# Remedial Investigation/Feasibility Study

Former Shell Oil Tank Farm
Anacortes, Washington
Ecology Agreed Order No. DE-08TCPHQ-5474

*for*
**Washington State Department of Ecology on Behalf of Port of Anacortes**

February 3, 2014

GeoEngineers
Earth Science + Technology

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**File No. 5147-012-02**

**February 3, 2014**

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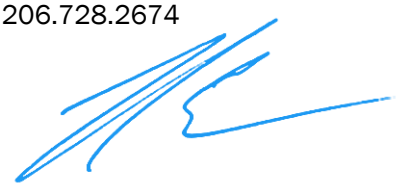

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## LIST OF ABBREVIATIONS AND ACRONYMS

| | |
|---|---|
| AST | Above ground storage tank |
| ASTM | American Society for Testing and Materials |
| BETX | Benzene, ethylbenzene, toluene and xylenes |
| BGS | Below ground surface |
| CAP | Cleanup Action Plan |
| Clearcreek | Clearcreek Contractors, Inc. |
| CAOs | Cleanup action objectives |
| cm | Centimeter |
| cm/s | Centimeters per second |
| cPAHs | Carcinogenic polycyclic aromatic hydrocarbons |
| CSM | Conceptual Site Model |
| DCA | Disproportionate cost analysis |
| DMMP | Dredged Material Management Program |
| Ecology | Washington State Department of Ecology |
| EPH | Extractable petroleum hydrocarbons |
| FS | Feasibility Study |
| GeoEngineers | GeoEngineers, Inc. |
| MTCA | Model Toxics Control Act |
| mg/kg | Milligram per kilogram |
| mg/L | Milligrams per liter |
| MLLW | Mean lower low water |
| PAHs | Polycyclic aromatic hydrocarbons |
| PCBs | Polychlorinated biphenyls |
| Port | Port of Anacortes |
| TEE | Terrestrial Ecological Evaluation |
| TEQ | Toxicity equivalent |
| TPH | Total petroleum hydrocarbons |
| RI | Remedial Investigation |
| UST | Underground Storage Tank |
| VPH | Volatile petroleum hydrocarbons |
| VOCs | Volatile organic compounds |
| WAC | Washington Administrative Code |

# 1.0 INTRODUCTION

This document presents the Remedial Investigation/Feasibility Study (RI/FS) for the Former Shell Oil Tank Farm Site (Site) located in Anacortes, Washington. The Site is formally referenced in the Washington State Department of Ecology (Ecology) databases as the Former Shell Oil Tank Farm Site (Ecology Facility Site Identification No. 4781157) and is generally located between 13th Street and 14th East of Commercial Avenue in Anacortes, Washington (Figure 1). The Site is subject to cleanup actions by the Port of Anacortes (Port) in accordance with the requirements of Agreed Order No. DE-08TCPHQ-5474 (Agreed Order; Ecology, 2008). Completion of the RI/FS is a requirement of the Agreed Order scope of work.

Preliminary investigation and remediation activities (removal of stained surficial soil) were completed at the Site in the late 1980s when bulk fuel storage and distribution operations ceased. Subsequent environmental investigations were completed at or in the vicinity of the Site from 2005 through 2012 to evaluate soil and groundwater conditions (Floyd|Snider, 2005; Landau, 2007a; GeoEngineers, 2008 and GeoEngineers, 2013). The results of these environmental investigations identified elevated concentrations of petroleum hydrocarbons (gasoline and diesel), carcinogenic polycyclic aromatic hydrocarbons (cPAHs), volatile organic compounds (benzene) and metals (cadmium) is soil at the Site.

The purpose of this report is to present the results of the RI activities completed at the Site and provide a FS evaluation of cleanup alternatives for addressing residual contamination.

## 1.1. Statement of Objectives

The objectives of this document are to: (1) summarize the results of historical data and RI activities completed to evaluate the environmental conditions at the Site and (2) present an evaluation of cleanup alternatives to address contaminants identified at the Site.

## 1.2. Report Organization

This report is organized as follows:

- Section 1.0 introduces the document with a brief description of the Site, and the objective and organization of the RI/FS report.
- Section 2.0 describes the Site history, previous environmental studies performed and soil, groundwater and sediment conditions at the Site. In addition, this section summarizes current and future land use, exposure pathways and receptors for Site contamination, and the regulatory framework for Site investigation and cleanup.
- Section 3.0 describes the development of cleanup standards and the results of the RI completed within and near the Site.
- Section 4.0 presents the Site FS.
- Section 5.0 presents the limitations for use of this report.
- Section 6.0 presents the references used in preparing this report.

# 2.0 SITE DESCRIPTION AND BACKGROUND

## 2.1. Site Description

Historically, bulk fuel and distribution facilities (former Shell Oil Tank Farm) operated at the property located between 13th and 14th Streets on Q Avenue (Figure 2). To the east of the former Shell Oil Tank Farm, historical fuel supply lines were routed across Q Avenue through a bulkhead and along a pier that extended into Fidalgo Bay. The pipelines terminated near the end of the historical fuel dock, which was located approximately at the location of the present day B-Dock (Figure 2). Currently, the area occupied by the former Shell Oil Tank Farm is generally flat, surfaced with crushed rock, and has been used as a parking lot for vehicles and boat trailers since the late 1980s. Although all above ground structures associated with the historical bulk storage and distribution operations have been removed, it is unknown if the historical fuel supply lines have been removed.

Adjacent properties include a McDonald's restaurant to the west that was constructed in the 1970s. The McDonald's property was the location of a former Shell automotive service station from the mid-1940s to 1966. The property south of the former Shell Oil Tank Farm (across 14th Street) was a transformer storage facility for Puget Sound Power and Light from the 1940s until 1970 when the current power distribution station (substation) was constructed. A Safeway grocery store is located north of the former Shell Oil Tank Farm, across 13th Street. Parking lots and commercial buildings on Port property and the Cap Sante Boat Haven are located east of the former Shell Oil Tank Farm across Q Avenue (Figure 2). Q Avenue is an arterial thoroughfare used for local, commercial and truck traffic.

## 2.2. Historical Operations and Site Uses

The area occupied by the former Shell Oil Tank Farm was originally a portion of the Fidalgo Bay tide flats, which were filled to the current grade (up to the former bulkhead just east of Q Avenue shown on Figure 2) between 1925 and 1929. This area was acquired by the Port in 1929 and subsequently leased to the Shell Oil Company in 1930 for use as a bulk fuel storage and distribution facility that primarily handled gasoline and diesel fuels. Prior to 1947, the area east of Q Avenue (east of the former Shell Oil Tank Farm) consisted of tide flats. From 1930 to approximately 1947, the historic fuel supply lines hung from historic fuel pier over the tide flats east of Q Avenue. In the late 1940s to early 1950s, the area east of Q Avenue was filled with dredged material from the adjacent federal waterway, and a second bulkhead was constructed farther to the east near the current shore of Fidalgo Bay (Figure 2). During this time, the hanging fuel lines were re-configured as underground lines. The former Shell Oil Tank Farm operated as a bulk fuel storage facility under Shell and various bulk product distributors until 1987. Bulk fuel storage and distribution operations ended in 1987 and the facility was reportedly decommissioned, including removal of all tanks, and associated piping and structures.

Additional information regarding the Site use history is presented in the Shell Work Plan (GeoEngineers, 2009). The approximate locations of the historical pump house, fill stand, underground storage tank (UST), gasoline and diesel above ground storage tanks (ASTs), and associated product supply lines are shown on Figure 2. Also shown on Figure 2 are historic visual observations of contamination observed in the vicinity of the former Shell Oil Tank Farm.

## 2.3. Previous Environmental Studies

Previous environmental investigations completed within and adjacent to the former Shell Oil Tank Farm include:

- Preliminary Environmental Site Assessment in 1987 (Hart Crowser, 1987);
- Limited Due Diligence Investigation in 2005 (Floyd|Snider, 2005);
- Cap Sante Marine Area Remedial Investigation in 2007 (Landau, 2007a);
- Soil Characterization Study in 2007 (GeoEngineers, 2008); and
- Remedial Investigation in 2011/2012 (GeoEngineers, 2013).

Detailed information regarding investigations completed prior to May 2007 is presented in the Shell Work Plan (GeoEngineers, 2009) and Cap Sante Work Plan (Landau, 2007b). Reports summarizing GeoEngineers' 2007 and 2011/2012 environmental studies are presented in Attachments 1 and 2, respectively. A list of soil samples and analytical tests performed for each of the site investigations is presented in Table 1.

The environmental setting for the Site with respect to soil and groundwater conditions based on the results of these studies is summarized in the following sections.

### *2.3.1. Soil Conditions*

Based on subsurface information obtained during previous studies, subsurface geology consists of dredged fill material overlying native marine sediment (silt and silty sand) and glacial deposits. The dredged fill material at the Site generally consist of fine to medium sand with varying amounts of silt and gravel and extend from the ground surface to depths of approximately 5 feet to 12 feet below ground surface (bgs).

### *2.3.2. Groundwater Conditions*

Based on subsurface information obtained during previous studies, measured depth to groundwater at the Site ranges from approximately 3 to 6 feet bgs (approximately elevation 6.5 to 9.5 feet mean lower low water [MLLW]). Observed groundwater flow direction is predominantly to the east toward Fidalgo Bay. Based on the results of tidal studies completed in the vicinity of the Site (i.e. Former Cap Sante Marine Lease Area; Landau, 2007a), tidal influence on groundwater levels and flow direction at the Site appears to be limited with a 0.8-foot fluctuation in groundwater levels in near shore wells during a high-low tide cycle. Measured fluctuation in groundwater levels away from the shore (approximately 100 to 200 feet) is on the order of approximately 0.1 foot.

In accordance with WAC 173-340-720(2)(d), groundwater is classified as a potential future source of drinking water because it is present in sufficient quantity, contains less than 10,000 milligrams per liter (mg/L) total dissolved solids and is not too deep to recover. However, because (1) of the proximity to marine surface water; (2) groundwater does not serve as a current source of drinking water; (3) the surface water is not classified as a suitable domestic water supply source; (4) there are known points of entry of the groundwater into surface water; and (5) potentially contaminated groundwater will not migrate to groundwater that is a current or potential future source of drinking water, Site groundwater qualifies as a non-potable water source.

## 2.4. Current and Likely Future Land Use

The current and anticipated future use of the former Shell Oil Tank Farm is as a vehicle and boat trailer parking lot supporting the Cap Sante Boat Haven trailer boat launch facility located east of Q Avenue. Q Avenue serves as a major thoroughfare and truck route for the City of Anacortes. The alignment of the historic fuel supply lines east of Q Avenue is an asphalt-paved road that provides access to the Former Cap Sante Marine Lease Area and Cap Sante Boat Haven. There currently are no plans to change the uses of the Site in the foreseeable future.

## 2.5. Exposure Pathways and Receptors

Fuel released from the former USTs, ASTs and/or other historic operations at the Site have resulted in direct impacts to soil and secondary impacts to groundwater. Surface water and sediments have the potential for impacts through the migration of contaminants in groundwater to the marine environment of Fidalgo Bay. Potential exposure pathways related to these media are discussed below.

### *2.5.1. Soil*

The following potential exposure pathways and receptors existed for contaminants in Site soil:

- Contact (dermal, incidental ingestion or inhalation) by visitors, workers (including workers excavating soil) and potential future residents or other Site users with hazardous substances in soil;
- Contact (dermal, incidental ingestion or inhalation) by terrestrial wildlife with hazardous substances in soil; and
- Leaching to groundwater.

### *2.5.2. Groundwater*

The following are potential exposure pathways and receptors for contaminants in Site groundwater:

- Groundwater to surface water, exposure of aquatic receptors to impacted groundwater that may discharge to Fidalgo Bay, resulting in acute or chronic effects; and
- Ingestion by Site visitors of aquatic organisms affected by the discharge of impacted groundwater to Fidalgo Bay.

As described in Section 2.3.2, human ingestion of hazardous substances released from the Site in groundwater was not a potential exposure pathway because groundwater at the Site, or potentially affected by Site soil, is not a current or reasonable future source of drinking water.

## 2.6. Regulatory Framework

In 2008, the Port entered into Agreed Order No. DE-08TCPHQ-5474 with Ecology. Work to be performed under the Agreed Order included completing the scope of remedial investigation activities outlined in the Ecology-approved Shell Work Plan. In addition, the requirements of the Agreed Order include preparation of RI/FS and Cleanup Action Plan (CAP) documents for the Site. This RI/FS and a separate CAP will complete the work requirements described in the Agreed Order.

# 3.0 REMEDIAL INVESTIGATION

## 3.1. Cleanup Standards

Cleanup standards consist of: (1) cleanup levels that are protective of human health and the environment, and (2) the point of compliance at which the cleanup levels must be met. Preliminary cleanup levels were developed in the Shell Work Plan as part of the RI planning activities. This process identified potential exposure pathways for human and environmental impacts based on the planned land use. Proposed cleanup standards for remedial alternative evaluation are presented below. Final cleanup standards will be established during preparation of the CAP.

### *3.1.1. Proposed Cleanup Levels*

#### 3.1.1.1. SOIL

Preliminary soil cleanup levels for the Site were developed as part of the Ecology-approved Shell Work Plan and are based on MTCA Method A values for unrestricted land use, MTCA Method B standard formula values for the protection of human health and MTCA Method B soil concentrations protective of surface water calculated using Ecology's fixed-parameter, three-phase partitioning model (MTCASGL Workbook; WAC 173-340-747(4)(b)). Preliminary soil cleanup levels developed for the Shell Work Plan considered:

- Concentrations established under applicable state and federal laws;
- Concentrations protective of terrestrial ecological receptors;
- Concentrations protective of direct human contact with soil;
- Concentrations protective of groundwater; and
- Concentrations protective of surface water.

Because Site conditions do not meet any of the criteria in WAC 173-340-741(2), a terrestrial evaluation is not required. A copy of the completed Terrestrial Ecological Evaluation Process – Primary Exclusions Documentation Form is presented in Appendix A.

In addition to these criteria, natural background soil metals concentrations in Washington state (Ecology, 1994) were considered in accordance with (WAC) 173-340-705(6) and WAC 173-340-709 where the lowest applicable regulatory criteria, adjusted for natural background metals concentrations, were selected as the preliminary soil cleanup levels. Details regarding the sources/derivation of each of the regulatory criteria are presented in the Shell Work Plan.

For this RI/FS report, the preliminary soil cleanup levels developed for the Shell Work Plan have been adopted as the proposed final soil cleanup levels for the Site and are presented in Table 2.

#### 3.1.1.2. GROUNDWATER

Preliminary groundwater cleanup levels for the Site were developed as part of the Ecology-approved Shell Work Plan. As indicated above, groundwater at, or potentially affected by the Site contamination is not currently used for drinking water and is not a reasonable future source of drinking water because of its proximity to marine surface water. Therefore, the following potential exposure pathways for Site groundwater were considered for developing preliminary cleanup levels:

- Human ingestion of marine organisms contaminated by releases of affected Site groundwater to adjacent marine surface water; and
- Acute or chronic effects to aquatic organisms contaminated by releases from exposure to constituents in groundwater discharging to adjacent marine surface water.

The most conservative (lowest) published values were selected from the following regulatory criteria:

- MTCA Method A Cleanup Levels Groundwater WAC 173-340-720(3) and Chapter 173-340 Table 720-1;
- Water Quality Standards for Surface Waters of the State of Washington (Chapter 173-201A);
- National Recommended Water Quality Criteria (Section 304 of the Clean Water Act);
- National Toxics Rule (40 CFR Part 131.36); and
- MTCA Method B Surface Water Cleanup Levels (WAC 173-340-730[3][b][iii]).

Because cleanup levels protective of marine surface water have not been established for petroleum hydrocarbons, gasoline-, diesel- and heavy oil-range hydrocarbon cleanup levels for groundwater were referenced from MTCA Table 720-1 (MTCA Method A), in accordance with WAC 173-340-730(3)(b)(iii)(C). Details regarding the sources/derivation of each of the regulatory criteria are presented in the Shell Work Plan.

For this RI/FS report, the preliminary groundwater cleanup levels developed for the Shell Work Plan have been adopted as the proposed final groundwater cleanup levels for the Site and are presented in Table 3.

#### *3.1.2. Point of Compliance*

Under MTCA, the point of compliance is the point or location on a site where the cleanup levels must be attained. This section describes the proposed points of compliance for soil and groundwater.

##### 3.1.2.1. SOIL

The standard point of compliance for the proposed human health based-direct contact soil cleanup levels presented in Table 2 is throughout the soil column from the ground surface to 15 feet bgs, in accordance with WAC 173-340-740(6)(d).

##### 3.1.2.2. GROUNDWATER

Because the proposed final groundwater cleanup levels shown in Table 3 are based on protection of marine surface water and not protection of groundwater as drinking water, the proposed conditional point of compliance for the groundwater cleanup levels presented in Table 3 is where groundwater discharges to Fidalgo Bay.

### 3.2. Soil Investigations and Results

This section presents a summary of the RI soil investigation activities conducted at the Site. RI field study locations completed between 1987 and 2011 are shown on Figure 3. Soil investigation

activities and chemical analytical results are summarized in the following sections (Sections 3.2.1 through 3.2.5).

#### *3.2.1. Preliminary Environmental Site Assessment (Hart Crowser, 1987)*

A Preliminary Environmental Site Assessment by Hart Crowser in 1987 was completed on behalf of the Port to evaluate subsurface conditions at the Site (Hart Crowser, 1987). During this study, soil conditions were evaluated by completing two boring (MW-1 and MW-2). A total of two soil samples were submitted for chemical analysis of diesel- and heavy oil-range petroleum hydrocarbons.

Results of the 1987 soil investigation indicated the presence of diesel-range petroleum hydrocarbons in the central portion of the Site at a depth of approximately 5.5 to 6 feet below ground surface (bgs) at boring location MW-2.

#### *3.2.2. Environmental Due Diligence Investigation (Floyd|Snider, 2005)*

An environmental due diligence investigation by Floyd|Snider was completed in 2005 on behalf of the Port to evaluate the extent of soil and groundwater contamination at the Site (Floyd|Snider, 2005). During this investigation, soil samples were obtained from seven locations (SHL01 through SHL07) in the vicinity of the former Shell Oil Tank Farm. In addition, soil samples were also obtained from fourteen locations (CSM01 through CSM14) east of the Site in the vicinity of the historical fuel supply lines (current location of the parking/boat staging area south of the Cap Sante Marine Lease Area). A total of 24 soil samples were analyzed for petroleum hydrocarbon identification, gasoline-, diesel-, and/or heavy oil-range petroleum hydrocarbons, and/or BETX.

Results of the 2005 soil investigation identified gasoline- and diesel-range petroleum hydrocarbon contamination in soil samples obtained from borings SHL01, SHL02, SHL03 and SHL-05 located in the central portion of the former Shell Oil Tank Farm at depths ranging from approximately 4 feet and 9 feet bgs. Additionally, gasoline- and diesel-range petroleum hydrocarbons were detected at concentrations exceeding preliminary soil cleanup levels in soil samples obtained from boring CSM13 located at the southwestern portion of the former Cap Sante Marine Lease Area, north of the historic fuel supply line alignment. However, RI activities completed by GeoEngineers in 2011 (see Section 3.2.5) shown that contaminated soil at this location is not likely the result of releases from the historical fuel supply lines (i.e., contaminants were not detected in soil samples obtained between boring CSM13 and the approximate location of the historical fuel supply lines).

#### *3.2.3. Cap Sante Marine Area Remedial Investigation (Landau, 2007a)*

In 2007, Landau completed an RI field study on behalf of the Port to delineate the extent of petroleum-impacted soil within the Cap Sante Marine Lease Area associated with releases from two USTs (Landau, 2007a). As part of this investigation, borings SB-10, SB-13 and SB-14 were completed south of the Cap Sante Marine Lease Area in the vicinity of the historic fuel supply lines At this location, a total of nine soil samples obtained and analyzed for diesel-, and heavy oil-range petroleum hydrocarbons and volatile organic compounds (VOCs).

Results of the 2007 soil investigation identified gasoline-range petroleum hydrocarbon contamination south of the historical fuel supply line in boring SB-13 at a depth of approximately 5

to 6 feet bgs. However, RI activities completed by GeoEngineers in 2011 (see Section 3.2.5) shown that contaminated soil at this location is not likely the result of releases from the historical fuel supply lines (i.e., contaminants were not detected in soil samples obtained between boring SB-13 and the approximate location of the historical fuel supply lines).

#### *3.2.4. Soil Characterization Study (GeoEngineers, 2008)*

In 2007, GeoEngineers completed a shallow soil investigation on behalf of the Port to evaluate soil conditions in the vicinity of a planned construction excavation to re-route a storm drain located within 13th Street (GeoEngineers, 2008). Soil samples were obtained from four test pits explorations (TP-1 through TP-4) completed within the new planned storm drain alignment spanning the western portion of the Site. A total of five soil samples were submitted for chemical analysis of gasoline-, diesel- and oil-range petroleum hydrocarbons, BETX, polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs) and/or metals (arsenic, cadmium, chromium, lead and mercury).

Results of the this investigation identified a single metal exceedance (cadmium) at the southwest corner of the former Shell Oil Tank Farm in test pit TP-1 at a depth of approximately 6 feet bgs. This exceedance was below the planned elevation of the new sewer line being installed as part of the City of Anacortes 13th Street sewer re-route project.

Results of the shallow soil investigation are presented in the Independent Remedial Action Completion Report (Attachment 1).

#### *3.2.5. Remedial Investigation Data Report (GeoEngineers, 2013)*

In 2011, GeoEngineers completed an RI field study on behalf of the Port to further evaluate the extent of petroleum- and PAH-impacted soil previously identified at the Site (GeoEngineers, 2013). Soil samples were obtained from thirty six boring locations (GEI-1 through GEI-35 and GEI-MW-1) within former Shell Soil Tank Farm and adjacent to the historical fuel supply lines. A total of 89 soil samples (including duplicate samples) were analyzed for gasoline-, diesel-, and heavy oil-range petroleum hydrocarbons, VOCs, PAHs, polychlorinated biphenyls (PCBs) and/or metals (cadmium and/or lead).

Results of the this soil investigation provided additional delineation of the lateral and vertical extent of contaminated soil associated with historic soil sample locations MW-2, SHL01 through SHL03, SHL05, CSM13, SB-13, SB-14 and TP-1 in which contaminants (petroleum hydrocarbons, PAHs and/or metals) were detected at concentrations greater than preliminary soil cleanup levels. Based on the sample results, gasoline- and diesel-range petroleum hydrocarbons, cPAHs and benzene were detected at concentrations exceeding preliminary soil cleanup levels in the central and southern portions of the former Shell Oil Tank Farm at depths ranging between approximately 2.5 and 10 feet bgs. Gasoline-range petroleum hydrocarbons and PAHs exceeding preliminary soil cleanup levels detected in the vicinity of SB-13 and SB-14 appear to be limited in extent and occur between approximately 3 and 10 feet bgs. Gasoline- and diesel-range petroleum hydrocarbons exceeding preliminary soil cleanup levels detected in the vicinity of CSM-13 also appear to be limited in extent and occur between 8 and 14 feet bgs. However, soil sample results from the 2011 investigation indicate that there is no direct connection between the historic fuel line and the observed contamination in the vicinity of CSM13, SB-13 and SB-14.

Results of the 2011 soil investigation as well as the soil investigation results from previous environmental studies are presented the RI Data Report (Attachment 2).

### 3.3. Groundwater Investigations and Results

Groundwater monitoring activities were completed by Hart Crowser in 1987, Floyd|Snider in 2005 and GeoEngineers in 2012. Groundwater monitoring activities during these investigations included measurements of groundwater levels and collection of groundwater samples for chemical analysis. Additionally, field parameters, including pH, temperature, conductivity, dissolved oxygen, turbidity and oxidation reduction potential were measured during the 2012 groundwater investigation (GeoEngineers, 2013). Groundwater samples obtained from monitoring wells MW-1, MW-2 and GEI-MW-1 through GEI-MW-7, and borings SHL01 through SHL07, CSM01 through CSM03, CSM12 and CSM13 (grab samples) were analyzed for gasoline-, diesel- and heavy oil-range petroleum hydrocarbons, PAHs, BETX, methyl tert-butyl ether (MTBE), ethylene dibromide (EDB), ethylene dichloride (EDC), n-hexane cadmium and/or lead.

Results of the 1987 and 2005 groundwater investigations indicated gasoline-range petroleum hydrocarbons and lead at concentrations exceeding preliminary groundwater cleanup levels in water samples obtained from monitoring wells MW-1 and MW-2 and grab sample locations SHL01 and SHL04 within the former Shell Oil Tank Farm. Gasoline- and diesel-range petroleum hydrocarbons were also detected at concentrations exceeding preliminary groundwater cleanup levels in a water sample obtained from grab sample location CSM-12 located in the general vicinity of the historical fuel supply lines. However, as previously discussed, the historical fuel supply lines do not appear to be a source for the observed contamination at this location.

During the 2012 sampling event, contaminants (petroleum hydrocarbons, BETX, PAHs cadmium and lead) were not detected in groundwater samples obtained from monitoring wells MW-1 through MW-7 located within or down gradient of identified petroleum hydrocarbon, benzene, cPAH, and/or cadmium exceedances in soil at the Site.

Groundwater investigation results for recent and previous sampling events are presented in the RI Data Report (Attachment 2). Groundwater sampling locations are shown on Figure 4.

### 3.4. Terrestrial Ecological Evaluation

As indicated in Section 3.1.1, a terrestrial ecological evaluation (TEE) was not required for the Site because the Site does not meet any of the criteria in WAC 173-340-7491(1). Copies of the forms documenting this determination for the Site are presented in Appendix A.

Based on this evaluation, human contact and soil leaching to groundwater remain as the only applicable, potential exposure pathways for soil contamination at the Site.

### 3.5. Remedial Investigation – Summary of Findings

Several remedial investigations have been completed (as described above) to evaluate contamination in soil and groundwater related to historic Site use, and petroleum releases from former ASTs, USTs and/or historic fuel lines. The results of the RI indicate the presence of petroleum constituents at concentrations exceeding preliminary soil cleanup levels in the central and southern portions of the former Shell Oil Tank Farm associated with releases from the former

ASTs, USTs, product lines and/or historic operations. Additionally, recent investigations indicate that groundwater at the Site is not impacted by contaminants identified in soil.

Based on the results of the soil and groundwater sampling, potential exposure pathways for human contact with contaminated soil and leaching/migration of contamination from soil to groundwater are present.

As agreed to with Ecology, the contamination identified in the vicinity of CSM13, SB-13 and SB-14 located east of Q Avenue will be addressed as part of the Cap Sante Marine site cleanup action (GeoEngineers, 2012) since they are located within the Cap Sante Marine study area and there is no specific evidence that the contamination is associated with the historic fuel lines from the former Shell Oil Tank Farm.

Current Site conditions and the approximate extent of contaminants identified are shown on Figure 5 and in generalized geologic cross-section on Figures 6 and 7.

# 4.0 FEASIBILITY STUDY

## 4.1. Conceptual Site Model

The Conceptual Site Model (CSM) is a model of the potential contaminant sources, release mechanisms, and transport mechanisms currently present at the Site. The CSM also identifies potential receptors and associated exposure pathways for Site contaminants. The CSM does not quantify potential risks to human health or the environment posed by Site-related contamination. It is intended to focus remedial actions (site investigations, monitoring, cleanup actions, etc.) on those areas of the Site that may warrant further consideration.

Petroleum hydrocarbons and benzene contamination identified within and adjacent to the former Shell Oil Tank Farm were likely the result of releases from ASTs, USTs, product piping and/or historic operations. The approximate location of the former ASTs, USTs and product lines and the estimated extent of petroleum-related contaminated soil are shown on Figure 2. Following release, petroleum-related contamination was then potentially transported downgradient of the former Shell Oil Tank Farm beneath portions of Q Avenue and 14th Streets. Data indicate that the contamination has not migrated to the eastern side of Q Avenue. Vertical and horizontal transport may have been facilitated by groundwater flow and water level fluctuations however, groundwater within and downgradient of the petroleum-related contaminant plume is currently not adversely impacted based on the results of recent groundwater samples obtained from the Site.

The sources of the localized areas cPAH- and cadmium-impacted soil is not known but are either suspected to have been deposited during the 1940s and 1950s when the tide flat was in filled with dredge material or the result of historic site operations.

The current condition of Site media of concern is described below.

### *4.1.1. Soil*

As discussed in Section 2.3.1 of this report, soil types consist of dredged fill material from the surface to depths of approximately 5 to 12 feet bgs overlying native marine sediments and glacial

deposits. The unsaturated zone extends from ground surface to 5 feet bgs, and the top of the saturated zone begins at approximately 5 feet bgs. Contaminants including gasoline-, diesel- and heavy oil-range hydrocarbons, benzene, cPAHs and metals (cadmium) have been detected at concentrations exceeding preliminary soil cleanup levels at depths ranging from approximately 2.5 to 14 feet bgs.

Based on the geology, hydrogeology and the distribution of remaining contaminants at the Site, the potential exposure pathways to contaminated soil at the Site include:

- Direct contact (dermal, incidental ingestion or inhalation) with contaminated soil by site visitors, workers, future residents and/or other site users;
- Leaching/migration of contamination from soil to groundwater.

#### *4.1.2. Groundwater*

Depth to groundwater at the Site is approximately 4 to 6 feet bgs, and the flow direction is predominantly east toward Fidalgo Bay. Based on the Landau's 2007 tidal evaluation (Landau, 2007a), tidal influence on groundwater levels and flow direction appears to be limited to the near shore areas.

Historic groundwater samples obtained from the central portion of the former Shell Oil Tank Farm identified diesel-range hydrocarbons and lead. However, recent groundwater results show that concentrations of these contaminants as well as, other contaminants detected in soil are less than preliminary groundwater cleanup levels. Because groundwater at the Site is not a potential source of drinking water and contaminants have not been detected at concentrations exceeding preliminary groundwater cleanup levels, human ingestion of hazardous substances in groundwater, exposure of aquatic organisms to hazardous substances and human consumption of marine organisms are not potential exposure pathways.

### 4.2. Basis for Cleanup Action

This section presents the basis for the site-wide cleanup action. There are two distinct elements that form the basis for the cleanup action: (1) the site-specific cleanup standards, and (2) the locations and media requiring cleanup action evaluation.

#### *4.2.1. Cleanup Standards*

Cleanup standards consist of: (1) cleanup levels that are protective of human health and the environment, and (2) the point of compliance at which the cleanup levels must be met, and (3) additional regulatory requirements, specified in applicable state and federal laws, that apply to a cleanup action because of the type of action and/or the location of the site. Preliminary site-specific cleanup levels for soil and groundwater were developed during preparation of the Shell Work Plan (GeoEngineers, 2009). As discussed in Section 3.1, the preliminary cleanup levels developed in the Shell Work Plan have been adopted as the proposed final cleanup levels in this FS, for the purpose of developing cleanup action objectives and alternatives for the Site. The proposed points of compliance presented in Section 3.1 have also been adopted. Additional regulatory requirements potentially applicable to the cleanup action will be presented and evaluated in the CAP.

The proposed final soil cleanup levels are presented in Table 2. The proposed final groundwater cleanup levels are presented in Table 3. Cleanup action objectives for the Site are presented in Section 4.2.3.

#### *4.2.2. Locations and Media Requiring Cleanup Action Evaluation*

Based on the results of the RI (Section 3.0), soil within the former Shell Oil Tank Farm requires evaluation of cleanup action alternatives based on the presence of gasoline-, diesel- and heavy oil-range hydrocarbons, benzene, PAHs and/or cadmium at concentrations exceeding cleanup levels protective of human health and the environment.

The existing groundwater sampling data confirm that the contaminated soil at the Site is not adversely impacting groundwater. Therefore the primary medium of concern at the Site is soil. The estimated total in-situ volume of impacted soil requiring cleanup action (i.e., the volume exceeding soil cleanup levels) is estimated to be approximately 4,000 in-place cubic yards. The impacted soil is distributed approximately as follows:

- Petroleum Hydrocarbon and Benzene Contamination Area – approximately 3,500 in-place cubic yards
- PAH Contamination Area – approximately 425 in-place cubic yards
- Cadmium Contamination Area – approximately 25 in-place cubic yards

Because of the similarity in physical characteristics, natural resources, accessibility and likely release mechanisms, these areas of the Site warrant similar approaches to cleanup. Cleanup approaches are discussed further in Section 4.3 – Identification and Description of Cleanup Action Alternatives.

#### *4.2.3. Cleanup Action Objectives*

The cleanup action objective of the proposed cleanup action is to eliminate, reduce, or otherwise control to the extent feasible and practicable, unacceptable risks to human health and the environment posed by hazardous substances in soil at the Site in accordance with the MTCA Cleanup Regulation (WAC 173-340) and other applicable regulatory requirements. Specifically, the objective of the cleanup action is to mitigate risks associated with the following potential receptors and exposure routes:

- Direct contact (dermal, incidental ingestion or inhalation) with contaminated soil by site visitors, workers, future residents and/or other site users, and
- Leaching/migration of contamination from soil into groundwater.

The cleanup goal is to mitigate these risks by meeting the proposed soil and groundwater cleanup standards identified in Section 3.1. The proposed final cleanup levels, which were derived from regulatory criteria, are considered to be protective of human health and ecological receptors.

## 4.3. Identification and Description of Cleanup Action Alternatives

Table 4 presents the results of a screening evaluation of potentially applicable remediation technologies for the cleanup action. Based on the screening evaluation, selected technologies are carried forward for use in the development of cleanup action alternatives.

The general response actions considered in the screening evaluation include no action, institutional controls/access control, soil containment, soil removal and disposal, soil removal with ex-situ soil treatment, and in-situ soil treatment. The potential remediation technologies for soil were screened on the basis of effectiveness, implementability, and relative cost. The screening process determined the most appropriate technologies that warrant development into cleanup action alternatives for further evaluation. Remediation technologies were screened out from further consideration if they were unable to meet MTCA threshold requirements, if they had limited effectiveness or implementability, and/or if another technology was similarly effective and implementable but had a significantly lower cost.

Remediation technologies and process options for Site cleanup that were retained through the screening evaluation, as summarized in Table 4, were used to develop four cleanup action alternatives to address contaminated media at the Site. Each alternative addresses contaminated media with one or a combination of technologies appropriate for Site conditions. Cleanup action alternatives selected for evaluation represent a reasonable range of potentially applicable cleanup options to provide a basis for evaluation. The design parameters used to develop these cleanup action alternatives are based on engineering judgment and current knowledge of Site conditions. The final design for the selected alternative may require additional characterization and analysis to better define the scope and costs associated with the final cleanup action. Cleanup action alternatives were developed to be generally consistent with the current and anticipated future land uses at the Site; however, some of the alternatives are more compatible with preserving the existing Site use than others. Components of the cleanup action alternatives evaluated for the Site are described below and are summarized in Table 5.

#### *4.3.1. Alternative 1 – Engineering and Institutional Controls*

Remedial Alternative 1 relies on the use of engineering controls that currently exist at the Site combined with institutional controls to prevent human exposure to soil in which contaminant concentrations exceed cleanup levels. This alternative requires the least amount of remediation construction and has the lowest costs related to confirmational monitoring of soil and groundwater contaminant concentrations and administrative costs associated with developing the components of the institutional controls. The remedy under this alternative would be subject to confirmational monitoring and periodic review by Ecology to ensure long-term protectiveness.

Alternative 1 has the following components:

- Maintain existing protective concrete, asphalt and soil to isolate Site contaminants from human contact.
- Confirmational groundwater monitoring on a quarterly basis for at least one year following the cleanup action to verify that contaminant concentrations do not exceed groundwater cleanup levels, confirm plume stability and monitor natural attenuation performance. Additional

groundwater monitoring may be necessary if initial groundwater monitoring indicates the potential for contaminant transfer from remaining contaminated soil to groundwater over time.

- Institutional controls in the form of environmental covenants, signage, and other notification measures would be utilized as appropriate to address residual inorganic contaminants and any remaining organic contaminants remaining in place in areas of the Site.
- Additional response actions would be implemented should the remedy be determined to not be effective.

#### *4.3.2. Alternative 2 – In-Situ Soil Treatment*

Remedial Alternative 2 utilizes all of the cleanup action components described above for Alternative 1, with the addition of the injection of chemical reagents through soil mixing technologies to chemically oxidize petroleum-related compounds within the readily accessible portion of the Site (i.e., gravel surface within the former Shell Oil Tank Farm) and to enhance bioremediation of petroleum-related compounds in the less accessible portions of the Site (i.e., beneath the sidewalk and asphalt surfaces of the Q Avenue and the 14th Street). Prevention of exposure to residual contaminants (i.e., inorganic contaminants and/or organic contaminants not addressed by in-situ soil treatment activities) will rely on the use of institutional and engineering controls and groundwater monitoring. The remedy under this alternative would be subject to periodic review by Ecology to ensure long-term protectiveness.

Alternative 2 has the following components:

- Maintain existing protective concrete, asphalt and/or soil caps within the sidewalk and the Q Avenue and the 14th Street to isolate Site contaminants from human contact.
- Injection of chemical oxidant into the subsurface soil through soil mixing technologies to desorb and destroy petroleum-related compounds in soil within the easily accessible portion of the Site (gravel surface within the former Shell Oil Tank Farm) followed by injection of an oxygen releasing material to stimulate naturally occurring microbes for enhancing biological degradation of residual organic contaminants remaining in place beneath the sidewalk and asphalt surfaces of the Q Avenue and the 14th Street. Treatment of organic contaminants in these less accessible portions of the Site would rely on groundwater as a transport mechanism to carry the chemical reagent and/or to expand the zone of bioremediation conditions. Overall contaminant mass reduction will be evaluated after the in-situ soil treatment using supplemental soil samples collected at the Site.
- Confirmational groundwater monitoring on a quarterly basis for at least one year following the cleanup action to verify that contaminant concentrations do not exceed groundwater cleanup levels, confirm plume stability and monitor attenuation performance. Additional groundwater monitoring may be necessary if initial groundwater monitoring indicates the potential for contaminant transfer from remaining contaminated soil to groundwater over-time.
- Institutional controls in the form of environmental covenants, signage, and other notification measures would be utilized as appropriate to address residual inorganic contaminants and any remaining organic contaminants remaining in place in areas of the Site following in-situ treatment.

- Additional response actions would be implemented should the remedy be determined to be not effective.

#### *4.3.3. Alternative 3 – Partial Removal with In-Situ Soil Treatment.*

Remedial Alternative 3 utilizes the cleanup action components described above for Alternative 1, with the addition of excavation and off-site disposal of contaminated soil within the readily accessible portion of the Site (i.e., gravel surface within the former Shell Oil Tank Farm) followed by placement of a chemical reagent within the backfill to enhance bioremediation of petroleum-related compounds in the less accessible portions of the Site (i.e., beneath the sidewalk and asphalt surfaces of the Q Avenue and the 14th Street). Excavated soil exceeding soil cleanup levels would be disposed of at an off-site, permitted landfill. Prevention of exposure to residual contaminants (i.e., inorganic contaminants and/or organic contaminants not addressed by in-situ soil treatment activities) will rely on the use of institutional and engineering controls and groundwater monitoring. The remedy under this alternative would be subject to periodic review by Ecology to ensure long-term protectiveness.

Alternative 3 has the following components:

- Excavate approximately 3,000 in-place cubic yards of contaminated soil (approximately 75% of the total volume) in addition to approximately 1,000 in-place cubic yards of overburden within the readily accessible portion of the Site (i.e., gravel surface within the former Shell Oil Tank Farm) boundary using commonly available excavation techniques. Due to insufficient space to cost effectively segregate, stockpile and test the overburden soil for reuse and geotechnically unsuitable nature of the material (i.e., high silt content), it is assumed that all excavated soil will be transported from the Site for permitted disposal.
- Existing utility infrastructure (power, phone, sewer, water, etc.) would remain undisturbed and protected in-place during remedial excavation activities. In addition, excavation slopes and/or shoring would be required to protect adjacent utilities, sidewalks and roads.
- Confirmation soil samples will be obtained during remedial excavation activities to verify the successful removal of contaminants in accessible portions of the Site and to document residual contaminant concentrations along the excavation sidewall along 14th Street and Q Avenue.
- Transport excavated soil to an approved landfill facility. Excavated soil would be characterized for disposal as required by MTCA and the selected disposal facility. The contaminated soil is expected to designate as non-dangerous waste suitable for disposal at a Subtitle D landfill.
- During backfilling activities, an oxygen releasing material would be placed in lifts throughout the saturated and/or smear zone to stimulate naturally occurring microbes to enhance biological degradation of organic contaminants remaining in-place beneath the sidewalk and asphalt surfaces of the 14th Street and the Q Avenue. Treatment of organic contaminants in these inaccessible portions of the Site would rely on groundwater as a transport mechanism to carry the chemical reagent and/or to expand the zone of bioremediation conditions beyond the limits of excavation.
- Confirmational groundwater monitoring on a quarterly basis for at least one year following the cleanup action to verify that contaminant concentrations do not exceed groundwater cleanup

levels, confirm plume stability and monitor attenuation performance. Additional groundwater monitoring may be necessary if initial groundwater monitoring indicates the potential for contaminant transfer from remaining contaminated soil to groundwater over-time.

- Institutional controls in the form of environmental covenants, signage, and other notification measures would be utilized as appropriate to address residual inorganic contaminants and any remaining organic contaminants remaining in-place in areas of the Site following in-situ treatment.
- Additional response actions would be implemented should the remedy be determined to not be effective.

#### *4.3.4. Alternative 4 – Complete Removal*

Alternative 4 achieves complete removal of soil that exceeds cleanup levels. Contaminated soil exceeding cleanup levels within the former Shell Oil Tank Farm and within the adjacent sidewalk and asphalt surfaces of 14th Street and Q Avenue would be excavated to the extent practicable and disposed of at an off-site, permitted landfill.

Alternative 4 includes the following components:

- Excavate to the extent practicable approximately 4,000 in-place cubic yards of contaminated soil in addition to 2,000 in-place cubic yards of overburden soil using commonly available excavation techniques. Due to insufficient space to cost effectively segregate, stockpile and test the overburden soil for reuse and geotechnically unsuitable nature of the material (i.e., high silt content), it is assumed that all excavated soil will be transported from the Site for permitted disposal.
- Existing utility infrastructure (power, phone, sewer, water, etc.), and asphalt and concrete surfaces would need to be temporality relocated and/or demolished and restored to facilitate removal of the contaminated soil. During construction local, commercial and truck traffic for Q Avenue would be rerouted to nearby arterial roads, street and pedestrian traffic for 14th Street in the vicinity of the Site would also be rerouted.
- Transport excavated soil to an approved landfill facility. Excavated soil would be characterized for disposal as required by MTCA and the selected disposal facility. The contaminated soil is expected to designate as non-dangerous waste suitable for disposal at a Subtitle D landfill.
- Confirmation soil samples will be obtained during remedial excavation activities to verify the successful removal of contaminants from the Site.
- Backfill excavated areas with clean imported fill and restore original Site topography and restore damaged or rerouted infrastructure (utilities, sidewalks and roads).
- Confirmation groundwater monitoring will be performed on a quarterly basis for at least one year following the cleanup action to verify that contaminant concentrations do not exceed groundwater cleanup levels.
- If necessary, develop institutional controls in the form of environmental covenants, signage, and other notification measures to address any remaining contaminated soil left in place in areas of the Site where excavation is found to be impracticable during construction.

## 4.4. MTCA Evaluation Criteria

This section presents a description of the threshold requirements for cleanup actions under MTCA and the additional criteria used in this FS to evaluate the cleanup action alternatives.

### *4.4.1. Threshold Requirements*

Cleanup actions performed under MTCA must comply with several threshold requirements. Cleanup action alternatives that do not comply with these requirements are not considered suitable cleanup actions under MTCA. As provided in WAC 173-340-360(2)(a), cleanup actions must:

- Protect human health and the environment;
- Comply with cleanup standards;
- Comply with applicable state and federal laws; and
- Provide for compliance monitoring.

#### 4.4.1.1. PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT

Cleanup actions performed under MTCA must ensure that human health and the environment are protected.

#### 4.4.1.2. COMPLIANCE WITH CLEANUP STANDARDS

Compliance with cleanup standards requires, in part, that cleanup levels are met at the applicable points of compliance. If a remedial action does not comply with cleanup standards, the remedial action is an interim action, not a cleanup action. Where a cleanup action involves containment of soils with hazardous substance concentrations exceeding cleanup levels at the point of compliance, the cleanup action may be determined to comply with cleanup standards, provided the requirements specified in WAC 173-340-740(6)(f) are met.

#### 4.4.1.3. COMPLIANCE WITH APPLICABLE STATE AND FEDERAL LAWS

Cleanup actions conducted under MTCA must comply with applicable state and federal laws. The term "applicable state and federal laws" includes legally applicable requirements and those requirements that Ecology determines to be relevant and appropriate as described in WAC 173-340-710.

#### 4.4.1.4. PROVISION FOR COMPLIANCE MONITORING

The cleanup action must allow for compliance monitoring in accordance with WAC 173-340-410. Compliance monitoring consists of protection monitoring, performance monitoring and confirmational monitoring. Protection monitoring is conducted to confirm that human health and the environment are adequately protected during the construction, operation, and maintenance phases of a cleanup action. Performance monitoring is conducted to confirm that the cleanup action has attained cleanup standards and/or, if applicable, remediation levels or other performance standards. Confirmational monitoring is conducted to confirm the long-term effectiveness of the cleanup action once cleanup standards and/or, if applicable, remediation levels or other performance standards have been attained.

#### *4.4.2. Other Requirements*

Under MTCA, when selecting from the cleanup action alternatives that meet the threshold requirements described above, the alternatives must be further evaluated against the following additional criteria:

- **Use permanent solutions to the maximum extent practicable (WAC 173-340-360[2][b][i]):** MTCA Cleanup Regulation requires that when selecting from cleanup action alternatives that fulfill the threshold requirements, the selected action shall use permanent solutions to the maximum extent practicable (WAC 173-340-360[2][b][i]). MTCA specifies that the permanence of these qualifying alternatives shall be evaluated by balancing the costs and benefits of each of the alternatives using a "disproportionate cost analysis" in accordance with WAC 173-340-360(3)(e). The criteria for conducting a disproportionate cost analysis are described in Section 4.4.3 below.
- **Provide a reasonable restoration time frame (WAC 173-340-360[2][b][ii]):** In accordance with WAC 173-340-360(2)(b)(ii), selected cleanup actions must provide for a reasonable restoration time frame. The MTCA Cleanup Regulation lists factors to be considered in evaluating whether a cleanup action provides for a reasonable restoration time frame (WAC 173-340-360[4][b]).
- **Consideration of Public Concerns (WAC 173-340-360[2][b][iii]):** Ecology will consider public comments submitted during the RI/FS process in making its preliminary selection of an appropriate cleanup action alternative. This preliminary selection is subject to further public review and comment when the proposed remedy is published in the Cleanup Action Plan.

#### *4.4.3. MTCA Disproportionate Cost Analysis*

The MTCA disproportionate cost analysis (DCA) is used to evaluate which of the cleanup action alternatives that meet the threshold requirements are permanent to the maximum extent practicable. This analysis involves comparing the costs and benefits of the alternatives and selecting the alternative whose incremental costs are not disproportionate to the incremental benefits. The evaluation criteria for the DCA are specified in WAC 173-340-360(2) and (3), and include protectiveness, permanence, cost, long-term effectiveness, management of short-term risks, implementability, and consideration of public concerns.

As outlined in WAC 173-340-360(3)(e), the MTCA Cleanup Regulation provides a methodology that uses the criteria below to determine whether the costs associated with each cleanup action alternative are disproportionate relative to the incremental benefit of the alternative over the next lowest cost alternative. The comparison of benefits relative to costs may be quantitative, but will often be qualitative. When possible for this FS, quantitative factors such as mass of contaminant removed or percentage of area of impacts remaining were compared to costs for the alternatives evaluated, but many of the benefits associated with the criteria described below were necessarily evaluated qualitatively. Costs are disproportionate to benefits if the incremental costs of the more permanent alternative exceed the incremental degree of benefits achieved over the lower-cost alternative (WAC 173-340-360[e][i]). Where two or more alternatives are equal in benefits, Ecology selects the less costly alternative (WAC 173-340-360[e][ii][c]).

The MTCA criteria used in the DCA are described below.

#### 4.4.3.1. PROTECTIVENESS

The overall protectiveness of a cleanup action alternative is evaluated based on several factors. First, the extent to which human health and the environment are protected and the degree to which overall risk at a site is reduced are considered. Both on-site and off-site reductions in risk resulting from implementing the alternative are considered.

#### 4.4.3.2. PERMANENCE

MTCA specifies that when selecting a cleanup action alternative, preference shall be given to actions that are "permanent solutions to the maximum extent practicable." Evaluation criteria include the degree to which the alternative permanently reduces the toxicity, mobility or mass of hazardous substances, including the effectiveness of the alternative in destroying the hazardous substances, the reduction or elimination of hazardous substance releases and sources of releases, the degree of irreversibility of waste treatment processes, and the characteristics and quantity of treatment residuals generated.

#### 4.4.3.3. COST

The analysis of cleanup action alternative costs under MTCA includes all costs associated with implementing an alternative, including design, construction, confirmational monitoring, and institutional controls. Costs are intended to be comparable among different alternatives to assist in the overall analysis of relative costs and benefits of the alternatives. The costs to implement an alternative include the cost of construction, the net present value of any long-term costs, and Port administrative costs. Long-term costs include operation and maintenance costs, monitoring costs, equipment replacement costs, and the cost of maintaining institutional controls. Unit costs used to develop cost estimates for the cleanup action alternatives in this FS were derived using a combination of published engineering reference manuals (i.e., R.S. Means), construction cost estimates solicited from applicable vendors and contractors, review of actual costs incurred during similar, applicable projects, and professional judgment.

#### 4.4.3.4. LONG-TERM EFFECTIVENESS

Long-term effectiveness is a parameter that expresses the degree of certainty that the cleanup action alternative will be successful in maintaining compliance with cleanup standards over the long-term performance of the cleanup action. The MTCA Cleanup Regulation contains a specific preference ranking for different types of technologies that is to be considered as part of the comparative analysis. The ranking gives the highest preference to technologies such as reuse/recycling, treatment, immobilization/solidification, and disposal in an engineered, lined, and monitored facility. Lower preference rankings are given to technologies such as on-site isolation/containment with attendant engineered controls, and institutional controls and monitoring.

#### 4.4.3.5. MANAGEMENT OF SHORT-TERM RISKS

Evaluation of this criterion considers the relative magnitude and complexity of actions required to maintain protection of human health and the environment during implementation of the cleanup action. Cleanup actions carry short-term risks, such as potential mobilization of contaminants during construction, or safety risks typical of large construction projects. Some short-term risks can be managed through the use of best practices during project design and construction, while

other risks are inherent to project alternatives and can offset the long-term benefits of an alternative.

#### 4.4.3.6. IMPLEMENTABILITY

Implementability is an overall metric expressing the relative difficulty and uncertainty of implementing the cleanup action. Evaluation of implementability includes consideration of technical factors such as the availability of mature technologies and experienced contractors to accomplish the cleanup work. It also includes administrative factors associated with permitting and completing the cleanup.

#### 4.4.3.7. CONSIDERATION OF PUBLIC CONCERNS

The public involvement process under MTCA is used to identify potential public concerns regarding cleanup action alternatives. The extent to which an alternative addresses those concerns is considered as part of the evaluation process. This includes concerns raised by individuals, community groups, local governments, tribes, federal and state agencies, and other organizations that may have an interest in or knowledge of the site. In particular, the public concerns for this Site would generally be associated with environmental concerns and performance of the cleanup action, which are addressed under other criteria such as protectiveness and permanence.

## 4.5. Evaluation of Cleanup Action Alternatives

Each alternative is evaluated with respect to the MTCA evaluation criteria described in Section 4.4 and then compared to the other alternatives relative to its expected performance under each criterion. The components of the four Alternatives are described above in Section 4.3 and are summarized in Table 5. A MTCA DCA was completed to determine which cleanup action alternative that otherwise meets threshold requirements is permanent to the maximum extent practicable. The results of the detailed alternatives evaluation and DCA are presented in Tables 6 and 7, and illustrated in Figure 8.

### *4.5.1. Threshold Requirements*

All of the alternatives developed for the Site meet the four MTCA threshold requirements described for cleanup actions:

- Protection of human health and the environment;
- Compliance with cleanup standards;
- Compliance with applicable state and federal regulations; and
- Provision for compliance monitoring.

### *4.5.2. MTCA Disproportionate Cost Analysis*

The DCA compares cleanup costs and benefits and allows selection of a cleanup action alternative that provides the greatest benefits relative to cost. Cleanup Action Alternatives 1 through 4 were evaluated based on the MTCA DCA criteria described in Section 4.4.3. The alternatives were ranked on a scale of 1 (lowest) to 10 (highest) for each of the DCA criteria. Each of the DCA criteria was assigned a weighting factor as determined by Ecology, that ranged between 10 percent and

30 percent (the sum of the weighting factors equaled 100 percent). Results of the DCA are as follows:

- Alternative 1: 4.2 (out of 10) benefit ranking; estimated cleanup cost of $400,000.
- Alternative 2: 6.5 (out of 10) benefit ranking; estimated cleanup cost of $2,120,000.
- Alternative 3: 7.8 (out of 10) benefit ranking; estimated cleanup cost of $3,000,000.
- Alternative 4: 8.6 (out of 10) benefit ranking; estimated cleanup cost of $4,130,000.

The high ranking of Alternative 4, and to a lesser degree Alternative 3, is due to the higher level of contaminant mass removal achieved through excavation and disposal of contaminated soil with these Alternatives. Alternative 2 has a lower ranking than Alternative 3 due to the lower degree of immediate contaminant mass removal and uncertainty in short-term and long-term risks associated with in-situ treatment technologies. Alternative 1 is the least protective of each of the alternatives evaluated given the short- and long-term risks associated with leaving the contaminant mass in place.

However, the marginal gains in protectiveness and permanence resulting from Alternative 4 are determined to be disproportionately more costly given the higher potential for short-term risks and greater complexities related to implementability in comparison to Alternative 3. As a result, Alternative 3 is the alternative with the highest overall ranking.

Detailed scoring of Alternatives 1 through 4 are presented in Table 6. A summary of the relative benefits ranking and disproportionate cost analysis is presented in Table 7. A comparison of the relative benefits ranking and disproportionate cost analysis is shown on Figure 8. Conceptual-level cost estimates for the cleanup action alternatives are presented in Table B-1 through B-4 of Appendix B.

#### *4.5.3. Reasonable Restoration Time Frame*

The restoration time frame, which includes project design, contracting and construction, for all of the proposed Remedial Alternatives is expected to be on the order of one to three years. However, it should be noted that there are unknowns and intangibles related to the restoration timeframe for Alternative 2. There is a lag time between in-situ treatment and verification of that the treatment was successful in achieving the site cleanup objectives. Furthermore, multiple treatment events may be required before the Site cleanup objectives are met. Acceptable restoration timeframes cannot be predicted with certainty for Alternative 2.

Alternatives 1 through 3 would require monitoring of contaminant concentrations in groundwater for a period of approximately five to ten years to ensure long-term effectiveness of the Cleanup Action.

### 4.6. Preferred Cleanup Action Alternative

Based on the comparative analysis summarized in Section 4.5 and Tables 6 and 7, the preferred cleanup action alternative for the Site is Alternative 3. This alternative will result in:

- Significant reduction in contaminant mass from the Site through remedial excavation activities;

- Enhancing the biological degradation and ultimate attenuation of organic contaminants in soil located beneath the sidewalk and asphalt surfaces of the Q Avenue and 14th Street through the placement of oxygen releasing material during backfilling activities; and
- Reduction of human health risks to Site users and terrestrial wildlife.

Although some of the contamination will be left in place above soil cleanup levels as part of Alternative 3, exposure to these contaminants is prevented through the use of engineering controls in the form or soil capping by concrete and asphalt paved surfaces and institutional controls in the form of environmental covenants, signage, and other notification measures at the Site.

## 5.0 LIMITATIONS

This report has been prepared for the exclusive use of the Port of Anacortes, their authorized agents and regulatory agencies in their evaluation of the Former Shell Tank Farm Site located in Anacortes, Washington. No other party may rely on the product of our services unless we agree in advance and in writing to such reliance.

Within the limitations of scope, schedule and budget, our services have been executed in accordance with generally accepted environmental science practices in this area at the time this report was prepared. No warranty or other conditions express or implied should be understood.

Any electronic form, facsimile or hard copy of the original document (email, text, table, and/or figure), if provided, and any attachments are only a copy of the original document. The original document is stored by GeoEngineers, Inc. and will serve as the official document of record.

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TABLES

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# Table 1

## Remedial Investigation Sampling and Analysis Summary

**Former Shell Oil Tank Farm Site**

**Anacortes, Washington**

| Sample Location | Sample Identification | Sample Depth (feet) | Sample Date | Sampled By | Petroleum Hydrocarbons | | | | Volatile Organic Compounds (VOCs) | Polycyclic Aromatic Hydrocarbons (PAHs) | Polychlorinated Biphenyls (PCBs) | Metals | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | HCID | Gasoline-Range | Diesel-Range | Heavy Oil-Range | | | | Arsenic | Cadmium | Chromium | Lead | Mercury |
| **Soil Investigation** | | | | | | | | | | | | | | | | |
| MW-1 | MW-1 S-4[2] | 10.0 - 11.5 | 4/21/1987 | Hart Crowser | | | X | X | | | | | | | X | |
| MW-2 | MW-2 S-2[2] | 5.0 - 6.5 | 4/22/1987 | Hart Crowser | | | X | | | | | | | | X | |
| SHL01 | SHL01-S1 | 8.0 - 8.5 | 8/24/2005 | Floyd Snider | | X | X | X | X | | | | | | | |
| SHL02 | SHL02-S1 | 4.0 - 5.0 | 8/24/2005 | Floyd Snider | | X | X | X | X | | | | | | | |
| | SHL02-S2 | 5.0 - 6.0 | 8/24/2005 | Floyd Snider | | X | X | X | X | | | | | | | |
| | SHL02-S3 | 8.0 - 9.5 | 8/24/2005 | Floyd Snider | X | X | X | X | X | | | | | | | |
| SHL03 | SHL03-S1 | 4.0 - 5.5 | 8/24/2005 | Floyd Snider | X | | | | | | | | | | | |
| | SHL03-S2 | 5.5 - 6.2 | 8/24/2005 | Floyd Snider | | X | X | X | X | | | | | | | |
| SHL04 | SHL04-S1 | 2.0 - 3.5 | 8/24/2005 | Floyd Snider | X | | | | | | | | | | | |
| | SHL04-S2 | 9.5 | 8/24/2005 | Floyd Snider | | X | X | X | X | | | | | | | |
| SHL05 | SHL05-S1 | 2.0 - 3.5 | 8/24/2005 | Floyd Snider | | X | X | X | X | | | | | | | |
| | SHL05-S2 | 4.4 - 6.2 | 8/24/2005 | Floyd Snider | | X | X | X | X | | | | | | | |
| | SHL05-S3 | 8.0 - 10.0 | 8/24/2005 | Floyd Snider | | X | X | X | X | | | | | | | |
| SHL06 | SHL06-S1 | 4.0 - 6.0 | 8/26/2005 | Floyd Snider | X | | | | | | | | | | | |
| SHL07 | SHL07-S1 | 4.0 - 5.1 | 8/26/2005 | Floyd Snider | X | | | | | | | | | | | |
| CSM01 | CSM01-S1 | 4.0 - 5.0 | 8/24/2005 | Floyd Snider | X | | X | X | | | | | | | | |
| | CSM01-S2 | 4.0 - 5.0 | 8/24/2005 | Floyd Snider | X | | | | | | | | | | | |
| CSM02 | CSM02-S1 | 8.0 - 8.7 | 8/24/2005 | Floyd Snider | X | | X | X | | | | | | | | |
| CSM03 | CSM03-S1 | 4.0 - 5.0 | 8/24/2005 | Floyd Snider | X | | X | X | | | | | | | | |
| | CSM03-S2 | 8.0 - 9.0 | 8/24/2005 | Floyd Snider | | X | X | X | X | | | | | | | |
| CSM04 | CSM04-S1 | 4.5 - 5.8 | 8/25/2005 | Floyd Snider | X | | | | | | | | | | | |
| | CSM04-S2 | 10.3 - 12 | 8/25/2005 | Floyd Snider | X | | | | | | | | | | | |
| CSM12 | CSM12-S1 | 5.0 - 6.0 | 8/26/2005 | Floyd Snider | X | | X | X | | | | | | | | |
| | CSM12-S2 | 10.0 - 11.0 | 8/26/2005 | Floyd Snider | X | X | X | X | X | | | | | | | |
| CSM13 | CSM13-S1 | 5.0 - 5.5 | 8/26/2005 | Floyd Snider | X | | | | | | | | | | | |
| | CSM13-S2 | 10.5 - 11.5 | 8/26/2005 | Floyd Snider | X | X | X | X | X | | | | | | | |
| SB-10 | SB-10 (0-0.5) | 0.0 - 0.5 | 5/24/2007 | Landau | | X | X | X | X | X | | | | | X | |
| | SB-10 (1-2) | 1.0 - 2.0 | 5/24/2007 | Landau | | X | X | X | X | X | | | | | X | |
| | SB-10 (5-6) | 5.0 - 6.0 | 5/24/2007 | Landau | | X | X | X | X | X | | | | | X | |
| SB-13 | SB-13 (0.5-1.5) | 0.5 - 1.5 | 5/25/2007 | Landau | | X | X | X | X | X | | | | | X | |
| | SB-13 (1.5-3) | 1.5 - 3 | 5/25/2007 | Landau | | X | X | X | X | X | | | | | X | |
| | SB-13 (5-6) | 5 - 6 | 5/25/2007 | Landau | | X | X | X | X | X | | | | | X | |

| Sample Location | Sample Identification | Sample Depth (feet) | Sample Date | Sampled By | Petroleum Hydrocarbons | | | | Volatile Organic Compounds (VOCs) | Polycyclic Aromatic Hydrocarbons (PAHs) | Polychlorinated Biphenyls (PCBs) | Metals | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | HCID | Gasoline-Range | Diesel-Range | Heavy Oil-Range | | | | Arsenic | Cadmium | Chromium | Lead | Mercury |
| **Soil Investigation** | | | | | | | | | | | | | | | | |
| SB-14 | SB-14 (0.5-1.5) | 0.5 - 1.5 | 5/25/2007 | Landau | | X | X | X | X | X | | | | | X | |
| | SB-14 (8-9) | 8 - 9 | 5/25/2007 | Landau | | X | X | X | X | X | | | | | X | |
| | SB-14 (9-10) | 9 - 10 | 5/25/2007 | Landau | | X | X | X | X | X | | | | | X | |
| TP-1 | TP-1-6.0 | 6.0 - 6.5 | 11/30/2007 | GeoEngineers | | X | X | X | X | X | X | X | X | X | X | X |
| | TP-1-8.0 | 7.5 - 8.5 | 11/30/2007 | GeoEngineers | | | | | | | | | X | | | |
| TP-2 | TP-2-4.0 | 4.0 - 4.5 | 11/30/2007 | GeoEngineers | | X | X | X | X | X | X | X | X | X | X | X |
| TP-3 | TP-3-8.0 | 7.5 - 8.0 | 11/30/2007 | GeoEngineers | | X | X | X | X | X | X | X | X | X | X | X |
| TP-4 | TP-4-2.0 | 2.0 - 2.5 | 11/30/2007 | GeoEngineers | | X | X | X | X | X | X | X | X | X | X | X |
| GEI-1 | GEI-1-5.0 | 5.0 | 9/27/2011 | GeoEngineers | | X | X | X | X | | | | | | | |
| | GEI-1-7.5 | 7.5 | 9/27/2011 | GeoEngineers | | X | X | X | X | | | | | | | |
| GEI-2 | GEI-2-5.0 | 5.0 | 9/27/2011 | GeoEngineers | | X | X | X | X | | | | | | | |
| | GEI-2-7.5 | 7.5 | 9/27/2011 | GeoEngineers | | X | X | X | X | | | | | | | |
| GEI-3 | GEI-3-2.5 | 2.5 | 9/27/2011 | GeoEngineers | | X | X | X | X | | | | | | | |
| | GEI-3-10.0 | 10.0 | 9/27/2011 | GeoEngineers | | X | X | X | X | | | | | | | |
| | GEI-3-18.0 | 18.0 | 9/27/2011 | GeoEngineers | | X | X | X | X | | | | | | | |
| GEI-4 | GEI-4-5.0 | 5.0 | 9/27/2011 | GeoEngineers | | X | X | X | X | | | | | | | |
| | GEI-4-10.0 | 10.0 | 9/27/2011 | GeoEngineers | | X | X | X | X | | | | | | | |
| GEI-5 | GEI-5-2.5 | 2.5 | 9/27/2011 | GeoEngineers | | X | X | X | X | | | | | | | |
| | GEI-5-10.0 | 10.0 | 9/27/2011 | GeoEngineers | | X | X | X | X | | | | | | | |
| | GEI-5-17.0 | 17.0 | 9/27/2011 | GeoEngineers | | X | X | X | X | | | | | | | |
| GEI-6 | GEI-6-5.0 | 5.0 | 9/27/2011 | GeoEngineers | | X | X | X | X | | | | | | | |
| | GEI-6-10.0 | 10.0 | 9/27/2011 | GeoEngineers | | X | X | X | X | | | | | | | |
| GEI-7 | GEI-7-2.5 | 2.5 | 9/27/2011 | GeoEngineers | | X | X | X | X | | | | | | | |
| | GEI-7-5.0 | 5.0 | 9/27/2011 | GeoEngineers | | X | X | X | X | | | | | | | |
| | GEI-7-7.5 | 7.5 | 9/27/2011 | GeoEngineers | | X | X | X | X | | | | | | | |
| GEI-8 | GEI-8-2.5 | 2.5 | 9/27/2011 | GeoEngineers | | X | X | X | X | | | | | | | |
| | GEI-8-7.5 | 7.5 | 9/27/2011 | GeoEngineers | | X | X | X | X | | | | | | | |
| GEI-9 | GEI-9-2.5 | 2.5 | 9/27/2011 | GeoEngineers | | X | X | X | X | | | | | | | |
| | GEI-9-7.5 | 7.5 | 9/27/2011 | GeoEngineers | | X | X | X | X | | | | | | | |
| | GEI-9-10.0 | 10.0 | 9/27/2011 | GeoEngineers | | X | X | X | X | | | | | | | |
| GEI-10 | GEI-10-5.0 | 5.0 | 9/27/2011 | GeoEngineers | | X | X | X | X | | | | | | | |
| | GEI-10-7.5 | 7.5 | 9/27/2011 | GeoEngineers | | X | X | X | X | | | | | | | |
| GEI-11 | GEI-11-5.0 | 5.0 | 9/28/2011 | GeoEngineers | | X | X | X | X | X | X | | | | X | |
| | GEI-11-10.0 | 10.0 | 9/28/2011 | GeoEngineers | | X | X | X | X | X | X | | | | X | |

| Sample Location | Sample Identification | Sample Depth (feet) | Sample Date | Sampled By | Petroleum Hydrocarbons | | | | Volatile Organic Compounds (VOCs) | Polycyclic Aromatic Hydrocarbons (PAHs) | Polychlorinated Biphenyls (PCBs) | Metals | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | HCID | Gasoline-Range | Diesel-Range | Heavy Oil-Range | | | | Arsenic | Cadmium | Chromium | Lead | Mercury |
| **Soil Investigation** | | | | | | | | | | | | | | | | |
| GEI-12 | GEI-12-7.5 | 7.5 | 9/28/2011 | GeoEngineers | | X | X | X | X | X | | | | | X | |
| | GEI-12-12.0 | 12.0 | 9/28/2011 | GeoEngineers | | X | X | X | X | X | | | | | X | |
| | GEI-12-15.0 | 15.0 | 9/28/2011 | GeoEngineers | | X | X | X | X | X | | | | | X | |
| GEI-13 | GEI-13-5.0 | 5.0 | 9/28/2011 | GeoEngineers | | X | X | X | X | X | | | X | | X | |
| | GEI-13-7.5 | 7.5 | 9/28/2011 | GeoEngineers | | X | X | X | X | X | | | X | | X | |
| | GEI-13-12.5 | 12.5 | 9/28/2011 | GeoEngineers | | X | X | X | X | X | | | X | | X | |
| | GEI-13-15.0 | 15.0 | 9/28/2011 | GeoEngineers | | X | | | | | | | | | | |
| GEI-14 | GEI-14-5.0 | 5.0 | 9/28/2011 | GeoEngineers | | X | X | X | X | X | | | X | | X | |
| | GEI-14-8.0 | 8.0 | 9/28/2011 | GeoEngineers | | X | X | X | X | X | | | X | | X | |
| | GEI-14-10.0 | 10.0 | 9/28/2011 | GeoEngineers | | X | X | X | X | X | | | X | | X | |
| GEI-15 | GEI-15-5.0 | 5.0 | 9/28/2011 | GeoEngineers | | | | | | | | | X | | | |
| | GEI-15-10.0 | 10.0 | 9/28/2011 | GeoEngineers | | X | | | X | | | | X | | | |
| GEI-15A | GEI-15A-5.0 | 5.0 | 9/28/2011 | GeoEngineers | | | | | | | | | X | | | |
| | GEI-15A-10.0 | 10.0 | 9/28/2011 | GeoEngineers | | X | | | X | | | | X | | | |
| GEI-16 | GEI-16-5.0 | 5.0 | 9/29/2011 | GeoEngineers | | X | X | X | X | | | | | | X | |
| | GEI-16-10.0 | 10.0 | 9/29/2011 | GeoEngineers | | X | X | X | X | | | | | | X | |
| GEI-17 | GEI-17-10.0 | 10.0 | 9/29/2011 | GeoEngineers | | X | X | X | X | | | | | | X | |
| | GEI-17-14.0 | 14.0 | 9/29/2011 | GeoEngineers | | X | X | X | X | | | | | | X | |
| | GEI-17-17.5 | 17.5 | 9/29/2011 | GeoEngineers | | X | X | X | X | | | | | | X | |
| GEI-18 | GEI-18-5.0 | 5.0 | 9/29/2011 | GeoEngineers | | X | X | X | X | | | | | | X | |
| | GEI-18-12.5 | 12.5 | 9/29/2011 | GeoEngineers | | X | X | X | X | | | | | | X | |
| | GEI-18-15.0 | 15.0 | 9/29/2011 | GeoEngineers | | X | X | X | X | | | | | | X | |
| GEI-19 | GEI-19-5.0 | 5.0 | 9/29/2011 | GeoEngineers | | X | X | X | X | | | | | | X | |
| | GEI-19-10.0 | 10.0 | 9/29/2011 | GeoEngineers | | X | X | X | X | | | | | | X | |
| GEI-20 | GEI-20-5.0 | 5.0 | 9/29/2011 | GeoEngineers | | X | X | X | X | X | | | | | X | |
| | GEI-20-10.0 | 10.0 | 9/29/2011 | GeoEngineers | | X | X | X | X | X | | | | | X | |
| GEI-21 | GEI-21-5.0 | 5.0 | 9/29/2011 | GeoEngineers | | X | X | X | X | X | | | | | X | |
| | GEI-21-10.0 | 10.0 | 9/29/2011 | GeoEngineers | | X | X | X | X | X | | | | | X | |
| | GEI-21-15.0 | 15.0 | 9/29/2011 | GeoEngineers | | | | | | X | | | | | | |
| GEI-22 | GEI-22-5.0 | 5.0 | 9/29/2011 | GeoEngineers | | X | X | X | X | X | | | | | X | |
| | GEI-22-12.5 | 12.5 | 9/29/2011 | GeoEngineers | | X | X | X | X | X | | | | | X | |
| | GEI-22-15.0 | 15.0 | 9/29/2011 | GeoEngineers | | | | | | X | | | | | | |
| GEI-23 | GEI-23-7.5 | 7.5 | 9/29/2011 | GeoEngineers | | X | X | X | X | | | | | | X | |
| | GEI-23-12.5 | 12.5 | 9/29/2011 | GeoEngineers | | X | X | X | X | | | | | | X | |
| | GEI-23-15.0 | 15.0 | 9/29/2011 | GeoEngineers | | | X | X | | | | | | | | |

| Sample Location | Sample Identification | Sample Depth (feet) | Sample Date | Sampled By | Petroleum Hydrocarbons | | | | Volatile Organic Compounds (VOCs) | Polycyclic Aromatic Hydrocarbons (PAHs) | Polychlorinated Biphenyls (PCBs) | Metals | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | HCID | Gasoline-Range | Diesel-Range | Heavy Oil-Range | | | | Arsenic | Cadmium | Chromium | Lead | Mercury |
| **Soil Investigation** | | | | | | | | | | | | | | | | |
| GEI-24 | GEI-24-5.0 | 5.0 | 9/29/2011 | GeoEngineers | | X | X | X | X | | | | | | X | |
| | GEI-24-10.0 | 10.0 | 9/29/2011 | GeoEngineers | | X | X | X | X | | | | | | X | |
| GEI-25 | GEI-25-5.0 | 5.0 | 9/29/2011 | GeoEngineers | | X | X | X | X | | | | | | X | |
| | GEI-25-10.0 | 10.0 | 9/29/2011 | GeoEngineers | | X | X | X | X | | | | | | X | |
| GEI-26 | GEI-26-5.0 | 5.0 | 9/29/2011 | GeoEngineers | | X | X | X | X | X | | | | | X | |
| | GEI-26-10.0 | 10.0 | 9/29/2011 | GeoEngineers | | X | X | X | X | X | | | | | X | |
| GEI-27 | GEI-27-7.5 | 7.5 | 9/29/2011 | GeoEngineers | | X | X | X | X | X | X | | | | X | |
| | GEI-27-11.0 | 11.0 | 9/29/2011 | GeoEngineers | | X | X | X | X | X | X | | | | X | |
| | GEI-27-13.0 | 13.0 | 9/29/2011 | GeoEngineers | | X | X | X | X | X | X | | | | X | |
| GEI-28 | GEI-28-5.0 | 5.0 | 9/29/2011 | GeoEngineers | | X | X | X | X | X | | | | | X | |
| | GEI-28-10.0 | 10.0 | 9/29/2011 | GeoEngineers | | X | X | X | X | X | | | | | X | |
| GEI-29 | GEI-29-5.0 | 5.0 | 9/29/2011 | GeoEngineers | | X | X | X | X | X | | | | | X | |
| | GEI-29-10.0 | 10.0 | 9/29/2011 | GeoEngineers | | X | X | X | X | X | | | | | X | |
| GEI-30 | GEI-30-7.5 | 7.5 | 9/28/2011 | GeoEngineers | | X | X | X | X | X | | | X | | | |
| GEI-31 | GEI-31-7.5 | 7.5 | 9/29/2011 | GeoEngineers | | X | X | X | X | X | | | | | X | |
| GEI-32 | GEI-32-5.0 | 5.0 | 9/29/2011 | GeoEngineers | | X | X | X | X | X | | | | | X | |
| GEI-33 | GEI-33-5.0 | 5.0 | 9/29/2011 | GeoEngineers | | X | X | X | X | X | | | | | X | |
| | GEI-33-10.0 | 10.0 | 9/29/2011 | GeoEngineers | | X | X | X | X | X | | | | | X | |
| | GEI-33-14.0 | 14.0 | 9/29/2011 | GeoEngineers | | X | X | X | X | X | | | | | X | |
| GEI-34 | GEI-34-12.0 | 12.0 | 9/29/2011 | GeoEngineers | | X | X | X | X | X | | | | | X | |
| | GEI-34-15.0 | 15.0 | 9/29/2011 | GeoEngineers | | | | | | X | | | | | | |
| GEI-35 | GEI-35-15.0 | 15.0 | 9/29/2011 | GeoEngineers | | X | X | X | X | | | | | | X | |
| GEI-MW-1 | GEI-MW-1-7.5 | 7.5 | 2/9/2012 | GeoEngineers | | X | | | | | | | | | | |
| | GEI-MW-1-12.5 | 12.5 | 2/9/2012 | GeoEngineers | | X | | | X | X | | | | | | |
| **Groundwater Investigation** | | | | | | | | | | | | | | | | |
| MW-12 | MW-1 | NA | 4/23/1987 | Hart Crowser | | | | | X | | | | | | X | |
| MW-22 | MW-2 | NA | 4/23/1987 | Hart Crowser | | | | | X | | | | | | X | |
| SHL01 | SHL01-W1 | NA | 8/24/2005 | Floyd Snider | | X | X | X | X | | | | | | | |
| SHL02 | SHL02-W1 | NA | 8/24/2005 | Floyd Snider | | X | X | X | X | | | | | | | |
| SHL03 | SHL03-W1 | NA | 8/24/2005 | Floyd Snider | | X | X | X | X | | | | | | | |
| SHL04 | SHL04-W1 | NA | 8/24/2005 | Floyd Snider | | X | X | X | X | | | | | | | |
| SHL05 | SHL05-W1 | NA | 8/24/2005 | Floyd Snider | | X | X | X | X | | | | | | | |
| SHL06 | SHL06-W1 | NA | 8/26/2005 | Floyd Snider | | X | X | X | X | | | | | | | |
| SHL07 | SHL07-W1 | NA | 8/26/2005 | Floyd Snider | | X | X | X | X | | | | | | | |
| CSM12 | CSM12-W1 | NA | 8/26/2005 | Floyd Snider | | X | X | X | X | | | | | | | |

| Sample Location | Sample Identification | Sample Depth (feet) | Sample Date | Sampled By | Petroleum Hydrocarbons | | | | Volatile Organic Compounds (VOCs) | Polycyclic Aromatic Hydrocarbons (PAHs) | Polychlorinated Biphenyls (PCBs) | Metals | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | HCID | Gasoline-Range | Diesel-Range | Heavy Oil-Range | | | | Arsenic | Cadmium | Chromium | Lead | Mercury |
| **Groundwater Investigation** | | | | | | | | | | | | | | | | |
| CSM13 | CSM13-W1 | NA | 8/26/2005 | Floyd Snider | | X | X | X | X | | | | | | | |
| GEI-MW-1 | GEI-MW-1 | NA | 3/6/2012 | GeoEngineers | | X | X | X | X | X | | | | | X | |
| GEI-MW-2 | GEI-MW-2 | NA | 3/6/2012 | GeoEngineers | | X | X | X | X | X | | | | | X | |
| GEI-MW-3 | GEI-MW-3 | NA | 3/6/2012 | GeoEngineers | | X | X | X | X | X | | | | | X | |
| GEI-MW-4 | GEI-MW-4 | NA | 3/6/2012 | GeoEngineers | | X | X | X | X | X | | | | | X | |
| GEI-MW-5 | GEI-MW-5 | NA | 3/6/2012 | GeoEngineers | | X | X | X | X | X | | | | | X | |
| GEI-MW-6 | GEI-MW-6 | NA | 3/6/2012 | GeoEngineers | | X | X | X | X | X | | | | | X | |
| GEI-MW-7 | GEI-MW-7 | NA | 3/6/2012 | GeoEngineers | | X | X | X | X | X | | | | | X | |

# Table 2

## Proposed Final Soil Cleanup Levels

**Former Shell Oil Tank Farm Site**

**Anacortes, Washington**

| Constituent | Soil Cleanup Level (mg/kg) |
|---|---|
| **Petroleum Hydrocarbons** | |
| Gasoline-Range | 30/100[1] |
| Diesel-Range | 2,000 |
| Heavy Oil-Range | 2,000 |
| **Volatile Organic Compounds (VOCs)** | |
| Benzene | 0.13 |
| Ethylbenzene | 18.0 |
| Toluene | 109 |
| Total Xylenes | 9 |
| Methyl tert-butyl ether (MTBE) | 560 |
| Ethylene Dibromide (EDB) | 0.012 |
| ethylene dichloride (EDC) | 0.179 |
| Tetrachloroethylene (PCE) | 0.01 |
| Trichloroethylene (TCE) | 0.044 |
| (cis) 1,2-Dichloroethene (DCE) | NE |
| 1,1,1-Trichloroethane | 13,957 |
| Vinyl Chloride | 0 |
| Trichlorofluoromethane (freon) | 24,000 |
| Carbon tetrachloride | 0.015 |
| **Polycyclic Aromatic Hydrocarbons (PAHs)** | |
| Naphthalene | 140 |
| 2-Methylnaphthalene | 3,200 |
| 1-Methylnaphthalene | NE |
| Benzo(a)anthracene | 0.13 |
| Chrysene | 0.14 |
| Benzo(b)fluoranthene | 0.43 |
| Benzo(k)fluoranthene | 0.43 |
| Benzo(a)pyrene | 0.137 |
| Indeno(1,2,3-cd)pyrene | 1.3 |
| Dibenz(a,h)anthracene | 0.65 |
| Total cPAHs (TEQ) | 0.137 |
| **Metals** | |
| Arsenic | 20 |
| Cadmium | 1.2 |
| Chromium | 120,000 |
| Lead | 250 |
| Mercury | 0.07 |
| **Polychlorinated Biphenyls (PCBs)** | |
| Total PCBs | 0.1 |

**Notes:**

[1]Cleanup level is 30 mg/kg when benzene is present.

NE = not established

mg/kg = milligrams per kilogram

TEQ = toxicity equivalency

# Table 3

## Proposed Final Groundwater Cleanup Levels

**Former Shell Oil Tank Farm Site**

**Anacortes, Washington**

| Constituent | Groundwater Cleanup Level (µg/L) |
|---|---|
| **Petroleum Hydrocarbons** | |
| Gasoline-Range | 800/1,000[1] |
| Diesel-Range | 500 |
| Heavy Oil-Range | 500 |
| **Volatile Organic Compounds (VOCs)** | |
| Benzene | 23.00 |
| Ethylbenzene | 15000.0 |
| Toluene | 2100 |
| Total Xylenes | 1,000 |
| Methyl tert-butyl ether (MTBE) | 20 |
| Ethylene Dibromide (EDB) | 2.000 |
| ethylene dichloride (EDC) | 37.000 |
| Tetrachloroethylene (PCE) | 0.39 |
| Trichloroethylene (TCE) | 6.700 |
| (cis) 1,2-Dichloroethene (DCE) | NE |
| 1,1,1-Trichloroethane | 420,000 |
| Vinyl Chloride | 2 |
| Trichlorofluoromethane (freon) | NE |
| Carbon tetrachloride | 1.600 |
| **Polycyclic Aromatic Hydrocarbons (PAHs)** | |
| Naphthalene | NE |
| 2-Methylnaphthalene | NE |
| 1-Methylnaphthalene | 4,900 |
| Benzo(a)anthracene | 0 |
| Chrysene | 0 |
| Benzo(b)fluoranthene | 0 |
| Benzo(k)fluoranthene | 0.018 |
| Benzo(a)pyrene | 0.018 |
| Indeno(1,2,3-cd)pyrene | 0 |
| Dibenz(a,h)anthracene | 0.018 |
| Total cPAHs (TEQ) | 0.100 |
| **Metals** | |
| Arsenic | 8 |
| Cadmium | 8.8 |
| Chromium | 240,000 |
| Lead | 10 |
| Mercury | 0.2 |
| **Polychlorinated Biphenyls (PCBs)** | |
| Total PCBs | 0.1 |

**Notes:**

[1]Cleanup level is 800 µg/L when benzene is present.

NE = not established

µg/L = microgram per liter

TEQ = toxicity equivalency

# Table 4

## Soil Remediation Technology Screening

**Former Shell Oil Tank Farm Site**

**Anacortes, Washington**

| General Response Action | Remediation Technology | Process Option | Description | Effectiveness | Implementability | Relative Cost | Summary of Screening |
|---|---|---|---|---|---|---|---|
| No Action | No Action | None | No institutional controls or treatment. | Not effective for protecting human health and environment. | Implementable but not acceptable to the general public or government agencies. | None | Generally used as a baseline for comparison. |
| Institutional / Engineering Controls | Institutional Controls | Deed Notification / Restriction | Implement deed notification to inform future owners of the presence of potentially hazardous substances at the site and /or implement deed restriction to restrict certain specific future site activities. | Effectiveness for protection of human health would depend on enforcement of and compliance with deed restrictions | Technically implementable. Specific legal requirements and authority would need to be met. | Low capital | Potentially applicable in combination with other technologies. |
| | Engineering Controls | Passive Soil Venting / Vapor Intrusion Prevention | This engineering control involves constructing a barrier between soil contaminated with VOCs and indoor space through the use of passive soil vents installed below the building foundation and/or installation of vapor barrier material during construction of new floor slab and/or basement walls. | Effective for eliminating migration pathway from soil to indoor air. Passive venting allows some mass removal by providing a preferential path for vapor containing VOCs. | Technically implementable using common building construction products and methods. | Low capital. | Applicable for areas where new building is constructed where VOCs are left in place in subsurface soil. |
| | Access Controls | Fencing / Warning Signage | Construct or maintain existing site fencing and signage to control site access by the general public thereby reducing potential exposure to contaminants | Effective for reducing exposure risk to the general public provided fencing and signage is maintained in the long term. | Technically implementable but not consistent with current and proposed future land use. | Low capital. | Not consistent with current and future land use. |
| Soil Containment | Capping | Surface Cap | Installation of surface cap over contaminated soil areas to prevent or reduce contaminant migration and to prevent exposure. Multiple-component cap may include asphalt or concrete paving, synthetic membranes, low permeability soil caps over geotextiles in landscaped areas, and existing or new buildings or structures. | Effective for preventing direct contact exposure (i.e. dermal contact or ingestion). Limits infiltration and leachate formation, but less effective than source removal options for protection of groundwater. | Technically implementable. The selected capping technology must be consistent with proposed future land use. Existing asphalt and concrete pavement and concrete building foundations currently cap a significant volume of shallow impacted soil. | Low capital | Potentially applicable in combination with other technologies. |
| Soil Removal | Removal / Off-Site Disposal | Excavation | Excavation of impacted material using common excavation methods for upland soil removal. Excavation at the site will likely require shoring methods to allow excavation near buildings and dewatering techniques to allow dry excavation. | Effective for complete range of contaminant groups. Loss of effectiveness where impacted soil is inaccessible due to presence of structures (i.e., roads, buildings, foundations, etc.). | Technically implementable in most areas of contaminated soil. | Moderate to high capital. Negligible O&M. | Potentially applicable in areas not occupied by buildings. Retained. |
| Off-Site Management | Land disposal | Permitted Subtitle D Landfill | Disposal of impacted soil at a permitted, off-site Subtitle D landfill. | Effective for most contaminant groups. | Technically implementable. Impacted soil must be profiled and meet land disposal restrictions. Pretreatment of excavated material may be required to meet land disposal restrictions. | Moderate to high capital depending on types of waste present. Negligible O&M | Common disposal option for excavated soils, where appropriate. |

| General Response Action | Remediation Technology | Process Option | Description | Effectiveness | Implementability | Relative Cost | Summary of Screening |
|---|---|---|---|---|---|---|---|
| Ex-Situ Soil Treatment | Physical / Chemical Treatment | Stabilization | Contaminants are physically bound or enclosed within a stabilized mass or chemical reactions are induced between stabilizing agent and contaminants to reduce their mobility. | Stabilization is a common and effective technology for reducing the leachability of metals in soil, when TCLP concentrations prohibit non-hazardous disposal. | Technically implementable. However most processes result in moderate increase in volume. | Moderate capital. Low O&M. Moderate cost relative to other ex-situ physical/chemical options. Significant cost savings for disposal. | Not warranted for known Site contaminant levels. |
| | | Thermal Desorption | Wastes are heated within a continuous flow reactor to 320 to 560 $^{o}$ C to volatilize organic contaminants. A carrier gas or vacuum system transports volatilized organics to the gas treatment system. | Effective for VOCs, SVOCs and fuels. Fine grained soils increase treatment time as a result of binding of contaminants to soil. | Technically implementable. However, particles size screening, dewatering to achieve acceptable moisture content, and off-gas treatment may be required. Special permitting may be required. | High capital. High O&M. Lower cost than incineration. | High cost relative other ex-situ technologies. Extensive preparation for treatment will be required and requires significant space and time and potentially special permits. |
| | Biological Treatment | Biopiles | Excavated soils are mixed with soil amendments and placed on a treatment area that includes leachate collection systems and some form of aeration. | Solid-phase (soil) process is most effective for non-halogenated VOCs and fuel hydrocarbons. | Difficult to implement. Treatment area may require complete enclosure. Addition of amendment material results in volumetric increase in treated material. Leachate and off-gas may require treatment. | Moderate capital and O&M. Moderate cost relative to other ex-situ biological options | Difficult to implement and requires space that is not readily available. |
| | | Composting | Controlled biological process by which excavated soils are mixed with bulking agents and organic amendments to enhance microorganism conversion of organic contaminants to innocuous, stabilized byproducts. | Most effective for treatment of fuels and PAHs. Moderately effective for treatment of halogenated VOCs. | Difficult to implement. Treatment area may require complete enclosure. Addition of amendment material results in volumetric increase in treated material. Off-gas may require treatment. | Moderate capital and O&M. Moderate cost relative to other ex-situ biological options | Difficult to implement and generally not cost effective for volatile compounds compared to other in-situ technologies. Requires space that is not readily available. |
| In-Situ Soil Treatment | Biological Treatment | Bioventing | Oxygen is supplied through direct low-flow air injection into residual contamination in soil. | Effective in higher permeability soil for petroleum hydrocarbons and VOCs amenable to aerobic bioremediation. Degradation is relatively slow. Ineffective for inorganics and non-degradable organic constituents. | Technically implementable. Monitoring of off-gasses at ground surface may be required. Venting requires infrastructure of air injection piping, blower, controls, etc. | Moderate capital and O&M. Low cost relative to other in-situ options. | Implementation requires long time period. Not effective for metals or other recalcitrant contaminants. |
| | | Bioremediation | Stimulation of naturally occurring microbes by circulating water-based solutions through contaminated soils to enhance in-situ biological degradation of organic contaminants or immobilize inorganic contaminants by injection and/or mixing a bioremediation product (solid or liquid) directly into the soil, generally using common drilling/tilling methods. | Effective at treating the specific contaminants found at the Site with the exception of metals or recalcitrant organic contaminants. | Technically implementable. May be implemented with standard construction equipment. | Moderate capital and O&M. Moderate cost relative to other in-situ options. | Longer time frame. Not effective for metals or recalcitrant organic contaminants. |

| General Response Action | Remediation Technology | Process Option | Description | Effectiveness | Implementability | Relative Cost | Summary of Screening |
|---|---|---|---|---|---|---|---|
| In-Situ Soil Treatment | Biological Treatment | Natural Attenuation | Natural biotransformation processes such as volatilization, biodegradation, adsorption, and chemical reactions with soil materials can reduce contaminant concentrations to acceptable levels. | Moderate effectiveness. Effective for petroleum hydrocarbons. | Moderate implementability. | low capital. Low O&M. Low cost relative to other in-situ options | Longer time frame. Not effective for metals or recalcitrant organic contaminants. |
| In-Situ Soil Treatment (Continued) | Physical / Chemical Treatment | Soil Flushing | The extraction of contaminants from soil with aqueous solution accomplished by passing fluid and/or surfactant through in-place soils using an injection or infiltration process. Extraction fluids must be recovered from underlying aquifer. | Effective for VOCs and inorganic chemicals. Presence of fine grained soils limits effectiveness. Effectiveness relies on ability to capture and treat flushed contaminants. | Technically implementable. However, there has been little commercial application. Regulatory concerns over potential to wash contaminants beyond fluid capture zones and introduction of surfactants in to the subsurface make permitting difficult. | High capital and O&M. High cost relative to other in-situ options | High cost relative to other in-situ soil treatment technologies. |
| | | Chemical Oxidation | Contaminant destruction by injecting or mixing chemical oxidizers directly into the contaminated soil to destroy chemical contaminants in place generally using common drilling/tilling methods. | Effectiveness at treating the specific contaminants found at the Site with the exception of metals or recalcitrant organic contaminants. | Technically implementable. May be implemented with standard construction equipment. | Moderate capital and O&M. Moderate cost relative to other in-situ options. | longer time frame. Not effective for metals or recalcitrant organic contaminants. |
| | | Soil Vapor Extraction | Vacuum is applied through extraction pipes to create a pressure/concentration gradient in impacted areas, which induces gas-phase volatiles to diffuse through soil to extraction wells. The process includes a system for treating off-gas. Air flow also induces aerobic bioremediation of petroleum hydrocarbons and degradable VOCs. | Effective for volatile petroleum hydrocarbons and VOCs in granular soils. Presence of fine grained soils reduces effectiveness. Not significantly effective for heavier hydrocarbons or in low permeability soil. Ineffective for inorganics and non-volatile organic constituents. | Technically implementable. Typical application involves numerous extraction wells, conveyance piping, and large scale vacuum blowers. Installation under existing building would require installation using horizontal directionally drilled wells, significantly reducing implementability. | High capital and O&M. High cost relative to other in-situ options | High cost relative to other in-situ soil treatment technologies. |

**Notes:**

Shaded Process Options are retained.

# Table 5

## Description of Cleanup Action Alternatives

**Former Shell Oil Tank Farm Site**

**Anacortes, Washington**

| Contaminants of Concern | Matrix | Objective | Cleanup Action Alternative Components | | | |
|---|---|---|---|---|---|---|
| | | | **Alternative 1 - Engineering and Institutional Controls** | **Alternative 2 - In-Situ Soil Treatment** | **Alternative 3 - Partial Removal with In-Situ Soil Treatment** | **Alternative 4 - Complete Removal** |
| Gasoline-, Diesel-, Heavy Oil-Range Hydrocarbons, Benzene, cPAHs and Cadmium | Soil | ■ Prevent direct human contact with soil containing contaminants exceeding proposed cleanup levels.<br>■ Prevent potential leaching/migration of soil contaminants into groundwater. | ■ Leave in place soil with contaminant concentrations exceeding cleanup levels.<br>■ Maintain existing protective concrete, asphalt and/or soil surfaces isolating Site contaminants from human contact.<br>■ Monitor groundwater conditions quarterly for at least one year and annually (or as agreed upon with Ecology) for approximately ten years to evaluate contaminant concentrations, plume stability and natural attenuation performance.<br>■ Implement deed notifications to inform future owners of the presence of potentially hazardous substances at the Property and /or Implement deed restrictions to restrict certain specific site activities. | ■ Maintain existing protective concrete, asphalt and/or soil surfaces outside of the in-situ treatment area to isolate Site contaminants from human contact.<br>■ Injection of a chemical oxidant and an oxygen releasing material to break down and/or enhance bioremediation/degradation of organic contaminants and/or immobilize inorganic contaminants.<br>■ Monitor groundwater conditions quarterly for at least one year following treatment and then annually (or as agreed upon with Ecology) for approximately ten years to evaluate contaminant concentrations, plume stability and natural attenuation performance.<br>■ Develop institutional controls in the form of environmental covenants, signage, and other notification measures to address any remaining contaminated soil remaining in place in areas of the Site following in-situ treatment. | ■ Excavate contaminated soil within the property boundary to the extent practicable using commonly available excavation techniques.<br>■ Transport excavated soil to an approved landfill facility.<br>■ Protect or relocate existing utility infrastructure (power, phone, sewer, water, etc.) during construction.<br>■ Placement of an oxygen releasing material within backfill layers to enhances bioremediation/ degradation of organic contaminants remaining in-place in adjacent rights-or-way.<br>■ Monitor groundwater conditions quarterly for at least one year following treatment and then annually (or as agreed upon with Ecology) for approximately ten years to evaluate contaminant concentrations, plume stability and natural attenuation performance.<br>■ Develop institutional controls in the form of environmental covenants, signage, and other notification measures to address any remaining contaminated soil remaining in place in areas of the Site following remedial excavation and in-situ treatment. | ■ Excavate contaminated soil using commonly available excavation techniques.<br>■ Transport excavated soil to an approved landfill facility.<br>■ Protect or relocate existing utility infrastructure (power, phone, sewer, water, etc.) during construction.<br>■ Reroute vehicular and pedestrian traffic around the Site during construction.<br>■ Backfill and restore the Site to current conditions. |
| Estimated Alternative Cost (+50%/-30%, rounded)[1] | | | $400,000 | $2,120,000 | $3,000,000 | $4,130,000 |
| Estimated Volume of Contaminated Soil Removed | | | 0 Cubic Yards | 0 Cubic Yards | 4,500 In-Place Cubic Yards | 9,000 In-Place Cubic Yards |
| Estimated Timeframe to Closure | | | 5-10 Years | 5-10 Years | 5-10 Years | 2-3 Years |

**Notes:**

[1] Alternative cost estimates are presented in Appendix B.

# Table 6

## Evaluation of Cleanup Action Alternatives

**Former Shell Oil Tank Farm Site**

**Anacortes, Washington**

| Evaluation Criteria | Alternative 1 - Engineering and Institutional Controls | Alternative 2 - In-Situ Soil Treatment | Alternative 3 - Partial Removal with In-Situ Soil Treatment | Alternative 4 - Complete Removal |
|---|---|---|---|---|
| **Compliance with MTCA Threshold Criteria** | | | | |
| Protection of Human Health and the Environment | **Yes** - Alternative would protect human health and the environment through a combination of engineering and institutional controls. | **Yes -** Alternative would protect human health and the environment through a combination of engineering and institutional controls and soil treatment. | **Yes -** Alternative would protect human health and the environment through a combination of engineering and institutional controls, source removal and limited soil treatment. | **Yes -** Alternative would protect human health and the environment through complete source removal. |
| Compliance With Cleanup Standards | **Yes -** Alternative is expected to comply with cleanup standards. This alternative utilizes institutional controls to prevent exposure to contaminants in the subsurface. Compliance would rely on long-term monitoring and maintenance of institutional controls. Future development of property could potentially require additional environmental cleanup or special provisions. | **Yes -** Alternative is expected to comply with cleanup standards. This alternative utilizes in-situ soil treatment and institutional controls (if necessary) to prevent exposure to contaminants in the subsurface. Compliance would rely on verification soil sampling, long-term groundwater monitoring and maintenance of institutional controls. Future development of property could potentially require additional environmental cleanup or special provisions. | **Yes -** Alternative is expected to comply with cleanup standards. This alternative utilizes partial source removal, in-situ soil treatment and institutional controls (if necessary) to prevent exposure to contaminants. Compliance would rely on verification soil sampling, long-term groundwater monitoring and maintenance of institutional controls. Future development of property could potentially require additional environmental cleanup or special provisions. | **Yes -** Alternative is expected to comply with cleanup standards to the greatest extent practicable. All contaminant exceedance will be removed to the extent practical. |
| Compliance With Applicable State and Federal Regulations | **Yes -** Alternative complies with applicable state and federal regulations. | **Yes -** Alternative complies with applicable state and federal regulations. | **Yes -** Alternative complies with applicable state and federal regulations. | **Yes -** Alternative complies with applicable state and federal regulations. |
| Provision for Compliance Monitoring | **Yes -** Alternative includes provisions for compliance monitoring. | **Yes -** Alternative includes provisions for compliance monitoring. | **Yes -** Alternative includes provisions for compliance monitoring. | **Yes -** Alternative includes provisions for compliance monitoring. |
| **Restoration Time Frame** | | | | |
| *Restoration Time Frame* | Restoration time frame is short. Primary cleanup action components have already been implemented. The time frame for long-term groundwater monitoring is unknown. Potential future maintenance of institutional controls will extend the restoration time frame of this alternative. | Restoration time frame is moderate. Primary cleanup action components have already been implemented. In-situ soil treatment is expected to achieve cleanup objectives in 3-5 years. The time frame for long-term monitoring is unknown and depends on the effectiveness of the treatment. Potential future maintenance of institutional controls may extend the restoration time frame of this alternative. | Restoration time frame is moderate. Primary cleanup action components have already been implemented. Partial source removal followed by in-situ soil treatment is expected to achieve cleanup objectives in 3-5 years. Potential future maintenance of institutional controls may extend the restoration time frame of this alternative. | Restoration time frame is short. Full source removal is expected to achieve cleanup objectives in 2-3 years |
| **Relative Benefits Ranking (Scored from 1-lowest to 10-highest)** | | | | |
| Protectiveness | **Score = 3**<br>Achieves a moderate-low level of overall protectiveness as a result of institutional and engineering controls. Protectiveness would rely on maintenance of institutional and engineering controls to prevent exposure. Existing environmental risks are not significantly reduced. | **Score = 7**<br>Achieves a medium-high level of overall protectiveness as a result of in-situ soil treatment. However, this alternative would leave in place both organic and inorganic contaminants in soil, and protectiveness would rely on maintenance of institutional controls to prevent the overall exposure. | **Score = 8**<br>Achieves a medium-high level of overall protectiveness as a result of partial soil removal followed by in-situ soil treatment. However, this alternative would leave contaminants in soil, and overall protectiveness would rely on maintenance of institutional controls to prevent exposure. | **Score = 10**<br>Achieves a high level of overall protectiveness as a result of full source removal of the soil that poses risk to human and ecological receptors at the Site. |
| Permanence | **Score = 3**<br>Achieves a medium-low level of permanence, primarily through the use of the paved road surfaces and soil cap. This alternative relies on natural attenuation methods to achieve a reduction of mass. Future development may require modification of the remedy. | **Score = 7**<br>Achieves a medium-high level of permanence through permanent reduction of toxicity and mobility of Site contaminants through the use of capping beneath paved surfaces, as with Alternative 1, and in-situ soil treatment within the property boundary. This alternative provides for reduction of mass in accessible portions of the Site. Inorganic contaminants would require maintenance of institutional controls to prevent exposure. | **Score = 8**<br>Achieves a medium-high level of permanence through permanent reduction of toxicity and mobility of Site contaminants through the removal and capping. This alternative provides for enhanced reduction of mass across the Site. | **Score = 10**<br>Achieves a high level of permanent reduction of mass, toxicity, and mobility of hazardous substances at the Site through soil excavation. This alternative would reduce to the extent feasible the need to perform additional actions. |

| Evaluation Criteria | Alternative 1 - Engineering and Institutional Controls | Alternative 2 - In-Situ Soil Treatment | Alternative 3 - Partial Removal with In-Situ Soil Treatment | Alternative 4 - Complete Removal |
|---|---|---|---|---|
| **Relative Benefits Ranking (Scored from 1-lowest to 10-highest) Continued** | | | | |
| Long-Term Effectiveness | **Score = 3**<br>This Alternative achieves a medium-low level of long-term effectiveness. The use of existing paved surfaced and soil cap provide for long-term reduction of risk to human health, but leaves soil at the Site exceeding cleanup levels. The use of institutional controls reduces the risk to human health and the environment from the residual contamination left in place. Future development may require modification of the remedy. | **Score = 6**<br>This Alternative achieves a medium level of long-term effectiveness. The use of in-situ soil treatment within the property boundary provides for long-term reduction of risk to human health and the environment. However, this alternative would leave in place inorganic contaminants in soil within the property boundary and in soil beneath the adjacent rights-of-way exceeding cleanup levels and potentially leave organic contaminants in place due to incomplete treatment. The use of institutional controls reduces the risk to human health and the environment from the residual contamination left in place. Future development may require modification of the remedy. | **Score = 7**<br>This Alternative achieves a medium level of long-term effectiveness. Source removal within the property boundary provides for immediate reduction of risk to human health and the environment and in-situ soil treatment allows for further reduction of contaminant mass over time.. However, this alternative leaves contamination in soil beneath the adjacent rights-of-way exceeding cleanup levels. The use of institutional controls reduces the risk to human health and the environment from the residual contamination left in place. Future development may require modification of the remedy. | **Score = 10**<br>Removes hazardous substances from the Site to the greatest degree feasible and utilizes approved off-site disposal facilities for final disposition. |
| Management of Short-Term Risks | **Score = 10**<br>Short-term risks are low with this alternative due to the lack of construction activities involved in completing the components of the alternative. The capping components are already in place. | **Score = 5**<br>Short-term risks are moderately-high with this alternative. The in-situ soil treatment included in this Alternative is not expected to pose significant risks to the public. However, may require multiple rounds of treatment to meet the cleanup objectives. | **Score = 8**<br>Short-term risks are moderately low with this alternative. The soil removal included in this Alternative involves is not expected to pose significant risks to the public. | **Score = 4**<br>Short-term risks associated with this alternative would be moderately high. This alternative involves selective structure modification of the surface roads and buried utilities to access contaminated soil. |
| Technical and Admin. Implementability | **Score = 8**<br>Readily implemented. No active cleanup activities required. Administrative implementability of institutional controls is high. | **Score = 7**<br>Moderate challenge to implement. No active cleanup activities required beyond the property boundary. Administrative implementability of institutional controls is high. | **Score = 8**<br>Moderate challenge to implement. No active cleanup activities required beyond the property boundary. Excavation of contaminated soil a large volume of soil, but utilizes standard excavation methods. Administrative implementability of institutional controls is high. | **Score = 4**<br>Difficult to implement due to the design and coordination associated with shoring and rerouting of utilities in adjacent rights-of-way. Cleanup alternative does not require development of institutional controls. |
| Consideration of Public Concerns | **Score = 3**<br>Residual contamination remaining in place could result in concerns by the public and nearby property owners. | **Score = 6**<br>Organic soil contamination within the property boundary is addressed by this Alternative. However, residual organic contaminants beneath the adjacent rights-of-way and inorganic contaminants (metals) within the property boundary following implementation of the cleanup action could result in concerns by the public and nearby property owners. In addition, use of an oxidation product in the vicinity of marine water may cause public concern. The remaining contaminated soil left in place would require maintenance of institutional controls and impose limitations on future use and development of the property. | **Score = 8**<br>Soil contamination within the property boundary is addressed by this Alternative. However, residual organic contaminants beneath the adjacent rights-of-way following implementation of the clean action could result in concerns by the public and nearby property owners. The remaining contaminated soil left in place would require maintenance of institutional controls and impose limitations on future use and development of the property. | **Score = 8**<br>Soil contamination would be removed to the extent practical under this alterative. Concerns by the public and nearby property owners could result from the temporary closure and rerouting of surface streets and buried utilities. However, closure and rerouting of surface streets and buried utilities would be on a short term basis. |

# Table 7

## Summary of MTCA Evaluation and Ranking of Cleanup Action Alternatives

**Former Shell Oil Tank Farm Site**

**Anacortes, Washington**

| Remedial Alternative | Alternative 1 - Engineering and Institutional Controls | Alternative 2 - In-Situ Soil Treatment | Alternative 3 - Partial Removal with In-Situ Soil Treatment | Alternative 4 - Complete Removal |
|---|---|---|---|---|
| **Evaluation** | | | | |
| Compliance with MTCA Threshold Criteria | Yes | Yes | Yes | Yes |
| Restoration Time Frame | 1-2 years | 2-3 years | 2-3 years | 2-3 years |
| **Relative Benefits Ranking**[1] | | | | |
| Protectiveness (weighted as 30%) | 0.9 | 2.1 | 2.4 | 3 |
| Permanence (weighted as 20%) | 0.6 | 1.4 | 1.6 | 2 |
| Long-Term Effectiveness (weighted as 20%) | 0.6 | 1.2 | 1.4 | 2 |
| Management of Short-Term Risks (weighted as 10%) | 1 | 0.5 | 0.8 | 0.4 |
| Technical and Administrative Implementability (weighted as 10%) | 0.8 | 0.7 | 0.8 | 0.4 |
| Consideration of Public Concerns (weighted as 10%) | 0.3 | 0.6 | 0.8 | 0.8 |
| **Total of Scores** | **4.2** | **6.5** | **7.8** | **8.6** |
| **Disproportionate Cost Analysis** | | | | |
| Probable Remedy Cost (+50%/-30%, rounded) | $400,000 | $2,120,000 | $3,000,000 | $4,130,000 |
| Costs Disproportionate to Incremental Benefits | No | No | No | Yes |
| Practicability of Remedy | Practicable | Practicable | Practicable | Practicable |
| Remedy Permanent to Maximum Extent Practicable | Yes | Yes | Yes | Yes |
| **Overall Alternative Ranking** | **3rd** | **2nd** | **1st** | **--** |

**Note:**

[1] Weightings were established by Ecology as referenced in their Opinion Letter dated December 28, 2009.

FIGURES

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Data Sources: ESRI Data & Maps

Projection: NAD 1983 UTM Zone 10N

# Vicinity Map

Former Shell Oil Tank Farm
Anacortes, Washington

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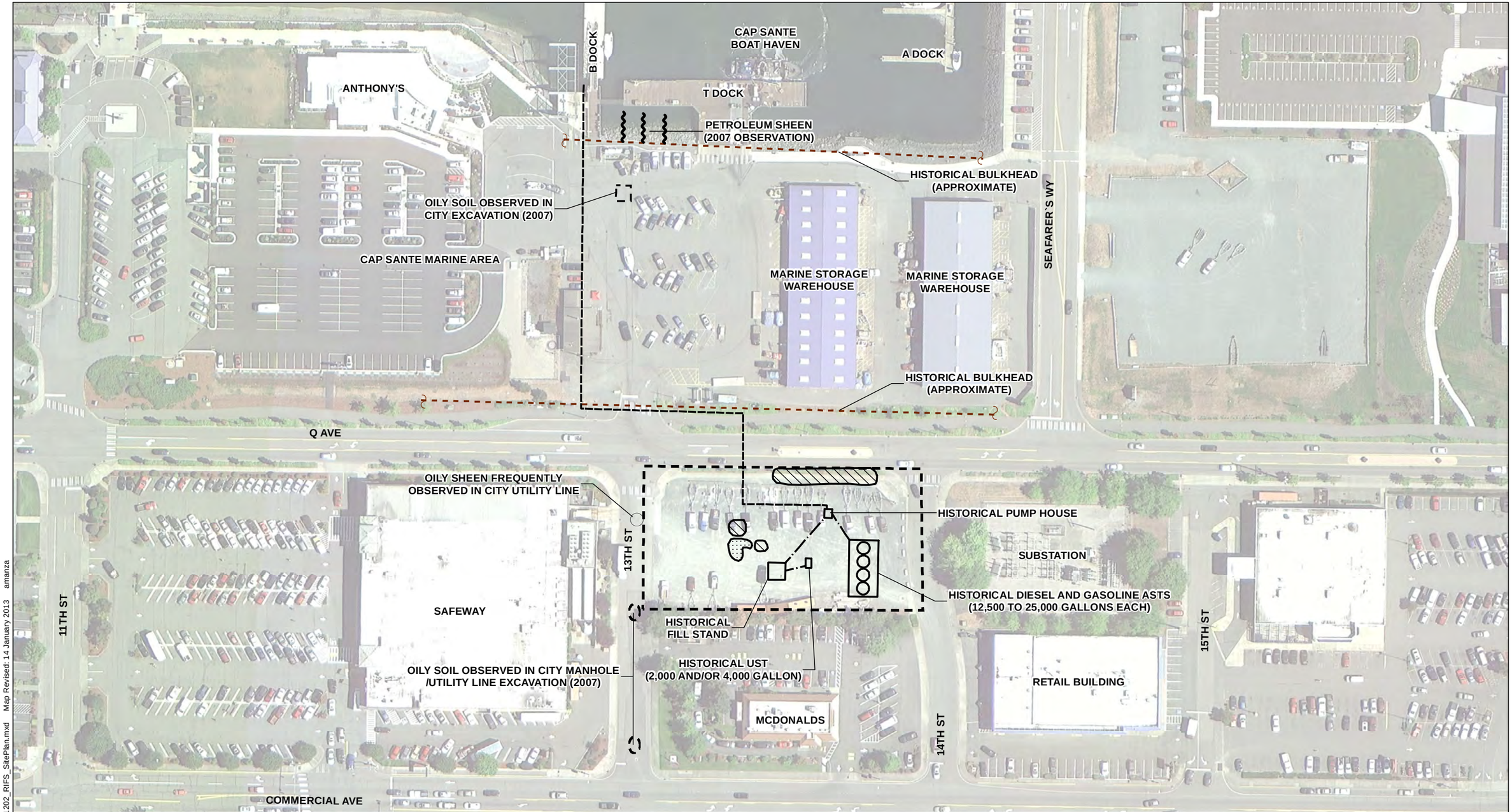
**Figure 1**

Path: \\sea\projects\5\5147012\GIS\5147012_VicinityMap.mxd Map Revised: 09 January 2013 amanza




Path: \\sea\projects\5\51470\2\GIS\51470202_RIFS_SitePlan.mxd Map Revised: 14 January 2013 amanza

**Notes:**
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**Reference:** Roads from Skagit County. Point, line and polygon features digitized from figures 5.1 and 6.1 of November 2006 and Figure 2 of September 2005 by Floyd Snider. Imagery date: 2011.

**Legend**

- Former Shell Oil Tank Farm
- Historical Features
- Surface Oil (1987 Observation)
- White Powder (1987 Observation)
- Historical Fuel Supply Line
- Historical Product Line

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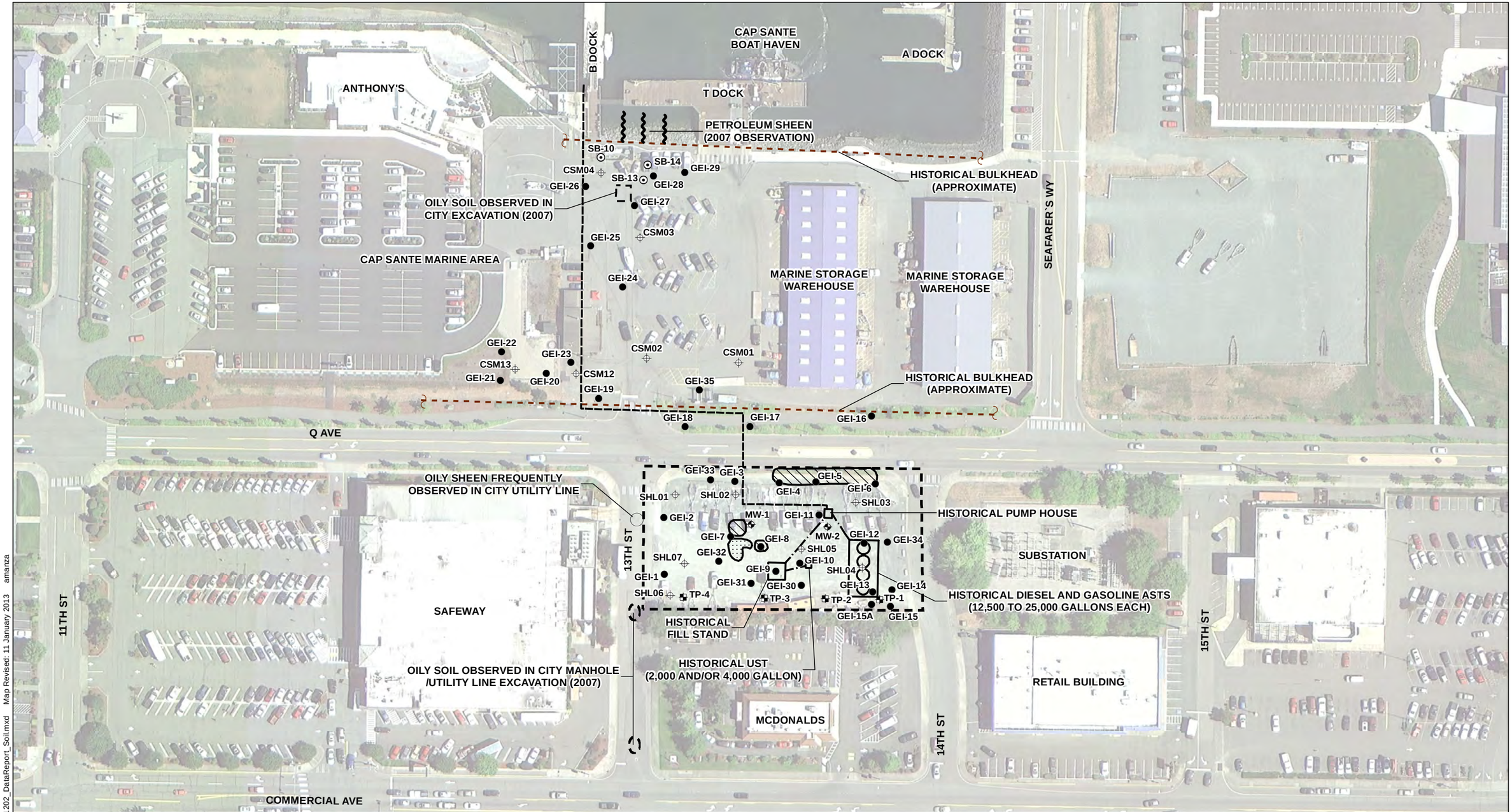
# Site Plan

Former Shell Oil Tank Farm
Anacortes, Washington

GeoEngineers

Figure 2

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**Reference:** Roads from Skagit County. Point, line and polygon features digitized from figures 5.1 and 6.1 of November 2006 and Figure 2 of September 2005 by Floyd Snider. Imagery date: 2011.

**Remedial Investigation Locations**

- GeoEngineers (2011)
- GeoEngineers (2007)
- Landau (2007)
- Floyd Snider (2005)
- Hart Crowser (1987)

**Legend**

- Former Shell Oil Tank Farm
- Historical Features
- Surface Oil (1987 Observation)
- White Powder (1987 Observation)
- Historical Fuel Supply Line
- Historical Product Line

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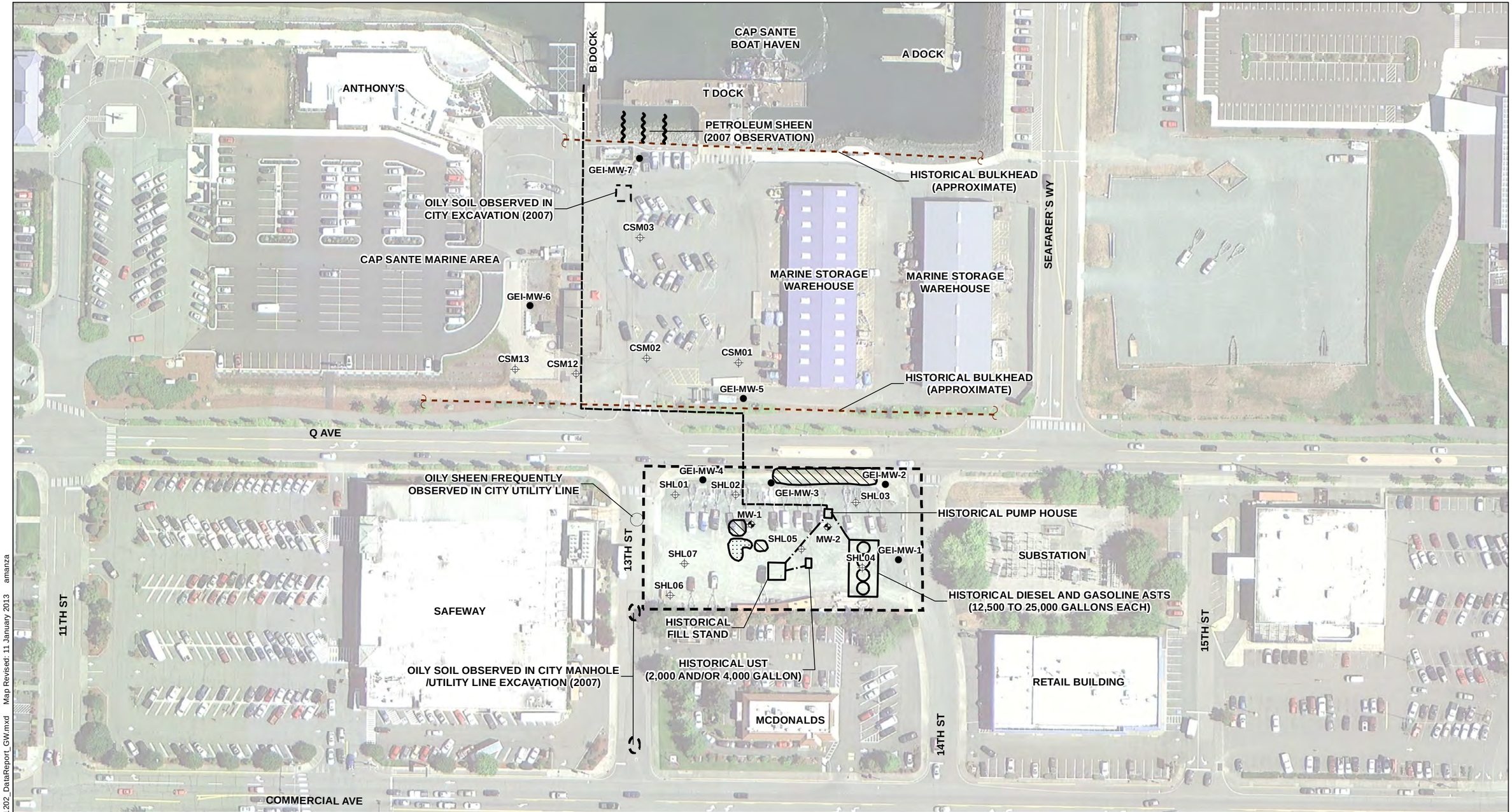
# Soil Investigation Sampling Locations

Former Shell Oil Tank Farm
Anacortes, Washington

GeoEngineers

Figure 3

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**Reference:** Roads from Skagit County. Point, line and polygon features digitized from figures 5.1 and 6.1 of November 2006 and Figure 2 of September 2005 by Floyd Snider. Imagery date: 2011.

**Remedial Investigation Locations**

- GeoEngineers (2011)
- Floyd Snider (2005)
- Hart Crowser (1987)

**Legend**

- Former Shell Oil Tank Farm
- Historical Features
- Surface Oil (1987 Observation)
- White Powder (1987 Observation)
- Historical Fuel Supply Line
- Historical Product Line

N E S W

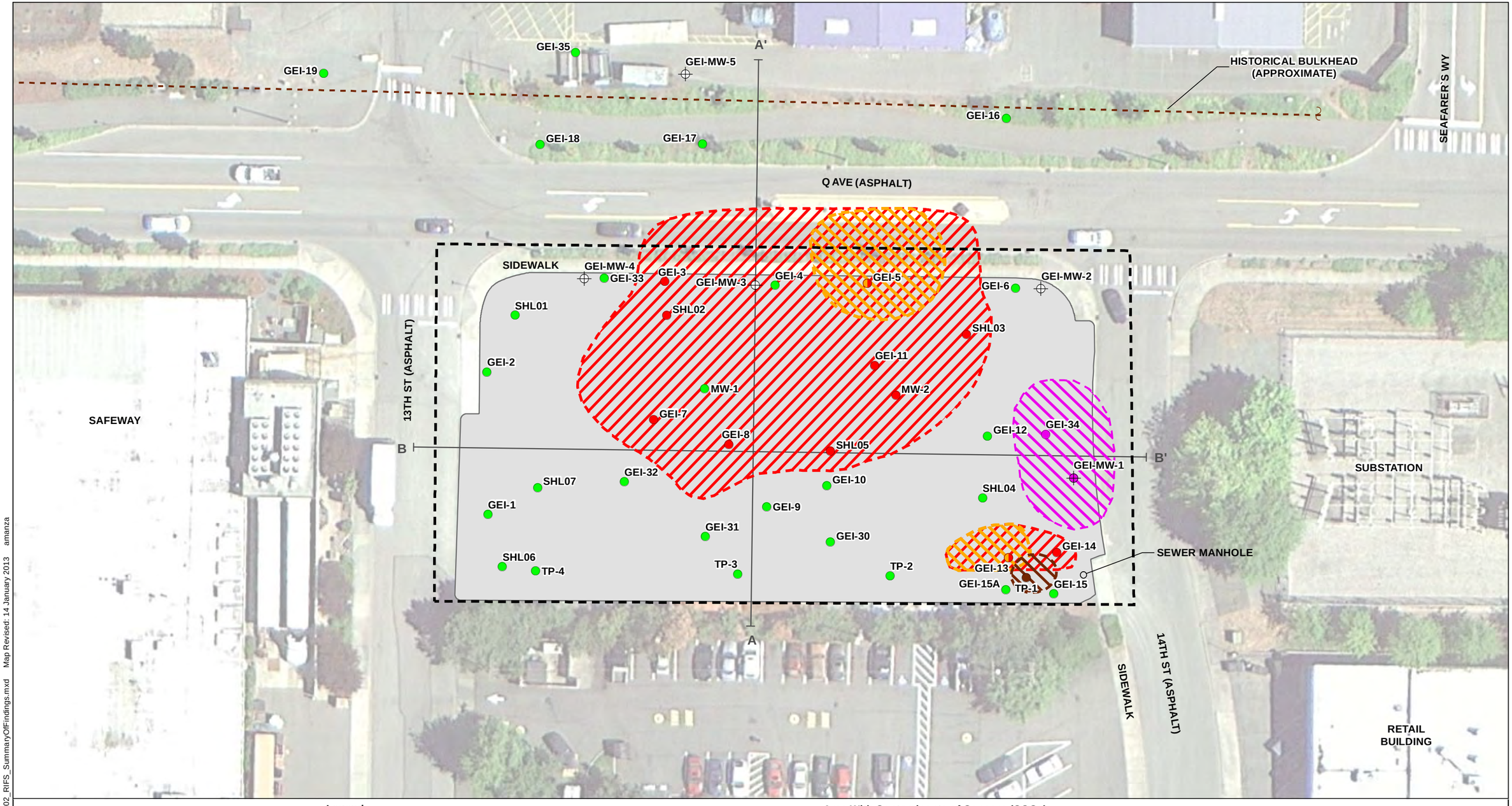
100 0 100
Feet

# Groundwater Investigation Sampling Locations

Former Shell Oil Tank Farm
Anacortes, Washington

GeoEngineers

Figure 4

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**Notes:**
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**Reference:** Roads from Skagit County. Point, line and polygon features digitized from figures 5.1 and 6.1 of November 2006 and Figure 2 of September 2005 by Floyd Snider. Imagery date: 2011.

**Legend**

- Soil Exploration Location
- Monitoring Well Location
- TPH Exceeds Soil Cleanup Level
- Benzene Exceeds Soil Cleanup Level
- cPAH Exceeds Soil Cleanup Level
- Cadmium Exceeds Soil Cleanup Level
- COCs (TPH, Benzene, cPAHs, and/or Cadmium) Less Than Soil Cleanup Level
- Cross Section
- Former Shell Oil Tank Farm
- Gravel Surface

**Area With Contaminants of Concern (COCs) Exceeding Soil Cleanup Level**

- Approximate Area of TPH Exceedance in Soil
- Approximate Area of Benzene Exceedance in Soil
- Approximate Area of cPAH Exceedance in Soil
- Approximate Area of Metals (Cadmium) Exceedance in Soil

cPAH Carcinogenic Polycyclic Aromatic Hydrocarbons
TPH Petroleum Hydrocarbons (Gasoline, Diesel and/or Heavy Oil)

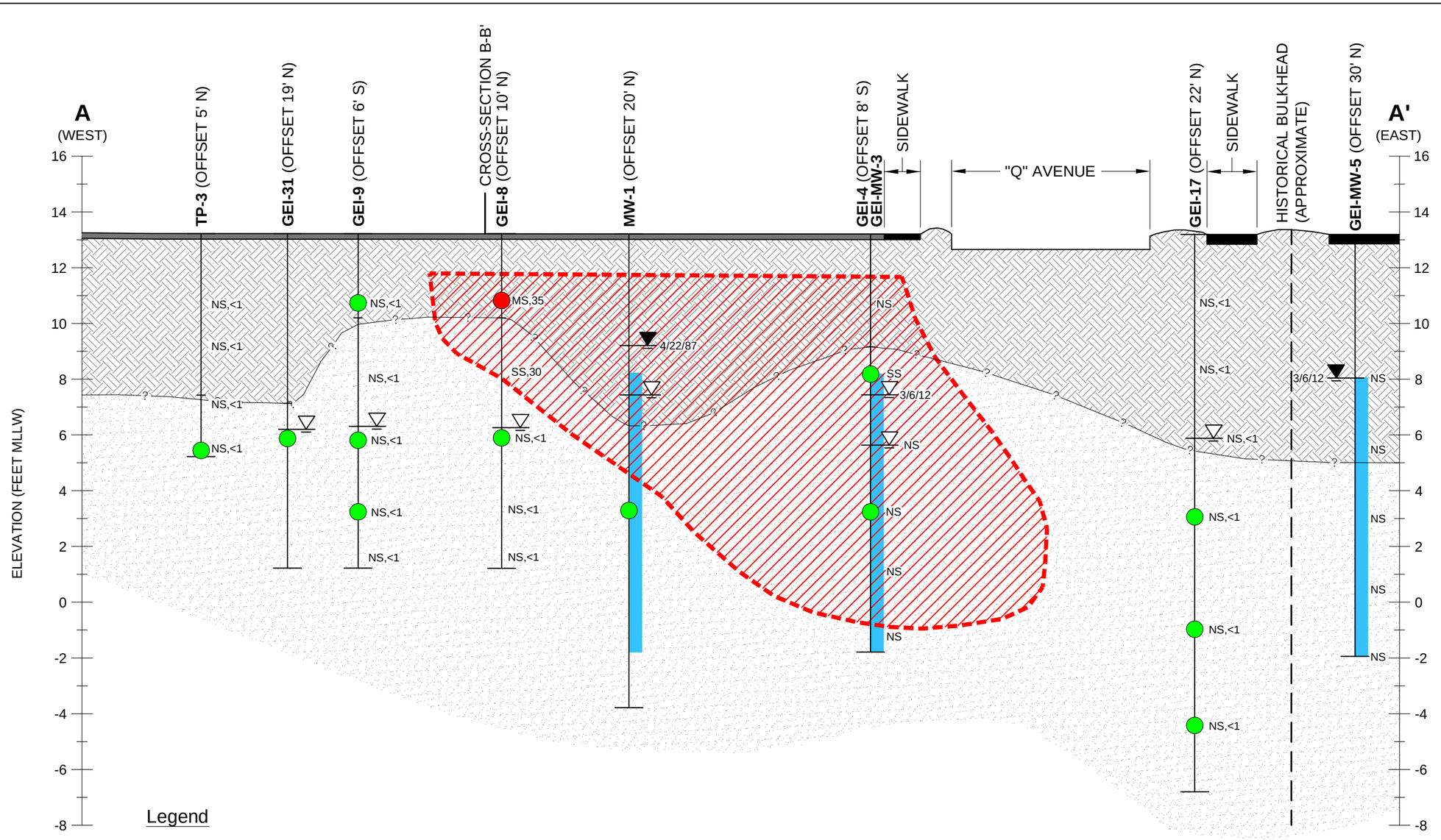
**Summary of Remedial Investigation Findings**

Former Shell Oil Tank Farm
Anacortes, Washington

GeoEngineers

**Figure 5**

Path: \\sea\projects\51\51470\12\GIS\51470120_RIFS_SummaryOfFindings.mxd Map Revised: 14 January 2013 amanza




## Legend

GEI-8 — Boring

? — Inferred Soil Contact

Groundwater Level Observed During Drilling

Measured Ground Water Level and Date

NS,<1 — Field Screening Results (Sheen, Headspace Vapor)

Well Screen Interval

Fill Material (Silty Sand with varying amounts of Silt and Gravel)

Native Marine Sediment (Silt and Silty Sand)

Soil Sample Location - Petroleum Hydrocarbons (Gasoline, Diesel and/or Heavy Oil) Exceed Preliminary Cleanup Levels (See Tables 1 and 3)

Soil Sample Location - Contaminants Less then Preliminary Cleanup Levels (See Tables 1 and 3)

Approximate Area of Petroleum Hydrocarbon (Gasoline, Diesel and/or Heavy Oil) Exceedance in Soil

MLLW — Mean Lower Low Water

HORIZONTAL SCALE: 1"= 20'
VERTICAL SCALE: 1"= 4'
VERTICAL EXAGGERATION: 5X

20 0 20
FEET

**Cross-Section A-A'**

Former Shell Oil Tank Farm
Anacortes, Washington

GeoEngineers

**Figure 6**

P:\15\5\4701\2\CAD\RIFS\15\4701-02 CROSS-SECTIONS.DWG\TAB:CROSS-SECTION AA MODIFIED BY THICHAUD ON JAN 14, 2013 - 10:45

B (NORTH)

B' (SOUTH)

13th STREET

14th STREET

GEI-1 (OFFSET 27' W)

SHL07 (OFFSET 16' W)

GEI-32 (OFFSET 13' W)

GEI-7 (OFFSET 12' E)

GEI-8 (OFFSET 3' E)

CROSS-SECTION B-B'

SHL05

GEI-12 (OFFSET 7' E)

GEI-34 (OFFSET 9' E)

GEI-MW-1 (OFFSET 9' W)

ELEVATION (FEET MLLW)

NS,<1

MS,35

HS,450

SS,30

3/6/12

## Legend

GEI-8 — Boring

? — Inferred Soil Contact

Groundwater Level Observed During Drilling

Measured Ground Water Level and Date

NS,<1 — Field Screening Results (Sheen, Headspace Vapor)

Well Screen Interval

Fill Material (Silty Sand with varying amounts of Silt and Gravel)

Native Marine Sediment (Silt and Silty Sand)

Soil Sample Location - Petroleum Hydrocarbons (Gasoline, Diesel and/or Heavy Oil) Exceed Preliminary Cleanup Levels (See Tables 1 and 3)

Soil Sample Location - PAHs Exceed Preliminary Cleanup Levels (See Tables 1 and 3)

Soil Sample Location - Contaminants Less then Preliminary Cleanup Levels (See Tables 1 and 3)

Approximate Area of Petroleum Hydrocarbon (Gasoline, Diesel and/or Heavy Oil) Exceedance in Soil

Approximate Area of PAH Exceedance in Soil

MLLW — Mean Lower Low Water

PAH — Polycyclic Aromatic Hydrocarbon

HORIZONTAL SCALE: 1"= 30'
VERTICAL SCALE: 1"= 3'
VERTICAL EXAGGERATION: 10X

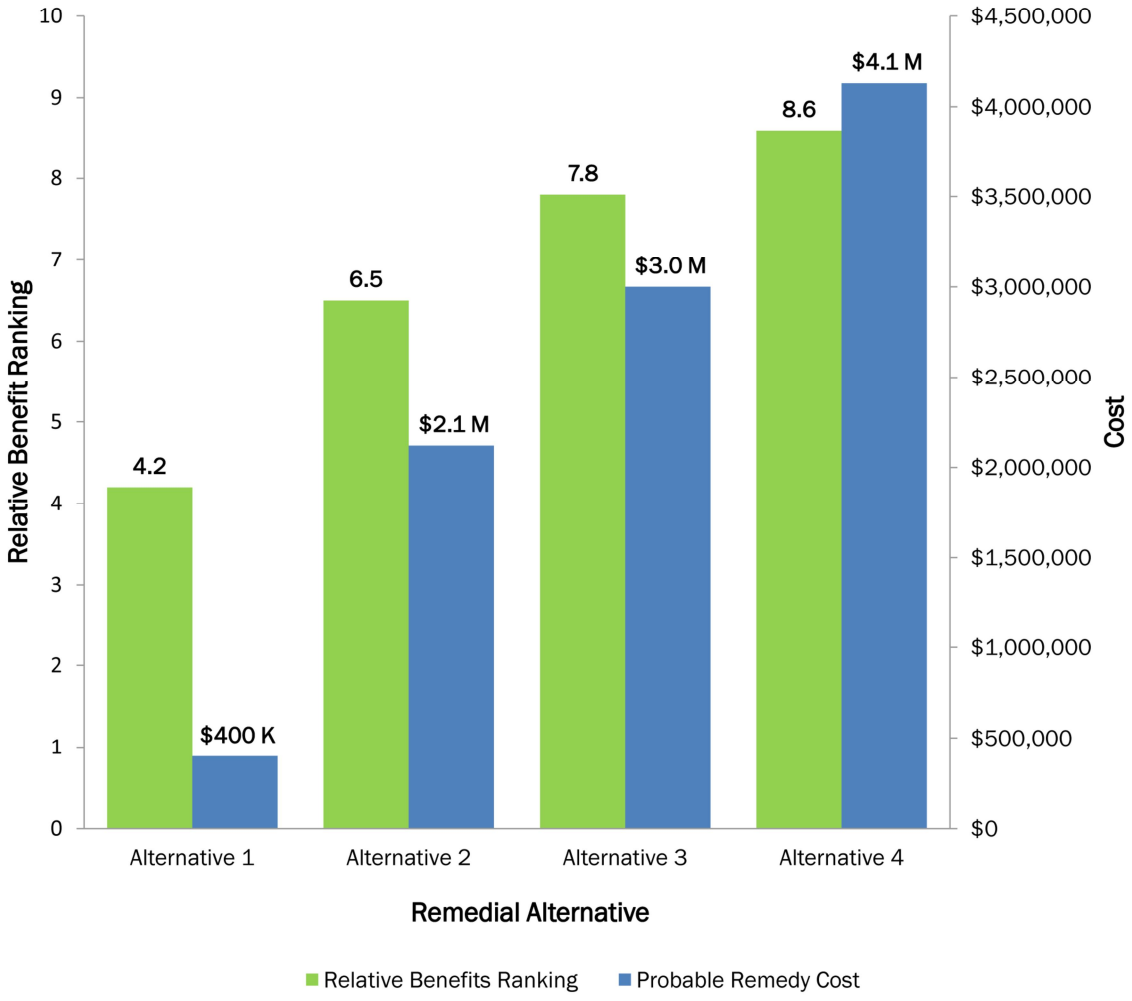
30 0 30
FEET

**Cross-Section B-B'**

Former Shell Oil Tank Farm
Anacortes, Washington

GeoEngineers

**Figure 7**




**Disproportionate Cost Analysis**

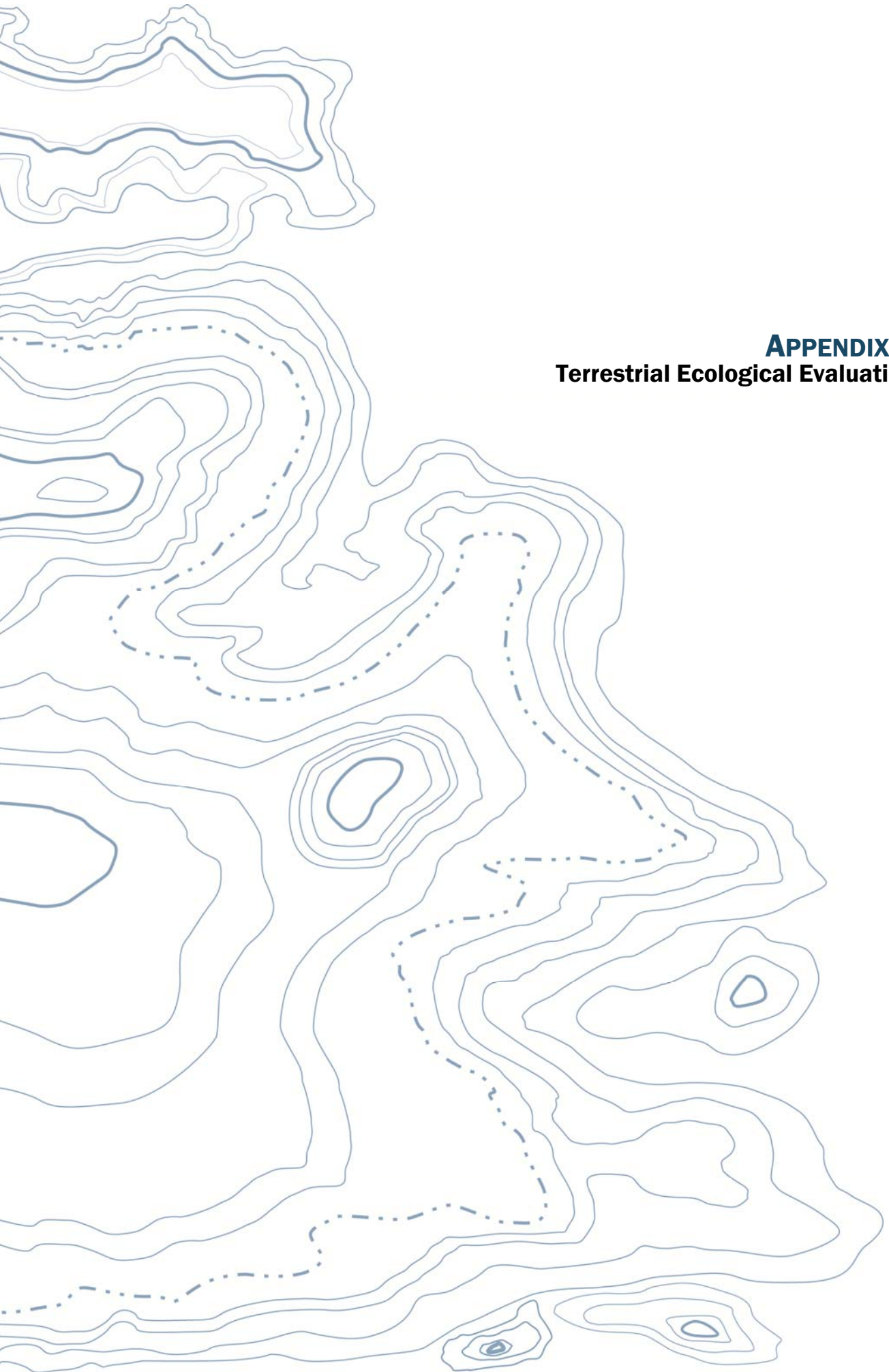
Former Shell Oil Tank Farm
Anacortes, Washington

GeoEngineers

**Figure 8**

APPENDICES

GeoEngineers



# APPENDIX A
## Terrestrial Ecological Evaluation

# Terrestrial Ecological Evaluation Process- Simplified or Site-Specific Evaluation?

## Documentation Form

| | Terrestrial Concern | Response (Circle One) |
|---|---|---|
| *1 | Is the site is located on or directly adjacent to an area where management or land use plans will maintain or restore native or semi-native vegetation? | Yes / (No) |
| *2a | Is the site used by a threatened or endangered species? | Yes / (No) |
| *2b | Is the site used by a wildlife species classified by the state department of fish and wildlife as a "priority species" or "species of concern" under Title 77 RCW? | Yes / (No) |
| *2c | Is the site used by a plant species classified by the Washington state department of Natural Resources natural heritage program as "endangered," "threatened," or "sensitive" under Title 79 RCW. | Yes / (No) |
| *3 | Is the site (area where the contamination is located) located on a property that contains at least ten acres of native vegetation within 500 feet of the area where the contamination is located? | Yes / (No) |
| 4 | Has the department determined that the site may present a risk to significant wildlife populations? | Yes / (No) |

*1 This includes for example, green-belts, protected wetlands, forestlands, locally designated environmentally sensitive areas, open space areas managed for wildlife, and some parks or outdoor recreation areas. This does not include park areas used for intensive sport activities such as baseball or football.

*2a What are the threatened or endangered species in Washington state?

*2b Which plant species are classified as threatened, endangered, or sensitive? Where can I find out more information about this topic?

*2c For plants, "used" means that a plant species grows at the site or has been found growing at the site. For animals, "used" means that individuals of a species have been observed to live, feed or breed at the site.

*3 For this analysis, do not include native vegetation beyond the property boundary.

The following sources shall be used in making this determination: Natural Vegetation of Oregon and Washington, J.F. Franklin and C.T. Dyrness, Oregon State University Press, 1988, and L.C. Hitchcock, C.L. Hitchcock, J.W. Thompson and A. Cronquist, 1955-1969, Vascular Plants of the Pacific Northwest(5 volumes). Areas planted with native species for ornamental or landscaping purposes shall not be considered to be native vegetation. [WAC 173-340-7491(2)(c)(i)]

(Here's a link to the Seattle Public Library and the Washington State Library to borrow a copy of Natural Vegetation of Oregon and Washington, J.F. Franklin and C.T. Dyrness, Oregon State University Press, 1988, or you may purchase it through your favorite bookseller. Here's an additional link to a useful online Field Guide to Selected Rare Plants of Washington developed by the Washington State Department of Natural Resources' Natural Heritage Program (WNHP) and the Spokane District of the U.S.D.I. Bureau of Land Management (BLM) which contains fact sheets for 139 vascular plant species and one lichen species.

Here is an aid to calculating area and an aerial photo depicting a site, its 500 foot boundary and several labeled circles identifying various areas for reference in judging the area of native vegetation within the 500 foot radius.

[Exclusions Main] [TEE Definitions] [Simplified or Site-Specific?] [Simplified Ecological Evaluation] [Site-Specific Ecological Evaluation] [WAC 173-340-7493] [Index of Tables]

[TEE Home]

Washington State Department of Ecology
Toxics Cleanup Program

# Terrestrial Ecological Evaluation Process- Simplified Evaluation

## Documentation Form

| Criteria # (Concern) | Criteria | Response (Circle One) |
|---|---|---|
| 1 (exposure) | Is the total area of soil contamination at the site less than or equal to 350 square feet | **Yes (End TEE) / No** |
| 2 (exposure) | Does land use at the site and surrounding area make substantial wildlife exposure unlikely based on completion of Table 749-1? | **Yes (End TEE) / No** |
| 3 (pathway) | Is there a potential exposure pathway from soil contamination to soil biota, plants, or wildlife? | **Yes / No (End TEE)** |
| 4 (contaminant) | Are the hazardous substances at your site listed in Table 749-2 and is (or will) their location in the soil at your site be at a depth not exceeding the point of compliance, and at concentrations that do not exceed the values provided in Table 749-2. | **Yes (End TEE) / No**<br><br>**Note: You must perform bioassays for contaminants at your site if no table value is provided.** |
| 5 (contaminant) | Will hazardous substances listed in Table 749-2 be present in the soil at your site within 6 feet of the ground surface at concentrations likely to be toxic, or with the potential to bioaccumulate, based on bioassays using methods approved by the department. | **Yes / No (End TEE)** |

[Exclusions Main] [TEE Definitions] [Simplified or Site-Specific?] [Simplified Ecological Evaluation] [Site-Specific Ecological Evaluation] [WAC 173-340-7493] [Index of Tables]

[TEE Home]

# Table 749-1

## Simplified Terrestrial Ecological Evaluation-Exposure Analysis Procedure

| | |
|---|---|
| Estimate the area of contiguous (connected) undeveloped land on the site or within 500 feet of any area of the site to the nearest 1/2 acre (1/4 acre if the area is less than 0.5 acre). | |
| 1) From the table below, find the number of points corresponding to the area and enter this number in the field to the right. | |
| Area (acres) / Points<br>0.25 or less / 4<br>0.5 / 5<br>1.0 / 6<br>1.5 / 7<br>2.0 / 8<br>2.5 / 9<br>3.0 / 10<br>3.5 / 11<br>4.0 or more / 12 | 6 |
| 2) Is this an industrial or commercial property? If yes, enter a score of 3. If no, enter a score of 1 | 1 |
| 3)[a] Enter a score in the box to the right for the habitat quality of the site, using the following rating system[b]. High=1, Intermediate=2, Low=3 | 3 |
| 4) Is the undeveloped land likely to attract wildlife? If yes, enter a score of 1 in the box to the right. If no, enter a score of 2.[c] | 2 |
| 5) Are there any of the following soil contaminants present: Chlorinated dioxins/furans, PCB mixtures, DDT, DDE, DDD, aldrin, chlordane, dieldrin, endosulfan, endrin, heptachlor, benzene hexachloride, toxaphene, hexachlorobenzene, pentachlorophenol, pentachlorobenzene? If yes, enter a score of 1 in the box to the right. If no, enter a score of 4. | 4 |
| 6) Add the numbers in the boxes on lines 2-5 and enter this number in the box to the right. If this number is larger than the number in the box on line 1, the simplified evaluation may be ended. | 10 |

**Notes for Table 749-1**

[a] It is expected that this habitat evaluation will be undertaken by an experienced field biologist. If this is not the case, enter a conservative score of (1) for questions 3 and 4.

[b] **Habitat rating system.** Rate the quality of the habitat as high, intermediate or low based on your professional judgment as a field biologist. The following are suggested factors to consider in making this evaluation:

> **Low:** Early successional vegetative stands; vegetation predominantly noxious, nonnative, exotic plant species or weeds. Areas severely disturbed by human activity, including intensively cultivated croplands. Areas isolated from other habitat used by wildlife.

**High:** Area is ecologically significant for one or more of the following reasons: Late-successional native plant communities present; relatively high species diversity; used by an uncommon or rare species; priority habitat (as defined by the Washington Department of fish and Wildlife); part of a larger area of habitat where size or fragmentation may be important for the retention of some species.

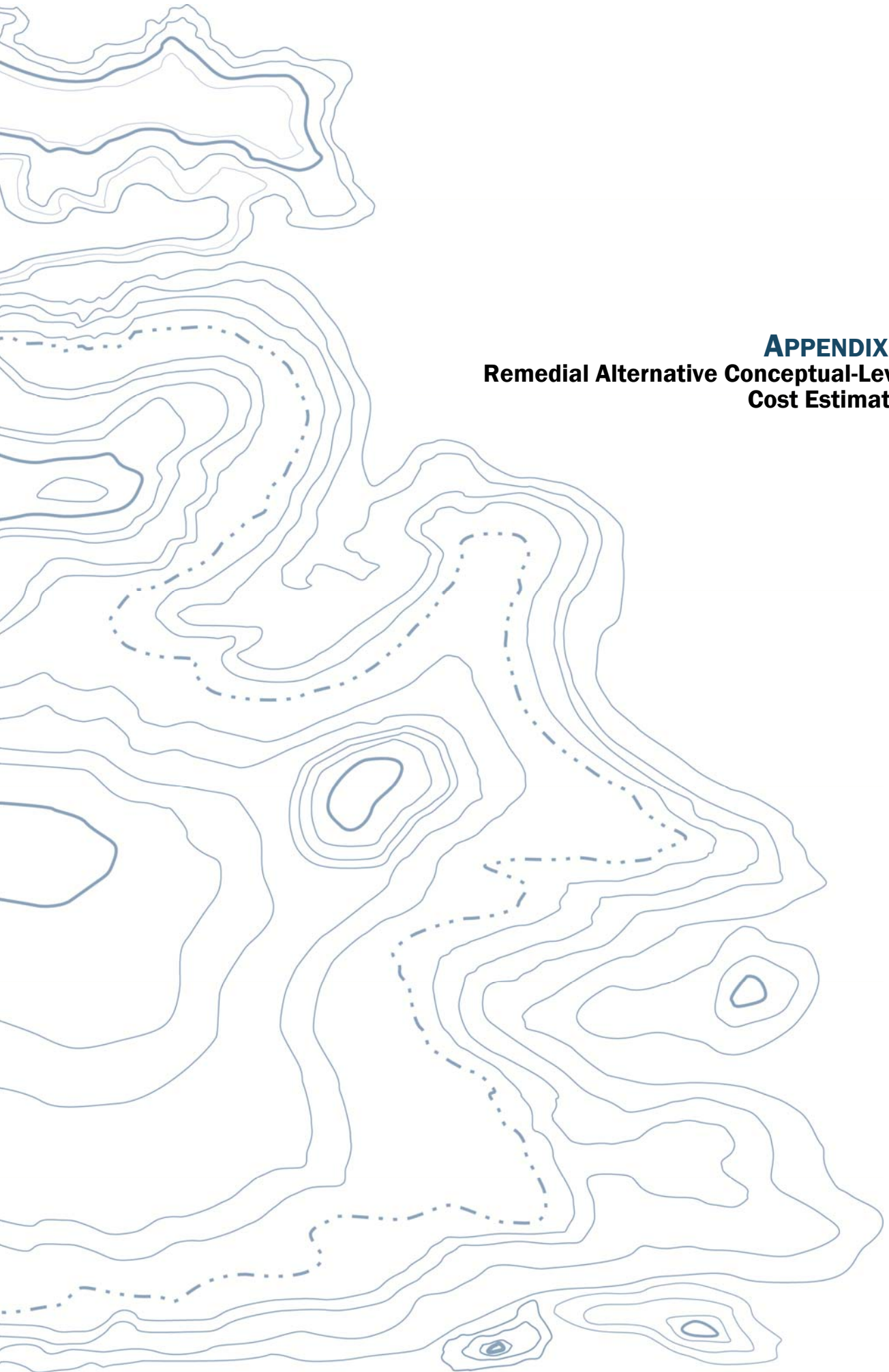
**Intermediate:** Area does not rate as either high or low.

[c] Indicate "yes" if the area attracts wildlife or is likely to do so. Examples: Birds frequently visit the area to feed; evidence of high use b mammals (tracks, scat, etc.); habitat "island" in an industrial area; unusual features of an area that make it important for feeding animals; heavy use during seasonal migrations.

[Area Calculation Aid] [Aerial Photo with Area Designations] [TEE Table 749-1] [Index of Tables]

[Exclusions Main] [TEE Definitions] [Simplified or Site-Specific?] [Simplified Ecological Evaluation] [Site-Specific Ecological Evaluation] [WAC 173-340-7493]

[TEE Home]



# APPENDIX B
## Remedial Alternative Conceptual-Level Cost Estimates

# Table B-1

## Cost Estimate - Proposed Cleanup Action Alternative 1

## Engineering and Institutional Controls

**Former Shell Oil Tank Farm Site**
**Anacortes, Washington**

| Description | QTY | Unit | Unit Cost | Total | Notes |
|---|---|---|---|---|---|
| **Capital Costs** | | | | | |
| **Institutional Controls** | | | | | |
| Institutional Control Plan | 1 | LS | $25,000 | $25,000 | Describe controls/implementation |
| Groundwater Use Restriction | 1 | LS | $20,000 | $20,000 | Legal fees |
| Site Information Database | 1 | LS | $2,500 | $2,500 | Setup data management system |
| | | | SUBTOTAL | $47,500 | |
| **Annual Operation & Maintenance (O&M) Costs** | | | | | |
| **Site Monitoring and Reporting** | | | | | |
| Quarterly Groundwater Sampling and Reporting | 4 | QTR | $5,000 | $20,000 | Sample 5 wells per quarter for one year - summerize quartely groundwater monitoring results in a single report |
| Annual Groundwater Sampling and Reporting | 10 | YR | $9,500 | $95,000 | Sample 5 wells per year for ten years - summerize annual monitoring events in separate reports (ten annual events) |
| Groundwater Sample Laboratory Analysis | 84 | EA | $610 | $51,240 | Chemical analysis of TPH, PAH, VOC and/or Metals. Includes duplicate sample per sampling event. |
| Cap Inspection | 10 | YR | $3,000 | $30,000 | |
| Site Information Database Update | 3 | EA | $1,000 | $3,000 | |
| | | | SUBTOTAL | $199,240 | |
| **Periodic Costs** | | | | | |
| **Off-Site Treatment/Disposal** | | | | | |
| Wastewater Testing/Discharge | 300 | GAL | $1 | $300 | Disposal fee for purge water generated |
| | | | SUBTOTAL | $300 | |
| **Monitoring Well Abandonment/Decommissioning** | | | | | |
| Monitoring Well Decommissioning by Licensed Driller | 1 | LS | $5,000 | $5,000 | Decomission 5 wells following completion of groundwater monitoring |
| | | | SUBTOTAL | $5,000 | |
| **Cleanup Alternative Cost Summary** | | | | | |
| **Capital Costs** | | | | $47,500 | |
| **O&M Costs** | | | | $199,240 | |
| **Periodic Costs** | | | | $5,300 | |
| | | | CLEANUP ALTERNATIVE SUBTOTAL | $252,040 | |
| **Contingency (30%)** | | | | $75,612 | % of Cleanup Alternative Subtotal |
| **Project Planning, Management and Support (15%)** | | | | $49,148 | % of Cleanup Alternative Subtotal with Contingency |
| **Port Administration Cost (6%)** | | | | $19,659 | % of Cleanup Alternative Subtotal with Contingency |
| **Total Estimated Cleanup Action Alternative Cost** | | | | **$396,459** | |

Notes:

QTY = quantity
LS = lump sum
QTR = quarter
YR = year
EA = each
GAL = gallon
TPH = gasoline-, diesel- and heavy oil-range petroleum hydrocarbons
PAH = polycyclic aromatic hydrocarbons
VOC = volatile organic compounds

# Table B-2

## Cost Estimate - Proposed Cleanup Action Alternative 2

## In-Situ Soil Treatment

**Former Shell Oil Tank Farm Site**
**Anacortes, Washington**

| Description | QTY | Unit | Unit Cost | Total | Notes |
|---|---|---|---|---|---|
| **Capital Costs** | | | | | |
| **Preperation/Planning and Treatability Testing** | | | | | |
| Project Preperation, Planning and Treatability Testing | 1 | LS | $25,000 | $25,000 | |
| | | | SUBTOTAL | $25,000 | |
| **Mobilization/Demobilization** | | | | | |
| Mobilization/Site Controls/Demobilization | 1 | LS | $150,000 | $150,000 | Basis: Preliminary contractor quote - assumes mobilization/demobilization cost for two round of treatment |
| | | | SUBTOTAL | $150,000 | |
| **In-Situ Treatment** | | | | | |
| Purchase of Chemical Oxidant | 212,800 | LB | $2 | $425,600 | Basis: Preliminary contractor quote for two rounds of treatment |
| Purchase of Oxygen Releasing Material | 34,580 | LB | $1 | $34,580 | Basis: Preliminary contractor quote for two rounds of treatment |
| In-Situ Treatment using Soil Mixing Technology | 1 | LS | $246,050 | $246,050 | Basis: Preliminary contractor quote for two rounds of treatment |
| | | | SUBTOTAL | $706,230 | |
| **Verification Soil Sampling and Analyses** | | | | | |
| Soil Sampling | 1 | LS | 16,000 | 16,000 | Geoprobe sampling on a 25'x25' grid over an area of 20,000 square feet for two rounds of sampling |
| Soil Laboratory Analysis | 70 | EA | $600 | $42,000 | Chemical analysis of TPH, PAH, VOC and/or Metals. Assume 25' by 25' sample grid spacing. Includes 10% duplicate samples. For two rounds of sampling. |
| | | | SUBTOTAL | $58,000 | |
| **Annual Operation & Maintenance (O&M) Costs** | | | | | |
| **Site Monitoring and Reporting** | | | | | |
| Quarterly Groundwater Sampling and Reporting | 4 | QTR | $5,000 | $20,000 | Sample 5 wells per quarter for one year - summerize quartely groundwater monitoring results in a single report |
| Annual Groundwater Sampling and Reporting | 10 | YR | $9,500 | $95,000 | Sample 5 wells per year for ten years - summerize annual monitoring events in separate reports (ten annual events) |
| Groundwater Sample Laboratory Analysis | 84 | EA | $610 | $51,240 | Chemical analysis of TPH, PAH, VOC and/or Metals. Includes duplicate sample per sampling event. |
| Site Information Database Update | 5 | EA | $1,000 | $5,000 | |
| | | | SUBTOTAL | $171,240 | |
| **Periodic Costs** | | | | | |
| **Reporting** | | | | | |
| Cleanup Action Report | 1 | EA | $50,000 | $50,000 | |
| | | | SUBTOTAL | $50,000 | |

| Description | QTY | Unit | Unit Cost | Total | Notes |
|---|---|---|---|---|---|
| **Periodic Costs Continued** | | | | | |
| **Off-Site Treatment/Disposal** | | | | | |
| Soil cuttings from soil sampling activities | 2 | EA | $80 | $160 | Disposal fee for soil cuttings per 55-gallon drum |
| Wastewater Testing/Discharge | 300 | GAL | $1 | $300 | Disposal fee for purge water generated |
| | | | SUBTOTAL | $460 | |
| **Monitoring Well Abandonment/Decommissioning** | | | | | |
| Monitoring Well Decommissioning by Licensed Driller | 1 | LS | $5,000 | $5,000 | Decomission 5 wells following completion of groundwater monitoring |
| | | | SUBTOTAL | $5,000 | |
| **Cleanup Alternative Cost Summary** | | | | | |
| **Capital Costs** | | | | $939,230 | |
| **O&M Costs** | | | | $171,240 | |
| **Periodic Costs** | | | | $55,460 | |
| CLEANUP ALTERNATIVE SUBTOTAL | | | | $1,165,930 | |
| **Construction Management and Field Monitoring (10%)** | | | | $93,923 | % of Capital Cost |
| **Contractor Overhead (20%)** | | | | $187,846 | % of Capital Cost |
| **Contingency (30%)** | | | | $349,779 | % of Cleanup Alternative Subtotal |
| **Project Planning, Design, Management and Support (15%)** | | | | $227,356 | % of Cleanup Alternative Subtotal with Contingency |
| **Port Administration Cost (6%)** | | | | $90,943 | % of Cleanup Alternative Subtotal with Contingency |
| **Total Estimated Cleanup Action Alternative Cost** | | | | **$2,115,777** | |

Notes:
QTY = quantity
CY = cubic yard
TON = tons
LS = lump sum
QTR = quarter
YR = year
EA = each
GAL = gallon
TPH = gasoline-, diesel- and heavy oil-range petroleum hydrocarbons
PAH = polycyclic aromatic hydrocarbons
VOC = volatile organic compounds

# Table B-3

## Cost Estimate - Proposed Cleanup Action Alternative 3
## Partial Source Removal With In-Situ Soil Treatment

**Former Shell Oil Tank Farm Site**
**Anacortes, Washington**

| Description | QTY | Unit | Unit Cost | Total | Notes |
|---|---|---|---|---|---|
| **Capital Costs** | | | | | |
| **Mobalization/Demobalization** | | | | | |
| Mobilization/Site Controls/Demobilization | 1 | LS | $127,004 | $127,004 | Assume 10% of Overall Capital Cost |
| | | | SUBTOTAL | $127,004 | |
| **Monitoring Well Abandonment/Decommissioning** | | | | | |
| Monitoring well Decommissioning by Licensed Driller | 1 | LS | $3,500 | $3,500 | Decomission four wells prior to soil removal |
| | | | SUBTOTAL | $3,500 | |
| **Soil Removal, Backfill, and Pavement Restoration** | | | | | |
| Shoring | 350 | LF | $500 | $175,000 | Assume temporary sheet pile in Q Avenue and 14th Street. Average depth of 30 feet. |
| Excavation Dewatering | 1 | LS | $175,000 | $175,000 | Unit cost based on average of three Cap Sante Marine Interim Action bids. |
| Wastewater Treatment | 1 | LS | $16,000 | $16,000 | Unit cost based on average of three Cap Sante Marine Interim Action bids. |
| Excavate Soil (0'-14' bgs) | 4,800 | CY | $6 | $28,800 | Excavate overburden and contaminated soil. Assume 20% expansion above in-place volume. Cost includes excavation and stockpile. Unit cost for excavation based on average of three Cap Sante Marine Interim Action bids. |
| Contaminated Soil (non-haz) Transport and Disposal at Approved Off-Site Facility | 7,680 | TON | $60 | $460,800 | Assume 1.6 ton/cy. Cost includes loading and hauling. |
| Purchase, Place and Compact General Backfill Material | 7,680 | TON | $46 | $349,440 | Assume 1.6 ton/cy. Cost includes purchase, filling and compaction. Unit cost based on average of three Cap Sante Marine Interim Action bids. |
| | | | SUBTOTAL | $1,205,040 | |
| **Monitoring Well Installation** | | | | | |
| Monitoring well Installation by Licensed Driller | 1 | LS | $10,000 | $10,000 | Install four replacement wells following soil removal and backfilling |
| | | | SUBTOTAL | $10,000 | |
| **Site Survey** | | | | | |
| Post-Construction (As-Built) Surveys | 1 | LS | $15,000 | $15,000 | |
| | | | SUBTOTAL | $15,000 | |
| **In-Situ Treatment** | | | | | |
| Purchase of Oxygen Releasing Material (ORC) | 9,000 | LB | $1 | $9,000 | Basis: Preliminary contractor quote |
| Placement of Oxygen Releasing Material (ORC) | 1 | LS | $5,000 | $5,000 | Basis: Preliminary contractor quote |
| | | | SUBTOTAL | $14,000 | |

| Description | QTY | Unit | Unit Cost | Total | Notes |
|---|---|---|---|---|---|
| **Verification Soil Sampling and Analyses** | | | | | |
| Soil Laboratory Analysis | 60 | EA | $600 | $36,000 | Chemical analysis of TPH, PAH, VOC and/or Metals. Assume base samples on 25' by 25' grid spacing and sidewall sample on 40 linear foot spacing. Includes 10% duplicate samples. |
| | | | SUBTOTAL | $36,000 | |
| **Annual Operation & Maintenance (O&M) Costs** | | | | | |
| **Site Monitoring** | | | | | |
| Quarterly Groundwater Sampling and Reporting | 4 | QTR | $5,000 | $20,000 | Sample 5 wells per quarter for one year - summerize quartely groundwater monitoring results in a single report. |
| Annual Groundwater Sampling and Rporting | 10 | YR | $9,500 | $95,000 | Sample 5 wells per year for ten years - summerize annual monitoring events in separate reports (ten annual events). |
| Groundwater Sample Laboratory Analysis | 84 | EA | $610 | $51,240 | Chemical analysis of TPH, PAH, VOC and/or Metals. Includes duplicate sample per sampling event. |
| Site Information Database Update | 5 | EA | $1,000 | $5,000 | |
| | | | SUBTOTAL | $171,240 | |
| **Periodic Costs** | | | | | |
| **Reporting** | | | | | |
| Cleanup Action Report | 1 | EA | $50,000 | $50,000 | |
| | | | SUBTOTAL | $50,000 | |
| **Off-Site Treatment/Disposal** | | | | | |
| Monitoirng Well Soil Cuttings Disposal | 6 | EA | $80 | $480 | Disposal fee for soil cuttings per 55-gallon drum |
| Wastewater Testing/Discharge | 300 | GAL | $1 | $300 | Disposal fee for purge water generated |
| | | | SUBTOTAL | $780 | |
| **Monitoring Well Abandonment/Decommissioning** | | | | | |
| Monitoring Well Decommissioning by Licensed Driller | 1 | LS | $5,000 | $5,000 | Decomission 5 wells following completion of groundwater monitoring |
| | | | SUBTOTAL | $5,000 | |
| **Cleanup Alternative Cost Summary** | | | | | |
| **Capital Costs** | | | | $1,410,544 | |
| **O&M Costs** | | | | $171,240 | |
| **Periodic Costs** | | | | $55,780 | |
| | | | CLEANUP ALTERNATIVE SUBTOTAL | $1,637,564 | |
| **Construction Management and Field Monitoring (10%)** | | | | $141,054 | % of Capital Cost |
| **Contractor Overhead (20%)** | | | | $282,109 | % of Capital Cost |
| **Contingency (30%)** | | | | $491,269 | % of Cleanup Alternative Subtotal |
| **Project Planning, Management and Support (15%)** | | | | $319,325 | % of Cleanup Alternative Subtotal with Contingancy |
| **Port Administration Cost (6%)** | | | | $127,730 | % of Cleanup Alternative Subtotal with Contingancy |
| **Total Estimated Cleanup Action Alternative Cost** | | | | **$2,999,051** | |

Notes:
QTY = quantity
CY = cubic yard
TON = tons
LS = lump sum
QTR = quarter
YR = year
EA = each
GAL = gallon
TPH = gasoline-, diesel- and heavy oil-range petroleum hydrocarbons
PAH = polycyclic aromatic hydrocarbons
VOC = volatile organic compounds

# Table B-4

## Cost Estimate - Proposed Cleanup Action Alternative 4

## Complete Source Removal

**Former Shell Oil Tank Farm Site**
**Anacortes, Washington**

| Description | QTY | Unit | Unit Cost | Total | Notes |
|---|---|---|---|---|---|
| **Capital Costs** | | | | | |
| **Mobalization/Demobalization** | | | | | |
| Mobilization/Site Controls/Demobilization | 1 | LS | $192,297 | $192,297 | Assume 10% of Overall Capital Cost |
| | | | SUBTOTAL | $192,297 | |
| **Demolition** | | | | | |
| Asphalt Demolition and Disposal | 148 | SY | $12 | $1,748 | Assumes asphalt surfaces at ~6" thick |
| Concrete Demolition and Disposal | 19 | CY | $149 | $2,759 | Includes concrete foundations, and sidewalks |
| | | | SUBTOTAL | $4,507 | |
| **Monitoring Well Abandonment/Decommissioning** | | | | | |
| Monitoring well Decommissioning by Licensed Driller | 1 | LS | $3,500 | $3,500 | Decomission four wells prior to soil removal |
| | | | SUBTOTAL | $3,500 | |
| **Soil Removal, Backfill, and Pavement Restoration** | | | | | |
| Shoring | 350 | LF | $500 | $175,000 | Assume temporary sheet pile in Q Avenue and 14th Street. Average depth of 30 feet. |
| Excavation Dewatering | 1 | LS | $175,000 | $175,000 | Unit cost based on average of three Cap Sante Marine Interim Action bids. |
| Wastewater Treatment | 1 | LS | $16,000 | $16,000 | Unit cost based on average of three Cap Sante Marine Interim Action bids. |
| Excavate Soil (0'-14' bgs) | 7,200 | CY | $6 | $43,200 | Assume 20% expansion above in-place volume. Cost includes excavation and stockpile. Unit cost for excavation based on average of three Cap Sante Marine Interim Action bids. |
| Contaminated Soil (non-haz) Transport and Disposal at Approved Off-Site Facility | 11,520 | TON | $60 | $691,200 | Assume 1.6 ton/cy. Cost includes loading and hauling. |
| Purchase, Place and Compact General Backfill Material | 11,520 | TON | $46 | $524,160 | Assume 1.6 ton/cy. Cost includes purchase, filling and compaction. Unit cost based on average of three Cap Sante Marine Interim Action bids. |
| | | | SUBTOTAL | $1,624,560 | |
| **Surface Restoration** | | | | | |
| Pavement and Subgrade Restoration | 2,100 | SY | $40 | $84,000 | Assumes pavement surfaces at ~6" thick |
| | | | SUBTOTAL | $84,000 | |
| **Utility Alteration and Replacement** | | | | | |
| Remove, Bypass, and/or Replace utilities in project area | 1 | LS | $150,000 | $150,000 | |
| | | | SUBTOTAL | $150,000 | |
| **Monitoring Well Installation** | | | | | |
| Monitoring well Installation by Licensed Driller | 1 | LS | $10,000 | $10,000 | Install four replacement wells following soil removal and backfilling |
| | | | SUBTOTAL | $10,000 | |
| **Site Survey** | | | | | |
| Post-Construction (As-Built) Surveys | 1 | LS | $15,000 | $15,000 | |
| | | | SUBTOTAL | $15,000 | |

| Description | QTY | Unit | Unit Cost | Total | Notes |
|---|---|---|---|---|---|
| **Capital Costs Continued** | | | | | |
| **Verification Soil Sampling** | | | | | |
| Soil Laboratory Analysis | 69 | EA | $600 | $41,400 | Chemical analysis of TPH, PAH, VOC and/or Metals. Assume base samples on 25' by 25' grid spacing and sidewall sample on 40 linear foot spacing. Includes 10% duplicate samples |
| | | | SUBTOTAL | $41,400 | |
| **Annual Operation & Maintenance (O&M) Costs** | | | | | |
| **Site Monitoring and Reporting** | | | | | |
| Quarterly Groundwater Sampling and Reporting | 4 | QTR | $5,000 | $20,000 | Sample 5 wells per quarter for one year - summerize quartely groundwater monitoring results in a single report |
| Groundwater Sample Laboratory Analysis | 24 | EA | $610 | $14,640 | Chemical analysis of TPH, PAH, VOC and/or Metals. Includes duplicate sample per sampling event. |
| Site Information Database Update | 2 | EA | $1,000 | $2,000 | |
| | | | SUBTOTAL | $36,640 | |
| **Periodic Costs** | | | | | |
| **Reporting** | | | | | |
| Cleanup Action Report | 1 | EA | $50,000 | $50,000 | |
| | | | SUBTOTAL | $50,000 | |
| **Off-Site Treatment/Disposal** | | | | | |
| Monitoirng Well Soil Cuttings Disposal | 6 | EA | $80 | $480 | Disposal fee for soil cuttings per 55-gallon drum |
| Wastewater Testing/Discharge | 100 | GAL | $1 | $100 | Disposal fee for purge water generated |
| | | | SUBTOTAL | $580 | |
| **Monitoring Well Abandonment/Decommissioning** | | | | | |
| Monitoring Well Decommissioning by Licensed Driller | 1 | LS | $5,000 | $5,000 | Decomission 5 wells following completion of groundwater monitoring |
| | | | SUBTOTAL | $5,000 | |
| **Cleanup Alternative Cost Summary** | | | | | |
| **Capital Costs** | | | | $2,125,264 | |
| **O&M Costs** | | | | $36,640 | |
| **Periodic Costs** | | | | $55,580 | |
| CLEANUP ALTERNATIVE SUBTOTAL | | | | $2,217,484 | |
| **Construction Management and Field Monitoring (10%)** | | | | $212,526 | % of Capital Cost |
| **Contractor Overhead (20%)** | | | | $425,053 | % of Capital Cost |
| **Contingency (30%)** | | | | $665,245 | % of Cleanup Alternative Subtotal |
| **Project Planning, Management and Support (15%)** | | | | $432,409 | % of Cleanup Alternative Subtotal with Contingency |
| **Port Administration Cost (6%)** | | | | $172,964 | % of Cleanup Alternative Subtotal with Contingency |
| **Total Estimated Cleanup Action Alternative Cost** | | | | **$4,125,682** | |

Notes:

QTY = quantity
CY = cubic yard
TON = tons
LS = lump sum
QTR = quarter
YR = year
EA = each
GAL = gallon
TPH = gasoline-, diesel- and heavy oil-range petroleum hydrocarbons
PAH = polycyclic aromatic hydrocarbons
VOC = volatile organic compounds

# ATTACHMENT 1

**Independent Remedial Action Completion Report**
**(Provided on attached CD)**

# INDEPENDENT REMEDIAL ACTION COMPLETION REPORT FORMER SHELL TANK FARM STORM DRAIN RE-ROUTE 13TH STREET AND Q AVENUE ANACORTES, WASHINGTON

**APRIL 18, 2008**

**FOR**
**PORT OF ANACORTES**

GeoEngineers

# Independent Remedial Action Completion Report
# Former Shell Tank Farm
# Storm Drain Re-Route
# 13th Street and Q Avenue
# Anacortes, Washington
## File No. 5147-012-00

## April 18, 2008

**Prepared for:**

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**Attention: Bob Elsner**

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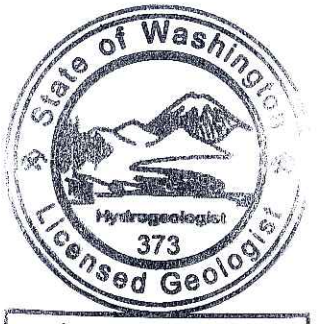


**James G. Roth, LG, LHG**
**Associate Hydrogeologist**

FOR

**John M. Herzog, Ph.D.**
**Principal**

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# INDEPENDENT REMEDIAL ACTION COMPLETION REPORT
# FORMER SHELL TANK FARM STORM DRAIN RE-ROUTE
# 13TH STREET AND Q AVENUE
# ANACORTES, WASHINGTON
# FOR
# PORT OF ANACORTES

## INTRODUCTION

This document presents the Independent Remedial Action Completion Report for the re-route of a City of Anacortes (City) storm drain line at the Former Shell Tank Farm Site (Site) located at the intersection of 13th Street and Q Avenue in Anacortes, Washington. The Site is owned by the Port of Anacortes (Port) and is currently used for vehicle and boat trailer parking. The Port and Ecology are in the process of completing an Agreed Order for environmental investigation and cleanup at the Site. Cleanup is being required by Ecology to address soil and groundwater contamination resulting from historical bulk fuel handling at the Site. The Site is shown relative to its surrounding features in the Vicinity Map on Figure 1. The general layout of the Site and historic facilities are shown on the Site Plan on Figure 2.

As a source control measure, the City re-routed a 12-inch-diameter storm drain line across the western portion of the Site. The storm drain line, originally located in 13th Street between Commercial Avenue and Q Avenue was re-routed to address a non-functioning section of the storm drain system that discharges into the Cap Sante Boat Haven. The independent remedial action consisted of excavating soil from approximately 280 feet of trench along the west edge of the Site for the installation of the new storm drain line. This report documents the results of site characterization activities completed at the Site prior to excavation of the trench and environmental monitoring observations that were made during construction excavation activities. Site characterization and construction excavation activities were completed at the Site between November 30 and December 21, 2007. The independent remedial action was completed as part of the Fidalgo Bay component of the Puget Sound Initiative.

## SITE BACKGROUND

Site background and history are described in the document "Limited Environmental Due Diligence Investigation Report, Former Shell Oil Tank Farm, Cap Sante Marine Lease Area" by Floyd Snider, dated November 2005. According to the report, the Port acquired the Site in 1929 and leased it to the Shell Oil Company (Shell) and various distributors of gasoline and diesel fuel. Site facilities included three 25,000 gallon aboveground storage tanks (ASTs) that contained and gasoline and diesel. Product lines connected the ASTs and pump house to a historical pier located east of the Site across Q Avenue. Historically, gasoline and diesel were pumped from the pier to the bulk fuel facility for storage and distribution. In the 1950s, two additional 12,500 gallon ASTs and one 4,000 gallon underground storage tank (UST) were installed at the Site. Gasoline, diesel and stove oil were reportedly stored in the ASTs and dry cleaning solvent was stored in the UST. The Site was operated as a bulk fuel handling facility until it was closed in approximately 1985 and the aboveground structures were demolished. The approximate locations of the historical pump house, fill stand, UST, ASTs and associated product supply lines are shown in Figure 2.

Subsurface explorations completed at the Site for the 2005 environmental study identified petroleum-related contaminants in soil and groundwater in the vicinity of the ASTs and product supply lines and downgradient (east) of the Site.

## PURPOSE AND SCOPE

The purpose of the independent remedial action activities was to assist the Port in evaluating environmental conditions within the alignment of the storm drain re-route at the Site for protection of the environment and management of excavated materials. GeoEngineers' specific scope of services included the following:

1. Complete four test pit explorations to depths of approximately 8 feet below the ground surface (bgs) at the approximate locations shown in Figure 2. Document soil and groundwater conditions observed in each exploration.
2. Field screen soil encountered in the test pits for evidence of petroleum hydrocarbons and volatile organic compounds (VOCs) using visual, water sheen and headspace vapor methods.
3. Submit one or two soil samples from each test pit for chemical analysis of the following: gasoline-range petroleum hydrocarbons by Ecology Method NWTPH-G, diesel- and heavy oil-range petroleum hydrocarbons by Ecology Method NWTPH-Dx with acid/silica gel cleanup, VOCs including benzene, ethylbenzene, toluene and xylenes (BETX) by EPA Method 8260, polycyclic aromatic hydrocarbons (PAHs) by EPA Method 8270 SIM, polychlorinated biphenyls (PCBs) by EPA Method 8082 and metals (lead, arsenic, cadmium, chromium and mercury) by EPA Methods 6010/7471. Analytical parameters were selected based on the historical site use and existing environmental data for the site.
4. Evaluate the soil chemical analytical results relative to preliminary MTCA Method A and Method B soil cleanup levels for the Site.
5. Observe soil and groundwater conditions during construction excavation activities for installation of the storm drain. Perform field screening of soil from the storm drain re-route excavation for petroleum hydrocarbons and VOCs.
6. Document offsite disposal of excess soil removed from the storm drain trench excavation.

## SITE CHARACTERIZATION

### GENERAL

Test pits TP-1 through TP-4 were completed near the west edge of the Site to evaluate the potential presence of petroleum hydrocarbons, VOCs, PAHs, PCBs and metals in soil along the storm drain re-route alignment. The test pits were completed to depths of approximately 8 feet bgs, the estimated maximum depth of the storm line trench. Soil samples from the test pits were field screened for the potential presence of petroleum hydrocarbons and VOCs and selected soil samples were submitted for chemical analyses. The test pits were backfilled immediately after soil samples were obtained. Soil sampling and field screening methods are described in Appendix A.

### SURFACE AND SUBSURFACE CONDITIONS

The Site is surfaced with crushed rock and is used as a parking lot for vehicles and boat trailers. Soil encountered beneath the crushed rock surface consisted of fill material including silt, sand and occasional gravel. Soil conditions encountered in the test pits are shown on the test pit logs (Figures A-2 through A-5). Groundwater was encountered in three of the test pits at approximately 7 feet bgs. Based on our experience at the nearby Cap Sante Marine Site, groundwater flow at the subject Site is assumed to be generally to the east toward Fidalgo Bay.

## FIELD SCREENING RESULTS

Field screening methods including visual, water sheen and headspace vapor methods were used to evaluate the potential presence of petroleum hydrocarbons and VOCs in soil samples obtained from the test pits. Evidence of petroleum hydrocarbons and VOCs was not observed during field screening of soil samples. Field screening results are presented in Table 1 and Figures A-2 through A-5.

## SOIL ANALYTICAL RESULTS

Five discrete soil samples (TP-1-6.0, TP-1-8.0, TP-2-4.0, TP-3-8.0 and TP-4-2.0) obtained from the test pits at the Site were submitted to CCI Analytical of Everett, Washington for chemical analysis. The samples were analyzed for gasoline-range petroleum hydrocarbons, diesel- and heavy oil-range petroleum hydrocarbons, VOCs including BETX, PAHs, PCBs and metals (lead, arsenic, cadmium, chromium and mercury). The samples were selected for analysis to provide representative data on soil conditions for a range of depths along the storm drain alignment (the last number in the sample name represents the depth of the sample below the ground surface). Sample TP-1-8.0 was a follow-up sample submitted for analysis based on a detection of cadmium in the sample obtained at a depth of 6 feet bgs from TP-1.

Petroleum hydrocarbons, BETX and PCBs were not detected in the soil samples. PAHs either were not detected or were detected at concentrations less then preliminary MTCA soil cleanup levels. Lead, arsenic, cadmium, chromium and mercury either were not detected or were detected at concentrations less then preliminary MTCA soil cleanup levels, with one exception. Cadmium was detected at a concentration of 6.4 milligrams per kilogram (mg/kg) in sample TP-1-6.0, which exceeds the MTCA Method A cleanup level of 2 mg/kg. Cadmium was not detected in TP-1-8.0, the follow-up sample obtained two feet below sample TP-1-6.0. Chemical analytical results are presented in Tables 1 through 4. A copy of the laboratory report is presented in Appendix B.

## STORM DRAIN EXCAVATION MONITORING

GeoEngineers conducted environmental monitoring of the storm drain trench excavation at the Site from December 17 to December 21, 2007. Clearcreek Contractors excavated approximately 280 lineal feet of trench at the Site to depths of approximately 5 to 6 feet bgs. GeoEngineers conducted soil field screening on soil removed from the trench excavation to evaluate the potential presence of contaminants at concentrations of regulatory concern. Field screening evidence of petroleum hydrocarbons was not observed in the storm drain re-route trench or the excavation for Manhole No. 1 in the southwest portion of the Site. Groundwater was not encountered during the storm drain trench excavation activities.

Based on the results of the chemical analyses for the soil samples obtained from the four site characterization test pits and field screening observations during trench excavation, soil excavated from the storm drain trench at the Site between December 17 and 21, 2007 was considered clean and suitable for use as excavation backfill. All of the excavated soil was used to backfill the storm drain trench with the exception of approximately 40 cubic yards that was excess. The excess soil was transported offsite for placement as clean fill at another Port property.

GeoEngineers staff also observed excavations north and west of the Site that were completed in December 2007 and January 2008 for installation of the storm drain line and Manholes No. 2 and No. 3 in 13th Street. Field screening evidence of petroleum-contaminated soil was observed in the excavations for Manhole No. 2 and Manhole No. 3 at depths of 6 to 7 feet bgs and 9 to 11 feet bgs, respectively. Field screening evidence of petroleum-contaminated soil was not observed in the section of storm drain trench that extended from the northwest corner of the Site to Manhole No. 2 located in approximately the center of 13th Street.

## CONCLUSIONS

Field observations, field screening results, and soil chemical analytical data obtained during the November 2007 Site characterization and December 2007 storm drain installation at the Site indicate that shallow soils along the storm drain re-route alignment on Port property are not contaminated relative to preliminary MTCA cleanup levels, with one exception. Contaminants of concern including petroleum hydrocarbons, VOCs, PAHs, PCBs, lead, arsenic. chromium and mercury either were not detected or were detected at concentrations less than the preliminary MTCA cleanup levels for the Site. Cadmium was detected at a concentration exceeding the preliminary MTCA cleanup level in one soil sample from 6 feet bgs in test pit TP-1 (south portion of the storm drain alignment). The sample with the cadmium exceedance was obtained from soil slightly below the bottom of the storm drain trench and was not excavated during construction activities. It is our opinion that the cadmium-impacted soil represented by TP-1-6 is limited in extent. Cadmium was not detected in a sample obtained two feet below the location of the cadmium exceedance and in three other samples collected along the storm drain re-route alignment. Field observations obtained during the December 2007 and January 2008 storm drain installation activities in the 13th Street corridor indicate that shallow soils along the storm drain re-route alignment in 13th Street are contaminated with petroleum hydrocarbons. Because of the limited nature of the December 2007 field activities, it was unable to be determined whether the observed contamination in the 13th Street corridor was related to the Site or was a separate and distinct release. The Port intends to complete future site characterization studies to delineate the nature and extent of contaminants at the Site and will implement appropriate cleanup actions based on those studies.

## LIMITATIONS

This report has been prepared for the exclusive use of Port of Anacortes, their authorized agents and regulatory agencies. This report is not intended for use by others and the information contained herein is not applicable to other sites. No other party may rely on the product of our services unless we agree in advance, and in writing, to such reliance. This is to provide our firm with reasonable protection against open-ended liability claims by third parties with whom there would otherwise be no contractual limits to their actions.

Interpretation of soil conditions for this study is based on site observations, field screening results and chemical analysis of a limited number of soil samples. It is always possible that contamination not identified by our study exists in portions of the Site that were not sampled or analyzed.

Within the limitations of scope, schedule and budget, our services have been executed in accordance with our general agreement with the Port of Anacortes (Contract No. 72-00-07) and generally accepted environmental science practices in this area at the time this report was prepared. No warranty or other conditions, express or implied, should be understood.

This document and any attachments are only a copy of a master document. The master hard copy is stored by GeoEngineers, Inc. and will serve as the official document of record.

# TABLE 1
## SUMMARY OF FIELD SCREENING AND SOIL CHEMICAL ANALYTICAL DATA
## PETROLEUM HYDROCARBONS, BETX AND VOLATILE ORGANIC COMPOUNDS
### FORMER SHELL TANK FARM STORM DRAIN RE-ROUTE
### ANACORTES, WASHINGTON

| Sample Number[1] | Sample Depth (feet bgs) | Date Sampled | Field Screening Results[2] | | Petroleum Hydrocarbons[3] (mg/kg) | | | BETX[4] (mg/kg) | | | | Volatile Organic Compounds[5] (mg/kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Headspace Vapors (ppm) | Sheen | Gasoline-Range | Diesel-Range | Oil-Range | Benzene | Ethlybenzene | Toluene | Xylenes | |
| TP-1-6.0 | 6.0 | 11/30/2007 | <1 | NS | <3 | <50 | 1,300 | <0.01 | <0.01 | <0.01 | <0.02 | ND |
| TP-2-4.0 | 4.0 | 11/30/2007 | <1 | NS | <3 | <25 | <50 | <0.01 | <0.01 | <0.01 | <0.02 | ND |
| TP-3-8.0 | 8.0 | 11/30/2007 | <1 | NS | <3 | <25 | <50 | <0.01 | <0.01 | <0.01 | <0.02 | ND |
| TP-4-2.0 | 2.0 | 11/30/2007 | <1 | NS | <3 | <25 | <50 | <0.01 | <0.01 | <0.01 | <0.02 | ND |
| MTCA Method A Cleanup Level | | | | | 100 | 2,000 | 2,000 | 0.03 | 6 | 7 | 9 | varies |

Notes:

[1]The approximate sample locations are shown in Figure 2.

[2]A description of field screening methods is presented in Appendix A.

[3]Analyzed by Ecology Methods NWTPH-Gx and NWTPH-Dx with silica gel cleanup.

[4]BETX analyzed by EPA Method 8260.

[5]Volatile organic compounds analyzed by EPA Method 8260. Chemical analytical results are presented in Appendix B.

NS=no sheen

ND=non detect

bgs = below ground surface

ppm = parts per million

mg/kg = milligrams per kilogram < = less than

Shading indicates analyte was detected at a concentration exceeding the MTCA Method A cleanup level.

Chemical analyses conducted by CCI Analytical Laboratory of Everett, Washington.

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# TABLE 2
# SUMMARY OF SOIL CHEMICAL ANALYTICAL DATA
# NON-CARCINOGENIC POLYCYCLIC AROMATIC HYDROCARBONS
## FORMER SHELL TANK FARM STORM DRAIN RE-ROUTE
## ANACORTES, WASHINGTON

| Sample Number[1] | Sample Depth (feet bgs) | Date Sampled | Non-Carcinogenic Polycyclic Aromatic Hydrocarbons[2] (mg/kg) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Naph-thalenes | Acenaph-thylene | Acenaph-thene | Fluorene | Phenan-threne | Anthra-cene | Fluoran-thene | Pyrene | Benzo(g,h,i)-perylene |
| TP-1-6.0 | 6.0 | 11/30/2007 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | 0.03 | 0.03 | 0.07 |
| TP-2-4.0 | 4.0 | 11/30/2007 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |
| TP-3-8.0 | 8.0 | 11/30/2007 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |
| TP-4-2.0 | 2.0 | 11/30/2007 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |
| MTCA Method B Cleanup Level | | | 5[3] | NE | 4,800 | 3,200 | NE | 24,000 | 3,200 | 2,400 | NE |

Notes:

[1]The approximate sample locations are shown in Figure 2.

[2]Analyzed by EPA Method 8270 SIM.

[3]MTCA Method A cleanup level for unrestricted land use.

bgs = below ground surface

mg/kg = milligrams per kilogram

NE = not established

Shading indicates analyte was detected at a concentration exceeding the MTCA cleanup level.

Chemical analyses conducted by CCI Analytical Laboratory of Everett, Washington.

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# TABLE 3
# SUMMARY OF SOIL CHEMICAL ANALYTICAL DATA
# CARCINOGENIC POLYCYCLIC AROMATIC HYDROCARBONS
## FORMER SHELL TANK FARM STORM DRAIN RE-ROUTE
## ANACORTES, WASHINGTON

| Sample Number[1] | Sample Depth (feet bgs) | Date Sampled | Carcinogenic Polycyclic Aromatic Hydrocarbons[2] (mg/kg) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Benzo(a)-anthracene | Chrysene | Benzo(b)-fluoranthene | Benzo(k)-fluoranthene | Benzo(a)-pyrene | Indeno(1,2,3--cd)Pyrene | Dibenz(a,h)-anthracene | Total cPAHs (TEQ)[3] |
| TP-1-6.0 | 6.0 | 11/30/2007 | <0.02 | 0.06 | 0.04 | 0.02 | 0.04 | 0.03 | 0.03 | 0.06 |
| TP-2-4.0 | 4.0 | 11/30/2007 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |
| TP-3-8.0 | 8.0 | 11/30/2007 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |
| TP-4-2.0 | 2.0 | 11/30/2007 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |
| MTCA Method B Cleanup Level | | | 0.137 | 0.137 | 0.137 | 0.137 | 0.137 | 0.137 | 0.137 | 0.137 |

Notes:

[1]The approximate sample locations are shown in Figure 2.

[2]Carcinogenic polycyclic aromatic hydrocarbons (cPAHs) analyzed by EPA Method 8270 SIM.

[3]Calculated using the toxicity equivalency (TEQ) methodology specified in WAC 173-340-708(8). cPAHs that were not detected were assigned a value of one-half the detection limit for these calculations.

bgs = below ground surface

mg/kg = milligrams per kilogram

NE = not established

Shading indicates analyte was detected at a concentration exceeding the MTCA cleanup level.

Chemical analyses conducted by CCI Analytical Laboratory of Everett, Washington.

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# TABLE 4
# SUMMARY OF SOIL CHEMICAL ANALYTICAL DATA
# POLYCHLORINATED BIPHENYLS AND METALS
## FORMER SHELL TANK FARM STORM DRAIN RE-ROUTE
## ANACORTES, WASHINGTON

| Sample Number[1] | Sample Depth (feet bgs) | Date Sampled | Polychlorinated Biphenyls[2] (mg/kg) | Metals[3] (mg/kg) | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | Arsenic | Cadmium | Chromium | Lead | Mercury |
| TP-1-6.0 | 6.0 | 11/30/2007 | <0.1 | 8.1 | 6.4 | 21 | 28 | 0.02 |
| TP-1-8.0 | 8.0 | 11/30/2007 | -- | -- | <1 | -- | -- | -- |
| TP-2-4.0 | 4.0 | 11/30/2007 | <0.1 | <5 | <1 | 31 | 5.2 | <0.02 |
| TP-3-8.0 | 8.0 | 11/30/2007 | <0.1 | 5.4 | <1 | 32 | 5.8 | 0.03 |
| TP-4-2.0 | 2.0 | 11/30/2007 | <0.1 | <5 | <1 | 11 | <5 | <0.02 |
| MTCA Method A Cleanup Level | | | 1 | 20 | 2 | 2,000 | 250 | 2 |

Notes:

[1]The approximate sample locations are shown on Figure 2.

[2]Polychlorinated biphenyls analyzed using EPA Method 8082.

[3]Metals analyzed using EPA Method 6010 or EPA Method 7471.

bgs = below ground surface.

mg/kg = milligrams per kilogram.

"--" = not analyzed.

Shading indicates analyte was detected at a concentration exceeding the MTCA cleanup level.

Chemical analyses performed by CCI Analytical Laboratories, Everett, Washington.

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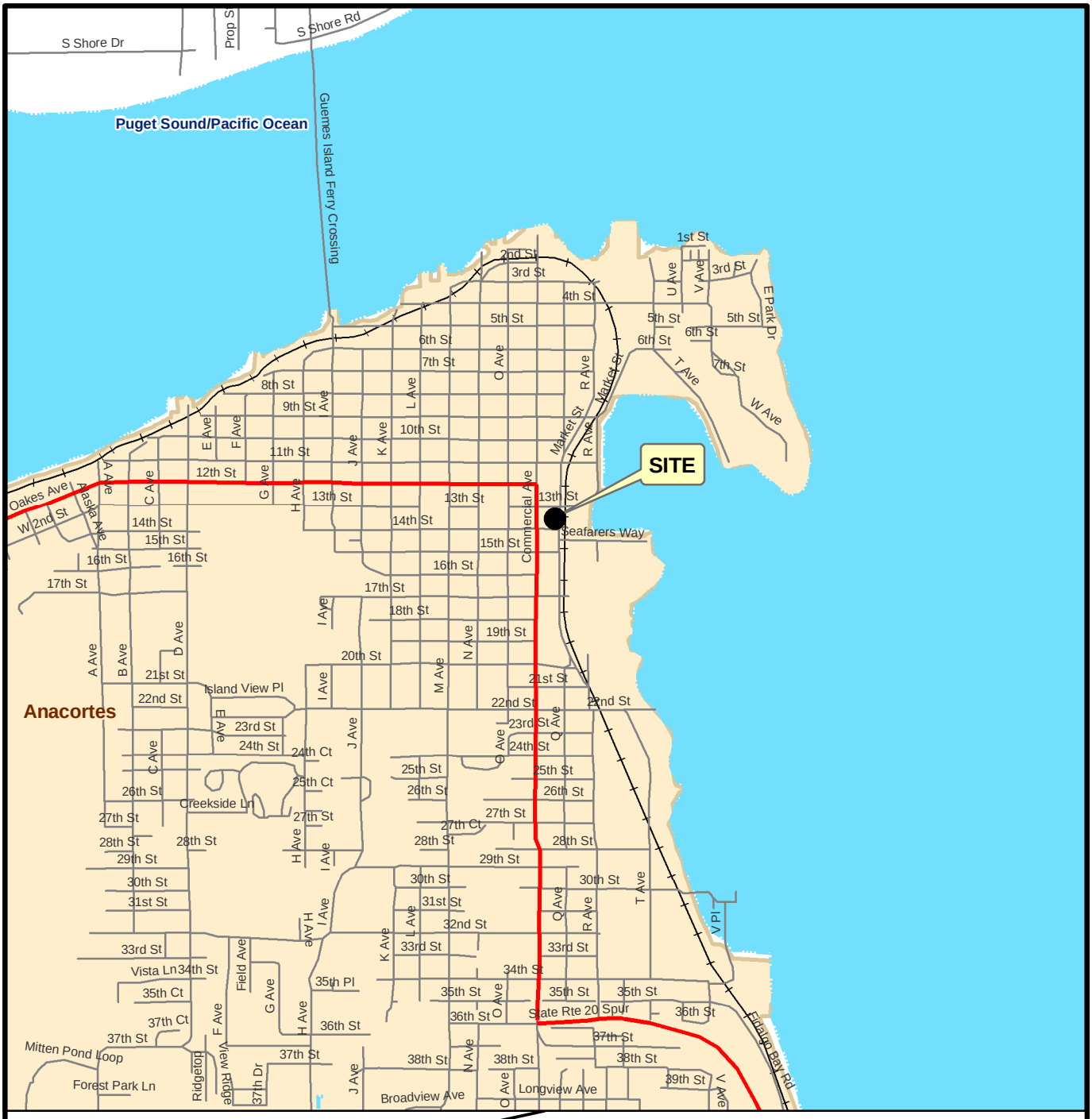
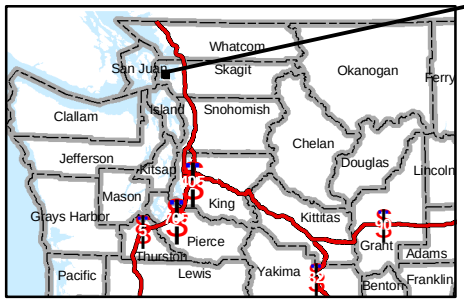



Lambert Conformal Conic
Washington State Plane North
North American Datum 1983

Data Sources: Interstates, state routes, and roads from TIGER 2000.
County boundaries, cities, and waterbodies from Department of Ecology.

Note: This drawing is for informational purposes.
It is intended to assist in showing features discussed in an attached document.

All locations are approximate.

0 1,000 2,000 Feet

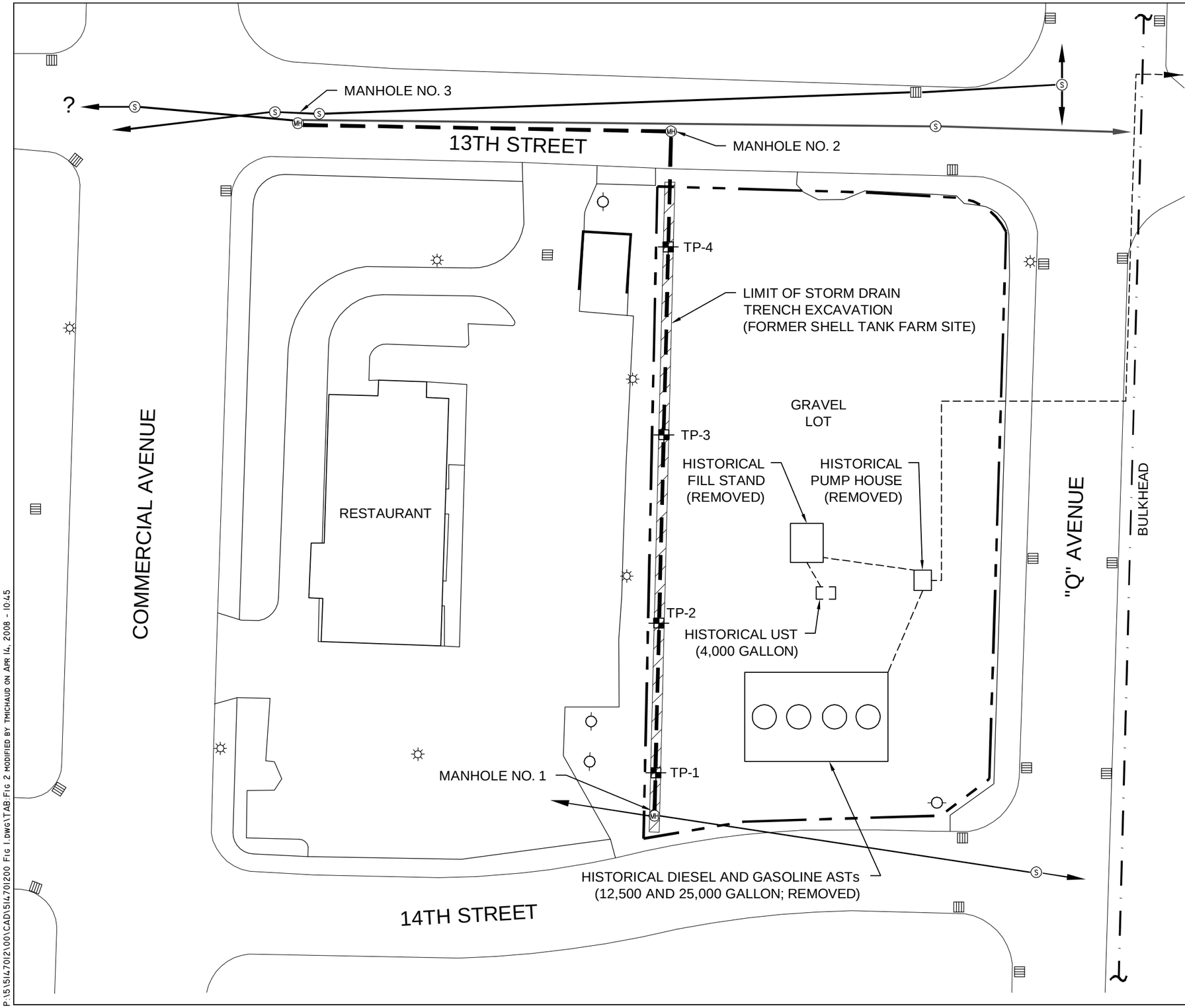
# VICINITY MAP

**13th Street and Q Avenue**
**Anacortes, Washington**

GeoEngineers

**FIGURE 1**

Office: REDM Path: P:\Seattle\Projects\51547012\00\CAD\51470120OT00_F1.mxd Map Revised: January 8, 2008 MAA




LEGEND:

- Property Boundary
- Existing Storm Line
- New Storm Line
- Decommissioned Storm Line
- Historical Product Supply Line
- Storm Water Catch Basin
- New Manhole
- Storm Drain
- Utility Pole
- Light Pole
- TP-1 — Test Pit Exploration
- AST — Aboveground Storage Tank
- UST — Underground Storage Tank

N W E S

40 0 40
FEET

NOTES:

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. can not guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

**Site Plan**

Former Shell Tank Farm
Anacortes, Washington

GeoEngineers | Figure 2

P:\15\14701\001\CAD\14701200 Fig 1.dwg\TAB Fig 2 modified by tmichaud on Apr 14, 2008 - 10:45

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# APPENDIX A
# FIELD PROCEDURES

# APPENDIX A
# FIELD PROCEDURES

## GENERAL

GeoEngineers monitored the completion of four test pits completed by Clearcreek Contractors. The test pits were completed on November 30, 2007. The approximate exploration locations are shown in Figure 2. A representative from our staff selected the exploration locations, examined and classified the soils encountered, and prepared a detailed log of each exploration. Soils encountered were visually classified in general accordance with ASTM D-2488-94, which is described in Figure A-1. The logs are presented in Figures A-2 through A-5.

## TEST PIT EXCAVATION SOIL SAMPLING

Test pit explorations were completed to approximately 8 feet bgs using a backhoe. Soil samples were obtained from the backhoe bucket using a stainless steel trowel. A portion of each sample was placed in a laboratory-prepared sample jar for potential chemical analysis. The sample containers were completely filled to minimize headspace. The remaining portion of each sample was used for field screening. The sampling equipment was decontaminated prior to each use with a Liqui-Nox® soap solution, a tap water initial rinse and a distilled water final rinse.

Select samples were submitted for chemical analysis, based on field screening results and/or the sample location relative to potential sources of contamination. Samples submitted for chemical analysis are denoted by "CA" on the logs. The soil samples were placed in a cooler with ice for transport to the laboratory. Standard chain-of-custody procedures were followed in transporting the soil samples to the laboratory.

## FIELD SCREENING OF SOIL SAMPLES

Soil samples obtained from the excavations were evaluated for the potential presence of petroleum contamination and VOCs using field screening. Field screening results can be used as a general guideline to delineate areas of potential petroleum-related and VOC contamination in soils. In addition, screening results are often used as a basis for selecting soil samples for chemical analysis. The screening methods that were used included visual screening, water sheen screening and headspace vapor screening.

Visual screening consists of inspecting the soil for stains indicative of petroleum-related contamination. Visual screening is generally more effective when contamination is related to heavy petroleum hydrocarbons such as motor oil, or when hydrocarbon concentrations are high. Sheen screening and headspace vapor screening are more sensitive screening methods that can be effective in detecting petroleum hydrocarbons and VOCs at concentrations less than regulatory cleanup levels.

Water sheen testing involves placing soil in water and observing the water surface for signs of sheen. The results of water sheen testing on soil samples from the test pits are presented in Table 1 and Figures A-2 through A-5. Sheens are classified as follows:

| Classification | Description |
|---|---|
| No Sheen (NS) | No visible sheen on water surface. |
| Slight Sheen (SS) | Light, colorless, dull sheen; spread is irregular, not rapid; sheen dissipates rapidly. |

| Classification | Description |
|---|---|
| Moderate Sheen (MS) | Light to heavy sheen, may have some color/iridescence; spread is irregular to flowing; few remaining areas of no sheen on water surface. |
| Heavy Sheen (HS) | Heavy sheen with color/iridescence; spread is rapid; entire water surface may be covered with sheen. |

Headspace vapor screening may identify volatile organic compounds and involves placing a soil sample in a plastic sample bag. Air is captured in the bag and the bag is shaken to expose the soil to the air trapped in the bag. The probe of a photoionization detector (PID) is inserted into the bag. The PID measures the concentration of photoionizable gases and vapors in the sample headspace in parts per million (ppm) and is calibrated to isobutylene. The PID is designed to quantify vapors at concentrations of 1 to 2,000 ppm.

Field screening results are site-specific. The effectiveness of field screening results varies with temperature, moisture content, organic content, soil type and type and age of contaminant. The presence or absence of a sheen does not necessarily indicate the presence or absence of petroleum hydrocarbons or other contaminants.

## SOIL CLASSIFICATION CHART

| MAJOR DIVISIONS | | | SYMBOLS GRAPH | SYMBOLS LETTER | TYPICAL DESCRIPTIONS |
|---|---|---|---|---|---|
| COARSE GRAINED SOILS | GRAVEL AND GRAVELLY SOILS | CLEAN GRAVELS (LITTLE OR NO FINES) | | GW | WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES |
| | | | | GP | POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES |
| | MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE | GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES) | | GM | SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES |
| | | | | GC | CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES |
| MORE THAN 50% RETAINED ON NO. 200 SIEVE | SAND AND SANDY SOILS | CLEAN SANDS (LITTLE OR NO FINES) | | SW | WELL-GRADED SANDS, GRAVELLY SANDS |
| | | | | SP | POORLY-GRADED SANDS, GRAVELLY SAND |
| | MORE THAN 50% OF COARSE FRACTION PASSING NO. 4 SIEVE | SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES) | | SM | SILTY SANDS, SAND - SILT MIXTURES |
| | | | | SC | CLAYEY SANDS, SAND - CLAY MIXTURES |
| FINE GRAINED SOILS | SILTS AND CLAYS | LIQUID LIMIT LESS THAN 50 | | ML | INORGANIC SILTS, ROCK FLOUR, CLAYEY SILTS WITH SLIGHT PLASTICITY |
| | | | | CL | INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS |
| | | | | OL | ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY |
| MORE THAN 50% PASSING NO. 200 SIEVE | SILTS AND CLAYS | LIQUID LIMIT GREATER THAN 50 | | MH | INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS SILTY SOILS |
| | | | | CH | INORGANIC CLAYS OF HIGH PLASTICITY |
| | | | | OH | ORGANIC CLAYS AND SILTS OF MEDIUM TO HIGH PLASTICITY |
| HIGHLY ORGANIC SOILS | | | | PT | PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS |

NOTE: Multiple symbols are used to indicate borderline or dual soil classifications

## ADDITIONAL MATERIAL SYMBOLS

| SYMBOLS GRAPH | SYMBOLS LETTER | TYPICAL DESCRIPTIONS |
|---|---|---|
| | CC | Cement Concrete |
| | AC | Asphalt Concrete |
| | CR | Crushed Rock/ Quarry Spalls |
| | TS | Topsoil/ Forest Duff/Sod |

**Measured groundwater level in exploration, well, or piezometer**

**Groundwater observed at time of exploration**

**Perched water observed at time of exploration**

**Measured free product in well or piezometer**

### Stratigraphic Contact

**Distinct contact between soil strata or geologic units**

**Gradual change between soil strata or geologic units**

**Approximate location of soil strata change within a geologic soil unit**

### Sampler Symbol Descriptions

**2.4-inch I.D. split barrel**

**Standard Penetration Test (SPT)**

**Shelby tube**

**Piston**

**Direct-Push**

**Bulk or grab**

**Blowcount is recorded for driven samplers as the number of blows required to advance sampler 12 inches (or distance noted). See exploration log for hammer weight and drop.**

**A "P" indicates sampler pushed using the weight of the drill rig.**

### Laboratory / Field Tests

| | |
|---|---|
| %F | Percent fines |
| AL | Atterberg limits |
| CA | Chemical analysis |
| CP | Laboratory compaction test |
| CS | Consolidation test |
| DS | Direct shear |
| HA | Hydrometer analysis |
| MC | Moisture content |
| MD | Moisture content and dry density |
| OC | Organic content |
| PM | Permeability or hydraulic conductivity |
| PP | Pocket penetrometer |
| SA | Sieve analysis |
| TX | Triaxial compression |
| UC | Unconfined compression |
| VS | Vane shear |

### Sheen Classification

| | |
|---|---|
| NS | No Visible Sheen |
| SS | Slight Sheen |
| MS | Moderate Sheen |
| HS | Heavy Sheen |
| NT | Not Tested |

NOTE: The reader must refer to the discussion in the report text and the logs of explorations for a proper understanding of subsurface conditions. Descriptions on the logs apply only at the specific exploration locations and at the time the explorations were made; they are not warranted to be representative of subsurface conditions at other locations or times.

**KEY TO EXPLORATION LOGS**

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**FIGURE A-1**

Date Excavated: 11/30/2007 Logged by: RST

Equipment: CAT 303 Mini Track Hoe Surface Elevation (ft): 11

| Elevation feet | Depth feet | Sample | Sample Number | Analytical Testing | Graphic Log | Group Symbol | MATERIAL DESCRIPTION | Sheen | Headspace Vapor PPM | OTHER TESTS AND NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | | | | | CR | Gray fine crushed rock (fill) | | | |
| | | | | | | SP | Gray-brown fine to medium sand with gravel and occasional shell fragments (dry) (fill) | | | |
| 10 | | | | | | | | | | |
| | | | 1 | | | | | NS | <1 | |
| | | | 2 | | | | | NS | <1 | |
| | 5 | | | | | SM | Gray silty fine to medium sand with gravel and occasional shell fragments (moist) (fill) | | | |
| 5 | | | 3 | CA | | | | NS | <1 | |
| | | | 4 | CA | | | Wood debris near base of test pit | SS | <1 | |
| | | | | | | | Test pit completed at 8 feet<br>Slight groundwater seepage observed at 7 feet bgs | | | |
| | 10 | | | | | | | | | |

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

## LOG OF TEST PIT TP-1

GeoEngineers

Project: Former Shell Tank Farm
Project Location: 13th & Q Avenue, Anacortes, Washington
Project Number: 5147-012-00

FIGURE A-2
Sheet 1 of 1

V6_ENVTPIT P:\5\5147012\00\FINALS\5147012000.GPJ GEIV6_1.GDT 4/4/08

Date Excavated: 11/30/2007 Logged by: RST

Equipment: CAT 303 Mini Track Hoe Surface Elevation (ft): 11

| Elevation feet | Depth feet | Sample | Sample Number | Analytical Testing | Graphic Log | Group Symbol | MATERIAL DESCRIPTION | Sheen | Headspace Vapor PPM | OTHER TESTS AND NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | | | | | CR | Gray fine crushed rock (fill) | | | |
| | | | | | | SP | Light brown fine to medium sand with occasional gravel and shell fragments (dry) (fill) | | | |
| 10 | | | | | | | | | | |
| | | X | 1 | | | | | NS | <1 | |
| | | | | | | ML | Gray silt with fine to coarse sand and gravel (moist) (fill) | | | |
| | | X | 2 | CA | | | | NS | <1 | |
| | 5 | | | | | | | | | |
| 5 | | X | 3 | | | | | NS | <1 | |
| | | X | 4 | | | | | NS | <1 | |
| | | | | | | | Test pit completed at 8 feet<br>Slight groundwater seepage observed at 7 feet bgs | | | |
| | 10 | | | | | | | | | |

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

## LOG OF TEST PIT TP-2

GeoEngineers

Project: Former Shell Tank Farm
Project Location: 13th & Q Avenue, Anacortes, Washington
Project Number: 5147-012-00

FIGURE A-3
Sheet 1 of 1

V6_ENVTPIT P:\5\5147012\00\FINALS\5147012000.GPJ GEIV6_1.GDT 4/4/08

Date Excavated: 11/30/2007 Logged by: RST

Equipment: CAT 303 Mini Track Hoe Surface Elevation (ft): 10

| Elevation feet | Depth feet | Sample | Sample Number | Analytical Testing | Graphic Log | Group Symbol | MATERIAL DESCRIPTION | Sheen | Headspace Vapor PPM | OTHER TESTS AND NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| 10 | 0 | | | | | CR | Gray crushed rock (fill) | | | |
| | | | | | | SM | Brown silty fine to medium sand (moist) (fill) | | | |
| | | | | | | ML | Gray silt with occasional shell fragments (dry) (fill) | | | |
| | | | 1 | | | | | NS | <1 | |
| | | | 2 | | | | | NS | <1 | |
| 5 | 5 | | | | | SM | Interbedded gray silty fine sand and brown organic silt (wet) | | | |
| | | | 3 | | | | | NS | <1 | |
| | | | 4 | CA | | | | NS | <1 | |
| | | | | | | | Test pit completed at 8 feet<br>No groundwater seepage observed | | | |
| 0 | 10 | | | | | | | | | |

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

## LOG OF TEST PIT TP-3

GeoEngineers

Project: Former Shell Tank Farm
Project Location: 13th & Q Avenue, Anacortes, Washington
Project Number: 5147-012-00

FIGURE A-4
Sheet 1 of 1

V6_ENVTPIT P:\5\5147012\00\FINALS\5147012000.GPJ GEIV6_1.GDT 4/4/08

Date Excavated: 11/30/2007 Logged by: RST

Equipment: CAT 303 Mini Track Hoe Surface Elevation (ft): 10

| Elevation feet | Depth feet | Sample | Sample Number | Analytical Testing | Graphic Log | Group Symbol | MATERIAL DESCRIPTION | Sheen | Headspace Vapor PPM | OTHER TESTS AND NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| 10 | 0 | | | | | CR | Gray fine crushed rock (fill) | | | |
| | | | | | | SP | Gray fine sand (moist) (fill) | | | |
| | | | | | | ML | Gray silt with fine sand and occasional shell fragments (moist) (fill) | | | |
| | | | 1 | CA | | | | NS | <1 | |
| | | | 2 | | | | | NS | <1 | |
| 5 | 5 | | | | | SP | Gray fine to medium sand with occasional shell fragments (moist to wet) (fill) | | | |
| | | | 3 | | | | | NS | <1 | |
| | | | 4 | | | | | NS | <1 | |
| | | | | | | | Test pit completed at 8 feet<br>Slight groundwater seepage observed at 7 feet bgs | | | |
| 0 | 10 | | | | | | | | | |

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

## LOG OF TEST PIT TP-4

GeoEngineers

Project: Former Shell Tank Farm
Project Location: 13th & Q Avenue, Anacortes, Washington
Project Number: 5147-012-00

FIGURE A-5
Sheet 1 of 1

V6_ENVTPIT P:\5\5147012\00\FINALS\5147012000.GPJ GEIV6_1.GDT 4/4/08

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# APPENDIX B
## CHEMICAL ANALYTICAL PROGRAM AND DATA

# APPENDIX B
# CHEMICAL ANALYTICAL PROGRAM AND DATA

## SAMPLES

Chain-of-custody procedures were followed during the transport of the field samples to the accredited analytical laboratory. The samples were held in cold storage pending extraction and/or analysis. The analytical results and quality control (QC) records are included in this appendix.

## ANALYTICAL DATA REVIEW

The laboratory maintains an internal quality assurance program as documented in its laboratory quality assurance manual. The laboratory uses a combination of blanks, surrogate recoveries, duplicates, matrix spike recoveries, matrix spike duplicate recoveries, blank spike recoveries and blank spike duplicate recoveries to evaluate the analytical results. The laboratory also uses data quality goals for individual chemicals or groups of chemicals based on the long-term performance of the test methods. The data quality goals were included in the laboratory reports. The laboratory compared each group of samples with the existing data quality goals and noted any exceptions in the laboratory reports. Any data quality exceptions documented by the accredited laboratory were reviewed by GeoEngineers and are addressed in the data quality exception section of this appendix.

## ANALYTICAL DATA REVIEW SUMMARY

Based on our data quality review and the qualifications indicated, it is our opinion that the analytical data are of acceptable quality for their intended use in this report.

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## CERTIFICATE OF ANALYSIS

CLIENT: GEOENGINEERS, INC.
600 STEWART ST. PLAZA 600 BUILDING, SUITE 1700
SEATTLE, WA 98101

DATE: 2/1/2008
CCIL JOB #: 0711151
DATE RECEIVED: 11/30/2007
WDOE ACCREDITATION #: C1336

CLIENT CONTACT: JIM ROTH
CLIENT PROJECT ID: 5147-012-00
CLIENT SAMPLE ID: 11/30/2007 10:25 TP-1-6.0
CCIL SAMPLE #: -03

## DATA RESULTS

| ANALYTE | METHOD | RESULTS* | REPORTING LIMITS | DILUTION FACTOR | UNITS** | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| TPH-Volatile Range | NWTPH-GX | ND | 3 | 1 | MG/KG | 12/4/2007 | DLC |
| TPH-Diesel Range | NWTPH-DX | ND | 50 | 2 | MG/KG | 12/4/2007 | EBS |
| TPH-Oil Range | NWTPH-DX | 1300 | 100 | 2 | MG/KG | 12/4/2007 | EBS |
| Dichlorodifluoromethane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Chloromethane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Vinyl Chloride | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Bromomethane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Chloroethane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Trichlorofluoromethane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Acetone | EPA-8260 | ND | 50 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,1-Dichloroethene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Methylene Chloride | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Acrylonitrile | EPA-8260 | ND | 50 | 1 | UG/KG | 12/3/2007 | GAP |
| Methyl T-Butyl Ether | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,1-Dichloroethane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 2-Butanone | EPA-8260 | ND | 50 | 1 | UG/KG | 12/3/2007 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 2,2-Dichloropropane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Bromochloromethane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Chloroform | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,1-Dichloropropene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Carbon Tetrachloride | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,2-Dichloroethane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Benzene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Trichloroethene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,2-Dichloropropane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Dibromomethane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Bromodichloromethane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 4-Methyl-2-Pentanone | EPA-8260 | ND | 50 | 1 | UG/KG | 12/3/2007 | GAP |
| Toluene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |



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CLIENT CONTACT: JIM ROTH
CLIENT PROJECT ID: 5147-012-00
CLIENT SAMPLE ID: 11/30/2007 10:25 TP-1-6.0
CCIL SAMPLE #: -03

## DATA RESULTS

| ANALYTE | METHOD | RESULTS* | REPORTING LIMITS | DILUTION FACTOR | UNITS** | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Cis-1,3-Dichloropropene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 2-Hexanone | EPA-8260 | ND | 50 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,3-Dichloropropane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Tetrachloroethylene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Dibromochloromethane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,2-Dibromoethane | EPA-8260 | ND | 5 | 1 | UG/KG | 12/3/2007 | GAP |
| Chlorobenzene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Ethylbenzene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| m,p-Xylene | EPA-8260 | ND | 20 | 1 | UG/KG | 12/3/2007 | GAP |
| Styrene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| o-Xylene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Bromoform | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Isopropylbenzene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Bromobenzene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| N-Propyl Benzene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 2-Chlorotoluene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,3,5-Trimethylbenzene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 4-Chlorotoluene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| T-Butyl Benzene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,2,4-Trimethylbenzene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| S-Butyl Benzene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| P-Isopropyltoluene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,3 Dichlorobenzene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| N-Butylbenzene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | ND | 50 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Hexachlorobutadiene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |



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CLIENT PROJECT ID: 5147-012-00
CLIENT SAMPLE ID: 11/30/2007 10:25 TP-1-6.0
CCIL SAMPLE #: -03

## DATA RESULTS

| ANALYTE | METHOD | RESULTS* | REPORTING LIMITS | DILUTION FACTOR | UNITS** | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Naphthalene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Naphthalene | EPA-8270 SIM | ND | 0.02 | 1 | MG/KG | 12/6/2007 | RAL |
| 1-Methylnaphthalene | EPA-8270 SIM | ND | 0.02 | 1 | MG/KG | 12/6/2007 | RAL |
| 2-Methylnaphthalene | EPA-8270 SIM | ND | 0.02 | 1 | MG/KG | 12/6/2007 | RAL |
| Acenaphthylene | EPA-8270 SIM | ND | 0.02 | 1 | MG/KG | 12/6/2007 | RAL |
| Acenaphthene | EPA-8270 SIM | ND | 0.02 | 1 | MG/KG | 12/6/2007 | RAL |
| Fluorene | EPA-8270 SIM | ND | 0.02 | 1 | MG/KG | 12/6/2007 | RAL |
| Phenanthrene | EPA-8270 SIM | ND | 0.02 | 1 | MG/KG | 12/6/2007 | RAL |
| Anthracene | EPA-8270 SIM | ND | 0.02 | 1 | MG/KG | 12/6/2007 | RAL |
| Fluoranthene | EPA-8270 SIM | 0.03 | 0.02 | 1 | MG/KG | 12/6/2007 | RAL |
| Pyrene | EPA-8270 SIM | 0.03 | 0.02 | 1 | MG/KG | 12/6/2007 | RAL |
| Benzo[A]Anthracene | EPA-8270 SIM | ND | 0.02 | 1 | MG/KG | 12/6/2007 | RAL |
| Chrysene | EPA-8270 SIM | 0.06 | 0.02 | 1 | MG/KG | 12/6/2007 | RAL |
| Benzo[B]Fluoranthene | EPA-8270 SIM | 0.04 | 0.02 | 1 | MG/KG | 12/6/2007 | RAL |
| Benzo[K]Fluoranthene | EPA-8270 SIM | 0.02 | 0.02 | 1 | MG/KG | 12/6/2007 | RAL |
| Benzo(A)Pyrene | EPA-8270 SIM | 0.04 | 0.02 | 1 | MG/KG | 12/6/2007 | RAL |
| Indeno[1,2,3-Cd]Pyrene | EPA-8270 SIM | 0.03 | 0.02 | 1 | MG/KG | 12/6/2007 | RAL |
| Dibenz[A,H]Anthracene | EPA-8270 SIM | 0.03 | 0.02 | 1 | MG/KG | 12/6/2007 | RAL |
| Benzo[G,H,I]Perylene | EPA-8270 SIM | 0.07 | 0.02 | 1 | MG/KG | 12/6/2007 | RAL |
| PCB-1016 | EPA-8082 | ND | 0.1 | 1 | MG/KG | 12/4/2007 | RAL |
| PCB-1221 | EPA-8082 | ND | 0.1 | 1 | MG/KG | 12/4/2007 | RAL |
| PCB-1232 | EPA-8082 | ND | 0.1 | 1 | MG/KG | 12/4/2007 | RAL |
| PCB-1242 | EPA-8082 | ND | 0.1 | 1 | MG/KG | 12/4/2007 | RAL |
| PCB-1248 | EPA-8082 | ND | 0.1 | 1 | MG/KG | 12/4/2007 | RAL |
| PCB-1254 | EPA-8082 | ND | 0.1 | 1 | MG/KG | 12/4/2007 | RAL |
| PCB-1260 | EPA-8082 | ND | 0.1 | 1 | MG/KG | 12/4/2007 | RAL |
| Arsenic | EPA-6010 | 8.1 | 52 | 41 | MG/KG | 12/3/2007 | CEO |
| Cadmium | EPA-6010 | 6.4 | 1 | 4 | MG/KG | 12/3/2007 | CEO |
| Chromium | EPA-6010 | 21 | 1 | 4 | MG/KG | 12/3/2007 | CEO |
| Lead | EPA-6010 | 28 | 5 | 4 | MG/KG | 12/3/2007 | CEO |
| Mercury | EPA-7471 | 0.02 | 0.02 | 1 | MG/KG | 12/3/2007 | CEO |



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## CERTIFICATE OF ANALYSIS

CLIENT: GEOENGINEERS, INC.
600 STEWART ST. PLAZA 600 BUILDING, SUITE 1700
SEATTLE, WA 98101

DATE: 2/1/2008
CCIL JOB #: 0711151
DATE RECEIVED: 11/30/2007
WDOE ACCREDITATION #: C1336

CLIENT CONTACT: JIM ROTH
CLIENT PROJECT ID: 5147-012-00
CLIENT SAMPLE ID: 11/30/2007 10:25 TP-1-6.0
CCIL SAMPLE #: -03

## DATA RESULTS

| ANALYTE | METHOD | RESULTS* | REPORTING LIMITS | DILUTION FACTOR | UNITS** | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|

NOTE: CHROMATOGRAM INDICATES SAMPLE CONTAINS PRODUCT WHICH IS LIKELY LUBE OIL.

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES.

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

APPROVED BY:



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DATE: 2/1/2008
CCIL JOB #: 0711151
DATE RECEIVED: 11/30/2007
WDOE ACCREDITATION #: C1336

CLIENT CONTACT: JIM ROTH
CLIENT PROJECT ID: 5147-012-00
CLIENT SAMPLE ID: 11/30/2007 10:30 TP-1-8.0
CCIL SAMPLE #: -04

## DATA RESULTS

| ANALYTE | METHOD | RESULTS* | REPORTING LIMITS | DILUTION FACTOR | UNITS** | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Cadmium | EPA-6010 | ND | 1 | 4 | MG/KG | 1/31/2008 | CEO |

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES.
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DATE RECEIVED: 11/30/2007
WDOE ACCREDITATION #: C1336

CLIENT CONTACT: JIM ROTH
CLIENT PROJECT ID: 5147-012-00
CLIENT SAMPLE ID: 11/30/2007 10:45 TP-2-4.0
CCIL SAMPLE #: -06

## DATA RESULTS

| ANALYTE | METHOD | RESULTS* | REPORTING LIMITS | DILUTION FACTOR | UNITS** | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| TPH-Volatile Range | NWTPH-GX | ND | 3 | 1 | MG/KG | 12/4/2007 | DLC |
| TPH-Diesel Range | NWTPH-DX | ND | 25 | 1 | MG/KG | 12/4/2007 | EBS |
| TPH-Oil Range | NWTPH-DX | ND | 50 | 1 | MG/KG | 12/4/2007 | EBS |
| Dichlorodifluoromethane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Chloromethane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Vinyl Chloride | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Bromomethane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Chloroethane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Trichlorofluoromethane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Acetone | EPA-8260 | ND | 50 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,1-Dichloroethene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Methylene Chloride | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Acrylonitrile | EPA-8260 | ND | 50 | 1 | UG/KG | 12/3/2007 | GAP |
| Methyl T-Butyl Ether | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,1-Dichloroethane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 2-Butanone | EPA-8260 | ND | 50 | 1 | UG/KG | 12/3/2007 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 2,2-Dichloropropane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Bromochloromethane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Chloroform | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,1-Dichloropropene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Carbon Tetrachloride | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,2-Dichloroethane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Benzene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Trichloroethene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,2-Dichloropropane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Dibromomethane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Bromodichloromethane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 4-Methyl-2-Pentanone | EPA-8260 | ND | 50 | 1 | UG/KG | 12/3/2007 | GAP |
| Toluene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |



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600 STEWART ST. PLAZA 600 BUILDING, SUITE 1700
SEATTLE, WA 98101

DATE: 2/1/2008
CCIL JOB #: 0711151
DATE RECEIVED: 11/30/2007
WDOE ACCREDITATION #: C1336

CLIENT CONTACT: JIM ROTH
CLIENT PROJECT ID: 5147-012-00
CLIENT SAMPLE ID: 11/30/2007 10:45 TP-2-4.0
CCIL SAMPLE #: -06

## DATA RESULTS

| ANALYTE | METHOD | RESULTS* | REPORTING LIMITS | DILUTION FACTOR | UNITS** | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Cis-1,3-Dichloropropene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 2-Hexanone | EPA-8260 | ND | 50 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,3-Dichloropropane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Tetrachloroethylene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Dibromochloromethane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,2-Dibromoethane | EPA-8260 | ND | 5 | 1 | UG/KG | 12/3/2007 | GAP |
| Chlorobenzene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Ethylbenzene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| m,p-Xylene | EPA-8260 | ND | 20 | 1 | UG/KG | 12/3/2007 | GAP |
| Styrene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| o-Xylene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Bromoform | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Isopropylbenzene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Bromobenzene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| N-Propyl Benzene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 2-Chlorotoluene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,3,5-Trimethylbenzene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 4-Chlorotoluene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| T-Butyl Benzene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,2,4-Trimethylbenzene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| S-Butyl Benzene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| P-Isopropyltoluene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,3 Dichlorobenzene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| N-Butylbenzene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | ND | 50 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Hexachlorobutadiene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |



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## CERTIFICATE OF ANALYSIS

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DATE: 2/1/2008
CCIL JOB #: 0711151
DATE RECEIVED: 11/30/2007
WDOE ACCREDITATION #: C1336

CLIENT CONTACT: JIM ROTH
CLIENT PROJECT ID: 5147-012-00
CLIENT SAMPLE ID: 11/30/2007 10:45 TP-2-4.0
CCIL SAMPLE #: -06

## DATA RESULTS

| ANALYTE | METHOD | RESULTS* | REPORTING LIMITS | DILUTION FACTOR | UNITS** | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Naphthalene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Naphthalene | EPA-8270 SIM | ND | 0.02 | 1 | MG/KG | 12/6/2007 | RAL |
| 1-Methylnaphthalene | EPA-8270 SIM | ND | 0.02 | 1 | MG/KG | 12/6/2007 | RAL |
| 2-Methylnaphthalene | EPA-8270 SIM | ND | 0.02 | 1 | MG/KG | 12/6/2007 | RAL |
| Acenaphthylene | EPA-8270 SIM | ND | 0.02 | 1 | MG/KG | 12/6/2007 | RAL |
| Acenaphthene | EPA-8270 SIM | ND | 0.02 | 1 | MG/KG | 12/6/2007 | RAL |
| Fluorene | EPA-8270 SIM | ND | 0.02 | 1 | MG/KG | 12/6/2007 | RAL |
| Phenanthrene | EPA-8270 SIM | ND | 0.02 | 1 | MG/KG | 12/6/2007 | RAL |
| Anthracene | EPA-8270 SIM | ND | 0.02 | 1 | MG/KG | 12/6/2007 | RAL |
| Fluoranthene | EPA-8270 SIM | ND | 0.02 | 1 | MG/KG | 12/6/2007 | RAL |
| Pyrene | EPA-8270 SIM | ND | 0.02 | 1 | MG/KG | 12/6/2007 | RAL |
| Benzo[A]Anthracene | EPA-8270 SIM | ND | 0.02 | 1 | MG/KG | 12/6/2007 | RAL |
| Chrysene | EPA-8270 SIM | ND | 0.02 | 1 | MG/KG | 12/6/2007 | RAL |
| Benzo[B]Fluoranthene | EPA-8270 SIM | ND | 0.02 | 1 | MG/KG | 12/6/2007 | RAL |
| Benzo[K]Fluoranthene | EPA-8270 SIM | ND | 0.02 | 1 | MG/KG | 12/6/2007 | RAL |
| Benzo(A)Pyrene | EPA-8270 SIM | ND | 0.02 | 1 | MG/KG | 12/6/2007 | RAL |
| Indeno[1,2,3-Cd]Pyrene | EPA-8270 SIM | ND | 0.02 | 1 | MG/KG | 12/6/2007 | RAL |
| Dibenz[A,H]Anthracene | EPA-8270 SIM | ND | 0.02 | 1 | MG/KG | 12/6/2007 | RAL |
| Benzo[G,H,I]Perylene | EPA-8270 SIM | ND | 0.02 | 1 | MG/KG | 12/6/2007 | RAL |
| PCB-1016 | EPA-8082 | ND | 0.1 | 1 | MG/KG | 12/4/2007 | RAL |
| PCB-1221 | EPA-8082 | ND | 0.1 | 1 | MG/KG | 12/4/2007 | RAL |
| PCB-1232 | EPA-8082 | ND | 0.1 | 1 | MG/KG | 12/4/2007 | RAL |
| PCB-1242 | EPA-8082 | ND | 0.1 | 1 | MG/KG | 12/4/2007 | RAL |
| PCB-1248 | EPA-8082 | ND | 0.1 | 1 | MG/KG | 12/4/2007 | RAL |
| PCB-1254 | EPA-8082 | ND | 0.1 | 1 | MG/KG | 12/4/2007 | RAL |
| PCB-1260 | EPA-8082 | ND | 0.1 | 1 | MG/KG | 12/4/2007 | RAL |
| Arsenic | EPA-6010 | ND | 5 | 4 | MG/KG | 12/3/2007 | CEO |
| Cadmium | EPA-6010 | ND | 1 | 4 | MG/KG | 12/3/2007 | CEO |
| Chromium | EPA-6010 | 31 | 1 | 4 | MG/KG | 12/3/2007 | CEO |
| Lead | EPA-6010 | 5.2 | 5 | 4 | MG/KG | 12/3/2007 | CEO |
| Mercury | EPA-7471 | ND | 0.02 | 1 | MG/KG | 12/3/2007 | CEO |



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WDOE ACCREDITATION #: C1336

CLIENT CONTACT: JIM ROTH
CLIENT PROJECT ID: 5147-012-00
CLIENT SAMPLE ID: 11/30/2007 10:45 TP-2-4.0
CCIL SAMPLE #: -06

## DATA RESULTS

| ANALYTE | METHOD | RESULTS* | REPORTING LIMITS | DILUTION FACTOR | UNITS** | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES.
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600 STEWART ST. PLAZA 600 BUILDING, SUITE 1700
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DATE: 2/1/2008
CCIL JOB #: 0711151
DATE RECEIVED: 11/30/2007
WDOE ACCREDITATION #: C1336

CLIENT CONTACT: JIM ROTH
CLIENT PROJECT ID: 5147-012-00
CLIENT SAMPLE ID: 11/30/2007 11:55 TP-3-8.0
CCIL SAMPLE #: -12

## DATA RESULTS

| ANALYTE | METHOD | RESULTS* | REPORTING LIMITS | DILUTION FACTOR | UNITS** | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| TPH-Volatile Range | NWTPH-GX | ND | 3 | 1 | MG/KG | 12/4/2007 | DLC |
| TPH-Diesel Range | NWTPH-DX | ND | 25 | 1 | MG/KG | 12/3/2007 | EBS |
| TPH-Oil Range | NWTPH-DX | ND | 50 | 1 | MG/KG | 12/3/2007 | EBS |
| Dichlorodifluoromethane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Chloromethane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Vinyl Chloride | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Bromomethane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Chloroethane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Trichlorofluoromethane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Acetone | EPA-8260 | ND | 50 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,1-Dichloroethene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Methylene Chloride | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Acrylonitrile | EPA-8260 | ND | 50 | 1 | UG/KG | 12/3/2007 | GAP |
| Methyl T-Butyl Ether | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,1-Dichloroethane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 2-Butanone | EPA-8260 | ND | 50 | 1 | UG/KG | 12/3/2007 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 2,2-Dichloropropane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Bromochloromethane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Chloroform | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,1-Dichloropropene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Carbon Tetrachloride | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,2-Dichloroethane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Benzene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Trichloroethene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,2-Dichloropropane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Dibromomethane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Bromodichloromethane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 4-Methyl-2-Pentanone | EPA-8260 | ND | 50 | 1 | UG/KG | 12/3/2007 | GAP |
| Toluene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |



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## CERTIFICATE OF ANALYSIS

CLIENT: GEOENGINEERS, INC.
600 STEWART ST. PLAZA 600 BUILDING, SUITE 1700
SEATTLE, WA 98101

DATE: 2/1/2008
CCIL JOB #: 0711151
DATE RECEIVED: 11/30/2007
WDOE ACCREDITATION #: C1336

CLIENT CONTACT: JIM ROTH
CLIENT PROJECT ID: 5147-012-00
CLIENT SAMPLE ID: 11/30/2007 11:55 TP-3-8.0
CCIL SAMPLE #: -12

## DATA RESULTS

| ANALYTE | METHOD | RESULTS* | REPORTING LIMITS | DILUTION FACTOR | UNITS** | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Cis-1,3-Dichloropropene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 2-Hexanone | EPA-8260 | ND | 50 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,3-Dichloropropane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Tetrachloroethylene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Dibromochloromethane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,2-Dibromoethane | EPA-8260 | ND | 5 | 1 | UG/KG | 12/3/2007 | GAP |
| Chlorobenzene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Ethylbenzene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| m,p-Xylene | EPA-8260 | ND | 20 | 1 | UG/KG | 12/3/2007 | GAP |
| Styrene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| o-Xylene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Bromoform | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Isopropylbenzene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Bromobenzene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| N-Propyl Benzene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 2-Chlorotoluene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,3,5-Trimethylbenzene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 4-Chlorotoluene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| T-Butyl Benzene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,2,4-Trimethylbenzene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| S-Butyl Benzene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| P-Isopropyltoluene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,3 Dichlorobenzene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| N-Butylbenzene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | ND | 50 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Hexachlorobutadiene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |



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## CERTIFICATE OF ANALYSIS

CLIENT: GEOENGINEERS, INC.
600 STEWART ST. PLAZA 600 BUILDING, SUITE 1700
SEATTLE, WA 98101

DATE: 2/1/2008
CCIL JOB #: 0711151
DATE RECEIVED: 11/30/2007
WDOE ACCREDITATION #: C1336

CLIENT CONTACT: JIM ROTH
CLIENT PROJECT ID: 5147-012-00
CLIENT SAMPLE ID: 11/30/2007 11:55 TP-3-8.0
CCIL SAMPLE #: -12

## DATA RESULTS

| ANALYTE | METHOD | RESULTS* | REPORTING LIMITS | DILUTION FACTOR | UNITS** | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Naphthalene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Naphthalene | EPA-8270 SIM | ND | 0.02 | 1 | MG/KG | 12/6/2007 | RAL |
| 1-Methylnaphthalene | EPA-8270 SIM | ND | 0.02 | 1 | MG/KG | 12/6/2007 | RAL |
| 2-Methylnaphthalene | EPA-8270 SIM | ND | 0.02 | 1 | MG/KG | 12/6/2007 | RAL |
| Acenaphthylene | EPA-8270 SIM | ND | 0.02 | 1 | MG/KG | 12/6/2007 | RAL |
| Acenaphthene | EPA-8270 SIM | ND | 0.02 | 1 | MG/KG | 12/6/2007 | RAL |
| Fluorene | EPA-8270 SIM | ND | 0.02 | 1 | MG/KG | 12/6/2007 | RAL |
| Phenanthrene | EPA-8270 SIM | ND | 0.02 | 1 | MG/KG | 12/6/2007 | RAL |
| Anthracene | EPA-8270 SIM | ND | 0.02 | 1 | MG/KG | 12/6/2007 | RAL |
| Fluoranthene | EPA-8270 SIM | ND | 0.02 | 1 | MG/KG | 12/6/2007 | RAL |
| Pyrene | EPA-8270 SIM | ND | 0.02 | 1 | MG/KG | 12/6/2007 | RAL |
| Benzo[A]Anthracene | EPA-8270 SIM | ND | 0.02 | 1 | MG/KG | 12/6/2007 | RAL |
| Chrysene | EPA-8270 SIM | ND | 0.02 | 1 | MG/KG | 12/6/2007 | RAL |
| Benzo[B]Fluoranthene | EPA-8270 SIM | ND | 0.02 | 1 | MG/KG | 12/6/2007 | RAL |
| Benzo[K]Fluoranthene | EPA-8270 SIM | ND | 0.02 | 1 | MG/KG | 12/6/2007 | RAL |
| Benzo(A)Pyrene | EPA-8270 SIM | ND | 0.02 | 1 | MG/KG | 12/6/2007 | RAL |
| Indeno[1,2,3-Cd]Pyrene | EPA-8270 SIM | ND | 0.02 | 1 | MG/KG | 12/6/2007 | RAL |
| Dibenz[A,H]Anthracene | EPA-8270 SIM | ND | 0.02 | 1 | MG/KG | 12/6/2007 | RAL |
| Benzo[G,H,I]Perylene | EPA-8270 SIM | ND | 0.02 | 1 | MG/KG | 12/6/2007 | RAL |
| PCB-1016 | EPA-8082 | ND | 0.1 | 1 | MG/KG | 12/4/2007 | RAL |
| PCB-1221 | EPA-8082 | ND | 0.1 | 1 | MG/KG | 12/4/2007 | RAL |
| PCB-1232 | EPA-8082 | ND | 0.1 | 1 | MG/KG | 12/4/2007 | RAL |
| PCB-1242 | EPA-8082 | ND | 0.1 | 1 | MG/KG | 12/4/2007 | RAL |
| PCB-1248 | EPA-8082 | ND | 0.1 | 1 | MG/KG | 12/4/2007 | RAL |
| PCB-1254 | EPA-8082 | ND | 0.1 | 1 | MG/KG | 12/4/2007 | RAL |
| PCB-1260 | EPA-8082 | ND | 0.1 | 1 | MG/KG | 12/4/2007 | RAL |
| Arsenic | EPA-6010 | 5.4 | 5 | 4 | MG/KG | 12/3/2007 | CEO |
| Cadmium | EPA-6010 | ND | 1 | 4 | MG/KG | 12/3/2007 | CEO |
| Chromium | EPA-6010 | 32 | 1 | 4 | MG/KG | 12/3/2007 | CEO |
| Lead | EPA-6010 | 5.8 | 5 | 4 | MG/KG | 12/3/2007 | CEO |
| Mercury | EPA-7471 | 0.03 | 0.02 | 1 | MG/KG | 12/3/2007 | CEO |



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CLIENT SAMPLE ID: 11/30/2007 11:55 TP-3-8.0
CCIL SAMPLE #: -12

## DATA RESULTS

| ANALYTE | METHOD | RESULTS* | REPORTING LIMITS | DILUTION FACTOR | UNITS** | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES.
** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

APPROVED BY:



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CLIENT CONTACT: JIM ROTH
CLIENT PROJECT ID: 5147-012-00
CLIENT SAMPLE ID: 11/30/2007 12:05 TP-4-2.0
CCIL SAMPLE #: -13

## DATA RESULTS

| ANALYTE | METHOD | RESULTS* | REPORTING LIMITS | DILUTION FACTOR | UNITS** | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| TPH-Volatile Range | NWTPH-GX | ND | 3 | 1 | MG/KG | 12/4/2007 | DLC |
| TPH-Diesel Range | NWTPH-DX | ND | 25 | 1 | MG/KG | 12/3/2007 | EBS |
| TPH-Oil Range | NWTPH-DX | ND | 50 | 1 | MG/KG | 12/3/2007 | EBS |
| Dichlorodifluoromethane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Chloromethane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Vinyl Chloride | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Bromomethane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Chloroethane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Trichlorofluoromethane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Acetone | EPA-8260 | ND | 50 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,1-Dichloroethene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Methylene Chloride | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Acrylonitrile | EPA-8260 | ND | 50 | 1 | UG/KG | 12/3/2007 | GAP |
| Methyl T-Butyl Ether | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Trans-1,2-Dichloroethene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,1-Dichloroethane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 2-Butanone | EPA-8260 | ND | 50 | 1 | UG/KG | 12/3/2007 | GAP |
| Cis-1,2-Dichloroethene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 2,2-Dichloropropane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Bromochloromethane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Chloroform | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,1,1-Trichloroethane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,1-Dichloropropene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Carbon Tetrachloride | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,2-Dichloroethane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Benzene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Trichloroethene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,2-Dichloropropane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Dibromomethane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Bromodichloromethane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Trans-1,3-Dichloropropene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 4-Methyl-2-Pentanone | EPA-8260 | ND | 50 | 1 | UG/KG | 12/3/2007 | GAP |
| Toluene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |



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CLIENT SAMPLE ID: 11/30/2007 12:05 TP-4-2.0
CCIL SAMPLE #: -13

## DATA RESULTS

| ANALYTE | METHOD | RESULTS* | REPORTING LIMITS | DILUTION FACTOR | UNITS** | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Cis-1,3-Dichloropropene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,1,2-Trichloroethane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 2-Hexanone | EPA-8260 | ND | 50 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,3-Dichloropropane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Tetrachloroethylene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Dibromochloromethane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,2-Dibromoethane | EPA-8260 | ND | 5 | 1 | UG/KG | 12/3/2007 | GAP |
| Chlorobenzene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,1,1,2-Tetrachloroethane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Ethylbenzene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| m,p-Xylene | EPA-8260 | ND | 20 | 1 | UG/KG | 12/3/2007 | GAP |
| Styrene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| o-Xylene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Bromoform | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Isopropylbenzene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,1,2,2-Tetrachloroethane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,2,3-Trichloropropane | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Bromobenzene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| N-Propyl Benzene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 2-Chlorotoluene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,3,5-Trimethylbenzene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 4-Chlorotoluene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| T-Butyl Benzene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,2,4-Trimethylbenzene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| S-Butyl Benzene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| P-Isopropyltoluene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,3 Dichlorobenzene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,4-Dichlorobenzene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| N-Butylbenzene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,2-Dichlorobenzene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,2-Dibromo 3-Chloropropane | EPA-8260 | ND | 50 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,2,4-Trichlorobenzene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Hexachlorobutadiene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |



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CLIENT CONTACT: JIM ROTH
CLIENT PROJECT ID: 5147-012-00
CLIENT SAMPLE ID: 11/30/2007 12:05 TP-4-2.0
CCIL SAMPLE #: -13

## DATA RESULTS

| ANALYTE | METHOD | RESULTS* | REPORTING LIMITS | DILUTION FACTOR | UNITS** | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| Naphthalene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| 1,2,3-Trichlorobenzene | EPA-8260 | ND | 10 | 1 | UG/KG | 12/3/2007 | GAP |
| Naphthalene | EPA-8270 SIM | ND | 0.02 | 1 | MG/KG | 12/6/2007 | RAL |
| 1-Methylnaphthalene | EPA-8270 SIM | ND | 0.02 | 1 | MG/KG | 12/6/2007 | RAL |
| 2-Methylnaphthalene | EPA-8270 SIM | ND | 0.02 | 1 | MG/KG | 12/6/2007 | RAL |
| Acenaphthylene | EPA-8270 SIM | ND | 0.02 | 1 | MG/KG | 12/6/2007 | RAL |
| Acenaphthene | EPA-8270 SIM | ND | 0.02 | 1 | MG/KG | 12/6/2007 | RAL |
| Fluorene | EPA-8270 SIM | ND | 0.02 | 1 | MG/KG | 12/6/2007 | RAL |
| Phenanthrene | EPA-8270 SIM | ND | 0.02 | 1 | MG/KG | 12/6/2007 | RAL |
| Anthracene | EPA-8270 SIM | ND | 0.02 | 1 | MG/KG | 12/6/2007 | RAL |
| Fluoranthene | EPA-8270 SIM | ND | 0.02 | 1 | MG/KG | 12/6/2007 | RAL |
| Pyrene | EPA-8270 SIM | ND | 0.02 | 1 | MG/KG | 12/6/2007 | RAL |
| Benzo[A]Anthracene | EPA-8270 SIM | ND | 0.02 | 1 | MG/KG | 12/6/2007 | RAL |
| Chrysene | EPA-8270 SIM | ND | 0.02 | 1 | MG/KG | 12/6/2007 | RAL |
| Benzo[B]Fluoranthene | EPA-8270 SIM | ND | 0.02 | 1 | MG/KG | 12/6/2007 | RAL |
| Benzo[K]Fluoranthene | EPA-8270 SIM | ND | 0.02 | 1 | MG/KG | 12/6/2007 | RAL |
| Benzo(A)Pyrene | EPA-8270 SIM | ND | 0.02 | 1 | MG/KG | 12/6/2007 | RAL |
| Indeno[1,2,3-Cd]Pyrene | EPA-8270 SIM | ND | 0.02 | 1 | MG/KG | 12/6/2007 | RAL |
| Dibenz[A,H]Anthracene | EPA-8270 SIM | ND | 0.02 | 1 | MG/KG | 12/6/2007 | RAL |
| Benzo[G,H,I]Perylene | EPA-8270 SIM | ND | 0.02 | 1 | MG/KG | 12/6/2007 | RAL |
| PCB-1016 | EPA-8082 | ND | 0.1 | 1 | MG/KG | 12/4/2007 | RAL |
| PCB-1221 | EPA-8082 | ND | 0.1 | 1 | MG/KG | 12/4/2007 | RAL |
| PCB-1232 | EPA-8082 | ND | 0.1 | 1 | MG/KG | 12/4/2007 | RAL |
| PCB-1242 | EPA-8082 | ND | 0.1 | 1 | MG/KG | 12/4/2007 | RAL |
| PCB-1248 | EPA-8082 | ND | 0.1 | 1 | MG/KG | 12/4/2007 | RAL |
| PCB-1254 | EPA-8082 | ND | 0.1 | 1 | MG/KG | 12/4/2007 | RAL |
| PCB-1260 | EPA-8082 | ND | 0.1 | 1 | MG/KG | 12/4/2007 | RAL |
| Arsenic | EPA-6010 | ND | 5 | 4 | MG/KG | 12/3/2007 | CEO |
| Cadmium | EPA-6010 | ND | 1 | 4 | MG/KG | 12/3/2007 | CEO |
| Chromium | EPA-6010 | 11 | 1 | 4 | MG/KG | 12/3/2007 | CEO |
| Lead | EPA-6010 | ND | 5 | 4 | MG/KG | 12/3/2007 | CEO |
| Mercury | EPA-7471 | ND | 0.02 | 1 | MG/KG | 12/3/2007 | CEO |



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## DATA RESULTS

| ANALYTE | METHOD | RESULTS* | REPORTING LIMITS | DILUTION FACTOR | UNITS** | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES.
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DATE RECEIVED: 11/30/2007
WDOE ACCREDITATION #: C1336

CLIENT CONTACT: JIM ROTH
CLIENT PROJECT ID: 5147-012-00

## QUALITY CONTROL RESULTS

**SURROGATE RECOVERY**

| CCIL SAMPLE ID | METHOD | SUR ID | SPIKE AMOUNT | % RECV |
|---|---|---|---|---|
| 0711151-03 | NWTPH-GX | TFT | 250 PPB | 68 |
| 0711151-03 | NWTPH-DX | C25 | 5 PPM | 112 |
| 0711151-03 | EPA-8260 | 1,2-Dichloroethane-d4 | 100 PPB | 106 |
| 0711151-03 | EPA-8260 | Toluene-d8 | 100 PPB | 101 |
| 0711151-03 | EPA-8260 | 4-Bromofluorobenzene | 100 PPB | 106 |
| 0711151-03 | EPA-8270 SIM | Terphenyl-d14 | 1 PPM | 83 |
| 0711151-03 | EPA-8082 | TCMX | 170 PPB | 91 |
| 0711151-03 | EPA-8082 | DCB | 170 PPB | 84 |
| 0711151-06 | NWTPH-GX | TFT | 250 PPB | 73 |
| 0711151-06 | NWTPH-DX | C25 | 5 PPM | 84 |
| 0711151-06 | EPA-8260 | 1,2-Dichloroethane-d4 | 100 PPB | 108 |
| 0711151-06 | EPA-8260 | Toluene-d8 | 100 PPB | 102 |
| 0711151-06 | EPA-8260 | 4-Bromofluorobenzene | 100 PPB | 117 |
| 0711151-06 | EPA-8270 SIM | Terphenyl-d14 | 1 PPM | 107 |
| 0711151-06 | EPA-8082 | TCMX | 170 PPB | 76 |
| 0711151-06 | EPA-8082 | DCB | 170 PPB | 80 |
| 0711151-12 | NWTPH-GX | TFT | 250 PPB | 62 |
| 0711151-12 | NWTPH-DX | C25 | 5 PPM | 108 |
| 0711151-12 | EPA-8260 | 1,2-Dichloroethane-d4 | 100 PPB | 107 |
| 0711151-12 | EPA-8260 | Toluene-d8 | 100 PPB | 101 |
| 0711151-12 | EPA-8260 | 4-Bromofluorobenzene | 100 PPB | 102 |
| 0711151-12 | EPA-8270 SIM | Terphenyl-d14 | 1 PPM | 95 |
| 0711151-12 | EPA-8082 | TCMX | 170 PPB | 77 |
| 0711151-12 | EPA-8082 | DCB | 170 PPB | 72 |
| 0711151-13 | NWTPH-GX | TFT | 250 PPB | 87 |
| 0711151-13 | NWTPH-DX | C25 | 5 PPM | 100 |
| 0711151-13 | EPA-8260 | 1,2-Dichloroethane-d4 | 100 PPB | 108 |
| 0711151-13 | EPA-8260 | Toluene-d8 | 100 PPB | 100 |
| 0711151-13 | EPA-8260 | 4-Bromofluorobenzene | 100 PPB | 103 |
| 0711151-13 | EPA-8270 SIM | Terphenyl-d14 | 1 PPM | 112 |
| 0711151-13 | EPA-8082 | TCMX | 170 PPB | 99 |
| 0711151-13 | EPA-8082 | DCB | 170 PPB | 98 |



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## CERTIFICATE OF ANALYSIS

CLIENT: GEOENGINEERS, INC.
600 STEWART ST. PLAZA 600 BUILDING, SUITE 1700
SEATTLE, WA 98101

DATE: 2/1/2008
CCIL JOB #: 0711151
DATE RECEIVED: 11/30/2007
WDOE ACCREDITATION #: C1336

CLIENT CONTACT: JIM ROTH
CLIENT PROJECT ID: 5147-012-00

## QUALITY CONTROL RESULTS

### BLANK RESULTS

| METHOD | RESULT | ASSOCIATED SAMPLES |
|---|---|---|
| NWTPH-GX (TPH-Volatile Range) | ND(<3) | 0711151 -3, 6, 12, 13 |
| NWTPH-DX (TPH-Diesel Range) | ND(<25) | 0711151 -3, 6, 12, 13 |
| NWTPH-DX (TPH-Oil Range) | ND(<50) | 0711151 -3, 6, 12, 13 |
| EPA-8260 (Dichlorodifluoromethane) | ND(<10) | 0711151 -3, 6, 12, 13 |
| EPA-8260 (Chloromethane) | ND(<10) | 0711151 -3, 6, 12, 13 |
| EPA-8260 (Vinyl Chloride) | ND(<10) | 0711151 -3, 6, 12, 13 |
| EPA-8260 (Bromomethane) | ND(<10) | 0711151 -3, 6, 12, 13 |
| EPA-8260 (Chloroethane) | ND(<10) | 0711151 -3, 6, 12, 13 |
| EPA-8260 (Trichlorofluoromethane) | ND(<10) | 0711151 -3, 6, 12, 13 |
| EPA-8260 (Acetone) | ND(<50) | 0711151 -3, 6, 12, 13 |
| EPA-8260 (1,1-Dichloroethene) | ND(<10) | 0711151 -3, 6, 12, 13 |
| EPA-8260 (Methylene Chloride) | ND(<10) | 0711151 -3, 6, 12, 13 |
| EPA-8260 (Acrylonitrile) | ND(<50) | 0711151 -3, 6, 12, 13 |
| EPA-8260 (Methyl T-Butyl Ether) | ND(<10) | 0711151 -3, 6, 12, 13 |
| EPA-8260 (Trans-1,2-Dichloroethene) | ND(<10) | 0711151 -3, 6, 12, 13 |
| EPA-8260 (1,1-Dichloroethane) | ND(<10) | 0711151 -3, 6, 12, 13 |
| EPA-8260 (2-Butanone) | ND(<50) | 0711151 -3, 6, 12, 13 |
| EPA-8260 (Cis-1,2-Dichloroethene) | ND(<10) | 0711151 -3, 6, 12, 13 |
| EPA-8260 (2,2-Dichloropropane) | ND(<10) | 0711151 -3, 6, 12, 13 |
| EPA-8260 (Bromochloromethane) | ND(<10) | 0711151 -3, 6, 12, 13 |
| EPA-8260 (Chloroform) | ND(<10) | 0711151 -3, 6, 12, 13 |
| EPA-8260 (1,1,1-Trichloroethane) | ND(<10) | 0711151 -3, 6, 12, 13 |
| EPA-8260 (1,1-Dichloropropene) | ND(<10) | 0711151 -3, 6, 12, 13 |
| EPA-8260 (Carbon Tetrachloride) | ND(<10) | 0711151 -3, 6, 12, 13 |
| EPA-8260 (1,2-Dichloroethane) | ND(<10) | 0711151 -3, 6, 12, 13 |
| EPA-8260 (Benzene) | ND(<10) | 0711151 -3, 6, 12, 13 |
| EPA-8260 (Trichloroethene) | ND(<10) | 0711151 -3, 6, 12, 13 |
| EPA-8260 (1,2-Dichloropropane) | ND(<10) | 0711151 -3, 6, 12, 13 |
| EPA-8260 (Dibromomethane) | ND(<10) | 0711151 -3, 6, 12, 13 |
| EPA-8260 (Bromodichloromethane) | ND(<10) | 0711151 -3, 6, 12, 13 |
| EPA-8260 (Trans-1,3-Dichloropropene) | ND(<10) | 0711151 -3, 6, 12, 13 |
| EPA-8260 (4-Methyl-2-Pentanone) | ND(<50) | 0711151 -3, 6, 12, 13 |
| EPA-8260 (Toluene) | ND(<10) | 0711151 -3, 6, 12, 13 |



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## CERTIFICATE OF ANALYSIS

CLIENT: GEOENGINEERS, INC.
600 STEWART ST. PLAZA 600 BUILDING, SUITE 1700
SEATTLE, WA 98101

DATE: 2/1/2008
CCIL JOB #: 0711151
DATE RECEIVED: 11/30/2007
WDOE ACCREDITATION #: C1336

CLIENT CONTACT: JIM ROTH
CLIENT PROJECT ID: 5147-012-00

## QUALITY CONTROL RESULTS

### BLANK RESULTS

| METHOD | RESULT | ASSOCIATED SAMPLES |
|---|---|---|
| EPA-8260 (Cis-1,3-Dichloropropene) | ND(<10) | 0711151 -3, 6, 12, 13 |
| EPA-8260 (1,1,2-Trichloroethane) | ND(<10) | 0711151 -3, 6, 12, 13 |
| EPA-8260 (2-Hexanone) | ND(<50) | 0711151 -3, 6, 12, 13 |
| EPA-8260 (1,3-Dichloropropane) | ND(<10) | 0711151 -3, 6, 12, 13 |
| EPA-8260 (Tetrachloroethylene) | ND(<10) | 0711151 -3, 6, 12, 13 |
| EPA-8260 (Dibromochloromethane) | ND(<10) | 0711151 -3, 6, 12, 13 |
| EPA-8260 (1,2-Dibromoethane) | ND(<5) | 0711151 -3, 6, 12, 13 |
| EPA-8260 (Chlorobenzene) | ND(<10) | 0711151 -3, 6, 12, 13 |
| EPA-8260 (1,1,1,2-Tetrachloroethane) | ND(<10) | 0711151 -3, 6, 12, 13 |
| EPA-8260 (Ethylbenzene) | ND(<10) | 0711151 -3, 6, 12, 13 |
| EPA-8260 (m,p-Xylene) | ND(<20) | 0711151 -3, 6, 12, 13 |
| EPA-8260 (Styrene) | ND(<10) | 0711151 -3, 6, 12, 13 |
| EPA-8260 (o-Xylene) | ND(<10) | 0711151 -3, 6, 12, 13 |
| EPA-8260 (Bromoform) | ND(<10) | 0711151 -3, 6, 12, 13 |
| EPA-8260 (Isopropylbenzene) | ND(<10) | 0711151 -3, 6, 12, 13 |
| EPA-8260 (1,1,2,2-Tetrachloroethane) | ND(<10) | 0711151 -3, 6, 12, 13 |
| EPA-8260 (1,2,3-Trichloropropane) | ND(<10) | 0711151 -3, 6, 12, 13 |
| EPA-8260 (Bromobenzene) | ND(<10) | 0711151 -3, 6, 12, 13 |
| EPA-8260 (N-Propyl Benzene) | ND(<10) | 0711151 -3, 6, 12, 13 |
| EPA-8260 (2-Chlorotoluene) | ND(<10) | 0711151 -3, 6, 12, 13 |
| EPA-8260 (1,3,5-Trimethylbenzene) | ND(<10) | 0711151 -3, 6, 12, 13 |
| EPA-8260 (4-Chlorotoluene) | ND(<10) | 0711151 -3, 6, 12, 13 |
| EPA-8260 (T-Butyl Benzene) | ND(<10) | 0711151 -3, 6, 12, 13 |
| EPA-8260 (1,2,4-Trimethylbenzene) | ND(<10) | 0711151 -3, 6, 12, 13 |
| EPA-8260 (S-Butyl Benzene) | ND(<10) | 0711151 -3, 6, 12, 13 |
| EPA-8260 (P-Isopropyltoluene) | ND(<10) | 0711151 -3, 6, 12, 13 |
| EPA-8260 (1,3 Dichlorobenzene) | ND(<10) | 0711151 -3, 6, 12, 13 |
| EPA-8260 (1,4-Dichlorobenzene) | ND(<10) | 0711151 -3, 6, 12, 13 |
| EPA-8260 (N-Butylbenzene) | ND(<10) | 0711151 -3, 6, 12, 13 |
| EPA-8260 (1,2-Dichlorobenzene) | ND(<10) | 0711151 -3, 6, 12, 13 |
| EPA-8260 (1,2-Dibromo 3-Chloropropane) | ND(<50) | 0711151 -3, 6, 12, 13 |
| EPA-8260 (1,2,4-Trichlorobenzene) | ND(<10) | 0711151 -3, 6, 12, 13 |
| EPA-8260 (Hexachlorobutadiene) | ND(<10) | 0711151 -3, 6, 12, 13 |



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## CERTIFICATE OF ANALYSIS

CLIENT: GEOENGINEERS, INC.
600 STEWART ST. PLAZA 600 BUILDING, SUITE 1700
SEATTLE, WA 98101

DATE: 2/1/2008
CCIL JOB #: 0711151
DATE RECEIVED: 11/30/2007
WDOE ACCREDITATION #: C1336

CLIENT CONTACT: JIM ROTH
CLIENT PROJECT ID: 5147-012-00

## QUALITY CONTROL RESULTS

### BLANK RESULTS

| METHOD | RESULT | ASSOCIATED SAMPLES |
|---|---|---|
| EPA-8260 (Naphthalene) | ND(<10) | 0711151 -3, 6, 12, 13 |
| EPA-8260 (1,2,3-Trichlorobenzene) | ND(<10) | 0711151 -3, 6, 12, 13 |
| EPA-8270 SIM (Naphthalene) | ND(<0.02) | 0711151 -3, 6, 12, 13 |
| EPA-8270 SIM (1-Methylnaphthalene) | ND(<0.02) | 0711151 -3, 6, 12, 13 |
| EPA-8270 SIM (2-Methylnaphthalene) | ND(<0.02) | 0711151 -3, 6, 12, 13 |
| EPA-8270 SIM (Acenaphthylene) | ND(<0.02) | 0711151 -3, 6, 12, 13 |
| EPA-8270 SIM (Acenaphthene) | ND(<0.02) | 0711151 -3, 6, 12, 13 |
| EPA-8270 SIM (Fluorene) | ND(<0.02) | 0711151 -3, 6, 12, 13 |
| EPA-8270 SIM (Phenanthrene) | ND(<0.02) | 0711151 -3, 6, 12, 13 |
| EPA-8270 SIM (Anthracene) | ND(<0.02) | 0711151 -3, 6, 12, 13 |
| EPA-8270 SIM (Fluoranthene) | ND(<0.02) | 0711151 -3, 6, 12, 13 |
| EPA-8270 SIM (Pyrene) | ND(<0.02) | 0711151 -3, 6, 12, 13 |
| EPA-8270 SIM (Benzo[A]Anthracene) | ND(<0.02) | 0711151 -3, 6, 12, 13 |
| EPA-8270 SIM (Chrysene) | ND(<0.02) | 0711151 -3, 6, 12, 13 |
| EPA-8270 SIM (Benzo[B]Fluoranthene) | ND(<0.02) | 0711151 -3, 6, 12, 13 |
| EPA-8270 SIM (Benzo[K]Fluoranthene) | ND(<0.02) | 0711151 -3, 6, 12, 13 |
| EPA-8270 SIM (Benzo(A)Pyrene) | ND(<0.02) | 0711151 -3, 6, 12, 13 |
| EPA-8270 SIM (Indeno[1,2,3-Cd]Pyrene) | ND(<0.02) | 0711151 -3, 6, 12, 13 |
| EPA-8270 SIM (Dibenz[A,H]Anthracene) | ND(<0.02) | 0711151 -3, 6, 12, 13 |
| EPA-8270 SIM (Benzo[G,H,I]Perylene) | ND(<0.02) | 0711151 -3, 6, 12, 13 |
| EPA-8082 (PCB-1016) | ND(<0.1) | 0711151 -3, 6, 12, 13 |
| EPA-8082 (PCB-1221) | ND(<0.1) | 0711151 -3, 6, 12, 13 |
| EPA-8082 (PCB-1232) | ND(<0.1) | 0711151 -3, 6, 12, 13 |
| EPA-8082 (PCB-1242) | ND(<0.1) | 0711151 -3, 6, 12, 13 |
| EPA-8082 (PCB-1248) | ND(<0.1) | 0711151 -3, 6, 12, 13 |
| EPA-8082 (PCB-1254) | ND(<0.1) | 0711151 -3, 6, 12, 13 |
| EPA-8082 (PCB-1260) | ND(<0.1) | 0711151 -3, 6, 12, 13 |
| EPA-6010 (Arsenic) | ND(<5.0) | 0711151 -3, 6, 12, 13 |
| EPA-6010 (Cadmium) | ND(<1.0) | 0711151 -4 |
| EPA-6010 (Cadmium) | ND(<1.0) | 0711151 -3, 6, 12, 13 |
| EPA-6010 (Chromium) | ND(<1.0) | 0711151 -3, 6, 12, 13 |
| EPA-6010 (Lead) | ND(<5.0) | 0711151 -3, 6, 12, 13 |
| EPA-7471 (Mercury) | ND(<0.02) | 0711151 -3, 6, 12, 13 |



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## CERTIFICATE OF ANALYSIS

CLIENT: GEOENGINEERS, INC.
600 STEWART ST. PLAZA 600 BUILDING, SUITE 1700
SEATTLE, WA 98101

DATE: 2/1/2008
CCIL JOB #: 0711151
DATE RECEIVED: 11/30/2007
WDOE ACCREDITATION #: C1336

CLIENT CONTACT: JIM ROTH
CLIENT PROJECT ID: 5147-012-00

## QUALITY CONTROL RESULTS

**SPIKE/SPIKE DUPLICATE RESULTS**

| METHOD | ANALYTE | ASSOCIATED SAMPLES | SPIKE AMOUNT | DILUTION FACTOR | SPIKE RECOVERY | SPIKE DUP RECOVERY | RPD |
|---|---|---|---|---|---|---|---|
| NWTPH-GX | TPH-Volatile Range | 0711151 -3, 6, 12, 13 | 25 MG/KG | 1 | 76 % | 75 % | 1 |
| NWTPH-DX | TPH-Diesel Range | 0711151 -3, 6, 12, 13 | 125 MG/KG | 1 | 92 % | 93 % | 1 |
| EPA-8260 | 1,1-Dichloroethene | 0711151 -3, 6, 12, 13 | 10 UG/KG | 1 | 91 % | 85 % | 6 |
| EPA-8260 | Benzene | 0711151 -3, 6, 12, 13 | 10 UG/KG | 1 | 94 % | 92 % | 2 |
| EPA-8260 | Trichloroethene | 0711151 -3, 6, 12, 13 | 10 UG/KG | 1 | 90 % | 87 % | 3 |
| EPA-8260 | Toluene | 0711151 -3, 6, 12, 13 | 10 UG/KG | 1 | 93 % | 90 % | 3 |
| EPA-8260 | Chlorobenzene | 0711151 -3, 6, 12, 13 | 10 UG/KG | 1 | 96 % | 95 % | 1 |
| EPA-8270 SIM | Naphthalene | 0711151 -3, 6, 12, 13 | 0.5 MG/KG | 1 | 91 % | 100 % | 10 |
| EPA-8270 SIM | Acenaphthene | 0711151 -3, 6, 12, 13 | 0.5 MG/KG | 1 | 89 % | 99 % | 10 |
| EPA-8270 SIM | Pyrene | 0711151 -3, 6, 12, 13 | 0.5 MG/KG | 1 | 113 % | 124 % | 10 |
| EPA-8270 SIM | Benzo[G,H,I]Perylene | 0711151 -3, 6, 12, 13 | 0.5 MG/KG | 1 | 96 % | 109 % | 13 |
| EPA-8082 | PCB-1016 | 0711151 -3, 6, 12, 13 | 0.17 MG/KG | 1 | 114 % | 118 % | 3 |
| EPA-8082 | PCB-1260 | 0711151 -3, 6, 12, 13 | 0.17 MG/KG | 1 | 114 % | 118 % | 3 |
| EPA-6010 | Arsenic | 0711151 -3, 6, 12, 13 | 20 MG/KG | 1 | 93 % | 96 % | 3 |
| EPA-6010 | Cadmium | 0711151 -4 | 20 MG/KG | 1 | 101 % | 101 % | 0 |
| EPA-6010 | Cadmium | 0711151 -3, 6, 12, 13 | 20 MG/KG | 1 | 92 % | 94 % | 2 |
| EPA-6010 | Chromium | 0711151 -3, 6, 12, 13 | 20 MG/KG | 1 | 94 % | 96 % | 2 |
| EPA-6010 | Lead | 0711151 -3, 6, 12, 13 | 20 MG/KG | 1 | 93 % | 94 % | 1 |
| EPA-7471 | Mercury | 0711151 -3, 6, 12, 13 | 1 MG/KG | 1 | 92 % | 93 % | 1 |

APPROVED BY:



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CCI Analytical Laboratories
8620 Holly Drive
Everett, WA 98208
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(206) 292-9059 Seattle
(425) 356-2626 Fax
http://www.ccilabs.com

# Chain Of Custody/ Laboratory Analysis Request

CCI Job# (Laboratory Use Only) 71151

Date 11-30-07 Page 1 Of 2

PROJECT ID: 5147-012-00
REPORT TO COMPANY: GeoEngineers
PROJECT MANAGER: Jim Roth
ADDRESS: 600 Stewart St. Suite 1700
Seattle Wa
PHONE: 728-6274 FAX:
P.O. NUMBER: 26 E-MAIL:
INVOICE TO COMPANY:
ATTENTION: SAME
ADDRESS:

ANALYSIS REQUESTED

| SAMPLE I.D. | DATE | TIME | TYPE | LAB# | NWTPH-HCID | NWTPH-DX | NWTPH-GX | BTEX by EPA-8021 | MTBE by EPA-8021 ☐ EPA-8260 ☐ | Halogenated Volatiles by EPA 8260 | Volatile Organic Compounds by EPA 8260 | EDB / EDC by EPA 8260 SIM (water) | EDB / EDC by EPA 8260 (soil) | Semivolatile Organic Compounds by EPA 8270 | Polycyclic Aromatic Hydrocarbons (PAH) by EPA-8270 SIM ☐ | PCB ☒ Pesticides ☐ by EPA 8081/8082 | Metals-MTCA-5 ☒ RCRA-8 ☐ Pri Pol ☐ TAL ☐ | Metals Other (Specify) | TCLP-Metals ☐ VOA ☐ Semi-Vol ☐ Pest ☐ Herbs ☐ | OTHER (Specify) Cadmium Allel 1/30/08 | NUMBER OF CONTAINERS | RECEIVED IN GOOD CONDITION? |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. TP-1-2.0 | 11-30-07 | 1015 | S | 1 | | | | | | | | | | | | | | | | | 5 | |
| 2. TP-1-4.0 | | 1020 | | 2 | | | | | | | | | | | | | | | | | 2 | |
| 3. TP-1-6.0 | | 1025 | | 3 | | X | X | | | | X | | | | ⊗ | X | X | | | | 5 | |
| 4. TP-1-8.0 | | 1030 | | 4 | | | | | | | | | | | | | | | | | 2 | |
| 5. TP-2-2.0 | | 1040 | | 5 | | | | | | | | | | | | | | | | | 2 | |
| 6. TP-2-4.0 | | 1045 | | 6 | | X | X | | | | X | | | | ⊗ | X | X | | | | 5 | |
| 7. TP-2-6.0 | | 1050 | | 7 | | | | | | | | | | | | | | | | | 5 | |
| 8. TP-2-8.0 | | 1055 | | 8 | | | | | | | | | | | | | | | | | 3 | |
| 9. TP-3-2.0 | | 1140 | | 9 | | | | | | | | | | | | | | | | | 2 | |
| 10. TP-3-4.0 | | 1145 | | 10 | | | | | | | | | | | | | | | | | 5 | |

LABORATORY COPY

SPECIAL INSTRUCTIONS Rec'd samples # 1, 3, 6, 7, 10, 12, 13, 15 per 5035 low kits.

CCI Analytical Laboratories, Inc accepts and processes this request on the terms and conditions set forth on the reverse side. By its signature hereon, Customer accepts these terms and conditions.

SIGNATURES (Name, Company, Date, Time):

1. Relinquished By: GEI- 11-30-07 1545
   Received By: Shawn Robinson CCIAL 11/30/07 1545
2. Relinquished By:
   Received By:

TURNAROUND REQUESTED in Business Days*

Organic, Metals & Inorganic Analysis: 10 Standard | 5 | ~~3~~ | 2 | 1 | SAME DAY

Fuels & Hydrocarbon Analysis: 5 Standard | ~~3~~ | 1 | SAME DAY

OTHER:

Specify: cc Greg w/ Chem Results

⊗ Added 12/5/07 Rush by Friday pm

* Turnaround request less than standard may incur Rush Charges

CCI Analytical Laboratories
8620 Holly Drive
Everett, WA 98208
Phone (425) 356-2600
(206) 292-9059 Seattle
(425) 356-2626 Fax
http://www.ccilabs.com

# Chain Of Custody/ Laboratory Analysis Request

CCI Job# (Laboratory Use Only) 71151

Date 11-30-07 Page 2 Of 2

PROJECT ID: 5147-012-00
REPORT TO COMPANY: GeoEngineers
PROJECT MANAGER: Jim Roth
ADDRESS: 600 Stewart St. Suite 1700
Seattle Wa
PHONE: 728-2674 FAX:
P.O. NUMBER: E-MAIL:
INVOICE TO COMPANY:
ATTENTION: SAME
ADDRESS:

ANALYSIS REQUESTED

| SAMPLE I.D. | DATE | TIME | TYPE | LAB# | NWTPH-HCID | NWTPH-DX | NWTPH-GX | BTEX by EPA-8021 | MTBE by EPA-8021 ☐ EPA-8260 ☐ | Halogenated Volatiles by EPA 8260 | Volatile Organic Compounds by EPA 8260 | EDB / EDC by EPA 8260 SIM (water) | EDB / EDC by EPA 8260 (soil) | Semivolatile Organic Compounds by EPA 8270 | Polycyclic Aromatic Hydrocarbons (PAH) by EPA-8270 SIM ☐ | PCB ☒ Pesticides ☐ by EPA 8081/8082 | Metals-MTCA-5 ☒ RCRA-8 ☐ Pri Pol ☐ TAL ☐ | Metals Other (Specify) | TCLP-Metals ☐ VOA ☐ Semi-Vol ☐ Pest ☐ Herbs ☐ | OTHER (Specify) | NUMBER OF CONTAINERS | RECEIVED IN GOOD CONDITION? |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. TP-3-6.0 | 11-30-07 | 1050 | S | 11 | | | | | | | | | | | | | | | | 2 | |
| 2. TP-3-8.0 | | 1155 | | 12 | | X | X | | | | X | | | | X | X | X | | | 5 | |
| 3. TP-4-2.0 | | 1205 | | 13 | | X | X | | | | X | | | | X | X | X | | | 5 | |
| 4. TP-4-4.0 | | 1210 | | 14 | | | | | | | | | | | | | | | | 2 | |
| 5. TP-4-6.0 | | 1215 | | 15 | | | | | | | | | | | | | | | | 5 | |
| 6. TP-4-8.0 | | 1220 | | 16 | | | | | | | | | | | | | | | | 2 | SM |
| 7. | | | | | | | | | | | | | | | | | | | | | |
| 8. | | | | | | | | | | | | | | | | | | | | | |
| 9. | | | | | | | | | | | | | | | | | | | | | |
| 10. | | | | | | | | | | | | | | | | | | | | | |

LABORATORY COPY

SPECIAL INSTRUCTIONS Rec'd samples #1, 3, 6, 7, 10, 12, 13, 15 per 5035 low kits

CCI Analytical Laboratories, Inc accepts and processes this request on the terms and conditions set forth on the reverse side. By its signature hereon, Customer accepts these terms and conditions.

SIGNATURES (Name, Company, Date, Time):

1. Relinquished By: GEI 11-30-07 1545
   Received By: Shawn Robinson CCIAL 11/30/07 1545
2. Relinquished By:
   Received By:

TURNAROUND REQUESTED in Business Days*

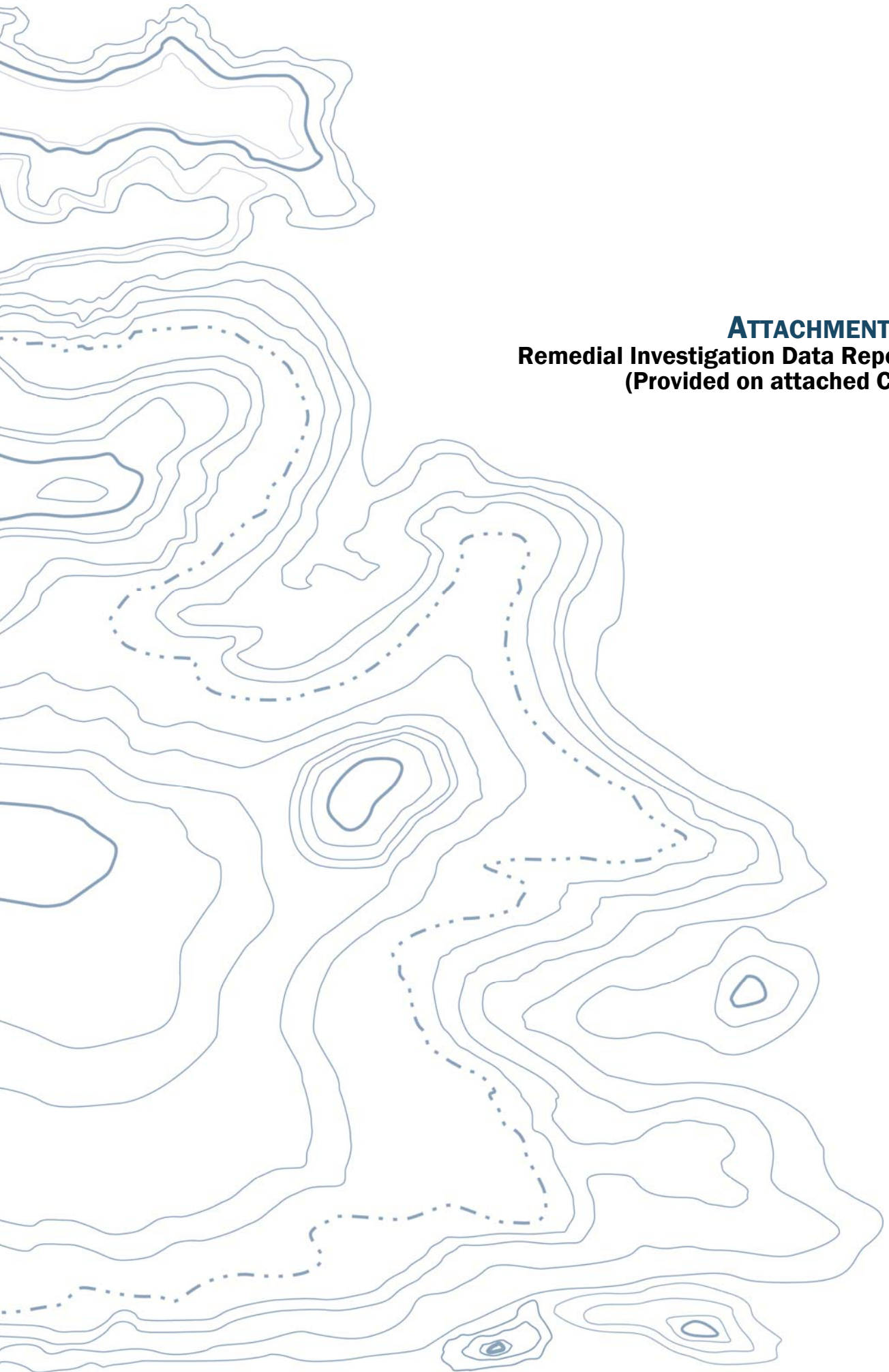
Organic, Metals & Inorganic Analysis: 10 Standard ☐ 5 ☐ ☒ 2 ☐ 1 ☐ SAME DAY ☐

Fuels & Hydrocarbon Analysis: 5 Standard ☐ ☒ 3 ☐ 1 ☐ SAME DAY ☐

OTHER:

Specify: CC: Greg w/ Chem Results

* Turnaround request less than standard may incur Rush Charges



# ATTACHMENT 2

**Remedial Investigation Data Report**
**(Provided on attached CD)**

# Remedial Investigation Data Report

Former Shell Oil Tank Farm
Anacortes, Washington
Ecology Agreed Order No. DE-08TCPHQ-5474

*for*
**Washington State Department of Ecology on Behalf of Port of Anacortes**

April 19, 2013

GeoEngineers

Plaza 600 Building
600 Stewart Street, Suite 1700
Seattle, Washington 98101
206.728.2674

# Remedial Investigation Data Report

# Former Shell Oil Tank Farm
# Anacortes, Washington
# Ecology Agreed Order
# No. DE-08TCPHQ-5474

**File No. 5147-012-02**

**April 19, 2013**

Prepared for:

Washington State Department of Ecology
PO Box 47600
Olympia, Washington 98504-7600

Attention: Sandra Caldwell

On Behalf of:

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GeoEngineers

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## LIST OF ABBREVIATIONS AND ACRONYMS

| | |
|---|---|
| 1,1,1-TCA | 1,1,1-Trichloroethane |
| ASTM | American Society for Testing and Materials |
| BETX | Benzene, ethylbenzene, toluene and xylenes |
| BGS | Below ground surface |
| cPAHs | Carcinogenic polycyclic aromatic hydrocarbons |
| City | City of Anacortes |
| COPC | Contaminants of potential concern |
| DCE | [cis] 1,2-Dichloroethene |
| Ecology | Washington State Department of Ecology |
| EDB | Ethylene dibromide |
| EDC | Ethylene dichloride |
| FS | Feasibility Study |
| GeoEngineers | GeoEngineers, Inc. |
| GPR | Ground penetrating radar |
| HVOCs | Halogenated volatile organic compounds |
| MH | Megahertz |
| MTBE | Methyl tert-butyl ether |
| MTCA | Model Toxics Control Act |
| mg/kg | Milligram per kilogram |
| mg/L | Milligrams per liter |
| MLLW | Mean lower low water |
| NOAA | National Oceanic and Atmospheric Administration |
| PAHs | Polycyclic aromatic hydrocarbons |
| PCBs | Polychlorinated biphenyls |
| PCE | Tetrachloroethylene |
| Port | Port of Anacortes |
| TCE | Trichloroethylene |
| TCFM | Trichlorofluoromethane |
| TEQ | Toxicity equivalent |
| TPH | Total petroleum hydrocarbons |
| RI | Remedial Investigation |

| | |
|---|---|
| UST | Underground Storage Tank |
| VC | Vinyl chloride |
| VOCs | Volatile organic compounds |

# 1.0 INTRODUCTION

This document presents the results of the Remedial Investigation (RI) field study completed for the Former Shell Oil Tank Farm Site (Site) located in Anacortes, Washington. The Site is formally referenced in the Washington State Department of Ecology (Ecology) databases as the Former Shell Oil Tank Farm Site (Ecology Facility Site Identification No. 4781157) and is generally located between 13th Street and 14th East of Commercial Avenue in Anacortes, Washington (Figure 1). The Site is subject to cleanup actions by the Port of Anacortes (Port) in accordance with the requirements of Agreed Order No. DE-08TCPHQ-5474 (Agreed Order; Ecology, 2008). Completion of the RI is a requirement of the Agreed Order scope of work.

The purpose of the RI field study was to collect data to address data gaps identified in the Ecology-approved Former Shell Oil Tank Farm RI/FS Work Plan (Work Plan; GeoEngineers, 2009) to evaluate the nature and extent of contamination in both soil and groundwater. The results of this RI and previous investigations completed at and in the vicinity of the Site are summarized below.

# 2.0 BACKGROUND INFORMATION

## 2.1. Site Description

For the purposes of the RI, the Site is generally divided into two separate areas that are based on the historical use of the property. The two areas are the historical Tank Farm Area and the historical Fuel Supply Line Area. The Tank Farm and Fuel Supply Line Areas are shown relative to the Site on Figure 2.

The historical Tank Farm Area was located between 13th and 14th Streets on Q Avenue. Currently, this portion of the Site is generally flat, surfaced with crushed rock, and has been used as a parking lot for vehicles and boat trailers since the late 1980s. Historically, fuel supply lines were routed off the eastern portion of the Former Tank Farm Area and across Q Avenue through a bulkhead and along a pier that extended into Fidalgo Bay. The pipelines terminated near the end of the historical dock at approximately the location the present day B-Dock (Figure 2). All above ground structures associated with historical operations at the Site have been removed; underground structures at the former Tank Farm have reportedly been removed. However, it is not known whether the historic fuel supply lines remain beneath the ground surface.

Adjacent properties include a McDonald's restaurant to the west that was constructed in the 1970s. The McDonald's property was the site of a Shell automotive service station from the mid-1940s to 1966. The property south of the Tank Farm (across 14th Street) was a transformer storage facility for Puget Sound Power and Light from the 1940s until 1970, when the current power distribution station (substation) was constructed. A Safeway grocery store is located north of the Site, across 13th Street. Parking lots and commercial buildings on Port property and the Cap Sante Boat Haven are located east-northeast of the Site across Q Street (Figure 2).

## 2.2. Historical Operations and Site Uses

The Tank Farm Area was originally a portion of the Fidalgo Bay tide flats, which were filled to the current grade (up to the former bulkhead just east of Q Avenue shown on Figure 2) between 1925 and 1929. The property was acquired by the Port in 1929 and leased to Shell Oil Company in 1930 for use as a bulk fuel storage and distribution facility that primarily handled gasoline and diesel fuels. Prior to 1947, the area east of Q Avenue (east of the former Tank Farm Area) consisted of tide flats. From 1930 to approximately 1947, the historic fuel supply lines hung from historic fuel pier over the tide flats east of Q Avenue. In the late 1940s to early 1950s, the area east of Q Avenue was filled with dredged material from the adjacent federal waterway, and a second bulkhead was constructed farther to the east near the current shore of Fidalgo Bay (Figure 2). During this time, the hanging fuel lines were re-configured as underground lines. The Site operated as a bulk fuel storage facility under Shell and various bulk product distributors until 1987. Operations on the property ended in 1987 and the bulk terminal was reportedly decommissioned, including removal of all tanks, associated piping, and Site structures.

Additional information regarding the Site use history is presented in the Work Plan (GeoEngineers, 2009). The approximate locations of the historical pump house, fill stand, underground storage tank (UST), gasoline and diesel above ground storage tanks (ASTs), and associated product supply lines are shown on Figure 2.

## 2.3. Previous Investigations

Previous soil and groundwater investigations completed within and/or adjacent to the Historic Fuel Supply Line and Tank Farm Areas include:

- Preliminary Environmental Site Assessment in 1987 (Hart Crowser, 1987);
- Limited Due Diligence Investigation in 2005 (Floyd|Snider, 2005);
- Cap Sante Marine Area Remedial Investigation in 2007 (Landau, 2007a); and
- Limited Soil Characterization Study in 2007 (GeoEngineers, 2008).

Detailed information regarding these previous investigations is presented in the Former Shell Oil Tank Farm RI/FS Work Plan (Shell Work Plan; GeoEngineers 2009) and Cap Sante Marine RI/FS and Interim Action Work Plan (Cap Sante Work Plan; Landau, 2007b). The results of these previous studies and historical field evidence of observed petroleum contamination at and surrounding the Site are briefly discussed in the following sections.

### *2.3.1. Summary of Historic Soil Conditions*

Contaminants of potential concern (COPCs) identified in soil during previous investigations at the Site at concentrations exceeding MTCA Method A cleanup levels included gasoline-, diesel- and heavy oil-range petroleum hydrocarbons, cPAHs, and cadmium. The petroleum-related exceedances in soil were found near the former UST(s), fill stand, pump house, and near the historic fuel supply lines in the northeast portion of the Site. The petroleum contamination at the Tank Farm portion of the Site was generally encountered at depths ranging from 4 to 9.5 feet below ground surface (bgs). Surficial oily soil identified in the 1987 Hart Crowser investigation within the Tank Farm Area was reportedly excavated. The excavated materials were thought to

comprise less than 10 cubic yards in volume. East of Q Avenue, petroleum-related contamination was identified at exceedances were found at four locations within about 70 feet of the historic fuel supply lines at depths ranging from 0.5 to 11.5 feet bgs. The cadmium detection was thought to be an isolated exceedance at the southwest corner of the Tank Farm Area.

During construction of a new sewer/stormwater line in 2007, field screening evidence of petroleum-impacted soil was observed by the City of Anacortes (City). Field screening evidence of petroleum-impacted soil was encountered at depths ranging from 6 to 11 feet bgs in two manhole/utility line excavations (Figure 2) located within 13th Street northwest of the Site. As reported by the City, an oily sheen was frequently observed in a utility manhole located approximately 50 feet west of Q Avenue in 13th Street and downgradient of the manhole/utility line excavations (Figure 2).

Chemical analytical results for historic soil samples obtained during previous environmental studies are summarized in Table 1.

#### *2.3.2. Summary of Historic Groundwater Conditions*

COPCs identified in groundwater during previous investigations completed at the Site at concentrations exceeding MTCA Method A cleanup levels included diesel- and heavy oil-range petroleum hydrocarbons and total lead. Diesel- and/or heavy oil- range hydrocarbons were present in groundwater near the former ASTs, adjacent to the historic fuel supply lines in the northeast portion of the Tank Farm Area, and about 60 feet east of Q Avenue adjacent to the historic fuel supply lines. Total lead was detected in two monitoring wells located in the eastern third of the Tank Farm portion of the Site. The total lead exceedances in the two wells were from 1987 groundwater samples analyzed using an outdated analytical method and was reportedly biased high due to the level of turbidity observed in the water samples collected (Hart Crowser, 1987).

Chemical analytical results for historic groundwater samples obtained during previous environmental studies are summarized in Table 2.

## 3.0 REMEDIAL INVESTIGATION AND STUDY RESULTS

Geophysical, soil and groundwater investigations were completed in accordance with the Ecology approved Shell Work Plan (GeoEngineers, 2009) to determine the existence of two historic monitoring wells and historic UST, and to further evaluate the nature and extent of contamination identified during previous investigations at the Site. Soil and groundwater investigation locations for this study and previous studies are shown on Figures 3 and 4, respectively.

COPCs for Site soil and groundwater include contaminants previously detected at levels exceeding preliminary cleanup levels, contaminants associated with historic storage and distribution of petroleum products, and dry cleaning solvents. Site COPCs include:

- Gasoline-range hydrocarbons;
- Diesel- and oil-range petroleum hydrocarbons;
- Volatile organic compounds (VOCs) including:

  - Benzene, ethylbenzene, toluene and xylenes (BETX); and
  - Fuel oxygenates methyl tert-butyl ether (MTBE), ethylene dibromide (EDB), and ethylene dichloride (EDC).
- Halogenated volatile organic compounds (HVOCs; dry cleaning solvents) including:
  - Tetrachloroethylene (PCE);
  - Trichloroethylene (TCE);
  - 1,1,1-trichloroethane (1,1,1-TCA);
  - Trichlorofluoromethane (TCFM);
  - carbon tetrachloride; and
  - Breakdown products of PCE/TCE including dichloroethenes ([cis] 1,2-Dichloroethene; DCE) and vinyl chloride (VC):
- Polycyclic aromatic hydrocarbons (PAHs);
- Polychlorinated biphenyls (PCBs); and
- Metals (cadmium and lead).

Based on the findings of this RI, historical PAH and petroleum-related exceedances in soil near the historical fuel supply lines are assumed to be not associated with the Shell Site due to the lack of evidence that soil contamination sourced from the historical fuel supply lines. Soil contamination at this location is likely the result of historical property use from an adjacent site (Cap Sante Marine Site) which is subject to cleanup actions by the Port under a separate Agreed Order between the Port and Ecology.

Field investigations and chemical analytical results of samples obtained are summarized in Sections 3.1 through 3.3. A detailed description of field investigation and sampling methodology is presented in the Shell Work Plan (GeoEngineers, 2009). Chemical analytical results for the soil and groundwater investigations were screened against the preliminary cleanup levels established for the Site. Soil and groundwater results from previous environmental studies are summarized in Tables 1 and 2, respectively. Soil and groundwater results from this RI are summarized in Tables 3 and 4, respectively.

### 3.1. Geophysical Investigation

Documentation for the removal of a historic 2,000- and/or 4,000-gallon UST within the Tank Farm Area was not identified during our review of historical records and reports. Similarly, there is no record of whether historic monitoring wells MW-1 and MW-2 at the Site were removed or decommissioned. Based on this uncertainty, a geophysical survey was completed by GeoRecon on August 8, 2011 to evaluate whether the UST and monitoring wells remain at the Site. Geophysical methods used to search for the UST and historic monitoring wells included ground penetrating radar (GPR) and electromagnetic surveying.

The areas of interest in which the geophysical survey was completed are shown on Figure 5. A copy of GeoRecon's survey report and GPR survey transects are presented in Appendix A. Survey results are summarized below.

#### *3.1.1. Historic Monitoring Well Survey and Results*

A Garrett GTI 2500 magnetometer was used to complete a survey within a 20-foot radius of the suspected locations of monitoring wells MW-1 and MW-2 to detect any potentially buried metal well monuments. No evidence of the buried monuments was identified during the electromagnetic survey.

#### *3.1.2. Historic UST Survey and Results*

A GSSI SIR 3000 GPR utilizing a 400 megahertz (MH) antenna was to complete a survey measuring approximately 46 feet by 46 feet centered on the suspected location of the UST using a grid spacing of approximately 3 feet. Based on the results of this survey, GPR anomalies indicative of a UST was not identified. The GPR survey did however show evidence of an excavation and backfill measuring approximately 12 feet long by 6 feet wide near the suspected location of the historic UST thus indicating that the tank had been previously removed.

### 3.2. Soil Investigation

Subsurface soil conditions were evaluated by completing direct-push borings GEI-1 through GEI-35 between November 27 and November 29, 2011, hollow stem auger borings MW-GEI-1 through MW-GEI-7 on February 15 and February 16, 2012, and by reviewing boring logs from previous studies. Based on soils encountered during this RI and previous studies, the subsurface conditions generally consist of fill material generally consisting of 5 to 10 feet of silty sand with varying amounts of silt and gravel overlying marine deposits generally consisting of silt and silty sand.

Field procedures and exploration logs for this RI Data Report are presented in Appendix B. Copies of historical exploration logs are presented in Appendix C. Soil sample collection and chemical analytical results are summarized below.

#### *3.2.1. Soil Sample Collection and Chemical Analytical Results*

Discrete soil samples from borings GEI-1 through GEI-35 and MW-GEI-1 were screened in the field for evidence of petroleum hydrocarbons and VOCs. Samples were obtained at approximately 2.5-foot depth intervals for possible chemical analysis. Field evidence of potential petroleum-related contamination (moderate to heavy sheen and/or elevated head space vapor measurements greater than 20 ppm) was identified in shallow soil samples obtained from borings GEI-5 and GEI-8 between approximately 1 and 3 feet bgs. Deeper field screening evidence of petroleum-related contamination was identified in soil samples obtained from borings GEI-MW-1, GEI-3, GEI-5, GEI-7, GEI-9, GEI-11 through GEI-13, GEI-17, GEI-18 and GEI-33 at depths ranging between approximately 3 and 17 feet bgs. Field screening evidence of petroleum-related contamination was not observed in soil samples obtained from other RI field study locations.

A total of 89 soil samples (including duplicate samples) were submitted to OnSite Environmental, Inc. (OnSite) located in Redmond, Washington for one or more COPC listed in Section 3.0. Soil samples were selected based on field screening results and location relative to potential sources of contamination identified in our historical review. Concentrations of the following analytes were detected at concentrations greater than the associated preliminary cleanup levels:

- Gasoline-range petroleum hydrocarbons exceeded the preliminary cleanup level of 30 milligrams per kilogram (mg/kg) in soil samples obtained at boring locations GEI-13 and GEI-14 at depths of 12.5 feet and 8 feet bgs, respectively;
- Diesel-range petroleum hydrocarbons exceeded the preliminary cleanup level of 2,000 mg/kg in soil samples obtained at boring locations GEI-3, GEI-5, GEI-7, GEI-8 and GEI-11 at depths ranging from 2.5 feet to 10 feet bgs;
- Heavy oil-range petroleum hydrocarbons exceeded the preliminary cleanup level of 2,000 mg/kg in soil samples obtained at boring location GEI-23 at a depth of 12.5 feet bgs;
- Benzene exceeded the preliminary cleanup level of 0.13 mg/kg in soil samples obtained at boring locations GEI-5 and GEI-13 at depths of 5 feet and 12.5 feet bgs, respectively; and
- Total carcinogenic PAHs (cPAHs) calculated using toxic equivalent (TEQ) methodology relative to benzo(a)pyrene exceeded the preliminary cleanup level of 0.137 mg/kg in soil samples obtained at boring locations GEI-21, GEI-22, GEI-34 and MW-GEI-1 at depths ranging from 2.5 feet to 10 feet bgs.

All other analytes, including dry cleaning solvents, PCBs and metals either were not detected or were detected at concentrations less than their associated preliminary cleanup levels in soil samples submitted for chemical analysis.

Chemical analytical results for soil samples obtained during this RI field investigation are summarized in Table 3. Copies of the chemical analytical laboratory reports and data validation reports are presented in Appendix D and E, respectively.

## 3.3. Groundwater Investigation

The groundwater investigation included the installation and development of seven monitoring wells (GEI-MW-1 through GEI-MW-7), measuring groundwater levels and collection of groundwater samples at the Site. Monitoring well locations were selected in consultation with Ecology based on the soil investigation results summarized above. In general, monitoring wells are located downgradient of contaminants detected in soil at concentrations exceeding preliminary cleanup levels.

Details of the installation, development and surveying of monitoring wells GEI-MW-1 through GEI-MW-7 are presented in Appendix B. Groundwater sample collection and chemical analytical results are summarized below.

### *3.3.1. Groundwater Sample Collection and Chemical Analytical Results*

Monitoring wells GEI-MW-1 through GEI-MW-7 were sampled on March 6, 2012. Monitoring well GEI-MW-7 was sampled during hours of low tide. Predicted low tide at the Site was 4.8 feet MLLW at 9:02 based on the U.S. National Oceanic and Atmospheric Administration (NOAA) tidal chart for Guemes Channel. Prior to sampling, groundwater levels were measured in each monitoring well using an electric water level indicator (e-tape) to the nearest 0.01 foot relative to the surveyed casing rim elevations. Measured groundwater elevations in monitoring wells GEI-MW-1 through GEI-MW-7 ranged between 6.50 and 9.58 feet MLLW. Based on the measured groundwater elevations, the inferred predominant groundwater flow direction is to the east toward Cap Sante

Waterway, with one exception. There appears to be a localized high in the groundwater table in the vicinity of GEI-MW-6. This localized high is likely being influence by a stormwater pond located northwest of monitoring well GEI-MW-6.

A total of 8 groundwater samples (including one duplicate sample) were submitted to OnSite for one or more COPC listed in Section 3.0. Concentrations of gasoline-range hydrocarbons, xylenes, PAHs and lead were detected in groundwater at locations GEI-MW-1 through GEI-MW-3 and GEI-MW-6. However, COPCs were not detected at concentrations exceeding preliminary groundwater cleanup levels in any of the groundwater samples submitted for chemical analysis.

Chemical analytical results for groundwater samples obtained during this RI are summarized in Table 4. Copies of the chemical analytical laboratory reports and data validation reports are presented in Appendix D and E, respectively.

## 4.0 SUMMARY OF RI FIELD INVESTIGATION FINDINGS

### 4.1. Soil Conditions

Soil encountered during this RI and previous studies generally consist of native marine deposits overlain by approximately 5 to 10 feet of dredged fill material, sourcing from the adjacent federal water way placed during the late 1940s to early 1950s.

Contaminants including gasoline-, diesel- and heavy oil-range petroleum hydrocarbons, benzene, cPAHs and cadmium were detected in soil at concentrations exceeding preliminary soil cleanup levels in the vicinity of the historical Tank Farm Area. Other contaminants including dry cleaning solvents, PCBs and metals (lead) either were not detected, or were detected at concentrations less than their associated preliminary soil cleanup levels.

The approximate horizontal extent of metal (cadmium), PAHs, petroleum hydrocarbons and VOC exceedances associated with the Site, based on the field screening and chemical analytical results of this RI field investigation and previous environmental studies, are shown Figures 6 through 9, respectively. Subsurface conditions and the approximate vertical extent of soil contamination are shown in generalized geologic cross-sections on Figures 10 and 11. As previously stated, there is no direct evidence that the exceedances of PAHs and petroleum hydrocarbons in soil east of the Tank Farm Area were the result of releases from the historical fuel supply lines. Soil contamination at this location is, however, likely the result of historical property use of the Cap Sante Marine Site (adjacent site subject to cleanup actions by the Port).

### 4.2. Groundwater Conditions

The inferred groundwater flow direction for the Site is east toward Fidalgo Bay and ranges in elevation from approximately 6 to 8 feet MLLW.

Historically, petroleum hydrocarbons and metals (lead) were detected at concentrations exceeding preliminary groundwater cleanup levels in groundwater samples obtained from the Tank Farm Area. However, recent groundwater sample results indicate that groundwater at the Site is not impacted (i.e., petroleum hydrocarbons, PAHs and VOCs as well as other contaminants, including

dry cleaning solvents, PCBs and metals (cadmium) either were not detected or were detected at concentrations less than preliminary groundwater cleanup levels in all monitoring wells sampled).

## 5.0 LIMITATIONS

This report has been prepared for the exclusive use of the Port of Anacortes, their authorized agents and regulatory agencies in their evaluation of the Former Shell Tank Farm Site located in Anacortes, Washington. No other party may rely on the product of our services unless we agree in advance and in writing to such reliance.

Within the limitations of scope, schedule and budget, our services have been executed in accordance with generally accepted environmental science practices in this area at the time this report was prepared. No warranty or other conditions, express or implied, should be understood.

Any electronic form, facsimile or hard copy of the original document (email, text, table, and/or figure), if provided, and any attachments are only a copy of the original document. The original document is stored by GeoEngineers, Inc. and will serve as the official document of record.

## 6.0 REFERENCES

Floyd|Snider, Inc., 2008, "Limited Environmental Due Diligence Report, Former Shell Oil Tank Farm, Cap Sante Marine Lease Area," prepared for Port of Anacortes, November 8, 2008.

GeoEngineers, Inc., 2009, "Work Plan, Remedial Investigation/Feasibility Study, Former Shell Soil Tank Farm, Prepared for the Washington State Department of Ecology." GEI File No. 5147-012-01, September 1, 2009.

GeoEngineers, Inc., 2008, "Independent Remedial Action Completion Report, Former Shell Tank Farm, Storm Drain Re-Route, 13th Street and Q Avenue, Anacortes, Washington, Prepared for Port of Anacortes." GEI File No. 5147-012-00, April 18, 2008.

Hart Crowser, Inc., 1987, "Preliminary Environmental Site Assessment, Petroleum Bulk Storage Facility, Anacortes Washington, Prepared for Port of Anacortes," May 27, 1987.

Landau Associates (Landau, 2007a), "Work Plan, Remedial Investigation/Feasibility Study and Interim Action, Cap Sante Marine Lease Area, Anacortes, Washington," prepared for the Port of Anacortes, June 19, 2007.

Landau Associates (Landau, 2007b), "Ecology Review Draft, Investigation Data Report, Cap Sante Marine Lease Area, Anacortes, Washington," Prepared for Port of Anacortes, July 25, 2007.

Washington State Department of Ecology, 2008, "Agreed Order for Remedial Investigation/Feasibility Study, Former Shell Oil Tank Farm," Agreed Order No. DE-08TCPHQ-5474, June 6, 2008.

# Table 1

## Summary of Historic Soil Chemical Analytical Data

**Former Shell Oil Tank Farm**

**Anacortes, Washington**

| Sample ID[1] | MW-1 S-4[2] | MW-2 S-2[2] | SHL01-S1 | SHL02-S1 | SHL02-S2 | SHL02-S3 | SHL03-S1 | SHL03-S2 | SHL04-S1 | SHL04-S2 | SHL05-S1 | SHL05-S2 | SHL05-S3 | SHL06-S1 | Preliminary Soil Cleanup Level[3] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Study** | **Hart Crowser, 1987** | **Hart Crowser, 1987** | **Floyd Snider, 2005** | **Floyd Snider, 2005** | **Floyd Snider, 2005** | **Floyd Snider, 2005** | **Floyd Snider, 2005** | **Floyd Snider, 2005** | **Floyd Snider, 2005** | **Floyd Snider, 2005** | **Floyd Snider, 2005** | **Floyd Snider, 2005** | **Floyd Snider, 2005** | **Floyd Snider, 2005** | |
| **Sample Date** | **4/21/1987** | **4/22/1987** | **8/24/2005** | **8/24/2005** | **8/24/2005** | **8/24/2005** | **8/24/2005** | **8/24/2005** | **8/24/2005** | **8/24/2005** | **8/24/2005** | **8/24/2005** | **8/24/2005** | **8/26/2005** | |
| **Sample Interval (ft bgs)** | **10 - 11.5** | **5 - 6.5** | **8 - 8.5** | **41004** | **41035** | **8 - 9.5** | **4 - 5.5** | **5.5 - 6.2** | **2 - 3.5** | **9.5** | **2 - 3.5** | **4.4 - 6.2** | **8 - 10** | **4 - 6** | |
| **Petroleum Hydrocarbons by NWTPH-HCID, NWTPH-G or NWTPH-Dx (mg/kg)** | | | | | | | | | | | | | | | |
| HCID | -- | -- | -- | -- | -- | G, D, HO | ND | -- | ND | -- | -- | -- | -- | ND | NE |
| Gasoline-Range | -- | -- | 26 UJ | **1,600 J** | **1,100 J** | **2,200 J** | -- | **58 J** | -- | 21 UJ | 13 UJ | **2,100 J** | **84 J** | -- | 30/100[4] |
| Diesel-Range | 20 U | **3,300** | 7.6 U | **22,000** | **510** | **5,100** | -- | **11** | -- | **110** | **120** | **1,100** | **180** | -- | 2,000 |
| Oil-Range | 20 U | -- | **21** | 1,200 U | **720** | 620 U | -- | **20** | -- | **150** | 11 U | 64 U | **92** | -- | 2,000 |
| **Volatile Organic Compounds (VOCs) by EPA 8260 (mg/kg)** | | | | | | | | | | | | | | | |
| Benzene | -- | -- | 0.064 UJ | 0.036 UJ | 0.024 UJ | 0.04 UJ | -- | 0.027 UJ | -- | 0.053 UJ | 0.032 UJ | 0.037 UJ | 0.029 UJ | -- | 0.013 |
| Ethylbenzene | -- | -- | 0.13 UJ | **0.67 J** | **0.66 J** | **1.8 J** | -- | **0.11 J** | -- | 0.11 UJ | 0.065 UJ | **1.7J** | 0.057 UJ | -- | 109 |
| Toluene | -- | -- | 0.13 UJ | 0.071 UJ | 0.048 UJ | **0.1 J** | -- | 0.053 UJ | -- | 0.11 UJ | 0.065 UJ | 0.074 UJ | 0.057 UJ | -- | 18 |
| Xylenes | -- | -- | 0.26 UJ | **0.4 J** | **0.36 J** | **0.001 J** | -- | **0.064 J** | -- | 0.21 UJ | 0.13 UJ | **1.1 J** | 0.11 UJ | -- | 9 |
| Methyl tert-butyl ether (MTBE) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 560 |
| Ethylene Dibromide (EDB) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.012 |
| 1,2-Dichloroethane (EDC) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.179 |
| Tetrachloroethylene (PCE) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.01 |
| Trichloroethylene (TCE) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.044 |
| 1,1,1-Trichloroethane | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 13,957 |
| Vinyl Chloride | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.015 |
| Trichlorofluoromethane (freon) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 24,000 |
| Carbon tetrachloride | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.015 |
| **Polycyclic Aromatic Hydrocarbons (PAHs) by EPA 8270SIM (mg/kg)** | | | | | | | | | | | | | | | |
| Naphthalenes | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 140 |
| Benzo(a)anthracene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.13 |
| Chrysene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.137 |
| Benzo(b)fluoranthene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.43 |
| Benzo(k)fluoranthene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.43 |
| Benzo(a)pyrene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.14 |
| Indeno(1,2,3-cd)pyrene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.65 |
| Dibenz(a,h)anthracene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1.3 |
| Total cPAHs (TEQ)[5] | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.137 |
| **Metals by EPA 6000/7000 Series (mg/kg)** | | | | | | | | | | | | | | | |
| Arsenic | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 20 |
| Cadmium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1.2 |
| Chromium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 120,000 |
| Lead | 10 U | 10 U | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 250 |
| Mercury | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.07 |
| **Polychlorinated Biphenyls (PCBs) by EPA 8280 (mg/kg)** | | | | | | | | | | | | | | | |
| Total PCBs | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.1 |

**Notes:**

[1]Sample locations are shown on Figures 4 Through 7.

[2]Sample was not analyzed with current EPA Methods so results should be considered estimates. Results listed for Heavy Oil are for "total oil and grease."

[3]Preliminary soil cleanup levels referenced from GeoEngineers' Work Plan, Remedial Investigation/Feasibility Study, Former Shell Oil Tank Farm dated Sepember 1, 2009.

[4]Gasoline cleanup level is 30 mg/kg if benzene is present.

[5]Carcinogenic Polycyclic Aromatic Hydrocarbons (cPAHs) by EPA method 8270 SIM. Total carcinogenic PAHs (cPAHs) calculated using toxic equivalent (TEQ) methodology relative to benzo(a)pyrene. cPAHs that were not detected were assigned a value of one half of the reporting limit for these calculations.

mg/kg = milligrams per kilograms

U = Not detected above laboratory reporting limit

J = Estimated Value

**Bold** indicates analyte was detected.

Shading indicates analyte was detected at a concentration above the Preliminary Soil Cleanup Level.

| Sample ID[1] | SHL07-S1 | CSM01-S1 | CSM01-S2 | CSM02-S1 | CSM03-S1 | CSM03-S2 | CSM04-S1 | CSM04-S2 | CSM12-S1 | CSM12-S2 | CSM13-S1 | CSM13-S2 | SB-10 | SB-10 | Preliminary Soil Cleanup Level[3] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Study | Floyd Snider, 2005 | Floyd Snider, 2005 | Floyd Snider, 2005 | Floyd Snider, 2005 | Floyd Snider, 2005 | Floyd Snider, 2005 | Floyd Snider, 2005 | Floyd Snider, 2005 | Floyd Snider, 2005 | Floyd Snider, 2005 | Floyd Snider, 2005 | Floyd Snider, 2005 | Landau, 2007b | Landau, 2007b | |
| Sample Date | 8/26/2005 | 8/24/2005 | 8/24/2005 | 8/24/2005 | 8/24/2005 | 8/24/2005 | 8/25/2005 | 8/25/2005 | 8/26/2005 | 8/26/2005 | 8/26/2005 | 8/26/2005 | 5/24/2007 | 5/24/2007 | |
| Sample Interval (ft bgs) | 4 - 5.1 | 4 - 5 | 4 - 5 | 8 - 8.7 | 4 - 5 | 8 - 9 | 4.5 - 5.8 | 10.3 - 12 | 5 - 6 | 10 - 11 | 5 - 5.5 | 10.5 - 11.5 | 0 - 0.5 | 1 - 2 | |
| **Petroleum Hydrocarbons by NWTPH-HCID, NWTPH-G or NWTPH-Dx (mg/kg)** | | | | | | | | | | | | | | | |
| HCID | ND | D, HO | ND | D, HO | HO | -- | ND | ND | HO | D, HO | ND | D | -- | -- | NE |
| Gasoline-Range | -- | -- | -- | -- | -- | 15 UJ | -- | -- | -- | 34 UJ | -- | **110 J** | 3 U | 3.1 U | 30/100[4] |
| Diesel-Range | -- | **180** | -- | **87** | **85** | 32 U | -- | -- | 110 U | **800** | -- | **16,000** | **8.9** | 5.3 U | 2,000 |
| Oil-Range | -- | **1,300** | -- | **330** | **280** | **140** | -- | -- | **440** | **1,900** | -- | 1,100 U | **160** | **17** | 2,000 |
| **Volatile Organic Compounds (VOCs) by EPA 8260 (mg/kg)** | | | | | | | | | | | | | | | |
| Benzene | -- | -- | -- | -- | -- | 0.037 UJ | -- | -- | -- | 0.084 U | -- | 0.095 U | 0.0005 U | 0.0006 U | 0.013 |
| Ethylbenzene | -- | -- | -- | -- | -- | 0.074 UJ | -- | -- | -- | 0.17 UJ | -- | 0.19 UJ | 0.0005 U | 0.0006 U | 109 |
| Toluene | -- | -- | -- | -- | -- | 0.074 UJ | -- | -- | -- | 0.17 UJ | -- | 0.19 UJ | 0.0005 U | 0.0006 U | 18 |
| Xylenes | -- | -- | -- | -- | -- | 0.15 UJ | -- | -- | -- | 0.34 UJ | -- | 0.38 UJ | 0.0005 U | 0.0006 U | 9 |
| Methyl tert-butyl ether (MTBE) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 560 |
| Ethylene Dibromide (EDB) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.012 |
| 1,2-Dichloroethane (EDC) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.179 |
| Tetrachloroethylene (PCE) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.01 |
| Trichloroethylene (TCE) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.044 |
| 1,1,1-Trichloroethane | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 13,957 |
| Vinyl Chloride | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.015 |
| Trichlorofluoromethane (freon) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 24,000 |
| Carbon tetrachloride | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.015 |
| **Polycyclic Aromatic Hydrocarbons (PAHs) by EPA 8270SIM (mg/kg)** | | | | | | | | | | | | | | | |
| Naphthalenes | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.0062 U | 0.0066 U | 140 |
| Benzo(a)anthracene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | **0.0094** | 0.0066 U | 0.13 |
| Chrysene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | **0.039** | 0.0066 U | 0.137 |
| Benzo(b)fluoranthene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | **0.018** | 0.0066 U | 0.43 |
| Benzo(k)fluoranthene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.0062 U | 0.0066 U | 0.43 |
| Benzo(a)pyrene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | **0.014** | 0.0066 U | 0.14 |
| Indeno(1,2,3-cd)pyrene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.0062 U | 0.0066 U | 0.65 |
| Dibenz(a,h)anthracene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.0062 U | 0.0066 U | 1.3 |
| Total cPAHs (TEQ)[5] | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | **0.0171** | ND | 0.137 |
| **Metals by EPA 6000/7000 Series (mg/kg)** | | | | | | | | | | | | | | | |
| Arsenic | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 20 |
| Cadmium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1.2 |
| Chromium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 120,000 |
| Lead | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | **2** | 2 U | 250 |
| Mercury | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.07 |
| **Polychlorinated Biphenyls (PCBs) by EPA 8280 (mg/kg)** | | | | | | | | | | | | | | | |
| **Total PCBs** | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.1 |

**Notes:**

[1]Sample locations are shown on Figures 4 Through 7.

[2]Sample was not analyzed with current EPA Methods so results should be considered estimates. Results listed for Heavy Oil are for "total oil and grease."

[3]Preliminary soil cleanup levels referenced from GeoEngineers' Work Plan, Remedial Investigation/Feasibility Study, Former Shell Oil Tank Farm dated Sepember 1, 2009.

[4]Gasoline cleanup level is 30 mg/kg if benzene is present.

[5]Carcinogenic Polycyclic Aromatic Hydrocarbons (cPAHs) by EPA method 8270 SIM. Total carcinogenic PAHs (cPAHs) calculated using toxic equivalent (TEQ) methodology relative to benzo(a)pyrene. cPAHs that were not detected were assigned a value of one half of the reporting limit for these calculations.

mg/kg = milligrams per kilograms

U = Not detected above laboratory reporting limit

J = Estimated Value

**Bold** indicates analyte was detected.

Shading indicates analyte was detected at a concentration above the Preliminary Soil Cleanup Level.

| Sample ID[1] | SB-10 | SB-13 | SB-13 | SB-13 | SB-14 | SB-14 | SB-14 | TP-1-6.0 | TP-1-8.0 | TP-2-4.0 | TP-3-8.0 | TP-4-2.0 | Preliminary Soil Cleanup Level[3] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Study | Landau, 2007b | Landau, 2007b | Landau, 2007b | Landau, 2007b | Landau, 2007b | Landau, 2007b | Landau, 2007b | GeoEngineers, 2008a | GeoEngineers, 2008a | GeoEngineers, 2008a | GeoEngineers, 2008a | GeoEngineers, 2008a | |
| Sample Date | 5/24/2007 | 5/25/2007 | 5/25/2007 | 5/25/2007 | 5/25/2007 | 5/25/2007 | 5/25/2007 | 11/30/2007 | 11/30/2007 | 11/30/2007 | 11/30/2007 | 11/30/2007 | |
| Sample Interval (ft bgs) | 5 - 6 | 0.5 - 1.5 | 1.5 - 3 | 5 - 6 | 0.5 - 1.5 | 8 - 9 | 9 - 10 | 6 - 6.5 | 7.5 - 8 | 4 - 4.5 | 7.5 - 8 | 2 - 2.5 | |
| **Petroleum Hydrocarbons by NWTPH-HCID, NWTPH-G or NWTPH-Dx (mg/kg)** | | | | | | | | | | | | | |
| HCID | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | NE |
| Gasoline-Range | 3.4 U | 4.3 U | 4.2 U | **23** | 5.1 U | **650** | 11 U | 3 U | -- | 3 U | 3 U | 3 U | 30/100[4] |
| Diesel-Range | **24** | **21** | 5.4 U | **100** | 5.3 U | **48** | **11** | 50 U | -- | 25 U | 25 U | 25 U | 2,000 |
| Oil-Range | **220** | **170** | 11 U | **230** | **11** | **120** | **60** | **1,300** | -- | 50 U | 50 U | 50 U | 2,000 |
| **Volatile Organic Compounds (VOCs) by EPA 8260 (mg/kg)** | | | | | | | | | | | | | |
| Benzene | 0.0007 U | 0.0008 U | 0.0008 U | 0.0019 U | 0.0012 U | 0.074 U | 0.0013 U | 0.01 U | -- | 0.01 U | 0.01 U | 0.01 U | 0.013 |
| Ethylbenzene | 0.0007 U | 0.0008 U | 0.0008 U | 0.0019 U | 0.0012 U | 0.074 U | 0.0013 U | 0.01 U | -- | 0.01 U | 0.01 U | 0.01 U | 109 |
| Toluene | 0.0007 U | 0.0008 U | 0.0008 U | 0.0019 U | 0.0012 U | 0.074 U | 0.0013 U | 0.01 U | -- | 0.01 U | 0.01 U | 0.01 U | 18 |
| Xylenes | **0.0012** | 0.0008 U | 0.0008 U | 0.0019 U | 0.0012 U | 0.074 U | 0.0013 U | 0.02 U | -- | 0.02 U | 0.02 U | 0.02 U | 9 |
| Methyl tert-butyl ether (MTBE) | -- | -- | -- | -- | -- | -- | -- | | | | | | 560 |
| Ethylene Dibromide (EDB) | -- | -- | -- | -- | -- | -- | -- | | | | | | 0.012 |
| 1,2-Dichloroethane (EDC) | -- | -- | -- | -- | -- | -- | -- | | | | | | 0.179 |
| Tetrachloroethylene (PCE) | -- | -- | -- | -- | -- | -- | -- | | | | | | 0.01 |
| Trichloroethylene (TCE) | -- | -- | -- | -- | -- | -- | -- | | | | | | 0.044 |
| 1,1,1-Trichloroethane | -- | -- | -- | -- | -- | -- | -- | | | | | | 13,957 |
| Vinyl Chloride | -- | -- | -- | -- | -- | -- | -- | | | | | | 0.015 |
| Trichlorofluoromethane (freon) | -- | -- | -- | -- | -- | -- | -- | | | | | | 24,000 |
| Carbon tetrachloride | -- | -- | -- | -- | -- | -- | -- | | | | | | 0.015 |
| **Polycyclic Aromatic Hydrocarbons (PAHs) by EPA 8270SIM (mg/kg)** | | | | | | | | | | | | | |
| Naphthalenes | **0.01** | **0.0092** | 0.0064 U | **0.069** | 0.0066 U | **0.016** | **0.029** | 0.02 U | -- | 0.02 U | 0.02 U | 0.02 U | 140 |
| Benzo(a)anthracene | **0.019** | **0.073** | 0.0064 U | **0.14** | 0.0066 U | **0.0072** | **0.06** | 0.02 U | -- | 0.02 U | 0.02 U | 0.02 U | 0.13 |
| Chrysene | **0.039** | **0.11** | 0.0064 U | **0.16** | 0.0066 U | **0.01** | **0.073** | **0.06** | -- | 0.02 U | 0.02 U | 0.02 U | 0.137 |
| Benzo(b)fluoranthene | **0.027** | **0.16** | 0.0064 U | **0.17** | 0.0066 U | **0.0091** | **0.072** | **0.04** | -- | 0.02 U | 0.02 U | 0.02 U | 0.43 |
| Benzo(k)fluoranthene | **0.0071** | **0.057** | 0.0064 U | **0.069** | 0.0066 U | 0.0065 U | **0.038** | **0.02** | -- | 0.02 U | 0.02 U | 0.02 U | 0.43 |
| Benzo(a)pyrene | **0.018** | **0.082** | 0.0064 U | **0.12** | 0.0066 U | **0.0065** | **0.062** | **0.04** | -- | 0.02 U | 0.02 U | 0.02 U | 0.14 |
| Indeno(1,2,3-cd)pyrene | **0.0071** | **0.029** | 0.0064 U | **0.066** | 0.0066 U | 0.0065 U | **0.034** | **0.03** | -- | 0.02 U | 0.02 U | 0.02 U | 0.65 |
| Dibenz(a,h)anthracene | 0.0064 U | **0.0072** | 0.0064 U | **0.017** | 0.0066 U | 0.0065 U | **0.0078** | **0.03** | -- | 0.02 U | 0.02 U | 0.02 U | 1.3 |
| Total cPAHs (TEQ)[5] | **0.0244** | **0.1179** | ND | **0.173** | ND | **0.009205** | **0.08391** | **0.06** | -- | ND | ND | ND | 0.137 |
| **Metals by EPA 6000/7000 Series (mg/kg)** | | | | | | | | | | | | | |
| Arsenic | -- | -- | -- | -- | -- | -- | -- | **8.1** | -- | 5 U | **5.4** | 5 U | 20 |
| Cadmium | -- | -- | -- | -- | -- | -- | -- | **6.4** | 1U | 1 U | 1 U | 1 U | 1.2 |
| Chromium | -- | -- | -- | -- | -- | -- | -- | **21** | -- | **31** | **32** | **11** | 120,000 |
| Lead | **7** | **9** | 5 U | **26** | **2** | **3** | **6** | **28** | -- | **5.2** | **5.8** | 5 U | 250 |
| Mercury | -- | -- | -- | -- | -- | -- | -- | **0.02** | -- | 0.02 U | **0.03** | 0.02 U | 0.07 |
| **Polychlorinated Biphenyls (PCBs) by EPA 8280 (mg/kg)** | | | | | | | | | | | | | |
| **Total PCBs** | -- | -- | -- | -- | -- | -- | -- | 0.1 U | -- | 0.1 U | 0.1 U | 0.1 U | 0.1 |

**Notes:**

[1]Sample locations are shown on Figures 4 Through 7.

[2]Sample was not analyzed with current EPA Methods so results should be considered estimates. Results listed for Heavy Oil are for "total oil and grease."

[3]Preliminary soil cleanup levels referenced from GeoEngineers' Work Plan, Remedial Investigation/Feasibility Study, Former Shell Oil Tank Farm dated Sepember 1, 2009.

[4]Gasoline cleanup level is 30 mg/kg if benzene is present.

[5]Carcinogenic Polycyclic Aromatic Hydrocarbons (cPAHs) by EPA method 8270 SIM. Total carcinogenic PAHs (cPAHs) calculated using toxic equivalent (TEQ) methodology relative to benzo(a)pyrene. cPAHs that were not detected were assigned a value of one half of the reporting limit for these calculations.

mg/kg = milligrams per kilograms

U = Not detected above laboratory reporting limit

J = Estimated Value

**Bold** indicates analyte was detected.

Shading indicates analyte was detected at a concentration above the Preliminary Soil Cleanup Level.

# Table 2

## Summary of Historic Groundwater Chemical Analytical Data

**Former Shell Oil Tank Farm**

**Anacortes, Washington**

| Sample ID[1] | MW-1[2] | MW-2[2] | SHL01-W1 | SHL02-W1 | SHL03-W1 | SHL04-W1 | SHL05-W1 | SHL06-W1 | SHL07-W1 | CSM01-W1 | CSM02-W1 | CSM03-W1 | CSM12-W1 | CSM13-W1 | Preliminary Groundwater Cleanup Level[3] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Study** | **Hart Crowser, 1987** | **Hart Crowser, 1987** | **Floyd Snider, 2005** | **Floyd Snider, 2005** | **Floyd Snider, 2005** | **Floyd Snider, 2005** | **Floyd Snider, 2005** | **Floyd Snider, 2005** | **Floyd Snider, 2005** | **Floyd Snider, 2005** | **Floyd Snider, 2005** | **Floyd Snider, 2005** | **Floyd Snider, 2005** | **Floyd Snider, 2005** | |
| **Sample Date** | **4/23/1987** | **4/23/1987** | **8/24/2005** | **8/24/2005** | **8/24/2005** | **8/24/2005** | **8/24/2005** | **8/26/2005** | **8/26/2005** | **8/24/2005** | **8/24/2005** | **8/24/2005** | **8/26/2005** | **8/26/2005** | |
| **Petroleum Hydrocarbons by NWTPH-HCID, NWTPH-G or NWTPH-Dx (µg/kg)** | | | | | | | | | | | | | | | |
| Gasoline-Range | **–** | **–** | 250 U | **670** | **500** | **520** | 250 U | 250 U | 250 U | 250 U | 250 U | 250 U | 250 U | 250 U | 800/1,000[4] |
| Diesel-Range | **–** | **–** | 250 U | **5,600** | 250 U | **7,200** | 250 U | 250 U | 250 U | **260** | **330** | **370** | **1,900** | 250 U | 500 |
| Oil-Range | **–** | **–** | 500 U | 1,000 | 500 U | 1,000 U | 500 U | 500 U | 500 U | 500 U | 500 U | 500 U | **5,000** | 500 U | 500 |
| **Volatile Organic Compounds (VOCs) by EPA 8260 (µg/kg)** | | | | | | | | | | | | | | | |
| Benzene | 3 | 1 U | **1.4** | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 23 |
| Ethylbenzene | **–** | **–** | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 2,100 |
| Toluene | **24** | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 15,000 |
| Xylenes | **49** | 1 U | 1 U | 1 U | **1.6** | **1** | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1,000 |
| **Metals by EPA 6000/7000 Series (µg/kg)** | | | | | | | | | | | | | | | |
| Arsenic | – | – | – | – | – | – | – | – | – | – | – | – | – | – | 8 |
| Cadmium | – | – | – | – | – | – | – | – | – | – | – | – | – | – | 8.8 |
| Chromium | – | – | – | – | – | – | – | – | – | – | – | – | – | – | 240,000 |
| Lead | **40** | **100** | **–** | **–** | **–** | **–** | **–** | **–** | **–** | **–** | **–** | **–** | **–** | **–** | 10 |
| Mercury | – | – | – | – | – | – | – | – | – | – | – | – | – | – | 0.2 |

**Notes:**

[1]Sample locations are shown on Figures 11 and 12.

[2]Sample was not analyzed with current EPA Methods so results should be considered estimates. Results listed for Heavy Oil are for "total oil and grease."

[3]Preliminary soil cleanup levels referenced from GeoEngineers' Work Plan, Remedial Investigation/Feasibility Study, Former Shell Oil Tank Farm dated Sepember 1, 2009.

[4]Gasoline cleanup level is 800 mg/kg if benzene is present.

mg/kg = milligrams per kilograms

U = Not detected above laboratory reporting limit

J = Estimated Value

**Bold** indicates analyte was detected.

Shading indicates analyte was detected at a concentration above the Preliminary Soil Cleanup Level.

# Table 3

## Summary of Soil Investigation Chemical Analytical Data

**Former Shell Oil Tank Farm**

**Anacortes, Washington**

| Sample ID[1] | GEI-1-5.0 | GEI-1-7.5 | GEI-2-5.0 | GEI-2-7.5 | GEI-3-2.5 | GEI-3-10.0 | DUP-1 (GEI-3-10.0) | GEI-3-18.0 | GEI-4-5.0 | GEI-4-10.0 | GEI-5-2.5 | GEI-5-10.0 | GEI-5-17.0 | Preliminary Soil Cleanup Level [2] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sample Date** | **9/27/2011** | **9/27/2011** | **9/27/2011** | **9/27/2011** | **9/27/2011** | **9/27/2011** | **9/27/2011** | **9/27/2011** | **9/27/2011** | **9/27/2011** | **9/27/2011** | **9/27/2011** | **9/27/2011** | |
| **Sample Depth** | **5** | **7.5** | **5** | **7.5** | **2.5** | **10** | **10** | **18** | **5** | **10** | **2.5** | **10** | **17** | |
| **Field Screening** | | | | | | | | | | | | | | |
| Sheen | NS | NS | NS | NS | NS | HS | HS | SS | SS | NS | SS | HS | SS | NE |
| Headspace Vapors (ppm) | <1 | <1 | <1 | <1 | <1 | 230 | 230 | -- | -- | -- | -- | -- | -- | NE |
| **Petroleum Hydrocarbons by NWTPH-G or NWTPH-Dx (mg/kg)** | | | | | | | | | | | | | | |
| Gasoline-Range | 9.1 U | 7.3 U | 8.7 U | 6.9 U | 6.8 UJ | 12 U | -- | 7.6 U | 6.1 UJ | 5.8 UJ | 12 U | 11 U | 7.2 UJ | 30/100 |
| Diesel-Range | 38 U | 32 U | 36 U | 31 U | **53** | **4,300** | **4,500** | **200** | **740** | 29 U | **7,400** | **3,200** | **32** | 2,000 |
| Oil-Range | 75 U | 64 U | 72 U | 62 U | **270** | 300 U | 330 U | 64 U | 57 U | 58 U | 600 U | 68 U | 56 U | 2,000 |
| **Volatile Organic Compounds (VOCs) by EPA 8260 (mg/kg)** | | | | | | | | | | | | | | |
| Benzene | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 UJ | 0.024 U | -- | 0.02 U | 0.02 UJ | 0.02 UJ | **0.16** | 0.13 | 0.02 UJ | 0.13 |
| Ethylbenzene | 0.091 U | 0.073 U | 0.087 U | 0.069 U | 0.068 UJ | 0.12 U | -- | 0.076 U | 0.061 UJ | 0.058 UJ | 0.60 U | 0.55 U | 0.072 UJ | 18 |
| Toluene | 0.091 U | 0.073 U | 0.087 U | 0.069 U | 0.068 UJ | **0.3** | -- | 0.076 U | 0.061 UJ | 0.058 UJ | **3.3** | **3.3** | **0.12J** | 109 |
| Xylenes | 0.091 U | 0.073 U | 0.087 U | 0.069 U | 0.068 UJ | **0.54** | -- | 0.076 U | 0.061 UJ | 0.058 UJ | **5.2** | **1.6** | 0.072 UJ | 9 |
| Methyl tert-butyl ether (MTBE) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 560 |
| Ethylene Dibromide (EDB) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.012 |
| 1,2-Dichloroethane (EDC) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.179 |
| Tetrachloroethylene (PCE) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.01 |
| Trichloroethylene (TCE) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.044 |
| (cis) 1,2-Dichloroethene (DCE) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 1,1,1-Trichloroethane | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 13,957 |
| Vinyl Chloride | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.015 |
| Trichlorofluoromethane (freon) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 24,000 |
| Carbon tetrachloride | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.015 |
| **Polycyclic Aromatic Hydrocarbons (PAHs) by EPA 8270SIM (mg/kg)** | | | | | | | | | | | | | | |
| Naphthalene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 140 |
| 2-Methylnaphthalene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 3,200 |
| 1-Methylnaphthalene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | NE |
| Benzo(a)anthracene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.13 |
| Chrysene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.14 |
| Benzo(b)fluoranthene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.43 |
| Benzo(k)fluoranthene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.43 |
| Benzo(a)pyrene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.137 |
| Indeno(1,2,3-cd)pyrene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1.3 |
| Dibenz(a,h)anthracene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.65 |
| Total cPAHs (TEQ)[3] | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.137 |
| **Metals by EPA 6000/7000 Series (mg/kg)** | | | | | | | | | | | | | | |
| Cadmium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1.2 |
| Lead | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 250 |
| **Polychlorinated Biphenyls (PCBs) by EPA 8280 (mg/kg)** | | | | | | | | | | | | | | |
| Total PCBs | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.1 |

**Notes:**

[1]Sample locations are shown on Figures 4 Through 7.

[2]Preliminary soil cleanup levels referenced from GeoEngineers' Work Plan, Remedial Investigation/Feasibility Study, Former Shell Oil Tank Farm dated Sepember 1, 2009.

[3]Carcinogenic Polycyclic Aromatic Hydrocarbons (cPAHs) by EPA method 8270 SIM. Total carcinogenic PAHs (cPAHs) calculated using toxic equivalent (TEQ) methodology relative to benzo(a)pyrene. cPAHs that were not detected were assigned a value of one half of the reporting limit for these calculations.

ppm = parts per million

mg/kg = milligrams per kilograms

U = Not detected above laboratory reporting limit

J = Estimated Value

**Bold** indicates analyte was detected.

Shading indicates analyte was detected at a concentration above the Preliminary Soil Cleanup Level.

Chemical analysis performed by OnSite Environmental of Redmond, Washington. Laboratory reports are presented in Appendix C

| Sample ID[1] | GEI-6-5.0 | GEI-6-10.0 | GEI-7-2.5 | GEI-7-5.0 | GEI-7-7.5 | GEI-8-2.5 | GEI-8-7.5 | GEI-9-2.5 | GEI-9-7.5 | DUP-2 (GEI-9-7.5) | GEI-9-10.0 | GEI-10-5.0 | GEI-10-7.5 | Preliminary Soil Cleanup Level [2] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sample Date** | **9/27/2011** | **9/27/2011** | **9/27/2011** | **9/27/2011** | **9/27/2011** | **9/27/2011** | **9/27/2011** | **9/27/2011** | **9/27/2011** | **9/27/2011** | **9/27/2011** | **9/27/2011** | **9/27/2011** | |
| **Sample Depth** | **5** | **10** | **2.5** | **5** | **7.5** | **2.5** | **7.5** | **2.5** | **7.5** | **7.5** | **10** | **5** | **7.5** | |
| **Field Screening** | | | | | | | | | | | | | | |
| Sheen | NS | NS | NS | HS | NS | MS | NS | NS | HS | NS | NS | NS | NS | NE |
| Headspace Vapors (ppm) | -- | -- | <1 | 450 | <1 | 35 | 10 | 8 | 550 | 550 | <1 | <1 | <1 | NE |
| **Petroleum Hydrocarbons by NWTPH-G or NWTPH-Dx (mg/kg)** | | | | | | | | | | | | | | |
| Gasoline-Range | 5.3 U | 5.2 U | 6.2 UJ | 13 U | 7.1 U | 4.8 U | 5.8 U | 6.7 UJ | 13 U | -- | 6.3 U | 5.6 U | 6.6 U | 30/100 |
| Diesel-Range | 28 U | 28 U | **54** | **4,200** | 32 U | **4,400** | **38** | 29 U | **900** | **950** | 30 U | 28 U | 29 U | 2,000 |
| Oil-Range | 56 U | 56 U | **140** | **69** | 63 U | 61 U | 60 U | 59 U | 58 U | 60 U | 60 U | 56 U | 59 U | 2,000 |
| **Volatile Organic Compounds (VOCs) by EPA 8260 (mg/kg)** | | | | | | | | | | | | | | |
| Benzene | 0.02 U | 0.02 U | 0.02 UJ | 0.025 U | 0.02 U | 0.02 U | 0.02 U | 0.02 UJ | 0.025 U | -- | 0.02 U | 0.02 U | 0.02 U | 0.13 |
| Ethylbenzene | 0.053 U | 0.052 U | 0.062 UJ | 0.13 U | 0.071 U | 0.048 U | 0.058 U | 0.067 UJ | 0.13 U | -- | 0.063 U | 0.056 U | 0.066 U | 18 |
| Toluene | 0.053 U | 0.052 U | 0.062 UJ | **0.18** | 0.071 U | 0.048 U | 0.058 U | 0.067 UJ | **5.4** | -- | 0.063 U | 0.056 U | 0.066 U | 109 |
| Xylenes | 0.053 U | 0.052 U | 0.062 UJ | **1** | 0.071 U | 0.048 U | 0.058 U | 0.067 UJ | **4.5** | -- | 0.063 U | 0.056 U | 0.066 U | 9 |
| Methyl tert-butyl ether (MTBE) | -- | -- | 0.0011 UJ | 0.065 U | 0.0010 U | 0.055 U | 0.0011 U | 0.0012 UJ | 0.053 U | -- | 0.0010 U | 0.00091 U | 0.0011 U | 560 |
| Ethylene Dibromide (EDB) | -- | -- | 0.0011 UJ | 0.065 U | 0.0010 U | 0.055 U | 0.0011 U | 0.0012 UJ | 0.053 U | -- | 0.0010 U | 0.00091 U | 0.0011 U | 0.012 |
| 1,2-Dichloroethane (EDC) | -- | -- | 0.0011 UJ | 0.065 U | 0.0010 U | 0.055 U | 0.0011 U | 0.0012 UJ | 0.053 U | -- | 0.0010 U | 0.00091 U | 0.0011 U | 0.179 |
| Tetrachloroethylene (PCE) | -- | -- | -- | -- | -- | -- | -- | 0.0012 UJ | 0.053 U | -- | 0.0010 U | 0.00091 U | 0.0011 U | 0.01 |
| Trichloroethylene (TCE) | -- | -- | -- | -- | -- | -- | -- | 0.0012 UJ | 0.053 U | -- | 0.0010 U | 0.00091 U | 0.0011 U | 0.044 |
| (cis) 1,2-Dichloroethene (DCE) | -- | -- | -- | -- | -- | -- | -- | 0.0012 UJ | 0.053 U | -- | 0.0010 U | 0.00091 U | 0.0011 U | -- |
| 1,1,1-Trichloroethane | -- | -- | -- | -- | -- | -- | -- | 0.0012 UJ | 0.053 U | -- | 0.0010 U | 0.00091 U | 0.0011 U | 13,957 |
| Vinyl Chloride | -- | -- | -- | -- | -- | -- | -- | 0.0012 UJ | 0.053 U | -- | 0.0010 U | 0.00091 U | 0.0011 U | 0.015 |
| Trichlorofluoromethane (freon) | -- | -- | -- | -- | -- | -- | -- | 0.0012 UJ | 0.053 U | -- | 0.0010 U | 0.00091 U | 0.0011 U | 24,000 |
| Carbon tetrachloride | -- | -- | -- | -- | -- | -- | -- | 0.0012 UJ | 0.053 U | -- | 0.0010 U | 0.00091 U | 0.0011 U | 0.015 |
| **Polycyclic Aromatic Hydrocarbons (PAHs) by EPA 8270SIM (mg/kg)** | | | | | | | | | | | | | | |
| Naphthalene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 140 |
| 2-Methylnaphthalene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 3,200 |
| 1-Methylnaphthalene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | NE |
| Benzo(a)anthracene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.13 |
| Chrysene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.14 |
| Benzo(b)fluoranthene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.43 |
| Benzo(k)fluoranthene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.43 |
| Benzo(a)pyrene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.137 |
| Indeno(1,2,3-cd)pyrene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1.3 |
| Dibenz(a,h)anthracene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.65 |
| Total cPAHs (TEQ)[3] | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.137 |
| **Metals by EPA 6000/7000 Series (mg/kg)** | | | | | | | | | | | | | | |
| Cadmium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1.2 |
| Lead | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 250 |
| **Polychlorinated Biphenyls (PCBs) by EPA 8280 (mg/kg)** | | | | | | | | | | | | | | |
| Total PCBs | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.1 |

**Notes:**

[1]Sample locations are shown on Figures 4 Through 7.

[2]Preliminary soil cleanup levels referenced from GeoEngineers' Work Plan, Remedial Investigation/Feasibility Study, Former Shell Oil Tank Farm dated Sepember 1, 2009.

[3]Carcinogenic Polycyclic Aromatic Hydrocarbons (cPAHs) by EPA method 8270 SIM. Total carcinogenic PAHs (cPAHs) calculated using toxic equivalent (TEQ) methodology relative to benzo(a)pyrene. cPAHs that were not detected were assigned a value of one half of the reporting limit for these calculations.

ppm = parts per million

mg/kg = milligrams per kilograms

U = Not detected above laboratory reporting limit

J = Estimated Value

**Bold** indicates analyte was detected.

Shading indicates analyte was detected at a concentration above the Preliminary Soil Cleanup Level.

Chemical analysis performed by OnSite Environmental of Redmond, Washington. Laboratory reports are presented in Appendix C

| Sample ID[1] | GEI-11-5.0 | DUP-3 (GEI-11-5.0) | GEI-11-10.0 | GEI-12-7.5 | GEI-12-12.0 | GEI-12-15.0 | GEI-13-5.0 | GEI-13-7.5 | GEI-13-12.5 | GEI-13-15.0 | GEI-14-5.0 | GEI-14-8.0 | GEI-14-10.0 | Preliminary Soil Cleanup Level [2] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sample Date** | **9/28/2011** | **9/28/2011** | **9/28/2011** | **9/28/2011** | **9/28/2011** | **9/28/2011** | **9/28/2011** | **9/28/2011** | **9/28/2011** | **9/28/2011** | **9/28/2011** | **9/28/2011** | **9/28/2011** | |
| **Sample Depth** | **5** | **5** | **10** | **7.5** | **12** | **15** | **5** | **7.5** | **12.5** | **15** | **5** | **8** | **10** | |
| **Field Screening** | | | | | | | | | | | | | | |
| Sheen | MS | MS | NS | NS | MS | NS | NS | MS | NS | NS | NS | SS | NS | NE |
| Headspace Vapors (ppm) | 280 | 280 | 35 | <1 | 120 | <1 | <1 | 4 | <1 | <1 | <1 | 250 | <1 | NE |
| **Petroleum Hydrocarbons by NWTPH-G or NWTPH-Dx (mg/kg)** | | | | | | | | | | | | | | |
| Gasoline-Range | 13 U | -- | 6 U | 5.5 U | 12 U | 16 UJ | 5.1 U | 6.3 U | **56 J** | 6.9 UJ | 6.2 UJ | **45 J** | 6.3 U | 30/100 |
| Diesel-Range | **2,200** | **2,600** | 29 U | 30 U | **380** | 33 U | 27 U | **890** | **240** | -- | 48 U | **700** | 31 U | 2,000 |
| Oil-Range | **920** | **1,200** | 59 U | 60 U | **62** | 66 U | 54 U | **200** | 63 U | -- | **88** | **220** | 62 U | 2,000 |
| **Volatile Organic Compounds (VOCs) by EPA 8260 (mg/kg)** | | | | | | | | | | | | | | |
| Benzene | **0.05** | -- | 0.02 U | 0.02 U | 0.025 U | 0.016 UJ | 0.02 U | 0.02 U | **0.65** | -- | 0.02 UJ | **0.025** | 0.02 U | 0.13 |
| Ethylbenzene | 0.13 U | -- | 0.060 U | 0.055 U | 0.12 U | 0.16 UJ | 0.051 U | 0.063 U | 0.049 U | -- | 0.062 UJ | 0.056 U | 0.063 U | 18 |
| Toluene | **2.5** | -- | 0.060 U | 0.055 U | 0.12 U | 0.16 UJ | 0.051 U | 0.063 U | 0.049 U | -- | 0.062 UJ | 0.056 U | 0.063 U | 109 |
| Xylenes | **2.1** | -- | 0.060 U | 0.055 U | 0.12 U | 0.16 UJ | 0.051 U | 0.063 U | **0.14** | -- | 0.062 UJ | 0.056 U | 0.063 U | 9 |
| Methyl tert-butyl ether (MTBE) | 0.058 U | -- | 0.001 U | 0.001 U | 0.0093 U | 0.0013 UJ | -- | -- | -- | -- | -- | -- | -- | 560 |
| Ethylene Dibromide (EDB) | 0.058 U | -- | 0.001 U | 0.001 U | 0.0093 U | 0.0013 UJ | -- | -- | -- | -- | -- | -- | -- | 0.012 |
| 1,2-Dichloroethane (EDC) | 0.058 U | -- | 0.001 U | 0.001 U | 0.0093 U | 0.0013 UJ | -- | -- | -- | -- | -- | -- | -- | 0.179 |
| Tetrachloroethylene (PCE) | -- | -- | -- | 0.001 U | 0.0093 U | 0.0013 UJ | -- | -- | -- | -- | -- | -- | -- | 0.01 |
| Trichloroethylene (TCE) | -- | -- | -- | 0.001 U | 0.0093 U | 0.0013 UJ | -- | -- | -- | -- | -- | -- | -- | 0.044 |
| (cis) 1,2-Dichloroethene (DCE) | -- | -- | -- | 0.001 U | 0.0093 U | 0.0013 UJ | -- | -- | -- | -- | -- | -- | -- | -- |
| 1,1,1-Trichloroethane | -- | -- | -- | 0.001 U | 0.0093 U | 0.0013 UJ | -- | -- | -- | -- | -- | -- | -- | 13,957 |
| Vinyl Chloride | -- | -- | -- | 0.001 U | 0.0093 U | 0.0013 UJ | -- | -- | -- | -- | -- | -- | -- | 0.015 |
| Trichlorofluoromethane (freon) | -- | -- | -- | 0.001 U | 0.0093 U | 0.0013 UJ | -- | -- | -- | -- | -- | -- | -- | 24,000 |
| Carbon tetrachloride | -- | -- | -- | 0.001 U | 0.0093 U | 0.0013 UJ | -- | -- | -- | -- | -- | -- | -- | 0.015 |
| **Polycyclic Aromatic Hydrocarbons (PAHs) by EPA 8270SIM (mg/kg)** | | | | | | | | | | | | | | |
| Naphthalene | **0.37** | -- | 0.0078 U | **0.026** | **0.026** | **0.14** | **0.013** | **0.12** | **0.021** | -- | **0.0083** | **0.028** | 0.0083 U | 140 |
| 2-Methylnaphthalene | **3.1** | -- | 0.0078 U | **0.029** | **0.019** | 0.0087 U | **0.069** | **0.18** | 0.0083 U | -- | **0.026** | **0.044** | 0.0083 U | 3,200 |
| 1-Methylnaphthalene | **2.8** | -- | **0.011** | **0.027** | **0.021** | 0.0087 U | **0.016** | **0.082** | 0.0083 U | -- | **0.0078** | **0.027** | 0.0083 U | NE |
| Benzo(a)anthracene | 0.082 U | -- | 0.0078 U | 0.0080 U | 0.0080 U | 0.0087 U | 0.0072 U | 0.0080 U | **0.025** | -- | 0.0074 U | 0.0075 U | 0.0083 U | 0.13 |
| Chrysene | 0.082 U | -- | 0.0078 U | 0.0080 U | 0.0080 U | 0.0087 U | 0.0072 U | 0.0080 U | **0.023** | -- | 0.0074 U | 0.0075 U | 0.0083 U | 0.14 |
| Benzo(b)fluoranthene | 0.082 U | -- | 0.0078 U | 0.0080 U | 0.0080 U | 0.0087 U | 0.0072 U | 0.0080 U | **0.019** | -- | 0.0074 U | 0.0075 U | 0.0083 U | 0.43 |
| Benzo(k)fluoranthene | 0.082 U | -- | 0.0078 U | 0.0080 U | 0.0080 U | 0.0087 U | 0.0072 U | 0.0080 U | **0.023** | -- | 0.0074 U | 0.0075 U | 0.0083 U | 0.43 |
| Benzo(a)pyrene | 0.082 U | -- | 0.0078 U | 0.0080 U | 0.0080 U | 0.0087 U | 0.0072 U | 0.0080 U | **0.036** | -- | 0.0074 U | 0.0075 U | 0.0083 U | 0.137 |
| Indeno(1,2,3-cd)pyrene | 0.082 U | -- | 0.0078 U | 0.0080 U | 0.0080 U | 0.0087 U | 0.0072 U | 0.0080 U | **0.018** | -- | 0.0074 U | 0.0075 U | 0.0083 U | 1.3 |
| Dibenz(a,h)anthracene | 0.082 U | -- | 0.0078 U | 0.0080 U | 0.0080 U | 0.0087 U | 0.0072 U | 0.0080 U | 0.0083 U | -- | 0.0074 U | 0.0075 U | 0.0083 U | 0.65 |
| Total cPAHs (TEQ)[3] | 0.006 | -- | 0.0059 | 0.006 | 0.006 | 0.0066 | 0.0054 | 0.006 | 0.045 | -- | 0.0056 | 0.0057 | 0.0063 | 0.137 |
| **Metals by EPA 6000/7000 Series (mg/kg)** | | | | | | | | | | | | | | |
| Cadmium | -- | -- | -- | -- | -- | -- | **0.54** | 0.6 U | 0.63 U | -- | 0.56 U | 0.56 U | 0.62 U | 1.2 |
| Lead | 6.2 U | -- | 5.8 U | 6 U | 6 U | 6.5 U | **5.5** | 6 U | 6.3 U | -- | 5.6 U | 5.6 U | 6.2 U | 250 |
| **Polychlorinated Biphenyls (PCBs) by EPA 8280 (mg/kg)** | | | | | | | | | | | | | | |
| Total PCBs | 0.062 U | -- | 0.058 U | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.1 |

**Notes:**

[1]Sample locations are shown on Figures 4 Through 7.

[2]Preliminary soil cleanup levels referenced from GeoEngineers' Work Plan, Remedial Investigation/Feasibility Study, Former Shell Oil Tank Farm dated Sepember 1, 2009.

[3]Carcinogenic Polycyclic Aromatic Hydrocarbons (cPAHs) by EPA method 8270 SIM. Total carcinogenic PAHs (cPAHs) calculated using toxic equivalent (TEQ) methodology relative to benzo(a)pyrene. cPAHs that were not detected were assigned a value of one half of the reporting limit for these calculations.

ppm = parts per million

mg/kg = milligrams per kilograms

U = Not detected above laboratory reporting limit

J = Estimated Value

**Bold** indicates analyte was detected.

Shading indicates analyte was detected at a concentration above the Preliminary Soil Cleanup Level.

Chemical analysis performed by OnSite Environmental of Redmond, Washington. Laboratory reports are presented in Appendix C

| Sample ID[1] | GEI-15-5.0 | GEI-15-10.0 | GEI-15A-5.0 | GEI-15A-10.0 | GEI-16-5.0 | DUP-4 (GEI-16-5.0) | GEI-16-10.0 | GEI-17-10.0 | GEI-17-14.0 | GEI-17-17.5 | GEI-18-5.0 | GEI-18-12.5 | GEI-18-15.0 | Preliminary Soil Cleanup Level [2] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sample Date** | **9/28/2011** | **9/28/2011** | **9/28/2011** | **9/28/2011** | **9/29/2011** | **9/29/2011** | **9/29/2011** | **9/29/2011** | **9/29/2011** | **9/29/2011** | **9/29/2011** | **9/29/2011** | **9/29/2011** | |
| **Sample Depth** | **5** | **10** | **5** | **10** | **5** | **5** | **10** | **10** | **14** | **17.5** | **5** | **12.5** | **15** | |
| **Field Screening** | | | | | | | | | | | | | | |
| Sheen | NS | NS | NS | NS | SS | SS | NS | NS | HS | NS | NS | MS | NS | NE |
| Headspace Vapors (ppm) | <1 | <1 | <1 | 3 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | NE |
| **Petroleum Hydrocarbons by NWTPH-G or NWTPH-Dx (mg/kg)** | | | | | | | | | | | | | | |
| Gasoline-Range | -- | 5.7 UJ | -- | 5.7 U | 11 U | -- | 5.4 U | 9.9 U | **26** | 14 U | 7.5 U | 13 U | 13 U | 30/100 |
| Diesel-Range | -- | -- | -- | -- | 43 U | 29 U | 28 U | 39 U | **53** | 32 U | 32 U | 32 U | **87** | 2,000 |
| Oil-Range | -- | -- | -- | -- | 85 U | 58 U | 56 U | 78 U | 57 U | 63 U | 64 U | 64 U | **290** | 2,000 |
| **Volatile Organic Compounds (VOCs) by EPA 8260 (mg/kg)** | | | | | | | | | | | | | | |
| Benzene | -- | 0.02 UJ | -- | 0.02 U | 0.022 U | -- | 0.02 U | 0.02 U | 0.027 U | 0.027 U | 0.02 U | 0.026 U | 0.026 U | 0.13 |
| Ethylbenzene | -- | 0.057 UJ | -- | 0.057 U | 0.11 U | -- | 0.054 U | 0.099 U | 0.13 U | 0.14 U | 0.075 U | 0.13 U | 0.13 U | 18 |
| Toluene | -- | 0.057 UJ | -- | 0.057 U | 0.11 U | -- | 0.054 U | 0.099 U | 0.13 U | 0.14 U | 0.075 U | 0.13 U | 0.13 U | 109 |
| Xylenes | -- | 0.057 UJ | -- | 0.057 U | 0.11 U | -- | 0.054 U | 0.099 U | 0.13 U | 0.14 U | 0.075 U | 0.13 U | 0.13 U | 9 |
| Methyl tert-butyl ether (MTBE) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 560 |
| Ethylene Dibromide (EDB) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.012 |
| 1,2-Dichloroethane (EDC) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.179 |
| Tetrachloroethylene (PCE) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.01 |
| Trichloroethylene (TCE) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.044 |
| (cis) 1,2-Dichloroethene (DCE) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 1,1,1-Trichloroethane | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 13,957 |
| Vinyl Chloride | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.015 |
| Trichlorofluoromethane (freon) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 24,000 |
| Carbon tetrachloride | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.015 |
| **Polycyclic Aromatic Hydrocarbons (PAHs) by EPA 8270SIM (mg/kg)** | | | | | | | | | | | | | | |
| Naphthalene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 140 |
| 2-Methylnaphthalene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 3,200 |
| 1-Methylnaphthalene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | NE |
| Benzo(a)anthracene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.13 |
| Chrysene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.14 |
| Benzo(b)fluoranthene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.43 |
| Benzo(k)fluoranthene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.43 |
| Benzo(a)pyrene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.137 |
| Indeno(1,2,3-cd)pyrene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1.3 |
| Dibenz(a,h)anthracene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.65 |
| Total cPAHs (TEQ)[3] | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.137 |
| **Metals by EPA 6000/7000 Series (mg/kg)** | | | | | | | | | | | | | | |
| Cadmium | 0.54 U | 0.6 U | **0.77** | **0.9** | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1.2 |
| Lead | -- | -- | -- | -- | 8.5 U | -- | 5.6 U | 7.8 U | 5.7 U | 6.3 U | 6.3 U | 6.4 U | **24** | 250 |
| **Polychlorinated Biphenyls (PCBs) by EPA 8280 (mg/kg)** | | | | | | | | | | | | | | |
| Total PCBs | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.1 |

**Notes:**

[1]Sample locations are shown on Figures 4 Through 7.

[2]Preliminary soil cleanup levels referenced from GeoEngineers' Work Plan, Remedial Investigation/Feasibility Study, Former Shell Oil Tank Farm dated Sepember 1, 2009.

[3]Carcinogenic Polycyclic Aromatic Hydrocarbons (cPAHs) by EPA method 8270 SIM. Total carcinogenic PAHs (cPAHs) calculated using toxic equivalent (TEQ) methodology relative to benzo(a)pyrene. cPAHs that were not detected were assigned a value of one half of the reporting limit for these calculations.

ppm = parts per million

mg/kg = milligrams per kilograms

U = Not detected above laboratory reporting limit

J = Estimated Value

**Bold** indicates analyte was detected.

Shading indicates analyte was detected at a concentration above the Preliminary Soil Cleanup Level.

Chemical analysis performed by OnSite Environmental of Redmond, Washington. Laboratory reports are presented in Appendix C

| Sample ID[1] | GEI-19-5.0 | GEI-19-10.0 | GEI-20-5.0 | GEI-20-10.0 | GEI-21-5.0 | GEI-21-10.0 | GEI-21-15.0 | GEI-22-5.0 | GEI-22-12.5 | GEI-22-15.0 | GEI-23-7.5 | GEI-23-12.5 | GEI-23-15.0 | Preliminary Soil Cleanup Level [2] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sample Date** | **9/29/2011** | **9/29/2011** | **9/29/2011** | **9/29/2011** | **9/29/2011** | **9/29/2011** | **9/29/2011** | **9/29/2011** | **9/29/2011** | **9/29/2011** | **9/29/2011** | **9/29/2011** | **9/29/2011** | |
| **Sample Depth** | **5** | **10** | **5** | **10** | **5** | **10** | **15** | **5** | **12.5** | **15** | **7.5** | **12.5** | **15** | |
| **Field Screening** | | | | | | | | | | | | | | |
| Sheen | NS | NS | NS | NS | NS | SS | NS | NS | NS | NS | NS | SS | NS | NE |
| Headspace Vapors (ppm) | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | NE |
| **Petroleum Hydrocarbons by NWTPH-G or NWTPH-Dx (mg/kg)** | | | | | | | | | | | | | | |
| Gasoline-Range | 12 U | 10 U | 11 U | 11 U | 11 U | 8 U | -- | 7.3 U | 12 U | -- | 12 U | 21 UJ | -- | 30/100 |
| Diesel-Range | **92** | 39 U | 41 U | 42 U | 41 U | **650** | -- | 33 U | **1,300** | -- | 45 U | **1,300** | 32 U | 2,000 |
| Oil-Range | **330** | 77 U | 81 U | 82 U | 81 U | **1,400** | -- | 65 U | **1,700** | -- | **160** | **2,700** | 63 U | 2,000 |
| **Volatile Organic Compounds (VOCs) by EPA 8260 (mg/kg)** | | | | | | | | | | | | | | |
| Benzene | 0.024 U | 0.021 U | 0.022 U | 0.023 U | 0.021 U | 0.02 U | -- | 0.02 U | 0.024 U | -- | 0.024 U | **0.072 J** | -- | 0.13 |
| Ethylbenzene | 0.12 U | 0.1 U | 0.11 U | 0.11 U | 0.11 U | 0.08 U | -- | 0.073 U | 0.12 U | -- | 0.12 U | 0.21 UJ | -- | 18 |
| Toluene | 0.12 U | 0.1 U | 0.11 U | 0.11 U | 0.11 U | 0.08 U | -- | 0.073 U | 0.12 U | -- | 0.12 U | 0.21 UJ | -- | 109 |
| Xylenes | 0.12 U | 0.1 U | 0.11 U | 0.11 U | 0.11 U | 0.08 U | -- | 0.073 U | 0.12 U | -- | 0.12 U | 0.21 UJ | -- | 9 |
| Methyl tert-butyl ether (MTBE) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 560 |
| Ethylene Dibromide (EDB) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.012 |
| 1,2-Dichloroethane (EDC) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.179 |
| Tetrachloroethylene (PCE) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.01 |
| Trichloroethylene (TCE) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.044 |
| (cis) 1,2-Dichloroethene (DCE) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 1,1,1-Trichloroethane | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 13,957 |
| Vinyl Chloride | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.015 |
| Trichlorofluoromethane (freon) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 24,000 |
| Carbon tetrachloride | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.015 |
| **Polycyclic Aromatic Hydrocarbons (PAHs) by EPA 8270SIM (mg/kg)** | | | | | | | | | | | | | | |
| Naphthalene | -- | -- | **0.02** | 0.011 U | **0.02** | **0.59** | 0.0082 UJ | 0.0087 U | **1.2** | 0.01 UJ | -- | -- | -- | 140 |
| 2-Methylnaphthalene | -- | -- | 0.011 U | 0.011 U | 0.011 U | **0.26** | 0.0082 UJ | 0.0087 U | **0.98** | 0.01 UJ | -- | -- | -- | 3,200 |
| 1-Methylnaphthalene | -- | -- | 0.011 U | 0.011 U | 0.011 U | **0.28** | 0.0082 UJ | **0.016** | **0.97** | 0.01 UJ | -- | -- | -- | NE |
| Benzo(a)anthracene | -- | -- | 0.011 U | 0.011 U | 0.011 U | **2.5** | 0.0082 UJ | 0.0087 U | **0.54** | **0.011 J** | -- | -- | -- | 0.13 |
| Chrysene | -- | -- | 0.011 U | 0.011 U | 0.011 U | **2.5** | 0.0082 UJ | 0.0087 U | **0.53** | **0.011 J** | -- | -- | -- | 0.14 |
| Benzo(b)fluoranthene | -- | -- | 0.011 U | 0.011 U | 0.011 U | **1.4** | 0.0082 UJ | 0.0087 U | **0.32** | 0.01 UJ | -- | -- | -- | 0.43 |
| Benzo(k)fluoranthene | -- | -- | 0.011 U | 0.011 U | 0.011 U | **1.6** | 0.0082 UJ | 0.0087 U | **0.36** | 0.01 UJ | -- | -- | -- | 0.43 |
| Benzo(a)pyrene | -- | -- | 0.011 U | 0.011 U | 0.011 U | **2.3** | 0.0082 UJ | 0.0087 U | **0.51** | **0.011 J** | -- | -- | -- | 0.137 |
| Indeno(1,2,3-cd)pyrene | -- | -- | 0.011 U | 0.011 U | 0.011 U | **0.35** | 0.0082 UJ | 0.0087 U | **0.077** | 0.01 UJ | -- | -- | -- | 1.3 |
| Dibenz(a,h)anthracene | -- | -- | 0.011 U | 0.011 U | 0.011 U | **1.2** | 0.0082 UJ | 0.0087 U | **0.26** | 0.01 UJ | -- | -- | -- | 0.65 |
| Total cPAHs (TEQ)[3] | -- | -- | 0.008 | 0.008 | 0.008 | **3.03** | 0.006 | 0.007 | **0.67** | 0.014 | -- | -- | -- | 0.137 |
| **Metals by EPA 6000/7000 Series (mg/kg)** | | | | | | | | | | | | | | |
| Cadmium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1.2 |
| Lead | **21** | 7.7 U | 8.1 U | 8.4 U | 8.1 U | **19** | -- | 6.5 U | 32 | -- | 9 U | **100** | -- | 250 |
| **Polychlorinated Biphenyls (PCBs) by EPA 8280 (mg/kg)** | | | | | | | | | | | | | | |
| Total PCBs | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.1 |

**Notes:**

[1]Sample locations are shown on Figures 4 Through 7.

[2]Preliminary soil cleanup levels referenced from GeoEngineers' Work Plan, Remedial Investigation/Feasibility Study, Former Shell Oil Tank Farm dated Sepember 1, 2009.

[3]Carcinogenic Polycyclic Aromatic Hydrocarbons (cPAHs) by EPA method 8270 SIM. Total carcinogenic PAHs (cPAHs) calculated using toxic equivalent (TEQ) methodology relative to benzo(a)pyrene. cPAHs that were not detected were assigned a value of one half of the reporting limit for these calculations.

ppm = parts per million

mg/kg = milligrams per kilograms

U = Not detected above laboratory reporting limit

J = Estimated Value

**Bold** indicates analyte was detected.

Shading indicates analyte was detected at a concentration above the Preliminary Soil Cleanup Level.

Chemical analysis performed by OnSite Environmental of Redmond, Washington. Laboratory reports are presented in Appendix C

| Sample ID[1] | GEI-24-5.0 | GEI-24-10.0 | GEI-25-5.0 | GEI-25-10.0 | GEI-26-5.0 | GEI-26-10.0 | GEI-27-7.5 | GEI-27-11.0 | GEI-27-13.0 | GEI-28-5.0 | GEI-28-10.0 | GEI-29-5.0 | GEI-29-10.0 | Preliminary Soil Cleanup Level [2] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sample Date** | **9/29/2011** | **9/29/2011** | **9/29/2011** | **9/29/2011** | **9/29/2011** | **9/29/2011** | **9/29/2011** | **9/29/2011** | **9/29/2011** | **9/29/2011** | **9/29/2011** | **9/29/2011** | **9/29/2011** | |
| **Sample Depth** | **5** | **10** | **5** | **10** | **5** | **10** | **7.5** | **11** | **13** | **5** | **10** | **5** | **10** | |
| **Field Screening** | | | | | | | | | | | | | | |
| Sheen | NS | NS | NS | NS | NS | NS | NS | MS | NS | NS | NS | NS | NS | NE |
| Headspace Vapors (ppm) | <1 | <1 | <1 | <1 | <1 | <1 | <1 | 10 | <1 | <1 | <1 | <1 | <1 | NE |
| **Petroleum Hydrocarbons by NWTPH-G or NWTPH-Dx (mg/kg)** | | | | | | | | | | | | | | |
| Gasoline-Range | 12 U | 12 U | 8.7 U | 12 U | 8.4 U | 9.5 U | 8.8 U | 17 U | 11 U | 5.9 U | 8.2 U | 5.4 U | 6.4 U | 30/100 |
| Diesel-Range | **88** | 42 U | **67** | 44 U | 33 U | 38 U | 35 U | 35 U | **52** | 31 U | 34 U | 28 U | **64** | 2,000 |
| Oil-Range | **250** | 85 U | **240** | **100** | 66 U | 76 U | 97 U | **190** | **180** | **63** | 69 U | 56 U | **170** | 2,000 |
| **Volatile Organic Compounds (VOCs) by EPA 8260 (mg/kg)** | | | | | | | | | | | | | | |
| Benzene | 0.024 U | 0.024 U | 0.02 U | 0.025 U | 0.02 U | 0.02 U | 0.02 U | 0.017 U | 0.022 U | 0.02 U | 0.02 U | 0.02 U | 0.022 U | 0.13 |
| Ethylbenzene | 0.12 U | 0.12 U | 0.087 U | 0.12 U | 0.084 U | 0.095 U | 0.088 U | 0.17 U | 0.11 U | 0.059 U | 0.082 U | 0.054 U | 0.064 U | 18 |
| Toluene | 0.12 U | 0.12 U | 0.087 U | 0.12 U | 0.084 U | 0.095 U | 0.088 U | 0.17 U | 0.11 U | 0.059 U | 0.082 U | 0.054 U | 0.064 U | 109 |
| Xylenes | 0.12 U | 0.12 U | 0.087 U | 0.12 U | 0.084 U | 0.095 U | 0.088 U | 0.17 U | 0.11 U | 0.059 U | 0.082 U | 0.054 U | 0.064 U | 9 |
| Methyl tert-butyl ether (MTBE) | -- | -- | -- | -- | -- | -- | 0.0017 U | 0.0016 U | 0.0015 U | -- | -- | -- | -- | 560 |
| Ethylene Dibromide (EDB) | -- | -- | -- | -- | -- | -- | 0.0017 U | 0.0016 U | 0.0015 U | -- | -- | -- | -- | 0.012 |
| 1,2-Dichloroethane (EDC) | -- | -- | -- | -- | -- | -- | 0.0017 U | 0.0016 U | 0.0015 U | -- | -- | -- | -- | 0.179 |
| Tetrachloroethylene (PCE) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.01 |
| Trichloroethylene (TCE) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.044 |
| (cis) 1,2-Dichloroethene (DCE) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 1,1,1-Trichloroethane | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 13,957 |
| Vinyl Chloride | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.015 |
| Trichlorofluoromethane (freon) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 24,000 |
| Carbon tetrachloride | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.015 |
| **Polycyclic Aromatic Hydrocarbons (PAHs) by EPA 8270SIM (mg/kg)** | | | | | | | | | | | | | | |
| Naphthalene | -- | -- | -- | -- | 0.0089 U | 0.01 U | 0.0093 U | 0.0094 U | 0.01 U | **0.012** | 0.0092 U | 0.0075 U | 0.034 | 140 |
| 2-Methylnaphthalene | -- | -- | -- | -- | 0.0089 U | 0.01 U | 0.0093 U | 0.0094 U | 0.01 U | 0.0082 U | 0.0092 U | 0.0075 U | ND | 3,200 |
| 1-Methylnaphthalene | -- | -- | -- | -- | 0.0089 U | 0.01 U | 0.0093 U | 0.0094 U | 0.01 U | 0.0082 U | 0.0092 U | 0.0075 U | ND | NE |
| Benzo(a)anthracene | -- | -- | -- | -- | 0.0089 U | 0.01 U | 0.0093 U | 0.0094 U | 0.01 U | 0.0082 U | 0.0092 U | 0.0075 U | 0.015 | 0.13 |
| Chrysene | -- | -- | -- | -- | 0.0089 U | 0.01 U | 0.0093 U | 0.0094 U | 0.01 U | 0.0082 U | 0.0092 U | 0.0075 U | 0.017 | 0.14 |
| Benzo(b)fluoranthene | -- | -- | -- | -- | 0.0089 U | 0.01 U | 0.0093 U | 0.0094 U | 0.01 U | 0.0082 U | 0.0092 U | 0.0075 U | 0.011 | 0.43 |
| Benzo(k)fluoranthene | -- | -- | -- | -- | 0.0089 U | 0.01 U | 0.0093 U | 0.0094 U | 0.01 U | 0.0082 U | 0.0092 U | 0.0075 U | 0.012 | 0.43 |
| Benzo(a)pyrene | -- | -- | -- | -- | 0.0089 U | 0.01 U | 0.0093 U | 0.0094 U | 0.01 U | 0.0082 U | 0.0092 U | 0.0075 U | 0.016 | 0.137 |
| Indeno(1,2,3-cd)pyrene | -- | -- | -- | -- | 0.0089 U | 0.01 U | 0.0093 U | 0.0094 U | 0.01 U | 0.0082 U | 0.0092 U | 0.0075 U | ND | 1.3 |
| Dibenz(a,h)anthracene | -- | -- | -- | -- | 0.0089 U | 0.01 U | 0.0093 U | 0.0094 U | 0.01 U | 0.0082 U | 0.0092 U | 0.0075 U | **0.011** | 0.65 |
| Total cPAHs (TEQ)[3] | -- | -- | -- | -- | 0.007 | 0.008 | 0.007 | 0.007 | 0.008 | 0.006 | 0.007 | 0.006 | 0.021 | 0.137 |
| **Metals by EPA 6000/7000 Series (mg/kg)** | | | | | | | | | | | | | | |
| Cadmium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1.2 |
| Lead | **22** | 8.5 U | **22** | 8.7 U | 6.6 U | 7.6 U | 7 U | 7 U | 7.7 U | 6.2 U | 6.9 U | 5.6 U | 14 U | 250 |
| **Polychlorinated Biphenyls (PCBs) by EPA 8280 (mg/kg)** | | | | | | | | | | | | | | |
| Total PCBs | -- | -- | -- | -- | -- | -- | 0.07 U | 0.07 U | 0.077 U | -- | -- | -- | -- | 0.1 |

**Notes:**

[1]Sample locations are shown on Figures 4 Through 7.

[2]Preliminary soil cleanup levels referenced from GeoEngineers' Work Plan, Remedial Investigation/Feasibility Study, Former Shell Oil Tank Farm dated Sepember 1, 2009.

[3]Carcinogenic Polycyclic Aromatic Hydrocarbons (cPAHs) by EPA method 8270 SIM. Total carcinogenic PAHs (cPAHs) calculated using toxic equivalent (TEQ) methodology relative to benzo(a)pyrene. cPAHs that were not detected were assigned a value of one half of the reporting limit for these calculations.

ppm = parts per million

mg/kg = milligrams per kilograms

U = Not detected above laboratory reporting limit

J = Estimated Value

**Bold** indicates analyte was detected.

Shading indicates analyte was detected at a concentration above the Preliminary Soil Cleanup Level.

Chemical analysis performed by OnSite Environmental of Redmond, Washington. Laboratory reports are presented in Appendix C

| Sample ID[1] | GEI-30-7.5 | GEI-31-7.5 | GEI-32-5.0 | GEI-33-5.0 | GEI-33-10.0 | GEI-33-14.0 | GEI-34-12.0 | GEI-34-15.0 | GEI-35-15.0 | GEI-MW-1-7.5 | GEI-MW-1-12.5 | Preliminary Soil Cleanup Level [2] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sample Date** | **9/28/2011** | **9/29/2011** | **9/29/2011** | **9/29/2011** | **9/29/2011** | **9/29/2011** | **9/29/2011** | **9/29/2011** | **9/29/2011** | **2/9/2012** | **2/9/2012** | |
| **Sample Depth** | **7.5** | **7.5** | **5** | **5** | **10** | **14** | **12** | **15** | **15** | **7.5** | **12.5** | |
| **Field Screening** | | | | | | | | | | | | |
| Sheen | NS | NS | NS | SS | HS | NS | NS | NS | NS | NS | NS | NE |
| Headspace Vapors (ppm) | <1 | <1 | <1 | <1 | 200 | 32 | <1 | <1 | <1 | <1 | <1 | NE |
| **Petroleum Hydrocarbons by NWTPH-G or NWTPH-Dx (mg/kg)** | | | | | | | | | | | | |
| Gasoline-Range | 5.5 U | 7 U | 6.4 U | 16 U | 13 U | 13 U | 5.9 U | -- | 6.9 U | 7.4 U | 5.4 U | 30/100 |
| Diesel-Range | 29 U | 31 U | 31 U | **220** | **700** | **66** | 29 U | -- | 30 U | -- | -- | 2,000 |
| Oil-Range | 58 U | 62 U | 62 U | **74** | 73 U | 63 U | 59 U | -- | 61 U | -- | -- | 2,000 |
| **Volatile Organic Compounds (VOCs) by EPA 8260 (mg/kg)** | | | | | | | | | | | | |
| Benzene | 0.02 U | 0.02 U | 0.02 U | 0.016 U | 0.027 U | **0.026** | 0.02 U | -- | 0.02 U | -- | 0.02 U | 0.13 |
| Ethylbenzene | 0.055 U | 0.07 U | 0.064 U | 0.16 U | 0.13 U | 0.13 U | 0.059 U | -- | 0.069 U | -- | 0.054 U | 18 |
| Toluene | 0.055 U | 0.07 U | 0.064 U | 0.16 U | 0.13 U | 0.13 U | 0.059 U | -- | 0.069 U | -- | 0.054 U | 109 |
| Xylenes | 0.055 U | 0.07 U | 0.064 U | 0.16 U | 0.23 | 0.13 U | 0.059 U | -- | 0.069 U | -- | 0.054 U | 9 |
| Methyl tert-butyl ether (MTBE) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 560 |
| Ethylene Dibromide (EDB) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.012 |
| 1,2-Dichloroethane (EDC) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.179 |
| Tetrachloroethylene (PCE) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.01 |
| Trichloroethylene (TCE) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.044 |
| (cis) 1,2-Dichloroethene (DCE) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 1,1,1-Trichloroethane | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 13,957 |
| Vinyl Chloride | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.015 |
| Trichlorofluoromethane (freon) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 24,000 |
| Carbon tetrachloride | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.015 |
| **Polycyclic Aromatic Hydrocarbons (PAHs) by EPA 8270SIM (mg/kg)** | | | | | | | | | | | | |
| Naphthalene | 0.0078 U | 0.0082 U | 0.0082 U | 0.0087 U | 0.0082 U | 0.0083 U | **0.2** | 0.0074 U | -- | -- | **0.05** | 140 |
| 2-Methylnaphthalene | 0.0078 U | 0.0082 U | 0.0082 U | 0.0087 U | 0.0082 U | 0.0083 U | **0.03** | 0.0074 U | -- | -- | 0.037 U | 3,200 |
| 1-Methylnaphthalene | 0.0078 U | 0.0082 U | 0.0082 U | 0.0087 U | **0.015** | 0.0083 U | **0.017** | 0.0074 U | -- | -- | 0.037 U | NE |
| Benzo(a)anthracene | **0.0095** | 0.0082 U | 0.0082 U | 0.0087 U | 0.0082 U | 0.0083 U | **0.38** | 0.0074 U | -- | -- | **0.47** | 0.13 |
| Chrysene | 0.0078 U | 0.0082 U | 0.0082 U | 0.0087 U | 0.0082 U | 0.0083 U | **0.37** | 0.0074 U | -- | -- | **0.55** | 0.14 |
| Benzo(b)fluoranthene | 0.0078 U | 0.0082 U | 0.0082 U | 0.0087 U | 0.0082 U | 0.0083 U | **0.23** | 0.0074 U | -- | -- | **0.47** | 0.43 |
| Benzo(k)fluoranthene | 0.0078 U | 0.0082 U | 0.0082 U | 0.0087 U | 0.0082 U | 0.0083 U | **0.27** | 0.0074 U | -- | -- | **0.16** | 0.43 |
| Benzo(a)pyrene | **0.0092** | 0.0082 U | 0.0082 U | 0.0087 U | 0.0082 U | 0.0083 U | **0.41** | 0.0074 U | -- | -- | **0.48** | 0.137 |
| Indeno(1,2,3-cd)pyrene | 0.0078 U | 0.0082 U | 0.0082 U | 0.0087 U | 0.0082 U | 0.0083 U | **0.058** | 0.0074 U | -- | -- | **0.073** | 1.3 |
| Dibenz(a,h)anthracene | 0.0078 U | 0.0082 U | 0.0082 U | 0.0087 U | 0.0082 U | 0.0083 U | **0.24** | 0.0074 U | -- | -- | **0.37** | 0.65 |
| Total cPAHs (TEQ)[3] | 0.012 | 0.006 | 0.006 | 0.007 | 0.006 | 0.006 | **0.53** | 0.006 | -- | -- | **0.52** | 0.137 |
| **Metals by EPA 6000/7000 Series (mg/kg)** | | | | | | | | | | | | |
| Cadmium | 5.8 U | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1.2 |
| Lead | -- | 6.1 U | 6.2 U | 6.5 U | 6.1 U | 6.2 U | **25** | -- | **6.1** | -- | -- | 250 |
| **Polychlorinated Biphenyls (PCBs) by EPA 8280 (mg/kg)** | | | | | | | | | | | | |
| Total PCBs | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.1 |

**Notes:**

[1]Sample locations are shown on Figures 4 Through 7.

[2]Preliminary soil cleanup levels referenced from GeoEngineers' Work Plan, Remedial Investigation/Feasibility Study, Former Shell Oil Tank Farm dated Sepember 1, 2009.

[3]Carcinogenic Polycyclic Aromatic Hydrocarbons (cPAHs) by EPA method 8270 SIM. Total carcinogenic PAHs (cPAHs) calculated using toxic equivalent (TEQ) methodology relative to benzo(a)pyrene. cPAHs that were not detected were assigned a value of one half of the reporting limit for these calculations.

ppm = parts per million

mg/kg = milligrams per kilograms

U = Not detected above laboratory reporting limit

J = Estimated Value

**Bold** indicates analyte was detected.

Shading indicates analyte was detected at a concentration above the Preliminary Soil Cleanup Level.

Chemical analysis performed by OnSite Environmental of Redmond, Washington. Laboratory reports are presented in Appendix C

# Table 4

## Summary of Groundwater Investigation Chemical Analytical Data

**Former Shell Oil Tank Farm**

**Anacortes, Washington**

| Sample ID[1] | GEI-MW-1 | GEI-MW-2 | GEI-MW-3 | GEI-MW-4 | GEI-MW-5 | GEI-MW-6 | GEI-MW-7 | Dup (GEI-MW-7) | Trip Blank | Preliminary Groundwater Cleanup Level [2] |
|---|---|---|---|---|---|---|---|---|---|---|
| **Sample Date** | **3/6/2012** | **3/6/2012** | **3/6/2012** | **3/6/2012** | **3/6/2012** | **3/6/2012** | **3/6/2012** | **3/6/2012** | **3/6/2012** | |
| **Depth to Water (feet)** | **5.88** | **5.26** | **5.37** | **5.34** | **5.10** | **2.94** | **5.15** | **5.15** | **–** | |
| **Top of Casing Elevation (feet MLLW)** | **14.16** | **12.98** | **13.09** | **12.98** | **12.67** | **12.52** | **11.65** | **11.65** | **–** | |
| **Groudwater Elevation (feet MLLW)** | **8.28** | **7.72** | **7.72** | **7.64** | **7.57** | **9.58** | **6.50** | **6.50** | **–** | |
| **Petroleum Hydrocarbons by NWTPH-G or NWTPH-Dx (µg/kg)** | | | | | | | | | | |
| Gasoline-Range | 100 U | **190** | **230** | 100 U | 100 U | 100 U | 100 U | 100 U | – | 800/1,000[3] |
| Diesel-Range | 260 U | 260 U | 260 U | 260 U | 260 U | 270 U | 250 U | 260U | – | 500 |
| Oil-Range | 410 U | 410 U | 410 U | 410 U | 410 U | 440 U | 410 U | 410 U | – | 500 |
| **Volatile Organic Compounds (VOCs) by EPA 8260 (µg/kg)** | | | | | | | | | | |
| Benzene | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 23 |
| Ethylbenzene | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 2,100 |
| Toluene | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 15,000 |
| Xylenes | 1.0 U | **1.3** | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1,000 |
| Methyl tert-butyl ether (MTBE) | – | – | 0.20 U | – | – | – | – | – | 0.20 U | 20 |
| Ethylene Dibromide (EDB) | – | – | 0.20 U | – | – | – | – | – | 0.20 U | 2.000 |
| 1,2-Dichloroethane (EDC) | – | – | 0.20 U | – | – | – | – | – | 0.20 U | 37 |
| Tetrachloroethylene (PCE) | – | – | 0.20 U | – | – | – | – | – | 0.20 U | 0.39 |
| Trichloroethylene (TCE) | – | – | 0.20 U | – | – | – | – | – | 0.20 U | 6.7 |
| (cis) 1,2-Dichloroethene (DCE) | – | – | 0.20 U | – | – | – | – | – | 0.20 U | – |
| 1,1,1-Trichloroethane | – | – | 0.20 U | – | – | – | – | – | 0.20 U | 420,000 |
| Vinyl Chloride | – | – | 0.20 U | – | – | – | – | – | 0.20 U | 2.4 |
| Trichlorofluoromethane (freon) | – | – | 0.20 U | – | – | – | – | – | 0.20 U | – |
| Carbon tetrachloride | – | – | 0.20 U | – | – | – | – | – | 0.20 U | 1.6 |
| **Polycyclic Aromatic Hydrocarbons (PAHs) by EPA 8270SIM (µg/kg)** | | | | | | | | | | |
| Naphthalene | 0.095 U | 0.23 | 0.30 | 0.094 U | 0.095 U | 0.095 U | 0.094 U | 0.094 U | – | 4900 |
| 2-Methylnaphthalene | 0.095 U | 0.095 U | 0.095 U | 0.094 U | 0.095 U | 0.095 U | 0.094 U | 0.094 U | – | – |
| 1-Methylnaphthalene | 0.095 U | 0.095 U | 1.3 | 0.094 U | 0.095 U | 0.095 U | 0.094 U | 0.094 U | – | – |
| Benzo(a)anthracene | 0.0095 U | 0.015 | 0.010 | 0.0094 U | 0.0095 U | 0.0095 | 0.0094 U | 0.0094 U | – | 0.018 |
| Chrysene | 0.0095 U | 0.011 | 0.0095 U | 0.0094 U | 0.0095 U | 0.0095 U | 0.0094 U | 0.0094 U | – | 0.018 |
| Benzo(b)fluoranthene | 0.0095 U | 0.0095 U | 0.0095 U | 0.0094 U | 0.0095 U | 0.0095 U | 0.0094 U | 0.0094 U | – | 0.018 |
| Benzo(k)fluoranthene | 0.0095 U | 0.0095 U | 0.0095 U | 0.0094 U | 0.0095 U | 0.0095 U | 0.0094 U | 0.0094 U | – | 0.018 |
| Benzo(a)pyrene | 0.0095 U | 0.0095 U | 0.0095 U | 0.0094 U | 0.0095 U | 0.0095 U | 0.0094 U | 0.0094 U | – | 0.018 |
| Indeno(1,2,3-cd)pyrene | 0.0095 U | 0.0095 U | 0.0095 U | 0.0094 U | 0.0095 U | 0.0095 U | 0.0094 U | 0.0094 U | – | 0.018 |
| Dibenz(a,h)anthracene | 0.0095 U | 0.0095 U | 0.0095 U | 0.0094 U | 0.0095 U | 0.0095 U | 0.0094 U | 0.0094 U | – | 0.018 |
| Total cPAHs (TEQ)[3] | 0.0072 | 0.0083 | 0.0077 | 0.0071 | 0.0072 | 0.0076 | 0.0071 | 0.0071 | – | 0.1 |
| **Metals by EPA 6000/7000 Series (µg/kg)** | | | | | | | | | | |
| Cadmium | 4.4 U | – | – | – | – | – | – | – | – | 8.8 |
| Lead | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | **1.4** | 1.1 U | 1.1 U | – | 10 |

**Notes:**

[1]Sample locations are shown on Figures 4 Through 7.

[2]Preliminary soil cleanup levels referenced from GeoEngineers' Work Plan, Remedial Investigation/Feasibility Study, Former Shell Oil Tank Farm dated Sepember 1, 2009.

[3]Carcinogenic Polycyclic Aromatic Hydrocarbons (cPAHs) by EPA method 8270 SIM. Total carcinogenic PAHs (cPAHs) calculated using toxic equivalent (TEQ) methodology relative to benzo(a)pyrene. cPAHs that were not detected were assigned a value of one half of the reporting limit for these calculations.

MLLW = Mean Lower Low Water

ppm = parts per million

µg/kg = micrograms per kilograms

U = Not detected above laboratory reporting limit

J = Estimated Value

**Bold** indicates analyte was detected.

Shading indicates analyte was detected at a concentration above the Preliminary Soil Cleanup Level.

Chemical analysis performed by OnSite Environmental of Redmond, Washington. Laboratory reports are presented in Appendix C



N
W E
S

2,000 0 2,000

Feet

Notes:
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Data Sources: ESRI Data & Maps

Projection: NAD 1983 UTM Zone 10N

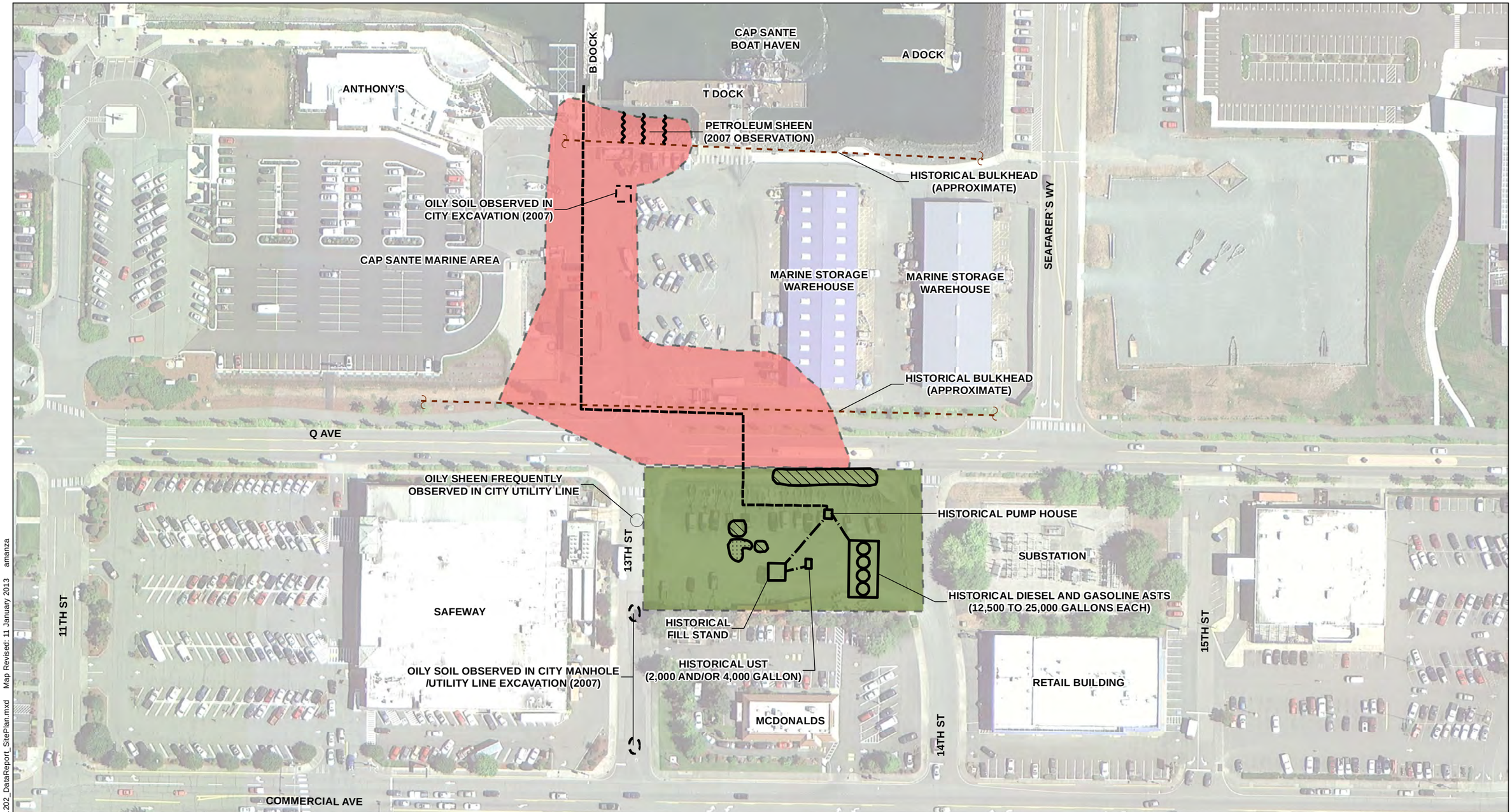
# Vicinity Map

Former Shell Oil Tank Farm
Anacortes, Washington

GeoEngineers

**Figure 1**

Path: \\sea\projects\5\5147012\GIS\5147012_VicinityMap.mxd Map Revised: 09 January 2013 amanza




Path: \\sealprojects\5\5147012\GIS\5147012_DataReport_SitePlan.mxd Map Revised: 11 January 2013 amanza

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**Reference:** Roads from Skagit County. Point, line and polygon features digitized from figures 5.1 and 6.1 of November 2006 and Figure 2 of September 2005 by Floyd Snider. Imagery date: 2011.

**Legend**

- Fuel Supply Line Area
- Tank Farm Area
- Historical Features
- Surface Oil (1987 Observation)
- White Powder (1987 Observation)
- Historical Fuel Supply Line
- Historical Product Line
- AST - Above Ground Storage Tank
- UST - Underground Storage Tank

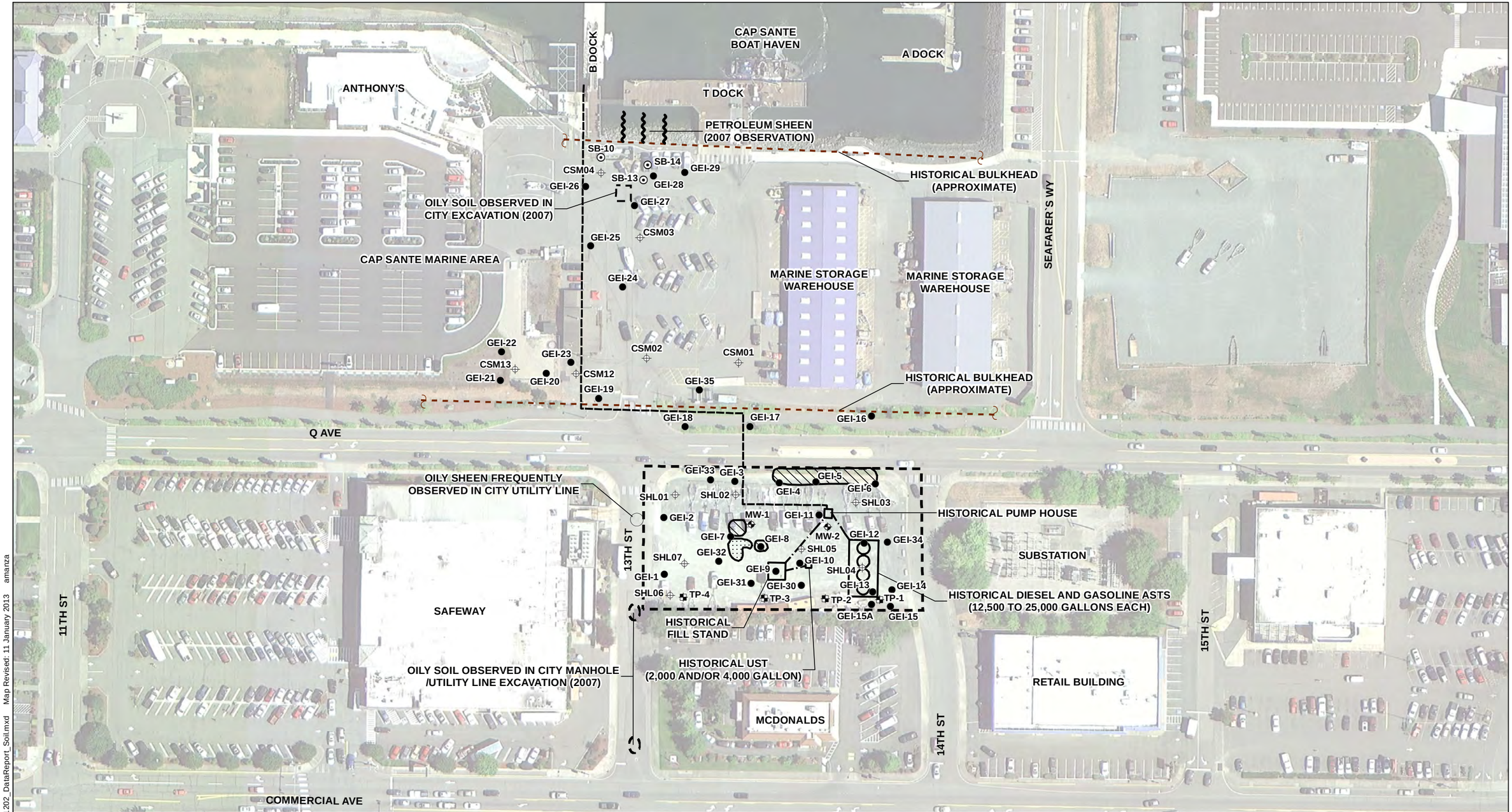
100 0 100
Feet

# Site Plan

Former Shell Oil Tank Farm
Anacortes, Washington

GeoEngineers

Figure 2




Path: \\sea\projects\5\51470\GIS\51470202_DataReport_Soil.mxd Map Revised: 11 January 2013 amanza

**Notes:**
1. AST = Above Ground Storage Tank. UST = Underground Storage Tank
2. The locations of all features shown are approximate.
3. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

**Reference:** Roads from Skagit County. Point, line and polygon features digitized from figures 5.1 and 6.1 of November 2006 and Figure 2 of September 2005 by Floyd Snider. Imagery date: 2011.

**Remedial Investigation Locations**

- GeoEngineers (2011)
- GeoEngineers (2007)
- Landau (2007)
- Floyd Snider (2005)
- Hart Crowser (1987)

**Legend**

- Former Shell Oil Tank Farm
- Historical Features
- Surface Oil (1987 Observation)
- White Powder (1987 Observation)
- Historical Fuel Supply Line
- Historical Product Line

N E S W

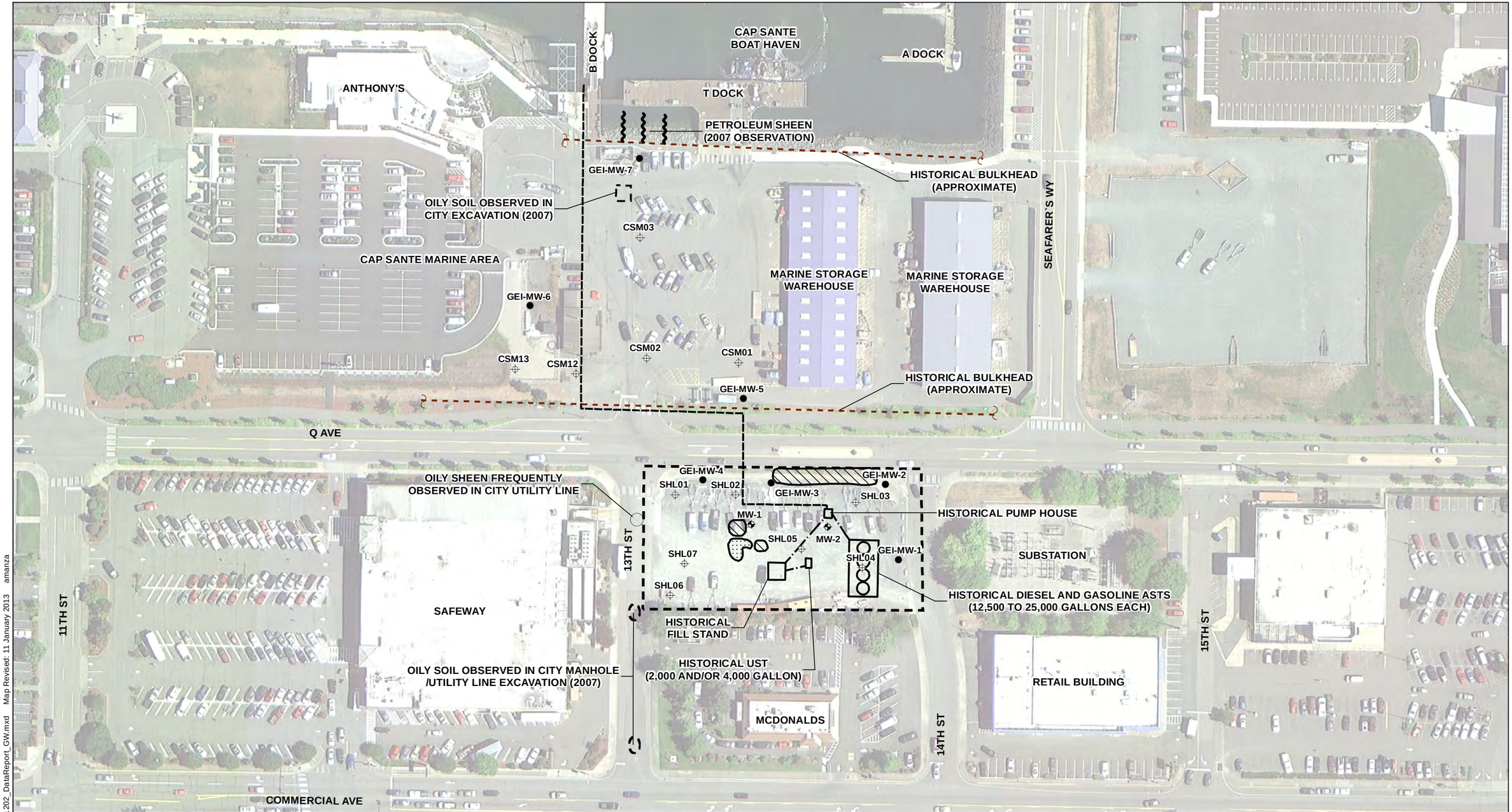
100 0 100
Feet

# Soil Investigation Sampling Locations

Former Shell Oil Tank Farm
Anacortes, Washington

GeoEngineers

Figure 3




Path: \\sea\projects\5\51470\GIS\51470202_DataReport_GW.mxd Map Revised: 11 January 2013 amanza

**Notes:**
1. AST = Above Ground Storage Tank. UST = Underground Storage Tank
2. The locations of all features shown are approximate.
3. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

**Reference:** Roads from Skagit County. Point, line and polygon features digitized from figures 5.1 and 6.1 of November 2006 and Figure 2 of September 2005 by Floyd Snider. Imagery date: 2011.

**Remedial Investigation Locations**

- GeoEngineers (2011)
- Floyd Snider (2005)
- Hart Crowser (1987)

**Legend**

- Former Shell Oil Tank Farm
- Historical Features
- Surface Oil (1987 Observation)
- White Powder (1987 Observation)
- Historical Fuel Supply Line
- Historical Product Line

N E S W

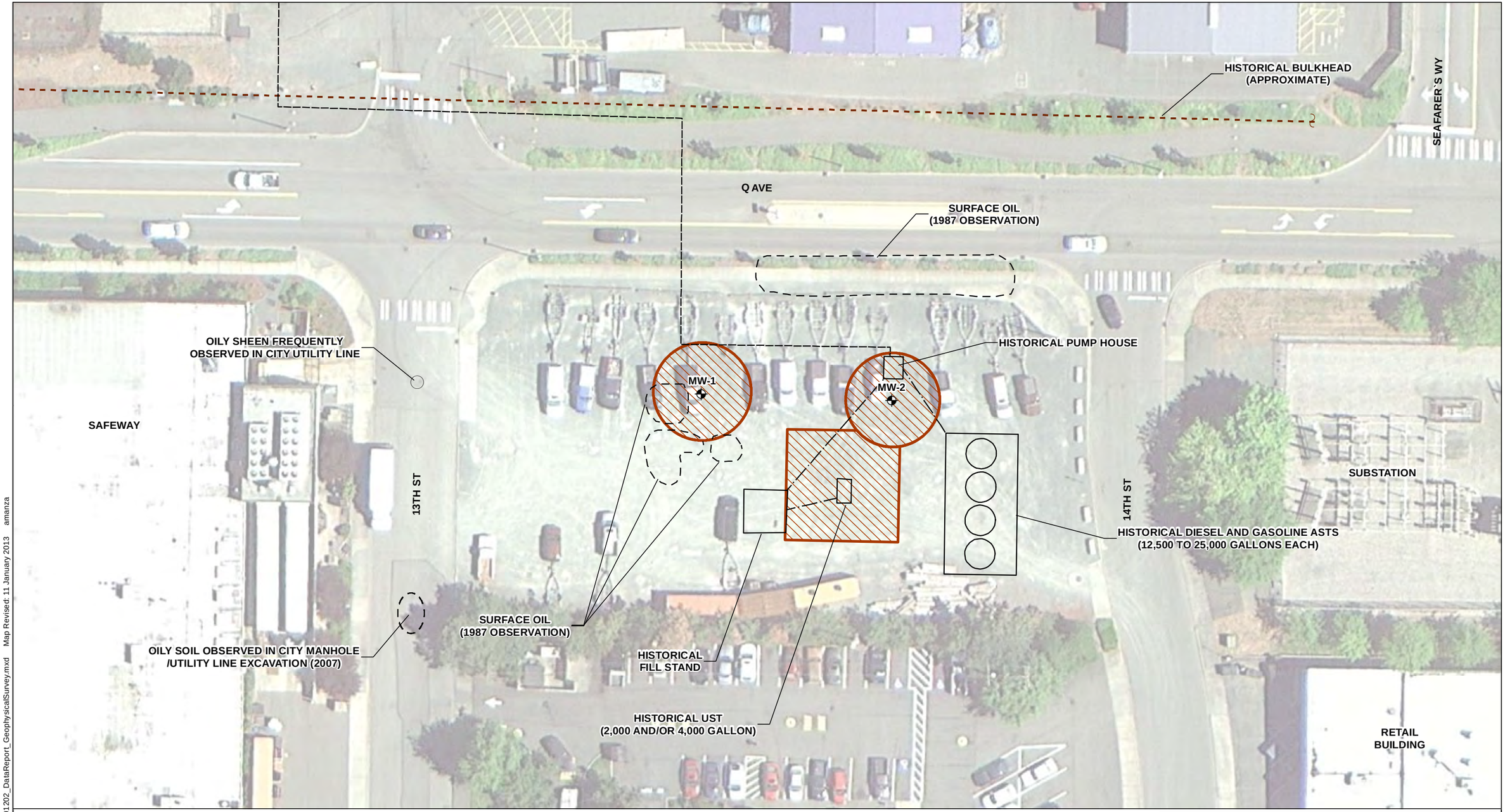
100 0 100
Feet

**Groundwater Investigation Sampling Locations**

Former Shell Oil Tank Farm
Anacortes, Washington

GeoEngineers

**Figure 4**




Path: \\seaprojects\5\5147012\GIS\5147012_DataReport_GeophysicalSurvey.mxd Map Revised: 11 January 2013 amanza

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**Reference:** Roads from Skagit County. Point, line and polygon features digitized from figures 5.1 and 6.1 of November 2006 and Figure 2 of September 2005 by Floyd Snider. Imagery date: 2011.

**Legend**

- Historical Monitoring Well Location
- Historical Fuel Supply Line
- Historical Product Line
- Electromagnetic/GPR Survey Area

GPR - Ground Penetrating Radar

N E S W

40 0 40

Feet

# Geophysical Survey

Former Shell Oil Tank Farm
Anacortes, Washington

GeoEngineers

Figure 5

GEI-35
GEI-19
GEI-MW-5
A'
HISTORICAL BULKHEAD
(APPROXIMATE)
GEI-16
SEAFARER`S WY
GEI-18
GEI-17
Q AVE
SURFACE OIL
(1987 OBSERVATION)
GEI-MW-4
GEI-33
GEI-3
GEI-MW-3
GEI-4
GEI-5
GEI-6
GEI-MW-2
SHL01
SHL02
SHL03
OILY SHEEN FREQUENTLY
OBSERVED IN CITY UTILITY LINE
HISTORICAL PUMP HOUSE
GEI-2
GEI-11
MW-1
MW-2
GEI-7
SAFEWAY
GEI-12
GEI-34
B
SHL05
B'
GEI-8
GEI-MW-1
SUBSTATION
SHL07
GEI-32
GEI-10
13TH ST
14TH ST
GEI-1
GEI-9
SHL04
GEI-31
GEI-30
HISTORICAL DIESEL AND GASOLINE ASTS
(12,500 TO 25,000 GALLONS EACH)
GEI-13
GEI-14
SHL06
TP-4
TP-2
TP-1
TP-3
GEI-15A
GEI-15
A
SURFACE OIL
(1987 OBSERVATION)
OILY SOIL OBSERVED IN CITY MANHOLE
/UTILITY LINE EXCAVATION (2007)
HISTORICAL
FILL STAND
HISTORICAL UST
(2,000 AND/OR 4,000 GALLON)
RETAIL
BUILDING

**Legend**

- Soil Sample Location - Metals less than Preliminary Cleanup Level (see Tables 1 and 3)
- Soil Sample Location - Metals exceeds Preliminary Cleanup Level (see Tables 1 and 3)
- Soil Sample Location - No Metals Sample Data
- Cross Section
- Historical Fuel Supply Line
- Historical Product Line
- Approximate Area of Metals (Cadmium) Exceedance in Soil

N E S W

40 0 40
Feet

**Notes:**
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**Reference:** Roads from Skagit County. Point, line and polygon features digitized from figures 5.1 and 6.1 of November 2006 and Figure 2 of September 2005 by Floyd Snider. Imagery date: 2011.

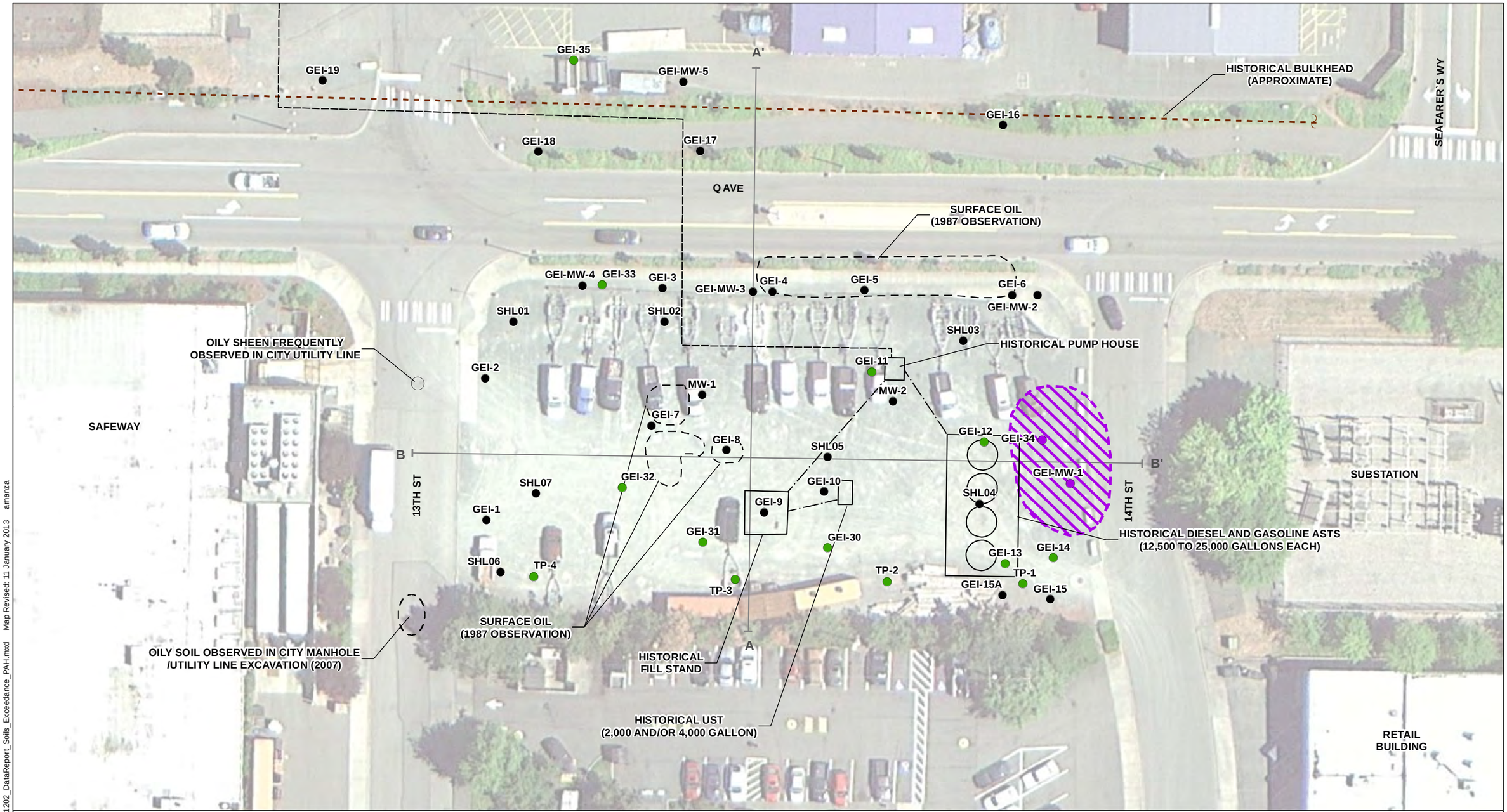
Path: \\sealprojects\5\5147012\GIS\5147012_DataReport_Soils_Exceedance_Metals.mxd Map Revised: 11 January 2013 amanza

**Soil Investigation Summary**
**Metals Exceedances**

Former Shell Oil Tank Farm
Anacortes, Washington

GeoEngineers

**Figure 6**




Path: \\sealprojects\515\147012\GIS\514701202_DataReport_Soils_Exceedance_PAH.mxd Map Revised: 11 January 2013 amanza

**Notes:**
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2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

**Reference:** Roads from Skagit County. Point, line and polygon features digitized from figures 5.1 and 6.1 of November 2006 and Figure 2 of September 2005 by Floyd Snider. Imagery date: 2011.

**Legend**

- Soil Sample Location - PAHs less than Preliminary Cleanup Level (see Tables 1 and 3)
- Soil Sample Location - PAHs exceeds Preliminary Cleanup Level (see Tables 1 and 3)
- Soil Sample Location - No PAH Sample Data
- Cross Section
- Historical Fuel Supply Line
- Historical Product Line
- Approximate Area of PAH Exceedance in Soil

PAH - Polycyclic Aromatic Hydrocarbons

N E S W

40 0 40
Feet

**Soil Investigation Summary**
**PAH Exceedances**

Former Shell Oil Tank Farm
Anacortes, Washington

GeoEngineers

**Figure 7**

GEI-35
GEI-19
GEI-MW-5
A'
HISTORICAL BULKHEAD
(APPROXIMATE)
GEI-16
SEAFARER`S WY
GEI-18
GEI-17
Q AVE
SURFACE OIL
(1987 OBSERVATION)
GEI-MW-4
GEI-33
GEI-3
GEI-MW-3
GEI-4
GEI-5
GEI-6
GEI-MW-2
SHL01
SHL02
SHL03
OILY SHEEN FREQUENTLY
OBSERVED IN CITY UTILITY LINE
HISTORICAL PUMP HOUSE
GEI-2
GEI-11
MW-1
MW-2
GEI-7
SAFEWAY
GEI-12
GEI-34
GEI-8
SHL05
B
B'
SUBSTATION
13TH ST
SHL07
GEI-32
GEI-10
GEI-MW-1
14TH ST
GEI-9
SHL04
GEI-1
GEI-31
GEI-30
HISTORICAL DIESEL AND GASOLINE ASTS
(12,500 TO 25,000 GALLONS EACH)
GEI-13
GEI-14
SHL06
TP-4
TP-1
TP-2
GEI-15A
GEI-15
TP-3
SURFACE OIL
(1987 OBSERVATION)
A
OILY SOIL OBSERVED IN CITY MANHOLE
/UTILITY LINE EXCAVATION (2007)
HISTORICAL
FILL STAND
HISTORICAL UST
(2,000 AND/OR 4,000 GALLON)
RETAIL
BUILDING

**Legend**

- Soil Sample Location - TPH less than Preliminary Cleanup Level (see Tables 1 and 3)
- Soil Sample Location - TPH exceeds Preliminary Cleanup Level (see Tables 1 and 3)
- Soil Sample Location - No TPH Sample Data
- Cross Section
- Historical Fuel Supply Line
- Historical Product Line
- Approximate Area of TPH Exceedance in Soil

TPH - Petroleum Hydrocarbons (Gasoline, Diesel and/or Heavy Oil)

N E S W

40 0 40
Feet

**Notes:**
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**Reference:** Roads from Skagit County. Point, line and polygon features digitized from figures 5.1 and 6.1 of November 2006 and Figure 2 of September 2005 by Floyd Snider. Imagery date: 2011.

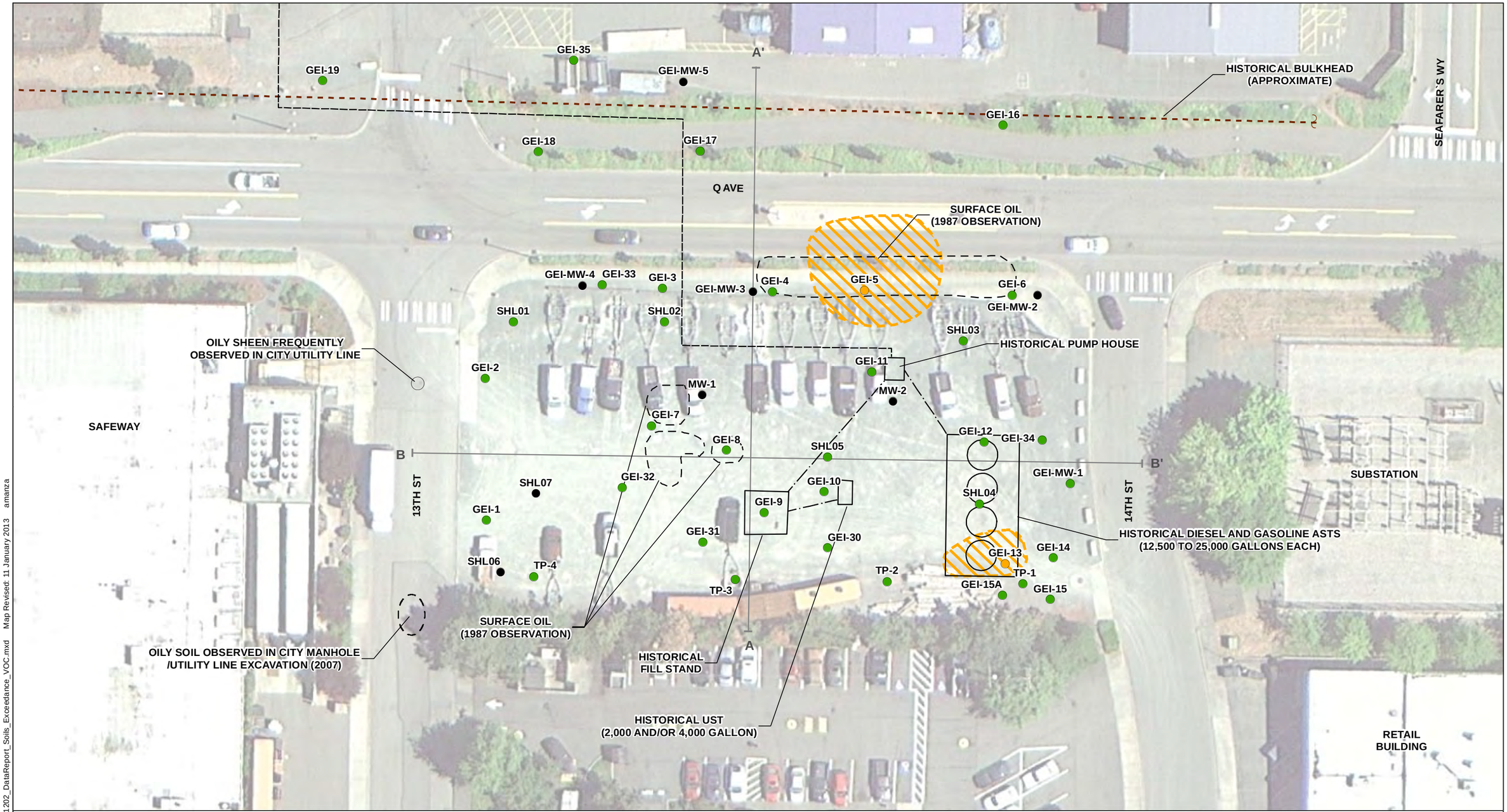
Path: \\sealprojects\5\5147012\GIS\5147012_DataReport_Soils_Exceedance_TPH.mxd Map Revised: 11 January 2013 amanza

**Soil Investigation Summary**
**TPH Exceedances**

Former Shell Oil Tank Farm
Anacortes, Washington

GeoEngineers

**Figure 8**




Path: \\sealprojects\515\147012\GIS\514701202_DataReport_Soils_Exceedance_VOC.mxd Map Revised: 11 January 2013 amanza

**Notes:**
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**Reference:** Roads from Skagit County. Point, line and polygon features digitized from figures 5.1 and 6.1 of November 2006 and Figure 2 of September 2005 by Floyd Snider. Imagery date: 2011.

**Legend**

- Soil Sample Location - VOC less than Preliminary Cleanup Level (see Tables 1 and 3)
- Soil Sample Location - VOC exceeds Preliminary Cleanup Level (see Tables 1 and 3)
- Soil Sample Location - No VOC Sample Data
- Cross Section
- Historical Fuel Supply Line
- Historical Product Line
- Approximate Area of VOC (BETX) Exceedance in Soil

VOC - Voilatile Organic Compound

N E S W

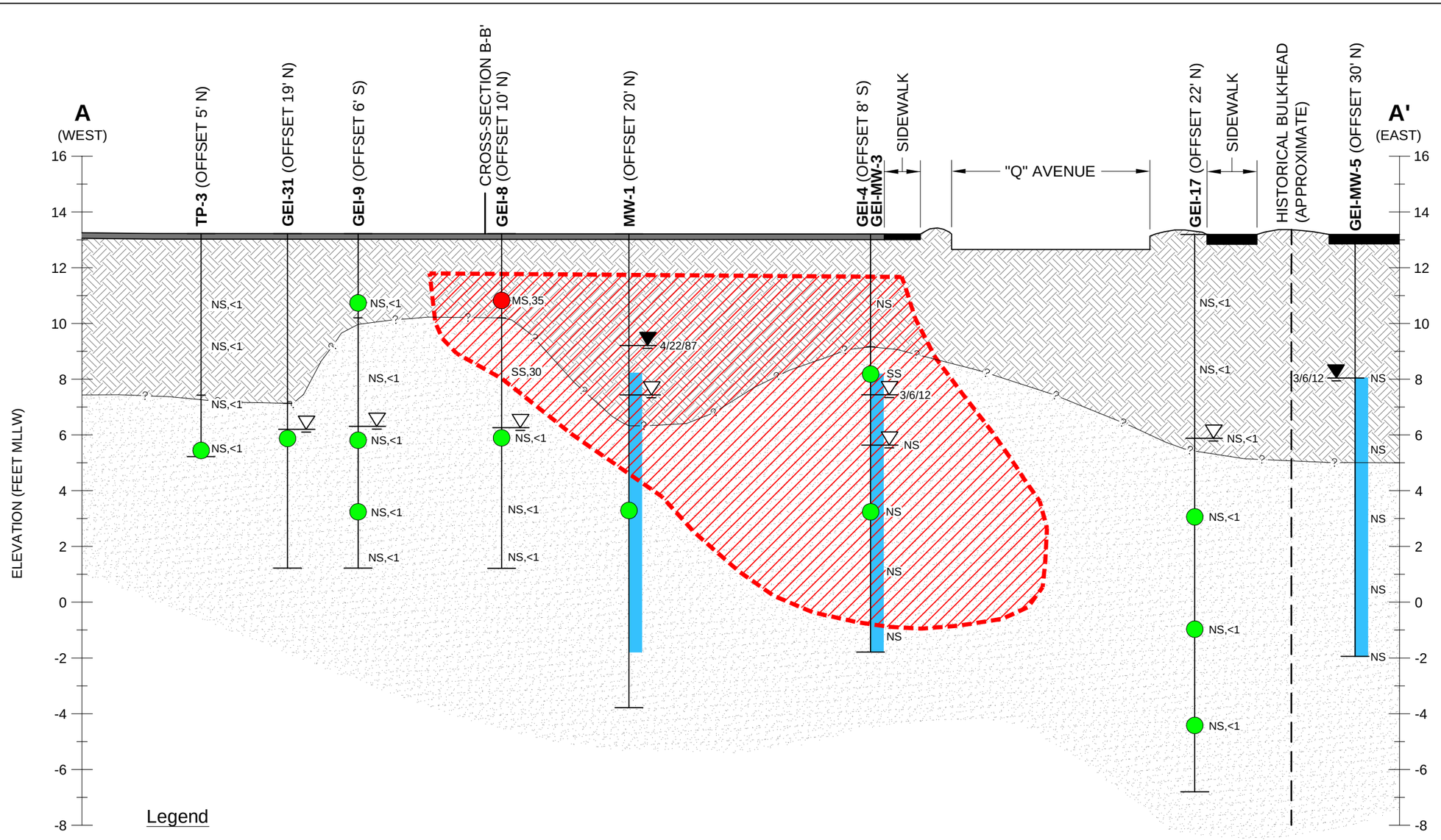
40 0 40
Feet

**Soil Investigation Summary**
**VOC Exceedances**

Former Shell Oil Tank Farm
Anacortes, Washington

GeoEngineers

**Figure 9**




## Legend

GEI-8 — Boring

? — Inferred Soil Contact

Groundwater Level Observed During Drilling

Measured Ground Water Level and Date

NS,<1 — Field Screening Results (Sheen, Headspace Vapor)

Well Screen Interval

Fill Material (Silty Sand with varying amounts of Silt and Gravel)

Native Marine Sediment (Silt and Silty Sand)

Soil Sample Location - Petroleum Hydrocarbons (Gasoline, Diesel and/or Heavy Oil) Exceed Preliminary Cleanup Levels (See Tables 1 and 3)

Soil Sample Location - Contaminants Less then Preliminary Cleanup Levels (See Tables 1 and 3)

Approximate Area of Petroleum Hydrocarbon (Gasoline, Diesel and/or Heavy Oil) Exceedance in Soil

MLLW — Mean Lower Low Water

HORIZONTAL SCALE: 1"= 20'
VERTICAL SCALE: 1"= 4'
VERTICAL EXAGGERATION: 5X

20 0 20
FEET

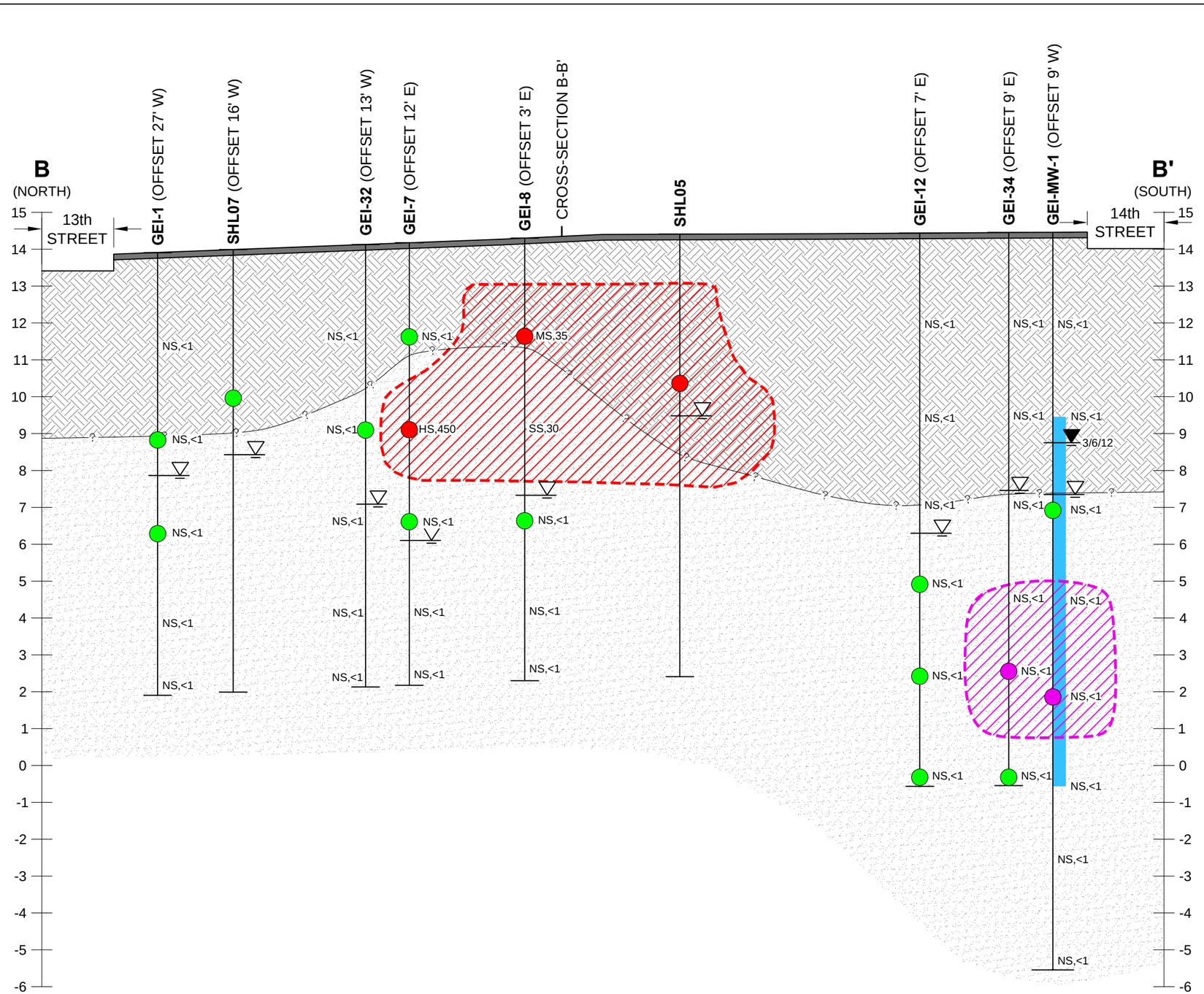
**Cross-Section A-A'**

Former Shell Oil Tank Farm
Anacortes, Washington

GeoEngineers

**Figure 10**

P:\15\5\4701\2\CAD\RIFS\15I4701I2-02 CROSS-SECTIONS.DWG\TAB:CROSS-SECTION AA MODIFIED BY THICHAUD ON JAN 14, 2013 - 10:45




## Legend

- GEI-8 — Boring
- ? — Inferred Soil Contact
- Groundwater Level Observed During Drilling
- Measured Ground Water Level and Date
- NS,<1 — Field Screening Results (Sheen, Headspace Vapor)
- Well Screen Interval
- Fill Material (Silty Sand with varying amounts of Silt and Gravel)
- Native Marine Sediment (Silt and Silty Sand)
- Soil Sample Location - Petroleum Hydrocarbons (Gasoline, Diesel and/or Heavy Oil) Exceed Preliminary Cleanup Levels (See Tables 1 and 3)
- Soil Sample Location - PAHs Exceed Preliminary Cleanup Levels (See Tables 1 and 3)
- Soil Sample Location - Contaminants Less then Preliminary Cleanup Levels (See Tables 1 and 3)
- Approximate Area of Petroleum Hydrocarbon (Gasoline, Diesel and/or Heavy Oil) Exceedance in Soil
- Approximate Area of PAH Exceedance in Soil
- MLLW — Mean Lower Low Water
- PAH — Polycyclic Aromatic Hydrocarbon

HORIZONTAL SCALE: 1"= 30'
VERTICAL SCALE: 1"= 3'
VERTICAL EXAGGERATION: 10X

30 0 30
FEET

**Cross-Section B-B'**

Former Shell Oil Tank Farm
Anacortes, Washington

GeoEngineers | **Figure 11**

# APPENDIX A
## Geophysical Survey

**GEO-RECON INTERNATIONAL LTD.**
**POB 55189**
**Seattle, Wa 98155**
**(206) 362 9484 Fax (206) 362-9486**

**Underground Storage Tank Location:**

Date: August 24, 2011
Job: J11-830/64

To: Geo Engineers
8410 154th Ave NE
Redmond, WA 98052

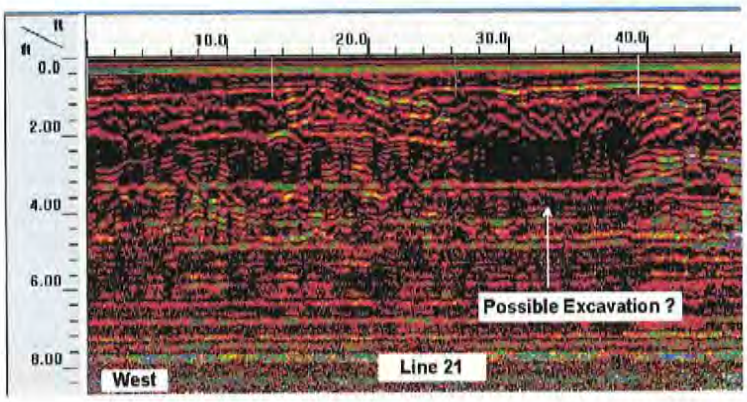
Your File Number 5147-021-02

Property: Former Shell Tank Farm, Port of Anacortes
Anacortes, WA

Results: A GSSI SIR 3000 utilizing with a 400 MH antenna Ground Penetrating Radar (GPR) was used to scan a 14 by 14 metre (45.9 by 45.9 feet) area surrounding the approximate location of a reported Underground Storage Tank (UST). Figure 1 attached to this report shows the scanned traverses.

No evidence of a UST was found.

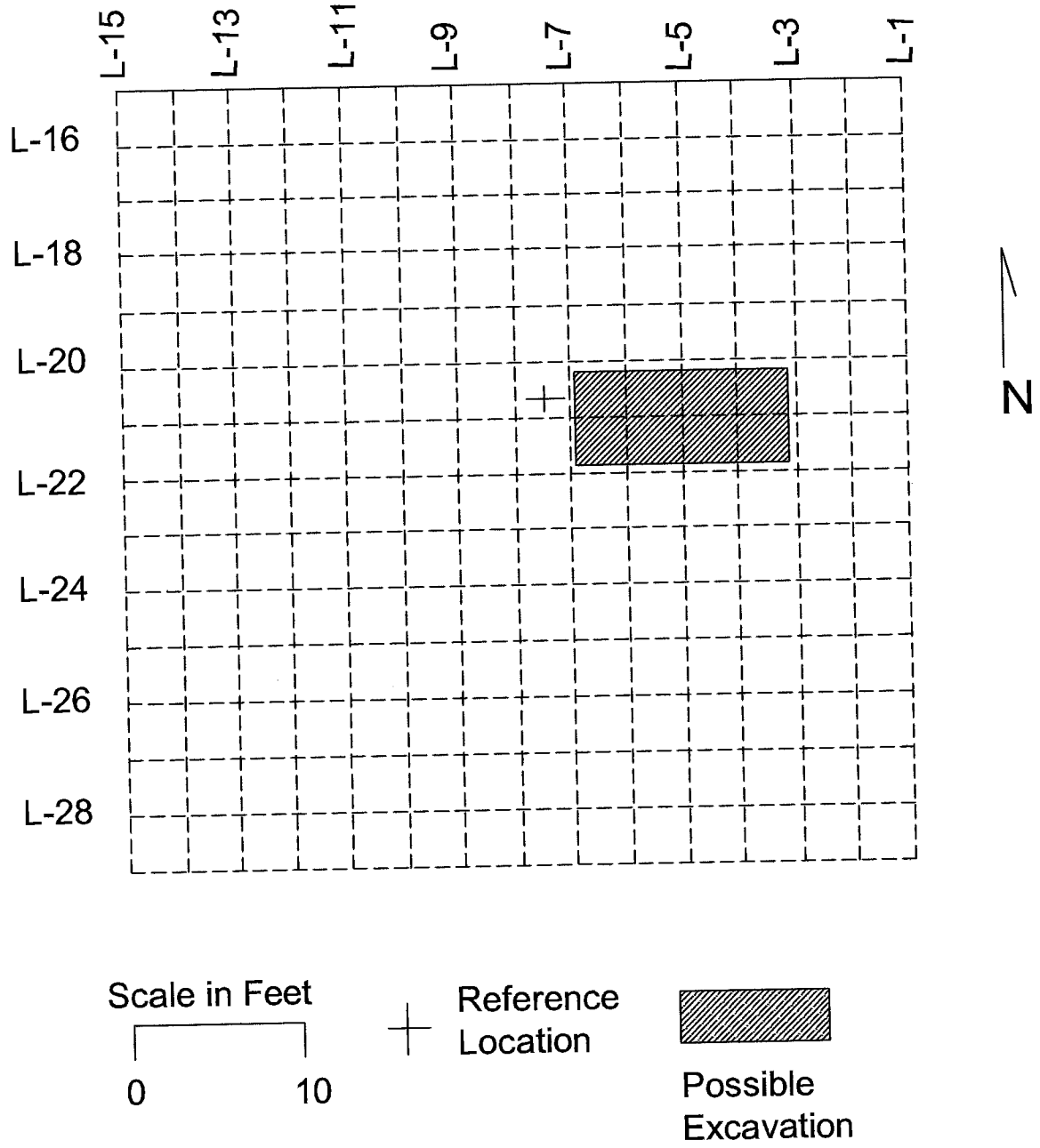
An area was found that may show evidence of an excavation that may have resulted from the UST removal.. The GPR image over the area is shown below. The location of the scan is shown on Figure 1.



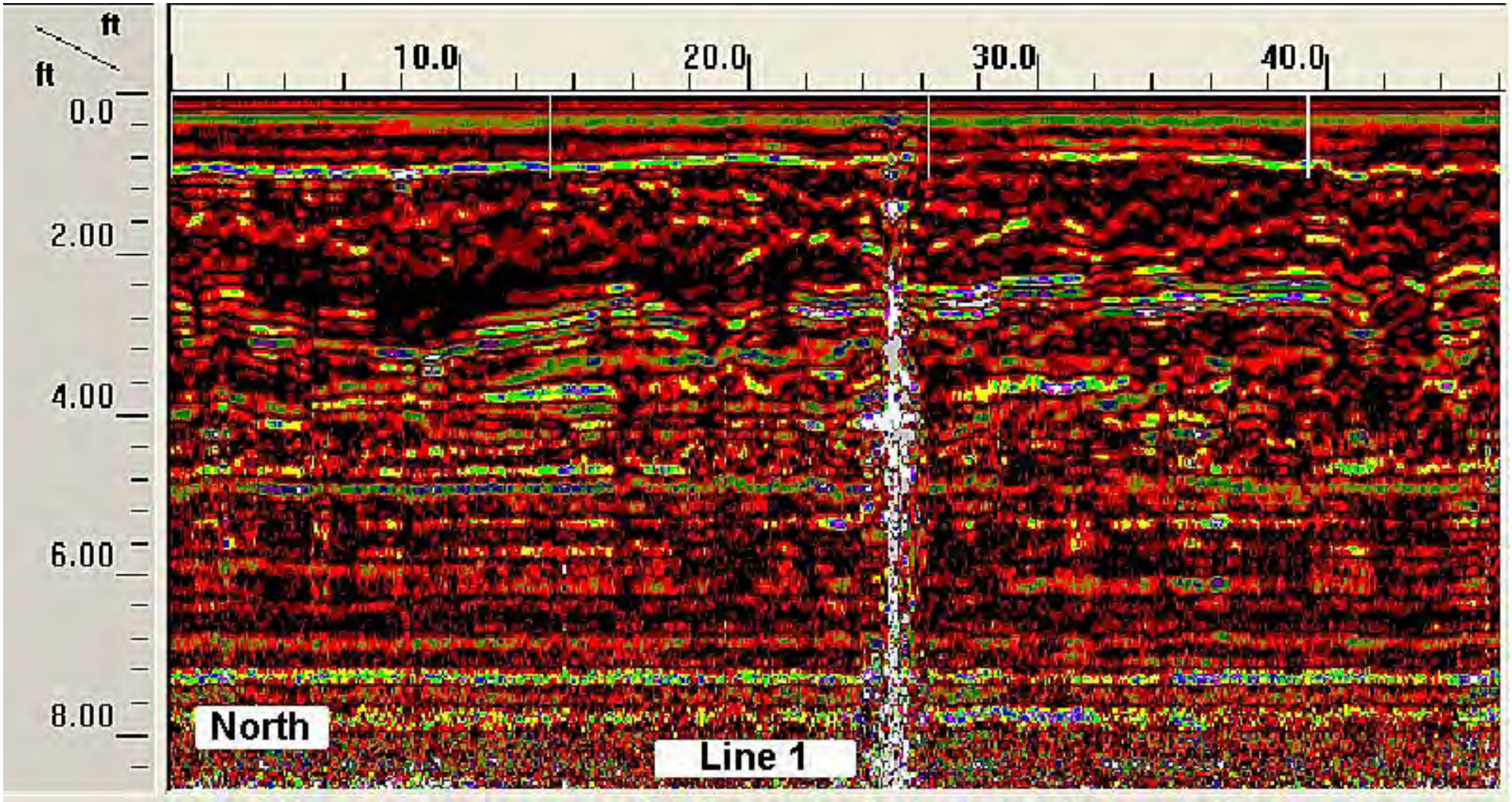

The collected GPR data are presented on the attached CD.

An attempt was made to locate two monitoring well monument casings with electromagnet methods. The monument casings were not found, an may have been removed during grading operations on the lot.

The information presented in this report is based upon geophysical measurements made by generally accepted methods and field procedures, and our interpretation of these data. The presented information is based upon our best estimate of subsurface conditions considering the geophysical results and all other information available to us. These results are interpretive in nature and are considered to be a reasonably accurate presentation of the existing conditions within the limitations of the method or methods employed.




| GPR IMAGERY | Location Plan | |
|---|---|---|
| 400 M Hertz Antenna<br>J11-830/64 | GEO-RECON INTERNATIONAL | FIG. 1 |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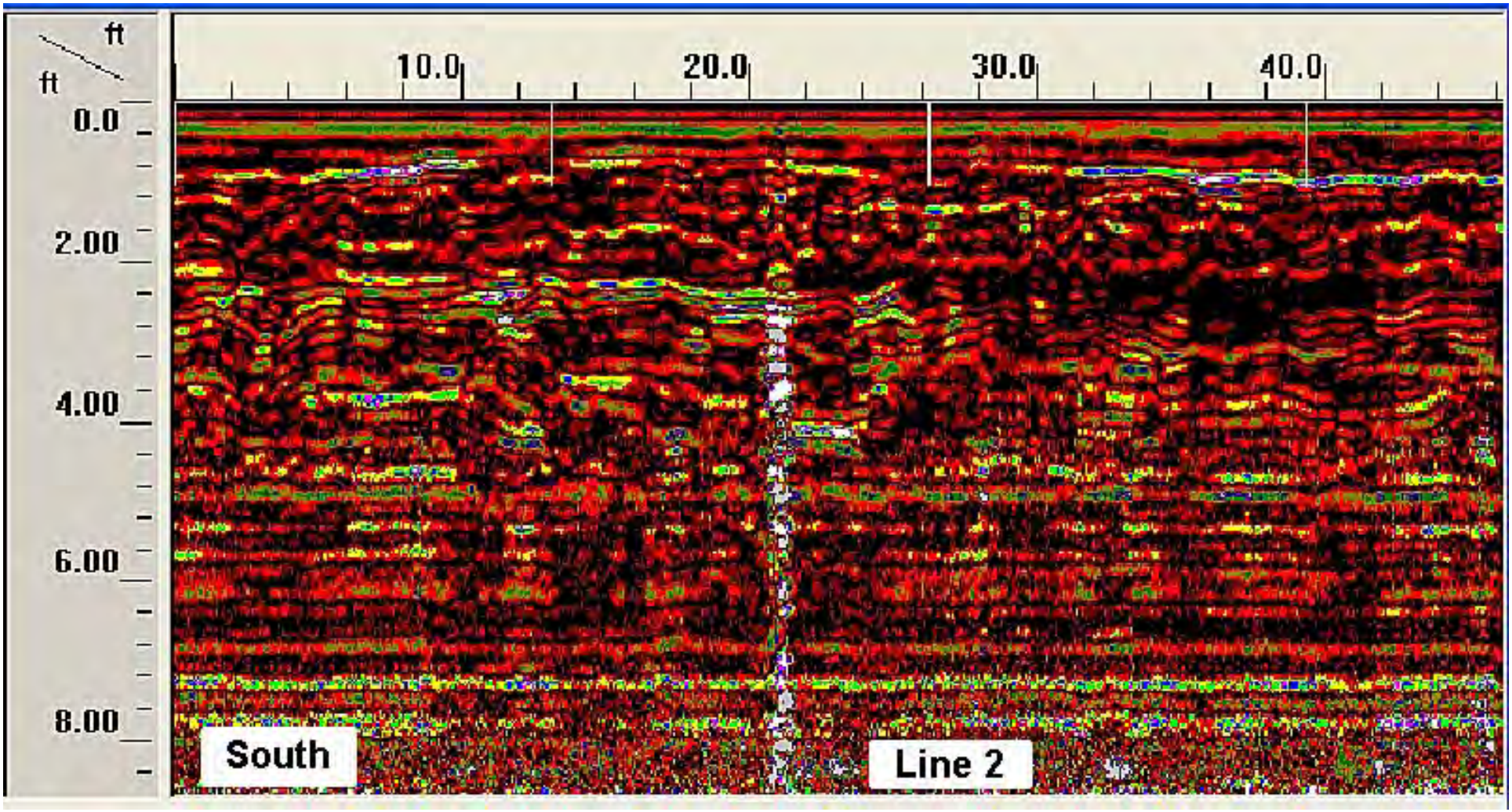
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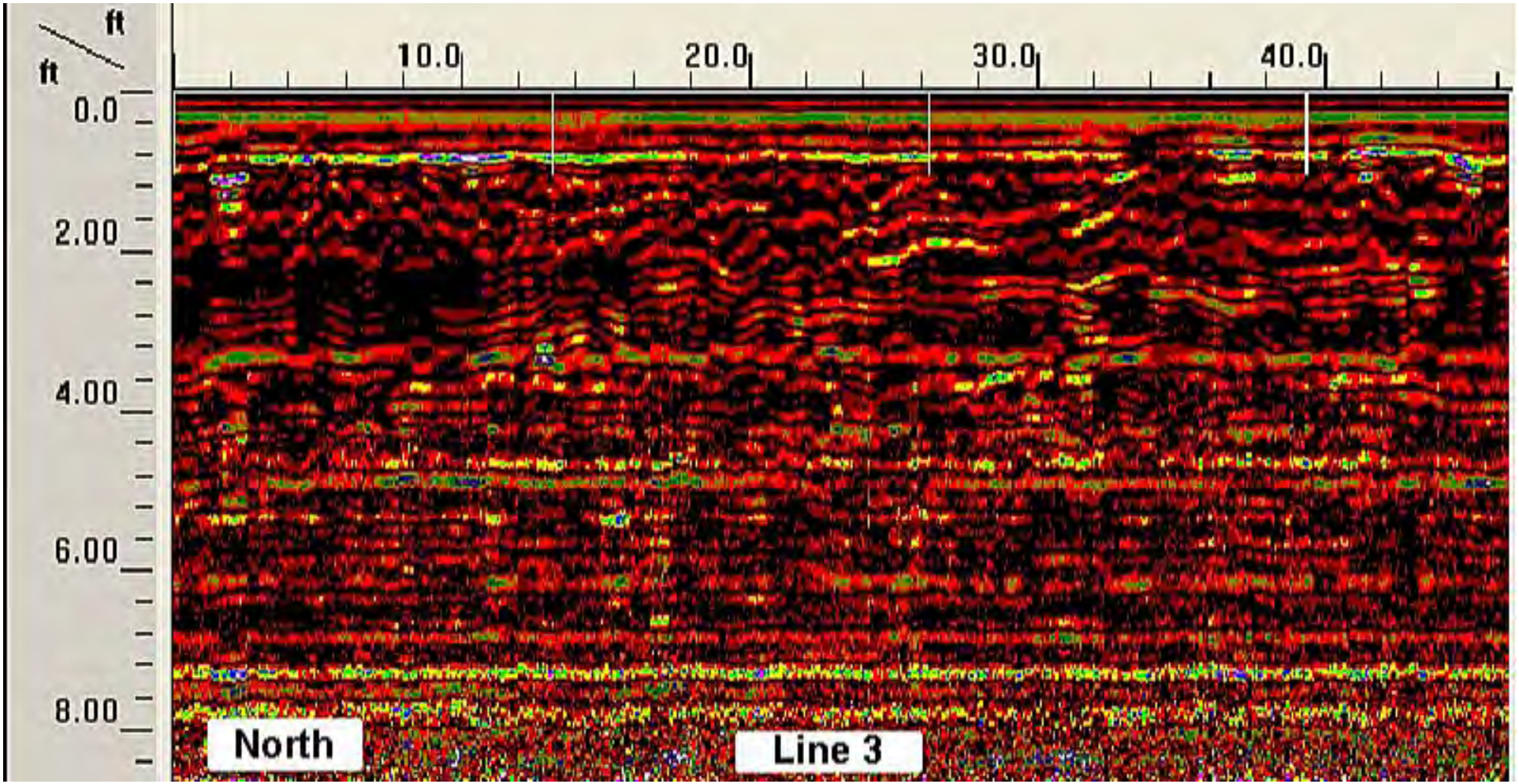
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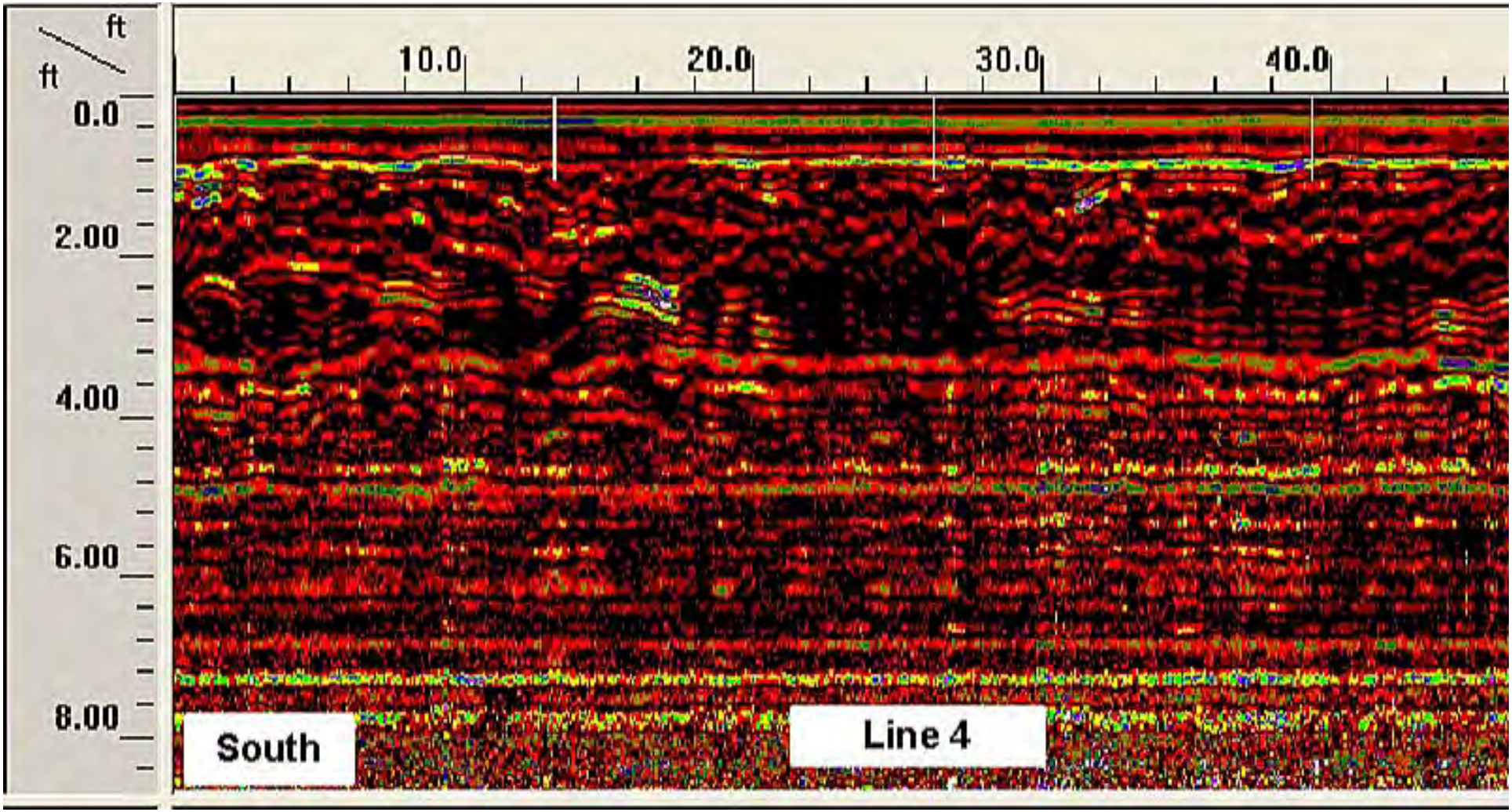
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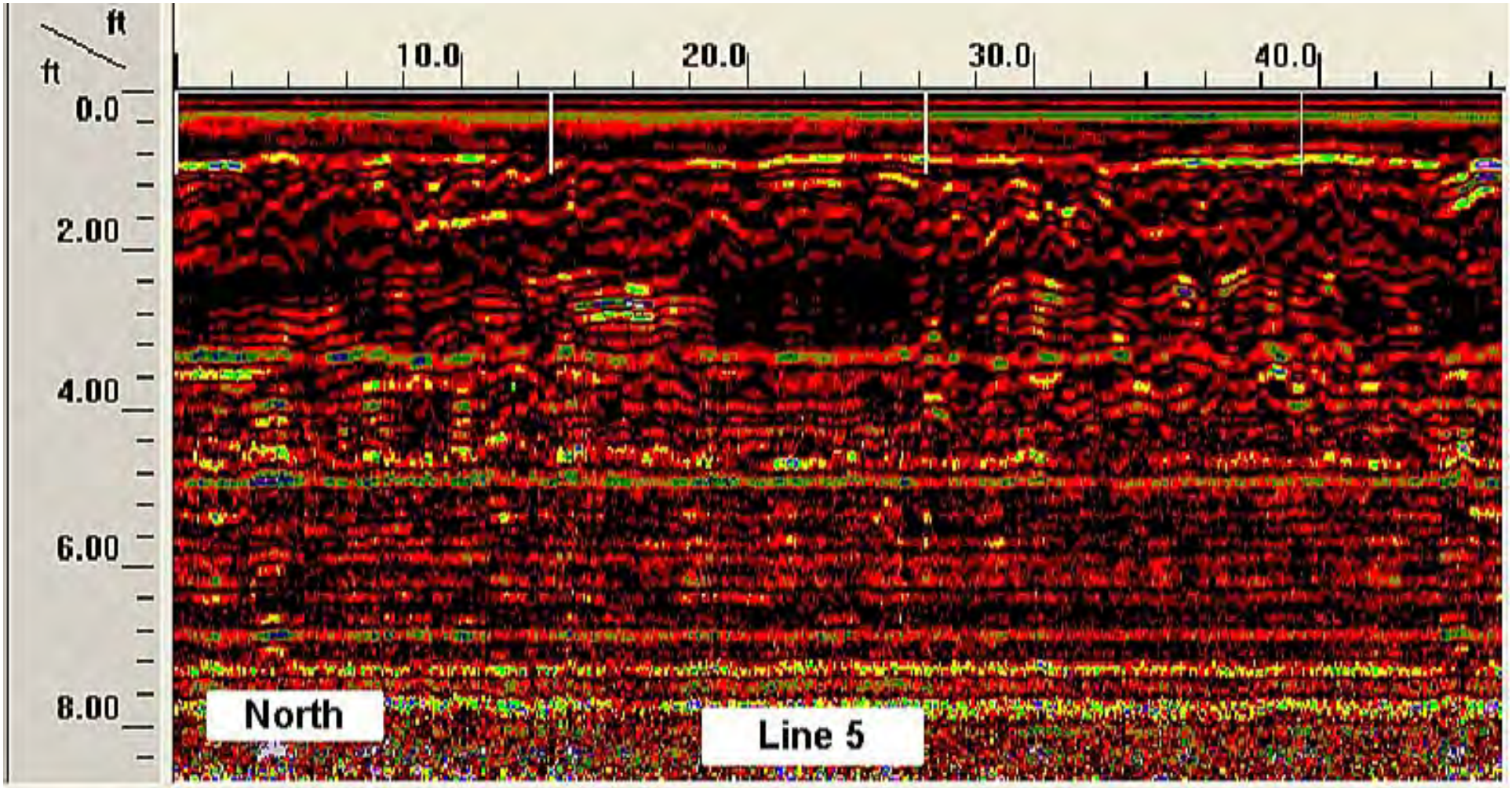
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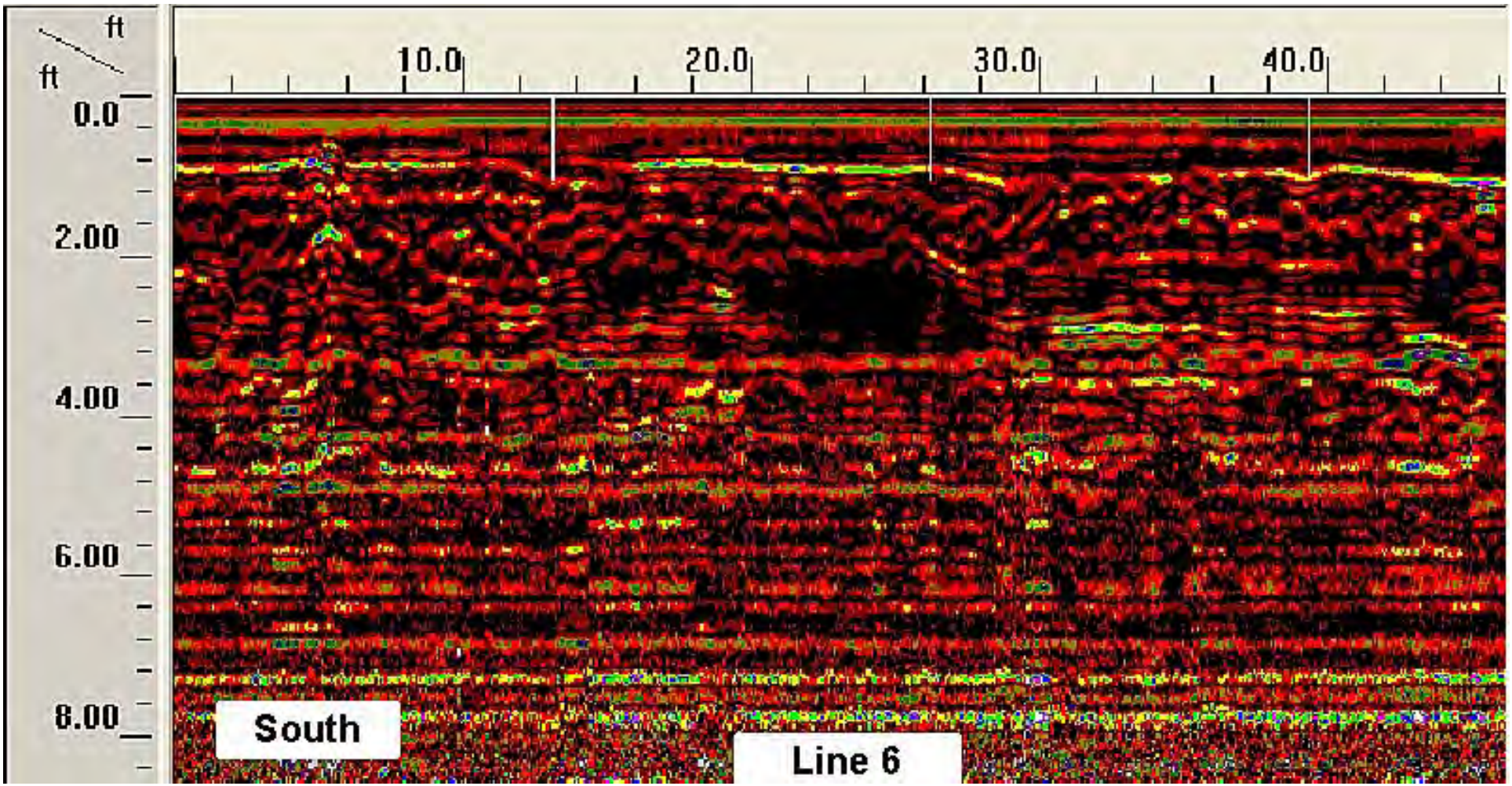
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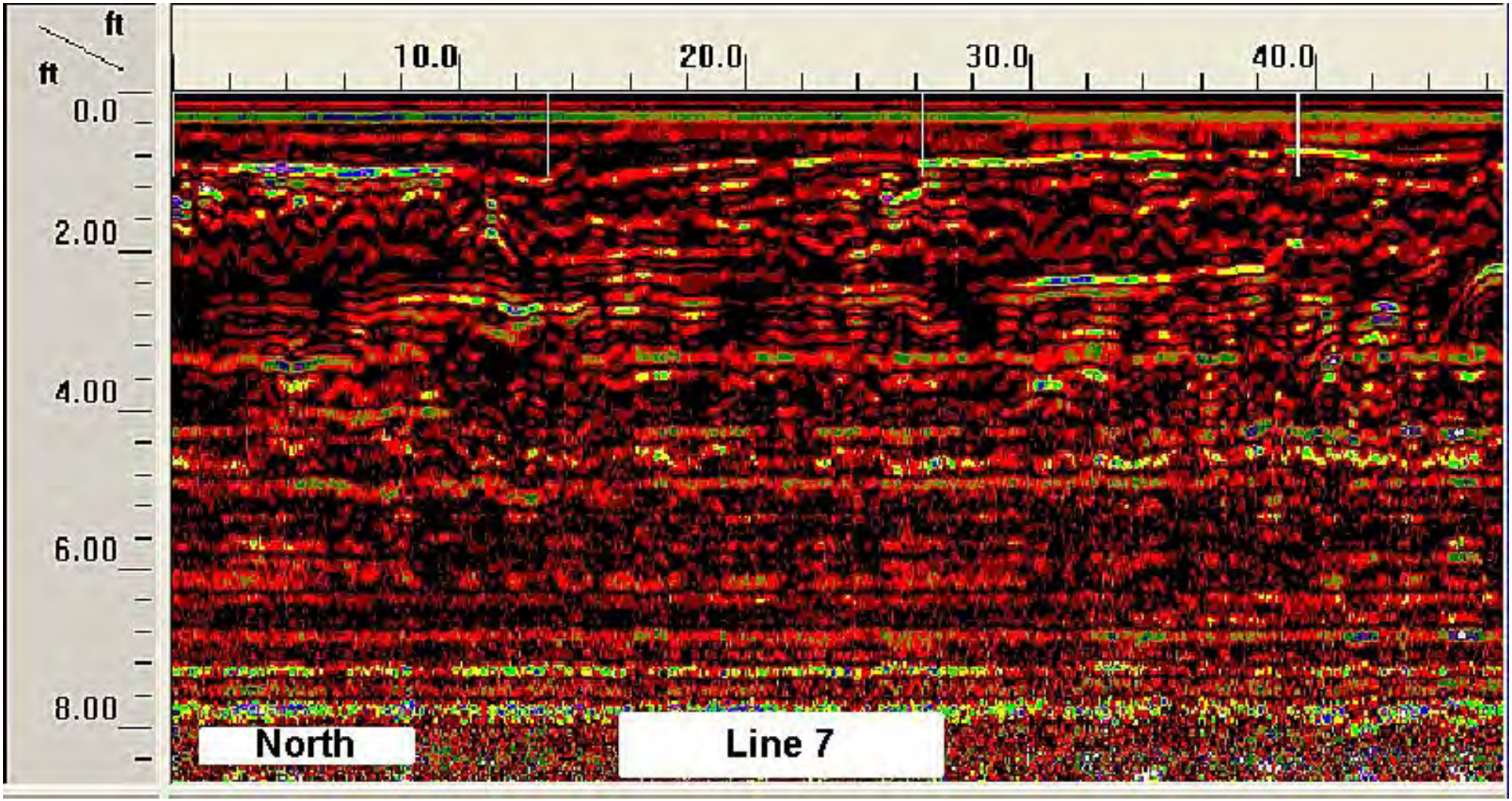
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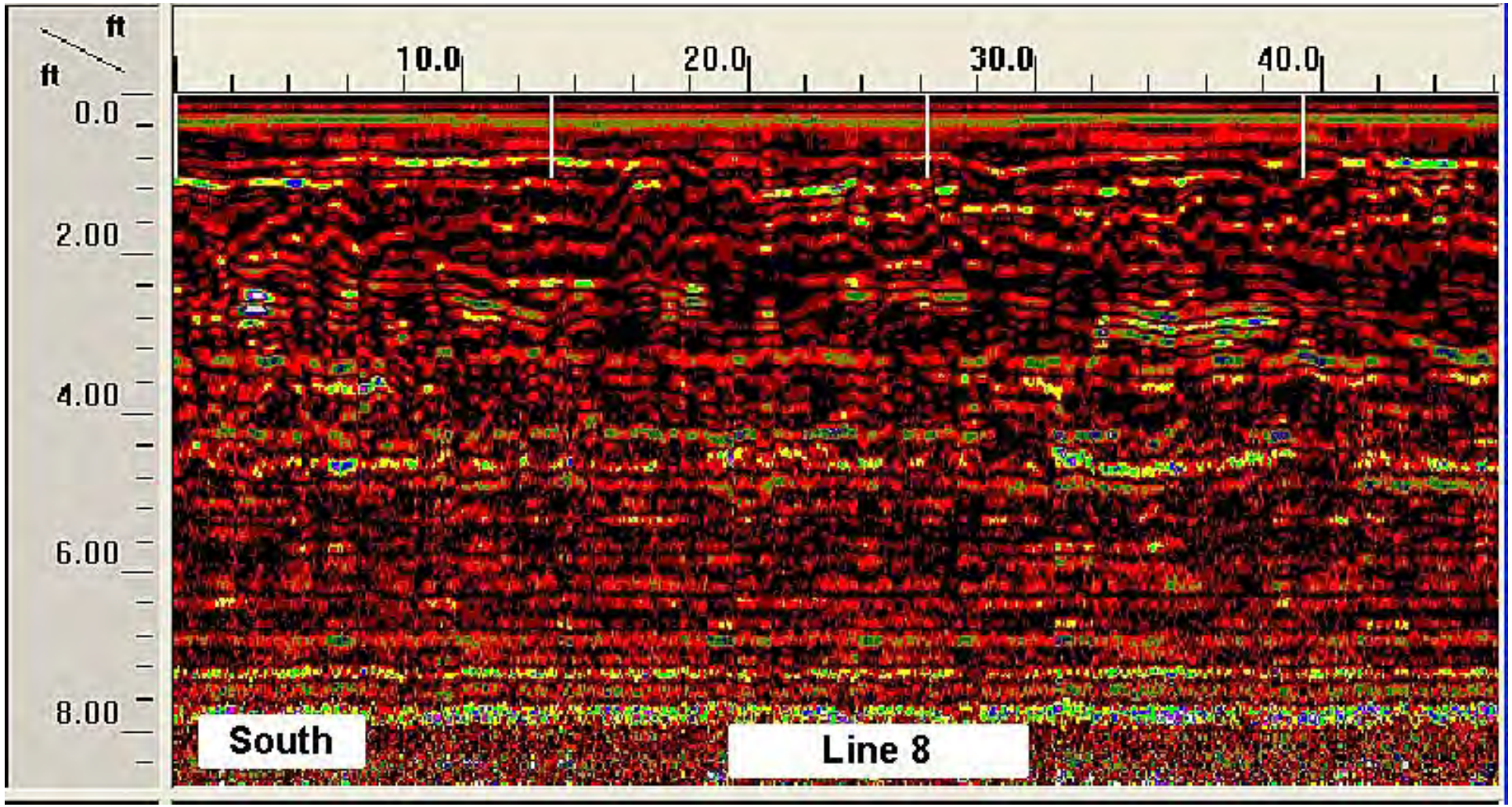
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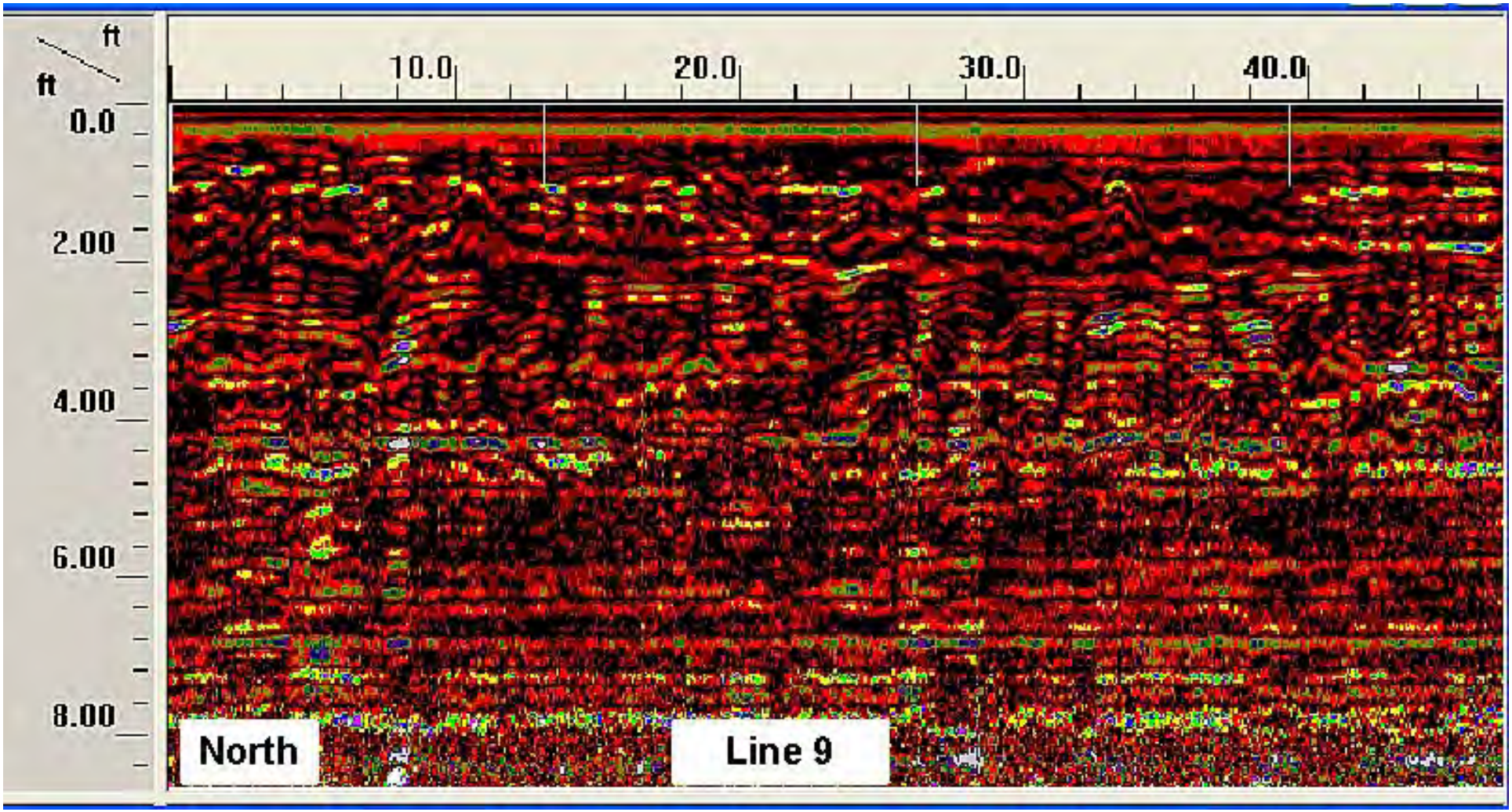
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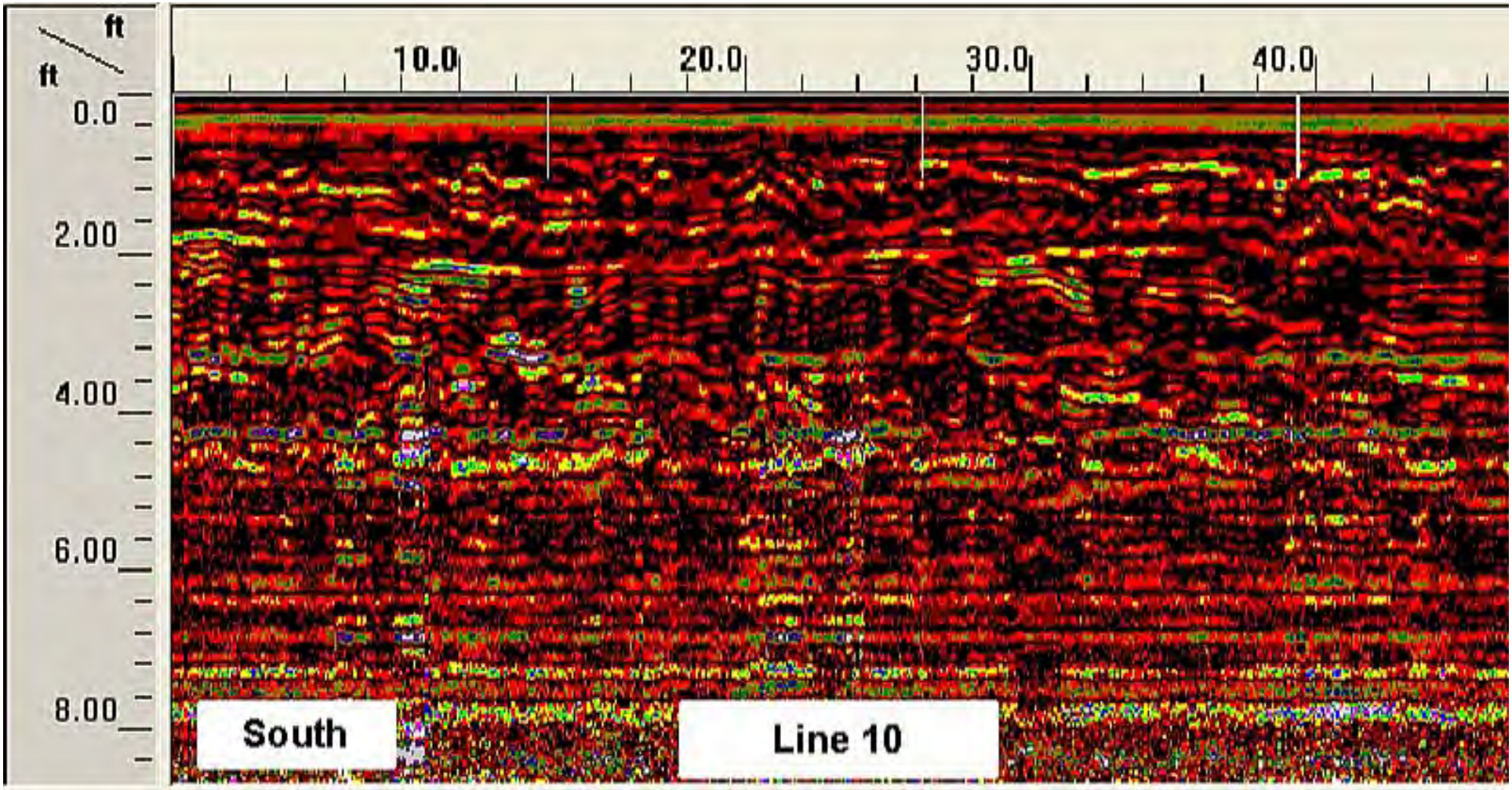
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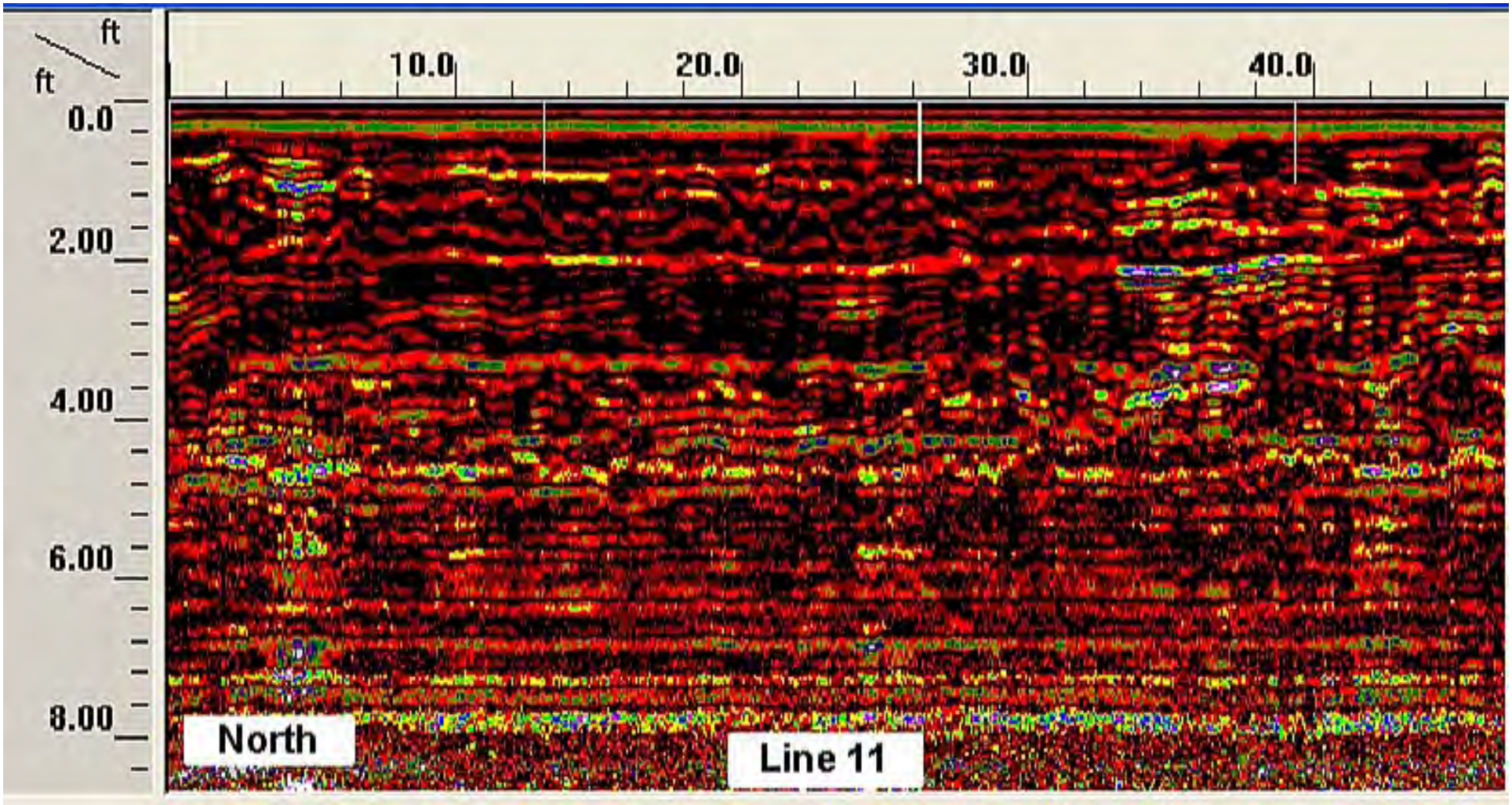
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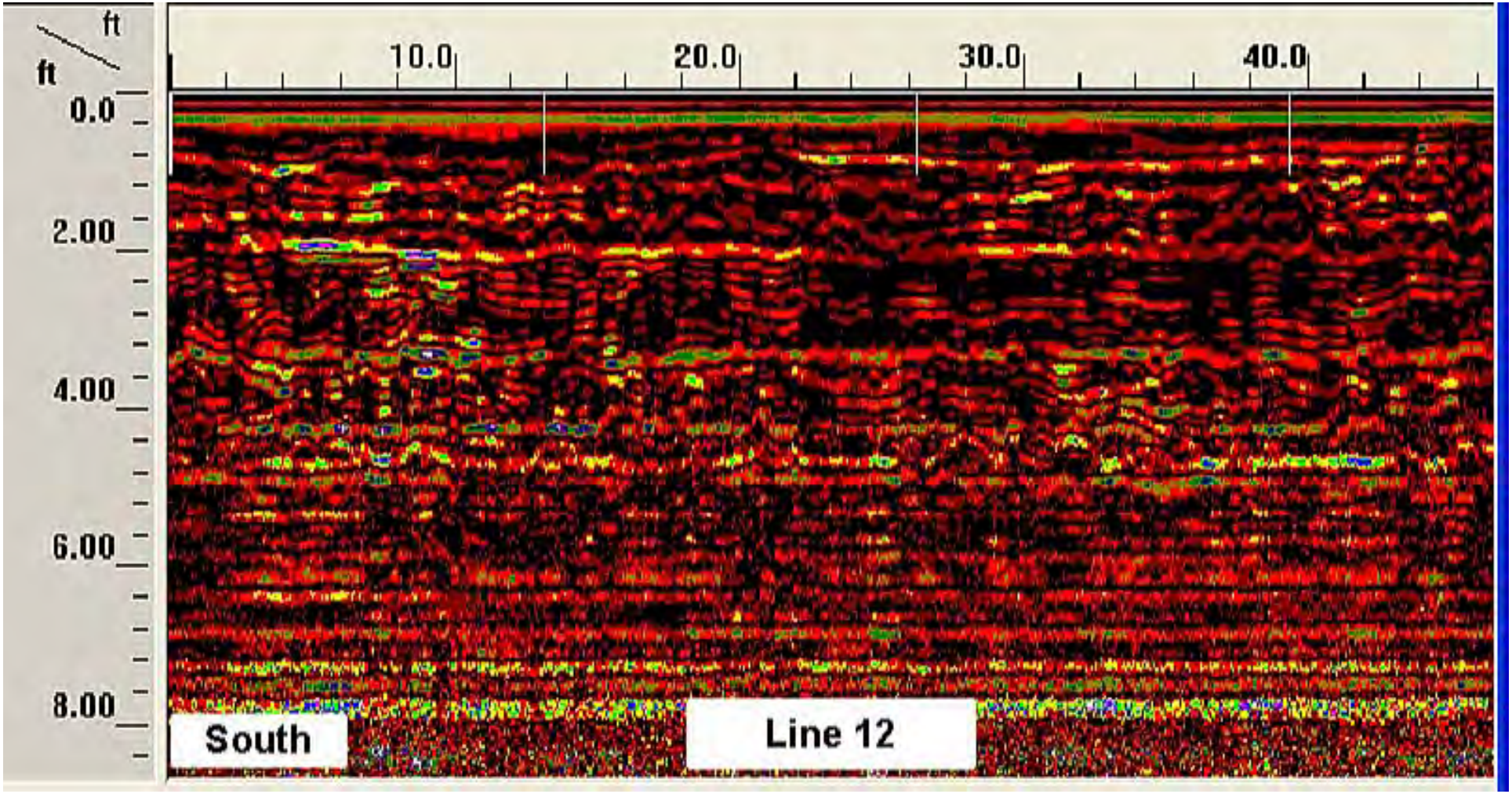
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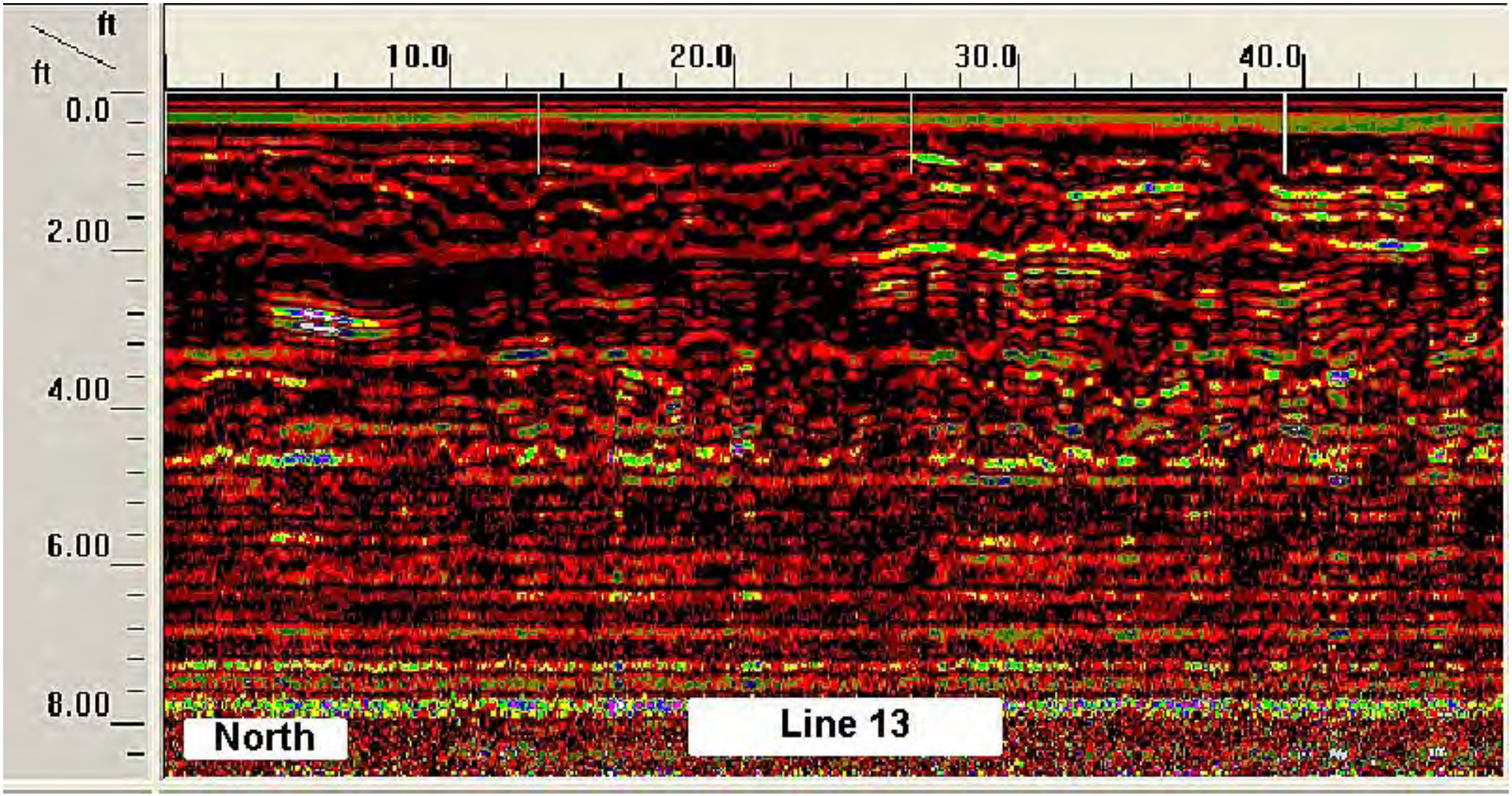
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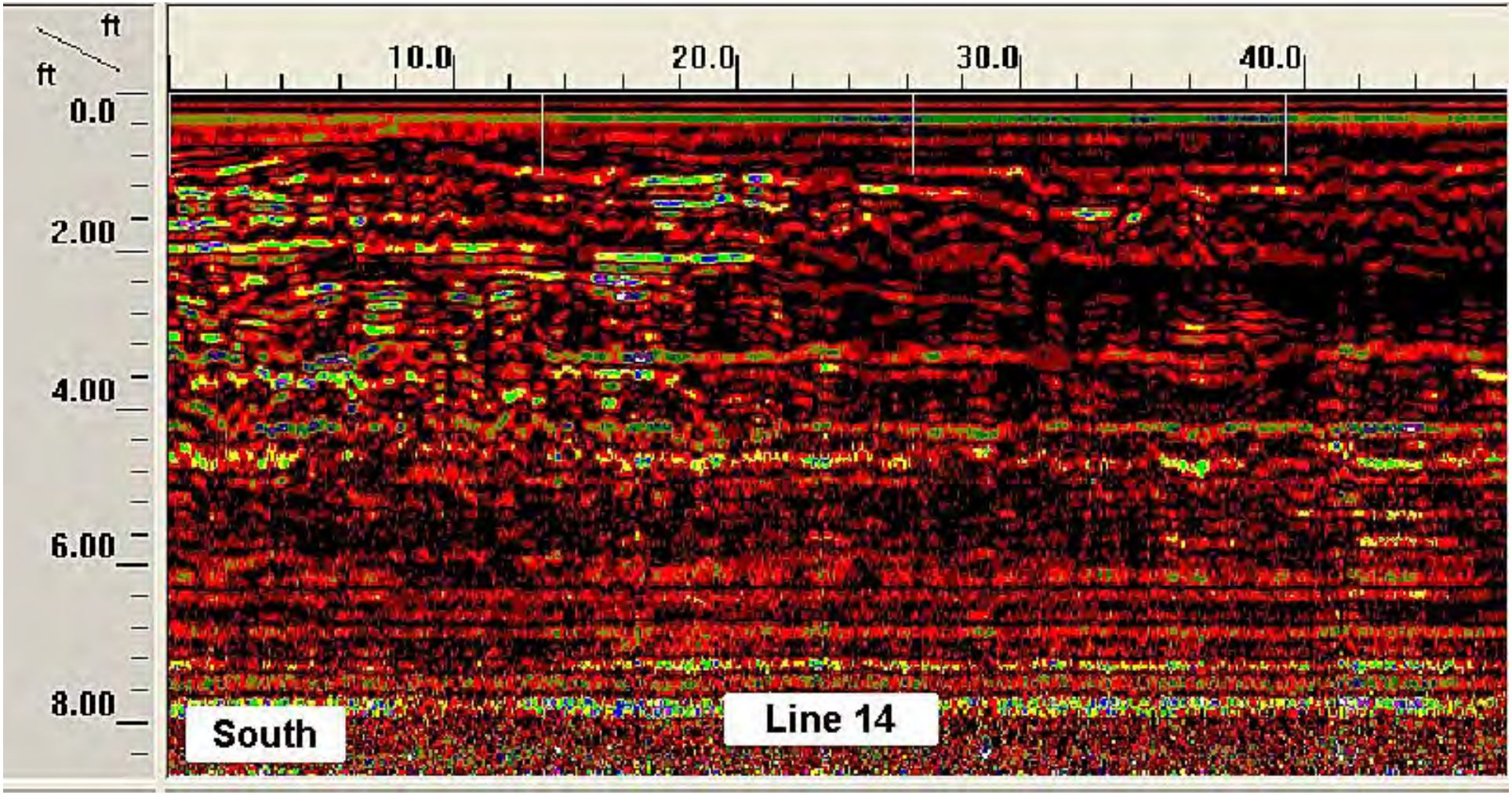
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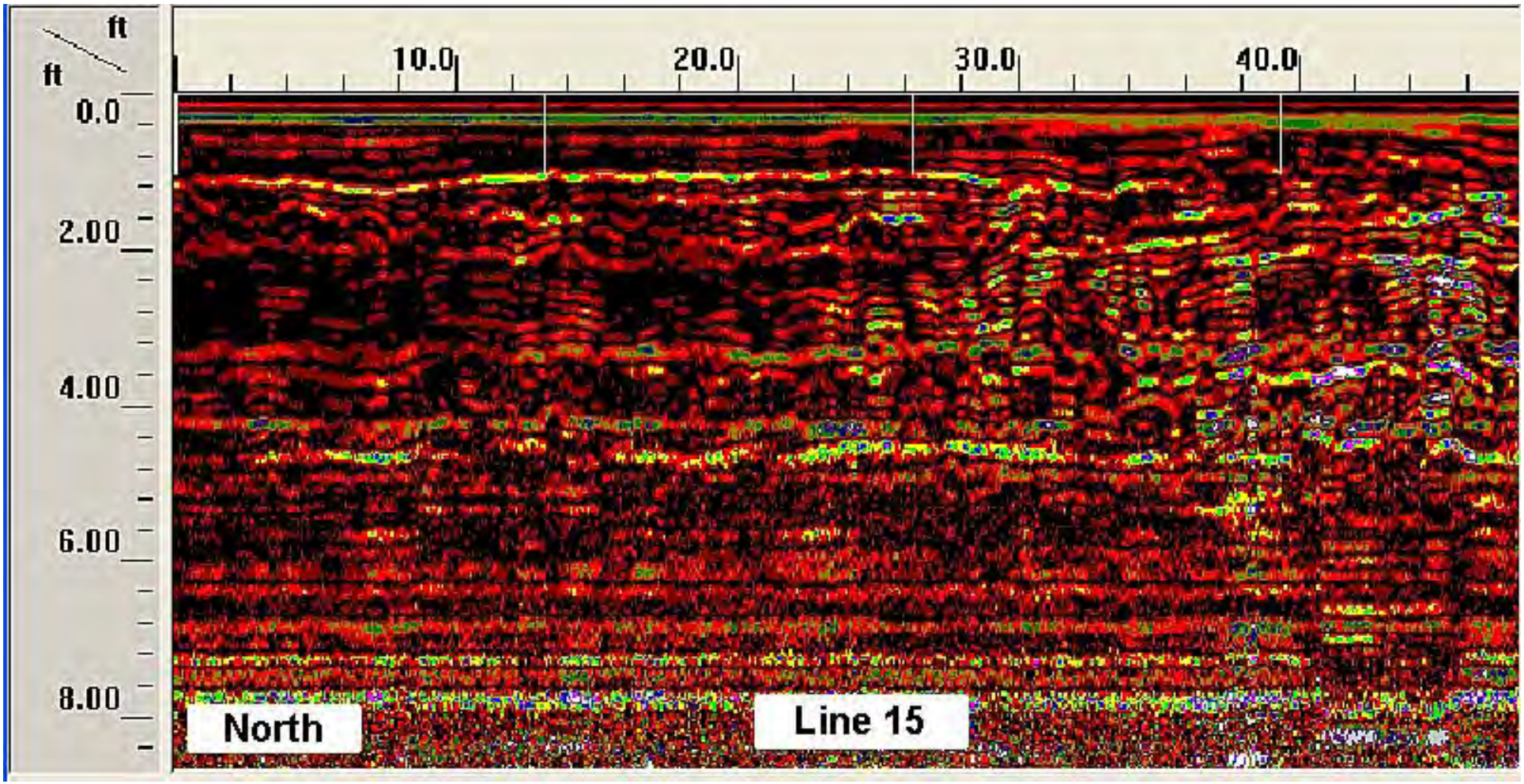
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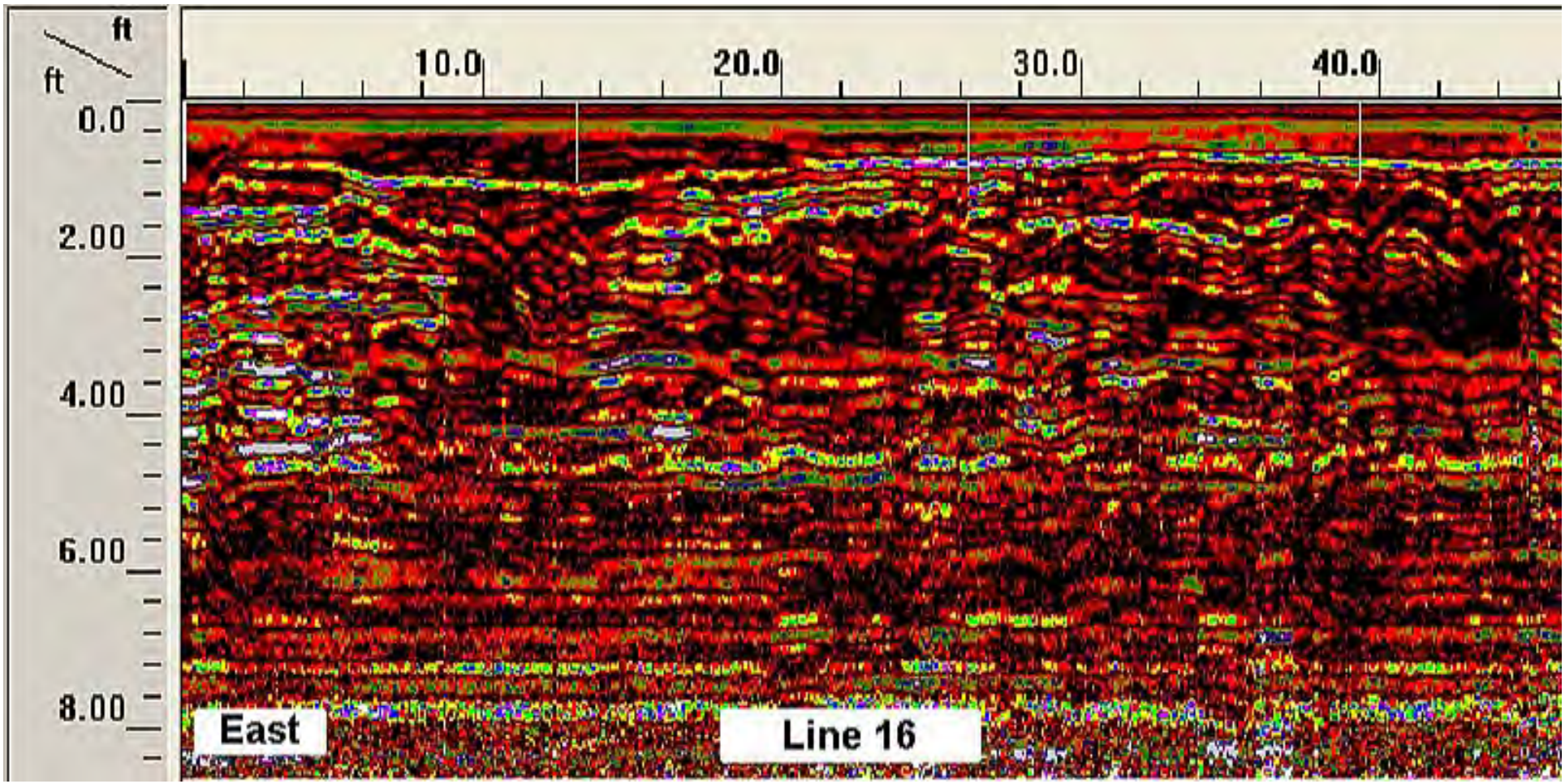
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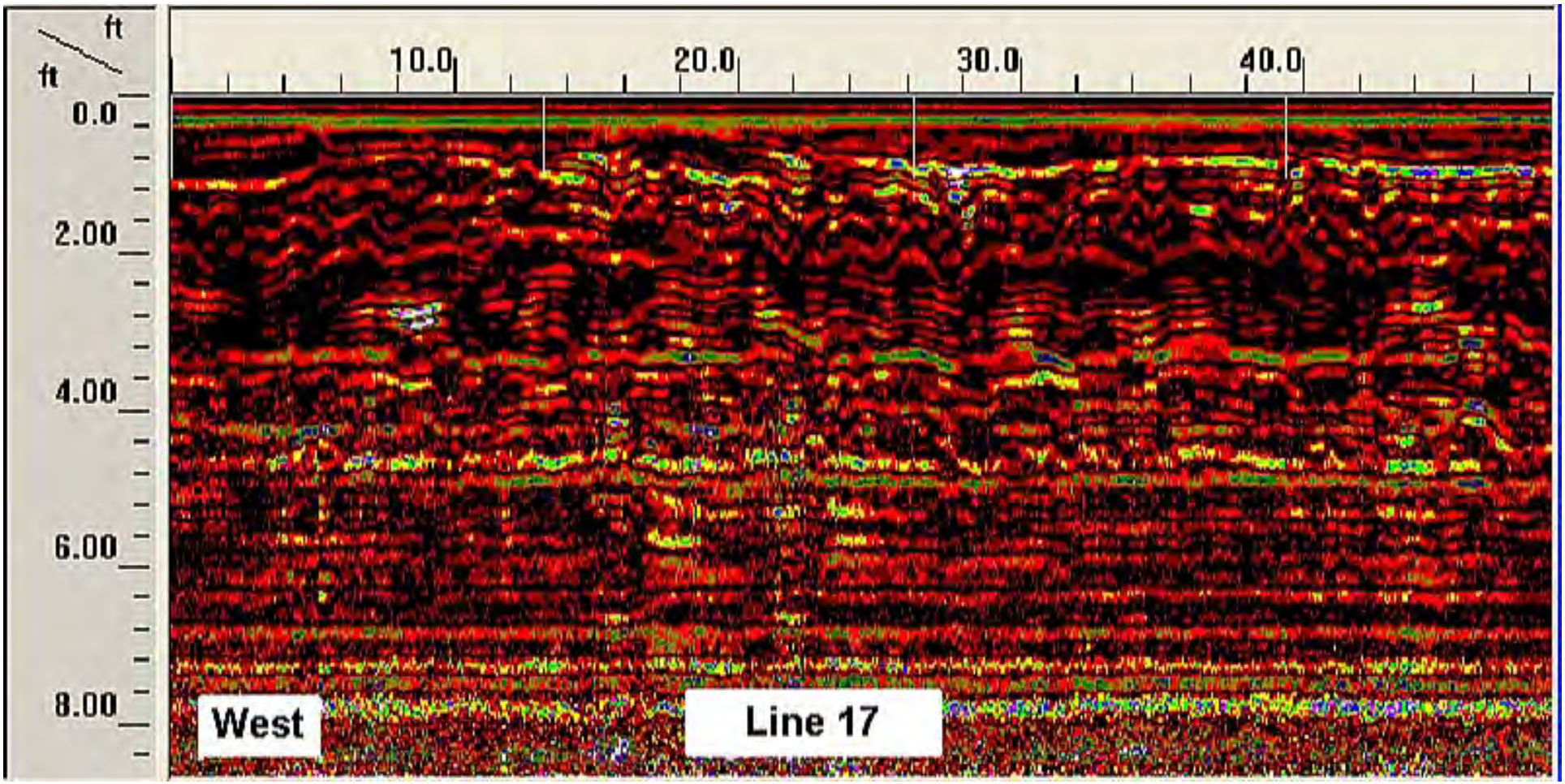
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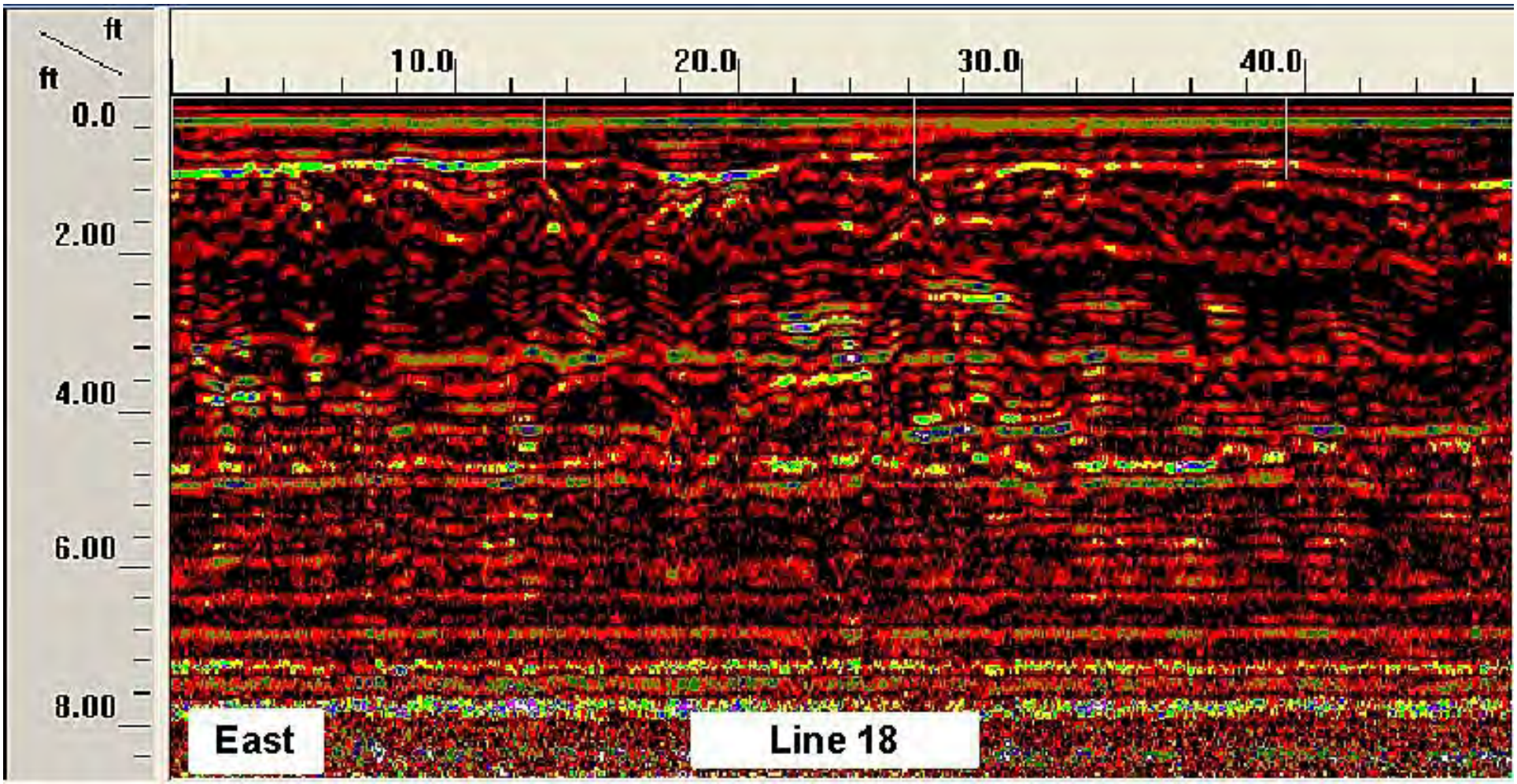
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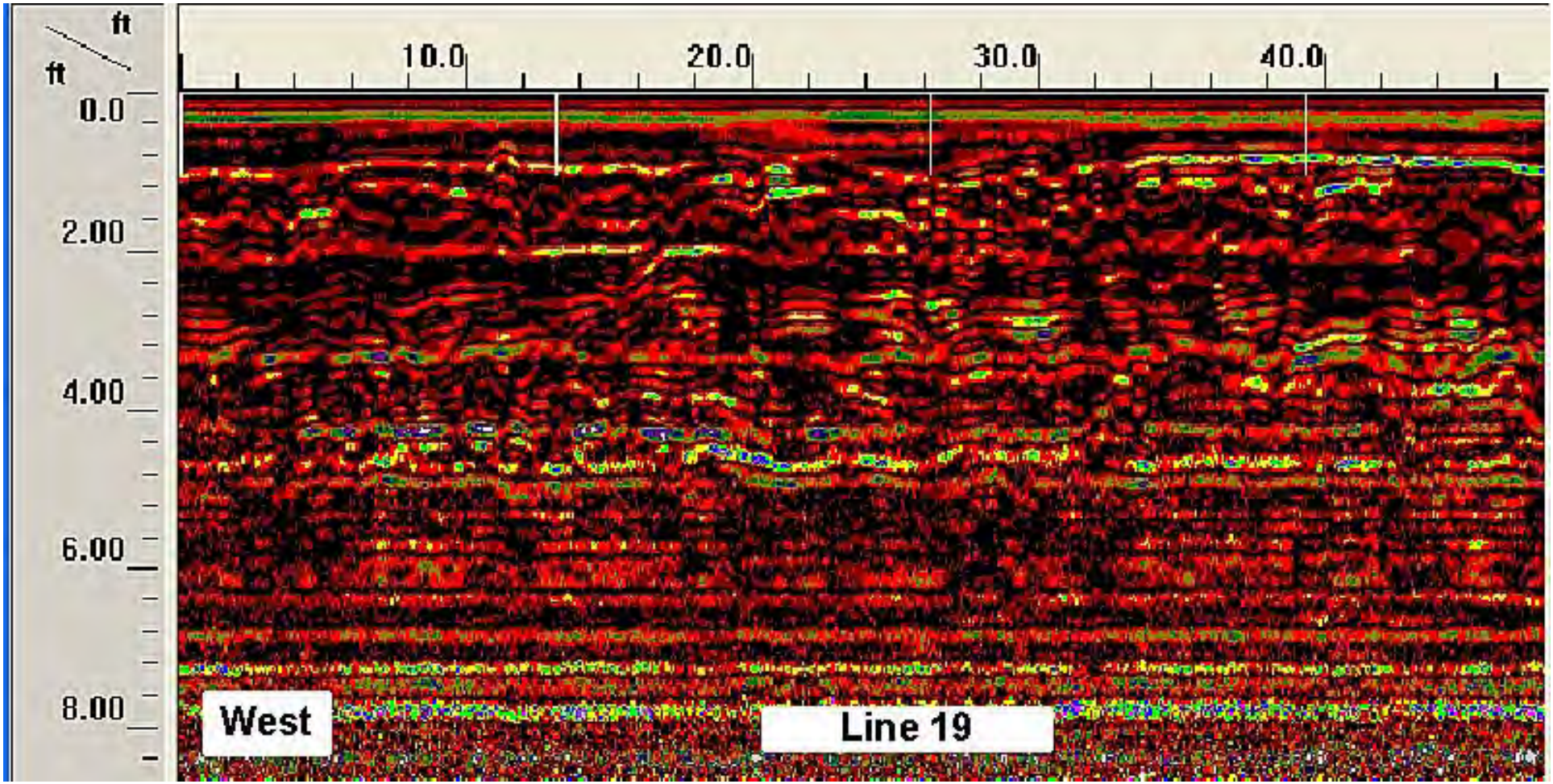
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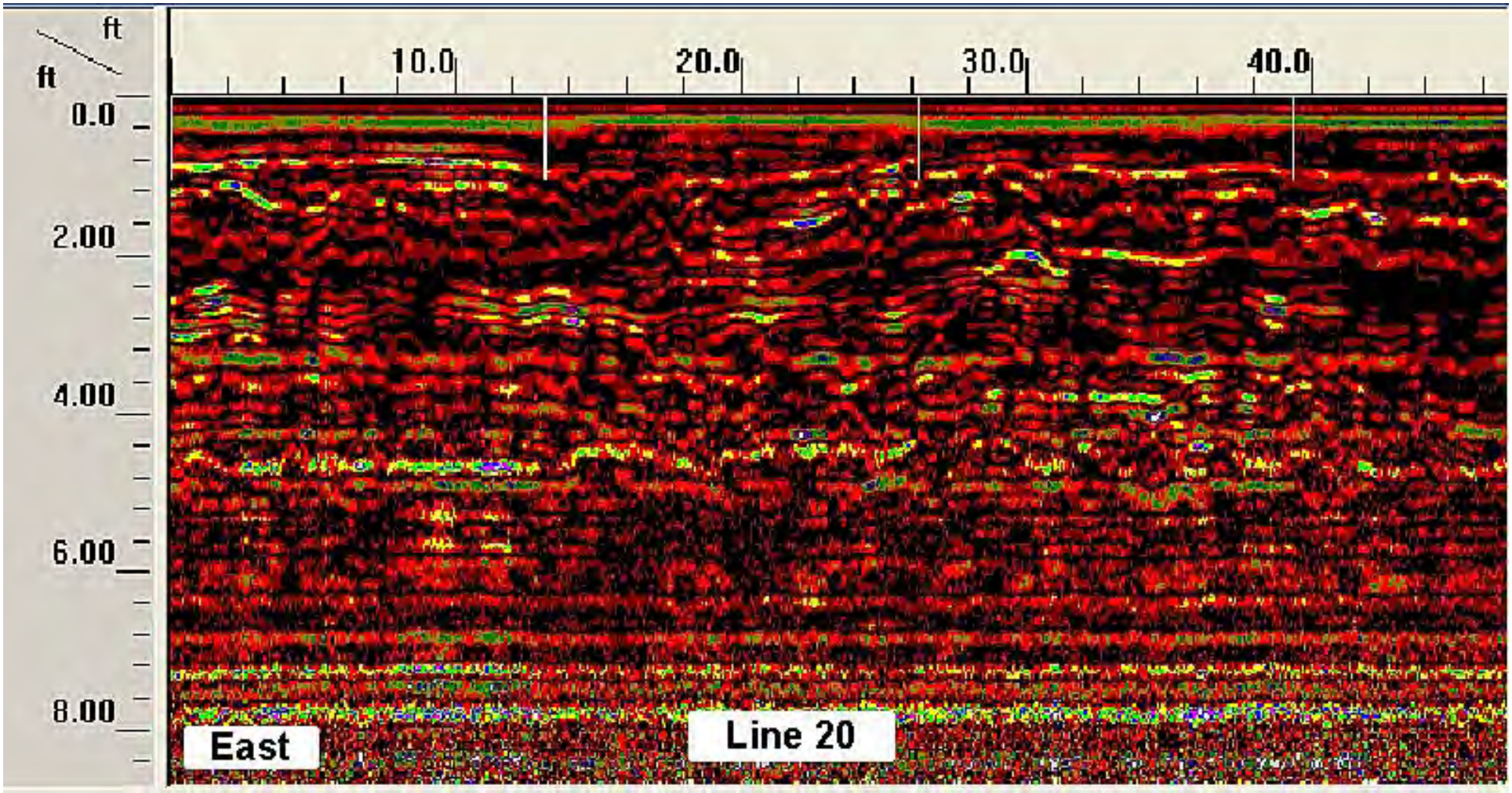
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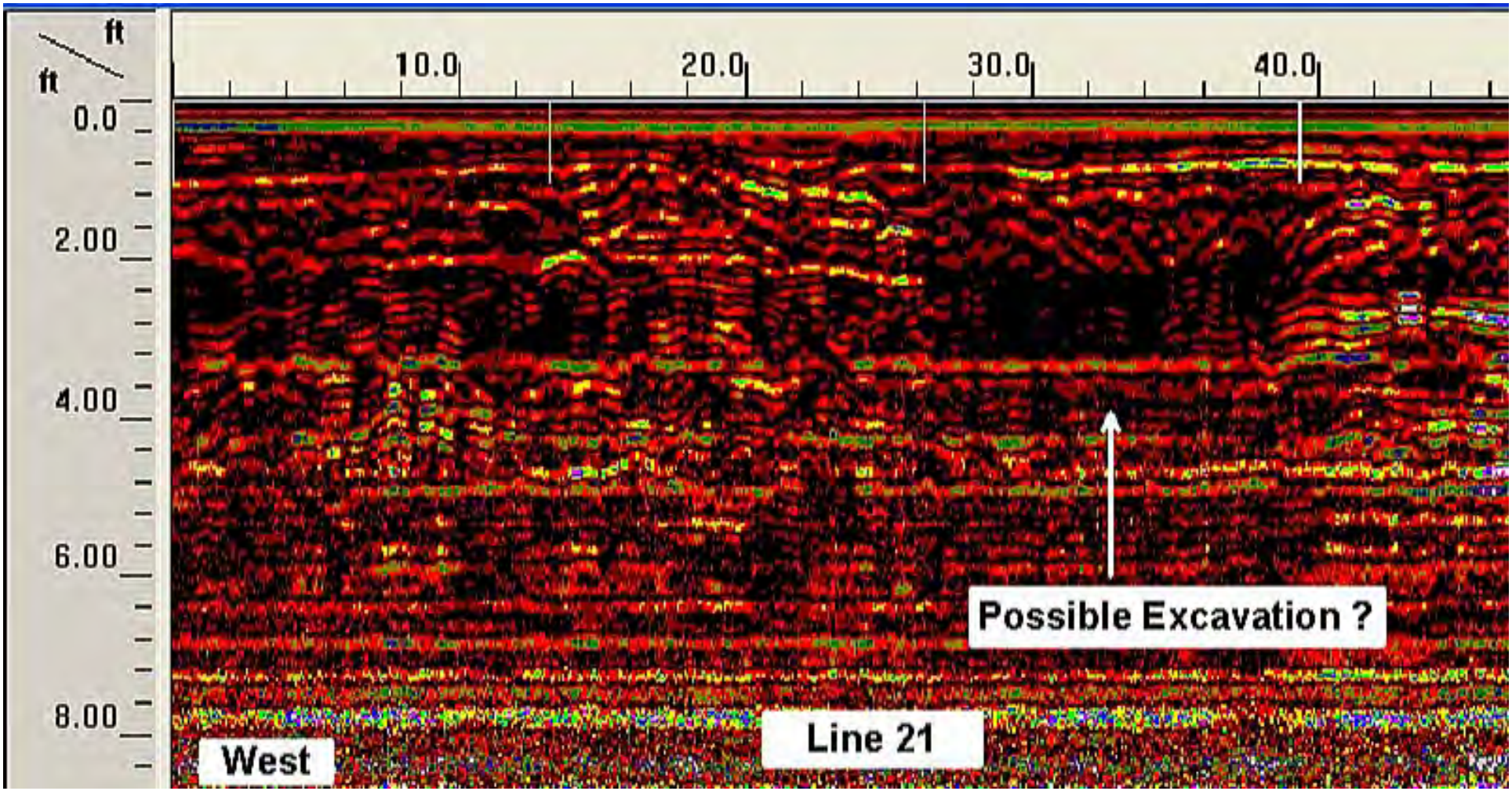
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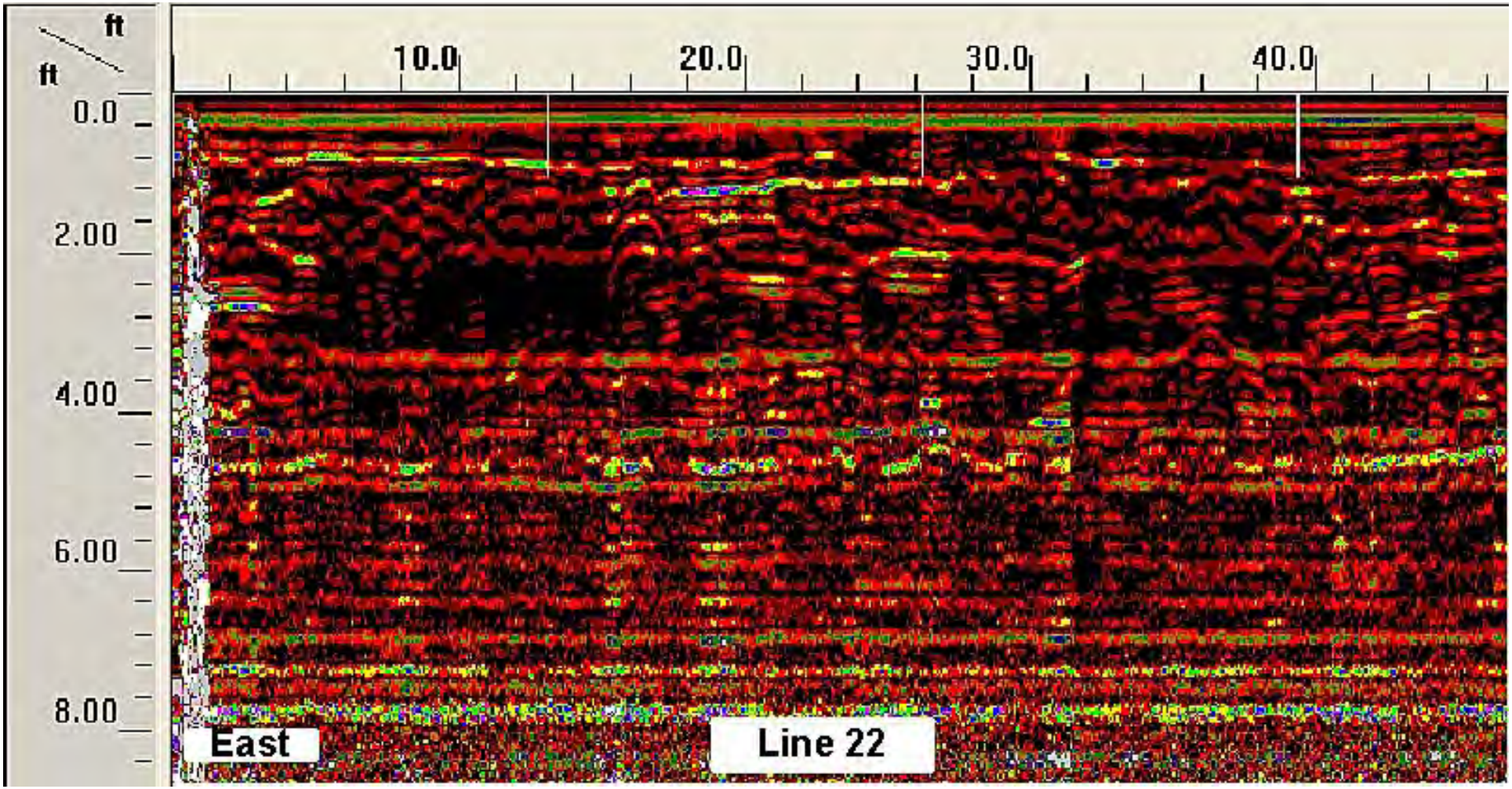
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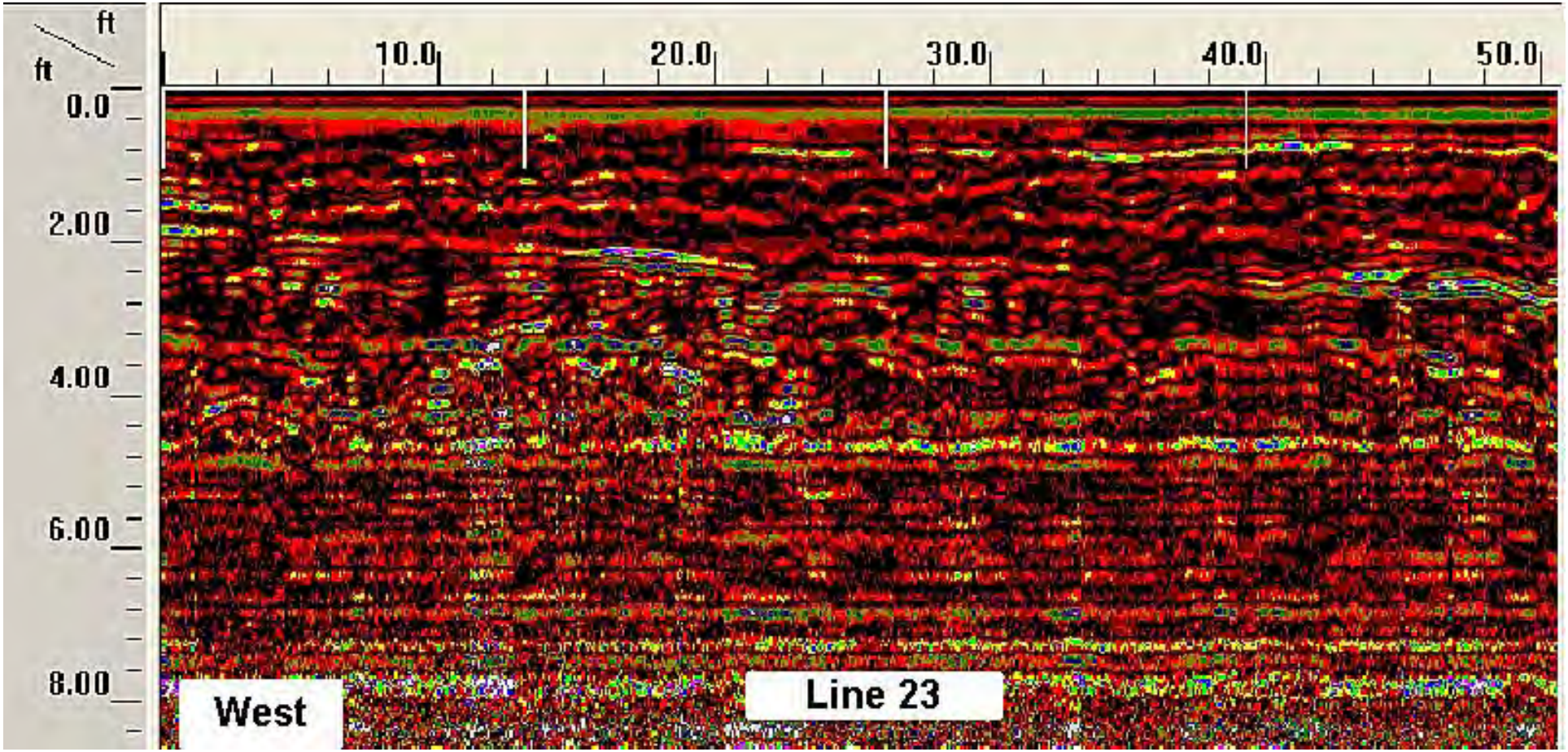
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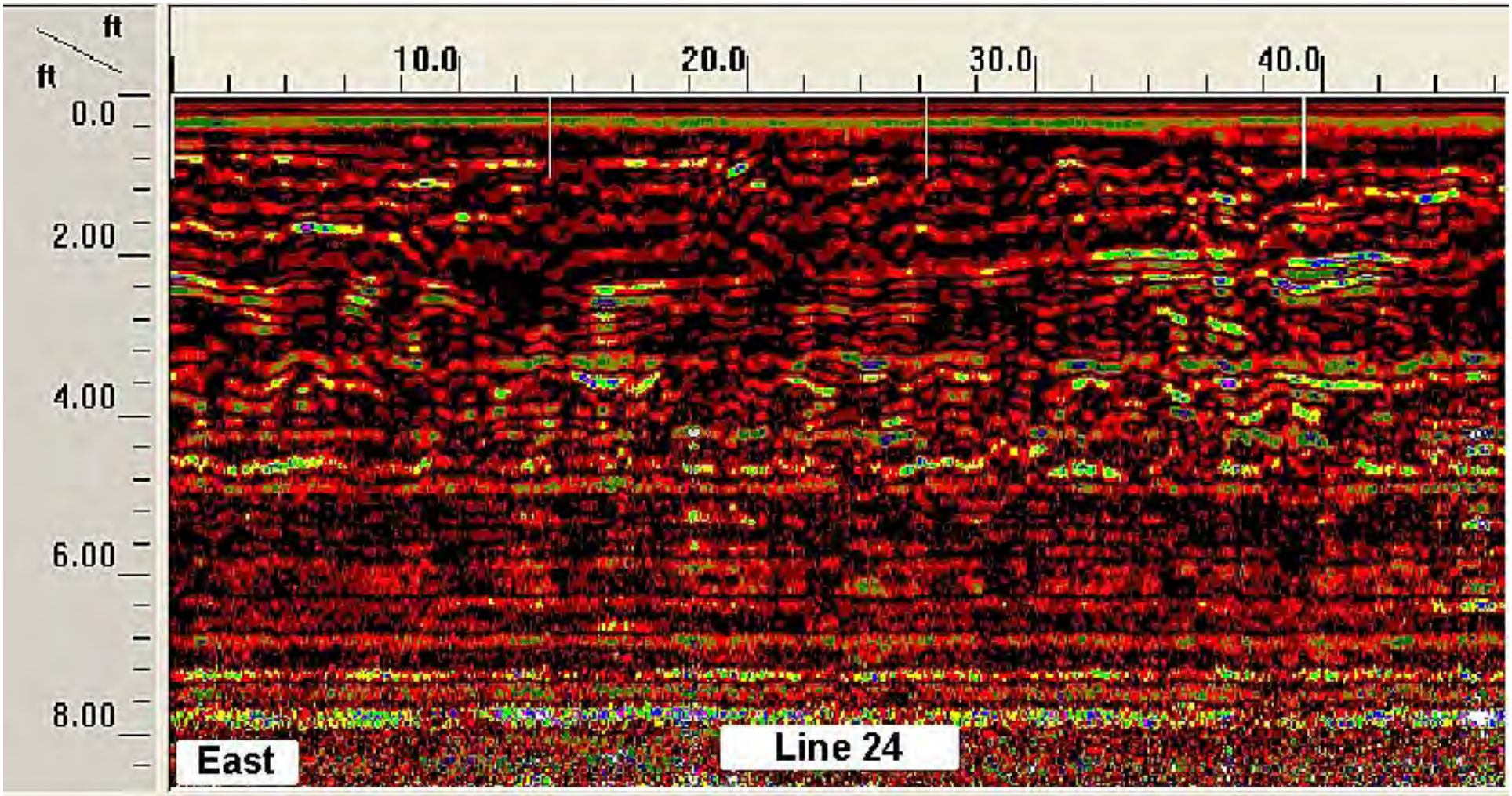
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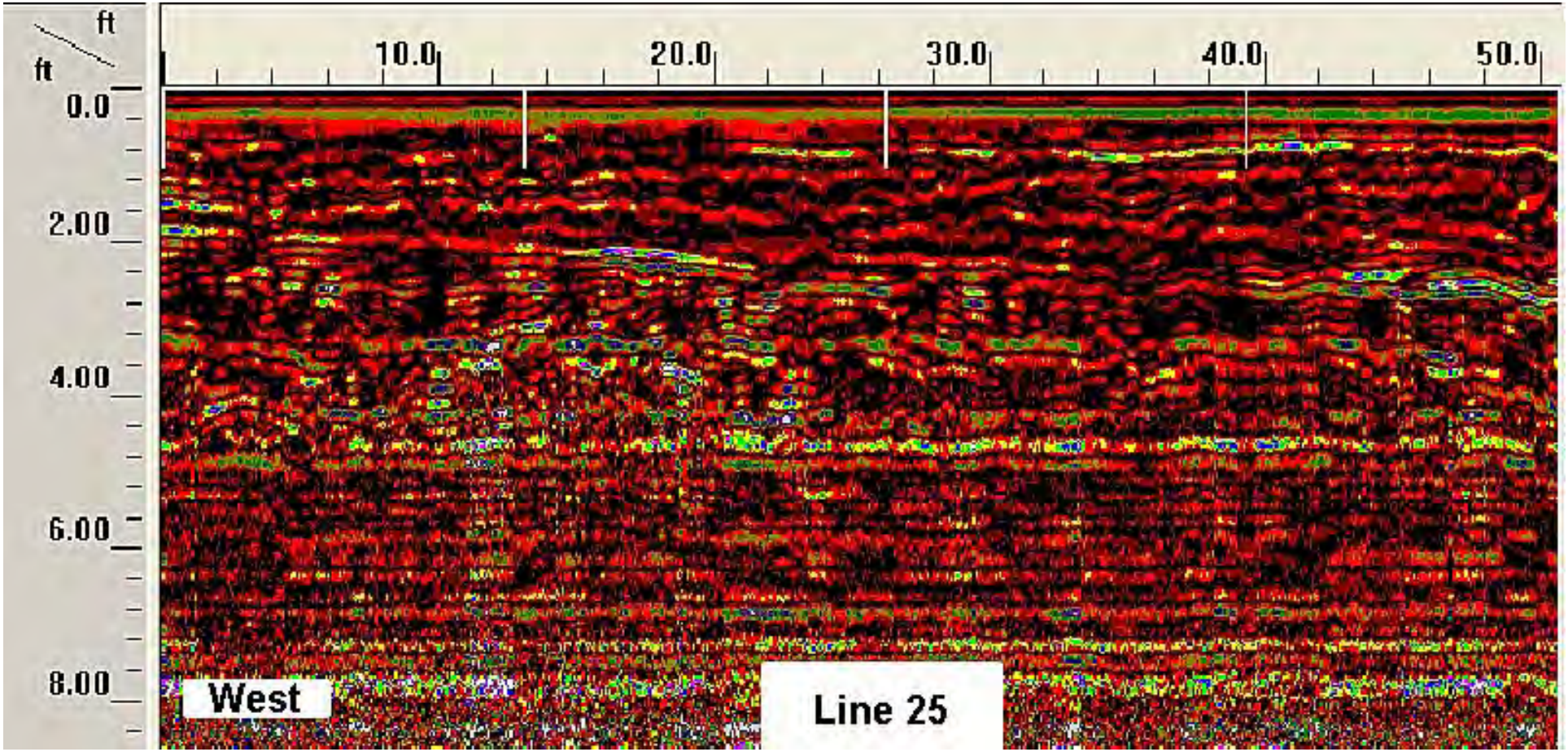
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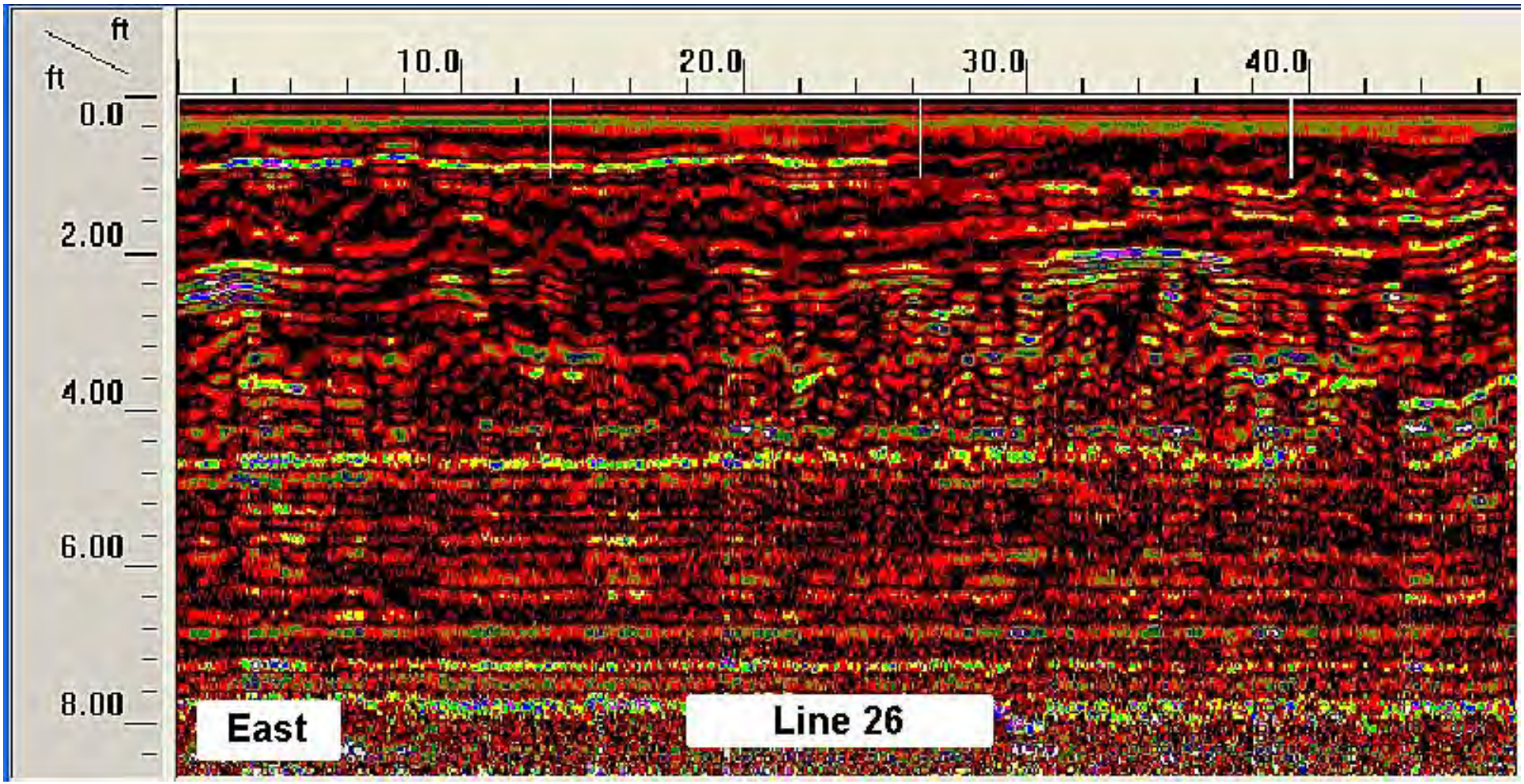
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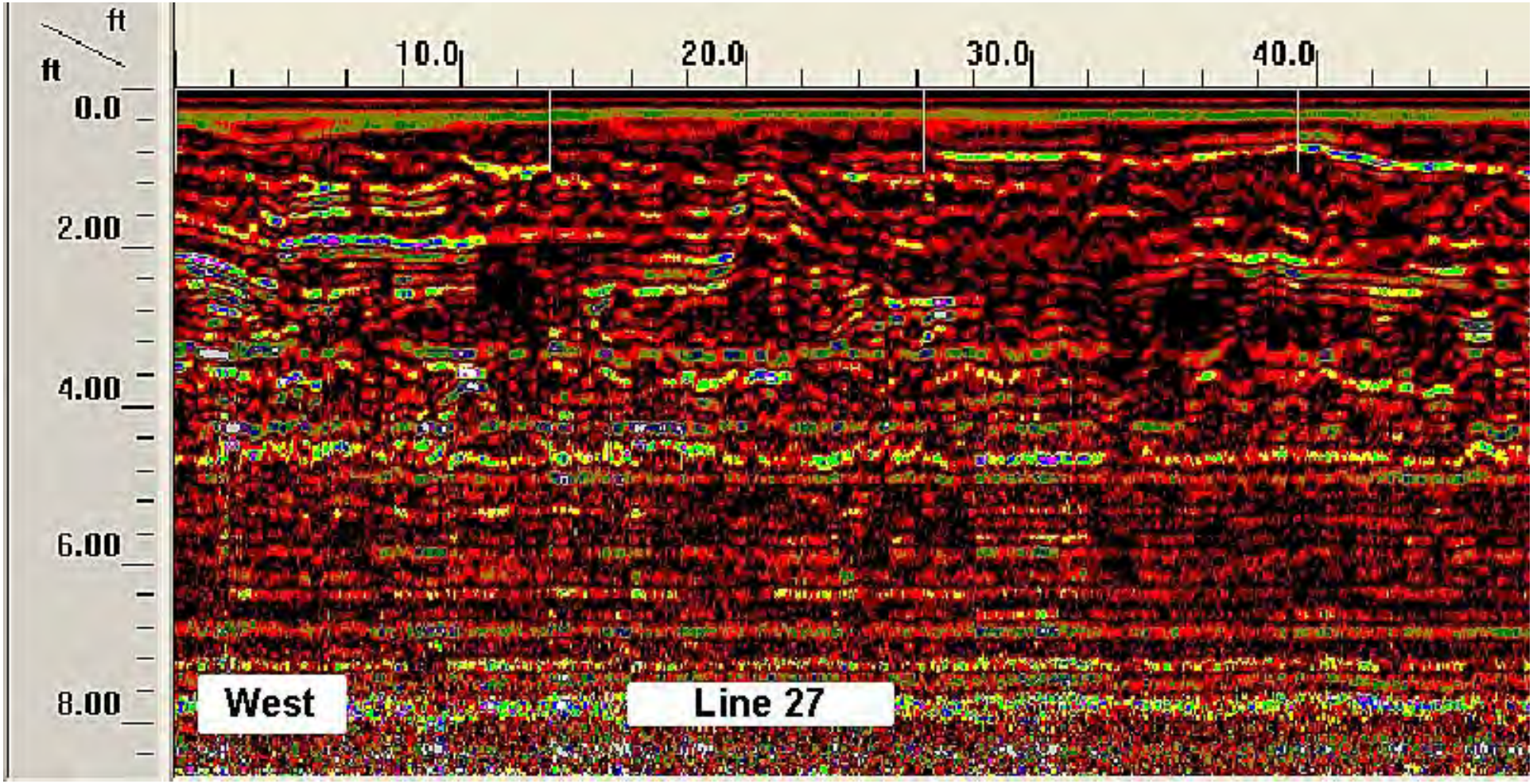
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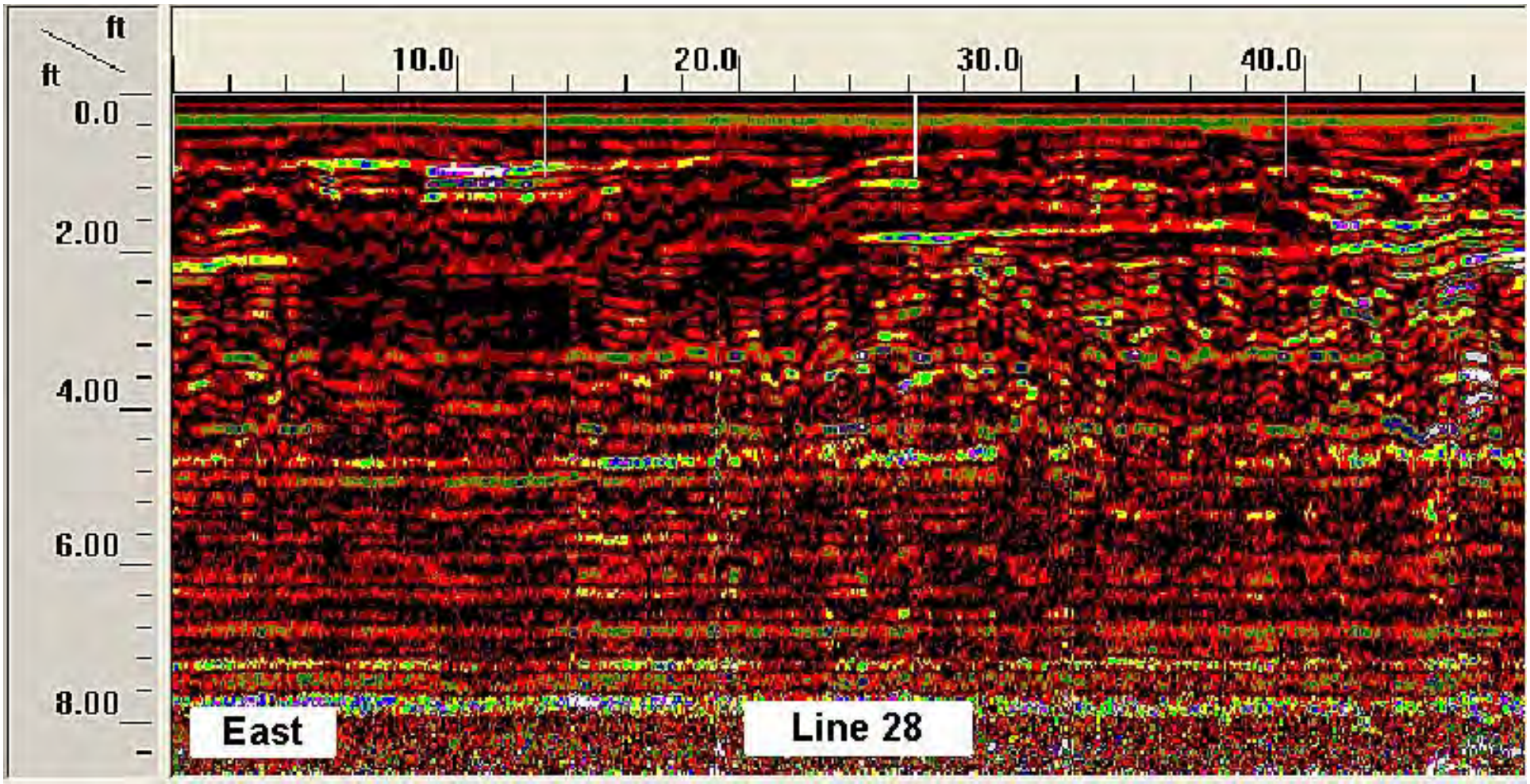
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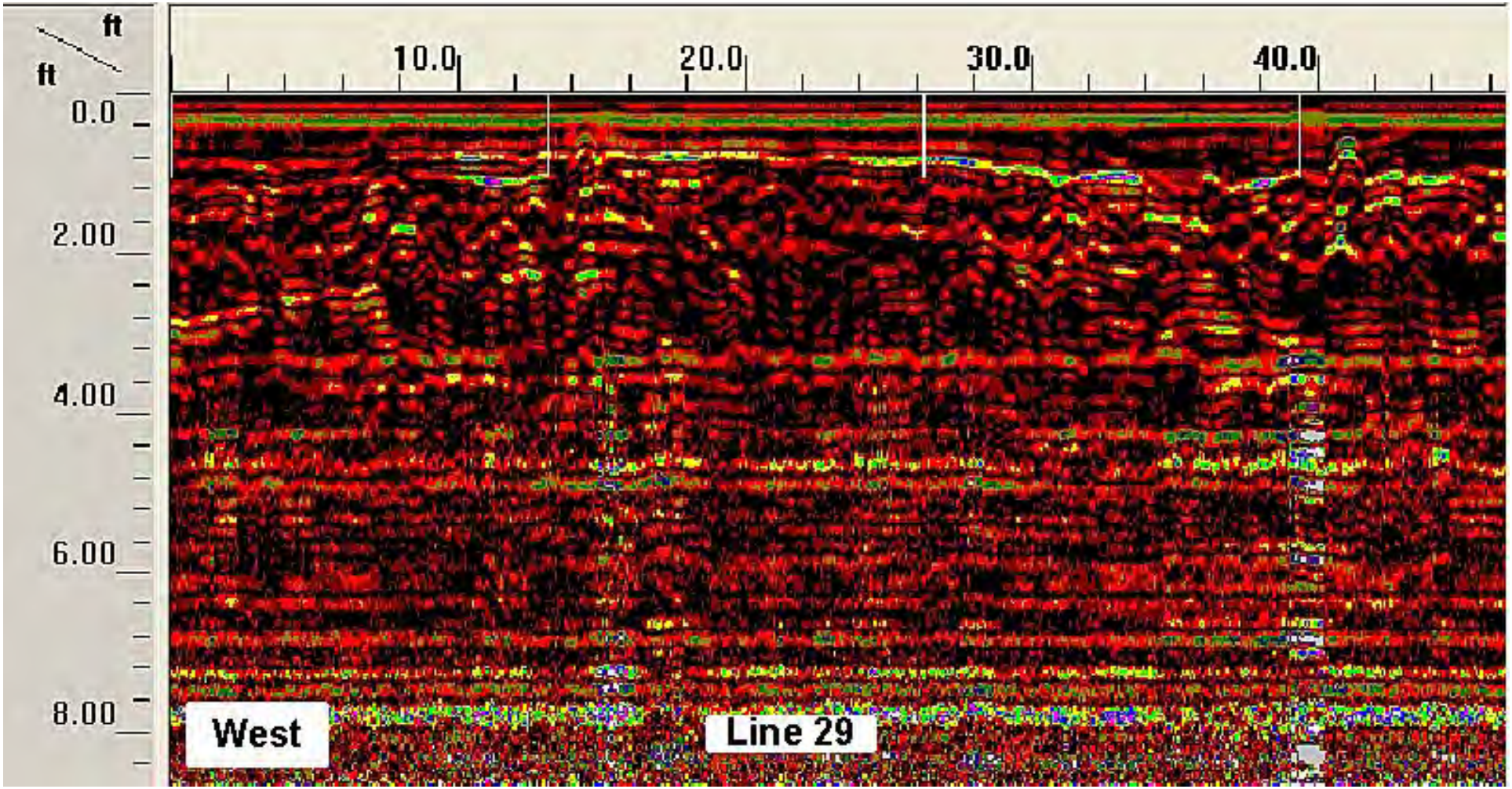
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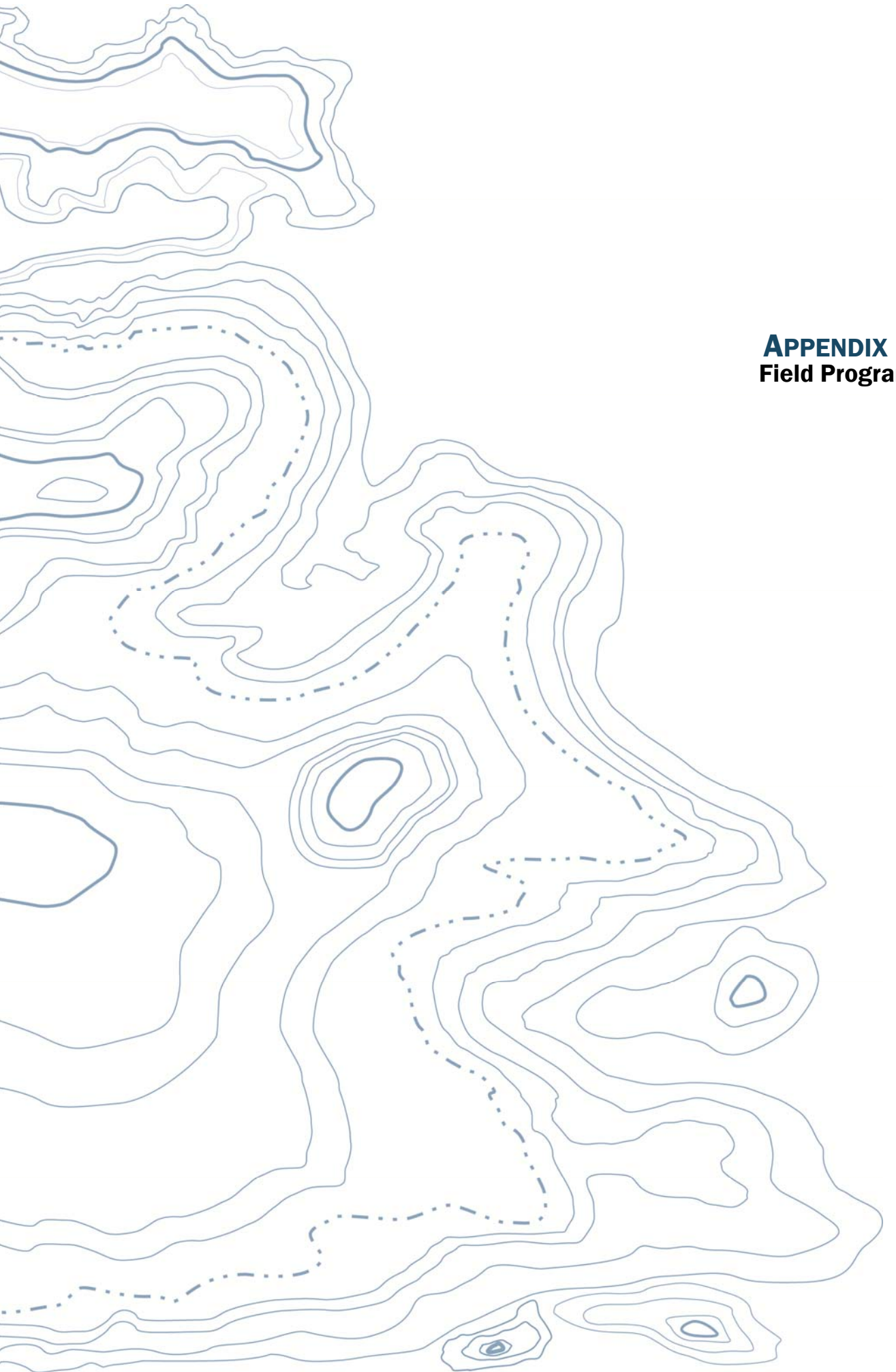


# APPENDIX B
## Field Program

# APPENDIX B
# FIELD PROGRAM

## Soil Investigation

Soil conditions were evaluated during soil exploration activities using a truck mounted direct-push and hollow stem auger (HAS) drill rig owned and operated by Cascade Drilling Inc. The explorations were completed to depths ranging from approximately 12 feet to 20 feet below the existing ground surface (bgs). A GeoEngineers representative selected the exploration locations, examined and classified the soils encountered and prepared a detailed log of each exploration. Soils encountered were visually classified in general accordance with American Society for Testing and Materials (ASTM) D 2488-94 (described in Figure B-1). Exploration logs are presented in Figures B-2 through B-44.

### *Hollow Stem Auger Explorations*

Representative soil samples were obtained from HAS exploration GEI-MW-1 at selected depths using a 1-inch-diameter, SPT split-barrel sampler. The sampler was driven a maximum of 18 inches by a 140-pound weight falling a vertical distance of approximately 30 inches. The number of blows needed to advance the sampler the final 12 inches or other specified distance is indicated to the left of the corresponding sample notation on the boring log. Soil from the middle section of the split-barrel sampler was placed in containers provided by the testing laboratory for potential chemical analysis. The remaining portion of the sample was placed in a plastic bag for field screening. The sampling equipment was decontaminated before each sampling attempt with a Liqui-Nox® solution wash and distilled water rinse.

### *Direct-Push Explorations*

Representative soil samples were obtained from direct-push explorations GEI-1 through GEI-35 at selected depths from the sample tube. The sampler was driven a maximum of 60 inches using a pneumatic hammer. A portion of each sample was placed in a laboratory-prepared sample jar for possible chemical analysis. The sample containers were completely filled to minimize headspace. The remaining portion of each sample was used for field screening. The sampling equipment was decontaminated before each sampling attempt with a Liqui-Nox® solution wash and distilled water rinse.

### *Soil Sample Collection and Handling*

Soil samples obtained from the explorations for chemical analysis were transferred to laboratory-prepared sample jars. Sample containers were filled to minimize headspace. The samples were placed in a cooler with ice pending transport to the analytical laboratory. Chain-of-custody procedures were followed in transporting the samples to the laboratory.

Samples that were submitted for chemical analysis are denoted in our exploration logs with "CA." Chemical analytical results for these samples are summarized in Tables 3 and 4. Copies of the analytical reports are presented in Appendix D.

***Field Screening of Soil Samples***

Soil samples obtained from the explorations were evaluated for evidence of possible contamination using field screening techniques. Field screening results can be used as a general guideline to delineate areas of possible petroleum- or volatile organic compound (VOC)-related contamination in soils. In addition, screening results are often used as a basis for selecting soil samples for chemical analysis. The screening methods employed included: (1) visual examination, (2) water sheen testing, and (3) headspace vapor testing using a photoionization detector (PID).

Visual screening consists of observing the soil for stains indicative of petroleum-related contamination. Visual screening is generally more effective when contamination is related to heavy petroleum hydrocarbons such as motor oil, or when hydrocarbon concentrations are high. Sheen screening is a more sensitive screening method that can be effective in detecting petroleum-based products.

Water sheen testing involves placing soil in water and observing the water surface for signs of sheen. The results of water sheen testing on soil samples from the explorations are presented on boring log figures B-2 through B-44. Sheens are classified as follows:

| | |
|---|---|
| No Sheen (NS) | No visible sheen on water surface. |
| Slight Sheen (SS) | Light, colorless, dull sheen; spread is irregular, not rapid; sheen dissipates rapidly. |
| Moderate Sheen (MS) | Light to heavy sheen, may have some color/iridescence; spread is irregular to flowing; few remaining areas of no sheen on water surface. |
| Heavy Sheen (HS) | Heavy sheen with color/iridescence; spread is rapid; entire water surface may be covered with sheen. |

Headspace vapor screening involves placing a soil sample in a plastic bag. Air is captured in the bag, and the bag is shaken to expose the soil to the air trapped in the bag. The probe of the PID is inserted into the bag. The PID measures the concentration of photoionizable gases and vapors in the sample bag headspace. The PID is designed to quantify photoionizable gases and vapors up to 2,000 parts per million (ppm), and is calibrated with isobutylene. A lower threshold of significance of 1 ppm is used in application.

Field screening results are site- and boring-specific. The results may vary with temperature, moisture content, soil lithology, organic content and type of contaminant. The presence or absence of sheen does not necessarily confirm the presence or absence of contaminants in a sample.

## Groundwater Investigation

Monitoring wells were installed using a truck mounted and hollow stem auger (HAS) drill rig owned and operated by Cascade Drilling Inc. HAS borings were completed at the Site to depths ranging from approximately 15 feet to 20 feet bgs. A GeoEngineers representative selected the exploration locations, examined and classified the soils encountered from the drill cuttings and prepared a detailed log of each exploration. Drill cuttings were visually classified in general accordance with American Society for Testing and Materials (ASTM) D 2488-94 (described in

Figure B-1). Exploration and monitoring well construction logs are presented in Figures B-2 through B-8.

***Monitoring Well Construction***

Groundwater monitoring wells GEI-MW-1 through GEI-MW-6 were completed to approximately 15 feet bgs. Groundwater monitoring well GEI-MW-7 was completed to approximately 20 feet bgs. Monitoring wells GEI-MW-1 through GEI-MW-6 were constructed with 2-inch diameter, flush-threaded Schedule 40 polyvinyl chloride (PVC) casing with 10-foot machine-slotted PVC screens (0.010-inch slot). Monitoring well GEI-MW-7 was constructed with a 2-inch diameter, flush-threaded Schedule 40 PVC casing with 15-foot machine-slotted PVC screens (0.010-inch slot). The top of each well screen were positioned approximately 5 feet below the ground surface.

Following placement of the well screen and casing in the borehole, a filter pack was installed around the well screen. The filter pack was extended from the bottom of the well to a minimum of 1 foot above the top of the screen. Filter pack material consisted of commercially prepared 2-12 silica sand. A bentonite seal at least 1-foot thick was placed above the sand pack to about 1.5 feet bgs. The surface of monitoring wells were completed with a concrete seal and concrete pad extending from the top of the bentonite seal to slightly above the ground surface. Steel flush-mount monuments were cemented in place from the surface to a depth of about 1.5 feet bgs at each well location.

A summary of monitoring well construction details is provided in Table B-1 and on exploration logs presented in Figures B-2 through B-44.

***Monitoring Well Development***

Each well was developed to stabilize the filter pack and formation materials surrounding the well screen, and restore the hydraulic connection between the well screen and the surrounding soil. Well development was completed between February 15 and 16, 2012, in advance of sampling. Well development involved gently surging the well screens with a decontaminated stainless steel bailer several times. Development continued until a minimum of 5 casing volumes of water were removed and turbidity of the discharged water is relatively low. The goal of well development was to reduce the turbidity of the water to approximately 25 nephelometric turbidity units (NTUs). Up to 10 well volumes of water was removed from each of the wells in an effort to attain the 25 NTU goal.

Water that was removed from the well during well development activities is stored on Site in the in labeled and sealed 55-gallon drums, pending off-site disposal.

***Surveying***

**VERTICAL CONTROLS**

Existing permanent survey benchmarks established by the Port were used to determine the elevation of the post-construction groundwater monitoring wells. Elevations were surveyed using a laser level, which has an accuracy of 0.01 feet. Each monitoring well casing rim and ground surface elevation was surveyed by GeoEngineers relative to the temporary or permanent benchmark.

The vertical datum for the Site was derived from running levels to the US Coast and Geodetic (USCGS) 2-inch brass disk set in the vertical wall at the northeast corner of the Old Train Depot located at 7th Street and R Avenue (National Geodetic Survey designation – PID – TR0689; MLLW – Elevation 16.98 feet; NAVD 88 – Elevation 16.33 feet).

Temporary benchmark used:

- **"BM-1A"** – Sixty D nail set on north face of piling at the northeast corner of the T-dock of Cap Sante Marina. Elevation is 13.0 feet MLLW.

#### HORIZONTAL CONTROLS

GeoEngineers recorded the boring/monitoring well sampling locations using hand-held Trimble GeoXT global positioning system (GPS) unit. The horizontal survey data are referenced to the Washington State Plane North Coordinate System (NAD83) and in latitude and longitude.

Monitoring Well Coordinates and casing rim elevations are summarized in Table B-2.

#### *Depth to Groundwater Measurements*

The depth to groundwater was measured in the mentoring wells using a decontaminated electronic water level indicator (e-tape).

Groundwater elevations were calculated by subtracting the top of casing elevations from the depth to groundwater measurements.

#### *Groundwater Sample Collection and Handling*

Groundwater samples were collected for chemical analytical testing using a peristaltic pump and disposable polyethylene tubing using low-flow/low-turbidity sampling techniques on March 6, 2012. A Horiba U-22 water quality measuring system (with flow-through-cell) was used to monitor water quality parameters during purging. The water quality parameters monitored during sampling included; electrical conductivity, dissolved oxygen, pH, salinity, total dissolved solids, turbidity, oxidation-reduction potential and temperature. Ambient groundwater conditions were considered to be achieved once these parameters varied by less than 10 percent on three consecutive measurements.

Groundwater samples obtained were transferred to laboratory-prepared sample jars. Sample containers were filled to minimize headspace. The samples were placed in a cooler with ice pending transport to the analytical laboratory. Chain-of-custody procedures were followed in transporting the samples to the laboratory.

### Underground Utility Locate

Prior to drilling activities, a "One Call" and private utility locate was conducted within a 20-foot radius of each boring location to identify any subsurface utilities and/or potential underground physical hazards. Utility locate records are on file with GeoEngineers and available upon request.

### Investigative Wastes

Soil cuttings, decontamination rinse water, development water and purge water are stored on site in sealed and labeled four 55-gallon drums located on the western portion of the Site pending permitted disposal.

# Table B-1

## Groundwater Monitoring Well Completion Data

**Former Shell Oil Tank Farm**
**Anacortes, Washington**

| Monitoring Well[1] | Date Installed | Installed By | Ecology Well Identification | Ground Elevation (feet) | Top of Casing Elevation (feet) | Bottom of Casing Elevation (feet) | Total Well Depth (feet bgs) | Casing Diameter (inches) | Screen Interval (feet bgs) | Screen Specifications |
|---|---|---|---|---|---|---|---|---|---|---|
| GEI-MW-1 | 2/9/2012 | GeoEngineers | BHM-142 | 14.59 | 14.16 | -0.84 | 15 | 2 | 5 to 15 | 2-inch Schedule 40 PVC 0.010-inch slot |
| GEI-MW-2 | 2/9/2012 | GeoEngineers | BHM-141 | 13.4 | 12.98 | -2.02 | 15 | 2 | 5 to 15 | 2-inch Schedule 40 PVC 0.010-inch slot |
| GEI-MW-3 | 2/9/2012 | GeoEngineers | BHM-143 | 13.46 | 13.09 | -1.91 | 15 | 2 | 5 to 15 | 2-inch Schedule 40 PVC 0.010-inch slot |
| GEI-MW-4 | 2/9/2012 | GeoEngineers | BHM-144 | 13.36 | 12.98 | -2.02 | 15 | 2 | 5 to 15 | 2-inch Schedule 40 PVC 0.010-inch slot |
| GEI-MW-5 | 2/10/2012 | GeoEngineers | BHM-146 | 13.05 | 12.67 | -0.33 | 13 | 2 | 5 to 15 | 2-inch Schedule 40 PVC 0.010-inch slot |
| GEI-MW-6 | 2/9/2012 | GeoEngineers | BHM-145 | 12.84 | 12.52 | -0.48 | 13 | 2 | 5 to 15 | 2-inch Schedule 40 PVC 0.010-inch slot |
| GEI-MW-7 | 2/10/2012 | GeoEngineers | BHM-147 | 11.99 | 11.65 | -8.35 | 20 | 2 | 5 to 20 | 2-inch Schedule 40 PVC 0.010-inch slot |

**Notes:**

[1]Monitoring well locations are shown on Figure 11.

All borings were installed using hollow-stem auger (HAS) drilling methods.

All elevations referenced to Mean Lower Low Water (MLLW).

bgs = below ground surface

PVC = polyvinyl chloride

# Table B-2

## Groundwater Monitoring Well Coordinates

**Former Shell Oil Tank Farm**
**Anacortes, Washington**

| Monitoring Well[1] | Date Installed | Installed By | Ecology Well Identification | Latitude and Longitude Coodinates | | Washington State Planes North Coordinates (NAD83) | |
|---|---|---|---|---|---|---|---|
| | | | | Latitude (DMS) | Longitude (DMS) | Northing (feet) | Easting (feet) |
| GEI-MW-1 | 2/9/2012 | GeoEngineers | BHM-142 | 48°30'39.7616" | -122°36'41.5280" | 556175.46 | 1209423.71 |
| GEI-MW-2 | 2/9/2012 | GeoEngineers | BHM-141 | 48°30'39.8984" | -122°36'40.3647" | 556187.51 | 1209502.34 |
| GEI-MW-3 | 2/9/2012 | GeoEngineers | BHM-143 | 48°30'41.0678" | -122°36'40.3484" | 556305.95 | 1209506.17 |
| GEI-MW-4 | 2/9/2012 | GeoEngineers | BHM-144 | 48°30'41.7669" | -122°36'40.3141" | 556376.73 | 1209510.12 |
| GEI-MW-5 | 2/10/2012 | GeoEngineers | BHM-146 | 48°30'41.3563" | -122°36'39.0529" | 556333.16 | 1209594.05 |
| GEI-MW-6 | 2/9/2012 | GeoEngineers | BHM-145 | 48°30'43.5422" | -122°36'37.6383" | 556552.42 | 1209694.39 |
| GEI-MW-7 | 2/10/2012 | GeoEngineers | BHM-147 | 48°30'42.4281" | -122°36'35.3598" | 556436.01 | 1209845.16 |

**Notes:**

[1]Monitoring well locations are shown on Figure 11.

NAD83 = 1983 North American Datum

# APPENDIX C
## Historic Exploration Logs

# Key to Exploration Logs

## Sample Descriptions

Classification of soils in this report is based on visual field and laboratory observations which include density/consistency, moisture condition, grain size, and plasticity estimates and should not be construed to imply field nor laboratory testing unless presented herein. Visual-manual classification methods of ASTM D 2488 were used as an identification guide.

Soil descriptions consist of the following:
Density/consistency, moisture, color, minor constituents, MAJOR CONSTITUENT, additional remarks.

### Density/Consistency

Soil density/consistency in borings is related primarily to the Standard Penetration Resistance. Soil density/consistency in test pits is estimated based on visual observation and is presented parenthetically on the test pit logs.

| SAND or GRAVEL Density | Standard Penetration Resistance in Blows/Foot | SILT or CLAY Consistency | Standard Penetration Resistance in Blows/Foot | Approximate Shear Strength in TSF |
|---|---|---|---|---|
| Very loose | 0 - 4 | Very soft | 0 - 2 | <0.125 |
| Loose | 4 - 10 | Soft | 2 - 4 | 0.125 - 0.25 |
| Medium dense | 10 - 30 | Medium stiff | 4 - 8 | 0.25 - 0.5 |
| Dense | 30 - 50 | Stiff | 8 - 15 | 0.5 - 1.0 |
| Very dense | >50 | Very stiff | 15 - 30 | 1.0 - 2.0 |
| | | Hard | >30 | >2.0 |

### Moisture

| | |
|---|---|
| Dry | Little perceptible moisture |
| Damp | Some perceptible moisture, probably below optimum |
| Moist | Probably near optimum moisture content |
| Wet | Much perceptible moisture, probably above optimum |

### Minor Constituents

| | Estimated Percentage |
|---|---|
| Not identified in description | 0 - 5 |
| Slightly (clayey, silty, etc.) | 5 - 12 |
| Clayey, silty, sandy, gravelly | 12 - 30 |
| Very (clayey, silty, etc.) | 30 - 50 |

## Legends

### Sampling

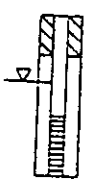
BORING SAMPLES

- Split Spoon
- Shelby Tube
- Cuttings
- Core-Run
- * No Sample Recovery
- P Tube Pushed, Not Driven

TEST PIT SAMPLES

- Grab (Jar)
- Bag
- Shelby Tube

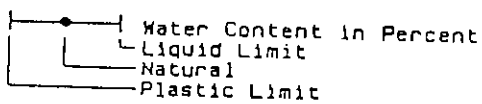
### Ground Water Observations



- Surface Seal
- Ground Water Level on Date (ATD) At Time of Drilling
- Observation Well Tip or Slotted Section
- Ground Water Seepage (Test Pits)

### Test Symbols

| | |
|---|---|
| GS | Grain Size Classification |
| CN | Consolidation |
| TUU | Triaxial Unconsolidated Undrained |
| TCU | Triaxial Consolidated Undrained |
| TCD | Triaxial Consolidated Drained |
| QU | Unconfined Compression |
| DS | Direct Shear |
| K | Permeability |
| PP | Pocket Penetrometer<br>Approximate Compressive Strength in TSF |
| TV | Torvane<br>Approximate Shear Strength in TSF |
| CBR | California Bearing Ratio |
| MO | Moisture Density Relationship |
| AL | Atterberg Limits |




J-1919 May 1987
HART-CROWSER & associates, inc.
Figure A-1

# Boring Log and Construction Data for Monitoring Well MW-1

Geologic Log

Depth In Feet

Ground Surface Elevation in Feet

0 — Loose to medium dense, moist to wet, gray, silty, fine to medium SAND with scattered gravel and shell fragments. (FILL)

5

Loose to medium dense, wet, slight-silty, fine to medium SAND with scattered shell fragments.

10

Soft, wet, dark gray SILT with scattered shell and wood fragments.

Medium dense, wet, gray, silty, gravelly SAND with scattered shell fragments.

15

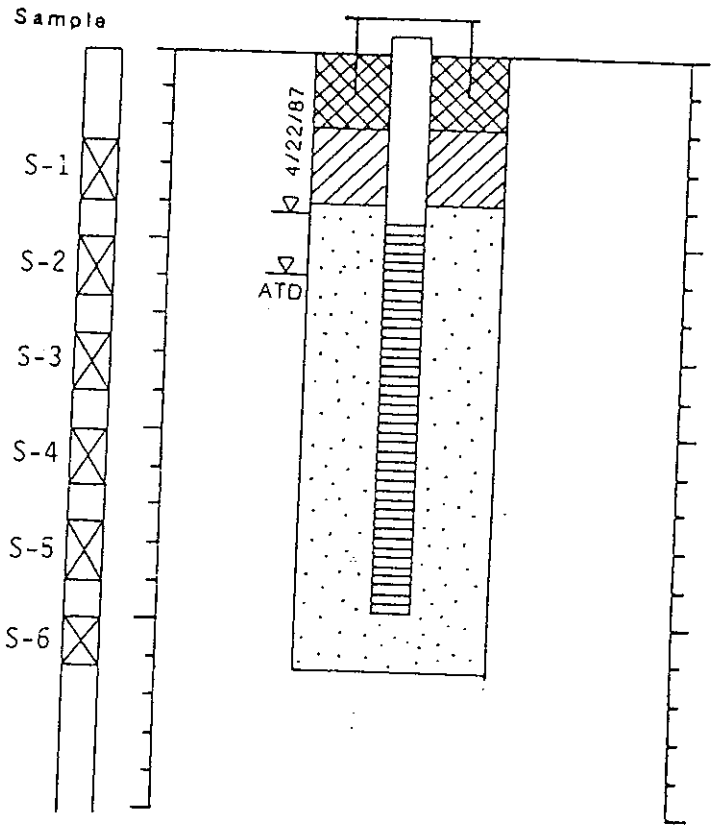
Hard, moist, blue-green SILT.

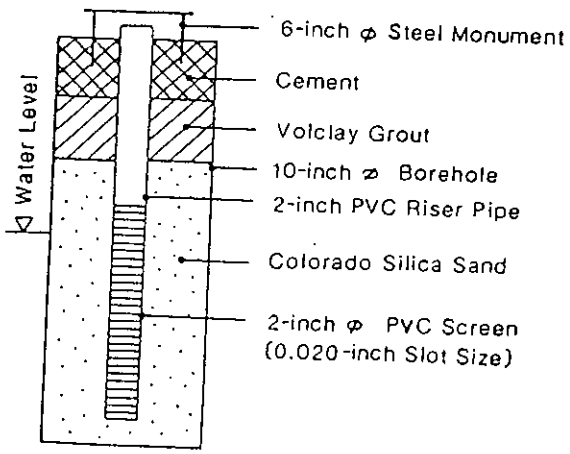
Bottom of Boring at 16.2 Feet. Completed 4/21/87.

20

Monitoring Well Design

Casing Stickup in Feet 2.45'




NOTES:

1. Soil descriptions are interpretive and actual changes may be gradual.
2. Water Level is for date indicated and may vary with the time of year. ATD: At Time of Drilling

J-1919 April 1987

HART-CROWSER & associates inc.

Figure A-2

# Boring Log and Construction Data for Monitoring Well MW-2

## Geologic Log

Depth in Feet

Ground Surface Elevation in Feet

0 — Medium dense, moist to wet, gray, slightly silty to silty, gravelly SAND with product odor and scattered shell fragments. (FILL)

5

Medium dense to dense, wet, gray, gravelly SAND with scattered shell fragments and thin (2 inch) SILT interbeds.

10

Medium dense, wet, gray SAND with slight product odor and scattered shell fragments.

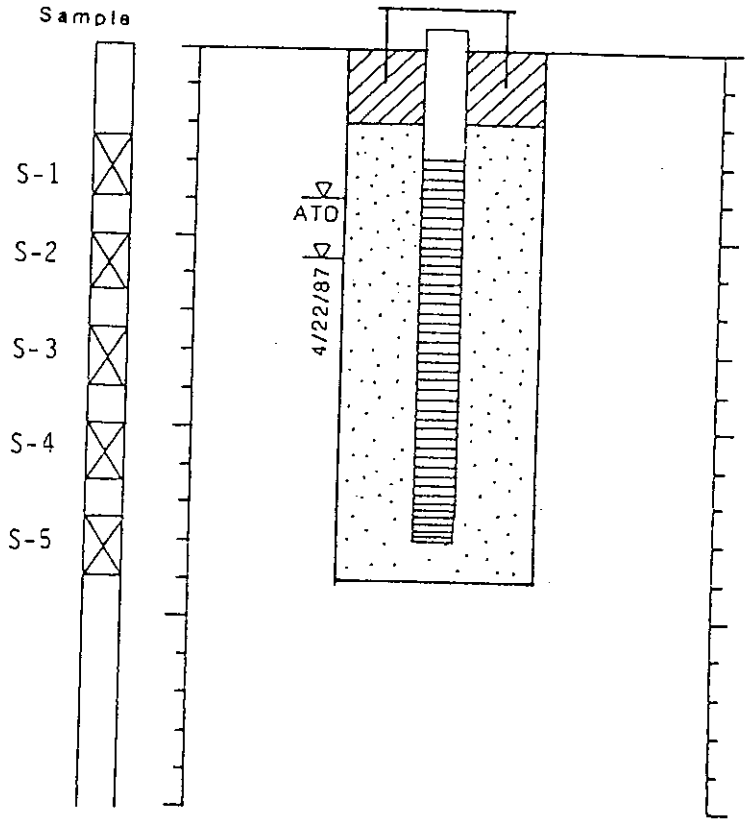
15 — Medium dense, wet, gray, silty, gravelly SAND.

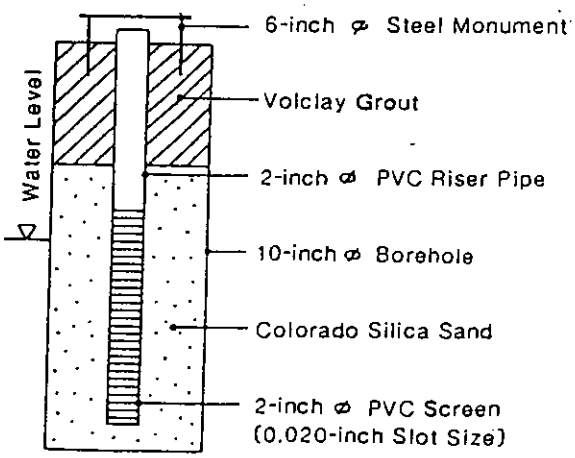
Bottom of Boring at 14.0 Feet. Completed 4/22/87.

20

## Monitoring Well Design

Casing Stickup in Feet 2.3'




NOTES:

1. Soil descriptions are interpretive and actual changes may be gradual.
2. Water Level is for date indicated and may vary with the time of year. ATD: At Time of Drilling

J-1919 April 1987

HART-CROWSER & associates inc.

Figure A-3

# Log of Soil Boring CSM01

FLOYD | SNIDER

**Floyd | Snider**

Boring CSM01 Date August 24, 2005 Sheet 1 of 1

Job Former Shell Tank Farm Due Diligence Job No. POA CSMSHELL

Logged By Woltman/Satterberg Weather Sunny, 75 degrees F

Drilled By Cascade Drilling

Drill Type/Method Geoprobe

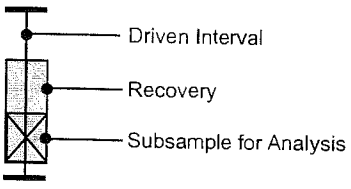
Sampling Method Direct Push, 4-Ft Cores

Bottom of Boring 12' ATD Water Level Depth 5.0'

Obs. Well Install. Yes [X] No

Ground Surface Elevation Approx. 12' MLLW

| SAMPLE ID | PID (ppm) | DEPTH From | DEPTH To | SAMPLE RECOVERY (FT) | USCS Symbol | DESCRIPTION: color, texture, moisture MAJOR CONSTITUENT. NON-SOIL SUBSTANCES: Odor, staining, sheen, scrap, slag, etc. | Sheen Test |
|---|---|---|---|---|---|---|---|
| | | | | | | 4-inches asphalt over 3-inches crushed base course gravel. | |
| | | | | | ML | Dark brown, dry, sandy SILT with rounded gravels. | |
| CSM01-S1 | | 4.0 | 5.0 | | | Soil transitions from dry to moist. | |
| | | | | | CL | Gray, moist to wet, silty CLAY. | |
| | | | | | SP | Gray, wet, silty SAND with trace gravel. | |
| | | | | | CL | Gray, moist to wet, silty CLAY. | |
| CSM01-S2 | | 10.0 | 11.8 | | | Fine fibers of wood and layers of decayed organic matter to depth of 11 feet. | |
| | | | | | | Bottom of Boring at 12' | |
| | | | | | | Note: Water sample CSM01-W1 collected from temporary well point. | |



# Log of Soil Boring CSM02

FLOYD | SNIDER

**Floyd | Snider**

Boring CSM02 Date August 24, 2005 Sheet 1 of 1

Job Former Shell Tank Farm Due Diligence Job No. POA CSMSHELL

Logged By Woltman/Satterberg Weather Sunny, 75 degrees F

Drilled By Cascade Drilling

Drill Type/Method Geoprobe

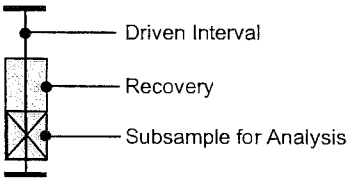
Sampling Method Direct Push, 4-Ft Cores

Bottom of Boring 12' ATD Water Level Depth 8.0'

Ground Surface Elevation Approx. 12' MLLW

Obs. Well Install. Yes [X] No

| SAMPLE ID | PID (ppm) | DEPTH From | DEPTH To | SAMPLE RECOVERY (FT) | USCS Symbol | DESCRIPTION: color, texture, moisture MAJOR CONSTITUENT. NON-SOIL SUBSTANCES: Odor, staining, sheen, scrap, slag, etc. | Sheen Test |
|---|---|---|---|---|---|---|---|
| | | | | | | 2-inches asphalt over 5-inches crushed base course gravel. | |
| | | | | | SW | Dark gray to brown, dry to moist, very gravelly SAND. | |
| | | | | | SW | Dark gray, moist, slightly silty, slightly gravelly SAND. | |
| | | | | | ML | Gray to brown, moist, sandy SILT with wood fibers. | |
| | | | | | CL | Dark gray, moist to wet, silty CLAY with abundant wood fibers. | |
| CSM02-S1 | | 8.0 | 8.7 | | | Sand lenses and abundant wood debris. | |
| | | | | | | No sand lenses and reduction in organic material below depth 10 feet. | |
| | | | | | | Bottom of Boring at 12' | |
| | | | | | | Note: Water sample CSM02-W1 collected from temporary well point. | |



# Log of Soil Boring CSM03

FLOYD | SNIDER

**Floyd | Snider**

Boring CSM03 Date August 24, 2005 Sheet 1 of 1

Job Former Shell Tank Farm Due Diligence Job No. POA CSMSHELL

Logged By Woltman/Satterberg Weather Sunny, 75 degrees F

Drilled By Cascade Drilling

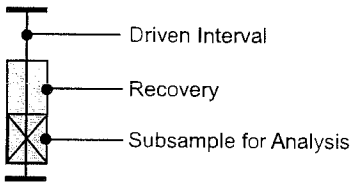
Drill Type/Method Geoprobe

Sampling Method Direct Push, 4-Ft Cores

Bottom of Boring 12' ATD Water Level Depth 8.0'

Obs. Well Install. Yes ~~No~~ Ground Surface Elevation Approx. 12' MLLW

| SAMPLE ID | PID (ppm) | DEPTH From | DEPTH To | SAMPLE RECOVERY (FT) | USCS Symbol | DESCRIPTION: color, texture, moisture MAJOR CONSTITUENT. NON-SOIL SUBSTANCES: Odor, staining, sheen, scrap, slag, etc. | Sheen Test |
|---|---|---|---|---|---|---|---|
| | | | | | | 6-inches asphalt over 6-inches crushed base course gravel. | |
| | | | | | SW | Dark brown to light gray, dry, slightly silty, very gravelly SAND. | |
| | | | | | ML | Light gray, dry to moist, slightly gravelly, sandy SILT with wood fibers and faint organic odor. | |
| CSM03-S1 | | 4.0 | 5.0 | | | Faint hydrocarbon odor. | |
| | | | | | CL | Gray, moist, silty CLAY. | |
| | | | | | SP | Dark brown to gray, moist to wet, slightly silty, slightly clayey SAND. | |
| CSM03-S2 | | 8.0 | 9.0 | | CL | Dark brown to gray, wet, slightly sandy, silty CLAY with wood fibers and fuel odor. No wood fibers below depth 9 feet. | |
| | | | | | | Bottom of Boring at 12' Note: Water sample CSM03-W1 collected from temporary well point. | |



# Log of Soil Boring CSM04

FLOYD | SNIDER

**Floyd | Snider**

Boring CSM04 Date August 25, 2005 Sheet 1 of 1

Job Cap Sante Marine Phase 2 Due Diligence Job No. POA CSMSHELL

Logged By Woltman/Satterberg Weather Sunny, 80 degrees F

Drilled By Cascade Drilling

Drill Type/Method Geoprobe

Sampling Method Direct Push, 4-Ft Cores

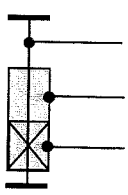
Bottom of Boring 12' ATD Water Level Depth 4.5'

Obs. Well Install. Yes [X] No

Ground Surface Elevation Approx. 12' MLLW

| SAMPLE ID | PID (ppm) | DEPTH From | DEPTH To | SAMPLE RECOVERY (FT) | USCS Symbol | DESCRIPTION: color, texture, moisture MAJOR CONSTITUENT. NON-SOIL SUBSTANCES: Odor, staining, sheen, scrap, slag, etc. | Sheen Test |
|---|---|---|---|---|---|---|---|
| | | | | | | Asphalt. | |
| | | | | | SW | Brown, dry, silty, very gravelly SAND with scattered wood debris. | |
| | | | | | CL | Dark gray, moist, sandy silty CLAY with large wood chunk at depth 1.5 feet. | |
| CSM04-S1 | | 4.5 | 5.8 | | ML | Dark gray, wet, sandy clayey SILT with abundant shell fragments. | No Sheen |
| | | | | | SW | Dark gray, wet, slightly silty, slightly gravelly SAND with abundant shell fragments and decayed organic odor. Chalky-white inclusion at bottom of sand unit. | |
| CSM04-S2 | | 10.3 | 12.0 | | ML | Gray to brown, moist to wet, sandy, clayey SILT with decayed organic odor. | |
| | | | | | | Bottom of Boring at 12' Note: Water sample CSM04-W1 collected from temporary well point. | |

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14



# Log of Soil Boring CSM12

FLOYD | SNIDER

**Floyd | Snider**

Boring CSM12 Date August 26, 2005 Sheet 1 of 1

Job Cap Sante Marine Phase 2 Due Diligence Job No. POA CSMSHELL

Logged By Woltman/Satterberg Weather Sunny, 65 degrees F

Drilled By Cascade Drilling

Drill Type/Method Geoprobe

Sampling Method Direct Push, 4-Ft Cores

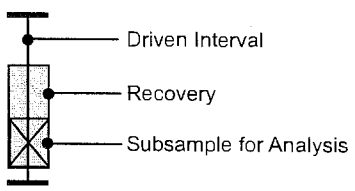
Bottom of Boring 12' ATD Water Level Depth 4.0'

Obs. Well Install. Yes [X] No

Ground Surface Elevation Approx. 12' MLLW

| SAMPLE ID | PID (ppm) | DEPTH From | DEPTH To | SAMPLE RECOVERY (FT) | USCS Symbol | DESCRIPTION: color, texture, moisture MAJOR CONSTITUENT. NON-SOIL SUBSTANCES: Odor, staining, sheen, scrap, slag, etc. | Sheen Test |
|---|---|---|---|---|---|---|---|
| | | | | | | Asphalt with abundant gravel. | |
| | | | | | SW | Light brown to gray, moist to wet, slightly silty, gravelly SAND. | |
| CSM12-S1 | | 5.0 | 6.0 | | ML | Light gray to brown, wet, sandy SILT. | |
| | | | | | | Wood fibers present in recovered soil. | |
| CSM12-S2 | | 10.0 | 11.0 | | | 3-inch layer of black sand with wood debris and oil odor. | Sheen on Sample |
| | | | | | | Bottom of Boring at 12' | |

Notes:
1) Water sample CSM12-W1 collected from temporary well point.



# Log of Soil Boring CSM13

FLOYD | SNIDER

**Floyd | Snider**

Boring CSM13 Date August 26, 2005 Sheet 1 of 1

Job Cap Sante Marine Phase 2 Due Diligence Job No. POA CSMSHELL

Logged By Woltman/Satterberg Weather Sunny, 65 degrees F

Drilled By Cascade Drilling

Drill Type/Method Geoprobe

Sampling Method Direct Push, 4-Ft Cores

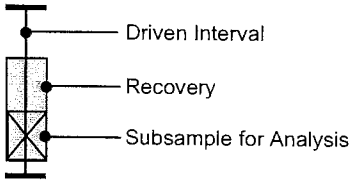
Bottom of Boring 12' ATD Water Level Depth 4.0'

Obs. Well Install. Yes [X] No

Ground Surface Elevation Approx. 12' MLLW

| SAMPLE ID | PID (ppm) | DEPTH From | DEPTH To | SAMPLE RECOVERY (FT) | USCS Symbol | DESCRIPTION: color, texture, moisture MAJOR CONSTITUENT. NON-SOIL SUBSTANCES: Odor, staining, sheen, scrap, slag, etc. | Sheen Test |
|---|---|---|---|---|---|---|---|
| | | | | | SW | Light brown to gray, dry, silty, very gravelly SAND. | |
| | | | | | SW | Dark gray, moist to wet, slightly silty to silty SAND with abundant shell fragments. | |
| | | | | | SW | Brown, wet, slightly silty, slightly gravelly SAND with scattered wood fibers and lenses of fine gray sand. | |
| CSM13-S1 | | 5.0 | 5.5 | | | | |
| | | | | | | Faint petroleum odor and large wood debris. | |
| CSM13-S2 | | 10.5 | 11.5 | | CL | Dark gray to olive, moist, silty CLAY with scattered organic debris and scattered shell fragments. | |
| | | | | | | Bottom of Boring at 12' | |

Notes:
1) Water sample CSM13-W1 collected from temporary well point.



# Log of Soil Boring CSM13

FLOYD | SNIDER

**Floyd | Snider**

Boring CSM13 Date August 26, 2005 Sheet 1 of 1

Job Cap Sante Marine Phase 2 Due Diligence Job No. POA CSMSHELL

Logged By Woltman/Satterberg Weather Sunny, 65 degrees F

Drilled By Cascade Drilling

Drill Type/Method Geoprobe

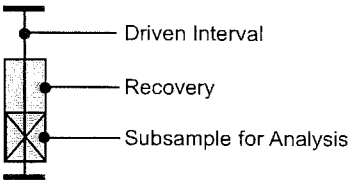
Sampling Method Direct Push, 4-Ft Cores

Bottom of Boring 12' ATD Water Level Depth 4.0'

Obs. Well Install. Yes ~~No~~ Ground Surface Elevation Approx. 12' MLLW

| SAMPLE ID | PID (ppm) | DEPTH From | DEPTH To | SAMPLE RECOVERY (FT) | USCS Symbol | DESCRIPTION: color, texture, moisture MAJOR CONSTITUENT. NON-SOIL SUBSTANCES: Odor, staining, sheen, scrap, slag, etc. | Sheen Test |
|---|---|---|---|---|---|---|---|
| | | | | | SW | Light brown to gray, dry, silty, very gravelly SAND. | |
| | | | | | SW | Dark gray, moist to wet, slightly silty to silty SAND with abundant shell fragments. | |
| | | | | | SW | Brown, wet, slightly silty, slightly gravelly SAND with scattered wood fibers and lenses of fine gray sand. | |
| CSM13-S1 | | 5.0 | 5.5 | | | | |
| | | | | | | Faint petroleum odor and large wood debris. | |
| CSM13-S2 | | 10.5 | 11.5 | | CL | Dark gray to olive, moist, silty CLAY with scattered organic debris and scattered shell fragments. | |
| | | | | | | Bottom of Boring at 12' | |

Notes:
1) Water sample CSM13-W1 collected from temporary well point.



# Log of Soil Boring SHL01

FLOYD | SNIDER

**Floyd | Snider**

Boring SHL01 Date August 24, 2005 Sheet 1 of 1

Job Former Shell Tank Farm Due Diligence Job No. POA CSMSHELL

Logged By Woltman/Satterberg Weather Sunny, 65 degrees F

Drilled By Cascade Drilling

Drill Type/Method Geoprobe

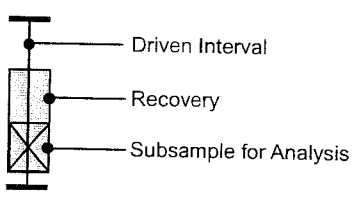
Sampling Method Direct Push, 4-Ft Cores

Bottom of Boring 12' ATD Water Level Depth 4.9'

Obs. Well Install. Yes [X] No

Ground Surface Elevation Approx. 12' MLLW

| SAMPLE ID | PID (ppm) | DEPTH From | DEPTH To | SAMPLE RECOVERY (FT) | USCS Symbol | DESCRIPTION: color, texture, moisture MAJOR CONSTITUENT. NON-SOIL SUBSTANCES: Odor, staining, sheen, scrap, slag, etc. | Sheen Test |
|---|---|---|---|---|---|---|---|
| | | | | | SW | Light brown, dry, silty, gravelly SAND with angular debris. FILL. | |
| | | | | | GW-GM | Gray, moist to wet, SAND with varrying amounts of gravel, abundant shells, and scattered wood debris. | |
| SHL01-S1 | | 8.0 | 8.5 | | | Slight gas/diesel odor at top of sample. | No Sheen |
| | | | | | | Contact with olive-green, sandy SILT at bottom of recovered soil. | |
| | | | | | | Bottom of Boring at 12' | |
| | | | | | | Note: Water sample SHL01-W1 collected from temporary well point. | |



# Log of Soil Boring SHL02

FLOYD | SNIDER

**Floyd |Snider**

Boring SHL02 Date August 24, 2005 Sheet 1 of 1

Job Former Shell Tank Farm Due Diligence Job No. POA CSMSHELL

Logged By Woltman/Satterberg Weather Sunny, 70 degrees F

Drilled By Cascade Drilling

Drill Type/Method Geoprobe

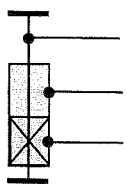
Sampling Method Direct Push, 4-Ft Cores

Bottom of Boring 12' ATD Water Level Depth 4.5'

Ground Surface Elevation Approx. 12' MLLW

Obs. Well Install. Yes [X] No

| SAMPLE ID | PID (ppm) | DEPTH From | DEPTH To | SAMPLE RECOVERY (FT) | USCS Symbol | DESCRIPTION: color, texture, moisture MAJOR CONSTITUENT. NON-SOIL SUBSTANCES: Odor, staining, sheen, scrap, slag, etc. | Sheen Test |
|---|---|---|---|---|---|---|---|
| | | | | | SW | Light brown to gray, dry, gravelly SAND with scattered brick and shell fragments. Light fuel odor. | |
| | | | | | SP | Light brown, dry, silty SAND. | |
| | | | | | SM | Light to dark brown-gray, moist, silty SAND. | |
| SHL02-S1 | | 4.0 | 5.0 | | | Diesel odor in sample. | |
| SHL02-S2 | | 5.0 | 6.0 | | SM | Dark gray to black, wet, slightly gravelly SAND with shell fragments. Strong diesel odor. | |
| SHL02-S3 | | 8.0 | 9.5 | | SM-ML | Dark gray, wet, silty, clayey SAND grading to gray, silty CLAY. Slight odor in sample. | |
| | | | | | SW | Light gray, wet, gravelly SAND with shell fragments. Slight odor in soil. | |
| | | | | | | Bottom of Boring at 12'<br><br>Note: Water sample SHL02-W1 collected from temporary well point. | |



# Log of Soil Boring SHL03

FLOYD | SNIDER

**Floyd | Snider**

Boring SHL03 Date August 24, 2005 Sheet 1 of 1

Job Former Shell Tank Farm Due Diligence Job No. POA CSMSHELL

Logged By Woltman/Satterberg Weather Sunny, 70 degrees F

Drilled By Cascade Drilling

Drill Type/Method Geoprobe

Sampling Method Direct Push, 4-Ft Cores

Bottom of Boring 12' ATD Water Level Depth 5.5'

Obs. Well Install. Yes [X] No

Ground Surface Elevation Approx. 12' MLLW

| SAMPLE ID | PID (ppm) | DEPTH From | DEPTH To | SAMPLE RECOVERY (FT) | USCS Symbol | DESCRIPTION: color, texture, moisture MAJOR CONSTITUENT. NON-SOIL SUBSTANCES: Odor, staining, sheen, scrap, slag, etc. | Sheen Test |
|---|---|---|---|---|---|---|---|
| | | | | | SW | Light brown to gray, gravelly SAND with shell fragments. | |
| | | | | | CL | Light brown, dry, slightly sandy, silty CLAY with trace gravel. | |
| | | | | | SW | Light brown, dry, slightly silty, slightly gravelly SAND with shell fragments. | |
| | | | | | ML | Brown, dry, clayey SILT with some sand, large gravels, shell fragments, and brown reduced veins of organic matter. | |
| SHL03-S1 | | 4.0 | 5.5 | | | | |
| SHL03-S2 | | 5.5 | 6.2 | | SW | Dark gray, wet, slightly gravelly SAND with abundant shell fragments. | |
| | | | | | ML | Dark gray, wet, clayey SILT with trace sand. Fuel odor on soil. | |
| | | | | | SP | Dark gray, wet, slightly gravelly to gravelly SAND with abundant shell fragments. | |
| | | | | | ML | Dark gray, wet slightly clayey, sandy SILT. | |
| | | | | | | Bottom of Boring at 12'<br><br>Note: Water sample SHL03-W1 collected from temporary well point. | |

0 1 2 3 4 5 ▽ 6 7 8 9 10 11 12 13 14

Driven Interval

Recovery

Subsample for Analysis

# Log of Soil Boring SHL04

FLOYD | SNIDER

**Floyd | Snider**

Boring SHL04 Date August 24, 2005 Sheet 1 of 1

Job Former Shell Tank Farm Due Diligence Job No. POA CSMSHELL

Logged By Woltman/Satterberg Weather Sunny, 75 degrees F

Drilled By Cascade Drilling

Drill Type/Method Geoprobe

Sampling Method Direct Push, 4-Ft Cores

Bottom of Boring 12' ATD Water Level Depth 8.0'

Obs. Well Install. Yes [X] No

Ground Surface Elevation Approx. 12' MLLW

| SAMPLE ID | PID (ppm) | DEPTH From | DEPTH To | SAMPLE RECOVERY (FT) | USCS Symbol | DESCRIPTION: color, texture, moisture MAJOR CONSTITUENT. NON-SOIL SUBSTANCES: Odor, staining, sheen, scrap, slag, etc. | Sheen Test |
|---|---|---|---|---|---|---|---|
| | | | | | SW | Light gray to brown, dry, silty, gravelly SAND. | |
| | | | | | GW-GM | Light gray, dry, silty, sandy GRAVEL. | |
| SHL04-S1 | | 2.0 | 3.5 | | CL | Light to dark brown, moist, slightly sandy, silty CLAY with scattered gravel. | No Sheen |
| | | | | | SP | Brown to gray, moist, clayey, gravelly SAND with shell fragments. Slight fuel odor. | |
| | | | | | ML | Brown to gray, moist to wet, clayey SILT with some sand, shell fragments, and decaying wood. Fuel/petroleum odor on soil. | No Sheen |
| SHL04-S2 | | 9.5 | 10.5 | | SP | Gray, wet SAND. Fuel/petroleum odor on sample. | |
| | | | | | | Bottom of Boring at 12'<br><br>Note: Water sample SHL04-W1 collected from temporary well point. | |

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14

Driven Interval

Recovery

Subsample for Analysis

# Log of Soil Boring SHL05

FLOYD | SNIDER

**Floyd | Snider**

Boring SHL05 Date August 24, 2005 Sheet 1 of 1

Job Former Shell Tank Farm Due Diligence Job No. POA CSMSHELL

Logged By Woltman/Satterberg Weather Sunny, 75 degrees F

Drilled By Cascade Drilling

Drill Type/Method Geoprobe

Sampling Method Direct Push, 4-Ft Cores

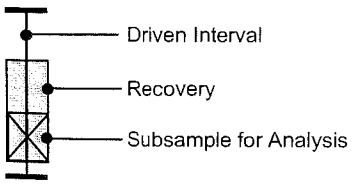
Bottom of Boring 12' ATD Water Level Depth 9.0'

Obs. Well Install. Yes [X] No

Ground Surface Elevation Approx. 12' MLLW

| SAMPLE ID | PID (ppm) | DEPTH From | DEPTH To | SAMPLE RECOVERY (FT) | USCS Symbol | DESCRIPTION: color, texture, moisture MAJOR CONSTITUENT. NON-SOIL SUBSTANCES: Odor, staining, sheen, scrap, slag, etc. | Sheen Test |
|---|---|---|---|---|---|---|---|
| | | | | | SW | Light brown, dry, silty, gravelly SAND with trace shell fragments. | |
| | | | | | | Abundant shell fragments. | |
| SHL05-S1 | | 2.0 | 3.5 | | ML | Light gray, dry, sandy SILT with black banding. Fuel odor on black bands. | |
| | | | | | GW | Dark gray, dry, sandy GRAVEL with shell fragments. Fuel odor on sample. | |
| SHL05-S2 | | 4.4 | 6.2 | | CL | Gray to olive-green, moist, sandy, silty CLAY with shell fragments. Slight fuel odor on sample. | No Sheen |
| | | | | | | Large wood fragment at depth 5.4 feet. | |
| | | | | | | Heavy fuel odor at depth 5.9 feet. | |
| | | | | | SW | Gray, moist to wet, slightly silty, gravelly SAND with clay inclusions and scattered shell fragments. | |
| SHL05-S3 | | 8.0 | 10.0 | | | Slight to strong fuel odor throughout sample. | No Sheen |
| | | | | | | Bottom of Boring at 12' | |
| | | | | | | Note: Water sample SHL05-W1 collected from temporary well point. | |

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14



# Log of Soil Boring SHL06

FLOYD | SNIDER

**Floyd | Snider**

Boring SHL06 Date August 26, 2005 Sheet 1 of 1

Job Former Shell Tank Farm Due Diligence Job No. POA CSMSHELL

Logged By Woltman/Satterberg Weather Sunny, 70 degrees F

Drilled By Cascade Drilling

Drill Type/Method Geoprobe

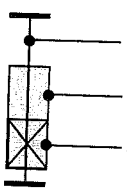
Sampling Method Direct Push, 4-Ft Cores

Bottom of Boring 12' ATD Water Level Depth 5.0'

Obs. Well Install. Yes [X] No

Ground Surface Elevation Approx. 12' MLLW

| SAMPLE ID | PID (ppm) | DEPTH From | DEPTH To | SAMPLE RECOVERY (FT) | USCS Symbol | DESCRIPTION: color, texture, moisture MAJOR CONSTITUENT. NON-SOIL SUBSTANCES: Odor, staining, sheen, scrap, slag, etc. | Sheen Test |
|---|---|---|---|---|---|---|---|
| | | | | | SP | 3-inches gravel over dark brown, dry, silty, gravelly SAND. | |
| | | | | | ML | Dark brown to gray, dry, slightly clayey, slightly sandy SILT with trace gravel. | |
| | | | | | | 6-inch layer of light brown, dry, poorly graded sand. | |
| | | | | | ML | Gray, moist to wet, sandy SILT with increasing clay content at bottom of unit. | |
| SHL06-S1 | | 4.0 | 6.0 | | | | |
| | | | | | SP | Dark gray, wet, slightly silty SAND with abundant shell fragments. | |
| | | | | | SP | Light to dark gray, wet SAND with abundant shell fragments. | |
| | | | | | | Bottom of Boring at 12' | |
| | | | | | | Note: Water sample SHL06-W1 collected from temporary well point. | |



# Log of Soil Boring SHL07

FLOYD | SNIDER

**Floyd | Snider**

Boring SHL07 Date August 26, 2005 Sheet 1 of 1

Job Former Shell Tank Farm Due Diligence Job No. POA CSMSHELL

Logged By Woltman/Satterberg Weather Sunny, 70 degrees F

Drilled By Cascade Drilling

Drill Type/Method Geoprobe

Sampling Method Direct Push, 4-Ft Cores

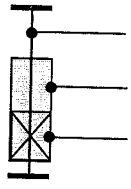
Bottom of Boring 12' ATD Water Level Depth 5.5'

Obs. Well Install. Yes [X] No

Ground Surface Elevation Approx. 12' MLLW

| SAMPLE ID | PID (ppm) | DEPTH From | DEPTH To | SAMPLE RECOVERY (FT) | USCS Symbol | DESCRIPTION: color, texture, moisture MAJOR CONSTITUENT. NON-SOIL SUBSTANCES: Odor, staining, sheen, scrap, slag, etc. | Sheen Test |
|---|---|---|---|---|---|---|---|
| | | | | | SW | 3-inches sandy GRAVEL over 3-inches dry, brown, silty SAND with gravel over 6-inches dry, light brown, gravelly SAND. | |
| | | | | | SP | Dark gray, moist, slightly gravelly SAND with silty clay inclusions. | |
| | | | | | ML | Dark gray, moist to wet, slightly clayey, sandy SILT. | |
| SHL07-S1 | | 4.0 | 5.1 | | | | |
| | | | | | SP | Dark gray, wet, slightly gravelly, SAND with abundant shell fragments and silt inclusions. | |
| | | | | | | Bottom of Boring at 12'<br><br>Note: Water sample SHL07-W1 collected from temporary well point. | |

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14



# SB-13

| SAMPLE DATA | | | | SOIL PROFILE | | | GROUNDWATER |
|---|---|---|---|---|---|---|---|
| Depth (ft) | Sample Number & Interval | Sampler Type | Blows/Foot | PID (ppm) | Graphic Symbol | USCS Symbol | Drilling Method: Geoprobe™<br>Ground Elevation (ft):<br>Drilled By: Cascade Drilling Inc. | Water Level |
| 0 | | | | | | AC | Asphalt | |
| | | | | | | SP | Grey, gravelly SAND (medium dense, dry) (no odor, no sheen) | |
| | SB13 (0.5-1.5) | | | 0.0 | | GM | Grey, sandy GRAVEL with wood debris (medium dense, moist) (no odor, no sheen) | |
| 2 | SB13 (1.5-3) | d3 | | | | | | |
| 4 | | | | | | | | |
| | | | | | | ML | Grey, sandy SILT with wood debris (loose, wet) (no odor, no sheen) | |
| | SB13 (5-6) | | | | | | | |
| 6 | | d3 | | 0.0 | | | | ▽ ATD |
| 8 | | | | | | | | |

Boring Completed 05/25/07
Total Depth of Boring = 8.0 ft.

10
12
14

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

529013.14 7/10/07 \\EDM\DATA\GINT\GINT7\PROJECTS\529013.010.014GPJ.GPJ SOIL BORING LOG

LANDAU ASSOCIATES

Cap Sante Marine
Anacortes, Washington

Log of Boring SB-13

Figure
A-19

# SB-14

| SAMPLE DATA | | | | SOIL PROFILE | | | GROUNDWATER |
|---|---|---|---|---|---|---|---|
| Depth (ft) | Sample Number & Interval | Sampler Type | Blows/Foot | PID (ppm) | Graphic Symbol | USCS Symbol | Drilling Method: Geoprobe™<br>Ground Elevation (ft):<br>Drilled By: Cascade Drilling Inc. | Water Level |
| 0 | | | | | | AC | Asphalt | |
| | SB14 (0.5-1.5) | | | 0.0 | | SP | Light brown, gravelly SAND with wood debris (medium dense, moist) (no odor, no sheen) | |
| 2 | | d3 | | | | | | |
| 4 | | | | | | ML | Dark brown, sandy SILT with trace wood debris (medium dense, moist) (no odor, no sheen) | |
| 6 | | d3 | | 0.0 | | | | |
| | | | | | | SM | Grey, silty, medium SAND with trace shell debris (medium dense, wet) (petroleum odor, no sheen) | ▽ ATD |
| 8 | | | | | | ML | Dark grey, sandy SILT with organic debris (dense, wet) (no odor, no sheen) | |
| | SB14 (8-9) | d3 | | 16 | | | | |
| | SB14 (9-10) | d3 | | 0.0 | | | | |
| 10 | | | | | | | | |
| 12 | | | | | | | | |
| 14 | | | | | | | | |

Boring Completed 05/25/07
Total Depth of Boring = 10.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

529013.14 7/10/07 \\EDM\DATA\GINT\GINT7\PROJECTS\529013.010.014GPJ.GPJ SOIL BORING LOG

LANDAU ASSOCIATES

Cap Sante Marine
Anacortes, Washington

Log of Boring SB-14

Figure
A-20

## SOIL CLASSIFICATION CHART

| MAJOR DIVISIONS | | | SYMBOLS GRAPH | SYMBOLS LETTER | TYPICAL DESCRIPTIONS |
|---|---|---|---|---|---|
| COARSE GRAINED SOILS | GRAVEL AND GRAVELLY SOILS | CLEAN GRAVELS (LITTLE OR NO FINES) | | GW | WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES |
| | | | | GP | POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES |
| | MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE | GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES) | | GM | SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES |
| | | | | GC | CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES |
| MORE THAN 50% RETAINED ON NO. 200 SIEVE | SAND AND SANDY SOILS | CLEAN SANDS (LITTLE OR NO FINES) | | SW | WELL-GRADED SANDS, GRAVELLY SANDS |
| | | | | SP | POORLY-GRADED SANDS, GRAVELLY SAND |
| | MORE THAN 50% OF COARSE FRACTION PASSING NO. 4 SIEVE | SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES) | | SM | SILTY SANDS, SAND - SILT MIXTURES |
| | | | | SC | CLAYEY SANDS, SAND - CLAY MIXTURES |
| FINE GRAINED SOILS | SILTS AND CLAYS | LIQUID LIMIT LESS THAN 50 | | ML | INORGANIC SILTS, ROCK FLOUR, CLAYEY SILTS WITH SLIGHT PLASTICITY |
| | | | | CL | INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS |
| | | | | OL | ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY |
| MORE THAN 50% PASSING NO. 200 SIEVE | SILTS AND CLAYS | LIQUID LIMIT GREATER THAN 50 | | MH | INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS SILTY SOILS |
| | | | | CH | INORGANIC CLAYS OF HIGH PLASTICITY |
| | | | | OH | ORGANIC CLAYS AND SILTS OF MEDIUM TO HIGH PLASTICITY |
| HIGHLY ORGANIC SOILS | | | | PT | PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS |

NOTE: Multiple symbols are used to indicate borderline or dual soil classifications

## ADDITIONAL MATERIAL SYMBOLS

| SYMBOLS GRAPH | SYMBOLS LETTER | TYPICAL DESCRIPTIONS |
|---|---|---|
| | CC | Cement Concrete |
| | AC | Asphalt Concrete |
| | CR | Crushed Rock/ Quarry Spalls |
| | TS | Topsoil/ Forest Duff/Sod |

**Measured groundwater level in exploration, well, or piezometer**

**Groundwater observed at time of exploration**

**Perched water observed at time of exploration**

**Measured free product in well or piezometer**

### Stratigraphic Contact

**Distinct contact between soil strata or geologic units**

**Gradual change between soil strata or geologic units**

**Approximate location of soil strata change within a geologic soil unit**

### Sampler Symbol Descriptions

**2.4-inch I.D. split barrel**

**Standard Penetration Test (SPT)**

**Shelby tube**

**Piston**

**Direct-Push**

**Bulk or grab**

**Blowcount is recorded for driven samplers as the number of blows required to advance sampler 12 inches (or distance noted). See exploration log for hammer weight and drop.**

**A "P" indicates sampler pushed using the weight of the drill rig.**

### Laboratory / Field Tests

| | |
|---|---|
| %F | Percent fines |
| AL | Atterberg limits |
| CA | Chemical analysis |
| CP | Laboratory compaction test |
| CS | Consolidation test |
| DS | Direct shear |
| HA | Hydrometer analysis |
| MC | Moisture content |
| MD | Moisture content and dry density |
| OC | Organic content |
| PM | Permeability or hydraulic conductivity |
| PP | Pocket penetrometer |
| SA | Sieve analysis |
| TX | Triaxial compression |
| UC | Unconfined compression |
| VS | Vane shear |

### Sheen Classification

| | |
|---|---|
| NS | No Visible Sheen |
| SS | Slight Sheen |
| MS | Moderate Sheen |
| HS | Heavy Sheen |
| NT | Not Tested |

NOTE: The reader must refer to the discussion in the report text and the logs of explorations for a proper understanding of subsurface conditions. Descriptions on the logs apply only at the specific exploration locations and at the time the explorations were made; they are not warranted to be representative of subsurface conditions at other locations or times.

**KEY TO EXPLORATION LOGS**

GeoEngineers

**FIGURE A-1**

Date Excavated: 11/30/2007 Logged by: RST

Equipment: CAT 303 Mini Track Hoe Surface Elevation (ft): 11

| Elevation feet | Depth feet | Sample | Sample Number | Analytical Testing | Graphic Log | Group Symbol | MATERIAL DESCRIPTION | Sheen | Headspace Vapor PPM | OTHER TESTS AND NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | | | | | CR | Gray fine crushed rock (fill) | | | |
| | | | | | | SP | Gray-brown fine to medium sand with gravel and occasional shell fragments (dry) (fill) | | | |
| 10 | | | | | | | | | | |
| | | | 1 | | | | | NS | <1 | |
| | | | 2 | | | | | NS | <1 | |
| | 5 | | | | | SM | Gray silty fine to medium sand with gravel and occasional shell fragments (moist) (fill) | | | |
| 5 | | | 3 | CA | | | | NS | <1 | |
| | | | 4 | CA | | | Wood debris near base of test pit | SS | <1 | |
| | | | | | | | Test pit completed at 8 feet<br>Slight groundwater seepage observed at 7 feet bgs | | | |
| | 10 | | | | | | | | | |

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

## LOG OF TEST PIT TP-1

GeoEngineers

Project: Former Shell Tank Farm
Project Location: 13th & Q Avenue, Anacortes, Washington
Project Number: 5147-012-00

FIGURE A-2
Sheet 1 of 1

V6_ENVTPIT P:\5\5147012\00\FINALS\5147012 00.GPJ GEIV6_1.GDT 4/4/08

Date Excavated: 11/30/2007 Logged by: RST

Equipment: CAT 303 Mini Track Hoe Surface Elevation (ft): 11

| Elevation feet | Depth feet | Sample | Sample Number | Analytical Testing | Graphic Log | Group Symbol | MATERIAL DESCRIPTION | Sheen | Headspace Vapor PPM | OTHER TESTS AND NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | | | | | CR | Gray fine crushed rock (fill) | | | |
| | | | | | | SP | Light brown fine to medium sand with occasional gravel and shell fragments (dry) (fill) | | | |
| 10 | | | | | | | | | | |
| | | X | 1 | | | | | NS | <1 | |
| | | | | | | ML | Gray silt with fine to coarse sand and gravel (moist) (fill) | | | |
| | | X | 2 | CA | | | | NS | <1 | |
| | 5 | | | | | | | | | |
| 5 | | X | 3 | | | | | NS | <1 | |
| | | X | 4 | | | | | NS | <1 | |
| | | | | | | | Test pit completed at 8 feet<br>Slight groundwater seepage observed at 7 feet bgs | | | |
| | 10 | | | | | | | | | |

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

## LOG OF TEST PIT TP-2

GeoEngineers

Project: Former Shell Tank Farm
Project Location: 13th & Q Avenue, Anacortes, Washington
Project Number: 5147-012-00

FIGURE A-3
Sheet 1 of 1

V6_ENVTPIT P:\5\5147012\00\FINALS\5147012 00.GPJ GEIV6_1.GDT 4/4/08

Date Excavated: 11/30/2007 Logged by: RST

Equipment: CAT 303 Mini Track Hoe Surface Elevation (ft): 10

| Elevation feet | Depth feet | Sample | Sample Number | Analytical Testing | Graphic Log | Group Symbol | MATERIAL DESCRIPTION | Sheen | Headspace Vapor PPM | OTHER TESTS AND NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| 10 | 0 | | | | | CR | Gray crushed rock (fill) | | | |
| | | | | | | SM | Brown silty fine to medium sand (moist) (fill) | | | |
| | | | | | | ML | Gray silt with occasional shell fragments (dry) (fill) | | | |
| | | | 1 | | | | | NS | <1 | |
| | | | 2 | | | | | NS | <1 | |
| 5 | 5 | | | | | SM | Interbedded gray silty fine sand and brown organic silt (wet) | | | |
| | | | 3 | | | | | NS | <1 | |
| | | | 4 | CA | | | | NS | <1 | |
| | | | | | | | Test pit completed at 8 feet<br>No groundwater seepage observed | | | |
| 0 | 10 | | | | | | | | | |

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

## LOG OF TEST PIT TP-3

GeoEngineers

Project: Former Shell Tank Farm
Project Location: 13th & Q Avenue, Anacortes, Washington
Project Number: 5147-012-00

FIGURE A-4
Sheet 1 of 1

V6_ENVTPIT P:\5\5147012\00\FINALS\5147012000.GPJ GEIV6_1.GDT 4/4/08

Date Excavated: 11/30/2007 Logged by: RST

Equipment: CAT 303 Mini Track Hoe Surface Elevation (ft): 10

| Elevation feet | Depth feet | Sample | Sample Number | Analytical Testing | Graphic Log | Group Symbol | MATERIAL DESCRIPTION | Sheen | Headspace Vapor PPM | OTHER TESTS AND NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| 10 | 0 | | | | | CR | Gray fine crushed rock (fill) | | | |
| | | | | | | SP | Gray fine sand (moist) (fill) | | | |
| | | | | | | ML | Gray silt with fine sand and occasional shell fragments (moist) (fill) | | | |
| | | | 1 | CA | | | | NS | <1 | |
| | | | 2 | | | | | NS | <1 | |
| 5 | 5 | | | | | SP | Gray fine to medium sand with occasional shell fragments (moist to wet) (fill) | | | |
| | | | 3 | | | | | NS | <1 | |
| | | | 4 | | | | | NS | <1 | |
| | | | | | | | Test pit completed at 8 feet<br>Slight groundwater seepage observed at 7 feet bgs | | | |
| 0 | 10 | | | | | | | | | |

Notes: See Figure A-1 for explanation of symbols.
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

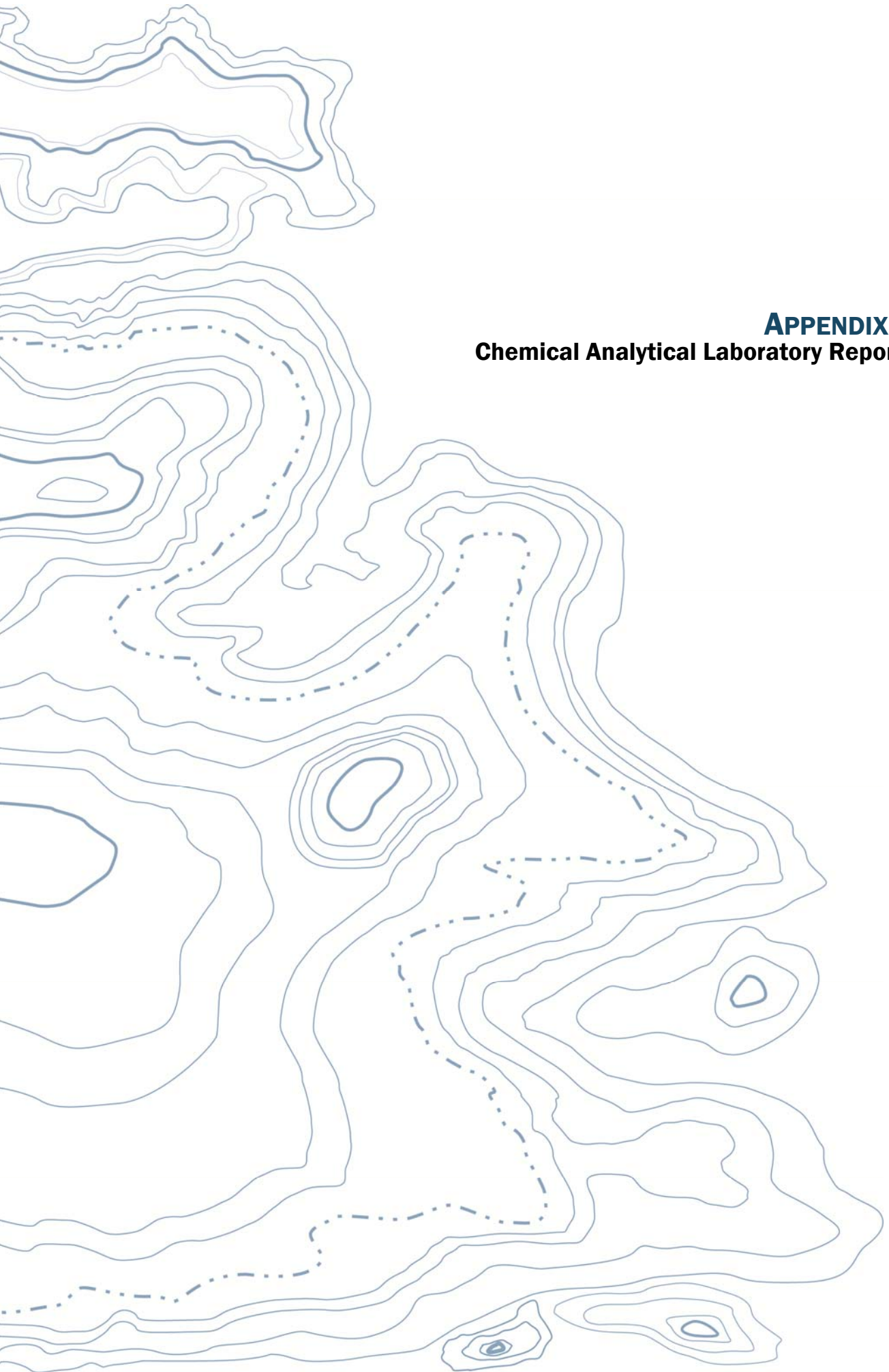
## LOG OF TEST PIT TP-4

GeoEngineers

Project: Former Shell Tank Farm
Project Location: 13th & Q Avenue, Anacortes, Washington
Project Number: 5147-012-00

FIGURE A-5
Sheet 1 of 1

V6_ENVTPIT P:\5\5147012\00\FINALS\5147012000.GPJ GEIV6_1.GDT 4/4/08



# APPENDIX D
## Chemical Analytical Laboratory Reports

OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

October 7, 2011

Robert Trahan
GeoEngineers, Inc.
600 Stewart, Suite 1700
Seattle, WA 98101-1233

Re: Analytical Data for Project 5147-012-02
Laboratory Reference No. 1109-195

Dear Robert:

Enclosed are the analytical results and associated quality control data for samples submitted on September 28, 2011.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

David Baumeister
Project Manager

Enclosures

Date of Report: October 7, 2011
Samples Submitted: September 28, 2011
Laboratory Reference: 1109-195
Project: 5147-012-02

**Case Narrative**

Samples were collected on September 27, 2011 and received by the laboratory on September 28, 2011. They were maintained at the laboratory at a temperature of 2°C to 6°C.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.

NWTPH Gx/BTEX Analysis

Per EPA Method 5035A, samples were received by the laboratory in pre-weighed 40 mL VOA vials within 48 hours of sample collection. They were stored in a freezer at between -7°C and -20°C until extraction or analysis.

Method 5035A VOA vials were not provided for samples GEI-3-2.5, GEI-5-17.0, GEI-7-2.5 and GEI-9-2.5. These samples were therefore extracted from 8-ounce jars for analysis.

Any other QA/QC issues associated with this extraction and analysis will be indicated with a footnote reference and discussed in detail on the Data Qualifier page.

Volatiles EPA 8260B Analysis

Per EPA Method 5035A, samples were received by the laboratory in pre-weighed 40 mL VOA vials within 48 hours of sample collection. They were stored in a freezer at between -7°C and -20°C until extraction or analysis.

Method 5035A VOA vials were not provided for samples GEI-7-2.5 and GEI-9-2.5. The samples were therefore extracted from 8-ounce jars and analyzed.

Some MTCA Method A cleanup levels are non-achievable for samples GEI-7-5.0, GEI-8-2.5, and GEI-9-7.5 due to the necessary dilution of the samples.

Any other QA/QC issues associated with this extraction and analysis will be indicated with a footnote reference and discussed in detail on the Data Qualifier page.

Date of Report: October 7, 2011
Samples Submitted: September 28, 2011
Laboratory Reference: 1109-195
Project: 5147-012-02

**ANALYTICAL REPORT FOR SAMPLES**

| Client ID | Laboratory ID | Matrix | Date Sampled | Date Received | Notes |
|---|---|---|---|---|---|
| GEI-1-5.0 | 09-195-02 | Soil | 9-28-11 | 9-28-11 | |
| GEI-1-7.5 | 09-195-03 | Soil | 9-28-11 | 9-28-11 | |
| GEI-2-5.0 | 09-195-07 | Soil | 9-28-11 | 9-28-11 | |
| GEI-2-7.5 | 09-195-08 | Soil | 9-28-11 | 9-28-11 | |
| GEI-3-2.5 | 09-195-11 | Soil | 9-28-11 | 9-28-11 | |
| GEI-3-10.0 | 09-195-14 | Soil | 9-28-11 | 9-28-11 | |
| GEI-3-18.0 | 09-195-16 | Soil | 9-28-11 | 9-28-11 | |
| GEI-4-5.0 | 09-195-19 | Soil | 9-28-11 | 9-28-11 | |
| GEI-4-10.0 | 09-195-21 | Soil | 9-28-11 | 9-28-11 | |
| GEI-5-2.5 | 09-195-23 | Soil | 9-28-11 | 9-28-11 | |
| GEI-5-10.0 | 09-195-26 | Soil | 9-28-11 | 9-28-11 | |
| GEI-5-17.0 | 09-195-28 | Soil | 9-28-11 | 9-28-11 | |
| GEI-6-5.0 | 09-195-31 | Soil | 9-28-11 | 9-28-11 | |
| GEI-6-10.0 | 09-195-33 | Soil | 9-28-11 | 9-28-11 | |
| GEI-7-2.5 | 09-195-35 | Soil | 9-28-11 | 9-28-11 | |
| GEI-7-5.0 | 09-195-36 | Soil | 9-28-11 | 9-28-11 | |
| GEI-7-7.5 | 09-195-37 | Soil | 9-28-11 | 9-28-11 | |
| GEI-8-2.5 | 09-195-40 | Soil | 9-28-11 | 9-28-11 | |
| GEI-8-7.5 | 09-195-42 | Soil | 9-28-11 | 9-28-11 | |
| GEI-9-2.5 | 09-195-45 | Soil | 9-28-11 | 9-28-11 | |
| GEI-9-7.5 | 09-195-47 | Soil | 9-28-11 | 9-28-11 | |
| GEI-9-10.0 | 09-195-48 | Soil | 9-28-11 | 9-28-11 | |
| GEI-10-5.0 | 09-195-51 | Soil | 9-28-11 | 9-28-11 | |
| GEI-10-7.5 | 09-195-52 | Soil | 9-28-11 | 9-28-11 | |

Date of Report: October 7, 2011
Samples Submitted: September 28, 2011
Laboratory Reference: 1109-195
Project: 5147-012-02

**NWTPH-Gx/BTEX**

Matrix: Soil
Units: mg/kg (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-1-5.0** | | | | | |
| Laboratory ID: | 09-195-02 | | | | | |
| Benzene | **ND** | 0.020 | EPA 8021 | 10-5-11 | 10-5-11 | |
| Toluene | **ND** | 0.091 | EPA 8021 | 10-5-11 | 10-5-11 | |
| Ethyl Benzene | **ND** | 0.091 | EPA 8021 | 10-5-11 | 10-5-11 | |
| m,p-Xylene | **ND** | 0.091 | EPA 8021 | 10-5-11 | 10-5-11 | |
| o-Xylene | **ND** | 0.091 | EPA 8021 | 10-5-11 | 10-5-11 | |
| Gasoline | **ND** | 9.1 | NWTPH-Gx | 10-5-11 | 10-5-11 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***Fluorobenzene*** | ***114*** | ***68-124*** | | | | |
| **Client ID:** | **GEI-1-7.5** | | | | | |
| Laboratory ID: | 09-195-03 | | | | | |
| Benzene | **ND** | 0.020 | EPA 8021 | 10-5-11 | 10-5-11 | |
| Toluene | **ND** | 0.073 | EPA 8021 | 10-5-11 | 10-5-11 | |
| Ethyl Benzene | **ND** | 0.073 | EPA 8021 | 10-5-11 | 10-5-11 | |
| m,p-Xylene | **ND** | 0.073 | EPA 8021 | 10-5-11 | 10-5-11 | |
| o-Xylene | **ND** | 0.073 | EPA 8021 | 10-5-11 | 10-5-11 | |
| Gasoline | **ND** | 7.3 | NWTPH-Gx | 10-5-11 | 10-5-11 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***Fluorobenzene*** | ***99*** | ***68-124*** | | | | |
| **Client ID:** | **GEI-2-5.0** | | | | | |
| Laboratory ID: | 09-195-07 | | | | | |
| Benzene | **ND** | 0.020 | EPA 8021 | 10-5-11 | 10-5-11 | |
| Toluene | **ND** | 0.087 | EPA 8021 | 10-5-11 | 10-5-11 | |
| Ethyl Benzene | **ND** | 0.087 | EPA 8021 | 10-5-11 | 10-5-11 | |
| m,p-Xylene | **ND** | 0.087 | EPA 8021 | 10-5-11 | 10-5-11 | |
| o-Xylene | **ND** | 0.087 | EPA 8021 | 10-5-11 | 10-5-11 | |
| Gasoline | **ND** | 8.7 | NWTPH-Gx | 10-5-11 | 10-5-11 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***Fluorobenzene*** | ***113*** | ***68-124*** | | | | |

Date of Report: October 7, 2011
Samples Submitted: September 28, 2011
Laboratory Reference: 1109-195
Project: 5147-012-02

**NWTPH-Gx/BTEX**

Matrix: Soil
Units: mg/kg (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-2-7.5** | | | | | |
| Laboratory ID: | 09-195-08 | | | | | |
| Benzene | **ND** | 0.020 | EPA 8021 | 10-5-11 | 10-5-11 | |
| Toluene | **ND** | 0.069 | EPA 8021 | 10-5-11 | 10-5-11 | |
| Ethyl Benzene | **ND** | 0.069 | EPA 8021 | 10-5-11 | 10-5-11 | |
| m,p-Xylene | **ND** | 0.069 | EPA 8021 | 10-5-11 | 10-5-11 | |
| o-Xylene | **ND** | 0.069 | EPA 8021 | 10-5-11 | 10-5-11 | |
| Gasoline | **ND** | 6.9 | NWTPH-Gx | 10-5-11 | 10-5-11 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***Fluorobenzene*** | ***92*** | ***68-124*** | | | | |
| **Client ID:** | **GEI-3-2.5** | | | | | |
| Laboratory ID: | 09-195-11 | | | | | |
| Benzene | **ND** | 0.020 | EPA 8021 | 10-5-11 | 10-5-11 | |
| Toluene | **ND** | 0.068 | EPA 8021 | 10-5-11 | 10-5-11 | |
| Ethyl Benzene | **ND** | 0.068 | EPA 8021 | 10-5-11 | 10-5-11 | |
| m,p-Xylene | **ND** | 0.068 | EPA 8021 | 10-5-11 | 10-5-11 | |
| o-Xylene | **ND** | 0.068 | EPA 8021 | 10-5-11 | 10-5-11 | |
| Gasoline | **ND** | 6.8 | NWTPH-Gx | 10-5-11 | 10-5-11 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***Fluorobenzene*** | ***106*** | ***68-124*** | | | | |
| **Client ID:** | **GEI-3-10.0** | | | | | |
| Laboratory ID: | 09-195-14 | | | | | |
| Benzene | **ND** | 0.024 | EPA 8021 | 10-5-11 | 10-5-11 | |
| Toluene | **ND** | 0.12 | EPA 8021 | 10-5-11 | 10-5-11 | |
| Ethyl Benzene | **0.30** | 0.12 | EPA 8021 | 10-5-11 | 10-5-11 | |
| m,p-Xylene | **0.54** | 0.12 | EPA 8021 | 10-5-11 | 10-5-11 | |
| o-Xylene | **ND** | 0.60 | EPA 8021 | 10-5-11 | 10-5-11 | U1 |
| Gasoline | **ND** | 12 | NWTPH-Gx | 10-5-11 | 10-5-11 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***Fluorobenzene*** | ***97*** | ***68-124*** | | | | |

Date of Report: October 7, 2011
Samples Submitted: September 28, 2011
Laboratory Reference: 1109-195
Project: 5147-012-02

**NWTPH-Gx/BTEX**

Matrix: Soil
Units: mg/kg (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-3-18.0** | | | | | |
| Laboratory ID: | 09-195-16 | | | | | |
| Benzene | **ND** | 0.020 | EPA 8021 | 10-5-11 | 10-5-11 | |
| Toluene | **ND** | 0.076 | EPA 8021 | 10-5-11 | 10-5-11 | |
| Ethyl Benzene | **ND** | 0.076 | EPA 8021 | 10-5-11 | 10-5-11 | |
| m,p-Xylene | **ND** | 0.076 | EPA 8021 | 10-5-11 | 10-5-11 | |
| o-Xylene | **ND** | 0.076 | EPA 8021 | 10-5-11 | 10-5-11 | |
| Gasoline | **ND** | 7.6 | NWTPH-Gx | 10-5-11 | 10-5-11 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***Fluorobenzene*** | ***108*** | ***68-124*** | | | | |
| **Client ID:** | **GEI-4-5.0** | | | | | |
| Laboratory ID: | 09-195-19 | | | | | |
| Benzene | **ND** | 0.020 | EPA 8021 | 10-5-11 | 10-5-11 | |
| Toluene | **ND** | 0.061 | EPA 8021 | 10-5-11 | 10-5-11 | |
| Ethyl Benzene | **ND** | 0.061 | EPA 8021 | 10-5-11 | 10-5-11 | |
| m,p-Xylene | **ND** | 0.061 | EPA 8021 | 10-5-11 | 10-5-11 | |
| o-Xylene | **ND** | 0.061 | EPA 8021 | 10-5-11 | 10-5-11 | |
| Gasoline | **ND** | 6.1 | NWTPH-Gx | 10-5-11 | 10-5-11 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***Fluorobenzene*** | ***100*** | ***68-124*** | | | | |
| **Client ID:** | **GEI-4-10.0** | | | | | |
| Laboratory ID: | 09-195-21 | | | | | |
| Benzene | **ND** | 0.020 | EPA 8021 | 10-5-11 | 10-5-11 | |
| Toluene | **ND** | 0.058 | EPA 8021 | 10-5-11 | 10-5-11 | |
| Ethyl Benzene | **ND** | 0.058 | EPA 8021 | 10-5-11 | 10-5-11 | |
| m,p-Xylene | **ND** | 0.058 | EPA 8021 | 10-5-11 | 10-5-11 | |
| o-Xylene | **ND** | 0.058 | EPA 8021 | 10-5-11 | 10-5-11 | |
| Gasoline | **ND** | 5.8 | NWTPH-Gx | 10-5-11 | 10-5-11 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***Fluorobenzene*** | ***100*** | ***68-124*** | | | | |

Date of Report: October 7, 2011
Samples Submitted: September 28, 2011
Laboratory Reference: 1109-195
Project: 5147-012-02

**NWTPH-Gx/BTEX**

Matrix: Soil
Units: mg/kg (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-5-2.5** | | | | | |
| Laboratory ID: | 09-195-23 | | | | | |
| Benzene | **0.16** | 0.025 | EPA 8021 | 10-5-11 | 10-6-11 | |
| Toluene | **ND** | 0.60 | EPA 8021 | 10-5-11 | 10-6-11 | U1 |
| Ethyl Benzene | **3.3** | 0.12 | EPA 8021 | 10-5-11 | 10-6-11 | |
| m,p-Xylene | **5.2** | 0.12 | EPA 8021 | 10-5-11 | 10-6-11 | |
| o-Xylene | **ND** | 1.2 | EPA 8021 | 10-5-11 | 10-6-11 | U1 |
| Gasoline | **ND** | 12 | NWTPH-Gx | 10-5-11 | 10-6-11 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***Fluorobenzene*** | ***98*** | ***68-124*** | | | | |
| **Client ID:** | **GEI-5-10.0** | | | | | |
| Laboratory ID: | 09-195-26 | | | | | |
| Benzene | **0.13** | 0.023 | EPA 8021 | 10-5-11 | 10-6-11 | |
| Toluene | **ND** | 0.55 | EPA 8021 | 10-5-11 | 10-6-11 | U1 |
| Ethyl Benzene | **3.3** | 0.11 | EPA 8021 | 10-5-11 | 10-6-11 | |
| m,p-Xylene | **1.6** | 0.11 | EPA 8021 | 10-5-11 | 10-6-11 | |
| o-Xylene | **ND** | 0.11 | EPA 8021 | 10-5-11 | 10-6-11 | |
| Gasoline | **ND** | 11 | NWTPH-Gx | 10-5-11 | 10-6-11 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***Fluorobenzene*** | ***96*** | ***68-124*** | | | | |
| **Client ID:** | **GEI-5-17.0** | | | | | |
| Laboratory ID: | 09-195-28 | | | | | |
| Benzene | **ND** | 0.020 | EPA 8021 | 10-5-11 | 10-7-11 | |
| Toluene | **ND** | 0.072 | EPA 8021 | 10-5-11 | 10-7-11 | |
| Ethyl Benzene | **0.12** | 0.072 | EPA 8021 | 10-5-11 | 10-7-11 | |
| m,p-Xylene | **ND** | 0.072 | EPA 8021 | 10-5-11 | 10-7-11 | |
| o-Xylene | **ND** | 0.072 | EPA 8021 | 10-5-11 | 10-7-11 | |
| Gasoline | **ND** | 7.2 | NWTPH-Gx | 10-5-11 | 10-7-11 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***Fluorobenzene*** | ***101*** | ***68-124*** | | | | |

Date of Report: October 7, 2011
Samples Submitted: September 28, 2011
Laboratory Reference: 1109-195
Project: 5147-012-02

**NWTPH-Gx/BTEX**

Matrix: Soil
Units: mg/kg (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-6-5.0** | | | | | |
| Laboratory ID: | 09-195-31 | | | | | |
| Benzene | **ND** | 0.020 | EPA 8021 | 10-5-11 | 10-5-11 | |
| Toluene | **ND** | 0.053 | EPA 8021 | 10-5-11 | 10-5-11 | |
| Ethyl Benzene | **ND** | 0.053 | EPA 8021 | 10-5-11 | 10-5-11 | |
| m,p-Xylene | **ND** | 0.053 | EPA 8021 | 10-5-11 | 10-5-11 | |
| o-Xylene | **ND** | 0.053 | EPA 8021 | 10-5-11 | 10-5-11 | |
| Gasoline | **ND** | 5.3 | NWTPH-Gx | 10-5-11 | 10-5-11 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***Fluorobenzene*** | ***94*** | ***68-124*** | | | | |
| **Client ID:** | **GEI-6-10.0** | | | | | |
| Laboratory ID: | 09-195-33 | | | | | |
| Benzene | **ND** | 0.020 | EPA 8021 | 10-5-11 | 10-5-11 | |
| Toluene | **ND** | 0.052 | EPA 8021 | 10-5-11 | 10-5-11 | |
| Ethyl Benzene | **ND** | 0.052 | EPA 8021 | 10-5-11 | 10-5-11 | |
| m,p-Xylene | **ND** | 0.052 | EPA 8021 | 10-5-11 | 10-5-11 | |
| o-Xylene | **ND** | 0.052 | EPA 8021 | 10-5-11 | 10-5-11 | |
| Gasoline | **ND** | 5.2 | NWTPH-Gx | 10-5-11 | 10-5-11 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***Fluorobenzene*** | ***97*** | ***68-124*** | | | | |
| **Client ID:** | **GEI-7-2.5** | | | | | |
| Laboratory ID: | 09-195-35 | | | | | |
| Benzene | **ND** | 0.020 | EPA 8021 | 10-5-11 | 10-6-11 | |
| Toluene | **ND** | 0.062 | EPA 8021 | 10-5-11 | 10-6-11 | |
| Ethyl Benzene | **ND** | 0.062 | EPA 8021 | 10-5-11 | 10-6-11 | |
| m,p-Xylene | **ND** | 0.062 | EPA 8021 | 10-5-11 | 10-6-11 | |
| o-Xylene | **ND** | 0.062 | EPA 8021 | 10-5-11 | 10-6-11 | |
| Gasoline | **ND** | 6.2 | NWTPH-Gx | 10-5-11 | 10-6-11 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***Fluorobenzene*** | ***97*** | ***68-124*** | | | | |

Date of Report: October 7, 2011
Samples Submitted: September 28, 2011
Laboratory Reference: 1109-195
Project: 5147-012-02

**NWTPH-Gx/BTEX**

Matrix: Soil
Units: mg/kg (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-7-5.0** | | | | | |
| Laboratory ID: | 09-195-36 | | | | | |
| Benzene | **ND** | 0.025 | EPA 8021 | 10-5-11 | 10-6-11 | |
| Toluene | **ND** | 0.13 | EPA 8021 | 10-5-11 | 10-6-11 | |
| Ethyl Benzene | **0.18** | 0.13 | EPA 8021 | 10-5-11 | 10-6-11 | |
| m,p-Xylene | **1.0** | 0.13 | EPA 8021 | 10-5-11 | 10-6-11 | |
| o-Xylene | **ND** | 0.65 | EPA 8021 | 10-5-11 | 10-6-11 | U1 |
| Gasoline | **ND** | 13 | NWTPH-Gx | 10-5-11 | 10-6-11 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***Fluorobenzene*** | ***92*** | ***68-124*** | | | | |
| **Client ID:** | **GEI-7-7.5** | | | | | |
| Laboratory ID: | 09-195-37 | | | | | |
| Benzene | **ND** | 0.020 | EPA 8021 | 10-5-11 | 10-5-11 | |
| Toluene | **ND** | 0.071 | EPA 8021 | 10-5-11 | 10-5-11 | |
| Ethyl Benzene | **ND** | 0.071 | EPA 8021 | 10-5-11 | 10-5-11 | |
| m,p-Xylene | **ND** | 0.071 | EPA 8021 | 10-5-11 | 10-5-11 | |
| o-Xylene | **ND** | 0.071 | EPA 8021 | 10-5-11 | 10-5-11 | |
| Gasoline | **ND** | 7.1 | NWTPH-Gx | 10-5-11 | 10-5-11 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***Fluorobenzene*** | ***103*** | ***68-124*** | | | | |
| **Client ID:** | **GEI-8-2.5** | | | | | |
| Laboratory ID: | 09-195-40 | | | | | |
| Benzene | **ND** | 0.020 | EPA 8021 | 10-5-11 | 10-5-11 | |
| Toluene | **ND** | 0.048 | EPA 8021 | 10-5-11 | 10-5-11 | |
| Ethyl Benzene | **ND** | 0.048 | EPA 8021 | 10-5-11 | 10-5-11 | |
| m,p-Xylene | **ND** | 0.048 | EPA 8021 | 10-5-11 | 10-5-11 | |
| o-Xylene | **ND** | 0.048 | EPA 8021 | 10-5-11 | 10-5-11 | |
| Gasoline | **ND** | 4.8 | NWTPH-Gx | 10-5-11 | 10-5-11 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***Fluorobenzene*** | ***94*** | ***68-124*** | | | | |

Date of Report: October 7, 2011
Samples Submitted: September 28, 2011
Laboratory Reference: 1109-195
Project: 5147-012-02

**NWTPH-Gx/BTEX**

Matrix: Soil
Units: mg/kg (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-8-7.5** | | | | | |
| Laboratory ID: | 09-195-42 | | | | | |
| Benzene | **ND** | 0.020 | EPA 8021 | 10-5-11 | 10-5-11 | |
| Toluene | **ND** | 0.058 | EPA 8021 | 10-5-11 | 10-5-11 | |
| Ethyl Benzene | **ND** | 0.058 | EPA 8021 | 10-5-11 | 10-5-11 | |
| m,p-Xylene | **ND** | 0.058 | EPA 8021 | 10-5-11 | 10-5-11 | |
| o-Xylene | **ND** | 0.058 | EPA 8021 | 10-5-11 | 10-5-11 | |
| Gasoline | **ND** | 5.8 | NWTPH-Gx | 10-5-11 | 10-5-11 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***Fluorobenzene*** | ***92*** | ***68-124*** | | | | |
| **Client ID:** | **GEI-9-2.5** | | | | | |
| Laboratory ID: | 09-195-45 | | | | | |
| Benzene | **ND** | 0.020 | EPA 8021 | 10-5-11 | 10-5-11 | |
| Toluene | **ND** | 0.067 | EPA 8021 | 10-5-11 | 10-5-11 | |
| Ethyl Benzene | **ND** | 0.067 | EPA 8021 | 10-5-11 | 10-5-11 | |
| m,p-Xylene | **ND** | 0.067 | EPA 8021 | 10-5-11 | 10-5-11 | |
| o-Xylene | **ND** | 0.067 | EPA 8021 | 10-5-11 | 10-5-11 | |
| Gasoline | **ND** | 6.7 | NWTPH-Gx | 10-5-11 | 10-5-11 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***Fluorobenzene*** | ***101*** | ***68-124*** | | | | |
| **Client ID:** | **GEI-9-7.5** | | | | | |
| Laboratory ID: | 09-195-47 | | | | | |
| Benzene | **ND** | 0.025 | EPA 8021 | 10-5-11 | 10-6-11 | |
| Toluene | **ND** | 0.13 | EPA 8021 | 10-5-11 | 10-6-11 | |
| Ethyl Benzene | **5.4** | 0.13 | EPA 8021 | 10-5-11 | 10-6-11 | |
| m,p-Xylene | **4.5** | 0.13 | EPA 8021 | 10-5-11 | 10-6-11 | |
| o-Xylene | **ND** | 2.6 | EPA 8021 | 10-5-11 | 10-6-11 | U1 |
| Gasoline | **ND** | 13 | NWTPH-Gx | 10-5-11 | 10-6-11 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***Fluorobenzene*** | ***88*** | ***68-124*** | | | | |

Date of Report: October 7, 2011
Samples Submitted: September 28, 2011
Laboratory Reference: 1109-195
Project: 5147-012-02

**NWTPH-Gx/BTEX**

Matrix: Soil
Units: mg/kg (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-9-10.0** | | | | | |
| Laboratory ID: | 09-195-48 | | | | | |
| Benzene | **ND** | 0.020 | EPA 8021 | 10-5-11 | 10-5-11 | |
| Toluene | **ND** | 0.063 | EPA 8021 | 10-5-11 | 10-5-11 | |
| Ethyl Benzene | **ND** | 0.063 | EPA 8021 | 10-5-11 | 10-5-11 | |
| m,p-Xylene | **ND** | 0.063 | EPA 8021 | 10-5-11 | 10-5-11 | |
| o-Xylene | **ND** | 0.063 | EPA 8021 | 10-5-11 | 10-5-11 | |
| Gasoline | **ND** | 6.3 | NWTPH-Gx | 10-5-11 | 10-5-11 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***Fluorobenzene*** | ***92*** | ***68-124*** | | | | |
| **Client ID:** | **GEI-10-5.0** | | | | | |
| Laboratory ID: | 09-195-51 | | | | | |
| Benzene | **ND** | 0.020 | EPA 8021 | 10-5-11 | 10-5-11 | |
| Toluene | **ND** | 0.056 | EPA 8021 | 10-5-11 | 10-5-11 | |
| Ethyl Benzene | **ND** | 0.056 | EPA 8021 | 10-5-11 | 10-5-11 | |
| m,p-Xylene | **ND** | 0.056 | EPA 8021 | 10-5-11 | 10-5-11 | |
| o-Xylene | **ND** | 0.056 | EPA 8021 | 10-5-11 | 10-5-11 | |
| Gasoline | **ND** | 5.6 | NWTPH-Gx | 10-5-11 | 10-5-11 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***Fluorobenzene*** | ***102*** | ***68-124*** | | | | |
| **Client ID:** | **GEI-10-7.5** | | | | | |
| Laboratory ID: | 09-195-52 | | | | | |
| Benzene | **ND** | 0.020 | EPA 8021 | 10-5-11 | 10-5-11 | |
| Toluene | **ND** | 0.066 | EPA 8021 | 10-5-11 | 10-5-11 | |
| Ethyl Benzene | **ND** | 0.066 | EPA 8021 | 10-5-11 | 10-5-11 | |
| m,p-Xylene | **ND** | 0.066 | EPA 8021 | 10-5-11 | 10-5-11 | |
| o-Xylene | **ND** | 0.066 | EPA 8021 | 10-5-11 | 10-5-11 | |
| Gasoline | **ND** | 6.6 | NWTPH-Gx | 10-5-11 | 10-5-11 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***Fluorobenzene*** | ***81*** | ***68-124*** | | | | |

Date of Report: October 7, 2011
Samples Submitted: September 28, 2011
Laboratory Reference: 1109-195
Project: 5147-012-02

**NWTPH-Dx**
**(with acid/silica gel clean-up)**

Matrix: Soil
Units: mg/Kg (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-1-5.0** | | | | | |
| Laboratory ID: | 09-195-02 | | | | | |
| Diesel Range Organics | **ND** | 38 | NWTPH-Dx | 10-5-11 | 10-5-11 | |
| Lube Oil Range Organics | **ND** | 75 | NWTPH-Dx | 10-5-11 | 10-5-11 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***o-Terphenyl*** | ***93*** | ***50-150*** | | | | |
| **Client ID:** | **GEI-1-7.5** | | | | | |
| Laboratory ID: | 09-195-03 | | | | | |
| Diesel Range Organics | **ND** | 32 | NWTPH-Dx | 10-5-11 | 10-5-11 | |
| Lube Oil Range Organics | **ND** | 64 | NWTPH-Dx | 10-5-11 | 10-5-11 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***o-Terphenyl*** | ***97*** | ***50-150*** | | | | |
| **Client ID:** | **GEI-2-5.0** | | | | | |
| Laboratory ID: | 09-195-07 | | | | | |
| Diesel Range Organics | **ND** | 36 | NWTPH-Dx | 10-5-11 | 10-5-11 | |
| Lube Oil Range Organics | **ND** | 72 | NWTPH-Dx | 10-5-11 | 10-5-11 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***o-Terphenyl*** | ***94*** | ***50-150*** | | | | |
| **Client ID:** | **GEI-2-7.5** | | | | | |
| Laboratory ID: | 09-195-08 | | | | | |
| Diesel Range Organics | **ND** | 31 | NWTPH-Dx | 10-5-11 | 10-5-11 | |
| Lube Oil Range Organics | **ND** | 62 | NWTPH-Dx | 10-5-11 | 10-5-11 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***o-Terphenyl*** | ***99*** | ***50-150*** | | | | |
| **Client ID:** | **GEI-3-2.5** | | | | | |
| Laboratory ID: | 09-195-11 | | | | | |
| Diesel Range Organics | **53** | 30 | NWTPH-Dx | 10-6-11 | 10-6-11 | |
| Lube Oil | **270** | 59 | NWTPH-Dx | 10-6-11 | 10-6-11 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***o-Terphenyl*** | ***108*** | ***50-150*** | | | | |
| **Client ID:** | **GEI-3-10.0** | | | | | |
| Laboratory ID: | 09-195-14 | | | | | |
| Diesel Range Organics | **4300** | 29 | NWTPH-Dx | 10-6-11 | 10-6-11 | |
| Lube Oil Range Organics | **ND** | 300 | NWTPH-Dx | 10-6-11 | 10-6-11 | U1 |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***o-Terphenyl*** | ***100*** | ***50-150*** | | | | |

Date of Report: October 7, 2011
Samples Submitted: September 28, 2011
Laboratory Reference: 1109-195
Project: 5147-012-02

**NWTPH-Dx**
**(with acid/silica gel clean-up)**

Matrix: Soil
Units: mg/Kg (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-3-18.0** | | | | | |
| Laboratory ID: | 09-195-16 | | | | | |
| Diesel Range Organics | **200** | 32 | NWTPH-Dx | 10-6-11 | 10-6-11 | |
| Lube Oil Range Organics | **ND** | 64 | NWTPH-Dx | 10-6-11 | 10-6-11 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***o-Terphenyl*** | ***94*** | ***50-150*** | | | | |
| **Client ID:** | **GEI-4-5.0** | | | | | |
| Laboratory ID: | 09-195-19 | | | | | |
| Diesel Range Organics | **740** | 29 | NWTPH-Dx | 10-6-11 | 10-6-11 | |
| Lube Oil Range Organics | **ND** | 57 | NWTPH-Dx | 10-6-11 | 10-6-11 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***o-Terphenyl*** | ***130*** | ***50-150*** | | | | |
| **Client ID:** | **GEI-4-10.0** | | | | | |
| Laboratory ID: | 09-195-21 | | | | | |
| Diesel Range Organics | **ND** | 29 | NWTPH-Dx | 10-6-11 | 10-6-11 | |
| Lube Oil Range Organics | **ND** | 58 | NWTPH-Dx | 10-6-11 | 10-6-11 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***o-Terphenyl*** | ***103*** | ***50-150*** | | | | |
| **Client ID:** | **GEI-5-2.5** | | | | | |
| Laboratory ID: | 09-195-23 | | | | | |
| Diesel Range Organics | **7400** | 58 | NWTPH-Dx | 10-6-11 | 10-7-11 | |
| Lube Oil Range Organics | **ND** | 600 | NWTPH-Dx | 10-6-11 | 10-7-11 | U1 |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***o-Terphenyl*** | ***99*** | ***50-150*** | | | | |
| **Client ID:** | **GEI-5-10.0** | | | | | |
| Laboratory ID: | 09-195-26 | | | | | |
| Diesel Range Organics | **3200** | 29 | NWTPH-Dx | 10-6-11 | 10-6-11 | |
| Lube Oil Range Organics | **ND** | 68 | NWTPH-Dx | 10-6-11 | 10-6-11 | U1 |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***o-Terphenyl*** | ***110*** | ***50-150*** | | | | |
| **Client ID:** | **GEI-5-17.0** | | | | | |
| Laboratory ID: | 09-195-28 | | | | | |
| Diesel Range Organics | **58** | 31 | NWTPH-Dx | 10-6-11 | 10-6-11 | |
| Lube Oil Range Organics | **ND** | 62 | NWTPH-Dx | 10-6-11 | 10-6-11 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***o-Terphenyl*** | ***64*** | ***50-150*** | | | | |

Date of Report: October 7, 2011
Samples Submitted: September 28, 2011
Laboratory Reference: 1109-195
Project: 5147-012-02

**NWTPH-Dx**
**(with acid/silica gel clean-up)**

Matrix: Soil
Units: mg/Kg (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-6-5.0** | | | | | |
| Laboratory ID: | 09-195-31 | | | | | |
| Diesel Range Organics | **32** | 28 | NWTPH-Dx | 10-6-11 | 10-6-11 | |
| Lube Oil Range Organics | **ND** | 56 | NWTPH-Dx | 10-6-11 | 10-6-11 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***o-Terphenyl*** | ***106*** | ***50-150*** | | | | |
| **Client ID:** | **GEI-6-10.0** | | | | | |
| Laboratory ID: | 09-195-33 | | | | | |
| Diesel Range Organics | **ND** | 28 | NWTPH-Dx | 10-6-11 | 10-6-11 | |
| Lube Oil Range Organics | **ND** | 56 | NWTPH-Dx | 10-6-11 | 10-6-11 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***o-Terphenyl*** | ***91*** | ***50-150*** | | | | |
| **Client ID:** | **GEI-7-2.5** | | | | | |
| Laboratory ID: | 09-195-35 | | | | | |
| Diesel Range Organics | **54** | 28 | NWTPH-Dx | 10-6-11 | 10-6-11 | |
| Lube Oil Range Organics | **140** | 56 | NWTPH-Dx | 10-6-11 | 10-6-11 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***o-Terphenyl*** | ***81*** | ***50-150*** | | | | |
| **Client ID:** | **GEI-7-5.0** | | | | | |
| Laboratory ID: | 09-195-36 | | | | | |
| Diesel Range Organics | **4200** | 29 | NWTPH-Dx | 10-6-11 | 10-6-11 | |
| Lube Oil | **69** | 57 | NWTPH-Dx | 10-6-11 | 10-6-11 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***o-Terphenyl*** | ***112*** | ***50-150*** | | | | |
| **Client ID:** | **GEI-7-7.5** | | | | | |
| Laboratory ID: | 09-195-37 | | | | | |
| Diesel Range Organics | **ND** | 32 | NWTPH-Dx | 10-6-11 | 10-6-11 | |
| Lube Oil Range Organics | **ND** | 63 | NWTPH-Dx | 10-6-11 | 10-6-11 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***o-Terphenyl*** | ***83*** | ***50-150*** | | | | |
| **Client ID:** | **GEI-8-2.5** | | | | | |
| Laboratory ID: | 09-195-40 | | | | | |
| Diesel Range Organics | **4400** | 28 | NWTPH-Dx | 10-6-11 | 10-6-11 | |
| Lube Oil Range Organics | **ND** | 61 | NWTPH-Dx | 10-6-11 | 10-6-11 | U1 |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***o-Terphenyl*** | ***120*** | ***50-150*** | | | | |

Date of Report: October 7, 2011
Samples Submitted: September 28, 2011
Laboratory Reference: 1109-195
Project: 5147-012-02

**NWTPH-Dx**
**(with acid/silica gel clean-up)**

Matrix: Soil
Units: mg/Kg (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-8-7.5** | | | | | |
| Laboratory ID: | 09-195-42 | | | | | |
| Diesel Range Organics | **38** | 30 | NWTPH-Dx | 10-6-11 | 10-6-11 | |
| Lube Oil Range Organics | **ND** | 60 | NWTPH-Dx | 10-6-11 | 10-6-11 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***o-Terphenyl*** | ***86*** | ***50-150*** | | | | |
| **Client ID:** | **GEI-9-2.5** | | | | | |
| Laboratory ID: | 09-195-45 | | | | | |
| Diesel Range Organics | **ND** | 29 | NWTPH-Dx | 10-6-11 | 10-6-11 | |
| Lube Oil Range Organics | **ND** | 59 | NWTPH-Dx | 10-6-11 | 10-6-11 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***o-Terphenyl*** | ***77*** | ***50-150*** | | | | |
| **Client ID:** | **GEI-9-7.5** | | | | | |
| Laboratory ID: | 09-195-47 | | | | | |
| Diesel Range Organics | **900** | 29 | NWTPH-Dx | 10-6-11 | 10-6-11 | |
| Lube Oil Range Organics | **ND** | 58 | NWTPH-Dx | 10-6-11 | 10-6-11 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***o-Terphenyl*** | ***106*** | ***50-150*** | | | | |
| **Client ID:** | **GEI-9-10.0** | | | | | |
| Laboratory ID: | 09-195-48 | | | | | |
| Diesel Range Organics | **ND** | 30 | NWTPH-Dx | 10-6-11 | 10-6-11 | |
| Lube Oil Range Organics | **ND** | 60 | NWTPH-Dx | 10-6-11 | 10-6-11 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***o-Terphenyl*** | ***95*** | ***50-150*** | | | | |
| **Client ID:** | **GEI-10-5.0** | | | | | |
| Laboratory ID: | 09-195-51 | | | | | |
| Diesel Range Organics | **ND** | 28 | NWTPH-Dx | 10-6-11 | 10-6-11 | |
| Lube Oil Range Organics | **ND** | 56 | NWTPH-Dx | 10-6-11 | 10-6-11 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***o-Terphenyl*** | ***78*** | ***50-150*** | | | | |
| **Client ID:** | **GEI-10-7.5** | | | | | |
| Laboratory ID: | 09-195-52 | | | | | |
| Diesel Range Organics | **ND** | 29 | NWTPH-Dx | 10-6-11 | 10-6-11 | |
| Lube Oil Range Organics | **ND** | 59 | NWTPH-Dx | 10-6-11 | 10-6-11 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***o-Terphenyl*** | ***97*** | ***50-150*** | | | | |

Date of Report: October 7, 2011
Samples Submitted: September 28, 2011
Laboratory Reference: 1109-195
Project: 5147-012-02

**VOLATILES by EPA 8260B**

Matrix: Soil
Units: mg/kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-7-2.5** | | | | | |
| Laboratory ID: | 09-195-35 | | | | | |
| Methyl t-Butyl Ether | ND | 0.0011 | EPA 8260 | 10-4-11 | 10-4-11 | |
| 1,2-Dichloroethane | ND | 0.0011 | EPA 8260 | 10-4-11 | 10-4-11 | |
| 1,2-Dibromoethane | ND | 0.0011 | EPA 8260 | 10-4-11 | 10-4-11 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***Dibromofluoromethane*** | ***70*** | ***63-127*** | | | | |
| ***Toluene-d8*** | ***85*** | ***65-129*** | | | | |
| ***4-Bromofluorobenzene*** | ***95*** | ***55-121*** | | | | |
| **Client ID:** | **GEI-7-5.0** | | | | | |
| Laboratory ID: | 09-195-36 | | | | | |
| Methyl t-Butyl Ether | ND | 0.065 | EPA 8260 | 10-6-11 | 10-6-11 | |
| 1,2-Dichloroethane | ND | 0.065 | EPA 8260 | 10-6-11 | 10-6-11 | |
| 1,2-Dibromoethane | ND | 0.065 | EPA 8260 | 10-6-11 | 10-6-11 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***Dibromofluoromethane*** | ***84*** | ***63-127*** | | | | |
| ***Toluene-d8*** | ***84*** | ***65-129*** | | | | |
| ***4-Bromofluorobenzene*** | ***93*** | ***55-121*** | | | | |
| **Client ID:** | **GEI-7-7.5** | | | | | |
| Laboratory ID: | 09-195-37 | | | | | |
| Methyl t-Butyl Ether | ND | 0.0010 | EPA 8260 | 10-4-11 | 10-4-11 | |
| 1,2-Dichloroethane | ND | 0.0010 | EPA 8260 | 10-4-11 | 10-4-11 | |
| 1,2-Dibromoethane | ND | 0.0010 | EPA 8260 | 10-4-11 | 10-4-11 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***Dibromofluoromethane*** | ***70*** | ***63-127*** | | | | |
| ***Toluene-d8*** | ***87*** | ***65-129*** | | | | |
| ***4-Bromofluorobenzene*** | ***95*** | ***55-121*** | | | | |
| **Client ID:** | **GEI-8-2.5** | | | | | |
| Laboratory ID: | 09-195-40 | | | | | |
| Methyl t-Butyl Ether | ND | 0.055 | EPA 8260 | 10-6-11 | 10-6-11 | |
| 1,2-Dichloroethane | ND | 0.055 | EPA 8260 | 10-6-11 | 10-6-11 | |
| 1,2-Dibromoethane | ND | 0.055 | EPA 8260 | 10-6-11 | 10-6-11 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***Dibromofluoromethane*** | ***82*** | ***63-127*** | | | | |
| ***Toluene-d8*** | ***85*** | ***65-129*** | | | | |
| ***4-Bromofluorobenzene*** | ***80*** | ***55-121*** | | | | |

Date of Report: October 7, 2011
Samples Submitted: September 28, 2011
Laboratory Reference: 1109-195
Project: 5147-012-02

**VOLATILES by EPA 8260B**

Matrix: Soil
Units: mg/kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-8-7.5** | | | | | |
| Laboratory ID: | 09-195-42 | | | | | |
| Methyl t-Butyl Ether | ND | 0.0011 | EPA 8260 | 10-6-11 | 10-6-11 | |
| 1,2-Dichloroethane | ND | 0.0011 | EPA 8260 | 10-6-11 | 10-6-11 | |
| 1,2-Dibromoethane | ND | 0.0011 | EPA 8260 | 10-6-11 | 10-6-11 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***Dibromofluoromethane*** | ***103*** | ***63-127*** | | | | |
| ***Toluene-d8*** | ***96*** | ***65-129*** | | | | |
| ***4-Bromofluorobenzene*** | ***102*** | ***55-121*** | | | | |
| **Client ID:** | **GEI-9-2.5** | | | | | |
| Laboratory ID: | 09-195-45 | | | | | |
| Vinyl Chloride | ND | 0.0012 | EPA 8260 | 10-6-11 | 10-6-11 | |
| Trichlorofluoromethane | ND | 0.0012 | EPA 8260 | 10-6-11 | 10-6-11 | |
| Methyl t-Butyl Ether | ND | 0.0012 | EPA 8260 | 10-6-11 | 10-6-11 | |
| (cis) 1,2-Dichloroethene | ND | 0.0012 | EPA 8260 | 10-6-11 | 10-6-11 | |
| 1,1,1-Trichloroethane | ND | 0.0012 | EPA 8260 | 10-6-11 | 10-6-11 | |
| Carbon Tetrachloride | ND | 0.0012 | EPA 8260 | 10-6-11 | 10-6-11 | |
| 1,2-Dichloroethane | ND | 0.0012 | EPA 8260 | 10-6-11 | 10-6-11 | |
| Trichloroethene | ND | 0.0012 | EPA 8260 | 10-6-11 | 10-6-11 | |
| Tetrachloroethene | ND | 0.0012 | EPA 8260 | 10-6-11 | 10-6-11 | |
| 1,2-Dibromoethane | ND | 0.0012 | EPA 8260 | 10-6-11 | 10-6-11 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***Dibromofluoromethane*** | ***94*** | ***63-127*** | | | | |
| ***Toluene-d8*** | ***97*** | ***65-129*** | | | | |
| ***4-Bromofluorobenzene*** | ***87*** | ***55-121*** | | | | |

Date of Report: October 7, 2011
Samples Submitted: September 28, 2011
Laboratory Reference: 1109-195
Project: 5147-012-02

**VOLATILES by EPA 8260B**

Matrix: Soil
Units: mg/kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-9-7.5** | | | | | |
| Laboratory ID: | 09-195-47 | | | | | |
| Vinyl Chloride | ND | 0.053 | EPA 8260 | 10-6-11 | 10-6-11 | |
| Trichlorofluoromethane | ND | 0.053 | EPA 8260 | 10-6-11 | 10-6-11 | |
| Methyl t-Butyl Ether | ND | 0.053 | EPA 8260 | 10-6-11 | 10-6-11 | |
| (cis) 1,2-Dichloroethene | ND | 0.053 | EPA 8260 | 10-6-11 | 10-6-11 | |
| 1,1,1-Trichloroethane | ND | 0.053 | EPA 8260 | 10-6-11 | 10-6-11 | |
| Carbon Tetrachloride | ND | 0.053 | EPA 8260 | 10-6-11 | 10-6-11 | |
| 1,2-Dichloroethane | ND | 0.053 | EPA 8260 | 10-6-11 | 10-6-11 | |
| Trichloroethene | ND | 0.053 | EPA 8260 | 10-6-11 | 10-6-11 | |
| Tetrachloroethene | ND | 0.053 | EPA 8260 | 10-6-11 | 10-6-11 | |
| 1,2-Dibromoethane | ND | 0.053 | EPA 8260 | 10-6-11 | 10-6-11 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***Dibromofluoromethane*** | ***82*** | ***63-127*** | | | | |
| ***Toluene-d8*** | ***85*** | ***65-129*** | | | | |
| ***4-Bromofluorobenzene*** | ***83*** | ***55-121*** | | | | |
| **Client ID:** | **GEI-9-10.0** | | | | | |
| Laboratory ID: | 09-195-48 | | | | | |
| Vinyl Chloride | ND | 0.0010 | EPA 8260 | 10-6-11 | 10-6-11 | |
| Trichlorofluoromethane | ND | 0.0010 | EPA 8260 | 10-6-11 | 10-6-11 | |
| Methyl t-Butyl Ether | ND | 0.0010 | EPA 8260 | 10-6-11 | 10-6-11 | |
| (cis) 1,2-Dichloroethene | ND | 0.0010 | EPA 8260 | 10-6-11 | 10-6-11 | |
| 1,1,1-Trichloroethane | ND | 0.0010 | EPA 8260 | 10-6-11 | 10-6-11 | |
| Carbon Tetrachloride | ND | 0.0010 | EPA 8260 | 10-6-11 | 10-6-11 | |
| 1,2-Dichloroethane | ND | 0.0010 | EPA 8260 | 10-6-11 | 10-6-11 | |
| Trichloroethene | ND | 0.0010 | EPA 8260 | 10-6-11 | 10-6-11 | |
| Tetrachloroethene | ND | 0.0010 | EPA 8260 | 10-6-11 | 10-6-11 | |
| 1,2-Dibromoethane | ND | 0.0010 | EPA 8260 | 10-6-11 | 10-6-11 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***Dibromofluoromethane*** | ***87*** | ***63-127*** | | | | |
| ***Toluene-d8*** | ***87*** | ***65-129*** | | | | |
| ***4-Bromofluorobenzene*** | ***77*** | ***55-121*** | | | | |

Date of Report: October 7, 2011
Samples Submitted: September 28, 2011
Laboratory Reference: 1109-195
Project: 5147-012-02

**VOLATILES by EPA 8260B**

Matrix: Soil
Units: mg/kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-10-5.0** | | | | | |
| Laboratory ID: | 09-195-51 | | | | | |
| Vinyl Chloride | ND | 0.00091 | EPA 8260 | 10-6-11 | 10-6-11 | |
| Trichlorofluoromethane | ND | 0.00091 | EPA 8260 | 10-6-11 | 10-6-11 | |
| Methyl t-Butyl Ether | ND | 0.00091 | EPA 8260 | 10-6-11 | 10-6-11 | |
| (cis) 1,2-Dichloroethene | ND | 0.00091 | EPA 8260 | 10-6-11 | 10-6-11 | |
| 1,1,1-Trichloroethane | ND | 0.00091 | EPA 8260 | 10-6-11 | 10-6-11 | |
| Carbon Tetrachloride | ND | 0.00091 | EPA 8260 | 10-6-11 | 10-6-11 | |
| 1,2-Dichloroethane | ND | 0.00091 | EPA 8260 | 10-6-11 | 10-6-11 | |
| Trichloroethene | ND | 0.00091 | EPA 8260 | 10-6-11 | 10-6-11 | |
| Tetrachloroethene | ND | 0.00091 | EPA 8260 | 10-6-11 | 10-6-11 | |
| 1,2-Dibromoethane | ND | 0.00091 | EPA 8260 | 10-6-11 | 10-6-11 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***Dibromofluoromethane*** | ***97*** | ***63-127*** | | | | |
| ***Toluene-d8*** | ***99*** | ***65-129*** | | | | |
| ***4-Bromofluorobenzene*** | ***87*** | ***55-121*** | | | | |
| | | | | | | |
| **Client ID:** | **GEI-10-7.5** | | | | | |
| Laboratory ID: | 09-195-52 | | | | | |
| Vinyl Chloride | ND | 0.0011 | EPA 8260 | 10-6-11 | 10-6-11 | |
| Trichlorofluoromethane | ND | 0.0011 | EPA 8260 | 10-6-11 | 10-6-11 | |
| Methyl t-Butyl Ether | ND | 0.0011 | EPA 8260 | 10-6-11 | 10-6-11 | |
| (cis) 1,2-Dichloroethene | ND | 0.0011 | EPA 8260 | 10-6-11 | 10-6-11 | |
| 1,1,1-Trichloroethane | ND | 0.0011 | EPA 8260 | 10-6-11 | 10-6-11 | |
| Carbon Tetrachloride | ND | 0.0011 | EPA 8260 | 10-6-11 | 10-6-11 | |
| 1,2-Dichloroethane | ND | 0.0011 | EPA 8260 | 10-6-11 | 10-6-11 | |
| Trichloroethene | ND | 0.0011 | EPA 8260 | 10-6-11 | 10-6-11 | |
| Tetrachloroethene | ND | 0.0011 | EPA 8260 | 10-6-11 | 10-6-11 | |
| 1,2-Dibromoethane | ND | 0.0011 | EPA 8260 | 10-6-11 | 10-6-11 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***Dibromofluoromethane*** | ***97*** | ***63-127*** | | | | |
| ***Toluene-d8*** | ***98*** | ***65-129*** | | | | |
| ***4-Bromofluorobenzene*** | ***88*** | ***55-121*** | | | | |

Date of Report: October 7, 2011
Samples Submitted: September 28, 2011
Laboratory Reference: 1109-195
Project: 5147-012-02

**NWTPH-Gx/BTEX**
**METHOD BLANK QUALITY CONTROL**

Matrix: Soil
Units: mg/kg (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **METHOD BLANK** | | | | | | |
| Laboratory ID: | MB1005S1 | | | | | |
| Benzene | **ND** | 0.020 | EPA 8021 | 10-5-11 | 10-5-11 | |
| Toluene | **ND** | 0.050 | EPA 8021 | 10-5-11 | 10-5-11 | |
| Ethyl Benzene | **ND** | 0.050 | EPA 8021 | 10-5-11 | 10-5-11 | |
| m,p-Xylene | **ND** | 0.050 | EPA 8021 | 10-5-11 | 10-5-11 | |
| o-Xylene | **ND** | 0.050 | EPA 8021 | 10-5-11 | 10-5-11 | |
| Gasoline | **ND** | 5.0 | NWTPH-Gx | 10-5-11 | 10-5-11 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***Fluorobenzene*** | ***99*** | ***68-124*** | | | | |
| Laboratory ID: | MB1005S2 | | | | | |
| Benzene | **ND** | 0.020 | EPA 8021 | 10-5-11 | 10-5-11 | |
| Toluene | **ND** | 0.050 | EPA 8021 | 10-5-11 | 10-5-11 | |
| Ethyl Benzene | **ND** | 0.050 | EPA 8021 | 10-5-11 | 10-5-11 | |
| m,p-Xylene | **ND** | 0.050 | EPA 8021 | 10-5-11 | 10-5-11 | |
| o-Xylene | **ND** | 0.050 | EPA 8021 | 10-5-11 | 10-5-11 | |
| Gasoline | **ND** | 5.0 | NWTPH-Gx | 10-5-11 | 10-5-11 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***Fluorobenzene*** | ***102*** | ***68-124*** | | | | |
| Laboratory ID: | MB1005S3 | | | | | |
| Benzene | **ND** | 0.020 | EPA 8021 | 10-5-11 | 10-6-11 | |
| Toluene | **ND** | 0.050 | EPA 8021 | 10-5-11 | 10-6-11 | |
| Ethyl Benzene | **ND** | 0.050 | EPA 8021 | 10-5-11 | 10-6-11 | |
| m,p-Xylene | **ND** | 0.050 | EPA 8021 | 10-5-11 | 10-6-11 | |
| o-Xylene | **ND** | 0.050 | EPA 8021 | 10-5-11 | 10-6-11 | |
| Gasoline | **ND** | 5.0 | NWTPH-Gx | 10-5-11 | 10-6-11 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***Fluorobenzene*** | ***92*** | ***68-124*** | | | | |

Date of Report: October 7, 2011
Samples Submitted: September 28, 2011
Laboratory Reference: 1109-195
Project: 5147-012-02

**NWTPH-Gx/BTEX**
**DUPLICATE QUALITY CONTROL**

Matrix: Soil
Units: mg/kg (ppm)

| Analyte | Result | | Spike Level | | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|---|---|---|---|---|---|---|---|---|---|---|
| **DUPLICATE** | | | | | | | | | | |
| Laboratory ID: | 09-195-02 | | | | | | | | | |
| | ORIG | DUP | | | | | | | | |
| Benzene | **ND** | **ND** | NA | NA | | NA | NA | NA | 30 | |
| Toluene | **ND** | **ND** | NA | NA | | NA | NA | NA | 30 | |
| Ethyl Benzene | **ND** | **ND** | NA | NA | | NA | NA | NA | 30 | |
| m,p-Xylene | **ND** | **ND** | NA | NA | | NA | NA | NA | 30 | |
| o-Xylene | **ND** | **ND** | NA | NA | | NA | NA | NA | 30 | |
| Gasoline | **ND** | **ND** | NA | NA | | NA | NA | NA | 30 | |
| ***Surrogate:*** | | | | | | | | | | |
| ***Fluorobenzene*** | | | | | | ***114*** | ***118*** | ***68-124*** | | |
| Laboratory ID: | 09-195-11 | | | | | | | | | |
| | ORIG | DUP | | | | | | | | |
| Benzene | **ND** | **ND** | NA | NA | | NA | NA | NA | 30 | |
| Toluene | **ND** | **ND** | NA | NA | | NA | NA | NA | 30 | |
| Ethyl Benzene | **ND** | **ND** | NA | NA | | NA | NA | NA | 30 | |
| m,p-Xylene | **ND** | **ND** | NA | NA | | NA | NA | NA | 30 | |
| o-Xylene | **ND** | **ND** | NA | NA | | NA | NA | NA | 30 | |
| Gasoline | **ND** | **ND** | NA | NA | | NA | NA | NA | 30 | |
| ***Surrogate:*** | | | | | | | | | | |
| ***Fluorobenzene*** | | | | | | ***106*** | ***108*** | ***68-124*** | | |
| Laboratory ID: | 09-195-35 | | | | | | | | | |
| | ORIG | DUP | | | | | | | | |
| Benzene | **ND** | **ND** | NA | NA | | NA | NA | NA | 30 | |
| Toluene | **ND** | **ND** | NA | NA | | NA | NA | NA | 30 | |
| Ethyl Benzene | **ND** | **ND** | NA | NA | | NA | NA | NA | 30 | |
| m,p-Xylene | **ND** | **ND** | NA | NA | | NA | NA | NA | 30 | |
| o-Xylene | **ND** | **ND** | NA | NA | | NA | NA | NA | 30 | |
| Gasoline | **ND** | **ND** | NA | NA | | NA | NA | NA | 30 | |
| ***Surrogate:*** | | | | | | | | | | |
| ***Fluorobenzene*** | | | | | | ***97*** | ***100*** | ***68-124*** | | |

Date of Report: October 7, 2011
Samples Submitted: September 28, 2011
Laboratory Reference: 1109-195
Project: 5147-012-02

**NWTPH-Gx/BTEX**
**MS/MSD QUALITY CONTROL**

Matrix: Soil
Units: mg/kg (ppm)

| Analyte | Result | | Spike Level | | Source Result | Percent Recovery | | Recovery Limits | RPD | RPD Limit | Flags |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **MATRIX SPIKES** | | | | | | | | | | | |
| Laboratory ID: | 09-195-11 | | | | | | | | | | |
| | MS | MSD | MS | MSD | | MS | MSD | | | | |
| Benzene | **1.02** | **1.05** | 1.00 | 1.00 | ND | **102** | **105** | 79-121 | 3 | 10 | |
| Toluene | **1.03** | **1.06** | 1.00 | 1.00 | ND | **103** | **106** | 83-121 | 3 | 14 | |
| Ethyl Benzene | **1.00** | **1.03** | 1.00 | 1.00 | ND | **100** | **103** | 83-123 | 3 | 9 | |
| m,p-Xylene | **0.994** | **1.03** | 1.00 | 1.00 | ND | **99** | **103** | 84-123 | 4 | 10 | |
| o-Xylene | **0.990** | **1.01** | 1.00 | 1.00 | ND | **99** | **101** | 82-124 | 2 | 10 | |
| ***Surrogate:*** | | | | | | | | | | | |
| ***Fluorobenzene*** | | | | | | ***101*** | ***103*** | ***68-124*** | | | |
| Laboratory ID: | 09-195-35 | | | | | | | | | | |
| | MS | MSD | MS | MSD | | MS | MSD | | | | |
| Benzene | **0.997** | **1.01** | 1.00 | 1.00 | ND | **100** | **101** | 79-121 | 1 | 10 | |
| Toluene | **1.01** | **1.02** | 1.00 | 1.00 | ND | **101** | **102** | 83-121 | 1 | 14 | |
| Ethyl Benzene | **0.979** | **0.985** | 1.00 | 1.00 | ND | **98** | **99** | 83-123 | 1 | 9 | |
| m,p-Xylene | **0.978** | **0.984** | 1.00 | 1.00 | ND | **98** | **98** | 84-123 | 1 | 10 | |
| o-Xylene | **0.964** | **0.956** | 1.00 | 1.00 | ND | **96** | **96** | 82-124 | 1 | 10 | |
| ***Surrogate:*** | | | | | | | | | | | |
| ***Fluorobenzene*** | | | | | | ***102*** | ***102*** | ***68-124*** | | | |

Date of Report: October 7, 2011
Samples Submitted: September 28, 2011
Laboratory Reference: 1109-195
Project: 5147-012-02

**NWTPH-Dx**
**QUALITY CONTROL**
**(with acid/silica gel clean-up)**

Matrix: Soil
Units: mg/Kg (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **METHOD BLANK** | | | | | | |
| Laboratory ID: | MB1005S1 | | | | | |
| Diesel Range Organics | **ND** | 25 | NWTPH-Dx | 10-5-11 | 10-5-11 | |
| Lube Oil Range Organics | **ND** | 50 | NWTPH-Dx | 10-5-11 | 10-5-11 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***o-Terphenyl*** | ***111*** | ***50-150*** | | | | |
| | | | | | | |
| Laboratory ID: | MB1006S1 | | | | | |
| Diesel Range Organics | **ND** | 25 | NWTPH-Dx | 10-6-11 | 10-6-11 | |
| Lube Oil Range Organics | **ND** | 50 | NWTPH-Dx | 10-6-11 | 10-6-11 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***o-Terphenyl*** | ***111*** | ***50-150*** | | | | |

| Analyte | Result | | Percent Recovery | | Recovery Limits | RPD | RPD Limit | Flags |
|---|---|---|---|---|---|---|---|---|
| **DUPLICATE** | | | | | | | | |
| Laboratory ID: | 09-195-03 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Diesel Range Organics | **ND** | **ND** | | | | NA | NA | |
| Lube Oil Range Organics | **ND** | **ND** | | | | NA | NA | |
| ***Surrogate:*** | | | | | | | | |
| ***o-Terphenyl*** | | | ***97*** | ***97*** | ***50-150*** | | | |
| | | | | | | | | |
| Laboratory ID: | 09-195-36 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Diesel Range Organics | **3690** | **3610** | | | | 2 | NA | |
| Lube Oil | **60.3** | **59.8** | | | | 1 | NA | |
| ***Surrogate:*** | | | | | | | | |
| ***o-Terphenyl*** | | | ***112*** | ***118*** | ***50-150*** | | | |
| | | | | | | | | |
| Laboratory ID: | 09-195-47 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Diesel Range Organics | **773** | **728** | | | | 6 | NA | |
| Lube Oil Range Organics | **ND** | **ND** | | | | NA | NA | |
| ***Surrogate:*** | | | | | | | | |
| ***o-Terphenyl*** | | | ***106*** | ***100*** | ***50-150*** | | | |

Date of Report: October 7, 2011
Samples Submitted: September 28, 2011
Laboratory Reference: 1109-195
Project: 5147-012-02

**VOLATILES by EPA 8260B**
**METHOD BLANK QUALITY CONTROL**

Matrix: Soil
Units: mg/kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| Laboratory ID: | MB1004S1 | | | | | |
| Methyl t-Butyl Ether | ND | 0.0010 | EPA 8260 | 10-4-11 | 10-4-11 | |
| 1,2-Dichloroethane | ND | 0.0010 | EPA 8260 | 10-4-11 | 10-4-11 | |
| 1,2-Dibromoethane | ND | 0.0010 | EPA 8260 | 10-4-11 | 10-4-11 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***Dibromofluoromethane*** | ***74*** | ***63-127*** | | | | |
| ***Toluene-d8*** | ***87*** | ***65-129*** | | | | |
| ***4-Bromofluorobenzene*** | ***97*** | ***55-121*** | | | | |
| Laboratory ID: | MB1006S1 | | | | | |
| Vinyl Chloride | ND | 0.0010 | EPA 8260 | 10-6-11 | 10-6-11 | |
| Trichlorofluoromethane | ND | 0.0010 | EPA 8260 | 10-6-11 | 10-6-11 | |
| Methyl t-Butyl Ether | ND | 0.0010 | EPA 8260 | 10-6-11 | 10-6-11 | |
| (cis) 1,2-Dichloroethene | ND | 0.0010 | EPA 8260 | 10-6-11 | 10-6-11 | |
| 1,1,1-Trichloroethane | ND | 0.0010 | EPA 8260 | 10-6-11 | 10-6-11 | |
| Carbon Tetrachloride | ND | 0.0010 | EPA 8260 | 10-6-11 | 10-6-11 | |
| 1,2-Dichloroethane | ND | 0.0010 | EPA 8260 | 10-6-11 | 10-6-11 | |
| Trichloroethene | ND | 0.0010 | EPA 8260 | 10-6-11 | 10-6-11 | |
| Tetrachloroethene | ND | 0.0010 | EPA 8260 | 10-6-11 | 10-6-11 | |
| 1,2-Dibromoethane | ND | 0.0010 | EPA 8260 | 10-6-11 | 10-6-11 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***Dibromofluoromethane*** | ***95*** | ***63-127*** | | | | |
| ***Toluene-d8*** | ***98*** | ***65-129*** | | | | |
| ***4-Bromofluorobenzene*** | ***91*** | ***55-121*** | | | | |

Date of Report: October 7, 2011
Samples Submitted: September 28, 2011
Laboratory Reference: 1109-195
Project: 5147-012-02

**VOLATILES by EPA 8260B**
**SB/SBD QUALITY CONTROL**

Matrix: Soil
Units: mg/kg

| Analyte | Result | | Spike Level | | Percent Recovery | | Recovery Limits | RPD | RPD Limit | Flags |
|---|---|---|---|---|---|---|---|---|---|---|
| **SPIKE BLANKS** | | | | | | | | | | |
| Laboratory ID: | SB1004S1 | | | | | | | | | |
| | SB | SBD | SB | SBD | SB | SBD | | | | |
| 1,1-Dichloroethene | **0.0482** | **0.0548** | 0.0500 | 0.0500 | 96 | 110 | 70-130 | 13 | 19 | |
| Benzene | **0.0416** | **0.0426** | 0.0500 | 0.0500 | 83 | 85 | 70-125 | 2 | 15 | |
| Trichloroethene | **0.0453** | **0.0472** | 0.0500 | 0.0500 | 91 | 94 | 70-122 | 4 | 14 | |
| Toluene | **0.0458** | **0.0439** | 0.0500 | 0.0500 | 92 | 88 | 73-120 | 4 | 16 | |
| Chlorobenzene | **0.0521** | **0.0490** | 0.0500 | 0.0500 | 104 | 98 | 74-109 | 6 | 12 | |
| ***Surrogate:*** | | | | | | | | | | |
| ***Dibromofluoromethane*** | | | | | ***69*** | ***79*** | ***63-127*** | | | |
| ***Toluene-d8*** | | | | | ***80*** | ***81*** | ***65-129*** | | | |
| ***4-Bromofluorobenzene*** | | | | | ***90*** | ***87*** | ***55-121*** | | | |
| Laboratory ID: | SB1006S1 | | | | | | | | | |
| | SB | SBD | SB | SBD | SB | SBD | | | | |
| 1,1-Dichloroethene | **0.0516** | **0.0538** | 0.0500 | 0.0500 | 103 | 108 | 70-130 | 4 | 19 | |
| Benzene | **0.0476** | **0.0480** | 0.0500 | 0.0500 | 95 | 96 | 70-125 | 1 | 15 | |
| Trichloroethene | **0.0471** | **0.0469** | 0.0500 | 0.0500 | 94 | 94 | 70-122 | 0 | 14 | |
| Toluene | **0.0479** | **0.0477** | 0.0500 | 0.0500 | 96 | 95 | 73-120 | 0 | 16 | |
| Chlorobenzene | **0.0497** | **0.0482** | 0.0500 | 0.0500 | 99 | 96 | 74-109 | 3 | 12 | |
| ***Surrogate:*** | | | | | | | | | | |
| ***Dibromofluoromethane*** | | | | | ***87*** | ***87*** | ***63-127*** | | | |
| ***Toluene-d8*** | | | | | ***91*** | ***90*** | ***65-129*** | | | |
| ***4-Bromofluorobenzene*** | | | | | ***82*** | ***82*** | ***55-121*** | | | |

Date of Report: October 7, 2011
Samples Submitted: September 28, 2011
Laboratory Reference: 1109-195
Project: 5147-012-02

**% MOISTURE**

Date Analyzed: 10-5&6-11

| Client ID | Lab ID | % Moisture |
|---|---|---|
| GEI-1-5.0 | 09-195-02 | 33 |
| GEI-1-7.5 | 09-195-03 | 22 |
| GEI-2-5.0 | 09-195-07 | 30 |
| GEI-2-7.5 | 09-195-08 | 20 |
| GEI-3-2.5 | 09-195-11 | 15 |
| GEI-3-10.0 | 09-195-14 | 14 |
| GEI-3-18.0 | 09-195-16 | 22 |
| GEI-4-5.0 | 09-195-19 | 13 |
| GEI-4-10.0 | 09-195-21 | 13 |
| GEI-5-2.5 | 09-195-23 | 14 |
| GEI-5-10.0 | 09-195-26 | 15 |
| GEI-5-17.0 | 09-195-28 | 19 |
| GEI-6-5.0 | 09-195-31 | 11 |
| GEI-6-10.0 | 09-195-33 | 11 |
| GEI-7-2.5 | 09-195-35 | 11 |
| GEI-7-5.0 | 09-195-36 | 13 |
| GEI-7-7.5 | 09-195-37 | 21 |
| GEI-8-2.5 | 09-195-40 | 10 |
| GEI-8-7.5 | 09-195-42 | 17 |
| GEI-9-2.5 | 09-195-45 | 15 |
| GEI-9-7.5 | 09-195-47 | 14 |
| GEI-9-10.0 | 09-195-48 | 16 |
| GEI-10-5.0 | 09-195-51 | 11 |
| GEI-10-7.5 | 09-195-52 | 15 |

OnSite Environmental Inc.

**Data Qualifiers and Abbreviations**

A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.

B - The analyte indicated was also found in the blank sample.

C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.

E - The value reported exceeds the quantitation range and is an estimate.

F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.

H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.

I - Compound recovery is outside of the control limits.

J - The value reported was below the practical quantitation limit. The value is an estimate.

K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.

L - The RPD is outside of the control limits.

M - Hydrocarbons in the gasoline range are impacting the diesel range result.

M1 - Hydrocarbons in the gasoline range (toluene-napthalene) are present in the sample.

N - Hydrocarbons in the lube oil range are impacting the diesel range result.

N1 - Hydrocarbons in diesel range are impacting lube oil range results.

O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.

P - The RPD of the detected concentrations between the two columns is greater than 40.

Q - Surrogate recovery is outside of the control limits.

S - Surrogate recovery data is not available due to the necessary dilution of the sample.

T - The sample chromatogram is not similar to a typical _____.

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

U1 - The practical quantitation limit is elevated due to interferences present in the sample.

V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.

W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.

X - Sample extract treated with a mercury cleanup procedure.

Y - Sample extract treated with an acid/silica gel cleanup procedure.

Z -

ND - Not Detected at PQL
PQL - Practical Quantitation Limit
RPD - Relative Percent Difference

# Chain of Custody

OnSite Environmental Inc.
14648 NE 95th Street • Redmond, WA 98052
Phone (425) 883-3881 • www.onsite-env.com



Company: GEI
Project Number: 5147-012-02
Project Name: FORMER SHELL TANK FARM
Project Manager: ROBERT TRAHAN
Sampled by: ABHIJIT JOSHI

**Turnaround Request (in working days)**
(Check One)
☐ Same Day ☐ 1 Day
☐ 2 Days ☐ 3 Days
☒ Standard (7 Days)
(TPH analysis 5 Days)
☐ _____ (other)

**Laboratory Number: 09-195**

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | Number of Containers | NWTPH-HCID | NWTPH-Gx/BTEX | NWTPH-Gx | NWTPH-Dx | Volatiles 8260B | Halogenated Volatiles 8260B | Semivolatiles 8270D/SIM (with low-level PAHs) | PAHs 8270D/SIM (low-level) | PCBs 8082 | Organochlorine Pesticides 8081A | Organophosphorus Pesticides 8270D/SIM | Chlorinated Acid Herbicides 8151A | Total RCRA / MTCA Metals (circle one) | TCLP Metals | HEM (oil and grease) 1664 | Lead | Naphthalenes | | | | | % Moisture |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | GEI-1-2.5 | 9/27/11 | 1225 | SOIL | 1 | | | | | | | | | | | | | | | | | | | | | | |
| 2 | GEI-1-5.0 | | 1230 | | 5 | | X | | X | | | | | | | | | | | | X | | | | | | X |
| 3 | GEI-1-7.5 | | 1235 | | 5 | | X | | X | | | | | | | | | | | | X | | | | | | X |
| 4 | GEI-1-10.0 | | 1240 | | 5 | | | | | | | | | | | | | | | | | | | | | | |
| 5 | GEI-1-12.0 | | 1245 | | 1 | | | | | | | | | | | | | | | | | | | | | | |
| 6 | GEI-2-2.5 | | 1330 | | 1 | | | | | | | | | | | | | | | | | | | | | | |
| 7 | GEI-2-5.0 | | 1335 | | 5 | | X | | X | | | | | | | | | | | | X | | | | | | X |
| 8 | GEI-2-7.5 | | 1340 | | 5 | | X | | X | | | | | | | | | | | | X | | | | | | X |
| 9 | GEI-2-10.0 | | 1345 | | 5 | | | | | | | | | | | | | | | | | | | | | | |
| 10 | GEI-2-12.0 | ↓ | 1350 | ↓ | 1 | | | | | | | | | | | | | | | | | | | | | | |

| | Signature | Company | Date | Time |
|---|---|---|---|---|
| Relinquished | | GEI | 9/28/11 | 1445 |
| Received | Dipti Pant | Speedy messenger | 9/28/11 | 13:02 |
| Relinquished | Dipti Pant | Speedy messenger | 9/28/11 | 1656 |
| Received | | ODG | 9/28/11 | 1658 |
| Relinquished | | | | |
| Received | | | | |
| Reviewed/Date | | Reviewed/Date | | |

**Comments/Special Instructions**
X - Added 10/4/11. DB (STA)

Chromatograms with final report ☐

Data Package: Level III ☐ Level IV ☐ Electronic Data Deliverables (EDDs) ☐ _____

# Chain of Custody

Page 2 of 6

OnSite Environmental Inc.
14648 NE 95th Street • Redmond, WA 98052
Phone: (425) 883-3881 • www.onsite-env.com

Company: GEI
Project Number: 5147-012-02
Project Name: FORMER SHELL TANK FARM
Project Manager: ROBERT TRAHAN
Sampled by: ABHIJIT JOSHI

**Turnaround Request (in working days)**

(Check One)

- ☐ Same Day
- ☐ 1 Day
- ☐ 2 Days
- ☐ 3 Days
- ☒ Standard (7 Days) (TPH analysis 5 Days)
- ☐ _____ (other)

**Laboratory Number: 09-195**

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11 | GEI-3-2.5 | 9/27/11 | 1410 | SOIL | 1 | | X | | X | | | | X | | | | | | | | X | | | | | | X |
| 12 | GEI-3-5.0 | | 1415 | | 5 | | | | | | | | | | | | | | | | | | | | | | |
| 13 | GEI-3-7.5 | | 1420 | | 5 | | | | | | | | | | | | | | | | | | | | | | |
| 14 | GEI-3-10.0 | | 1425 | | 5 | | X | | X | | | | X | | | | | | | | X | | | | | | X |
| 15 | GEI-3-14.0 | | 1430 | | 5 | | | | | | | | | | | | | | | | | | | | | | |
| 16 | GEI-3-18.0 | | 1500 | | 5 | | X | | X | | | | X | | | | | | | | X | | | | | | X |
| 17 | GEI-3-20.0 | | 1505 | | 1 | | | | | | | | | | | | | | | | | | | | | | |
| 18 | GEI-4-2.5 | | 1530 | | 1 | | | | | | | | | | | | | | | | | | | | | | |
| 19 | GEI-4-5.0 | | 1535 | | 5 | | X | | X | | | | X | | | | | | | | X | | | | | | X |
| 20 | GEI-4-7.5 | | 1540 | | 5 | | | | | | | | | | | | | | | | | | | | | | |

| | Signature | Company | Date | Time |
|---|---|---|---|---|
| Relinquished | | GEI | 9/28/11 | 1445 |
| Received | | SPEEDY MESSENGER | 9/28/11 | 1302 |
| Relinquished | | SPEEDY MESSENGER | 9/28/11 | 1658 |
| Received | | GSE | 9/28/11 | 1658 |
| Relinquished | | | | |
| Received | | | | |
| Reviewed/Date | | Reviewed/Date | | |

**Comments/Special Instructions**

X - Added 10/4/11 - DJ (STA)

Chromatograms with final report ☐

Data Package: Level III ☐ Level IV ☐ Electronic Data Deliverables (EDDs) ☐ _____

# Chain of Custody

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Laboratory Number: 09-195

Company: GEI
Project Number: 5147-012-02
Project Name: FORMER SHELL TANK FARM
Project Manager: ROBERT TRAHAN
Sampled by: ABHIJIT JOSHI

**Turnaround Request (in working days)**
(Check One)
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(TPH analysis 5 Days)
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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 21 | GEI-4-10.0 | 9/27/11 | 1545 | SOIL | 5 | | X | | X | | | | X | | | | | | | | X | | | | | X |
| 22 | GEI-4-14.0 | | 1550 | | 1 | | | | | | | | | | | | | | | | | | | | | |
| 23 | GEI-5-2.5 | | 1600 | | 5 | | X | | X | | | | X | | | | | | | | X | | | | | X |
| 24 | GEI-5-5.0 | | 1605 | | 5 | | | | | | | | | | | | | | | | | | | | | |
| 25 | GEI-5-7.5 | | 1610 | | 5 | | | | | | | | | | | | | | | | | | | | | |
| 26 | GEI-5-10.0 | | 1615 | | 5 | | X | | X | | | | X | | | | | | | | X | | | | | X |
| 27 | GEI-5-14.0 | | 1620 | | 1 | | | | | | | | | | | | | | | | | | | | | |
| 28 | GEI-5-17.0 | | 1625 | | 1 | | X | | X | | | | X | | | | | | | | X | | | | | X |
| 29 | GEI-5-19.0 | | 1630 | | 1 | | | | | | | | | | | | | | | | | | | | | |
| 30 | GEI-6-2.5 | ↓ | 1650 | ↓ | 1 | | | | | | | | | | | | | | | | | | | | | |

| | Signature | Company | Date | Time |
|---|---|---|---|---|
| Relinquished | | GEI | 9/28/11 | 1445 |
| Received | | Speedy messenger | 9/28/11 | 13:02 |
| Relinquished | | Speedy messenger | 9/28/11 | 16:58 |
| Received | | OSE | 9/28/11 | 1658 |
| Relinquished | | | | |
| Received | | | | |

**Comments/Special Instructions**
X - Added 10/4/11. DD (STA)

Reviewed/Date
Reviewed/Date
Chromatograms with final report ☐

Data Package: Level III ☐ Level IV ☐ Electronic Data Deliverables (EDDs) ☐ _____

# Chain of Custody



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Laboratory Number: 09-195

Company: GEI
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Project Manager: ROBERT TRAHAN
Sampled by: ABHIJIT JOSHI

Turnaround Request (in working days)
(Check One)
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☐ 2 Days ☐ 3 Days
☒ Standard (7 Days) (TPH analysis 5 Days)
☐ _____ (other)

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 31 | GEI-6-5.0 | 9/27/11 | 1655 | Soil | 5 | | X | | X | | | | X | | | | | | | | X | | | | | X |
| 32 | GEI-6-7.5 | | 1700 | | 5 | | | | | | | | | | | | | | | | | | | | | |
| 33 | GEI-6-10.0 | | 1705 | | 5 | | X | | X | | | | X | | | | | | | | X | | | | | X |
| 34 | GEI-6-14.0 | | 1710 | | 1 | | | | | | | | | | | | | | | | | | | | | |
| 35 | GEI-7-2.5 | | 1140 | | 1 | | X | | X | | | | X | | | | | | | | X | | X | | | X |
| 36 | GEI-7-5.0 | | 1145 | | 5 | | X | | X | | | | X | | | | | | | | X | | X | | | X |
| 37 | GEI-7-7.5 | | 1150 | | 5 | | X | | X | | | | X | | | | | | | | X | | X | | | X |
| 38 | GEI-7-10.0 | | 1155 | | 5 | | | | | | | | | | | | | | | | | | | | | |
| 39 | GEI-7-12.0 | | 1200 | | 1 | | | | | | | | | | | | | | | | | | | | | |
| 40 | GEI-8-2.5 | ↓ | 1105 | ↓ | 5 | | X | | X | | | | X | | | | | | | | X | | X | | | X |

| | Signature | Company | Date | Time |
|---|---|---|---|---|
| Relinquished | | GEI | 9/28/11 | 1445 |
| Received | | Speedy messenger | 9/28/11 | 1302 |
| Relinquished | | Speedy messenger | | 16:58 |
| Received | | GEI | 9/28/11 | 1658 |
| Relinquished | | | | |
| Received | | | | |
| Reviewed/Date | | Reviewed/Date | | |

Comments/Special Instructions

Chromatograms with final report ☐

Data Package: Level III ☐ Level IV ☐ Electronic Data Deliverables (EDDs) ☐ _____

# Chain of Custody



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Laboratory Number: 09-195

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Project Number: 5147-012-02

Project Name: FORMER SHELL TANK FARM

Project Manager: ROBERT TRAHAN

Sampled by: ABHIJIT JOSHI

Turnaround Request (in working days)

(Check One)

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 41 | GEI-8-5.0 | 9/27/11 | 1110 | SOIL | 5 | | | | | | | | | | | | | | | | | | | | |
| 42 | GEI-8-7.5 | | 1115 | | 5 | | X | | X | | | | X | | | | | | | | X | | X | | X |
| 43 | GEI-8-10.0 | | 1120 | | 1 | | | | | | | | | | | | | | | | | | | | |
| 44 | GEI-8-12.0 | | 1125 | | 1 | | | | | | | | | | | | | | | | | | | | |
| 45 | GEI-9-2.5 | | 940 | | 1 | | X | | X | | | | X | | | | | | | | X | | X | X | X |
| 46 | GEI-9-5.0 | | 950 | | 5 | | | | | | | | | | | | | | | | | | | | |
| 47 | GEI-9-7.5 | | 1000 | | 5 | | X | | X | | | | X | | | | | | | | X | | X | X | X |
| 48 | GEI-9-10.0 | | 1005 | | 5 | | X | | X | | | | X | | | | | | | | X | | X | X | X |
| 49 | GEI-9-12.0 | | 1010 | | 1 | | | | | | | | | | | | | | | | | | | | |
| 50 | GEI-10-2.5 | ↓ | 1025 | ↓ | 1 | | | | | | | | | | | | | | | | | | | | |

| | Signature | Company | Date | Time |
|---|---|---|---|---|
| Relinquished | | GEI | 9/28/11 | 1445 |
| Received | | Speedy messenger | 9/28/11 | 13:10 |
| Relinquished | | Speedy, messenger | 9/28/11 | 1700 |
| Received | | GEI | 9/28/11 | 1700 |
| Relinquished | | | | |
| Received | | | | |
| Reviewed/Date | | Reviewed/Date | | |

Comments/Special Instructions

X - Added 10/4/11. DB (STN)

Chromatograms with final rep

Data Package: Level III ☐ Level IV ☐ Electronic Data Deliverables (EDDs) ☐ _____

# Chain of Custody

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- ☐ _____ (other)

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | Number of Containers | NWTPH-HCID | NWTPH-Gx/BTEX | NWTPH-Gx | NWTPH-Dx | Volatiles 8260B | Halogenated Volatiles 8260B | Semivolatiles 8270D/SIM (with low-level PAHs) | PAHs 8270D/SIM (low-level) | PCBs 8082 | Organochlorine Pesticides 8081A | Organophosphorus Pesticides 8270D/SIM | Chlorinated Acid Herbicides 8151A | Total RCRA / MTCA Metals (circle one) | TCLP Metals | HEM (oil and grease) 1664 | Lead | Naphthalenes | MTBE, EDB, EDC | PCE, TCE, cis-1,2-DCE, 1,1,1-TCA | VC, the Library Naphthalene Method, Carbon Tetrachloride only | % Moisture |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 51 | GEI-10-5.0 | 9/27/11 | 1030 | Soil | 5 | | X | | X | | | | X | | | | | | | | X | | X | X | | 24 |
| 52 | GEI-10-7.5 | | 1035 | | 5 | | X | | X | | | | X | | | | | | | | X | | X | X | | X |
| 53 | GEI-10-10.0 | | 1040 | | 5 | | | | | | | | | | | | | | | | | | | | | |
| 54 | GEI-10-12.0 | | 1045 | | 1 | | | | | | | | | | | | | | | | | | | | | |

| | Signature | Company | Date | Time |
|---|---|---|---|---|
| Relinquished | | GEI | 9/28/11 | 1445 |
| Received | | Special Messenger | 9/29/11 | 13:03 |
| Relinquished | | Special Messenger | 9/29/11 | 1700 |
| Received | | OSE | 9/30/11 | 1700 |
| Relinquished | | | | |
| Received | | | | |
| Reviewed/Date | | Reviewed/Date | | |

Comments/Special Instructions

X - added 10/4/11. DB (STA)

Chromatograms with final report ☐

Data Package Level III ☐ Level IV ☐ Electronic Data Deliverables (EDDs) ☐ _____

OnSite Environmental Inc.

14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

October 14, 2011

Robert Trahan
GeoEngineers, Inc.
600 Stewart, Suite 1700
Seattle, WA 98101-1233

Re: Analytical Data for Project 5147-012-02
Laboratory Reference No. 1109-196

Dear Robert:

Enclosed are the analytical results and associated quality control data for samples submitted on September 28, 2011.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

David Baumeister
Project Manager

Enclosures

Date of Report: October 14, 2011
Samples Submitted: September 28, 2011
Laboratory Reference: 1109-196
Project: 5147-012-02

**Case Narrative**

Samples were collected on September 28, 2011 and received by the laboratory on September 28, 2011. They were maintained at the laboratory at a temperature of 2°C to 6°C.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.

NWTPH Gx/BTEX Analysis

Per EPA Method 5035A, samples were received by the laboratory in pre-weighed 40 mL VOA vials within 48 hours of sample collection; except for samples GEI-12-15.0, GEI-14-5.0, and GEI-13-15.0 which were extracted from 8-ounce jars and analyzed. The VOA vials were stored in a freezer at between -7°C and -20°C until extraction or analysis.

Sample analysis holding time was exceeded for sample GEI-13-15.0 by approximately 3 hours.

Volatiles EPA 8260B Analysis

Per EPA Method 5035A, samples were received by the laboratory in pre-weighed 40 mL VOA vials within 48 hours of sample collection; except for sample GEI-12-15.0 which was extracted from an 8-ounce jar and analyzed. The VOA vials were stored in a freezer at between -7°C and -20°C until extraction or analysis.

Some MTCA Method A cleanup levels are non-achievable for sample GEI-11-5.0 due to the necessary dilution of the sample.

PAHs EPA 8270D/SIM Analysis

Sample GEI-14-8.0 had one surrogate recovery out of control limits. This is within allowance of our standard operating procedure as long as the recovery is above 10%.

**Please note that any other QA/QC issues associated with these extractions and analyses will be indicated with a footnote reference and discussed in detail on the Data Qualifier page.**

Date of Report: October 14, 2011
Samples Submitted: September 28, 2011
Laboratory Reference: 1109-196
Project: 5147-012-02

**ANALYTICAL REPORT FOR SAMPLES**

| Client ID | Laboratory ID | Matrix | Date Sampled | Date Received | Notes |
|---|---|---|---|---|---|
| GEI-11-5.0 | 09-196-02 | Soil | 9-28-11 | 9-28-11 | |
| GEI-11-10.0 | 09-196-04 | Soil | 9-28-11 | 9-28-11 | |
| GEI-12-7.5 | 09-196-08 | Soil | 9-28-11 | 9-28-11 | |
| GEI-12-12.0 | 09-196-10 | Soil | 9-28-11 | 9-28-11 | |
| GEI-12-15.0 | 09-196-11 | Soil | 9-28-11 | 9-28-11 | |
| GEI-13-5.0 | 09-196-13 | Soil | 9-28-11 | 9-28-11 | |
| GEI-13-7.5 | 09-196-14 | Soil | 9-28-11 | 9-28-11 | |
| GEI-13-12.5 | 09-196-16 | Soil | 9-28-11 | 9-28-11 | |
| GEI-13-15.0 | 09-196-17 | Soil | 9-28-11 | 9-28-11 | |
| GEI-14-5.0 | 09-196-21 | Soil | 9-28-11 | 9-28-11 | |
| GEI-14-8.0 | 09-196-22 | Soil | 9-28-11 | 9-28-11 | |
| GEI-14-10.0 | 09-196-23 | Soil | 9-28-11 | 9-28-11 | |
| GEI-15-5.0 | 09-196-26 | Soil | 9-28-11 | 9-28-11 | |
| GEI-15-10.0 | 09-196-28 | Soil | 9-28-11 | 9-28-11 | |
| GEI-15A-5.0 | 09-196-32 | Soil | 9-28-11 | 9-28-11 | |
| GEI-15A-10.0 | 09-196-34 | Soil | 9-28-11 | 9-28-11 | |
| GEI-30-7.5 | 09-196-38 | Soil | 9-28-11 | 9-28-11 | |

Date of Report: October 14, 2011
Samples Submitted: September 28, 2011
Laboratory Reference: 1109-196
Project: 5147-012-02

**NWTPH-Gx/BTEX**

Matrix: Soil
Units: mg/kg (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-11-5.0** | | | | | |
| Laboratory ID: | 09-196-02 | | | | | |
| Benzene | **0.050** | 0.026 | EPA 8021 | 10-5-11 | 10-6-11 | |
| Toluene | **ND** | 0.13 | EPA 8021 | 10-5-11 | 10-6-11 | |
| Ethyl Benzene | **2.5** | 0.13 | EPA 8021 | 10-5-11 | 10-6-11 | |
| m,p-Xylene | **2.1** | 0.13 | EPA 8021 | 10-5-11 | 10-6-11 | |
| o-Xylene | **ND** | 1.3 | EPA 8021 | 10-5-11 | 10-6-11 | U1 |
| Gasoline | **ND** | 13 | NWTPH-Gx | 10-5-11 | 10-6-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *114* | *68-124* | | | | |
| **Client ID:** | **GEI-11-10.0** | | | | | |
| Laboratory ID: | 09-196-04 | | | | | |
| Benzene | **ND** | 0.020 | EPA 8021 | 10-5-11 | 10-6-11 | |
| Toluene | **ND** | 0.060 | EPA 8021 | 10-5-11 | 10-6-11 | |
| Ethyl Benzene | **ND** | 0.060 | EPA 8021 | 10-5-11 | 10-6-11 | |
| m,p-Xylene | **ND** | 0.060 | EPA 8021 | 10-5-11 | 10-6-11 | |
| o-Xylene | **ND** | 0.060 | EPA 8021 | 10-5-11 | 10-6-11 | |
| Gasoline | **ND** | 6.0 | NWTPH-Gx | 10-5-11 | 10-6-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *96* | *68-124* | | | | |
| **Client ID:** | **GEI-12-7.5** | | | | | |
| Laboratory ID: | 09-196-08 | | | | | |
| Benzene | **ND** | 0.020 | EPA 8021 | 10-5-11 | 10-6-11 | |
| Toluene | **ND** | 0.055 | EPA 8021 | 10-5-11 | 10-6-11 | |
| Ethyl Benzene | **ND** | 0.055 | EPA 8021 | 10-5-11 | 10-6-11 | |
| m,p-Xylene | **ND** | 0.055 | EPA 8021 | 10-5-11 | 10-6-11 | |
| o-Xylene | **ND** | 0.055 | EPA 8021 | 10-5-11 | 10-6-11 | |
| Gasoline | **ND** | 5.5 | NWTPH-Gx | 10-5-11 | 10-6-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *106* | *68-124* | | | | |

Date of Report: October 14, 2011
Samples Submitted: September 28, 2011
Laboratory Reference: 1109-196
Project: 5147-012-02

**NWTPH-Gx/BTEX**

Matrix: Soil
Units: mg/kg (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-12-12.0** | | | | | |
| Laboratory ID: | 09-196-10 | | | | | |
| Benzene | **ND** | 0.025 | EPA 8021 | 10-5-11 | 10-6-11 | |
| Toluene | **ND** | 0.12 | EPA 8021 | 10-5-11 | 10-6-11 | |
| Ethyl Benzene | **ND** | 0.12 | EPA 8021 | 10-5-11 | 10-6-11 | |
| m,p-Xylene | **ND** | 0.12 | EPA 8021 | 10-5-11 | 10-6-11 | |
| o-Xylene | **ND** | 0.12 | EPA 8021 | 10-5-11 | 10-6-11 | |
| Gasoline | **ND** | 12 | NWTPH-Gx | 10-5-11 | 10-6-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *95* | *68-124* | | | | |
| **Client ID:** | **GEI-12-15.0** | | | | | |
| Laboratory ID: | 09-196-11 | | | | | |
| Benzene | **ND** | 0.016 | EPA 8021 | 10-5-11 | 10-11-11 | |
| Toluene | **ND** | 0.16 | EPA 8021 | 10-5-11 | 10-6-11 | |
| Ethyl Benzene | **ND** | 0.16 | EPA 8021 | 10-5-11 | 10-6-11 | |
| m,p-Xylene | **ND** | 0.16 | EPA 8021 | 10-5-11 | 10-6-11 | |
| o-Xylene | **ND** | 0.16 | EPA 8021 | 10-5-11 | 10-6-11 | |
| Gasoline | **ND** | 16 | NWTPH-Gx | 10-5-11 | 10-6-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *98* | *68-124* | | | | |
| **Client ID:** | **GEI-13-5.0** | | | | | |
| Laboratory ID: | 09-196-13 | | | | | |
| Benzene | **ND** | 0.020 | EPA 8021 | 10-5-11 | 10-6-11 | |
| Toluene | **ND** | 0.051 | EPA 8021 | 10-5-11 | 10-6-11 | |
| Ethyl Benzene | **ND** | 0.051 | EPA 8021 | 10-5-11 | 10-6-11 | |
| m,p-Xylene | **ND** | 0.051 | EPA 8021 | 10-5-11 | 10-6-11 | |
| o-Xylene | **ND** | 0.051 | EPA 8021 | 10-5-11 | 10-6-11 | |
| Gasoline | **ND** | 5.1 | NWTPH-Gx | 10-5-11 | 10-6-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *99* | *68-124* | | | | |

Date of Report: October 14, 2011
Samples Submitted: September 28, 2011
Laboratory Reference: 1109-196
Project: 5147-012-02

**NWTPH-Gx/BTEX**

Matrix: Soil
Units: mg/kg (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-13-7.5** | | | | | |
| Laboratory ID: | 09-196-14 | | | | | |
| Benzene | **ND** | 0.020 | EPA 8021 | 10-5-11 | 10-6-11 | |
| Toluene | **ND** | 0.063 | EPA 8021 | 10-5-11 | 10-6-11 | |
| Ethyl Benzene | **ND** | 0.063 | EPA 8021 | 10-5-11 | 10-6-11 | |
| m,p-Xylene | **ND** | 0.063 | EPA 8021 | 10-5-11 | 10-6-11 | |
| o-Xylene | **ND** | 0.063 | EPA 8021 | 10-5-11 | 10-6-11 | |
| Gasoline | **ND** | 6.3 | NWTPH-Gx | 10-5-11 | 10-6-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *95* | *68-124* | | | | |
| **Client ID:** | **GEI-13-12.5** | | | | | |
| Laboratory ID: | 09-196-16 | | | | | |
| Benzene | **0.065** | 0.020 | EPA 8021 | 10-5-11 | 10-6-11 | |
| Toluene | **ND** | 0.049 | EPA 8021 | 10-5-11 | 10-6-11 | |
| Ethyl Benzene | **ND** | 0.049 | EPA 8021 | 10-5-11 | 10-6-11 | |
| m,p-Xylene | **0.14** | 0.049 | EPA 8021 | 10-5-11 | 10-6-11 | |
| o-Xylene | **ND** | 0.049 | EPA 8021 | 10-5-11 | 10-6-11 | |
| Gasoline | **56** | 4.9 | NWTPH-Gx | 10-5-11 | 10-6-11 | O |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *103* | *68-124* | | | | |
| **Client ID:** | **GEI-14-5.0** | | | | | |
| Laboratory ID: | 09-196-21 | | | | | |
| Benzene | **ND** | 0.020 | EPA 8021 | 10-5-11 | 10-6-11 | |
| Toluene | **ND** | 0.062 | EPA 8021 | 10-5-11 | 10-6-11 | |
| Ethyl Benzene | **ND** | 0.062 | EPA 8021 | 10-5-11 | 10-6-11 | |
| m,p-Xylene | **ND** | 0.062 | EPA 8021 | 10-5-11 | 10-6-11 | |
| o-Xylene | **ND** | 0.062 | EPA 8021 | 10-5-11 | 10-6-11 | |
| Gasoline | **ND** | 6.2 | NWTPH-Gx | 10-5-11 | 10-6-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *99* | *68-124* | | | | |

Date of Report: October 14, 2011
Samples Submitted: September 28, 2011
Laboratory Reference: 1109-196
Project: 5147-012-02

**NWTPH-Gx/BTEX**

Matrix: Soil
Units: mg/kg (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-14-8.0** | | | | | |
| Laboratory ID: | 09-196-22 | | | | | |
| Benzene | **0.025** | 0.020 | EPA 8021 | 10-5-11 | 10-6-11 | |
| Toluene | **ND** | 0.056 | EPA 8021 | 10-5-11 | 10-6-11 | |
| Ethyl Benzene | **ND** | 0.056 | EPA 8021 | 10-5-11 | 10-6-11 | |
| m,p-Xylene | **ND** | 0.056 | EPA 8021 | 10-5-11 | 10-6-11 | |
| o-Xylene | **ND** | 0.056 | EPA 8021 | 10-5-11 | 10-6-11 | |
| Gasoline | **45** | 5.6 | NWTPH-Gx | 10-5-11 | 10-6-11 | O |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *102* | *68-124* | | | | |
| **Client ID:** | **GEI-14-10.0** | | | | | |
| Laboratory ID: | 09-196-23 | | | | | |
| Benzene | **ND** | 0.020 | EPA 8021 | 10-5-11 | 10-6-11 | |
| Toluene | **ND** | 0.063 | EPA 8021 | 10-5-11 | 10-6-11 | |
| Ethyl Benzene | **ND** | 0.063 | EPA 8021 | 10-5-11 | 10-6-11 | |
| m,p-Xylene | **ND** | 0.063 | EPA 8021 | 10-5-11 | 10-6-11 | |
| o-Xylene | **ND** | 0.063 | EPA 8021 | 10-5-11 | 10-6-11 | |
| Gasoline | **ND** | 6.3 | NWTPH-Gx | 10-5-11 | 10-6-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *107* | *68-124* | | | | |
| **Client ID:** | **GEI-30-7.5** | | | | | |
| Laboratory ID: | 09-196-38 | | | | | |
| Benzene | **ND** | 0.020 | EPA 8021 | 10-5-11 | 10-6-11 | |
| Toluene | **ND** | 0.055 | EPA 8021 | 10-5-11 | 10-6-11 | |
| Ethyl Benzene | **ND** | 0.055 | EPA 8021 | 10-5-11 | 10-6-11 | |
| m,p-Xylene | **ND** | 0.055 | EPA 8021 | 10-5-11 | 10-6-11 | |
| o-Xylene | **ND** | 0.055 | EPA 8021 | 10-5-11 | 10-6-11 | |
| Gasoline | **ND** | 5.5 | NWTPH-Gx | 10-5-11 | 10-6-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *105* | *68-124* | | | | |

Date of Report: October 14, 2011
Samples Submitted: September 28, 2011
Laboratory Reference: 1109-196
Project: 5147-012-02

**NWTPH-Dx**
**(with acid/silica gel clean-up)**

Matrix: Soil
Units: mg/Kg (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-11-5.0** | | | | | |
| Laboratory ID: | 09-196-02 | | | | | |
| Diesel Range Organics | **2200** | 31 | NWTPH-Dx | 10-6-11 | 10-6-11 | |
| Lube Oil | **920** | 62 | NWTPH-Dx | 10-6-11 | 10-6-11 | N1 |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *o-Terphenyl* | *74* | *50-150* | | | | |
| **Client ID:** | **GEI-11-10.0** | | | | | |
| Laboratory ID: | 09-196-04 | | | | | |
| Diesel Range Organics | **ND** | 29 | NWTPH-Dx | 10-6-11 | 10-6-11 | |
| Lube Oil Range Organics | **ND** | 59 | NWTPH-Dx | 10-6-11 | 10-6-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *o-Terphenyl* | *92* | *50-150* | | | | |
| **Client ID:** | **GEI-12-7.5** | | | | | |
| Laboratory ID: | 09-196-08 | | | | | |
| Diesel Range Organics | **ND** | 30 | NWTPH-Dx | 10-6-11 | 10-6-11 | |
| Lube Oil Range Organics | **ND** | 60 | NWTPH-Dx | 10-6-11 | 10-6-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *o-Terphenyl* | *60* | *50-150* | | | | |
| **Client ID:** | **GEI-12-12.0** | | | | | |
| Laboratory ID: | 09-196-10 | | | | | |
| Diesel Range Organics | **380** | 30 | NWTPH-Dx | 10-6-11 | 10-6-11 | |
| Lube Oil | **62** | 60 | NWTPH-Dx | 10-6-11 | 10-6-11 | N1 |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *o-Terphenyl* | *98* | *50-150* | | | | |
| **Client ID:** | **GEI-12-15.0** | | | | | |
| Laboratory ID: | 09-196-11 | | | | | |
| Diesel Range Organics | **ND** | 33 | NWTPH-Dx | 10-6-11 | 10-6-11 | |
| Lube Oil Range Organics | **ND** | 66 | NWTPH-Dx | 10-6-11 | 10-6-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *o-Terphenyl* | *92* | *50-150* | | | | |
| **Client ID:** | **GEI-13-5.0** | | | | | |
| Laboratory ID: | 09-196-13 | | | | | |
| Diesel Range Organics | **ND** | 27 | NWTPH-Dx | 10-6-11 | 10-6-11 | |
| Lube Oil Range Organics | **ND** | 54 | NWTPH-Dx | 10-6-11 | 10-6-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *o-Terphenyl* | *85* | *50-150* | | | | |

Date of Report: October 14, 2011
Samples Submitted: September 28, 2011
Laboratory Reference: 1109-196
Project: 5147-012-02

**NWTPH-Dx**
**(with acid/silica gel clean-up)**

Matrix: Soil
Units: mg/Kg (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-13-7.5** | | | | | |
| Laboratory ID: | 09-196-14 | | | | | |
| Diesel Range Organics | **890** | 30 | NWTPH-Dx | 10-6-11 | 10-6-11 | |
| Lube Oil | **200** | 60 | NWTPH-Dx | 10-6-11 | 10-6-11 | N1 |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *o-Terphenyl* | *74* | *50-150* | | | | |
| **Client ID:** | **GEI-13-12.5** | | | | | |
| Laboratory ID: | 09-196-16 | | | | | |
| Diesel Range Organics | **240** | 31 | NWTPH-Dx | 10-6-11 | 10-6-11 | |
| Lube Oil Range Organics | **ND** | 63 | NWTPH-Dx | 10-6-11 | 10-6-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *o-Terphenyl* | *87* | *50-150* | | | | |
| **Client ID:** | **GEI-14-5.0** | | | | | |
| Laboratory ID: | 09-196-21 | | | | | |
| Diesel Range Organics | **ND** | 48 | NWTPH-Dx | 10-6-11 | 10-6-11 | U1 |
| Lube Oil | **88** | 56 | NWTPH-Dx | 10-6-11 | 10-6-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *o-Terphenyl* | *77* | *50-150* | | | | |
| **Client ID:** | **GEI-14-8.0** | | | | | |
| Laboratory ID: | 09-196-22 | | | | | |
| Diesel Range Organics | **700** | 28 | NWTPH-Dx | 10-6-11 | 10-6-11 | |
| Lube Oil | **220** | 56 | NWTPH-Dx | 10-6-11 | 10-6-11 | N1 |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *o-Terphenyl* | *83* | *50-150* | | | | |
| **Client ID:** | **GEI-14-10.0** | | | | | |
| Laboratory ID: | 09-196-23 | | | | | |
| Diesel Range Organics | **ND** | 31 | NWTPH-Dx | 10-6-11 | 10-6-11 | |
| Lube Oil Range Organics | **ND** | 62 | NWTPH-Dx | 10-6-11 | 10-6-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *o-Terphenyl* | *72* | *50-150* | | | | |
| **Client ID:** | **GEI-30-7.5** | | | | | |
| Laboratory ID: | 09-196-38 | | | | | |
| Diesel Range Organics | **ND** | 29 | NWTPH-Dx | 10-6-11 | 10-6-11 | |
| Lube Oil Range Organics | **ND** | 58 | NWTPH-Dx | 10-6-11 | 10-6-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *o-Terphenyl* | *70* | *50-150* | | | | |

Date of Report: October 14, 2011
Samples Submitted: September 28, 2011
Laboratory Reference: 1109-196
Project: 5147-012-02

**PAHs by EPA 8270D/SIM**
**(with silica gel clean-up)**

Matrix: Soil
Units: mg/Kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-11-5.0** | | | | | |
| Laboratory ID: | 09-196-02 | | | | | |
| Naphthalene | **0.37** | 0.0082 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| 2-Methylnaphthalene | **3.1** | 0.082 | EPA 8270/SIM | 10-6-11 | 10-10-11 | |
| 1-Methylnaphthalene | **2.8** | 0.082 | EPA 8270/SIM | 10-6-11 | 10-10-11 | |
| Acenaphthylene | **0.028** | 0.0082 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Acenaphthene | **0.088** | 0.0082 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Fluorene | **0.23** | 0.0082 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Phenanthrene | **0.21** | 0.0082 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Anthracene | **0.017** | 0.0082 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Fluoranthene | **0.012** | 0.0082 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Pyrene | **0.016** | 0.0082 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Benzo[a]anthracene | **ND** | 0.082 | EPA 8270/SIM | 10-6-11 | 10-10-11 | |
| Chrysene | **ND** | 0.082 | EPA 8270/SIM | 10-6-11 | 10-10-11 | |
| Benzo[b]fluoranthene | **ND** | 0.082 | EPA 8270/SIM | 10-6-11 | 10-10-11 | |
| Benzo(j,k)fluoranthene | **ND** | 0.082 | EPA 8270/SIM | 10-6-11 | 10-10-11 | |
| Benzo[a]pyrene | **ND** | 0.082 | EPA 8270/SIM | 10-6-11 | 10-10-11 | |
| Indeno(1,2,3-c,d)pyrene | **ND** | 0.082 | EPA 8270/SIM | 10-6-11 | 10-10-11 | |
| Dibenz[a,h]anthracene | **ND** | 0.082 | EPA 8270/SIM | 10-6-11 | 10-10-11 | |
| Benzo[g,h,i]perylene | **ND** | 0.082 | EPA 8270/SIM | 10-6-11 | 10-10-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *2-Fluorobiphenyl* | *94* | *43 - 109* | | | | |
| *Pyrene-d10* | *105* | *38 - 128* | | | | |
| *Terphenyl-d14* | *87* | *33 - 119* | | | | |

Date of Report: October 14, 2011
Samples Submitted: September 28, 2011
Laboratory Reference: 1109-196
Project: 5147-012-02

**PAHs by EPA 8270D/SIM**
**(with silica gel clean-up)**

Matrix: Soil
Units: mg/Kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-11-10.0** | | | | | |
| Laboratory ID: | 09-196-04 | | | | | |
| Naphthalene | **ND** | 0.0078 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| 2-Methylnaphthalene | **ND** | 0.0078 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| 1-Methylnaphthalene | **0.011** | 0.0078 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Acenaphthylene | **ND** | 0.0078 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Acenaphthene | **ND** | 0.0078 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Fluorene | **ND** | 0.0078 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Phenanthrene | **ND** | 0.0078 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Anthracene | **ND** | 0.0078 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Fluoranthene | **ND** | 0.0078 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Pyrene | **ND** | 0.0078 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Benzo[a]anthracene | **ND** | 0.0078 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Chrysene | **ND** | 0.0078 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Benzo[b]fluoranthene | **ND** | 0.0078 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Benzo(j,k)fluoranthene | **ND** | 0.0078 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Benzo[a]pyrene | **ND** | 0.0078 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Indeno(1,2,3-c,d)pyrene | **ND** | 0.0078 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Dibenz[a,h]anthracene | **ND** | 0.0078 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Benzo[g,h,i]perylene | **ND** | 0.0078 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *2-Fluorobiphenyl* | *80* | *43 - 109* | | | | |
| *Pyrene-d10* | *99* | *38 - 128* | | | | |
| *Terphenyl-d14* | *88* | *33 - 119* | | | | |

Date of Report: October 14, 2011
Samples Submitted: September 28, 2011
Laboratory Reference: 1109-196
Project: 5147-012-02

**PAHs by EPA 8270D/SIM**
**(with silica gel clean-up)**

Matrix: Soil
Units: mg/Kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-12-7.5** | | | | | |
| Laboratory ID: | 09-196-08 | | | | | |
| Naphthalene | **0.026** | 0.0080 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| 2-Methylnaphthalene | **0.029** | 0.0080 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| 1-Methylnaphthalene | **0.027** | 0.0080 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Acenaphthylene | **ND** | 0.0080 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Acenaphthene | **ND** | 0.0080 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Fluorene | **ND** | 0.0080 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Phenanthrene | **0.010** | 0.0080 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Anthracene | **ND** | 0.0080 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Fluoranthene | **ND** | 0.0080 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Pyrene | **ND** | 0.0080 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Benzo[a]anthracene | **ND** | 0.0080 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Chrysene | **ND** | 0.0080 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Benzo[b]fluoranthene | **ND** | 0.0080 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Benzo(j,k)fluoranthene | **ND** | 0.0080 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Benzo[a]pyrene | **ND** | 0.0080 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Indeno(1,2,3-c,d)pyrene | **ND** | 0.0080 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Dibenz[a,h]anthracene | **ND** | 0.0080 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Benzo[g,h,i]perylene | **ND** | 0.0080 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *2-Fluorobiphenyl* | *65* | *43 - 109* | | | | |
| *Pyrene-d10* | *78* | *38 - 128* | | | | |
| *Terphenyl-d14* | *68* | *33 - 119* | | | | |

Date of Report: October 14, 2011
Samples Submitted: September 28, 2011
Laboratory Reference: 1109-196
Project: 5147-012-02

**PAHs by EPA 8270D/SIM**
**(with silica gel clean-up)**

Matrix: Soil
Units: mg/Kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-12-12.0** | | | | | |
| Laboratory ID: | 09-196-10 | | | | | |
| Naphthalene | **0.026** | 0.0080 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| 2-Methylnaphthalene | **0.019** | 0.0080 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| 1-Methylnaphthalene | **0.021** | 0.0080 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Acenaphthylene | **ND** | 0.0080 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Acenaphthene | **0.012** | 0.0080 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Fluorene | **ND** | 0.0080 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Phenanthrene | **0.016** | 0.0080 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Anthracene | **ND** | 0.0080 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Fluoranthene | **0.015** | 0.0080 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Pyrene | **0.018** | 0.0080 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Benzo[a]anthracene | **ND** | 0.0080 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Chrysene | **ND** | 0.0080 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Benzo[b]fluoranthene | **ND** | 0.0080 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Benzo(j,k)fluoranthene | **ND** | 0.0080 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Benzo[a]pyrene | **ND** | 0.0080 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Indeno(1,2,3-c,d)pyrene | **ND** | 0.0080 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Dibenz[a,h]anthracene | **ND** | 0.0080 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Benzo[g,h,i]perylene | **ND** | 0.0080 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *2-Fluorobiphenyl* | *60* | *43 - 109* | | | | |
| *Pyrene-d10* | *83* | *38 - 128* | | | | |
| *Terphenyl-d14* | *80* | *33 - 119* | | | | |

Date of Report: October 14, 2011
Samples Submitted: September 28, 2011
Laboratory Reference: 1109-196
Project: 5147-012-02

**PAHs by EPA 8270D/SIM**
**(with silica gel clean-up)**

Matrix: Soil
Units: mg/Kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-12-15.0** | | | | | |
| Laboratory ID: | 09-196-11 | | | | | |
| Naphthalene | **0.014** | 0.0087 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| 2-Methylnaphthalene | **ND** | 0.0087 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| 1-Methylnaphthalene | **ND** | 0.0087 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Acenaphthylene | **ND** | 0.0087 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Acenaphthene | **ND** | 0.0087 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Fluorene | **ND** | 0.0087 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Phenanthrene | **ND** | 0.0087 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Anthracene | **ND** | 0.0087 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Fluoranthene | **0.012** | 0.0087 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Pyrene | **0.011** | 0.0087 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Benzo[a]anthracene | **ND** | 0.0087 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Chrysene | **ND** | 0.0087 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Benzo[b]fluoranthene | **ND** | 0.0087 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Benzo(j,k)fluoranthene | **ND** | 0.0087 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Benzo[a]pyrene | **ND** | 0.0087 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Indeno(1,2,3-c,d)pyrene | **ND** | 0.0087 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Dibenz[a,h]anthracene | **ND** | 0.0087 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Benzo[g,h,i]perylene | **ND** | 0.0087 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *2-Fluorobiphenyl* | *68* | *43 - 109* | | | | |
| *Pyrene-d10* | *79* | *38 - 128* | | | | |
| *Terphenyl-d14* | *76* | *33 - 119* | | | | |

Date of Report: October 14, 2011
Samples Submitted: September 28, 2011
Laboratory Reference: 1109-196
Project: 5147-012-02

**PAHs by EPA 8270D/SIM**
**(with silica gel clean-up)**

Matrix: Soil
Units: mg/Kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-13-5.0** | | | | | |
| Laboratory ID: | 09-196-13 | | | | | |
| Naphthalene | **0.013** | 0.0072 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| 2-Methylnaphthalene | **0.069** | 0.0072 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| 1-Methylnaphthalene | **0.016** | 0.0072 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Acenaphthylene | **ND** | 0.0072 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Acenaphthene | **ND** | 0.0072 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Fluorene | **ND** | 0.0072 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Phenanthrene | **0.0077** | 0.0072 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Anthracene | **ND** | 0.0072 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Fluoranthene | **ND** | 0.0072 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Pyrene | **ND** | 0.0072 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Benzo[a]anthracene | **ND** | 0.0072 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Chrysene | **ND** | 0.0072 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Benzo[b]fluoranthene | **ND** | 0.0072 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Benzo(j,k)fluoranthene | **ND** | 0.0072 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Benzo[a]pyrene | **ND** | 0.0072 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Indeno(1,2,3-c,d)pyrene | **ND** | 0.0072 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Dibenz[a,h]anthracene | **ND** | 0.0072 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Benzo[g,h,i]perylene | **ND** | 0.0072 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *2-Fluorobiphenyl* | *67* | *43 - 109* | | | | |
| *Pyrene-d10* | *83* | *38 - 128* | | | | |
| *Terphenyl-d14* | *72* | *33 - 119* | | | | |

Date of Report: October 14, 2011
Samples Submitted: September 28, 2011
Laboratory Reference: 1109-196
Project: 5147-012-02

**PAHs by EPA 8270D/SIM**
**(with silica gel clean-up)**

Matrix: Soil
Units: mg/Kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-13-7.5** | | | | | |
| Laboratory ID: | 09-196-14 | | | | | |
| Naphthalene | **0.12** | 0.0080 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| 2-Methylnaphthalene | **0.18** | 0.0080 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| 1-Methylnaphthalene | **0.082** | 0.0080 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Acenaphthylene | **ND** | 0.0080 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Acenaphthene | **ND** | 0.0080 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Fluorene | **0.015** | 0.0080 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Phenanthrene | **0.011** | 0.0080 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Anthracene | **ND** | 0.0080 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Fluoranthene | **ND** | 0.0080 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Pyrene | **ND** | 0.0080 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Benzo[a]anthracene | **ND** | 0.0080 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Chrysene | **ND** | 0.0080 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Benzo[b]fluoranthene | **ND** | 0.0080 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Benzo(j,k)fluoranthene | **ND** | 0.0080 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Benzo[a]pyrene | **ND** | 0.0080 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Indeno(1,2,3-c,d)pyrene | **ND** | 0.0080 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Dibenz[a,h]anthracene | **ND** | 0.0080 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Benzo[g,h,i]perylene | **ND** | 0.0080 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *2-Fluorobiphenyl* | *49* | *43 - 109* | | | | |
| *Pyrene-d10* | *68* | *38 - 128* | | | | |
| *Terphenyl-d14* | *62* | *33 - 119* | | | | |

Date of Report: October 14, 2011
Samples Submitted: September 28, 2011
Laboratory Reference: 1109-196
Project: 5147-012-02

**PAHs by EPA 8270D/SIM**
**(with silica gel clean-up)**

Matrix: Soil
Units: mg/Kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-13-12.5** | | | | | |
| Laboratory ID: | 09-196-16 | | | | | |
| Naphthalene | **0.021** | 0.0083 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| 2-Methylnaphthalene | **ND** | 0.0083 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| 1-Methylnaphthalene | **ND** | 0.0083 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Acenaphthylene | **ND** | 0.0083 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Acenaphthene | **ND** | 0.0083 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Fluorene | **ND** | 0.0083 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Phenanthrene | **0.045** | 0.0083 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Anthracene | **0.011** | 0.0083 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Fluoranthene | **0.068** | 0.0083 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Pyrene | **0.063** | 0.0083 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Benzo[a]anthracene | **0.025** | 0.0083 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Chrysene | **0.023** | 0.0083 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Benzo[b]fluoranthene | **0.019** | 0.0083 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Benzo(j,k)fluoranthene | **0.023** | 0.0083 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Benzo[a]pyrene | **0.036** | 0.0083 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Indeno(1,2,3-c,d)pyrene | **0.018** | 0.0083 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Dibenz[a,h]anthracene | **ND** | 0.0083 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Benzo[g,h,i]perylene | **0.020** | 0.0083 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *2-Fluorobiphenyl* | *50* | *43 - 109* | | | | |
| *Pyrene-d10* | *66* | *38 - 128* | | | | |
| *Terphenyl-d14* | *62* | *33 - 119* | | | | |

Date of Report: October 14, 2011
Samples Submitted: September 28, 2011
Laboratory Reference: 1109-196
Project: 5147-012-02

**PAHs by EPA 8270D/SIM**
**(with silica gel clean-up)**

Matrix: Soil
Units: mg/Kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-14-5.0** | | | | | |
| Laboratory ID: | 09-196-21 | | | | | |
| Naphthalene | **0.0083** | 0.0074 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| 2-Methylnaphthalene | **0.026** | 0.0074 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| 1-Methylnaphthalene | **0.0078** | 0.0074 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Acenaphthylene | **ND** | 0.0074 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Acenaphthene | **ND** | 0.0074 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Fluorene | **ND** | 0.0074 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Phenanthrene | **ND** | 0.0074 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Anthracene | **ND** | 0.0074 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Fluoranthene | **ND** | 0.0074 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Pyrene | **ND** | 0.0074 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Benzo[a]anthracene | **ND** | 0.0074 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Chrysene | **ND** | 0.0074 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Benzo[b]fluoranthene | **ND** | 0.0074 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Benzo(j,k)fluoranthene | **ND** | 0.0074 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Benzo[a]pyrene | **ND** | 0.0074 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Indeno(1,2,3-c,d)pyrene | **ND** | 0.0074 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Dibenz[a,h]anthracene | **ND** | 0.0074 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Benzo[g,h,i]perylene | **ND** | 0.0074 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *2-Fluorobiphenyl* | *64* | *43 - 109* | | | | |
| *Pyrene-d10* | *76* | *38 - 128* | | | | |
| *Terphenyl-d14* | *65* | *33 - 119* | | | | |

Date of Report: October 14, 2011
Samples Submitted: September 28, 2011
Laboratory Reference: 1109-196
Project: 5147-012-02

**PAHs by EPA 8270D/SIM**
**(with silica gel clean-up)**

Matrix: Soil
Units: mg/Kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-14-8.0** | | | | | |
| Laboratory ID: | 09-196-22 | | | | | |
| Naphthalene | **0.028** | 0.0075 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| 2-Methylnaphthalene | **0.044** | 0.0075 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| 1-Methylnaphthalene | **0.027** | 0.0075 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Acenaphthylene | **ND** | 0.0075 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Acenaphthene | **ND** | 0.0075 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Fluorene | **ND** | 0.0075 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Phenanthrene | **0.0086** | 0.0075 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Anthracene | **ND** | 0.0075 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Fluoranthene | **ND** | 0.0075 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Pyrene | **0.0091** | 0.0075 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Benzo[a]anthracene | **ND** | 0.0075 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Chrysene | **ND** | 0.0075 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Benzo[b]fluoranthene | **ND** | 0.0075 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Benzo(j,k)fluoranthene | **ND** | 0.0075 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Benzo[a]pyrene | **ND** | 0.0075 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Indeno(1,2,3-c,d)pyrene | **ND** | 0.0075 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Dibenz[a,h]anthracene | **ND** | 0.0075 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Benzo[g,h,i]perylene | **ND** | 0.0075 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *2-Fluorobiphenyl* | *42* | *43 - 109* | | | | Q |
| *Pyrene-d10* | *59* | *38 - 128* | | | | |
| *Terphenyl-d14* | *52* | *33 - 119* | | | | |

Date of Report: October 14, 2011
Samples Submitted: September 28, 2011
Laboratory Reference: 1109-196
Project: 5147-012-02

**PAHs by EPA 8270D/SIM**
**(with silica gel clean-up)**

Matrix: Soil
Units: mg/Kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-14-10.0** | | | | | |
| Laboratory ID: | 09-196-23 | | | | | |
| Naphthalene | **ND** | 0.0083 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| 2-Methylnaphthalene | **ND** | 0.0083 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| 1-Methylnaphthalene | **ND** | 0.0083 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Acenaphthylene | **ND** | 0.0083 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Acenaphthene | **ND** | 0.0083 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Fluorene | **ND** | 0.0083 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Phenanthrene | **ND** | 0.0083 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Anthracene | **ND** | 0.0083 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Fluoranthene | **ND** | 0.0083 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Pyrene | **ND** | 0.0083 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Benzo[a]anthracene | **ND** | 0.0083 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Chrysene | **ND** | 0.0083 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Benzo[b]fluoranthene | **ND** | 0.0083 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Benzo(j,k)fluoranthene | **ND** | 0.0083 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Benzo[a]pyrene | **ND** | 0.0083 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Indeno(1,2,3-c,d)pyrene | **ND** | 0.0083 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Dibenz[a,h]anthracene | **ND** | 0.0083 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Benzo[g,h,i]perylene | **ND** | 0.0083 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *2-Fluorobiphenyl* | *47* | *43 - 109* | | | | |
| *Pyrene-d10* | *49* | *38 - 128* | | | | |
| *Terphenyl-d14* | *46* | *33 - 119* | | | | |

Date of Report: October 14, 2011
Samples Submitted: September 28, 2011
Laboratory Reference: 1109-196
Project: 5147-012-02

**PAHs by EPA 8270D/SIM**
**(with silica gel clean-up)**

Matrix: Soil
Units: mg/Kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-30-7.5** | | | | | |
| Laboratory ID: | 09-196-38 | | | | | |
| Naphthalene | **ND** | 0.0078 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| 2-Methylnaphthalene | **ND** | 0.0078 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| 1-Methylnaphthalene | **ND** | 0.0078 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Acenaphthylene | **ND** | 0.0078 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Acenaphthene | **ND** | 0.0078 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Fluorene | **ND** | 0.0078 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Phenanthrene | **0.016** | 0.0078 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Anthracene | **ND** | 0.0078 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Fluoranthene | **0.018** | 0.0078 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Pyrene | **0.021** | 0.0078 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Benzo[a]anthracene | **0.0095** | 0.0078 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Chrysene | **ND** | 0.0078 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Benzo[b]fluoranthene | **ND** | 0.0078 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Benzo(j,k)fluoranthene | **ND** | 0.0078 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Benzo[a]pyrene | **0.0092** | 0.0078 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Indeno(1,2,3-c,d)pyrene | **ND** | 0.0078 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Dibenz[a,h]anthracene | **ND** | 0.0078 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Benzo[g,h,i]perylene | **ND** | 0.0078 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *2-Fluorobiphenyl* | *50* | *43 - 109* | | | | |
| *Pyrene-d10* | *50* | *38 - 128* | | | | |
| *Terphenyl-d14* | *46* | *33 - 119* | | | | |

Date of Report: October 14, 2011
Samples Submitted: September 28, 2011
Laboratory Reference: 1109-196
Project: 5147-012-02

**PCBs by EPA 8082**

Matrix: Soil
Units: mg/Kg (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-11-5.0** | | | | | |
| Laboratory ID: | 09-196-02 | | | | | |
| Aroclor 1016 | **ND** | 0.062 | EPA 8082 | 10-4-11 | 10-5-11 | |
| Aroclor 1221 | **ND** | 0.062 | EPA 8082 | 10-4-11 | 10-5-11 | |
| Aroclor 1232 | **ND** | 0.062 | EPA 8082 | 10-4-11 | 10-5-11 | |
| Aroclor 1242 | **ND** | 0.062 | EPA 8082 | 10-4-11 | 10-5-11 | |
| Aroclor 1248 | **ND** | 0.062 | EPA 8082 | 10-4-11 | 10-5-11 | |
| Aroclor 1254 | **ND** | 0.062 | EPA 8082 | 10-4-11 | 10-5-11 | |
| Aroclor 1260 | **ND** | 0.062 | EPA 8082 | 10-4-11 | 10-5-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *DCB* | *67* | *42-123* | | | | |
| **Client ID:** | **GEI-11-10.0** | | | | | |
| Laboratory ID: | 09-196-04 | | | | | |
| Aroclor 1016 | **ND** | 0.058 | EPA 8082 | 10-4-11 | 10-5-11 | |
| Aroclor 1221 | **ND** | 0.058 | EPA 8082 | 10-4-11 | 10-5-11 | |
| Aroclor 1232 | **ND** | 0.058 | EPA 8082 | 10-4-11 | 10-5-11 | |
| Aroclor 1242 | **ND** | 0.058 | EPA 8082 | 10-4-11 | 10-5-11 | |
| Aroclor 1248 | **ND** | 0.058 | EPA 8082 | 10-4-11 | 10-5-11 | |
| Aroclor 1254 | **ND** | 0.058 | EPA 8082 | 10-4-11 | 10-5-11 | |
| Aroclor 1260 | **ND** | 0.058 | EPA 8082 | 10-4-11 | 10-5-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *DCB* | *70* | *42-123* | | | | |

Date of Report: October 14, 2011
Samples Submitted: September 28, 2011
Laboratory Reference: 1109-196
Project: 5147-012-02

**TOTAL LEAD**
**EPA 6010B**

Matrix: Soil
Units: mg/kg (ppm)

| Analyte | Result | PQL | EPA Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| Lab ID: | 09-196-02 | | | | | |
| **Client ID:** | **GEI-11-5.0** | | | | | |
| Lead | **ND** | 6.2 | 6010B | 10-7-11 | 10-12-11 | |
| Lab ID: | 09-196-04 | | | | | |
| **Client ID:** | **GEI-11-10.0** | | | | | |
| Lead | **ND** | 5.8 | 6010B | 10-7-11 | 10-12-11 | |
| Lab ID: | 09-196-08 | | | | | |
| **Client ID:** | **GEI-12-7.5** | | | | | |
| Lead | **ND** | 6.0 | 6010B | 10-7-11 | 10-12-11 | |
| Lab ID: | 09-196-10 | | | | | |
| **Client ID:** | **GEI-12-12.0** | | | | | |
| Lead | **ND** | 6.0 | 6010B | 10-7-11 | 10-12-11 | |
| Lab ID: | 09-196-11 | | | | | |
| **Client ID:** | **GEI-12-15.0** | | | | | |
| Lead | **ND** | 6.5 | 6010B | 10-7-11 | 10-12-11 | |

Date of Report: October 14, 2011
Samples Submitted: September 28, 2011
Laboratory Reference: 1109-196
Project: 5147-012-02

**TOTAL METALS**
**EPA 6010B**

Matrix: Soil
Units: mg/kg (ppm)

| Analyte | Result | PQL | EPA Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| Lab ID: | 09-196-13 | | | | | |
| **Client ID:** | **GEI-13-5.0** | | | | | |
| Cadmium | **ND** | 0.54 | 6010B | 10-7-11 | 10-11-11 | |
| Lead | **5.5** | 5.4 | 6010B | 10-7-11 | 10-11-11 | |
| Lab ID: | 09-196-14 | | | | | |
| **Client ID:** | **GEI-13-7.5** | | | | | |
| Cadmium | **ND** | 0.60 | 6010B | 10-7-11 | 10-12-11 | |
| Lead | **ND** | 6.0 | 6010B | 10-7-11 | 10-12-11 | |
| Lab ID: | 09-196-16 | | | | | |
| **Client ID:** | **GEI-13-12.5** | | | | | |
| Cadmium | **ND** | 0.63 | 6010B | 10-7-11 | 10-12-11 | |
| Lead | **ND** | 6.3 | 6010B | 10-7-11 | 10-12-11 | |
| Lab ID: | 09-196-21 | | | | | |
| **Client ID:** | **GEI-14-5.0** | | | | | |
| Cadmium | **ND** | 0.56 | 6010B | 10-7-11 | 10-12-11 | |
| Lead | **ND** | 5.6 | 6010B | 10-7-11 | 10-12-11 | |
| Lab ID: | 09-196-22 | | | | | |
| **Client ID:** | **GEI-14-8.0** | | | | | |
| Cadmium | **ND** | 0.56 | 6010B | 10-7-11 | 10-12-11 | |
| Lead | **ND** | 5.6 | 6010B | 10-7-11 | 10-12-11 | |
| Lab ID: | 09-196-23 | | | | | |
| **Client ID:** | **GEI-14-10.0** | | | | | |
| Cadmium | **ND** | 0.62 | 6010B | 10-7-11 | 10-12-11 | |
| Lead | **ND** | 6.2 | 6010B | 10-7-11 | 10-12-11 | |

Date of Report: October 14, 2011
Samples Submitted: September 28, 2011
Laboratory Reference: 1109-196
Project: 5147-012-02

**TOTAL METALS**
**EPA 6010B**

Matrix: Soil
Units: mg/kg (ppm)

| Analyte | Result | PQL | EPA Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| Lab ID: | 09-196-26 | | | | | |
| **Client ID:** | **GEI-15-5.0** | | | | | |
| Cadmium | **ND** | 0.54 | 6010B | 10-7-11 | 10-12-11 | |
| Lab ID: | 09-196-28 | | | | | |
| **Client ID:** | **GEI-15-10.0** | | | | | |
| Cadmium | **ND** | 0.60 | 6010B | 10-7-11 | 10-12-11 | |
| Lab ID: | 09-196-32 | | | | | |
| **Client ID:** | **GEI-15A-5.0** | | | | | |
| Cadmium | **0.77** | 0.62 | 6010B | 10-7-11 | 10-12-11 | |
| Lab ID: | 09-196-34 | | | | | |
| **Client ID:** | **GEI-15A-10.0** | | | | | |
| Cadmium | **0.90** | 0.69 | 6010B | 10-11-11 | 10-12-11 | |
| Lab ID: | 09-196-38 | | | | | |
| **Client ID:** | **GEI-30-7.5** | | | | | |
| Lead | **ND** | 5.8 | 6010B | 10-7-11 | 10-12-11 | |

Date of Report: October 14, 2011
Samples Submitted: September 28, 2011
Laboratory Reference: 1109-196
Project: 5147-012-02

**MTBE, EDC, and EDB by EPA 8260B**

Matrix: Soil
Units: mg/kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-11-5.0** | | | | | |
| Laboratory ID: | 09-196-02 | | | | | |
| Methyl t-Butyl Ether | ND | 0.058 | EPA 8260 | 10-6-11 | 10-6-11 | |
| 1,2-Dichloroethane | ND | 0.058 | EPA 8260 | 10-6-11 | 10-6-11 | |
| 1,2-Dibromoethane | ND | 0.058 | EPA 8260 | 10-6-11 | 10-6-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Dibromofluoromethane* | *82* | *63-127* | | | | |
| *Toluene-d8* | *90* | *65-129* | | | | |
| *4-Bromofluorobenzene* | *82* | *55-121* | | | | |

Date of Report: October 14, 2011
Samples Submitted: September 28, 2011
Laboratory Reference: 1109-196
Project: 5147-012-02

**MTBE, EDC, and EDB by EPA 8260B**

Matrix: Soil
Units: mg/kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-11-10.0** | | | | | |
| Laboratory ID: | 09-196-04 | | | | | |
| Methyl t-Butyl Ether | ND | 0.0010 | EPA 8260 | 10-7-11 | 10-7-11 | |
| 1,2-Dichloroethane | ND | 0.0010 | EPA 8260 | 10-7-11 | 10-7-11 | |
| 1,2-Dibromoethane | ND | 0.0010 | EPA 8260 | 10-7-11 | 10-7-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Dibromofluoromethane* | *93* | *63-127* | | | | |
| *Toluene-d8* | *98* | *65-129* | | | | |
| *4-Bromofluorobenzene* | *89* | *55-121* | | | | |

Date of Report: October 14, 2011
Samples Submitted: September 28, 2011
Laboratory Reference: 1109-196
Project: 5147-012-02

**HALOGENATED VOLATILES by EPA 8260B**

Matrix: Soil
Units: mg/kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-12-7.5** | | | | | |
| Laboratory ID: | 09-196-08 | | | | | |
| Vinyl Chloride | ND | 0.0010 | EPA 8260 | 10-6-11 | 10-6-11 | |
| Trichlorofluoromethane | ND | 0.0010 | EPA 8260 | 10-6-11 | 10-6-11 | |
| Methyl t-Butyl Ether | ND | 0.0010 | EPA 8260 | 10-6-11 | 10-6-11 | |
| (cis) 1,2-Dichloroethene | ND | 0.0010 | EPA 8260 | 10-6-11 | 10-6-11 | |
| 1,1,1-Trichloroethane | ND | 0.0010 | EPA 8260 | 10-6-11 | 10-6-11 | |
| Carbon Tetrachloride | ND | 0.0010 | EPA 8260 | 10-6-11 | 10-6-11 | |
| 1,2-Dichloroethane | ND | 0.0010 | EPA 8260 | 10-6-11 | 10-6-11 | |
| Trichloroethene | ND | 0.0010 | EPA 8260 | 10-6-11 | 10-6-11 | |
| Tetrachloroethene | ND | 0.0010 | EPA 8260 | 10-6-11 | 10-6-11 | |
| 1,2-Dibromoethane | ND | 0.0010 | EPA 8260 | 10-6-11 | 10-6-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Dibromofluoromethane* | *98* | *63-127* | | | | |
| *Toluene-d8* | *97* | *65-129* | | | | |
| *4-Bromofluorobenzene* | *89* | *55-121* | | | | |

Date of Report: October 14, 2011
Samples Submitted: September 28, 2011
Laboratory Reference: 1109-196
Project: 5147-012-02

**HALOGENATED VOLATILES by EPA 8260B**

Matrix: Soil
Units: mg/kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-12-12.0** | | | | | |
| Laboratory ID: | 09-196-10 | | | | | |
| Vinyl Chloride | ND | 0.00093 | EPA 8260 | 10-7-11 | 10-7-11 | |
| Trichlorofluoromethane | ND | 0.00093 | EPA 8260 | 10-7-11 | 10-7-11 | |
| Methyl t-Butyl Ether | ND | 0.00093 | EPA 8260 | 10-7-11 | 10-7-11 | |
| (cis) 1,2-Dichloroethene | ND | 0.00093 | EPA 8260 | 10-7-11 | 10-7-11 | |
| 1,1,1-Trichloroethane | ND | 0.00093 | EPA 8260 | 10-7-11 | 10-7-11 | |
| Carbon Tetrachloride | ND | 0.00093 | EPA 8260 | 10-7-11 | 10-7-11 | |
| 1,2-Dichloroethane | ND | 0.00093 | EPA 8260 | 10-7-11 | 10-7-11 | |
| Trichloroethene | ND | 0.00093 | EPA 8260 | 10-7-11 | 10-7-11 | |
| Tetrachloroethene | ND | 0.00093 | EPA 8260 | 10-7-11 | 10-7-11 | |
| 1,2-Dibromoethane | ND | 0.00093 | EPA 8260 | 10-7-11 | 10-7-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Dibromofluoromethane* | *97* | *63-127* | | | | |
| *Toluene-d8* | *94* | *65-129* | | | | |
| *4-Bromofluorobenzene* | *102* | *55-121* | | | | |

Date of Report: October 14, 2011
Samples Submitted: September 28, 2011
Laboratory Reference: 1109-196
Project: 5147-012-02

**HALOGENATED VOLATILES by EPA 8260B**

Matrix: Soil
Units: mg/kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-12-15.0** | | | | | |
| Laboratory ID: | 09-196-11 | | | | | |
| Vinyl Chloride | ND | 0.0013 | EPA 8260 | 10-6-11 | 10-6-11 | |
| Trichlorofluoromethane | ND | 0.0013 | EPA 8260 | 10-6-11 | 10-6-11 | |
| Methyl t-Butyl Ether | ND | 0.0013 | EPA 8260 | 10-6-11 | 10-6-11 | |
| (cis) 1,2-Dichloroethene | ND | 0.0013 | EPA 8260 | 10-6-11 | 10-6-11 | |
| 1,1,1-Trichloroethane | ND | 0.0013 | EPA 8260 | 10-6-11 | 10-6-11 | |
| Carbon Tetrachloride | ND | 0.0013 | EPA 8260 | 10-6-11 | 10-6-11 | |
| 1,2-Dichloroethane | ND | 0.0013 | EPA 8260 | 10-6-11 | 10-6-11 | |
| Trichloroethene | ND | 0.0013 | EPA 8260 | 10-6-11 | 10-6-11 | |
| Tetrachloroethene | ND | 0.0013 | EPA 8260 | 10-6-11 | 10-6-11 | |
| 1,2-Dibromoethane | ND | 0.0013 | EPA 8260 | 10-6-11 | 10-6-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Dibromofluoromethane* | *97* | *63-127* | | | | |
| *Toluene-d8* | *96* | *65-129* | | | | |
| *4-Bromofluorobenzene* | *95* | *55-121* | | | | |

Date of Report: October 14, 2011
Samples Submitted: September 28, 2011
Laboratory Reference: 1109-196
Project: 5147-012-02

**NWTPH-Gx**

Matrix: Soil
Units: mg/kg (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-13-15.0** | | | | | |
| Laboratory ID: | 09-196-17 | | | | | |
| Gasoline | **ND** | 6.9 | NWTPH-Gx | 10-12-11 | 10-12-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *99* | *68-124* | | | | |

Date of Report: October 14, 2011
Samples Submitted: September 28, 2011
Laboratory Reference: 1109-196
Project: 5147-012-02

**NWTPH-Gx/BTEX**
**METHOD BLANK QUALITY CONTROL**

Matrix: Soil
Units: mg/kg (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| Laboratory ID: | MB1005S3 | | | | | |
| Benzene | **ND** | 0.020 | EPA 8021 | 10-5-11 | 10-6-11 | |
| Toluene | **ND** | 0.050 | EPA 8021 | 10-5-11 | 10-6-11 | |
| Ethyl Benzene | **ND** | 0.050 | EPA 8021 | 10-5-11 | 10-6-11 | |
| m,p-Xylene | **ND** | 0.050 | EPA 8021 | 10-5-11 | 10-6-11 | |
| o-Xylene | **ND** | 0.050 | EPA 8021 | 10-5-11 | 10-6-11 | |
| Gasoline | **ND** | 5.0 | NWTPH-Gx | 10-5-11 | 10-6-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *92* | *68-124* | | | | |
| Laboratory ID: | MB1005S4 | | | | | |
| Benzene | **ND** | 0.020 | EPA 8021 | 10-5-11 | 10-6-11 | |
| Toluene | **ND** | 0.050 | EPA 8021 | 10-5-11 | 10-6-11 | |
| Ethyl Benzene | **ND** | 0.050 | EPA 8021 | 10-5-11 | 10-6-11 | |
| m,p-Xylene | **ND** | 0.050 | EPA 8021 | 10-5-11 | 10-6-11 | |
| o-Xylene | **ND** | 0.050 | EPA 8021 | 10-5-11 | 10-6-11 | |
| Gasoline | **ND** | 5.0 | NWTPH-Gx | 10-5-11 | 10-6-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *93* | *68-124* | | | | |

Date of Report: October 14, 2011
Samples Submitted: September 28, 2011
Laboratory Reference: 1109-196
Project: 5147-012-02

**NWTPH-Gx/BTEX**
**QUALITY CONTROL**

Matrix: Soil
Units: mg/kg (ppm)

| Analyte | Result | | Spike Level | | Source Result | Percent Recovery | | Recovery Limits | RPD | RPD Limit | Flags |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **DUPLICATE** | | | | | | | | | | | |
| Laboratory ID: | 09-195-35 | | | | | | | | | | |
| | ORIG | DUP | | | | | | | | | |
| Benzene | **ND** | **ND** | NA | NA | | NA | | NA | NA | 30 | |
| Toluene | **ND** | **ND** | NA | NA | | NA | | NA | NA | 30 | |
| Ethyl Benzene | **ND** | **ND** | NA | NA | | NA | | NA | NA | 30 | |
| m,p-Xylene | **ND** | **ND** | NA | NA | | NA | | NA | NA | 30 | |
| o-Xylene | **ND** | **ND** | NA | NA | | NA | | NA | NA | 30 | |
| Gasoline | **ND** | **ND** | NA | NA | | NA | | NA | NA | 30 | |
| *Surrogate:* | | | | | | | | | | | |
| *Fluorobenzene* | | | | | | *97* | *100* | *68-124* | | | |
| Laboratory ID: | 09-196-23 | | | | | | | | | | |
| | ORIG | DUP | | | | | | | | | |
| Benzene | **ND** | **ND** | NA | NA | | NA | | NA | NA | 30 | |
| Toluene | **ND** | **ND** | NA | NA | | NA | | NA | NA | 30 | |
| Ethyl Benzene | **ND** | **ND** | NA | NA | | NA | | NA | NA | 30 | |
| m,p-Xylene | **ND** | **ND** | NA | NA | | NA | | NA | NA | 30 | |
| o-Xylene | **ND** | **ND** | NA | NA | | NA | | NA | NA | 30 | |
| Gasoline | **ND** | **ND** | NA | NA | | NA | | NA | NA | 30 | |
| *Surrogate:* | | | | | | | | | | | |
| *Fluorobenzene* | | | | | | *107* | *107* | *68-124* | | | |
| **MATRIX SPIKES** | | | | | | | | | | | |
| Laboratory ID: | 09-195-35 | | | | | | | | | | |
| | MS | MSD | MS | MSD | | MS | MSD | | | | |
| Benzene | **0.997** | **1.01** | 1.00 | 1.00 | ND | **100** | **101** | 79-121 | 1 | 10 | |
| Toluene | **1.01** | **1.02** | 1.00 | 1.00 | ND | **101** | **102** | 83-121 | 1 | 14 | |
| Ethyl Benzene | **0.979** | **0.985** | 1.00 | 1.00 | ND | **98** | **99** | 83-123 | 1 | 9 | |
| m,p-Xylene | **0.978** | **0.984** | 1.00 | 1.00 | ND | **98** | **98** | 84-123 | 1 | 10 | |
| o-Xylene | **0.964** | **0.956** | 1.00 | 1.00 | ND | **96** | **96** | 82-124 | 1 | 10 | |
| *Surrogate:* | | | | | | | | | | | |
| *Fluorobenzene* | | | | | | *102* | *102* | *68-124* | | | |

Date of Report: October 14, 2011
Samples Submitted: September 28, 2011
Laboratory Reference: 1109-196
Project: 5147-012-02

**NWTPH-Dx**
**QUALITY CONTROL**
**(with acid/silica gel clean-up)**

Matrix: Soil
Units: mg/Kg (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **METHOD BLANK** | | | | | | |
| Laboratory ID: | MB1006S2 | | | | | |
| Diesel Range Organics | **ND** | 25 | NWTPH-Dx | 10-6-11 | 10-6-11 | |
| Lube Oil Range Organics | **ND** | 50 | NWTPH-Dx | 10-6-11 | 10-6-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *o-Terphenyl* | *94* | *50-150* | | | | |

| Analyte | Result | | Percent Recovery | | Recovery Limits | RPD | RPD Limit | Flags |
|---|---|---|---|---|---|---|---|---|
| **DUPLICATE** | | | | | | | | |
| Laboratory ID: | 09-196-08 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Diesel Range Organics | **ND** | **ND** | | | | NA | NA | |
| Lube Oil Range Organics | **ND** | **ND** | | | | NA | NA | |
| *Surrogate:* | | | | | | | | |
| *o-Terphenyl* | | | *60* | *66* | *50-150* | | | |
| Laboratory ID: | 09-196-14 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Diesel Range Organics | **746** | **445** | | | | 51 | NA | |
| Lube Oil | **165** | **110** | | | | 40 | NA | N1 |
| *Surrogate:* | | | | | | | | |
| *o-Terphenyl* | | | *74* | *70* | *50-150* | | | |

Date of Report: October 14, 2011
Samples Submitted: September 28, 2011
Laboratory Reference: 1109-196
Project: 5147-012-02

**PAHs by EPA 8270D/SIM**
**METHOD BLANK QUALITY CONTROL**
**(with silica gel clean-up)**

Matrix: Soil
Units: mg/Kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| Laboratory ID: | MB1006S2 | | | | | |
| Naphthalene | **ND** | 0.0067 | EPA 8270/SIM | 10-6-11 | 10-6-11 | |
| 2-Methylnaphthalene | **ND** | 0.0067 | EPA 8270/SIM | 10-6-11 | 10-6-11 | |
| 1-Methylnaphthalene | **ND** | 0.0067 | EPA 8270/SIM | 10-6-11 | 10-6-11 | |
| Acenaphthylene | **ND** | 0.0067 | EPA 8270/SIM | 10-6-11 | 10-6-11 | |
| Acenaphthene | **ND** | 0.0067 | EPA 8270/SIM | 10-6-11 | 10-6-11 | |
| Fluorene | **ND** | 0.0067 | EPA 8270/SIM | 10-6-11 | 10-6-11 | |
| Phenanthrene | **ND** | 0.0067 | EPA 8270/SIM | 10-6-11 | 10-6-11 | |
| Anthracene | **ND** | 0.0067 | EPA 8270/SIM | 10-6-11 | 10-6-11 | |
| Fluoranthene | **ND** | 0.0067 | EPA 8270/SIM | 10-6-11 | 10-6-11 | |
| Pyrene | **ND** | 0.0067 | EPA 8270/SIM | 10-6-11 | 10-6-11 | |
| Benzo[a]anthracene | **ND** | 0.0067 | EPA 8270/SIM | 10-6-11 | 10-6-11 | |
| Chrysene | **ND** | 0.0067 | EPA 8270/SIM | 10-6-11 | 10-6-11 | |
| Benzo[b]fluoranthene | **ND** | 0.0067 | EPA 8270/SIM | 10-6-11 | 10-6-11 | |
| Benzo(j,k)fluoranthene | **ND** | 0.0067 | EPA 8270/SIM | 10-6-11 | 10-6-11 | |
| Benzo[a]pyrene | **ND** | 0.0067 | EPA 8270/SIM | 10-6-11 | 10-6-11 | |
| Indeno(1,2,3-c,d)pyrene | **ND** | 0.0067 | EPA 8270/SIM | 10-6-11 | 10-6-11 | |
| Dibenz[a,h]anthracene | **ND** | 0.0067 | EPA 8270/SIM | 10-6-11 | 10-6-11 | |
| Benzo[g,h,i]perylene | **ND** | 0.0067 | EPA 8270/SIM | 10-6-11 | 10-6-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *2-Fluorobiphenyl* | *81* | *43 - 109* | | | | |
| *Pyrene-d10* | *89* | *38 - 128* | | | | |
| *Terphenyl-d14* | *90* | *33 - 119* | | | | |

Date of Report: October 14, 2011
Samples Submitted: September 28, 2011
Laboratory Reference: 1109-196
Project: 5147-012-02

**PAHs by EPA 8270D/SIM**
**MS/MSD QUALITY CONTROL**
**(with silica gel clean-up)**

Matrix: Soil
Units: mg/Kg

| Analyte | Result | | Spike Level | | Source Result | Percent Recovery | | Recovery Limits | RPD | RPD Limit | Flags |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **MATRIX SPIKES** | | | | | | | | | | | |
| Laboratory ID: | 09-196-23 | | | | | | | | | | |
| | MS | MSD | MS | MSD | | MS | MSD | | | | |
| Naphthalene | **0.0596** | **0.0621** | 0.0833 | 0.0833 | ND | 72 | 75 | 39 - 110 | 4 | 21 | |
| Acenaphthylene | **0.0526** | **0.0589** | 0.0833 | 0.0833 | ND | 63 | 71 | 47 - 124 | 11 | 21 | |
| Acenaphthene | **0.0557** | **0.0605** | 0.0833 | 0.0833 | ND | 67 | 73 | 50 - 120 | 8 | 20 | |
| Fluorene | **0.0553** | **0.0598** | 0.0833 | 0.0833 | ND | 66 | 72 | 52 - 126 | 8 | 21 | |
| Phenanthrene | **0.0526** | **0.0578** | 0.0833 | 0.0833 | ND | 63 | 69 | 41 - 130 | 9 | 22 | |
| Anthracene | **0.0501** | **0.0558** | 0.0833 | 0.0833 | ND | 60 | 67 | 48 - 124 | 11 | 23 | |
| Fluoranthene | **0.0532** | **0.0592** | 0.0833 | 0.0833 | ND | 64 | 71 | 40 - 137 | 11 | 23 | |
| Pyrene | **0.0505** | **0.0565** | 0.0833 | 0.0833 | ND | 61 | 68 | 36 - 139 | 11 | 23 | |
| Benzo[a]anthracene | **0.0461** | **0.0528** | 0.0833 | 0.0833 | ND | 55 | 63 | 43 - 127 | 14 | 21 | |
| Chrysene | **0.0457** | **0.0518** | 0.0833 | 0.0833 | ND | 55 | 62 | 41 - 133 | 13 | 19 | |
| Benzo[b]fluoranthene | **0.0449** | **0.0515** | 0.0833 | 0.0833 | ND | 54 | 62 | 40 - 132 | 14 | 25 | |
| Benzo(j,k)fluoranthene | **0.0442** | **0.0510** | 0.0833 | 0.0833 | ND | 53 | 61 | 35 - 132 | 14 | 25 | |
| Benzo[a]pyrene | **0.0405** | **0.0464** | 0.0833 | 0.0833 | ND | 49 | 56 | 37 - 131 | 14 | 26 | |
| Indeno(1,2,3-c,d)pyrene | **0.0433** | **0.0506** | 0.0833 | 0.0833 | ND | 52 | 61 | 39 - 134 | 16 | 23 | |
| Dibenz[a,h]anthracene | **0.0457** | **0.0534** | 0.0833 | 0.0833 | ND | 55 | 64 | 40 - 137 | 16 | 21 | |
| Benzo[g,h,i]perylene | **0.0441** | **0.0515** | 0.0833 | 0.0833 | ND | 53 | 62 | 35 - 135 | 15 | 22 | |
| *Surrogate:* | | | | | | | | | | | |
| *2-Fluorobiphenyl* | | | | | | *65* | *70* | *43 - 109* | | | |
| *Pyrene-d10* | | | | | | *58* | *64* | *38 - 128* | | | |
| *Terphenyl-d14* | | | | | | *57* | *64* | *33 - 119* | | | |

Date of Report: October 14, 2011
Samples Submitted: September 28, 2011
Laboratory Reference: 1109-196
Project: 5147-012-02

**PCBs by EPA 8082**
**QUALITY CONTROL**

Matrix: Soil
Units: mg/Kg (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **METHOD BLANK** | | | | | | |
| Laboratory ID: | MB1004S1 | | | | | |
| Aroclor 1016 | **ND** | 0.050 | EPA 8082 | 10-4-11 | 10-5-11 | |
| Aroclor 1221 | **ND** | 0.050 | EPA 8082 | 10-4-11 | 10-5-11 | |
| Aroclor 1232 | **ND** | 0.050 | EPA 8082 | 10-4-11 | 10-5-11 | |
| Aroclor 1242 | **ND** | 0.050 | EPA 8082 | 10-4-11 | 10-5-11 | |
| Aroclor 1248 | **ND** | 0.050 | EPA 8082 | 10-4-11 | 10-5-11 | |
| Aroclor 1254 | **ND** | 0.050 | EPA 8082 | 10-4-11 | 10-5-11 | |
| Aroclor 1260 | **ND** | 0.050 | EPA 8082 | 10-4-11 | 10-5-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *DCB* | *73* | *42-123* | | | | |

| Analyte | Result | | Spike Level | | Source Result | Percent Recovery | | Recovery Limits | RPD | RPD Limit | Flags |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **MATRIX SPIKES** | | | | | | | | | | | |
| Laboratory ID: | 10-003-04 | | | | | | | | | | |
| | MS | MSD | MS | MSD | | MS | MSD | | | | |
| Aroclor 1260 | **0.405** | **0.404** | 0.500 | 0.500 | ND | **81** | **81** | 44-125 | 0 | 15 | |
| *Surrogate:* | | | | | | | | | | | |
| *DCB* | | | | | | *72* | *69* | *42-123* | | | |

Date of Report: October 14, 2011
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Laboratory Reference: 1109-196
Project: 5147-012-02

**TOTAL METALS**
**EPA 6010B**
**METHOD BLANK QUALITY CONTROL**

| | |
|---|---|
| Date Extracted: | 10-7-11 |
| Date Analyzed: | 10-11-11 |
| Matrix: | Soil |
| Units: | mg/kg (ppm) |
| Lab ID: | MB1007S3 |

| Analyte | Method | Result | PQL |
|---|---|---|---|
| Cadmium | 6010B | **ND** | 0.50 |
| Lead | 6010B | **ND** | 5.0 |

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Project: 5147-012-02

**TOTAL METALS**
**EPA 6010B**
**METHOD BLANK QUALITY CONTROL**

| | |
|---|---|
| Date Extracted: | 10-11-11 |
| Date Analyzed: | 10-11-11 |
| Matrix: | Soil |
| Units: | mg/kg (ppm) |
| Lab ID: | MB1011S1 |

| Analyte | Method | Result | PQL |
|---|---|---|---|
| Cadmium | 6010B | **ND** | 0.50 |
| Lead | 6010B | **ND** | 5.0 |

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Samples Submitted: September 28, 2011
Laboratory Reference: 1109-196
Project: 5147-012-02

**TOTAL METALS**
**EPA 6010B**
**DUPLICATE QUALITY CONTROL**

Date Extracted: 10-7-11
Date Analyzed: 10-11-11

Matrix: Soil
Units: mg/kg (ppm)

Lab ID: 09-196-13

| Analyte | Sample Result | Duplicate Result | RPD | PQL | Flags |
|---|---|---|---|---|---|
| Cadmium | **ND** | **ND** | NA | 0.50 | |
| Lead | **5.15** | **12.0** | 80 | 5.0 | C |

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Project: 5147-012-02

**TOTAL METALS**
**EPA 6010B**
**DUPLICATE QUALITY CONTROL**

Date Extracted: 10-11-11
Date Analyzed: 10-11-11

Matrix: Soil
Units: mg/kg (ppm)

Lab ID: 10-058-04

| Analyte | Sample Result | Duplicate Result | RPD | PQL | Flags |
|---|---|---|---|---|---|
| Cadmium | **ND** | **ND** | NA | 0.50 | |
| Lead | **19.5** | **20.1** | 3 | 5.0 | |

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Samples Submitted: September 28, 2011
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Project: 5147-012-02

**TOTAL METALS**
**EPA 6010B**
**MS/MSD QUALITY CONTROL**

Date Extracted: 10-7-11
Date Analyzed: 10-11-11

Matrix: Soil
Units: mg/kg (ppm)

Lab ID: 09-196-13

| Analyte | Spike Level | MS | Percent Recovery | MSD | Percent Recovery | RPD | Flags |
|---|---|---|---|---|---|---|---|
| Cadmium | 50.0 | **46.8** | 94 | **47.0** | 94 | 0 | |
| Lead | 250 | **224** | 87 | **240** | 94 | 7 | |

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Samples Submitted: September 28, 2011
Laboratory Reference: 1109-196
Project: 5147-012-02

**TOTAL METALS**
**EPA 6010B**
**MS/MSD QUALITY CONTROL**

Date Extracted: 10-11-11
Date Analyzed: 10-11-11

Matrix: Soil
Units: mg/kg (ppm)

Lab ID: 10-058-04

| Analyte | Spike Level | MS | Percent Recovery | MSD | Percent Recovery | RPD | Flags |
|---|---|---|---|---|---|---|---|
| Cadmium | 50.0 | **48.2** | 96 | **48.5** | 97 | 1 | |
| Lead | 250 | **246** | 91 | **248** | 92 | 1 | |

Date of Report: October 14, 2011
Samples Submitted: September 28, 2011
Laboratory Reference: 1109-196
Project: 5147-012-02

**HALOGENATED VOLATILES by EPA 8260B**
**METHOD BLANK QUALITY CONTROL**

Matrix: Soil
Units: mg/kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| Laboratory ID: | MB1006S1 | | | | | |
| Vinyl Chloride | ND | 0.0010 | EPA 8260 | 10-6-11 | 10-6-11 | |
| Trichlorofluoromethane | ND | 0.0010 | EPA 8260 | 10-6-11 | 10-6-11 | |
| Methyl t-Butyl Ether | ND | 0.0010 | EPA 8260 | 10-6-11 | 10-6-11 | |
| (cis) 1,2-Dichloroethene | ND | 0.0010 | EPA 8260 | 10-6-11 | 10-6-11 | |
| 1,1,1-Trichloroethane | ND | 0.0010 | EPA 8260 | 10-6-11 | 10-6-11 | |
| Carbon Tetrachloride | ND | 0.0010 | EPA 8260 | 10-6-11 | 10-6-11 | |
| 1,2-Dichloroethane | ND | 0.0010 | EPA 8260 | 10-6-11 | 10-6-11 | |
| Trichloroethene | ND | 0.0010 | EPA 8260 | 10-6-11 | 10-6-11 | |
| Tetrachloroethene | ND | 0.0010 | EPA 8260 | 10-6-11 | 10-6-11 | |
| 1,2-Dibromoethane | ND | 0.0010 | EPA 8260 | 10-6-11 | 10-6-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Dibromofluoromethane* | *95* | *63-127* | | | | |
| *Toluene-d8* | *98* | *65-129* | | | | |
| *4-Bromofluorobenzene* | *91* | *55-121* | | | | |
| Laboratory ID: | MB1007S2 | | | | | |
| Vinyl Chloride | ND | 0.0010 | EPA 8260 | 10-7-11 | 10-7-11 | |
| Trichlorofluoromethane | ND | 0.0010 | EPA 8260 | 10-7-11 | 10-7-11 | |
| Methyl t-Butyl Ether | ND | 0.0010 | EPA 8260 | 10-7-11 | 10-7-11 | |
| (cis) 1,2-Dichloroethene | ND | 0.0010 | EPA 8260 | 10-7-11 | 10-7-11 | |
| 1,1,1-Trichloroethane | ND | 0.0010 | EPA 8260 | 10-7-11 | 10-7-11 | |
| Carbon Tetrachloride | ND | 0.0010 | EPA 8260 | 10-7-11 | 10-7-11 | |
| 1,2-Dichloroethane | ND | 0.0010 | EPA 8260 | 10-7-11 | 10-7-11 | |
| Trichloroethene | ND | 0.0010 | EPA 8260 | 10-7-11 | 10-7-11 | |
| Tetrachloroethene | ND | 0.0010 | EPA 8260 | 10-7-11 | 10-7-11 | |
| 1,2-Dibromoethane | ND | 0.0010 | EPA 8260 | 10-7-11 | 10-7-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Dibromofluoromethane* | *97* | *63-127* | | | | |
| *Toluene-d8* | *93* | *65-129* | | | | |
| *4-Bromofluorobenzene* | *92* | *55-121* | | | | |

Date of Report: October 14, 2011
Samples Submitted: September 28, 2011
Laboratory Reference: 1109-196
Project: 5147-012-02

**HALOGENATED VOLATILES by EPA 8260B**
**SB/SBD QUALITY CONTROL**

Matrix: Soil
Units: mg/kg

| Analyte | Result | | Spike Level | | Percent Recovery | | Recovery Limits | RPD | RPD Limit | Flags |
|---|---|---|---|---|---|---|---|---|---|---|
| **SPIKE BLANKS** | | | | | | | | | | |
| Laboratory ID: | SB1006S1 | | | | | | | | | |
| | SB | SBD | SB | SBD | SB | SBD | | | | |
| 1,1-Dichloroethene | **0.0516** | **0.0538** | 0.0500 | 0.0500 | 103 | 108 | 70-130 | 4 | 19 | |
| Benzene | **0.0476** | **0.0480** | 0.0500 | 0.0500 | 95 | 96 | 70-125 | 1 | 15 | |
| Trichloroethene | **0.0471** | **0.0469** | 0.0500 | 0.0500 | 94 | 94 | 70-122 | 0 | 14 | |
| Toluene | **0.0479** | **0.0477** | 0.0500 | 0.0500 | 96 | 95 | 73-120 | 0 | 16 | |
| Chlorobenzene | **0.0497** | **0.0482** | 0.0500 | 0.0500 | 99 | 96 | 74-109 | 3 | 12 | |
| *Surrogate:* | | | | | | | | | | |
| *Dibromofluoromethane* | | | | | *87* | *87* | *63-127* | | | |
| *Toluene-d8* | | | | | *91* | *90* | *65-129* | | | |
| *4-Bromofluorobenzene* | | | | | *82* | *82* | *55-121* | | | |
| Laboratory ID: | SB1007S2 | | | | | | | | | |
| | SB | SBD | SB | SBD | SB | SBD | | | | |
| 1,1-Dichloroethene | **0.0455** | **0.0473** | 0.0500 | 0.0500 | 91 | 95 | 70-130 | 4 | 19 | |
| Benzene | **0.0452** | **0.0471** | 0.0500 | 0.0500 | 90 | 94 | 70-125 | 4 | 15 | |
| Trichloroethene | **0.0464** | **0.0472** | 0.0500 | 0.0500 | 93 | 94 | 70-122 | 2 | 14 | |
| Toluene | **0.0455** | **0.0456** | 0.0500 | 0.0500 | 91 | 91 | 73-120 | 0 | 16 | |
| Chlorobenzene | **0.0479** | **0.0483** | 0.0500 | 0.0500 | 96 | 97 | 74-109 | 1 | 12 | |
| *Surrogate:* | | | | | | | | | | |
| *Dibromofluoromethane* | | | | | *88* | *87* | *63-127* | | | |
| *Toluene-d8* | | | | | *89* | *85* | *65-129* | | | |
| *4-Bromofluorobenzene* | | | | | *83* | *82* | *55-121* | | | |

Date of Report: October 14, 2011
Samples Submitted: September 28, 2011
Laboratory Reference: 1109-196
Project: 5147-012-02

**NWTPH-Gx**
**QUALITY CONTROL**

Matrix: Soil
Units: mg/kg (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **METHOD BLANK** | | | | | | |
| Laboratory ID: | MB1012S1 | | | | | |
| Gasoline | **ND** | 5.0 | NWTPH-Gx | 10-12-11 | 10-12-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *94* | *68-124* | | | | |

| Analyte | Result | | Spike Level | | Source Result | Percent Recovery | | Recovery Limits | RPD | RPD Limit | Flags |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **DUPLICATE** | | | | | | | | | | | |
| Laboratory ID: | 09-196-17 | | | | | | | | | | |
| | ORIG | DUP | | | | | | | | | |
| Gasoline | **ND** | **ND** | NA | NA | | NA | | NA | NA | 30 | |
| *Surrogate:* | | | | | | | | | | | |
| *Fluorobenzene* | | | | | | *98* | *101* | *68-124* | | | |

Date of Report: October 14, 2011
Samples Submitted: September 28, 2011
Laboratory Reference: 1109-196
Project: 5147-012-02

**% MOISTURE**

Date Analyzed: 10-4,6,7&12-11

| Client ID | Lab ID | % Moisture |
|---|---|---|
| GEI-11-5.0 | 09-196-02 | 19 |
| GEI-11-10.0 | 09-196-04 | 15 |
| GEI-12-7.5 | 09-196-08 | 16 |
| GEI-12-12.0 | 09-196-10 | 17 |
| GEI-12-15.0 | 09-196-11 | 24 |
| GEI-13-5.0 | 09-196-13 | 7 |
| GEI-13-7.5 | 09-196-14 | 16 |
| GEI-13-12.5 | 09-196-16 | 20 |
| GEI-13-15.0 | 09-196-17 | 15 |
| GEI-14-5.0 | 09-196-21 | 10 |
| GEI-14-8.0 | 09-196-22 | 11 |
| GEI-14-10.0 | 09-196-23 | 20 |
| GEI-15-5.0 | 09-196-26 | 8 |
| GEI-15-10.0 | 09-196-28 | 17 |
| GEI-15A-5.0 | 09-196-32 | 19 |
| GEI-15A-10.0 | 09-196-34 | 28 |
| GEI-30-7.5 | 09-196-38 | 14 |

OnSite Environmental Inc.

**Data Qualifiers and Abbreviations**

A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.

B - The analyte indicated was also found in the blank sample.

C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.

E - The value reported exceeds the quantitation range and is an estimate.

F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.

H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.

I - Compound recovery is outside of the control limits.

J - The value reported was below the practical quantitation limit. The value is an estimate.

K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.

L - The RPD is outside of the control limits.

M - Hydrocarbons in the gasoline range are impacting the diesel range result.

M1 - Hydrocarbons in the gasoline range (toluene-napthalene) are present in the sample.

N - Hydrocarbons in the lube oil range are impacting the diesel range result.

N1 - Hydrocarbons in diesel range are impacting lube oil range results.

O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.

P - The RPD of the detected concentrations between the two columns is greater than 40.

Q - Surrogate recovery is outside of the control limits.

S - Surrogate recovery data is not available due to the necessary dilution of the sample.

T - The sample chromatogram is not similar to a typical _____.

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

U1 - The practical quantitation limit is elevated due to interferences present in the sample.

V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.

W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.

X - Sample extract treated with a mercury cleanup procedure.

Y - Sample extract treated with an acid/silica gel cleanup procedure.

Z -

ND - Not Detected at PQL
PQL - Practical Quantitation Limit
RPD - Relative Percent Difference

# Chain of Custody

OnSite Environmental Inc.
14648 NE 95th Street • Redmond, WA 98052
Phone: (425) 883-3881 • www.onsite-env.com



Laboratory Number: 09-196

Company: GEI

Project Number: 5147-012-02

Project Name: FORMER SHELL TANK FARM

Project Manager: ROBERT TRAHAN

Sampled by: ABHIJIT JOSHI

**Turnaround Request (in working days)**

(Check One)

- ☐ Same Day
- ☐ 1 Day
- ☐ 2 Days
- ☐ 3 Days
- ☒ Standard (7 Days) (TPH analysis 5 Days)
- ☐ _____ (other)

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | Number of Containers | NWTPH-HCID | NWTPH-Gx/BTEX | NWTPH-Gx | NWTPH-Dx | Volatiles 8260B | Halogenated Volatiles 8260B | Semivolatiles 8270D/SIM (with low-level PAHs) | PAHs 8270D/SIM (low-level) | PCBs 8082 | Organochlorine Pesticides 8081A | Organophosphorus Pesticides 8270D/SIM | Chlorinated Acid Herbicides 8151A | Total RCRA / MTCA Metals (circle one) | TCLP Metals | HEM (oil and grease) 1664 | LEAD | | MTBE EDB EDC | | PCE, TCE, cis-1,2 DCE, 1,1,1-TCA (GC/MS Analytical Volatiles Method) | | % Moisture |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | GEI-11-2.5 | 9/28/11 | 840 | SOIL | 1 | | | | | | | | | | | | | | | | | | | | | | |
| 2 | GEI-11-5.0 | " | 845 | " | 5 | | X | | X | | | | X | X | | | | | | | X | | X | | | | X |
| 3 | GEI-11-7.5 | | 850 | | 5 | | | | | | | | | | | | | | | | | | | | | | |
| 4 | GEI-11-100 | | 855 | | 5 | | X | | X | | | | X | X | | | | | | | X | | X | | | | X |
| 5 | GEI-11-13.0 | | 0900 | | 1 | | | | | | | | | | | | | | | | | | | | | | |
| 6 | GEI-12-2.5 | | 0920 | | 1 | | | | | | | | | | | | | | | | | | | | | | |
| 7 | GEI-12-5.0 | | 925 | | 1 | | | | | | | | | | | | | | | | | | | | | | |
| 8 | GEI-12-7.5 | | 930 | | 5 | | X | | X | | | | X | | | | | | | | X | | X | | X | | X |
| 9 | GEI-12-10.0 | | 935 | | 5 | | | | | | | | | | | | | | | | | | | | | | |
| 10 | GEI-12-12.0 | ↓ | 940 | ↓ | 5 | | X | | X | | | | X | | | | | | | | X | | X | | X | | X |

| | Signature | Company | Date | Time |
|---|---|---|---|---|
| Relinquished | [signature] | GEI | 9/28/11 | 1445 |
| Received | Brit Perry | Speedy messenger | 9/28/11 | 13:03 |
| Relinquished | Brit Perry | Speedy messenger | 9/28/11 | 1700 |
| Received | [signature] | GSE | 9/28/11 | 1700 |
| Relinquished | | | | |
| Received | | | | |
| Reviewed/Date | | Reviewed/Date | | |

**Comments/Special Instructions**

X - Added 10/4/11. DB (STA)

Chromatograms with final report ☐

Data Package: Level III ☐ Level IV ☐ Electronic Data Deliverables (EDDs) ☐ _____

# Chain of Custody



OnSite Environmental Inc.
14648 NE 95th Street • Redmond, WA 98052
Phone: (425) 883-3881 • www.onsite-env.com

Laboratory Number: 09-196

Company: 5147-012-02
Project Number: GE1
Project Name: FORMER SHELL TANK FARM
Project Manager: KST
Sampled by: AJ

Turnaround Request (in working days)
(Check One)
- [ ] Same Day
- [ ] 1 Day
- [ ] 2 Days
- [ ] 3 Days
- [ ] Standard (7 Days) (TPH analysis 5 Days)
- [ ] _____ (other)

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | Number of Containers | NWTPH-HCID | NWTPH-Gx/BTEX | NWTPH-Gx | NWTPH-Dx | Volatiles 8260B | Halogenated Volatiles 8260B | Semivolatiles 8270D/SIM (with low-level PAHs) | PAHs 8270D/SIM (low-level) | PCBs 8082 | Organochlorine Pesticides 8081A | Organophosphorus Pesticides 8270D/SIM | Chlorinated Acid Herbicides 8151A | Total RCRA / MTCA Metals (circle one) | TCLP Metals | HEM (oil and grease) 1664 | LEAD | CADMIUM | MTBE EDB EDC | PCE, TCE, cis-1,2 DCE, 1,1,1-TCA, VC, Trichloroethene, Dichloroethene, Carbon Tetrachloride, Benzene | % Moisture |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11 | GE1-12-15.0 | 9/28/11 | 945 | Soil | 1 | | X | | X | | | | X | | | | | | | | X | | X | X | X |
| 12 | GE1-13-2.5 | | 1200 | | 1 | | | | | | | | | | | | | | | | | | | | |
| 13 | GE1-13-5.0 | | 1205 | | 5 | | X | | X | | | | X | | | | | | | | X | X | | | X |
| 14 | GE1-13-7.5 | | 1210 | | 5 | | X | | X | | | | X | | | | | | | | X | X | | | X |
| 15 | GE1-13-10.0 | | 1215 | | 1 | | | | | | | | | | | | | | | | | | | | |
| 16 | GE1-13-12.5 | | 1220 | | 5 | | X | | X | | | | X | | | | | | | | X | X | | | X |
| 17 | GE1-13-15.0 | | 1225 | | 1 | | | | | | | | | | | | | | | | | | | | |
| 18 | GE1-13-17.5 | | 1230 | | 1 | | | | | | | | | | | | | | | | | | | | |
| 19 | GE1-13-20.0 | | 1235 | | 1 | | | | | | | | | | | | | | | | | | | | |
| 20 | GE1-14-2.5 | | 1055 | | 1 | | | | | | | | | | | | | | | | | | | | |

| | Signature | Company | Date | Time |
|---|---|---|---|---|
| Relinquished | [signature] | GE1 | 9/28/11 | 1445 |
| Received | [signature] | Speedy messenger | 9/28/11 | 13:03 |
| Relinquished | [signature] | Speedy messenger | 9/28/11 | 1700 |
| Received | [signature] | QLG | 9/28/11 | 1700 |
| Relinquished | | | | |
| Received | | | | |
| Reviewed/Date | | Reviewed/Date | | |

Comments/Special Instructions
X - Added 10/4/11. DB (STA)

Chromatograms with final report ☐

Data Package: Level III ☐ Level IV ☐ Electronic Data Deliverables (EDDs) ☐ _____

# Chain of Custody



OnSite Environmental Inc.
14648 NE 95th Street • Redmond, WA 98052
Phone: (425) 883-3881 • www.onsite-env.com

Company: GEI
Project Number: 5147-012-02
Project Name: FORMER SHELL TERMINAL FARM
Project Manager: RST
Sampled by: AJ

**Turnaround Request (in working days)**
(Check One)
☐ Same Day ☐ 1 Day
☐ 2 Days ☐ 3 Days
☒ Standard (7 Days)
(TPH analysis 5 Days)
☐ _____ (other)

**Laboratory Number: 09-196**

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | Number of Containers | NWTPH-HCID | NWTPH-Gx/BTEX | NWTPH-Gx | NWTPH-Dx | Volatiles 8260B | Halogenated Volatiles 8260B | Semivolatiles 8270D/SIM (with low-level PAHs) | PAHs 8270D/SIM (low-level) | PCBs 8082 | Organochlorine Pesticides 8081A | Organophosphorus Pesticides 8270D/SIM | Chlorinated Acid Herbicides 8151A | Total RCRA / MTCA Metals (circle one) | TCLP Metals | HEM (oil and grease) 1664 | LEAD | CADMIUM | | | | | % Moisture |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 21 | GEI-14-5.0 | 9/28/11 | 1100 | SOIL | 1 | | X | | X | | | | X | | | | | | | | X | X | | | | | X |
| 22 | GEI-14-8.0 | " | 1105 | " | 5 | | X | | X | | | | X | | | | | | | | X | X | | | | | X |
| 23 | GEI-14-10.0 | | 1110 | | 5 | | X | | X | | | | X | | | | | | | | X | X | | | | | X |
| 24 | GEI-14-13.0 | | 1115 | | 1 | | | | | | | | | | | | | | | | | | | | | | |
| 25 | GEI-15-2.5 | | 1120 | | 1 | | | | | | | | | | | | | | | | | | | | | | |
| 26 | GEI-15-5.0 | | 1125 | | 1 | | | | | | | | | | | | | | | | | X | | | | | X |
| 27 | GEI-15-7.5 | | 1130 | | 5 | | | | | | | | | | | | | | | | | | | | | | |
| 28 | GEI-15-10.0 | | 1135 | | 5 | | | | | | | | | | | | | | | | | X | | | | | X |
| 29 | GEI-15-12.5 | | 1140 | | 5 | | | | | | | | | | | | | | | | | | | | | | |
| 30 | GEI-15-15.0 | ↓ | 1145 | ↓ | 1 | | | | | | | | | | | | | | | | | | | | | | |

| | Signature | Company | Date | Time |
|---|---|---|---|---|
| Relinquished | [signature] | GEI | 1445 | 9/28/11 |
| Received | [signature] | Speedy messenger | 13:03 | 9/29/11 |
| Relinquished | [signature] | Speedy messenger | 0100 | 9/29/11 |
| Received | [signature] | GEI | 9/28/11 | 1700 |
| Relinquished | | | | |
| Received | | | | |

**Comments/Special Instructions**
X-Added 10/4/11. DB (STA)

Reviewed/Date
Reviewed/Date
Chromatograms with final report ☐

Data Package: Level III ☐ Level IV ☐ Electronic Data Deliverables (EDDs) ☐ _____

# Chain of Custody



OnSite Environmental Inc.
14648 NE 95th Street • Redmond, WA 98052
Phone (425) 883-3881 • www.onsite-env.com

Company: GEI
Project Number: 5147-012-02
Project Name: FORMER SHELL TANK FARM
Project Manager: RST
Sampled by: AJ

**Turnaround Request (in working days)**
(Check One)
☐ Same Day ☐ 1 Day
☐ 2 Days ☐ 3 Days
☒ Standard (7 Days) (TPH analysis 5 Days)
☐ _____ (other)

**Laboratory Number: 09-196**

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | Number of Containers | NWTPH-HCID | NWTPH-Gx/BTEX | NWTPH-Gx | NWTPH-Dx | Volatiles 8260B | Halogenated Volatiles 8260B | Semivolatiles 8270D/SIM (with low-level PAHs) | PAHs 8270D/SIM (low-level) | PCBs 8082 | Organochlorine Pesticides 8081A | Organophosphorus Pesticides 8270D/SIM | Chlorinated Acid Herbicides 8151A | Total RCRA / MTCA Metals (circle one) | TCLP Metals | HEM (oil and grease) 1664 | LEAD | CADMIUM | | | | % Moisture |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 31 | GEI-15A-2.5 | 9/28/11 | 1310 | SOIL | 1 | | | | | | | | | | | | | | | | | | | | | |
| 32 | GEI-15A-5.0 | " | 1315 | " | 1 | | | | | | | | | | | | | | | | | X | | | | X |
| 33 | GEI-15A-7.5 | | 1320 | | 1 | | | | | | | | | | | | | | | | | | | | | |
| 34 | GEI-15A-10.0 | | 1325 | | 5 | | | | | | | | | | | | | | | | | X | | | | X |
| 35 | GEI-15A-13.0 | | 1330 | | 1 | | | | | | | | | | | | | | | | | | | | | |
| 36 | GEI-30-2.5 | | 1400 | | 1 | | | | | | | | | | | | | | | | | | | | | |
| 37 | GEI-30-5.0 | | 1405 | | 5 | | | | | | | | | | | | | | | | | | | | | |
| 38 | GEI-30-7.5 | | 1410 | | 5 | | X | | X | | | | X | | | | | | | | X | | | | | X |
| 39 | GEI-30-10.0 | | 1415 | | 1 | | | | | | | | | | | | | | | | | | | | | |
| 40 | GEI-30-13.0 | V | 1420 | V | 1 | | | | | | | | | | | | | | | | | | | | | |

| | Signature | Company | Date | Time |
|---|---|---|---|---|
| Relinquished | | GEI | 9/28/11 | 1445 |
| Received | | Speedy messenger | 9/28/11 | 13:03 |
| Relinquished | | Speedy messenger | 9/28/11 | 1658 |
| Received | | GEI | 9/28/11 | 1700 |
| Relinquished | | | | |
| Received | | | | |
| Reviewed/Date | | Reviewed/Date | | |

**Comments/Special Instructions**
X-added 10/4/11. DB (STA)

Chromatograms with final report ☐

Data Package: Level III ☐ Level IV ☐ Electronic Data Deliverables (EDDs) ☐ _____

OnSite Environmental Inc.

14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

October 21, 2011

Robert Trahan
GeoEngineers, Inc.
600 Stewart, Suite 1700
Seattle, WA 98101-1233

Re: Analytical Data for Project 5147-012-02
Laboratory Reference No. 1109-196B

Dear Robert:

Enclosed are the analytical results and associated quality control data for samples submitted on September 28, 2011.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

David Baumeister
Project Manager

Enclosures

Date of Report: October 21, 2011
Samples Submitted: September 28, 2011
Laboratory Reference: 1109-196B
Project: 5147-012-02

**Case Narrative**

Samples were collected on September 28, 2011 and received by the laboratory on September 28, 2011. They were maintained at the laboratory at a temperature of 2°C to 6°C.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.

NWTPH Gx/BTEX Analysis

Per EPA Method 5035A, samples were received by the laboratory in pre-weighed 40 mL VOA vials within 48 hours of sample collection. They were stored in a freezer at between -7°C and -20°C until extraction or analysis.

Sample analysis holding time was exceeded for sample GEI-15-10.0 by one week.

Any other QA/QC issues associated with this extraction and analysis will be indicated with a footnote reference and discussed in detail on the Data Qualifier page.

Date of Report: October 21, 2011
Samples Submitted: September 28, 2011
Laboratory Reference: 1109-196B
Project: 5147-012-02

**ANALYTICAL REPORT FOR SAMPLES**

| Client ID | Laboratory ID | Matrix | Date Sampled | Date Received | Notes |
|---|---|---|---|---|---|
| GEI-15-10.0 | 09-196-28 | Soil | 9-28-11 | 9-28-11 | |

Date of Report: October 21, 2011
Samples Submitted: September 28, 2011
Laboratory Reference: 1109-196B
Project: 5147-012-02

**NWTPH-Gx/BTEX**

Matrix: Soil
Units: mg/kg (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-15-10.0** | | | | | |
| Laboratory ID: | 09-196-28 | | | | | |
| Benzene | **ND** | 0.020 | EPA 8021 | 10-20-11 | 10-20-11 | |
| Toluene | **ND** | 0.057 | EPA 8021 | 10-20-11 | 10-20-11 | |
| Ethyl Benzene | **ND** | 0.057 | EPA 8021 | 10-20-11 | 10-20-11 | |
| m,p-Xylene | **ND** | 0.057 | EPA 8021 | 10-20-11 | 10-20-11 | |
| o-Xylene | **ND** | 0.057 | EPA 8021 | 10-20-11 | 10-20-11 | |
| Gasoline | **ND** | 5.7 | NWTPH-Gx | 10-20-11 | 10-20-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *99* | *68-124* | | | | |

Date of Report: October 21, 2011
Samples Submitted: September 28, 2011
Laboratory Reference: 1109-196B
Project: 5147-012-02

**NWTPH-Gx/BTEX**
**QUALITY CONTROL**

Matrix: Soil
Units: mg/kg (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **METHOD BLANK** | | | | | | |
| Laboratory ID: | MB1020S1 | | | | | |
| Benzene | **ND** | 0.020 | EPA 8021 | 10-20-11 | 10-20-11 | |
| Toluene | **ND** | 0.050 | EPA 8021 | 10-20-11 | 10-20-11 | |
| Ethyl Benzene | **ND** | 0.050 | EPA 8021 | 10-20-11 | 10-20-11 | |
| m,p-Xylene | **ND** | 0.050 | EPA 8021 | 10-20-11 | 10-20-11 | |
| o-Xylene | **ND** | 0.050 | EPA 8021 | 10-20-11 | 10-20-11 | |
| Gasoline | **ND** | 5.0 | NWTPH-Gx | 10-20-11 | 10-20-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *98* | *68-124* | | | | |

| Analyte | Result | | Spike Level | | Source Result | Percent Recovery | | Recovery Limits | RPD | RPD Limit | Flags |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **DUPLICATE** | | | | | | | | | | | |
| Laboratory ID: | 10-134-01 | | | | | | | | | | |
| | ORIG | DUP | | | | | | | | | |
| Benzene | **ND** | **ND** | NA | NA | | NA | | NA | NA | 30 | |
| Toluene | **ND** | **ND** | NA | NA | | NA | | NA | NA | 30 | |
| Ethyl Benzene | **ND** | **ND** | NA | NA | | NA | | NA | NA | 30 | |
| m,p-Xylene | **ND** | **ND** | NA | NA | | NA | | NA | NA | 30 | |
| o-Xylene | **ND** | **ND** | NA | NA | | NA | | NA | NA | 30 | |
| Gasoline | **ND** | **ND** | NA | NA | | NA | | NA | NA | 30 | |
| *Surrogate:* | | | | | | | | | | | |
| *Fluorobenzene* | | | | | | *100* | *101* | *68-124* | | | |
| **SPIKE BLANKS** | | | | | | | | | | | |
| Laboratory ID: | SB1020S1 | | | | | | | | | | |
| | SB | SBD | SB | SBD | | SB | SBD | | | | |
| Benzene | **0.982** | **0.969** | 1.00 | 1.00 | | **98** | **97** | 77-114 | 1 | 9 | |
| Toluene | **0.998** | **0.979** | 1.00 | 1.00 | | **100** | **98** | 80-115 | 2 | 9 | |
| Ethyl Benzene | **0.975** | **0.964** | 1.00 | 1.00 | | **98** | **96** | 80-118 | 1 | 9 | |
| m,p-Xylene | **0.984** | **0.964** | 1.00 | 1.00 | | **98** | **96** | 82-118 | 2 | 9 | |
| o-Xylene | **0.972** | **0.958** | 1.00 | 1.00 | | **97** | **96** | 82-116 | 1 | 9 | |
| *Surrogate:* | | | | | | | | | | | |
| *Fluorobenzene* | | | | | | *100* | *99* | *68-124* | | | |

OnSite Environmental Inc.

**Data Qualifiers and Abbreviations**

A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.

B - The analyte indicated was also found in the blank sample.

C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.

E - The value reported exceeds the quantitation range and is an estimate.

F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.

H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.

I - Compound recovery is outside of the control limits.

J - The value reported was below the practical quantitation limit. The value is an estimate.

K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.

L - The RPD is outside of the control limits.

M - Hydrocarbons in the gasoline range are impacting the diesel range result.

M1 - Hydrocarbons in the gasoline range (toluene-napthalene) are present in the sample.

N - Hydrocarbons in the lube oil range are impacting the diesel range result.

N1 - Hydrocarbons in diesel range are impacting lube oil range results.

O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.

P - The RPD of the detected concentrations between the two columns is greater than 40.

Q - Surrogate recovery is outside of the control limits.

S - Surrogate recovery data is not available due to the necessary dilution of the sample.

T - The sample chromatogram is not similar to a typical _____.

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

U1 - The practical quantitation limit is elevated due to interferences present in the sample.

V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.

W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.

X - Sample extract treated with a mercury cleanup procedure.

Y - Sample extract treated with an acid/silica gel cleanup procedure.

Z -

ND - Not Detected at PQL
PQL - Practical Quantitation Limit
RPD - Relative Percent Difference

# Chain of Custody

OnSite Environmental Inc.
14648 NE 95th Street • Redmond, WA 98052
Phone: (425) 883-3881 • www.onsite-env.com



Laboratory Number: 09-196

Company: GEI

Project Number: 5147-012-02

Project Name: FORMER SHELL TANK FARM

Project Manager: ROBERT TRAHAN

Sampled by: ABHIJIT JOSHI

**Turnaround Request (in working days)**

(Check One)

- ☐ Same Day
- ☐ 1 Day
- ☐ 2 Days
- ☐ 3 Days
- ☒ Standard (7 Days) (TPH analysis 5 Days)
- ☐ _____ (other)

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | Number of Containers | NWTPH-HCID | NWTPH-Gx/BTEX | NWTPH-Gx | NWTPH-Dx | Volatiles 8260B | Halogenated Volatiles 8260B | Semivolatiles 8270D/SIM (with low-level PAHs) | PAHs 8270D/SIM (low-level) | PCBs 8082 | Organochlorine Pesticides 8081A | Organophosphorus Pesticides 8270D/SIM | Chlorinated Acid Herbicides 8151A | Total RCRA / MTCA Metals (circle one) | TCLP Metals | HEM (oil and grease) 1664 | LEAD | | MTBE EDB EDC | | PCE, TCE, cis-1,2 DCE, 1,1,1-TCA, VC, Tetrachloroethene, Methylene chloride, Carbon Tetrachloride | | % Moisture |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | GEI-11-2.5 | 9/28/11 | 840 | SOIL | 1 | | | | | | | | | | | | | | | | | | | | | | |
| 2 | GEI-11-5.0 | | 845 | | 5 | | X | | X | | | | X | X | | | | | | | X | | X | | | | X |
| 3 | GEI-11-7.5 | | 850 | | 5 | | | | | | | | | | | | | | | | | | | | | | |
| 4 | GEI-11-10.0 | | 855 | | 5 | | X | | X | | | | X | X | | | | | | | X | | X | | | | X |
| 5 | GEI-11-13.0 | | 0900 | | 1 | | | | | | | | | | | | | | | | | | | | | | |
| 6 | GEI-12-2.5 | | 0920 | | 1 | | | | | | | | | | | | | | | | | | | | | | |
| 7 | GEI-12-5.0 | | 925 | | 1 | | | | | | | | | | | | | | | | | | | | | | |
| 8 | GEI-12-7.5 | | 930 | | 5 | | X | | X | | | | X | | | | | | | | X | | X | | X | | X |
| 9 | GEI-12-10.0 | | 935 | | 5 | | | | | | | | | | | | | | | | | | | | | | |
| 10 | GEI-12-12.0 | ↓ | 940 | ↓ | 5 | | X | | X | | | | X | | | | | | | | X | | X | | X | | X |

| | Signature | Company | Date | Time |
|---|---|---|---|---|
| Relinquished | | GEI | 9/28/11 | 1445 |
| Received | Bill Parry | SPEEDY messenger | 9/28/11 | 13:03 |
| Relinquished | Bill Parry | SPEEDY messenger | 9/28/11 | 1700 |
| Received | | GSE | 9/28/11 | 1700 |
| Relinquished | | | | |
| Received | | | | |
| Reviewed/Date | | Reviewed/Date | | |

**Comments/Special Instructions**

X - Added 10/4/11. DB (STA)
⊗ Added 10/13/11. DB (STA)
○ Added 10/28/11. DB (3 day TAT)

Chromatograms with final re

Data Package: Level III ☐ Level IV ☐ Electronic Data Deliverables (EDDs) ☐ _____

# Chain of Custody

Page 2 of 4

**OnSite Environmental Inc.**
14648 NE 95th Street • Redmond, WA 98052
Phone. (425) 883-3881 • www.onsite-env.com

Laboratory Number: 09-196

Company: 5147-012-02
Project Number: GEI
Project Name: FORMER SHELL TANK FARM
Project Manager: KST
Sampled by: AJ

**Turnaround Request (in working days)**
(Check One)
☐ Same Day ☐ 1 Day
☐ 2 Days ☐ 3 Days
☐ Standard (7 Days)
(TPH analysis 5 Days)
☐ _____ (other)

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | Number of Containers | NWTPH-HCID | NWTPH-Gx/BTEX | NWTPH-Gx | NWTPH-Dx | Volatiles 8260B | Halogenated Volatiles 8260B | Semivolatiles 8270D/SIM (with low-level PAHs) | PAHs 8270D/SIM (low-level) | PCBs 8082 | Organochlorine Pesticides 8081A | Organophosphorus Pesticides 8270D/SIM | Chlorinated Acid Herbicides 8151A | Total RCRA / MTCA Metals (circle one) | TCLP Metals | HEM (oil and grease) 1664 | LEAD | CADMIUM | MTBE EDB EDC | PCE, TCE, cis-1,2-DCE, 1,1-DCA, VC, Trichloroethene, Tetrachloroethene, Chloroform, Methylene Chloride, Naphthalene, 1,2-DCA | % Moisture |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11 | GEI-12-15.0 | 9/28/11 | 945 | SOIL | 1 | | X | | X | | | | X | | | | | | | | X | | X | X | X |
| 12 | GEI-13-2.5 | | 1200 | | 1 | | | | | | | | | | | | | | | | | | | | |
| 13 | GEI-13-5.0 | | 1205 | | 5 | | X | | X | | | | X | | | | | | | | X | X | | | X |
| 14 | GEI-13-7.5 | | 1210 | | 5 | | X | | X | | | | X | | | | | | | | X | X | | | X |
| 15 | GEI-13-10.0 | | 1215 | | 1 | | | | | | | | | | | | | | | | | | | | |
| 16 | GEI-13-12.5 | | 1220 | | 5 | | X | | X | | | | X | | | | | | | | X | X | | | X |
| 17 | GEI-13-15.0 | | 1225 | | 1 | | ⊗ - GAS ONLY | | | | | | | | | | | | | | | | | | ⊗ |
| 18 | GEI-13-17.5 | | 1230 | | 1 | | | | | | | | | | | | | | | | | | | | |
| 19 | GEI-13-20.0 | | 1235 | | 1 | | | | | | | | | | | | | | | | | | | | |
| 20 | GEI-14-2.5 | ↓ | 1050 | ↓ | 1 | | | | | | | | | | | | | | | | | | | | |

| | Signature | Company | Date | Time |
|---|---|---|---|---|
| Relinquished | | GEI | 9/27/11 | 1445 |
| Received | Dirk Pay | Speedy messenger | 9/28/11 | 13:03 |
| Relinquished | Dirk Pay | Speedy messenger | 9/28/11 | 1700 |
| Received | | OSG | 9/28/11 | 1700 |
| Relinquished | | | | |
| Received | | | | |
| Reviewed/Date | | Reviewed/Date | | |

**Comments/Special Instructions**

X - Added 10/4/11. DB (STA)
⊗ Added 10/12/11. DB (STA)

Chromatograms with final rep

Data Package. Level III ☐ Level IV ☐ Electronic Data Deliverables (EDDs) ☐ _____

# Chain of Custody



OnSite Environmental Inc.
14648 NE 95th Street • Redmond, WA 98052
Phone: (425) 883-3881 • www.onsite-env.com

Company: GEI
Project Number: 5147-012-02
Project Name: FORMER SHELL TERMINAL FARM
Project Manager: RST
Sampled by: AJ

**Turnaround Request (in working days)**
(Check One)
☐ Same Day ☐ 1 Day
☐ 2 Days ☐ 3 Days
☒ Standard (7 Days)
(TPH analysis 5 Days)
☐ _____ (other)

**Laboratory Number:** 09-196

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | Number of Containers | NWTPH-HCID | NWTPH-Gx/BTEX | NWTPH-Gx | NWTPH-Dx | Volatiles 8260B | Halogenated Volatiles 8260B | Semivolatiles 8270D/SIM (with low-level PAHs) | PAHs 8270D/SIM (low-level) | PCBs 8082 | Organochlorine Pesticides 8081A | Organophosphorus Pesticides 8270D/SIM | Chlorinated Acid Herbicides 8151A | Total RCRA / MTCA Metals (circle one) | TCLP Metals | HEM (oil and grease) 1664 | Lead | Cadmium | | | | | % Moisture |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 21 | GEI-14-5.0 | 9/28/11 | 1100 | Soil | 1 | | X | | X | | | | X | | | | | | | | X | X | | | | | X |
| 22 | GEI-14-8.0 | | 1105 | | 5 | | X | | X | | | | X | | | | | | | | X | X | | | | | X |
| 23 | GEI-14-10.0 | | 1110 | | 5 | | X | | X | | | | X | | | | | | | | X | X | | | | | X |
| 24 | GEI-14-13.0 | | 1115 | | 1 | | | | | | | | | | | | | | | | | | | | | | |
| 25 | GEI-15-2.5 | | 1120 | | 1 | | | | | | | | | | | | | | | | | | | | | | |
| 26 | GEI-15-5.0 | | 1125 | | 1 | | | | | | | | | | | | | | | | | X | | | | | X |
| 27 | GEI-15-7.5 | | 1130 | | 5 | | | | | | | | | | | | | | | | | | | | | | |
| 28 | GEI-15-10.0 | | 1135 | | 5 | | O | | | | | | | | | | | | | | | X | | | | | X |
| 29 | GEI-15-12.5 | | 1140 | | 5 | | | | | | | | | | | | | | | | | | | | | | |
| 30 | GEI-15-15.0 | ↓ | 1145 | ↓ | 1 | | | | | | | | | | | | | | | | | | | | | | |

| | Signature | Company | Date | Time |
|---|---|---|---|---|
| Relinquished | [signature] | GEI | 1445 | 9/28/11 |
| Received | [signature] | Speedy messenger | 13:03 | 9/28/11 |
| Relinquished | [signature] | Speedy messenger | drop | 9/28/11 |
| Received | [signature] | GEI | 9/28/11 | 1700 |
| Relinquished | | | | |
| Received | | | | |
| Reviewed/Date | | Reviewed/Date | | |

**Comments/Special Instructions**
X-Added 10/4/11 m. DB (STA)
OAdded 10/19/11 m. DB (3 day TAT)

Chromatograms with final report ☐

Data Package: Level III ☐ Level IV ☐ Electronic Data Deliverables (EDDs) ☐ _____

# Chain of Custody

Page 4 of 4

OnSite Environmental Inc.
14648 NE 95th Street • Redmond, WA 98052
Phone: (425) 883-3881 • www.onsite-env.com

Company: GEI

Project Number: 5147-012-02

Project Name: FORMER SHELL TANK FARM

Project Manager: RST

Sampled by: AJ

**Turnaround Request (in working days)**

(Check One)

- ☐ Same Day
- ☐ 1 Day
- ☐ 2 Days
- ☐ 3 Days
- ☒ Standard (7 Days) (TPH analysis 5 Days)
- ☐ _____ (other)

**Laboratory Number:** 09-196

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | Number of Containers | NWTPH-HCID | NWTPH-Gx/BTEX | NWTPH-Gx | NWTPH-Dx | Volatiles 8260B | Halogenated Volatiles 8260B | Semivolatiles 8270D/SIM (with low-level PAHs) | PAHs 8270D/SIM (low-level) | PCBs 8082 | Organochlorine Pesticides 8081A | Organophosphorus Pesticides 8270D/SIM | Chlorinated Acid Herbicides 8151A | Total RCRA / MTCA Metals (circle one) | TCLP Metals | HEM (oil and grease) 1664 | LEAD | CADMIUM | | | | % Moisture |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 31 | GEI-15A-2.5 | 9/28/11 | 1310 | SOIL | 1 | | | | | | | | | | | | | | | | | | | | | |
| 32 | GEI-15A-5.0 | | 1315 | | 1 | | | | | | | | | | | | | | | | | X | | | | X |
| 33 | GEI-15A-7.5 | | 1320 | | 1 | | | | | | | | | | | | | | | | | | | | | |
| 34 | GEI-15A-10.0 | | 1325 | | 5 | | | | | | | | | | | | | | | | | X | | | | X |
| 35 | GEI-15A-13.0 | | 1330 | | 1 | | | | | | | | | | | | | | | | | | | | | |
| 36 | GEI-30-2.5 | | 1400 | | 1 | | | | | | | | | | | | | | | | | | | | | |
| 37 | GEI-30-5.0 | | 1405 | | 5 | | | | | | | | | | | | | | | | | | | | | |
| 38 | GEI-30-7.5 | | 1410 | | 5 | | X | | X | | | | X | | | | | | | | X | | | | | X |
| 39 | GEI-30-10.0 | | 1415 | | 1 | | | | | | | | | | | | | | | | | | | | | |
| 40 | GEI-30-13.0 | V | 1420 | V | 1 | | | | | | | | | | | | | | | | | | | | | |

| | Signature | Company | Date | Time |
|---|---|---|---|---|
| Relinquished | | GEI | 9/28/11 | 1445 |
| Received | Drop Box | Speedy Messenger | 9/28/11 | 13:03 |
| Relinquished | Drop Box | Speedy Messenger | 9/28/11 | 1658 |
| Received | | | 9/28/11 | 1700 |
| Relinquished | | | | |
| Received | | | | |
| Reviewed/Date | | Reviewed/Date | | |

**Comments/Special Instructions**

X-added 10/4/11. DB (STA)

Chromatograms with final rep

Data Package: Level III ☐ Level IV ☐ Electronic Data Deliverables (EDDs) ☐ _____

OnSite Environmental Inc.

14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

October 14, 2011

Robert Trahan
GeoEngineers, Inc.
600 Stewart, Suite 1700
Seattle, WA 98101-1233

Re: Analytical Data for Project 5147-012-02
Laboratory Reference No. 1109-223

Dear Robert:

Enclosed are the analytical results and associated quality control data for samples submitted on September 30, 2011.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

David Baumeister
Project Manager

Enclosures

Date of Report: October 14, 2011
Samples Submitted: September 30, 2011
Laboratory Reference: 1109-223
Project: 5147-012-02

**Case Narrative**

Samples were collected on September 28 and 29, 2011 and received by the laboratory on September 30, 2011. They were maintained at the laboratory at a temperature of 2°C to 6°C.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.

NWTPH Gx/BTEX Analysis

Per EPA Method 5035A, samples were received by the laboratory in pre-weighed 40 mL VOA vials within 48 hours of sample collection. They were stored in a freezer at between -7°C and -20°C until extraction or analysis.

The surrogate recovery is outside of control limits on the high end for sample GEI-16-5.0; however, since the sample was non-detect no further action was taken.

The gasoline result for sample GEI-17-14.0 is mainly attributed to a single peak (Naphthalene).

The surrogate recovery is outside of the control limits for sample GEI-23-12.5 due to matrix effects. The sample was re-analyzed with similar results.

Any other QA/QC issues associated with this extraction and analysis will be indicated with a footnote reference and discussed in detail on the Data Qualifier page.

Date of Report: October 14, 2011
Samples Submitted: September 30, 2011
Laboratory Reference: 1109-223
Project: 5147-012-02

**ANALYTICAL REPORT FOR SAMPLES**
Page 1 of 2

| Client ID | Laboratory ID | Matrix | Date Sampled | Date Received | Notes |
|---|---|---|---|---|---|
| GEI-31-7.5 | 09-223-03 | Soil | 9-28-11 | 9-30-11 | |
| GEI-32-5.0 | 09-223-07 | Soil | 9-28-11 | 9-30-11 | |
| GEI-33-5.0 | 09-223-12 | Soil | 9-28-11 | 9-30-11 | |
| GEI-33-10.0 | 09-223-14 | Soil | 9-28-11 | 9-30-11 | |
| GEI-33-14.0 | 09-223-16 | Soil | 9-28-11 | 9-30-11 | |
| GEI-20-5.0 | 09-223-20 | Soil | 9-29-11 | 9-30-11 | |
| GEI-20-10.0 | 09-223-22 | Soil | 9-29-11 | 9-30-11 | |
| GEI-21-5.0 | 09-223-26 | Soil | 9-29-11 | 9-30-11 | |
| GEI-21-10.0 | 09-223-28 | Soil | 9-29-11 | 9-30-11 | |
| GEI-22-5.0 | 09-223-32 | Soil | 9-29-11 | 9-30-11 | |
| GEI-22-12.5 | 09-223-35 | Soil | 9-29-11 | 9-30-11 | |
| GEI-26-5.0 | 09-223-38 | Soil | 9-29-11 | 9-30-11 | |
| GEI-26-10.0 | 09-223-40 | Soil | 9-29-11 | 9-30-11 | |
| GEI-28-5.0 | 09-223-44 | Soil | 9-29-11 | 9-30-11 | |
| GEI-28-10.0 | 09-223-46 | Soil | 9-29-11 | 9-30-11 | |
| GEI-29-5.0 | 09-223-50 | Soil | 9-29-11 | 9-30-11 | |
| GEI-29-10.0 | 09-223-51 | Soil | 9-29-11 | 9-30-11 | |
| GEI-16-5.0 | 09-223-56 | Soil | 9-29-11 | 9-30-11 | |
| GEI-16-10.0 | 09-223-58 | Soil | 9-29-11 | 9-30-11 | |
| GEI-17-10.0 | 09-223-65 | Soil | 9-29-11 | 9-30-11 | |
| GEI-17-14.0 | 09-223-66 | Soil | 9-29-11 | 9-30-11 | |
| GEI-17-17.5 | 09-223-67 | Soil | 9-29-11 | 9-30-11 | |

Date of Report: October 14, 2011
Samples Submitted: September 30, 2011
Laboratory Reference: 1109-223
Project: 5147-012-02

**ANALYTICAL REPORT FOR SAMPLES**
Page 2 of 2

| Client ID | Laboratory ID | Matrix | Date Sampled | Date Received | Notes |
|---|---|---|---|---|---|
| GEI-18-5.0 | 09-223-70 | Soil | 9-29-11 | 9-30-11 | |
| GEI-18-12.5 | 09-223-72 | Soil | 9-29-11 | 9-30-11 | |
| GEI-18-15.0 | 09-223-73 | Soil | 9-29-11 | 9-30-11 | |
| GEI-19-5.0 | 09-223-77 | Soil | 9-29-11 | 9-30-11 | |
| GEI-19-10.0 | 09-223-79 | Soil | 9-29-11 | 9-30-11 | |
| GEI-23-7.5 | 09-223-86 | Soil | 9-29-11 | 9-30-11 | |
| GEI-23-12.5 | 09-223-88 | Soil | 9-29-11 | 9-30-11 | |
| GEI-23-15.0 | 09-223-89 | Soil | 9-29-11 | 9-30-11 | |
| GEI-24-5.0 | 09-223-91 | Soil | 9-29-11 | 9-30-11 | |
| GEI-24-10.0 | 09-223-93 | Soil | 9-29-11 | 9-30-11 | |
| GEI-25-5.0 | 09-223-97 | Soil | 9-29-11 | 9-30-11 | |
| GEI-25-10.0 | 09-223-99 | Soil | 9-29-11 | 9-30-11 | |
| GEI-27-7.5 | 09-223-104 | Soil | 9-29-11 | 9-30-11 | |
| GEI-27-11.0 | 09-223-105 | Soil | 9-29-11 | 9-30-11 | |
| GEI-27-13.0 | 09-223-106 | Soil | 9-29-11 | 9-30-11 | |
| GEI-34-12.0 | 09-223-112 | Soil | 9-29-11 | 9-30-11 | |
| GEI-35-15.0 | 09-223-119 | Soil | 9-29-11 | 9-30-11 | |

Date of Report: October 14, 2011
Samples Submitted: September 30, 2011
Laboratory Reference: 1109-223
Project: 5147-012-02

**NWTPH-Gx/BTEX**

Matrix: Soil
Units: mg/kg (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-31-7.5** | | | | | |
| Laboratory ID: | 09-223-03 | | | | | |
| Benzene | **ND** | 0.020 | EPA 8021 | 10-7-11 | 10-7-11 | |
| Toluene | **ND** | 0.070 | EPA 8021 | 10-7-11 | 10-7-11 | |
| Ethyl Benzene | **ND** | 0.070 | EPA 8021 | 10-7-11 | 10-7-11 | |
| m,p-Xylene | **ND** | 0.070 | EPA 8021 | 10-7-11 | 10-7-11 | |
| o-Xylene | **ND** | 0.070 | EPA 8021 | 10-7-11 | 10-7-11 | |
| Gasoline | **ND** | 7.0 | NWTPH-Gx | 10-7-11 | 10-7-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *94* | *68-124* | | | | |
| **Client ID:** | **GEI-32-5.0** | | | | | |
| Laboratory ID: | 09-223-07 | | | | | |
| Benzene | **ND** | 0.020 | EPA 8021 | 10-7-11 | 10-7-11 | |
| Toluene | **ND** | 0.064 | EPA 8021 | 10-7-11 | 10-7-11 | |
| Ethyl Benzene | **ND** | 0.064 | EPA 8021 | 10-7-11 | 10-7-11 | |
| m,p-Xylene | **ND** | 0.064 | EPA 8021 | 10-7-11 | 10-7-11 | |
| o-Xylene | **ND** | 0.064 | EPA 8021 | 10-7-11 | 10-7-11 | |
| Gasoline | **ND** | 6.4 | NWTPH-Gx | 10-7-11 | 10-7-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *98* | *68-124* | | | | |
| **Client ID:** | **GEI-33-5.0** | | | | | |
| Laboratory ID: | 09-223-12 | | | | | |
| Benzene | **ND** | 0.016 | EPA 8021 | 10-7-11 | 10-11-11 | |
| Toluene | **ND** | 0.16 | EPA 8021 | 10-7-11 | 10-10-11 | |
| Ethyl Benzene | **ND** | 0.16 | EPA 8021 | 10-7-11 | 10-10-11 | |
| m,p-Xylene | **ND** | 0.16 | EPA 8021 | 10-7-11 | 10-10-11 | |
| o-Xylene | **ND** | 0.16 | EPA 8021 | 10-7-11 | 10-10-11 | |
| Gasoline | **ND** | 16 | NWTPH-Gx | 10-7-11 | 10-10-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *89* | *68-124* | | | | |

Date of Report: October 14, 2011
Samples Submitted: September 30, 2011
Laboratory Reference: 1109-223
Project: 5147-012-02

**NWTPH-Gx/BTEX**

Matrix: Soil
Units: mg/kg (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-33-10.0** | | | | | |
| Laboratory ID: | 09-223-14 | | | | | |
| Benzene | **ND** | 0.027 | EPA 8021 | 10-7-11 | 10-10-11 | |
| Toluene | **ND** | 0.13 | EPA 8021 | 10-7-11 | 10-10-11 | |
| Ethyl Benzene | **ND** | 0.13 | EPA 8021 | 10-7-11 | 10-10-11 | |
| m,p-Xylene | **0.23** | 0.13 | EPA 8021 | 10-7-11 | 10-10-11 | |
| o-Xylene | **ND** | 0.13 | EPA 8021 | 10-7-11 | 10-10-11 | |
| Gasoline | **ND** | 13 | NWTPH-Gx | 10-7-11 | 10-10-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *100* | *68-124* | | | | |
| **Client ID:** | **GEI-33-14.0** | | | | | |
| Laboratory ID: | 09-223-16 | | | | | |
| Benzene | **ND** | 0.026 | EPA 8021 | 10-7-11 | 10-10-11 | |
| Toluene | **ND** | 0.13 | EPA 8021 | 10-7-11 | 10-10-11 | |
| Ethyl Benzene | **ND** | 0.13 | EPA 8021 | 10-7-11 | 10-10-11 | |
| m,p-Xylene | **ND** | 0.13 | EPA 8021 | 10-7-11 | 10-10-11 | |
| o-Xylene | **ND** | 0.13 | EPA 8021 | 10-7-11 | 10-10-11 | |
| Gasoline | **ND** | 13 | NWTPH-Gx | 10-7-11 | 10-10-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *106* | *68-124* | | | | |
| **Client ID:** | **GEI-20-5.0** | | | | | |
| Laboratory ID: | 09-223-20 | | | | | |
| Benzene | **ND** | 0.022 | EPA 8021 | 10-7-11 | 10-7-11 | |
| Toluene | **ND** | 0.11 | EPA 8021 | 10-7-11 | 10-7-11 | |
| Ethyl Benzene | **ND** | 0.11 | EPA 8021 | 10-7-11 | 10-7-11 | |
| m,p-Xylene | **ND** | 0.11 | EPA 8021 | 10-7-11 | 10-7-11 | |
| o-Xylene | **ND** | 0.11 | EPA 8021 | 10-7-11 | 10-7-11 | |
| Gasoline | **ND** | 11 | NWTPH-Gx | 10-7-11 | 10-7-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *104* | *68-124* | | | | |

Date of Report: October 14, 2011
Samples Submitted: September 30, 2011
Laboratory Reference: 1109-223
Project: 5147-012-02

**NWTPH-Gx/BTEX**

Matrix: Soil
Units: mg/kg (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-20-10.0** | | | | | |
| Laboratory ID: | 09-223-22 | | | | | |
| Benzene | **ND** | 0.023 | EPA 8021 | 10-7-11 | 10-7-11 | |
| Toluene | **ND** | 0.11 | EPA 8021 | 10-7-11 | 10-7-11 | |
| Ethyl Benzene | **ND** | 0.11 | EPA 8021 | 10-7-11 | 10-7-11 | |
| m,p-Xylene | **ND** | 0.11 | EPA 8021 | 10-7-11 | 10-7-11 | |
| o-Xylene | **ND** | 0.11 | EPA 8021 | 10-7-11 | 10-7-11 | |
| Gasoline | **ND** | 11 | NWTPH-Gx | 10-7-11 | 10-7-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *100* | *68-124* | | | | |
| **Client ID:** | **GEI-21-5.0** | | | | | |
| Laboratory ID: | 09-223-26 | | | | | |
| Benzene | **ND** | 0.021 | EPA 8021 | 10-7-11 | 10-11-11 | |
| Toluene | **ND** | 0.11 | EPA 8021 | 10-7-11 | 10-11-11 | |
| Ethyl Benzene | **ND** | 0.11 | EPA 8021 | 10-7-11 | 10-11-11 | |
| m,p-Xylene | **ND** | 0.11 | EPA 8021 | 10-7-11 | 10-11-11 | |
| o-Xylene | **ND** | 0.11 | EPA 8021 | 10-7-11 | 10-11-11 | |
| Gasoline | **ND** | 11 | NWTPH-Gx | 10-7-11 | 10-11-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *102* | *68-124* | | | | |
| **Client ID:** | **GEI-21-10.0** | | | | | |
| Laboratory ID: | 09-223-28 | | | | | |
| Benzene | **ND** | 0.020 | EPA 8021 | 10-7-11 | 10-7-11 | |
| Toluene | **ND** | 0.080 | EPA 8021 | 10-7-11 | 10-7-11 | |
| Ethyl Benzene | **ND** | 0.080 | EPA 8021 | 10-7-11 | 10-7-11 | |
| m,p-Xylene | **ND** | 0.080 | EPA 8021 | 10-7-11 | 10-7-11 | |
| o-Xylene | **ND** | 0.080 | EPA 8021 | 10-7-11 | 10-7-11 | |
| Gasoline | **ND** | 8.0 | NWTPH-Gx | 10-7-11 | 10-7-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *106* | *68-124* | | | | |

Date of Report: October 14, 2011
Samples Submitted: September 30, 2011
Laboratory Reference: 1109-223
Project: 5147-012-02

**NWTPH-Gx/BTEX**

Matrix: Soil
Units: mg/kg (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-22-5.0** | | | | | |
| Laboratory ID: | 09-223-32 | | | | | |
| Benzene | **ND** | 0.020 | EPA 8021 | 10-7-11 | 10-7-11 | |
| Toluene | **ND** | 0.073 | EPA 8021 | 10-7-11 | 10-7-11 | |
| Ethyl Benzene | **ND** | 0.073 | EPA 8021 | 10-7-11 | 10-7-11 | |
| m,p-Xylene | **ND** | 0.073 | EPA 8021 | 10-7-11 | 10-7-11 | |
| o-Xylene | **ND** | 0.073 | EPA 8021 | 10-7-11 | 10-7-11 | |
| Gasoline | **ND** | 7.3 | NWTPH-Gx | 10-7-11 | 10-7-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *103* | *68-124* | | | | |
| **Client ID:** | **GEI-22-12.5** | | | | | |
| Laboratory ID: | 09-223-35 | | | | | |
| Benzene | **ND** | 0.024 | EPA 8021 | 10-7-11 | 10-7-11 | |
| Toluene | **ND** | 0.12 | EPA 8021 | 10-7-11 | 10-7-11 | |
| Ethyl Benzene | **ND** | 0.12 | EPA 8021 | 10-7-11 | 10-7-11 | |
| m,p-Xylene | **ND** | 0.12 | EPA 8021 | 10-7-11 | 10-7-11 | |
| o-Xylene | **ND** | 0.12 | EPA 8021 | 10-7-11 | 10-7-11 | |
| Gasoline | **ND** | 12 | NWTPH-Gx | 10-7-11 | 10-7-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *109* | *68-124* | | | | |
| **Client ID:** | **GEI-26-5.0** | | | | | |
| Laboratory ID: | 09-223-38 | | | | | |
| Benzene | **ND** | 0.020 | EPA 8021 | 10-7-11 | 10-7-11 | |
| Toluene | **ND** | 0.084 | EPA 8021 | 10-7-11 | 10-7-11 | |
| Ethyl Benzene | **ND** | 0.084 | EPA 8021 | 10-7-11 | 10-7-11 | |
| m,p-Xylene | **ND** | 0.084 | EPA 8021 | 10-7-11 | 10-7-11 | |
| o-Xylene | **ND** | 0.084 | EPA 8021 | 10-7-11 | 10-7-11 | |
| Gasoline | **ND** | 8.4 | NWTPH-Gx | 10-7-11 | 10-7-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *103* | *68-124* | | | | |

Date of Report: October 14, 2011
Samples Submitted: September 30, 2011
Laboratory Reference: 1109-223
Project: 5147-012-02

**NWTPH-Gx/BTEX**

Matrix: Soil
Units: mg/kg (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-26-10.0** | | | | | |
| Laboratory ID: | 09-223-40 | | | | | |
| Benzene | **ND** | 0.020 | EPA 8021 | 10-7-11 | 10-7-11 | |
| Toluene | **ND** | 0.095 | EPA 8021 | 10-7-11 | 10-7-11 | |
| Ethyl Benzene | **ND** | 0.095 | EPA 8021 | 10-7-11 | 10-7-11 | |
| m,p-Xylene | **ND** | 0.095 | EPA 8021 | 10-7-11 | 10-7-11 | |
| o-Xylene | **ND** | 0.095 | EPA 8021 | 10-7-11 | 10-7-11 | |
| Gasoline | **ND** | 9.5 | NWTPH-Gx | 10-7-11 | 10-7-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *109* | *68-124* | | | | |
| **Client ID:** | **GEI-28-5.0** | | | | | |
| Laboratory ID: | 09-223-44 | | | | | |
| Benzene | **ND** | 0.020 | EPA 8021 | 10-7-11 | 10-7-11 | |
| Toluene | **ND** | 0.059 | EPA 8021 | 10-7-11 | 10-7-11 | |
| Ethyl Benzene | **ND** | 0.059 | EPA 8021 | 10-7-11 | 10-7-11 | |
| m,p-Xylene | **ND** | 0.059 | EPA 8021 | 10-7-11 | 10-7-11 | |
| o-Xylene | **ND** | 0.059 | EPA 8021 | 10-7-11 | 10-7-11 | |
| Gasoline | **ND** | 5.9 | NWTPH-Gx | 10-7-11 | 10-7-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *106* | *68-124* | | | | |
| **Client ID:** | **GEI-28-10.0** | | | | | |
| Laboratory ID: | 09-223-46 | | | | | |
| Benzene | **ND** | 0.020 | EPA 8021 | 10-7-11 | 10-7-11 | |
| Toluene | **ND** | 0.082 | EPA 8021 | 10-7-11 | 10-7-11 | |
| Ethyl Benzene | **ND** | 0.082 | EPA 8021 | 10-7-11 | 10-7-11 | |
| m,p-Xylene | **ND** | 0.082 | EPA 8021 | 10-7-11 | 10-7-11 | |
| o-Xylene | **ND** | 0.082 | EPA 8021 | 10-7-11 | 10-7-11 | |
| Gasoline | **ND** | 8.2 | NWTPH-Gx | 10-7-11 | 10-7-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *95* | *68-124* | | | | |

Date of Report: October 14, 2011
Samples Submitted: September 30, 2011
Laboratory Reference: 1109-223
Project: 5147-012-02

**NWTPH-Gx/BTEX**

Matrix: Soil
Units: mg/kg (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-29-5.0** | | | | | |
| Laboratory ID: | 09-223-50 | | | | | |
| Benzene | **ND** | 0.020 | EPA 8021 | 10-7-11 | 10-7-11 | |
| Toluene | **ND** | 0.054 | EPA 8021 | 10-7-11 | 10-7-11 | |
| Ethyl Benzene | **ND** | 0.054 | EPA 8021 | 10-7-11 | 10-7-11 | |
| m,p-Xylene | **ND** | 0.054 | EPA 8021 | 10-7-11 | 10-7-11 | |
| o-Xylene | **ND** | 0.054 | EPA 8021 | 10-7-11 | 10-7-11 | |
| Gasoline | **ND** | 5.4 | NWTPH-Gx | 10-7-11 | 10-7-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *99* | *68-124* | | | | |
| **Client ID:** | **GEI-29-10.0** | | | | | |
| Laboratory ID: | 09-223-52 | | | | | |
| Benzene | **ND** | 0.020 | EPA 8021 | 10-7-11 | 10-7-11 | |
| Toluene | **ND** | 0.064 | EPA 8021 | 10-7-11 | 10-7-11 | |
| Ethyl Benzene | **ND** | 0.064 | EPA 8021 | 10-7-11 | 10-7-11 | |
| m,p-Xylene | **ND** | 0.064 | EPA 8021 | 10-7-11 | 10-7-11 | |
| o-Xylene | **ND** | 0.064 | EPA 8021 | 10-7-11 | 10-7-11 | |
| Gasoline | **ND** | 6.4 | NWTPH-Gx | 10-7-11 | 10-7-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *76* | *68-124* | | | | |
| **Client ID:** | **GEI-16-5.0** | | | | | |
| Laboratory ID: | 09-223-56 | | | | | |
| Benzene | **ND** | 0.022 | EPA 8021 | 10-7-11 | 10-7-11 | |
| Toluene | **ND** | 0.11 | EPA 8021 | 10-7-11 | 10-7-11 | |
| Ethyl Benzene | **ND** | 0.11 | EPA 8021 | 10-7-11 | 10-7-11 | |
| m,p-Xylene | **ND** | 0.11 | EPA 8021 | 10-7-11 | 10-7-11 | |
| o-Xylene | **ND** | 0.11 | EPA 8021 | 10-7-11 | 10-7-11 | |
| Gasoline | **ND** | 11 | NWTPH-Gx | 10-7-11 | 10-7-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *132* | *68-124* | | | | Q |

Date of Report: October 14, 2011
Samples Submitted: September 30, 2011
Laboratory Reference: 1109-223
Project: 5147-012-02

**NWTPH-Gx/BTEX**

Matrix: Soil
Units: mg/kg (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-16-10.0** | | | | | |
| Laboratory ID: | 09-223-58 | | | | | |
| Benzene | **ND** | 0.020 | EPA 8021 | 10-7-11 | 10-8-11 | |
| Toluene | **ND** | 0.054 | EPA 8021 | 10-7-11 | 10-8-11 | |
| Ethyl Benzene | **ND** | 0.054 | EPA 8021 | 10-7-11 | 10-8-11 | |
| m,p-Xylene | **ND** | 0.054 | EPA 8021 | 10-7-11 | 10-8-11 | |
| o-Xylene | **ND** | 0.054 | EPA 8021 | 10-7-11 | 10-8-11 | |
| Gasoline | **ND** | 5.4 | NWTPH-Gx | 10-7-11 | 10-8-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *92* | *68-124* | | | | |
| **Client ID:** | **GEI-17-10.0** | | | | | |
| Laboratory ID: | 09-223-65 | | | | | |
| Benzene | **ND** | 0.020 | EPA 8021 | 10-7-11 | 10-8-11 | |
| Toluene | **ND** | 0.099 | EPA 8021 | 10-7-11 | 10-8-11 | |
| Ethyl Benzene | **ND** | 0.099 | EPA 8021 | 10-7-11 | 10-8-11 | |
| m,p-Xylene | **ND** | 0.099 | EPA 8021 | 10-7-11 | 10-8-11 | |
| o-Xylene | **ND** | 0.099 | EPA 8021 | 10-7-11 | 10-8-11 | |
| Gasoline | **ND** | 9.9 | NWTPH-Gx | 10-7-11 | 10-8-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *106* | *68-124* | | | | |
| **Client ID:** | **GEI-17-14.0** | | | | | |
| Laboratory ID: | 09-223-66 | | | | | |
| Benzene | **ND** | 0.027 | EPA 8021 | 10-7-11 | 10-10-11 | |
| Toluene | **ND** | 0.13 | EPA 8021 | 10-7-11 | 10-10-11 | |
| Ethyl Benzene | **ND** | 0.13 | EPA 8021 | 10-7-11 | 10-10-11 | |
| m,p-Xylene | **ND** | 0.13 | EPA 8021 | 10-7-11 | 10-10-11 | |
| o-Xylene | **ND** | 0.13 | EPA 8021 | 10-7-11 | 10-10-11 | |
| Gasoline | **26** | 13 | NWTPH-Gx | 10-7-11 | 10-10-11 | Z |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *94* | *68-124* | | | | |

Date of Report: October 14, 2011
Samples Submitted: September 30, 2011
Laboratory Reference: 1109-223
Project: 5147-012-02

**NWTPH-Gx/BTEX**

Matrix: Soil
Units: mg/kg (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-17-17.5** | | | | | |
| Laboratory ID: | 09-223-67 | | | | | |
| Benzene | **ND** | 0.027 | EPA 8021 | 10-7-11 | 10-10-11 | |
| Toluene | **ND** | 0.14 | EPA 8021 | 10-7-11 | 10-10-11 | |
| Ethyl Benzene | **ND** | 0.14 | EPA 8021 | 10-7-11 | 10-10-11 | |
| m,p-Xylene | **ND** | 0.14 | EPA 8021 | 10-7-11 | 10-10-11 | |
| o-Xylene | **ND** | 0.14 | EPA 8021 | 10-7-11 | 10-10-11 | |
| Gasoline | **ND** | 14 | NWTPH-Gx | 10-7-11 | 10-10-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *103* | *68-124* | | | | |
| **Client ID:** | **GEI-18-5.0** | | | | | |
| Laboratory ID: | 09-223-70 | | | | | |
| Benzene | **ND** | 0.020 | EPA 8021 | 10-7-11 | 10-8-11 | |
| Toluene | **ND** | 0.075 | EPA 8021 | 10-7-11 | 10-8-11 | |
| Ethyl Benzene | **ND** | 0.075 | EPA 8021 | 10-7-11 | 10-8-11 | |
| m,p-Xylene | **ND** | 0.075 | EPA 8021 | 10-7-11 | 10-8-11 | |
| o-Xylene | **ND** | 0.075 | EPA 8021 | 10-7-11 | 10-8-11 | |
| Gasoline | **ND** | 7.5 | NWTPH-Gx | 10-7-11 | 10-8-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *100* | *68-124* | | | | |
| **Client ID:** | **GEI-18-12.5** | | | | | |
| Laboratory ID: | 09-223-72 | | | | | |
| Benzene | **ND** | 0.026 | EPA 8021 | 10-7-11 | 10-10-11 | |
| Toluene | **ND** | 0.13 | EPA 8021 | 10-7-11 | 10-10-11 | |
| Ethyl Benzene | **ND** | 0.13 | EPA 8021 | 10-7-11 | 10-10-11 | |
| m,p-Xylene | **ND** | 0.13 | EPA 8021 | 10-7-11 | 10-10-11 | |
| o-Xylene | **ND** | 0.13 | EPA 8021 | 10-7-11 | 10-10-11 | |
| Gasoline | **ND** | 13 | NWTPH-Gx | 10-7-11 | 10-10-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *106* | *68-124* | | | | |

Date of Report: October 14, 2011
Samples Submitted: September 30, 2011
Laboratory Reference: 1109-223
Project: 5147-012-02

**NWTPH-Gx/BTEX**

Matrix: Soil
Units: mg/kg (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-18-15.0** | | | | | |
| Laboratory ID: | 09-223-73 | | | | | |
| Benzene | **ND** | 0.026 | EPA 8021 | 10-7-11 | 10-8-11 | |
| Toluene | **ND** | 0.13 | EPA 8021 | 10-7-11 | 10-8-11 | |
| Ethyl Benzene | **ND** | 0.13 | EPA 8021 | 10-7-11 | 10-8-11 | |
| m,p-Xylene | **ND** | 0.13 | EPA 8021 | 10-7-11 | 10-8-11 | |
| o-Xylene | **ND** | 0.13 | EPA 8021 | 10-7-11 | 10-8-11 | |
| Gasoline | **ND** | 13 | NWTPH-Gx | 10-7-11 | 10-8-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *91* | *68-124* | | | | |
| **Client ID:** | **GEI-19-5.0** | | | | | |
| Laboratory ID: | 09-223-77 | | | | | |
| Benzene | **ND** | 0.024 | EPA 8021 | 10-7-11 | 10-8-11 | |
| Toluene | **ND** | 0.12 | EPA 8021 | 10-7-11 | 10-8-11 | |
| Ethyl Benzene | **ND** | 0.12 | EPA 8021 | 10-7-11 | 10-8-11 | |
| m,p-Xylene | **ND** | 0.12 | EPA 8021 | 10-7-11 | 10-8-11 | |
| o-Xylene | **ND** | 0.12 | EPA 8021 | 10-7-11 | 10-8-11 | |
| Gasoline | **ND** | 12 | NWTPH-Gx | 10-7-11 | 10-8-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *93* | *68-124* | | | | |
| **Client ID:** | **GEI-19-10.0** | | | | | |
| Laboratory ID: | 09-223-79 | | | | | |
| Benzene | **ND** | 0.021 | EPA 8021 | 10-7-11 | 10-8-11 | |
| Toluene | **ND** | 0.10 | EPA 8021 | 10-7-11 | 10-8-11 | |
| Ethyl Benzene | **ND** | 0.10 | EPA 8021 | 10-7-11 | 10-8-11 | |
| m,p-Xylene | **ND** | 0.10 | EPA 8021 | 10-7-11 | 10-8-11 | |
| o-Xylene | **ND** | 0.10 | EPA 8021 | 10-7-11 | 10-8-11 | |
| Gasoline | **ND** | 10 | NWTPH-Gx | 10-7-11 | 10-8-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *97* | *68-124* | | | | |

Date of Report: October 14, 2011
Samples Submitted: September 30, 2011
Laboratory Reference: 1109-223
Project: 5147-012-02

**NWTPH-Gx/BTEX**

Matrix: Soil
Units: mg/kg (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-23-7.5** | | | | | |
| Laboratory ID: | 09-223-86 | | | | | |
| Benzene | **ND** | 0.024 | EPA 8021 | 10-7-11 | 10-8-11 | |
| Toluene | **ND** | 0.12 | EPA 8021 | 10-7-11 | 10-8-11 | |
| Ethyl Benzene | **ND** | 0.12 | EPA 8021 | 10-7-11 | 10-8-11 | |
| m,p-Xylene | **ND** | 0.12 | EPA 8021 | 10-7-11 | 10-8-11 | |
| o-Xylene | **ND** | 0.12 | EPA 8021 | 10-7-11 | 10-8-11 | |
| Gasoline | **ND** | 12 | NWTPH-Gx | 10-7-11 | 10-8-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *102* | *68-124* | | | | |
| **Client ID:** | **GEI-23-12.5** | | | | | |
| Laboratory ID: | 09-223-88 | | | | | |
| Benzene | **0.072** | 0.042 | EPA 8021 | 10-7-11 | 10-8-11 | |
| Toluene | **ND** | 0.21 | EPA 8021 | 10-7-11 | 10-8-11 | |
| Ethyl Benzene | **ND** | 0.21 | EPA 8021 | 10-7-11 | 10-8-11 | |
| m,p-Xylene | **ND** | 0.21 | EPA 8021 | 10-7-11 | 10-8-11 | |
| o-Xylene | **ND** | 0.21 | EPA 8021 | 10-7-11 | 10-8-11 | |
| Gasoline | **ND** | 21 | NWTPH-Gx | 10-7-11 | 10-8-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *48* | *68-124* | | | | Q |
| **Client ID:** | **GEI-24-5.0** | | | | | |
| Laboratory ID: | 09-223-91 | | | | | |
| Benzene | **ND** | 0.024 | EPA 8021 | 10-7-11 | 10-8-11 | |
| Toluene | **ND** | 0.12 | EPA 8021 | 10-7-11 | 10-8-11 | |
| Ethyl Benzene | **ND** | 0.12 | EPA 8021 | 10-7-11 | 10-8-11 | |
| m,p-Xylene | **ND** | 0.12 | EPA 8021 | 10-7-11 | 10-8-11 | |
| o-Xylene | **ND** | 0.12 | EPA 8021 | 10-7-11 | 10-8-11 | |
| Gasoline | **ND** | 12 | NWTPH-Gx | 10-7-11 | 10-8-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *107* | *68-124* | | | | |

Date of Report: October 14, 2011
Samples Submitted: September 30, 2011
Laboratory Reference: 1109-223
Project: 5147-012-02

**NWTPH-Gx/BTEX**

Matrix: Soil
Units: mg/kg (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-24-10.0** | | | | | |
| Laboratory ID: | 09-223-93 | | | | | |
| Benzene | **ND** | 0.024 | EPA 8021 | 10-7-11 | 10-8-11 | |
| Toluene | **ND** | 0.12 | EPA 8021 | 10-7-11 | 10-8-11 | |
| Ethyl Benzene | **ND** | 0.12 | EPA 8021 | 10-7-11 | 10-8-11 | |
| m,p-Xylene | **ND** | 0.12 | EPA 8021 | 10-7-11 | 10-8-11 | |
| o-Xylene | **ND** | 0.12 | EPA 8021 | 10-7-11 | 10-8-11 | |
| Gasoline | **ND** | 12 | NWTPH-Gx | 10-7-11 | 10-8-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *109* | *68-124* | | | | |
| **Client ID:** | **GEI-25-5.0** | | | | | |
| Laboratory ID: | 09-223-97 | | | | | |
| Benzene | **ND** | 0.020 | EPA 8021 | 10-7-11 | 10-8-11 | |
| Toluene | **ND** | 0.087 | EPA 8021 | 10-7-11 | 10-8-11 | |
| Ethyl Benzene | **ND** | 0.087 | EPA 8021 | 10-7-11 | 10-8-11 | |
| m,p-Xylene | **ND** | 0.087 | EPA 8021 | 10-7-11 | 10-8-11 | |
| o-Xylene | **ND** | 0.087 | EPA 8021 | 10-7-11 | 10-8-11 | |
| Gasoline | **ND** | 8.7 | NWTPH-Gx | 10-7-11 | 10-8-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *112* | *68-124* | | | | |
| **Client ID:** | **GEI-25-10.0** | | | | | |
| Laboratory ID: | 09-223-99 | | | | | |
| Benzene | **ND** | 0.025 | EPA 8021 | 10-7-11 | 10-8-11 | |
| Toluene | **ND** | 0.12 | EPA 8021 | 10-7-11 | 10-8-11 | |
| Ethyl Benzene | **ND** | 0.12 | EPA 8021 | 10-7-11 | 10-8-11 | |
| m,p-Xylene | **ND** | 0.12 | EPA 8021 | 10-7-11 | 10-8-11 | |
| o-Xylene | **ND** | 0.12 | EPA 8021 | 10-7-11 | 10-8-11 | |
| Gasoline | **ND** | 12 | NWTPH-Gx | 10-7-11 | 10-8-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *114* | *68-124* | | | | |

Date of Report: October 14, 2011
Samples Submitted: September 30, 2011
Laboratory Reference: 1109-223
Project: 5147-012-02

**NWTPH-Gx/BTEX**

Matrix: Soil
Units: mg/kg (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-27-7.5** | | | | | |
| Laboratory ID: | 09-223-104 | | | | | |
| Benzene | **ND** | 0.020 | EPA 8021 | 10-7-11 | 10-8-11 | |
| Toluene | **ND** | 0.088 | EPA 8021 | 10-7-11 | 10-8-11 | |
| Ethyl Benzene | **ND** | 0.088 | EPA 8021 | 10-7-11 | 10-8-11 | |
| m,p-Xylene | **ND** | 0.088 | EPA 8021 | 10-7-11 | 10-8-11 | |
| o-Xylene | **ND** | 0.088 | EPA 8021 | 10-7-11 | 10-8-11 | |
| Gasoline | **ND** | 8.8 | NWTPH-Gx | 10-7-11 | 10-8-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *98* | *68-124* | | | | |
| **Client ID:** | **GEI-27-11.0** | | | | | |
| Laboratory ID: | 09-223-105 | | | | | |
| Benzene | **ND** | 0.017 | EPA 8021 | 10-7-11 | 10-11-11 | |
| Toluene | **ND** | 0.17 | EPA 8021 | 10-7-11 | 10-10-11 | |
| Ethyl Benzene | **ND** | 0.17 | EPA 8021 | 10-7-11 | 10-10-11 | |
| m,p-Xylene | **ND** | 0.17 | EPA 8021 | 10-7-11 | 10-10-11 | |
| o-Xylene | **ND** | 0.17 | EPA 8021 | 10-7-11 | 10-10-11 | |
| Gasoline | **ND** | 17 | NWTPH-Gx | 10-7-11 | 10-10-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *91* | *68-124* | | | | |
| **Client ID:** | **GEI-27-13.0** | | | | | |
| Laboratory ID: | 09-223-106 | | | | | |
| Benzene | **ND** | 0.022 | EPA 8021 | 10-7-11 | 10-8-11 | |
| Toluene | **ND** | 0.11 | EPA 8021 | 10-7-11 | 10-8-11 | |
| Ethyl Benzene | **ND** | 0.11 | EPA 8021 | 10-7-11 | 10-8-11 | |
| m,p-Xylene | **ND** | 0.11 | EPA 8021 | 10-7-11 | 10-8-11 | |
| o-Xylene | **ND** | 0.11 | EPA 8021 | 10-7-11 | 10-8-11 | |
| Gasoline | **ND** | 11 | NWTPH-Gx | 10-7-11 | 10-8-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *115* | *68-124* | | | | |

Date of Report: October 14, 2011
Samples Submitted: September 30, 2011
Laboratory Reference: 1109-223
Project: 5147-012-02

**NWTPH-Gx/BTEX**

Matrix: Soil
Units: mg/kg (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-34-12.0** | | | | | |
| Laboratory ID: | 09-223-112 | | | | | |
| Benzene | **ND** | 0.020 | EPA 8021 | 10-7-11 | 10-8-11 | |
| Toluene | **ND** | 0.059 | EPA 8021 | 10-7-11 | 10-8-11 | |
| Ethyl Benzene | **ND** | 0.059 | EPA 8021 | 10-7-11 | 10-8-11 | |
| m,p-Xylene | **ND** | 0.059 | EPA 8021 | 10-7-11 | 10-8-11 | |
| o-Xylene | **ND** | 0.059 | EPA 8021 | 10-7-11 | 10-8-11 | |
| Gasoline | **ND** | 5.9 | NWTPH-Gx | 10-7-11 | 10-8-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *103* | *68-124* | | | | |
| **Client ID:** | **GEI-35-15.0** | | | | | |
| Laboratory ID: | 09-223-119 | | | | | |
| Benzene | **ND** | 0.020 | EPA 8021 | 10-7-11 | 10-10-11 | |
| Toluene | **ND** | 0.069 | EPA 8021 | 10-7-11 | 10-10-11 | |
| Ethyl Benzene | **ND** | 0.069 | EPA 8021 | 10-7-11 | 10-10-11 | |
| m,p-Xylene | **ND** | 0.069 | EPA 8021 | 10-7-11 | 10-10-11 | |
| o-Xylene | **ND** | 0.069 | EPA 8021 | 10-7-11 | 10-10-11 | |
| Gasoline | **ND** | 6.9 | NWTPH-Gx | 10-7-11 | 10-10-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *101* | *68-124* | | | | |

Date of Report: October 14, 2011
Samples Submitted: September 30, 2011
Laboratory Reference: 1109-223
Project: 5147-012-02

**NWTPH-Dx**
**(with acid/silica gel clean-up)**

Matrix: Soil
Units: mg/Kg (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-31-7.5** | | | | | |
| Laboratory ID: | 09-223-03 | | | | | |
| Diesel Range Organics | **ND** | 31 | NWTPH-Dx | 10-6-11 | 10-6-11 | |
| Lube Oil Range Organics | **ND** | 62 | NWTPH-Dx | 10-6-11 | 10-6-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *o-Terphenyl* | *83* | *50-150* | | | | |
| **Client ID:** | **GEI-32-5.0** | | | | | |
| Laboratory ID: | 09-223-07 | | | | | |
| Diesel Range Organics | **ND** | 31 | NWTPH-Dx | 10-6-11 | 10-6-11 | |
| Lube Oil Range Organics | **ND** | 62 | NWTPH-Dx | 10-6-11 | 10-6-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *o-Terphenyl* | *99* | *50-150* | | | | |
| **Client ID:** | **GEI-33-5.0** | | | | | |
| Laboratory ID: | 09-223-12 | | | | | |
| Diesel Range Organics | **220** | 33 | NWTPH-Dx | 10-6-11 | 10-6-11 | |
| Lube Oil | **74** | 66 | NWTPH-Dx | 10-6-11 | 10-6-11 | N1 |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *o-Terphenyl* | *80* | *50-150* | | | | |
| **Client ID:** | **GEI-33-10.0** | | | | | |
| Laboratory ID: | 09-223-14 | | | | | |
| Diesel Range Organics | **700** | 31 | NWTPH-Dx | 10-6-11 | 10-6-11 | |
| Lube Oil Range Organics | **ND** | 73 | NWTPH-Dx | 10-6-11 | 10-6-11 | U1 |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *o-Terphenyl* | *95* | *50-150* | | | | |
| **Client ID:** | **GEI-33-14.0** | | | | | |
| Laboratory ID: | 09-223-16 | | | | | |
| Diesel Range Organics | **66** | 31 | NWTPH-Dx | 10-6-11 | 10-6-11 | |
| Lube Oil Range Organics | **ND** | 63 | NWTPH-Dx | 10-6-11 | 10-6-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *o-Terphenyl* | *91* | *50-150* | | | | |
| **Client ID:** | **GEI-20-5.0** | | | | | |
| Laboratory ID: | 09-223-20 | | | | | |
| Diesel Range Organics | **ND** | 41 | NWTPH-Dx | 10-7-11 | 10-7-11 | |
| Lube Oil Range Organics | **ND** | 81 | NWTPH-Dx | 10-7-11 | 10-7-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *o-Terphenyl* | *96* | *50-150* | | | | |

Date of Report: October 14, 2011
Samples Submitted: September 30, 2011
Laboratory Reference: 1109-223
Project: 5147-012-02

**NWTPH-Dx**
**(with acid/silica gel clean-up)**

Matrix: Soil
Units: mg/Kg (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-20-10.0** | | | | | |
| Laboratory ID: | 09-223-22 | | | | | |
| Diesel Range Organics | **ND** | 42 | NWTPH-Dx | 10-6-11 | 10-6-11 | |
| Lube Oil Range Organics | **ND** | 84 | NWTPH-Dx | 10-6-11 | 10-6-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *o-Terphenyl* | *66* | *50-150* | | | | |
| **Client ID:** | **GEI-21-5.0** | | | | | |
| Laboratory ID: | 09-223-26 | | | | | |
| Diesel Range Organics | **ND** | 41 | NWTPH-Dx | 10-6-11 | 10-6-11 | |
| Lube Oil Range Organics | **ND** | 81 | NWTPH-Dx | 10-6-11 | 10-6-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *o-Terphenyl* | *93* | *50-150* | | | | |
| **Client ID:** | **GEI-21-10.0** | | | | | |
| Laboratory ID: | 09-223-28 | | | | | |
| Diesel Range Organics | **650** | 34 | NWTPH-Dx | 10-7-11 | 10-7-11 | |
| Lube Oil Range Organics | **1400** | 68 | NWTPH-Dx | 10-7-11 | 10-7-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *o-Terphenyl* | *131* | *50-150* | | | | |
| **Client ID:** | **GEI-22-5.0** | | | | | |
| Laboratory ID: | 09-223-32 | | | | | |
| Diesel Range Organics | **ND** | 33 | NWTPH-Dx | 10-7-11 | 10-7-11 | |
| Lube Oil Range Organics | **ND** | 65 | NWTPH-Dx | 10-7-11 | 10-7-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *o-Terphenyl* | *89* | *50-150* | | | | |
| **Client ID:** | **GEI-22-12.5** | | | | | |
| Laboratory ID: | 09-223-35 | | | | | |
| Diesel Range Organics | **1300** | 220 | NWTPH-Dx | 10-7-11 | 10-7-11 | |
| Lube Oil Range Organics | **1700** | 440 | NWTPH-Dx | 10-7-11 | 10-7-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *o-Terphenyl* | *126* | *50-150* | | | | |
| **Client ID:** | **GEI-26-5.0** | | | | | |
| Laboratory ID: | 09-223-38 | | | | | |
| Diesel Range Organics | **ND** | 33 | NWTPH-Dx | 10-7-11 | 10-7-11 | |
| Lube Oil Range Organics | **ND** | 66 | NWTPH-Dx | 10-7-11 | 10-7-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *o-Terphenyl* | *105* | *50-150* | | | | |

Date of Report: October 14, 2011
Samples Submitted: September 30, 2011
Laboratory Reference: 1109-223
Project: 5147-012-02

**NWTPH-Dx**
**(with acid/silica gel clean-up)**

Matrix: Soil
Units: mg/Kg (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-26-10.0** | | | | | |
| Laboratory ID: | 09-223-40 | | | | | |
| Diesel Range Organics | **ND** | 38 | NWTPH-Dx | 10-7-11 | 10-7-11 | |
| Lube Oil Range Organics | **ND** | 76 | NWTPH-Dx | 10-7-11 | 10-7-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *o-Terphenyl* | *93* | *50-150* | | | | |
| **Client ID:** | **GEI-28-5.0** | | | | | |
| Laboratory ID: | 09-223-44 | | | | | |
| Diesel Range Organics | **ND** | 31 | NWTPH-Dx | 10-7-11 | 10-7-11 | |
| Lube Oil | **63** | 62 | NWTPH-Dx | 10-7-11 | 10-7-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *o-Terphenyl* | *106* | *50-150* | | | | |
| **Client ID:** | **GEI-28-10.0** | | | | | |
| Laboratory ID: | 09-223-46 | | | | | |
| Diesel Range Organics | **ND** | 34 | NWTPH-Dx | 10-7-11 | 10-7-11 | |
| Lube Oil Range Organics | **ND** | 69 | NWTPH-Dx | 10-7-11 | 10-7-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *o-Terphenyl* | *95* | *50-150* | | | | |
| **Client ID:** | **GEI-29-5.0** | | | | | |
| Laboratory ID: | 09-223-50 | | | | | |
| Diesel Range Organics | **ND** | 28 | NWTPH-Dx | 10-7-11 | 10-7-11 | |
| Lube Oil Range Organics | **ND** | 56 | NWTPH-Dx | 10-7-11 | 10-7-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *o-Terphenyl* | *104* | *50-150* | | | | |
| **Client ID:** | **GEI-29-10.0** | | | | | |
| Laboratory ID: | 09-223-52 | | | | | |
| Diesel Range Organics | **64** | 29 | NWTPH-Dx | 10-7-11 | 10-7-11 | |
| Lube Oil | **170** | 58 | NWTPH-Dx | 10-7-11 | 10-7-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *o-Terphenyl* | *92* | *50-150* | | | | |
| **Client ID:** | **GEI-16-5.0** | | | | | |
| Laboratory ID: | 09-223-56 | | | | | |
| Diesel Range Organics | **ND** | 43 | NWTPH-Dx | 10-7-11 | 10-7-11 | |
| Lube Oil Range Organics | **ND** | 85 | NWTPH-Dx | 10-7-11 | 10-7-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *o-Terphenyl* | *96* | *50-150* | | | | |

Date of Report: October 14, 2011
Samples Submitted: September 30, 2011
Laboratory Reference: 1109-223
Project: 5147-012-02

**NWTPH-Dx**
**(with acid/silica gel clean-up)**

Matrix: Soil
Units: mg/Kg (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-16-10.0** | | | | | |
| Laboratory ID: | 09-223-58 | | | | | |
| Diesel Range Organics | **ND** | 28 | NWTPH-Dx | 10-7-11 | 10-7-11 | |
| Lube Oil Range Organics | **ND** | 56 | NWTPH-Dx | 10-7-11 | 10-7-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *o-Terphenyl* | *99* | *50-150* | | | | |
| **Client ID:** | **GEI-17-10.0** | | | | | |
| Laboratory ID: | 09-223-65 | | | | | |
| Diesel Range Organics | **ND** | 39 | NWTPH-Dx | 10-7-11 | 10-7-11 | |
| Lube Oil Range Organics | **ND** | 78 | NWTPH-Dx | 10-7-11 | 10-7-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *o-Terphenyl* | *89* | *50-150* | | | | |
| **Client ID:** | **GEI-17-14.0** | | | | | |
| Laboratory ID: | 09-223-66 | | | | | |
| Diesel Range Organics | **53** | 29 | NWTPH-Dx | 10-7-11 | 10-7-11 | |
| Lube Oil Range Organics | **ND** | 57 | NWTPH-Dx | 10-7-11 | 10-7-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *o-Terphenyl* | *100* | *50-150* | | | | |
| **Client ID:** | **GEI-17-17.5** | | | | | |
| Laboratory ID: | 09-223-67 | | | | | |
| Diesel Range Organics | **ND** | 32 | NWTPH-Dx | 10-7-11 | 10-7-11 | |
| Lube Oil Range Organics | **ND** | 63 | NWTPH-Dx | 10-7-11 | 10-7-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *o-Terphenyl* | *94* | *50-150* | | | | |
| **Client ID:** | **GEI-18-5.0** | | | | | |
| Laboratory ID: | 09-223-70 | | | | | |
| Diesel Range Organics | **ND** | 32 | NWTPH-Dx | 10-7-11 | 10-7-11 | |
| Lube Oil Range Organics | **ND** | 63 | NWTPH-Dx | 10-7-11 | 10-7-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *o-Terphenyl* | *101* | *50-150* | | | | |
| **Client ID:** | **GEI-18-12.5** | | | | | |
| Laboratory ID: | 09-223-72 | | | | | |
| Diesel Range Organics | **ND** | 32 | NWTPH-Dx | 10-7-11 | 10-7-11 | |
| Lube Oil Range Organics | **ND** | 64 | NWTPH-Dx | 10-7-11 | 10-7-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *o-Terphenyl* | *87* | *50-150* | | | | |

Date of Report: October 14, 2011
Samples Submitted: September 30, 2011
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Project: 5147-012-02

**NWTPH-Dx**
**(with acid/silica gel clean-up)**

Matrix: Soil
Units: mg/Kg (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-18-15.0** | | | | | |
| Laboratory ID: | 09-223-73 | | | | | |
| Diesel Range Organics | **87** | 44 | NWTPH-Dx | 10-7-11 | 10-7-11 | |
| Lube Oil | **290** | 88 | NWTPH-Dx | 10-7-11 | 10-7-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *o-Terphenyl* | *85* | *50-150* | | | | |
| **Client ID:** | **GEI-19-5.0** | | | | | |
| Laboratory ID: | 09-223-77 | | | | | |
| Diesel Range Organics | **92** | 43 | NWTPH-Dx | 10-7-11 | 10-7-11 | |
| Lube Oil | **330** | 85 | NWTPH-Dx | 10-7-11 | 10-7-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *o-Terphenyl* | *87* | *50-150* | | | | |
| **Client ID:** | **GEI-19-10.0** | | | | | |
| Laboratory ID: | 09-223-79 | | | | | |
| Diesel Range Organics | **ND** | 39 | NWTPH-Dx | 10-7-11 | 10-7-11 | |
| Lube Oil Range Organics | **ND** | 77 | NWTPH-Dx | 10-7-11 | 10-7-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *o-Terphenyl* | *89* | *50-150* | | | | |
| **Client ID:** | **GEI-23-7.5** | | | | | |
| Laboratory ID: | 09-223-86 | | | | | |
| Diesel Range Organics | **ND** | 45 | NWTPH-Dx | 10-7-11 | 10-7-11 | |
| Lube Oil Range Organics | **160** | 90 | NWTPH-Dx | 10-7-11 | 10-7-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *o-Terphenyl* | *79* | *50-150* | | | | |
| **Client ID:** | **GEI-23-12.5** | | | | | |
| Laboratory ID: | 09-223-88 | | | | | |
| Diesel Range Organics | **1300** | 64 | NWTPH-Dx | 10-7-11 | 10-7-11 | |
| Lube Oil | **2700** | 130 | NWTPH-Dx | 10-7-11 | 10-7-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *o-Terphenyl* | *93* | *50-150* | | | | |
| **Client ID:** | **GEI-24-5.0** | | | | | |
| Laboratory ID: | 09-223-91 | | | | | |
| Diesel Range Organics | **88** | 44 | NWTPH-Dx | 10-7-11 | 10-7-11 | |
| Lube Oil | **250** | 88 | NWTPH-Dx | 10-7-11 | 10-7-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *o-Terphenyl* | *95* | *50-150* | | | | |

Date of Report: October 14, 2011
Samples Submitted: September 30, 2011
Laboratory Reference: 1109-223
Project: 5147-012-02

**NWTPH-Dx**
**(with acid/silica gel clean-up)**

Matrix: Soil
Units: mg/Kg (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-24-10.0** | | | | | |
| Laboratory ID: | 09-223-93 | | | | | |
| Diesel Range Organics | **ND** | 42 | NWTPH-Dx | 10-7-11 | 10-7-11 | |
| Lube Oil Range Organics | **ND** | 85 | NWTPH-Dx | 10-7-11 | 10-7-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *o-Terphenyl* | *87* | *50-150* | | | | |
| **Client ID:** | **GEI-25-5.0** | | | | | |
| Laboratory ID: | 09-223-97 | | | | | |
| Diesel Range Organics | **67** | 37 | NWTPH-Dx | 10-7-11 | 10-7-11 | |
| Lube Oil | **240** | 75 | NWTPH-Dx | 10-7-11 | 10-7-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *o-Terphenyl* | *82* | *50-150* | | | | |
| **Client ID:** | **GEI-25-10.0** | | | | | |
| Laboratory ID: | 09-223-99 | | | | | |
| Diesel Range Organics | **ND** | 44 | NWTPH-Dx | 10-7-11 | 10-7-11 | |
| Lube Oil Range Organics | **100** | 87 | NWTPH-Dx | 10-7-11 | 10-7-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *o-Terphenyl* | *99* | *50-150* | | | | |
| **Client ID:** | **GEI-27-7.5** | | | | | |
| Laboratory ID: | 09-223-104 | | | | | |
| Diesel Range Organics | **ND** | 35 | NWTPH-Dx | 10-7-11 | 10-7-11 | |
| Lube Oil | **97** | 70 | NWTPH-Dx | 10-7-11 | 10-7-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *o-Terphenyl* | *98* | *50-150* | | | | |
| **Client ID:** | **GEI-27-11.0** | | | | | |
| Laboratory ID: | 09-223-105 | | | | | |
| Diesel Range Organics | **ND** | 35 | NWTPH-Dx | 10-7-11 | 10-7-11 | |
| Lube Oil | **190** | 70 | NWTPH-Dx | 10-7-11 | 10-7-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *o-Terphenyl* | *94* | *50-150* | | | | |
| **Client ID:** | **GEI-27-13.0** | | | | | |
| Laboratory ID: | 09-223-106 | | | | | |
| Diesel Range Organics | **52** | 39 | NWTPH-Dx | 10-7-11 | 10-7-11 | |
| Lube Oil | **180** | 77 | NWTPH-Dx | 10-7-11 | 10-7-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *o-Terphenyl* | *97* | *50-150* | | | | |

Date of Report: October 14, 2011
Samples Submitted: September 30, 2011
Laboratory Reference: 1109-223
Project: 5147-012-02

**NWTPH-Dx**
**(with acid/silica gel clean-up)**

Matrix: Soil
Units: mg/Kg (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-34-12.0** | | | | | |
| Laboratory ID: | 09-223-112 | | | | | |
| Diesel Range Organics | **ND** | 29 | NWTPH-Dx | 10-7-11 | 10-7-11 | |
| Lube Oil Range Organics | **ND** | 59 | NWTPH-Dx | 10-7-11 | 10-7-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *o-Terphenyl* | *112* | *50-150* | | | | |
| | | | | | | |
| **Client ID:** | **GEI-35-15.0** | | | | | |
| Laboratory ID: | 09-223-119 | | | | | |
| Diesel Range Organics | **ND** | 30 | NWTPH-Dx | 10-7-11 | 10-7-11 | |
| Lube Oil Range Organics | **ND** | 61 | NWTPH-Dx | 10-7-11 | 10-7-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *o-Terphenyl* | *101* | *50-150* | | | | |

Date of Report: October 14, 2011
Samples Submitted: September 30, 2011
Laboratory Reference: 1109-223
Project: 5147-012-02

**PAHs by EPA 8270D/SIM**
**(with silica gel clean-up)**

Matrix: Soil
Units: mg/Kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-31-7.5** | | | | | |
| Laboratory ID: | 09-223-03 | | | | | |
| Naphthalene | **ND** | 0.0082 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| 2-Methylnaphthalene | **ND** | 0.0082 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| 1-Methylnaphthalene | **ND** | 0.0082 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Acenaphthylene | **ND** | 0.0082 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Acenaphthene | **ND** | 0.0082 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Fluorene | **ND** | 0.0082 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Phenanthrene | **ND** | 0.0082 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Anthracene | **ND** | 0.0082 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Fluoranthene | **ND** | 0.0082 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Pyrene | **ND** | 0.0082 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Benzo[a]anthracene | **ND** | 0.0082 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Chrysene | **ND** | 0.0082 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Benzo[b]fluoranthene | **ND** | 0.0082 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Benzo(j,k)fluoranthene | **ND** | 0.0082 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Benzo[a]pyrene | **ND** | 0.0082 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Indeno(1,2,3-c,d)pyrene | **ND** | 0.0082 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Dibenz[a,h]anthracene | **ND** | 0.0082 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| Benzo[g,h,i]perylene | **ND** | 0.0082 | EPA 8270/SIM | 10-6-11 | 10-8-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *2-Fluorobiphenyl* | *69* | *43 - 109* | | | | |
| *Pyrene-d10* | *62* | *38 - 128* | | | | |
| *Terphenyl-d14* | *59* | *33 - 119* | | | | |

Date of Report: October 14, 2011
Samples Submitted: September 30, 2011
Laboratory Reference: 1109-223
Project: 5147-012-02

**PAHs by EPA 8270D/SIM**
**(with silica gel clean-up)**

Matrix: Soil
Units: mg/Kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-32-5.0** | | | | | |
| Laboratory ID: | 09-223-07 | | | | | |
| Naphthalene | **ND** | 0.0082 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| 2-Methylnaphthalene | **ND** | 0.0082 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| 1-Methylnaphthalene | **ND** | 0.0082 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Acenaphthylene | **ND** | 0.0082 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Acenaphthene | **ND** | 0.0082 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Fluorene | **ND** | 0.0082 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Phenanthrene | **ND** | 0.0082 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Anthracene | **ND** | 0.0082 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Fluoranthene | **ND** | 0.0082 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Pyrene | **ND** | 0.0082 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Benzo[a]anthracene | **ND** | 0.0082 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Chrysene | **ND** | 0.0082 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Benzo[b]fluoranthene | **ND** | 0.0082 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Benzo(j,k)fluoranthene | **ND** | 0.0082 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Benzo[a]pyrene | **ND** | 0.0082 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Indeno(1,2,3-c,d)pyrene | **ND** | 0.0082 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Dibenz[a,h]anthracene | **ND** | 0.0082 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Benzo[g,h,i]perylene | **ND** | 0.0082 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *2-Fluorobiphenyl* | *73* | *43 - 109* | | | | |
| *Pyrene-d10* | *65* | *38 - 128* | | | | |
| *Terphenyl-d14* | *62* | *33 - 119* | | | | |

Date of Report: October 14, 2011
Samples Submitted: September 30, 2011
Laboratory Reference: 1109-223
Project: 5147-012-02

**PAHs by EPA 8270D/SIM**
**(with silica gel clean-up)**

Matrix: Soil
Units: mg/Kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-33-5.0** | | | | | |
| Laboratory ID: | 09-223-12 | | | | | |
| Naphthalene | **ND** | 0.0087 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| 2-Methylnaphthalene | **ND** | 0.0087 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| 1-Methylnaphthalene | **ND** | 0.0087 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Acenaphthylene | **ND** | 0.0087 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Acenaphthene | **ND** | 0.0087 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Fluorene | **ND** | 0.0087 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Phenanthrene | **ND** | 0.0087 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Anthracene | **ND** | 0.0087 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Fluoranthene | **ND** | 0.0087 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Pyrene | **ND** | 0.0087 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Benzo[a]anthracene | **ND** | 0.0087 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Chrysene | **ND** | 0.0087 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Benzo[b]fluoranthene | **ND** | 0.0087 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Benzo(j,k)fluoranthene | **ND** | 0.0087 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Benzo[a]pyrene | **ND** | 0.0087 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Indeno(1,2,3-c,d)pyrene | **ND** | 0.0087 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Dibenz[a,h]anthracene | **ND** | 0.0087 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Benzo[g,h,i]perylene | **ND** | 0.0087 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *2-Fluorobiphenyl* | *79* | *43 - 109* | | | | |
| *Pyrene-d10* | *76* | *38 - 128* | | | | |
| *Terphenyl-d14* | *74* | *33 - 119* | | | | |

Date of Report: October 14, 2011
Samples Submitted: September 30, 2011
Laboratory Reference: 1109-223
Project: 5147-012-02

**PAHs by EPA 8270D/SIM**
**(with silica gel clean-up)**

Matrix: Soil
Units: mg/Kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-33-10.0** | | | | | |
| Laboratory ID: | 09-223-14 | | | | | |
| Naphthalene | **ND** | 0.0082 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| 2-Methylnaphthalene | **ND** | 0.0082 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| 1-Methylnaphthalene | **0.015** | 0.0082 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Acenaphthylene | **0.0098** | 0.0082 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Acenaphthene | **0.037** | 0.0082 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Fluorene | **0.062** | 0.0082 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Phenanthrene | **ND** | 0.0082 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Anthracene | **ND** | 0.0082 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Fluoranthene | **ND** | 0.0082 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Pyrene | **ND** | 0.0082 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Benzo[a]anthracene | **ND** | 0.0082 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Chrysene | **ND** | 0.0082 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Benzo[b]fluoranthene | **ND** | 0.0082 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Benzo(j,k)fluoranthene | **ND** | 0.0082 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Benzo[a]pyrene | **ND** | 0.0082 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Indeno(1,2,3-c,d)pyrene | **ND** | 0.0082 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Dibenz[a,h]anthracene | **ND** | 0.0082 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Benzo[g,h,i]perylene | **ND** | 0.0082 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *2-Fluorobiphenyl* | *64* | *43 - 109* | | | | |
| *Pyrene-d10* | *59* | *38 - 128* | | | | |
| *Terphenyl-d14* | *57* | *33 - 119* | | | | |

Date of Report: October 14, 2011
Samples Submitted: September 30, 2011
Laboratory Reference: 1109-223
Project: 5147-012-02

**PAHs by EPA 8270D/SIM**
**(with silica gel clean-up)**

Matrix: Soil
Units: mg/Kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-33-14.0** | | | | | |
| Laboratory ID: | 09-223-16 | | | | | |
| Naphthalene | **ND** | 0.0083 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| 2-Methylnaphthalene | **ND** | 0.0083 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| 1-Methylnaphthalene | **ND** | 0.0083 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Acenaphthylene | **ND** | 0.0083 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Acenaphthene | **ND** | 0.0083 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Fluorene | **ND** | 0.0083 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Phenanthrene | **ND** | 0.0083 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Anthracene | **ND** | 0.0083 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Fluoranthene | **ND** | 0.0083 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Pyrene | **ND** | 0.0083 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Benzo[a]anthracene | **ND** | 0.0083 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Chrysene | **ND** | 0.0083 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Benzo[b]fluoranthene | **ND** | 0.0083 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Benzo(j,k)fluoranthene | **ND** | 0.0083 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Benzo[a]pyrene | **ND** | 0.0083 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Indeno(1,2,3-c,d)pyrene | **ND** | 0.0083 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Dibenz[a,h]anthracene | **ND** | 0.0083 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Benzo[g,h,i]perylene | **ND** | 0.0083 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *2-Fluorobiphenyl* | *79* | *43 - 109* | | | | |
| *Pyrene-d10* | *79* | *38 - 128* | | | | |
| *Terphenyl-d14* | *77* | *33 - 119* | | | | |

Date of Report: October 14, 2011
Samples Submitted: September 30, 2011
Laboratory Reference: 1109-223
Project: 5147-012-02

**PAHs by EPA 8270D/SIM**
**(with silica gel clean-up)**

Matrix: Soil
Units: mg/Kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-20-5.0** | | | | | |
| Laboratory ID: | 09-223-20 | | | | | |
| Naphthalene | **0.020** | 0.011 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| 2-Methylnaphthalene | **ND** | 0.011 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| 1-Methylnaphthalene | **ND** | 0.011 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Acenaphthylene | **ND** | 0.011 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Acenaphthene | **ND** | 0.011 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Fluorene | **ND** | 0.011 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Phenanthrene | **ND** | 0.011 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Anthracene | **ND** | 0.011 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Fluoranthene | **ND** | 0.011 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Pyrene | **ND** | 0.011 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Benzo[a]anthracene | **ND** | 0.011 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Chrysene | **ND** | 0.011 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Benzo[b]fluoranthene | **ND** | 0.011 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Benzo(j,k)fluoranthene | **ND** | 0.011 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Benzo[a]pyrene | **ND** | 0.011 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Indeno(1,2,3-c,d)pyrene | **ND** | 0.011 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Dibenz[a,h]anthracene | **ND** | 0.011 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Benzo[g,h,i]perylene | **ND** | 0.011 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *2-Fluorobiphenyl* | *79* | *43 - 109* | | | | |
| *Pyrene-d10* | *79* | *38 - 128* | | | | |
| *Terphenyl-d14* | *78* | *33 - 119* | | | | |

Date of Report: October 14, 2011
Samples Submitted: September 30, 2011
Laboratory Reference: 1109-223
Project: 5147-012-02

**PAHs by EPA 8270D/SIM**
**(with silica gel clean-up)**

Matrix: Soil
Units: mg/Kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-20-10.0** | | | | | |
| Laboratory ID: | 09-223-22 | | | | | |
| Naphthalene | **ND** | 0.011 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| 2-Methylnaphthalene | **ND** | 0.011 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| 1-Methylnaphthalene | **ND** | 0.011 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Acenaphthylene | **ND** | 0.011 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Acenaphthene | **ND** | 0.011 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Fluorene | **ND** | 0.011 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Phenanthrene | **ND** | 0.011 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Anthracene | **ND** | 0.011 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Fluoranthene | **ND** | 0.011 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Pyrene | **ND** | 0.011 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Benzo[a]anthracene | **ND** | 0.011 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Chrysene | **ND** | 0.011 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Benzo[b]fluoranthene | **ND** | 0.011 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Benzo(j,k)fluoranthene | **ND** | 0.011 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Benzo[a]pyrene | **ND** | 0.011 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Indeno(1,2,3-c,d)pyrene | **ND** | 0.011 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Dibenz[a,h]anthracene | **ND** | 0.011 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Benzo[g,h,i]perylene | **ND** | 0.011 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *2-Fluorobiphenyl* | *76* | *43 - 109* | | | | |
| *Pyrene-d10* | *74* | *38 - 128* | | | | |
| *Terphenyl-d14* | *75* | *33 - 119* | | | | |

Date of Report: October 14, 2011
Samples Submitted: September 30, 2011
Laboratory Reference: 1109-223
Project: 5147-012-02

**PAHs by EPA 8270D/SIM**
**(with silica gel clean-up)**

Matrix: Soil
Units: mg/Kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-21-5.0** | | | | | |
| Laboratory ID: | 09-223-26 | | | | | |
| Naphthalene | **0.020** | 0.011 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| 2-Methylnaphthalene | **ND** | 0.011 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| 1-Methylnaphthalene | **ND** | 0.011 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Acenaphthylene | **ND** | 0.011 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Acenaphthene | **ND** | 0.011 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Fluorene | **ND** | 0.011 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Phenanthrene | **ND** | 0.011 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Anthracene | **ND** | 0.011 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Fluoranthene | **ND** | 0.011 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Pyrene | **ND** | 0.011 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Benzo[a]anthracene | **ND** | 0.011 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Chrysene | **ND** | 0.011 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Benzo[b]fluoranthene | **ND** | 0.011 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Benzo(j,k)fluoranthene | **ND** | 0.011 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Benzo[a]pyrene | **ND** | 0.011 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Indeno(1,2,3-c,d)pyrene | **ND** | 0.011 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Dibenz[a,h]anthracene | **ND** | 0.011 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Benzo[g,h,i]perylene | **ND** | 0.011 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *2-Fluorobiphenyl* | *70* | *43 - 109* | | | | |
| *Pyrene-d10* | *70* | *38 - 128* | | | | |
| *Terphenyl-d14* | *72* | *33 - 119* | | | | |

Date of Report: October 14, 2011
Samples Submitted: September 30, 2011
Laboratory Reference: 1109-223
Project: 5147-012-02

**PAHs by EPA 8270D/SIM**
**(with silica gel clean-up)**

Matrix: Soil
Units: mg/Kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-21-10.0** | | | | | |
| Laboratory ID: | 09-223-28 | | | | | |
| Naphthalene | **0.59** | 0.0091 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| 2-Methylnaphthalene | **0.26** | 0.0091 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| 1-Methylnaphthalene | **0.28** | 0.0091 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Acenaphthylene | **0.70** | 0.0091 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Acenaphthene | **0.27** | 0.0091 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Fluorene | **0.64** | 0.0091 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Phenanthrene | **4.1** | 0.18 | EPA 8270/SIM | 10-7-11 | 10-10-11 | |
| Anthracene | **1.2** | 0.18 | EPA 8270/SIM | 10-7-11 | 10-10-11 | |
| Fluoranthene | **6.2** | 0.18 | EPA 8270/SIM | 10-7-11 | 10-10-11 | |
| Pyrene | **6.0** | 0.18 | EPA 8270/SIM | 10-7-11 | 10-10-11 | |
| Benzo[a]anthracene | **2.5** | 0.18 | EPA 8270/SIM | 10-7-11 | 10-10-11 | |
| Chrysene | **2.5** | 0.18 | EPA 8270/SIM | 10-7-11 | 10-10-11 | |
| Benzo[b]fluoranthene | **1.4** | 0.18 | EPA 8270/SIM | 10-7-11 | 10-10-11 | |
| Benzo(j,k)fluoranthene | **1.6** | 0.18 | EPA 8270/SIM | 10-7-11 | 10-10-11 | |
| Benzo[a]pyrene | **2.3** | 0.18 | EPA 8270/SIM | 10-7-11 | 10-10-11 | |
| Indeno(1,2,3-c,d)pyrene | **1.0** | 0.18 | EPA 8270/SIM | 10-7-11 | 10-10-11 | |
| Dibenz[a,h]anthracene | **0.35** | 0.18 | EPA 8270/SIM | 10-7-11 | 10-10-11 | |
| Benzo[g,h,i]perylene | **1.2** | 0.18 | EPA 8270/SIM | 10-7-11 | 10-10-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *2-Fluorobiphenyl* | *61* | *43 - 109* | | | | |
| *Pyrene-d10* | *55* | *38 - 128* | | | | |
| *Terphenyl-d14* | *62* | *33 - 119* | | | | |

Date of Report: October 14, 2011
Samples Submitted: September 30, 2011
Laboratory Reference: 1109-223
Project: 5147-012-02

**PAHs by EPA 8270D/SIM**
**(with silica gel clean-up)**

Matrix: Soil
Units: mg/Kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-22-5.0** | | | | | |
| Laboratory ID: | 09-223-32 | | | | | |
| Naphthalene | **ND** | 0.0087 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| 2-Methylnaphthalene | **ND** | 0.0087 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| 1-Methylnaphthalene | **0.016** | 0.0087 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Acenaphthylene | **ND** | 0.0087 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Acenaphthene | **ND** | 0.0087 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Fluorene | **0.012** | 0.0087 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Phenanthrene | **0.017** | 0.0087 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Anthracene | **ND** | 0.0087 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Fluoranthene | **ND** | 0.0087 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Pyrene | **ND** | 0.0087 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Benzo[a]anthracene | **ND** | 0.0087 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Chrysene | **ND** | 0.0087 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Benzo[b]fluoranthene | **ND** | 0.0087 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Benzo(j,k)fluoranthene | **ND** | 0.0087 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Benzo[a]pyrene | **ND** | 0.0087 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Indeno(1,2,3-c,d)pyrene | **ND** | 0.0087 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Dibenz[a,h]anthracene | **ND** | 0.0087 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Benzo[g,h,i]perylene | **ND** | 0.0087 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *2-Fluorobiphenyl* | *78* | *43 - 109* | | | | |
| *Pyrene-d10* | *76* | *38 - 128* | | | | |
| *Terphenyl-d14* | *74* | *33 - 119* | | | | |

Date of Report: October 14, 2011
Samples Submitted: September 30, 2011
Laboratory Reference: 1109-223
Project: 5147-012-02

**PAHs by EPA 8270D/SIM**
**(with silica gel clean-up)**

Matrix: Soil
Units: mg/Kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-22-12.5** | | | | | |
| Laboratory ID: | 09-223-35 | | | | | |
| Naphthalene | **1.2** | 0.012 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| 2-Methylnaphthalene | **0.98** | 0.012 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| 1-Methylnaphthalene | **0.97** | 0.012 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Acenaphthylene | **0.21** | 0.012 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Acenaphthene | **0.71** | 0.012 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Fluorene | **1.1** | 0.012 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Phenanthrene | **2.2** | 0.058 | EPA 8270/SIM | 10-7-11 | 10-10-11 | |
| Anthracene | **0.38** | 0.012 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Fluoranthene | **1.2** | 0.012 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Pyrene | **1.2** | 0.012 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Benzo[a]anthracene | **0.54** | 0.012 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Chrysene | **0.53** | 0.012 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Benzo[b]fluoranthene | **0.32** | 0.012 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Benzo(j,k)fluoranthene | **0.36** | 0.012 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Benzo[a]pyrene | **0.51** | 0.012 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Indeno(1,2,3-c,d)pyrene | **0.23** | 0.012 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Dibenz[a,h]anthracene | **0.077** | 0.012 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| Benzo[g,h,i]perylene | **0.26** | 0.012 | EPA 8270/SIM | 10-7-11 | 10-8-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *2-Fluorobiphenyl* | *81* | *43 - 109* | | | | |
| *Pyrene-d10* | *77* | *38 - 128* | | | | |
| *Terphenyl-d14* | *82* | *33 - 119* | | | | |

Date of Report: October 14, 2011
Samples Submitted: September 30, 2011
Laboratory Reference: 1109-223
Project: 5147-012-02

**PAHs by EPA 8270D/SIM**
**(with silica gel clean-up)**

Matrix: Soil
Units: mg/Kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-26-5.0** | | | | | |
| Laboratory ID: | 09-223-38 | | | | | |
| Naphthalene | **ND** | 0.0089 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| 2-Methylnaphthalene | **ND** | 0.0089 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| 1-Methylnaphthalene | **ND** | 0.0089 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Acenaphthylene | **ND** | 0.0089 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Acenaphthene | **ND** | 0.0089 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Fluorene | **ND** | 0.0089 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Phenanthrene | **ND** | 0.0089 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Anthracene | **ND** | 0.0089 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Fluoranthene | **ND** | 0.0089 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Pyrene | **ND** | 0.0089 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Benzo[a]anthracene | **ND** | 0.0089 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Chrysene | **ND** | 0.0089 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Benzo[b]fluoranthene | **ND** | 0.0089 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Benzo(j,k)fluoranthene | **ND** | 0.0089 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Benzo[a]pyrene | **ND** | 0.0089 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Indeno(1,2,3-c,d)pyrene | **ND** | 0.0089 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Dibenz[a,h]anthracene | **ND** | 0.0089 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Benzo[g,h,i]perylene | **ND** | 0.0089 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *2-Fluorobiphenyl* | *80* | *43 - 109* | | | | |
| *Pyrene-d10* | *71* | *38 - 128* | | | | |
| *Terphenyl-d14* | *72* | *33 - 119* | | | | |

Date of Report: October 14, 2011
Samples Submitted: September 30, 2011
Laboratory Reference: 1109-223
Project: 5147-012-02

**PAHs by EPA 8270D/SIM**
**(with silica gel clean-up)**

Matrix: Soil
Units: mg/Kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-26-10** | | | | | |
| Laboratory ID: | 09-223-40 | | | | | |
| Naphthalene | **ND** | 0.010 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| 2-Methylnaphthalene | **ND** | 0.010 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| 1-Methylnaphthalene | **ND** | 0.010 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Acenaphthylene | **ND** | 0.010 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Acenaphthene | **ND** | 0.010 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Fluorene | **ND** | 0.010 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Phenanthrene | **ND** | 0.010 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Anthracene | **ND** | 0.010 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Fluoranthene | **ND** | 0.010 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Pyrene | **ND** | 0.010 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Benzo[a]anthracene | **ND** | 0.010 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Chrysene | **ND** | 0.010 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Benzo[b]fluoranthene | **ND** | 0.010 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Benzo(j,k)fluoranthene | **ND** | 0.010 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Benzo[a]pyrene | **ND** | 0.010 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Indeno(1,2,3-c,d)pyrene | **ND** | 0.010 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Dibenz[a,h]anthracene | **ND** | 0.010 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Benzo[g,h,i]perylene | **ND** | 0.010 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *2-Fluorobiphenyl* | *74* | *43 - 109* | | | | |
| *Pyrene-d10* | *67* | *38 - 128* | | | | |
| *Terphenyl-d14* | *69* | *33 - 119* | | | | |

Date of Report: October 14, 2011
Samples Submitted: September 30, 2011
Laboratory Reference: 1109-223
Project: 5147-012-02

**PAHs by EPA 8270D/SIM**
**(with silica gel clean-up)**

Matrix: Soil
Units: mg/Kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-28-5.0** | | | | | |
| Laboratory ID: | 09-223-44 | | | | | |
| Naphthalene | **0.012** | 0.0082 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| 2-Methylnaphthalene | **ND** | 0.0082 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| 1-Methylnaphthalene | **ND** | 0.0082 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Acenaphthylene | **ND** | 0.0082 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Acenaphthene | **ND** | 0.0082 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Fluorene | **ND** | 0.0082 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Phenanthrene | **ND** | 0.0082 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Anthracene | **ND** | 0.0082 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Fluoranthene | **0.013** | 0.0082 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Pyrene | **0.012** | 0.0082 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Benzo[a]anthracene | **ND** | 0.0082 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Chrysene | **ND** | 0.0082 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Benzo[b]fluoranthene | **ND** | 0.0082 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Benzo(j,k)fluoranthene | **ND** | 0.0082 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Benzo[a]pyrene | **ND** | 0.0082 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Indeno(1,2,3-c,d)pyrene | **ND** | 0.0082 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Dibenz[a,h]anthracene | **ND** | 0.0082 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Benzo[g,h,i]perylene | **ND** | 0.0082 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *2-Fluorobiphenyl* | *85* | *43 - 109* | | | | |
| *Pyrene-d10* | *81* | *38 - 128* | | | | |
| *Terphenyl-d14* | *84* | *33 - 119* | | | | |

Date of Report: October 14, 2011
Samples Submitted: September 30, 2011
Laboratory Reference: 1109-223
Project: 5147-012-02

**PAHs by EPA 8270D/SIM**
**(with silica gel clean-up)**

Matrix: Soil
Units: mg/Kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-28-10.0** | | | | | |
| Laboratory ID: | 09-223-46 | | | | | |
| Naphthalene | **ND** | 0.0092 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| 2-Methylnaphthalene | **ND** | 0.0092 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| 1-Methylnaphthalene | **ND** | 0.0092 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Acenaphthylene | **ND** | 0.0092 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Acenaphthene | **ND** | 0.0092 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Fluorene | **ND** | 0.0092 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Phenanthrene | **ND** | 0.0092 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Anthracene | **ND** | 0.0092 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Fluoranthene | **ND** | 0.0092 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Pyrene | **ND** | 0.0092 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Benzo[a]anthracene | **ND** | 0.0092 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Chrysene | **ND** | 0.0092 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Benzo[b]fluoranthene | **ND** | 0.0092 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Benzo(j,k)fluoranthene | **ND** | 0.0092 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Benzo[a]pyrene | **ND** | 0.0092 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Indeno(1,2,3-c,d)pyrene | **ND** | 0.0092 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Dibenz[a,h]anthracene | **ND** | 0.0092 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Benzo[g,h,i]perylene | **ND** | 0.0092 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *2-Fluorobiphenyl* | *69* | *43 - 109* | | | | |
| *Pyrene-d10* | *72* | *38 - 128* | | | | |
| *Terphenyl-d14* | *74* | *33 - 119* | | | | |

Date of Report: October 14, 2011
Samples Submitted: September 30, 2011
Laboratory Reference: 1109-223
Project: 5147-012-02

**PAHs by EPA 8270D/SIM**
**(with silica gel clean-up)**

Matrix: Soil
Units: mg/Kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-29-5.0** | | | | | |
| Laboratory ID: | 09-223-50 | | | | | |
| Naphthalene | **ND** | 0.0075 | EPA 8270/SIM | 10-7-11 | 10-10-11 | |
| 2-Methylnaphthalene | **ND** | 0.0075 | EPA 8270/SIM | 10-7-11 | 10-10-11 | |
| 1-Methylnaphthalene | **ND** | 0.0075 | EPA 8270/SIM | 10-7-11 | 10-10-11 | |
| Acenaphthylene | **ND** | 0.0075 | EPA 8270/SIM | 10-7-11 | 10-10-11 | |
| Acenaphthene | **ND** | 0.0075 | EPA 8270/SIM | 10-7-11 | 10-10-11 | |
| Fluorene | **ND** | 0.0075 | EPA 8270/SIM | 10-7-11 | 10-10-11 | |
| Phenanthrene | **ND** | 0.0075 | EPA 8270/SIM | 10-7-11 | 10-10-11 | |
| Anthracene | **ND** | 0.0075 | EPA 8270/SIM | 10-7-11 | 10-10-11 | |
| Fluoranthene | **ND** | 0.0075 | EPA 8270/SIM | 10-7-11 | 10-10-11 | |
| Pyrene | **ND** | 0.0075 | EPA 8270/SIM | 10-7-11 | 10-10-11 | |
| Benzo[a]anthracene | **ND** | 0.0075 | EPA 8270/SIM | 10-7-11 | 10-10-11 | |
| Chrysene | **ND** | 0.0075 | EPA 8270/SIM | 10-7-11 | 10-10-11 | |
| Benzo[b]fluoranthene | **ND** | 0.0075 | EPA 8270/SIM | 10-7-11 | 10-10-11 | |
| Benzo(j,k)fluoranthene | **ND** | 0.0075 | EPA 8270/SIM | 10-7-11 | 10-10-11 | |
| Benzo[a]pyrene | **ND** | 0.0075 | EPA 8270/SIM | 10-7-11 | 10-10-11 | |
| Indeno(1,2,3-c,d)pyrene | **ND** | 0.0075 | EPA 8270/SIM | 10-7-11 | 10-10-11 | |
| Dibenz[a,h]anthracene | **ND** | 0.0075 | EPA 8270/SIM | 10-7-11 | 10-10-11 | |
| Benzo[g,h,i]perylene | **ND** | 0.0075 | EPA 8270/SIM | 10-7-11 | 10-10-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *2-Fluorobiphenyl* | *73* | *43 - 109* | | | | |
| *Pyrene-d10* | *75* | *38 - 128* | | | | |
| *Terphenyl-d14* | *79* | *33 - 119* | | | | |

Date of Report: October 14, 2011
Samples Submitted: September 30, 2011
Laboratory Reference: 1109-223
Project: 5147-012-02

**PAHs by EPA 8270D/SIM**
**(with silica gel clean-up)**

Matrix: Soil
Units: mg/Kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-29-10.0** | | | | | |
| Laboratory ID: | 09-223-52 | | | | | |
| Naphthalene | **0.034** | 0.0077 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| 2-Methylnaphthalene | **ND** | 0.0077 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| 1-Methylnaphthalene | **ND** | 0.0077 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Acenaphthylene | **ND** | 0.0077 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Acenaphthene | **ND** | 0.0077 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Fluorene | **ND** | 0.0077 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Phenanthrene | **0.030** | 0.0077 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Anthracene | **ND** | 0.0077 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Fluoranthene | **0.045** | 0.0077 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Pyrene | **0.044** | 0.0077 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Benzo[a]anthracene | **0.015** | 0.0077 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Chrysene | **0.017** | 0.0077 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Benzo[b]fluoranthene | **0.011** | 0.0077 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Benzo(j,k)fluoranthene | **0.012** | 0.0077 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Benzo[a]pyrene | **0.016** | 0.0077 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Indeno(1,2,3-c,d)pyrene | **0.0090** | 0.0077 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Dibenz[a,h]anthracene | **ND** | 0.0077 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Benzo[g,h,i]perylene | **0.011** | 0.0077 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *2-Fluorobiphenyl* | *83* | *43 - 109* | | | | |
| *Pyrene-d10* | *82* | *38 - 128* | | | | |
| *Terphenyl-d14* | *86* | *33 - 119* | | | | |

Date of Report: October 14, 2011
Samples Submitted: September 30, 2011
Laboratory Reference: 1109-223
Project: 5147-012-02

**PAHs by EPA 8270D/SIM**
**(with silica gel clean-up)**

Matrix: Soil
Units: mg/Kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-27-7.5** | | | | | |
| Laboratory ID: | 09-223-104 | | | | | |
| Naphthalene | **ND** | 0.0093 | EPA 8270/SIM | 10-7-11 | 10-10-11 | |
| 2-Methylnaphthalene | **ND** | 0.0093 | EPA 8270/SIM | 10-7-11 | 10-10-11 | |
| 1-Methylnaphthalene | **ND** | 0.0093 | EPA 8270/SIM | 10-7-11 | 10-10-11 | |
| Acenaphthylene | **ND** | 0.0093 | EPA 8270/SIM | 10-7-11 | 10-10-11 | |
| Acenaphthene | **ND** | 0.0093 | EPA 8270/SIM | 10-7-11 | 10-10-11 | |
| Fluorene | **ND** | 0.0093 | EPA 8270/SIM | 10-7-11 | 10-10-11 | |
| Phenanthrene | **ND** | 0.0093 | EPA 8270/SIM | 10-7-11 | 10-10-11 | |
| Anthracene | **ND** | 0.0093 | EPA 8270/SIM | 10-7-11 | 10-10-11 | |
| Fluoranthene | **ND** | 0.0093 | EPA 8270/SIM | 10-7-11 | 10-10-11 | |
| Pyrene | **ND** | 0.0093 | EPA 8270/SIM | 10-7-11 | 10-10-11 | |
| Benzo[a]anthracene | **ND** | 0.0093 | EPA 8270/SIM | 10-7-11 | 10-10-11 | |
| Chrysene | **ND** | 0.0093 | EPA 8270/SIM | 10-7-11 | 10-10-11 | |
| Benzo[b]fluoranthene | **ND** | 0.0093 | EPA 8270/SIM | 10-7-11 | 10-10-11 | |
| Benzo(j,k)fluoranthene | **ND** | 0.0093 | EPA 8270/SIM | 10-7-11 | 10-10-11 | |
| Benzo[a]pyrene | **ND** | 0.0093 | EPA 8270/SIM | 10-7-11 | 10-10-11 | |
| Indeno(1,2,3-c,d)pyrene | **ND** | 0.0093 | EPA 8270/SIM | 10-7-11 | 10-10-11 | |
| Dibenz[a,h]anthracene | **ND** | 0.0093 | EPA 8270/SIM | 10-7-11 | 10-10-11 | |
| Benzo[g,h,i]perylene | **ND** | 0.0093 | EPA 8270/SIM | 10-7-11 | 10-10-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *2-Fluorobiphenyl* | *77* | *43 - 109* | | | | |
| *Pyrene-d10* | *77* | *38 - 128* | | | | |
| *Terphenyl-d14* | *81* | *33 - 119* | | | | |

Date of Report: October 14, 2011
Samples Submitted: September 30, 2011
Laboratory Reference: 1109-223
Project: 5147-012-02

**PAHs by EPA 8270D/SIM**
**(with silica gel clean-up)**

Matrix: Soil
Units: mg/Kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-27-11.0** | | | | | |
| Laboratory ID: | 09-223-105 | | | | | |
| Naphthalene | **ND** | 0.0094 | EPA 8270/SIM | 10-7-11 | 10-10-11 | |
| 2-Methylnaphthalene | **ND** | 0.0094 | EPA 8270/SIM | 10-7-11 | 10-10-11 | |
| 1-Methylnaphthalene | **ND** | 0.0094 | EPA 8270/SIM | 10-7-11 | 10-10-11 | |
| Acenaphthylene | **ND** | 0.0094 | EPA 8270/SIM | 10-7-11 | 10-10-11 | |
| Acenaphthene | **ND** | 0.0094 | EPA 8270/SIM | 10-7-11 | 10-10-11 | |
| Fluorene | **ND** | 0.0094 | EPA 8270/SIM | 10-7-11 | 10-10-11 | |
| Phenanthrene | **ND** | 0.0094 | EPA 8270/SIM | 10-7-11 | 10-10-11 | |
| Anthracene | **ND** | 0.0094 | EPA 8270/SIM | 10-7-11 | 10-10-11 | |
| Fluoranthene | **ND** | 0.0094 | EPA 8270/SIM | 10-7-11 | 10-10-11 | |
| Pyrene | **ND** | 0.0094 | EPA 8270/SIM | 10-7-11 | 10-10-11 | |
| Benzo[a]anthracene | **ND** | 0.0094 | EPA 8270/SIM | 10-7-11 | 10-10-11 | |
| Chrysene | **ND** | 0.0094 | EPA 8270/SIM | 10-7-11 | 10-10-11 | |
| Benzo[b]fluoranthene | **ND** | 0.0094 | EPA 8270/SIM | 10-7-11 | 10-10-11 | |
| Benzo(j,k)fluoranthene | **ND** | 0.0094 | EPA 8270/SIM | 10-7-11 | 10-10-11 | |
| Benzo[a]pyrene | **ND** | 0.0094 | EPA 8270/SIM | 10-7-11 | 10-10-11 | |
| Indeno(1,2,3-c,d)pyrene | **ND** | 0.0094 | EPA 8270/SIM | 10-7-11 | 10-10-11 | |
| Dibenz[a,h]anthracene | **ND** | 0.0094 | EPA 8270/SIM | 10-7-11 | 10-10-11 | |
| Benzo[g,h,i]perylene | **ND** | 0.0094 | EPA 8270/SIM | 10-7-11 | 10-10-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *2-Fluorobiphenyl* | *83* | *43 - 109* | | | | |
| *Pyrene-d10* | *80* | *38 - 128* | | | | |
| *Terphenyl-d14* | *88* | *33 - 119* | | | | |

Date of Report: October 14, 2011
Samples Submitted: September 30, 2011
Laboratory Reference: 1109-223
Project: 5147-012-02

**PAHs by EPA 8270D/SIM**
**(with silica gel clean-up)**

Matrix: Soil
Units: mg/Kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-27-13.0** | | | | | |
| Laboratory ID: | 09-223-106 | | | | | |
| Naphthalene | **ND** | 0.010 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| 2-Methylnaphthalene | **ND** | 0.010 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| 1-Methylnaphthalene | **ND** | 0.010 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Acenaphthylene | **ND** | 0.010 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Acenaphthene | **ND** | 0.010 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Fluorene | **ND** | 0.010 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Phenanthrene | **ND** | 0.010 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Anthracene | **ND** | 0.010 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Fluoranthene | **ND** | 0.010 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Pyrene | **ND** | 0.010 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Benzo[a]anthracene | **ND** | 0.010 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Chrysene | **ND** | 0.010 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Benzo[b]fluoranthene | **ND** | 0.010 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Benzo(j,k)fluoranthene | **ND** | 0.010 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Benzo[a]pyrene | **ND** | 0.010 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Indeno(1,2,3-c,d)pyrene | **ND** | 0.010 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Dibenz[a,h]anthracene | **ND** | 0.010 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Benzo[g,h,i]perylene | **ND** | 0.010 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *2-Fluorobiphenyl* | *81* | *43 - 109* | | | | |
| *Pyrene-d10* | *84* | *38 - 128* | | | | |
| *Terphenyl-d14* | *87* | *33 - 119* | | | | |

Date of Report: October 14, 2011
Samples Submitted: September 30, 2011
Laboratory Reference: 1109-223
Project: 5147-012-02

**PAHs by EPA 8270D/SIM**
**(with silica gel clean-up)**

Matrix: Soil
Units: mg/Kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-34-12.0** | | | | | |
| Laboratory ID: | 09-223-112 | | | | | |
| Naphthalene | **0.20** | 0.0078 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| 2-Methylnaphthalene | **0.030** | 0.0078 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| 1-Methylnaphthalene | **0.017** | 0.0078 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Acenaphthylene | **0.075** | 0.0078 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Acenaphthene | **0.026** | 0.0078 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Fluorene | **0.052** | 0.0078 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Phenanthrene | **0.47** | 0.0078 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Anthracene | **0.18** | 0.0078 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Fluoranthene | **0.89** | 0.0078 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Pyrene | **0.87** | 0.0078 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Benzo[a]anthracene | **0.38** | 0.0078 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Chrysene | **0.37** | 0.0078 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Benzo[b]fluoranthene | **0.23** | 0.0078 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Benzo(j,k)fluoranthene | **0.27** | 0.0078 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Benzo[a]pyrene | **0.41** | 0.0078 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Indeno(1,2,3-c,d)pyrene | **0.20** | 0.0078 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Dibenz[a,h]anthracene | **0.058** | 0.0078 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| Benzo[g,h,i]perylene | **0.24** | 0.0078 | EPA 8270/SIM | 10-7-11 | 10-9-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *2-Fluorobiphenyl* | *78* | *43 - 109* | | | | |
| *Pyrene-d10* | *75* | *38 - 128* | | | | |
| *Terphenyl-d14* | *81* | *33 - 119* | | | | |

Date of Report: October 14, 2011
Samples Submitted: September 30, 2011
Laboratory Reference: 1109-223
Project: 5147-012-02

**PCBs by EPA 8082**

Matrix: Soil
Units: mg/Kg (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-27-7.5** | | | | | |
| Laboratory ID: | 09-223-104 | | | | | |
| Aroclor 1016 | **ND** | 0.070 | EPA 8082 | 10-4-11 | 10-5-11 | |
| Aroclor 1221 | **ND** | 0.070 | EPA 8082 | 10-4-11 | 10-5-11 | |
| Aroclor 1232 | **ND** | 0.070 | EPA 8082 | 10-4-11 | 10-5-11 | |
| Aroclor 1242 | **ND** | 0.070 | EPA 8082 | 10-4-11 | 10-5-11 | |
| Aroclor 1248 | **ND** | 0.070 | EPA 8082 | 10-4-11 | 10-5-11 | |
| Aroclor 1254 | **ND** | 0.070 | EPA 8082 | 10-4-11 | 10-5-11 | |
| Aroclor 1260 | **ND** | 0.070 | EPA 8082 | 10-4-11 | 10-5-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *DCB* | *69* | *42-123* | | | | |
| **Client ID:** | **GEI-27-11.0** | | | | | |
| Laboratory ID: | 09-223-105 | | | | | |
| Aroclor 1016 | **ND** | 0.070 | EPA 8082 | 10-4-11 | 10-5-11 | |
| Aroclor 1221 | **ND** | 0.070 | EPA 8082 | 10-4-11 | 10-5-11 | |
| Aroclor 1232 | **ND** | 0.070 | EPA 8082 | 10-4-11 | 10-5-11 | |
| Aroclor 1242 | **ND** | 0.070 | EPA 8082 | 10-4-11 | 10-5-11 | |
| Aroclor 1248 | **ND** | 0.070 | EPA 8082 | 10-4-11 | 10-5-11 | |
| Aroclor 1254 | **ND** | 0.070 | EPA 8082 | 10-4-11 | 10-5-11 | |
| Aroclor 1260 | **ND** | 0.070 | EPA 8082 | 10-4-11 | 10-5-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *DCB* | *67* | *42-123* | | | | |
| **Client ID:** | **GEI-27-13.0** | | | | | |
| Laboratory ID: | 09-223-106 | | | | | |
| Aroclor 1016 | **ND** | 0.077 | EPA 8082 | 10-4-11 | 10-5-11 | |
| Aroclor 1221 | **ND** | 0.077 | EPA 8082 | 10-4-11 | 10-5-11 | |
| Aroclor 1232 | **ND** | 0.077 | EPA 8082 | 10-4-11 | 10-5-11 | |
| Aroclor 1242 | **ND** | 0.077 | EPA 8082 | 10-4-11 | 10-5-11 | |
| Aroclor 1248 | **ND** | 0.077 | EPA 8082 | 10-4-11 | 10-5-11 | |
| Aroclor 1254 | **ND** | 0.077 | EPA 8082 | 10-4-11 | 10-5-11 | |
| Aroclor 1260 | **ND** | 0.077 | EPA 8082 | 10-4-11 | 10-5-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *DCB* | *67* | *42-123* | | | | |

Date of Report: October 14, 2011
Samples Submitted: September 30, 2011
Laboratory Reference: 1109-223
Project: 5147-012-02

**TOTAL LEAD**
**EPA 6010B**

Matrix: Soil
Units: mg/kg (ppm)

| Analyte | Result | PQL | EPA Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| Lab ID: | 09-223-03 | | | | | |
| **Client ID:** | **GEI-31-7.5** | | | | | |
| Lead | **ND** | 6.1 | 6010B | 10-11-11 | 10-12-11 | |
| Lab ID: | 09-223-07 | | | | | |
| **Client ID:** | **GEI-32-5.0** | | | | | |
| Lead | **ND** | 6.2 | 6010B | 10-11-11 | 10-12-11 | |
| Lab ID: | 09-223-12 | | | | | |
| **Client ID:** | **GEI-33-5.0** | | | | | |
| Lead | **ND** | 6.5 | 6010B | 10-11-11 | 10-12-11 | |
| Lab ID: | 09-223-14 | | | | | |
| **Client ID:** | **GEI-33-10.0** | | | | | |
| Lead | **ND** | 6.1 | 6010B | 10-11-11 | 10-12-11 | |
| Lab ID: | 09-223-16 | | | | | |
| **Client ID:** | **GEI-33-14.0** | | | | | |
| Lead | **ND** | 6.2 | 6010B | 10-11-11 | 10-12-11 | |
| Lab ID: | 09-223-20 | | | | | |
| **Client ID:** | **GEI-20-5.0** | | | | | |
| Lead | **ND** | 8.1 | 6010B | 10-11-11 | 10-12-11 | |
| Lab ID: | 09-223-22 | | | | | |
| **Client ID:** | **GEI-20-10.0** | | | | | |
| Lead | **ND** | 8.4 | 6010B | 10-11-11 | 10-12-11 | |

Date of Report: October 14, 2011
Samples Submitted: September 30, 2011
Laboratory Reference: 1109-223
Project: 5147-012-02

**TOTAL LEAD**
**EPA 6010B**

Matrix: Soil
Units: mg/kg (ppm)

| Analyte | Result | PQL | EPA Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| Lab ID: | 09-223-26 | | | | | |
| **Client ID:** | **GEI-21-5.0** | | | | | |
| Lead | **ND** | 8.1 | 6010B | 10-11-11 | 10-12-11 | |
| Lab ID: | 09-223-28 | | | | | |
| **Client ID:** | **GEI-21-10.0** | | | | | |
| Lead | **19** | 6.8 | 6010B | 10-11-11 | 10-12-11 | |
| Lab ID: | 09-223-32 | | | | | |
| **Client ID:** | **GEI-22-5.0** | | | | | |
| Lead | **ND** | 6.5 | 6010B | 10-11-11 | 10-12-11 | |
| Lab ID: | 09-223-35 | | | | | |
| **Client ID:** | **GEI-22-12.5** | | | | | |
| Lead | **32** | 8.8 | 6010B | 10-11-11 | 10-12-11 | |
| Lab ID: | 09-223-38 | | | | | |
| **Client ID:** | **GEI-26-5.0** | | | | | |
| Lead | **ND** | 6.6 | 6010B | 10-11-11 | 10-12-11 | |
| Lab ID: | 09-223-40 | | | | | |
| **Client ID:** | **GEI-26-10.0** | | | | | |
| Lead | **ND** | 7.6 | 6010B | 10-11-11 | 10-12-11 | |
| Lab ID: | 09-223-44 | | | | | |
| **Client ID:** | **GEI-28-5.0** | | | | | |
| Lead | **ND** | 6.2 | 6010B | 10-11-11 | 10-12-11 | |

Date of Report: October 14, 2011
Samples Submitted: September 30, 2011
Laboratory Reference: 1109-223
Project: 5147-012-02

**TOTAL LEAD**
**EPA 6010B**

Matrix: Soil
Units: mg/kg (ppm)

| Analyte | Result | PQL | EPA Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| Lab ID: | 09-223-46 | | | | | |
| **Client ID:** | **GEI-28-10.0** | | | | | |
| Lead | **ND** | 6.9 | 6010B | 10-11-11 | 10-12-11 | |
| Lab ID: | 09-223-50 | | | | | |
| **Client ID:** | **GEI-29-5.0** | | | | | |
| Lead | **ND** | 5.6 | 6010B | 10-11-11 | 10-12-11 | |
| Lab ID: | 09-223-52 | | | | | |
| **Client ID:** | **GEI-29-10.0** | | | | | |
| Lead | **14** | 5.8 | 6010B | 10-11-11 | 10-12-11 | |
| Lab ID: | 09-223-56 | | | | | |
| **Client ID:** | **GEI-16-5.0** | | | | | |
| Lead | **ND** | 8.5 | 6010B | 10-11-11 | 10-12-11 | |
| Lab ID: | 09-223-58 | | | | | |
| **Client ID:** | **GEI-16-10.0** | | | | | |
| Lead | **ND** | 5.6 | 6010B | 10-11-11 | 10-12-11 | |
| Lab ID: | 09-223-65 | | | | | |
| **Client ID:** | **GEI-17-10.0** | | | | | |
| Lead | **ND** | 7.8 | 6010B | 10-11-11 | 10-12-11 | |
| Lab ID: | 09-223-66 | | | | | |
| **Client ID:** | **GEI-17-14.0** | | | | | |
| Lead | **ND** | 5.7 | 6010B | 10-12-11 | 10-12-11 | |

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Project: 5147-012-02

**TOTAL LEAD**
**EPA 6010B**

Matrix: Soil
Units: mg/kg (ppm)

| Analyte | Result | PQL | EPA Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| Lab ID: | 09-223-67 | | | | | |
| **Client ID:** | **GEI-17-17.5** | | | | | |
| Lead | **ND** | 6.3 | 6010B | 10-12-11 | 10-12-11 | |
| Lab ID: | 09-223-70 | | | | | |
| **Client ID:** | **GEI-18-5.0** | | | | | |
| Lead | **ND** | 6.3 | 6010B | 10-12-11 | 10-12-11 | |
| Lab ID: | 09-223-72 | | | | | |
| **Client ID:** | **GEI-18-12.5** | | | | | |
| Lead | **ND** | 6.4 | 6010B | 10-12-11 | 10-12-11 | |
| Lab ID: | 09-223-73 | | | | | |
| **Client ID:** | **GEI-18-15.0** | | | | | |
| Lead | **24** | 8.8 | 6010B | 10-12-11 | 10-12-11 | |
| Lab ID: | 09-223-77 | | | | | |
| **Client ID:** | **GEI-19-5.0** | | | | | |
| Lead | **21** | 8.5 | 6010B | 10-12-11 | 10-12-11 | |
| Lab ID: | 09-223-79 | | | | | |
| **Client ID:** | **GEI-19-10.0** | | | | | |
| Lead | **ND** | 7.7 | 6010B | 10-12-11 | 10-12-11 | |
| Lab ID: | 09-223-86 | | | | | |
| **Client ID:** | **GEI-23-7.5** | | | | | |
| Lead | **ND** | 9.0 | 6010B | 10-12-11 | 10-12-11 | |

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**TOTAL LEAD**
**EPA 6010B**

Matrix: Soil
Units: mg/kg (ppm)

| Analyte | Result | PQL | EPA Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| Lab ID: | 09-223-88 | | | | | |
| **Client ID:** | **GEI-23-12.5** | | | | | |
| Lead | **100** | 13 | 6010B | 10-12-11 | 10-12-11 | |
| Lab ID: | 09-223-91 | | | | | |
| **Client ID:** | **GEI-24-5.0** | | | | | |
| Lead | **22** | 8.8 | 6010B | 10-12-11 | 10-12-11 | |
| Lab ID: | 09-223-93 | | | | | |
| **Client ID:** | **GEI-24-10.0** | | | | | |
| Lead | **ND** | 8.5 | 6010B | 10-12-11 | 10-12-11 | |
| Lab ID: | 09-223-97 | | | | | |
| **Client ID:** | **GEI-25-5.0** | | | | | |
| Lead | **22** | 7.5 | 6010B | 10-12-11 | 10-12-11 | |
| Lab ID: | 09-223-99 | | | | | |
| **Client ID:** | **GEI-25-10.0** | | | | | |
| Lead | **ND** | 8.7 | 6010B | 10-12-11 | 10-12-11 | |
| Lab ID: | 09-223-104 | | | | | |
| **Client ID:** | **GEI-27-7.5** | | | | | |
| Lead | **ND** | 7.0 | 6010B | 10-12-11 | 10-12-11 | |
| Lab ID: | 09-223-105 | | | | | |
| **Client ID:** | **GEI-27-11.0** | | | | | |
| Lead | **ND** | 7.0 | 6010B | 10-12-11 | 10-12-11 | |

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**TOTAL LEAD**
**EPA 6010B**

Matrix: Soil
Units: mg/kg (ppm)

| Analyte | Result | PQL | EPA Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| Lab ID: | 09-223-106 | | | | | |
| **Client ID:** | **GEI-27-13.0** | | | | | |
| Lead | **ND** | 7.7 | 6010B | 10-12-11 | 10-12-11 | |
| Lab ID: | 09-223-112 | | | | | |
| **Client ID:** | **GEI-34-12.0** | | | | | |
| Lead | **25** | 5.9 | 6010B | 10-12-11 | 10-12-11 | |
| Lab ID: | 09-223-119 | | | | | |
| **Client ID:** | **GEI-35-15.0** | | | | | |
| Lead | **ND** | 6.1 | 6010B | 10-12-11 | 10-12-11 | |

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**MTBE, EDB, EDC by EPA 8260B**

Matrix: Soil
Units: mg/kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-27-7.5** | | | | | |
| Laboratory ID: | 09-223-104 | | | | | |
| Methyl t-Butyl Ether | ND | 0.0017 | EPA 8260 | 10-6-11 | 10-6-11 | |
| 1,2-Dichloroethane | ND | 0.0017 | EPA 8260 | 10-6-11 | 10-6-11 | |
| 1,2-Dibromoethane | ND | 0.0017 | EPA 8260 | 10-6-11 | 10-6-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Dibromofluoromethane* | *103* | *63-127* | | | | |
| *Toluene-d8* | *102* | *65-129* | | | | |
| *4-Bromofluorobenzene* | *95* | *55-121* | | | | |
| **Client ID:** | **GEI-27-11.0** | | | | | |
| Laboratory ID: | 09-223-105 | | | | | |
| Methyl t-Butyl Ether | ND | 0.0016 | EPA 8260 | 10-6-11 | 10-6-11 | |
| 1,2-Dichloroethane | ND | 0.0016 | EPA 8260 | 10-6-11 | 10-6-11 | |
| 1,2-Dibromoethane | ND | 0.0016 | EPA 8260 | 10-6-11 | 10-6-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Dibromofluoromethane* | *104* | *63-127* | | | | |
| *Toluene-d8* | *100* | *65-129* | | | | |
| *4-Bromofluorobenzene* | *92* | *55-121* | | | | |
| **Client ID:** | **GEI-27-13.0** | | | | | |
| Laboratory ID: | 09-223-106 | | | | | |
| Methyl t-Butyl Ether | ND | 0.0015 | EPA 8260 | 10-6-11 | 10-6-11 | |
| 1,2-Dichloroethane | ND | 0.0015 | EPA 8260 | 10-6-11 | 10-6-11 | |
| 1,2-Dibromoethane | ND | 0.0015 | EPA 8260 | 10-6-11 | 10-6-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Dibromofluoromethane* | *105* | *63-127* | | | | |
| *Toluene-d8* | *105* | *65-129* | | | | |
| *4-Bromofluorobenzene* | *102* | *55-121* | | | | |

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Project: 5147-012-02

**NWTPH-Dx**
**(with acid/silica gel clean-up)**

Matrix: Soil
Units: mg/Kg (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-23-15.0** | | | | | |
| Laboratory ID: | 09-223-89 | | | | | |
| Diesel Range Organics | **ND** | 32 | NWTPH-Dx | 10-12-11 | 10-12-11 | |
| Lube Oil Range Organics | **ND** | 63 | NWTPH-Dx | 10-12-11 | 10-12-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *o-Terphenyl* | *97* | *50-150* | | | | |

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**NWTPH-Gx/BTEX**
**METHOD BLANK QUALITY CONTROL**

Matrix: Soil
Units: mg/kg (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **METHOD BLANK** | | | | | | |
| Laboratory ID: | MB1007S1 | | | | | |
| Benzene | **ND** | 0.020 | EPA 8021 | 10-7-11 | 10-7-11 | |
| Toluene | **ND** | 0.050 | EPA 8021 | 10-7-11 | 10-7-11 | |
| Ethyl Benzene | **ND** | 0.050 | EPA 8021 | 10-7-11 | 10-7-11 | |
| m,p-Xylene | **ND** | 0.050 | EPA 8021 | 10-7-11 | 10-7-11 | |
| o-Xylene | **ND** | 0.050 | EPA 8021 | 10-7-11 | 10-7-11 | |
| Gasoline | **ND** | 5.0 | NWTPH-Gx | 10-7-11 | 10-7-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *87* | *68-124* | | | | |
| Laboratory ID: | MB1007S2 | | | | | |
| Benzene | **ND** | 0.020 | EPA 8021 | 10-7-11 | 10-7-11 | |
| Toluene | **ND** | 0.050 | EPA 8021 | 10-7-11 | 10-7-11 | |
| Ethyl Benzene | **ND** | 0.050 | EPA 8021 | 10-7-11 | 10-7-11 | |
| m,p-Xylene | **ND** | 0.050 | EPA 8021 | 10-7-11 | 10-7-11 | |
| o-Xylene | **ND** | 0.050 | EPA 8021 | 10-7-11 | 10-7-11 | |
| Gasoline | **ND** | 5.0 | NWTPH-Gx | 10-7-11 | 10-7-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *98* | *68-124* | | | | |
| Laboratory ID: | MB1007S3 | | | | | |
| Benzene | **ND** | 0.020 | EPA 8021 | 10-7-11 | 10-10-11 | |
| Toluene | **ND** | 0.050 | EPA 8021 | 10-7-11 | 10-10-11 | |
| Ethyl Benzene | **ND** | 0.050 | EPA 8021 | 10-7-11 | 10-10-11 | |
| m,p-Xylene | **ND** | 0.050 | EPA 8021 | 10-7-11 | 10-10-11 | |
| o-Xylene | **ND** | 0.050 | EPA 8021 | 10-7-11 | 10-10-11 | |
| Gasoline | **ND** | 5.0 | NWTPH-Gx | 10-7-11 | 10-10-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *100* | *68-124* | | | | |
| Laboratory ID: | MB1007S4 | | | | | |
| Benzene | **ND** | 0.020 | EPA 8021 | 10-7-11 | 10-8-11 | |
| Toluene | **ND** | 0.050 | EPA 8021 | 10-7-11 | 10-8-11 | |
| Ethyl Benzene | **ND** | 0.050 | EPA 8021 | 10-7-11 | 10-8-11 | |
| m,p-Xylene | **ND** | 0.050 | EPA 8021 | 10-7-11 | 10-8-11 | |
| o-Xylene | **ND** | 0.050 | EPA 8021 | 10-7-11 | 10-8-11 | |
| Gasoline | **ND** | 5.0 | NWTPH-Gx | 10-7-11 | 10-8-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *104* | *68-124* | | | | |

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Project: 5147-012-02

**NWTPH-Gx/BTEX**
**DUPLICATE QUALITY CONTROL**

Matrix: Soil
Units: mg/kg (ppm)

| Analyte | Result | | Spike Level | | Source Result | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|---|---|---|---|---|---|---|---|---|---|---|
| Laboratory ID: | 10-038-01 | | | | | | | | | |
| | ORIG | DUP | | | | | | | | |
| Benzene | **ND** | **ND** | NA | NA | | NA | NA | NA | 30 | |
| Toluene | **ND** | **ND** | NA | NA | | NA | NA | NA | 30 | |
| Ethyl Benzene | **ND** | **ND** | NA | NA | | NA | NA | NA | 30 | |
| m,p-Xylene | **ND** | **ND** | NA | NA | | NA | NA | NA | 30 | |
| o-Xylene | **ND** | **ND** | NA | NA | | NA | NA | NA | 30 | |
| Gasoline | **ND** | **ND** | NA | NA | | NA | NA | NA | 30 | |
| *Surrogate:* | | | | | | | | | | |
| *Fluorobenzene* | | | | | | *102* | *91* | *68-124* | | |
| Laboratory ID: | 09-223-07 | | | | | | | | | |
| | ORIG | DUP | | | | | | | | |
| Benzene | **ND** | **ND** | NA | NA | | NA | NA | NA | 30 | |
| Toluene | **ND** | **ND** | NA | NA | | NA | NA | NA | 30 | |
| Ethyl Benzene | **ND** | **ND** | NA | NA | | NA | NA | NA | 30 | |
| m,p-Xylene | **ND** | **ND** | NA | NA | | NA | NA | NA | 30 | |
| o-Xylene | **ND** | **ND** | NA | NA | | NA | NA | NA | 30 | |
| Gasoline | **ND** | **ND** | NA | NA | | NA | NA | NA | 30 | |
| *Surrogate:* | | | | | | | | | | |
| *Fluorobenzene* | | | | | | *98* | *100* | *68-124* | | |
| Laboratory ID: | 09-223-58 | | | | | | | | | |
| | ORIG | DUP | | | | | | | | |
| Benzene | **ND** | **ND** | NA | NA | | NA | NA | NA | 30 | |
| Toluene | **ND** | **ND** | NA | NA | | NA | NA | NA | 30 | |
| Ethyl Benzene | **ND** | **ND** | NA | NA | | NA | NA | NA | 30 | |
| m,p-Xylene | **ND** | **ND** | NA | NA | | NA | NA | NA | 30 | |
| o-Xylene | **ND** | **ND** | NA | NA | | NA | NA | NA | 30 | |
| Gasoline | **ND** | **ND** | NA | NA | | NA | NA | NA | 30 | |
| *Surrogate:* | | | | | | | | | | |
| *Fluorobenzene* | | | | | | *92* | *99* | *68-124* | | |
| Laboratory ID: | 09-223-65 | | | | | | | | | |
| | ORIG | DUP | | | | | | | | |
| Benzene | **ND** | **ND** | NA | NA | | NA | NA | NA | 30 | |
| Toluene | **ND** | **ND** | NA | NA | | NA | NA | NA | 30 | |
| Ethyl Benzene | **ND** | **ND** | NA | NA | | NA | NA | NA | 30 | |
| m,p-Xylene | **ND** | **ND** | NA | NA | | NA | NA | NA | 30 | |
| o-Xylene | **ND** | **ND** | NA | NA | | NA | NA | NA | 30 | |
| Gasoline | **ND** | **ND** | NA | NA | | NA | NA | NA | 30 | |
| *Surrogate:* | | | | | | | | | | |
| *Fluorobenzene* | | | | | | *106* | *104* | *68-124* | | |

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**NWTPH-Gx/BTEX**
**SB/SBD QUALITY CONTROL**

Matrix: Soil
Units: mg/kg (ppm)

| Analyte | Result | | Spike Level | | Source Result | Percent Recovery | | Recovery Limits | RPD | RPD Limit | Flags |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **SPIKE BLANKS** | | | | | | | | | | | |
| Laboratory ID: | SB1007S1 | | | | | | | | | | |
| | SB | SBD | SB | SBD | | SB | SBD | | | | |
| Benzene | **0.983** | **1.04** | 1.00 | 1.00 | | **98** | **104** | 77-114 | 6 | 9 | |
| Toluene | **0.991** | **1.04** | 1.00 | 1.00 | | **99** | **104** | 80-115 | 5 | 9 | |
| Ethyl Benzene | **0.959** | **1.00** | 1.00 | 1.00 | | **96** | **100** | 80-118 | 4 | 9 | |
| m,p-Xylene | **0.958** | **1.00** | 1.00 | 1.00 | | **96** | **100** | 82-118 | 4 | 9 | |
| o-Xylene | **0.950** | **0.986** | 1.00 | 1.00 | | **95** | **99** | 82-116 | 4 | 9 | |
| *Surrogate:* | | | | | | | | | | | |
| *Fluorobenzene* | | | | | | *103* | *105* | *68-124* | | | |
| Laboratory ID: | SB1007S2 | | | | | | | | | | |
| | SB | SBD | SB | SBD | | SB | SBD | | | | |
| Benzene | **0.984** | **1.00** | 1.00 | 1.00 | | **98** | **100** | 77-114 | 2 | 9 | |
| Toluene | **0.997** | **0.989** | 1.00 | 1.00 | | **100** | **99** | 80-115 | 1 | 9 | |
| Ethyl Benzene | **0.970** | **0.949** | 1.00 | 1.00 | | **97** | **95** | 80-118 | 2 | 9 | |
| m,p-Xylene | **0.974** | **0.947** | 1.00 | 1.00 | | **97** | **95** | 82-118 | 3 | 9 | |
| o-Xylene | **0.958** | **0.910** | 1.00 | 1.00 | | **96** | **91** | 82-116 | 5 | 9 | |
| *Surrogate:* | | | | | | | | | | | |
| *Fluorobenzene* | | | | | | *102* | *102* | *68-124* | | | |

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**NWTPH-Dx**
**METHOD BLANK QUALITY CONTROL**
**(with acid/silica gel clean-up)**

Matrix: Soil
Units: mg/Kg (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **METHOD BLANK** | | | | | | |
| Laboratory ID: | MB1006S2 | | | | | |
| Diesel Range Organics | **ND** | 25 | NWTPH-Dx | 10-6-11 | 10-6-11 | |
| Lube Oil Range Organics | **ND** | 50 | NWTPH-Dx | 10-6-11 | 10-6-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *o-Terphenyl* | *94* | *50-150* | | | | |
| Laboratory ID: | MB1007S1 | | | | | |
| Diesel Range Organics | **ND** | 25 | NWTPH-Dx | 10-7-11 | 10-7-11 | |
| Lube Oil Range Organics | **ND** | 50 | NWTPH-Dx | 10-7-11 | 10-7-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *o-Terphenyl* | *105* | *50-150* | | | | |
| Laboratory ID: | MB1007S2 | | | | | |
| Diesel Range Organics | **ND** | 25 | NWTPH-Dx | 10-7-11 | 10-7-11 | |
| Lube Oil Range Organics | **ND** | 50 | NWTPH-Dx | 10-7-11 | 10-7-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *o-Terphenyl* | *102* | *50-150* | | | | |

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**NWTPH-Dx**
**DUPLICATE QUALITY CONTROL**
**(with acid/silica gel clean-up)**

Matrix: Soil
Units: mg/Kg (ppm)

| Analyte | Result | | Percent Recovery | | Recovery Limits | RPD | RPD Limit | Flags |
|---|---|---|---|---|---|---|---|---|
| **DUPLICATE** | | | | | | | | |
| Laboratory ID: | 09-196-08 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Diesel Range Organics | **ND** | **ND** | | | | NA | NA | |
| Lube Oil Range Organics | **ND** | **ND** | | | | NA | NA | |
| *Surrogate:* | | | | | | | | |
| *o-Terphenyl* | | | *60* | *66* | *50-150* | | | |
| Laboratory ID: | 09-223-28 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Diesel Range Organics | **475** | **400** | | | | 17 | NA | |
| Lube Oil Range Organics | **1040** | **831** | | | | 22 | NA | |
| *Surrogate:* | | | | | | | | |
| *o-Terphenyl* | | | *131* | *124* | *50-150* | | | |
| Laboratory ID: | 09-223-56 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Diesel Range Organics | **ND** | **ND** | | | | NA | NA | |
| Lube Oil Range Organics | **ND** | **ND** | | | | NA | NA | |
| *Surrogate:* | | | | | | | | |
| *o-Terphenyl* | | | *96* | *100* | *50-150* | | | |
| Laboratory ID: | 09-223-58 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Diesel Range Organics | **ND** | **ND** | | | | NA | NA | |
| Lube Oil Range Organics | **ND** | **ND** | | | | NA | NA | |
| *Surrogate:* | | | | | | | | |
| *o-Terphenyl* | | | *99* | *101* | *50-150* | | | |
| Laboratory ID: | 09-223-106 | | | | | | | |
| | ORIG | DUP | | | | | | |
| Diesel Range Organics | **33.8** | **33.0** | | | | 2 | NA | |
| Lube Oil | **114** | **106** | | | | 7 | NA | |
| *Surrogate:* | | | | | | | | |
| *o-Terphenyl* | | | *97* | *107* | *50-150* | | | |

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**PAHs by EPA 8270D/SIM**
**METHOD BLANK QUALITY CONTROL**
**(with silica gel clean-up)**

Matrix: Soil
Units: mg/Kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| Laboratory ID: | MB1006S2 | | | | | |
| Naphthalene | **ND** | 0.0067 | EPA 8270/SIM | 10-6-11 | 10-6-11 | |
| 2-Methylnaphthalene | **ND** | 0.0067 | EPA 8270/SIM | 10-6-11 | 10-6-11 | |
| 1-Methylnaphthalene | **ND** | 0.0067 | EPA 8270/SIM | 10-6-11 | 10-6-11 | |
| Acenaphthylene | **ND** | 0.0067 | EPA 8270/SIM | 10-6-11 | 10-6-11 | |
| Acenaphthene | **ND** | 0.0067 | EPA 8270/SIM | 10-6-11 | 10-6-11 | |
| Fluorene | **ND** | 0.0067 | EPA 8270/SIM | 10-6-11 | 10-6-11 | |
| Phenanthrene | **ND** | 0.0067 | EPA 8270/SIM | 10-6-11 | 10-6-11 | |
| Anthracene | **ND** | 0.0067 | EPA 8270/SIM | 10-6-11 | 10-6-11 | |
| Fluoranthene | **ND** | 0.0067 | EPA 8270/SIM | 10-6-11 | 10-6-11 | |
| Pyrene | **ND** | 0.0067 | EPA 8270/SIM | 10-6-11 | 10-6-11 | |
| Benzo[a]anthracene | **ND** | 0.0067 | EPA 8270/SIM | 10-6-11 | 10-6-11 | |
| Chrysene | **ND** | 0.0067 | EPA 8270/SIM | 10-6-11 | 10-6-11 | |
| Benzo[b]fluoranthene | **ND** | 0.0067 | EPA 8270/SIM | 10-6-11 | 10-6-11 | |
| Benzo(j,k)fluoranthene | **ND** | 0.0067 | EPA 8270/SIM | 10-6-11 | 10-6-11 | |
| Benzo[a]pyrene | **ND** | 0.0067 | EPA 8270/SIM | 10-6-11 | 10-6-11 | |
| Indeno(1,2,3-c,d)pyrene | **ND** | 0.0067 | EPA 8270/SIM | 10-6-11 | 10-6-11 | |
| Dibenz[a,h]anthracene | **ND** | 0.0067 | EPA 8270/SIM | 10-6-11 | 10-6-11 | |
| Benzo[g,h,i]perylene | **ND** | 0.0067 | EPA 8270/SIM | 10-6-11 | 10-6-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *2-Fluorobiphenyl* | *81* | *43 - 109* | | | | |
| *Pyrene-d10* | *89* | *38 - 128* | | | | |
| *Terphenyl-d14* | *90* | *33 - 119* | | | | |

Date of Report: October 14, 2011
Samples Submitted: September 30, 2011
Laboratory Reference: 1109-223
Project: 5147-012-02

**PAHs by EPA 8270D/SIM**
**METHOD BLANK QUALITY CONTROL**
**(with silica gel clean-up)**

Matrix: Soil
Units: mg/Kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| Laboratory ID: | MB1007S1 | | | | | |
| Naphthalene | **ND** | 0.0067 | EPA 8270/SIM | 10-7-11 | 10-7-11 | |
| 2-Methylnaphthalene | **ND** | 0.0067 | EPA 8270/SIM | 10-7-11 | 10-7-11 | |
| 1-Methylnaphthalene | **ND** | 0.0067 | EPA 8270/SIM | 10-7-11 | 10-7-11 | |
| Acenaphthylene | **ND** | 0.0067 | EPA 8270/SIM | 10-7-11 | 10-7-11 | |
| Acenaphthene | **ND** | 0.0067 | EPA 8270/SIM | 10-7-11 | 10-7-11 | |
| Fluorene | **ND** | 0.0067 | EPA 8270/SIM | 10-7-11 | 10-7-11 | |
| Phenanthrene | **ND** | 0.0067 | EPA 8270/SIM | 10-7-11 | 10-7-11 | |
| Anthracene | **ND** | 0.0067 | EPA 8270/SIM | 10-7-11 | 10-7-11 | |
| Fluoranthene | **ND** | 0.0067 | EPA 8270/SIM | 10-7-11 | 10-7-11 | |
| Pyrene | **ND** | 0.0067 | EPA 8270/SIM | 10-7-11 | 10-7-11 | |
| Benzo[a]anthracene | **ND** | 0.0067 | EPA 8270/SIM | 10-7-11 | 10-7-11 | |
| Chrysene | **ND** | 0.0067 | EPA 8270/SIM | 10-7-11 | 10-7-11 | |
| Benzo[b]fluoranthene | **ND** | 0.0067 | EPA 8270/SIM | 10-7-11 | 10-7-11 | |
| Benzo(j,k)fluoranthene | **ND** | 0.0067 | EPA 8270/SIM | 10-7-11 | 10-7-11 | |
| Benzo[a]pyrene | **ND** | 0.0067 | EPA 8270/SIM | 10-7-11 | 10-7-11 | |
| Indeno(1,2,3-c,d)pyrene | **ND** | 0.0067 | EPA 8270/SIM | 10-7-11 | 10-7-11 | |
| Dibenz[a,h]anthracene | **ND** | 0.0067 | EPA 8270/SIM | 10-7-11 | 10-7-11 | |
| Benzo[g,h,i]perylene | **ND** | 0.0067 | EPA 8270/SIM | 10-7-11 | 10-7-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *2-Fluorobiphenyl* | *88* | *43 - 109* | | | | |
| *Pyrene-d10* | *91* | *38 - 128* | | | | |
| *Terphenyl-d14* | *92* | *33 - 119* | | | | |

Date of Report: October 14, 2011
Samples Submitted: September 30, 2011
Laboratory Reference: 1109-223
Project: 5147-012-02

**PAHs by EPA 8270D/SIM**
**MS/MSD QUALITY CONTROL**
**(with silica gel clean-up)**

Matrix: Soil
Units: mg/Kg

| Analyte | Result | | Spike Level | | Source Result | Percent Recovery | | Recovery Limits | RPD | RPD Limit | Flags |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **MATRIX SPIKES** | | | | | | | | | | | |
| Laboratory ID: | 09-196-23 | | | | | | | | | | |
| | MS | MSD | MS | MSD | | MS | MSD | | | | |
| Naphthalene | **0.0596** | **0.0621** | 0.0833 | 0.0833 | ND | 72 | 75 | 39 - 110 | 4 | 21 | |
| Acenaphthylene | **0.0526** | **0.0589** | 0.0833 | 0.0833 | ND | 63 | 71 | 47 - 124 | 11 | 21 | |
| Acenaphthene | **0.0557** | **0.0605** | 0.0833 | 0.0833 | ND | 67 | 73 | 50 - 120 | 8 | 20 | |
| Fluorene | **0.0553** | **0.0598** | 0.0833 | 0.0833 | ND | 66 | 72 | 52 - 126 | 8 | 21 | |
| Phenanthrene | **0.0526** | **0.0578** | 0.0833 | 0.0833 | ND | 63 | 69 | 41 - 130 | 9 | 22 | |
| Anthracene | **0.0501** | **0.0558** | 0.0833 | 0.0833 | ND | 60 | 67 | 48 - 124 | 11 | 23 | |
| Fluoranthene | **0.0532** | **0.0592** | 0.0833 | 0.0833 | ND | 64 | 71 | 40 - 137 | 11 | 23 | |
| Pyrene | **0.0505** | **0.0565** | 0.0833 | 0.0833 | ND | 61 | 68 | 36 - 139 | 11 | 23 | |
| Benzo[a]anthracene | **0.0461** | **0.0528** | 0.0833 | 0.0833 | ND | 55 | 63 | 43 - 127 | 14 | 21 | |
| Chrysene | **0.0457** | **0.0518** | 0.0833 | 0.0833 | ND | 55 | 62 | 41 - 133 | 13 | 19 | |
| Benzo[b]fluoranthene | **0.0449** | **0.0515** | 0.0833 | 0.0833 | ND | 54 | 62 | 40 - 132 | 14 | 25 | |
| Benzo(j,k)fluoranthene | **0.0442** | **0.0510** | 0.0833 | 0.0833 | ND | 53 | 61 | 35 - 132 | 14 | 25 | |
| Benzo[a]pyrene | **0.0405** | **0.0464** | 0.0833 | 0.0833 | ND | 49 | 56 | 37 - 131 | 14 | 26 | |
| Indeno(1,2,3-c,d)pyrene | **0.0433** | **0.0506** | 0.0833 | 0.0833 | ND | 52 | 61 | 39 - 134 | 16 | 23 | |
| Dibenz[a,h]anthracene | **0.0457** | **0.0534** | 0.0833 | 0.0833 | ND | 55 | 64 | 40 - 137 | 16 | 21 | |
| Benzo[g,h,i]perylene | **0.0441** | **0.0515** | 0.0833 | 0.0833 | ND | 53 | 62 | 35 - 135 | 15 | 22 | |
| *Surrogate:* | | | | | | | | | | | |
| *2-Fluorobiphenyl* | | | | | | *65* | *70* | *43 - 109* | | | |
| *Pyrene-d10* | | | | | | *58* | *64* | *38 - 128* | | | |
| *Terphenyl-d14* | | | | | | *57* | *64* | *33 - 119* | | | |

Date of Report: October 14, 2011
Samples Submitted: September 30, 2011
Laboratory Reference: 1109-223
Project: 5147-012-02

**PAHs by EPA 8270D/SIM**
**MS/MSD QUALITY CONTROL**
**(with silica gel clean-up)**

Matrix: Soil
Units: mg/Kg

| Analyte | Result | | Spike Level | | Source Result | Percent Recovery | | Recovery Limits | RPD | RPD Limit | Flags |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **MATRIX SPIKES** | | | | | | | | | | | |
| Laboratory ID: | 09-223-44 | | | | | | | | | | |
| | MS | MSD | MS | MSD | | MS | MSD | | | | |
| Naphthalene | **0.0713** | **0.0661** | 0.0833 | 0.0833 | 0.00942 | 74 | 68 | 39 - 110 | 8 | 21 | |
| Acenaphthylene | **0.0677** | **0.0606** | 0.0833 | 0.0833 | ND | 81 | 73 | 47 - 124 | 11 | 21 | |
| Acenaphthene | **0.0736** | **0.0666** | 0.0833 | 0.0833 | ND | 88 | 80 | 50 - 120 | 10 | 20 | |
| Fluorene | **0.0784** | **0.0692** | 0.0833 | 0.0833 | ND | 94 | 83 | 52 - 126 | 12 | 21 | |
| Phenanthrene | **0.0782** | **0.0677** | 0.0833 | 0.0833 | ND | 94 | 81 | 41 - 130 | 14 | 22 | |
| Anthracene | **0.0740** | **0.0644** | 0.0833 | 0.0833 | ND | 89 | 77 | 48 - 124 | 14 | 23 | |
| Fluoranthene | **0.0860** | **0.0723** | 0.0833 | 0.0833 | 0.0102 | 91 | 75 | 40 - 137 | 17 | 23 | |
| Pyrene | **0.0796** | **0.0670** | 0.0833 | 0.0833 | 0.00982 | 84 | 69 | 36 - 139 | 17 | 23 | |
| Benzo[a]anthracene | **0.0744** | **0.0658** | 0.0833 | 0.0833 | ND | 89 | 79 | 43 - 127 | 12 | 21 | |
| Chrysene | **0.0726** | **0.0641** | 0.0833 | 0.0833 | ND | 87 | 77 | 41 - 133 | 12 | 19 | |
| Benzo[b]fluoranthene | **0.0730** | **0.0676** | 0.0833 | 0.0833 | ND | 88 | 81 | 40 - 132 | 8 | 25 | |
| Benzo(j,k)fluoranthene | **0.0710** | **0.0636** | 0.0833 | 0.0833 | ND | 85 | 76 | 35 - 132 | 11 | 25 | |
| Benzo[a]pyrene | **0.0709** | **0.0631** | 0.0833 | 0.0833 | ND | 85 | 76 | 37 - 131 | 12 | 26 | |
| Indeno(1,2,3-c,d)pyrene | **0.0720** | **0.0642** | 0.0833 | 0.0833 | ND | 86 | 77 | 39 - 134 | 11 | 23 | |
| Dibenz[a,h]anthracene | **0.0727** | **0.0654** | 0.0833 | 0.0833 | ND | 87 | 79 | 40 - 137 | 11 | 21 | |
| Benzo[g,h,i]perylene | **0.0725** | **0.0649** | 0.0833 | 0.0833 | ND | 87 | 78 | 35 - 135 | 11 | 22 | |
| *Surrogate:* | | | | | | | | | | | |
| *2-Fluorobiphenyl* | | | | | | *84* | *77* | *43 - 109* | | | |
| *Pyrene-d10* | | | | | | *84* | *73* | *38 - 128* | | | |
| *Terphenyl-d14* | | | | | | *89* | *80* | *33 - 119* | | | |

Date of Report: October 14, 2011
Samples Submitted: September 30, 2011
Laboratory Reference: 1109-223
Project: 5147-012-02

**PCBs by EPA 8082**
**QUALITY CONTROL**

Matrix: Soil
Units: mg/Kg (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **METHOD BLANK** | | | | | | |
| Laboratory ID: | MB1004S1 | | | | | |
| Aroclor 1016 | **ND** | 0.050 | EPA 8082 | 10-4-11 | 10-5-11 | |
| Aroclor 1221 | **ND** | 0.050 | EPA 8082 | 10-4-11 | 10-5-11 | |
| Aroclor 1232 | **ND** | 0.050 | EPA 8082 | 10-4-11 | 10-5-11 | |
| Aroclor 1242 | **ND** | 0.050 | EPA 8082 | 10-4-11 | 10-5-11 | |
| Aroclor 1248 | **ND** | 0.050 | EPA 8082 | 10-4-11 | 10-5-11 | |
| Aroclor 1254 | **ND** | 0.050 | EPA 8082 | 10-4-11 | 10-5-11 | |
| Aroclor 1260 | **ND** | 0.050 | EPA 8082 | 10-4-11 | 10-5-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *DCB* | *73* | *42-123* | | | | |

| Analyte | Result | | Spike Level | | Source Result | Percent Recovery | | Recovery Limits | RPD | RPD Limit | Flags |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **MATRIX SPIKES** | | | | | | | | | | | |
| Laboratory ID: | 10-003-04 | | | | | | | | | | |
| | MS | MSD | MS | MSD | | MS | MSD | | | | |
| Aroclor 1260 | **0.405** | **0.404** | 0.500 | 0.500 | ND | **81** | **81** | 44-125 | 0 | 15 | |
| *Surrogate:* | | | | | | | | | | | |
| *DCB* | | | | | | *72* | *69* | *42-123* | | | |

Date of Report: October 14, 2011
Samples Submitted: September 30, 2011
Laboratory Reference: 1109-223
Project: 5147-012-02

**TOTAL LEAD**
**EPA 6010B**
**METHOD BLANK QUALITY CONTROL**

| | |
|---|---|
| Date Extracted: | 10-11-11 |
| Date Analyzed: | 10-12-11 |
| Matrix: | Soil |
| Units: | mg/kg (ppm) |
| Lab ID: | MB1011S4 |

| Analyte | Method | Result | PQL |
|---|---|---|---|
| Lead | 6010B | **ND** | 5.0 |

Date of Report: October 14, 2011
Samples Submitted: September 30, 2011
Laboratory Reference: 1109-223
Project: 5147-012-02

**TOTAL LEAD**
**EPA 6010B**
**METHOD BLANK QUALITY CONTROL**

| | |
|---|---|
| Date Extracted: | 10-12-11 |
| Date Analyzed: | 10-12-11 |
| Matrix: | Soil |
| Units: | mg/kg (ppm) |
| Lab ID: | MB1012S1 |

| Analyte | Method | Result | PQL |
|---|---|---|---|
| Lead | 6010B | **ND** | 5.0 |

Date of Report: October 14, 2011
Samples Submitted: September 30, 2011
Laboratory Reference: 1109-223
Project: 5147-012-02

**TOTAL LEAD**
**EPA 6010B**
**DUPLICATE QUALITY CONTROL**

Date Extracted: 10-11-11
Date Analyzed: 10-12-11

Matrix: Soil
Units: mg/kg (ppm)

Lab ID: 09-223-52

| Analyte | Sample Result | Duplicate Result | RPD | PQL | Flags |
|---|---|---|---|---|---|
| Lead | **11.9** | **12.6** | 6 | 5.0 | |

Date of Report: October 14, 2011
Samples Submitted: September 30, 2011
Laboratory Reference: 1109-223
Project: 5147-012-02

**TOTAL LEAD**
**EPA 6010B**
**DUPLICATE QUALITY CONTROL**

Date Extracted: 10-12-11
Date Analyzed: 10-12-11

Matrix: Soil
Units: mg/kg (ppm)

Lab ID: 09-223-91

| Analyte | Sample Result | Duplicate Result | RPD | PQL | Flags |
|---|---|---|---|---|---|
| Lead | **12.6** | **13.7** | 9 | 5.0 | |

Date of Report: October 14, 2011
Samples Submitted: September 30, 2011
Laboratory Reference: 1109-223
Project: 5147-012-02

**TOTAL LEAD**
**EPA 6010B**
**MS/MSD QUALITY CONTROL**

Date Extracted: 10-11-11
Date Analyzed: 10-12-11

Matrix: Soil
Units: mg/kg (ppm)

Lab ID: 09-223-52

| Analyte | Spike Level | MS | Percent Recovery | MSD | Percent Recovery | RPD | Flags |
|---|---|---|---|---|---|---|---|
| Lead | 250 | **246** | 94 | **244** | 93 | 1 | |

Date of Report: October 14, 2011
Samples Submitted: September 30, 2011
Laboratory Reference: 1109-223
Project: 5147-012-02

**TOTAL LEAD**
**EPA 6010B**
**MS/MSD QUALITY CONTROL**

Date Extracted: 10-12-11
Date Analyzed: 10-12-11

Matrix: Soil
Units: mg/kg (ppm)

Lab ID: 09-223-91

| Analyte | Spike Level | MS | Percent Recovery | MSD | Percent Recovery | RPD | Flags |
|---|---|---|---|---|---|---|---|
| Lead | 250 | **245** | 93 | **242** | 92 | 1 | |

Date of Report: October 14, 2011
Samples Submitted: September 30, 2011
Laboratory Reference: 1109-223
Project: 5147-012-02

**MTBE, EDB, EDC by EPA 8260B**
**QUALITY CONTROL**

Matrix: Soil
Units: mg/kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **METHOD BLANK** | | | | | | |
| Laboratory ID: | MB1006S2 | | | | | |
| Methyl t-Butyl Ether | ND | 0.0010 | EPA 8260 | 10-6-11 | 10-6-11 | |
| 1,2-Dichloroethane | ND | 0.0010 | EPA 8260 | 10-6-11 | 10-6-11 | |
| 1,2-Dibromoethane | ND | 0.0010 | EPA 8260 | 10-6-11 | 10-6-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Dibromofluoromethane* | *107* | *63-127* | | | | |
| *Toluene-d8* | *107* | *65-129* | | | | |
| *4-Bromofluorobenzene* | *106* | *55-121* | | | | |

| Analyte | Result | | Spike Level | | Percent Recovery | | Recovery Limits | RPD | RPD Limit | Flags |
|---|---|---|---|---|---|---|---|---|---|---|
| **SPIKE BLANKS** | | | | | | | | | | |
| Laboratory ID: | SB1006S2 | | | | | | | | | |
| | SB | SBD | SB | SBD | SB | SBD | | | | |
| 1,1-Dichloroethene | **0.0560** | **0.0605** | 0.0500 | 0.0500 | 112 | 121 | 70-130 | 8 | 19 | |
| Benzene | **0.0476** | **0.0516** | 0.0500 | 0.0500 | 95 | 103 | 70-125 | 8 | 15 | |
| Trichloroethene | **0.0496** | **0.0534** | 0.0500 | 0.0500 | 99 | 107 | 70-122 | 7 | 14 | |
| Toluene | **0.0482** | **0.0521** | 0.0500 | 0.0500 | 96 | 104 | 73-120 | 8 | 16 | |
| Chlorobenzene | **0.0503** | **0.0545** | 0.0500 | 0.0500 | 101 | 109 | 74-109 | 8 | 12 | |
| *Surrogate:* | | | | | | | | | | |
| *Dibromofluoromethane* | | | | | *100* | *107* | *63-127* | | | |
| *Toluene-d8* | | | | | *100* | *106* | *65-129* | | | |
| *4-Bromofluorobenzene* | | | | | *99* | *106* | *55-121* | | | |

Date of Report: October 14, 2011
Samples Submitted: September 30, 2011
Laboratory Reference: 1109-223
Project: 5147-012-02

**NWTPH-Dx**
**QUALITY CONTROL**
**(with acid/silica gel clean-up)**

Matrix: Soil
Units: mg/Kg (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **METHOD BLANK** | | | | | | |
| Laboratory ID: | MB1012S1 | | | | | |
| Diesel Range Organics | **ND** | 25 | NWTPH-Dx | 10-12-11 | 10-12-11 | |
| Lube Oil Range Organics | **ND** | 50 | NWTPH-Dx | 10-12-11 | 10-12-11 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *o-Terphenyl* | *116* | *50-150* | | | | |

| Analyte | Result | | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|---|---|---|---|---|---|---|---|
| **DUPLICATE** | | | | | | | |
| Laboratory ID: | 10-053-01 | | | | | | |
| | ORIG | DUP | | | | | |
| Diesel Range Organics | **ND** | **ND** | | | NA | NA | |
| Lube Oil Range Organics | **ND** | **ND** | | | NA | NA | |
| *Surrogate:* | | | | | | | |
| *o-Terphenyl* | | | *112* *123* | *50-150* | | | |

Date of Report: October 14, 2011
Samples Submitted: September 30, 2011
Laboratory Reference: 1109-223
Project: 5147-012-02

**% MOISTURE**

Date Analyzed: 10-4,6&7-11

| Client ID | Lab ID | % Moisture |
|---|---|---|
| GEI-31-7.5 | 09-223-03 | 19 |
| GEI-32-5.0 | 09-223-07 | 19 |
| GEI-33-5.0 | 09-223-12 | 24 |
| GEI-33-10.0 | 09-223-14 | 18 |
| GEI-33-14.0 | 09-223-16 | 20 |
| GEI-20-5.0 | 09-223-20 | 38 |
| GEI-20-10.0 | 09-223-22 | 41 |
| GEI-21-5.0 | 09-223-26 | 38 |
| GEI-21-10.0 | 09-223-28 | 26 |
| GEI-22-5.0 | 09-223-32 | 23 |
| GEI-22-12.5 | 09-223-35 | 43 |
| GEI-26-5.0 | 09-223-38 | 25 |
| GEI-26-10.0 | 09-223-40 | 34 |
| GEI-28-5.0 | 09-223-44 | 19 |
| GEI-28-10.0 | 09-223-46 | 27 |
| GEI-29-5.0 | 09-223-50 | 11 |
| GEI-29-10.0 | 09-223-52 | 13 |
| GEI-16-5.0 | 09-223-56 | 41 |
| GEI-16-10.0 | 09-223-58 | 10 |
| GEI-17-10.0 | 09-223-65 | 36 |
| GEI-17-14.0 | 09-223-66 | 13 |
| GEI-17-17.5 | 09-223-67 | 21 |
| GEI-18-5.0 | 09-223-70 | 21 |
| GEI-18-12.5 | 09-223-72 | 22 |
| GEI-18-15.0 | 09-223-73 | 43 |
| GEI-19-5.0 | 09-223-77 | 41 |
| GEI-19-10.0 | 09-223-79 | 35 |

Date of Report: October 14, 2011
Samples Submitted: September 30, 2011
Laboratory Reference: 1109-223
Project: 5147-012-02

**% MOISTURE**

Date Analyzed: 10-4,6&7-11

| Client ID | Lab ID | % Moisture |
|---|---|---|
| GEI-23-7.5 | 09-223-86 | 45 |
| GEI-23-12.5 | 09-223-88 | 61 |
| GEI-24-5.0 | 09-223-91 | 43 |
| GEI-24-10.0 | 09-223-93 | 41 |
| GEI-25-5.0 | 09-223-97 | 33 |
| GEI-25-10.0 | 09-223-99 | 43 |
| GEI-27-7.5 | 09-223-104 | 28 |
| GEI-27-11.0 | 09-223-105 | 29 |
| GEI-27-13.0 | 09-223-106 | 35 |
| GEI-34-12.0 | 09-223-112 | 15 |
| GEI-35-15.0 | 09-223-119 | 18 |

OnSite Environmental Inc.

**Data Qualifiers and Abbreviations**

A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.

B - The analyte indicated was also found in the blank sample.

C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.

E - The value reported exceeds the quantitation range and is an estimate.

F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.

H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.

I - Compound recovery is outside of the control limits.

J - The value reported was below the practical quantitation limit. The value is an estimate.

K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.

L - The RPD is outside of the control limits.

M - Hydrocarbons in the gasoline range are impacting the diesel range result.

M1 - Hydrocarbons in the gasoline range (toluene-napthalene) are present in the sample.

N - Hydrocarbons in the lube oil range are impacting the diesel range result.

N1 - Hydrocarbons in diesel range are impacting lube oil range results.

O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.

P - The RPD of the detected concentrations between the two columns is greater than 40.

Q - Surrogate recovery is outside of the control limits.

S - Surrogate recovery data is not available due to the necessary dilution of the sample.

T - The sample chromatogram is not similar to a typical _____.

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

U1 - The practical quantitation limit is elevated due to interferences present in the sample.

V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.

W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.

X - Sample extract treated with a mercury cleanup procedure.

Y - Sample extract treated with an acid/silica gel cleanup procedure.

Z - The gasoline result is mainly attributed to a single peak (Naphthalene).

ND - Not Detected at PQL
PQL - Practical Quantitation Limit
RPD - Relative Percent Difference

# Chain of Custody

OnSite Environmental Inc.
14648 NE 95th Street • Redmond, WA 98052
Phone: (425) 883-3881 • www.onsite-env.com

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Laboratory Number: 09-223

Company: 5147-012-02
Project Number: GEI
Project Name: FORMER SHELL TANK FARM
Project Manager: RST
Sampled by: AJ

Turnaround Request (in working days)
(Check One)
☐ Same Day ☐ 1 Day
☐ 2 Days ☐ 3 Days
☒ Standard (7 Days) (TPH analysis 5 Days)
☐ _____ (other)

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | Number of Containers | NWTPH-HCID | NWTPH-Gx/BTEX | NWTPH-Gx | NWTPH-Dx | Volatiles 8260B | Halogenated Volatiles 8260B | Semivolatiles 8270D/SIM (with low-level PAHs) | PAHs 8270D/SIM (low-level) | PCBs 8082 | Organochlorine Pesticides 8081A | Organophosphorus Pesticides 8270D/SIM | Chlorinated Acid Herbicides 8151A | Total RCRA / MTCA Metals (circle one) | TCLP Metals | HEM (oil and grease) 1664 | LEAD | | | | | % Moisture |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | GEI-31-2.5 | 9/28/11 | 1450 | Soil | 1 | | | | | | | | | | | | | | | | | | | | | |
| 2 | GEI-31-5.0 | | 1455 | | 5 | | | | | | | | | | | | | | | | | | | | | |
| 3 | GEI-31-7.5 | | 1500 | | 5 | | X | | X | | | | X | | | | | | | | X | | | | | X |
| 4 | GEI-31-10.0 | | 1505 | | 5 | | | | | | | | | | | | | | | | | | | | | |
| 5 | GEI-31-12.0 | | 1510 | | 1 | | | | | | | | | | | | | | | | | | | | | |
| 6 | GEI-32-2.5 | | 1530 | | 1 | | | | | | | | | | | | | | | | | | | | | |
| 7 | GEI-32-5.0 | | 1535 | | 5 | | X | | X | | | | X | | | | | | | | X | | | | | X |
| 8 | GEI-32-7.5 | | 1540 | | 5 | | | | | | | | | | | | | | | | | | | | | |
| 9 | GEI-32-10.0 | | 1545 | | 5 | | | | | | | | | | | | | | | | | | | | | |
| 10 | GEI-32-12.0 | | ~~1600~~ DB 1550 | | 1 | | | | | | | | | | | | | | | | | | | | | |

| | Signature | Company | Date | Time |
|---|---|---|---|---|
| Relinquished | | GEI | 9/30/11 | 1100 |
| Received | | Speedy | 9-30-11 | 1310 |
| Relinquished | | Speedy | 9.30.11 | 1850 |
| Received | | DSC | 9/30/11 | 1350 |
| Relinquished | | | | |
| Received | | | | |
| Reviewed/Date | | Reviewed/Date | | |

Comments/Special Instructions
X - Added 10/4/11. DB (STA)

Chromatograms with final report ☐

Data Package: Level III ☐ Level IV ☐ Electronic Data Deliverables (EDDs) ☐ _____

# Chain of Custody



OnSite Environmental Inc.
14648 NE 95th Street • Redmond, WA 98052
Phone (425) 883-3881 • www.onsite-env.com

Company: GEI
Project Number: 5147-012-02
Project Name: FORMER SHELL TANK FARM
Project Manager: RST
Sampled by: AJ

**Turnaround Request (in working days)**
(Check One)
☐ Same Day ☐ 1 Day
☐ 2 Days ☐ 3 Days
☒ Standard (7 Days)
(TPH analysis 5 Days)
☐ ____ (other)

**Laboratory Number: 09-223**

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | Number of Containers | NWTPH-HCID | NWTPH-Gx/BTEX | NWTPH-Gx | NWTPH-Dx | Volatiles 8260B | Halogenated Volatiles 8260B | Semivolatiles 8270D/SIM (with low-level PAHs) | PAHs 8270D/SIM (low-level) | PCBs 8082 | Organochlorine Pesticides 8081A | Organophosphorus Pesticides 8270D/SIM | Chlorinated Acid Herbicides 8151A | Total RCRA / MTCA Metals (circle one) | TCLP Metals | HEM (oil and grease) 1664 | Lead (Pb) | % Moisture |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11 | GEI-33-2.5 | 9/28/11 | 1610 | Soil | 1 | | | | | | | | | | | | | | | | | |
| 12 | GEI-33-5.0 | | 1615 | | 5 | | X | | X | | | | X | | | | | | | | X | X |
| 13 | GEI-33-7.5 | | 1620 | | 5 | | | | | | | | | | | | | | | | | |
| 14 | GEI-33-10.0 | | 1625 | | 5 | | X | | X | | | | X | | | | | | | | X | X |
| 15 | GEI-33-12.5 | | 1630 | | 1 | | | | | | | | | | | | | | | | | |
| 16 | GEI-33-14.0 | | 1635 | | 5 | | X | | X | | | | X | | | | | | | | X | X |
| 17 | GEI-33-18.0 | | 1640 | | 5 | | | | | | | | | | | | | | | | | |
| 18 | GEI-33-20.0 | | 1645 | | 1 | | | | | | | | | | | | | | | | | |
| 19 | GEI-20-2.5 | 9/29/11 | 1005 | | 1 | | | | | | | | | | | | | | | | | |
| 20 | GEI-20-5.0 | | 1010 | | 5 | | X | | X | | | | X | | | | | | | | X | X |

| | Signature | Company | Date | Time |
|---|---|---|---|---|
| Relinquished | | GEI | 9/30/11 | 1100 |
| Received | | Seedy | 9-30-11 | 1315 |
| Relinquished | | Seedy | 9-30-11 | 1350 |
| Received | | GEI | 9/30/11 | 1350 |
| Relinquished | | | | |
| Received | | | | |
| Reviewed/Date | | Reviewed/Date | | |

**Comments/Special Instructions**
X - Added 10/4/11. DS (STA)

Chromatograms with final report ☐

Data Package: Level III ☐ Level IV ☐ Electronic Data Deliverables (EDDs) ☐ _____

# Chain of Custody



OnSite Environmental Inc.
14648 NE 95th Street • Redmond, WA 98052
Phone: (425) 883-3881 • www.onsite-env.com

Company: 5147-012-02
Project Number: GEI
Project Name: FORMER SHELL TANK FARM
Project Manager: RST
Sampled by: AJ

**Turnaround Request (in working days)**
(Check One)
☐ Same Day ☐ 1 Day
☐ 2 Days ☐ 3 Days
☐ Standard (7 Days)
(TPH analysis 5 Days)
☐ _____ (other)

**Laboratory Number: 09-223**

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | Number of Containers | NWTPH-HCID | NWTPH-Gx/BTEX | NWTPH-Gx | NWTPH-Dx | Volatiles 8260B | Halogenated Volatiles 8260B | Semivolatiles 8270D/SIM (with low-level PAHs) | PAHs 8270D/SIM (low-level) | PCBs 8082 | Organochlorine Pesticides 8081A | Organophosphorus Pesticides 8270D/SIM | Chlorinated Acid Herbicides 8151A | Total RCRA / MTCA Metals (circle one) | TCLP Metals | HEM (oil and grease) 1664 | LEAD | | | | | | % Moisture |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 21 | GEI-20-7.5 | 9/29/11 | ~~1005~~ 1215 | SOIL | 1 | | | | | | | | | | | | | | | | | | | | | | |
| 22 | GEI-20-10.0 | | ~~1010~~ 1220 | | 5 | | X | | X | | | | X | | | | | | | | X | | | | | | X |
| 23 | GEI-20-12.5 | | ~~1015~~ 1225 | | 5 | | | | | | | | | | | | | | | | | | | | | | |
| 24 | GEI-20-15.0 | | ~~1020~~ 1230 | | 1 | | | | | | | | | | | | | | | | | | | | | | |
| 25 | GEI-21-2.5 | | 900 | | 1 | | | | | | | | | | | | | | | | | | | | | | |
| 26 | GEI-21-5.0 | | 905 | | 5 | | X | | X | | | | X | | | | | | | | X | | | | | | 12 |
| 27 | GEI-21-7.5 | | 910 | | 1 | | | | | | | | | | | | | | | | | | | | | | |
| 28 | GEI-21-10.0 | | 915 | | 5 | | X | | X | | | | X | | | | | | | | X | | | | | | X |
| 29 | GEI-21-12.5 | | 920 | | 5 | | | | | | | | | | | | | | | | | | | | | | |
| 30 | GEI-21-15.0 | | 925 | | 1 | | | | | | | | | | | | | | | | | | | | | | |

| | Signature | Company | Date | Time |
|---|---|---|---|---|
| Relinquished | | GEI | 9/30/11 | 1100 |
| Received | | Speedy | 9-30-11 | 1315 |
| Relinquished | | Speedy | 9-30-11 | 1350 |
| Received | | OSE | 9/30/11 | 1350 |
| Relinquished | | | | |
| Received | | | | |

**Comments/Special Instructions**
X - Added 10/4/11. DB (STA)

Reviewed/Date | Reviewed/Date | Chromatograms with final report ☐

Data Package: Level II ☐ Level IV ☐ Electronic Data Deliverables (EDDs) ☐ _____

# Chain of Custody



OnSite Environmental Inc.
14648 NE 95th Street • Redmond, WA 98052
Phone: (425) 883-3881 • www.onsite-env.com

Company: GEI
Project Number: 5147-012-02
Project Name: FORMER SHELL TANK FARM
Project Manager: RST
Sampled by: AJ

**Turnaround Request (in working days)**
(Check One)
☐ Same Day ☐ 1 Day
☐ 2 Days ☐ 3 Days
☒ Standard (7 Days) (TPH analysis 5 Days)
☐ _____ (other)

**Laboratory Number: 09-223**

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | Number of Containers | NWTPH-HCID | NWTPH-Gx/BTEX | NWTPH-Gx | NWTPH-Dx | Volatiles 8260B | Halogenated Volatiles 8260B | Semivolatiles 8270D/SIM (with low-level PAHs) | PAHs 8270D/SIM (low-level) | PCBs 8082 | Organochlorine Pesticides 8081A | Organophosphorus Pesticides 8270D/SIM | Chlorinated Acid Herbicides 8151A | Total RCRA / MTCA Metals (circle one) | TCLP Metals | HEM (oil and grease) 1664 | LEAD | | | | | | % Moisture |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 31 | GEI-22-2.5 | 9/29/11 | 935 | Soil | 1 | | | | | | | | | | | | | | | | | | | | | | |
| 32 | GEI-22-5.0 | | 940 | | 5 | | X | | X | | | | X | | | | | | | | X | | | | | | X |
| 33 | GEI-22-7.5 | | 945 | | 1 | | | | | | | | | | | | | | | | | | | | | | |
| 34 | GEI-22-10.0 | | 950 | | 5 | | | | | | | | | | | | | | | | | | | | | | |
| 35 | GEI-22-12.5 | | 955 | | 5 | | X | | X | | | | X | | | | | | | | X | | | | | | X |
| 36 | GEI-22-15.0 | | 1000 | | 1 | | | | | | | | | | | | | | | | | | | | | | |
| 37 | GEI-26-2.5 | | 1420 | | 1 | | | | | | | | | | | | | | | | | | | | | | |
| 38 | GEI-26-5.0 | | 1425 | | 5 | | X | | X | | | | X | | | | | | | | X | | | | | | X |
| 39 | GEI-26-7.5 | | 1430 | | 5 | | | | | | | | | | | | | | | | | | | | | | |
| 40 | GEI-26-10.0 | ↓ | 1435 | ↓ | 5 | | X | | X | | | | X | | | | | | | | X | | | | | | X |

| | Signature | Company | Date | Time |
|---|---|---|---|---|
| Relinquished | | GEI | 9/30/11 | 1100 |
| Received | | Spoke | 9-30-11 | 1315 |
| Relinquished | | Spoke | 9-30-11 | 1350 |
| Received | | GEI | 9/30/11 | 1350 |
| Relinquished | | | | |
| Received | | | | |
| Reviewed/Date | | Reviewed/Date | | |

**Comments/Special Instructions**
X - Added 10/4/11. DB (STA)

Chromatograms with final report ☐

Data Package: Level III ☐ Level IV ☐ Electronic Data Deliverables (EDDs) ☐ _____

# Chain of Custody

OnSite Environmental Inc.
14648 NE 95th Street • Redmond, WA 98052
Phone: (425) 883-3881 • www.onsite-env.com



Laboratory Number: 09-223

Company: GEI

Project Number: 5147-012-02

Project Name: FORMER SHELL TANK FARM

Project Manager: RST

Sampled by: AJ

**Turnaround Request (in working days)**

(Check One)

- ☐ Same Day
- ☐ 1 Day
- ☐ 2 Days
- ☐ 3 Days
- ☒ Standard (7 Days) (TPH analysis 5 Days)
- ☐ _____ (other)

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | Number of Containers | NWTPH-HCID | NWTPH-Gx/BTEX | NWTPH-Gx | NWTPH-Dx | Volatiles 8260B | Halogenated Volatiles 8260B | Semivolatiles 8270D/SIM (with low-level PAHs) | PAHs 8270D/SIM (low-level) | PCBs 8082 | Organochlorine Pesticides 8081A | Organophosphorus Pesticides 8270D/SIM | Chlorinated Acid Herbicides 8151A | Total RCRA / MTCA Metals (circle one) | TCLP Metals | HEM (oil and grease) 1664 | LEAD | | | | | | % Moisture |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 41 | GEI-26-12.5 | 9/29/11 | 1440 | SOIL | 15 | | | | | | | | | | | | | | | | X | | | | | | |
| 42 | GEI-26-15.0 | | 1445 | | 1 | | | | | | | | | | | | | | | | | | | | | | |
| 43 | GEI-28-2.5 | | 1520 | | 1 | | | | | | | | | | | | | | | | | | | | | | |
| 44 | GEI-28-5.0 | | 1525 | | 5 | | X | | X | | | | X | | | | | | | | X | | | | | | X |
| 45 | GEI-28-7.5 | | 1530 | | 1 | | | | | | | | | | | | | | | | | | | | | | |
| 46 | GEI-28-10.0 | | 1535 | | 5 | | X | | X | | | | X | | | | | | | | X | | | | | | X |
| 47 | GEI-28-12.5 | | 1540 | | 5 | | | | | | | | | | | | | | | | | | | | | | |
| 48 | GEI-28-15.0 | | 1545 | | 1 | | | | | | | | | | | | | | | | | | | | | | |
| 49 | GEI-29-2.5 | | 1450 | | 1 | | | | | | | | | | | | | | | | | | | | | | |
| 50 | GEI-29-5.0 | | 1455 | | 5 | | X | | X | | | | X | | | | | | | | X | | | | | | X |

| | Signature | Company | Date | Time |
|---|---|---|---|---|
| Relinquished | | GEI | 9/30/11 | 1100 |
| Received | | Speedy | 9-30-11 | 1315 |
| Relinquished | | Speedy | 9-30-11 | 1350 |
| Received | | GEI | 9/30/11 | 1350 |
| Relinquished | | | | |
| Received | | | | |
| Reviewed/Date | | Reviewed/Date | | |

**Comments/Special Instructions**

X - Added 10/4/11 - DB (STA)

Chromatograms with final report ☐

Data Package Level III ☐ Level IV ☐ Electronic Data Deliverables (EDDs) ☐ _____

# Chain of Custody



09-223

OnSite Environmental Inc.
14648 NE 95th Street • Redmond, WA 98052
Phone (425) 883-3881 • www.onsite-env.com

Company: GEI

Project Number: 5147-012-02

Project Name: FORMER SHELL TANK FARM

Project Manager: RST

Sampled by: AJ

**Turnaround Request (in working days)**

(Check One)

- ☐ Same Day
- ☐ 1 Day
- ☐ 2 Days
- ☐ 3 Days
- ☒ Standard (7 Days) (TPH analysis 5 Days)
- ☐ _____ (other)

**Laboratory Number:**

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | Number of Containers | NWTPH-HCID | NWTPH-Gx/BTEX | NWTPH-Gx | NWTPH-Dx | Volatiles 8260B | Halogenated Volatiles 8260B | Semivolatiles 8270D/SIM (with low-level PAHs) | PAHs 8270D/SIM (low-level) | PCBs 8082 | Organochlorine Pesticides 8081A | Organophosphorus Pesticides 8270D/SIM | Chlorinated Acid Herbicides 8151A | Total RCRA / MTCA Metals (circle one) | TCLP Metals | HEM (oil and grease) 1664 | (LEAD) | | | | | % Moisture |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 51 | GEI-29-7.5 | 9/29/11 | 1500 | SOIL | 5 | | | | | | | | | | | | | | | | | | | | | |
| 52 | GEI-29-10.0 | | 1505 | | 5 | | X | | X | | | | X | | | | | | | | X | | | | | X |
| 53 | GEI-29-12.5 | | 1510 | | 1 | | | | | | | | | | | | | | | | | | | | | |
| 54 | GEI-29-15.0 | | 1515 | | 1 | | | | | | | | | | | | | | | | | | | | | |
| 55 | GEI-16-2.5 | | 1150 | | 1 | | | | | | | | | | | | | | | | | | | | | |
| 56 | GEI-16-5.0 | | 1155 | | 5 | | X | | X | | | | | | | | | | | | X | | | | | X |
| 57 | GEI-16-7.5 | | 1200 | | 1 | | | | | | | | | | | | | | | | | | | | | |
| 58 | GEI-16-10.0 | | 1205 | | 5 | | X | | X | | | | | | | | | | | | X | | | | | X |
| 59 | GEI-16-12.5 | | 1210 | | 5 | | | | | | | | | | | | | | | | | | | | | |
| 60 | GEI-16-15.0 | ↓ | 1215 | ↓ | 5 | | | | | | | | | | | | | | | | | | | | | |

| | Signature | Company | Date | Time |
|---|---|---|---|---|
| Relinquished | | GEI | 9/30/11 | 0100 |
| Received | | Speedy | 9-30-11 | 135 |
| Relinquished | | Speedy | 9-30-11 | 1350 |
| Received | | GEI | 9/30/11 | 1350 |
| Relinquished | | | | |
| Received | | | | |
| Reviewed/Date | | Reviewed/Date | | |

**Comments/Special Instructions**

X - Added 10/4/11. DB (STA)

Chromatograms with final rep

Data Package: Level III ☐ Level IV ☐ Electronic Data Deliverables (EDDs) ☐ _____

# Chain of Custody



OnSite Environmental Inc.
14648 NE 95th Street • Redmond, WA 98052
Phone: (425) 883-3881 • www.onsite-env.com

Laboratory Number: 09-223

Company: GEI
Project Number: 5147-012-02
Project Name: FORMER SHELL TANK FARM
Project Manager: RST
Sampled by: AJ

Turnaround Request (in working days)
(Check One)
☐ Same Day ☐ 1 Day
☐ 2 Days ☐ 3 Days
☒ Standard (7 Days)
(TPH analysis 5 Days)
☐ _____ (other)

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | Number of Containers | NWTPH-HCID | NWTPH-Gx/BTEX | NWTPH-Gx | NWTPH-Dx | Volatiles 8260B | Halogenated Volatiles 8260B | Semivolatiles 8270D/SIM (with low-level PAHs) | PAHs 8270D/SIM (low-level) | PCBs 8082 | Organochlorine Pesticides 8081A | Organophosphorus Pesticides 8270D/SIM | Chlorinated Acid Herbicides 8151A | Total RCRA / MTCA Metals (circle one) | TCLP Metals | HEM (oil and grease) 1664 | cPAH | | | | % Moisture |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 61 | GEI-16-19.0 | 9/29/11 | 1220 | SOIL | 1 | | | | | | | | | | | | | | | | | | | | |
| 62 | GEI-17-2.5 | | 1115 | | 1 | | | | | | | | | | | | | | | | | | | | |
| 63 | GEI-17-5.0 | | 1120 | | 5 | | | | | | | | | | | | | | | | | | | | |
| 64 | GEI-17-7.5 | | 1125 | | 5 | | | | | | | | | | | | | | | | | | | | |
| 65 | GEI-17-10.0 | | 1130 | | 5 | | X | | X | | | | | | | | | | | X | | | | | X |
| 66 | GEI-17-14.0 | | 1135 | | 5 | | X | | X | | | | | | | | | | | X | | | | | X |
| 67 | GEI-17-17.5 | | 1140 | | 5 | | X | | X | | | | | | | | | | | X | | | | | X |
| 68 | GEI-17-~~19.0~~ 20.0 DB | | 1145 | | 1 | | | | | | | | | | | | | | | | | | | | |
| 69 | GEI-18-2.5 | | 1035 | | 1 | | | | | | | | | | | | | | | | | | | | |
| 70 | GEI-18-5.0 | ↓ | 1040 | ↓ | 5 | | X | | X | | | | | | | | | | | X | | | | | X |

| | Signature | Company | Date | Time |
|---|---|---|---|---|
| Relinquished | | GEI | 9/30/11 | 1100 |
| Received | | Speedy | 9-30-11 | 1315 |
| Relinquished | | Speedy | 9-30-11 | 1350 |
| Received | | GEL | 9/30/11 | 1350 |
| Relinquished | | | | |
| Received | | | | |
| Reviewed/Date | | Reviewed/Date | | |

Comments/Special Instructions
X-Added 10/4/11. DB (STA)

Chromatograms with final report ☐

Data Package: Level III ☐ Level IV ☐ Electronic Data Deliverables (EDDs) ☐ _____

# Chain of Custody



OnSite Environmental Inc.
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Phone: (425) 883-3881 • www.onsite-env.com

Company: GEI
Project Number: 5147-012-02
Project Name: FORMER SHELL TANK FARM
Project Manager: RST
Sampled by: AJ

**Turnaround Request (in working days)**
(Check One)
☐ Same Day ☐ 1 Day
☐ 2 Days ☐ 3 Days
☑ Standard (7 Days)
(TPH analysis 5 Days)
☐ _____ (other)

**Laboratory Number:** 09-223

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | Number of Containers | NWTPH-HCID | NWTPH-Gx/BTEX | NWTPH-Gx | NWTPH-Dx | Volatiles 8260B | Halogenated Volatiles 8260B | Semivolatiles 8270D/SIM (with low-level PAHs) | PAHs 8270D/SIM (low-level) | PCBs 8082 | Organochlorine Pesticides 8081A | Organophosphorus Pesticides 8270D/SIM | Chlorinated Acid Herbicides 8151A | Total RCRA / MTCA Metals (circle one) | TCLP Metals | HEM (oil and grease) 1664 | LEAD | | | | | % Moisture |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71 | GEI-18-10.0 | 9/29/11 | 1050 | Soil | 5 | | | | | | | | | | | | | | | | | | | | | |
| 72 | GEI-18-12.5 | | 1055 | | 5 | | X | | X | | | | | | | | | | | | X | | | | | X |
| 73 | GEI-18-15.0 | | 1100 | | 5 | | X | | X | | | | | | | | | | | | X | | | | | X |
| 74 | GEI-18-17.5 | | 1105 | | 5 | | | | | | | | | | | | | | | | | | | | | |
| 75 | GEI-18-20.0 | | 1110 | | 1 | | | | | | | | | | | | | | | | | | | | | |
| 76 | GEI-19-2.5 | | 1240 | | 1 | | | | | | | | | | | | | | | | | | | | | |
| 77 | GEI-19-5.0 | | 1245 | | 5 | | X | | X | | | | | | | | | | | | X | | | | | X |
| 78 | GEI-19-7.5 | | 1250 | | 5 | | | | | | | | | | | | | | | | | | | | | |
| 79 | GEI-19-10.0 | | 1255 | | 5 | | X | | X | | | | | | | | | | | | X | | | | | X |
| 80 | GEI-19-12.5 | ↓ | 1300 | ↓ | 5 | | | | | | | | | | | | | | | | | | | | | |

| | Signature | Company | Date | Time |
|---|---|---|---|---|
| Relinquished | | GEI | 9/30/11 | 1100 |
| Received | | Speedy | 9/30/11 | 1315 |
| Relinquished | | Speedy | 9/30/11 | 1350 |
| Received | | OSE | 9/30/11 | 1350 |
| Relinquished | | | | |
| Received | | | | |
| Reviewed/Date | | Reviewed/Date | | |

**Comments/Special Instructions**
X - Added 10/4/11. DB (STA)

Chromatograms with final report ☐

Data Package: Level III ☐ Level IV ☐ Electronic Data Deliverables (EDDs) ☐ _____

# Chain of Custody

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14648 NE 95th Street • Redmond, WA 98052
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Laboratory Number: 09-223

Company: GEI

Project Number: 5147-012-02

Project Name: FORMER SHELL TANK FARM

Project Manager: RST

Sampled by: AJ

**Turnaround Request (in working days)**

(Check One)

- ☐ Same Day
- ☐ 1 Day
- ☐ 2 Days
- ☐ 3 Days
- ☑ Standard (7 Days) (TPH analysis 5 Days)
- ☐ _____ (other)

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | Number of Containers | NWTPH-HCID | NWTPH-Gx/BTEX | NWTPH-Gx | NWTPH-Dx | Volatiles 8260B | Halogenated Volatiles 8260B | Semivolatiles 8270D/SIM (with low-level PAHs) | PAHs 8270D/SIM (low level) | PCBs 8082 | Organochlorine Pesticides 8081A | Organophosphorus Pesticides 8270D/SIM | Chlorinated Acid Herbicides 8151A | Total RCRA / MTCA Metals (circle one) | TCLP Metals | HEM (oil and grease) 1664 | Lead | | | | | % Moisture |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 81 | GEI-19-15.0 | 9/29/11 | 1305 | Soil | 5 | | | | | | | | | | | | | | | | X | | | | | |
| 82 | GEI-19-17.5 | | 1310 | | 1 | | | | | | | | | | | | | | | | | | | | | |
| 83 | GEI-19-20.0 | | 1315 | | 1 | | | | | | | | | | | | | | | | | | | | | |
| 84 | GEI-23-2.5 | | 1550 | | 1 | | | | | | | | | | | | | | | | | | | | | |
| 85 | GEI-23-5.0 | | 1600 | | 5 | | | | | | | | | | | | | | | | | | | | | |
| 86 | GEI-23-7.5 | | 1605 | | 5 | | X | | X | | | | | | | | | | | | X | | | | | X |
| 87 | GEI-23-10.0 | | 1610 | | 1 | | | | | | | | | | | | | | | | | | | | | |
| 88 | GEI-23-12.5 | | 1615 | | 5 | | X | | X | | | | | | | | | | | | X | | | | | X |
| 89 | GEI-23-15.0 | | 1620 | | 1 | | | | | | | | | | | | | | | | | | | | | |
| 90 | GEI-24-2.5 | ↓ | 1320 | ↓ | 1 | | | | | | | | | | | | | | | | | | | | | |

| | Signature | Company | Date | Time |
|---|---|---|---|---|
| Relinquished | | GEI | 9/30/11 | 1100 |
| Received | | | 9-30-11 | 1315 |
| Relinquished | | | 9-30-11 | 1350 |
| Received | | | 9/30/11 | 1350 |
| Relinquished | | | | |
| Received | | | | |
| Reviewed/Date | | Reviewed/Date | | |

**Comments/Special Instructions**

X - Added 10/4/11. DB (STA)

Chromatograms with final rep

Data Package Level III ☐ Level IV ☐ Electronic Data Deliverables (EDDs) ☐ _____

# Chain of Custody



OnSite Environmental Inc.
14648 NE 95th Street • Redmond, WA 98052
Phone: (425) 883-3881 • www.onsite-env.com

Laboratory Number: 09-223

Company: GEI

Project Number: 5147-012-02

Project Name: FORMER SHELL TANK FARM

Project Manager: RST

Sampled by: AJ

**Turnaround Request (in working days)**

(Check One)

☐ Same Day ☐ 1 Day

☐ 2 Days ☐ 3 Days

☐ Standard (7 Days) (TPH analysis 5 Days)

☐ _____ (other)

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | Number of Containers | NWTPH-HCID | NWTPH-Gx/BTEX | NWTPH-Gx | NWTPH-Dx | Volatiles 8260B | Halogenated Volatiles 8260B | Semivolatiles 8270D/SIM (with low-level PAHs) | PAHs 8270D/SIM (low-level) | PCBs 8082 | Organochlorine Pesticides 8081A | Organophosphorus Pesticides 8270D/SIM | Chlorinated Acid Herbicides 8151A | Total RCRA / MTCA Metals (circle one) | TCLP Metals | HEM (oil and grease) 1664 | LEAD | | | | | % Moisture |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 91 | GEI-24-5.0 | 9/29/11 | 1325 | Soil | 5 | | X | | X | | | | | | | | | | | | X | | | | | X |
| 92 | GEI-24-7.5 | | 1330 | | 1 | | | | | | | | | | | | | | | | | | | | | |
| 93 | GEI-24-10.0 | | 1335 | | 5 | | X | | X | | | | | | | | | | | | X | | | | | X |
| 94 | GEI-24-12.5 | | 1340 | | 5 | | | | | | | | | | | | | | | | | | | | | |
| 95 | GEI-24-15.0 | | 1345 | | 1 | | | | | | | | | | | | | | | | | | | | | |
| 96 | GEI-25-2.5 | | 1350 | | 1 | | | | | | | | | | | | | | | | | | | | | |
| 97 | GEI-25-5.0 | | 1355 | | 5 | | X | | X | | | | | | | | | | | | X | | | | | X |
| 98 | GEI-25-7.5 | | 1400 | | 1 | | | | | | | | | | | | | | | | | | | | | |
| 99 | GEI-25-10.0 | | 1405 | | 5 | | X | | X | | | | | | | | | | | | X | | | | | X |
| 100 | GEI-25-12.5 | | 1410 | | 5 | | | | | | | | | | | | | | | | | | | | | |

| | Signature | Company | Date | Time |
|---|---|---|---|---|
| Relinquished | | GEI | 9/30/11 | 1100 |
| Received | | Speedy | 9-30-11 | 1315 |
| Relinquished | | Speedy | 9-30-11 | 1350 |
| Received | | GSE | 9/30/11 | 1350 |
| Relinquished | | | | |
| Received | | | | |
| Reviewed/Date | | Reviewed/Date | | |

Comments/Special Instructions

X - Added 10/4/11. DB (STAT)

Chromatograms with final report ☐

Data Package: Level III ☐ Level IV ☐ Electronic Data Deliverables (EDDs) ☐ _____

# Chain of Custody



OnSite Environmental Inc.
14648 NE 95th Street • Redmond, WA 98052
Phone: (425) 883-3881 • www.onsite-env.com

Company: GEI

Project Number: 5147-012-02

Project Name: FORMER SHELL TANK FARM

Project Manager: RST

Sampled by: AJ

**Turnaround Request (in working days)**

(Check One)

- ☐ Same Day
- ☐ 1 Day
- ☐ 2 Days
- ☐ 3 Days
- ☒ Standard (7 Days) (TPH analysis 5 Days)
- ☐ _____ (other)

**Laboratory Number:** 09-223

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | Number of Containers | NWTPH-HCID | NWTPH-Gx/BTEX | NWTPH-Gx | NWTPH-Dx | Volatiles 8260B | Halogenated Volatiles 8260B | Semivolatiles 8270D/SIM (with low-level PAHs) | PAHs 8270D/SIM (low-level) | PCBs 8082 | Organochlorine Pesticides 8081A | Organophosphorus Pesticides 8270D/SIM | Chlorinated Acid Herbicides 8151A | Total RCRA / MTCA Metals (circle one) | TCLP Metals | HEM (oil and grease) 1664 | LEAD | | MTBE, EDB, EDC | | | | % Moisture |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 101 | GEI-25-15.0 | 9/29/11 | 1415 | SOIL | 1 | | | | | | | | | | | | | | | | | | | | | | |
| 102 | GEI-27-2.5 | | 1700 | | 1 | | | | | | | | | | | | | | | | | | | | | | |
| 103 | GEI-27-5.0 | | 1705 | | 5 | | | | | | | | | | | | | | | | | | | | | | |
| 104 | GEI-27-7.5 | | 1710 | | 5 | | X | | X | | | | X | X | | | | | | | X | | X | | | | X |
| 105 | GEI-27-11.0 | | 1715 | | 5 | | X | | X | | | | X | X | | | | | | | X | | X | | | | X |
| 106 | GEI-27-13.0 | | 1720 | | 5 | | X | | X | | | | X | X | | | | | | | X | | X | | | | X |
| 107 | GEI-27-15.0 | | 1725 | | 1 | | | | | | | | | | | | | | | | | | | | | | |
| 108 | GEI-34-2.5 | | 830 | | 1 | | | | | | | | | | | | | | | | | | | | | | |
| 109 | GEI-34-5.0 | | 835 | | 1 | | | | | | | | | | | | | | | | | | | | | | |
| 110 | GEI-34-7.5 | ↓ | 840 | ↓ | 5 | | | | | | | | | | | | | | | | | | | | | | |

| | Signature | Company | Date | Time |
|---|---|---|---|---|
| Relinquished | | GEI | 9/30/11 | 1100 |
| Received | | Lindy Speedy | 9-30-11 | 1315 |
| Relinquished | | Lindy Speedy | 9.30.11 | 1350 |
| Received | | GSE | 9/30/11 | 1350 |
| Relinquished | | | | |
| Received | | | | |
| Reviewed/Date | | Reviewed/Date | | |

**Comments/Special Instructions**

X - Added 10/4/11. DB (STA)

Chromatograms with final report ☐

Data Package: Level III ☐ Level IV ☐ Electronic Data Deliverables (EDDs) ☐ _____ _____

# Chain of Custody



OnSite Environmental Inc.
14648 NE 95th Street • Redmond, WA 98052
Phone (425) 883-3881 • www.onsite-env.com

Company: GEI
Project Number: 5147-012-02
Project Name: FORMER SHELL TANK FARM
Project Manager: RST
Sampled by: AJ

Turnaround Request (in working days)
(Check One)
☐ Same Day ☐ 1 Day
☐ 2 Days ☐ 3 Days
☒ Standard (7 Days) (TPH analysis 5 Days)
☐ _____ (other)

Laboratory Number: 09-223

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | Number of Containers | NWTPH-HCID | NWTPH-Gx/BTEX | NWTPH-Gx | NWTPH-Dx | Volatiles 8260B | Halogenated Volatiles 8260B | Semivolatiles 8270D/SIM (with low-level PAHs) | PAHs 8270D/SIM (low-level) | PCBs 8082 | Organochlorine Pesticides 8081A | Organophosphorus Pesticides 8270D/SIM | Chlorinated Acid Herbicides 8151A | Total RCRA / MTCA Metals (circle one) | TCLP Metals | HEM (oil and grease) 1664 | LEAD | | | | | % Moisture |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 111 | GEI-34-10.0 | 9/29/11 | 845 | SOIL | 5 | | | | | | | | | | | | | | | | | | | | | |
| 112 | GEI-34-12.0 | | 850 | | 5 | | X | | X | | | | X | | | | | | | | X | | | | | X |
| 113 | GEI-34-15.0 | | 855 | | 1 | | | | | | | | | | | | | | | | | | | | | |
| 114 | GEI-35-2.5 | | 1625 | | 1 | | | | | | | | | | | | | | | | | | | | | |
| 115 | GEI-35-5.0 | | 1630 | | 5 | | | | | | | | | | | | | | | | | | | | | |
| 116 | GEI-35-7.5 | | 1635 | | 1 | | | | | | | | | | | | | | | | | | | | | |
| 117 | GEI-35-10.0 | | 1640 | | 5 | | | | | | | | | | | | | | | | | | | | | |
| 118 | GEI-35-12.5 | | 1645 | | 5 | | | | | | | | | | | | | | | | | | | | | |
| 119 | GEI-35-15.0 | | 1650 | | 5 | | X | | X | | | | | | | | | | | | X | | | | | X |
| 120 | GEI-35-19.0 | ↓ | 1655 | ↓ | 1 | | | | | | | | | | | | | | | | | | | | | |

| | Signature | Company | Date | Time |
|---|---|---|---|---|
| Relinquished | [signature] | GEI | 9/30/11 | 1100 |
| Received | [signature] | Speedy | 9/30/11 | 1315 |
| Relinquished | [signature] | Speedy | 9/30/11 | 1350 |
| Received | [signature] | GEI | 9/30/11 | 1350 |
| Relinquished | | | | |
| Received | | | | |
| Reviewed/Date | | Reviewed/Date | | |

Comments/Special Instructions
X - Added 10/24/11. DB (STA)

Chromatograms with final report ☐

Data Package: Level III ☐ Level IV ☐ Electronic Data Deliverables (EDDs) ☐ _____

OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

October 20, 2011

Robert Trahan
GeoEngineers, Inc.
600 Stewart, Suite 1700
Seattle, WA 98101-1233

Re: Analytical Data for Project 5147-012-02
Laboratory Reference No. 1109-223B

Dear Robert:

Enclosed are the analytical results and associated quality control data for samples submitted on September 30, 2011.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

David Baumeister
Project Manager

Enclosures

Date of Report: October 20, 2011
Samples Submitted: September 30, 2011
Laboratory Reference: 1109-223B
Project: 5147-012-02

**Case Narrative**

Samples were collected on September 28 and 29, 2011 and received by the laboratory on September 30, 2011. They were maintained at the laboratory at a temperature of $2^{o}$C to $6^{o}$C.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.

Date of Report: October 20, 2011
Samples Submitted: September 30, 2011
Laboratory Reference: 1109-223B
Project: 5147-012-02

**ANALYTICAL REPORT FOR SAMPLES**

| Client ID | Laboratory ID | Matrix | Date Sampled | Date Received | Notes |
|---|---|---|---|---|---|
| GEI-21-15.0 | 09-223-30 | Soil | 9-29-11 | 9-30-11 | |
| GEI-22-15.0 | 09-223-36 | Soil | 9-29-11 | 9-30-11 | |
| GEI-34-15.0 | 09-223-113 | Soil | 9-29-11 | 9-30-11 | |

Date of Report: October 20, 2011
Samples Submitted: September 30, 2011
Laboratory Reference: 1109-223B
Project: 5147-012-02

**PAHs by EPA 8270D/SIM**
**(with silica gel clean-up)**

Matrix: Soil
Units: mg/Kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-21-15.0** | | | | | |
| Laboratory ID: | 09-223-30 | | | | | |
| Naphthalene | **ND** | 0.0082 | EPA 8270/SIM | 10-18-11 | 10-19-11 | |
| 2-Methylnaphthalene | **ND** | 0.0082 | EPA 8270/SIM | 10-18-11 | 10-19-11 | |
| 1-Methylnaphthalene | **ND** | 0.0082 | EPA 8270/SIM | 10-18-11 | 10-19-11 | |
| Acenaphthylene | **ND** | 0.0082 | EPA 8270/SIM | 10-18-11 | 10-19-11 | |
| Acenaphthene | **ND** | 0.0082 | EPA 8270/SIM | 10-18-11 | 10-19-11 | |
| Fluorene | **ND** | 0.0082 | EPA 8270/SIM | 10-18-11 | 10-19-11 | |
| Phenanthrene | **0.0091** | 0.0082 | EPA 8270/SIM | 10-18-11 | 10-19-11 | |
| Anthracene | **ND** | 0.0082 | EPA 8270/SIM | 10-18-11 | 10-19-11 | |
| Fluoranthene | **0.015** | 0.0082 | EPA 8270/SIM | 10-18-11 | 10-19-11 | |
| Pyrene | **0.015** | 0.0082 | EPA 8270/SIM | 10-18-11 | 10-19-11 | |
| Benzo[a]anthracene | **ND** | 0.0082 | EPA 8270/SIM | 10-18-11 | 10-19-11 | |
| Chrysene | **ND** | 0.0082 | EPA 8270/SIM | 10-18-11 | 10-19-11 | |
| Benzo[b]fluoranthene | **ND** | 0.0082 | EPA 8270/SIM | 10-18-11 | 10-19-11 | |
| Benzo(j,k)fluoranthene | **ND** | 0.0082 | EPA 8270/SIM | 10-18-11 | 10-19-11 | |
| Benzo[a]pyrene | **ND** | 0.0082 | EPA 8270/SIM | 10-18-11 | 10-19-11 | |
| Indeno(1,2,3-c,d)pyrene | **ND** | 0.0082 | EPA 8270/SIM | 10-18-11 | 10-19-11 | |
| Dibenz[a,h]anthracene | **ND** | 0.0082 | EPA 8270/SIM | 10-18-11 | 10-19-11 | |
| Benzo[g,h,i]perylene | **ND** | 0.0082 | EPA 8270/SIM | 10-18-11 | 10-19-11 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***2-Fluorobiphenyl*** | ***82*** | ***43 - 109*** | | | | |
| ***Pyrene-d10*** | ***91*** | ***38 - 128*** | | | | |
| ***Terphenyl-d14*** | ***83*** | ***33 - 119*** | | | | |

Date of Report: October 20, 2011
Samples Submitted: September 30, 2011
Laboratory Reference: 1109-223B
Project: 5147-012-02

**PAHs by EPA 8270D/SIM**
**(with silica gel clean-up)**

Matrix: Soil
Units: mg/Kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-22-15.0** | | | | | |
| Laboratory ID: | 09-223-36 | | | | | |
| Naphthalene | **ND** | 0.010 | EPA 8270/SIM | 10-18-11 | 10-19-11 | |
| 2-Methylnaphthalene | **ND** | 0.010 | EPA 8270/SIM | 10-18-11 | 10-19-11 | |
| 1-Methylnaphthalene | **ND** | 0.010 | EPA 8270/SIM | 10-18-11 | 10-19-11 | |
| Acenaphthylene | **ND** | 0.010 | EPA 8270/SIM | 10-18-11 | 10-19-11 | |
| Acenaphthene | **ND** | 0.010 | EPA 8270/SIM | 10-18-11 | 10-19-11 | |
| Fluorene | **ND** | 0.010 | EPA 8270/SIM | 10-18-11 | 10-19-11 | |
| Phenanthrene | **0.024** | 0.010 | EPA 8270/SIM | 10-18-11 | 10-19-11 | |
| Anthracene | **ND** | 0.010 | EPA 8270/SIM | 10-18-11 | 10-19-11 | |
| Fluoranthene | **0.028** | 0.010 | EPA 8270/SIM | 10-18-11 | 10-19-11 | |
| Pyrene | **0.025** | 0.010 | EPA 8270/SIM | 10-18-11 | 10-19-11 | |
| Benzo[a]anthracene | **0.011** | 0.010 | EPA 8270/SIM | 10-18-11 | 10-19-11 | |
| Chrysene | **0.011** | 0.010 | EPA 8270/SIM | 10-18-11 | 10-19-11 | |
| Benzo[b]fluoranthene | **ND** | 0.010 | EPA 8270/SIM | 10-18-11 | 10-19-11 | |
| Benzo(j,k)fluoranthene | **ND** | 0.010 | EPA 8270/SIM | 10-18-11 | 10-19-11 | |
| Benzo[a]pyrene | **0.011** | 0.010 | EPA 8270/SIM | 10-18-11 | 10-19-11 | |
| Indeno(1,2,3-c,d)pyrene | **ND** | 0.010 | EPA 8270/SIM | 10-18-11 | 10-19-11 | |
| Dibenz[a,h]anthracene | **ND** | 0.010 | EPA 8270/SIM | 10-18-11 | 10-19-11 | |
| Benzo[g,h,i]perylene | **ND** | 0.010 | EPA 8270/SIM | 10-18-11 | 10-19-11 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***2-Fluorobiphenyl*** | ***85*** | ***43 - 109*** | | | | |
| ***Pyrene-d10*** | ***94*** | ***38 - 128*** | | | | |
| ***Terphenyl-d14*** | ***81*** | ***33 - 119*** | | | | |

Date of Report: October 20, 2011
Samples Submitted: September 30, 2011
Laboratory Reference: 1109-223B
Project: 5147-012-02

**PAHs by EPA 8270D/SIM**
**(with silica gel clean-up)**

Matrix: Soil
Units: mg/Kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-34-15.0** | | | | | |
| Laboratory ID: | 09-223-113 | | | | | |
| Naphthalene | **ND** | 0.0074 | EPA 8270/SIM | 10-18-11 | 10-20-11 | |
| 2-Methylnaphthalene | **ND** | 0.0074 | EPA 8270/SIM | 10-18-11 | 10-20-11 | |
| 1-Methylnaphthalene | **ND** | 0.0074 | EPA 8270/SIM | 10-18-11 | 10-20-11 | |
| Acenaphthylene | **ND** | 0.0074 | EPA 8270/SIM | 10-18-11 | 10-20-11 | |
| Acenaphthene | **ND** | 0.0074 | EPA 8270/SIM | 10-18-11 | 10-20-11 | |
| Fluorene | **ND** | 0.0074 | EPA 8270/SIM | 10-18-11 | 10-20-11 | |
| Phenanthrene | **ND** | 0.0074 | EPA 8270/SIM | 10-18-11 | 10-20-11 | |
| Anthracene | **ND** | 0.0074 | EPA 8270/SIM | 10-18-11 | 10-20-11 | |
| Fluoranthene | **ND** | 0.0074 | EPA 8270/SIM | 10-18-11 | 10-20-11 | |
| Pyrene | **ND** | 0.0074 | EPA 8270/SIM | 10-18-11 | 10-20-11 | |
| Benzo[a]anthracene | **ND** | 0.0074 | EPA 8270/SIM | 10-18-11 | 10-20-11 | |
| Chrysene | **ND** | 0.0074 | EPA 8270/SIM | 10-18-11 | 10-20-11 | |
| Benzo[b]fluoranthene | **ND** | 0.0074 | EPA 8270/SIM | 10-18-11 | 10-20-11 | |
| Benzo(j,k)fluoranthene | **ND** | 0.0074 | EPA 8270/SIM | 10-18-11 | 10-20-11 | |
| Benzo[a]pyrene | **ND** | 0.0074 | EPA 8270/SIM | 10-18-11 | 10-20-11 | |
| Indeno(1,2,3-c,d)pyrene | **ND** | 0.0074 | EPA 8270/SIM | 10-18-11 | 10-20-11 | |
| Dibenz[a,h]anthracene | **ND** | 0.0074 | EPA 8270/SIM | 10-18-11 | 10-20-11 | |
| Benzo[g,h,i]perylene | **ND** | 0.0074 | EPA 8270/SIM | 10-18-11 | 10-20-11 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***2-Fluorobiphenyl*** | ***91*** | ***43 - 109*** | | | | |
| ***Pyrene-d10*** | ***97*** | ***38 - 128*** | | | | |
| ***Terphenyl-d14*** | ***87*** | ***33 - 119*** | | | | |

Date of Report: October 20, 2011
Samples Submitted: September 30, 2011
Laboratory Reference: 1109-223B
Project: 5147-012-02

**PAHs by EPA 8270D/SIM**
**METHOD BLANK QUALITY CONTROL**
**(with silica gel clean-up)**

Matrix: Soil
Units: mg/Kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| Laboratory ID: | MB1018S1 | | | | | |
| Naphthalene | **ND** | 0.0067 | EPA 8270/SIM | 10-18-11 | 10-18-11 | |
| 2-Methylnaphthalene | **ND** | 0.0067 | EPA 8270/SIM | 10-18-11 | 10-18-11 | |
| 1-Methylnaphthalene | **ND** | 0.0067 | EPA 8270/SIM | 10-18-11 | 10-18-11 | |
| Acenaphthylene | **ND** | 0.0067 | EPA 8270/SIM | 10-18-11 | 10-18-11 | |
| Acenaphthene | **ND** | 0.0067 | EPA 8270/SIM | 10-18-11 | 10-18-11 | |
| Fluorene | **ND** | 0.0067 | EPA 8270/SIM | 10-18-11 | 10-18-11 | |
| Phenanthrene | **ND** | 0.0067 | EPA 8270/SIM | 10-18-11 | 10-18-11 | |
| Anthracene | **ND** | 0.0067 | EPA 8270/SIM | 10-18-11 | 10-18-11 | |
| Fluoranthene | **ND** | 0.0067 | EPA 8270/SIM | 10-18-11 | 10-18-11 | |
| Pyrene | **ND** | 0.0067 | EPA 8270/SIM | 10-18-11 | 10-18-11 | |
| Benzo[a]anthracene | **ND** | 0.0067 | EPA 8270/SIM | 10-18-11 | 10-18-11 | |
| Chrysene | **ND** | 0.0067 | EPA 8270/SIM | 10-18-11 | 10-18-11 | |
| Benzo[b]fluoranthene | **ND** | 0.0067 | EPA 8270/SIM | 10-18-11 | 10-18-11 | |
| Benzo(j,k)fluoranthene | **ND** | 0.0067 | EPA 8270/SIM | 10-18-11 | 10-18-11 | |
| Benzo[a]pyrene | **ND** | 0.0067 | EPA 8270/SIM | 10-18-11 | 10-18-11 | |
| Indeno(1,2,3-c,d)pyrene | **ND** | 0.0067 | EPA 8270/SIM | 10-18-11 | 10-18-11 | |
| Dibenz[a,h]anthracene | **ND** | 0.0067 | EPA 8270/SIM | 10-18-11 | 10-18-11 | |
| Benzo[g,h,i]perylene | **ND** | 0.0067 | EPA 8270/SIM | 10-18-11 | 10-18-11 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***2-Fluorobiphenyl*** | ***86*** | ***43 - 109*** | | | | |
| ***Pyrene-d10*** | ***93*** | ***38 - 128*** | | | | |
| ***Terphenyl-d14*** | ***104*** | ***33 - 119*** | | | | |

Date of Report: October 20, 2011
Samples Submitted: September 30, 2011
Laboratory Reference: 1109-223B
Project: 5147-012-02

**PAHs by EPA 8270D/SIM**
**SB/SBD QUALITY CONTROL**
**(with silica gel clean-up)**

Matrix: Soil
Units: mg/Kg

| Analyte | Result | | Spike Level | | Percent Recovery | | Recovery Limits | RPD | RPD Limit | Flags |
|---|---|---|---|---|---|---|---|---|---|---|
| **SPIKE BLANKS** | | | | | | | | | | |
| Laboratory ID: | SB1018S1 | | | | | | | | | |
| | SB | SBD | SB | SBD | SB | SBD | | | | |
| Naphthalene | **0.0675** | **0.0662** | 0.0833 | 0.0833 | 81 | 79 | 43 - 108 | 2 | 27 | |
| Acenaphthylene | **0.0829** | **0.0815** | 0.0833 | 0.0833 | 100 | 98 | 52 - 120 | 2 | 21 | |
| Acenaphthene | **0.0690** | **0.0682** | 0.0833 | 0.0833 | 83 | 82 | 59 - 113 | 1 | 17 | |
| Fluorene | **0.0752** | **0.0746** | 0.0833 | 0.0833 | 90 | 90 | 64 - 117 | 1 | 14 | |
| Phenanthrene | **0.0713** | **0.0713** | 0.0833 | 0.0833 | 86 | 86 | 67 - 112 | 0 | 12 | |
| Anthracene | **0.0807** | **0.0811** | 0.0833 | 0.0833 | 97 | 97 | 59 - 110 | 0 | 16 | |
| Fluoranthene | **0.0875** | **0.0877** | 0.0833 | 0.0833 | 105 | 105 | 68 - 120 | 0 | 15 | |
| Pyrene | **0.0786** | **0.0812** | 0.0833 | 0.0833 | 94 | 97 | 66 - 121 | 3 | 17 | |
| Benzo[a]anthracene | **0.0801** | **0.0806** | 0.0833 | 0.0833 | 96 | 97 | 63 - 114 | 1 | 12 | |
| Chrysene | **0.0777** | **0.0780** | 0.0833 | 0.0833 | 93 | 94 | 67 - 118 | 0 | 12 | |
| Benzo[b]fluoranthene | **0.0868** | **0.0861** | 0.0833 | 0.0833 | 104 | 103 | 58 - 125 | 1 | 20 | |
| Benzo(j,k)fluoranthene | **0.0869** | **0.0847** | 0.0833 | 0.0833 | 104 | 102 | 42 - 134 | 3 | 26 | |
| Benzo[a]pyrene | **0.0852** | **0.0875** | 0.0833 | 0.0833 | 102 | 105 | 55 - 111 | 3 | 19 | |
| Indeno(1,2,3-c,d)pyrene | **0.0883** | **0.0882** | 0.0833 | 0.0833 | 106 | 106 | 60 - 125 | 0 | 20 | |
| Dibenz[a,h]anthracene | **0.0864** | **0.0859** | 0.0833 | 0.0833 | 104 | 103 | 62 - 125 | 1 | 19 | |
| Benzo[g,h,i]perylene | **0.0835** | **0.0838** | 0.0833 | 0.0833 | 100 | 101 | 61 - 124 | 0 | 19 | |
| ***Surrogate:*** | | | | | | | | | | |
| ***2-Fluorobiphenyl*** | | | | | ***81*** | ***80*** | ***43 - 109*** | | | |
| ***Pyrene-d10*** | | | | | ***86*** | ***89*** | ***38 - 128*** | | | |
| ***Terphenyl-d14*** | | | | | ***103*** | ***97*** | ***33 - 119*** | | | |

Date of Report: October 20, 2011
Samples Submitted: September 30, 2011
Laboratory Reference: 1109-223B
Project: 5147-012-02

**% MOISTURE**

Date Analyzed: 10-18-11

| Client ID | Lab ID | % Moisture |
|---|---|---|
| GEI-21-15.0 | 09-223-30 | 19 |
| GEI-22-15.0 | 09-223-36 | 34 |
| GEI-34-15.0 | 09-223-113 | 10 |

OnSite Environmental Inc.

**Data Qualifiers and Abbreviations**

A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.

B - The analyte indicated was also found in the blank sample.

C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.

E - The value reported exceeds the quantitation range and is an estimate.

F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.

H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.

I - Compound recovery is outside of the control limits.

J - The value reported was below the practical quantitation limit. The value is an estimate.

K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.

L - The RPD is outside of the control limits.

M - Hydrocarbons in the gasoline range are impacting the diesel range result.

M1 - Hydrocarbons in the gasoline range (toluene-napthalene) are present in the sample.

N - Hydrocarbons in the lube oil range are impacting the diesel range result.

N1 - Hydrocarbons in diesel range are impacting lube oil range results.

O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.

P - The RPD of the detected concentrations between the two columns is greater than 40.

Q - Surrogate recovery is outside of the control limits.

S - Surrogate recovery data is not available due to the necessary dilution of the sample.

T - The sample chromatogram is not similar to a typical _____.

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

U1 - The practical quantitation limit is elevated due to interferences present in the sample.

V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.

W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.

X - Sample extract treated with a mercury cleanup procedure.

Y - Sample extract treated with an acid/silica gel cleanup procedure.

Z -

ND - Not Detected at PQL
PQL - Practical Quantitation Limit
RPD - Relative Percent Difference

# Chain of Custody

Page 1 of 12

OnSite Environmental Inc.
14648 NE 95th Street • Redmond, WA 98052
Phone: (425) 883-3881 • www.onsite-env.com

Laboratory Number: 09-223

Company: 5147-012-02
Project Number: GEI
Project Name: FORMER SHELL TANK FARM
Project Manager: RST
Sampled by: AJ

Turnaround Request (in working days)
(Check One)
☐ Same Day ☐ 1 Day
☐ 2 Days ☐ 3 Days
☒ Standard (7 Days) (TPH analysis 5 Days)
☐ _____ (other)

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | Number of Containers | NWTPH-HCID | NWTPH-Gx/BTEX | NWTPH-Gx | NWTPH-Dx | Volatiles 8260B | Halogenated Volatiles 8260B | Semivolatiles 8270D/SIM (with low-level PAHs) | PAHs 8270D/SIM (low-level) | PCBs 8082 | Organochlorine Pesticides 8081A | Organophosphorus Pesticides 8270D/SIM | Chlorinated Acid Herbicides 8151A | Total RCRA / MTCA Metals (circle one) | TCLP Metals | HEM (oil and grease) 1664 | LEAD | | | | % Moisture |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | GEI-31-2.5 | 9/28/11 | 1450 | SOIL | 1 | | | | | | | | | | | | | | | | | | | | |
| 2 | GEI-31-5.0 | | 1455 | | 5 | | | | | | | | | | | | | | | | | | | | |
| 3 | GEI-31-7.5 | | 1500 | | 5 | | X | | X | | | | X | | | | | | | | X | | | | X |
| 4 | GEI-31-10.0 | | 1505 | | 5 | | | | | | | | | | | | | | | | | | | | |
| 5 | GEI-31-12.0 | | 1510 | | 1 | | | | | | | | | | | | | | | | | | | | |
| 6 | GEI-32-2.5 | | 1530 | | 1 | | | | | | | | | | | | | | | | | | | | |
| 7 | GEI-32-5.0 | | 1535 | | 5 | | X | | X | | | | X | | | | | | | | X | | | | X |
| 8 | GEI-32-7.5 | | 1540 | | 5 | | | | | | | | | | | | | | | | | | | | |
| 9 | GEI-32-10.0 | | 1545 | | 5 | | | | | | | | | | | | | | | | | | | | |
| 10 | GEI-32-12.0 | | ~~1600~~ DB 1550 | | 1 | | | | | | | | | | | | | | | | | | | | |

| | Signature | Company | Date | Time |
|---|---|---|---|---|
| Relinquished | | GEI | 9/30/11 | 1100 |
| Received | | Speedy | 9-30-11 | 1310 |
| Relinquished | | Speedy | 9-30-11 | 1850 |
| Received | | DBE | 9/30/11 | 1350 |
| Relinquished | | | | |
| Received | | | | |
| Reviewed/Date | | Reviewed/Date | | |

Comments/Special Instructions

X - Added 10/4/11. DB (STA)

⊗ Added 10/12/11. DB (STA)

○ Added 10/18/11. DB (~~5 day~~ 3 day TAT)

Chromatograms with final report ☐

Data Package: Level III ☐ Level IV ☐ Electronic Data Deliverables (EDDs) ☐ _____

# Chain of Custody



OnSite Environmental Inc.
14648 NE 95th Street • Redmond, WA 98052
Phone (425) 883-3881 • www.onsite-env.com

Company: GEI
Project Number: 5147-012-02
Project Name: FORMER SHELL TANK FARM
Project Manager: RST
Sampled by: AJ

**Turnaround Request (in working days)**
(Check One)
☐ Same Day ☐ 1 Day
☐ 2 Days ☐ 3 Days
☒ Standard (7 Days) (TPH analysis 5 Days)
☐ _____ (other)

**Laboratory Number: 09-223**

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | Number of Containers | NWTPH-HCID | NWTPH-Gx/BTEX | NWTPH-Gx | NWTPH-Dx | Volatiles 8260B | Halogenated Volatiles 8260B | Semivolatiles 8270D/SIM (with low-level PAHs) | PAHs 8270D/SIM (low-level) | PCBs 8082 | Organochlorine Pesticides 8081A | Organophosphorus Pesticides 8270D/SIM | Chlorinated Acid Herbicides 8151A | Total RCRA / MTCA Metals (circle one) | TCLP Metals | HEM (oil and grease) 1664 | LEAD | | | | | % Moisture |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11 | GEI-33-2.5 | 9/28/11 | 1610 | SOIL | 1 | | | | | | | | | | | | | | | | | | | | | |
| 12 | GEI-33-5.0 | | 1615 | | 5 | | X | | X | | | | X | | | | | | | | X | | | | | X |
| 13 | GEI-33-7.5 | | 1620 | | 5 | | | | | | | | | | | | | | | | | | | | | |
| 14 | GEI-33-10.0 | | 1625 | | 5 | | X | | X | | | | X | | | | | | | | X | | | | | X |
| 15 | GEI-33-12.5 | | 1630 | | 1 | | | | | | | | | | | | | | | | | | | | | |
| 16 | GEI-33-14.0 | | 1635 | | 5 | | X | | X | | | | X | | | | | | | | X | | | | | X |
| 17 | GEI-33-18.0 | | 1640 | | 5 | | | | | | | | | | | | | | | | | | | | | |
| 18 | GEI-33-20.0 | | 1645 | | 1 | | | | | | | | | | | | | | | | | | | | | |
| 19 | GEI-20-2.5 | 9/29/11 | 1005 | | 1 | | | | | | | | | | | | | | | | | | | | | |
| 20 | GEI-20-5.0 | | 1010 | | 5 | | X | | X | | | | X | | | | | | | | X | | | | | X |

| | Signature | Company | Date | Time |
|---|---|---|---|---|
| Relinquished | | GEI | 9/30/11 | 1100 |
| Received | | Speedy | 9-30-11 | 1315 |
| Relinquished | | Speedy | 9-30-11 | 1350 |
| Received | | GEI | 9/30/11 | 1350 |
| Relinquished | | | | |
| Received | | | | |

Reviewed/Date
Reviewed/Date

**Comments/Special Instructions**
X, Added 10/4/11. SB (STA)

Chromatograms with final report ☐

Data Package: Level III ☐ Level IV ☐ Electronic Data Deliverables (EDDs) ☐ _____

# Chain of Custody

OnSite Environmental Inc.
14648 NE 95th Street • Redmond, WA 98052
Phone (425) 883-3881 • www.onsite-env.com



Laboratory Number: 09-223

Company: 5147-012-02
Project Number: GEI
Project Name: FORMER SHELL TANK FARM
Project Manager: KST
Sampled by: AJ

**Turnaround Request (in working days)**
(Check One)
☐ Same Day ☐ 1 Day
☐ 2 Days ☐ 3 Days
☐ Standard (7 Days) (TPH analysis 5 Days)
☐ ____ (other)

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 21 | GEI-20-7.5 | 9/29/11 | ~~1005~~ 1015 | Soil | 1 | | | | | | | | | | | | | | | | | |
| 22 | GEI-20-10.0 | | ~~1010~~ 1020 | | 5 | | X | | X | | | | X | | | | | | | | X | X |
| 23 | GEI-20-12.5 | | ~~1015~~ 1025 | | 5 | | | | | | | | | | | | | | | | | |
| 24 | GEI-20-15.0 | | ~~1020~~ 1030 | | 1 | | | | | | | | | | | | | | | | | |
| 25 | GEI-21-2.5 | | 900 | | 1 | | | | | | | | | | | | | | | | | |
| 26 | GEI-21-5.0 | | 905 | | 5 | | X | | X | | | | X | | | | | | | | X | X |
| 27 | GEI-21-7.5 | | 910 | | 1 | | | | | | | | | | | | | | | | | |
| 28 | GEI-21-10.0 | | 915 | | 5 | | X | | X | | | | X | | | | | | | | X | X |
| 29 | GEI-21-12.5 | | 920 | | 5 | | | | | | | | | | | | | | | | | |
| 30 | GEI-21-15.0 | | 925 | | 1 | | | | | | | | O | | | | | | | | | O |

| | Signature | Company | Date | Time |
|---|---|---|---|---|
| Relinquished | | GEI | 9/30/11 | 1100 |
| Received | | Speedy | 9-30-11 | 1315 |
| Relinquished | | Speedy | 9-30-11 | 1350 |
| Received | | OSE | 9/30/11 | 1350 |
| Relinquished | | | | |
| Received | | | | |

Comments/Special Instructions
X - Added 10/4/11. DB (STA)
O Added 10/18/11. DB (3 day TAT ~~STA~~)

Reviewed/Date
Reviewed/Date
Chromatograms with final report ☐

Data Package. Level III ☐ Level IV ☐ Electronic Data Deliverables (EDDs) ☐ _____

# Chain of Custody



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Company: GEI
Project Number: 5147-012-02
Project Name: FORMER SHELL TANK FARM
Project Manager: RST
Sampled by: AJ

**Turnaround Request (in working days)**
(Check One)
☐ Same Day ☐ 1 Day
☐ 2 Days ☐ 3 Days
☒ Standard (7 Days) (TPH analysis 5 Days)
☐ _____ (other)

**Laboratory Number:** 09-223

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 31 | GEI-22-2.5 | 9/29/11 | 935 | Soil | 1 | | | | | | | | | | | | | | | | | | | | | |
| 32 | GEI-22-5.0 | | 940 | | 5 | | X | | X | | | | X | | | | | | | | X | | | | | X |
| 33 | GEI-22-7.5 | | 945 | | 1 | | | | | | | | | | | | | | | | | | | | | |
| 34 | GEI-22-10.0 | | 950 | | 5 | | | | | | | | | | | | | | | | | | | | | |
| 35 | GEI-22-12.5 | | 955 | | 5 | | X | | X | | | | X | | | | | | | | X | | | | | X |
| 36 | GEI-22-15.0 | | 1000 | | 1 | | | | | | | | O | | | | | | | | | | | | | O |
| 37 | GEI-26-2.5 | | 1420 | | 1 | | | | | | | | | | | | | | | | | | | | | |
| 38 | GEI-26-5.0 | | 1425 | | 5 | | X | | X | | | | X | | | | | | | | X | | | | | X |
| 39 | GEI-26-7.5 | | 1430 | | 5 | | | | | | | | | | | | | | | | | | | | | |
| 40 | GEI-26-10.0 | | 1435 | | 5 | | X | | X | | | | X | | | | | | | | X | | | | | X |

| | Signature | Company | Date | Time |
|---|---|---|---|---|
| Relinquished | | GEI | 9/30/11 | 1100 |
| Received | | Eagle | 9-30-11 | 1315 |
| Relinquished | | Eagle | 9-30-11 | 1350 |
| Received | | GEL | 9/30/11 | 1350 |
| Relinquished | | | | |
| Received | | | | |
| Reviewed/Date | | Reviewed/Date | | |

**Comments/Special Instructions**
X - Added 10/4/11. DB (STA)
O Added 10/18/11. DB (~~STA~~) 3 day TAT

Chromatograms with final report ☐

Data Package: Level III ☐ Level IV ☐ Electronic Data Deliverables (EDDs) ☐ _____

# Chain of Custody



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14648 NE 95th Street • Redmond, WA 98052
Phone: (425) 883-3881 • www.onsite-env.com

Laboratory Number: 09-223

Company: GEI
Project Number: 5147-012-02
Project Name: FORMER SHELL TANK FARM
Project Manager: RST
Sampled by: AJ

Turnaround Request (in working days)
(Check One)
☐ Same Day ☐ 1 Day
☐ 2 Days ☐ 3 Days
☒ Standard (7 Days)
(TPH analysis 5 Days)
☐ _____ (other)

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 41 | GEI-26-12.5 | 9/29/11 | 1440 | Soil | 15 | | | | | | | | | | | | | | | | X | | | | | |
| 42 | GEI-26-15.0 | | 1445 | | 1 | | | | | | | | | | | | | | | | | | | | | |
| 43 | GEI-28-2.5 | | 1520 | | 1 | | | | | | | | | | | | | | | | X | | | | | |
| 44 | GEI-28-5.0 | | 1525 | | 5 | | X | | X | | | | X | | | | | | | | X | | | | | X |
| 45 | GEI-28-7.5 | | 1530 | | 1 | | | | | | | | | | | | | | | | | | | | | |
| 46 | GEI-28-10.0 | | 1535 | | 5 | | X | | X | | | | X | | | | | | | | X | | | | | X |
| 47 | GEI-28-12.5 | | 1540 | | 5 | | | | | | | | | | | | | | | | | | | | | |
| 48 | GEI-28-15.0 | | 1545 | | 1 | | | | | | | | | | | | | | | | | | | | | |
| 49 | GEI-29-2.5 | | 1450 | | 1 | | | | | | | | | | | | | | | | | | | | | |
| 50 | GEI-29-5.0 | | 1455 | | 5 | | X | | X | | | | X | | | | | | | | X | | | | | X |

| | Signature | Company | Date | Time |
|---|---|---|---|---|
| Relinquished | | GEI | 9/30/11 | 1100 |
| Received | | Speedy | 9/30/11 | 1315 |
| Relinquished | | Speedy | 9-30-11 | 1350 |
| Received | | | 9/30/11 | 1350 |
| Relinquished | | | | |
| Received | | | | |
| Reviewed/Date | | Reviewed/Date | | |

Comments/Special Instructions
X - added 10/4/11 - DB (STA)

Chromatograms with final report ☐

Data Package: Level III ☐ Level IV ☐ Electronic Data Deliverables (EDDs) ☐ _____

# Chain of Custody

OnSite Environmental Inc.
14648 NE 95th Street • Redmond, WA 98052
Phone: (425) 883-3881 • www.onsite-env.com



Laboratory Number: 09-223

Company: GEI
Project Number: 5147-012-02
Project Name: FORMER SHELL TANK FARM
Project Manager: RST
Sampled by: AJ

**Turnaround Request (in working days)**
(Check One)
☐ Same Day ☐ 1 Day
☐ 2 Days ☐ 3 Days
☒ Standard (7 Days) (TPH analysis 5 Days)
☐ _____ (other)

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | Number of Containers | NWTPH-HCID | NWTPH-Gx/BTEX | NWTPH-Gx | NWTPH-Dx | Volatiles 8260B | Halogenated Volatiles 8260B | Semivolatiles 8270D/SIM (with low-level PAHs) | PAHs 8270D/SIM (low-level) | PCBs 8082 | Organochlorine Pesticides 8081A | Organophosphorus Pesticides 8270D/SIM | Chlorinated Acid Herbicides 8151A | Total RCRA / MTCA Metals (circle one) | TCLP Metals | HEM (oil and grease) 1664 | LEAD | | | | | | % Moisture |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 51 | GEI-29-7.5 | 9/29/11 | 1500 | SOIL | 5 | | | | | | | | | | | | | | | | | | | | | | |
| 52 | GEI-29-10.0 | | 1505 | | 5 | | X | | X | | | | X | | | | | | | | X | | | | | | X |
| 53 | GEI-29-12.5 | | 1510 | | 1 | | | | | | | | | | | | | | | | | | | | | | |
| 54 | GEI-29-15.0 | | 1515 | | 1 | | | | | | | | | | | | | | | | | | | | | | |
| 55 | GEI-16-2.5 | | 1150 | | 1 | | | | | | | | | | | | | | | | | | | | | | |
| 56 | GEI-16-5.0 | | 1155 | | 5 | | X | | X | | | | | | | | | | | | X | | | | | | X |
| 57 | GEI-16-7.5 | | 1200 | | 1 | | | | | | | | | | | | | | | | | | | | | | |
| 58 | GEI-16-10.0 | | 1205 | | 5 | | X | | X | | | | | | | | | | | | X | | | | | | X |
| 59 | GEI-16-12.5 | | 1210 | | 5 | | | | | | | | | | | | | | | | | | | | | | |
| 60 | GEI-16-15.0 | ↓ | 1215 | ↓ | 5 | | | | | | | | | | | | | | | | | | | | | | |

| | Signature | Company | Date | Time |
|---|---|---|---|---|
| Relinquished | | GEI | 9/30/11 | 0100 |
| Received | Kelly Ledum | Speedy | 9-30-11 | 1355 |
| Relinquished | Kelly Ledum | Speedy | 9-30-11 | 1350 |
| Received | | GSE | 9/30/11 | 1350 |
| Relinquished | | | | |
| Received | | | | |
| Reviewed/Date | | Reviewed/Date | | |

**Comments/Special Instructions**
X - Added 10/4/11. DB (STA)

Chromatograms with final rep

Data Package: Level III ☐ Level IV ☐ Electronic Data Deliverables (EDDs) ☐ _____

# Chain of Custody



OnSite Environmental Inc.
14648 NE 95th Street • Redmond, WA 98052
Phone: (425) 883-3881 • www.onsite-env.com

Laboratory Number: 09-223

Company: GEI
Project Number: 5147-012-02
Project Name: FORMER SHELL TANK FARM
Project Manager: RST
Sampled by: AJ

Turnaround Request (in working days)
(Check One)
☐ Same Day ☐ 1 Day
☐ 2 Days ☐ 3 Days
☒ Standard (7 Days) (TPH analysis 5 Days)
☐ _____ (other)

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | Number of Containers | NWTPH-HCID | NWTPH-Gx/BTEX | NWTPH-Gx | NWTPH-Dx | Volatiles 8260B | Halogenated Volatiles 8260B | Semivolatiles 8270D/SIM (with low-level PAHs) | PAHs 8270D/SIM (low-level) | PCBs 8082 | Organochlorine Pesticides 8081A | Organophosphorus Pesticides 8270D/SIM | Chlorinated Acid Herbicides 8151A | Total RCRA / MTCA Metals (circle one) | TCLP Metals | HEM (oil and grease) 1664 | LEAD | | | | | % Moisture |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 61 | GEI-16-19.0 | 9/29/11 | 1220 | Soil | 1 | | | | | | | | | | | | | | | | X | | | | | |
| 62 | GEI-17-2.5 | | 1115 | | 1 | | | | | | | | | | | | | | | | | | | | | |
| 63 | GEI-17-5.0 | | 1120 | | 5 | | | | | | | | | | | | | | | | | | | | | |
| 64 | GEI-17-7.5 | | 1125 | | 5 | | | | | | | | | | | | | | | | | | | | | |
| 65 | GEI-17-10.0 | | 1130 | | 5 | | X | | X | | | | | | | | | | | | X | | | | | X |
| 66 | GEI-17-14.0 | | 1135 | | 5 | | X | | X | | | | | | | | | | | | X | | | | | X |
| 67 | GEI-17-17.5 | | 1140 | | 5 | | X | | X | | | | | | | | | | | | X | | | | | X |
| 68 | GEI-17-~~19.0~~ 20.0 DB | | 1145 | | 1 | | | | | | | | | | | | | | | | | | | | | |
| 69 | GEI-18-2.5 | | 1035 | | 1 | | | | | | | | | | | | | | | | | | | | | |
| 70 | GEI-18-5.0 | ↓ | 1040 | ↓ | 5 | | X | | X | | | | | | | | | | | | X | | | | | X |

| | Signature | Company | Date | Time |
|---|---|---|---|---|
| Relinquished | | GEI | 9/30/11 | 1100 |
| Received | | Speedy | 9-30-11 | 1315 |
| Relinquished | | Speedy | 9-30-11 | 1356 |
| Received | | OSE | 9/30/11 | 1358 |
| Relinquished | | | | |
| Received | | | | |
| Reviewed/Date | | Reviewed/Date | | |

Comments/Special Instructions
X - Added 10/4/11. DB (STA)

Chromatograms with final report ☐

Data Package: Level III ☐ Level IV ☐ Electronic Data Deliverables (EDDs) ☐ _____

# Chain of Custody



OnSite Environmental Inc.
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Phone: (425) 883-3881 • www.onsite-env.com

Company: GEI
Project Number: 5147-012-02
Project Name: FORMER SHELL TANK FARM
Project Manager: RST
Sampled by: AJ

**Turnaround Request (in working days)**
(Check One)
☐ Same Day ☐ 1 Day
☐ 2 Days ☐ 3 Days
☑ Standard (7 Days)
(TPH analysis 5 Days)
☐ _____ (other)

**Laboratory Number: 09-223**

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | Number of Containers | NWTPH-HCID | NWTPH-Gx/BTEX | NWTPH-Gx | NWTPH-Dx | Volatiles 8260B | Halogenated Volatiles 8260B | Semivolatiles 8270D/SIM (with low-level PAHs) | PAHs 8270D/SIM (low-level) | PCBs 8082 | Organochlorine Pesticides 8081A | Organophosphorus Pesticides 8270D/SIM | Chlorinated Acid Herbicides 8151A | Total RCRA / MTCA Metals (circle one) | TCLP Metals | HEM (oil and grease) 1664 | LEAD | | | | | % Moisture |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71 | GEI-18-10.0 | 9/29/11 | 1050 | Soil | 5 | | | | | | | | | | | | | | | | | | | | | |
| 72 | GEI-18-12.5 | | 1055 | | 5 | | X | | X | | | | | | | | | | | | X | | | | | X |
| 73 | GEI-18-15.0 | | 1100 | | 5 | | X | | X | | | | | | | | | | | | X | | | | | X |
| 74 | GEI-18-17.5 | | 1105 | | 5 | | | | | | | | | | | | | | | | | | | | | |
| 75 | GEI-18-20.0 | | 1110 | | 1 | | | | | | | | | | | | | | | | | | | | | |
| 76 | GEI-19-2.5 | | 1240 | | 1 | | | | | | | | | | | | | | | | | | | | | |
| 77 | GEI-19-5.0 | | 1245 | | 5 | | X | | X | | | | | | | | | | | | X | | | | | X |
| 78 | GEI-19-7.5 | | 1250 | | 5 | | | | | | | | | | | | | | | | | | | | | |
| 79 | GEI-19-10.0 | | 1255 | | 5 | | X | | X | | | | | | | | | | | | X | | | | | X |
| 80 | GEI-19-12.5 | ↓ | 1300 | ↓ | 5 | | | | | | | | | | | | | | | | | | | | | |

| | Signature | Company | Date | Time |
|---|---|---|---|---|
| Relinquished | | GEI | 9/30/11 | 1100 |
| Received | | Speedy | 9/30/11 | 1315 |
| Relinquished | | Speedy | 9/30/11 | 1350 |
| Received | | GEI | 9/30/11 | 1350 |
| Relinquished | | | | |
| Received | | | | |
| Reviewed/Date | | Reviewed/Date | | |

Comments/Special Instructions
X - Added 10/4/11. DB (STA)

Chromatograms with final report ☐

Data Package: Level III ☐ Level IV ☐ Electronic Data Deliverables (EDDs) ☐ ___ _____

# Chain of Custody

OnSite Environmental Inc.
14648 NE 95th Street • Redmond WA 98052
Phone (425) 883-3881 • www.onsite-env.com



Laboratory Number: 09-223

Company: GEI
Project Number: 5147-012-02
Project Name: FORMER SHELL TANK FARM
Project Manager: RST
Sampled by: AJ

**Turnaround Request (in working days)**
(Check One)
- ☐ Same Day ☐ 1 Day
- ☐ 2 Days ☐ 3 Days
- ☑ ~~Standard (7 Days)~~ (TPH analysis 5 Days)
- ☐ _____ (other)

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | Number of Containers | NWTPH-HCID | NWTPH-Gx/BTEX | NWTPH-Gx | NWTPH-Dx | Volatiles 8260B | Halogenated Volatiles 8260B | Semivolatiles 8270D/SIM (with low-level PAHs) | PAHs 8270D/SIM (low-level) | PCBs 8082 | Organochlorine Pesticides 8081A | Organophosphorus Pesticides 8270D/SIM | Chlorinated Acid Herbicides 8151A | Total RCRA / MTCA Metals (circle one) | TCLP Metals | HEM (oil and grease) 1664 | LEAD | % Moisture |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 81 | GEI-19-15.0 | 9/29/11 | 1305 | Soil | 5 | | | | | | | | | | | | | | | | | |
| 82 | GEI-19-17.5 | | 1310 | | 1 | | | | | | | | | | | | | | | | | |
| 83 | GEI-19-20.0 | | 1315 | | 1 | | | | | | | | | | | | | | | | | |
| 84 | GEI-23-2.5 | | 1550 | | 1 | | | | | | | | | | | | | | | | | |
| 85 | GEI-23-5.0 | | 1600 | | 5 | | | | | | | | | | | | | | | | | |
| 86 | GEI-23-7.5 | | 1605 | | 5 | | X | | X | | | | | | | | | | | | X | X |
| 87 | GEI-23-10.0 | | 1610 | | 1 | | | | | | | | | | | | | | | | | |
| 88 | GEI-23-12.5 | | 1615 | | 5 | | X | | X | | | | | | | | | | | | X | X |
| 89 | GEI-23-15.0 | | 1620 | | 1 | | | | ⊘ | | | | | | | | | | | | | ⊘ |
| 90 | GEI-24-2.5 | | 1320 | | 1 | | | | | | | | | | | | | | | | | |

| | Signature | Company | Date | Time |
|---|---|---|---|---|
| Relinquished | | GEI | 9/30/11 | 1100 |
| Received | | Speedy | 9-30-11 | 1315 |
| Relinquished | | Speedy | 9-30-11 | 1350 |
| Received | | TOSC | 9/30/11 | 1350 |
| Relinquished | | | | |
| Received | | | | |
| Reviewed/Date | | Reviewed/Date | | |

**Comments/Special Instructions**
X - Added 10/4/11. DB (STA)
⊘ Added 10/12/11. DB (STA)

Chromatograms with final report ☐

Data Package Level III ☐ Level IV ☐ Electronic Data Deliverables (EDDs) ☐ _____ _____

# Chain of Custody



OnSite Environmental Inc.
14648 NE 95th Street • Redmond, WA 98052
Phone (425) 883-3881 • www.onsite-env.com

Laboratory Number: 09-223

Company: GEI

Project Number: 5147-012-02

Project Name: FORMER SHELL TANK FARM

Project Manager: RST

Sampled by: AJ

**Turnaround Request (in working days)**

(Check One)

☐ Same Day ☐ 1 Day

☐ 2 Days ☐ 3 Days

☐ Standard (7 Days)
(TPH analysis 5 Days)

☐ _____ (other)

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 91 | GEI-24-5.0 | 9/29/11 | 1325 | Soil | 5 | | X | | X | | | | | | | | | | | | X | | | | | | X |
| 92 | GEI-24-7.5 | | 1330 | | 1 | | | | | | | | | | | | | | | | | | | | | | |
| 93 | GEI-24-10.0 | | 1335 | | 5 | | X | | X | | | | | | | | | | | | X | | | | | | X |
| 94 | GEI-24-12.5 | | 1340 | | 5 | | | | | | | | | | | | | | | | | | | | | | |
| 95 | GEI-24-15.0 | | 1345 | | 1 | | | | | | | | | | | | | | | | | | | | | | |
| 96 | GEI-25-2.5 | | 1350 | | 1 | | | | | | | | | | | | | | | | | | | | | | |
| 97 | GEI-25-5.0 | | 1355 | | 5 | | X | | X | | | | | | | | | | | | X | | | | | | X |
| 98 | GEI-25-7.5 | | 1400 | | 1 | | | | | | | | | | | | | | | | | | | | | | |
| 99 | GEI-25-10.0 | | 1405 | | 5 | | X | | X | | | | | | | | | | | | X | | | | | | X |
| 100 | GEI-25-12.5 | | 1410 | | 5 | | | | | | | | | | | | | | | | | | | | | | |

| | Signature | Company | Date | Time |
|---|---|---|---|---|
| Relinquished | | GEI | 9/30/11 | 1100 |
| Received | | Speedy | 9-30-11 | 1315 |
| Relinquished | | Speedy | 9-30-11 | 1350 |
| Received | | GSE | 9/30/11 | 1350 |
| Relinquished | | | | |
| Received | | | | |

Comments/Special Instructions: X - Added 10/4/11. DB (STAT)

Reviewed/Date

Reviewed/Date

Chromatograms with final report ☐

Data Package: Level III ☐ Level IV ☐ Electronic Data Deliverables (EDDs) ☐ _____

# Chain of Custody



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Phone: (425) 883-3881 • www.onsite-env.com

Laboratory Number: 09-223

Company: GEI
Project Number: 5147-012-02
Project Name: FORMER SHELL TANK FARM
Project Manager: RST
Sampled by: AJ

Turnaround Request (in working days)
(Check One)
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☐ 2 Days ☐ 3 Days
☒ Standard (7 Days)
(TPH analysis 5 Days)
☐ _____ (other)

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 101 | GEI-25-15.0 | 9/29/11 | 1415 | SOIL | 1 | | | | | | | | | | | | | | | | | | | | | | |
| 102 | GEI-27-2.5 | | 1700 | | 1 | | | | | | | | | | | | | | | | | | | | | | |
| 103 | GEI-27-5.0 | | 1705 | | 5 | | | | | | | | | | | | | | | | | | | | | | |
| 104 | GEI-27-7.5 | | 1710 | | 5 | | X | | X | | | | X | X | | | | | | | X | | X | | | | X |
| 105 | GEI-27-11.0 | | 1715 | | 5 | | X | | X | | | | X | X | | | | | | | X | | X | | | | X |
| 106 | GEI-27-13.0 | | 1720 | | 5 | | X | | X | | | | X | X | | | | | | | X | | X | | | | X |
| 107 | GEI-27-15.0 | | 1725 | | 1 | | | | | | | | | | | | | | | | | | | | | | |
| 108 | GEI-34-2.5 | | 830 | | 1 | | | | | | | | | | | | | | | | | | | | | | |
| 109 | GEI-34-5.0 | | 835 | | 1 | | | | | | | | | | | | | | | | | | | | | | |
| 110 | GEI-34-7.5 | ↓ | 840 | ↓ | 5 | | | | | | | | | | | | | | | | | | | | | | |

| | Signature | Company | Date | Time |
|---|---|---|---|---|
| Relinquished | | GEI | 9/30/11 | 1100 |
| Received | | Speedy | 9-30-11 | 1315 |
| Relinquished | | Speedy | 9.30.11 | 1350 |
| Received | | GEI | 9/30/11 | 1350 |
| Relinquished | | | | |
| Received | | | | |

Comments/Special Instructions
X - Added 10/4/11. DB (STA)

Reviewed/Date
Reviewed/Date
Chromatograms with final report ☐

Data Package: Level III ☐ Level IV ☐ Electronic Data Deliverables (EDDs) ☐ _____

# Chain of Custody

Page 12 of 12

OnSite Environmental Inc.
14648 NE 95th Street • Redmond, WA 98052
Phone: (425) 883-3881 • www.onsite-env.com

Laboratory Number: 09-223

Company: GEI
Project Number: 5147-012-02
Project Name: FORMER SHELL TANK FARM
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Turnaround Request (in working days)
(Check One)
☐ Same Day ☐ 1 Day
☐ 2 Days ☐ 3 Days
☒ Standard (7 Days) (TPH analysis 5 Days)
☐ _____ (other)

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 111 | GEI-34-10.0 | 9/29/11 | 845 | Soil | 5 | | | | | | | | | | | | | | | | | |
| 112 | GEI-34-12.0 | | 850 | | 5 | | X | | X | | | | X | | | | | | | | X | X |
| 113 | GEI-34-15.0 | | 855 | | 1 | | | | | | | | O | | | | | | | | | O |
| 114 | GEI-35-2.5 | | 1625 | | 1 | | | | | | | | | | | | | | | | | |
| 115 | GEI-35-5.0 | | 1630 | | 5 | | | | | | | | | | | | | | | | | |
| 116 | GEI-35-7.5 | | 1635 | | 1 | | | | | | | | | | | | | | | | | |
| 117 | GEI-35-10.0 | | 1640 | | 5 | | | | | | | | | | | | | | | | | |
| 118 | GEI-35-12.5 | | 1645 | | 5 | | | | | | | | | | | | | | | | | |
| 119 | GEI-35-15.0 | | 1650 | | 5 | | X | | X | | | | | | | | | | | | X | X |
| 120 | GEI-35-19.0 | | 1655 | | 1 | | | | | | | | | | | | | | | | | |

| | Signature | Company | Date | Time |
|---|---|---|---|---|
| Relinquished | | GEI | 9/30/11 | 1100 |
| Received | | Speedy | 9/30/11 | 1315 |
| Relinquished | | Speedy | 9/30/11 | 1350 |
| Received | | OSE | 9/30/11 | 1350 |
| Relinquished | | | | |
| Received | | | | |
| Reviewed/Date | | Reviewed/Date | | |

Comments/Special Instructions

X - Added 10/24/11. DB (STA)

O - Added 10/18/11. DB (3 day TAT)

Chromatograms with final report ☐

Data Package: Level III ☐ Level IV ☐ Electronic Data Deliverables (EDDs) ☐ _____

OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

October 19, 2011

Robert Trahan
GeoEngineers, Inc.
600 Stewart, Suite 1700
Seattle, WA 98101-1233

Re: Analytical Data for Project 5147-012-02
Laboratory Reference No. 1110-119

Dear Robert:

Enclosed are the analytical results and associated quality control data for samples submitted on October 17, 2011.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

David Baumeister
Project Manager

Enclosures

Date of Report: October 19, 2011
Samples Submitted: October 17, 2011
Laboratory Reference: 1110-119
Project: 5147-012-02

**Case Narrative**

Samples were collected on September 27, 28 and 29, 2011 and received by the laboratory on October 17, 2011. They were maintained at the laboratory at a temperature of $2^{o}$C to $6^{o}$C.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.

Date of Report: October 19, 2011
Samples Submitted: October 17, 2011
Laboratory Reference: 1110-119
Project: 5147-012-02

**ANALYTICAL REPORT FOR SAMPLES**

| Client ID | Laboratory ID | Matrix | Date Sampled | Date Received | Notes |
|---|---|---|---|---|---|
| DUP-1 | 10-119-01 | Soil | 9-27-11 | 10-17-11 | |
| DUP-2 | 10-119-02 | Soil | 9-27-11 | 10-17-11 | |
| DUP-3 | 10-119-03 | Soil | 9-28-11 | 10-17-11 | |
| DUP-4 | 10-119-04 | Soil | 9-29-11 | 10-17-11 | |

Date of Report: October 19, 2011
Samples Submitted: October 17, 2011
Laboratory Reference: 1110-119
Project: 5147-012-02

**NWTPH-Dx**
**(with acid/silica gel clean-up)**

Matrix: Soil
Units: mg/Kg (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **DUP-1** | | | | | |
| Laboratory ID: | 10-119-01 | | | | | |
| Diesel Range Organics | **4500** | 30 | NWTPH-Dx | 10-18-11 | 10-18-11 | |
| Lube Oil Range Organics | **ND** | 330 | NWTPH-Dx | 10-18-11 | 10-18-11 | U1 |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***o-Terphenyl*** | ***98*** | ***50-150*** | | | | |
| **Client ID:** | **DUP-2** | | | | | |
| Laboratory ID: | 10-119-02 | | | | | |
| Diesel Range Organics | **950** | 30 | NWTPH-Dx | 10-18-11 | 10-18-11 | |
| Lube Oil Range Organics | **ND** | 60 | NWTPH-Dx | 10-18-11 | 10-18-11 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***o-Terphenyl*** | ***115*** | ***50-150*** | | | | |
| **Client ID:** | **DUP-3** | | | | | |
| Laboratory ID: | 10-119-03 | | | | | |
| Diesel Range Organics | **2600** | 30 | NWTPH-Dx | 10-18-11 | 10-18-11 | |
| Lube Oil | **1200** | 60 | NWTPH-Dx | 10-18-11 | 10-18-11 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***o-Terphenyl*** | ***114*** | ***50-150*** | | | | |
| **Client ID:** | **DUP-4** | | | | | |
| Laboratory ID: | 10-119-04 | | | | | |
| Diesel Range Organics | **ND** | 29 | NWTPH-Dx | 10-18-11 | 10-18-11 | |
| Lube Oil Range Organics | **ND** | 58 | NWTPH-Dx | 10-18-11 | 10-18-11 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***o-Terphenyl*** | ***106*** | ***50-150*** | | | | |

Date of Report: October 19, 2011
Samples Submitted: October 17, 2011
Laboratory Reference: 1110-119
Project: 5147-012-02

**NWTPH-Dx**
**QUALITY CONTROL**
**(with acid/silica gel clean-up)**

Matrix: Soil
Units: mg/Kg (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **METHOD BLANK** | | | | | | |
| Laboratory ID: | MB1018S1 | | | | | |
| Diesel Range Organics | **ND** | 25 | NWTPH-Dx | 10-18-11 | 10-18-11 | |
| Lube Oil Range Organics | **ND** | 50 | NWTPH-Dx | 10-18-11 | 10-18-11 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***o-Terphenyl*** | ***116*** | ***50-150*** | | | | |

| Analyte | Result | | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|---|---|---|---|---|---|---|---|
| **DUPLICATE** | | | | | | | |
| Laboratory ID: | 10-119-02 | | | | | | |
| | ORIG | DUP | | | | | |
| Diesel Range Organics | **793** | **743** | | | 7 | NA | |
| Lube Oil Range Organics | **ND** | **ND** | | | NA | NA | |
| ***Surrogate:*** | | | | | | | |
| ***o-Terphenyl*** | | | ***115*** ***119*** | ***50-150*** | | | |

Date of Report: October 19, 2011
Samples Submitted: October 17, 2011
Laboratory Reference: 1110-119
Project: 5147-012-02

**% MOISTURE**

Date Analyzed: 10-18-11

| Client ID | Lab ID | % Moisture |
|---|---|---|
| DUP-1 | 10-119-01 | 16 |
| DUP-2 | 10-119-02 | 16 |
| DUP-3 | 10-119-03 | 17 |
| DUP-4 | 10-119-04 | 14 |

OnSite Environmental Inc.

**Data Qualifiers and Abbreviations**

A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.

B - The analyte indicated was also found in the blank sample.

C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.

E - The value reported exceeds the quantitation range and is an estimate.

F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.

H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.

I - Compound recovery is outside of the control limits.

J - The value reported was below the practical quantitation limit. The value is an estimate.

K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.

L - The RPD is outside of the control limits.

M - Hydrocarbons in the gasoline range are impacting the diesel range result.

M1 - Hydrocarbons in the gasoline range (toluene-napthalene) are present in the sample.

N - Hydrocarbons in the lube oil range are impacting the diesel range result.

N1 - Hydrocarbons in diesel range are impacting lube oil range results.

O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.

P - The RPD of the detected concentrations between the two columns is greater than 40.

Q - Surrogate recovery is outside of the control limits.

S - Surrogate recovery data is not available due to the necessary dilution of the sample.

T - The sample chromatogram is not similar to a typical _____.

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

U1 - The practical quantitation limit is elevated due to interferences present in the sample.

V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.

W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.

X - Sample extract treated with a mercury cleanup procedure.

Y - Sample extract treated with an acid/silica gel cleanup procedure.

Z -

ND - Not Detected at PQL
PQL - Practical Quantitation Limit
RPD - Relative Percent Difference

# Chain of Custody

OnSite Environmental Inc.
Analytical Laboratory Testing Services
14648 NE 95th Street • Redmond, WA 98052
Phone: (425) 883-3881 • www.onsite-env.com



Company: Geo Engineers
Project Number: 5147-012-02
Project Name: POA - Shell
Project Manager: Robert Trahan
Sampled by: Abijit Joshi

**Turnaround Request (in working days)**

(Check One)

- ☐ Same Day
- ☐ 1 Day
- ☐ 2 Days
- ☒ 3 Days
- ☐ Standard (7 Days) (TPH analysis 5 Days)
- ☐ _____ (other)

**Laboratory Number: 10-119**

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | No. of Cont. | NWTPH-HCID | NWTPH-Gx/BTEX | NWTPH-Gx | NWTPH-Dx | Volatiles 8260B | Halogenated Volatiles 8260B | Semivolatiles 8270D/SIM (with low-level PAHs) | PAHs 8270D/SIM (low-level) | PCBs 8082 | Organochlorine Pesticides 8081A | Organophosphorus Pesticides 8270D/SIM | Chlorinated Acid Herbicides 8151A | Total RCRA Metals | Total MTCA Metals | TCLP Metals | HEM (oil and grease) 1664 | | | | % Moisture |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Dup-1 | 9-27-11 | 1425 | S | 1 | | | | X | | | | | | | | | | | | | | | | X |
| 2 | Dup-2 | 9-27-11 | 1000 | | 1 | | | | X | | | | | | | | | | | | | | | | X |
| 3 | Dup-3 | 9-28-11 | 845 | | 1 | | | | X | | | | | | | | | | | | | | | | X |
| 4 | Dup-4 | 9-29-11 | 1155 | ↓ | 1 | | | | X | | | | | | | | | | | | | | | | X |

| | Signature | Company | Date | Time |
|---|---|---|---|---|
| Relinquished | | GEI | 10-7-11 | 1630 |
| Received | | OnSite Env | 10/7/11 | 1630 |
| Relinquished | | | | |
| Received | | | | |
| Relinquished | | | | |
| Received | | | | |

**Comments/Special Instructions**

Reviewed/Date

Reviewed/Date

Chromatograms with final report ☐

Data Package: Level III ☐ Level IV ☐ Electronic Data Deliverables (EDDs) ☒ _____

OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

February 22, 2012

Robert Trahan
GeoEngineers, Inc.
600 Stewart, Suite 1700
Seattle, WA 98101-1233

Re: Analytical Data for Project 5147-012-02
Laboratory Reference No. 1202-101

Dear Robert:

Enclosed are the analytical results and associated quality control data for samples submitted on February 10, 2012.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

David Baumeister
Project Manager

Enclosures

Date of Report: February 22, 2012
Samples Submitted: February 10, 2012
Laboratory Reference: 1202-101
Project: 5147-012-02

**Case Narrative**

Samples were collected on February 9, 2012 and received by the laboratory on February 10, 2012. They were maintained at the laboratory at a temperature of 2°C to 6°C.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.

NWTPH Gx/BTEX Analysis

Per EPA Method 5035A, samples were received by the laboratory in pre-weighed 40 mL VOA vials within 48 hours of sample collection. They were stored in a freezer at between -7°C and -20°C until extraction or analysis.

Any other QA/QC issues associated with this extraction and analysis will be indicated with a footnote reference and discussed in detail on the Data Qualifier page.

Date of Report: February 22, 2012
Samples Submitted: February 10, 2012
Laboratory Reference: 1202-101
Project: 5147-012-02

**ANALYTICAL REPORT FOR SAMPLES**

| Client ID | Laboratory ID | Matrix | Date Sampled | Date Received | Notes |
|---|---|---|---|---|---|
| GEI-MW-1-7.5 | 02-101-0 | Soil | 2-9-12 | 2-10-12 | |
| GEI-MW-1-12.5 | 02-101-0 | Soil | 2-9-12 | 2-10-12 | |

Date of Report: February 22, 2012
Samples Submitted: February 10, 2012
Laboratory Reference: 1202-101
Project: 5147-012-02

**NWTPH-Gx/BTEX**

Matrix: Soil
Units: mg/kg (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-MW-1-7.5** | | | | | |
| Laboratory ID: | 02-101-03 | | | | | |
| Gasoline | **ND** | 7.4 | NWTPH-Gx | 2-15-12 | 2-15-12 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *99* | *68-124* | | | | |
| | | | | | | |
| **Client ID:** | **GEI-MW-1-12.5** | | | | | |
| Laboratory ID: | 02-101-07 | | | | | |
| Benzene | **ND** | 0.020 | EPA 8021 | 2-15-12 | 2-15-12 | |
| Toluene | **ND** | 0.054 | EPA 8021 | 2-15-12 | 2-15-12 | |
| Ethyl Benzene | **ND** | 0.054 | EPA 8021 | 2-15-12 | 2-15-12 | |
| m,p-Xylene | **ND** | 0.054 | EPA 8021 | 2-15-12 | 2-15-12 | |
| o-Xylene | **ND** | 0.054 | EPA 8021 | 2-15-12 | 2-15-12 | |
| Gasoline | **ND** | 5.4 | NWTPH-Gx | 2-15-12 | 2-15-12 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *91* | *68-124* | | | | |

Date of Report: February 22, 2012
Samples Submitted: February 10, 2012
Laboratory Reference: 1202-101
Project: 5147-012-02

**PAHs by EPA 8270D/SIM**
**(with silica gel clean-up)**

Matrix: Soil
Units: mg/Kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-MW-1-12.5** | | | | | |
| Laboratory ID: | 02-101-07 | | | | | |
| Naphthalene | **0.050** | 0.037 | EPA 8270/SIM | 2-16-12 | 2-17-12 | |
| 2-Methylnaphthalene | **ND** | 0.037 | EPA 8270/SIM | 2-16-12 | 2-17-12 | |
| 1-Methylnaphthalene | **ND** | 0.037 | EPA 8270/SIM | 2-16-12 | 2-17-12 | |
| Acenaphthylene | **0.13** | 0.037 | EPA 8270/SIM | 2-16-12 | 2-17-12 | |
| Acenaphthene | **ND** | 0.037 | EPA 8270/SIM | 2-16-12 | 2-17-12 | |
| Fluorene | **0.19** | 0.037 | EPA 8270/SIM | 2-16-12 | 2-17-12 | |
| Phenanthrene | **1.5** | 0.037 | EPA 8270/SIM | 2-16-12 | 2-17-12 | |
| Anthracene | **0.35** | 0.037 | EPA 8270/SIM | 2-16-12 | 2-17-12 | |
| Fluoranthene | **1.5** | 0.037 | EPA 8270/SIM | 2-16-12 | 2-17-12 | |
| Pyrene | **1.4** | 0.037 | EPA 8270/SIM | 2-16-12 | 2-17-12 | |
| Benzo[a]anthracene | **0.47** | 0.037 | EPA 8270/SIM | 2-16-12 | 2-17-12 | |
| Chrysene | **0.55** | 0.037 | EPA 8270/SIM | 2-16-12 | 2-17-12 | |
| Benzo[b]fluoranthene | **0.47** | 0.037 | EPA 8270/SIM | 2-16-12 | 2-17-12 | |
| Benzo(j,k)fluoranthene | **0.16** | 0.037 | EPA 8270/SIM | 2-16-12 | 2-17-12 | |
| Benzo[a]pyrene | **0.48** | 0.037 | EPA 8270/SIM | 2-16-12 | 2-17-12 | |
| Indeno(1,2,3-c,d)pyrene | **0.33** | 0.037 | EPA 8270/SIM | 2-16-12 | 2-17-12 | |
| Dibenz[a,h]anthracene | **0.073** | 0.037 | EPA 8270/SIM | 2-16-12 | 2-17-12 | |
| Benzo[g,h,i]perylene | **0.37** | 0.037 | EPA 8270/SIM | 2-16-12 | 2-17-12 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *2-Fluorobiphenyl* | *76* | *43 - 109* | | | | |
| *Pyrene-d10* | *75* | *38 - 128* | | | | |
| *Terphenyl-d14* | *78* | *33 - 119* | | | | |

Date of Report: February 22, 2012
Samples Submitted: February 10, 2012
Laboratory Reference: 1202-101
Project: 5147-012-02

**NWTPH-Gx/BTEX**
**QUALITY CONTROL**

Matrix: Soil
Units: mg/kg (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **METHOD BLANK** | | | | | | |
| Laboratory ID: | MB0215S1 | | | | | |
| Benzene | **ND** | 0.020 | EPA 8021 | 2-15-12 | 2-15-12 | |
| Toluene | **ND** | 0.050 | EPA 8021 | 2-15-12 | 2-15-12 | |
| Ethyl Benzene | **ND** | 0.050 | EPA 8021 | 2-15-12 | 2-15-12 | |
| m,p-Xylene | **ND** | 0.050 | EPA 8021 | 2-15-12 | 2-15-12 | |
| o-Xylene | **ND** | 0.050 | EPA 8021 | 2-15-12 | 2-15-12 | |
| Gasoline | **ND** | 5.0 | NWTPH-Gx | 2-15-12 | 2-15-12 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *Fluorobenzene* | *90* | *68-124* | | | | |

| Analyte | Result | | Spike Level | | Source Result | Percent Recovery | | Recovery Limits | RPD | RPD Limit | Flags |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **DUPLICATE** | | | | | | | | | | | |
| Laboratory ID: | 02-101-07 | | | | | | | | | | |
| | ORIG | DUP | | | | | | | | | |
| Benzene | **ND** | **ND** | NA | NA | | NA | | NA | NA | 30 | |
| Toluene | **ND** | **ND** | NA | NA | | NA | | NA | NA | 30 | |
| Ethyl Benzene | **ND** | **ND** | NA | NA | | NA | | NA | NA | 30 | |
| m,p-Xylene | **ND** | **ND** | NA | NA | | NA | | NA | NA | 30 | |
| o-Xylene | **ND** | **ND** | NA | NA | | NA | | NA | NA | 30 | |
| Gasoline | **ND** | **ND** | NA | NA | | NA | | NA | NA | 30 | |
| *Surrogate:* | | | | | | | | | | | |
| *Fluorobenzene* | | | | | | *91* | *92* | *68-124* | | | |
| **SPIKE BLANKS** | | | | | | | | | | | |
| Laboratory ID: | SB0215S1 | | | | | | | | | | |
| | SB | SBD | SB | SBD | | SB | SBD | | | | |
| Benzene | **1.06** | **1.07** | 1.00 | 1.00 | | **106** | **107** | 77-114 | 1 | 9 | |
| Toluene | **1.11** | **1.09** | 1.00 | 1.00 | | **111** | **109** | 80-115 | 2 | 9 | |
| Ethyl Benzene | **1.11** | **1.10** | 1.00 | 1.00 | | **111** | **110** | 80-118 | 1 | 9 | |
| m,p-Xylene | **1.15** | **1.12** | 1.00 | 1.00 | | **115** | **112** | 82-118 | 3 | 9 | |
| o-Xylene | **1.12** | **1.10** | 1.00 | 1.00 | | **112** | **110** | 82-116 | 2 | 9 | |
| *Surrogate:* | | | | | | | | | | | |
| *Fluorobenzene* | | | | | | *92* | *94* | *68-124* | | | |

Date of Report: February 22, 2012
Samples Submitted: February 10, 2012
Laboratory Reference: 1202-101
Project: 5147-012-02

**NWTPH-Gx**
**CONTINUING CALIBRATION SUMMARY**

| Lab ID | True Value (ppm) | Calc. Value | Percent Difference | Control Limits |
|---|---|---|---|---|
| CCVD0215G-1 | 5.00 | 5.38 | -8 | +/- 20% |
| CCVD0215G-2 | 5.00 | 4.83 | 3 | +/- 20% |

Date of Report: February 22, 2012
Samples Submitted: February 10, 2012
Laboratory Reference: 1202-101
Project: 5147-012-02

**BTEX by**
**EPA 8021B**
**CONTINUING CALIBRATION SUMMARY**

| Analyte | Lab ID | True Value (ppm) | Calc. Value | Percent Difference | Control Limits |
|---|---|---|---|---|---|
| Benzene | CCVD0215B-1 | 50.0 | 56.3 | -13 | +/- 15% |
| Toluene | CCVD0215B-1 | 50.0 | 57.1 | -14 | +/- 15% |
| Ethyl Benzene | CCVD0215B-1 | 50.0 | 56.9 | -14 | +/- 15% |
| m,p-Xylene | CCVD0215B-1 | 50.0 | 57.2 | -14 | +/- 15% |
| o-Xylene | CCVD0215B-1 | 50.0 | 56.2 | -12 | +/- 15% |
| Benzene | CCVD0215B-2 | 50.0 | 52.1 | -4 | +/- 15% |
| Toluene | CCVD0215B-2 | 50.0 | 52.4 | -5 | +/- 15% |
| Ethyl Benzene | CCVD0215B-2 | 50.0 | 52.7 | -5 | +/- 15% |
| m,p-Xylene | CCVD0215B-2 | 50.0 | 52.7 | -5 | +/- 15% |
| o-Xylene | CCVD0215B-2 | 50.0 | 52.1 | -4 | +/- 15% |

Date of Report: February 22, 2012
Samples Submitted: February 10, 2012
Laboratory Reference: 1202-101
Project: 5147-012-02

**PAHs by EPA 8270D/SIM**
**METHOD BLANK QUALITY CONTROL**
**(with silica gel clean-up)**

Matrix: Soil
Units: mg/Kg

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| Laboratory ID: | MB0216S1 | | | | | |
| Naphthalene | **ND** | 0.0067 | EPA 8270/SIM | 2-16-12 | 2-17-12 | |
| 2-Methylnaphthalene | **ND** | 0.0067 | EPA 8270/SIM | 2-16-12 | 2-17-12 | |
| 1-Methylnaphthalene | **ND** | 0.0067 | EPA 8270/SIM | 2-16-12 | 2-17-12 | |
| Acenaphthylene | **ND** | 0.0067 | EPA 8270/SIM | 2-16-12 | 2-17-12 | |
| Acenaphthene | **ND** | 0.0067 | EPA 8270/SIM | 2-16-12 | 2-17-12 | |
| Fluorene | **ND** | 0.0067 | EPA 8270/SIM | 2-16-12 | 2-17-12 | |
| Phenanthrene | **ND** | 0.0067 | EPA 8270/SIM | 2-16-12 | 2-17-12 | |
| Anthracene | **ND** | 0.0067 | EPA 8270/SIM | 2-16-12 | 2-17-12 | |
| Fluoranthene | **ND** | 0.0067 | EPA 8270/SIM | 2-16-12 | 2-17-12 | |
| Pyrene | **ND** | 0.0067 | EPA 8270/SIM | 2-16-12 | 2-17-12 | |
| Benzo[a]anthracene | **ND** | 0.0067 | EPA 8270/SIM | 2-16-12 | 2-17-12 | |
| Chrysene | **ND** | 0.0067 | EPA 8270/SIM | 2-16-12 | 2-17-12 | |
| Benzo[b]fluoranthene | **ND** | 0.0067 | EPA 8270/SIM | 2-16-12 | 2-17-12 | |
| Benzo(j,k)fluoranthene | **ND** | 0.0067 | EPA 8270/SIM | 2-16-12 | 2-17-12 | |
| Benzo[a]pyrene | **ND** | 0.0067 | EPA 8270/SIM | 2-16-12 | 2-17-12 | |
| Indeno(1,2,3-c,d)pyrene | **ND** | 0.0067 | EPA 8270/SIM | 2-16-12 | 2-17-12 | |
| Dibenz[a,h]anthracene | **ND** | 0.0067 | EPA 8270/SIM | 2-16-12 | 2-17-12 | |
| Benzo[g,h,i]perylene | **ND** | 0.0067 | EPA 8270/SIM | 2-16-12 | 2-17-12 | |
| *Surrogate:* | *Percent Recovery* | *Control Limits* | | | | |
| *2-Fluorobiphenyl* | *83* | *43 - 109* | | | | |
| *Pyrene-d10* | *89* | *38 - 128* | | | | |
| *Terphenyl-d14* | *89* | *33 - 119* | | | | |

Date of Report: February 22, 2012
Samples Submitted: February 10, 2012
Laboratory Reference: 1202-101
Project: 5147-012-02

**PAHs by EPA 8270D/SIM**
**SB/SBD QUALITY CONTROL**
**(with silica gel clean-up)**

Matrix: Soil
Units: mg/Kg

| Analyte | Result | | Spike Level | | Percent Recovery | | Recovery Limits | RPD | RPD Limit | Flags |
|---|---|---|---|---|---|---|---|---|---|---|
| **SPIKE BLANKS** | | | | | | | | | | |
| Laboratory ID: | SB0216S1 | | | | | | | | | |
| | SB | SBD | SB | SBD | SB | SBD | | | | |
| Naphthalene | **0.0660** | **0.0616** | 0.0833 | 0.0833 | 79 | 74 | 43 - 108 | 7 | 27 | |
| Acenaphthylene | **0.0728** | **0.0687** | 0.0833 | 0.0833 | 87 | 82 | 52 - 120 | 6 | 21 | |
| Acenaphthene | **0.0684** | **0.0652** | 0.0833 | 0.0833 | 82 | 78 | 59 - 113 | 5 | 17 | |
| Fluorene | **0.0754** | **0.0698** | 0.0833 | 0.0833 | 91 | 84 | 64 - 117 | 8 | 14 | |
| Phenanthrene | **0.0716** | **0.0664** | 0.0833 | 0.0833 | 86 | 80 | 67 - 112 | 8 | 12 | |
| Anthracene | **0.0720** | **0.0661** | 0.0833 | 0.0833 | 86 | 79 | 59 - 110 | 9 | 16 | |
| Fluoranthene | **0.0733** | **0.0676** | 0.0833 | 0.0833 | 88 | 81 | 68 - 120 | 8 | 15 | |
| Pyrene | **0.0733** | **0.0668** | 0.0833 | 0.0833 | 88 | 80 | 66 - 121 | 9 | 17 | |
| Benzo[a]anthracene | **0.0680** | **0.0621** | 0.0833 | 0.0833 | 82 | 75 | 63 - 114 | 9 | 12 | |
| Chrysene | **0.0741** | **0.0677** | 0.0833 | 0.0833 | 89 | 81 | 67 - 118 | 9 | 12 | |
| Benzo[b]fluoranthene | **0.0706** | **0.0621** | 0.0833 | 0.0833 | 85 | 75 | 58 - 127 | 13 | 20 | |
| Benzo(j,k)fluoranthene | **0.0711** | **0.0659** | 0.0833 | 0.0833 | 85 | 79 | 42 - 134 | 8 | 26 | |
| Benzo[a]pyrene | **0.0699** | **0.0632** | 0.0833 | 0.0833 | 84 | 76 | 55 - 111 | 10 | 19 | |
| Indeno(1,2,3-c,d)pyrene | **0.0730** | **0.0716** | 0.0833 | 0.0833 | 88 | 86 | 60 - 125 | 2 | 20 | |
| Dibenz[a,h]anthracene | **0.0737** | **0.0697** | 0.0833 | 0.0833 | 88 | 84 | 62 - 125 | 6 | 19 | |
| Benzo[g,h,i]perylene | **0.0782** | **0.0741** | 0.0833 | 0.0833 | 94 | 89 | 61 - 124 | 5 | 19 | |
| *Surrogate:* | | | | | | | | | | |
| *2-Fluorobiphenyl* | | | | | *81* | *76* | *43 - 109* | | | |
| *Pyrene-d10* | | | | | *86* | *78* | *38 - 128* | | | |
| *Terphenyl-d14* | | | | | *85* | *78* | *33 - 119* | | | |

Date of Report: February 22, 2012
Samples Submitted: February 10, 2012
Laboratory Reference: 1202-101
Project: 5147-012-02

**% MOISTURE**

Date Analyzed: 2-15-12

| Client ID | Lab ID | % Moisture |
|---|---|---|
| GEI-MW-1-7.5 | 02-101-03 | 24 |
| GEI-MW-1-12.5 | 02-101-07 | 11 |

OnSite Environmental Inc.

**Data Qualifiers and Abbreviations**

A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.

B - The analyte indicated was also found in the blank sample.

C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.

E - The value reported exceeds the quantitation range and is an estimate.

F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.

H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.

I - Compound recovery is outside of the control limits.

J - The value reported was below the practical quantitation limit. The value is an estimate.

K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.

L - The RPD is outside of the control limits.

M - Hydrocarbons in the gasoline range are impacting the diesel range result.

M1 - Hydrocarbons in the gasoline range (toluene-napthalene) are present in the sample.

N - Hydrocarbons in the lube oil range are impacting the diesel range result.

N1 - Hydrocarbons in diesel range are impacting lube oil range results.

O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.

P - The RPD of the detected concentrations between the two columns is greater than 40.

Q - Surrogate recovery is outside of the control limits.

S - Surrogate recovery data is not available due to the necessary dilution of the sample.

T - The sample chromatogram is not similar to a typical _____.

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

U1 - The practical quantitation limit is elevated due to interferences present in the sample.

V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.

W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.

X - Sample extract treated with a mercury cleanup procedure.

Y - Sample extract treated with an acid/silica gel cleanup procedure.

Z -

ND - Not Detected at PQL
PQL - Practical Quantitation Limit
RPD - Relative Percent Difference

# Chain of Custody

OnSite Environmental Inc.
14648 NE 95th Street • Redmond, WA 98052
Phone: (425) 883-3881 • www.onsite-env.com

Page 1 of 1

Company: GEI
Project Number: 5147-012-02
Project Name: FORMER SHELL TANK FARM
Project Manager: ROBERT TRAHAN
Sampled by: ABHIJIT JOSHI

**Turnaround Request (in working days)**
(Check One)
☐ Same Day ☐ 1 Day
☐ 2 Days ☐ 3 Days
☒ Standard (7 Days)
(TPH analysis 5 Days)
☐ _____ (other)

**Laboratory Number:** 02-101

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | Number of Containers | NWTPH-HCID | NWTPH-Gx/BTEX | NWTPH-Gx | NWTPH-Dx | Volatiles 8260B | Halogenated Volatiles 8260B | Semivolatiles 8270D/SIM (with low-level PAHs) | PAHs 8270D/SIM (low-level) | PCBs 8082 | Organochlorine Pesticides 8081A | Organophosphorus Pesticides 8270D/SIM | Chlorinated Acid Herbicides 8151A | Total RCRA / MTCA Metals (circle one) | TCLP Metals | HEM (oil and grease) 1664 | % Moisture |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | GEI-MW-1-2.5 | 2/9/12 | 1100 | SOIL | 1 | | | | | | | | | | | | | | | | |
| 2 | GEI-MW-1-5.0 | | 1105 | | 1 | | | | | | | | | | | | | | | | |
| 3 | GEI-MW-1-7.5 | | 1110 | | 5 | | | X | | | | | | | | | | | | | X |
| 4 | GEI-MW-1-DUP1 | | 1111 | | 5 | | | | | | | | | | | | | | | | |
| 5 | GEI-MW-1-10.0 | | 1115 | | 5 | | | | | | | | | | | | | | | | |
| 6 | GEI-MW-1-DUP2 | | 1116 | | 5 | | | | | | | | | | | | | | | | |
| 7 | GEI-MW-1-12.5 | | 1120 | | 5 | | X | | | | | | X | | | | | | | | X |
| 8 | GEI-MW-1-DUP3 | | 1121 | | 5 | | | | | | | | | | | | | | | | |
| 9 | GEI-MW-1-15.0 | | 1125 | | 1 | | | | | | | | | | | | | | | | |
| 10 | GEI-MW-1-17.5 | ↓ | 1130 | ↓ | 1 | | | | | | | | | | | | | | | | |

| | Signature | Company | Date | Time |
|---|---|---|---|---|
| Relinquished | [signature] | GEI | 2/10/12 | 1615 |
| Received | [signature] | OSE | 2/10/12 | 1615 |
| Relinquished | | | | |
| Received | | | | |
| Relinquished | | | | |
| Received | | | | |
| Reviewed/Date | | Reviewed/Date | | |

**Comments/Special Instructions**
X Added 2/14/12. DB (STA)

Chromatograms with final report ☐

Data Package: Level III ☐ Level IV ☐ Electronic Data Deliverables (EDDs) ☐ _____

OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

March 14, 2012

Robert Trahan
GeoEngineers, Inc.
600 Stewart, Suite 1700
Seattle, WA 98101-1233

Re: Analytical Data for Project 5147-012-02
Laboratory Reference No. 1203-038

Dear Robert:

Enclosed are the analytical results and associated quality control data for samples submitted on March 7, 2012.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

David Baumeister
Project Manager

Enclosures

Date of Report: March 14, 2012
Samples Submitted: March 7, 2012
Laboratory Reference: 1203-038
Project: 5147-012-02

**Case Narrative**

Samples were collected on March 6, 2012 and received by the laboratory on March 7, 2012. They were maintained at the laboratory at a temperature of 2°C to 6°C.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.

Date of Report: March 14, 2012
Samples Submitted: March 7, 2012
Laboratory Reference: 1203-038
Project: 5147-012-02

**ANALYTICAL REPORT FOR SAMPLES**

| Client ID | Laboratory ID | Matrix | Date Sampled | Date Received | Notes |
|---|---|---|---|---|---|
| GEI-MW-1 | 03-038-01 | Water | 3-6-12 | 3-7-12 | |
| GEI-MW-2 | 03-038-02 | Water | 3-6-12 | 3-7-12 | |
| GEI-MW-3 | 03-038-03 | Water | 3-6-12 | 3-7-12 | |
| GEI-MW-4 | 03-038-04 | Water | 3-6-12 | 3-7-12 | |
| GEI-MW-5 | 03-038-05 | Water | 3-6-12 | 3-7-12 | |
| GEI-MW-6 | 03-038-06 | Water | 3-6-12 | 3-7-12 | |
| GEI-MW-7 | 03-038-07 | Water | 3-6-12 | 3-7-12 | |
| DUP | 03-038-08 | Water | 3-6-12 | 3-7-12 | |
| TRIP BLANK | 03-038-09 | Water | --- | 3-7-12 | |

Date of Report: March 14, 2012
Samples Submitted: March 7, 2012
Laboratory Reference: 1203-038
Project: 5147-012-02

**NWTPH-Gx/BTEX**

Matrix: Water
Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-MW-1** | | | | | |
| Laboratory ID: | 03-038-01 | | | | | |
| Benzene | **ND** | 1.0 | EPA 8021 | 3-9-12 | 3-9-12 | |
| Toluene | **ND** | 1.0 | EPA 8021 | 3-9-12 | 3-9-12 | |
| Ethyl Benzene | **ND** | 1.0 | EPA 8021 | 3-9-12 | 3-9-12 | |
| m,p-Xylene | **ND** | 1.0 | EPA 8021 | 3-9-12 | 3-9-12 | |
| o-Xylene | **ND** | 1.0 | EPA 8021 | 3-9-12 | 3-9-12 | |
| Gasoline | **ND** | 100 | NWTPH-Gx | 3-9-12 | 3-9-12 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***Fluorobenzene*** | ***98*** | ***73-121*** | | | | |
| **Client ID:** | **GEI-MW-2** | | | | | |
| Laboratory ID: | 03-038-02 | | | | | |
| Benzene | **ND** | 1.0 | EPA 8021 | 3-9-12 | 3-9-12 | |
| Toluene | **ND** | 1.0 | EPA 8021 | 3-9-12 | 3-9-12 | |
| Ethyl Benzene | **ND** | 1.0 | EPA 8021 | 3-9-12 | 3-9-12 | |
| m,p-Xylene | **1.3** | 1.0 | EPA 8021 | 3-9-12 | 3-9-12 | |
| o-Xylene | **ND** | 1.0 | EPA 8021 | 3-9-12 | 3-9-12 | |
| Gasoline | **190** | 100 | NWTPH-Gx | 3-9-12 | 3-9-12 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***Fluorobenzene*** | ***89*** | ***73-121*** | | | | |
| **Client ID:** | **GEI-MW-3** | | | | | |
| Laboratory ID: | 03-038-03 | | | | | |
| Benzene | **ND** | 1.0 | EPA 8021 | 3-9-12 | 3-9-12 | |
| Toluene | **ND** | 1.0 | EPA 8021 | 3-9-12 | 3-9-12 | |
| Ethyl Benzene | **ND** | 1.0 | EPA 8021 | 3-9-12 | 3-9-12 | |
| m,p-Xylene | **ND** | 1.0 | EPA 8021 | 3-9-12 | 3-9-12 | |
| o-Xylene | **ND** | 1.0 | EPA 8021 | 3-9-12 | 3-9-12 | |
| Gasoline | **230** | 100 | NWTPH-Gx | 3-9-12 | 3-9-12 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***Fluorobenzene*** | ***95*** | ***73-121*** | | | | |

Date of Report: March 14, 2012
Samples Submitted: March 7, 2012
Laboratory Reference: 1203-038
Project: 5147-012-02

**NWTPH-Gx/BTEX**

Matrix: Water
Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-MW-4** | | | | | |
| Laboratory ID: | 03-038-04 | | | | | |
| Benzene | **ND** | 1.0 | EPA 8021 | 3-9-12 | 3-9-12 | |
| Toluene | **ND** | 1.0 | EPA 8021 | 3-9-12 | 3-9-12 | |
| Ethyl Benzene | **ND** | 1.0 | EPA 8021 | 3-9-12 | 3-9-12 | |
| m,p-Xylene | **ND** | 1.0 | EPA 8021 | 3-9-12 | 3-9-12 | |
| o-Xylene | **ND** | 1.0 | EPA 8021 | 3-9-12 | 3-9-12 | |
| Gasoline | **ND** | 100 | NWTPH-Gx | 3-9-12 | 3-9-12 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***Fluorobenzene*** | ***93*** | ***73-121*** | | | | |
| **Client ID:** | **GEI-MW-5** | | | | | |
| Laboratory ID: | 03-038-05 | | | | | |
| Benzene | **ND** | 1.0 | EPA 8021 | 3-9-12 | 3-9-12 | |
| Toluene | **ND** | 1.0 | EPA 8021 | 3-9-12 | 3-9-12 | |
| Ethyl Benzene | **ND** | 1.0 | EPA 8021 | 3-9-12 | 3-9-12 | |
| m,p-Xylene | **ND** | 1.0 | EPA 8021 | 3-9-12 | 3-9-12 | |
| o-Xylene | **ND** | 1.0 | EPA 8021 | 3-9-12 | 3-9-12 | |
| Gasoline | **ND** | 100 | NWTPH-Gx | 3-9-12 | 3-9-12 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***Fluorobenzene*** | ***98*** | ***73-121*** | | | | |
| **Client ID:** | **GEI-MW-6** | | | | | |
| Laboratory ID: | 03-038-06 | | | | | |
| Benzene | **ND** | 1.0 | EPA 8021 | 3-9-12 | 3-9-12 | |
| Toluene | **ND** | 1.0 | EPA 8021 | 3-9-12 | 3-9-12 | |
| Ethyl Benzene | **ND** | 1.0 | EPA 8021 | 3-9-12 | 3-9-12 | |
| m,p-Xylene | **ND** | 1.0 | EPA 8021 | 3-9-12 | 3-9-12 | |
| o-Xylene | **ND** | 1.0 | EPA 8021 | 3-9-12 | 3-9-12 | |
| Gasoline | **ND** | 100 | NWTPH-Gx | 3-9-12 | 3-9-12 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***Fluorobenzene*** | ***88*** | ***73-121*** | | | | |

Date of Report: March 14, 2012
Samples Submitted: March 7, 2012
Laboratory Reference: 1203-038
Project: 5147-012-02

**NWTPH-Gx/BTEX**

Matrix: Water
Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-MW-7** | | | | | |
| Laboratory ID: | 03-038-07 | | | | | |
| Benzene | **ND** | 1.0 | EPA 8021 | 3-9-12 | 3-9-12 | |
| Toluene | **ND** | 1.0 | EPA 8021 | 3-9-12 | 3-9-12 | |
| Ethyl Benzene | **ND** | 1.0 | EPA 8021 | 3-9-12 | 3-9-12 | |
| m,p-Xylene | **ND** | 1.0 | EPA 8021 | 3-9-12 | 3-9-12 | |
| o-Xylene | **ND** | 1.0 | EPA 8021 | 3-9-12 | 3-9-12 | |
| Gasoline | **ND** | 100 | NWTPH-Gx | 3-9-12 | 3-9-12 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***Fluorobenzene*** | ***97*** | ***73-121*** | | | | |
| **Client ID:** | **DUP** | | | | | |
| Laboratory ID: | 03-038-08 | | | | | |
| Benzene | **ND** | 1.0 | EPA 8021 | 3-9-12 | 3-9-12 | |
| Toluene | **ND** | 1.0 | EPA 8021 | 3-9-12 | 3-9-12 | |
| Ethyl Benzene | **ND** | 1.0 | EPA 8021 | 3-9-12 | 3-9-12 | |
| m,p-Xylene | **ND** | 1.0 | EPA 8021 | 3-9-12 | 3-9-12 | |
| o-Xylene | **ND** | 1.0 | EPA 8021 | 3-9-12 | 3-9-12 | |
| Gasoline | **ND** | 100 | NWTPH-Gx | 3-9-12 | 3-9-12 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***Fluorobenzene*** | ***89*** | ***73-121*** | | | | |
| **Client ID:** | **TRIP BLANK** | | | | | |
| Laboratory ID: | 03-038-09 | | | | | |
| Benzene | **ND** | 1.0 | EPA 8021 | 3-9-12 | 3-9-12 | |
| Toluene | **ND** | 1.0 | EPA 8021 | 3-9-12 | 3-9-12 | |
| Ethyl Benzene | **ND** | 1.0 | EPA 8021 | 3-9-12 | 3-9-12 | |
| m,p-Xylene | **ND** | 1.0 | EPA 8021 | 3-9-12 | 3-9-12 | |
| o-Xylene | **ND** | 1.0 | EPA 8021 | 3-9-12 | 3-9-12 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***Fluorobenzene*** | ***98*** | ***73-121*** | | | | |

Date of Report: March 14, 2012
Samples Submitted: March 7, 2012
Laboratory Reference: 1203-038
Project: 5147-012-02

**NWTPH-Dx**
**(with acid/silica gel clean-up)**

Matrix: Water
Units: mg/L (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-MW-1** | | | | | |
| Laboratory ID: | 03-038-01 | | | | | |
| Diesel Range Organics | **ND** | 0.26 | NWTPH-Dx | 3-9-12 | 3-9-12 | |
| Lube Oil Range Organics | **ND** | 0.41 | NWTPH-Dx | 3-9-12 | 3-9-12 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***o-Terphenyl*** | ***76*** | ***50-150*** | | | | |
| **Client ID:** | **GEI-MW-2** | | | | | |
| Laboratory ID: | 03-038-02 | | | | | |
| Diesel Range Organics | **ND** | 0.26 | NWTPH-Dx | 3-9-12 | 3-9-12 | |
| Lube Oil Range Organics | **ND** | 0.41 | NWTPH-Dx | 3-9-12 | 3-9-12 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***o-Terphenyl*** | ***94*** | ***50-150*** | | | | |
| **Client ID:** | **GEI-MW-3** | | | | | |
| Laboratory ID: | 03-038-03 | | | | | |
| Diesel Range Organics | **ND** | 0.26 | NWTPH-Dx | 3-9-12 | 3-9-12 | |
| Lube Oil Range Organics | **ND** | 0.41 | NWTPH-Dx | 3-9-12 | 3-9-12 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***o-Terphenyl*** | ***98*** | ***50-150*** | | | | |
| **Client ID:** | **GEI-MW-4** | | | | | |
| Laboratory ID: | 03-038-04 | | | | | |
| Diesel Range Organics | **ND** | 0.26 | NWTPH-Dx | 3-9-12 | 3-9-12 | |
| Lube Oil Range Organics | **ND** | 0.41 | NWTPH-Dx | 3-9-12 | 3-9-12 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***o-Terphenyl*** | ***93*** | ***50-150*** | | | | |
| **Client ID:** | **GEI-MW-5** | | | | | |
| Laboratory ID: | 03-038-05 | | | | | |
| Diesel Range Organics | **ND** | 0.26 | NWTPH-Dx | 3-9-12 | 3-9-12 | |
| Lube Oil Range Organics | **ND** | 0.41 | NWTPH-Dx | 3-9-12 | 3-9-12 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***o-Terphenyl*** | ***91*** | ***50-150*** | | | | |
| **Client ID:** | **GEI-MW-6** | | | | | |
| Laboratory ID: | 03-038-06 | | | | | |
| Diesel Range Organics | **ND** | 0.27 | NWTPH-Dx | 3-9-12 | 3-9-12 | |
| Lube Oil Range Organics | **ND** | 0.44 | NWTPH-Dx | 3-9-12 | 3-9-12 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***o-Terphenyl*** | ***93*** | ***50-150*** | | | | |

Date of Report: March 14, 2012
Samples Submitted: March 7, 2012
Laboratory Reference: 1203-038
Project: 5147-012-02

**NWTPH-Dx**
**(with acid/silica gel clean-up)**

Matrix: Water
Units: mg/L (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-MW-7** | | | | | |
| Laboratory ID: | 03-038-07 | | | | | |
| Diesel Range Organics | **ND** | 0.25 | NWTPH-Dx | 3-9-12 | 3-9-12 | |
| Lube Oil Range Organics | **ND** | 0.41 | NWTPH-Dx | 3-9-12 | 3-9-12 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***o-Terphenyl*** | ***90*** | ***50-150*** | | | | |
| | | | | | | |
| **Client ID:** | **DUP** | | | | | |
| Laboratory ID: | 03-038-08 | | | | | |
| Diesel Range Organics | **ND** | 0.26 | NWTPH-Dx | 3-9-12 | 3-9-12 | |
| Lube Oil Range Organics | **ND** | 0.41 | NWTPH-Dx | 3-9-12 | 3-9-12 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***o-Terphenyl*** | ***94*** | ***50-150*** | | | | |

Date of Report: March 14, 2012
Samples Submitted: March 7, 2012
Laboratory Reference: 1203-038
Project: 5147-012-02

**VOLATILES EPA 8260B**

Matrix: Water
Units: ug/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-MW-3** | | | | | |
| Laboratory ID: | 03-038-03 | | | | | |
| Vinyl Chloride | ND | 0.20 | EPA 8260 | 3-9-12 | 3-9-12 | |
| Trichlorofluoromethane | ND | 0.20 | EPA 8260 | 3-9-12 | 3-9-12 | |
| Methyl t-Butyl Ether | ND | 0.20 | EPA 8260 | 3-9-12 | 3-9-12 | |
| (cis) 1,2-Dichloroethene | ND | 0.20 | EPA 8260 | 3-9-12 | 3-9-12 | |
| 1,1,1-Trichloroethane | ND | 0.20 | EPA 8260 | 3-9-12 | 3-9-12 | |
| Carbon Tetrachloride | ND | 0.20 | EPA 8260 | 3-9-12 | 3-9-12 | |
| 1,2-Dichloroethane | ND | 0.20 | EPA 8260 | 3-9-12 | 3-9-12 | |
| Trichloroethene | ND | 0.20 | EPA 8260 | 3-9-12 | 3-9-12 | |
| Tetrachloroethene | ND | 0.20 | EPA 8260 | 3-9-12 | 3-9-12 | |
| 1,2-Dibromoethane | ND | 0.20 | EPA 8260 | 3-9-12 | 3-9-12 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***Dibromofluoromethane*** | ***80*** | ***68-120*** | | | | |
| ***Toluene-d8*** | ***84*** | ***73-120*** | | | | |
| ***4-Bromofluorobenzene*** | ***92*** | ***65-120*** | | | | |

Date of Report: March 14, 2012
Samples Submitted: March 7, 2012
Laboratory Reference: 1203-038
Project: 5147-012-02

**VOLATILES EPA 8260B**

Matrix: Water
Units: ug/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **TRIP BLANK** | | | | | |
| Laboratory ID: | 03-038-09 | | | | | |
| Vinyl Chloride | ND | 0.20 | EPA 8260 | 3-9-12 | 3-9-12 | |
| Trichlorofluoromethane | ND | 0.20 | EPA 8260 | 3-9-12 | 3-9-12 | |
| Methyl t-Butyl Ether | ND | 0.20 | EPA 8260 | 3-9-12 | 3-9-12 | |
| (cis) 1,2-Dichloroethene | ND | 0.20 | EPA 8260 | 3-9-12 | 3-9-12 | |
| 1,1,1-Trichloroethane | ND | 0.20 | EPA 8260 | 3-9-12 | 3-9-12 | |
| Carbon Tetrachloride | ND | 0.20 | EPA 8260 | 3-9-12 | 3-9-12 | |
| 1,2-Dichloroethane | ND | 0.20 | EPA 8260 | 3-9-12 | 3-9-12 | |
| Trichloroethene | ND | 0.20 | EPA 8260 | 3-9-12 | 3-9-12 | |
| Tetrachloroethene | ND | 0.20 | EPA 8260 | 3-9-12 | 3-9-12 | |
| 1,2-Dibromoethane | ND | 0.20 | EPA 8260 | 3-9-12 | 3-9-12 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***Dibromofluoromethane*** | ***80*** | ***68-120*** | | | | |
| ***Toluene-d8*** | ***86*** | ***73-120*** | | | | |
| ***4-Bromofluorobenzene*** | ***90*** | ***65-120*** | | | | |

Date of Report: March 14, 2012
Samples Submitted: March 7, 2012
Laboratory Reference: 1203-038
Project: 5147-012-02

**cPAHs by EPA 8270D/SIM**
**(with silica gel clean-up)**

Matrix: Water
Units: ug/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-MW-1** | | | | | |
| Laboratory ID: | 03-038-01 | | | | | |
| Naphthalene | **ND** | 0.095 | EPA 8270/SIM | 3-8-12 | 3-8-12 | |
| 2-Methylnaphthalene | **ND** | 0.095 | EPA 8270/SIM | 3-8-12 | 3-8-12 | |
| 1-Methylnaphthalene | **ND** | 0.095 | EPA 8270/SIM | 3-8-12 | 3-8-12 | |
| Benzo[a]anthracene | **ND** | 0.0095 | EPA 8270/SIM | 3-8-12 | 3-8-12 | |
| Chrysene | **ND** | 0.0095 | EPA 8270/SIM | 3-8-12 | 3-8-12 | |
| Benzo[b]fluoranthene | **ND** | 0.0095 | EPA 8270/SIM | 3-8-12 | 3-8-12 | |
| Benzo(j,k)fluoranthene | **ND** | 0.0095 | EPA 8270/SIM | 3-8-12 | 3-8-12 | |
| Benzo[a]pyrene | **ND** | 0.0095 | EPA 8270/SIM | 3-8-12 | 3-8-12 | |
| Indeno(1,2,3-c,d)pyrene | **ND** | 0.0095 | EPA 8270/SIM | 3-8-12 | 3-8-12 | |
| Dibenz[a,h]anthracene | **ND** | 0.0095 | EPA 8270/SIM | 3-8-12 | 3-8-12 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***2-Fluorobiphenyl*** | ***53*** | ***38 - 105*** | | | | |
| ***Pyrene-d10*** | ***64*** | ***37 - 121*** | | | | |
| ***Terphenyl-d14*** | ***73*** | ***32 - 112*** | | | | |

Date of Report: March 14, 2012
Samples Submitted: March 7, 2012
Laboratory Reference: 1203-038
Project: 5147-012-02

**cPAHs by EPA 8270D/SIM**
**(with silica gel clean-up)**

Matrix: Water
Units: ug/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-MW-2** | | | | | |
| Laboratory ID: | 03-038-02 | | | | | |
| Naphthalene | **0.23** | 0.095 | EPA 8270/SIM | 3-8-12 | 3-8-12 | |
| 2-Methylnaphthalene | **ND** | 0.095 | EPA 8270/SIM | 3-8-12 | 3-8-12 | |
| 1-Methylnaphthalene | **ND** | 0.095 | EPA 8270/SIM | 3-8-12 | 3-8-12 | |
| Benzo[a]anthracene | **0.015** | 0.0095 | EPA 8270/SIM | 3-8-12 | 3-8-12 | |
| Chrysene | **0.011** | 0.0095 | EPA 8270/SIM | 3-8-12 | 3-8-12 | |
| Benzo[b]fluoranthene | **ND** | 0.0095 | EPA 8270/SIM | 3-8-12 | 3-8-12 | |
| Benzo(j,k)fluoranthene | **ND** | 0.0095 | EPA 8270/SIM | 3-8-12 | 3-8-12 | |
| Benzo[a]pyrene | **ND** | 0.0095 | EPA 8270/SIM | 3-8-12 | 3-8-12 | |
| Indeno(1,2,3-c,d)pyrene | **ND** | 0.0095 | EPA 8270/SIM | 3-8-12 | 3-8-12 | |
| Dibenz[a,h]anthracene | **ND** | 0.0095 | EPA 8270/SIM | 3-8-12 | 3-8-12 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***2-Fluorobiphenyl*** | ***49*** | ***38 - 105*** | | | | |
| ***Pyrene-d10*** | ***70*** | ***37 - 121*** | | | | |
| ***Terphenyl-d14*** | ***73*** | ***32 - 112*** | | | | |

Date of Report: March 14, 2012
Samples Submitted: March 7, 2012
Laboratory Reference: 1203-038
Project: 5147-012-02

**cPAHs by EPA 8270D/SIM**
**(with silica gel clean-up)**

Matrix: Water
Units: ug/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-MW-3** | | | | | |
| Laboratory ID: | 03-038-03 | | | | | |
| Naphthalene | **0.30** | 0.095 | EPA 8270/SIM | 3-8-12 | 3-8-12 | |
| 2-Methylnaphthalene | **ND** | 0.095 | EPA 8270/SIM | 3-8-12 | 3-8-12 | |
| 1-Methylnaphthalene | **1.3** | 0.095 | EPA 8270/SIM | 3-8-12 | 3-8-12 | |
| Benzo[a]anthracene | **0.010** | 0.0095 | EPA 8270/SIM | 3-8-12 | 3-8-12 | |
| Chrysene | **ND** | 0.0095 | EPA 8270/SIM | 3-8-12 | 3-8-12 | |
| Benzo[b]fluoranthene | **ND** | 0.0095 | EPA 8270/SIM | 3-8-12 | 3-8-12 | |
| Benzo(j,k)fluoranthene | **ND** | 0.0095 | EPA 8270/SIM | 3-8-12 | 3-8-12 | |
| Benzo[a]pyrene | **ND** | 0.0095 | EPA 8270/SIM | 3-8-12 | 3-8-12 | |
| Indeno(1,2,3-c,d)pyrene | **ND** | 0.0095 | EPA 8270/SIM | 3-8-12 | 3-8-12 | |
| Dibenz[a,h]anthracene | **ND** | 0.0095 | EPA 8270/SIM | 3-8-12 | 3-8-12 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***2-Fluorobiphenyl*** | ***56*** | ***38 - 105*** | | | | |
| ***Pyrene-d10*** | ***65*** | ***37 - 121*** | | | | |
| ***Terphenyl-d14*** | ***72*** | ***32 - 112*** | | | | |

Date of Report: March 14, 2012
Samples Submitted: March 7, 2012
Laboratory Reference: 1203-038
Project: 5147-012-02

**cPAHs by EPA 8270D/SIM**
**(with silica gel clean-up)**

Matrix: Water
Units: ug/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-MW-4** | | | | | |
| Laboratory ID: | 03-038-04 | | | | | |
| Naphthalene | **ND** | 0.094 | EPA 8270/SIM | 3-12-12 | 3-12-12 | |
| 2-Methylnaphthalene | **ND** | 0.094 | EPA 8270/SIM | 3-12-12 | 3-12-12 | |
| 1-Methylnaphthalene | **ND** | 0.094 | EPA 8270/SIM | 3-12-12 | 3-12-12 | |
| Benzo[a]anthracene | **ND** | 0.0094 | EPA 8270/SIM | 3-12-12 | 3-12-12 | |
| Chrysene | **ND** | 0.0094 | EPA 8270/SIM | 3-12-12 | 3-12-12 | |
| Benzo[b]fluoranthene | **ND** | 0.0094 | EPA 8270/SIM | 3-12-12 | 3-12-12 | |
| Benzo(j,k)fluoranthene | **ND** | 0.0094 | EPA 8270/SIM | 3-12-12 | 3-12-12 | |
| Benzo[a]pyrene | **ND** | 0.0094 | EPA 8270/SIM | 3-12-12 | 3-12-12 | |
| Indeno(1,2,3-c,d)pyrene | **ND** | 0.0094 | EPA 8270/SIM | 3-12-12 | 3-12-12 | |
| Dibenz[a,h]anthracene | **ND** | 0.0094 | EPA 8270/SIM | 3-12-12 | 3-12-12 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***2-Fluorobiphenyl*** | ***53*** | ***38 - 105*** | | | | |
| ***Pyrene-d10*** | ***66*** | ***37 - 121*** | | | | |
| ***Terphenyl-d14*** | ***72*** | ***32 - 112*** | | | | |

Date of Report: March 14, 2012
Samples Submitted: March 7, 2012
Laboratory Reference: 1203-038
Project: 5147-012-02

**cPAHs by EPA 8270D/SIM**
**(with silica gel clean-up)**

Matrix: Water
Units: ug/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-MW-5** | | | | | |
| Laboratory ID: | 03-038-05 | | | | | |
| Naphthalene | **ND** | 0.095 | EPA 8270/SIM | 3-12-12 | 3-12-12 | |
| 2-Methylnaphthalene | **ND** | 0.095 | EPA 8270/SIM | 3-12-12 | 3-12-12 | |
| 1-Methylnaphthalene | **ND** | 0.095 | EPA 8270/SIM | 3-12-12 | 3-12-12 | |
| Benzo[a]anthracene | **ND** | 0.0095 | EPA 8270/SIM | 3-12-12 | 3-12-12 | |
| Chrysene | **ND** | 0.0095 | EPA 8270/SIM | 3-12-12 | 3-12-12 | |
| Benzo[b]fluoranthene | **ND** | 0.0095 | EPA 8270/SIM | 3-12-12 | 3-12-12 | |
| Benzo(j,k)fluoranthene | **ND** | 0.0095 | EPA 8270/SIM | 3-12-12 | 3-12-12 | |
| Benzo[a]pyrene | **ND** | 0.0095 | EPA 8270/SIM | 3-12-12 | 3-12-12 | |
| Indeno(1,2,3-c,d)pyrene | **ND** | 0.0095 | EPA 8270/SIM | 3-12-12 | 3-12-12 | |
| Dibenz[a,h]anthracene | **ND** | 0.0095 | EPA 8270/SIM | 3-12-12 | 3-12-12 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***2-Fluorobiphenyl*** | ***54*** | ***38 - 105*** | | | | |
| ***Pyrene-d10*** | ***57*** | ***37 - 121*** | | | | |
| ***Terphenyl-d14*** | ***65*** | ***32 - 112*** | | | | |

Date of Report: March 14, 2012
Samples Submitted: March 7, 2012
Laboratory Reference: 1203-038
Project: 5147-012-02

**cPAHs by EPA 8270D/SIM**
**(with silica gel clean-up)**

Matrix: Water
Units: ug/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-MW-6** | | | | | |
| Laboratory ID: | 03-038-06 | | | | | |
| Naphthalene | **ND** | 0.095 | EPA 8270/SIM | 3-12-12 | 3-12-12 | |
| 2-Methylnaphthalene | **ND** | 0.095 | EPA 8270/SIM | 3-12-12 | 3-12-12 | |
| 1-Methylnaphthalene | **ND** | 0.095 | EPA 8270/SIM | 3-12-12 | 3-12-12 | |
| Benzo[a]anthracene | **0.0095** | 0.0095 | EPA 8270/SIM | 3-12-12 | 3-12-12 | |
| Chrysene | **ND** | 0.0095 | EPA 8270/SIM | 3-12-12 | 3-12-12 | |
| Benzo[b]fluoranthene | **ND** | 0.0095 | EPA 8270/SIM | 3-12-12 | 3-12-12 | |
| Benzo(j,k)fluoranthene | **ND** | 0.0095 | EPA 8270/SIM | 3-12-12 | 3-12-12 | |
| Benzo[a]pyrene | **ND** | 0.0095 | EPA 8270/SIM | 3-12-12 | 3-12-12 | |
| Indeno(1,2,3-c,d)pyrene | **ND** | 0.0095 | EPA 8270/SIM | 3-12-12 | 3-12-12 | |
| Dibenz[a,h]anthracene | **ND** | 0.0095 | EPA 8270/SIM | 3-12-12 | 3-12-12 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***2-Fluorobiphenyl*** | ***41*** | ***38 - 105*** | | | | |
| ***Pyrene-d10*** | ***62*** | ***37 - 121*** | | | | |
| ***Terphenyl-d14*** | ***65*** | ***32 - 112*** | | | | |

Date of Report: March 14, 2012
Samples Submitted: March 7, 2012
Laboratory Reference: 1203-038
Project: 5147-012-02

**cPAHs by EPA 8270D/SIM**
**(with silica gel clean-up)**

Matrix: Water
Units: ug/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **GEI-MW-7** | | | | | |
| Laboratory ID: | 03-038-07 | | | | | |
| Naphthalene | **ND** | 0.094 | EPA 8270/SIM | 3-12-12 | 3-12-12 | |
| 2-Methylnaphthalene | **ND** | 0.094 | EPA 8270/SIM | 3-12-12 | 3-12-12 | |
| 1-Methylnaphthalene | **ND** | 0.094 | EPA 8270/SIM | 3-12-12 | 3-12-12 | |
| Benzo[a]anthracene | **ND** | 0.0094 | EPA 8270/SIM | 3-12-12 | 3-12-12 | |
| Chrysene | **ND** | 0.0094 | EPA 8270/SIM | 3-12-12 | 3-12-12 | |
| Benzo[b]fluoranthene | **ND** | 0.0094 | EPA 8270/SIM | 3-12-12 | 3-12-12 | |
| Benzo(j,k)fluoranthene | **ND** | 0.0094 | EPA 8270/SIM | 3-12-12 | 3-12-12 | |
| Benzo[a]pyrene | **ND** | 0.0094 | EPA 8270/SIM | 3-12-12 | 3-12-12 | |
| Indeno(1,2,3-c,d)pyrene | **ND** | 0.0094 | EPA 8270/SIM | 3-12-12 | 3-12-12 | |
| Dibenz[a,h]anthracene | **ND** | 0.0094 | EPA 8270/SIM | 3-12-12 | 3-12-12 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***2-Fluorobiphenyl*** | ***53*** | ***38 - 105*** | | | | |
| ***Pyrene-d10*** | ***72*** | ***37 - 121*** | | | | |
| ***Terphenyl-d14*** | ***74*** | ***32 - 112*** | | | | |

Date of Report: March 14, 2012
Samples Submitted: March 7, 2012
Laboratory Reference: 1203-038
Project: 5147-012-02

**cPAHs by EPA 8270D/SIM**
**(with silica gel clean-up)**

Matrix: Water
Units: ug/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **Client ID:** | **DUP** | | | | | |
| Laboratory ID: | 03-038-08 | | | | | |
| Naphthalene | **ND** | 0.094 | EPA 8270/SIM | 3-8-12 | 3-8-12 | |
| 2-Methylnaphthalene | **ND** | 0.094 | EPA 8270/SIM | 3-8-12 | 3-8-12 | |
| 1-Methylnaphthalene | **ND** | 0.094 | EPA 8270/SIM | 3-8-12 | 3-8-12 | |
| Benzo[a]anthracene | **ND** | 0.0094 | EPA 8270/SIM | 3-8-12 | 3-8-12 | |
| Chrysene | **ND** | 0.0094 | EPA 8270/SIM | 3-8-12 | 3-8-12 | |
| Benzo[b]fluoranthene | **ND** | 0.0094 | EPA 8270/SIM | 3-8-12 | 3-8-12 | |
| Benzo(j,k)fluoranthene | **ND** | 0.0094 | EPA 8270/SIM | 3-8-12 | 3-8-12 | |
| Benzo[a]pyrene | **ND** | 0.0094 | EPA 8270/SIM | 3-8-12 | 3-8-12 | |
| Indeno(1,2,3-c,d)pyrene | **ND** | 0.0094 | EPA 8270/SIM | 3-8-12 | 3-8-12 | |
| Dibenz[a,h]anthracene | **ND** | 0.0094 | EPA 8270/SIM | 3-8-12 | 3-8-12 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***2-Fluorobiphenyl*** | ***56*** | ***38 - 105*** | | | | |
| ***Pyrene-d10*** | ***70*** | ***37 - 121*** | | | | |
| ***Terphenyl-d14*** | ***69*** | ***32 - 112*** | | | | |

Date of Report: March 14, 2012
Samples Submitted: March 7, 2012
Laboratory Reference: 1203-038
Project: 5147-012-02

**TOTAL METALS**
**EPA 200.8**

Matrix: Water
Units: ug/L (ppb)

| Analyte | Result | PQL | EPA Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| Lab ID: | 03-038-01 | | | | | |
| **Client ID:** | **GEI-MW-1** | | | | | |
| Cadmium | **ND** | 4.4 | 200.8 | 3-9-12 | 3-9-12 | |
| Lead | **ND** | 1.1 | 200.8 | 3-9-12 | 3-9-12 | |
| Lab ID: | 03-038-02 | | | | | |
| **Client ID:** | **GEI-MW-2** | | | | | |
| Lead | **ND** | 1.1 | 200.8 | 3-9-12 | 3-9-12 | |
| Lab ID: | 03-038-03 | | | | | |
| **Client ID:** | **GEI-MW-3** | | | | | |
| Lead | **ND** | 1.1 | 200.8 | 3-9-12 | 3-9-12 | |
| Lab ID: | 03-038-04 | | | | | |
| **Client ID:** | **GEI-MW-4** | | | | | |
| Lead | **ND** | 1.1 | 200.8 | 3-9-12 | 3-9-12 | |
| Lab ID: | 03-038-05 | | | | | |
| **Client ID:** | **GEI-MW-5** | | | | | |
| Lead | **ND** | 1.1 | 200.8 | 3-9-12 | 3-9-12 | |
| Lab ID: | 03-038-06 | | | | | |
| **Client ID:** | **GEI-MW-6** | | | | | |
| Lead | **1.4** | 1.1 | 200.8 | 3-9-12 | 3-9-12 | |

Date of Report: March 14, 2012
Samples Submitted: March 7, 2012
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Project: 5147-012-02

**TOTAL LEAD**
**EPA 200.8**

Matrix: Water
Units: ug/L (ppb)

| Analyte | Result | PQL | EPA Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| Lab ID: | 03-038-07 | | | | | |
| **Client ID:** | **GEI-MW-7** | | | | | |
| Lead | **ND** | 1.1 | 200.8 | 3-9-12 | 3-9-12 | |
| Lab ID: | 03-038-08 | | | | | |
| **Client ID:** | **DUP** | | | | | |
| Lead | **ND** | 1.1 | 200.8 | 3-9-12 | 3-9-12 | |

Date of Report: March 14, 2012
Samples Submitted: March 7, 2012
Laboratory Reference: 1203-038
Project: 5147-012-02

**DISSOLVED METALS**
**EPA 200.8**

Matrix: Water
Units: ug/L (ppb)

| Analyte | Result | PQL | EPA Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| Lab ID: | 03-038-01 | | | | | |
| **Client ID:** | **GEI-MW-1** | | | | | |
| Cadmium | **ND** | 4.0 | 200.8 | | 3-9-12 | |
| Lead | **ND** | 1.0 | 200.8 | | 3-9-12 | |
| Lab ID: | 03-038-02 | | | | | |
| **Client ID:** | **GEI-MW-2** | | | | | |
| Lead | **ND** | 1.0 | 200.8 | | 3-9-12 | |
| Lab ID: | 03-038-03 | | | | | |
| **Client ID:** | **GEI-MW-3** | | | | | |
| Lead | **ND** | 1.0 | 200.8 | | 3-9-12 | |
| Lab ID: | 03-038-04 | | | | | |
| **Client ID:** | **GEI-MW-4** | | | | | |
| Lead | **ND** | 1.0 | 200.8 | | 3-9-12 | |
| Lab ID: | 03-038-05 | | | | | |
| **Client ID:** | **GEI-MW-5** | | | | | |
| Lead | **ND** | 1.0 | 200.8 | | 3-9-12 | |
| Lab ID: | 03-038-06 | | | | | |
| **Client ID:** | **GEI-MW-6** | | | | | |
| Lead | **ND** | 1.0 | 200.8 | | 3-9-12 | |

Date of Report: March 14, 2012
Samples Submitted: March 7, 2012
Laboratory Reference: 1203-038
Project: 5147-012-02

**DISSOLVED LEAD**
**EPA 200.8**

Matrix: Water
Units: ug/L (ppb)

| Analyte | Result | PQL | EPA Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| Lab ID: | 03-038-07 | | | | | |
| **Client ID:** | **GEI-MW-7** | | | | | |
| Lead | **ND** | 1.0 | 200.8 | | 3-9-12 | |
| Lab ID: | 03-038-08 | | | | | |
| **Client ID:** | **DUP** | | | | | |
| Lead | **ND** | 1.0 | 200.8 | | 3-9-12 | |

Date of Report: March 14, 2012
Samples Submitted: March 7, 2012
Laboratory Reference: 1203-038
Project: 5147-012-02

**NWTPH-Gx/BTEX**
**QUALITY CONTROL**

Matrix: Water
Units: ug/L (ppb)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **METHOD BLANK** | | | | | | |
| Laboratory ID: | MB0309W1 | | | | | |
| Benzene | **ND** | 1.0 | EPA 8021 | 3-9-12 | 3-9-12 | |
| Toluene | **ND** | 1.0 | EPA 8021 | 3-9-12 | 3-9-12 | |
| Ethyl Benzene | **ND** | 1.0 | EPA 8021 | 3-9-12 | 3-9-12 | |
| m,p-Xylene | **ND** | 1.0 | EPA 8021 | 3-9-12 | 3-9-12 | |
| o-Xylene | **ND** | 1.0 | EPA 8021 | 3-9-12 | 3-9-12 | |
| Gasoline | **ND** | 100 | NWTPH-Gx | 3-9-12 | 3-9-12 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***Fluorobenzene*** | ***96*** | ***73-121*** | | | | |

| Analyte | Result | | Spike Level | | Source Result | Percent Recovery | | Recovery Limits | RPD | RPD Limit | Flags |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **DUPLICATE** | | | | | | | | | | | |
| Laboratory ID: | 03-038-01 | | | | | | | | | | |
| | ORIG | DUP | | | | | | | | | |
| Benzene | **ND** | **ND** | NA | NA | | NA | | NA | NA | 30 | |
| Toluene | **ND** | **ND** | NA | NA | | NA | | NA | NA | 30 | |
| Ethyl Benzene | **ND** | **ND** | NA | NA | | NA | | NA | NA | 30 | |
| m,p-Xylene | **ND** | **ND** | NA | NA | | NA | | NA | NA | 30 | |
| o-Xylene | **ND** | **ND** | NA | NA | | NA | | NA | NA | 30 | |
| Gasoline | **ND** | **ND** | NA | NA | | NA | | NA | NA | 30 | |
| ***Surrogate:*** | | | | | | | | | | | |
| ***Fluorobenzene*** | | | | | | ***98*** | ***87*** | ***73-121*** | | | |
| **MATRIX SPIKES** | | | | | | | | | | | |
| Laboratory ID: | 03-038-01 | | | | | | | | | | |
| | MS | MSD | MS | MSD | | MS | MSD | | | | |
| Benzene | **53.0** | **54.6** | 50.0 | 50.0 | ND | **106** | **109** | 82-120 | 3 | 8 | |
| Toluene | **52.7** | **54.6** | 50.0 | 50.0 | ND | **105** | **109** | 84-119 | 4 | 8 | |
| Ethyl Benzene | **52.9** | **54.9** | 50.0 | 50.0 | ND | **106** | **110** | 84-122 | 4 | 9 | |
| m,p-Xylene | **52.4** | **54.3** | 50.0 | 50.0 | ND | **105** | **109** | 85-121 | 4 | 9 | |
| o-Xylene | **52.1** | **54.1** | 50.0 | 50.0 | ND | **104** | **108** | 84-121 | 4 | 9 | |
| ***Surrogate:*** | | | | | | | | | | | |
| ***Fluorobenzene*** | | | | | | ***96*** | ***95*** | ***73-121*** | | | |

Date of Report: March 14, 2012
Samples Submitted: March 7, 2012
Laboratory Reference: 1203-038
Project: 5147-012-02

**NWTPH-Gx**
**CONTINUING CALIBRATION SUMMARY**

| Lab ID | True Value (ppm) | Calc. Value | Percent Difference | Control Limits |
|---|---|---|---|---|
| CCVD0309G-1 | 5.00 | 5.48 | -10 | +/- 20% |
| CCVD0309G-2 | 5.00 | 5.31 | -6 | +/- 20% |

Date of Report: March 14, 2012
Samples Submitted: March 7, 2012
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Project: 5147-012-02

**BTEX by**
**EPA 8021B**
**CONTINUING CALIBRATION SUMMARY**

| Analyte | Lab ID | True Value (ppm) | Calc. Value | Percent Difference | Control Limits |
|---|---|---|---|---|---|
| Benzene | CCVD0309B-1 | 50.0 | 50.4 | -1 | +/- 15% |
| Toluene | CCVD0309B-1 | 50.0 | 51.4 | -3 | +/- 15% |
| Ethyl Benzene | CCVD0309B-1 | 50.0 | 51.8 | -4 | +/- 15% |
| m,p-Xylene | CCVD0309B-1 | 50.0 | 52.4 | -5 | +/- 15% |
| o-Xylene | CCVD0309B-1 | 50.0 | 51.5 | -3 | +/- 15% |
| Benzene | CCVD0309B-2 | 50.0 | 53.4 | -7 | +/- 15% |
| Toluene | CCVD0309B-2 | 50.0 | 53.8 | -8 | +/- 15% |
| Ethyl Benzene | CCVD0309B-2 | 50.0 | 53.9 | -8 | +/- 15% |
| m,p-Xylene | CCVD0309B-2 | 50.0 | 54.0 | -8 | +/- 15% |
| o-Xylene | CCVD0309B-2 | 50.0 | 53.0 | -6 | +/- 15% |
| Benzene | CCVD0309B-3 | 50.0 | 54.2 | -8 | +/- 15% |
| Toluene | CCVD0309B-3 | 50.0 | 54.1 | -8 | +/- 15% |
| Ethyl Benzene | CCVD0309B-3 | 50.0 | 54.4 | -9 | +/- 15% |
| m,p-Xylene | CCVD0309B-3 | 50.0 | 54.2 | -8 | +/- 15% |
| o-Xylene | CCVD0309B-3 | 50.0 | 53.4 | -7 | +/- 15% |

Date of Report: March 14, 2012
Samples Submitted: March 7, 2012
Laboratory Reference: 1203-038
Project: 5147-012-02

**NWTPH-Dx**
**QUALITY CONTROL**
**(with acid/silica gel clean-up)**

Matrix: Water
Units: mg/L (ppm)

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| **METHOD BLANK** | | | | | | |
| Laboratory ID: | MB0308W1 | | | | | |
| Diesel Range Organics | **ND** | 0.25 | NWTPH-Dx | 3-9-12 | 3-9-12 | |
| Lube Oil Range Organics | **ND** | 0.40 | NWTPH-Dx | 3-9-12 | 3-9-12 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***o-Terphenyl*** | ***90*** | ***50-150*** | | | | |

| Analyte | Result | | Percent Recovery | Recovery Limits | RPD | RPD Limit | Flags |
|---|---|---|---|---|---|---|---|
| **DUPLICATE** | | | | | | | |
| Laboratory ID: | 03-038-02 | | | | | | |
| | ORIG | DUP | | | | | |
| Diesel Range Organics | **ND** | **ND** | | | NA | NA | |
| Lube Oil Range Organics | **ND** | **ND** | | | NA | NA | |
| ***Surrogate:*** | | | | | | | |
| ***o-Terphenyl*** | | | ***94*** ***96*** | ***50-150*** | | | |

Date of Report: March 14, 2012
Samples Submitted: March 7, 2012
Laboratory Reference: 1203-038
Project: 5147-012-02

**NWTPH-Dx**
**(with acid/silica gel clean-up)**
**CONTINUING CALIBRATION SUMMARY**

| Lab ID | True Value (ppm) | Calc. Value | Percent Difference | Contol Limits |
|---|---|---|---|---|
| CCV0309F-V1 | 100 | 88.3 | 11.7 | +/-15% |
| CCV0309F-V2 | 100 | 90.5 | 9.5 | +/-15% |
| CCV0309R-V1 | 100 | 90.1 | 9.9 | +/-15% |
| CCV0309R-V2 | 100 | 90.5 | 9.5 | +/-15% |

Date of Report: March 14, 2012
Samples Submitted: March 7, 2012
Laboratory Reference: 1203-038
Project: 5147-012-02

**VOLATILES EPA 8260B**
**METHOD BLANK QUALITY CONTROL**

Matrix: Water
Units: ug/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| Laboratory ID: | MB0309W1 | | | | | |
| Vinyl Chloride | ND | 0.20 | EPA 8260 | 3-9-12 | 3-9-12 | |
| Trichlorofluoromethane | ND | 0.20 | EPA 8260 | 3-9-12 | 3-9-12 | |
| Methyl t-Butyl Ether | ND | 0.20 | EPA 8260 | 3-9-12 | 3-9-12 | |
| (cis) 1,2-Dichloroethene | ND | 0.20 | EPA 8260 | 3-9-12 | 3-9-12 | |
| 1,1,1-Trichloroethane | ND | 0.20 | EPA 8260 | 3-9-12 | 3-9-12 | |
| Carbon Tetrachloride | ND | 0.20 | EPA 8260 | 3-9-12 | 3-9-12 | |
| 1,2-Dichloroethane | ND | 0.20 | EPA 8260 | 3-9-12 | 3-9-12 | |
| Trichloroethene | ND | 0.20 | EPA 8260 | 3-9-12 | 3-9-12 | |
| Tetrachloroethene | ND | 0.20 | EPA 8260 | 3-9-12 | 3-9-12 | |
| 1,2-Dibromoethane | ND | 0.20 | EPA 8260 | 3-9-12 | 3-9-12 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***Dibromofluoromethane*** | ***81*** | ***68-120*** | | | | |
| ***Toluene-d8*** | ***83*** | ***73-120*** | | | | |
| ***4-Bromofluorobenzene*** | ***89*** | ***65-120*** | | | | |

Date of Report: March 14, 2012
Samples Submitted: March 7, 2012
Laboratory Reference: 1203-038
Project: 5147-012-02

**VOLATILES EPA 8260B**
**MS/MSD QUALITY CONTROL**

Matrix: Water
Units: ug/L

| Analyte | Result | | Spike Level | | Source Result | Percent Recovery | | Recovery Limits | RPD | RPD Limit | Flags |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **MATRIX SPIKES** | | | | | | | | | | | |
| Laboratory ID: | 03-038-03 | | | | | | | | | | |
| | MS | MSD | MS | MSD | | MS | MSD | | | | |
| 1,1-Dichloroethene | **9.36** | **9.46** | 10.0 | 10.0 | ND | 94 | 95 | 70-130 | 1 | 12 | |
| Benzene | **8.80** | **9.10** | 10.0 | 10.0 | ND | 88 | 91 | 75-123 | 3 | 11 | |
| Trichloroethene | **8.86** | **8.97** | 10.0 | 10.0 | ND | 89 | 90 | 80-117 | 1 | 14 | |
| Toluene | **9.07** | **9.28** | 10.0 | 10.0 | ND | 91 | 93 | 80-115 | 2 | 12 | |
| Chlorobenzene | **9.52** | **9.54** | 10.0 | 10.0 | ND | 95 | 95 | 80-117 | 0 | 13 | |
| ***Surrogate:*** | | | | | | | | | | | |
| ***Dibromofluoromethane*** | | | | | | ***75*** | ***78*** | ***68-120*** | | | |
| ***Toluene-d8*** | | | | | | ***84*** | ***83*** | ***73-120*** | | | |
| ***4-Bromofluorobenzene*** | | | | | | ***91*** | ***90*** | ***65-120*** | | | |

Date of Report: March 14, 2012
Samples Submitted: March 7, 2012
Laboratory Reference: 1203-038
Project: 5147-012-02

**cPAHs by EPA 8270D/SIM**
**METHOD BLANK QUALITY CONTROL**
**(with silica gel clean-up)**

Matrix: Water
Units: ug/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| Laboratory ID: | MB0308W1 | | | | | |
| Naphthalene | **ND** | 0.10 | EPA 8270/SIM | 3-8-12 | 3-8-12 | |
| 2-Methylnaphthalene | **ND** | 0.10 | EPA 8270/SIM | 3-8-12 | 3-8-12 | |
| 1-Methylnaphthalene | **ND** | 0.10 | EPA 8270/SIM | 3-8-12 | 3-8-12 | |
| Benzo[a]anthracene | **ND** | 0.010 | EPA 8270/SIM | 3-8-12 | 3-8-12 | |
| Chrysene | **ND** | 0.010 | EPA 8270/SIM | 3-8-12 | 3-8-12 | |
| Benzo[b]fluoranthene | **ND** | 0.010 | EPA 8270/SIM | 3-8-12 | 3-8-12 | |
| Benzo(j,k)fluoranthene | **ND** | 0.010 | EPA 8270/SIM | 3-8-12 | 3-8-12 | |
| Benzo[a]pyrene | **ND** | 0.010 | EPA 8270/SIM | 3-8-12 | 3-8-12 | |
| Indeno(1,2,3-c,d)pyrene | **ND** | 0.010 | EPA 8270/SIM | 3-8-12 | 3-8-12 | |
| Dibenz[a,h]anthracene | **ND** | 0.010 | EPA 8270/SIM | 3-8-12 | 3-8-12 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***2-Fluorobiphenyl*** | ***64*** | ***38 - 105*** | | | | |
| ***Pyrene-d10*** | ***72*** | ***37 - 121*** | | | | |
| ***Terphenyl-d14*** | ***86*** | ***32 - 112*** | | | | |

Date of Report: March 14, 2012
Samples Submitted: March 7, 2012
Laboratory Reference: 1203-038
Project: 5147-012-02

**cPAHs by EPA 8270D/SIM**
**METHOD BLANK QUALITY CONTROL**
**(with silica gel clean-up)**

Matrix: Water
Units: ug/L

| Analyte | Result | PQL | Method | Date Prepared | Date Analyzed | Flags |
|---|---|---|---|---|---|---|
| Laboratory ID: | MB0312W1 | | | | | |
| Naphthalene | **ND** | 0.10 | EPA 8270/SIM | 3-12-12 | 3-12-12 | |
| 2-Methylnaphthalene | **ND** | 0.10 | EPA 8270/SIM | 3-12-12 | 3-12-12 | |
| 1-Methylnaphthalene | **ND** | 0.10 | EPA 8270/SIM | 3-12-12 | 3-12-12 | |
| Benzo[a]anthracene | **ND** | 0.010 | EPA 8270/SIM | 3-12-12 | 3-12-12 | |
| Chrysene | **ND** | 0.010 | EPA 8270/SIM | 3-12-12 | 3-12-12 | |
| Benzo[b]fluoranthene | **ND** | 0.010 | EPA 8270/SIM | 3-12-12 | 3-12-12 | |
| Benzo(j,k)fluoranthene | **ND** | 0.010 | EPA 8270/SIM | 3-12-12 | 3-12-12 | |
| Benzo[a]pyrene | **ND** | 0.010 | EPA 8270/SIM | 3-12-12 | 3-12-12 | |
| Indeno(1,2,3-c,d)pyrene | **ND** | 0.010 | EPA 8270/SIM | 3-12-12 | 3-12-12 | |
| Dibenz[a,h]anthracene | **ND** | 0.010 | EPA 8270/SIM | 3-12-12 | 3-12-12 | |
| ***Surrogate:*** | ***Percent Recovery*** | ***Control Limits*** | | | | |
| ***2-Fluorobiphenyl*** | ***57*** | ***38 - 105*** | | | | |
| ***Pyrene-d10*** | ***66*** | ***37 - 121*** | | | | |
| ***Terphenyl-d14*** | ***70*** | ***32 - 112*** | | | | |

Date of Report: March 14, 2012
Samples Submitted: March 7, 2012
Laboratory Reference: 1203-038
Project: 5147-012-02

**cPAHs by EPA 8270D/SIM**
**SB/SBD QUALITY CONTROL**
**(with silica gel clean-up)**

Matrix: Water
Units: ug/L

| Analyte | Result | | Spike Level | | Percent Recovery | | Recovery Limits | RPD | RPD Limit | Flags |
|---|---|---|---|---|---|---|---|---|---|---|
| **SPIKE BLANKS** | | | | | | | | | | |
| Laboratory ID: | SB0308W1 | | | | | | | | | |
| | SB | SBD | SB | SBD | SB | SBD | | | | |
| Naphthalene | **0.337** | **0.349** | 0.500 | 0.500 | 67 | 70 | 38 - 110 | 3 | 35 | |
| Benzo[a]anthracene | **0.422** | **0.455** | 0.500 | 0.500 | 84 | 91 | 51 - 124 | 8 | 18 | |
| Chrysene | **0.390** | **0.427** | 0.500 | 0.500 | 78 | 85 | 53 - 123 | 9 | 20 | |
| Benzo[b]fluoranthene | **0.395** | **0.417** | 0.500 | 0.500 | 79 | 83 | 53 - 126 | 5 | 18 | |
| Benzo(j,k)fluoranthene | **0.381** | **0.427** | 0.500 | 0.500 | 76 | 85 | 51 - 126 | 11 | 23 | |
| Benzo[a]pyrene | **0.387** | **0.419** | 0.500 | 0.500 | 77 | 84 | 52 - 127 | 8 | 21 | |
| Indeno(1,2,3-c,d)pyrene | **0.371** | **0.409** | 0.500 | 0.500 | 74 | 82 | 49 - 123 | 10 | 26 | |
| Dibenz[a,h]anthracene | **0.379** | **0.403** | 0.500 | 0.500 | 76 | 81 | 39 - 125 | 6 | 31 | |
| ***Surrogate:*** | | | | | | | | | | |
| ***2-Fluorobiphenyl*** | | | | | ***66*** | ***70*** | ***38 - 105*** | | | |
| ***Pyrene-d10*** | | | | | ***73*** | ***77*** | ***37 - 121*** | | | |
| ***Terphenyl-d14*** | | | | | ***74*** | ***80*** | ***32 - 112*** | | | |
| Laboratory ID: | SB0312W1 | | | | | | | | | |
| | SB | SBD | SB | SBD | SB | SBD | | | | |
| Naphthalene | **0.303** | **0.311** | 0.500 | 0.500 | 61 | 62 | 38 - 110 | 3 | 35 | |
| Benzo[a]anthracene | **0.389** | **0.401** | 0.500 | 0.500 | 78 | 80 | 51 - 124 | 3 | 18 | |
| Chrysene | **0.389** | **0.396** | 0.500 | 0.500 | 78 | 79 | 53 - 123 | 2 | 20 | |
| Benzo[b]fluoranthene | **0.358** | **0.374** | 0.500 | 0.500 | 72 | 75 | 53 - 126 | 4 | 18 | |
| Benzo(j,k)fluoranthene | **0.372** | **0.383** | 0.500 | 0.500 | 74 | 77 | 51 - 126 | 3 | 23 | |
| Benzo[a]pyrene | **0.353** | **0.365** | 0.500 | 0.500 | 71 | 73 | 52 - 127 | 3 | 21 | |
| Indeno(1,2,3-c,d)pyrene | **0.372** | **0.369** | 0.500 | 0.500 | 74 | 74 | 49 - 123 | 1 | 26 | |
| Dibenz[a,h]anthracene | **0.376** | **0.386** | 0.500 | 0.500 | 75 | 77 | 39 - 125 | 3 | 31 | |
| ***Surrogate:*** | | | | | | | | | | |
| ***2-Fluorobiphenyl*** | | | | | ***60*** | ***62*** | ***38 - 105*** | | | |
| ***Pyrene-d10*** | | | | | ***70*** | ***73*** | ***37 - 121*** | | | |
| ***Terphenyl-d14*** | | | | | ***71*** | ***73*** | ***32 - 112*** | | | |

Date of Report: March 14, 2012
Samples Submitted: March 7, 2012
Laboratory Reference: 1203-038
Project: 5147-012-02

**TOTAL METALS**
**EPA 200.8**
**METHOD BLANK QUALITY CONTROL**

| | |
|---|---|
| Date Extracted: | 3-9-12 |
| Date Analyzed: | 3-9-12 |
| Matrix: | Water |
| Units: | ug/L (ppb) |
| Lab ID: | MB0309WM1 |

| Analyte | Method | Result | PQL |
|---|---|---|---|
| Cadmium | 200.8 | **ND** | 4.4 |
| Lead | 200.8 | **ND** | 1.1 |

Date of Report: March 14, 2012
Samples Submitted: March 7, 2012
Laboratory Reference: 1203-038
Project: 5147-012-02

**TOTAL METALS**
**EPA 200.8**
**DUPLICATE QUALITY CONTROL**

Date Extracted: 3-9-12
Date Analyzed: 3-9-12

Matrix: Water
Units: ug/L (ppb)

Lab ID: 03-038-01

| Analyte | Sample Result | Duplicate Result | RPD | PQL | Flags |
|---|---|---|---|---|---|
| Cadmium | **ND** | **ND** | NA | 4.4 | |
| Lead | **ND** | **ND** | NA | 1.1 | |

Date of Report: March 14, 2012
Samples Submitted: March 7, 2012
Laboratory Reference: 1203-038
Project: 5147-012-02

**TOTAL METALS**
**EPA 200.8**
**MS/MSD QUALITY CONTROL**

Date Extracted: 3-9-12
Date Analyzed: 3-9-12

Matrix: Water
Units: ug/L (ppb)

Lab ID: 03-038-01

| Analyte | Spike Level | MS | Percent Recovery | MSD | Percent Recovery | RPD | Flags |
|---|---|---|---|---|---|---|---|
| Cadmium | 111 | **104** | 93 | **102** | 92 | 2 | |
| Lead | 111 | **104** | 94 | **104** | 93 | 1 | |

Date of Report: March 14, 2012
Samples Submitted: March 7, 2012
Laboratory Reference: 1203-038
Project: 5147-012-02

**TOTAL METALS**
**EPA 200.8**
**CONTINUING CALIBRATION SUMMARY**

| Analyte | Lab ID | True Value (ppb) | Calc. Value | Percent Difference | Control Limits |
|---|---|---|---|---|---|
| Cadmium | ICV030912E | 50.0 | 50.1 | -0.20 | +/- 10% |
| Lead | ICV030912E | 50.0 | 49.9 | 0.20 | +/- 10% |
| Cadmium | CCV1030912E | 100 | 99.1 | 0.90 | +/- 10% |
| Lead | CCV1030912E | 100 | 98.8 | 1.2 | +/- 10% |
| Cadmium | CCV1030912E | 40.0 | 39.8 | 0.50 | +/- 10% |
| Lead | CCV1030912E | 40.0 | 39.9 | 0.25 | +/- 10% |
| Cadmium | CCV2030912E | 100 | 99.1 | 0.90 | +/- 10% |
| Lead | CCV2030912E | 100 | 98.7 | 1.3 | +/- 10% |
| Cadmium | CCV2030912E | 40.0 | 40.1 | -0.25 | +/- 10% |
| Lead | CCV2030912E | 40.0 | 39.0 | 2.5 | +/- 10% |
| Cadmium | CCV3030912E | 100 | 101 | -1.0 | +/- 10% |
| Lead | CCV3030912E | 100 | 99.4 | 0.60 | +/- 10% |
| Cadmium | CCV3030912E | 40.0 | 39.9 | 0.25 | +/- 10% |
| Lead | CCV3030912E | 40.0 | 39.6 | 1.0 | +/- 10% |
| Cadmium | CCV4030912E | 100 | 99.8 | 0.20 | +/- 10% |
| Lead | CCV4030912E | 100 | 99.2 | 0.80 | +/- 10% |
| Cadmium | CCV4030912E | 40.0 | 40.1 | -0.25 | +/- 10% |
| Lead | CCV4030912E | 40.0 | 40.0 | 0 | +/- 10% |
| Cadmium | CCV5030912E | 100 | 98.7 | 1.3 | +/- 10% |
| Lead | CCV5030912E | 100 | 98.8 | 1.2 | +/- 10% |
| Cadmium | CCV5030912E | 40.0 | 39.8 | 0.50 | +/- 10% |
| Lead | CCV5030912E | 40.0 | 40.2 | -0.50 | +/- 10% |
| Lead | CCV6030912E | 100 | 97.9 | 2.1 | +/- 10% |
| Lead | CCV6030912E | 40.0 | 38.6 | 3.5 | +/- 10% |

Date of Report: March 14, 2012
Samples Submitted: March 7, 2012
Laboratory Reference: 1203-038
Project: 5147-012-02

**DISSOLVED METALS**
**EPA 200.8**
**METHOD BLANK QUALITY CONTROL**

Date Analyzed: 3-9-12

Matrix: Water
Units: ug/L (ppb)

Lab ID: MB0309D1

| Analyte | Method | Result | PQL |
|---|---|---|---|
| Cadmium | 200.8 | **ND** | 4.0 |
| Lead | 200.8 | **ND** | 1.0 |

Date of Report: March 14, 2012
Samples Submitted: March 7, 2012
Laboratory Reference: 1203-038
Project: 5147-012-02

**DISSOLVED METALS**
**EPA 200.8**
**DUPLICATE QUALITY CONTROL**

Date Analyzed: 3-9-12

Matrix: Water
Units: ug/L (ppb)

Lab ID: 03-038-01

| Analyte | Sample Result | Duplicate Result | RPD | PQL | Flags |
|---|---|---|---|---|---|
| Cadmium | **ND** | **ND** | NA | 4.0 | |
| Lead | **ND** | **ND** | NA | 1.0 | |

Date of Report: March 14, 2012
Samples Submitted: March 7, 2012
Laboratory Reference: 1203-038
Project: 5147-012-02

**DISSOLVED METALS**
**EPA 200.8**
**MS/MSD QUALITY CONTROL**

Date Analyzed: 3-9-12

Matrix: Water
Units: ug/L (ppb)

Lab ID: 03-038-01

| Analyte | Spike Level | MS | Percent Recovery | MSD | Percent Recovery | RPD | Flags |
|---|---|---|---|---|---|---|---|
| Cadmium | 200 | **195** | 98 | **197** | 98 | 1 | |
| Lead | 200 | **186** | 93 | **187** | 94 | 1 | |

Date of Report: March 14, 2012
Samples Submitted: March 7, 2012
Laboratory Reference: 1203-038
Project: 5147-012-02

**DISSOLVED METALS**
**EPA 200.8**
**CONTINUING CALIBRATION SUMMARY**

| Analyte | Lab ID | True Value (ppb) | Calc. Value | Percent Difference | Control Limits |
|---|---|---|---|---|---|
| Cadmium | ICV030912E | 50.0 | 50.1 | -0.20 | +/- 10% |
| Lead | ICV030912E | 50.0 | 49.9 | 0.20 | +/- 10% |
| Cadmium | CCV1030912E | 100 | 99.1 | 0.90 | +/- 10% |
| Lead | CCV1030912E | 100 | 98.8 | 1.2 | +/- 10% |
| Cadmium | CCV1030912E | 40.0 | 39.8 | 0.50 | +/- 10% |
| Lead | CCV1030912E | 40.0 | 39.9 | 0.25 | +/- 10% |
| Cadmium | CCV2030912E | 100 | 99.1 | 0.90 | +/- 10% |
| Lead | CCV2030912E | 100 | 98.7 | 1.3 | +/- 10% |
| Cadmium | CCV2030912E | 40.0 | 40.1 | -0.25 | +/- 10% |
| Lead | CCV2030912E | 40.0 | 39.0 | 2.5 | +/- 10% |
| Cadmium | CCV3030912E | 100 | 101 | -1.0 | +/- 10% |
| Lead | CCV3030912E | 100 | 99.4 | 0.60 | +/- 10% |
| Cadmium | CCV3030912E | 40.0 | 39.9 | 0.25 | +/- 10% |
| Lead | CCV3030912E | 40.0 | 39.6 | 1.0 | +/- 10% |
| Lead | CCV4030912E | 100 | 99.2 | 0.80 | +/- 10% |
| Lead | CCV4030912E | 40.0 | 40.0 | 0 | +/- 10% |

OnSite Environmental Inc.

**Data Qualifiers and Abbreviations**

A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.

B - The analyte indicated was also found in the blank sample.

C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.

E - The value reported exceeds the quantitation range and is an estimate.

F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.

H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.

I - Compound recovery is outside of the control limits.

J - The value reported was below the practical quantitation limit. The value is an estimate.

K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.

L - The RPD is outside of the control limits.

M - Hydrocarbons in the gasoline range are impacting the diesel range result.

M1 - Hydrocarbons in the gasoline range (toluene-napthalene) are present in the sample.

N - Hydrocarbons in the lube oil range are impacting the diesel range result.

N1 - Hydrocarbons in diesel range are impacting lube oil range results.

O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.

P - The RPD of the detected concentrations between the two columns is greater than 40.

Q - Surrogate recovery is outside of the control limits.

S - Surrogate recovery data is not available due to the necessary dilution of the sample.

T - The sample chromatogram is not similar to a typical _____.

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

U1 - The practical quantitation limit is elevated due to interferences present in the sample.

V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.

W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.

X - Sample extract treated with a mercury cleanup procedure.

Y - Sample extract treated with an acid/silica gel cleanup procedure.

Z -

ND - Not Detected at PQL
PQL - Practical Quantitation Limit
RPD - Relative Percent Difference

# Chain of Custody

Page 1 of 1

OnSite Environmental Inc.
14648 NE 95th Street • Redmond, WA 98052
Phone: (425) 883-3881 • www.onsite-env.com

Company: GEO ENGINEERS INC
Project Number: 5147-012-02
Project Name: FORMER SHELL TANK FARM
Project Manager: ROBERT TRAHAN
Sampled by: ABHIJIT JOSHI

**Turnaround Request (in working days)**
(Check One)
☐ Same Day ☐ 1 Day
☐ 2 Days ☐ 3 Days
☒ Standard (7 Days)
(TPH analysis 5 Days)
☐ _____ (other)

**Laboratory Number:** 03-038

| Lab ID | Sample Identification | Date Sampled | Time Sampled | Matrix | Number of Containers | NWTPH-HCID | NWTPH-Gx/BTEX | ~~NWTPH-Gx~~ BTEX | NWTPH-Dx | Volatiles 8260B | Halogenated Volatiles 8260B (*) | Semivolatiles 8270D/SIM (with low-level PAHs) | PAHs 8270D/SIM (low-level) cPAHs only | PCBs 8082 | Organochlorine Pesticides 8081A | Organophosphorus Pesticides 8270D/SIM | Chlorinated Acid Herbicides 8151A | Total RCRA / MTCA Metals (circle one) | TCLP Metals | HEM (oil and grease) 1664 | Naphthalenes | LEAD (Total & Dissolved) | CADMIUM (Total & Dissolved) | EDB Scott DB | % Moisture |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | GEI-MW-1 | 03/06/12 | 1400 | WATER | 10 | | X | | X | | | | X | | | | | | | | X | X | X | | |
| 2 | GEI-MW-2 | | 1320 | | 10 | | | | | | | | | | | | | | | | | | | | |
| 3 | GEI-MW-3 | | 1245 | | 11 | | | | | | X | | | | | | | | | | | | | X | |
| 4 | GEI-MW-4 | | 1215 | | 10 | | | | | | | | | | | | | | | | | | | | |
| 5 | GEI-MW-5 | | 1115 | | 10 | | | | | | | | | | | | | | | | | | | | |
| 6 | GEI-MW-6 | | 1025 | | 9 | | | | | | | | | | | | | | | | | | | | |
| 7 | GEI-MW-7 | | 915 | | 9 | | | | | | | | | | | | | | | | | | | | |
| 8 | DUP | | 920 | | 9 | | | | | | | | | | | | | | | | | | | | |
| 9 | TRIP BLANK | NA | NA | | 5 | | | X | | | X | | | | | | | | | | | | | X | |

| | Signature | Company | Date | Time |
|---|---|---|---|---|
| Relinquished | | GEI | 03/7/12 | 0840 |
| Received | | OnSite Env | 3/7/12 | 840 |
| Relinquished | | | | |
| Received | | | | |
| Relinquished | | | | |
| Received | | | | |
| Reviewed/Date | | Reviewed/Date | | |

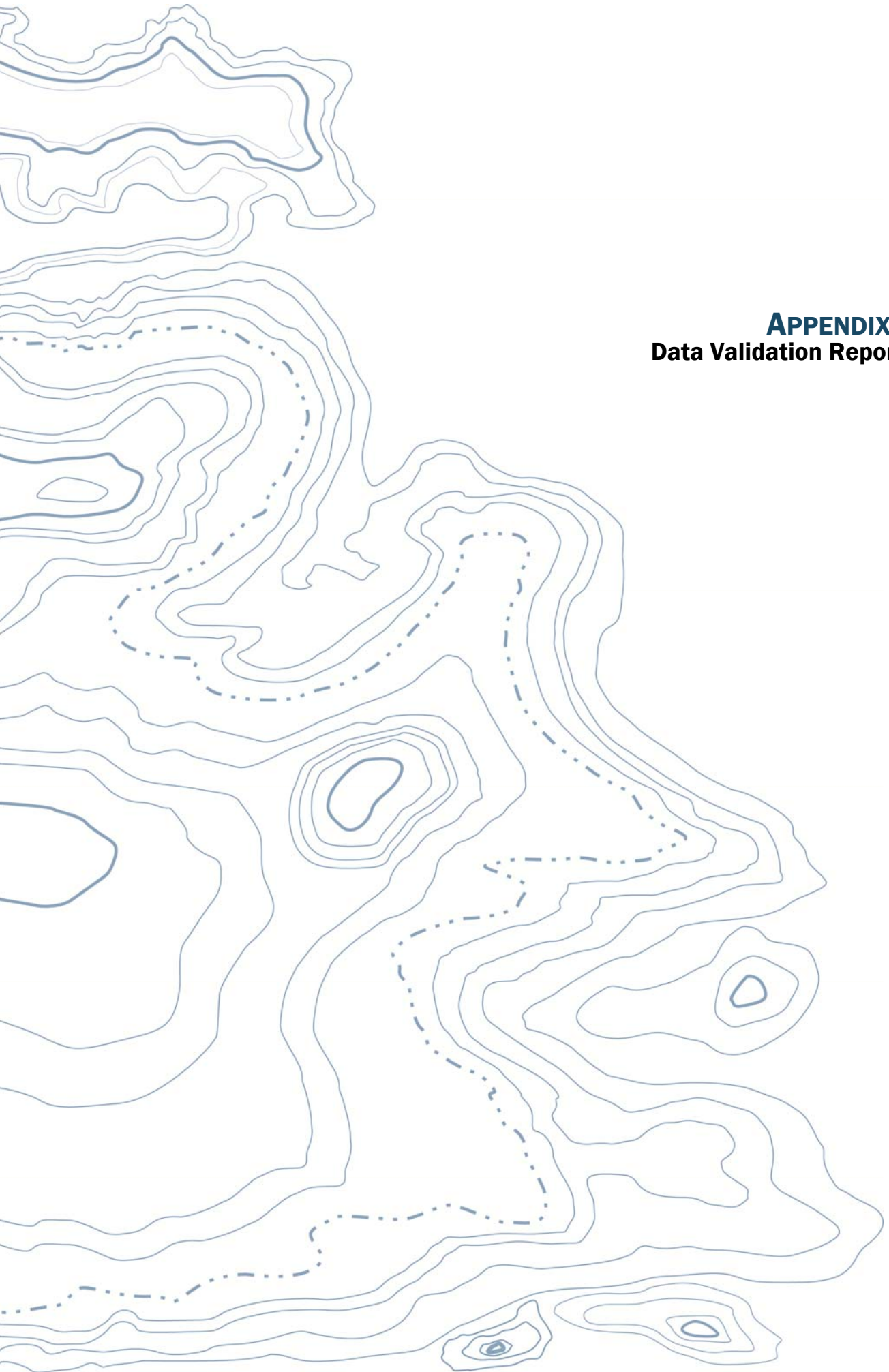
**Comments/Special Instructions**
(*) See the list of HVOCs to be analyzed & reported in the attached sheet

Samples are field filtered for dissolved Metal Analyses

Chromatograms with final report ☐

Data Package: Level III ☐ Level IV ☐ Electronic Data Deliverables (EDDs) ☐

Limited Volume For BTEX & HVOC analyses



# APPENDIX E
## Data Validation Reports

GeoEngineers

Plaza 600 Building, 600 Stewart Street, Suite 1700, Seattle, WA 98101, Telephone: 206.728.2674, Fax: 206.728.2732 www.geoengineers.com

# Data Validation Report

| | |
|---|---|
| **Project:** | Former Shell Oil Tank Farm – Soil Investigation |
| **GEI File No:** | 5147-012-02 |
| **Date:** | March 23, 2012 |

## GENERAL

This report presents the results of a United States Environmental Protection Agency (USEPA)-defined Stage 2A validation (USEPA Document 540-R-08-005; USEPA, 2009) of analytical data from the analyses of soil samples obtained from Shell Oil Tank Farm Site located in Anacortes, Washington.

### Objective and Quality Control (QC) Elements

The objective of the data quality assessment was to review laboratory analytical procedures and QC results to evaluate whether the samples were analyzed using well-defined and acceptable methods that provide quantitation limits below applicable regulatory criteria, the precision and accuracy of the data are well defined and sufficient to provide defensible data, and the quality assurance/quality control (QA/QC) procedures utilized by the laboratory meet acceptable industry practices and standards. In accordance with Quality Assurance Project Plan (Appendix C of the Work Plan; GeoEngineers, 2009), the laboratory data was reviewed for following QC elements:

- Chain of Custody
- Holding Times and Sample Preservation
- Surrogates
- Method, Trip and Equipment Blanks
- Laboratory Control Samples
- Matrix Spikes/Matrix Spike Duplicates
- Laboratory and Field Duplicates
- Sample Results

### Chemical Analysis Performed:

Samples obtained during the cleanup action were submitted to a Department of Ecology (Ecology)-certified laboratory - OnSite Environmental, Inc. (OnSite) of Redmond, Washington for one or more of the following analyses:

- Gasoline-range petroleum hydrocarbons by Ecology Method NWTPH-Gx;
- Diesel- and heavy oil-range petroleum hydrocarbons by Ecology Method NWTPH-Dx with silica gel/sulfuric acid cleanup;
- Volatile organic compounds (VOCs) by EPA Method 8260B;
- Halogenated volatile organic compounds (HVOCs) by EPA Method 8260B;

- Polycyclic aromatic hydrocarbons (PAHs) by EPA Method 8270SIM;
- Polychlorinated biphenyls (PCBs) by EPA Method 8082; and
- Metals (cadmium and lead) by EPA Method 6010B.

### OnSite Sample Data Groups (SDGs):

Following laboratory SDGs were delivered by OnSite and were reviewed by GeoEngineers for QC elements listed above:

- 1109-195
- 1109-196 (including "B" follow up)
- 1109-223 (including "B" Follow up)
- 1110-119
- 1202-101
- 1203-038

## DATA QUALITY ASSESSMENT SUMMARY

The results for each of the QC elements are summarized below. The data assessment was performed using guidance in two USEPA documents: USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (USEPA, 2004) and USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (USEPA, 2008).

### Chain-of-Custody Documentation

Chain-of-custody forms were provided with the laboratory analytical reports. No transcription errors were found, and the appropriate signatures were applied. There were no anomalies mentioned in the sample receipt forms, as the samples were transported to the laboratory at the appropriate temperatures of between 2 and 6 degrees Celsius.

### Holding Times and Sample Preservation

The holding time is defined as the time that elapses between sample collection and sample analysis. Maximum holding time criteria and sample preservation exist for each analysis to help ensure that the analyte concentrations found at the time of analysis reflect the concentration present at the time of sample collection. Recommended holding times and sample preservation was met for all analyses; with the following exceptions:

- SDG 1109-195: (BETX/VOC compounds) Samples GEI-3-2.5, GEI-4-5.0, GEI-4-10.0, GEI-5-17.0, GEI-7-2.5 and GEI-9-2.5 were not sampled in accordance with the EPA sampling method 5035A. There were no positive results for any target analytes in these samples. For this reason, the reporting limits in these samples were qualified as estimated (J/UJ) in these samples.
- SDG 1109-196: (NWTPH-Gx/BTEX Compounds) The 14 day holding time of Sample GEI-13-15.0 was exceeded by 3 hours and the holding time of Sample GEI-15-10.0 was exceeded by 7 days. There were no positive results for any target analytes in the sample. For this reason, the reporting limits in Sample GEI-15-10.0 were qualified as estimated (UJ) in this sample.

- SDG 1109-223B: (PAHs) The 14 day holding times of Samples GEI-21-15.0, GEI-22-15.0, and GEI-34-15.0 were exceeded by 5 days. For this reason, the positive results and reporting limits for any target analytes in these samples were qualified as estimated (J/UJ) in these samples.
- SDG 1109-196: (NWTPH-Gx/BTEX Compounds) Sample GEI-12-15.0, GEI-13-15.0 and GEI-14-5.0 were not sampled in accordance with the EPA sampling method 5035A. There were no positive results for any target analytes in these samples. For this reason, the reporting limits in these samples were qualified as estimated (UJ) in these samples.

### Surrogate Recoveries

A surrogate compound is a compound that is chemically similar to the analytes of interest, but unlikely to be found in any environmental sample. Surrogates are used for organic analyses and are added to all samples, standards, and blanks to serve as an accuracy and specificity check of each analysis. The surrogates are added at a known concentration and percent recoveries are calculated following analysis. All surrogate recoveries for field samples were within the laboratory control limits; with the following exceptions:

- SDG 1109-223: (NWTPH-Gx/BTEX Compounds) The %R value for the surrogate fluorobenzene was less than the control limit in Sample GEI-23-12.5. For this reason, the positive result for benzene and the remaining target analyte reporting limits were qualified as estimated (J/UJ) in this sample. The %R value for the surrogate fluorobenzene was greater than the control limit in Sample GEI-16-5.0. There were no positive results for any target analytes in the sample. For this reason, no qualifiers were required.

### Method, Trip and Equipment Rinsate Blanks

Method blanks are analyzed to ensure that laboratory procedures and reagents do not introduce measurable concentrations of the analytes of interest. Method blanks were analyzed with each batch of samples, at a frequency of one per twenty samples. Method Blanks analyzed at the required frequency. No method blank detections were reported by the testing laboratory and method blanks

Trip blanks are analyzed to assess whether field sampling or sample transport processes may have introduced measurable concentrations of volatile analytes of interest into project samples. No trip blanks were analyzed.

Equipment rinsate blanks are analyzed to assess whether sampling equipment decontamination procedures may have introduced measurable concentrations of the analytes of interest into project samples. Equipment rinsate blanks were analyzed with each field sampling event, at a frequency of one per day. No equipment rinsate blanks were analyzed.

### Matrix Spikes/Matrix Spike Duplicates (MS/MSD)

Because the actual analyte concentration in an environmental sample is not known, the accuracy of a particular analysis is usually inferred by performing a matrix spike (MS) analysis. One aliquot of sample is analyzed in the normal manner, and then a second aliquot of the sample is spiked with a known amount of analyte concentration and analyzed. From these analyses, a percent recovery (%R) is calculated. Matrix spike duplicates (MSD) analyses are generally performed for organic analyses as a precision check. For some organic analytical methods, such as NWTPH-Dx, a laboratory control sample/ laboratory control sample

duplicate (LCS/LCSD) sample set is performed in lieu of a MS/MSD analysis. LCS/LCSD analyses are discussed in the next section.

### Laboratory Control Samples/Laboratory Control Sample Duplicates

A laboratory control sample (LCS) is a blank sample that is spiked with a known amount of analyte and then analyzed. An LCS is similar to an MS, but without the possibility of matrix interference. Because matrix interference is not an issue, the LCS/LCSD control limits for accuracy and precision are usually more rigorous than for MS/MSD analyses. Additionally, data qualification based on LCS/LCSD analysis would apply to all samples in the analytical batch instead of just the parent sample.

One LCS/LCSD analysis should be performed for every analytical batch or every 20 project samples, whichever is more frequent. The recovery criteria (%R) for LCS and LCSD analyses are specified in the laboratory documents, as are the relative percent difference (RPD) criteria for LCS/LCSD sample pairs. The frequency criteria were met for all analyses. The %R and RPD values for all target analytes in the LCS/LCSD analyses were within the laboratory control limits.

### Field Replicates/Duplicates

Field duplicate samples were obtained and analyzed along with the primary project samples. The duplicate samples were analyzed for the same parameters as the associated primary samples. The RPD between the primary and duplicate samples is used to assess sample heterogeneity and laboratory precision, unless one or more of the samples used has a concentration greater than five times the method reporting limit for that sample. In such cases, the absolute difference is used instead of the RPD. The RPD control limit for soil samples is 50 percent, and the RPD control limit for water samples is 35 percent.

- NWTPH-Dx: Four field duplicate sample pairs were analyzed: GEI-3-10.0/DUP-1, GEI-9-7.5/DUP-2, GEI-11-5.0/DUP-3, and GEI-16-5.0/DUP-4. The precision criteria above were met for all target analyte hydrocarbon ranges.
- All analyses: One field duplicate sample pair was analyzed: GEI-MW-7/DUP. The precision criteria above were met for all target analytes in both samples.

### Sample Results

The laboratory indicated that several samples were screened before extraction because of the probable effects of natural matrix interference. In cases where certain petroleum hydrocarbon target analytes could not be distinguished because of chromatographic interference, the laboratory raised the reporting limits, and indicated this with a "UI" qualifier. These data points were appropriately taken through the validation process, and these reporting limits were qualified (UI) in GeoEngineer's database.

- SDG 1109-196: (NWTPH-Gx) The gasoline chromatography in Samples GEI-13-12.5 and GEI-14-8.0 indicated that the samples exhibited a pattern typical of heavier range petroleum hydrocarbons (i.e., diesel #2 or heavy lubrication oil). The positive results for gasoline were qualified as estimated (J) in order to note the high bias in these samples.

## OVERALL ASSESSMENT

The results of this Stage 2A data validation indicate that the laboratory followed the specified analytical methods, the accuracy of the data is acceptable, as demonstrated by the surrogate and LCS/LCSD, and MS/MSD %R values, and the precision of the data also is acceptable, as demonstrated by the LCS/LCSD, MS/MSD, and field duplicate RPD values with the following exception. Selected data (noted above) were qualified as estimated (J/UJ) either because of a holding time outlier, a surrogate %R outlier, or because chromatography did not match the appropriate calibration standard. However, based on the data quality review, it is our opinion that the analytical data, including data qualified as noted above, are of acceptable quality for their intended use.

## REFERENCES

GeoEngineers, Inc., "Work Plan, Remedial Investigation/Feasibility Study, Former Shell Oil Tank Farm," prepared for the Washington State Department of Ecology on behalf of Port of Anacortes, GEI File No. 5147-007-01, September 1, 2009.

U.S. Environmental Protection Agency (USEPA). "Contract Laboratory Program National Functional Guidelines for Inorganic Data Review," OSWER 9240.1-45, EPA 540-R-04-004. October 2004.

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U.S. Environmental Protection Agency (USEPA). "Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use," EPA-540-R-08-005. January 2009.

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