Two lines of investigation were conducted inside this area, one along the north side of the new fence and the second along the south side of the historic chain link fence. Another line of investigation was conducted along the north side of the historic chain link fence. No anomalies consistent with a former building foundation or buried USTs were found in the areas investigated by the EM survey, as shown on Figure 1.

EM-61 can be used as a stand-alone technique for buried metal detection or in conjunction with GPR for overall site clearance or for drum, tank and pipe location. GPR provides a graphic image of the subsurface and has a variety of applications. GPR is commonly used as part of Phase II environmental site assessments and other environmental studies to locate underground features. The instrument used by NGS for the GPR surveys was the SIR System-3 with 300-MHz and 500-MHz antennas manufactured by Geophysical Survey Systems, Inc. These antennas can penetrate up to depths of 18 feet. Similar limits on the depth of investigation existed due to the slope and overgrowth of the area. Using GPR, NGS surveyed the same area that had been surveyed with the EM-61 to locate the former Building N foundation and two USTs. No anomalies consistent with a building foundation or buried USTs were found in the areas investigated by GPR, as shown on Figure 1.

### **TEST PIT TRENCH EXCAVATIONS**

On December 17, 2007, CleanHarbors Environmental Services performed test pit trench excavations to further investigate the potential presence of the two USTs. The former Building N location was marked out on-site based on the overlay of the historic and current building locations and site features. Clean Harbors gained access to the work area by temporarily removing approximately 60 feet of chain link fencing installed by the City of Providence along the border of the Park Parcel (Appendix C, Photo #1).

Three test pit trenches were then performed to depths between 5 and 15 feet bgs. The locations of these test pit trenches are shown on Figure 2. It should be noted that this area of investigation has a steep slope down to Mashapaug Cove such that the bottoms of these excavations were approximately 10 to 25 feet below the retail complex road surface. One shallow test pit trench (Test Pit #2) was conducted well west of former Building N to define the western limits of the investigation while the eastern end of the investigation area was bound by the intersection of the new chain link fence, historic fence and extremely steep slope down to the cove (Figure 2). The test pit depths conducted in the vicinity of the former Building N were extended to a minimum depth of 8 feet based on the height of the former basement and cover over the USTs beneath the basement floor (identified in a 1995 report for Building N UST activities).

The first test pit (Test Pit #1) was excavated as a trench measuring approximately 5 feet wide by 10 feet long, down to a depth of between 8 and 15 feet bgs. This trench extended from the historic chain link fence into the middle of the investigation area thought to be the location of the

Former Building N. No evidence of the former building foundation or underground tanks was found in this trench and no head space detections were found in the excavated soils using a Photo Ionization Detector (PID), a device that measures low levels of Volatile Organic Compounds (VOC). Photo documentation of Test Pit #1 was collected (Appendix C, Photo #2) and the trench was backfilled to support the excavator for excavation of Test Pit #2.

The second test pit (Test Pit #2) was excavated to the west of Test Pit#1 (Figure 2). This trench was excavated approximately 5 feet wide by 10 feet long along the historic chain link fence. This test pit was 5 feet deep at the western most point and 15 feet deep at the eastern end. No evidence of the building foundation or underground tanks was found and no headspace PID readings were found in the soil excavated from the test pits. Photo documentation of Test Pit #2 (Appendix C, Photo #3) was collected and the trench was backfilled to support the excavator for excavation of Test Pit #3.

The third test pit (Test Pit #3) was excavated to the east of Test Pit #1 along the north side of the historic fence all the way up to the eastern corner of the investigation area. This area included the lowest elevation of the investigation area extending down into the valley. This trench was approximately 8 feet wide and 15 feet long and was excavated to a depth of 9 feet to 20 feet bgs. A portion of the historic chain link fence was removed to allow the trench to be widened. During this excavation Clean Harbors identified what was initially thought to be the man way into eastern most UST and began excavating to the north to delineate the tank outline. It was during this soil removal that the first tank was identified approximately 5 feet west of the structure (thought to be a manway) and the upper portion of the steel UST was cracked by the excavator bucket. This allowed a small stream of liquid (determined to be water) to be released from the tank into the bottom of the excavation. This tank was the eastern-most tank from which a water sample had been collected and sent to a state-certified laboratory for chemical analysis in 1995. Based on the 1995 sampling and analysis, it was determined the tank contained water and was not subject to UST regulations. Clean Harbors stopped the excavation work so that Textron and RIDEM could be notified of the tank location and soil and water samples could be collected for laboratory analysis. Soil and water samples were collected immediately adjacent to the eastern UST and no measured head space was detected with the PID. No stained soils or odors were observed. A water sample “East-1” was collected from the excavation using the excavator bucket had to scoop a volume of water that pooled up on the bottom of the trench. This water was transferred from the bucket into a 40ml HCL persevered vial for VOC analysis. A soil sample

was also taken from next to the tank using the excavator bucket. This soil sample was collected in a 40ml methanol (MEOH) preserved vial for VOC analysis. This soil sample was also labeled “East-1”.

More excavation to the west of the eastern tank was performed by Clean Harbors to locate the second tank. The western tank was found approximately 5 feet west of the eastern most tank and was elevated above the eastern tank by one to two feet. Soil was removed from the western side of the tank to expose soil beneath the tank bottom. No visual staining or odors were observed and this western tank appeared to be intact. A soil sample was collected west of the tank with no measured hits from the PID. This sample was collected in a 40ml MEOH preserved vial labeled “West-1” for VOC analysis. The water and soil samples were then submitted under chain of custody, to ESS Laboratory of Cranston, Rhode Island for analysis of VOC’s via EPA Method 8260 on December 17, 2007. Extensive photo documentation was conducted of Test Pit #3 (Appendix C, Photos #4 and #5).

Clean Harbors could not fully expose the USTs at their southern most ends as they extended into the hillside with an approximate depth below surface of 20 to 25 feet. Associated utility poles and buried utility lines were located approximately 15 feet from the wall of the excavation. Clean Harbors attempted to expose the northern ends of the USTs but due to the steep slope and size of the excavation they could not readily gain access into the valley containing the USTs. The Test Pit #3 remained open for full inspection by RIDEM and other interested parties. Following full discussions with Mr. Martella of RIDEM, the excavation area was backfilled and graded with a gradual slope extending from the new Park Parcel fence down to the historic chain link fence. A tree stump was buried (but extending above the ground surface) to clearly mark the location of the USTs. The Park Parcel chain link fence was then reinstalled in accordance with the March 2006 Consent Agreement. Field measurements were taken to document the location of the USTs as shown on Figure 2.

#### **LABORATORY ANALYTICAL RESULTS**

The laboratory report for the liquid sample (water) for the eastern tank (East-1) is contained in Appendix B. These results were consistent with the 1995 analytical results – the sample was water and only trace levels of VOCs below drinking water standards were detected. The five compounds detected in the water sample included naphthalene, xylene, tetrachloroethene (PCE),

and 1,2,4- and 1,3,5-trimethylbenzene. The detected concentrations and associated RIDEM Category GA Groundwater Standards (drinking-water standards) are shown below:

**TABLE 1.**

<b>Compound</b>	<b>Detected Concentration (mg/L)</b>	<b>Drinking Water Standard (mg/L)</b>
Naphthalene	0.0040	0.02
Tetrachloroethene	0.0014	0.005
Xylenes (total)	0.0053	10
1,2,4-trimethylbenzene	0.0043	0.330
1,3,5-trimethylbenzene	0.0067	0.330

There are no drinking water standards for trimethylbenzene. However, the USEPA Region III tap water Risk-Based Concentration is 0.330 mg/L.

The laboratory results for the two soil samples are also presented in Appendix B. The concentrations of detected compounds are well below RIDEM residential direct exposure criteria. There were trace levels of two compounds detected in the soils. The eastern tank soil sample (East-1) had trace amounts of tetrachloroethene (0.191 mg/kg) below the RIDEM RES standard for Tetrachloroethene of 12 mg/kg. The western tank soil sample (West-1) had a detected concentration of trichloroethylene of 1.16 mg/kg below the RIDEM RES standard for this compound of 13 mg/kg.

#### **CONCLUSIONS**

Based on the results of the water from the eastern tank and soil investigations around the eastern tank and western tank, detected concentrations are below RIDEM Category GA groundwater standards (and USEPA Risk-Based Concentrations) and RIDEM residential soil direct exposure criteria respectively. These results were consistent with 1995 investigation results previously provided to RIDEM and the City of Providence. Additional investigation is required to gain access and sample the contents of the western UST to complete the investigation of Former Building N.

#### **PROPOSED ACTIONS**

To achieve closure of the former Building N UST's, MACTEC will perform additional UST assessment, remove the tank contents for off-site disposal, and close the tanks in place in a manner that is consistent with the RIDEM UST regulations. MACTEC will gain access to the

western most UST and collect a liquid sample of the contents for analysis of VOCs. The sample will be analyzed with a 24-hour turn around so that the contents of the two tanks may be removed for off-site disposal and the tanks filled with a slurry concrete for abandonment in place. This work is currently scheduled for the week of January 14, 2008.

Equipment access to the tanks will be gained through the chain link fence at the top of the slope (same access point as the December 2007 investigation) and the clearing of a path for access to the USTs from their downhill, northern most end. These tanks will be exposed to assess their condition and gain access to the western most tank to collect a sample of the tank contents. This sample will be analyzed by ESS Laboratories of Cranston, RI for VOCs by EPA Method 8260. During the laboratory analysis period, the access point through the fence will be secured with construction fencing and any unsafe open excavations will be backfilled and secured to be protective of potential trespassers.

Based on the analytical results of the UST contents, Clean Harbors will remove and dispose the contents of both UST's. The contents will be pumped and transported to a Clean Harbors wastewater treatment facility located in Maine.

Because these USTs were found to extend into the hillside beneath the utilities for the retail complex they can not be removed without adversely impacting the developed portion of the site, but instead will be abandoned in place. This abandonment of the water USTs will be done in a manner consistent with RIDEM UST Regulation DEM-OWM-UST06-05. Closure in place will include removal of fill, gauge, pump, and/or vent lines, if any are found. The UST's will be then filled with a slurry concrete or flowable fill and backfilled. As this area is located within the Phase I Cap for the Park Parcel, no other restoration activities will be performed at this time. This site will receive additional soil cover and grading to support the final grades for the recreational use of the Park Parcel.

MACTEC plans to complete these UST assessment and closure activities by January 22, 2008. Based on this schedule, we look forward to close coordination with RIDEM on this activity and will provide daily updates to RIDEM prior to mobilizing to the site and during our field activities, including laboratory results. Please contact either Greg Simpson of Textron (401) 457-2635 or Dave Heislein at (781) 245-6606 with any questions on the investigation activities that were

January 8, 2008

conducted in December 2007 or the planned UST closure activities beginning the week of January 14, 2008.

Sincerely,  
**MACTEC Engineering and Consulting, Inc.**



Daron Kurkjian  
Project Engineer

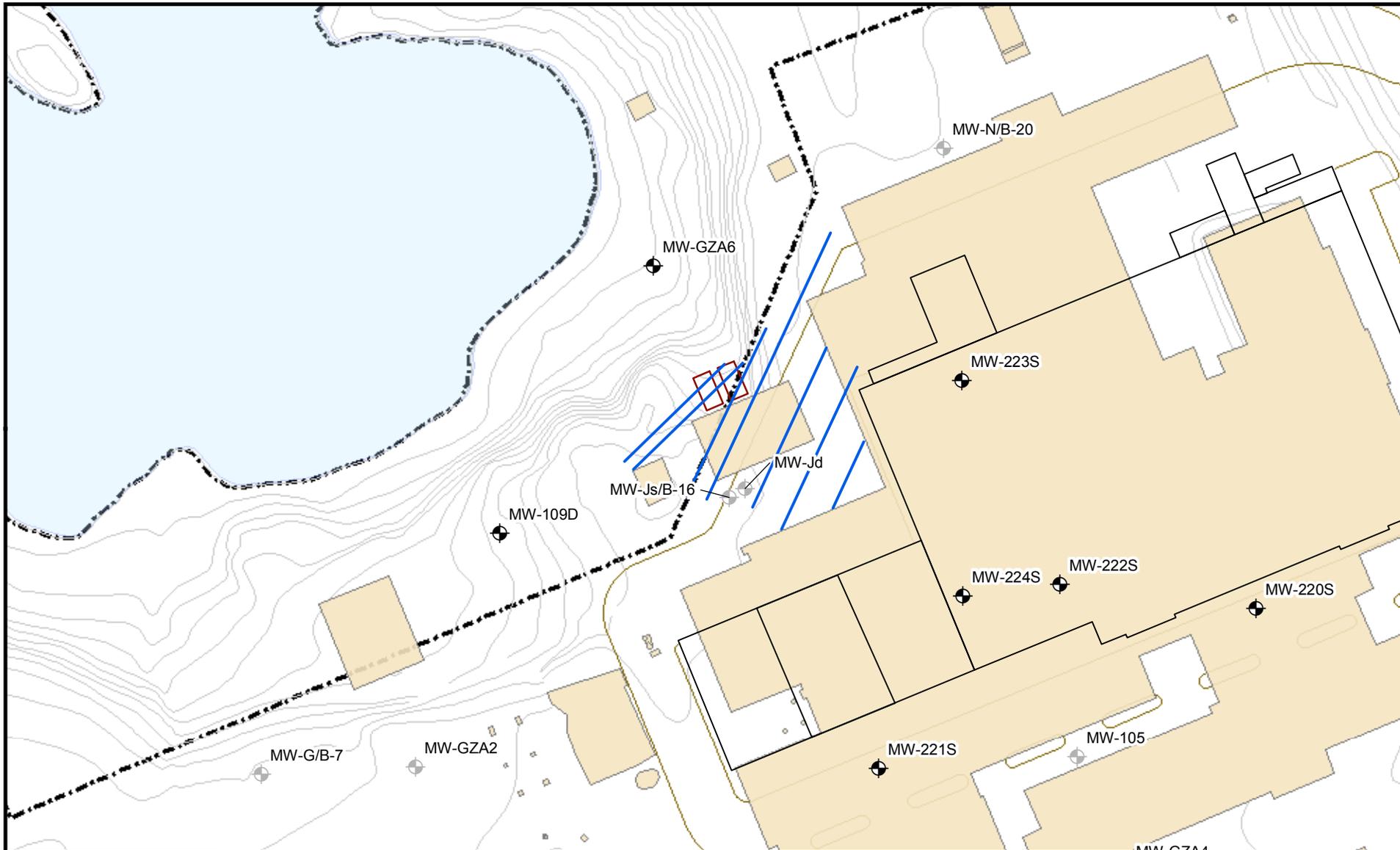


David E. Heislein  
Principal Engineer

Attachments: Figures  
Appendix A – Northeast Geophysical Services EM-61/GPR Summary  
Appendix B – ESS Laboratory Report for Soil and Eastern Tank Sample Results

cc: T. Dellar, City of Providence  
P. Grivers, EA Engineering, Science, and Technology  
T. Regan, EA Engineering, Science, and Technology  
G. Simpson, Textron, Inc.  
Knight Memorial Library Repository  
G. Wilson, Kimco Realty Corporation (including tenants)  
J. Morgan, The Stop & Shop Supermarket Co. LLC  
MACTEC Project File [P:\TEXTRON\GORHAM\Building N USTs\AdditionalInvestigationactivitiesdecember07.doc]

## **Figures**

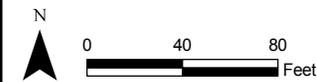


**Legend**

- Historical Monitoring Well
- Current Monitoring Well
- Transect
- Approximate Tanks
- Current Building
- Historic Buildings
- Pavement Outline
- Elevation

**Figure 1**  
**Approximate Transects of Magnetometer**  
**and Ground Penetrating Radar Survey**

Former Building N  
 333 Adelaide Avenue  
 Providence, Rhode Island



Prepared by BJR | Checked by DEH

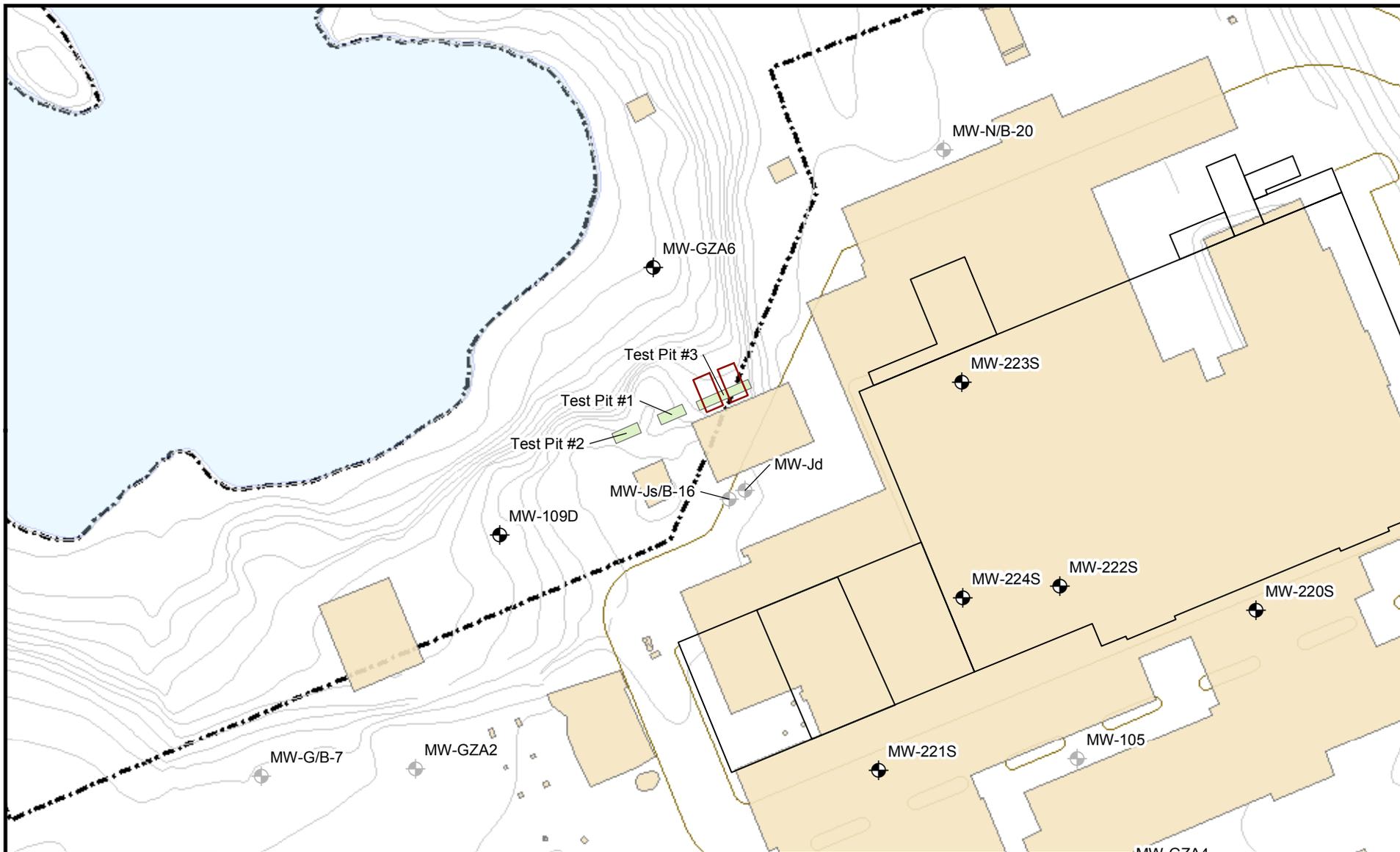
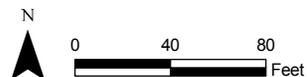


Figure 2  
Approximate Location of USTs

Former Building N  
333 Adelaide Avenue  
Providence, Rhode Island

**Legend**

- Historical Monitoring Well
- Current Monitoring Well
- Approximate Tanks
- Approximate Limits of Test Pits
- Current Building
- Historic Buildings
- Pavement Outline
- Elevation



Prepared by BJR | Checked by DEH

## **Appendix A**

### **Northeast Geophysical Services Metal Detection and Ground Penetrating Radar Surveys January 2008**

**Northeast Geophysical Services**

4 Union Street, Suite 3, Bangor, ME 04401

Phone: 207-942-2700 Fax: 207-942-8798

**METAL DETECTION AND GROUND  
PENETRATING RADAR SURVEYS AT THE  
FORMER GORHAM MANUFACTURING  
FACILITY, PROVIDENCE, RI**

**For:**

**MACTEC, Inc.**

January, 2008

**Northeast Geophysical Services**  
4 Union Street, Suite 3, Bangor, ME 04401

November, 2007

**METAL DETECTION AND GROUND PENETRATING RADAR SURVEYS AT THE  
FORMER GORHAM MANUFACTURING FACILITY, PROVIDENCE, RI**

**INTRODUCTION**

At the request of MACTEC Engineering & Consulting, Inc., metal detection and ground penetrating radar (GPR) surveys were conducted at the former Gorham Manufacturing Facility in Providence, Rhode Island. The objective of the surveys was to locate two suspected 10,000 gallon buried metal tanks at the site. These tanks were reportedly used for water storage by the former industrial operation. The surveys were conducted on December 13, 2007 by Mike Scully of Northeast Geophysical Services (NGS). This report summarizes site conditions, methods used, and the results of the geophysical surveys.

**SITE LOCATION AND CONDITIONS**

The former Gorham Manufacturing site is located at 333 Adelaide Avenue in Providence, Rhode Island. The property is currently the site of a small shopping center that includes a vacant grocery store. The survey area is located near the back of the property, behind the current store buildings.

The survey areas included paved driveway and shipping & receiving areas near the back of the store building, a small strip of lawn and shrubs adjacent to a relatively new chain-link fence, and a rough, overgrown area beyond the new fence which included an older chain-link fence. The ground surface generally drops steeply down beyond the older fence. Weather conditions were good during the initial part of the field survey, but heavy snow began falling during the last hour of the work.

**SURVEY RESULTS**

A 45-foot by 160-foot field grid was laid-out over the paved and grassy areas adjacent to the new fence. This grid area was then surveyed using the EM-61 metal detector along lines spaced 5 feet apart. Three GPR profiles were also produced along grid lines adjacent and parallel to the new fence. No EM or GPR anomalies were found in the grid area that would be consistent with a buried 10,000 gallon tank. Several smaller responses were seen that were likely caused by buried utilities or miscellaneous demolition debris from the former site buildings.

The areas of investigation outside of the new fence were surveyed in a wandering or reconnaissance fashion due to the rough and overgrown nature of the terrain. A minor amount of brush cutting was done in this area in order to allow access to the survey instruments along several paths. A few metal anomalies were detected in this area and marked with pink wire flags. No clear tank-like GPR reflectors were seen in the area; however there were a couple of weak reflectors noted that occurred near the depth penetration limits of the GPR antenna.

### **METHODS AND INSTRUMENTATION**

#### **EM-61 Metal Detector**

A Geonics EM-61 metal detector was used for the metal detection surveys. The EM-61 is a portable time-domain instrument with a coincident transmitter/receiver coil and second parallel receiver coil for depth to target estimation and rejection of surface metal response. The instrument measures the secondary electromagnetic field response in milli-volts (mV). The EM-61 is designed specifically to locate medium to large buried metal objects such as drums and tanks while being relatively insensitive to above-surface metallic objects such as fences, buildings and power lines. The technique is sensitive to conductive metal up to a depth of approximately 12 feet. The size and burial depth of the metal determine the strength of the response. The EM-61 transmitter/receiver coils can either be carried by the operator using a harness, or pulled on wheels. EM data is digitally recorded on an Allegro CX field computer. Readings can be triggered manually or, if the wheel mode is used, readings can be recorded at regular intervals controlled by the rotation of the wheels. The wheel mode was used for the surveys at this site. The EM readings were recorded in the open paved portion of the survey area, but not in the overgrown area on the far side of the new fence. Here the instrument was used in a reconnaissance fashion and metal responses were marked on the ground.

#### **Ground Penetrating Radar (GPR)**

Ground penetrating radar utilizes high frequency radio waves to probe the subsurface. Radar waves are transmitted into the ground from an antenna that is pulled across the ground surface. In the subsurface, radar waves are reflected at interfaces of materials with contrasting dielectric properties. The returning signal is intercepted by a receiver and converted to a digital graphic image. The horizontal axis of the image is distance along the traverse. The vertical axis is two-way travel time of the radar pulses, in nanoseconds (ns).

The GPR graphic images are examined and features noted on the images can then be transferred to a map. Tanks, pipelines and other objects with rounded tops (boulders, tree roots, or segments of old foundations, for example) may show up on the profiles as hyperbola-shaped reflections. Tanks and pipelines usually appear on more than one survey line as hyperbolic reflectors on lines perpendicular to the tank or pipe axis and as horizontal reflectors on lines along the axis. The GPR instrument used was a GSSI, SIR-3000. A 400-MHz antenna was used with a time range set for 120 nanoseconds. At this setting the depth surveyed is approximately 18 feet.

#### **LIMITATIONS OF THE SURVEYS**

The EM-61 metal detection survey provides an indication of where buried metal exists at the site surveyed. The Ground Penetrating Radar survey produces reflectors at interfaces of materials with contrasting dielectric properties. Both of these instruments provide indirect measurements of subsurface conditions. The actual cause of the features depicted on the figures can only be conclusively determined by direct observation.

## **Appendix B**

### **ESS Laboratory Report for Groundwater Samples**



# ESS Laboratory

Division of Thielsch Engineering, Inc.

## CERTIFICATE OF ANALYSIS

## PROJECT NARRATIVE

David Heislein  
MACTEC Engineering & Consulting, Inc.  
107 Audubon Road  
Wakefield, MA 01880

**RE: Providence Gorham Site**  
**ESS Laboratory Work Order Number: 0712197**

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 Project Narrative, the entire report has been paginated. The ESS Laboratory Certifications sheet is the final report page. 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 mailed. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard  
Laboratory Director

Date: December 18, 2007

### 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 may be used instead of automated integration because it produces more accurate results. All ICP Metals were analyzed using the established linear dynamic range to determine acceptable analytical results.

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

### Sample Receipt

The following sample(s) were received on December 17, 2007 for the analyses specified on the enclosed Chain of Custody Record.

Laboratory ID	Matrix	Client SampleID
0712197-01	Surface Water	East-1



# ESS Laboratory

*Division of Thielsch Engineering, Inc.*

## *CERTIFICATE OF ANALYSIS*

Client Name: MACTEC Engineering & Consulting, Inc.

Client Project ID: Providence Gorham Site

ESS Laboratory Work Order: 0712197

## **PROJECT NARRATIVE**

### **8260B Volatile Organic Compounds**

BQL0149-CCV1 **Continuing Calibration recovery is below lower control limit.**

1,4-Dioxane - Screen

**No other observations noted.**

**End of Project Narrative.**



# ESS Laboratory

Division of Thielsch Engineering, Inc.

## CERTIFICATE OF ANALYSIS

Client Name: MACTEC Engineering & Consulting, Inc.  
Client Project ID: Providence Gorham Site  
Client Sample ID: East-1  
Date Sampled: 12/17/07 12:45  
Percent Solids: N/A  
Initial Volume: 10  
Final Volume: 10  
Extraction Method: 5030B

ESS Laboratory Work Order: 0712197  
ESS Laboratory Sample ID: 0712197-01  
Sample Matrix: Surface Water  
Analyst: MD

### 8260B Volatile Organic Compounds

<u>Analyte</u>	<u>Results</u>	<u>Units</u>	<u>MRL</u>	<u>RI - GA</u>		<u>Analyzed</u>
				<u>Limit</u>	<u>DF</u>	
1,1,1,2-Tetrachloroethane	ND	mg/L	0.0010		1	12/18/07
1,1,1-Trichloroethane	ND	mg/L	0.0010	0.2	1	12/18/07
1,1,2,2-Tetrachloroethane	ND	mg/L	0.0005		1	12/18/07
1,1,2-Trichloroethane	ND	mg/L	0.0010	0.005	1	12/18/07
1,1-Dichloroethane	ND	mg/L	0.0010		1	12/18/07
1,1-Dichloroethene	ND	mg/L	0.0010	0.007	1	12/18/07
1,1-Dichloropropene	ND	mg/L	0.0020		1	12/18/07
1,2,3-Trichlorobenzene	ND	mg/L	0.0010		1	12/18/07
1,2,3-Trichloropropane	ND	mg/L	0.0010		1	12/18/07
1,2,4-Trichlorobenzene	ND	mg/L	0.0010	0.07	1	12/18/07
<b>1,2,4-Trimethylbenzene</b>	<b>0.0043</b>	mg/L	0.0010		1	12/18/07
1,2-Dibromo-3-Chloropropane	ND	mg/L	0.0050	0.0002	1	12/18/07
1,2-Dibromoethane	ND	mg/L	0.0010	0.00005	1	12/18/07
1,2-Dichlorobenzene	ND	mg/L	0.0010	0.6	1	12/18/07
1,2-Dichloroethane	ND	mg/L	0.0010	0.005	1	12/18/07
1,2-Dichloropropane	ND	mg/L	0.0010	0.005	1	12/18/07
<b>1,3,5-Trimethylbenzene</b>	<b>0.0067</b>	mg/L	0.0010		1	12/18/07
1,3-Dichlorobenzene	ND	mg/L	0.0010	0.6	1	12/18/07
1,3-Dichloropropane	ND	mg/L	0.0010		1	12/18/07
1,4-Dichlorobenzene	ND	mg/L	0.0010	0.075	1	12/18/07
1,4-Dioxane - Screen	ND	mg/L	0.500		1	12/18/07
1-Chlorohexane	ND	mg/L	0.0010		1	12/18/07
2,2-Dichloropropane	ND	mg/L	0.0010		1	12/18/07
2-Butanone	ND	mg/L	0.0250		1	12/18/07
2-Chlorotoluene	ND	mg/L	0.0010		1	12/18/07
2-Hexanone	ND	mg/L	0.0100		1	12/18/07
4-Chlorotoluene	ND	mg/L	0.0010		1	12/18/07
4-Isopropyltoluene	ND	mg/L	0.0010		1	12/18/07
4-Methyl-2-Pentanone	ND	mg/L	0.0250		1	12/18/07
Acetone	ND	mg/L	0.0250		1	12/18/07
Benzene	ND	mg/L	0.0010	0.005	1	12/18/07
Bromobenzene	ND	mg/L	0.0020		1	12/18/07
Bromochloromethane	ND	mg/L	0.0010		1	12/18/07
Bromodichloromethane	ND	mg/L	0.0010		1	12/18/07
Bromoform	ND	mg/L	0.0010		1	12/18/07



# ESS Laboratory

Division of Thielsch Engineering, Inc.

## CERTIFICATE OF ANALYSIS

Client Name: MACTEC Engineering & Consulting, Inc.  
Client Project ID: Providence Gorham Site  
Client Sample ID: East-1  
Date Sampled: 12/17/07 12:45  
Percent Solids: N/A  
Initial Volume: 10  
Final Volume: 10  
Extraction Method: 5030B

ESS Laboratory Work Order: 0712197  
ESS Laboratory Sample ID: 0712197-01  
Sample Matrix: Surface Water  
Analyst: MD

### 8260B Volatile Organic Compounds

Bromomethane	ND	mg/L	0.0020		1	12/18/07
Carbon Disulfide	ND	mg/L	0.0010		1	12/18/07
Carbon Tetrachloride	ND	mg/L	0.0010	0.005	1	12/18/07
Chlorobenzene	ND	mg/L	0.0010	0.1	1	12/18/07
Chloroethane	ND	mg/L	0.0020		1	12/18/07
Chloroform	ND	mg/L	0.0010		1	12/18/07
Chloromethane	ND	mg/L	0.0020		1	12/18/07
cis-1,2-Dichloroethene	ND	mg/L	0.0010	0.07	1	12/18/07
cis-1,3-Dichloropropene	ND	mg/L	0.0005		1	12/18/07
Dibromochloromethane	ND	mg/L	0.0010		1	12/18/07
Dibromomethane	ND	mg/L	0.0010		1	12/18/07
Dichlorodifluoromethane	ND	mg/L	0.0020		1	12/18/07
Diethyl Ether	ND	mg/L	0.0010		1	12/18/07
Di-isopropyl ether	ND	mg/L	0.0010		1	12/18/07
Ethyl tertiary-butyl ether	ND	mg/L	0.0010		1	12/18/07
Ethylbenzene	ND	mg/L	0.0010	0.7	1	12/18/07
Hexachlorobutadiene	ND	mg/L	0.0006		1	12/18/07
Isopropylbenzene	ND	mg/L	0.0010		1	12/18/07
Methyl tert-Butyl Ether	ND	mg/L	0.0010	0.04	1	12/18/07
Methylene Chloride	ND	mg/L	0.0050	0.005	1	12/18/07
<b>Naphthalene</b>	<b>0.0040</b>	mg/L	0.0010	0.02	1	12/18/07
n-Butylbenzene	ND	mg/L	0.0010		1	12/18/07
n-Propylbenzene	ND	mg/L	0.0010		1	12/18/07
sec-Butylbenzene	ND	mg/L	0.0010		1	12/18/07
Styrene	ND	mg/L	0.0010	0.1	1	12/18/07
tert-Butylbenzene	ND	mg/L	0.0010		1	12/18/07
Tertiary-amyl methyl ether	ND	mg/L	0.0010		1	12/18/07
<b>Tetrachloroethene</b>	<b>0.0014</b>	mg/L	0.0010	0.005	1	12/18/07
Tetrahydrofuran	ND	mg/L	0.0050		1	12/18/07
Toluene	ND	mg/L	0.0010	1	1	12/18/07
trans-1,2-Dichloroethene	ND	mg/L	0.0010	0.1	1	12/18/07
trans-1,3-Dichloropropene	ND	mg/L	0.0005		1	12/18/07
Trichloroethene	ND	mg/L	0.0010	0.005	1	12/18/07
Trichlorofluoromethane	ND	mg/L	0.0020		1	12/18/07
Vinyl Acetate	ND	mg/L	0.0050		1	12/18/07
Vinyl Chloride	ND	mg/L	0.0010	0.002	1	12/18/07



# ESS Laboratory

Division of Thielsch Engineering, Inc.

## CERTIFICATE OF ANALYSIS

Client Name: MACTEC Engineering & Consulting, Inc.  
Client Project ID: Providence Gorham Site  
Client Sample ID: East-1  
Date Sampled: 12/17/07 12:45  
Percent Solids: N/A  
Initial Volume: 10  
Final Volume: 10  
Extraction Method: 5030B

ESS Laboratory Work Order: 0712197  
ESS Laboratory Sample ID: 0712197-01  
Sample Matrix: Surface Water  
Analyst: MD

### 8260B Volatile Organic Compounds

Xylene O	0.0017	mg/L	0.0010	10	1	12/18/07
Xylene P,M	0.0036	mg/L	0.0020	10	1	12/18/07
Xylenes (Total)	0.0053	mg/L	0.0030	10	1	12/18/07
Trihalomethanes (Total)	ND	mg/L	0.0040	0.1		12/18/07

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	94 %		70-130
Surrogate: 4-Bromofluorobenzene	98 %		70-130
Surrogate: Dibromofluoromethane	99 %		70-130
Surrogate: Toluene-d8	96 %		70-130



# ESS Laboratory

Division of Thielsch Engineering, Inc.

## CERTIFICATE OF ANALYSIS

Client Name: MACTEC Engineering & Consulting, Inc.

Client Project ID: Providence Gorham Site

ESS Laboratory Work Order: 0712197

### Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
---------	--------	-----	-------	-------------	---------------	------	-------------	-----	-----------	-----------

#### 8260B Volatile Organic Compounds

Batch BL71808 - 5030B

**Blank**

1,1,1,2-Tetrachloroethane	ND	0.0010	mg/L
1,1,1-Trichloroethane	ND	0.0010	mg/L
1,1,2,2-Tetrachloroethane	ND	0.0005	mg/L
1,1,2-Trichloroethane	ND	0.0010	mg/L
1,1-Dichloroethane	ND	0.0010	mg/L
1,1-Dichloroethene	ND	0.0010	mg/L
1,1-Dichloropropene	ND	0.0020	mg/L
1,2,3-Trichlorobenzene	ND	0.0010	mg/L
1,2,3-Trichloropropane	ND	0.0010	mg/L
1,2,4-Trichlorobenzene	ND	0.0010	mg/L
1,2,4-Trimethylbenzene	ND	0.0010	mg/L
1,2-Dibromo-3-Chloropropane	ND	0.0050	mg/L
1,2-Dibromoethane	ND	0.0010	mg/L
1,2-Dichlorobenzene	ND	0.0010	mg/L
1,2-Dichloroethane	ND	0.0010	mg/L
1,2-Dichloropropane	ND	0.0010	mg/L
1,3,5-Trimethylbenzene	ND	0.0010	mg/L
1,3-Dichlorobenzene	ND	0.0010	mg/L
1,3-Dichloropropane	ND	0.0010	mg/L
1,4-Dichlorobenzene	ND	0.0010	mg/L
1,4-Dioxane - Screen	ND	0.500	mg/L
1-Chlorohexane	ND	0.0010	mg/L
2,2-Dichloropropane	ND	0.0010	mg/L
2-Butanone	ND	0.0250	mg/L
2-Chlorotoluene	ND	0.0010	mg/L
2-Hexanone	ND	0.0100	mg/L
4-Chlorotoluene	ND	0.0010	mg/L
4-Isopropyltoluene	ND	0.0010	mg/L
4-Methyl-2-Pentanone	ND	0.0250	mg/L
Acetone	ND	0.0250	mg/L
Benzene	ND	0.0010	mg/L
Bromobenzene	ND	0.0020	mg/L
Bromochloromethane	ND	0.0010	mg/L
Bromodichloromethane	ND	0.0010	mg/L
Bromoform	ND	0.0010	mg/L
Bromomethane	ND	0.0020	mg/L
Carbon Disulfide	ND	0.0010	mg/L
Carbon Tetrachloride	ND	0.0010	mg/L
Chlorobenzene	ND	0.0010	mg/L
Chloroethane	ND	0.0020	mg/L
Chloroform	ND	0.0010	mg/L
Chloromethane	ND	0.0020	mg/L
cis-1,2-Dichloroethene	ND	0.0010	mg/L
cis-1,3-Dichloropropene	ND	0.0005	mg/L
Dibromochloromethane	ND	0.0010	mg/L



# ESS Laboratory

Division of Thielsch Engineering, Inc.

## CERTIFICATE OF ANALYSIS

Client Name: MACTEC Engineering & Consulting, Inc.  
 Client Project ID: Providence Gorham Site

ESS Laboratory Work Order: 0712197

### Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
---------	--------	-----	-------	-------------	---------------	------	-------------	-----	-----------	-----------

#### 8260B Volatile Organic Compounds

#### Batch BL71808 - S030B

Dibromomethane	ND	0.0010	mg/L							
Dichlorodifluoromethane	ND	0.0020	mg/L							
Diethyl Ether	ND	0.0010	mg/L							
Di-isopropyl ether	ND	0.0010	mg/L							
Ethyl tertiary-butyl ether	ND	0.0010	mg/L							
Ethylbenzene	ND	0.0010	mg/L							
Hexachlorobutadiene	ND	0.0006	mg/L							
Isopropylbenzene	ND	0.0010	mg/L							
Methyl tert-Butyl Ether	ND	0.0010	mg/L							
Methylene Chloride	ND	0.0050	mg/L							
Naphthalene	ND	0.0010	mg/L							
n-Butylbenzene	ND	0.0010	mg/L							
n-Propylbenzene	ND	0.0010	mg/L							
sec-Butylbenzene	ND	0.0010	mg/L							
Styrene	ND	0.0010	mg/L							
tert-Butylbenzene	ND	0.0010	mg/L							
Tertiary-amyl methyl ether	ND	0.0010	mg/L							
Tetrachloroethene	ND	0.0010	mg/L							
Tetrahydrofuran	ND	0.0050	mg/L							
Toluene	ND	0.0010	mg/L							
trans-1,2-Dichloroethene	ND	0.0010	mg/L							
trans-1,3-Dichloropropene	ND	0.0005	mg/L							
Trichloroethene	ND	0.0010	mg/L							
Trichlorofluoromethane	ND	0.0020	mg/L							
Vinyl Acetate	ND	0.0050	mg/L							
Vinyl Chloride	ND	0.0010	mg/L							
Xylene O	ND	0.0010	mg/L							
Xylene P,M	ND	0.0020	mg/L							
Surrogate: 1,2-Dichloroethane-d4	24.0		ug/L	25.00		96	70-130			
Surrogate: 4-Bromofluorobenzene	24.5		ug/L	25.00		98	70-130			
Surrogate: Dibromofluoromethane	25.0		ug/L	25.00		100	70-130			
Surrogate: Toluene-d8	24.8		ug/L	25.00		99	70-130			

#### LCS

1,1,1,2-Tetrachloroethane	9.66		ug/L	10.00		97	70-130			
1,1,1-Trichloroethane	9.69		ug/L	10.00		97	70-130			
1,1,2,2-Tetrachloroethane	9.93		ug/L	10.00		99	70-130			
1,1,2-Trichloroethane	9.43		ug/L	10.00		94	70-130			
1,1-Dichloroethane	10.3		ug/L	10.00		103	70-130			
1,1-Dichloroethene	11.0		ug/L	10.00		110	70-130			
1,1-Dichloropropene	9.62		ug/L	10.00		96	70-130			
1,2,3-Trichlorobenzene	11.0		ug/L	10.00		110	70-130			
1,2,3-Trichloropropane	8.83		ug/L	10.00		88	70-130			
1,2,4-Trichlorobenzene	10.8		ug/L	10.00		108	70-130			
1,2,4-Trimethylbenzene	10.3		ug/L	10.00		103	70-130			
1,2-Dibromo-3-Chloropropane	10.2		ug/L	10.00		102	70-130			
1,2-Dibromoethane	9.10		ug/L	10.00		91	70-130			



# ESS Laboratory

Division of Thielsch Engineering, Inc.

## CERTIFICATE OF ANALYSIS

Client Name: MACTEC Engineering & Consulting, Inc.

Client Project ID: Providence Gorham Site

ESS Laboratory Work Order: 0712197

### Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
---------	--------	-----	-------	-------------	---------------	------	-------------	-----	-----------	-----------

#### 8260B Volatile Organic Compounds

#### Batch BL71808 - 5030B

1,2-Dichlorobenzene	9.84		ug/L	10.00		98	70-130			
1,2-Dichloroethane	9.48		ug/L	10.00		95	70-130			
1,2-Dichloropropane	9.88		ug/L	10.00		99	70-130			
1,3,5-Trimethylbenzene	9.94		ug/L	10.00		99	70-130			
1,3-Dichlorobenzene	10.0		ug/L	10.00		100	70-130			
1,3-Dichloropropane	9.80		ug/L	10.00		98	70-130			
1,4-Dichlorobenzene	9.80		ug/L	10.00		98	70-130			
1,4-Dioxane - Screen	422		ug/L	200.0		211	0-332			
1-Chlorohexane	10.7		ug/L	10.00		107	70-130			
2,2-Dichloropropane	10.0		ug/L	10.00		100	70-130			
2-Butanone	56.0		ug/L	50.00		112	70-130			
2-Chlorotoluene	10.2		ug/L	10.00		102	70-130			
2-Hexanone	56.0		ug/L	50.00		112	70-130			
4-Chlorotoluene	9.81		ug/L	10.00		98	70-130			
4-Isopropyltoluene	9.75		ug/L	10.00		98	70-130			
4-Methyl-2-Pentanone	51.1		ug/L	50.00		102	70-130			
Acetone	62.8		ug/L	50.00		126	70-130			
Benzene	9.92		ug/L	10.00		99	70-130			
Bromobenzene	10.3		ug/L	10.00		103	70-130			
Bromochloromethane	9.55		ug/L	10.00		96	70-130			
Bromodichloromethane	10.9		ug/L	10.00		109	70-130			
Bromoform	9.17		ug/L	10.00		92	70-130			
Bromomethane	10.8		ug/L	10.00		108	70-130			
Carbon Disulfide	10.5		ug/L	10.00		105	70-130			
Carbon Tetrachloride	9.52		ug/L	10.00		95	70-130			
Chlorobenzene	10.2		ug/L	10.00		102	70-130			
Chloroethane	11.2		ug/L	10.00		112	70-130			
Chloroform	9.85		ug/L	10.00		98	70-130			
Chloromethane	11.1		ug/L	10.00		111	70-130			
cis-1,2-Dichloroethene	10.8		ug/L	10.00		108	70-130			
cis-1,3-Dichloropropene	9.47		ug/L	10.00		95	70-130			
Dibromochloromethane	9.69		ug/L	10.00		97	70-130			
Dibromomethane	9.86		ug/L	10.00		99	70-130			
Dichlorodifluoromethane	10.3		ug/L	10.00		103	70-130			
Diethyl Ether	10.4		ug/L	10.00		104	70-130			
Di-isopropyl ether	9.63		ug/L	10.00		96	70-130			
Ethyl tertiary-butyl ether	9.52		ug/L	10.00		95	70-130			
Ethylbenzene	10.2		ug/L	10.00		102	70-130			
Hexachlorobutadiene	11.6		ug/L	10.00		116	70-130			
Isopropylbenzene	9.12		ug/L	10.00		91	70-130			
Methyl tert-Butyl Ether	9.43		ug/L	10.00		94	70-130			
Methylene Chloride	10.6		ug/L	10.00		106	70-130			
Naphthalene	9.78		ug/L	10.00		98	70-130			
n-Butylbenzene	10.7		ug/L	10.00		107	70-130			
n-Propylbenzene	10.4		ug/L	10.00		104	70-130			
sec-Butylbenzene	10.1		ug/L	10.00		101	70-130			



# ESS Laboratory

Division of Thielsch Engineering, Inc.

## CERTIFICATE OF ANALYSIS

Client Name: MACTEC Engineering & Consulting, Inc.  
 Client Project ID: Providence Gorham Site

ESS Laboratory Work Order: 0712197

### Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
---------	--------	-----	-------	-------------	---------------	------	-------------	-----	-----------	-----------

#### 8260B Volatile Organic Compounds

##### Batch BL71808 - 50308

Styrene	9.75		ug/L	10.00		98	70-130			
tert-Butylbenzene	9.99		ug/L	10.00		100	70-130			
Tertiary-amyl methyl ether	10.3		ug/L	10.00		103	70-130			
Tetrachloroethene	7.68		ug/L	10.00		77	70-130			
Tetrahydrofuran	9.79		ug/L	10.00		98	70-130			
Toluene	10.8		ug/L	10.00		108	70-130			
trans-1,2-Dichloroethene	10.7		ug/L	10.00		107	70-130			
trans-1,3-Dichloropropene	8.42		ug/L	10.00		84	70-130			
Trichloroethene	9.85		ug/L	10.00		98	70-130			
Trichlorofluoromethane	9.89		ug/L	10.00		99	70-130			
Vinyl Acetate	11.2		ug/L	10.00		112	70-130			
Vinyl Chloride	12.2		ug/L	10.00		122	70-130			
Xylene O	10.2		ug/L	10.00		102	70-130			
Xylene P,M	20.6		ug/L	20.00		103	70-130			
Surrogate: 1,2-Dichloroethane-d4	22.2		ug/L	25.00		89	70-130			
Surrogate: 4-Bromofluorobenzene	25.1		ug/L	25.00		100	70-130			
Surrogate: Dibromofluoromethane	25.1		ug/L	25.00		101	70-130			
Surrogate: Toluene-d8	26.1		ug/L	25.00		104	70-130			

##### LCS Dup

1,1,1,2-Tetrachloroethane	9.17		ug/L	10.00		92	70-130	5	20	
1,1,1-Trichloroethane	8.95		ug/L	10.00		90	70-130	8	20	
1,1,2,2-Tetrachloroethane	9.67		ug/L	10.00		97	70-130	3	20	
1,1,2-Trichloroethane	9.76		ug/L	10.00		98	70-130	3	20	
1,1-Dichloroethane	9.61		ug/L	10.00		96	70-130	7	20	
1,1-Dichloroethene	10.6		ug/L	10.00		106	70-130	3	20	
1,1-Dichloropropene	8.89		ug/L	10.00		89	70-130	8	20	
1,2,3-Trichlorobenzene	9.40		ug/L	10.00		94	70-130	15	20	
1,2,3-Trichloropropane	9.07		ug/L	10.00		91	70-130	3	20	
1,2,4-Trichlorobenzene	9.45		ug/L	10.00		94	70-130	14	20	
1,2,4-Trimethylbenzene	9.50		ug/L	10.00		95	70-130	8	20	
1,2-Dibromo-3-Chloropropane	9.33		ug/L	10.00		93	70-130	9	20	
1,2-Dibromoethane	9.13		ug/L	10.00		91	70-130	0.3	20	
1,2-Dichlorobenzene	9.37		ug/L	10.00		94	70-130	5	20	
1,2-Dichloroethane	8.99		ug/L	10.00		90	70-130	5	20	
1,2-Dichloropropane	9.52		ug/L	10.00		95	70-130	4	20	
1,3,5-Trimethylbenzene	9.35		ug/L	10.00		94	70-130	6	20	
1,3-Dichlorobenzene	9.44		ug/L	10.00		94	70-130	6	20	
1,3-Dichloropropane	9.13		ug/L	10.00		91	70-130	7	20	
1,4-Dichlorobenzene	9.40		ug/L	10.00		94	70-130	4	20	
1,4-Dioxane - Screen	224		ug/L	200.0		112	0-332	61	200	
1-Chlorohexane	10.1		ug/L	10.00		101	70-130	6	20	
2,2-Dichloropropane	9.68		ug/L	10.00		97	70-130	4	20	
2-Butanone	51.6		ug/L	50.00		103	70-130	8	20	
2-Chlorotoluene	9.51		ug/L	10.00		95	70-130	7	20	
2-Hexanone	56.2		ug/L	50.00		112	70-130	0.4	20	
4-Chlorotoluene	9.31		ug/L	10.00		93	70-130	5	20	



# ESS Laboratory

Division of Thielsch Engineering, Inc.

## CERTIFICATE OF ANALYSIS

Client Name: MACTEC Engineering & Consulting, Inc.

Client Project ID: Providence Gorham Site

ESS Laboratory Work Order: 0712197

### Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
---------	--------	-----	-------	-------------	---------------	------	-------------	-----	-----------	-----------

#### 8260B Volatile Organic Compounds

#### Batch BL71808 - 5030B

4-Isopropyltoluene	9.09		ug/L	10.00		91	70-130	7	20	
4-Methyl-2-Pentanone	50.5		ug/L	50.00		101	70-130	1	20	
Acetone	55.7		ug/L	50.00		111	70-130	12	20	
Benzene	9.24		ug/L	10.00		92	70-130	7	20	
Bromobenzene	9.58		ug/L	10.00		96	70-130	7	20	
Bromochloromethane	9.19		ug/L	10.00		92	70-130	4	20	
Bromodichloromethane	10.4		ug/L	10.00		104	70-130	4	20	
Bromoform	9.01		ug/L	10.00		90	70-130	2	20	
Bromomethane	9.51		ug/L	10.00		95	70-130	12	20	
Carbon Disulfide	10.1		ug/L	10.00		101	70-130	4	20	
Carbon Tetrachloride	8.89		ug/L	10.00		89	70-130	7	20	
Chlorobenzene	9.65		ug/L	10.00		96	70-130	6	20	
Chloroethane	10.2		ug/L	10.00		102	70-130	9	20	
Chloroform	9.24		ug/L	10.00		92	70-130	6	20	
Chloromethane	10.1		ug/L	10.00		101	70-130	9	20	
cis-1,2-Dichloroethene	9.81		ug/L	10.00		98	70-130	9	20	
cis-1,3-Dichloropropene	9.17		ug/L	10.00		92	70-130	3	20	
Dibromochloromethane	9.46		ug/L	10.00		95	70-130	2	20	
Dibromomethane	9.21		ug/L	10.00		92	70-130	7	20	
Dichlorodifluoromethane	9.59		ug/L	10.00		96	70-130	7	20	
Diethyl Ether	9.37		ug/L	10.00		94	70-130	11	20	
Di-isopropyl ether	9.11		ug/L	10.00		91	70-130	6	20	
Ethyl tertiary-butyl ether	9.00		ug/L	10.00		90	70-130	6	20	
Ethylbenzene	9.71		ug/L	10.00		97	70-130	5	20	
Hexachlorobutadiene	10.3		ug/L	10.00		103	70-130	12	20	
Isopropylbenzene	8.51		ug/L	10.00		85	70-130	7	20	
Methyl tert-Butyl Ether	9.27		ug/L	10.00		93	70-130	2	20	
Methylene Chloride	10.1		ug/L	10.00		101	70-130	5	20	
Naphthalene	8.92		ug/L	10.00		89	70-130	9	20	
n-Butylbenzene	9.67		ug/L	10.00		97	70-130	10	20	
n-Propylbenzene	9.62		ug/L	10.00		96	70-130	8	20	
sec-Butylbenzene	9.55		ug/L	10.00		96	70-130	6	20	
Styrene	9.15		ug/L	10.00		92	70-130	6	20	
tert-Butylbenzene	9.42		ug/L	10.00		94	70-130	6	20	
Tertiary-amyl methyl ether	9.83		ug/L	10.00		98	70-130	4	20	
Tetrachloroethene	8.77		ug/L	10.00		88	70-130	13	20	
Tetrahydrofuran	10.2		ug/L	10.00		102	70-130	4	20	
Toluene	10.1		ug/L	10.00		101	70-130	6	20	
trans-1,2-Dichloroethene	10.1		ug/L	10.00		101	70-130	5	20	
trans-1,3-Dichloropropene	8.49		ug/L	10.00		85	70-130	0.8	20	
Trichloroethene	9.25		ug/L	10.00		92	70-130	6	20	
Trichlorofluoromethane	9.26		ug/L	10.00		93	70-130	7	20	
Vinyl Acetate	10.7		ug/L	10.00		107	70-130	5	20	
Vinyl Chloride	11.5		ug/L	10.00		115	70-130	5	20	
Xylene O	9.67		ug/L	10.00		97	70-130	5	20	
Xylene P,M	19.7		ug/L	20.00		99	70-130	4	20	





# ESS Laboratory

Division of Thielsch Engineering, Inc.

## CERTIFICATE OF ANALYSIS

Client Name: MACTEC Engineering & Consulting, Inc.

Client Project ID: Providence Gorham Site

ESS Laboratory Work Order: 0712197

### Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
---------	--------	-----	-------	-------------	---------------	------	-------------	-----	-----------	-----------

#### 8260B Volatile Organic Compounds

#### Batch BL71808 - 5030B

Surrogate: 1,2-Dichloroethane-d4	22.7		ug/L	25.00		91	70-130			
Surrogate: 4-Bromofluorobenzene	24.7		ug/L	25.00		99	70-130			
Surrogate: Dibromofluoromethane	25.1		ug/L	25.00		100	70-130			
Surrogate: Toluene-d8	26.1		ug/L	25.00		104	70-130			



# ESS Laboratory

*Division of Thielsch Engineering, Inc.*

## *CERTIFICATE OF ANALYSIS*

Client Name: MACTEC Engineering & Consulting, Inc.  
Client Project ID: Providence Gorham Site

ESS Laboratory Work Order: 0712197

### **Notes and Definitions**

- U Analyte included in the analysis, but not detected
- C- Continuing Calibration recovery is below lower control limit.
- ND Analyte NOT DETECTED above the detection limit
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference
- MDL Method Detection Limit
- MRL Method Reporting 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.



# ESS Laboratory

*Division of Thielsch Engineering, Inc.*

## *CERTIFICATE OF ANALYSIS*

Client Name: MACTEC Engineering & Consulting, Inc.  
Client Project ID: Providence Gorham Site

ESS Laboratory Work Order: 0712197

### **ESS LABORATORY CERTIFICATIONS**

U.S. Army Corps of Engineers  
Soil and Water

Navy Installation Restoration QA Program  
Soil and Water

Rhode Island: A-179

Connecticut: PH-0750

Maine: RI002

Massachusetts: M-RI002

New Hampshire (NELAP accredited): 242405  
Potable Water  
Non Potable Water

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

United States Department of Agriculture  
Soil Permit: S-54210

New Jersey (NELAP accredited): RI002  
Potable Water  
Non Potable Water  
Soil and Hazardous Waste

Maryland: 301  
Potable Water





# ESS Laboratory

Division of Thielsch Engineering, Inc.

## CERTIFICATE OF ANALYSIS

## PROJECT NARRATIVE

David Heislein  
MACTEC Engineering & Consulting, Inc.  
107 Audubon Road  
Wakefield, MA 01880

**RE: Providence Gorham Site**  
**ESS Laboratory Work Order Number: 0712198**

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 Project Narrative, the entire report has been paginated. The ESS Laboratory Certifications sheet is the final report page. 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 mailed. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard  
Laboratory Director

Date: December 19, 2007

### 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 may be used instead of automated integration because it produces more accurate results. All ICP Metals were analyzed using the established linear dynamic range to determine acceptable analytical results.

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

### Sample Receipt

The following sample(s) were received on December 17, 2007 for the analyses specified on the enclosed Chain of Custody Record.

Laboratory ID	Matrix	Client SampleID
0712198-01	Soil	East-1
0712198-02	Soil	West-1



# ESS Laboratory

*Division of Thielsch Engineering, Inc.*

## CERTIFICATE OF ANALYSIS

Client Name: MACTEC Engineering & Consulting, Inc.  
Client Project ID: Providence Gorham Site

ESS Laboratory Work Order: 0712198

## PROJECT NARRATIVE

### 5035/8260B Volatile Organic Compounds / Methanol

BL71910-BS1 **Blank Spike recovery is above upper control limit.**

Acetone

BL71910-BS1 **Blank Spike recovery is below lower control limit.**

Dichlorodifluoromethane

BL71910-BSD1 **Blank Spike recovery is above upper control limit.**

Acetone

BL71910-BSD1 **Relative percent difference for duplicate is outside of criteria.**

Dichlorodifluoromethane, Vinyl Chloride

BQL0158-CCV1 **Continuing Calibration recovery is below lower control limit.**

1,4-Dioxane - Screen

**No other observations noted.**

**End of Project Narrative.**



# ESS Laboratory

Division of Thielsch Engineering, Inc.

## CERTIFICATE OF ANALYSIS

Client Name: MACTEC Engineering & Consulting, Inc.  
Client Project ID: Providence Gorham Site  
Client Sample ID: East-1  
Date Sampled: 12/17/07 12:45  
Percent Solids: 84  
Initial Volume: 8  
Final Volume: 15  
Extraction Method: 5035

ESS Laboratory Work Order: 0712198  
ESS Laboratory Sample ID: 0712198-01  
Sample Matrix: Soil  
Analyst: RES

### 5035/8260B Volatile Organic Compounds / Methanol

RI - RES DEC

Analyte	Results	Units	MRL	MDL	Limit	DF	Analyzed
1,1,1,2-Tetrachloroethane	ND	mg/kg dry	0.242	0.0775	2.2	1	12/19/07
1,1,1-Trichloroethane	ND	mg/kg dry	0.121	0.0291	540	1	12/19/07
1,1,2,2-Tetrachloroethane	ND	mg/kg dry	0.121	0.0339	1.3	1	12/19/07
1,1,2-Trichloroethane	ND	mg/kg dry	0.121	0.0509	3.6	1	12/19/07
1,1-Dichloroethane	ND	mg/kg dry	0.121	0.0339	920	1	12/19/07
1,1-Dichloroethene	ND	mg/kg dry	0.121	0.0266	0.2	1	12/19/07
1,1-Dichloropropene	ND	mg/kg dry	0.121	0.0218		1	12/19/07
1,2,3-Trichlorobenzene	ND	mg/kg dry	0.121	0.0266		1	12/19/07
1,2,3-Trichloropropane	ND	mg/kg dry	0.121	0.0606		1	12/19/07
1,2,4-Trichlorobenzene	ND	mg/kg dry	0.121	0.0242	96	1	12/19/07
1,2,4-Trimethylbenzene	ND	mg/kg dry	0.121	0.0266		1	12/19/07
1,2-Dibromo-3-Chloropropane	ND	mg/kg dry	0.606	0.242	0.5	1	12/19/07
1,2-Dibromoethane	ND	mg/kg dry	0.121	0.0242	0.01	1	12/19/07
1,2-Dichlorobenzene	ND	mg/kg dry	0.121	0.0242	510	1	12/19/07
1,2-Dichloroethane	ND	mg/kg dry	0.121	0.0291	0.9	1	12/19/07
1,2-Dichloropropane	ND	mg/kg dry	0.121	0.0339	1.9	1	12/19/07
1,3,5-Trimethylbenzene	ND	mg/kg dry	0.121	0.0315		1	12/19/07
1,3-Dichlorobenzene	ND	mg/kg dry	0.121	0.0266	430	1	12/19/07
1,3-Dichloropropane	ND	mg/kg dry	0.121	0.0218		1	12/19/07
1,4-Dichlorobenzene	ND	mg/kg dry	0.121	0.0315	27	1	12/19/07
1,4-Dioxane - Screen	ND	mg/kg dry	12.1	5.81		1	12/19/07
1-Chlorohexane	ND	mg/kg dry	0.121	0.0291		1	12/19/07
2,2-Dichloropropane	ND	mg/kg dry	0.242	0.0557		1	12/19/07
2-Butanone	ND	mg/kg dry	3.03	0.494	10000	1	12/19/07
2-Chlorotoluene	ND	mg/kg dry	0.121	0.0339		1	12/19/07
2-Hexanone	ND	mg/kg dry	1.21	0.121		1	12/19/07
4-Chlorotoluene	ND	mg/kg dry	0.121	0.0291		1	12/19/07
4-Isopropyltoluene	ND	mg/kg dry	0.121	0.0291		1	12/19/07
4-Methyl-2-Pentanone	ND	mg/kg dry	1.21	0.153	1200	1	12/19/07
Acetone	ND	mg/kg dry	3.03	1.03	7800	1	12/19/07
Benzene	ND	mg/kg dry	0.121	0.0339	2.5	1	12/19/07
Bromobenzene	ND	mg/kg dry	0.121	0.0242		1	12/19/07
Bromochloromethane	ND	mg/kg dry	0.121	0.0363		1	12/19/07
Bromodichloromethane	ND	mg/kg dry	0.121	0.0315	10	1	12/19/07
Bromoform	ND	mg/kg dry	0.121	0.0266	81	1	12/19/07



# ESS Laboratory

Division of Thielsch Engineering, Inc.

## CERTIFICATE OF ANALYSIS

Client Name: MACTEC Engineering & Consulting, Inc.

Client Project ID: Providence Gorham Site

Client Sample ID: East-1

Date Sampled: 12/17/07 12:45

Percent Solids: 84

Initial Volume: 8

Final Volume: 15

Extraction Method: 5035

ESS Laboratory Work Order: 0712198

ESS Laboratory Sample ID: 0712198-01

Sample Matrix: Soil

Analyst: RES

### 5035/8260B Volatile Organic Compounds / Methanol

Bromomethane	ND	mg/kg dry	0.242	0.0242	0.8	1	12/19/07	
Carbon Disulfide	ND	mg/kg dry	0.121	0.0291		1	12/19/07	
Carbon Tetrachloride	ND	mg/kg dry	0.121	0.0315	1.5	1	12/19/07	
Chlorobenzene	ND	mg/kg dry	0.121	0.0266	210	1	12/19/07	
Chloroethane	ND	mg/kg dry	0.242	0.0727		1	12/19/07	
Chloroform	ND	mg/kg dry	0.121	0.0266	1.2	1	12/19/07	
Chloromethane	ND	mg/kg dry	0.242	0.0363		1	12/19/07	
cis-1,2-Dichloroethene	ND	mg/kg dry	0.121	0.0339	630	1	12/19/07	
cis-1,3-Dichloropropene	ND	mg/kg dry	0.121	0.0242		1	12/19/07	
Dibromochloromethane	ND	mg/kg dry	0.121	0.0194	7.6	1	12/19/07	
Dibromomethane	ND	mg/kg dry	0.121	0.0315		1	12/19/07	
Dichlorodifluoromethane	ND	mg/kg dry	0.121	0.0266		1	12/19/07	
Diethyl Ether	ND	mg/kg dry	0.121	0.0339		1	12/19/07	
Di-isopropyl ether	ND	mg/kg dry	0.121	0.0266		1	12/19/07	
Ethyl tertiary-butyl ether	ND	mg/kg dry	0.121	0.0242		1	12/19/07	
Ethylbenzene	ND	mg/kg dry	0.121	0.0266	71	1	12/19/07	
Hexachlorobutadiene	ND	mg/kg dry	0.121	0.0533	8.2	1	12/19/07	
Isopropylbenzene	ND	mg/kg dry	0.121	0.0266	27	1	12/19/07	
Methyl tert-Butyl Ether	ND	mg/kg dry	0.121	0.0266	390	1	12/19/07	
<b>Methylene Chloride</b>	<b>J</b>	<b>0.0678</b>	mg/kg dry	0.606	0.0460	45	1	12/19/07
Naphthalene	ND	mg/kg dry	0.121	0.0194	54	1	12/19/07	
n-Butylbenzene	ND	mg/kg dry	0.121	0.0266		1	12/19/07	
n-Propylbenzene	ND	mg/kg dry	0.121	0.0242		1	12/19/07	
sec-Butylbenzene	ND	mg/kg dry	0.121	0.0291		1	12/19/07	
Styrene	ND	mg/kg dry	0.121	0.0291	13	1	12/19/07	
tert-Butylbenzene	ND	mg/kg dry	0.121	0.0266		1	12/19/07	
Tertiary-amyl methyl ether	ND	mg/kg dry	0.121	0.0339		1	12/19/07	
<b>Tetrachloroethene</b>		<b>0.191</b>	mg/kg dry	0.121	0.0291	12	1	12/19/07
Tetrahydrofuran	ND	mg/kg dry	0.606	0.242		1	12/19/07	
Toluene	ND	mg/kg dry	0.121	0.0315	190	1	12/19/07	
trans-1,2-Dichloroethene	ND	mg/kg dry	0.121	0.0388	1100	1	12/19/07	
trans-1,3-Dichloropropene	ND	mg/kg dry	0.121	0.0291		1	12/19/07	
<b>Trichloroethene</b>	<b>J</b>	<b>0.0872</b>	mg/kg dry	0.121	0.0266	13	1	12/19/07
Trichlorofluoromethane	ND	mg/kg dry	0.121	0.0315		1	12/19/07	
Vinyl Acetate	ND	mg/kg dry	0.606	0.0460		1	12/19/07	
Vinyl Chloride	ND	mg/kg dry	0.121	0.0291	0.02	1	12/19/07	



# ESS Laboratory

Division of Thielsch Engineering, Inc.

## CERTIFICATE OF ANALYSIS

Client Name: MACTEC Engineering & Consulting, Inc.  
Client Project ID: Providence Gorham Site  
Client Sample ID: East-1  
Date Sampled: 12/17/07 12:45  
Percent Solids: 84  
Initial Volume: 8  
Final Volume: 15  
Extraction Method: 5035

ESS Laboratory Work Order: 0712198  
ESS Laboratory Sample ID: 0712198-01  
Sample Matrix: Soil  
Analyst: RES

### 5035/8260B Volatile Organic Compounds / Methanol

Xylene O	ND	mg/kg dry	0.121	0.0218	110	1	12/19/07
Xylene P,M	ND	mg/kg dry	0.242	0.0581	110	1	12/19/07
Xylenes (Total)	ND	mg/kg dry	0.363		110	1	12/19/07

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	91 %		70-130
Surrogate: 4-Bromofluorobenzene	92 %		70-130
Surrogate: Dibromofluoromethane	102 %		70-130
Surrogate: Toluene-d8	97 %		70-130



# ESS Laboratory

Division of Thielsch Engineering, Inc.

## CERTIFICATE OF ANALYSIS

Client Name: MACTEC Engineering & Consulting, Inc.  
Client Project ID: Providence Gorham Site  
Client Sample ID: West-1  
Date Sampled: 12/17/07 13:30  
Percent Solids: 93  
Initial Volume: 2.8  
Final Volume: 15  
Extraction Method: 5035

ESS Laboratory Work Order: 0712198  
ESS Laboratory Sample ID: 0712198-02  
Sample Matrix: Soil  
Analyst: RES

### 5035/8260B Volatile Organic Compounds / Methanol

RI - RES DEC

Analyte	Results	Units	MRL	MDL	Limit	DF	Analyzed
1,1,1,2-Tetrachloroethane	ND	mg/kg dry	0.584	0.187	2.2	1	12/19/07
1,1,1-Trichloroethane	J 0.158	mg/kg dry	0.292	0.0700	540	1	12/19/07
1,1,2,2-Tetrachloroethane	ND	mg/kg dry	0.292	0.0817	1.3	1	12/19/07
1,1,2-Trichloroethane	ND	mg/kg dry	0.292	0.123	3.6	1	12/19/07
1,1-Dichloroethane	ND	mg/kg dry	0.292	0.0817	920	1	12/19/07
1,1-Dichloroethene	ND	mg/kg dry	0.292	0.0642	0.2	1	12/19/07
1,1-Dichloropropene	ND	mg/kg dry	0.292	0.0525		1	12/19/07
1,2,3-Trichlorobenzene	ND	mg/kg dry	0.292	0.0642		1	12/19/07
1,2,3-Trichloropropane	ND	mg/kg dry	0.292	0.146		1	12/19/07
1,2,4-Trichlorobenzene	ND	mg/kg dry	0.292	0.0584	96	1	12/19/07
1,2,4-Trimethylbenzene	ND	mg/kg dry	0.292	0.0642		1	12/19/07
1,2-Dibromo-3-Chloropropane	ND	mg/kg dry	1.46	0.584	0.5	1	12/19/07
1,2-Dibromoethane	ND	mg/kg dry	0.292	0.0584	0.01	1	12/19/07
1,2-Dichlorobenzene	ND	mg/kg dry	0.292	0.0584	510	1	12/19/07
1,2-Dichloroethane	ND	mg/kg dry	0.292	0.0700	0.9	1	12/19/07
1,2-Dichloropropane	ND	mg/kg dry	0.292	0.0817	1.9	1	12/19/07
1,3,5-Trimethylbenzene	ND	mg/kg dry	0.292	0.0759		1	12/19/07
1,3-Dichlorobenzene	ND	mg/kg dry	0.292	0.0642	430	1	12/19/07
1,3-Dichloropropane	ND	mg/kg dry	0.292	0.0525		1	12/19/07
1,4-Dichlorobenzene	ND	mg/kg dry	0.292	0.0759	27	1	12/19/07
1,4-Dioxane - Screen	ND	mg/kg dry	29.2	14.0		1	12/19/07
1-Chlorohexane	ND	mg/kg dry	0.292	0.0700		1	12/19/07
2,2-Dichloropropane	ND	mg/kg dry	0.584	0.134		1	12/19/07
2-Butanone	ND	mg/kg dry	7.29	1.19	10000	1	12/19/07
2-Chlorotoluene	ND	mg/kg dry	0.292	0.0817		1	12/19/07
2-Hexanone	ND	mg/kg dry	2.92	0.292		1	12/19/07
4-Chlorotoluene	ND	mg/kg dry	0.292	0.0700		1	12/19/07
4-Isopropyltoluene	ND	mg/kg dry	0.292	0.0700		1	12/19/07
4-Methyl-2-Pentanone	ND	mg/kg dry	2.92	0.368	1200	1	12/19/07
Acetone	ND	mg/kg dry	7.29	2.48	7800	1	12/19/07
Benzene	ND	mg/kg dry	0.292	0.0817	2.5	1	12/19/07
Bromobenzene	ND	mg/kg dry	0.292	0.0584		1	12/19/07
Bromochloromethane	ND	mg/kg dry	0.292	0.0875		1	12/19/07
Bromodichloromethane	ND	mg/kg dry	0.292	0.0759	10	1	12/19/07
Bromoform	ND	mg/kg dry	0.292	0.0642	81	1	12/19/07



# ESS Laboratory

Division of Thielsch Engineering, Inc.

## CERTIFICATE OF ANALYSIS

Client Name: MACTEC Engineering & Consulting, Inc.  
 Client Project ID: Providence Gorham Site  
 Client Sample ID: West-1  
 Date Sampled: 12/17/07 13:30  
 Percent Solids: 93  
 Initial Volume: 2.8  
 Final Volume: 15  
 Extraction Method: 5035

ESS Laboratory Work Order: 0712198  
 ESS Laboratory Sample ID: 0712198-02  
 Sample Matrix: Soil  
 Analyst: RES

### 5035/8260B Volatile Organic Compounds / Methanol

Bromomethane	ND	mg/kg dry	0.584	0.0584	0.8	1	12/19/07	
Carbon Disulfide	ND	mg/kg dry	0.292	0.0700		1	12/19/07	
Carbon Tetrachloride	ND	mg/kg dry	0.292	0.0759	1.5	1	12/19/07	
Chlorobenzene	ND	mg/kg dry	0.292	0.0642	210	1	12/19/07	
Chloroethane	ND	mg/kg dry	0.584	0.175		1	12/19/07	
Chloroform	ND	mg/kg dry	0.292	0.0642	1.2	1	12/19/07	
Chloromethane	ND	mg/kg dry	0.584	0.0875		1	12/19/07	
cis-1,2-Dichloroethene	ND	mg/kg dry	0.292	0.0817	630	1	12/19/07	
cis-1,3-Dichloropropene	ND	mg/kg dry	0.292	0.0584		1	12/19/07	
Dibromochloromethane	ND	mg/kg dry	0.292	0.0467	7.6	1	12/19/07	
Dibromomethane	ND	mg/kg dry	0.292	0.0759		1	12/19/07	
Dichlorodifluoromethane	ND	mg/kg dry	0.292	0.0642		1	12/19/07	
Diethyl Ether	ND	mg/kg dry	0.292	0.0817		1	12/19/07	
Di-isopropyl ether	ND	mg/kg dry	0.292	0.0642		1	12/19/07	
Ethyl tertiary-butyl ether	ND	mg/kg dry	0.292	0.0584		1	12/19/07	
Ethylbenzene	ND	mg/kg dry	0.292	0.0642	71	1	12/19/07	
Hexachlorobutadiene	ND	mg/kg dry	0.292	0.128	8.2	1	12/19/07	
Isopropylbenzene	ND	mg/kg dry	0.292	0.0642	27	1	12/19/07	
Methyl tert-Butyl Ether	ND	mg/kg dry	0.292	0.0642	390	1	12/19/07	
<b>Methylene Chloride</b>	<b>J</b>	<b>0.123</b>	mg/kg dry	1.46	0.111	45	1	12/19/07
Naphthalene	ND	mg/kg dry	0.292	0.0467	54	1	12/19/07	
n-Butylbenzene	ND	mg/kg dry	0.292	0.0642		1	12/19/07	
n-Propylbenzene	ND	mg/kg dry	0.292	0.0584		1	12/19/07	
sec-Butylbenzene	ND	mg/kg dry	0.292	0.0700		1	12/19/07	
Styrene	ND	mg/kg dry	0.292	0.0700	13	1	12/19/07	
tert-Butylbenzene	ND	mg/kg dry	0.292	0.0642		1	12/19/07	
Tertiary-amyl methyl ether	ND	mg/kg dry	0.292	0.0817		1	12/19/07	
<b>Tetrachloroethene</b>	<b>J</b>	<b>0.128</b>	mg/kg dry	0.292	0.0700	12	1	12/19/07
Tetrahydrofuran	ND	mg/kg dry	1.46	0.584		1	12/19/07	
Toluene	ND	mg/kg dry	0.292	0.0759	190	1	12/19/07	
trans-1,2-Dichloroethene	ND	mg/kg dry	0.292	0.0934	1100	1	12/19/07	
trans-1,3-Dichloropropene	ND	mg/kg dry	0.292	0.0700		1	12/19/07	
<b>Trichloroethene</b>		<b>1.16</b>	mg/kg dry	0.292	0.0642	13	1	12/19/07
Trichlorofluoromethane	ND	mg/kg dry	0.292	0.0759		1	12/19/07	
Vinyl Acetate	ND	mg/kg dry	1.46	0.111		1	12/19/07	
Vinyl Chloride	ND	mg/kg dry	0.292	0.0700	0.02	1	12/19/07	



# ESS Laboratory

Division of Thielsch Engineering, Inc.

## CERTIFICATE OF ANALYSIS

Client Name: MACTEC Engineering & Consulting, Inc.  
 Client Project ID: Providence Gorham Site  
 Client Sample ID: West-1  
 Date Sampled: 12/17/07 13:30  
 Percent Solids: 93  
 Initial Volume: 2.8  
 Final Volume: 15  
 Extraction Method: 5035

ESS Laboratory Work Order: 0712198  
 ESS Laboratory Sample ID: 0712198-02  
 Sample Matrix: Soil  
 Analyst: RES

### 5035/8260B Volatile Organic Compounds / Methanol

Xylene O	ND	mg/kg dry	0.292	0.0525	110	1	12/19/07
Xylene P,M	ND	mg/kg dry	0.584	0.140	110	1	12/19/07
Xylenes (Total)	ND	mg/kg dry	0.875		110	1	12/19/07

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	86 %		70-130
Surrogate: 4-Bromofluorobenzene	89 %		70-130
Surrogate: Dibromofluoromethane	97 %		70-130
Surrogate: Toluene-d8	93 %		70-130



# ESS Laboratory

Division of Thielsch Engineering, Inc.

## CERTIFICATE OF ANALYSIS

Client Name: MACTEC Engineering & Consulting, Inc.

Client Project ID: Providence Gorham Site

ESS Laboratory Work Order: 0712198

### Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Methanol										

#### Batch BL71910 - 5035

Blank										
1,1,1,2-Tetrachloroethane	ND	100	ug/Kg wet							
1,1,1-Trichloroethane	ND	50.0	ug/Kg wet							
1,1,2,2-Tetrachloroethane	ND	50.0	ug/Kg wet							
1,1,2-Trichloroethane	ND	50.0	ug/Kg wet							
1,1-Dichloroethane	ND	50.0	ug/Kg wet							
1,1-Dichloroethene	ND	50.0	ug/Kg wet							
1,1-Dichloropropene	ND	50.0	ug/Kg wet							
1,2,3-Trichlorobenzene	ND	50.0	ug/Kg wet							
1,2,3-Trichloropropane	ND	50.0	ug/Kg wet							
1,2,4-Trichlorobenzene	ND	50.0	ug/Kg wet							
1,2,4-Trimethylbenzene	ND	50.0	ug/Kg wet							
1,2-Dibromo-3-Chloropropane	ND	250	ug/Kg wet							
1,2-Dibromoethane	ND	50.0	ug/Kg wet							
1,2-Dichlorobenzene	ND	50.0	ug/Kg wet							
1,2-Dichloroethane	ND	50.0	ug/Kg wet							
1,2-Dichloropropane	ND	50.0	ug/Kg wet							
1,3,5-Trimethylbenzene	ND	50.0	ug/Kg wet							
1,3-Dichlorobenzene	ND	50.0	ug/Kg wet							
1,3-Dichloropropane	ND	50.0	ug/Kg wet							
1,4-Dichlorobenzene	ND	50.0	ug/Kg wet							
1,4-Dioxane - Screen	ND	5000	ug/Kg wet							
1-Chlorohexane	ND	50.0	ug/Kg wet							
2,2-Dichloropropane	ND	100	ug/Kg wet							
2-Butanone	ND	1250	ug/Kg wet							
2-Chlorotoluene	ND	50.0	ug/Kg wet							
2-Hexanone	ND	500	ug/Kg wet							
4-Chlorotoluene	ND	50.0	ug/Kg wet							
4-Isopropyltoluene	ND	50.0	ug/Kg wet							
4-Methyl-2-Pentanone	ND	500	ug/Kg wet							
Acetone	ND	1250	ug/Kg wet							
Benzene	ND	50.0	ug/Kg wet							
Bromobenzene	ND	50.0	ug/Kg wet							
Bromochloromethane	ND	50.0	ug/Kg wet							
Bromodichloromethane	ND	50.0	ug/Kg wet							
Bromoform	ND	50.0	ug/Kg wet							
Bromomethane	ND	100	ug/Kg wet							
Carbon Disulfide	ND	50.0	ug/Kg wet							
Carbon Tetrachloride	ND	50.0	ug/Kg wet							
Chlorobenzene	ND	50.0	ug/Kg wet							
Chloroethane	ND	100	ug/Kg wet							
Chloroform	ND	50.0	ug/Kg wet							
Chloromethane	ND	100	ug/Kg wet							
cis-1,2-Dichloroethene	ND	50.0	ug/Kg wet							
cis-1,3-Dichloropropene	ND	50.0	ug/Kg wet							
Dibromochloromethane	ND	50.0	ug/Kg wet							



# ESS Laboratory

Division of Thielsch Engineering, Inc.

## CERTIFICATE OF ANALYSIS

Client Name: MACTEC Engineering & Consulting, Inc.

Client Project ID: Providence Gorham Site

ESS Laboratory Work Order: 0712198

### Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
---------	--------	-----	-------	-------------	---------------	------	-------------	-----	-----------	-----------

#### 5035/8260B Volatile Organic Compounds / Methanol

#### Batch BL71910 - 5035

Dibromomethane	ND	50.0	ug/Kg wet							
Dichlorodifluoromethane	ND	50.0	ug/Kg wet							
Diethyl Ether	ND	50.0	ug/Kg wet							
Di-isopropyl ether	ND	50.0	ug/Kg wet							
Ethyl tertiary-butyl ether	ND	50.0	ug/Kg wet							
Ethylbenzene	ND	50.0	ug/Kg wet							
Hexachlorobutadiene	ND	50.0	ug/Kg wet							
Isopropylbenzene	ND	50.0	ug/Kg wet							
Methyl tert-Butyl Ether	ND	50.0	ug/Kg wet							
Methylene Chloride	ND	250	ug/Kg wet							
Naphthalene	ND	50.0	ug/Kg wet							
n-Butylbenzene	ND	50.0	ug/Kg wet							
n-Propylbenzene	ND	50.0	ug/Kg wet							
sec-Butylbenzene	ND	50.0	ug/Kg wet							
Styrene	ND	50.0	ug/Kg wet							
tert-Butylbenzene	ND	50.0	ug/Kg wet							
Tertiary-amyl methyl ether	ND	50.0	ug/Kg wet							
Tetrachloroethene	ND	50.0	ug/Kg wet							
Tetrahydrofuran	ND	250	ug/Kg wet							
Toluene	ND	50.0	ug/Kg wet							
trans-1,2-Dichloroethene	ND	50.0	ug/Kg wet							
trans-1,3-Dichloropropene	ND	50.0	ug/Kg wet							
Trichloroethene	ND	50.0	ug/Kg wet							
Trichlorofluoromethane	ND	50.0	ug/Kg wet							
Vinyl Acetate	ND	250	ug/Kg wet							
Vinyl Chloride	ND	50.0	ug/Kg wet							
Xylene O	ND	50.0	ug/Kg wet							
Xylene P,M	ND	100	ug/Kg wet							
Surrogate: 1,2-Dichloroethane-d4	2290		ug/Kg wet	2500		92	70-130			
Surrogate: 4-Bromofluorobenzene	2340		ug/Kg wet	2500		93	70-130			
Surrogate: Dibromofluoromethane	2590		ug/Kg wet	2500		104	70-130			
Surrogate: Toluene-d8	2450		ug/Kg wet	2500		98	70-130			

#### LCS

1,1,1,2-Tetrachloroethane	23.6		ug/L	25.00		95	70-130			
1,1,1-Trichloroethane	24.6		ug/L	25.00		99	70-130			
1,1,2,2-Tetrachloroethane	24.2		ug/L	25.00		97	70-130			
1,1,2-Trichloroethane	24.8		ug/L	25.00		99	70-130			
1,1-Dichloroethane	24.4		ug/L	25.00		98	70-130			
1,1-Dichloroethene	26.3		ug/L	25.00		105	70-130			
1,1-Dichloropropene	24.6		ug/L	25.00		98	70-130			
1,2,3-Trichlorobenzene	28.0		ug/L	25.00		112	70-130			
1,2,3-Trichloropropane	22.5		ug/L	25.00		90	70-130			
1,2,4-Trichlorobenzene	27.0		ug/L	25.00		108	70-130			
1,2,4-Trimethylbenzene	24.2		ug/L	25.00		97	70-130			
1,2-Dibromo-3-Chloropropane	25.5		ug/L	25.00		102	70-130			
1,2-Dibromoethane	24.9		ug/L	25.00		100	70-130			



# ESS Laboratory

Division of Thielsch Engineering, Inc.

## CERTIFICATE OF ANALYSIS

Client Name: MACTEC Engineering & Consulting, Inc.

Client Project ID: Providence Gorham Site

ESS Laboratory Work Order: 0712198

### Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
---------	--------	-----	-------	-------------	---------------	------	-------------	-----	-----------	-----------

#### 5035/8260B Volatile Organic Compounds / Methanol

#### Batch BL71910 - 5035

1,2-Dichlorobenzene	24.0		ug/L	25.00		96	70-130			
1,2-Dichloroethane	24.4		ug/L	25.00		98	70-130			
1,2-Dichloropropane	24.4		ug/L	25.00		98	70-130			
1,3,5-Trimethylbenzene	23.8		ug/L	25.00		95	70-130			
1,3-Dichlorobenzene	24.0		ug/L	25.00		96	70-130			
1,3-Dichloropropane	24.1		ug/L	25.00		96	70-130			
1,4-Dichlorobenzene	23.7		ug/L	25.00		95	70-130			
1,4-Dioxane - Screen	944		ug/L	500.0		189	44-241			
1-Chlorohexane	24.4		ug/L	25.00		97	70-130			
2,2-Dichloropropane	26.6		ug/L	25.00		106	70-130			
2-Butanone	154		ug/L	125.0		123	70-130			
2-Chlorotoluene	21.8		ug/L	25.00		87	70-130			
2-Hexanone	136		ug/L	125.0		109	70-130			
4-Chlorotoluene	23.2		ug/L	25.00		93	70-130			
4-Isopropyltoluene	23.4		ug/L	25.00		94	70-130			
4-Methyl-2-Pentanone	127		ug/L	125.0		101	70-130			
Acetone	165		ug/L	125.0		132	70-130			B+
Benzene	24.4		ug/L	25.00		98	70-130			
Bromobenzene	24.2		ug/L	25.00		97	70-130			
Bromochloromethane	23.6		ug/L	25.00		95	70-130			
Bromodichloromethane	24.5		ug/L	25.00		98	70-130			
Bromoform	25.6		ug/L	25.00		103	70-130			
Bromomethane	22.6		ug/L	25.00		90	70-130			
Carbon Disulfide	27.5		ug/L	25.00		110	70-130			
Carbon Tetrachloride	25.3		ug/L	25.00		101	70-130			
Chlorobenzene	24.0		ug/L	25.00		96	70-130			
Chloroethane	22.1		ug/L	25.00		89	70-130			
Chloroform	24.5		ug/L	25.00		98	70-130			
Chloromethane	20.6		ug/L	25.00		83	70-130			
cis-1,2-Dichloroethene	25.0		ug/L	25.00		100	70-130			
cis-1,3-Dichloropropene	25.5		ug/L	25.00		102	70-130			
Dibromochloromethane	24.4		ug/L	25.00		98	70-130			
Dibromomethane	25.2		ug/L	25.00		101	70-130			
Dichlorodifluoromethane	15.3		ug/L	25.00		61	70-130			B-
Diethyl Ether	25.3		ug/L	25.00		101	70-130			
Di-isopropyl ether	24.8		ug/L	25.00		99	70-130			
Ethyl tertiary-butyl ether	24.2		ug/L	25.00		97	70-130			
Ethylbenzene	23.8		ug/L	25.00		95	70-130			
Hexachlorobutadiene	27.1		ug/L	25.00		108	70-130			
Isopropylbenzene	20.0		ug/L	25.00		80	70-130			
Methyl tert-Butyl Ether	25.4		ug/L	25.00		101	70-130			
Methylene Chloride	24.2		ug/L	25.00		97	70-130			
Naphthalene	25.4		ug/L	25.00		101	70-130			
n-Butylbenzene	24.7		ug/L	25.00		99	70-130			
n-Propylbenzene	24.8		ug/L	25.00		99	70-130			
sec-Butylbenzene	23.8		ug/L	25.00		95	70-130			



# ESS Laboratory

Division of Thielsch Engineering, Inc.

## CERTIFICATE OF ANALYSIS

Client Name: MACTEC Engineering & Consulting, Inc.  
 Client Project ID: Providence Gorham Site

ESS Laboratory Work Order: 0712198

### Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
---------	--------	-----	-------	-------------	---------------	------	-------------	-----	-----------	-----------

#### 5035/8260B Volatile Organic Compounds / Methanol

#### Batch BL71910 - 5035

Styrene	24.1		ug/L	25.00		96	70-130			
tert-Butylbenzene	26.4		ug/L	25.00		106	70-130			
Tertiary-amyl methyl ether	25.3		ug/L	25.00		101	70-130			
Tetrachloroethene	19.1		ug/L	25.00		76	70-130			
Tetrahydrofuran	25.3		ug/L	25.00		101	70-130			
Toluene	24.8		ug/L	25.00		99	70-130			
trans-1,2-Dichloroethene	25.2		ug/L	25.00		101	70-130			
trans-1,3-Dichloropropene	24.9		ug/L	25.00		99	70-130			
Trichloroethene	24.3		ug/L	25.00		97	70-130			
Trichlorofluoromethane	22.1		ug/L	25.00		89	70-130			
Vinyl Acetate	27.6		ug/L	25.00		110	70-130			
Vinyl Chloride	20.8		ug/L	25.00		83	70-130			
Xylene O	23.8		ug/L	25.00		95	70-130			
Xylene P,M	47.7		ug/L	50.00		95	70-130			
Surrogate: 1,2-Dichloroethane-d4	2420		ug/Kg wet	2500		97	70-130			
Surrogate: 4-Bromofluorobenzene	2370		ug/Kg wet	2500		95	70-130			
Surrogate: Dibromofluoromethane	2560		ug/Kg wet	2500		102	70-130			
Surrogate: Toluene-d8	2460		ug/Kg wet	2500		98	70-130			

#### LCS Dup

1,1,1,2-Tetrachloroethane	23.5		ug/L	25.00		94	70-130	0.6	20	
1,1,1-Trichloroethane	24.8		ug/L	25.00		99	70-130	0.8	20	
1,1,2,2-Tetrachloroethane	22.9		ug/L	25.00		92	70-130	5	20	
1,1,2-Trichloroethane	23.9		ug/L	25.00		96	70-130	3	20	
1,1-Dichloroethane	24.5		ug/L	25.00		98	70-130	0.08	20	
1,1-Dichloroethene	28.7		ug/L	25.00		115	70-130	9	20	
1,1-Dichloropropene	25.3		ug/L	25.00		101	70-130	3	20	
1,2,3-Trichlorobenzene	26.3		ug/L	25.00		105	70-130	6	20	
1,2,3-Trichloropropane	22.2		ug/L	25.00		89	70-130	1	20	
1,2,4-Trichlorobenzene	26.1		ug/L	25.00		104	70-130	3	20	
1,2,4-Trimethylbenzene	24.2		ug/L	25.00		97	70-130	0.08	20	
1,2-Dibromo-3-Chloropropane	23.6		ug/L	25.00		95	70-130	8	20	
1,2-Dibromoethane	24.2		ug/L	25.00		97	70-130	3	20	
1,2-Dichlorobenzene	23.8		ug/L	25.00		95	70-130	1	20	
1,2-Dichloroethane	23.9		ug/L	25.00		96	70-130	2	20	
1,2-Dichloropropane	24.2		ug/L	25.00		97	70-130	0.6	20	
1,3,5-Trimethylbenzene	23.9		ug/L	25.00		96	70-130	0.5	20	
1,3-Dichlorobenzene	23.8		ug/L	25.00		95	70-130	0.8	20	
1,3-Dichloropropane	23.7		ug/L	25.00		95	70-130	2	20	
1,4-Dichlorobenzene	23.5		ug/L	25.00		94	70-130	1	20	
1,4-Dioxane - Screen	947		ug/L	500.0		189	44-241	0.3	200	
1-Chlorohexane	25.0		ug/L	25.00		100	70-130	3	20	
2,2-Dichloropropane	26.0		ug/L	25.00		104	70-130	2	20	
2-Butanone	145		ug/L	125.0		116	70-130	6	20	
2-Chlorotoluene	22.1		ug/L	25.00		88	70-130	1	20	
2-Hexanone	130		ug/L	125.0		104	70-130	5	20	
4-Chlorotoluene	23.2		ug/L	25.00		93	70-130	0.1	20	



# ESS Laboratory

Division of Thielsch Engineering, Inc.

## CERTIFICATE OF ANALYSIS

Client Name: MACTEC Engineering & Consulting, Inc.

Client Project ID: Providence Gorham Site

ESS Laboratory Work Order: 0712198

### Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
---------	--------	-----	-------	-------------	---------------	------	-------------	-----	-----------	-----------

#### 5035/8260B Volatile Organic Compounds / Methanol

#### Batch BL71910 - 5035

4-Isopropyltoluene	23.4		ug/L	25.00		93	70-130	0.09	20	
4-Methyl-2-Pentanone	120		ug/L	125.0		96	70-130	5	20	
Acetone	166		ug/L	125.0		133	70-130	1	20	B+
Benzene	24.6		ug/L	25.00		98	70-130	0.7	20	
Bromobenzene	24.2		ug/L	25.00		97	70-130	0.2	20	
Bromochloromethane	23.3		ug/L	25.00		93	70-130	2	20	
Bromodichloromethane	25.3		ug/L	25.00		101	70-130	3	20	
Bromoform	24.7		ug/L	25.00		99	70-130	4	20	
Bromomethane	24.8		ug/L	25.00		99	70-130	9	20	
Carbon Disulfide	28.0		ug/L	25.00		112	70-130	2	20	
Carbon Tetrachloride	25.6		ug/L	25.00		102	70-130	1	20	
Chlorobenzene	24.0		ug/L	25.00		96	70-130	0.1	20	
Chloroethane	23.4		ug/L	25.00		94	70-130	6	20	
Chloroform	24.3		ug/L	25.00		97	70-130	0.8	20	
Chloromethane	22.1		ug/L	25.00		89	70-130	7	20	
cis-1,2-Dichloroethene	26.0		ug/L	25.00		104	70-130	4	20	
cis-1,3-Dichloropropene	25.0		ug/L	25.00		100	70-130	2	20	
Dibromochloromethane	24.5		ug/L	25.00		98	70-130	0.2	20	
Dibromomethane	24.2		ug/L	25.00		97	70-130	4	20	
Dichlorodifluoromethane	19.2		ug/L	25.00		77	70-130	23	20	D+
Diethyl Ether	26.4		ug/L	25.00		106	70-130	4	20	
Di-isopropyl ether	24.6		ug/L	25.00		98	70-130	0.9	20	
Ethyl tertiary-butyl ether	23.8		ug/L	25.00		95	70-130	2	20	
Ethylbenzene	24.0		ug/L	25.00		96	70-130	0.8	20	
Hexachlorobutadiene	27.2		ug/L	25.00		109	70-130	0.4	20	
Isopropylbenzene	20.8		ug/L	25.00		83	70-130	4	20	
Methyl tert-Butyl Ether	24.5		ug/L	25.00		98	70-130	3	20	
Methylene Chloride	24.8		ug/L	25.00		99	70-130	2	20	
Naphthalene	23.9		ug/L	25.00		96	70-130	6	20	
n-Butylbenzene	24.8		ug/L	25.00		99	70-130	0.2	20	
n-Propylbenzene	25.0		ug/L	25.00		100	70-130	0.7	20	
sec-Butylbenzene	24.0		ug/L	25.00		96	70-130	0.6	20	
Styrene	24.1		ug/L	25.00		96	70-130	0.04	20	
tert-Butylbenzene	26.5		ug/L	25.00		106	70-130	0.2	20	
Tertiary-amyl methyl ether	24.6		ug/L	25.00		98	70-130	3	20	
Tetrachloroethene	19.3		ug/L	25.00		77	70-130	1	20	
Tetrahydrofuran	24.5		ug/L	25.00		98	70-130	3	20	
Toluene	24.6		ug/L	25.00		98	70-130	0.8	20	
trans-1,2-Dichloroethene	26.0		ug/L	25.00		104	70-130	3	20	
trans-1,3-Dichloropropene	23.2		ug/L	25.00		93	70-130	7	20	
Trichloroethene	24.6		ug/L	25.00		98	70-130	0.9	20	
Trichlorofluoromethane	23.5		ug/L	25.00		94	70-130	6	20	
Vinyl Acetate	26.9		ug/L	25.00		108	70-130	2	20	
Vinyl Chloride	25.6		ug/L	25.00		103	70-130	21	20	D+
Xylene O	23.8		ug/L	25.00		95	70-130	0.2	20	
Xylene P,M	47.8		ug/L	50.00		96	70-130	0.3	20	



# ESS Laboratory

Division of Thielsch Engineering, Inc.

## CERTIFICATE OF ANALYSIS

Client Name: MACTEC Engineering & Consulting, Inc.  
Client Project ID: Providence Gorham Site

ESS Laboratory Work Order: 0712198

### Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
---------	--------	-----	-------	-------------	---------------	------	-------------	-----	-----------	-----------

5035/8260B Volatile Organic Compounds / Methanol

#### Batch BL71910 - 5035

Surrogate: 1,2-Dichloroethane-d4	2440		ug/Kg wet	2500		98	70-130			
Surrogate: 4-Bromofluorobenzene	2400		ug/Kg wet	2500		96	70-130			
Surrogate: Dibromofluoromethane	2590		ug/Kg wet	2500		103	70-130			
Surrogate: Toluene-d8	2500		ug/Kg wet	2500		100	70-130			



# ESS Laboratory

*Division of Thielsch Engineering, Inc.*

## CERTIFICATE OF ANALYSIS

Client Name: MACTEC Engineering & Consulting, Inc.

Client Project ID: Providence Gorham Site

ESS Laboratory Work Order: 0712198

### Notes and Definitions

- U Analyte included in the analysis, but not detected
- D+ Relative percent difference for duplicate is outside of criteria.
- C- Continuing Calibration recovery is below lower control limit.
- B+ Blank Spike recovery is above upper control limit.
- B- Blank Spike recovery is below lower control limit.
- ND Analyte NOT DETECTED above the detection limit
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference
- MDL Method Detection Limit
- MRL Method Reporting 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.



# ESS Laboratory

*Division of Thielsch Engineering, Inc.*

## *CERTIFICATE OF ANALYSIS*

Client Name: MACTEC Engineering & Consulting, Inc.  
Client Project ID: Providence Gorham Site

ESS Laboratory Work Order: 0712198

### **ESS LABORATORY CERTIFICATIONS**

U.S. Army Corps of Engineers  
Soil and Water

Navy Installation Restoration QA Program  
Soil and Water

Rhode Island: A-179

Connecticut: PH-0750

Maine: RI002

Massachusetts: M-RI002

New Hampshire (NELAP accredited): 242405  
Potable Water  
Non Potable Water

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

United States Department of Agriculture  
Soil Permit: S-54210

New Jersey (NELAP accredited): RI002  
Potable Water  
Non Potable Water  
Soil and Hazardous Waste

Maryland: 301  
Potable Water



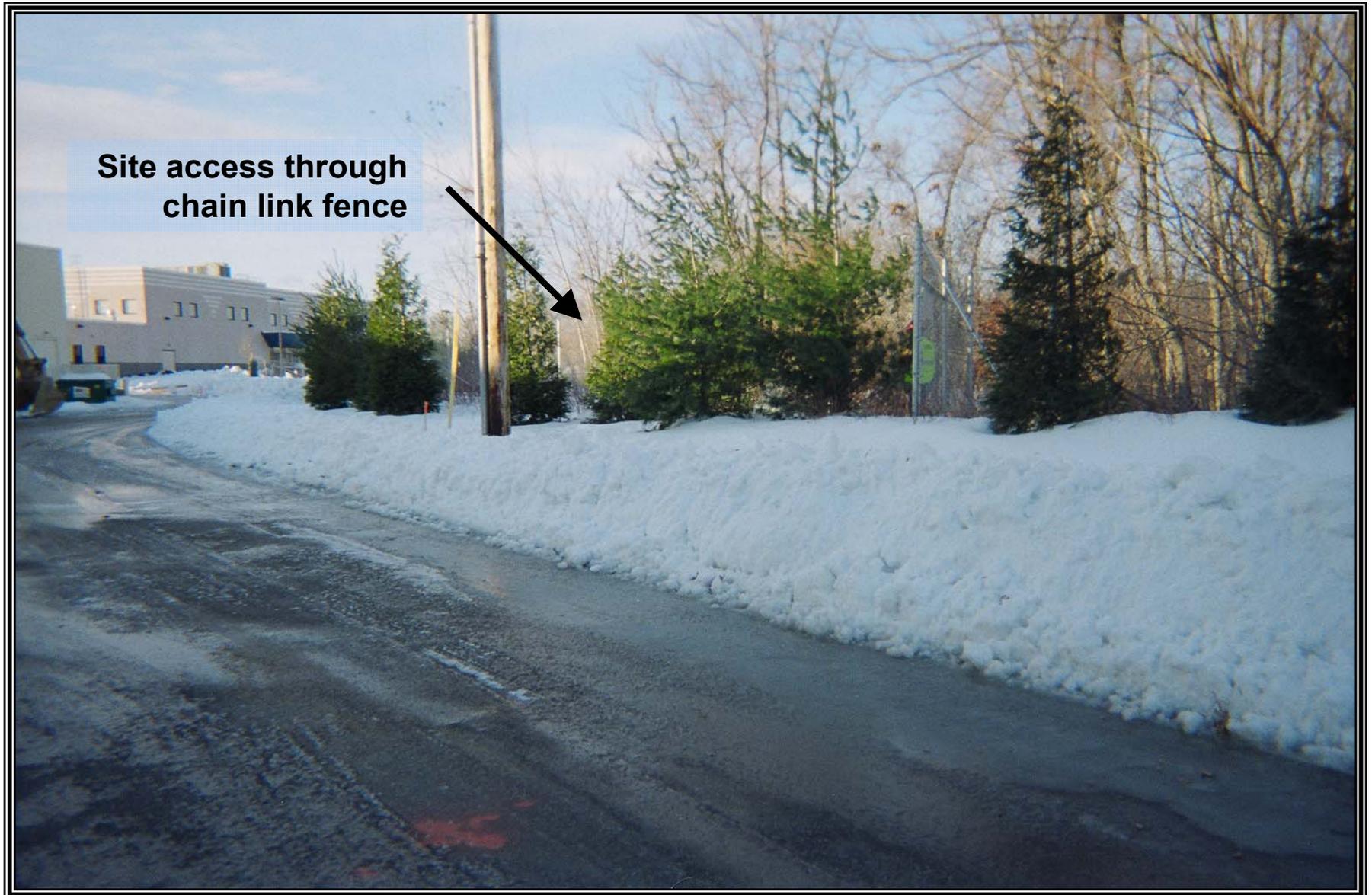


## **Appendix C**

### **Photographs**

**Building N UST Investigation  
December 2007  
333 Adelaide Ave  
Providence, Rhode Island**

Photo 1: Existing Site Conditions facing west.



**Building N UST Investigation  
December 2007  
333 Adelaide Ave  
Providence, Rhode Island**

Photo 2: Test pit #1 facing west.



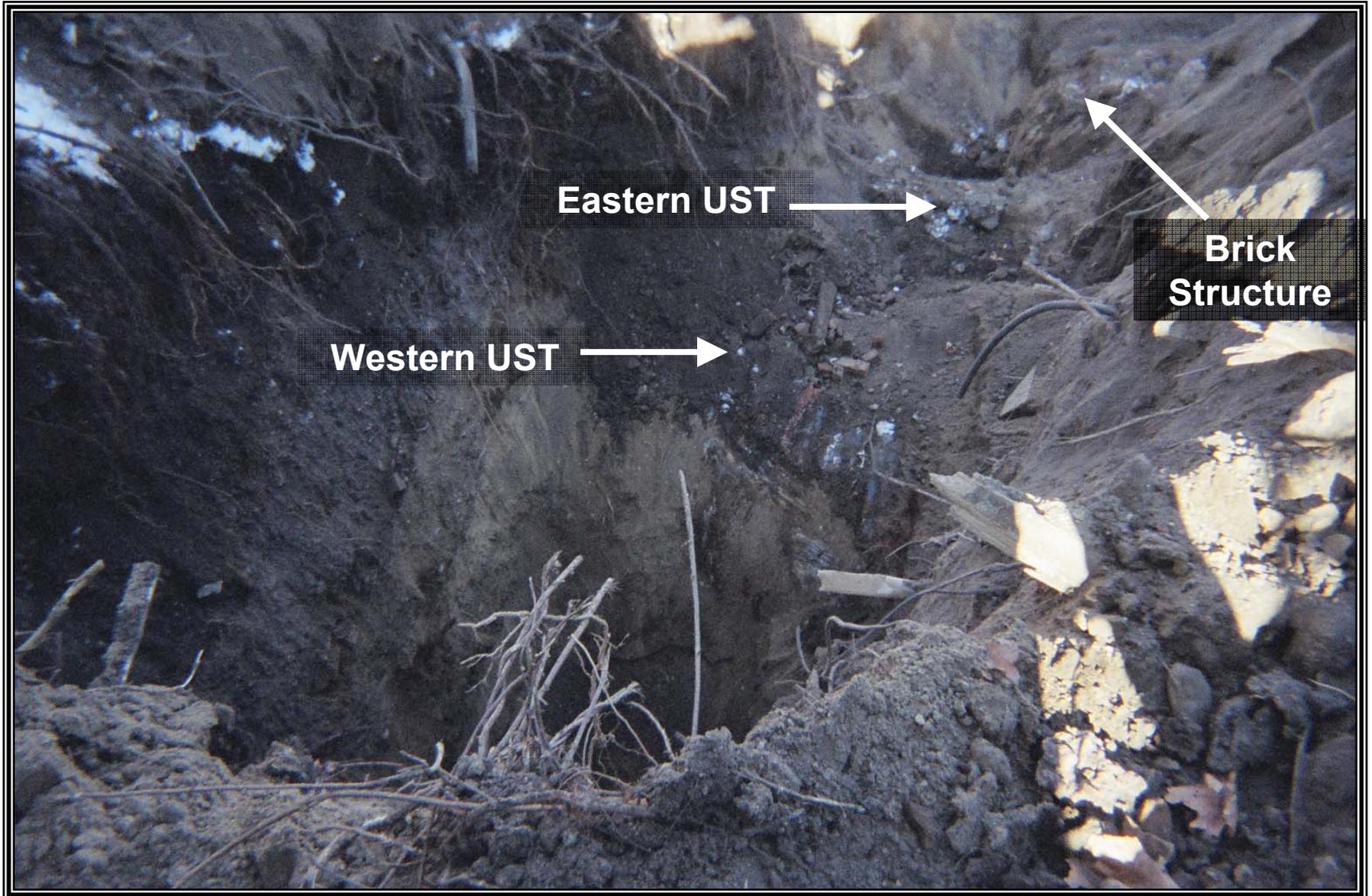
**Building N UST Investigation  
December 2007  
333 Adelaide Ave  
Providence, Rhode Island**

Photo 3: Test pit #2 facing west. Please note that the buried pipes in this picture are aligned from south to north and terminate at their extension out of the hillside, to the north of test pit #2.



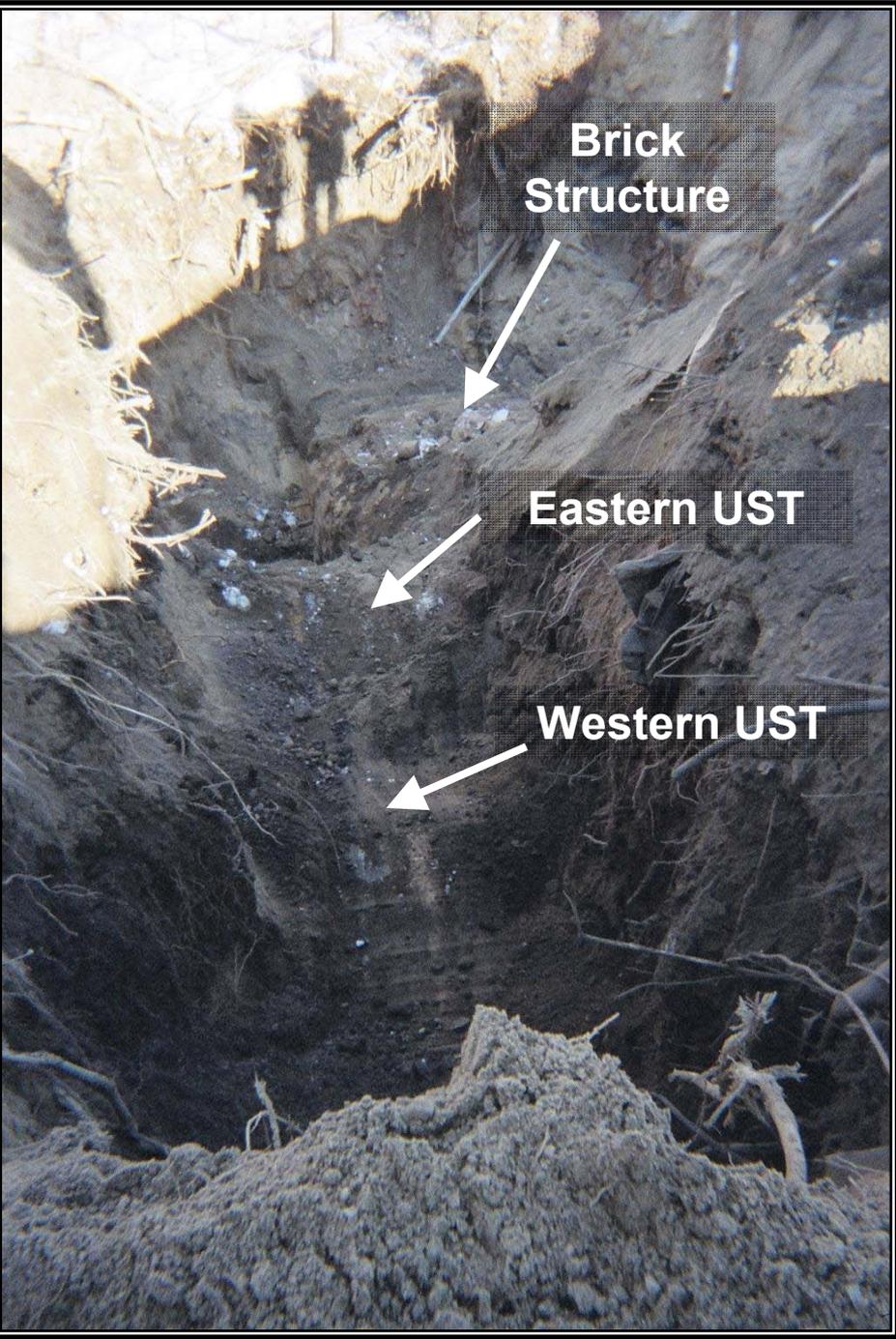
**Building N UST Investigation  
December 2007  
333 Adelaide Ave  
Providence, Rhode Island**

Photo 4: Test pit #3 showing USTs and brick structure.



**Building N UST Investigation  
December 2007  
333 Adelaide Ave  
Providence, Rhode Island**

Photo 5: Alternate view of test pit #3.



**Brick  
Structure**

**Eastern UST**

**Western UST**