Ecology Draft Final Remedial Investigation/Feasibility Study Report

Former Reliable Steel Site
1218 West Bay Drive NW
Olympia, Washington
Ecology Agreed Order No. DE-08TCPSR-5223

for
Washington State Department of Ecology

July 18, 2013

GeoEngineers

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1.0 INTRODUCTION

This report describes the results of the remedial investigation and feasibility study (RI/FS) completed for the Reliable Steel Site (Site) located in the City of Olympia, Thurston County, Washington (Figure 1). The Site address is 1218 West Bay Drive NW. The Site is approximately 6.5 acres in size and is comprised of both upland and marine in-water (i.e., tidelands) areas. The upland area of the Site is approximately 3.2 acres in size and the marine in-water area of the Site is approximately 3.3 acres in size.

Past Site use has consisted of commercial and industrial activities. Past commercial and industrial activities have included sawmill operations, boat building, and steel tank and structural beam fabrication. Structures that have existed in the upland area include four buildings and an elevated rail crane structure (Figure 2). Structures that have existed in the in-water area of the Site include a former shipway and a segment of the elevated rail crane structure.

Previous environmental investigations of the Site have identified the presence of chemicals at concentrations greater than Model Toxics Control Act (MTCA) cleanup levels (CULs) as a result of past Site use. Previous investigations have identified contamination in soil, groundwater, stormwater runoff and sediment at the Site. This RI/FS is intended to characterize the nature and extent of contamination, evaluate potential impacts on human health and the environment, and develop and evaluate cleanup alternatives for the Site.

The Site is under an Agreed Order (DE-08-TVPSR-5223) between the Washington State Department of Ecology (Ecology) and BOJO Investments LLC. Ecology's Toxic Cleanup Program is managing the completion of the RI/FS for the Site. GeoEngineers has prepared this RI/FS under contract to Ecology.

1.1. Purpose

The purpose of an RI/FS is to collect the data necessary to characterize the nature and extent of contamination and to identify and evaluate cleanup action alternatives for a Site in compliance with MTCA (Chapter 173-340 Washington Administrative Code [WAC]) and the Sediment Management Standards (SMS) (Chapter 173-204 WAC). This RI/FS has been prepared by combining data collected by multiple investigators working under contract to the previous and current Site owners and/or operators, data collected by Ecology, as well as data generated as part of investigations of Budd Inlet sediment.

The investigation activities performed at the Site and presented in this RI have included sampling and analysis to characterize the nature and extent of contamination in soil, groundwater, stormwater runoff and sediment. Sampling and analysis has been performed to evaluate the presence of multiple chemical groups including metals, petroleum hydrocarbons, semivolatile organic compounds (SVOCs), volatile organic compounds (VOCs), and polychlorinated biphenyls (PCBs). The FS includes identification and evaluation of cleanup alternatives, and presents a preferred cleanup alternative, for the contamination present at the Site.

1.2. Report Organization

This RI report is divided into 10 sections that include the following:

- Section 1.0 – Introduction.
- Section 2.0 – Site Background – presents a summary of the Site history, environmental setting, current and planned future land uses and previous environmental investigations.
- Section 3.0 – Remedial Investigation Activities – presents a description of the RI field program.
- Section 4.0 – Conceptual Site Models – presents the conceptual Site contaminant transport and exposure models.
- Section 5.0 – Development of Cleanup Standards – describes the development of cleanup standards used to assess risks posed by Site contaminants of potential concern (COPCs).
- Section 6.0 – Remedial Investigation Results – summarizes the RI analytical results, including a comparison of the data to the RI screening levels.
- Section 7.0 – Locations and Media Requiring Cleanup Action Evaluation.
- Section 8.0 – Feasibility Study.
- Section 9.0 – Limitations.
- Section 10.0 – References.

2.0 SITE BACKGROUND

2.1. Location

The Site is located at 1218 West Bay Drive NW within the City of Olympia, Thurston County, Washington (Figure 1). The Site is situated on the western shoreline of Budd Inlet within the southeast quarter of Section 10, Township 18, Range 2W, and at latitude 47.05544", longitude -122.91423”.

The Site is approximately 6.5 acres in size and is comprised of both upland and marine in-water (i.e., tidelands) property. The site is comprised of seven Thurston County parcels that include; 67400000102, 72600200200, 72600200201, 72600300000, 91013000000, 91013300000 and 91013500000.

The Site is bordered by the Hardel Mutual Plywood Site (Hardel Property) to the north, West Bay Drive NW to the west, and Port of Olympia and Burlington Northern Santa Fe properties to the south (Figure 2). Budd Inlet of Puget Sound is located east of the Site. The Hardel Mutual Plywood Site, Port of Olympia property, and Budd Inlet are also cleanup sites. A pier operated by Industrial Petroleum Distributors and used for petroleum transfer was formerly located at the Port of Olympia property (Figure 3).

2.2. Site History

Prior to development, the property comprising the Site was a portion of the Budd Inlet shoreline and the majority of the property likely consisted of intertidal aquatic lands. Site use has consisted of filling, followed by commercial and industrial activities. Existing information indicates that the initial Site use was for lumber production. Boat building was also identified to have been performed at the Site. The most recent Site use was steel tank and structural beam fabrication and painting that occurred from 1941 to relatively recently (i.e., 2009).

A 1924 Sanborn Map indicates that a “saw mill and planer” operated by Yankee Notion Mill Company was located on the northern portion of the Site. The Sanborn Map indicates that the northern portion of the Site was upland property. Therefore, the northern portion of the property was evidently filled prior to 1924. The Sanborn Map also indicates that a bulkhead was located south of the saw mill and planer and that the southern portion of the Site was tideflats. The Henry McCleary Timber Company is identified to be located north of the Site in the location of the present day Hardel Mutual Plywood Site and the Panama Lumber and Shingle Company is identified to be located south of the Site in the present day location of the Port of Olympia property.

A 1924 to 1947 Sanborn Map shows the shape of the shoreline at the Site in more or less its current configuration. Therefore the southern portion of the Site was evidently filled between 1924 and 1947.

The Site was purchased in 1941 by A.W. and Hazel Lewis to relocate their Reliable Welding business to the property (Tetra Tech, 1998). An elevated rail crane structure was the only aboveground structure present at the Site when purchased by the Lewis’ in 1941. A Sanborn Map from 1945 identifies a 5-ton traveling crane with an elevation of 16 feet. The western end of the crane abuts a railroad track, and the area on either side of the crane is identified as “Lumber in Transit.” Based on the configuration of the structures identified on the 1945 Sanborn Map, it appears that the crane may have previously been used to transfer lumber onto or off of railroad cars. The crane and railroad track(s) identified on the Sanborn Map are in the present location of the remaining elevated rail crane structures and railroad tracks currently present at the Site. Figures 2 and 3 show the existing and previous site conditions, respectively, including the rail crane structures and railroad tracks.

The Tank Shop (identified in one previous report as the Plate Shop) and the Maintenance Building were built by Reliable Welding in 1941 (Figure 3) (Tetra Tech, 1998). Additionally, during the 1940s, a dock was erected on Budd Inlet in the vicinity of the Tank Shop. A 1945 Sanborn Map identifies that ship welding was occurring in the building identified as the Tank Shop.

Additional expansions were performed in 1962, including construction of the Paint Shop, and in 1980, to construct the Structural Shop (Figure 3) (Tetra Tech, 1998).

During the late 1940s, the Lewis’ formed a partnership of family members. In 1974, the partnership incorporated and in 1983, Bart and Jerry Olsen, members of the partnership, bought out other family member interests in the corporation (Tetra Tech, 1998). In January 1998, ownership of all of the parcels except the former railroad right-of-way was transferred from Reliable Steel Fabricators Inc., to BOJO Investments, LLC (also owned by Bart and Jerry Olson). Ownership of the former railroad right-of-way was transferred to BOJO Investments, LLC in 2004.

In August 2001, BMT Properties acquired the operating assets of Reliable Steel and leased the property. BMT simultaneously assigned the operating assets and lease to BMT-NW. In April 2008, West Bay Reliable-0508, LLC purchased the property (Greylock, 2008a). BMT-NW performed steel fabrication, sandblasting, and painting operations at the Site until 2009.

A fire in November 2010 damaged the structural integrity of the Tank Shop. The Tank Shop, Maintenance Building, and the above-ground portion of the elevated rail crane located in the upland area were demolished in 2011 after the fire.

2.3. Site Description

The Site is located on the west side of Budd Inlet and includes approximately 3.2 acres of upland area and 3.3 acres of marine tideland area. Elevations across the Site range from approximately +15 feet NGVD on the western boundary to -10 feet NGVD29 on the eastern boundary of the Site (Figures 2 and 3). The ordinary high water (OHW) line along the shoreline of the Site which delineates the upland area from the marine area is at an elevation of approximately +5 feet NGVD29 or +12.5 feet mean lower low water (MLLW). MLLW in the area of the Site is approximately 7.5 feet higher relative to elevations in NGVD29.

A relatively steep embankment that slopes up to West Bay Drive NW is located adjacent to the western boundary of the Site. As stated above, the elevation in this area is approximately +15 feet NGVD29 (i.e., approximately +22.5 feet MLLW). The majority of the upland area including where structures are or were previously located is generally flat and is at an elevation between approximately +10 and +11 feet NGVD29 (+17.5 and +18.5 feet MLLW).

The upland area slopes down into the marine area of Budd Inlet from an elevation of approximately +9 feet NGVD29 (+16.5 feet MLLW) at the top of the shoreline bank in the upland area to between approximately +5 feet NGVD29 (+12.5 feet MLLW) and -2 feet NGVD29 (+5.5 feet MLLW) in the upper shoreline of the marine area. The Site gently slopes from the base of the upper shoreline to the eastern boundary of the Site which is at an elevation of between approximately -9 and -10 feet NGVD29 (-1.5 and -2.5 feet MLLW).

Structures present on the upland portion of the Site include two buildings that until 2009 were used for steel tank and structural beam fabrication and painting. These are identified as the Paint Shop and Structural Shop (Figure 2). The upland area of the Site surrounding the existing structures is comprised of paved and unpaved surfaces. The paved surfaces consist of asphalt or concrete. The unpaved surfaces consist of compacted gravel with varying amounts of sand and silt.

The Paint Shop is a metal-frame building with painted galvanized corrugated metal walls on the north and south sides and retractable canvas panels on the east and west sides of the building. The floor on the western half of the Paint Shop is concrete pavement. Additionally, a concrete pad is located on the west side of the Paint Shop (Figure 3). Fabricated steel products that were formerly produced at the Site were sand blasted and painted in the Paint Shop.

The Structural Shop is a metal-frame building with walls comprised of painted galvanized corrugated metal sheeting. The floor of the Structural Shop is predominantly unpaved. Structural steel beams and girders were formerly fabricated in the Structural Shop.

Two buildings identified as the Tank Shop and Maintenance Building were previously located on the Site (Figure 3). The Tank Shop and Maintenance Buildings were demolished in 2011 after a fire in November 2010 damaged the structural integrity of the Tank Shop building.

The Tank Shop was a wood-frame building with walls comprised of painted galvanized corrugated metal sheeting and was used for storage tank fabrication. The floor of the Tank Shop, which remains at the Site, is comprised of concrete of unknown thickness. Offices were present on a second floor of the Tank Shop in the southwestern portion of the building. The framing and siding of the Tank Shop that remained after the fire were removed from the Site as part of demolition. The Tank Shop was also identified as the "Plate Shop" in a previous Site report.

The Maintenance Building was a wood-frame building with walls comprised of painted galvanized corrugated metal sheeting. The floor consisted of wood planks partially covered with metal sheets. The building was supported on creosote treated piling, concrete foundation walls, and wood bulkheads. Equipment maintenance and materials storage occurred in the Maintenance Building. A former maintenance pit was located on the east end of the building (Figure 3). A 1998 Tetra Tech Environmental Compliance Audit states that the pit was historically used for oil disposal from equipment and facility vehicles. The sides of the pit were constructed of wood planking and the bottom of the pit was soil. A metal sheet covered the pit when not in use.

The walls and floor of the Maintenance Building were demolished and removed from the Site in 2011. The elevation of the area that was beneath the former Maintenance Building is approximately two- to four feet lower than the elevation of the surrounding ground surface. The foundation structures that previously supported the Maintenance Building remain after demolition including approximately 100 creosote-treated piling, concrete foundation walls, and wood bulkheads. A Site visit on February 27, 2013 revealed that metal debris is present within the area that was beneath the Maintenance Building as a layer or in mounds on top of the soil surface.

Multiple underground storage tanks (USTs) were utilized at the Site as part of previous operations. Information concerning USTs at the Site includes the following:

- A 750-gallon UST used for storage of bunker fuel located beneath the south eastern portion of the Tank Shop was closed-in-place in 1999 (Figure 3).
- A 2,000-gallon UST used for gasoline storage located west of the former Maintenance Building was removed in 1990.
- An 885-gallon UST used for diesel storage located west of the former Maintenance Building was removed in 1990.
- A 300-gallon UST used for heating oil storage is likely present adjacent to the southwest corner of the former Tank Shop.
- A UST of unknown size, suspected to have been used for calcium hydroxide storage is believed to be present west of the former Maintenance Building. Calcium hydroxide is a byproduct of acetylene generation. Acetylene (for welding) was reported to have been produced at the Site.

The USTs are discussed further in Sections 2.7 and 2.8.

Stormwater falling on the Site infiltrates in unpaved areas or flows towards stormwater drainage features and Budd Inlet. Stormwater drainage features present at the Site include catch basins and associated conveyance pipes as well as two drainage ditches and four stormwater outfalls.

Stormwater catch basins are present on the south and west sides of the former Tank Shop, on the west side of the Structural Shop, and on the north and west sides of the Paint Shop (Figure 2). One drainage ditch is located on the northern portion of the Site, and another ditch is located in the area that was beneath the former Maintenance Building. In the ditch beneath the former Maintenance Building, stormwater enters the area through a pipe located on the west side, flows through the ditch to the east side, and then is conveyed through a 30-inch-diameter corrugated stormwater pipe to an outfall located on the shoreline (Figure 2).

The four stormwater outfalls are present at locations along the shoreline and on the northern portion of the Site that include the following (Figure 2):

- The 30-inch-diameter corrugated steel pipe that outfalls at the shoreline east of the former Maintenance Building (described above);
- An 8-inch-diameter concrete pipe that outfalls at the shoreline east of the Structural Shop;
- A 12-inch-diameter corrugated high-density polyethylene (HDPE) pipe that outfalls at the shoreline south of the elevated rail crane structure; and
- An 8-inch-diameter corrugated HDPE pipe that outfalls into the drainage ditch located on the northern portion of the Site.

Off-site sources of stormwater combine with Site stormwater and discharge through the outfalls on the Site.

Remnant structures present on the marine tideland area of the Site include piling that are vestiges of former piers and a shipway, a segment of the elevated rail crane, and concrete foundation piers (Figures 2 and 3). The upper portion of the shoreline is armored in places with concrete debris (i.e., pieces, slabs, etc.) as well as wooden bulkheads at the location of the former Tank Shop and east of the Paint Shop. Metal debris is visible along the shoreline adjacent to and south of the Structural Shop and Tank Shop. The metal debris is visible at the shoreline as an oxidized conglomeration that includes unused pieces of welding rods, welding slag (i.e., a residual coating created during welding), and other small metal debris. The metal debris observed on the shoreline is frequently described as slag in previous investigation reports.

Numerous piling were identified in the marine tideland area in a Site survey drawing dated 2009 (Figure 3). The survey identifies the presence of more piling than are currently observed at the site (Figure 2). It is possible that piling identified in the survey have broken off and/or deteriorated to a level at or below the mudline.

Thirty-one wood piling were identified for removal from the southern portion of the marine tideland area by the Washington State Department of Natural Resources as part of a broad-based “West Bay Creosote Removal Project” (Figure 2). The piling removal activities were performed at the Site in early 2013. Of the 33 piling identified to be removed from the Site, 28 were removed completely (pulled out), and five were cut off below the mudline.

2.4. Geologic Setting

The geology in the vicinity of the Site is described in the Geologic Map of the Tumwater 7.5-Minute Quadrangle, Thurston County, Washington (Walsh et al., 2003). Soils at the site are mapped as artificial fill. Soils west of the site are mapped as Vashon advance outwash sand. Further west of the Site the Vashon advance outwash sand is identified to be overlain by Vashon till. Soils mapped north of the site include pre-Vashon glaciolacustrine and pre-Vashon sandy deposits.

2.5. Climate

The Olympia area has a maritime climate with a mean annual precipitation of about 51 inches. Rainfall is highest during October through March (4 to 8.5 inches per month) and lowest during the summer months (less than one inch in July). The average yearly temperature is 50 degrees Fahrenheit, with temperatures ranging between a monthly average low in January of 38 degrees to a July/August monthly average high of 63 degrees Fahrenheit. Below freezing temperatures, while rare, occasionally occur, typically during December and January.

2.6. Current and Future Land Use

The Site was re-zoned in 2006 from Industrial to Urban Waterfront zoning. The Urban Waterfront zoning allows for a variety of uses including, but not limited to, condominiums, office, retail and hotels.

The anticipated future use of the Site is as mixed-use development. Anticipated uses include commercial (i.e., office space, retail and restaurants), residential (i.e., condominiums) and public access (i.e., shoreline plaza and/or trail).

2.7. Previous Environmental Investigations

This section identifies and summarizes the scope of previous environmental assessments and investigations that were completed at the Site. Potential environmental concerns were identified at the Site by an initial environmental compliance audit and Phase I Environmental Site Assessment (ESA). These were the basis for initial environmental investigations to assess the presence of environmental contamination at the Site.

Multiple environmental assessments and investigations were completed at the Site that included evaluation of Site activities and operations as well as sampling and analysis of soil, groundwater, stormwater runoff and sediment at the Site. Additionally, the results of sediment sampling performed on and adjacent to the Reliable Steel property as part of other studies were included in the environmental evaluation. The results of the previous environmental evaluations that had been completed as of 2009 were compiled and presented in the RI/FS Work Plan (GeoEngineers, 2009) and were used to identify data gaps to be filled as part of the RI. Unless otherwise indicated in the Sections below, the data collected as part of the previous environmental investigations are also used to characterize the nature and extent of contamination and are presented in Section 2.8. The investigation logs from the previous environmental investigations (including upland and sediment logs) are presented in Appendix A.

Table 1 provides a summary of the potential environmental concerns that were identified for the Site based on the results of previous environmental assessments (i.e., compliance audit, Prospective Purchaser Evaluation, and Phase I and Phase II site assessments) and that were the basis for investigation activities performed as part of the RI. Table 1 presents the potential environmental concerns in relation to four areas. The four areas include the following:

- Former Maintenance Building and southern portion of the Site;
- Structural and (former) Tank Shops and adjacent areas;
- Paint Shop and northern portion of the Site; and
- Shoreline and sediment.

Figure 3 identifies the areas where potential environmental concerns were identified at the Site that are summarized in Table 1. Figure 4 presents the locations where samples were collected as part of the previous investigations. The following sections summarize the previous environmental evaluations and investigations that were performed at the Site.

2.7.1. *1998 Environmental Compliance Audit*

Tetra Tech EM Incorporated (Tetra Tech) (Tetra Tech, 1998) performed an environmental compliance audit of the Site in February 1998, at which time the Site was owned and operated by Reliable Steel Fabricators. The purpose of the audit was to document baseline environmental conditions, identify significant environmental liabilities and to ascertain the status of environmental compliance. Tetra Tech personnel reviewed environmental files and background information for the Site. Additionally, Tetra Tech personnel interviewed then president and vice president of Reliable Steel Fabricators and toured the Site. The audit included evaluation of Site operations and identified environmental concerns associated with activities occurring in the Maintenance Building, Tank Shop, Structural Shop and Paint Shop as well as the areas surrounding these facilities. The potential environmental concerns identified during the audit are summarized in (Table 1 and Figure 3).

The compliance audit discusses four USTs as summarized below:

- A 2,000-gallon UST used for gasoline storage located west of the former Maintenance Building was closed and removed in 1990. The audit indicates that the assessment performed at the time of the removal did not find contamination associated with the UST.
- An 885-gallon UST used for diesel storage located west of the former Maintenance Building was closed and removed in 1990. The audit indicates that the assessment performed at the time of the removal did not find contamination associated with the UST.
- A UST of unknown size was used to store “calcium chlorite sludges.” According to the Site operator at the time (Mr. J. Olsen), the UST had not been used for 20 years, and was drained prior to taking the UST out of service. The report does not indicate the location of the UST. The report does not indicate that the UST was removed. Note that based on all information available for the Site, the material stored in the UST was likely a sludge containing calcium hydroxide. Calcium hydroxide is a byproduct that is produced when calcium carbide is mixed with water to produce acetylene gas. Acetylene gas was known to have been produced at the Site for welding.

- An additional UST that had been out-of-service for 20 years. The report does not indicate the location, contents, or disposition of the UST.

Additionally, the compliance audit discusses an 80-gallon gasoline AST north of the Maintenance Building and an 800-gallon diesel AST located in the vicinity of a sand dryer (Figure 3). The ground surface beneath the ASTs was observed to be soil. No evidence of spills was noted.

2.7.2. *2001 Phase I Environmental Site Assessment*

LSI ADaPT (LSI) performed a Phase I ESA for the Site in June and July 2001 (LSI ADaPT, 2001). LSI performed the Phase I for Eidson Brown-Minneapolis Tank Company. The purpose of the ESA was to evaluate the Site for apparent recognized environmental conditions (RECs). LSI reviewed the 1998 Tetra Tech audit as part of their assessment, and performed a reconnaissance of the Site and observed adjacent portions of surrounding properties. The ESA documented many of the same features, activities, and potential environmental concerns identified in the 1998 Tetra Tech audit as well as additional Site features, activities and potential environmental concerns (Table 1 and Figure 3).

The LSI ADaPT report includes discussion of an additional UST at the Site. The LSI report discusses a 750-gallon UST visible in the Tank Shop (Figure 3) (identified as the “Plate Shop” in the report). The UST was reportedly filled with concrete in 1999. The UST was identified to be used to store bunker fuel for a boiler located west of the UST.

2.7.3. *2001 through 2007 Prospective Purchaser Environmental Evaluations*

Dalton, Olmsted & Fuglevand, Inc. (DOF) performed sampling and analysis of various media present at the Site between 2001 and 2007 to assess potential environmental concerns prior to a potential purchase of the property by BMT-NW (DOF, 2007). Investigation activities were performed to evaluate the following:

- Welding rod slag present on the shoreline;
- Migration of welding rod slag constituents into Budd Inlet;
- Calcium hydroxide sludge from production of acetylene;
- A 300-gallon UST formerly used for heating oil (diesel) adjacent to the southwest corner of the Tank Shop;
- Accumulations of sand blast grit associated with the Paint Shop; and
- Migration of sand blast grit into Budd Inlet.

Samples were collected from the surface of the Site, and from test pits and hand auger explorations (Figure 4). Four test pits (TP-1 through TP-4) and an unknown number of hand auger explorations were performed in the general area of welding slag and metal debris on the eastern side of the upland area of the property. Two samples (S1 and S3) that were collected from 2 feet below ground surface (bgs) were submitted for analysis of metals (i.e., arsenic, barium, cadmium, chromium, copper, lead, mercury, selenium and silver) and for the Toxicity Characteristic Leaching Procedure (TCLP) for metals (i.e., arsenic, barium, cadmium, chromium, lead, mercury, selenium and silver).

One sample (A3) that was collected from 0.5 feet bgs near an area of former acetylene gas generation west of the Maintenance Building was submitted for analysis of the same metals and TCLP metals analyses as samples S1 and S3.

Two soil samples (Mt. Pit and P1) that were collected from the soil surface beneath the Maintenance Building were submitted for analysis of the same metals as samples S1 and S3. Sample "Mt. Pit," which was collected from the bottom of the former maintenance pit, was also submitted for analysis of diesel- and heavy oil-range petroleum hydrocarbons.

A backhoe was used to investigate the suspected UST area south of the southwest corner of the Tank Shop. Two soil samples (U1 and U2) were collected from the area at 4 to 6 feet bgs and submitted for analysis of diesel- and oil-range petroleum hydrocarbons.

Samples of sand blast grit were collected in 2001 and 2007 for analysis of the same metals and TCLP metals as samples S1 and S3. The sand blast grit samples collected in 2007 were also analyzed for zinc.

Three sediment samples (Sed. 1 through Sed. 3) were collected from the sediment east of the upland portion of the Site and were submitted for analysis of the same metals as S1 and S3.

2.7.4. *2005 Phase II Environmental Site Assessment*

A Limited Phase II ESA was performed by Stemen Environmental, Inc. (Stemen) in October 2005 (Stemen, 2005). The purpose of the soil and groundwater investigation activities performed as part of the ESA was to assess the impacts of the current and/or past uses of the property and/or neighboring properties.

Sixteen borings were advanced to depths of approximately 12 feet bgs using a direct-push drill rig (S-1 through S-4, S-6, S-8 through S-11, and S-13 through S-19) (Figure 4). Four hand augers (S-22 through S-25) were advanced to depths ranging from approximately 3 feet to 8 feet bgs in the Maintenance Building. Two soil samples were collected from one of the direct-push borings (S-13), and one soil sample was collected from the remainder of the borings and hand auger explorations (a total of 22 soil samples). The depth of soil samples ranged from 3 to 12 feet bgs.

Twenty of the soil samples were analyzed for diesel-, heavy oil- and mineral oil-range petroleum hydrocarbons. Six of the samples were analyzed for gasoline-range petroleum hydrocarbons. Samples S-4 and S-7 were analyzed for benzene, ethylbenzene, toluene and xylene (BETX). Samples from S-3 and S-13 were analyzed for metals including arsenic, cadmium, chromium, lead and mercury; and samples from S-13 and S-18 were analyzed for volatile organic compounds (VOCs).

Discrete, one-time groundwater samples were collected from seven of the direct-push soil borings (S-1, S-4, S-8, S-13, S-15, S-16 and S-19). Since the Phase II ESA was performed, nine groundwater monitoring wells have been installed at the Site and multiple rounds of groundwater sampling have been performed as discussed in the following sections. Therefore, data generated from discrete, one-time groundwater samples collected from direct-push borings are not used as part of the RI/FS for the Site. The results from the one-time groundwater samples are presented in the RI/FS Work Plan (GeoEngineers, 2009).

2.7.5. *2005 Remedial Investigation*

Additional soil, groundwater and slag sampling was performed by Stemen in December 2005 (Stemen, 2006). A drill rig was used to advance five borings at the Site (MS-1 through MS-5). One soil sample was collected from MS-1 at a depth of 4 feet bgs, 12 feet south of the southeastern corner of the Tank Shop (Figure 4). In addition to the borings, a sample of welding slag (BS-1) was collected from the eastern portion of the Site using a hammer and chisel. The soil and slag samples were analyzed for metals including arsenic, cadmium, chromium, lead and mercury. In addition, the slag sample was analyzed using the TCLP for arsenic and lead.

Discrete, one-time groundwater samples were collected from the five borings. As discussed in Section 2.7.4, discrete, one-time groundwater results are not used as part of this RI/FS as groundwater monitoring wells were installed and sampled subsequent to this investigation. The results from the one-time groundwater samples are presented in the RI/FS Work Plan (GeoEngineers, 2009).

2.7.6. *2006 Groundwater Monitoring*

Seven groundwater monitoring wells (MW-1 through MW-7) were installed at the Site by Stemen in June and July 2006 (Stemen, 2007) (Figure 4). The depths of the tops of the well screens range from 2 to 3 feet bgs, and the depths of the bottoms of the wells range from 7 to 13 feet bgs. Three of the wells (MW-2, MW-3 and MW-5) are 3/4-inch-diameter wells, and four of the wells (MW-1, MW-4, MW-6 and MW-7) are 2-inch-diameter wells. The 3/4-inch-diameter wells utilize pre-packed filters. All of the wells are constructed from PVC casing and screen. The wells were surveyed by Hatton, Goddat, Pantier Licensed Surveyors. The vertical accuracy of the well survey was 0.01 feet (Stemen, 2007).

Groundwater monitoring was performed by Stemen using low-flow sampling techniques on July 11, 2006, October 28, 2006 and February 7, 2007. The wells were sampled after depth to water was measured. The samples were analyzed for a combination of analyses including gasoline-, diesel-, oil- and mineral oil-range petroleum hydrocarbons, semi-volatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), specific halogenated compounds, ethylene dibromide (EDB), and metals (total and dissolved arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver and zinc).

Two additional groundwater monitoring wells (MW-8 and MW-9) were later installed and several additional rounds of groundwater sampling were performed at the Site as discussed below. Therefore, the data generated from the July 11, 2006, October 28, 2006 and February 7, 2007 groundwater monitoring events are not used as part of this RI/FS, as more recent data is available. The results from the groundwater samples collected in 2006 and 2007 are presented in the RI/FS Work Plan (GeoEngineers, 2009).

2.7.7. *2008 Sediment Sampling*

Greylock and Integral Consulting, Inc. (Integral) performed sediment sampling in November 2007 (Greylock, 2008b). The purpose of the sampling was to investigate possible environmental liabilities associated with the sediment in the marine area of the property. Samples were collected from eight locations (RGS1 through RGS8) from the top 10 centimeters (cm) (approximately

4 inches) of sediment (Figure 4). Sample descriptions were recorded, including an estimation of the percentage of wood debris in the samples. Samples were submitted for a combination of conventionals (including total volatile solids [TVS] and total organic carbon [TOC]), metals (i.e., arsenic, cadmium, chromium, copper, lead, mercury, silver and zinc), tributyltin (TBT), diesel and oil-range petroleum hydrocarbons, SVOCs and PCBs.

2.7.8. *2008 Soil, Groundwater, Stormwater, and Sediment Sampling*

An additional investigation was performed by Greylock in February and March 2008 (Greylock, 2008b). The investigation included a focused geophysical survey on a portion of the Site, and additional soil, groundwater and sediment sampling. Stormwater samples were also collected as part of the investigation.

The geophysical survey used ground penetrating radar and an electromagnetic survey to investigate the area adjacent to the southwest corner of the Tank Shop and west of the Maintenance Building for USTs. The report presenting the results of the geophysical survey is included in Appendix B.

Soil sampling included the collection of 42 soil samples from 25 locations at the Site (Figure 4). Thirty-six samples (“RGB” samples) were collected from 22 direct-push borings at depths ranging between the ground surface and 12 feet bgs. Five samples (”Ditch” samples) were collected from two hand auger borings in the ditch in the northern portion of the Site. One sample of sand blast grit (PS Grit) was grabbed from the surface inside the Paint Shop. The samples were submitted for a combination of analyses including gasoline-, diesel- and oil-range petroleum hydrocarbons, VOCs, SVOCs and metals (i.e., arsenic, cadmium, chromium, lead, mercury and zinc).

Two of the borings (MW-8 and MW-9) were completed as additional groundwater monitoring wells at the Site (Figure 4). One round of groundwater monitoring from all nine monitoring wells present at the Site was performed in February 2008. Groundwater samples were submitted for analysis of gasoline-, diesel- and oil-range petroleum hydrocarbons, VOCs, SVOCs and dissolved metals (i.e., arsenic, cadmium, chromium, copper, lead, mercury and zinc).

Two stormwater samples (SW1 and SW2) were collected from different stormwater discharge locations in the northern portion of the Site. Sample SW1 was collected from the ditch in the northern portion of the Site, and SW2 was collected from the outfall of the 12-inch diameter stormwater pipe south of the elevated rail crane structure. SW1 was submitted for analysis of gasoline-, diesel- and heavy oil-range petroleum hydrocarbons, VOCs, SVOCs and total metals (i.e., arsenic, cadmium, chromium, copper, lead, mercury and zinc). Sample SW2 was submitted for analysis of total metals only. The other two Site outfalls (the 30-inch-diameter and 12-inch-diameter stormwater pipes) were not sampled because no flow was observed on the day of sampling.

Surface and subsurface sediment sampling was performed as part of the additional investigation. Surface sediment samples (0 to 10 cm) were analyzed from five locations. Two of the surface sediment samples roughly coincided with previous surface sediment sampling locations (RGS1 and RGS2). The remaining three surface sediment samples were collected from new locations (RGS9, RGS10 and RGS11). Sample location RGS11 is located on the Hardel Plywood Site adjacent to the

Reliable Steel Site. Subsurface samples (sediment cores) were collected and analyzed from four locations (RGS1, RGS2, RGS7 and RGS8). Sediment cores varied in length from 1.5 feet to 3.5 feet. Surface and subsurface sediment samples were submitted for a combination of analyses including conventionals, metals (i.e., arsenic, cadmium, chromium, copper, lead, mercury, silver and zinc), diesel- and oil-range petroleum hydrocarbons and SVOCs.

2.7.9. *2007 Sediment Characterization Study, Budd Inlet, Olympia, Washington*

Characterization of sediment in Budd Inlet was performed by Ecology in 2007 (SAIC, 2008). Ecology's Sediment Characterization Study, Budd Inlet, Olympia, Washington, included three sample locations within the intertidal portion of the Site. Three surface sediment samples (0 to 10 cm) were collected from intertidal locations T1-Sed, T1B-Sed and BI-S32 at the Site (Figure 4) and analyzed for conventionals, SMS chemicals of concern (metals, SVOCs and PCBs) and dioxins and furans. Additionally, tissue samples from shrimp and bent nose clams were collected from the location B1-Tissue1 (i.e., co-located T1-Sed) and tissue samples from little neck clams were collected from the location BI-Tissue1B (i.e., co-located T1B-Sed) and analyzed for dioxins and furans. The results for dioxin and furan analyses for sediment and tissue samples are presented in Ecology's Sediment Characterization Study, Budd Inlet, Olympia, Washington Report (SAIC, 2008).

2.7.10. *2013 Sediment Sampling, Port of Olympia, Budd Inlet, Olympia, Washington*

Characterization of sediment in Budd Inlet was performed by Anchor QEA on behalf of the Port of Olympia in 2013. The investigation included collection of samples from four locations in the vicinity of the Reliable Steel Site. Two samples (SS-21 and SS-22) were located east of the Site and two samples (SS-26 and SS-27) were located north of the Site and east of the Hardel Mutual Plywood Site. The work included collecting surface sediment samples (0 to 10 cm) at the four locations and analyzing the samples for conventionals (i.e., TOC and grain size), SMS SVOCs, and dioxins and furans. The results of the study had not been presented in a report as of the date of completion of this report.

2.7.11. *2007 Former Hardel Plywood Site, Draft Remedial Investigation Report*

Remedial investigation activities were performed at the Hardel Plywood Site between July and September 2007 (Greylock, 2007). The Former Hardel Plywood Site Draft Remedial Investigation Report included the results for one surface sediment (0 to 10 cm) sample location (GS-04) approximately 130 feet north of the Reliable Steel Site (Figure 4). The sample collected from this location was analyzed for conventionals and SMS chemicals of concern (metals, SVOCs and PCBs) and dioxins and furans. The results for dioxin and furan analyses for sediment samples are presented in The Former Hardel Plywood Site Draft Remedial Investigation Report (Greylock, 2007).

2.8. Previous Environmental Investigation Results and Data Gaps

The results from the previous environmental assessments and investigations were reviewed as part of the preparation of the RI/FS Work Plan (GeoEngineers, 2009) to identify data gaps for areas of potential environmental concern and in the characterization of the nature and extent of contamination at the Site. The analytical results from the previous investigations were compared to screening levels that included MTCA Method A and/or B cleanup levels for soil, MTCA Method A and B cleanup levels and surface water quality criteria for groundwater, surface water quality criteria for stormwater runoff, and SMS criteria for sediment to identify contaminants of potential concern (COPCs) for the Site. The review of the results of previous environmental assessments and investigations and the comparison of the analytical results for soil, groundwater, stormwater runoff, and sediment to the screening levels is presented in the RI/FS Work Plan (GeoEngineers, 2009). The following sections provide a summary of the data gaps presented in the RI/FS Work Plan.

2.8.1. *Soil*

The data gaps identified for soil at the Maintenance Building and southern portion of Site included the following:

- Presence of calcium hydroxide in soil: Acetylene generation for welding was identified to have occurred outside and adjacent to the west end of the Maintenance Building. A byproduct of acetylene generation is calcium hydroxide. Previous investigations identified a white layer of "spent carbide waste" in soil in the area outside of and adjacent to the west end of the Maintenance Building. Lead and cadmium were detected at concentrations greater than the MTCA Method A soil CUL in sample A3 (Figure 4) collected from this white layer. Boring RGB18 on the north side of the Maintenance Building, which was also observed to contain white layers from 5 feet bgs to 5.5 feet bgs, contained concentrations of carcinogenic polycyclic aromatic hydrocarbons (cPAHs) that were greater than the MTCA Method A CUL as discussed below. The COPCs for calcium carbide material were therefore identified to include lead, cadmium, and cPAHs.
- A potential UST was identified by a geophysical survey west of the Maintenance Building and south of the acetylene generation area. The UST may have been used to store calcium hydroxide waste. The report presenting the results of the geophysical survey is provided in Appendix B.
- Extent of lead contamination in soil beneath the Maintenance Building: Lead concentrations greater than the MTCA Method A soil CUL were detected in soil present beneath the Maintenance Building ("Mt. Pit" and P1) (Figure 4). Lead concentrations for samples collected from locations around the Maintenance Building (i.e., S-13, RGB10, RGB12, RGB13, RGB14, RGB15, RGB18 and RGB19) were less than the MTCA CUL.
- Extent of contamination of soil with gasoline-range petroleum hydrocarbons: Gasoline-range petroleum hydrocarbons were detected at a concentration greater than the MTCA Method A soil CUL in a sample collected from a former equipment/vehicle maintenance pit (S-24) (Figure 4) located in the northeast portion of the Maintenance Building.
- Presence of PCBs in soil adjacent to transformer utility pole: Three pole-mounted electrical transformers were located west of the Maintenance Building (Figure 3). One of the transformers malfunctioned in 1992 and oil spilled on the ground adjacent to the transformer utility pole.
- Extent of soil contaminated with gasoline-range petroleum hydrocarbons and cPAHs: Gasoline-range petroleum hydrocarbons were detected at a concentration greater than the MTCA Method A soil CUL in a sample collected from the former paint and solvent storage area (S-13) (Figure 4) located north of the Maintenance Building. Additionally, a sample located adjacent to the Maintenance Building (RGB18) contained cPAHs at a concentration greater than the

MTCA Method A CUL, and white layers were observed from 5 feet bgs to 5.5 feet bgs in the boring.

- Potential contamination of soil in a crane shed: Staining was observed in soil present in a crane shed that was formerly located on the south side of the Maintenance Building (Figure 3). The COPCs for soil in the crane shed were identified to be gasoline-, diesel- and oil-range petroleum hydrocarbons.
- Potential contamination of soil at the former location of a used solvent hopper: A used solvent hopper was identified to be present on the southern portion of the Site (Figure 3). The COPCs for soil at the former location of the solvent hopper are VOCs.

The data gaps identified for soil at the Tank Shop, Structural Shop, and associated areas included the following:

- Extent of soil contaminated with diesel-range petroleum hydrocarbons: Diesel-range petroleum hydrocarbons were detected at concentrations greater than the MTCA Method A soil CUL in samples collected from the area located adjacent to the southwest corner of the Tank Shop. The contamination is likely associated with the suspected 300-gallon UST identified at that location (Figure 3). The COPCs for soil in the area are diesel-range petroleum hydrocarbons. Samples U1, S-8, S-11, RGB5 (at 5 to 6 feet bgs) and RGB7 (at 6 to 7 feet bgs) (Figure 4) contain diesel-range petroleum hydrocarbons at concentrations greater than the MTCA Method A CUL of 2,000 mg/kg. The locations where diesel-range petroleum hydrocarbons were either not detected, or detected at concentration less than the Method A CUL, include U2, S-9, S-10, RGB5 (8 feet bgs), RGB6, RGB7 (12 feet bgs), RGB8 and RGB9. These sample locations delineate the east side, west side and vertical extent of the contaminated area.
- Potential contamination of soil adjacent to the shear machine: Staining was observed in soil adjacent to the shear machine in the Structural Shop (Figure 3). The COPCs for soil adjacent to the shear machine are oil-range petroleum hydrocarbons.
- Potential contamination of soil at the former forklift parking area: Staining was observed in soil present at the former forklift parking area south of the Tank Shop (Figure 3). The COPCs for soil at the former forklift parking area are gasoline-, diesel- and oil-range petroleum hydrocarbons.

The data gaps identified for soil at the Paint Shop and northern portion of the Site included the following:

- Extent of soil contaminated with cPAHs: cPAHs were detected at concentrations greater than the MTCA Method A CUL in soil samples collected from the Paint Shop area and the east end of the Structural Shop (RGB2, RGB3, and RGB4) (Figure 4). Additionally, cPAHs were detected at concentrations greater than the MTCA Method A CUL in soil samples collected from the drainage ditch located on the northern portion of the Site (Ditch1 and Ditch2).
- Extent of soil contaminated with mercury: Mercury was detected in one sample collected east of the Paint Shop (RGB1) (Figure 4) at a concentration greater than the MTCA Method A soil CUL.

- Extent of soil contaminated with diesel-range petroleum hydrocarbons: Diesel-range petroleum hydrocarbons were detected at a concentration greater than the MTCA Method A soil CUL in a sample collected from the area located east of the Paint Shop (RGB16) (Figure 4). Additionally, diesel-range petroleum hydrocarbons were also present in the drainage ditch located on the northern portion of the Site (Ditch2).

2.8.2. *Groundwater*

The data gaps identified for groundwater included the following:

- Nature of chemical concentrations in groundwater: Only one comprehensive round of low flow groundwater sampling and analysis from all nine monitoring wells had been performed at the Site as of 2009. Chemicals including metals, petroleum hydrocarbons, VOCs and bis(2-ethylhexyl)phthalate (DEHP) had been detected in groundwater collected at the Site. Additionally, the detection limits for mercury, cPAHs, and DEHP were greater than the screening level in previous samples. COPCs for groundwater were identified to include metals, petroleum hydrocarbons, VOCs, cPAHs and phthalates.

2.8.3. *Stormwater*

The data gaps identified for stormwater runoff included the following:

- Presence of chemicals in stormwater: Only two of the four known stormwater discharge locations had previously been sampled as of 2009. Chemicals including metals and petroleum hydrocarbons had been detected in stormwater collected at the Site. Additionally, the detection limits for several metals, cPAHs, and DEHP were greater than the screening level in previous samples. COPCs for stormwater runoff were identified to include metals, petroleum hydrocarbons, cPAHs, and phthalates.

2.8.4. *Sediment*

The data gaps identified for sediment included the following:

- Nature and extent of petroleum hydrocarbons in sediment: Petroleum hydrocarbons were detected in sediment at RGS4 and RGS8 (Figure 4) at concentrations greater than the screening criteria (i.e., 100 mg/kg). The concentration of petroleum hydrocarbons at RGS4 (106 mg/kg) was only slightly greater than the screening criteria.
- Extent of mercury in subsurface sediment: Mercury was detected at concentrations greater than SMS criteria in subsurface sediment at RGS7 (Figure 4).
- Potential impacts from wood in sediment: Wood had been observed in subsurface sediment present at the Reliable Steel Site. The nature and extent of wood was not fully characterized.
- Nature of chemicals in catch basin sediments: Catch basin sediments had not been sampled as of 2009; however, catch basin sediments in catch basins connected to the drainage ditch located in the northern portion of the Site were suspected of being a potential source of DEHP to the Site.

The RI/FS Work Plan included sampling and analysis activities for soil, groundwater, stormwater runoff, and sediment to address each of the data gaps presented in the Work Plan. The following sections describe the RI investigation activities that were performed to fill the data gaps identified at the Site.

3.0 REMEDIAL INVESTIGATION ACTIVITIES

3.1. General

Remedial investigation activities were performed in 2010 by Greylock Consulting for BOJO Investments LLC. The results of the investigation activities were presented in a report prepared by Greylock Consulting in 2011 (Greylock, 2011). Supplemental investigation activities were also performed by Ecology in 2013 to further define the nature and extent of contamination at the Site. The investigation activities performed by Greylock Consulting and Ecology are described in the following sections. Figure 5 presents the locations where samples were collected as part of the investigations. The analytical laboratory reports resulting from analysis of samples as part of the investigations performed by Greylock Consulting and Ecology are provided in Appendix C. Data collected as part of the investigations are used in conjunction with the data from previous environmental investigations to characterize the nature and extent of contamination at the Site.

3.2. 2010 Greylock Consulting Investigation

Greylock Consulting performed an investigation of soil, groundwater, stormwater runoff, and sediment at the Site in 2010. Investigation activities performed by Greylock Consulting included the following:

- Soil exploration at 30 locations and collection and analysis of soil samples.
- Collection and analysis of groundwater samples from the nine monitoring wells at the Site.
- Collection and analysis of stormwater runoff samples from the four stormwater outfalls at the Site.
- Collection and analysis of surface and subsurface sediment samples from seven locations at the Site.

Field activities were performed between July 12 and October 20, 2010. The investigation activities are described further in the following sections.

3.2.1. *Soil Investigation*

The soil investigation consisted of advancing soil borings at 30 locations (RI-1 through RI-30) (Figure 5) using a direct push drill rig and hand auger tools to fill data gaps identified in the RI/FS Work Plan and further define the nature and extent of soil contamination. Borings were advanced to depths ranging from 4 to 12 feet bgs. Borings were continuously logged, soil was field screened for evidence of contamination, and one to five soil samples were collected from each boring for submission to Friedman & Bruya Laboratory for a combination of the following chemical analyses:

- Metals (arsenic, chromium, copper, lead, mercury, tin and zinc) by EPA Methods 6010/7060/7470/7471/7421;

- Gasoline-range petroleum hydrocarbons by Ecology method NWTPH-Gx;
- BETX by EPA Method 8021;
- Diesel and oil-range petroleum hydrocarbons by Ecology method NWTPH-Dx;
- SVOCs by EPA Method 8270;
- VOCs by EPA Method 8260; and
- PCBs by EPA Method 8082 (modified).

The boring logs from the investigation performed by Greylock Consulting are presented in Appendix A

3.2.2. *Groundwater Investigation*

The groundwater investigation consisted of collecting groundwater samples from monitoring wells MW-1 through MW-9 (Figure 5) on October 6, 2010. Additionally, depth-to-water measurements were taken in each well within a relatively short timespan (approximately 30 minutes) on two occasions to evaluate the groundwater flow direction(s) and gradients. Depth-to-water measurements were performed during a high tide on September 16, 2010 and prior to low tide on October 6, 2010 (Greylock, 2011). Depth-to-water measurements were combined with surveyed well elevation data to create inferred and generalized groundwater contour maps for each day/time when groundwater was measured. A table containing the water level measurements is provided in Appendix D. Groundwater occurrence, flow direction, and gradients are discussed in Section 6.1.2.

Groundwater samples MW-1 through MW-9 and a field duplicate sample (i.e., sample MW-10 that was a field duplicate of MW-8) were collected using low-flow/low-turbidity sampling techniques. A peristaltic pump and disposable polyethylene tubing was used to purge and sample groundwater from each well at a rate of approximately 500 mL per minute. Samples were collected from approximately the mid-point of the screened interval of each well. Groundwater quality parameters were monitored using a water quality meter and flow-through cell. Samples were submitted to Friedman & Bruya Laboratory for a combination of the following chemical analyses (Greylock, 2011):

- Total and dissolved metals (arsenic, cadmium, chromium, copper, lead, mercury, and zinc) by EPA Methods 6010/7060/7470/7471/7421;
- Gasoline-range petroleum hydrocarbons by Ecology method NWTPH-Gx;
- BETX by EPA Method 8021;
- Diesel and oil-range petroleum hydrocarbons by Ecology method NWTPH-Dx;
- cPAHs by EPA Method 8270-SIM;
- VOCs by EPA Method 8260; and
- Total dissolved solids (TDS) by EPA Method 160.1.

3.2.3. *Stormwater Investigation*

The investigation of stormwater runoff consisted of collecting stormwater samples from the four stormwater outfall locations during a stormwater discharge event on September 16, 2010. Samples RI-SW-1 through RI-SW-4 were collected in general accordance with Ecology's guidance document, "How to do Stormwater Sampling – A guide for Industrial Facilities." The pH of the stormwater was measured in the field using pH indicator paper. The discharge locations that were sampled included the following (Figure 5):

- The 8-inch diameter outfall pipe that discharges into the drainage ditch located on the northern portion of the Site (RI-SW-1);
- The 12-inch-diameter outfall pipe located south of the elevated crane structure (RI-SW-2);
- The 8-inch-diameter outfall pipe located east of the Structural Shop (RI-SW-3); and
- The 30-inch-diameter outfall pipe located east of the former Maintenance Building (RI-SW-4).

Stormwater runoff samples were submitted to Friedman & Bruya Laboratory for the following chemical analyses:

- Total and dissolved metals (arsenic, cadmium, chromium, copper, lead, mercury, and zinc) by EPA Methods 6010/7060/7470/7471/7421;
- Diesel and heavy oil-range petroleum hydrocarbons by Ecology method NWTPH-Dx;
- cPAHs and phthalates by EPA Method 8270-SIM; and
- Turbidity.

3.2.4. *Sediment Investigation*

The sediment investigation included collection of surface sediment samples (0-10 cm) from seven locations (RI-S-1 through RI-S-7) (Figure 5) on July 12, 2010. Subsurface sediment sampling was also performed at three of the locations (RI-S-2 through RI-S-4).

The surface sediment samples were collected by hand. Subsurface sediment samples were collected at depths ranging between the mudline and 8 feet below the mudline using a hand probe. During sampling, the sediment characteristics and profiles were logged and the sediment was field screened for evidence of contamination. One surface sediment sample was submitted from each surface sediment sample location and two to three samples were submitted from each of the three subsurface sediment sampling locations. Sediment samples were submitted to Analytical Resources Inc. Laboratory for a combination of the following chemical analyses:

- Mercury by EPA Method 7471;
- Hydrocarbon Identification by NWTPH-HCID;
- PAHs by EPA Method 8270; and
- Conventionals (TOC, TVS, bulk ammonia and sulfides).

The sediment sample logs are presented in Appendix A.

3.2.5. *Deviations from Work Plan and Additional Data Gaps*

Deviations from the Final Work Plan occurred and data gaps in the characterization of the nature and extent of contamination remained upon completion of the investigation performed by in 2010. Deviations from the Final Work Plan for the Reliable Steel Site included the following:

- The soil sample collected from RI-1 was analyzed for gasoline-range petroleum hydrocarbons and BETX instead of VOCs.
- Phthalate analyses were not performed on groundwater samples.

Data gaps in the characterization of the extent of contamination that remained upon completion of the investigation performed in 2010 included the following;

- The extent of petroleum hydrocarbon contamination in soil in the former crane shed had not been delineated.
- The extent of PAHs in soil at the Site had not been delineated.
- The extent of mercury in subsurface sediment had not been delineated.
- The presence of VOC contamination near the former solvent hopper had not been evaluated.
- The presence of bis(2-ethylhexyl phthalate in groundwater at the Site had not been evaluated.

Ecology performed supplemental investigation activities at the Site to address deviations from the Final Work Plan and the data gaps that remained in the characterization of the extent of contamination. The scope of the supplemental investigation activities performed by Ecology is summarized in the following section.

3.3. 2013 Ecology Supplemental Investigation

Ecology performed supplemental soil, groundwater and sediment sampling at the Site in 2013. Investigation activities performed by Ecology included the following:

- Soil exploration at nine locations and collection and analysis of soil samples;
- Collection and analysis of groundwater samples from four monitoring wells; and
- Collection and analysis of a subsurface sediment sample at one location.

The investigation activities were performed on April 10th and April 11th, 2013. The investigation activities are described in the following sections.

3.3.1. *Soil Investigation*

The soil investigation consisted of advancing soil borings at nine locations (EC-1 through EC-7, and EC-9 and EC-10) (Figure 5) using a hand auger. An additional boring was attempted (i.e., EC-8) but met refusal due to compacted gravel at the surface. Boring EC-3 was performed in one location (EC-3A), but samples were not collected at this location as petroleum hydrocarbon contamination was observed in soil and the purpose of the sampling was to define the extent of petroleum hydrocarbon contamination the former crane shed area. Therefore, an additional boring (EC-3B) was advanced and a soil sample was collected approximately 20 feet to the south of the original location. Borings were advanced to depths ranging from 3 to 4 feet bgs. The soil borings were continuously logged and the soil was field screened for evidence of contamination. One to two soil samples were collected from each boring and submitted to Ecology's Manchester Laboratory for a combination of the following chemical analyses:

- Diesel and heavy oil-range petroleum hydrocarbons by Ecology method NWTPH-Dx;
- VOCs by EPA 8260;
- SVOCs by EPA 8270; and
- Pentachlorophenol by EPA Method 8082.

The soil boring logs from the investigation are provided in Appendix A.

3.3.2. *Groundwater Investigation*

The groundwater investigation consisted of collecting groundwater samples from monitoring wells MW-5, MW-7, MW-8, and MW-9 and a duplicate sample (i.e., sample MW-10 that was a field duplicate of MW-8) on April 10, 2013. Groundwater samples were collected using low-flow/low-turbidity sampling techniques. A peristaltic pump and disposable polyethylene tubing was used to purge and sample groundwater from each well at a rate of approximately 500 mL per minute. Samples were collected from approximately the mid-point of the screened interval of each well. Groundwater quality parameters were monitored using a water quality meter and flow-through cell. Samples were submitted to Ecology's Manchester Laboratory for a combination of the following chemical analyses:

- PAHs and phthalates by EPA Method 8270-SIM; and
- Total and dissolved mercury by EPA Method 245.7.

3.3.3. *Sediment Investigation*

The sediment investigation included collection of a subsurface sediment sample from one location in the marine area (EC-11) (Figure 5). The sediment was sampled to a depth of 3.2 feet below the mudline using hand tools. During sampling, the sediment characteristics and profiles were logged and the sediment was field screened for evidence of contamination. One subsurface sediment sample was submitted to Ecology's Manchester Laboratory for mercury by EPA Method 245.5.

The sediment sample logs are presented in Appendix A.

4.0 CONCEPTUAL SITE MODELS

Conceptual site models were developed to evaluate contaminant transport and exposure pathways. A conceptual site contaminant transport model was developed to describe historical releases of hazardous substances at the Site and the subsequent potential migration of those hazardous substances in environmental media. The conceptual site contaminant transport model is presented in Section 4.1. Separate conceptual site exposure models were developed to describe potential exposure pathways for human and ecological receptors. The conceptual site exposure models are presented in Section 4.2.

4.1. Conceptual Site Contaminant Transport Model

The potential contaminant sources and transport mechanisms identified for the Site are the following:

- Previous Site operations including lumber mill activities, boat building, and steel fabrication and painting resulted in spills and releases of petroleum hydrocarbons, metal debris, and other materials and contaminants to upland soil and marine sediment. Past releases represent potential sources of contamination to soil, groundwater, stormwater runoff and sediment.
- Contaminants in soil leach to the groundwater through dissolution into groundwater or dissolution into infiltrating/percolating stormwater and subsequent downward migration to groundwater. Groundwater flows towards Budd Inlet where it likely discharges into the intertidal area.
- Stormwater runoff from the Site and erosion of soil transports contaminants to surface water and sediment in Budd Inlet. Stormwater runs off of the Site via overland flow and through the existing stormwater conveyance features and discharges at the four outfalls at the Site.
- Waves and tidal fluctuations along the shoreline erode contaminated soil and/or intertidal sediment. Shoreline erosion transports contaminants to sediments at and adjacent to the Site.

4.2. Conceptual Site Exposure Models

The conceptual site exposure models were developed to identify exposure pathways and potential human and ecological receptors for contaminants detected in environmental media at the Site. The conceptual site exposure models were developed based on the Site physical features, historical activities, and field observations, and are depicted graphically in Figure 6 (human receptors) and Figure 7 (ecological receptors).

4.2.1. *Potentially Complete Exposure Pathways – Human Receptors*

Potential future use of the Site is for commercial and residential purposes. Human receptors that could potentially be exposed to contaminants at the Site include site workers, residents, and visitors. Because residential exposures and associated risks are typically greater than exposures/risks to site workers and visitors, a hypothetical residential scenario (i.e., unrestricted land use) was assumed for the purpose of assessing potential human health risks in this RI. The following sections present the potentially complete exposure pathways for human receptors.

4.2.1.1. SOIL

Potentially complete soil-based exposure pathways exist for humans in the upland area of the Site via incidental soil ingestion, dermal contact with soil, and inhalation of particulates. In accordance with WAC 173-340-740, human health exposure to on-Site soil is evaluated based on the direct contact with soil exposure pathway (i.e., incidental soil ingestion; unrestricted land use). Proposed soil cleanup levels applicable to this exposure pathway are discussed in Section 5.1.1.

A potentially complete exposure pathway exists for humans in the upland area of the Site via vapor intrusion and inhalation of volatile contaminants where volatile contaminants are present. Specific measurements of soil vapor were not collected as part of the RI. However, potential soil vapor intrusion and inhalation of volatile contaminants is discussed as part of the nature and extent of contamination (see Sections 6.3.2 and 6.3.6).

4.2.1.2. GROUNDWATER

Exposure of human receptors to contaminants in groundwater via direct contact and ingestion from groundwater use is not a complete exposure pathway. Groundwater at the Site is not used for potable or drinking water and based on the availability of municipal water supply and the proximity to marine surface water, groundwater at the Site is not a reasonable future source of potable or drinking water.

Groundwater from the Site is assumed to discharge in the shoreline area of the Site. Human exposure from occasional dermal contact or incidental ingestion of groundwater discharging in the shoreline area is assumed to be minimal as groundwater discharges or seeps in the shoreline area that would provide an exposure point were not identified at the Site. Therefore, these pathways are considered “potentially complete but not significant.”

A potentially complete exposure pathway exists for human exposure to contaminants in groundwater discharging to surface water in Budd Inlet via consumption of fish or shellfish. Proposed groundwater cleanup levels applicable to this exposure pathway are discussed in Section 5.1.2.

A potentially complete exposure pathway exists for humans in the upland area of the Site via vapor intrusion and inhalation of volatile contaminants where volatile contaminants are present. Potential soil vapor intrusion and inhalation of volatile contaminants is discussed as part of the nature and extent of contamination.

4.2.1.3. STORMWATER

Stormwater falling on the Site infiltrates in unpaved areas or flows towards stormwater collection and conveyance features and Budd Inlet. Stormwater collection and conveyance features present at the Site include catch basins and pipes and four stormwater outfalls. A potentially complete pathway currently exists for human exposure from occasional dermal contact or incidental ingestion of contaminated stormwater runoff. Remediation of the upland will be required prior to future Site use. Remedial actions for Site soil will include Site capping or removal of contaminated soil and replacement of the existing stormwater collection and conveyance system. The replacement stormwater system will be constructed to not allow contaminants from Site media to enter stormwater running off of the Site. Therefore, a complete exposure pathway for human receptors to stormwater runoff contaminated by Site media will not exist in the future. As a result, exposure of human receptors to stormwater runoff contaminated by Site media is not considered further in the RI.

A potentially complete pathway exists for human exposure to contaminants in stormwater runoff discharging to surface water in Budd Inlet via consumption of fish or shellfish. Proposed screening levels applicable to this exposure pathway are discussed in Section 5.1.3.

4.2.1.4. SEDIMENT

Potentially complete exposure pathways exist for human exposure to contaminants in intertidal sediments via incidental ingestion and dermal contact with sediment and ingestion of shellfish.

Screening levels applicable to the direct contact exposure pathways (i.e., ingestion and dermal contact) are discussed in Section 5.1.4.

4.2.2. *Potentially Complete Exposure Pathways – Ecological Receptors*

The following sections present the potentially complete exposure pathways for ecological receptors.

4.2.2.1. SOIL

The upland area of the Site is currently covered with asphalt pavement, concrete, and compact gravel and generally does not provide suitable habitat for ecological receptors. Remediation of upland soil will be required prior to future Site use. Remedial actions for Site soil will include Site capping or removal of contaminated soil. Therefore, a complete exposure pathway for ecological receptors to Site soil does not currently exist and will not exist in the future. As a result, exposure of ecological receptors to contaminated soil is not considered further in the RI.

4.2.2.2. GROUNDWATER

Potentially complete exposure pathways exist for exposure of terrestrial ecological receptors to contaminants in groundwater via direct contact. However, because of the depth to groundwater at the Site (generally 3 to 4 feet bgs), these exposure pathways are considered insignificant.

Ecological receptors may be exposed to contaminants in groundwater indirectly at locations where groundwater discharges to surface water in Budd Inlet. Therefore, ecological exposure to groundwater is evaluated via potential surface water exposure. Proposed groundwater cleanup levels applicable to this exposure pathway are discussed in Section 5.1.2.

4.2.2.3. STORMWATER

A complete potential pathway exists for benthic invertebrate and fish exposure to contaminants in stormwater runoff. Numerical criteria applicable to these exposure pathways that were used to derive proposed stormwater runoff screening levels are discussed in Section 5.1.3.

4.2.2.4. SEDIMENT

Complete potential exposure pathways exist for exposure of aquatic ecological receptors to contaminants in sediment via direct contact and consumption of benthic invertebrates and/or fish. Numerical criteria applicable to these exposure pathways that were used to derive proposed sediment cleanup levels are discussed in Section 5.1.4.

5.0 DEVELOPMENT OF 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. Typically, proposed cleanup standards are developed during the RI phase of a cleanup project, whereas proposed final cleanup standards are developed during the FS and are used in the development and evaluation of cleanup action alternatives. The final cleanup standards are typically established by Ecology in the Cleanup Action Plan (CAP).

Proposed cleanup levels were identified in the 2009 RI/FS Work Plan to evaluate data from previous investigations. The proposed cleanup levels were developed for Site soil, groundwater, stormwater runoff, and sediment (GeoEngineers, 2009). The proposed cleanup levels presented in this RI/FS report are based on the proposed cleanup levels developed in the RI/FS Work Plan and incorporate updates to regulatory criteria (i.e., based on updates to Ecology's Cleanup Levels and Risk Calculations [CLARC] online database). Consistent with the MTCA Cleanup Regulation (Chapter 173-340 WAC; Ecology, 2007a), proposed cleanup levels were developed based on identified potential exposure pathways for human health and ecological receptors consistent with the current and future land use of the Site. Potential exposure pathways are discussed in Section 4.0.

Since this report presents the RI and FS results in a single document, and since the RI description of the nature and extent of contamination is most meaningful when discussed in the context of Proposed cleanup levels and points of compliance for the Site, the proposed cleanup standards are presented in this section rather than in the FS section (Section 7.0) of the RI/FS report. The FS uses these cleanup standards for developing and evaluating cleanup action alternatives.

The specific regulatory criteria utilized in developing proposed cleanup levels for soil, groundwater, stormwater runoff, and sediment are presented in the following Sections 5.1.1 through 5.1.4. The proposed points of compliance are described in Section 5.2.

5.1. Proposed Cleanup Levels

5.1.1. *Soil*

The proposed soil cleanup levels are presented in Table 2. Based on current zoning and anticipated future use, proposed cleanup levels for Site soil were developed for unrestricted land use and were based on following regulatory criteria:

- MTCA Method A Soil Cleanup Levels. MTCA Method A values for unrestricted land uses are published in MTCA Table 740-1 (Chapter 173-340-900 WAC).
- MTCA Method B Soil Cleanup Levels. MTCA Method B carcinogen and non-carcinogen values for human health protection, which are based on unrestricted land use (incidental soil ingestion) exposure scenario, were obtained from Ecology's CLARC online database.

In addition to the regulatory criteria listed above, Washington State soil background concentrations for metals (Ecology, 1994) are considered in accordance with WAC 173-340-709 and WAC 173-340-705(6).

In general, the lowest of the regulatory criteria listed above were identified as the proposed soil cleanup levels with the following exception.

- If the lowest regulatory criterion was less than the background concentration, the proposed soil cleanup level was set at the background concentration.

5.1.2. *Groundwater*

The proposed groundwater cleanup levels are presented in Table 3. Groundwater at the Site is not used for drinking water at this time. Based on the availability of municipal water supply and the proximity to marine surface water, groundwater at the Site is not a reasonable future source of drinking water. Therefore, based on the proximity of the Site to marine surface water (Budd Inlet), proposed cleanup levels for groundwater are developed for protection of marine surface water and are selected from available state and federal surface water criteria listed below:

- Water Quality Standards for Surface Waters of the State of Washington. These marine surface water criteria for protection of aquatic life (acute and chronic exposures) are published in Chapter 173-201A WAC.
- National Toxics Rule Federal Water Quality Criteria. These marine surface water criteria for protection of aquatic life (acute and chronic exposures) and human health (fish consumption) are published in 40 C.F.R. 131.36.
- Federal National Recommended Water Quality Criteria. These marine surface water criteria for protection of aquatic life (acute and chronic exposures) and human health (fish consumption) are established under Section 304 of the Clean Water Act.
- MTCA Method B Formula Values. MTCA Method B surface water carcinogen and non-carcinogen standard formula values for human health protection, which are based on human consumption of fish, were obtained from Ecology’s CLARC online database.

In general, the lowest of the regulatory criterion listed above are identified as the proposed groundwater cleanup level with the following exceptions:

- If the lowest published regulatory criterion is less than the background concentration, the proposed groundwater cleanup level is set at the background concentration.
- Numerical surface water criteria have not been established for gasoline-, diesel- and heavy oil-range petroleum hydrocarbons; therefore, as allowed by WAC 173-340-730(3)(b)(iii)(C), the Method A groundwater value are used as proposed groundwater cleanup levels for these constituents.

5.1.3. *Stormwater*

The proposed stormwater runoff screening levels are presented in Table 4. The proposed cleanup levels developed for groundwater that were developed for protection of surface water are adopted as proposed stormwater runoff screening levels for the Site with following exceptions:

- Available industrial stormwater general permit benchmark criteria for total metals, excluding mercury, were also used as proposed stormwater runoff screening levels.

5.1.4. *Sediment*

The proposed sediment cleanup levels are presented in Table 5 and are based on following regulatory criteria:

- Sediment Management Standards (SMS). The SMS include the Sediment Quality Standard (SQS) and Cleanup Screening Level (CSL) criteria established under the SMS (Chapter 173-204 WAC).
- Apparent Effects Threshold (AET). The AET values including the Lowest Apparent Effect Threshold (LAET) and Second Lowest Apparent Effect Threshold (2LAET) on a dry weight basis. The AET values were provided to GeoEngineers on April 18, 2011 by Ecology and are based on

Ecology’s publication No. 06-09-094 (Sediment Quality Values Refinement: Volume 1- 1988 Update and Evaluation of Puget Sound AET) dated September 1988.

SMS and AET provide numerical criteria for a broad range of chemicals. The criteria for specific chemicals are based on either dry weight or organic carbon normalized concentrations. SMS criteria (lesser of SQS and CSL) are selected as the proposed sediment cleanup level to compare analytical results of sediment samples with total organic carbon (TOC) concentration within the range of 0.5 to 3.5 percent. Prior to comparing results to SMS criteria, chemical concentrations of non-ionizable SVOCs and PCBs are organic carbon normalized. AET criteria (lesser of LAET and 2LAET) are selected as the proposed sediment cleanup level to compare analytical results for samples with TOC concentrations outside of the 0.5 to 3.5 percent range.

Currently, there is no promulgated SMS/AET criterion for total petroleum hydrocarbons (diesel and oil) in sediment and tributyltin ion in sediment porewater. For the purposes of this RI/FS, total petroleum hydrocarbons are evaluated against the screening level of 100 mg/kg as requested by Ecology and the results for tributyltin ion are evaluated against the Dredged Material Management Program (DMMP) screening level of 0.15 micrograms per liter (µg/L).

5.2. Proposed Points of Compliance

Under MTCA, the point of compliance is the point or location on a site where the cleanup levels must be attained. The points of compliance for affected media will be approved by Ecology and presented in the CAP. However, it is necessary to identify proposed points of compliance in order to develop and evaluate cleanup action alternatives in the FS. This section describes the proposed points of compliance for soil, groundwater, stormwater runoff, and sediment.

5.2.1. *Soil*

The standard point of compliance for the soil cleanup levels shown in Table 2 will be throughout the soil column from the ground surface to 15 feet bgs, in accordance with WAC 173-340-740(6)(d) and WAC 173-340-7490(4)(b).

5.2.2. *Groundwater*

Because the groundwater cleanup levels (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 is the point of groundwater discharge to the marine water (i.e., Budd Inlet). The existing shoreline monitoring wells (MW-5, MW-7, MW-8 and MW-9) may be used to evaluate compliance.

5.2.3. *Stormwater*

Because the stormwater runoff cleanup levels (Table 4) are based on protection of marine surface water and industrial stormwater general permit benchmark criteria, the proposed conditional point of compliance for the stormwater screening levels is the point of stormwater discharge to the marine water (i.e., Budd Inlet). The four discharge points (i.e., stormwater outfall pipes) identified in Figure 5 that currently discharge stormwater to marine water in Budd Inlet may be used to evaluate compliance.

5.2.4. *Sediment*

For marine sediment the point of compliance is surface sediment within the biologically active aquatic zone. The biologically active zone is represented by samples collected from the top 10 cm (i.e., 0 to 4 inches) of the sediment column.

6.0 REMEDIAL INVESTIGATION RESULTS

6.1. Physical Characteristics of Site

The physical characteristics of the Site described in this section are based on available documents such as geologic maps, Site surveys, etc., as well as field observations of soil, groundwater, and sediment conditions documented during the Site investigations discussed in Sections 2.7 and 3.0. The investigation logs for borings advanced in the upland area and sediment logs (surface sediment description and core logs) are provided in Appendix A. Data for depth to groundwater and groundwater elevations are provided in Appendix D.

6.1.1. *Soil*

Approximately 60 soil borings have been advanced to depths of up to approximately 20 feet bgs as part of Site investigations of the upland area. Sampling locations for soil in the upland area are shown on Figure 5. Cross sections developed based on the information provided from Site investigations are presented in Figures 8 through 10.

In general, soil observed in borings advanced in the upland area consists of fill overlying native silt. The following describes soil material encountered beneath the upland area of the Site in general order from the ground surface to greater depths:

- Gravel fill: Gravel fill was encountered in the majority of the upland borings from the surface to depths of approximately two feet bgs. Grain size ranges from gravel with sand or silt, to silty gravel. Other materials observed in the gravel include a white layer that was observed within the gravel fill from 0.5 feet to 1 foot bgs in boring RI-3. Creosote treated wood was observed within the gravel fill from 1.5 feet to 2.5 feet bgs in RI-23; this wood is likely associated with a railroad line.
- Silty to sandy fill: Gray to olive to brown fill material ranging in composition from silt to sand was encountered below the gravel fill in the majority of upland borings to depths between approximately three feet and 13 feet bgs. In ten out of approximately 60 borings, this fill was observed to contain debris such as concrete, brick or wood at depths of up to 13 feet bgs or to have an unusual color (white, black, etc.). The majority of borings that contained debris or unusual color in this fill layer were located in the vicinity of the Maintenance Building (RGB-8, RBG-14, RGB-15, RGB-18, RGB-19, RI-1, RI-7, RI-13 and RI-18).
- Dredge fill: Gray dredge fill comprised of sand or silty sand with shells was encountered in the majority of the borings at depths ranging between approximately 4 and 15 feet bgs.
- Native deposits: Native deposits, generally comprised of gray silt but occasionally silty sand or sand with gravel, were encountered beneath the dredge fill in six borings located throughout the site (RGB-1, RGB-7, RGB-19, RI-9, RI-22 and RI-24). Native deposits were encountered at

depths of approximately 10 to 15 feet bgs. The native deposits are interpreted to be comprised of recent marine deposits or possibly older deposits such as a fine-grained layer of Vashon advance outwash, or even older pre-Vashon sediments.

6.1.2. *Hydrogeology*

6.1.2.1. GROUNDWATER OCCURRENCE

Static groundwater measurements were obtained from MW-1 through MW-9 on September 16, 2010 between 12:36 pm and 1:08 pm (at or near high tide) and October 6, 2010 between 8:23 am and 8:55 am (at or near low tide). The water level measurement data collected in 2010 are provided in Appendix D. Figures 11 and 12 present the groundwater elevations and inferred groundwater flow direction based the water level measurements collected in 2010.

Groundwater is typically present at the Site at a depth of three to four feet bgs. The inferred groundwater flow direction was to the east or northeast during the groundwater measurement events. The groundwater gradients during the 2010 measurement events were approximately 0.006 ft/ft.

6.1.2.2. GROUNDWATER USE

There are no groundwater supply wells located at the Site and groundwater at or in the vicinity of the Site is not a current source of drinking water. Based on a review of the Washington State Well Log Viewer (Ecology, 2007b) and the Ecology publication “Geology and Ground-Water Resources of Thurston County, Washington,” (Ecology, 1961), the closest water supply well is located about 1 mile northwest of the Site and more than ½ mile inland from Budd Inlet. The groundwater supply well is located a sufficient distance from the Site to not be pertinent to the investigation.

Groundwater beneath the Site satisfies the criteria in MTCA (WAC 173-340-720) for classification as non-potable groundwater. MTCA provides for this classification at sites where there is an extremely low probability that the groundwater will be used as a potable water supply. For groundwater to be considered as non-potable, MTCA requires that certain conditions be satisfied. These conditions (*in italics*), along with an accompanying explanation of why they are satisfied at this Site, are listed below.

- *Not a current source of drinking water*: There are no water supply wells located on the Site.
- *Contaminants unlikely to be transported to groundwater that is a current or potential future source of drinking water:* There are no potable groundwater resources downgradient of the Site. It is extremely unlikely that groundwater beneath the Site will be a future source of drinking water because: (a) potable water is supplied by the City of Olympia along West Bay Drive NW and therefore, there is no need to install a water supply well at the Site; (b) it is sufficiently connected (hydraulically) to Budd Inlet to be impracticable to use as a drinking water source, and; (c) groundwater beneath the Site is probably too shallow (three to four feet below ground surface) to be considered “the highest quality source feasible” as required under WAC 246-290-130.
- *There are known or projected points of entry of the groundwater into the surface water*: Groundwater discharges to surface waters of the adjacent Budd Inlet.

- *The surface water is not classified as a suitable domestic water supply source under Chapter 173-201A WAC:* Marine waters, including Budd Inlet, are not classified as a suitable domestic water supply source.
- *The groundwater is sufficiently hydraulically connected to the surface water that the groundwater is not practicable to use as a drinking water source:* Groundwater is in direct contact with marine surface water along the shoreline of the Site.

Based on the information provided above, groundwater beneath the Site satisfies the criteria in MTCA (WAC 173-340-720) for classification as non-potable groundwater.

6.1.3. *Shoreline and Marine Area Characteristics*

The upper shoreline slopes from the upland area down into the marine area of the Site from an elevation of approximately +9 feet NGVD29 (+16.5 feet MLLW) at the top of the shoreline bank to between approximately +5 and -2 feet NGVD29 (+12.5 and +5.5 feet MLLW) in the upper shoreline area. The shoreline gently slopes from the base of the upper shoreline to the eastern boundary of the Site which is at an elevation of between approximately -9 and -10 feet NGVD29 (-1.5 and -2.5 feet MLLW) (Figure 2). The tidal range at the Site is from mean higher high water (MHHW) at 7.14 feet NGVD29 (i.e., 14.6 feet MLLW) to MLLW at -7.4 feet NGVD29 (i.e., 0 feet MLLW) (NOAA, 2003).

The upper shoreline is generally armored along the majority of the Site with materials including concrete (i.e., chunks, blocks and slabs), metal debris, and wood bulkheads. Sediment and material present in the upper shoreline portion of the Site consists of gravel and sand mixed with brick along the southern portion of the upper shoreline and gravel, sand, and silt with some metal debris along the northern portion of the upper shoreline.

Sediment in the lower marine area has been investigated at 27 locations to depths of up to approximately 8 feet below the mudline. Sediment sampling locations in the marine area are shown on Figure 5. In general, sediment observed at surface and subsurface sampling locations consists of native sediment and anthropogenic materials. Native sediment consists of marine deposits of silts to sands with shells and shell fragments. Anthropogenic material predominantly consists of wood debris including sawdust and/or processed lumber pieces. Where present, sawdust and/or processed lumber pieces are most abundant at depths ranging from 1.5 feet to 3 feet below mudline. Wood debris was not documented in any of the surface sediment (0 to 10 cm) samples.

Remnant structures present in the marine area of the Site include piling that are vestiges of former piers and a shipway, a segment of the elevated rail crane, and concrete foundation piers (Figures 2 and 3). Metal debris is visible along the shoreline adjacent to and south of the Structural Shop and former Tank Shop. The metal debris is visible at the shoreline as an oxidized conglomeration that includes unused pieces of welding rods, welding slag (i.e., a residual coating created during welding), and other small metal debris.

6.1.4. *Budd Inlet Circulation and Sedimentation Rates*

Surface water circulation within Budd Inlet follows a counter-clockwise pattern. The flushing time for Budd Inlet (i.e., the time it takes for surface water in Budd Inlet to be replaced by incoming surface water) is approximately 10 days (Ebbesmeyer et al., 1998). Water replacement in the inlet occurs as cold and dense marine water enters Budd Inlet near the bottom along the western shore, and warmer, less saline water leaves the inlet near the surface along the eastern shore. Net current speeds in the inlet are relatively low, with historical measurements ranging from 2 to 13 cm/second (URS, 1986). The water column in Budd Inlet is generally well mixed in the winter with stratification of the water column most pronounced in the summer months. The central portion of the inlet contains a counterclockwise gyre that recirculates approximately 16 percent of the outgoing water back into the incoming water (Ebbesmeyer et al., 1998).

The creation of Capitol Lake in 1951 influenced historical sediment deposition in Budd Inlet and the lake now acts as a settling basin for suspended sediments in the Deschutes River. Therefore, sedimentation rates before and after 1951 differ significantly in some areas of Budd Inlet. Sediment cores were collected for sediment dating using radioisotopes Pb-210 and Cs-137 during a sediment characterization study for Budd Inlet prepared for Ecology (SAIC, 2008). Sampling was performed in Budd Inlet as part of the study at a location approximately 400 feet directly east of the Reliable Steel Site. The results identified that the average sedimentation rate is approximately 0.45 g/cm^2/yr after 1951 at the sample location near the Site. Based on the study, the sediment accumulation rates range from approximately 0.7 to 0.9 cm/yr in the area of the Reliable Steel Site.

6.2. Nature and Extent of Contamination

Chemical analytical results for soil, metal debris in the upper shoreline, groundwater and sediment samples collected from the Site were evaluated in comparison to the proposed cleanup levels (Section 5.1) to identify the nature and extent of contamination at the Site. Chemical analytical results for stormwater runoff collected from the Site were evaluated in comparison to the proposed screening levels (Section 5.1) to identify the nature and extent of contamination at the Site. The following sections present the results for each media at the Site. The results of chemical analyses performed on Site samples compared to the proposed cleanup levels are presented in Tables 6 through 24 and Figures 13 through 17 identify the extent of contamination at concentrations greater than the proposed cleanup levels.

6.3. Soil

Soil samples collected from the Site were analyzed for one of more of the following analytes:

- Metals including arsenic, barium, cadmium, chromium (total), copper, lead, mercury, selenium, silver, tin and zinc;
- TCLP Metals including arsenic, barium, cadmium, chromium, lead, mercury, selenium and silver;
- Gasoline-range petroleum hydrocarbons and BETX;
- Diesel- and oil-range petroleum hydrocarbons;
- PAHs;
- Phthalates and other SVOCs;
- VOCs; and
- PCBs.

Sections 6.3.1 through 6.3.7 present the results for each of the analyte groups in comparison to the proposed soil cleanup levels and identify the extent of contamination in Site soil. Analytes detected at concentrations greater than the proposed cleanup levels in Site soil include metals (arsenic, cadmium, lead, and mercury), gasoline-, diesel-, and oil-range petroleum hydrocarbons, cPAHs, pentachlorophenol (PCP) and PCBs.

6.3.1. *Metals*

Samples were obtained from a total of 35 locations to characterize the nature and extent of metals contamination in Site soil. Total metals analyses were performed on a total of 51 soil samples out of which seven soil samples exceeded the proposed soil cleanup levels for one or more metals. The analytical results for total metals in soil are summarized in Table 6. The sampling locations and estimated extent of metals at concentrations greater than the proposed cleanup levels in soil are shown on Figure 13. Based on the chemical analytical results, two areas were identified to have soil with metals concentrations greater than the proposed cleanup levels.

An area within the footprint of former Maintenance Building was identified to have soil with metals concentrations greater than the proposed cleanup levels. Five soil samples collected from the surface to approximately 1 foot bgs at sampling locations RI-4, RI-5, A3, P1, and Mt Pit contained arsenic, cadmium, and/or lead at concentrations greater than the proposed cleanup levels. The estimated horizontal extent of metals at concentrations greater than the proposed cleanup levels within the footprint of the former Maintenance Building is shown on Figure 13 and is based on the results of samples collected from sampling locations RI-2, RI-9, RGB10, RGB12, RGB15, RGB18, and RGB19. The vertical extent is estimated to be from the surface to a depth of approximately 2 feet bgs within the building footprint based on samples collected at RI-4 and RI-5 as well as visual observations at the Site. As stated in Section 2.2, metal debris is present within the area of the former Maintenance Building as a layer or in mounds on top of the soil surface. The maintenance activities within the former Maintenance Building that generated the metal debris are the likely source of metals contamination in this area.

An area east of the Paint Shop was also identified to have soil with metals concentrations greater than the proposed cleanup levels. Two sub-surface soil samples collected from depths ranging from approximately 2.5 to 5 feet bgs at sampling locations RI-27 and RGB1 contained lead and mercury at concentrations greater than the proposed cleanup levels. Lead was detected at a concentration exceeding the proposed cleanup level at RI-27 and mercury was detected at a concentration exceeding the proposed cleanup level at RGB1. The estimated horizontal extent of metals at concentrations greater than the proposed cleanup levels east of the Paint Shop is shown on Figure 13 and is based on the results of samples collected from sampling locations RI-20, RI-25, RI-26, RGB16, and Ditch 1. The vertical extent is estimated to be from 1 foot bgs based on sampling at RGB1 to a depth of 6 feet bgs based on sampling at RI-27. Sand blasting activities in the area of the Paint Shop may have been the source of metals contamination in this area.

Four soil samples were collected and analyzed for TCLP metals. One sample (A3) was collected from the area of the former Maintenance Building and three samples of sand blast grit (blast grit) were associated with operations at the Paint Shop. The analytical results for TCLP metals in these samples are summarized in Table 7. The approximate location of the sample collected from the area of the former Maintenance Building is shown on Figure 13. The TCLP metals concentrations detected in the samples were less than the Toxicity Characteristic criteria specified in the Dangerous Waste Regulations (WAC 173-303-090).

6.3.2. *Gasoline-Range Petroleum Hydrocarbons and BETX*

Samples were obtained from a total of 30 locations to characterize the nature and extent of gasoline-range petroleum hydrocarbon contamination in Site soil. Gasoline-range petroleum hydrocarbon analysis was performed on a total of 36 soil samples out of which three soil samples exceeded the proposed soil cleanup level. The analytical results for gasoline-range petroleum hydrocarbons in soil are summarized in Table 8. The sampling locations and estimated extent of gasoline-range petroleum hydrocarbons at concentrations greater than the proposed cleanup level in soil are shown on Figure 14. Based on chemical analytical results, two areas were identified to have soil with gasoline-range petroleum hydrocarbon concentrations greater than the proposed cleanup levels.

An area north of Maintenance Building was identified to have gasoline-range petroleum hydrocarbon concentrations greater than the proposed cleanup levels. Two subsurface samples were collected from depths of approximately 6 and 10 feet bgs at sampling location S-13 that contained gasoline-range petroleum hydrocarbons at concentrations greater than the proposed cleanup level. The estimated horizontal extent of gasoline-range petroleum hydrocarbons at concentrations greater than the proposed cleanup level north of the former Maintenance Building is shown on Figure 14 and is based on the results of samples collected from sampling locations RI-11, RGB10, RGB11, RGB12, RGB13, RGB18 and S-18. The vertical extent is estimated to be to a depth of approximately 13 feet bgs assuming that the vertical extent extends two feet deeper than the deepest sample with a concentration greater than the proposed cleanup level. Maintenance activities at the former Maintenance Building may have been the source of contamination in this area.

An area located within the eastern portion of the former Maintenance Building was also identified to have gasoline-range petroleum hydrocarbon concentrations greater than the proposed cleanup level. One sub-surface sample collected from the depth of approximately 3 feet bgs at sampling location S-24 contained gasoline-range petroleum hydrocarbons at a concentration greater than the proposed cleanup level. The estimated horizontal extent of gasoline-range petroleum hydrocarbons at concentrations greater than the proposed cleanup level within the eastern portion of the former Maintenance Building is shown on Figure 14 and is based on the results of samples collected from sampling locations RI-8, RI-9 and RGB12. The vertical extent is estimated to be to a depth of 6 feet bgs assuming that the vertical extent extends two feet deeper than the deepest sample with a concentration greater than the proposed cleanup level. Maintenance activities at the former maintenance pit within the former Maintenance Building are the likely source of contamination in this area (Figure 3).

Samples were collected from a total of 31 locations to characterize the nature and extent of BETX contamination in Site soil and BETX analysis was performed on a total of 36 soil samples. Benzene was not detected in any samples collected from the Site. Ethylbenzene, toluene, and xylenes were detected in between two and seven soil samples at concentrations less than the proposed cleanup levels. The analytical results for BETX in soil are summarized in Table 8.

Analysis for BTEX compounds was not performed on the soil samples with highest detected gasoline-range concentrations in soil (i.e., S-13 at 10 feet bgs and S-24 at 3 feet bgs). Therefore, it is not known whether BTEX is present at concentrations greater than the soil cleanup levels at these locations. Additionally, it is not known whether BTEX compounds are present at these locations at concentrations that would result in soil vapor intrusion and an inhalation exposure above acceptable risk levels. As BTEX data is not currently available for these locations, it has been assumed for the purposes of this RI, that BTEX compounds are present at concentrations greater than soil cleanup levels and concentrations that would result in soil vapor intrusion and an inhalation exposure above acceptable risk levels.

6.3.3. *Diesel- and Heavy-Oil Range Petroleum Hydrocarbons*

Samples were collected from a total of 59 sampling locations to characterize the nature and extent of diesel- and oil-range petroleum hydrocarbon contamination in Site soil. Diesel- and oil-range petroleum hydrocarbon analysis was performed on a total of 71 soil samples out of which 9 soil samples exceeded the proposed soil cleanup levels. The analytical results for diesel- and oil-range petroleum hydrocarbons are summarized in Table 8. The sampling locations and estimated extent of diesel- and oil-range petroleum hydrocarbons at concentrations greater than the proposed cleanup levels in soil are shown on Figure 15. Based on the chemical analytical results, four areas were identified to contain diesel- and/or oil-range petroleum hydrocarbon concentrations greater than the proposed cleanup levels.

An area located southwest of the former Tank Shop was identified to have soil with diesel-range petroleum hydrocarbons at concentrations greater than the proposed cleanup level. Five sub-surface samples were collected from depths ranging from approximately 4 to 8 feet bgs at sampling locations S-8, S-11, RGB5, RGB7 and U1 that contained diesel-range petroleum hydrocarbons at concentrations greater than the proposed cleanup level. The estimated horizontal extent of diesel-range petroleum hydrocarbons at concentrations greater than the proposed cleanup level southwest of the former Tank Shop is shown on Figure 15 and is based on the results of samples collected from sampling locations RI-13, RI-14, RGB6, RGB8, RGB9, S-6 and S-10. The vertical extent is estimated to be from approximately 4 to 10 feet bgs based on samples collected at RGB5 and RGB7. A 300 gallon heating oil UST located adjacent to the southwest corner of the Tank Shop is the likely source of the diesel-range petroleum hydrocarbon contamination in this area (Figures 2 and 3). No records were identified indicating that the UST was decommissioned including removing the contents of the UST. Therefore, the tank may be a continuing source of petroleum hydrocarbon contamination to soil.

An area located southeast of the former Maintenance Building was identified to have soil with diesel- and oil-range petroleum hydrocarbons at concentrations greater than the proposed cleanup levels. A sample was collected from a depth of approximately 1 foot bgs at sampling location RI-7 that contained diesel- and oil-range petroleum hydrocarbon concentrations greater than the proposed cleanup levels. The estimated horizontal extent of diesel- and oil-range petroleum hydrocarbons at concentrations greater than the proposed cleanup level southeast of the former Maintenance Building is shown on Figure 15 and is based on the results of samples collected from sampling location EC-3B and visual observation of soil staining during previous Site investigations. The vertical extent is estimated to be from the surface to 2 feet bgs based on the sample collected at EC-2. Activities in the former Crane Shed are the likely source of the diesel- and oil-range petroleum hydrocarbon contamination in this area (Figure 3). Stained soil was observed in this area during previous Site investigations (Table 1).

An area located on the north side of the Structural Shop was identified to have soil with oil-range petroleum hydrocarbons at concentrations greater than the proposed cleanup level. One sample was collected from a depth of approximately 0.5 feet bgs at sampling location RI-16 that contained an oil-range petroleum hydrocarbon concentration greater than the proposed cleanup level. The estimated horizontal extent of oil-range petroleum hydrocarbons at concentrations greater than the proposed cleanup level on the north side of the Structural Shop is shown on Figure 15 and is based on observations at locations ERI-15, RI-17, RI-19, and RI-21 during sampling. Petroleum hydrocarbons were not identified in soil at these locations during sampling. The vertical extent is estimated to be from the surface to 4 feet bgs based on the sample collected at EC-16. Activities in the Structural Shop associated with a former shear machine are the likely source of the oil-range petroleum hydrocarbon contamination in this area (Figure 3). Stained soil was observed in this area during previous Site investigations (Table 1).

An area located east of the Paint Shop was identified to have soil with diesel-range petroleum hydrocarbons at concentrations greater than the proposed cleanup level. Two sub-surface samples collected from depths ranging from approximately 2 to 6 feet bgs at sampling locations RGB-16 and Ditch2 contained diesel-range petroleum hydrocarbon concentrations greater than the proposed cleanup level. The estimated horizontal extent of diesel-range petroleum hydrocarbons at concentrations greater than the proposed cleanup level east of the Tank Shop is shown on Figure 15 and based on the results of sampling at locations RI-26, RI-27, RI-29, RGB-1 and Ditch1. The vertical extent is estimated to be from approximately 1 foot bgs based on sampling at Ditch2 to approximately 9 feet bgs based on sampling at RGB16 and assuming that the vertical extent extends two feet deeper than the deepest sample with a concentration greater than the proposed cleanup level. Activities in the area of the Paint Shop may have been the source of diesel-range petroleum hydrocarbon contamination in this area (Figure 3).

6.3.4. *Polycyclic Aromatic Hydrocarbons (PAHs)*

Samples were collected from a total of 44 locations to characterize the nature and extent of PAH contamination in Site soil. PAH analyses were performed on a total of 74 soil samples out of which 37 soil samples exceeded the proposed soil cleanup levels for PAHs. The analytical results for PAHs in soil are summarized in Table 9. The sampling locations and estimated extent of PAHs at concentrations greater than the proposed cleanup levels in soil are shown on Figure 16. Based on the chemical analytical results, the upland area of the Site was identified to contain soil with PAH concentrations greater than the proposed cleanup levels.

Forty-seven soil samples collected from the surface to depths of approximately 5 feet bgs at sampling locations across the upland area of the Site were analyzed for non-carcinogenic PAHs. Non-carcinogenic PAHs were either not detected or were detected at concentrations less than the proposed cleanup levels.

Seventy-one soil samples collected from the surface to depths of approximately 5 feet bgs at sampling locations across the upland area of the Site were analyzed for cPAHs. Thirty-seven of samples contained cPAHs at concentrations greater than the proposed cleanup levels. The estimated horizontal extent of cPAHs at concentrations greater than the proposed cleanup level at the Site is shown on Figure 16. The vertical extent is estimated to be from the surface to between depths of approximately 2 to 7 feet bgs based on the analytical results samples that have been collected at the Site. The facility operations or activities that were the source of the cPAHs at the Site were not identified by the Site investigations.

6.3.5. *Phthalates and Other Semivolatile Organic Compounds (SVOCs)*

Samples were collected from a total of 19 sampling locations to characterize the nature and extent of phthalates and other SVOC contamination in Site soil. SVOC analysis, including phthalates, was performed on a total of 31 soil samples. The analytical results for SVOCs including phthalates are summarized in Table 10. The sampling locations and results for phthalates in soil are shown on Figure 17

Phthalates were either not detected or detected at concentrations less than the proposed cleanup levels in soil samples collected from the Site.

Other SVOCs were either not detected or detected at concentrations less than the proposed cleanup levels in Site soil with the exception of PCP. PCP was detected at one location (GRB4) at a depth of approximately 1 foot bgs and at a concentration (4.2 mg/kg) slightly greater than the proposed cleanup level (2.5 mg/kg). PCP was not detected in the three additional samples from the same location collected from surface soil and approximately 1.5 feet and 4 feet bgs. Additionally, PCP was not detected in any of the other 30 soil samples collected from the Site at a concentration greater than the proposed cleanup level. Therefore, PCP was not evaluated further.

Two SVOCs, 4-chloroaniline and n-nitroso-di-n-propylamine, were not detected in soil at the Site. However, the detection limits for 4-chloroaniline and n-nitroso-di-n-propylamine were greater than the proposed cleanup levels in 10 soil samples. These SVOCs are not further evaluated based on the following considerations:

- 4-chloroaniline was not detected in any samples collected from the Site including 18 samples for which the detection limit was less than the proposed cleanup level. 4-chloroaniline is used in the chemical industry as a precursor for the production of pesticides, drugs and dyestuffs, none of which is known to have occurred at the Site.
- N-nitroso-di-n-propylamine was not detected in any samples collected from the Site including 21 samples for which the detection limit was less than the proposed cleanup level. Additionally, the detection limit (0.3 mg/kg) for the other 10 samples was only slightly greater than the proposed cleanup level of 0.14 mg/kg. N-nitroso-di-n-propylamine is a byproduct created during the production of herbicides and rubber products, neither of which is known to have occurred at the Site.

6.3.6. *Volatile Organic Compounds (VOCs)*

Soil samples were collected from a total of 14 sampling locations to characterize the nature and extent of VOC contamination in Site soil and VOC analysis was performed on a total of 18 soil samples. The analytical results for VOCs are summarized in Table 11.

VOCs were either not detected or detected at concentrations less than the proposed soil cleanup levels in Site soils with the exception of methylene chloride. Methylene chloride was detected in one soil sample collected from sampling location Ditch1 at a depth of approximately 2.5 feet bgs. Methylene chloride is a common laboratory contaminant and therefore, the detection of methylene chloride at this location was not further evaluated.

Detection limits for three VOCs including 1,2,3-trichloropropane, 1,2-dibromoethane (EDB), and methylene chloride were greater than the proposed cleanup levels in multiple soil samples collected from the Site. These VOCs are not further evaluated based on the following considerations:

- 1,2,3-trichloropropane was not detected in any samples at a concentration greater than the detection limit (0.05 mg/kg) which was slightly greater than the proposed cleanup level of 0.033 mg/kg. 1,2,3-trichloropropane is an industrial solvent and no other industrial solvents were detected at the Site.
- 1,2-dibromoethane (EDB) was not detected in any samples. EDB is a pesticide and pesticides were not identified to be chemicals of potential concern at the Site in previous evaluations (Section 2.7).
- Methylene chloride is an industrial solvent and no other industrial solvents were detected at the Site.

An evaluation of potential soil vapor intrusion and inhalation exposure from VOCs were not further evaluated as VOCs were not detected in soil samples collected from the Site with the exception of methylene chloride which is a common laboratory contaminant, as stated above.

6.3.7. *Polychlorinated Biphenyls (PCBs)*

Soil samples were collected from two sampling locations at the Site and analyzed for PCBs. The analytical results for PCB analyses are summarized in Table 12.

One sample was collected from adjacent to the northwest corner on the former Maintenance Building (RI-2) from the surface to 1 foot in depth to evaluate the presence of PCBs at the location where a transformer had previously malfunctioned and spilled oil on Site soil (Table 1). PCBs were not detected in the sample.

The PCB aroclor 1254 was detected at a concentration (0.6 mg/kg) slightly greater than the proposed cleanup level (0.5 mg/kg) in a subsurface sample collected from a depth of approximately 5 to 6 feet bgs at sampling location RGB5. Sampling location RGB5 is within the area where diesel-range petroleum hydrocarbons are present in soil at concentrations greater than the proposed cleanup level (Figure 15). PCBs were not identified in previous site investigations to be a chemical of potential concern except in the area adjacent to the northwest corner of the former Maintenance Building. Therefore, PCBs were not evaluated further as part of the RI

6.4. Metal Debris and Soil on The Shoreline

Soil samples were collected from the area where metal debris is visible along the shoreline east of the Structural Shop and former Tank Shop. The samples were analyzed for one of more of the following analytes:

- Metals including arsenic, barium, cadmium, chromium (total), copper, lead, mercury, selenium, silver, tin and zinc;
- TCLP Metals including arsenic, barium, cadmium, chromium, lead, mercury, selenium and silver; and
- Diesel- and oil-range petroleum hydrocarbons.

Sections 6.4.1 and 6.4.2 present the results for each of the analyte groups in comparison to the proposed soil cleanup levels. The analytical results for the samples are compared the proposed sediment cleanup levels in Section 5.1.4. The analytical results for the samples are being compared to proposed soil and sediment cleanup levels as the material is present above and below the OHW line along the shoreline at the Site (Figure 5). Analytes detected at concentrations greater than the proposed soil cleanup levels include metals (arsenic, cadmium, and lead).

6.4.1. *Metals*

Five samples were collected from the metal debris and soil adjacent to the metal debris and analyzed for metals. Three of the samples were collected from the metal debris present along the shoreline and two soil samples that were collected west of and adjacent to the metal debris. The analytical results for metals in the metal debris and soil samples are summarized in Table 13. The sampling locations and estimated extent of the metal debris are shown on Figure 13.

Three samples collected from the surface of the metal debris and from approximately 2 feet below the surface at sampling locations S1, S3, and BS-1 contained arsenic, cadmium, or lead at concentrations greater than the proposed soil cleanup levels. All other metals were not detected or were detected at concentrations less than the proposed soil cleanup levels.

Two samples were collected from soil west of and adjacent to the metal debris present on the shoreline from approximately 4 to 8 feet bgs at sampling locations S-3 and MS-1. Metals were either not detected or were detected at concentrations below the proposed soil cleanup levels.

The analytical results identify that the metal debris exceeds the proposed soil cleanup levels. The analytical results also indicate that the metals concentrations in soil located west of and adjacent to the metal debris are less than the proposed cleanup levels.

The three samples collected from the metal debris were also analyzed for TCLP metals. The analytical results for TCLP metals performed on the metal debris samples are summarized in Table 7. TCLP metals were not detected in the metal debris samples.

6.4.2. *Diesel-, Oil-, and Mineral Oil-Range Petroleum Hydrocarbons*

One sample collected west of and adjacent to the metal debris (S-3) was also analyzed for diesel-, oil-, and mineral oil-range petroleum hydrocarbons. Diesel-, oil-, and mineral oil-range petroleum hydrocarbons were not detected in the sample. The analytical results for diesel-, oil-, and mineral oil-range petroleum hydrocarbons in the soil sample are summarized in Table 13. The approximate sampling location is shown on Figure 16.

6.5. Groundwater

As described in Sections 2.7.8 and 3.2.2, groundwater monitoring activities were completed in 2008 and 2010 to characterize the nature and extent of contamination in groundwater. During the investigation activities, groundwater samples were collected from monitoring wells MW-1 through MW-9. Groundwater samples obtained from the Site were analyzed for a combination of the following analytes:

- Dissolved and total metals including arsenic, cadmium, chromium (total), copper, lead, mercury and zinc;
- Gasoline-range petroleum hydrocarbons and BETX;
- Diesel- and oil-range petroleum hydrocarbons;
- PAHs;
- Phthalates and other SVOCs; and
- VOCs.

As described in Section 3.3.2, groundwater samples were collected in 2013 from monitoring wells MW-5, MW-7, MW-8 and MW-9 to further evaluate the presence of PAHs and phthalates as well as the presence of mercury in groundwater in monitoring well MW-9.

Sections 6.5.1 through 6.5.6 present the results for each of the analytes in comparison to the proposed groundwater cleanup levels and identify the extent of contamination in Site groundwater. Analytes detected at concentrations greater than the proposed cleanup levels in Site groundwater include metals (arsenic and copper).

6.5.1. *Metals*

Groundwater samples were collected from monitoring wells MW-1 through MW-9 to characterize the nature and extent of metals contamination. Dissolved metals analyses were performed on groundwater samples collected from MW-1 and MW-9 in 2008, dissolved and total metals analyses were performed on groundwater samples collected from MW-1 through MW-9 in 2010, and dissolved and total mercury analyses were performed on a groundwater sample collected from MW-9 in 2013. The analytical results for metals in groundwater are summarized in Table 14. The approximate monitoring well locations and locations where metals contamination in groundwater is greater than the proposed groundwater cleanup levels are shown on Figure 13.

The analytical results for groundwater samples collected in 2008 and 2010 indicate that arsenic and copper concentrations are greater than the proposed cleanup levels in monitoring wells MW-6, MW-7 and MW-8. Arsenic and copper concentrations were either not detected or were detected at concentrations less than the proposed groundwater cleanup levels in monitoring wells MW-1 through MW-5 and MW-9. Additionally, cadmium, chromium, lead and zinc were either not detected or were detected at concentrations less than the proposed cleanup levels in groundwater from MW-1 through MW-9.

Monitoring wells MW-6, MW-7 and MW-8 are located where metal debris is present at the Site, where soil and metal debris samples contained the highest concentrations of arsenic and copper detected at the Site, and where metals were detected in soil and metal debris samples at concentrations greater than the proposed cleanup levels (Table 6 and Figure 13). As identified in Figures 11 and 12, monitoring wells MW-6, MW-7 and MW-8 are downgradient of or within the areas where the metal debris is located. The metals debris and metals-contaminated soil are the likely source of arsenic and copper in groundwater at concentrations greater than the proposed groundwater cleanup levels.

Groundwater samples collected from monitoring wells MW-1 through MW-9 in 2008 were not analyzed for total metals. As a result, a comparison of mercury concentrations to the proposed cleanup level could not be performed using the 2008 data as the proposed cleanup level for mercury is based on the results of total mercury analysis. Total mercury analyses were performed on samples collected in 2010. Total mercury was not detected in groundwater collected from monitoring wells MW-1 through MW-8 but was detected in groundwater from monitoring well MW-9 at a concentration (0.029 µg/L) slightly greater than the proposed groundwater cleanup level (0.025 µg/L). Supplemental groundwater sampling was performed at monitoring well MW-9 in 2013 to further evaluate the concentration of mercury at this location. Total mercury was not detected in the groundwater sample collected from monitoring well MW-9 in 2013 at a detection and order of magnitude below the proposed groundwater cleanup level. The results for total mercury in groundwater collected from MW-9 in 2013 indicate that the mercury concentration in groundwater at this location is less than the proposed groundwater cleanup level.

6.5.2. *Gasoline-Range Petroleum Hydrocarbons and BETX*

Groundwater samples collected from monitoring wells MW-1 through MW-9 in 2008 and 2010 were analyzed for gasoline-range petroleum hydrocarbons and BETX to characterize the nature and extent of groundwater contamination. The analytical results for gasoline-range petroleum hydrocarbons and BETX in groundwater are summarized in Table 15. The monitoring well locations and results for gasoline-range petroleum hydrocarbons and BETX are shown on Figure 14.

Gasoline-range petroleum hydrocarbons were not detected in any groundwater samples collected from the Site during sampling in both 2008 and 2010. Gasoline-range petroleum hydrocarbons were not detected in groundwater from monitoring wells MW-6, MW-7 and MW-8 that are located adjacent to and/or downgradient of where soil was identified to contain gasoline-range petroleum hydrocarbons at concentrations greater than the proposed soil cleanup level indicating that gasoline-range petroleum hydrocarbons concentrations in soil are not causing exceedances of the proposed cleanup level in groundwater (Figure 14). BETX compounds were also not detected or were detected in groundwater at concentrations less than the proposed groundwater cleanup levels.

Benzene was detected once in groundwater collected from monitoring well MW-9 (Table 15). The detected concentration (0.52 µg/L) was less than the groundwater screening level for protection of indoor air (2.4 µg/L) provided in Guidance for Evaluating Soil Vapor Intrusion in Washington State; Investigation and Remedial Action (Ecology, 2009a). Ethylbenzene, toluene, and xylene were not detected and the detection limits were less than the screening levels for protection of indoor air (Ecology, 2009a).

6.5.3. *Diesel- and Oil-Range Petroleum Hydrocarbons*

Groundwater samples collected from monitoring wells MW-1 through MW-9 in 2008 and 2010 were analyzed for diesel- and oil-range petroleum hydrocarbons to characterize the nature and extent of groundwater contamination. The analytical results for diesel- and oil-range petroleum hydrocarbons in groundwater are summarized in Table 15. The monitoring well locations and results for diesel- and oil-range petroleum hydrocarbons are shown on Figure 15.

Diesel- and oil-range petroleum hydrocarbons were not detected in any groundwater samples collected from the Site in both 2008 and 2010 except for one sample collected from monitoring well MW-4. Diesel- and oil-range petroleum hydrocarbons were detected in groundwater from monitoring well MW-4 at concentrations greater than the proposed cleanup levels in a sample collected in 2008. However, the diesel- and oil-range petroleum hydrocarbon concentrations were less than the proposed groundwater cleanup levels in the sample collected from MW-4 in 2010. Monitoring well MW-4 is located southwest of the former Tank Shop where diesel was detected in soil at concentrations greater than the proposed soil cleanup level and where a former heating oil UST has been identified to be located.

6.5.4. *PAHs*

Groundwater samples collected from monitoring wells MW-1 through MW-9 were analyzed for non-carcinogenic PAHs and cPAHs in 2008. However, the detection limits for cPAHs were greater than the proposed cleanup level. Groundwater samples were collected again in 2010 from monitoring wells MW-1 through MW-9 and were analyzed for cPAHs at a lower detection limit. Groundwater samples were also collected in 2013 from monitoring wells MW-5 and MW-7 through MW-9 and analyzed for non-carcinogenic PAHs and cPAHs to further characterize the nature and extent of groundwater contamination. The analytical results for PAHs in groundwater are summarized in Table 16. The monitoring well locations and results for PAHs in groundwater are shown on Figure 16.

Non-carcinogenic PAHs were either not detected or were detected at concentrations less than the proposed groundwater cleanup levels in the samples collected in 2008. As stated above, the detection limits for cPAHs were greater than the proposed cleanup level in the samples collected from 2008.

Groundwater samples collected from monitoring wells MW-1 through MW-9 were analyzed for cPAHs in 2010 to achieve detection limits less than the proposed cleanup level. cPAHs were either not detected or were detected at concentrations less than the proposed groundwater cleanup levels in the samples collected in 2010 except for benzo(a)anthracene in monitoring well MW-6. Benzo(a)anthracene was detected at a concentration (0.022 µg/L) slightly greater than the proposed groundwater cleanup level (0.018 µg/L). Although benzo(a)anthracene was detected in groundwater from MW-6, benzo(a)pyrene and all other PAHs were not detected in samples collected from downgradient monitoring wells MW-7 and MW-8.

Groundwater samples collected from monitoring wells MW-5 and MW-7 through MW-9 in 2013 were analyzed for non-carcinogenic PAHs and cPAHs. Non-carcinogenic PAHs and cPAHs were either not detected or were detected at concentrations less than the proposed groundwater cleanup levels.

Monitoring wells MW-5 and MW-7 through MW-9 are located downgradient of the PAH-contaminated soil at the Site and are adjacent to the shoreline where groundwater discharges to surface water in Budd Inlet. The PAH results for groundwater at these locations indicate that groundwater discharging to surface water meets the proposed groundwater cleanup levels.

6.5.5. *Phthalates and Other Semivolatile Organic Compounds*

Groundwater samples collected from monitoring wells MW-1 through MW-9 in 2008 were analyzed for phthalates and other SVOCs. Groundwater samples were collected again in 2013 from monitoring wells MW-5 and MW-7 through MW-9 and analyzed for phthalates to further evaluate the presence of phthalates in groundwater at the Site. The analytical results for phthalates and other SVOCs in groundwater are summarized in Table 17. The approximate monitoring well locations and results for PAHs in groundwater are shown on Figure 17.

Phthalates and other SVOCs were either not detected or were detected at concentrations less than the proposed groundwater cleanup levels in samples collected from monitoring wells MW-1 through MW-9 in 2008 with the exception of bis(2-ethylhexyl)phthalate (DEHP) in the sample collected from MW-4. The sample collected from monitoring well MW-4 in 2008 also contained diesel-range petroleum hydrocarbons at concentrations greater than the proposed cleanup level. The elevated DEHP concentration detected in groundwater from MW-4 in 2008 may have been a result of the elevated concentrations of petroleum hydrocarbons present in the sample.

Groundwater samples collected from monitoring wells MW-5 and MW-7 through MW-9 in 2013 were analyzed for phthalates and phthalates were either not detected or were detected at concentrations less than the proposed groundwater cleanup levels.

Monitoring wells MW-5 and MW-7 through MW-9 are located adjacent to the shoreline where groundwater discharges to surface water in Budd Inlet. The phthalate results for groundwater at these locations indicate that groundwater discharging to surface water meets the proposed groundwater cleanup levels.

The detection limits for 2,4,6-trichlorophenol, bis(2-chloroethyl)ether, hexachlorobenzene, n-nitroso-di-n-propylamine, and pentachlorophenol were greater than the proposed cleanup levels in groundwater samples collected in 2008. These SVOCs are not further evaluated based on the following considerations:

- 2,4,6-trichlorophenol is used as a fungicide, herbicide, insecticide, antiseptic, defoliant, and glue preservative. These categories of chemicals were not identified to be chemicals of potential concern at the Site in previous evaluations (Section 2.7). Additionally, 2,4,6-trichlorophenol was not detected in soil samples collected at the Site at detection limits that were less than the proposed soil cleanup level (Table 10).
- Bis(2-chloroethyl)ether is mainly used as a chemical intermediate to make pesticides and is also used as a solvent. Pesticide production has not been identified to have been performed at the Site and pesticides were not identified to be chemicals of potential concern at the Site in previous evaluations (Section 2.7). Additionally, bis(2-chloroethyl)ether was not detected in soil samples collected at the Site at detection limits that were less than the proposed soil cleanup level (Table 10).

- Hexachlorobenzene was used as a pesticide until 1965 and there are currently no commercial uses of hexachlorobenzene in the United States. Pesticides were not identified to be chemicals of potential concern at the Site in previous Site evaluations (Section 2.7). Additionally, hexachlorobenzene was not detected in soil samples collected at the Site at detection limits that were less than the proposed soil cleanup level (Table 10).
- n-nitroso-di-n-propylamine is produced as a byproduct during some manufacturing processes, as a contaminant in some weed killers, and during the manufacture of some rubber products. n-nitroso-di-n-propylamine has not been identified to be a chemical of potential concern at the Site in previous evaluations (Section 2.7). Additionally, n-nitroso-di-n-propylamine was not detected in soil samples collected at the Site at detection limits that were less than the proposed soil cleanup level (Table 10).
- PCP has been used as a herbicide, insecticide, fungicide, algaecide, and disinfectant and as an ingredient in antifouling paint and wood preservation. PCP has not been identified to be a chemical of potential concern at the Site in previous evaluations (Section 2.7). PCP was detected three times in Site soil but was only detected once in soil at a concentration greater than the proposed soil cleanup level. PCP treated wood may have been used at the Site and may be the source of PCP detections in soil. However, the use of PCP treated wood would not likely cause contamination of groundwater at concentrations greater than the proposed groundwater cleanup levels.

6.5.6. *VOCs*

Groundwater samples collected from monitoring wells MW-1 through MW-9 were analyzed for VOCs in 2008 and 2010. VOCs were either not detected or detected at concentrations less than the proposed groundwater cleanup levels in the samples collected from the Site. The analytical results for VOCs in groundwater are summarized in Table 18.

The VOCs that were detected in groundwater included methylene chloride which is a common laboratory contaminant and tert-butylbenzene. An evaluation of potential vapor intrusion and inhalation exposure from VOCs were not further evaluated as VOCs were not detected in groundwater samples collected from the Site with the exception of methylene chloride which is a common laboratory contaminant, as stated above, and tert-butylbenzene for which there is no groundwater screening level for protection of indoor air (Ecology, 2009a).

6.6. Stormwater

As described in Section 2.7.8 and 3.2.3, stormwater runoff samples were collected from two locations (SW1 and SW2) at the Site in 2008 and four locations (RI-SW-1 through RI-SW-4) in 2010. Stormwater runoff samples collected from the Site were analyzed for a combination of the following analytes:

- Water quality parameters including pH and turbidity;
- Total and dissolved metals including arsenic, cadmium, chromium (total), copper, lead, mercury and zinc;
- Gasoline–range petroleum hydrocarbons;

- Diesel- and oil-range petroleum hydrocarbons;
- PAHs; and
- Phthalates and other SVOCs.

Sections 6.3.1 through 6.3.7 present the results for each of the analyte groups in comparison to the proposed screening levels and identify the extent of contaminated Site stormwater runoff. Analytes detected at concentrations greater than the proposed screening levels in stormwater runoff include metals (copper, lead, mercury and zinc), and cPAHs.

6.6.1. *Water Quality Parameters*

Water quality parameters including pH and turbidity were measured at the four outfall sample locations (RI-SW-1 through RI-SW-4) as part of stormwater sampling performed in 2010. Water quality parameter measurements are presented in Table 19.

pH was measured to be 7 or 7.5 in all of the stormwater runoff samples collected in 2010. Turbidity ranged from 8.11 to 14.1 nephelometric turbidity units (NTUs) in the three samples collected from the stormwater outfalls located along the shoreline in the central (RI-SW-2 and RI-SW-3) and southern (RI-SW-4) portions of Site. The turbidity in stormwater runoff collected from the outfall located on the northern portion of the Site (92.6 NTUs) was greater than the proposed screening level (25 NTUs) that is based on benchmark values identified in the Industrial Stormwater General Permit (Ecology, 2009b). The elevated turbidity indicates that stormwater runoff is likely transporting soil particles from the upland area of the Site to surface water and sediment in the adjacent marine area.

6.6.2. *Metals*

The two stormwater runoff samples that were collected in 2008 (SW-1 and SW-2) were analyzed for total metals and the stormwater runoff samples that were collected from the four stormwater outfalls in 2010 were analyzed for dissolved and total metals to characterize the nature and extent of metals contaminated stormwater runoff. The analytical results for metals in stormwater runoff samples are summarized in Table 19. The stormwater sample locations and locations where metals concentrations in stormwater runoff are greater than the proposed screening levels are shown on Figure 13.

Total copper and zinc were detected at concentrations greater than the proposed screening levels in the two samples collected in 2008 (SW-1 and SW-2) from stormwater discharge locations on the shoreline on the northern portion of the Site. Total lead was also detected in one of the stormwater runoff samples collected in 2008 (SW-1) at a concentration greater than the proposed screening level. Additionally the detection limits for total cadmium and/or mercury were greater than the proposed cleanup levels in samples collected in 2008. The proposed screening levels for total metals are based on the benchmark values identified in the Industrial Stormwater General Permit (Ecology, 2009b) (Table 4).

The total copper, mercury and zinc concentrations in the stormwater runoff sample collected from the outfall located on the northern portion of the Site (RI-SW-1) in 2010 were greater than the proposed screening levels. The stormwater runoff sample collect from this area in 2008 (SW-1) also contained total copper and zinc concentrations greater that proposed screening levels.

The total mercury and zinc concentrations in the stormwater runoff sample collected from the outfall located on the shoreline east of the Paint Shop (RI-SW-2) in 2010 were greater than the proposed screening levels. The stormwater runoff sample collect from this area in 2008 (SW-2) also contained a total zinc concentration greater that proposed screening level.

The total copper concentration in the stormwater runoff sample collected in 2010 from the outfall located on the shoreline east of the former location of the Maintenance Building (RI-SW-4) was also greater than the proposed screening level. Total metals were either not detected or detected at a concentration less than the proposed screening levels in the sample collected from the outfall located on the shoreline east of the Structural Shop (RI-SW-3).

Dissolved copper concentrations detected in all four stormwater runoff samples collected from the outfalls present at the Site were greater than the proposed screening levels. The proposed screening levels for dissolved metals are based on protection of surface water (Table 4).

Residuals resulting from sandblasting activities in the Paint Shop area and metal debris in the area of the former Maintenance Building are likely sources of metals in stormwater runoff. Additionally, contaminants in stormwater could also be coming from offsite sources as offsite stormwater also flows through the stormwater conveyance system before discharging from the outfalls at the Site.

6.6.3. *Gasoline-Range Petroleum Hydrocarbons*

Gasoline-range petroleum hydrocarbon analysis was performed on one stormwater runoff sample collected from the shoreline located on the northern portion of the Site (SW-1) in 2008. The analytical results for gasoline-range petroleum hydrocarbons in the stormwater runoff sample are presented in Table 20. Gasoline-range petroleum hydrocarbons were not detected in the sample.

6.6.4. *Diesel- and Heavy-Oil Range Petroleum Hydrocarbons*

Diesel- and oil-range petroleum hydrocarbon analyses were performed on one stormwater runoff sample collected in 2008 (SW-1) and four stormwater runoff samples collected from the four stormwater outfalls in 2010 (RI-SW-1 through RI-SW-4). The analytical results for diesel- and oil-range petroleum hydrocarbons in the stormwater runoff samples are presented in Table 20. Diesel- and oil-range petroleum hydrocarbons were either not detected or were detected at concentrations less than the proposed screening levels except for the oil-range petroleum hydrocarbon concentration in the sample collected from the northern portion of the Site (SW-1). Stormwater runoff from the northern portion of the Site is the source of stormwater at this location.

6.6.5. *PAHs*

Analysis for non-carcinogenic PAHs and cPAHs was performed on one stormwater runoff sample collected from the shoreline on the northern portion of the Site (SW-1) in 2008. cPAH analyses were performed on four stormwater runoff samples collected in 2010 from the four stormwater outfalls (RI-SW-1 through RI-SW-4) at the Site. The analytical results for PAHs in the stormwater runoff samples are presented in Table 21. The stormwater sample locations and locations where

PAH concentrations in stormwater runoff are greater than the proposed screening levels are shown on Figure 13.

Non-carcinogenic PAHs were not detected at concentrations greater than the proposed cleanup levels in the sample collected from the northern portion of the Site (SW-1) in 2008. The detection limits for cPAH analysis on the sample collected in 2008 were greater than the proposed screening levels.

cPAHs were not detected in stormwater runoff samples collected from the three outfalls located on the shoreline in the central (RI-SW-2 and RI-SW-3) and southern (RI-SW-4) portions of the Site in 2010. The detections limits for cPAH analyses performed in 2010 were less than the proposed screening levels. Multiple cPAHs were detected at concentrations greater than the proposed screening levels in the stormwater runoff sample collected from the outfall located on the northern portion of the Site (RI-SW-1). Elevated turbidity (92.6 NTUs) was also measured in the stormwater runoff sample with cPAH concentrations greater than the proposed screening level indicating that stormwater runoff is likely transporting soil particles containing cPAHs from the upland area of the Site to surface water and sediment in the adjacent marine area.

6.6.6. *Phthalates and Other SVOCs*

Analysis for phthalates and other SVOCs was performed on one stormwater runoff sample collected from the shoreline on the northern portion of the Site (SW-1) in 2008. Analysis for phthalates was performed on four stormwater runoff samples collected in 2010 from the four stormwater outfalls (RI-SW-1 through RI-SW-4) at the Site. The analytical results for phthalates and other SVOCs in the stormwater runoff samples are presented in Table 22.

Phthalates and other SVOCs were not detected in the stormwater runoff sample collected from the northern portion of the Site (SW-1) in 2008 and phthalates were not detected in the stormwater samples collected from the outfalls at the Site (RI-SW-1 through RI-SW-4) in 2010. However, the detection limit for DEHP was greater than the proposed screening level in the stormwater runoff samples collected at the Site in 2010. Additionally, similar to groundwater sample analyses performed in 2008, the detection limits for stormwater runoff samples for 2,4,6-trichlorophenol, bis(2-chloroethyl)ether, hexachlorobenzene, n-nitroso-di-n-propylamine, and pentachlorophenol were greater than the proposed screening levels. These compounds are not further evaluated based on the considerations identified in Section 6.5.2.

6.7. Sediment

Sediment samples collected from the Site were analyzed for a combination of the following analytes to characterize the nature of contamination in sediment:

- Conventionals including ammonia, sulfides, total volatile solids (TVS), total organic carbon (TOC), total solids and percent fines;
- Metals including arsenic, barium, cadmium, chromium (total), copper, lead, mercury, selenium, silver, and zinc;
- Gasoline–range petroleum hydrocarbons;
- Diesel- and oil-range petroleum hydrocarbons;

- PAHs;
- Phthalates;
- Chlorinated hydrocarbons, ionizable organics, and miscellaneous extractables; and
- PCBs.

Sections 6.7.1 through 6.7.8 present the results for each analyte group in comparison to the proposed sediment cleanup levels and identify the extent of contamination in Site sediment. The results from sediment sample analyses for metals, SVOCs and PCBs are screened against the proposed sediment cleanup levels that are the SMS SQS and CSL criteria. The results for specific organic chemicals are compared to the organic carbon (OC) normalized SQS and CSL criteria where the TOC for a specific sample is equal to or between 0.5 and 3.5 percent. The results for specific organic chemicals are compared to organic carbon normalized criteria as studies have shown that the toxicity of the organic chemicals correlate with the organic carbon content of sediment (Michelsen, 1992). However, the same studies have also shown that the toxicity of the organic chemicals can be overestimated as the organic carbon content approaches zero or is underestimated as the organic carbon content becomes elevated. Therefore, the results for specific organic chemicals are compared to lowest apparent effects threshold (LAET) values (i.e., LAET and 2LAET) that are based on dry weight concentrations if the TOC for a specific sample is less than 0.5 or greater than 3.5 percent. Table 23 presents the results for metals, SVOCs and PCBs in sediment samples compared to the SMS SQS and CSL criteria and Table 24 presents the results for metals, SVOCs and PCBs compared to the LAET and 2LAET criteria.

The results for total petroleum hydrocarbons (i.e., sum of diesel- and oil-range petroleum hydrocarbons) are compared to a screening level of 100 mg/kg recommended by Ecology except where analytical results identify that separate petroleum products (i.e., diesel and oil) are present in the sample. If the analytical results identify that separate petroleum products are present in the sample, the concentration of the individual product is compared to the screening level. Additionally, the results for tributyltin are compared to the DMMP screening criteria of 15 µg/L.

Analytes detected at concentrations greater than the proposed sediment cleanup levels in surface sediment at the Site include total petroleum hydrocarbons, PAHs and phthalates. Analytes detected at concentrations greater than the proposed sediment cleanup levels in sub-surface sediment include mercury and phthalates.

6.7.1. *Conventionals*

One or more conventional analyses were performed on surface sediment samples collected from 22 locations and seven subsurface sediment samples collected from four locations. The analytical results for conventions in sediment are summarized in Table 23. The approximate sampling locations are shown on Figure 5.

TOC values ranged from 0.37 to 5.82 percent and TVS values ranged from 1.32 to 12.4 percent in surface sediment samples. TOC values ranged from 0.5 to 5.63 percent in subsurface sediment samples. Ammonia concentrations ranged from approximately 1 to 20 mg-N/kg and sulfide concentrations ranged from approximately 6 to 1,550 mg/kg in surface sediment.

6.7.2. *Metals*

Surface sediment samples collected from 18 locations and 15 subsurface sediment samples collected from eight locations were analyzed for one or more metals. The analytical results for metals in sediment are summarized in Table 23. The approximate sampling locations and estimated extent of metals at concentration greater than the proposed cleanup levels in sediment are shown on Figure 13.

Metals were either not detected or were detected at concentrations less than the proposed sediment cleanup levels in the surface sediment samples collected from the Site. However, mercury was detected at concentrations greater than the proposed cleanup level in five of the 15 subsurface sediment samples that were collected from three locations. Although mercury concentrations in surface sediment samples (0 to 10 cm) were less than the proposed cleanup level, mercury was detected at concentration greater than the proposed cleanup level in a sample collected from the surface to 2 feet below the mudline at RGS-7 indicating that mercury at concentrations greater than the cleanup level are present just below the surface.

Samples with mercury concentrations greater than the proposed cleanup level were comprised of sediment collected from the surface to a depth of 6 feet below the mudline at sampling locations RGS-7, RI-S-2 and RI-S-3. The estimated horizontal extent of mercury at concentrations greater than the proposed cleanup level is show on Figure 13 and is based on the results of samples collected from RI-S-4, RGS1, RGS2 and EC-11. The vertical extent is estimated to be from near the sediment surface to between 4 and 6 feet below mudline based on the results for samples collected from RI-S-2, RI-S-3, and RGS7.

Tributyltin analyses were performed on porewater samples collected from five surface sediment sample locations. The sample locations (RGS-4, RGS-6, RGS-7, RGS-8 and BI-S32) were positioned along the upper intertidal portion of the marine area of the Site. Tributyltin was not detected in any of the porewater samples.

6.7.3. *Gasoline-Range Petroleum Hydrocarbons*

Surface sediment samples collected from two locations (RI-S-1 and RI-S-5) at the Site were analyzed for gasoline-range petroleum hydrocarbons. Gasoline-range petroleum hydrocarbons were not detected in the surface sediment samples. The analytical results for gasoline-range petroleum hydrocarbons in sediment are summarized in Tables 23 and 24. The approximate sampling locations are shown on Figure 14.

6.7.4. *Diesel- and Heavy Oil-Range Petroleum Hydrocarbons*

Surface sediment samples collected from 12 locations at the Site were analyzed for diesel- and oil-range petroleum hydrocarbons. The analytical results for diesel- and oil-range petroleum hydrocarbons in sediment are summarized in Tables 23 and 24. The approximate sampling locations and estimated extent of total petroleum hydrocarbons (i.e., the sum of the detected diesel- and oil-range petroleum hydrocarbon concentrations) at concentrations greater than the proposed cleanup level in sediment are shown on Figure 15.

Total petroleum hydrocarbons were either not detected or were detected at concentrations less than the proposed sediment cleanup level except at three surface sediment samples locations. The total petroleum hydrocarbon concentrations for samples collected from RGS4, RGS5 and RGS8 were greater than the proposed cleanup level.

Additional investigation was performed to evaluate the total petroleum hydrocarbon concentrations at sampling locations RGS4 and RGS5 that included the following:

- An additional surface sediment sample (RI-S-1) was collected from sample location RGS4 to evaluate total petroleum hydrocarbon concentrations at this location. The original sample was collected from RGS4 in 2008 and had a total petroleum hydrocarbon concentration of 106 mg/kg. Sample RI-S-1 was collected in 2010 and total petroleum hydrocarbons were not detected in the sample. Therefore, based on the more recent results for sample RI-S-1, total petroleum hydrocarbon concentrations are less than the proposed cleanup level at this location (RGS4/RI-S-1).
- A review of the chromatogram for the sample collected from RGS5 identified the presence of two individual peaks representative of separate diesel- and oil-range petroleum hydrocarbon products in the sample. As separate products were present in the sample obtained from RGS5, the concentrations of the individual products (i.e., diesel and oil) were compared to the proposed cleanup levels. The concentrations of diesel as well as oil in the sample collected from RGS5 are less than the proposed sediment cleanup level. Therefore, based on the additional review of the results, total petroleum hydrocarbon concentrations are less than the proposed cleanup level at this location (RGS5).

The estimated horizontal extent of total petroleum hydrocarbons at concentrations greater than the proposed cleanup level is shown on Figure 15 and is based on the results of samples collected from RI-S-5 and RGS-1. The vertical extent is assumed to be from the surface to a depth of approximately 1 foot below the mudline.

6.7.5. *PAHs*

Surface sediment samples collected from 20 locations and seven subsurface sediment samples collected from four locations at the Site were analyzed for PAHs. The analytical results for PAHs in sediment are summarized in Tables 23 and 24. The approximate sampling locations and estimated extent of PAHs at concentrations greater than the proposed cleanup level in sediment are shown on Figure 16.

PAHs were detected at concentrations greater than the proposed cleanup level in nine surface sediment samples. PAHs were either not detected or were detected at concentrations less than the proposed cleanup levels in the remaining surface sediment samples. The detection limits for two PAH compounds (acenaphthene and dibenzo(a,h)anthracene) in one sample (GS-04) collected north of the northern property boundary had detection limits that were greater than the proposed cleanup levels. The detection limits for these two compounds were greater than the SMS SQS but not the CSL.

PAHs were not detected or were detected at concentrations less than the proposed cleanup levels in the seven subsurface sediment samples collected from the Site.

The PAH analysis results indicate that erosion of PAH-contaminated soil from the upland area at the shoreline and/or via stormwater runoff are the likely source of PAH contamination in sediment. All of the surface sediment samples with PAH concentrations greater than the proposed cleanup levels were collected from the intertidal marine area adjacent to the central and northern portions of the Site. The highest PAH concentrations in sediment were generally detected in the samples that were collected closest to the upland area and the stormwater outfalls. Additionally, PAH contamination was not detected at concentrations greater than the proposed cleanup level in subsurface sediment indicating that the PAH contamination in sediment at the Site is from more recent surface deposition.

The estimated horizontal extent of PAHs at concentrations greater than the proposed cleanup levels is shown on Figure 16 and is based on the results of samples collected from RI-S-3, RGS2, RGS6, RGS9, RGS11 and GS-04. The vertical extent is estimated to be from the surface to a depth of between approximately 1 foot and 2 feet below the mudline based on the results for samples collected from RGS1, RGS7, and RGS8.

6.7.6. *Phthalates*

Surface sediment samples collected from 14 locations and seven subsurface sediment samples collected from four locations at the Site were analyzed for phthalates. The analytical results for phthalates in sediment are summarized in Tables 23 and 24. Additional sediment samples have been collected adjacent to the Site as part of studies investigating the Hardel Site (Greylock, 2007) as well as Budd Inlet (Ecology 2008 and Port of Olympia 2013). The analytical results for phthalates in sediment adjacent to the Site are present in Table 25. The approximate sampling locations and estimated extent of phthalates at concentrations greater than the proposed cleanup level in sediment are shown on Figures 17A and 17B.

Bis(2-ethylhexyl) phthalate was detected at concentrations greater than the proposed cleanup level in seven surface sediment samples. Butylbenzyl phthalate was detected at a concentration greater than the proposed cleanup level in two surface sediment samples. Phthalates were either not detected or were detected at concentrations less than the proposed cleanup levels in the remaining surface sediment samples collected from the Site and adjacent to the Site. The detection limit for Butylbenzyl phthalate in the sample collected from GS-04 (Table 23) and butybenzyl phthalate, diethyl phthalate, and dimethyl phthalate in the samples collected from GS-01 through GS-03 (Table 25) located north of the northern property boundary were greater than the proposed cleanup levels. The detection limits for these compounds were greater than the SMS SQS/LAET but not the CSL/2LAET.

Bis(2-ethylhexyl)phthalate (DEHP) was detected at a concentration greater than the proposed screening level in one sample collected from the surface to a depth of 2 feet below the mudline at sampling location RGS-7. Phthalates were either not detected or were detected at concentrations less than the proposed cleanup levels in the remaining six subsurface sediment samples collected from the Site.

The phthalate analysis results indicate that stormwater runoff is the likely source of phthalate concentrations greater than the proposed cleanup level for sediment located on the northern portion of the marine area. The highest concentration of DEHP in sediment (19 mg/kg) at the Site was collected from a sample location on the shoreline (RGS8) downgradient of the northern-most outfall (SW-1). Additionally, phthalate concentrations in sediment in the northern portion of the marine area generally decrease with increased distance from the northern-most outfall location. However, other outfalls and stormwater discharges in the vicinity of the Site could be contributing to phthalate contamination in sediment as phthalates are a ubiquitous contaminant in stormwater in urban areas (City of Tacoma et al., 2007).

The estimated extent of PAHs at concentrations greater than the proposed cleanup levels is shown on Figures 17A and 17B and is based on the results of samples collected from RI-S-3, RGS2, RGS6, RGS9, RGS11, and GS-04. Phthalates were not detected in samples collected from locations adjacent to these sample locations at the Site or adjacent to the Site (i.e., RGS2 through RGS6, RGS9 through RGS11, GS-01 through GS-03, SS-22, SS-26, and SS-27, and BI-5 and BI-7). Note that although the detection limits for several phthalates were greater than the cleanup levels at GS-02 and GS-03, that bis[2-ethylhexyl] phthalate was not detected nor was the detection limit for bis(2-ethylhexyl) phthalate greater than the cleanup level at these locations. Bis(2-ethylhexyl) phthalate was detected at all other locations where phthalates were present at concentrations greater than the cleanup levels in sediment. The vertical extent is estimated to be from the surface to a depth of between approximately 1 foot and 2 feet below the mudline based on the results for samples collected from RGS1, RGS7, and RGS8.

6.7.7. *Chlorinated Hydrocarbons, Ionizable Organics, and Miscellaneous Extractables*

Surface sediment samples collected from 14 locations and seven sub-surface sediment samples collected from four locations at the Site were analyzed for chlorinated hydrocarbons (1,2, 4-trichlorobenzene, 1,2-dichlorobenzene, 1,4-Dichlorobenzene, and 1,3-Dichlorobenzene), ionizable organics (2,4-dimethylphenol, 2-methylphenol, 4-methylphenol, pentachlorophenol, phenol, benzoic acid, and benzyl alcohol) and miscellaneous extractables (dibenzofuran, hexachlorobutadiene, hexachlorobenzene, and n-nitrosodiphenylamine). The analytical results for chlorinated hydrocarbons, ionizable organics, and miscellaneous extractables in sediment are summarized in Tables 23 and 24.

Chlorinated hydrocarbons, ionizable organics, and miscellaneous extractables were not detected at concentrations greater than the proposed sediment cleanup levels. However, the detection limits for multiple chlorinated hydrocarbons, ionizable organic and miscellaneous extractable compounds were greater than the proposed cleanup levels in several samples. These compounds are not further evaluated because none of the compounds with detection limits greater than the proposed cleanup levels were detected in samples with detection limits that were less than the proposed cleanup level.

6.7.8. *PCBs*

Surface sediment samples collected from eight locations at the Site were analyzed for PCBs. PCBs were either not detected or were detected at concentrations less than the proposed sediment cleanup levels in each of the samples. The analytical results for PCBs in sediment are summarized in Tables 23 and 24.

6.8. Metal Debris on The Shoreline

Samples were collected from the metal debris visible along the shoreline east of the Structural Shop and former Tank Shop. The samples were analyzed for a combination of the following analytes:

- Metals including arsenic, barium, cadmium, chromium (total), copper, lead, mercury, selenium and silver.

Section 6.8.1 presents the results for each of the analytes in comparison to the proposed sediment cleanup levels. The analytical results for the samples are compared to the proposed soil cleanup levels in Section 5.1.1. The analytical results for the samples are being compared to proposed sediment and soil cleanup levels as the material is present above and below the OHW line along the shoreline at the Site (Figure 5). Analytes detected at concentrations greater than the proposed sediment cleanup levels include metals (arsenic, cadmium, copper and lead).

6.8.1. *Metals*

Three samples were collected from the metal debris present along the shoreline. The analytical results for metals in the metal debris in comparison to the proposed sediment cleanup levels are summarized in Table 26. The sampling locations and estimated extent of the metal debris are shown on Figure 13.

The three samples of the metal debris were collected from the surface of the metal debris and from approximately 2 feet below the surface at sampling locations S1, S3, and BS-1. Two of the three metal debris samples contained arsenic, cadmium, copper, or lead at concentrations greater than the proposed sediment cleanup levels. The analytical results identify that the metal debris exceeds the proposed sediment cleanup levels.

7.0 LOCATIONS AND MEDIA REQUIRING CLEANUP ACTION EVALUATION

This section identifies the areas and environmental media (soil, groundwater, stormwater runoff, and sediment) at the Site that require cleanup action evaluation. The areas requiring cleanup action evaluation for each media are summarized in the following sections and are shown on Figure 18.

7.1. Soil

Based on the information evaluated in the RI, soil in the following areas contains contaminant concentrations greater than the proposed soil cleanup levels:

- The area within the footprint of former Maintenance Building has soil with arsenic, cadmium, and lead at concentrations greater than cleanup levels. The vertical extent is estimated to be from the surface to a depth of approximately 2 feet bgs. Within the footprint of former Maintenance Building, metal debris is observed to be present as a layer or in mounds on top of the soil surface.

- The area east of the Paint Shop has soil with lead and mercury at concentrations greater than cleanup levels. The vertical extent is estimated to be from a depth of approximately 1 foot bgs to a depth of 6 feet bgs.
- The relatively small area north of the former Maintenance Building has soil with gasoline-range petroleum hydrocarbon concentrations greater than the cleanup level. Additionally, analysis for BTEX compounds was not performed on the soil samples from this area. As BTEX data is not currently available for these locations, it has been assumed for the purposes of this RI, that BTEX compounds are present at concentrations greater than soil cleanup levels and concentrations that would result in soil vapor intrusion and an inhalation exposure above acceptable risk levels. The vertical extent is estimated to be to a depth of approximately 13 feet bgs.
- The relatively small area located within the eastern portion of the former Maintenance Building has soil with gasoline-range petroleum hydrocarbon concentrations greater than the cleanup level. Additionally, analysis for BTEX compounds was not performed on the soil sample from this area. As BTEX data is not currently available for this location, it has been assumed for the purposes of this RI, that BTEX compounds are present at concentrations greater than soil cleanup levels and concentrations that would result in soil vapor intrusion and an inhalation exposure above acceptable risk levels. The vertical extent is estimated to be to a depth of 6 feet bgs.
- The area located southwest of the former Tank Shop has soil with diesel-range petroleum hydrocarbons at concentrations greater than the cleanup level. The vertical extent is estimated to be from a depth of approximately 4 feet to 10 feet bgs. A groundwater sample collected from this area (MW-4) in 2008 also contained petroleum hydrocarbons at a concentration greater than groundwater cleanup levels (Table 15). A 300 gallon heating oil UST located adjacent to the southwest corner of the Tank Shop is the likely source of the diesel-range petroleum hydrocarbon contamination in this area (Figures 2 and 3). No records were identified indicating that the UST was decommissioned including removing the contents of the UST. Therefore, the tank may be a continuing source of petroleum hydrocarbon contamination to soil.
- The relatively small area located near the southeast corner of the former Maintenance Building has soil with diesel- and oil-range petroleum hydrocarbons at concentrations greater than cleanup levels. The vertical extent is estimated to be from the surface to 2 feet bgs. Activities in the former Crane Shed are the likely source of the diesel- and oil-range petroleum hydrocarbons in this area (Figure 3). Stained soil was observed in this area during previous Site investigations (Table 1).
- The relatively small area located on the north side of the Structural Shop has soil with oil-range petroleum hydrocarbons at a concentration greater than the cleanup level. The vertical extent is estimated to be from the surface to 4 feet bgs. Activities in the Structural Shop associated with a former shear machine are the likely source of the oil-range petroleum hydrocarbon contamination in this area (Figure 3). Stained soil was observed in this area during previous Site investigations (Table 1).

- The area located east of the Paint Shop has soil with diesel-range petroleum hydrocarbons at concentrations greater than the cleanup level. The vertical extent is estimated to be from approximately 1 foot bgs to approximately 9 feet bgs.
- Soil across the Site contains PAHs at concentrations greater than the cleanup levels. The vertical extent is estimated to be from the surface to between approximately 2 to 7 feet bgs.
- Metal debris on the shoreline has arsenic, cadmium, and lead at concentrations greater than the soil cleanup levels. The metal debris contains arsenic, cadmium, copper, and lead at concentrations greater than the sediment cleanup levels. The vertical extent is estimated to be from the surface to approximately 3 feet bgs. The analytical results for the metal debris are compared to proposed soil and sediment cleanup levels as the material is present above and below the OHW line along the shoreline (Figure 5).

Cleanup action alternatives for soil will be developed for all of these areas that are protective of human and ecological receptors and other Site media (i.e., groundwater, surface water runoff, and sediment).

7.2. Groundwater

Based on information evaluated in the RI, groundwater in the vicinity of the former maintenance building contains metals concentrations greater than the proposed groundwater cleanup levels. Groundwater in monitoring wells MW-6, MW-7, and MW-8 contains arsenic and copper concentrations greater than cleanup levels. These monitoring wells are located down gradient of where metal debris is present at the Site, where soil and metal debris samples contained the highest concentrations of arsenic and copper detected at the Site, and where metals were detected in soil and metal debris samples at concentrations greater than soil cleanup levels (Figure 13). The metals debris and metals contaminated soil are the likely source of arsenic and copper in groundwater in the vicinity of the former maintenance building.

Groundwater in this area will require evaluation of cleanup action alternatives to protect human and ecological receptors. Cleanup action alternatives for groundwater will be coordinated with soil cleanup actions as contaminated soil is the source to contamination in groundwater.

7.3. Stormwater

Based on information evaluated in this RI, stormwater runoff from the four outfalls at the Site contains PAHs and/or metals at concentrations greater than the stormwater runoff screening levels. Stormwater runoff from the four outfalls SW-1, SW-2, SW-3 and SW-4 contains lead, mercury, zinc and/or copper at concentrations greater than the screening levels. Stormwater runoff from outfall SW-1 also contains PAHs at concentrations greater than the screening levels.

Stormwater at the Site runs off of contaminated soil surfaces and entrains soil particles that are then transported to surface water and sediment in the adjacent marine area. Elevated turbidity (92.6 NTUs) was measured in the stormwater runoff sample with cPAH concentrations greater than the stormwater screening levels indicating that stormwater runoff is transporting soil particles containing cPAHs from the upland area of the Site to surface water and sediment. Cleanup action alternatives for stormwater runoff will be coordinated with cleanup action alternatives for soil as contaminated soil is the source to contamination in stormwater.

7.4. Sediment

Based on the information evaluated in this RI, sediment in the following areas contains contaminant concentrations greater than the proposed sediment cleanup levels:

- The area east of the Structural Shop and former Tank Shop in the central portion of the marine area has sediment with mercury concentrations greater than the cleanup level. The vertical extent is estimated to be from near the sediment surface to between 4 and 6 feet below mudline.
- The area on the northern portion of the marine area has sediment with total petroleum hydrocarbons at a concentration greater than the cleanup level. The vertical extent is assumed to be from the surface to a depth of approximately 1 foot below the mudline.
- The northern portion of the marine area has sediment with PAH concentrations greater than cleanup levels. The PAH results indicate that erosion of PAH contaminated soil from the upland area at the shoreline and/or via stormwater runoff are the likely source of PAH contamination in sediment. The vertical extent is estimated to be from the surface to a depth of between approximately 1 foot and 2 feet below the mudline.
- The northern portion of the marine area has sediment with phthalate concentrations greater than cleanup levels. The phthalate results indicate that stormwater runoff is a likely source of phthalate concentrations greater than the cleanup level. The vertical extent is estimated to be from the surface to a depth of between approximately 1 foot and 2 feet below the mudline.

Sediment in the marine area will require evaluation of cleanup action alternatives to protect human and ecological receptors. Cleanup action alternatives for sediment will be coordinated with soil, groundwater, and stormwater cleanup actions as contaminants as these media are sources to contamination in sediment.

8.0 FEASIBILITY STUDY

This section presents the feasibility study (FS) prepared for the upland and marine areas of the Site. The FS was completed to develop and evaluate remedial action alternatives for addressing contamination identified at the Site and to select a preferred remedial alternative. The FS utilizes information about the history and environmental conditions gathered during Site investigations. The results of these investigations and history of the Site are summarized in Sections 1 through 7 of the RI. This FS was completed in accordance with the requirements of the Model Toxics Control Act (MTCA) Cleanup Regulation, Chapter 173-340 Washington Administrative Code (WAC) and the SMS, Chapter 173-204 WAC.

8.1. Cleanup Standards

Cleanup standards consist of cleanup levels that are protective of human health and the environment and the points of compliance at which the cleanup levels must be met. Proposed Site-specific cleanup standards were developed in the RI (Section 5.0). The proposed cleanup standards are adopted in this FS for the purpose of developing remedial action objectives (RAOs) for the Site. The RAOs are presented in Section 8.3. The proposed media-specific cleanup levels (screening levels for stormwater runoff) along with the points of compliance are summarized below.

8.1.1. *Cleanup Levels*

8.1.1.1. SOIL

Cleanup levels for soil that are protective of human health and terrestrial ecological receptors were developed in accordance with MTCA requirements. Based on current zoning and anticipated future use, cleanup levels for Site soil are for unrestricted land use and are based on MTCA Method A and Method B soil cleanup levels. In general the most conservative criteria (i.e., lowest of MTCA Method A and Method B) were identified as the cleanup level unless background concentrations for soil were greater than the cleanup level.

8.1.1.2. GROUNDWATER

The highest beneficial use of groundwater at the Site is based on the protection of surface water in Budd Inlet. Accordingly, surface water standards are applicable for groundwater at the Site where groundwater enters the surface water. In general, the most conservative (i.e., lowest) published numerical values selected from available state and federal surface water criteria were selected as the cleanup level for groundwater.

8.1.1.3. STORMWATER RUNOFF

The cleanup levels developed for groundwater that were developed for protection of surface water are adopted as stormwater runoff screening levels for the Site to evaluate potential impacts from Site stormwater runoff. Additionally, the industrial stormwater general permit benchmark criteria for total metals, excluding mercury, are also applied as stormwater runoff screening levels. The total mercury criteria from the industrial stormwater general permit benchmark criteria is not used as the total mercury criteria developed for groundwater is more conservative (i.e., lower).

8.1.1.4. SEDIMENT

Sediment cleanup levels were developed according to SMS requirements and direction provided by Ecology. The lower of the SMS criteria (lower of SQS and CSL) are selected as the sediment cleanup level to compare analytical results of sediment samples with a TOC concentration within the range of 0.5 to 3.5 percent. Prior to comparing results to SMS criteria, chemical concentrations of non-ionizable SVOCs and PCBs are organic carbon normalized. The lower of the AET criteria (lower of LAET and 2LAET) are selected as the sediment cleanup level to compare analytical results for samples with TOC concentrations outside of the 0.5 to 3.5 percent range.

Currently, there is no promulgated SMS criterion for total petroleum hydrocarbons (diesel and oil) in sediment and tributyltin ion in sediment porewater. For the Reliable Steel Site, total petroleum hydrocarbons are evaluated against the screening level of 100 mg/kg as requested by Ecology and the results for tributyltin ion are evaluated against the Dredged Material Management Program (DMMP) screening level of 0.15 µg/L.

8.1.2. *Points of Compliance*

Under MTCA, the point of compliance is the point or location on a site where the cleanup levels must be attained. The points of compliance for affected media will be approved by Ecology and presented in the Site-specific CAP. However, it is necessary to identify proposed points of compliance in order to develop and evaluate cleanup action alternatives in the FS. This section describes the proposed points of compliance for soil, groundwater, stormwater runoff and sediment.

8.1.2.1. SOIL

The standard point of compliance (upper 15 feet) is considered applicable to prevent human exposure by direct contact to Site soil, as defined in WAC 173-340-740(6)(d).

For potential terrestrial ecological exposures, MTCA regulations allow a conditional point of compliance to be established from the ground surface to 6 feet below ground surface (bgs) (the biologically active zone according to MTCA default assumptions), provided institutional controls are used to prevent excavation of deeper soil [WAC 173-340-7490(4)(a)]. Accordingly, in areas of the Site where potential ecological exposures are a concern, and where appropriate institutional controls can be implemented, a conditional point of compliance for soil concentrations protective of terrestrial ecological receptors may be proposed throughout the soil column from the ground surface to 6 feet bgs. Considering the potential future use of the Site as commercial and/or residential use, this is an appropriate proposal.

8.1.2.2. GROUNDWATER

Because the groundwater cleanup levels are based on protection of marine surface water and not protection of groundwater as drinking water and as provided for in WAC 173-340-720(8)(i), the proposed conditional point of compliance for the groundwater cleanup levels is the point or points where groundwater flows into the marine water of Budd Inlet.

8.1.2.3. STORMWATER RUNOFF

Because the stormwater screening levels are based on protection of marine surface water and industrial stormwater general permit benchmark criteria, the proposed conditional point of compliance for the stormwater screening levels is the point or points where stormwater discharges into the marine water of Budd Inlet.

8.1.2.4. SEDIMENT

For marine sediments potentially affected by Site-related hazardous substances, the point of compliance for protection of the environment is surface sediments within the biologically active zone. The biologically active zone is represented by samples collected across the top 10 centimeters (cm) (i.e., 0 to 4 inches) of the sediment column.

8.2. Locations and Media Requiring Cleanup Action Evaluation

This section identifies the locations and environmental media (soil, groundwater, stormwater runoff, and sediment) at the Site that require cleanup action evaluation. These areas are shown on Figure 18 and are summarized in Section 7.0 of the RI.

8.2.1. *Soil*

Based on the information evaluated in the RI, soil in the following areas contains contaminant concentrations greater than the soil cleanup levels:

- The area within the footprint of former Maintenance Building has soil with arsenic, cadmium, and lead at concentrations greater than cleanup levels.
- The area east of the Paint Shop has soil with lead and mercury at concentrations greater than cleanup levels.

- The relatively small area north of the former Maintenance Building has soil with gasoline-range petroleum hydrocarbon concentrations greater than the cleanup level.
- The relatively small area located within the eastern portion of the former Maintenance Building has soil with gasoline-range petroleum hydrocarbon concentrations greater than the cleanup level.
- The area located southwest of the former Tank Shop has soil with diesel-range petroleum hydrocarbons at concentrations greater than the cleanup level. A 300-gallon heating oil UST located adjacent to the southwest corner of the Tank Shop is the likely source of the diesel-range petroleum hydrocarbon contamination in this area and may be a continuing source of contaminants to soil.
- The relatively small area located near the southeast corner of the former Maintenance Building has soil with diesel- and oil-range petroleum hydrocarbons at concentrations greater than cleanup levels.
- The relatively small area located on the north side of the Structural Shop has soil with oil-range petroleum hydrocarbons at a concentration greater than the cleanup level.
- The area located east of the Paint Shop has soil with diesel-range petroleum hydrocarbons at concentrations greater than the cleanup level.
- Soil across the Site contains PAHs at concentrations greater than the cleanup levels.
- Metal debris on the shoreline has arsenic, cadmium, and lead at concentrations greater than the soil cleanup levels.

Cleanup action alternatives for soil will be developed for all of these areas that are protective of human and ecological receptors and other Site media (i.e., groundwater, surface water runoff, and sediment).

8.2.2. *Groundwater*

Based on information evaluated in the RI, groundwater in the vicinity of the former Maintenance Building contains metals concentrations greater than the groundwater cleanup levels. Groundwater in monitoring wells MW-6, MW-7, and MW-8 contains arsenic and copper concentrations greater than the cleanup levels. These monitoring wells are located downgradient of where metal debris is present at the Site, where soil and metal debris samples contained the highest concentrations of arsenic and copper detected at the Site, and where metals were detected in soil and metal debris samples at concentrations greater than soil cleanup levels. The metals debris and metals contaminated soil are the likely source of arsenic and copper in groundwater.

Groundwater in this area will require evaluation of cleanup action alternatives to protect human and ecological receptors. Cleanup action alternatives for groundwater will be coordinated with soil cleanup actions as contaminated soil and metal debris are the source to contamination in groundwater.

8.2.3. *Stormwater Runoff*

Based on information evaluated in this RI, stormwater runoff from the four outfalls at the Site contains PAHs and/or metals at concentrations greater than the stormwater runoff screening levels. Stormwater runoff from the four outfalls SW-1, SW-2, SW-3, and SW-4 contains lead, mercury, zinc and/or copper at concentrations greater than the screening levels. Stormwater runoff from outfall SW-1 also contains PAHs at concentrations greater than the screening levels.

Stormwater at the Site runs off of contaminated soil surfaces and entrains soil particles that are then transported to surface water and sediment in the adjacent marine area. Cleanup action alternatives for stormwater runoff will be coordinated with cleanup action alternatives for soil as contaminated soil is the source to contamination in stormwater.

8.2.4. *Sediment*

Based on the information evaluated in the RI, sediment in the following areas contains contaminant concentrations greater than the proposed sediment cleanup levels:

- The area east of the Structural Shop and former Tank Shop in the central portion of the marine area has sediment with mercury concentrations greater than the cleanup level.
- The area on the northern portion of the marine area has sediment with total petroleum hydrocarbons at a concentration greater than the cleanup level.
- The northern portion of the marine area has sediment with PAH concentrations greater than cleanup levels. The PAH results indicate that erosion of PAH contaminated soil from the upland area at the shoreline and/or via stormwater runoff are the likely source of PAH contamination in sediment.
- The northern portion of the marine area has sediment with phthalate concentrations greater than cleanup levels. The phthalate results indicate that stormwater runoff is the likely source of phthalate concentrations greater than the cleanup level.

Sediment in the marine area will require evaluation of remedial action alternatives to protect human and ecological receptors. Remedial action alternatives for sediment will be coordinated with soil, groundwater, and stormwater cleanup actions as contaminants as these media are sources to contamination in sediment.

8.3. Remedial Action Objectives

This section presents RAOs that are applicable to the Site. RAOs consist of chemical- and medium-specific goals for protecting human health and the environment. The RAOs specify the media and contaminants of interest, potential exposure routes and receptors, and proposed cleanup goals. Because of the substantial differences between the upland and marine area physical environments, resources/uses, and cleanup standards, as well as anticipated differences in cleanup-related construction logistics, separate remedial action alternatives are developed in this FS for the upland and marine areas. The RAOs for the upland and marine areas are summarized in the following sections.

8.3.1. *Upland Area Soil, Groundwater and Stormwater Runoff*

The objective of the proposed upland area remedial 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, groundwater, and stormwater runoff in accordance with the MTCA Cleanup Regulation (WAC 173-340) and other applicable regulatory requirements. Specifically, the objective of the upland area cleanup is to mitigate risks associated with the following potential exposure routes and receptors:

- Contact (dermal, incidental ingestion, or inhalation) by residents, visitors, workers (including excavation workers) and other Site users with hazardous substances in soil;
- Contact (dermal, incidental ingestion, or inhalation) by terrestrial wildlife with hazardous substances in soil;
- Contact by terrestrial plants and soil biota and/or food-web exposure with hazardous substances in soil; and
- Exposure by aquatic organisms to hazardous substances in eroded soil, groundwater that migrates and/or stormwater runoff that discharges, to the marine environment.

The cleanup goal for the upland area is to mitigate these risks by meeting the soil and groundwater cleanup levels and screening levels for stormwater runoff that are identified in Section 8.1.

8.3.2. *Marine Area Sediment*

The objective of the proposed marine area 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 Site-related hazardous substances in marine sediment in accordance with the MTCA Cleanup Regulation (WAC 173-340), SMS regulations (WAC 173-204) and other applicable regulatory requirements. Specifically, the objective of the sediment cleanup is to mitigate risks associated with the following potential exposure routes and receptors:

- Contact (dermal or incidental ingestion) by residents, visitors, workers (including dredging/ excavation workers) and other Site users with hazardous substances in sediment;
- Ingestion by Site visitors of marine organisms contaminated by Site-related hazardous substances in sediment;
- Exposure of benthic organisms to Site-related hazardous substances in the biologically active zone of sediment (the upper 10 cm of the sediment column); and
- Ingestion by aquatic organisms of benthic organisms contaminated by Site-related hazardous substances in sediment.

The cleanup goal for the marine area is to mitigate these risks by meeting the sediment cleanup standards identified in Section 8.1.

8.4. Applicable Regulatory Requirements

In addition to the cleanup standards developed through the MTCA process and presented in Section 8.1, other regulatory requirements must be considered in the selection and implementation of the cleanup action. MTCA requires the cleanup standards to be "at least as stringent as all applicable state and federal laws" [WAC 173-340-700(6)(a)]. Besides establishing minimum requirements for cleanup standards, applicable state and federal laws may also impose certain technical and procedural requirements for performing cleanup actions. These requirements are described in WAC 173-340-710. Table 27 presents the ARARs identified as being applicable at this Site.

The marine area remedial action is anticipated to qualify for a U.S. Army Corps of Engineers (USACE) Nationwide Permit 38 (NWP 38). Nevertheless, federal consultation under the Endangered Species Act, Section 401 Water Quality Certification, and other substantive requirements must still be met by the remedial action. Ecology will be responsible for issuing the final approval for the remedial action, following consultation with other state and local regulators. The USACE will separately be responsible for issuing approval of the project under NWP 38, following Endangered Species Act consultation with the federal Natural Resource Trustees, and also incorporating Ecology's 401 Water Quality Certification.

8.5. Screening of General Response Actions and Remediation Technologies

This section presents the results of a screening evaluation of potentially applicable general response actions and associated remediation technologies for the remedial actions to be performed at the Site. The screening evaluation is carried out for each of the environmental media (soil, groundwater, stormwater runoff and sediment) requiring remedial action evaluation. Based on the screening evaluation, selected response actions and technologies are carried forward for use in the development of remedial action alternatives for the upland and marine areas. The screening process determined the most appropriate technologies and process options that warrant use for development into remedial alternatives for further evaluation. Some response actions and technologies were screened out from further evaluation due to low effectiveness or implementability. Potentially effective and implementable response actions and remediation technologies are evaluated further below.

8.5.1. *Soil Remediation Technologies*

Multiple general response actions and remediation technologies for soil were screened to identify general response actions and remedial technologies to further evaluate for the remedial actions to be performed at the Site. A summary of the screening evaluation is presented in Table 28. Further discussion of specific, potentially applicable general response actions and remedial technologies for soil remedial actions including institutional controls, soil containment, soil removal/disposal, soil removal with ex situ treatment and in situ treatment is presented in the following sections.

8.5.1.1. INSTITUTIONAL CONTROLS

Institutional controls provide a notice to property owners or Site users that contaminants remain in soil above cleanup levels and are established to control human activities to limit exposure and ensure the effectiveness of the remedial action over time. A restrictive covenant (e.g., deed restrictions, posted notification of Site conditions) would not be an acceptable remedial action alternative on its own because it would not achieve the RAOs for the upland area. However, restrictive covenants can in certain instances be effective and implementable in combination with engineered and other institutional controls where the covenant requires maintenance of the protective barriers that keep humans and ecological receptors from contacting contaminated soil (i.e., access controls such as fencing and notification methods such as signage). If contaminated soil is to be left in place at a depth less than 15 feet bgs, then a restrictive covenant would be employed to require special procedures for future subgrade work (e.g., worker protection and soil management plans).

Institutional controls would require long-term monitoring to ensure that the Site conditions remain as specified in the final remedy to achieve RAOs. For example, if access controls such as fencing are implemented as part of the remedy, long-term monitoring and/or maintenance would be required to maintain the integrity of the fencing into the future. Institutional controls were retained for further evaluation for soil remedial alternatives.

8.5.1.2. SOIL CONTAINMENT

Soil containment includes engineered capping that could be employed to maintain a barrier between contaminated soil and potential human and ecological receptors. Soil containment is considered to be an effective technology to reduce exposure of human and ecological receptors to contaminants that are left on site. Asphalt and/or concrete paving and future infrastructure would provide an effective barrier that would prevent human or ecological exposure and also limit erosion of contaminated soil. Capping with soil or other aggregate material (such as, gravel) can also be used to provide a barrier to human and ecological receptors and to limit erosion of contaminated soil. A combination of pavement/infrastructure and soil capping would be compatible with future use of the Site for commercial and/or residential purposes.

Capping would require long-term monitoring to identify any areas where the capping material may be damaged and need maintenance or repair. Monitoring would consist of periodically inspecting the caps for areas of damaged or broken pavement or soil erosion and exposed underlying contaminated soil. Use of containment would not result in a permanent reduction in contaminant mass, mobility or toxicity. Surface capping is retained for further evaluation in remedial alternatives.

8.5.1.3. SOIL REMOVAL AND DISPOSAL

Soil removal by excavation is considered to be an effective technology to permanently eliminate the risk of exposure to contaminants at the Site. Excavation adjacent to or underneath existing buildings or other structures or utilities may require protective measures such as shoring or removal of structures. Excavation activities performed near the shoreline or at depths near or below the water table may require dewatering. Dewatering can be achieved through extraction of water from within the excavated area during excavation activities or can be initiated prior to excavation through installation of extraction wells that create a dry environment to work in. Installation of sheet-pile surrounding the expected excavation area can reduce the volume of water that enters the excavation, particularly in situations where excavation is performed adjacent to surface water. Extracted water may require storage, treatment to remove particulates and contaminants, and proper disposal to meet regulatory requirements.

It is anticipated that the majority of soil excavated to remediate the Site could be disposed of at a permitted solid waste landfill (for example, a Resource Conservation and Recovery Act [RCRA] Subtitle D facility) rather than requiring disposal at a hazardous/dangerous waste disposal facility (such as a RCRA Subtitle C facility). Due to the presence of elevated metals concentrations in some soil and metal debris, it will be necessary to perform Dangerous Waste characterization on soil that is excavated for off-site disposal. Treatment of metals-contaminated soil by stabilization is discussed below.

8.5.1.4. SOIL REMOVAL WITH EX SITU SOIL TREATMENT

There are a variety of ex situ soil treatment technologies that are used to treat soil. The technology screening for this Site identified that stabilization is the only ex situ soil treatment technology that to be retained for additional evaluation.

Stabilization of contaminated soil typically involves chemically binding and immobilizing the contaminants on a molecular level. Treatment of soil by stabilization is most commonly employed by mixing contaminated soil with Portland cement or another pozzolanic material. A pozzolanic material exhibits cementitious properties when combined with calcium hydroxide. With contaminants such as metals, stabilization has been reliably demonstrated. However, treatment using stabilization requires adequate characterization to develop a treatment plan, pilot testing to evaluate the effectiveness of the plan prior to implementation, additional testing during implementation to verify the treatment is effective during performance of the remedial action, and long-term monitoring to confirm the effectiveness of the treatment approach.

Although metals have been detected at concentrations greater than Site cleanup levels in several locations at the Site, the volume of metals-contaminated soil is relatively low. Because of the low volume of metals-contaminated soil, it would be more cost effective to remove and dispose of soil at a permitted solid waste landfill. Therefore, soil removal with ex situ treatment was not retained for further evaluation in this FS.

8.5.1.5. IN SITU SOIL TREATMENT

In situ soil treatment includes technologies such as biological treatment, phytoremediation and physical/chemical treatment applied to soil left in place. These remedial technologies will not be effective in treating metals-contaminated soils that are found at the Site. In situ treatment would be feasible, but likely ineffective in treating PAHs in soil. Although in situ treatment of TPH may be effective, this technology was not retained for further evaluation in this FS because the effectiveness is low for most of the contaminants present in soil at concentrations greater than the cleanup levels.

8.5.2. *Groundwater Remediation Technologies*

As described in the RI, metals (i.e., arsenic and copper) have been detected in groundwater at concentrations greater than the Site cleanup levels adjacent to the former location of the Maintenance Shop and metal debris present on the shoreline. The soil in the former location of the Maintenance Shop and metal debris present along the shoreline contain the highest concentrations of metals detected at the Site and contain metal concentrations greater than the soil cleanup levels as the metals-contaminated soil and metal debris are the source of contamination in groundwater, remediation of groundwater requires removal of the metals-contaminated soil and metal debris.

Upon the removal of the source of metals contamination to groundwater, the metals concentrations in groundwater are anticipated to attenuate to concentrations less than the cleanup levels. Therefore, monitored natural attenuation of metals concentrations in groundwater is the only remedial technology advanced for groundwater at the Site. Groundwater monitoring would be required upon the completion of the removal of metals-contaminated soil and metal debris to confirm the natural attenuation of metal concentrations in groundwater and compliance with the groundwater cleanup levels at the conditional point of compliance was occurring (i.e., where groundwater flows into marine water in Budd Inlet).

8.5.3. *Stormwater Runoff Remediation Technologies*

Screening levels for stormwater runoff were developed for the protection of marine water in Budd Inlet and to evaluate the presence of Site contaminants in stormwater. It is important that contaminants present in the upland area are not transported in stormwater runoff to the marine area of the Site and that contaminants in stormwater runoff do not re-contaminate the marine area following completion of remedial actions at the Site.

Based on the results from the investigation at the Site, the current stormwater collection and conveyance system at the Site is a transport pathway for contaminated upland media to surface water and sediment in the marine area. The results of stormwater runoff sampling and analysis indicate that stormwater running off of the Site entrains soil particles including Site contaminants that are then transported by the current stormwater collection and conveyance system to the marine area. The subsurface components of the current stormwater collection and conveyance system (i.e., catch basins, piping, etc.) are not likely fully contained (i.e., tight-lined) and therefore, groundwater containing Site contaminants and even soil could also be infiltrating into the conveyance system through gaps at the joints between system components or other cracks or breaks in the system. The stormwater system could then be transporting the infiltrating groundwater and soil particles and conveying it to the Site outfalls discharging to Budd Inlet.

Remedial actions for soil contamination in the upland area (such as, containment, removal and off-site disposal, etc.) will likely address multiple current sources that are affecting the quality of stormwater runoff at the Site. Identification and evaluation of remedial actions for the Site will include consideration of the removal and replacement of the existing stormwater collection and conveyance system to ensure stormwater runoff is not a continued transport pathway for contaminants from the upland area to the marine area at the Site.

8.5.4. *Sediment Remediation Technologies*

Multiple general response actions and remediation technologies for sediment were screened to identify general response actions and remedial technologies to further evaluate for the remedial actions to be performed at the Site. A summary of the screening evaluation is presented in Table 29. Further discussion of specific, potentially applicable general response actions and remedial technologies for sediment remedial actions including institutional controls, natural recovery, sediment containment, sediment removal/disposal and in situ sediment treatment is presented in the following sections.

8.5.4.1. INSTITUTIONAL CONTROLS

Institutional controls provide a notice to property owners or Site users that contaminants remain in sediment above cleanup levels and are established to control human activities to limit exposure and ensure the effectiveness of the remedial action over time. Institutional controls for sediment may include land use/access restrictions such as deed restrictions or covenants to ensure the remedial action (i.e., marine cap) remains protective of human health and the environment.

Informational devices such as education, public outreach and access controls such as fencing and notification methods such as signage can effectively alert Site visitors to the presence of contamination in sediment. Institutional controls would not be an acceptable remedial action alternative for sediment on its own because it would not achieve the RAOs for the marine area. However, in certain instances they may be effective and implementable in combination with engineered and other institutional controls to keep humans and ecological receptors from contacting contaminated sediment.

Institutional controls would require long-term monitoring to ensure that the Site conditions remain as specified in the final remedy to achieve RAOs. Institutional controls were retained for further evaluation for sediment remedial alternatives.

8.5.4.2. NATURAL RECOVERY

Natural biotransformation processes such as biodegradation and bioturbation as well as sedimentation can act to reduce contaminant concentrations in sediment to acceptable levels over time. Natural recovery response actions include monitored natural recovery (MNR) and enhanced natural recovery (ENR). MNR includes periodic monitoring of contaminant concentrations to assess progress of natural biotransformation processes and sedimentation to reduce contaminant concentrations to below cleanup levels. ENR is an enhancement of MNR through placement of a thin layer of sand and/or other suitable material typically between 6 and 12 inches thick to enhance the recovery/reduction of contaminant concentrations to below the cleanup levels.

MNR can be effective in areas where organic contaminants are found at concentrations above cleanup levels. MNR is generally not as effective for reducing risk from inorganic contaminants (i.e., mercury) in sediment. Deposition of cleaner sediment plays a significant role in the natural recovery of contaminated sediments. MNR is generally not an appropriate approach where sediment deposition is not adequate to promote attenuation of contaminant concentrations or where erosion from tidal and wave action occur such as in the upper portion of shoreline areas.

At the Site, the upper shoreline area is subject to erosion from tidal and wave action. As stated in the RI, the upper shoreline is armored with metal debris, concrete, and wood bulkheads in places to reduce erosion of the shoreline bank. The sediment in the upper shoreline area is comprised of gravel and sand that is indicative of an erosional area and loss of fines. However, the lower shoreline is comprised of silt and sands that are indicative of a depositional environment. As stated in the RI, a study performed in Budd Inlet identified that the sedimentation rate in the area east and adjacent to the Site ranges from approximately 0.7 to 0.9 centimeters per year (SAIC, 2008).

In the upper shoreline of the marine area, MNR and ENR are not expected to be effective due to erosional forces that would remove deposition including material placed as part of ENR. In the lower shoreline of the marine area, MNR is not expected to be an effective remedial technology for sediment at the Site on its own, but may be effective in conjunction with other remedial technologies (such as, capping or removal of the material that is a source of contaminants to the natural recovery area). Therefore, MNR is retained for further evaluation in remedial alternatives. ENR also not expected to be an effective remedial technology for sediment in the lower shoreline at the Site on its own and may also be effective in conjunction with other remedial technologies. However, the marine area of the Site where ENR is anticipated to be effective is where MNR is anticipated to be effective and the cost of MNR is substantially less than ENR. Therefore, ENR was not retained for further evaluation in this FS.

8.5.4.3. SEDIMENT CONTAINMENT

Containment is a commonly used remedial technology for contaminated sediment in marine areas. Containment of sediment involves placing an engineered aggregate cap to isolate the contaminated sediment. In the aquatic environment, the cap must be designed to withstand erosive forces generated by tidal and wave action and must be thick enough to provide the required isolation of the material contained by the cap.

Cap monitoring results at other sites in the Puget Sound region have shown that capping can provide effective and economical sediment remediation without the risks involved in removing contaminants by dredging (Sumeri, 1996). Typical sediment capping technologies include sand caps, composite caps and reactive (such as sorbent) caps. A sediment cap would be designed to effectively contain and isolate contaminated sediment from the biologically active surface zone. The cap would be designed to be thick enough and of sufficient grain size to maintain its integrity under a range of conditions. Sediment caps at the Site would likely include placement of an approximate 3-foot thick layer of sand as containment and to provide a suitable habitat for benthic species on the lower shoreline and a composite cap comprised of a sand and gravel confinement layer with an armored surface layer to prevent erosion in the upper shoreline.

Placement of a cap on the existing sediment surface raises the surface elevation and can cause a loss of aquatic habitat in near-shore areas that may require compensatory mitigation. Compensatory mitigation may include creation of new aquatic habitat at the Site or, if adequate mitigation can’t be created at the Site, mitigation may need to be created at another location to offset the loss at the Site. However, dredging can be performed in association with capping to remove a portion of the contamination and to lower the surface elevation so that placement of capping material does not change the surface elevation. The combination of dredging and capping can eliminate the need for compensatory mitigation as a result of capping activities.

Sediment capping is a proven technology to prevent exposure to contaminated sediment and could be implemented at the Site. Capping has been used frequently in sediment remediation projects conducted in the Northwest. Monitoring of the physical integrity and contaminant characteristics of the cap would be required as part of compliance monitoring. Sediment caps are a relatively inexpensive remediation technology. Therefore, capping has been retained for containment of contaminated sediment.

8.5.4.4. SEDIMENT REMOVAL AND DISPOSAL

Removal and off-site disposal is a common remedial technology for sediment. The marine area at the Site is an intertidal area and removal of sediment from the marine area may require use of both land-based and water-based equipment and methods. Land-based removal equipment and methods would include use of land-based excavation equipment and transport vehicles (such as dump trucks) operated from the shoreline during low tides when the work area is exposed. Water-based removal equipment and methods would include use of a barge-mounted dredge and a material barge for dredge sediment transport.

Because of the shallow nature of the marine area, water-based equipment would need to be relatively small with limited draft and/or would need to work partial shifts during high tide to prevent grounding. As a result, an upland-based removal approach performed during periods of low tide may be a more cost-effective method for removal. Land-based removal may be more effective if performed in conjunction with shoring and dewatering components such as installation of a sheet-pile wall at the perimeter of the sediment removal area. This would allow dredging to be performed from the land side with less consideration for tidal periods. However, dewatering would require treatment and disposal of significant volumes of water.

Following the completion of dredging, the dredged areas would be backfilled or capped with clean material appropriate for the area. In areas where all sediment with contaminant concentrations greater than the cleanup level was removed, the area would be backfilled with clean material. In areas where sediment with contaminant concentrations greater than the cleanup levels remains at the base of the dredged area (for example, the metals-contaminated sediment area shown in Figure 18), the backfill area would be capped with clean material.

Upland disposal at a permitted landfill (such as a Subtitle D landfill) would be necessary for dredged sediment. Open-water disposal is not anticipated to be utilized for sediment dredged from the Site. Sediment dredged using land-based equipment would be loaded onto land-based transport vehicles (such as dump trucks and/or rail cars) for shipment to a regional landfill. Sediment dredged using water-based equipment would be loaded on a barge, and would be shipped directly to a barge-truck-rail transloading facility for shipment to an upland landfill. Sediment removal and disposal at a landfill is retained for further evaluation in the remedial alternatives.

8.6. Development of Remedial Alternatives

This section presents the remedial action alternatives developed by combining technologies and process options retained through the screening evaluation presented in Tables 28 and 29 to address the RAOs for contaminated areas and media within the upland and marine areas of the Site. Each alternative addresses contaminated media with a combination of remedial technologies appropriate for the Site conditions. The four alternatives represent a reasonable number and range of potentially applicable cleanup actions to provide a further basis for evaluation. Section 8.8 provides a comparative analysis of the four remedial action alternatives developed to address contamination at the Site.

The remedial action alternatives developed in this section are based on conceptual-level design for the implementation of the individual technologies described in Section 8.5. The design parameters used to develop the alternatives are based on engineering judgment and the current knowledge of Site conditions. The final design for the selected, preferred alternative may require additional characterization and analysis of Site media in addition to specific plans for the future development of the Site to better define the remedial action and costs associated with the remedial action.

The four remedial action alternatives were developed to be consistent with the future land use at the Site. Each of the alternatives is compatible with potential future use of the Site as a mixed use commercial/residential property.

The "no-action" alternative was not further evaluated in this feasibility study. The use of a no action alternative for addressing contaminants present in the upland and marine areas of the Site would not be expected to achieve the RAOs or meet the minimum requirements of a remedial alternative under the MTCA guidance. Therefore, the no action option was screened out from further consideration during the remedial technology screening process.

In addition, an alternative that only includes institutional controls would not be expected to achieve RAOs. As discussed above, institutional controls will only be protective in combination with other remedial technologies.

8.6.1. *Remedial Alternative 1 – Upland Area and Marine Area Capping*

Remedial Alternative 1 includes the following in the areas identified in Figure 19:

- Capping contaminated upland soil and marine sediment using a combination of capping methods;
- Natural recovery of sediment in areas not being capped;
- Excavation of metals-contaminated soil and metal debris that are a source to groundwater contamination;
- Excavation of gasoline-contaminated soil that may be a source of vapor intrusion; and
- Removal of a UST and associated petroleum-contaminated soil.

The specific remedial actions to be performed at the Site as part of Remedial Alternative 1 include the following:

- Site preparation, including demolition of existing structures and infrastructure in the upland and marine areas of the Site.
- Excavation and off-site disposal of approximately 770 cubic yards of metals-contaminated soil and approximately 470 cubic yards of metal debris contributing to contamination in groundwater.
- Excavation and off-site disposal of approximately 140 cubic yards of gasoline contaminated soil.
- Excavation and removal/off-site disposal of the UST and approximately 680 cubic yards of associated diesel-contaminated soil located adjacent to the former Tank Shop.
- Placing a 2-foot thick soil or aggregate cap over approximately 68,400 square feet (1.6 acres) of contaminated soil at the Site to limit the potential exposure of human and ecological receptors to contaminants in the upland area of the Site.
- Placing asphalt or concrete pavement or structures to cap approximately 34,200 square feet (0.8 acres) of the Site to limit potential exposure of human and ecological receptors to contaminants in the upland area of the Site.
- Removal and replacement of the existing stormwater collection and conveyance system to limit transport of contaminated upland media (i.e., stormwater runoff, soil, and groundwater) to surface water and sediment in the marine area.

- Installation of monitoring wells to monitor the natural attenuation of groundwater.
- Placing a 3-foot thick aggregate cap over approximately 49,600 square feet (1.1 acres) of contaminated sediment at the Site to limit potential exposure of human and ecological receptors to contaminants in the marine area of the Site.
- Monitoring the natural recovery of contaminated sediment in the marine area of the Site outside of the sediment cap area.
- Implementation of institutional controls such as deed restrictions for contaminated media that is left in place.

The following sections provide further description of the components of Remedial Alternative 1.

8.6.1.1. DEMOLITION

Demolition is necessary to effectively conduct upland area and marine area capping. In addition, demolition of existing structures would support future development of the Site. Structures to be demolished as part of upland area demolition activities include the following (Figure 2):

- Structural Shop – Components of the structure including: walls; roof; concrete foundations and slabs; as well as other structural components and utilities (for example components of the stormwater collection and conveyance system, power, and sewer).
- Paint Shop – Components of the structure including: walls; roof; concrete foundations, slabs, and floors; as well as other structural components and utilities (for example components of the stormwater collection and conveyance system, power, and sewer).
- Tank Shop – Remaining components of the structure including concrete foundations, pads, and floors as well as other structural components and utilities (for example components of stormwater collection and conveyance system, power, and sewer).
- Buttress/Foundation on Northern Boundary of Site – Large concrete structure that is on northeast corner of the upland area adjacent to the marine area.
- Rail Crane – Remaining concrete foundations and footings.
- Other Remaining Structures and Remnant Debris - Other remaining structures (such as bulkheads) and remnant debris (such as wood and concrete) present that will interfere with cleanup actions in the upland marine area.

Note that the remaining structures (piling, foundation, etc.) associated with the former Maintenance Building will be removed as part of removing soil and metal debris (see Section 8.6.1.2).

Structures to be demolished as part of marine area demolition activities include the following:

- Buttresses/Foundations Along Shoreline – Multiple large concrete buttresses/foundations are present on the shoreline east of the former Tank Shop, Structural Shop, and Paint Shop in the marine area.
- Rail Crane – Remaining wood components and concrete foundations and footings present in the marine area.

- Other Remaining Structures and Remnant Debris - Other remaining structures, piling, and remnant debris present in the marine area that will interfere with the remedial actions within the identified sediment area.

For cost estimating purposes it is assumed that all demolition, removal, and disposal or recycling would be expected to be performed using land-based equipment during low tide. Demolition materials would be removed from the Site and recycled to the extent practicable or disposed of at an appropriate disposal facility.

8.6.1.2. EXCAVATION AND OFF-SITE DISPOSAL OF MATERIAL CONTRIBUTING TO GROUNDWATER EXCEEDANCES

As discussed in Section 7.0 of the RI, soil and metal debris containing metals at concentrations greater than cleanup levels is present at the surface within the footprint of the former Maintenance Building and along the upper shoreline in the central portion of the Site (Figure 13). Groundwater adjacent to and downgradient of these areas exceeds cleanup levels. As discussed in Section 8.5.2, remediation of groundwater (natural attenuation of metals in groundwater) is not effective without removal of the source of the metals contamination. Therefore, for the remedial action to be protective of groundwater, the source of metals contamination to groundwater must be removed. Natural attenuation is anticipated to be an effective remedy for groundwater after source removal.

Figure 19 identifies the approximate areas to be excavated to remove metal debris and metals contaminated soil that is the source of metals contamination in groundwater as part of Remedial Alternative 1. Soil in the area of the former Maintenance Building would be excavated to an approximate depth of 2 feet below the existing ground surface to remove metal debris observed at the surface and soil with metals concentrations greater than the cleanup levels. Metal debris located along the upper shoreline would be excavated to an assumed depth of 3 feet.

The excavated soil and metal debris would be characterized for disposal as required by MTCA, the Washington State Dangerous Waste Regulations and the disposal facility. The contaminated soil is anticipated to fall into two categories: non-dangerous waste suitable for disposal at a Subtitle D landfill (or similar facility approved by the local permitting agency and Ecology) or Dangerous Waste requiring disposal at a Subtitle C landfill.

For soil to be categorized as non-dangerous waste and suitable for disposal at a Subtitle D landfill (or similar facility approved by the local permitting agency and Ecology), it would be necessary to demonstrate that Site contaminants are not present at concentrations greater than 10 times the Universal Treatment Standards (UTS), as defined in 40 CFR 268.48 and/or the results of TCLP testing for metals that indicate that the excavated material does not designate as Dangerous Waste based on Toxicity Characteristic Criteria (WAC 173-303-100).

It is anticipated that some of the excavated soil and/or metal debris would designate as Dangerous Waste and therefore, would be precluded from disposal at a Subtitle D (or similar) landfill. For cost estimating purposes in the FS, it is assumed that 25 percent of the soil and metal debris excavated from the former Maintenance Building and shoreline in the central portion of the Site would fail TCLP and thus would need to be disposed of at a Subtitle C landfill.

8.6.1.3. EXCAVATION AND OFF-SITE DISPOSAL OF GASOLINE-CONTAMINATED SOIL

As discussed in Section 7.0 of the RI, gasoline concentrations greater than cleanup levels are present in soil within the footprint of the former Maintenance Building and adjacent to the former Maintenance Building to the north (Figure 14). As BTEX data is not currently available for these locations, it has been assumed for the purposes of this RI/FS, that BTEX compounds are present at concentrations greater than soil cleanup levels and concentrations that would result in soil vapor intrusion and an inhalation exposure above acceptable risk levels. Therefore, the gasoline contaminated soil would need to be addressed as part of the remedial alternatives.

Figure 19 identifies the areas to be excavated to remove gasoline contaminated soil as part of Remedial Alternative 1 and includes:

- Soil in a relatively small area north of the former Maintenance Building would be excavated to an approximate depth of 13 feet bgs to remove soil contaminated with gasoline-range petroleum hydrocarbons.
- Soil in a small area within the eastern portion of the former Maintenance Building would be excavated to an approximate depth of 6 feet bgs to remove soil contaminated with gasoline-range petroleum hydrocarbons. This area overlaps with the area of metals-contaminated soil mentioned above, but the gasoline-contaminated soil would be expected to be located deeper.

The excavated soil and metal debris would be characterized for disposal as required by MTCA, the Washington State Dangerous Waste Regulations and the disposal facility. The gasoline contaminated soil is anticipated be non-dangerous waste suitable for disposal at a Subtitle D landfill (or similar facility approved by the local permitting agency and Ecology).

8.6.1.4. UST DECOMMISSIONING AND EXCAVATION AND OFF-SITE DISPOSAL OF DIESEL CONTAMINATED SOIL

A UST, located southwest of the former Tank Shop (Figure 19) has been identified to be the likely source of diesel contaminated soil in this area. Information was not identified indicating that the UST was decommissioned or removed. Therefore, the UST remains a potential source of petroleum hydrocarbons to the surrounding soil and groundwater. As part of Remedial Action Alternative 1, the UST would be decommissioned and removed in accordance with local and state UST regulations and the associated diesel-contaminated soil would be excavated and disposed of off-site.

Soil in the vicinity of the UST would be excavated to an approximate depth of 7 feet bgs to remove soil contaminated with diesel-range petroleum hydrocarbons based on soil analytical data presented in the RI. Excavated soil would be characterized for disposal as required by MTCA, the Washington State Dangerous Waste Regulations and the disposal facility. Based on soil samples collected in the vicinity of the UST, the contaminated soil would be expected to be categorized as non-dangerous waste suitable for disposal at a Subtitle D landfill (or similar facility approved by the local permitting agency and Ecology). For cost estimating purposes in the FS, it is assumed that all of the diesel-contaminated soil removed adjacent to the UST would be disposed of at a Subtitle D (or similar) landfill.

8.6.1.5. UPLAND AREA CAPPING

As part of Remedial Alternative 1, contaminated soil in the upland area would be capped to isolate the soil and limit the exposure of humans and ecological receptors to the contaminated soil that remains at the Site. The specific future development plans for the Site are unknown at this time, but it is anticipated that the Site will be used as a mixed commercial/residential property. The property is expected to be developed with a mixture of buildings, pavement, planting areas and vegetative cover.

For the purposes of this FS it is assumed that the cap on half of the upland area would be composed of infrastructure (i.e., buildings with concrete floors, etc.) and pavement (i.e., asphalt or concrete) while the cap on the remaining half of the upland area would be composed of soil (i.e., planting areas, vegetative cover) or aggregate (i.e., gravel, etc.). In the areas where a soil or aggregate material is used as cap, a geotextile will be placed between the contaminated soil and capping material to act as a visual indication of the limits of the cap. Then a 2-foot thick layer of clean soil or aggregate would be placed to create a physical barrier between the contaminated soil and Site users. Figure 19 identifies the extent of capping associated with Remedial Alternative 1. For cost estimating purposes in the FS, it is assumed that 50 percent of the upland cap area will be a soil cap, 25 percent of the area will be an asphalt pavement cap, and the remaining 25 percent of the area will be capped by structures (i.e., buildings with concrete floors, etc.).

8.6.1.6. GROUNDWATER MONITORING

The removal and off-site disposal of metal debris and soil containing metals is anticipated to result in a reduction of metals concentrations in groundwater thereby alleviating the need for active groundwater remediation. To verify that the removal of metals-contaminated soil and metal debris is effective at reducing metals concentrations in groundwater and that natural attenuation of groundwater is occurring, new monitoring wells would be installed near the point of compliance adjacent to the shoreline following completion of the soil and metal debris removal activities.

For cost estimating purposes, it is assumed that the existing monitoring wells would be decommissioned as part of remedial actions at the Site and that four new monitoring wells would be installed adjacent to the shoreline to monitor the natural attenuation of metals concentrations in groundwater. The monitoring wells would be sampled and analyzed for contaminant concentrations as well as indicators of natural attenuation during at least eight monitoring events to demonstrate that impacts to groundwater have been addressed. Groundwater monitoring would be conducted on a quarterly basis for the first year. Ecology would then review the groundwater data to determine if quarterly monitoring should continue or if the frequency can be reduced (such as annual or semi-annual).

8.6.1.7. STORMWATER COLLECTION AND CONVEYANCE SYSTEM

As discussed in the RI, the stormwater collection and conveyance system is a likely transport pathway for contaminated soil and groundwater to the marine waters of Budd Inlet. This remedial alternative includes removal and replacement of the existing stormwater collection and conveyance system. The following assumptions regarding replacement of the stormwater collection and conveyance system have been made for cost estimating purposes as part of the FS:

- The four existing outfalls and associated piping will be replaced with new material that is sealed or gasketed to not allow infiltration out of or into the stormwater conveyance system.
- Installation of 16 new catch basins at the Site.

- Lining the trenches used for installation of the new stormwater system with geotextile and backfilling the trenches with clean, imported material.
- Connecting new stormwater conveyance and collection piping to any existing upstream stormwater piping.

It is important to note that the replacement of the stormwater collection and conveyance system would need to be integrated with the specific needs of future development at the Site and the quantity assumptions identified above (i.e., 16 catch basins) are conceptual in nature and are only for cost estimating purposes as part of development of the FS.

8.6.1.8. MARINE AREA CAPPING

As part of Remedial Alternative 1, the sediment in the marine area containing multiple contaminants (i.e., metals, petroleum hydrocarbons, PAHs, and phthalates) at concentrations greater than SMS SQS levels would be capped. The SMS SQS levels correspond to a sediment quality that will result in no adverse effects on biological resources and no significant health risk to humans (WAC 173-204). The portion of the marine area to be capped is identified in Figure 19. The contaminated sediment would be capped to isolate and contain the sediment and limit the exposure of humans and ecological receptors to the contaminants present in the sediment. Isolated areas will remain outside of the area to be capped that contain sediment with phthalates at concentrations greater than SMS SQS levels. Monitored natural recovery would be applied to the remaining areas with phthalates at concentrations greater than SMS SQS levels.

The sediment cap that is placed at the Site would be comprised of a 3-foot thick layer of sand as containment and to provide a suitable habitat for benthic species on the lower shoreline and a composite cap comprised of a sand and gravel confinement layer with an armored surface layer to prevent erosion in the upper shoreline. Design of the cap for the marine area would require modeling the wave strength and shoreline stability to identify the final cap thickness and grain size of the cap components and armoring. The cap for the marine area would likely be composed of a combination of sand, gravel, armoring (i.e., riprap and/or quarry spalls), and habitat mix. To the extent practical, capping would incorporate habitat enhancement features.

As discussed in Section 8.5.4.3 above, placement of a cap on the existing sediment surface raises the surface elevation and can cause a loss of aquatic habitat in near-shore areas that may require compensatory mitigation. The capping proposed as part of Remedial Action Alternative 1 would likely require mitigation for the loss of marine habitat due to an increase in the existing sediment elevation across the central and northern portions of the marine area. An evaluation of potential mitigation, development of a mitigation plan, and estimation of mitigation costs has not been performed as part of this FS.

8.6.1.9. NATURAL RECOVERY OF CONTAMINATED SEDIMENT

Sediment present beyond the area identified above for sediment capping (Figure 19) contains phthalates at concentrations greater than the cleanup levels (Figure 17). Natural recovery was identified for sediment in this area as part of Remedial Alternative 1 based on a reduction in source loading from the Site as a result of the remedial actions to be performed as part of Remedial Alternative 1 and the estimated deposition rates and phthalate concentrations identified in recent studies of Budd Inlet.

Completion of upland and marine area capping and removal and replacement of the stormwater collection and conveyance system as part of Remedial Alternative 1 is anticipated to substantially reduce the source loading of contaminants from upland media to sediment present in the area identified for natural recovery. Additionally, as identified in Section 8.5.4.2, a study to characterize deposition rates in Budd Inlet indicated that sediment accumulation rates range from approximately 0.7 to 0.9 cm/yr, which would provide additional sediment to the natural recovery area. A separate study performed to characterize contaminant concentrations in sediment in Budd Inlet indicates that the concentrations of phthalates in sediment in areas adjacent to the Site are substantially less than the cleanup levels (Appendix E) indicating that sediment that is being deposited in areas adjacent to the Site are well below the cleanup level. Therefore, based on a reduction in contaminant loading and anticipated deposition of sediment with concentrations of phthalates less than cleanup levels, it is anticipated that natural recovery would reduce phthalate concentrations to below cleanup levels in a reasonable time frame.

Monitoring of contaminant concentrations in sediment outside of the sediment cap area would be needed to confirm that natural recovery would reduce contaminant concentrations to below cleanup levels in a reasonable time frame. Monitoring of the natural recovery of sediment would include periodic sampling and analysis of surface sediment in the natural recovery area. For cost estimating purposes in the FS, it is assumed that six monitoring events will be conducted to demonstrate that natural recovery of sediment is occurring.

8.6.1.10. INSTITUTIONAL CONTROLS

Institutional controls will be required for capping the upland and marine areas of the Site as contaminated soil and sediment will remain beneath the caps. Institutional controls such as environmental convents or deed restrictions would be necessary to ensure that the future activities and development at the Site properly maintain the caps that are installed to contain the contaminated soil and sediment that is left in place. Environmental covenants would likely require periodic monitoring and maintenance and preparation of a soil management plan. A soil management plan would specify the requirements for performing invasive work in areas where contaminated soil and sediment remains in place.

8.6.2. *Remedial Alternative 2 – Upland Area Capping and Marine Area Hot Spot Removal*

Remedial Alternative 2 includes the following in the areas identified in Figure 20:

- Capping contaminated upland soil using a combination of capping methods;
- Removal of sediment hot spots containing the most contaminated sediment at the Site including sediment with contaminant concentrations greater than SMS CSL levels;
- Natural recovery in areas where sediment removal is not being performed;
- Excavation of metals-contaminated soil and debris that are a source to groundwater contamination;
- Excavation of gasoline-contaminated soil that may be a source of vapor intrusion; and
- Removal of a UST and associated petroleum-contaminated soil.

The specific remedial actions to be performed at the Site as part of Remedial Alternative 2 include the following:

- Site preparation including demolition of existing structures and infrastructure in the upland and marine areas of the Site (same as Remedial Alternative 1).
- Excavation and off-site disposal of approximately 770 cubic yards of metals-contaminated soil and approximately 470 cubic yards of metal debris contributing to contamination in groundwater (same as Remedial Alternative 1).
- Excavation and off-site disposal of approximately 140 cubic yards of gasoline contaminated soil (Same as Remedial Alternative 1).
- Excavation and removal/off-site disposal of the UST and approximately 680 cubic yards of associated diesel-contaminated soil located adjacent to the former Tank Shop (same as Remedial Alternative 1).
- Placing a 2-foot thick soil or aggregate cap over approximately 68,400 square feet (1.6 acres) of contaminated soil at the Site to limit potential exposure of human and ecological receptors to contaminants in the upland area of the Site (same as Remedial Alternative 1).
- Placing asphalt or concrete pavement or structures to cap approximately 34,200 square feet (0.8 acres) of the Site to limit potential exposure of human and ecological receptors to contaminants in the upland area of the Site (same as Remedial Alternative 1).
- Removal and replacement of the existing stormwater collection and conveyance system to limit transport of contaminated upland media (i.e., stormwater runoff, soil, and groundwater) to surface water and sediment in the marine area (same as Remedial Alternative 1).
- Installation of monitoring wells to monitor the natural attenuation of groundwater (same as Remedial Alternative 1).
- Removal and off-site disposal of approximately 2,500 cubic yards of the most contaminated sediment located in the marine area of the Site.
- Monitoring the natural recovery of contaminated sediment in the marine area of the Site outside of the area of hot spot removal.
- Implementation of institutional controls such as deed restrictions for contaminated soil and sediment that is left in place (same as Remedial Alternative 1).

The remedial actions for the upland area to be performed as part of Remedial Alternative 2 are the same as Remedial Alternative 1 and are described in Sections 8.6.1.1 through 8.6.1.7. Additionally, the institutional controls required for Remedial Alternative 2 are the same as Remedial Alternative 1 and are described in Section 8.6.1.10. The following sections provide descriptions of the components of Remedial Alternative 2 in the marine area.

8.6.2.1. MARINE AREA HOT SPOT REMOVAL

As part of Remedial Alternative 2, sediment in the nearshore marine area containing the highest concentrations of multiple contaminants (i.e., metals, petroleum hydrocarbons, PAHs, and phthalates) and at concentrations greater than SMS CSL levels would be removed and disposed of off-site. The SMS CSL levels correspond to chemical concentrations that result in minor adverse effects to the benthic community (WAC 173-204). The extent of the marine area hot spot removal is identified in Figure 20. The hot spot removal would include dredging to a maximum depth of 3 feet below the mudline and backfilling with imported material. Areas in the nearshore marine area where contaminant concentrations are greater than the cleanup level after dredging to a depth of 3 feet, will be capped with 3 feet of capping material to isolate and contain the remaining sediment and limit the exposure of human and ecological receptors to the contaminants present in the sediment. Remedial Alternative 2 will remove nearshore sediment with the highest contaminant concentrations as well as allow placement of a cap in areas where contaminated sediment remains at depth without changing the elevation of the sediment surface, alleviating the need for mitigation for loss of aquatic habitat.

Hot spot removal would encompass the following contaminants and areas:

- Sediment on or near the shoreline with PAH concentrations greater than the SMS CSL (i.e., RI-S-2, RI-S-4, T1B-SED) (Tables 24 and 25 and Figure 16).
- Sediment on or near the shoreline with phthalate concentrations greater than the SMS CSL (i.e., RGS7, RGS8, T1-SED, T1B-SED) (Tables 24 and 25 and Figure 17).
- Sediment on the northern portion of the shoreline with petroleum hydrocarbon concentrations greater than the cleanup level (i.e., RGS8) (Table 24 and Figure 15).
- Sediment in the area east of the Structural Shop and former Tank Shop with mercury concentrations greater than the SMS CSL (i.e., RI-S-2, RI-S-3, and RGS7) (Table 24 and Figure 13).

In the area were mercury is present in sediment (see Figure 18), it is assumed that dredging will be performed to the maximum depth of 3 feet and backfill material will be placed as a cap because the sediment remaining at the base of the dredge area upon completion of dredging will contain contaminant concentrations greater than the cleanup level. In areas where PAHs, phthalates, and petroleum hydrocarbons are present and mercury is not present, it is assumed that dredging will be performed to a depth of 2 feet below the mudline and backfill material will not be considered to be a cap because sediment remaining at the base of the dredge area upon completion of dredging will have contaminant concentrations less than the cleanup level.

It is anticipated that a total of approximately 2,500 cubic yards of sediment would be removed and disposed of off-site in a Subtitle D landfill (or similar facility approved by the local permitting agency and Ecology) as part of Remedial Alternative 2. The sediment removed would be replaced with clean imported backfill material to maintain bathymetric elevations. For cost estimating purposes it is assumed that marine area hot spot removal would be conducted using land-based construction equipment and temporary sheet piling to conduct dredging/ excavation without tidal inundation. To the extent practical, backfill placement would incorporate habitat enhancement features.

8.6.2.2. NATURAL RECOVERY OF CONTAMINATED SEDIMENT

Similar to Remedial Alternative 1, sediment present beyond the area identified above for marine area hot spot removal (Figure 20) contains phthalates at concentrations greater than the cleanup levels. Natural recovery was identified for sediment in this area as part of Remedial Alternative 2 based on a reduction in source loading from the Site as a result of the remedial actions to be performed as part of Remedial Alternative 2 and the estimated deposition rates and phthalate concentrations identified in recent studies of Budd Inlet.

Completion of upland area capping, marine area hot spot removal, and removal and replacement of the stormwater collection and conveyance system as part of Remedial Alternative 2 is anticipated to substantially reduce the source loading of contaminants from upland media to sediment in the area identified for natural recovery. As discussed in Section 8.5.4.2, based on a reduction in contaminant loading and anticipated deposition of sediment with concentrations of phthalates less than cleanup levels, it is anticipated that natural recovery would reduce phthalate concentrations to below cleanup levels in a reasonable time frame.

Monitoring of contaminant concentrations in sediment outside of the marine area hot spot removal would be needed to confirm that natural recovery would reduce contaminant concentrations to below cleanup levels in a reasonable time frame. Monitoring of the natural recovery of sediment would include periodic sampling and analysis of surface sediment in the natural recovery area. For the cost estimating purposes in the FS it is assumed that six monitoring events will be conducted to demonstrate that natural recovery of sediment is occurring.

8.6.3. *Remedial Alternative 3 – Upland Area Capping and Marine Area Removal*

Remedial Alternative 3 includes the following in the area identified in Figure 21:

- Capping contaminated upland soil using a combination of capping methods;
- Removal of sediment containing multiple contaminants at concentrations greater than SMS SQS levels;
- Natural recovery in areas where sediment removal is not being performed;
- Excavation of metals-contaminated soil and debris that are a source to groundwater contamination;
- Excavation of gasoline-contaminated soil that may be a source of vapor intrusion; and
- Removal of a UST and associated petroleum contaminated soil.

The specific remedial actions to be performed at the Site as part of Remedial Alternative 3 include the following:

- Site preparation including demolition of existing structures and infrastructure in the upland and marine areas of the Site (same as Remedial Alternatives 1 and 2).
- Excavation and off-site disposal of approximately 770 cubic yards of metals-contaminated soil and approximately 470 cubic yards of metal debris contributing to contamination in groundwater (same as Remedial Alternatives 1 and 2).
- Excavation and off-site disposal of approximately 140 cubic yards of gasoline contaminated soil (Same as Remedial Alternatives 1 and 2).
- Excavation and removal/off-site disposal of the UST and approximately 680 cubic yards of associated diesel-contaminated soil located adjacent to the former Tank Shop (same as Remedial Alternatives 1 and 2).

- Placing a 2-foot thick soil or aggregate cap over approximately 68,400 square feet (1.6 acres) of contaminated soil at the Site to limit potential exposure of human and ecological receptors to contaminants in the upland area of the Site (same as Remedial Alternatives 1 and 2).
- Placing asphalt or concrete pavement or structures to cap approximately 34,200 square feet (0.8 acres) of the Site to limit potential exposure of human and ecological receptors to contaminants in the upland area of the Site (same as Remedial Alternatives 1 and 2).
- Removal and replacement of the existing stormwater collection and conveyance system to limit transport of contaminated upland media (i.e., stormwater runoff, soil, and groundwater) to surface water and sediment in the marine area (same as Remedial Alternatives 1 and 2).
- Installation of monitoring wells to monitor the natural attenuation of groundwater (same as Remedial Alternatives 1 and 2).
- Removal and off-site disposal of approximately 5,200 cubic yards of the contaminated sediment located in the marine area of the Site.
- Monitoring the natural recovery of contaminated sediment in the marine area of the Site outside of the area of sediment removal (same as Remedial Alternatives 1 and 2).
- Implementation of institutional controls such as deed restrictions for contaminated soil and sediment that is left in place (same as Remedial Alternatives 1 and 2).

The remedial actions for the upland area to be performed as part of Remedial Alternative 3 are the same as Remedial Alternatives 1 and 2 and are described in Sections 8.6.1.1 through 8.6.1.7. Additionally, natural recovery required for Remedial Alternative 3 is the same as for Remedial Alternatives 1 and 2 and are described in Sections 8.6.1.9 and 8.6.2.2 and the institutional controls required for Remedial Alternative 3 are the same as Remedial Alternative 1 and are described in Section 8.6.1.10. The following section provides a description of the components of Remedial Alternative 3 in the marine area.

8.6.3.1. MARINE AREA REMOVAL

As part of Remedial Alternative 3, sediment in the marine area containing multiple contaminants (i.e., metals, petroleum hydrocarbons, PAHs, and phthalates) at concentrations greater than SMS SQS levels would be removed and disposed of off-site. The extent of the marine area removal is identified in Figure 21.

The marine area removal would include dredging to remove all sediment containing multiple contaminants at concentrations greater than the SMS SQS levels within the area shown in Figure 21. The SMS SQS levels correspond to a sediment quality that will result in no adverse effects on biological resources and no significant health risk to humans (WAC 173-204). Sampling would be performed upon completion of dredging within the sediment removal area to confirm that contaminant concentrations were less than the SMS SQS levels prior to backfilling with clean imported material. Isolated areas will remain outside of the removal area that contains phthalates at concentrations greater than SMS SQS levels. Monitored natural recovery would be applied to the remaining areas with phthalates at concentrations greater than SMS SQS levels.

The following provides additional detail regarding the depth and extent of soil excavation activities to be performed as part of Remedial Alternative 3:

- Sediment east of the Structural Shop and former Tank Shop in the central portion of the marine area would be dredged to an approximate depth of 5 feet below mudline to remove metals-contaminated sediment. PAH- and phthalate-contaminated sediment also exists in this area, at depths less than 5 feet below mudline.
- Sediment in the remainder of the marine area identified for removal (see Figure 21) would be dredged to an approximate depth of 2 feet below mudline to remove petroleum hydrocarbon-, PAH- and phthalate-contaminated sediment.

It is anticipated that a total of approximately 5,200 cubic yards of sediment would be removed and disposed of off-site in a Subtitle D landfill (or similar facility approved by the local permitting agency and Ecology) of as part of Remedial Alternative 3. The sediment removed would be replaced with clean imported backfill material to maintain the current elevations. For cost estimating purposes it is assumed that marine area removal would be conducted using land-based construction equipment and temporary sheet piling to conduct dredging/excavation without tidal inundation. To the extent practical, backfill placement would incorporate habitat enhancement features.

8.6.4. *Remedial Alternative 4 – Upland Area and Marine Area Removal*

Remedial Alternative 4 includes the following in the area identified in Figure 22:

- Removal of upland soil with contaminants at concentrations greater than the cleanup levels;
- Removal of sediment containing multiple contaminants at concentrations greater than SMS SQS levels;
- Natural recovery in areas where sediment removal is not being performed; and
- Removal of a UST and associated petroleum contaminated soil.

The specific remedial actions to be performed at the Site as part of Remedial Alternative 4 include the following:

- Site preparation including demolition of existing structures and infrastructure in the upland and marine areas of the Site (same as Remedial Alternatives 1 through 3).
- Excavation and off-site disposal of approximately 470 cubic yards of metal debris along the shoreline (same as Remedial Alternatives 1 through 3).
- Excavation and removal/offsite disposal of the UST and approximately 680 cubic yards of diesel-contaminated soil located adjacent to the former Tank Shop (same as Remedial Alternatives 1 through 3).
- Excavation and off-site disposal of approximately 24,000 cubic yards of contaminated soil from the upland area to remove all soil with contaminant concentrations greater than the cleanup levels.
- Removal and off-site disposal of approximately 5,200 cubic yards of the contaminated sediment located in the marine area of the Site (same as Remedial Alternative 3).
- Monitoring the natural recovery of contaminated sediment in the marine area of the Site outside of the area of sediment removal (same as Remedial Alternative 1 and 2).

The remedial actions for the marine area to be performed as part of Remedial Alternative 4 are the same as Remedial Alternative 3 and are described in Sections 8.6.3.1 and 8.6.2.2. Additionally, demolition of existing structures and infrastructure and UST removal to be performed as part of Remedial Alternative 4 are the same as Remedial Alternative 1 and are described in Sections 8.6.1.1 and 8.6.1.3, respectively.

Stormwater collection and conveyance system improvements would not be necessary as part of remedial actions because Remedial Alternative 4 would be expected to remove all contaminants in soil that are greater than cleanup levels. Therefore, contaminated upland media would not be expected to infiltrate into the conveyance system. Upgrades to the stormwater system would still be needed at the Site after the contaminated material is removed from the upland to replace the stormwater system as part of Site redevelopment but not as part of the remedial action. Institutional controls would not be needed (or would be minimal) because contamination is not anticipated to be left in place. Finally, monitoring of the natural attenuation of groundwater is not included because the potential source material would be removed and soil with residual groundwater at concentrations greater than cleanup levels would also be removed as part of Remedial Alternative 4. Therefore, any groundwater monitoring following Remedial Alternative 4 would be categorized as performance monitoring since no contamination would be left in place.

The following sections provide further descriptions of the components of Remedial Alternative 4 in the upland area.

8.6.4.1. UPLAND AREA REMOVAL

Remedial Alternative 4 includes removal of all upland soil with contaminant concentrations greater than cleanup levels. Figure 22 identifies the area of upland removal activities for Remedial Alternative 4.

Approximately 24,000 cubic yards of soil and metal debris would be excavated and disposed of offsite to removal all soil with contaminant concentrations greater than the cleanup levels. Upon completion of excavation activities, the upland area would be backfilled with clean, import material. The following provides additional detail regarding the depth and extent of soil excavation activities to be performed as part of Remedial Alternative 4:

- Soil in the footprint of the former Maintenance Building would be excavated to an approximate depth of 2 feet bgs to remove metals contaminated soil and metal debris (same as Remedial Alternatives 1 through 3).
- Soil east of the Paint Shop has lead and mercury contamination and soil in this area would be excavated to an approximate depth of 6 feet bgs.
- Soil in a relatively small area north of the former Maintenance Building would be excavated to an approximate depth of 13 feet bgs to remove soil contaminated with gasoline-range petroleum hydrocarbons (Same as Remedial Alternatives 1 through 3).
- Soil in a small area within the eastern portion of the former Maintenance Building would be excavated to an approximate depth of 6 feet bgs to remove soil contaminated with gasoline-range petroleum hydrocarbons (Same as Remedial Alternatives 1 through 3). This area

overlaps with the area of metals-contaminated soil mentioned above, but the gasoline-contaminated soil would be expected to be located deeper.

- Soil near the southeast corner of the former Maintenance Building would be excavated to an approximate depth of 2 feet bgs to remove soil contaminated with diesel- and oil-range hydrocarbons.
- Soil in a relatively small area on the north side of the Structural Shop would be excavated to an approximate depth of 4 feet bgs to remove soil contaminated with oil-range hydrocarbons.
- Soil east of the Paint Shop would be excavated to an approximate depth of 5 feet bgs to remove soil contaminated with diesel-range hydrocarbons.
- Metals debris along the shoreline would be excavated to an approximate depth of 3 feet bgs (same as Remedial Alternatives 1 through 3).
- Soil across the remaining portion of the Site would be excavated to an average depth of 4.5 feet to remove soil contaminated with PAHs.

The soil removed as part of Remedial Alternative 4 is anticipated to fall into two categories: non-dangerous waste suitable for disposal at a Subtitle D landfill (or similar facility approved by the local permitting agency and Ecology) or Dangerous Waste requiring disposal at a Subtitle C landfill. For soil to be categorized as non-dangerous waste and suitable for disposal at a Subtitle D (or similar) landfill, it would be necessary to demonstrate that Site contaminants are not present at concentrations greater than 10 times the UTS, as defined in 40 CFR 268.48 and/or the results of TCLP testing for metals that indicate that the excavated material does not designate as Dangerous Waste based on Toxicity Characteristic Criteria (WAC 173-303-100). It is anticipated that some of the excavated soil and/or metal debris would designate as Dangerous Waste and therefore, would be precluded from disposal at a Subtitle D (or similar) landfill. For cost estimating purposes in the FS, it is assumed that 25 percent of the soil and metal debris excavated from the former Maintenance Building and shoreline in the central portion of the Site would fail TCLP and thus would be disposed of at a Subtitle C landfill.

8.7. 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.

8.7.1. *Threshold Requirements*

Remedial actions performed under MTCA must comply with basic threshold requirements. Remedial action alternatives that do not comply with the threshold requirements are not considered suitable remedial actions under MTCA. As provided in WAC 173-340-360(2)(a), the four threshold requirements for remedial actions are that they must:

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

The following further describe the threshold requirements.

8.7.1.1. PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT

The results of remedial actions performed under MTCA must ensure that both human health and the environment are protected.

8.7.1.2. 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 remedial action. Where a remedial action involves containment of soils with hazardous substance concentrations exceeding cleanup levels at the point of compliance, the remedial action may be determined to comply with cleanup standards, provided the requirements specified in WAC 173-340-740(6)(f) are met.

8.7.1.3. COMPLIANCE WITH APPLICABLE STATE AND FEDERAL LAWS

Remedial 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.

8.7.1.4. PROVISION FOR COMPLIANCE MONITORING

The remedial 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 construction and the operation and maintenance period of a cleanup action. Performance monitoring is conducted to confirm that the remedial action has attained cleanup standards and, if appropriate, remediation levels or other performance standards. Confirmational monitoring (soil, groundwater, and/or sediment) is conducted to confirm the long-term effectiveness of the remedial action once cleanup standards and, if appropriate, remediation levels or other performance standards have been attained.

8.7.2. *Other MTCA Requirements*

Under MTCA, when selecting from the alternatives that meet the minimum requirements, the alternatives shall be further evaluated against the following additional criteria:

- **Use permanent solutions to the maximum extent practicable [WAC 173-340-360(2)(b)(i)].** MTCA requires that when selecting from remedial 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 this analysis are described in Section 9.7.2.1 below.
- **Provide a reasonable restoration time frame [WAC 173-340-360(2)(b)(ii)].** In accordance with WAC 173-340-360(2)(b)(ii), MTCA places a preference on those remedial action alternatives that, while equivalent in other respects, can be implemented in a shorter period of time. MTCA

includes a summary of factors to be considered in evaluating whether a remedial 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 remedial action alternative. This preliminary selection is subject to further public review and comment when the proposed remedy is published in the draft CAP.

8.7.2.1. MTCA DISPROPORTIONATE COST ANALYSIS

The MTCA disproportionate cost analysis (DCA) is used to further evaluate which of the alternatives that meet the threshold requirements are permanent to the maximum extent practicable. This analysis involves comparing the costs and benefits of alternatives and selecting the alternative whose incremental costs are not disproportionate to the incremental benefits. The evaluation criteria for the disproportionate cost analysis 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), MTCA provides a methodology that uses the criteria listed below to determine whether the costs associated with each remedial alternative are disproportionate relative to the incremental benefit of the alternative above 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 by the other 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)].

Each of the MTCA criteria used in the DCA is described below.

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 reduction in risk resulting from implementing the alternative are considered.

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.

COST

The analysis of remedial action alternative costs under MTCA includes all costs associated with implementing an alternative, including design, construction, long-term 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 agency oversight 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 overall remediation costs for 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.

LONG-TERM EFFECTIVENESS

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

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. In-water dredging activities carry a risk of temporary water quality degradation and potential sediment recontamination. 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.

IMPLEMENTABILITY

Implementability is an overall metric expressing the relative difficulty and uncertainty of implementing the remedial 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.

CONSIDERATION OF PUBLIC CONCERNS

The public involvement process under MTCA is used to identify potential public concerns regarding remedial 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 remedial action, which are addressed under other criteria such as protectiveness and permanence.

8.8. Evaluation and Comparison of Cleanup Alternatives

This section provides an evaluation and comparative analysis of the remedial action alternatives developed for the Site. The alternatives are evaluated with respect to the MTCA evaluation criteria described in Section 8.7, and then compared to each other relative to their expected performance under each criterion. The components of the four remedial alternatives are described above in Sections 8.6.1 through 8.6.4 and are summarized in Table 30. The detailed evaluation of the alternatives is presented in Table 31. Cost estimates for the remedial alternatives are presented in Tables 32 through 35. The results of the evaluation and MTCA DCA are summarized in Table 36.

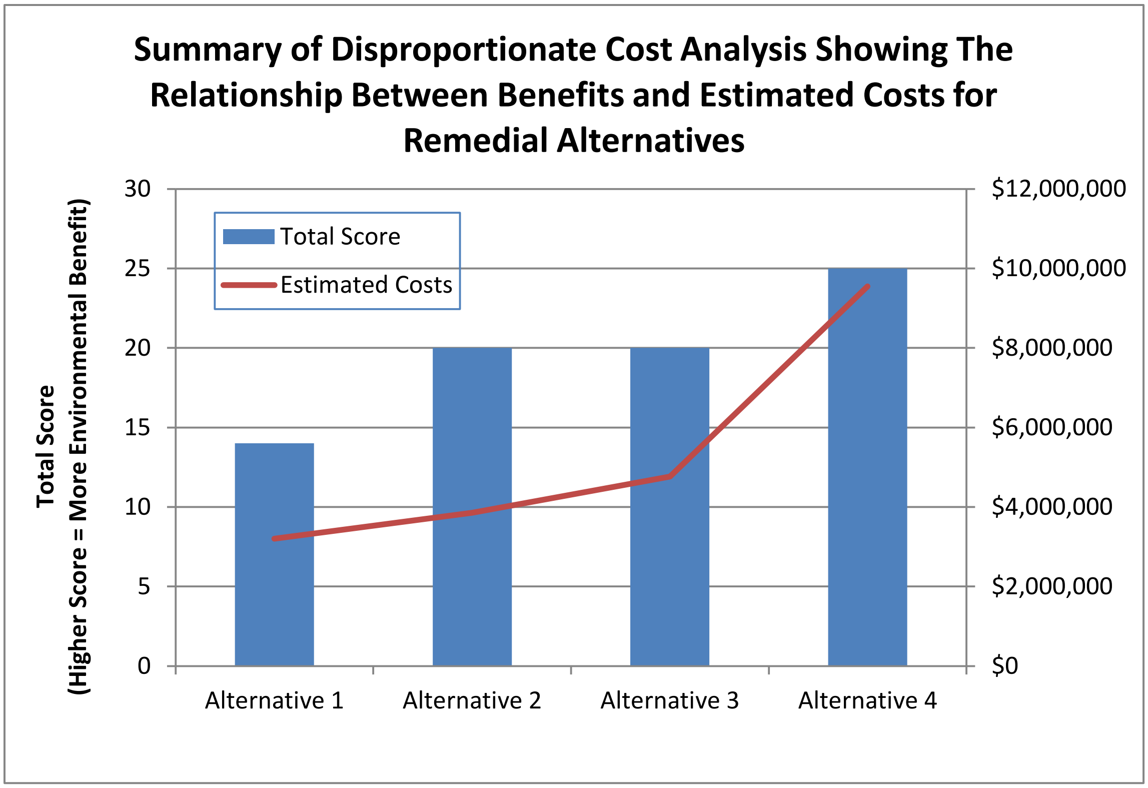
8.8.1. *Threshold Requirements*

All of the remedial alternatives developed in this FS meet each of 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.

The four alternatives differ in the manner in which the MTCA threshold requirements would be met. Alternative 4 utilizes soil and sediment removal to the greatest extent to remove soil and sediment exceeding cleanup levels at the Site. Alternative 4 is thus the most practicable permanent solution and forms the baseline remedial action alternative [WAC 173-340-350(8)(c)(ii)(A) and 173-340-360(3)(e)(ii)(B)]. Alternative 1 does not involve removal of contaminated soil or sediment, with the exception of the metals-contaminated soil and metals debris contributing to groundwater contamination, but addresses the requirements through elimination of the respective exposure pathways. Alternatives 2 and 3 meet the threshold requirements through the use of different combinations of removal and capping remedial methods.

8.8.2. *MTCA Disproportionate Cost Analysis*

As discussed in Section 8.7.2.1, the MTCA analysis of disproportionate costs is used to determine which remedial alternative that otherwise meets threshold requirements is permanent to the maximum extent practicable through comparison of the costs and benefits of the alternatives. Remedial Alternatives 1 through 4 meet MTCA threshold requirements, and thus were evaluated based on the relative benefits ranking factors of the DCA. The evaluation of the level of achievement for how each individual criterion applies to each alternative, using a numeric scoring scale of 1 (lowest) to 5 (highest) and the methodology described above in Section 9.7.2.1, is presented in Table 31. Table 36 presents the analysis of these results, including the summation of the resulting scores for each alternative and the determination of disproportionate cost. The conclusions of this evaluation are summarized in the following sections and the graph below.



Notes:

Vertical bars represent scoring for environmental benefit for each alternative.

The scale for scoring of environmental benefit is on the left axis.

Horizontal line represents cost for each alternative.

The scale for the cost of the remedial actions is on the right axis.

8.8.2.1. PROTECTIVENESS

Remedial Alternative 4 achieves the highest level of protectiveness of the alternatives as a result of achieving the maximum feasible removal of soil and sediment exceeding cleanup levels. Alternatives 1 through 3 share the same proposed remedial actions for the upland area of the Site and achieve lower levels of protectiveness relative to Alternative 4. Alternatives 2 and 3 provide similar levels of protectiveness with Alternative 3 being only slightly more protective because more removal of sediment is preformed. Alternative 1 is less protective relative to the other alternatives because it leaves the most contaminants in place and relies on institutional controls to maintain protection of human health and the environment.

8.8.2.2. PERMANENCE

Remedial Alternative 4 achieves a high level of permanence through removal of the largest amount of soil and sediment with contaminant concentrations that exceed cleanup levels. The permanence of Remedial Alternatives 2 and 3 are lower than Alternative 4 as a result of maintaining upland contaminant mass on Site by relying on capping methods and institutional controls. Remedial Alternative 1 would be expected to have the lowest permanence as it utilizes capping methods for the upland and marine areas.

8.8.2.3. LONG-TERM EFFECTIVENESS

The long-term effectiveness of the remedial alternatives has relative rankings similar to those described above for the Permanence category. The long-term effectiveness relies heavily on using proven technologies to remove contaminant mass. Alternatives that rely primarily (Alternative 1) or partially (Alternatives 2 and 3) on capping and/or institutional controls to protect human health and the environment, while leaving contaminants in place have lower long-term effectiveness as a result of the need to monitor the cap and the potential for the need to revisit the cleanup action in the event of failure. Alternative 4 relies on removal of contaminant mass from the Site to the greatest extent practicable and, therefore, achieves the highest level of long-term effectiveness.

8.8.2.4. MANAGEMENT OF SHORT-TERM RISKS

Remedial Alternatives 1 through 4 involve soil and/or sediment removal, including excavation near and within the shoreline. However, the relative difference between the short-term risks associated with the four remedial alternatives is low. The short-term risk associated with Remedial Alternative 1 is lower than the other three alternatives as a result of the reduced scope of the intrusive earthwork. However, Alternative 1 involves earthwork associated with upland and marine capping and soil removal, reducing the difference between the Alternatives.

8.8.2.5. TECHNICAL AND ADMINISTRATIVE IMPLEMENTABILITY

All of the Remedial Alternatives are generally technically implementable using commonly available methods. Alternative 1 has a significantly reduced level of administrative implementability associated with the likely need for mitigation required to account for habitat loss associated with placement of a cap in the marine area of the Site. Alternative 2 rates the highest for implementability due to the relatively reduced level of earthwork required. Alternatives 3 and 4 have slightly reduced technical implementability relative to Alternative 2 because these alternatives include more extensive removal of sediments in the marine area. It is assumed that sediment removal may be conducted using land-based equipment during low tides, but there may be some implementability issues associated with removal of sediments in the intertidal area.

8.8.2.6. COST

The cost estimates for Remedial Alternatives 1 through 4 were developed as described in Section 8.7.2.1 and are presented in Tables 32 through 35.

- **Remedial Alternative 1** (Upland Area and Marine Area Capping) has an estimated cost of approximately $3.20 million. This alternative includes the removal of approximately 2,060 cubic yards of contaminated soil and metal debris.
- **Remedial Alternative 2** (Upland Area Capping and Marine Area Hot Spot Removal) has an estimated cost of approximately $3.86 million. This alternative includes the removal of approximately 2,060 cubic yards of contaminated soil and metal debris and approximately 2,500 cubic yards of contaminated sediment.
- **Remedial Alternative 3** (Upland Area Capping and Marine Area Removal) has an estimated cost of approximately $4.76 million. This alternative includes the removal of approximately 2,060 cubic yards of contaminated soil and metal debris and approximately 5,200 cubic yards of contaminated sediment.
- **Remedial Alternative 4** (Upland Area and Marine Area Removal) has an estimated cost of approximately $9.55 million. This alternative includes the removal of approximately

25,200 cubic yards of contaminated soil and metal debris and approximately 5,200 cubic yards of contaminated sediment.

8.8.3. *Reasonable Restoration Time Frame*

The time frame for design, permitting, contracting, and construction for all of the proposed remedial alternatives is expected to be on the order of two to three years. The time frame for natural recovery of contaminated sediment is dependent of physical (i.e., deposition), biological (i.e., biodegradation, bioturbation, etc.), and chemical (i.e., transformation) processes but could be up to 10 years. Management of institutional controls in the form of restrictive covenants would be required for the contaminated upland soil left in place under Alternatives 1, 2, and 3 and would be required for the contaminated sediment left in place under all remedial alternatives. Long-term monitoring may be necessary to ensure compliance with the environmental covenants established as part of institutional controls. These requirements would extend the duration of the associated alternatives as described in Table 31.

8.8.4. *Considerations of Public Concerns*

The remedial alternatives proposed for the Site are generally expected to be acceptable to the public. The alternatives that achieve the greatest level of protection and certainty rely on the greatest level of soil and sediment removal and result in the most intrusive Site activities. Remedial Alternative 4, which involves significant removal of contaminated soil and sediment, scored the highest for this criterion (i.e., low to moderate public concern). Remedial Alternatives 2 and 3 rely more on capping methods as components of the upland remedial actions relative to Alternative 4 and therefore, were lower than Alternative 4 for this criterion. Remedial Alternative 1, which relies predominantly on capping, would be expected to have a lower level of acceptance by the public and therefore, was scored lower than the other alternatives.

8.9. Preferred Cleanup Alternative

Based on the comparative analysis presented in Section 8.8, the preferred remedial action alternative for the Site is Remedial Alternative 2. This alternative reduces immediate risk to potential human and ecological receptors through:

- Removal of metals-contaminated upland soil and metal debris that is contributing to groundwater exceedances of cleanup levels;
- Removal of a UST and associated diesel-contaminated soil;
- Capping the upland area of the Site along with institutional controls;
- Monitoring of the natural attenuation of metals concentrations in groundwater;
- Stormwater collection and conveyance system removal and replacement to eliminate transport of contaminated upland media in stormwater runoff;
- Hot spot removal of the most contaminated sediments in the marine area;
- Monitored natural recovery of contaminated sediments outside the hot spot removal area; and
- Implementation of Institutional controls.

As summarized in Table 36, Alternative 1 ranks the lowest of the four alternatives. Alternative 1 ($3.20 million) is the lowest cost, but the lower environmental benefit does not outweigh the only slightly lower cost compared to Alternative 2 ($3.86 million), which has the second lowest cost. Additionally, the cost for Alternative 1 does not include potential mitigation for the loss of aquatic habitat as a result of capping sediment in the nearshore area. Alternative 4 ranks the highest of the four alternatives that meet threshold requirements. However, the estimated costs associated with Alternative 4 ($9.55 million) is more than double the cost of the next highest ranking alternatives and therefore, the cost of Alternative 4 is considered substantial and disproportionately higher than the estimated cost of Alternative 3 relative to the incremental environmental benefit. Alternatives 2 and 3 both have the same ranking in the DCA for environmental benefit, but Alternative 2 ($3.86 million) costs less than Alternative 3 ($4.76 million). Consequently, Alternative 2 is the preferred alternative and provides the best balance of environmental benefit and cost.

9.0 REFERENCES

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Table 1

Summary of Potential Environmental Concerns Identified During Previous Environmental Investigations

Reliable Steel Site
Olympia, Washington

Potential Environmental Concern	Documentation	Location	Description of Environmental Concern
Former Maintenance Building and Southern Portion of Site			
Fuel pipeline area: two steel fuel transfer pipes (south of site)	Phase II	South of Site	Presence of two steel underground fuel transfer pipes located south of the site.
Former area of two petroleum USTs removed in 1990	Audit / Phase I	West of building (outside of building)	Review of Ecology files indicated removal of a 2,000-gallon gasoline UST and an 885-gallon diesel UST in 1990. A site assessment was not performed at the time of removal.
Calcium Hydroxide Sludge	Audit	Suspected to be west of building (outside of building)	Acetylene was historically manufactured on site and a calcium carbide sludge byproduct (calcium hydroxide) was disposed of on site (to the ground) and in a UST.
Used Oil Storage	Audit / Phase I	Inside building	Petroleum-like staining observed on the floor beneath a used oil storage area.
Former maintenance pit	Audit / Phase I	Northeast end of building (inside of building)	Interviewee (operator) indicated that used oil from equipment and vehicles was historically drained into the pit. Audit personnel observed petroleum hydrocarbon residue in the pit during a site visit.
Paint and solvent storage	Phase II	North side of building (outside of building)	Phase II documentation indicates paints and solvents were stored outside the Maintenance Building, north of the central portion of the building.
Sand dryer with 800 gallon diesel AST	Audit	Adjacent to north side of building (outside of building)	An 800-gallon AST with no secondary containment supplied a sand dryer with diesel fuel.
Crane shed	Phase I	South side of building (outside of building)	Oil-stained soil observed in the crane shed during site visit
Three transformers on utility pole	Audit	Northwest corner of building (outside of building)	Owner indicated oil was spilled onto the ground during a 1992 transformer malfunction. Owner indicated Puget Power cleaned up impacted soil and removed the soil from the site.
Used solvent hopper	Phase I	Southwest corner of site	A metal hopper for used solvent was observed on the southern portion of the site. No soil staining or distressed vegetation was observed beneath the hopper.
Structural Shop, (Former) Tank Shop and Adjacent Areas			
Underground Storage Tanks	Audit / DOF	Southwest corner of Tank Shop	Various reports indicate the likely presence of a 300-gallon heating oil UST under the southwest portion of the Tank Shop.
750 Gallon bunker fuel UST closed in place in 1999	Phase I	In south eastern portion of Tank Shop (partially inside Tank Shop)	Evidence of UST observed inside the Tank Shop. The UST was filled with concrete. Owner indicated the UST was 750 gallons in size and was used to supply bunker fuel to a historic boiler in the Tank Shop.
Staining underneath forklift	Phase I	Southeast corner of Tank Shop (outside building)	Petroleum-like oil staining observed beneath a forklift.
Shear machine	Phase I	Northeast portion of Structural Shop	Free product (oil) and soil staining observed beneath the shear machine.
Paint Shop and Northern Portion of Site			
Staining at location of transformer for elevated rail-crane	Phase I	Location unknown.	Stained soil observed beneath a ground-mounted transformer located beneath the elevated rail crane structure.
Spent sandblast grit	Audit / Phase I	In and around Paint Shop	Audit personnel observed spent sandblast grit on the ground surface in and around the Paint Shop (i.e., on paved and unpaved surfaces). Paint overspray observed mixed with sandblast grit.
Drainage / Ditch	Additional Evaluation	Northeast corner of site	Stormwater in the ditch on the northern portion of the site was identified to contain zinc.
1996 elevated rail-crane oil spill / soil staining	Audit / Phase I	Exact location unknown	1996 Oil spill from the elevated rail crane to a concrete pad underneath rail-crane. The amount of oil spilled was not known. The oil was cleaned up by Reliable Steel. The exact location of the spill under the ERCS was not reported.
Shoreline and Sediment			
Metal debris	Audit / Phase I	On shoreline east of Tank and Structural shops	Audit personnel observed welding slag on shoreline adjacent to Tank and Structural Shops. Review of Ecology files indicated that a slag sample contained metals exceeding sediment standards.
Sediment potentially impacted by sandblast grit and welding slag	DOF	Shoreline adjacent to the Site	Intertidal area adjacent to the Reliable Steel site where waste grit or welding slag may have migrated.

Notes:

Audit - Tetra Tech 1998 Environmental Compliance Audit.
Phase I - LSI ADaPT 2001 Phase I Environmental Site Assessment.
Phase II - Stemen 2005 Limited Phase II Environmental Site Assessment.
DOF - Dalton, Olmsted & Fuglevand, Inc. 2001, 2004 and 2007 Prospective Purchaser Environmental Investigations of Site Media (DOF, 2007).
Additional Evaluation - Evaluation of Soil, Groundwater, Surface Water and Sediment Quality (Greylock, 2008).

Table 2

Proposed Soil Cleanup Levels

Reliable Steel Site
Olympia, Washington

Analyte	CAS No.	MTCA Method A Cleanup Level For Unrestricted Land Use (MTCA Table 740-1)	MTCA Method B Cleanup Level For Unrestricted Land Use (Standard Formula Value[1])		Soil Cleanup Level Before Adjustment for Background	Background Concentration[2]	Proposed Soil Cleanup Levels[3]
			Carcinogen	Non-Carcinogen			
Metals (mg/kg)							
Arsenic	7440-38-2	20	0.67	24	0.67	20[4]	20
Barium	7440-39-3	NE	NE	16,000	16,000	NE	16,000
Cadmium	7440-43-9	2	NE	NE	2	1	2
Chromium III	7440-47-3	2,000	NE	120,000	2,000	48	2,000
Copper	7440-50-8	NE	NE	3,200	3,200	36	3,200
Lead	7439-92-1	250	NE	NE	250	24	250
Mercury	7439-97-6	2	NE	NE	2	0.07	2
Selenium	7782-49-2	NE	NE	400	400.0	NE	400
Silver	7440-22-4	NE	NE	400	400	NE	400
Tin	7440-31-5	NE	NE	4,800	4,800	NE	4,800
Zinc	7440-66-6	NE	NE	24,000	24,000	85	24,000
Petroleum Hydrocarbons (mg/kg)							
Gasoline-Range	8006-61-9	30/100[5]	NE	NE	30/100[5]	NE	30/100[5]
Diesel-Range	68334-30-5	2,000	NE	NE	2,000	NE	2,000
Heavy Oil-Range	30109	2,000	NE	NE	2,000	NE	2,000
Mineral Oil-Range	64475-85-0	4,000	NE	NE	4,000	NE	4,000
BETX Compounds (mg/kg)							
Benzene	71-43-2	0.03	18	320	0.03	NE	0.03
Ethylbenzene	100-41-4	6	NE	8,000	6	NE	6
Toluene	108-88-3	7	NE	6,400	7	NE	7
Xylenes	1330-20-7	9	NE	16,000	9	NE	9
Volatile Organic Compounds (VOCs) (mg/kg)							
1,1,1,2-Tetrachloroethane	630-20-6	NE	38	2,400	38	NE	38
1,1,1-Trichloroethane	71-55-6	2	NE	160,000	2	NE	2
1,1,2,2-Tetrachloroethane	79-34-5	NE	5	1,600	5	NE	5
1,1,2-Trichloroethane	79-00-5	NE	18	320	18	NE	18
1,1-Dichloroethane	75-34-3	NE	NE	16,000	16,000	NE	16,000
1,1-Dichloroethene	75-35-4	NE	NE	4,000	4,000	NE	4,000
1,1-Dichloropropene	563-58-6	NE	NE	NE	NE	NE	NE
1,2,3-Trichlorobenzene	87-61-6	NE	NE	NE	NE	NE	NE
1,2,3-Trichloropropane	96-18-4	NE	0.033	320	0.033	NE	0.033
1,2,4-Trichlorobenzene	120-82-1	NE	35	800	35	NE	35
1,2,4-Trimethylbenzene	95-63-6	NE	NE	NE	NE	NE	NE
1,2-Dibromo-3-chloropropane	96-12-8	NE	1.3	16	1.3	NE	1.3
1,2-Dibromoethane (EDB)	106-93-4	0.005	0.5	720	0.005	NE	0.005
1,2-Dichlorobenzene	95-50-1	NE	NE	7,200	7,200	NE	7,200
1,2-Dichloroethane (EDC)	107-06-2	NE	11	1,600	11	NE	11
1,2-Dichloropropane	78-87-5	NE	NE	NE	NE	NE	NE
1,3,5-Trimethylbenzene	108-67-8	NE	NE	800	800	NE	800
1,3-Dichlorobenzene	541-73-1	NE	NE	NE	NE	NE	NE
1,3-Dichloropropane	142-28-9	NE	NE	NE	NE	NE	NE
1,4-Dichlorobenzene	106-46-7	NE	NE	NE	NE	NE	NE
2,2-Dichloropropane	594-20-7	NE	NE	NE	NE	NE	NE
2-Butanone (MEK)	78-93-3	NE	NE	48,000	48,000	NE	48,000
2-Chlorotoluene	95-49-8	NE	NE	1,600	1,600	NE	1,600
2-Hexanone	591-78-6	NE	NE	NE	NE	NE	NE
4-Chlorotoluene	106-43-4	NE	NE	NE	NE	NE	NE
4-Methyl-2-Pentanone	108-10-1	NE	NE	6,400	6,400	NE	6,400
Acetone	67-64-1	NE	NE	72,000	72,000	NE	72,000
Bromobenzene	108-86-1	NE	NE	NE	NE	NE	NE
Bromochloromethane	74-97-5	NE	NE	NE	NE	NE	NE
Bromodichloromethane	75-27-4	NE	16	1,600	16	NE	16
Bromoform	75-25-2	NE	130	1,600	130	NE	130
Bromomethane	74-83-9	NE	NE	110	110	NE	110
Carbon Tetrachloride	56-23-5	NE	14	320	14	NE	14
Chlorobenzene	108-90-7	NE	NE	1,600	1,600	NE	1,600
Chloroethane	75-00-3	NE	NE	NE	NE	NE	NE
Chloroform	67-66-3	NE	NE	800	800	NE	800
Chloromethane	74-87-3	NE	NE	NE	NE	NE	NE
Cis-1,2-Dichloroethene	156-59-2	NE	NE	160	160	NE	160
Cis-1,3-Dichloropropene	10061-01-5	NE	NE	NE	NE	NE	NE
Dibromochloromethane	124-48-1	NE	12	1,600	12	NE	12
Dibromodichloromethane	594-18-3	NE	NE	NE	NE	NE	NE
Dibromomethane	74-95-3	NE	NE	800	800	NE	800
Dichlorodifluoromethane (CFC 12)	75-71-8	NE	NE	16,000	16,000	NE	16,000
Dichloroethylene	156-60-5	NE	NE	720	720	NE	720
Hexachlorobutadiene	87-68-3	NE	13	81	13	NE	13
Hexane	110-54-3	NE	NE	4,800	4,800	NE	4,800
Isopropylbenzene	98-82-8	NE	NE	8,000	8,000	NE	8,000
Methyl t-Butyl Ether (MTBE)	1634-04-4	0.1	NE	NE	0.1	NE	0.1
Methylene Chloride	75-09-2	0.02	130	4,800	0.02	NE	0.02
Naphthalene	91-20-3	5	NE	1,600	5	NE	5
n-Butylbenzene	104-51-8	NE	NE	NE	NE	NE	NE
n-Propylbenzene	95-47-6	NE	NE	8,000	8,000	NE	8,000
p-Isopropyltoluene	99-87-6	NE	NE	NE	NE	NE	NE
sec-Butylbenzene	135-98-8	NE	NE	NE	NE	NE	NE
Styrene	100-42-5	NE	NE	16,000	16,000	NE	16,000
tert-Butylbenzene	98-06-6	NE	NE	NE	NE	NE	NE

Table 2

Proposed Soil Cleanup Levels

Reliable Steel Site
Olympia, Washington

Analyte	CAS No.	MTCA Method A Cleanup Level For Unrestricted Land Use (MTCA Table 740-1)	MTCA Method B Cleanup Level For Unrestricted Land Use (Standard Formula Value[1])		Soil Cleanup Level Before Adjustment for Background	Background Concentration[2]	Proposed Soil Cleanup Levels[3]
			Carcinogen	Non-Carcinogen			
VOCs continued (mg/kg)							
Tetrachloroethene (PCE)	127-18-4	0.05	480	480	0.05	NE	0.05
Trans-1,2-Dichloroethene	156-60-5	NE	NE	1,600	1,600	NE	1,600
Trans-1,3-Dichloropropene	10061-02-6	NE	NE	NE	NE	NE	NE
Trichloroethene (TCE)	79-01-6	0.03	12	40	0.03	NE	0.03
Trichlorofluoromethane (CFC 11)	75-69-4	NE	NE	24,000	24,000	NE	24,000
Vinyl Chloride	75-01-4	NE	0.67	240	0.67	NE	0.67
Semi-volatile Organic Compounds (SVOCs) (mg/kg)							
1,2,4-Trichlorobenzene	120-82-1	NE	35	800	35	NE	35
1,2-Dichlorobenzene	95-50-1	NE	NE	72,000	72,000	NE	72,000
1,3-Dichlorobenzene	541-73-1	NE	NE	NE	NE	NE	NE
1,4-Dichlorobenzene	106-46-7	NE	NE	NE	NE	NE	NE
2,4,5-Trichlorophenol	95-95-4	NE	NE	8,000	8,000	NE	8,000
2,4,6-Trichlorophenol	88-06-2	NE	91	81	81	NE	81
2,4-Dichlorophenol	120-83-2	NE	NE	240	240	NE	240
2,4-Dimethylphenol	105-67-9	NE	NE	1,600	1,600	NE	1,600
2,4-Dinitrophenol	51-28-5	NE	NE	160	160	NE	160
2,4-Dinitrotoluene	121-14-2	NE	NE	160	160	NE	160
2,6-Dinitrotoluene	606-20-2	NE	NE	81	81	NE	81
2-Chloronaphthalene	91-58-7	NE	NE	6,400	6,400	NE	6,400
2-Chlorophenol	95-57-8	NE	NE	400	400	NE	400
2-Methylphenol	95-48-7	NE	NE	4,000	4,000	NE	4,000
2-Nitroaniline	88-74-4	NE	NE	800	800	NE	800
2-Nitrophenol	88-75-5	NE	NE	NE	NE	NE	NE
3-Nitroaniline	99-09-2	NE	NE	NE	NE	NE	NE
4,6-Dinitro-2-methylphenol	534-52-1	NE	NE	NE	NE	NE	NE
4-Bromophenyl-phenylether	101-55-3	NE	NE	NE	NE	NE	NE
4-Chloro-3-Methylphenol	59-50-7	NE	NE	NE	NE	NE	NE
4-Chloroaniline	106-47-8	NE	5	320	5	NE	5
4-Chlorophenyl-phenylether	7005-72-3	NE	NE	NE	NE	NE	NE
4-Methylphenol	106-44-5	NE	NE	400	400	NE	400
4-Nitroaniline	100-01-6	NE	NE	NE	NE	NE	NE
4-Nitrophenol	100-02-7	NE	NE	NE	NE	NE	NE
Benzoic acid	65-85-0	NE	NE	320,000	320,000	NE	320,000
Benzyl alcohol	100-51-6	NE	NE	8,000	8,000	NE	8,000
Butylbenzylphthalate	85-68-7	NE	530	16,000	530	NE	530
bis(2-Chloroethoxy)methane	111-91-1	NE	NE	NE	NE	NE	NE
bis(2-chloroethyl)ether	111-44-4	NE	0.91	NE	0.91	NE	0.91
bis(2-chloroisopropyl)ether	39638-32-9	NE	NE	NE	NE	NE	NE
bis(2-Ethylhexyl)phthalate	117-81-7	NE	71	1,600	71	NE	71
Carbazole	86-74-8	NE	NE	NE	NE	NE	NE
Dibenzofuran	132-64-9	NE	NE	81	81	NE	81
Diethylphthalate	84-66-2	NE	NE	64,000	64,000	NE	64,000
Dimethylphthalate	131-11-3	NE	NE	NE	NE	NE	NE
Di-n-butylphthalate	84-74-2	NE	NE	8,000	8,000	NE	8,000
Di-n-octylphthalate	117-84-0	NE	NE	NE	NE	NE	NE
Hexachlorobenzene	118-74-1	NE	0.63	64	0.63	NE	0.63
Hexachlorobutadiene	87-68-3	NE	13	81	13	NE	13
Hexachlorocyclopentadiene	77-47-4	NE	NE	480	480	NE	480
Hexachloroethane	67-72-1	NE	71	81	71	NE	71
Isophorone	78-59-1	NE	1,100	16,000	1,100	NE	1,100
Nitrobenzene	98-95-3	NE	NE	160	160	NE	160
n-Nitroso-di-n-propylamine	621-64-7	NE	0.14	NE	0.14	NE	0.14
n-Nitrosodiphenylamine	86-30-6	NE	200	NE	200	NE	200
Pentachlorophenol	87-86-5	NE	2.5	400	2.5	NE	2.5
Phenol	108-95-2	NE	NE	24,000	24,000	NE	24,000
Non-carcinogenic Polycyclic Aromatic Hydrocarbons (PAHs) (mg/kg)							
2-Methylnaphthalene	91-57-6	NE	NE	320	320	NE	320
Acenaphthene	83-32-9	NE	NE	4,800	4,800	NE	4,800
Acenaphthylene	208-96-8	NE	NE	NE	NE	NE	NE
Anthracene	120-12-7	NE	NE	24,000	24,000	NE	24,000
Benzo[g,h,i]perylene	191-24-2	NE	NE	NE	NE	NE	NE
Fluoranthene	206-44-0	NE	NE	3,200	3,200	NE	3,200
Fluorene	86-73-7	NE	NE	3,200	3,200	NE	3,200
Naphthalene	91-20-3	5	NE	1,600	5	NE	5
Phenanthrene	85-01-8	NE	NE	NE	NE	NE	NE
Pyrene	129-00-0	NE	NE	2,400	2,400	NE	2,400
Carcinogenic Polycyclic Aromatic Hydrocarbons (cPAHs) (mg/kg)							
Benzo[a]anthracene	56-55-3	NE	1.4	NE	1.4	NE	1.4
Chrysene	218-01-9	NE	140	NE	140	NE	140
Benzo[b]fluoranthene	205-99-2	NE	1.4	NE	1.4	NE	1.4
Benzo[k]fluoranthene	207-08-9	NE	14	NE	14	NE	14
Benzo[a]pyrene	50-32-8	0.1	0.14	NE	0.1	NE	0.1
Indeno[1,2,3-c,d]pyrene	193-39-5	NE	1.4	NE	1.4	NE	1.4
Dibenz[a,h]anthracene	53-70-3	NE	0.14	NE	0.14	NE	0.14
cPAHs TEQ	--	0.1	0.14	NE	0.1	NE	0.1

Table 2

Proposed Soil Cleanup Levels

Reliable Steel Site
Olympia, Washington

Analyte	CAS No.	MTCA Method A Cleanup Level For Unrestricted Land Use (MTCA Table 740-1)	MTCA Method B Cleanup Level For Unrestricted Land Use (Standard Formula Value[1])		Soil Cleanup Level Before Adjustment for Background	Background Concentration[2]	Proposed Soil Cleanup Levels[3]
			Carcinogen	Non-Carcinogen			
Polychlorinated Biphenyls (PCBs) (mg/kg)							
PCB-aroclor 1221	11104-28-2	NE	NE	NE	NE	NE	NE
PCB-aroclor 1232	11141-16-5	NE	NE	NE	NE	NE	NE
PCB-aroclor 1016	12674-11-2	NE	14	5.6	5.6	NE	5.6
PCB-aroclor 1242	53469-21-9	NE	NE	NE	NE	NE	NE
PCB-aroclor 1248	12672-29-6	NE	NE	NE	NE	NE	NE
PCB-aroclor 1254	11097-69-1	NE	0.5	1.6	0.5	NE	0.5
PCB-aroclor 1260	11096-82-5	NE	0.5	NE	0.5	NE	0.5
PCB-aroclor 1262	37324-23-5	NE	NE	NE	NE	NE	NE
Total PCBs (sum of Aroclors)	1336-36-3	1	0.5	NE	0.5	NE	0.5

Notes:

[1] Values from CLARC database accessed from Ecology Website February 2013 (https://fortress.wa.gov/ecy/clarc/CLARCOverview.aspx).

[2] Metals background values (Puget Sound Region 90th percentile values) are from Natural Background Soil Metals Concentrations in Washington State (Ecology Publication #94-115, 1994).

[3] Lowest of the MTCA Method A and B cleanup levels for unrestricted land use is used as the cleanup level for the site soil unless the background concentration is higher. If background concentration is higher than the MTCA Method A and B cleanup levels for unrestricted land use, then background concentration is used as the cleanup level for site soil.

[4] Background for arsenic as established in the MTCA A Table 745-1 (WAC 173-340-900).

[5] Cleanup level for gasoline-range petroleum hydrocarbon is 30 mg/kg if benzene is present and 100 mg/kg if benzene is not present.

MTCA = Washington State Model Toxics Control Act

TEQ = Toxicity equivalency quotient

mg/kg = Milligrams per kilogram

NE = No criteria is currently established for this analyte

Table 3

Proposed Groundwater Cleanup Levels

Reliable Steel Site
Olympia, Washington

Analyte	CAS No.	State Surface Water Quality Criteria[1]		National Toxics Rule[2]			Clean Water Act[3]			MTCA Method B Surface Water Cleanup Level[4] (Standard Formula Value)		Groundwater Cleanup Level Before Adjustment for Background	Background Concentration[5]	Proposed Groundwater Cleanup Levels[6,7]
		Marine Water		Marine Protection of Aquatic Life		AWQC for Protection of Human Health	Marine Protection of Aquatic Life		AWQC for Protection of Human Health					
		Acute	Chronic	Acute	Chronic		Acute	Chronic		Carcinogen	Non-Carcinogen			
Metals[8] (µg/l)														
Arsenic	7440-38-2	69	36	69	36	0.14	69	36	0.14	0.098	17.68	0.098	5[9]	5
Cadmium	7440-43-9	42	9.3	42	9.3	NE	40	8.8	NE	NE	40.5	8.8	NE	8.8
Chromium (total)	7440-47-3	1,100	50	1,100	50	NE	1,100	50	NE	NE	486	50	NE	50
Copper	7440-50-8	4.8	3.1	2.4	2.4	NE	4.8	3.1	NE	NE	2,880	2.4	NE	2.4
Lead	7439-92-1	210	8.1	210	8.1	NE	210	8.1	NE	NE	NE	8.1	NE	8.1
Mercury	7439-97-6	1.8	0.025	2.1	0.025	0.15	1.8	0.94	0.3	NE	NE	0.025	NE	0.025
Zinc	7440-66-6	90	81	90	81	NE	90	81	26,000	NE	16,548	81	NE	81
Petroleum Hydrocarbons (µg/l)														
Gasoline-Range	8006-61-9	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	800/1,000[10,11]
Diesel-Range	68334-30-5	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	500[10]
Heavy Oil-Range	30109	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	500[10]
BETX Compounds (µg/l)														
Benzene	71-43-2	NE	NE	NE	NE	71	NE	NE	51	22.66	1,990	22.66	NE	22.66
Ethylbenzene	100-41-4	NE	NE	NE	NE	29,000	NE	NE	2,100	NE	6,914	2,100	NE	2,100
Toluene	108-88-3	NE	NE	NE	NE	200,000	NE	NE	15,000	NE	19,400	15,000	NE	15,000
Xylenes	NA	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	1,000[12]
Volatile Organic Compounds (VOCs) (µg/l)														
1,1,1,2-Tetrachloroethane	630-20-6	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
1,1,1-Trichloroethane	71-55-6	NE	NE	NE	NE	NE	NE	NE	NE	NE	926,000	926,000	NE	926,000
1,1,2,2-Tetrachloroethane	79-34-5	NE	NE	NE	NE	11	NE	NE	4	6.48	10,400	4	NE	4
1,1,2-Trichloroethane	79-00-5	NE	NE	NE	NE	42	NE	NE	16	25.27	2,305	16	NE	16
1,1-Dichloroethane	75-34-3	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
1,1-Dichloroethene	75-35-4	NE	NE	NE	NE	3.2	NE	NE	7,100	NE	23,100	3.2	NE	3.2
1,1-Dichloropropene	563-58-6	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
1,2,3-Trichlorobenzene	87-61-6	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
1,2,3-Trichloropropane	96-18-4	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
1,2,4-Trichlorobenzene	120-82-1	NE	NE	NE	NE	NE	NE	NE	70	1.96	227	70	NE	70
1,2,4-Trimethylbenzene	95-63-6	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
1,2-Dibromo-3-chloropropane	96-12-8	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
1,2-Dichlorobenzene	95-50-1	NE	NE	NE	NE	17,000	NE	NE	1,300	NE	4,197	1,300	NE	1,300
1,2-Dichloroethane (EDC)	107-06-2	NE	NE	NE	NE	99	NE	NE	37	59.35	43,200	37	NE	37
1,2-Dichloropropane	78-87-5	NE	NE	NE	NE	NE	NE	NE	15	NE	NE	15	NE	15
1,3,5-Trimethylbenzene	108-67-8	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
1,3-Dichlorobenzene	541-73-1	NE	NE	NE	NE	2,600	NE	NE	960	NE	NE	960	NE	960

Table 3

Proposed Groundwater Cleanup Levels

Reliable Steel Site
Olympia, Washington

Analyte	CAS No.	State Surface Water Quality Criteria[1]		National Toxics Rule[2]			Clean Water Act[3]			MTCA Method B Surface Water Cleanup Level[4] (Standard Formula Value)		Groundwater Cleanup Level Before Adjustment for Background	Background Concentration[5]	Proposed Groundwater Cleanup Levels[6,7]
		Marine Water		Marine Protection of Aquatic Life		AWQC for Protection of Human Health	Marine Protection of Aquatic Life		AWQC for Protection of Human Health					
		Acute	Chronic	Acute	Chronic		Acute	Chronic		Carcinogen	Non-Carcinogen			
VOCs continued (µg/l)														
1,3-Dichloropropane	142-28-9	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
1,4-Dichlorobenzene	106-46-7	NE	NE	NE	NE	2,600	NE	NE	190	NE	NE	190	NE	190
2,2-Dichloropropane	594-20-7	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
2-Butanone (MEK)	78-93-3	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
2-Chlorotoluene	95-49-8	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
2-Hexanone	591-78-6	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
4-Chlorotoluene	106-43-4	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	108-10-1	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Acetone	67-64-1	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Bromobenzene	108-86-1	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Bromochloromethane	74-97-5	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Bromoform	75-25-2	NE	NE	NE	NE	360	NE	NE	140	218.78	13,827	140	NE	140
Bromomethane	74-83-9	NE	NE	NE	NE	4,000	NE	NE	1,500	NE	968	968	NE	968
Carbon Tetrachloride	56-23-5	NE	NE	NE	NE	4.4	NE	NE	1.6	4.94	553	1.6	NE	1.6
Chlorobenzene	108-90-7	NE	NE	NE	NE	21,000	NE	NE	1,600	NE	5,034	1,600	NE	1,600
Chloroethane	75-00-3	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Chloroform	67-66-3	NE	NE	NE	NE	470	NE	NE	470	NE	6,914	470	NE	470
Chloromethane	74-87-3	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Cis-1,2-Dichloroethene	156-59-2	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Cis-1,3-Dichloropropene	10061-01-5	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Dibromochloromethane	124-48-1	NE	NE	NE	NE	34	NE	NE	13	20.58	13,827	13	NE	13
Dibromomethane	74-95-3	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Dichlorobromomethane	75-27-4	NE	NE	NE	NE	22	NE	NE	17	27.88	13,827	17	NE	17
Dichlorodifluoromethane	75-71-8	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
1,2-Dibromoethane (EDB)	106-93-4	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Hexachlorobutadiene	87-68-3	NE	NE	NE	NE	50	NE	NE	18	29.89	933	18	NE	18
Isopropylbenzene	98-82-8	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Methyl t-Butyl Ether (MTBE)	1634-04-4	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Methylene Chloride	75-09-2	NE	NE	NE	NE	1,600	NE	NE	590	960.22	172,840	590	NE	590
Naphthalene	91-20-3	NE	NE	NE	NE	NE	NE	NE	NE	NE	4,938	4,938	NE	4,938
n-Propylbenzene	95-47-6	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
p-Isopropyltoluene	99-87-6	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
sec-Butylbenzene	135-98-8	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Styrene	100-42-5	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE

Table 3

Proposed Groundwater Cleanup Levels

Reliable Steel Site
Olympia, Washington

Analyte	CAS No.	State Surface Water Quality Criteria[1]		National Toxics Rule[2]			Clean Water Act[3]			MTCA Method B Surface Water Cleanup Level[4] (Standard Formula Value)		Groundwater Cleanup Level Before Adjustment for Background	Background Concentration[5]	Proposed Groundwater Cleanup Levels[6,7]
		Marine Water		Marine Protection of Aquatic Life		AWQC for Protection of Human Health	Marine Protection of Aquatic Life		AWQC for Protection of Human Health					
		Acute	Chronic	Acute	Chronic		Acute	Chronic		Carcinogen	Non-Carcinogen			
VOCs continued (µg/l)														
tert-Butylbenzene	98-06-6	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Tetrachloroethene (PCE)	127-18-4	NE	NE	NE	NE	8.85	NE	NE	3.3	99.6	502	3.3	NE	3.3
Trans-1,2-Dichloroethene	156-60-5	NE	NE	NE	NE	NE	NE	NE	10,000	NE	32,818	10,000	NE	10,000
Trans-1,3-Dichloropropene	10061-02-6	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Trichloroethene (TCE)	79-01-6	NE	NE	NE	NE	81	NE	NE	30	12.7	118	12.7	NE	12.7
Trichlorofluoromethane	75-69-4	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Vinyl Chloride	75-01-4	NE	NE	NE	NE	525	NE	NE	2.4	NE	6,647.67	2.4	NE	2.4
Semi-volatile Organic Compounds (SVOCs) (µg/l)														
1,2,4-Trichlorobenzene	120-82-1	NE	NE	NE	NE	NE	NE	NE	70	2	227	70	NE	70
1,2-Dichlorobenzene	95-50-1	NE	NE	NE	NE	17,000.00	NE	NE	1,300	NE	4,197	1,300	NE	1,300
1,3-Dichlorobenzene	541-73-1	NE	NE	NE	NE	2,600	NE	NE	960	NE	NE	960	NE	960
1,4-Dichlorobenzene	106-46-7	NE	NE	NE	NE	2,600	NE	NE	190	NE	NE	190	NE	190
2,4,5-Trichlorophenol	95-95-4	NE	NE	NE	NE	NE	NE	NE	3,600	NE	NE	3,600	NE	3,600
2,4,6-Trichlorophenol	88-06-2	NE	NE	NE	NE	6.5	NE	NE	2.4	4	17.3	2.4	NE	2.4
2,4-Dichlorophenol	120-83-2	NE	NE	NE	NE	790	NE	NE	290	NE	191	191	NE	191
2,4-Dimethylphenol	105-67-9	NE	NE	NE	NE	NE	NE	NE	850	NE	553	553	NE	553
2,4-Dinitrophenol	51-28-5	NE	NE	NE	NE	14,000	NE	NE	5,300	NE	3,457	3,457	NE	3,457
2,4-Dinitrotoluene	121-14-2	NE	NE	NE	NE	9.1	NE	NE	3.4	NE	1,365	3.4	NE	3.4
2,6-Dinitrotoluene	606-20-2	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
2-Chloronaphthalene	91-58-7	NE	NE	NE	NE	NE	NE	NE	1,600	NE	1,027	1,027	NE	1,027
2-Chlorophenol	95-57-8	NE	NE	NE	NE	NE	NE	NE	NE	NE	96.74	96.74	NE	97
2-Nitroaniline	88-74-4	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
2-Nitrophenol	88-75-5	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
3-Nitroaniline	99-09-2	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
4,6-Dinitro-2-methylphenol	534-52-1	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
4-Bromophenyl-phenylether	101-55-3	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
4-Chloro-3-methylphenol	59-50-7	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
4-Chloroaniline	106-47-8	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
4-Chlorophenyl-phenylether	7005-72-3	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
4-Nitroaniline	100-01-6	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
4-Nitrophenol	100-02-7	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Benzoic acid	65-85-0	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Benzyl alcohol	100-51-6	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
bis(2-Chloroethoxy)methane	111-91-1	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
bis(2-chloroethyl)ether	111-44-4	NE	NE	NE	NE	1.4	NE	NE	0.53	0.854	NE	0.53	NE	0.53

Table 3

Proposed Groundwater Cleanup Levels

Reliable Steel Site
Olympia, Washington

		State Surface Water Quality Criteria[1]		National Toxics Rule[2]			Clean Water Act[3]			MTCA Method B Surface Water Cleanup Level[4] (Standard Formula Value)		Groundwater Cleanup Level Before Adjustment for Background	Background Concentration[5]	Proposed Groundwater Cleanup Levels[6,7]
		Marine Water		Marine Protection of Aquatic Life		AWQC for Protection of Human Health	Marine Protection of Aquatic Life		AWQC for Protection of Human Health					
Analyte	CAS No.	Acute	Chronic	Acute	Chronic		Acute	Chronic		Carcinogen	Non-Carcinogen			
SVOCs continued (µg/l)														
bis(2-Ethylhexyl)phthalate	117-81-7	NE	NE	NE	NE	5.9	NE	NE	2.2	3.561	399	2.2	NE	2.2
Butylbenzylphthalate	85-68-7	NE	NE	NE	NE	NE	NE	NE	1,900	8.24	1,250	1,900	NE	1,900
Carbazole	86-74-8	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Dibenzofuran	132-64-9	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Diethylphthalate	84-66-2	NE	NE	NE	NE	120,000	NE	NE	44,000	NE	28,412	28,412	NE	28,412
Dimethylphthalate	131-11-3	NE	NE	NE	NE	2,900,000	NE	NE	1,100,000	NE	NE	1,100,000	NE	1,100,000
Di-n-butylphthalate	84-74-2	NE	NE	NE	NE	12,000	NE	NE	4,500	NE	2,913	2,913	NE	2,913
Di-n-octylphthalate	117-84-0	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Hexachlorobenzene	118-74-1	NE	NE	NE	NE	0.00077	NE	NE	0.00029	0.0005	0.24	0.00029	NE	0.00083[13]
Hexachlorobutadiene	87-68-3	NE	NE	NE	NE	50	NE	NE	18	29.89	933	18	NE	18
Hexachlorocyclopentadiene	77-47-4	NE	NE	NE	NE	17,000.0	NE	NE	1,100	NE	3,584	1,100	NE	1,100
Hexachloroethane	67-72-1	NE	NE	NE	NE	8.9	NE	NE	3.3	5.33	29.83	3.3	NE	3.3
Isophorone	78-59-1	NE	NE	NE	NE	600	NE	NE	960	1,558	118,383	600	NE	600
Nitrobenzene	98-95-3	NE	NE	NE	NE	1,900	NE	NE	690	NE	1,790	690	NE	690
n-Nitroso-di-n-propylamine	621-64-7	NE	NE	NE	NE	NE	NE	NE	0.51	0.82	NE	0.51	NE	0.51
n-Nitrosodiphenylamine	86-30-6	NE	NE	NE	NE	16	NE	NE	6	9.73	NE	6	NE	6
o-Cresol (2-Methylphenol)	95-48-7	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
p-Cresol (4-Methylphenol)	106-44-5	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Pentachlorophenol	87-86-5	13	7.9	13	7.9	8.2	13	7.9	3	1.47	1,180	1.47	NE	1.47
Phenol	108-95-2	NE	NE	NE	NE	4,600,000	NE	NE	1,700,000	NE	556,000	556,000	NE	556,000
Non-carcinogenic Polycyclic Aromatic Hydrocarbons (PAHs) (µg/l)														
1-Methylnaphthalene	90-12-0	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
2-Methylnaphthalene	91-57-6	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Acenaphthene	83-32-9	NE	NE	NE	NE	NE	NE	NE	990	NE	643	990	NE	990
Acenaphthylene	208-96-8	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Anthracene	120-12-7	NE	NE	NE	NE	110,000	NE	NE	40,000	NE	25,926	25,926	NE	25,926
Benzo[g,h,i]perylene	191-24-2	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Fluoranthene	206-44-0	NE	NE	NE	NE	370	NE	NE	140	NE	90.2	140	NE	140
Fluorene	86-73-7	NE	NE	NE	NE	14,000	NE	NE	5,300	NE	3,457	3,457	NE	3,457
Naphthalene	91-20-3	NE	NE	NE	NE	NE	NE	NE	NE	NE	4,938	4,938	NE	4,938
Phenanthrene	85-01-8	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Pyrene	129-00-0	NE	NE	NE	NE	11,000	NE	NE	4,000	NE	2,593	2,593	NE	2,593

Table 3

Proposed Groundwater Cleanup Levels

Reliable Steel Site
Olympia, Washington

		State Surface Water Quality Criteria[1]		National Toxics Rule[2]			Clean Water Act[3]			MTCA Method B Surface Water Cleanup Level[4] (Standard Formula Value)		Groundwater Cleanup Level Before Adjustment for Background	Background Concentration[5]	Proposed Groundwater Cleanup Levels[6,7]
		Marine Water		Marine Protection of Aquatic Life		AWQC for Protection of Human Health	Marine Protection of Aquatic Life		AWQC for Protection of Human Health					
Analyte	CAS No.	Acute	Chronic	Acute	Chronic		Acute	Chronic		Carcinogen	Non-Carcinogen			
Carcinogenic Polycyclic Aromatic Hydrocarbons (cPAHs) (μg/l)														
Benzo[a]anthracene	56-55-3	NE	NE	NE	NE	0.0311	NE	NE	0.018	0.296	NE	0.018	NE	0.018
Benzo[a]pyrene	50-32-8	NE	NE	NE	NE	0.0311	NE	NE	0.018	0.030	NE	0.018	NE	0.018
Benzo[b]fluoranthene	205-99-2	NE	NE	NE	NE	0.0311	NE	NE	0.018	0.296	NE	0.018	NE	0.018
Benzo[k]fluoranthene	207-08-9	NE	NE	NE	NE	0.0311	NE	NE	0.018	2.96	NE	0.018	NE	0.018
Chrysene	218-01-9	NE	NE	NE	NE	0.0311	NE	NE	0.018	29.6	NE	0.018	NE	0.018
Dibenz[a,h]anthracene	53-70-3	NE	NE	NE	NE	0.0311	NE	NE	0.018	0.030	NE	0.018	NE	0.018
Indeno[1,2,3-c,d]pyrene	193-39-5	NE	NE	NE	NE	0.0311	NE	NE	0.018	0.296	NE	0.018	NE	0.018
cPAHs TEQ	--	NE	NE	NE	NE	0.0311	NE	NE	0.018	0.740	NE	0.018	NE	0.018

Notes:

[1] Water Quality Standards for Surface Waters of the State of Washington (WAC 173-201A-240).

[2] 40 CFR Part 131 (National Toxics Rule).

[3] National Recommended Water Quality Criteria (Clean Water Act Section 304a).

[4] Model Toxics Control Act (MTCA) Method B criteria for surface water (WAC 173-340-730).

[5] Background concentration for Washington State.

[6] The groundwater cleanup level for the site are based on protection of surface water.

[7] Lowest of the State surface water quality criteria, National Toxics Rule criteria, Clean Water Act criteria, and MTCA Method B surface water cleanup level is used as the cleanup level for the site groundwater unless the background concentration is higher. If background concentration is higher than these criteria, then background concentration is used as the cleanup level for site groundwater.

[8] The cleanup level listed for each metal apply to the dissolve fraction with the exception of mercury. The cleanup level for mercury apply to the total fraction.

[9] Background for arsenic as established in the MTCA A Table 720-1 (WAC 173-340-900).

[10] MTCA Method A groundwater cleanup level is used as the proposed cleanup level since numerical criteria has not been established for gasoline-, diesel- and heavy oil-range petroleum hydrocarbons in surface water.

[11] Cleanup level for gasoline-range petroleum hydrocarbon is 800 μg/l if benzene is present and 1,000 μg/l if benzene is not present.

[12] The cleanup level provided is the MTCA Method A value as requested by Ecology.

[13] The Practical Quantitation Limit (PQL) of 0.00083 μg/l is used as the proposed cleanup level as the available criteria are less than the PQL. The PQL that is provided is based on a low-level method 8081A performed by ARI Laboratory in Redmond, Washington.

MTCA = Washington State Model Toxics Control Act

TEQ = Toxicity equivalency quotient

μg/l = Micrograms per liter

NE = No criteria is currently established for this analyte

Table 4

Proposed Stormwater Screening Levels

Reliable Steel Site
Olympia, Washington

Analyte	CAS No.	Proposed Groundwater Cleanup Level[1]	Industrial Stormwater Criteria[2]	Proposed Stormwater Screening Level
Metals (µg/l)				
Arsenic	7440-38-2	5	150	5[3]/150[4]
Cadmium	7440-43-9	8.8	2.1	8.8[3]/2.1[4]
Chromium (total)	7440-47-3	50	NE	50[3]/NE[5]
Copper	7440-50-8	2.4	14	2.4[3]/14[4]
Lead	7439-92-1	8.1	81.6	8.1[3]/81.6[4]
Mercury	7439-97-6	0.025	1.4	NE[3]/0.025[4]
Zinc	7440-66-6	81	117	81[3]/117[4]
Petroleum Hydrocarbons (µg/l)				
Gasonline-Range	8006-61-9	800/1,000	VS	800/1,000
Diesel-Range	68334-30-5	500	VS	500
Heavy Oil-Range	30109	500	VS	500
Semi-volatile Organic Compounds (SVOCs) (µg/l)				
1,2,4-Trichlorobenzene	120-82-1	70	NE	70
1,2-Dichlorobenzene	95-50-1	1,300	NE	1,300
1,3-Dichlorobenzene	541-73-1	960	NE	960
1,4-Dichlorobenzene	106-46-7	190	NE	190
2,4,5-Trichlorophenol	95-95-4	3,600	NE	3,600
2,4,6-Trichlorophenol	88-06-2	2.4	NE	2
2,4-Dichlorophenol	120-83-2	191	NE	191
2,4-Dimethylphenol	105-67-9	553	NE	553
2,4-Dinitrophenol	51-28-5	3,457	NE	3,457
2,4-Dinitrotoluene	121-14-2	3.4	NE	3
2,6-Dinitrotoluene	606-20-2	NE	NE	NE
2-Chloronaphthalene	91-58-7	1,026.77	NE	1,027
2-Chlorophenol	95-57-8	97	NE	97
2-Nitroaniline	88-74-4	NE	NE	NE
2-Nitrophenol	88-75-5	NE	NE	NE
3-Nitroaniline	99-09-2	NE	NE	NE
4,6-Dinitro-2-methylphenol	534-52-1	NE	NE	NE
4-Bromophenyl-phenylether	101-55-3	NE	NE	NE
4-Chloro-3-methylphenol	59-50-7	NE	NE	NE
4-Chloroaniline	106-47-8	NE	NE	NE
4-Chlorophenyl-phenylether	7005-72-3	NE	NE	NE
4-Nitroaniline	100-01-6	NE	NE	NE
4-Nitrophenol	100-02-7	NE	NE	NE
Benzoic acid	65-85-0	NE	NE	NE
Benzyl alcohol	100-51-6	NE	NE	NE
bis(2-Chloroethoxy)methane	111-91-1	NE	NE	NE
bis(2-chloroethyl)ether	111-44-4	0.53	NE	1
bis(2-Ethylhexyl)phthalate	117-81-7	2.2	NE	2
Butylbenzylphthalate	85-68-7	1,900	NE	1,900
Carbazole	86-74-8	NE	NE	NE
Dibenzofuran	132-64-9	NE	NE	NE
Diethylphthalate	84-66-2	28,412	NE	28,412
Dimethylphthalate	131-11-3	1,100,000	NE	1,100,000
Di-n-butylphthalate	84-74-2	2,913	NE	2,913
Di-n-octylphthalate	117-84-0	NE	NE	NE
Hexachlorobenzene	118-74-1	0.00029	NE	0.00083
Hexachlorobutadiene	87-68-3	18	NE	18
Hexachlorocyclopentadiene	77-47-4	1,100	NE	1,100
Hexachloroethane	67-72-1	3.3	NE	3
Isophorone	78-59-1	600	NE	600
Nitrobenzene	98-95-3	690	NE	690
n-Nitroso-di-n-propylamine	621-64-7	0.51	NE	1
n-Nitrosodiphenylamine	86-30-6	6	NE	6
o-Cresol (2-Methylphenol)	95-48-7	NE	NE	NE
p-Cresol (4-Methylphenol)	106-44-5	NE	NE	NE
Pentachlorophenol	87-86-5	1.47	NE	1
Phenol	108-95-2	556,000	NE	556,000

Table 4

Proposed Stormwater Screening Levels

Reliable Steel Site
Olympia, Washington

Analyte	CAS No.	Proposed Groundwater Cleanup Level[1]	Industrial Stormwater Criteria[2]	Proposed Stormwater Screening Level
Non-carcinogenic Polycyclic Aromatic Hydrocarbons (PAHs) (µg/l)				
1-Methylnaphthalene	90-12-0	NE	NE	NE
2-Methylnaphthalene	91-57-6	NE	NE	NE
Acenaphthene	83-32-9	990	NE	990
Acenaphthylene	208-96-8	NE	NE	NE
Anthracene	120-12-7	25,926	NE	25,926
Benzo[g,h,i]perylene	191-24-2	NE	NE	NE
Fluoranthene	206-44-0	140	NE	140
Fluorene	86-73-7	3,457	NE	3,457
Naphthalene	91-20-3	4,938	NE	4,938
Phenanthrene	85-01-8	NE	NE	NE
Pyrene	129-00-0	2,593	NE	2,593
Carcinogenic Polycyclic Aromatic Hydrocarbons (cPAHs) (µg/l)				
Benzo[a]anthracene	56-55-3	0.018	NE	0.018
Benzo[a]pyrene	50-32-8	0.018	NE	0.018
Benzo[b]fluoranthene	205-99-2	0.018	NE	0.018
Benzo[k]fluoranthene	207-08-9	0.018	NE	0.018
Chrysene	218-01-9	0.018	NE	0.018
Dibenz[a,h]anthracene	53-70-3	0.018	NE	0.018
Indeno[1,2,3-c,d]pyrene	193-39-5	0.018	NE	0.018
cPAHs TEQ	--	0.018	NE	0.018
Conventionals				
pH	7440-38-2	NE	5.0-9.0	5.0-9.0
Turbidity (NTU)	7440-43-9	NE	25	25

Notes:

[1] Proposed groundwater cleanup levels are referenced from Table 3 and are based on protection of surface water.

[2] Benchmark values identified in the Washington State Department of Ecology Industrial Stormwater General Permit.

[3] Cleanup level applicable to the dissolved concentration of identified metal.

[4] Cleanup level applicable to the total concentration of identified metal.

TEQ = Toxicity equivalency quotient

NTU = Nephelometric turbidity units

µg/l = Micrograms per liter

NE = No criteria is currently established for this analyte

VS = Visible sheen

Table 5

Proposed Sediment Cleanup Levels

Reliable Steel Site
Olympia, Washington

	Sediment Management Standards[1] (SMS)			Apparent Effects Threshold (AET) Criteria[2]			Proposed Sediment Cleanup Level	
Analyte	**Sediment Quality Standard (SQS)**	**Cleanup Screening Level (CSL)**	**Units**	**Lowest AET (LAET)**	**Second Lowest AET (2LAET)**	**Units**	**SMS[3]**	**AET[4]**
Metals								
Arsenic	57	93	mg/kg DW	57	93	mg/kg DW	57	57
Barium	NE	NE		NE	NE		NE	NE
Cadmium	5.1	6.7		5.1	6.7		5.1	5.1
Chromium (total)	260	270		260	270		260	260
Copper	390	390		390	390		390	390
Lead	450	530		450	530		450	450
Mercury	0.41	0.59		0.41	0.59		0.41	0.41
Selenium	NE	NE		NE	NE		NE	NE
Silver	6.1	6.1		6.1	6.1		6.1	6.1
Zinc	410	960		410	960		410	410
Butyltin in Porewater								
Tributyltin Ion	0.15[5]		µg/l	0.15[5]		µg/l	0.15[5]	
Petroleum Hydrocarbons								
Gasoline-Range	NE		mg/kg DW	NE		mg/kg DW	NE	
Diesel-Range	NE			NE			NE	
Heady oil-Range	NE			NE			NE	
Total petroleum hydrocarbons[6]	100[7]			100[7]			100[7]	
LPAH								
1-Methylnaphthalene	NE	NE	mg/kg DW	NE	NE	mg/kg OC	NE	NE
2-Methylnaphthalene	0.67	0.67		38	64		0.67	38
Acenaphthene	0.5	0.5		16	57		0.5	16
Acenaphthylene	1.3	1.3		66	66		1.3	66
Anthracene	0.96	0.96		220	1,200		0.96	220
Fluorene	0.54	0.54		23	79		0.54	23
Naphthalene	2.1	2.1		99	170		2.1	99
Phenanthrene	1.5	1.5		100	480		1.5	100
Total LPAH[8]	5.2	5.2		370	780		5.2	370
HPAH								
Benzo(a)anthracene	1.3	1.6	mg/kg DW	110	270	mg/kg OC	1.3	110
Benzo(a)pyrene	1.6	1.6		99	210		1.6	99
Benzo(b+k)fluoranthene	3.2	3.6		230	450		3.2	230
Benzo(g,h,i)perylene	0.67	0.72		31	78		0.67	31
Chrysene	1.4	2.8		110	460		1.4	110
Dibenzo(a,h)anthracene	0.23	0.23		12	33		0.23	12
Fluoranthene	1.7	2.5		160	1,200		1.7	160
Indeno(1, 2, 3-cd)pyrene	0.6	0.69		34	88		0.6	34
Pyrene	2.6	3.3		1,000	1,400		2.6	1,000
Total HPAH[9]	12	17		960	5,300		12	960
Chlorinated Hydrocarbons								
1, 2, 4-Trichlorobenzene	0.031	0.051	mg/kg DW	0.81	1.8	mg/kg OC	0.031	0.81
1, 2-Dichlorobenzene	0.035	0.05		2.3	2.3		0.035	2.3
1, 4-Dichlorobenzene	0.11	0.11		3.1	9		0.11	3.1
1, 3-Dichlorobenzene	0.17	NE		NE	NE		0.17	NE
Phthalates								
Bis(2-ethylhexyl) phthalate	1.3	3.1	mg/kg DW	47	78	mg/kg OC	1.3	47
Butylbenzyl phthalate	0.063	0.9		4.9	64		0.063	4.9
Dibutyl phthalate	1.4	5.1		220	1,700		1.4	220
Diethyl phthalate	0.2	1.2		61	110		0.2	61
Dimethyl phthalate	0.071	0.16		53	53		0.071	53
Di-n-octyl phthalte	6.2	6.2		58	4,500		6.2	58
Ionizable Organics								
2, 4-Dimethylphenol	0.029	0.029	mg/kg DW	0.029	0.029	mg/kg DW	0.029	0.029
2-Methylphenol	0.063	0.063		0.063	0.063		0.063	0.063
4-Methylphenol	0.67	0.67		0.67	0.67		0.67	0.67
Pentachlorophenol	0.36	0.69		0.36	0.69		0.36	0.36
Phenol	0.42	1.2		0.42	1.2		0.42	0.42
Benzoic acid	0.65	0.65		0.65	0.65		0.65	0.65
Benzyl alcohol	0.057	0.073		0.057	0.073		0.057	0.057
Miscellaneous Extractables								
Dibenzofuran	0.54	0.54	mg/kg DW	15	58	mg/kg OC	0.54	15
Hexachlorobutadiene	0.011	0.12		3.9	6.2		0.011	3.9
Hexachlorobenzene	0.022	0.07		0.38	2.3		0.022	0.38
N-Nitrosodiphenylamine	0.028	0.04		11	11		0.028	11
Polychlorinated Biphenyls								
Total PCBs	0.13	1.0	mg/kg DW	12	65	mg/kg OC	0.13	12

Table 5

Proposed Sediment Cleanup Levels

Reliable Steel Site
Olympia, Washington

Notes:

[1] Sediment Management Standards (Chapter 173-204 WAC).

[2] Apparent Effects Threshold Criteria (provided in an email from Peter Adolphson, Washington State Department of Ecology, dated April 18, 2011).

[3] Lowest of SQS and CSL is selected as the SMS criteria for preliminary sediment cleanup level. SMS criteria is used to screen analytical results of samples with total organic carbon (TOC) concentrations within 0.5 to 3.5 percent range.

[4] Lowest of LAET and 2LAET is selected as the AET criteria for preliminary sediment cleanup level. AET criteria is used to screen analytical results of samples with TOC concentrations outside 0.5 to 3.5 percent range.

[5] Dedged Material Management Program (DMMP) screening level.

[6] Total petroleum hydrocarbons are total of diesel- and heavy oil-range petroleum hydrocarbons.

[7] Cleanup level based on Ecology recommendation.

[8] Total low molecular weight polycyclic aromatic hydrocarbons (LPAHs) are the total of napthalene, acenapthylene, acenapthene, fluorene, phenanthrene and anthracene; 2-methylnapthalene is not included in the sum of LPAHs.

[9] Total high molecular weight polycyclic aromatic hydrocarbons (HPAHs) are the total of fluoranthene, pyrene, benzo(a)anthracene, chrysene, benzofluoranthenes, benzo(a)pyrene, indeno(1,2,3-c-d)pyrene, dibenzo(a,h)anthracene and benzo(g,h,i)perylene.

mg/kg = milligram per kilogram

µg/l = microgram per liter

DW = Dry weight

OC = Normalized to organic carbon

NE = No criteria is currently established for this analyte

Table 6

Summary of Soil Chemical Analytical Results

Metals[1]

Reliable Steel Site
Olympia, Washington

Analytes	Proposed Soil Cleanup Levels[2]	Location[3]	RI-2	RI-3	RI-4		RI-5		RI-6	RI-8		RI-9	RI-20		RI-25		RI-26	RI-27	
		Sample ID	RI-2	RI-3	RI-4	RI-4	RI-5	RI-5	RI-6	RI-8	RI-8	RI-9	RI-20	RI-20	RI-25	RI-25	RI-26	RI-27	RI-27
		Depth (feet)	0-1	0-0.5	0-0.5	2-3	0-1	1-2	0-1	0-1.5	2.5-3.5	0-1	2.5-3.5	3.5-4	3	4	2.5	2.5-3.5	6
		Date	7/13/10	7/13/10	7/13/10	7/13/10	7/13/10	7/13/10	7/13/10	7/13/10	7/13/10	7/13/10	7/13/10	7/13/10	7/8/10	7/8/10	7/8/10	7/13/10	7/13/10
Metals (mg/kg)																			
Arsenic	20		3.12	14.5	**25.8**	4.14	**31.6**	4.1	3.4	4.27	–	2.19	4.42	2.04	1.55	1.54	3.51	9.94	–
Barium	16,000		--	--	--	–	--	–	--	--	–	--	--	--	--	--	--	--	–
Cadmium	2		--	--	--	–	--	–	--	--	–	--	--	--	--	--	--	--	–
Chromium (total)	2,000		12	132	280	–	82.8	–	10.1	24.8	–	17.8	11.4	5.4	8.98	10.6	7.11	27.5	–
Copper	3,000		13.5	828	188	–	423	–	23.4	31	–	39.2	12.6	4.44	47.8	75.8	4.96	62.7	–
Lead	250		42	223	**596**	12.2	**710**	183	13	61	–	13	2	1	4	4	3	**551**	1.75
Mercury	2		0.2 U	0.2 U	0.2 U	--	0.2	--	0.2 U	0.2 U	--	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1.2	--
Selenium	400		--	--	--	–	--	–	--	--	–	--	--	--	--	--	--	--	–
Silver	400		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Tin	4,800		--	--	--	--	--	--	--	--	--	--	--	--	0.237 U	0.247 U	0.204 U	--	--
Zinc	24,000		83	893	857	--	1,610	--	39.6	102	--	75.4	70.1	15.8	1,030	979	241	1,190	--

Notes:

[1] Results of total metals analyses are reported in this table. Results of Toxicity Characteristic Leaching Procedure (TCLP) metals analyses are reported in Table 7.

[2] Proposed soil cleanup levels are referenced from Table 2.

[3] Sample locations are shown in Figure 13.

U = The analyte was not detected at a concentration greater than the identified reporting limit.

-- = not analyzed

mg/kg = milligrams per kilogram

☐ Yellow border indicates that the method reporting limit was greater than the proposed cleanup level.

☐ Red border and bold text indicates that the analyte was detected at a concentration greater than the proposed cleanup level.

Table 6

Summary of Soil Chemical Analytical Results

Metals[1]

Reliable Steel Site
Olympia, Washington

Analytes	Proposed Soil Cleanup Levels[2]	Location[3]	RI-31	S-13	RGB1		RGB2	RGB3		RGB4		RGB10		RGB12	RGB13	RGB14	RGB15	RGB16
		Sample ID	RI-31	S-13	RGB1-S	RGB1-4	RGB2-S	RGB3-S	RGB3-4	RGB4-S	RGB4-4	RGB10-S	RGB10-5	RGB12-4	RGB13-4	RGB14-4	RGB15-4	RGB16-6
		Depth (feet)	2.5-3.5	6	Surface	4	Surface	Surface	4	Surface	4	Surface	5	4	4	4	4	6
		Date	7/13/10	10/15/05	2/8/08	2/8/08	2/8/08	2/8/08	2/8/08	2/8/08	2/8/08	2/11/08	2/11/08	2/11/08	2/11/08	2/11/08	2/11/08	2/11/08
Metals (mg/kg)																		
Arsenic	20		1.35	5 U	1 U	2.88	1.07	1 U	3.21	2.69	3.7	1.82	4.71	3.64	5.85	5.45	2.75	5.86
Barium	16,000		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cadmium	2		--	1 U	1 U	1.57	1 U	1 U	1 U	1.6	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1.1
Chromium III	2,000		6.27	112	8.65	15.8	10.9	8.54	5.2	38.3	7.68	25.3	24.3	16	19	25.6	32.4	12.2
Copper	3,000		4.44	--	15.9	8.06	17.7	22.4	3.63	86.1	5.61	27.6	25.7	17.2	28.3	22.3	20.6	10.9
Lead	250		1.38	5 U	7.12	1.96	8.72	14.6	1 U	34.6	1 U	62.3	65.6	25.1	44.1	8.64	225	1.52
Mercury	2		0.2 U	0.5 U	0.2 U	**2.4**	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Selenium	400		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Silver	400		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Tin	NE		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Zinc	24,000		60.6	--	955	--	513	808	12.3	1,330	16.3	1,120	128	53.4	84.7	38	47.6	23.5

Notes:

[1] Results of total metals analyses are reported in this table. Results of Toxicity Characteristic Leaching Procedure (TCLP) metals analyses are reported in Table 7.

[2] Proposed soil cleanup levels are referenced from Table 2.

[3] Sample locations are shown in Figure 13.

U = The analyte was not detected at a concentration greater than the identified reporting limit.

-- = not analyzed

mg/kg = milligrams per kilogram

☐ Yellow border indicates that the method reporting limit was greater than the proposed cleanup level.

☐ Red border and bold text indicates that the analyte was detected at a concentration greater than the proposed cleanup level.

Table 6

Summary of Soil Chemical Analytical Results

Metals[1]

Reliable Steel Site
Olympia, Washington

Analytes	Proposed Soil Cleanup Levels[2]	Location[3]	RGB17	RGB18	RGB19		A3	P1	Mt. Pit	PS Grit	Sand Grit		MW9		Ditch1		Ditch2		GP-1		
		Sample ID	RGB17-5	RGB18-5	RGB19-S	RGB19-12	A3	P1	Mt. Pit	PS Grit	Sand Grit	Sand Grit	MW9-S	MW9-4	Ditch1-S	Ditch1-2.5	Ditch2-S	Ditch2-2.5	GP-1 (2-2.5)	GP (4-4.5)	GP-1 (6-6.5)
		Depth (feet)	5	5	Surface	12	0.5	Surface	Surface	Surface	Surface	Surface	Surface	4	Surface	2.5	Surface	2.5	2-2.5	4-4.5	6-6.5
		Date	2/11/08	2/11/08	2/11/08	2/11/08	6/3/04	6/3/04	5/7/04	2/8/08	6/19/01	6/27/07	2/8/08	2/8/08	2/11/08	2/11/08	2/11/08	2/11/08	8/25/2010	8/25/2010	8/25/2010
Metals (mg/kg)																					
Arsenic	20		1.79	3.55	2.25	9.72	7.82	7.28	5.21	1 U	1.82	--	1.55	3.71	2.82	5.33	2.46	1.77	12.3 U	4.8 U	--
Barium	16,000		--	--	--	--	110	93.4	117	--	469	--	--	--	--	--	--	--	80.6	52.7	--
Cadmium	2		1 U	1 U	1 U	1 U	**2.87**	1.52	0.5 U	1 U	0.33 U	--	1 U	1 U	1 U	1.38	1 U	1 U	6.2 U	2.4 U	--
Chromium III	2,000		5.81	24.5	18.5	10	53.9	37.1	50.7	9.65	15.1	--	60.3	30.9	18.3	16.2	16	8.89	26.7	10.4	--
Copper	3,000		5.81	34.2	16.3	19.2	84.4	119	75.8	14.7	--	--	117	46.6	29.2	69.3	31.1	6.95	--	--	--
Lead	250		1 U	106	17.1	95.6	**1,540**	**518**	**338**	14.2	3	--	17.8	102	85.2	69.2	43.8	1.78	4.7	5.2	--
Mercury	2		0.2 U	0.2 U	0.2 U	0.2 U	0.1 U	0.1 U	0.1 U	0.2 U	0.2 U	--	0.2 U	0.27	0.29	0.91	0.2 U	0.2 U	0.12 U	0.27 U	--
Selenium	400		--	--	--	--	0.735	0.5 U	0.5 U	--	0.33 U	--	--	--	--	--	--	--	6.2 U	2.4 U	--
Silver	400		--	--	--	--	0.5 U	0.5 U	0.664	--	0.33 U	--	--	--	--	--	--	--	6.2 U	2.4 U	--
Tin	NE		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Zinc	24,000		13.2	150	70	164	--	--	--	687	--	1,570	2,120	289	415	678	433	27.1	--	--	--

Notes:

[1] Results of total metals analyses are reported in this table. Results of Toxicity Characteristic Leaching Procedure (TCLP) metals analyses are reported in Table 7.

[2] Proposed soil cleanup levels are referenced from Table 2.

[3] Sample locations are shown in Figure 13.

U = The analyte was not detected at a concentration greater than the identified reporting limit.

-- = not analyzed

mg/kg = milligrams per kilogram

☐ Yellow border indicates that the method reporting limit was greater than the proposed cleanup level.

☐ Red border and bold text indicates that the analyte was detected at a concentration greater than the proposed cleanup level.

Table 7

Summary of Soil Chemical Analytical Data

TCLP Metals[1]

Reliable Steel Site

Olympia, Washington

Analytes	Dangerous Waste Criteria[2]	Location[3]	A3	Blast Grit			S1	S3	BS-1
		Sample ID	A3	Blast Grit	Blast Grit	Blast Grit	S1	S3	BS-1
		Depth (feet)	0.5	Surface	Surface	Surface	2	2	Surface
		Date	6/3/2004	6/19/2001	6/27/2007	6/27/2007	6/3/2004	6/3/2004	12/19/2005
TCLP Metals (mg/l)									
Arsenic	5		0.1 U	0.05 U	0.2 U	0.2	0.1 U	0.1 U	0.8 U
Barium	100		1 U	1.16	0.67	0.79	1 U	1 U	--
Cadmium	1		0.05 U	0.05 U	0.01 U	0.01 U	0.05 U	0.05 U	--
Chromium	5		0.1 U	0.05 U	0.02 U	0.02 U	0.1 U	0.1 U	--
Lead	5		0.31	0.05 U	0.1 U	0.1 U	0.1 U	0.1 U	0.2 U
Mercury	0.2		0.005 U	0.001 U	0.0001 U	0.0001 U	0.05 U	0.05 U	--
Selenium	1		0.1 U	0.05 U	0.2 U	0.2 U	0.1 U	0.1 U	--
Silver	5		0.05 U	0.05 U	0.02 U	0.02 U	0.05 U	0.05 U	--

Notes:

[1] Results of Toxicity Characteristic Leaching Procedure (TCLP) metals analyses are reported in this table. Results of total metals analyses are reported in Table 6.

[2] WAC 173-303-090

[3] Sample locations are shown in Figure 13.

U = The analyte was not detected at a concentration greater than the identified reporting limit.

-- = not analyzed

mg/l = milligrams per liter

☐ Yellow border indicates that the method reporting limit was greater than the proposed cleanup level.

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Table 8

Summary of Soil Chemical Analytical Results
Petroleum Hydrocarbons and BETX[1]

Reliable Steel Site
Olympia, Washington

Analyte	Proposed Soil Cleanup Levels[2]	Location[3]	EC-1	EC-2	EC-03B		RI-1	RI-5		RI-6	RI-7	RI-8	RI-9	RI-10	RI-11	RI-12		RI-13	RI-14	RI-15	RI-16		RI-17
		Sample ID	EC-1(0-0.4)	EC2(2-3)	EC-3B(0-1)	EC-3B(1-2)	RI-1	RI-5	RI-5	RI-6	RI-7A-1	RI-8	RI-9	RI-10	RI-11	RI-12	RI-12	RI-13	RI-14	RI-15	RI-16	RI-16	RI-17
		Depth (feet)	0-0.4	2-3	0-1	1-2	0-1	0-1	1-2	5-6	1	2.5-3.5	3	4	10	1	4	4	4	4	0.5	4	5
		Date	4/10/13	4/10/13	4/11/13	4/11/13	7/13/10	7/13/10	7/13/10	7/13/10	7/13/10	7/13/10	7/13/10	7/8/10	7/13/10	7/8/10	7/8/10	7/13/10	7/12/10	7/8/10	7/8/10	7/8/10	7/8/10
Petroleum Hydrocarbons (mg/kg)																							
Gasoline-range	30/100 [4]		--	--	--	--	2 U	--	3.3	2 U	2 U	2 U	2 U	2 U	2 U	--	2 U	--	--	--	--	--	--
Diesel-range	2,000		--	19 UJ	16 U	16 U	--	480	--	--	2,700	--	--	--	--	50 U	--	50 U	50 U	50 U	1,400	50 U	50 U
Heavy-oil range	2,000		--	290 J	99	40 U	--	930	--	--	7,300	--	--	--	--	250 U	--	250 U	250 U	250 U	8,600	250 U	250 U
Mineral oil-range	4,000		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BETX (mg/kg)																							
Benzene	0.03		0.001 UJ	--	--	--	0.02 U	--	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	--	0.02 U	--	--	--	--	--	--
Ethylbenzene	6		0.0003 J	--	--	--	0.02 U	--	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	--	0.02 U	--	--	--	--	--	--
Toluene	7		0.002 J	--	--	--	0.02 U	--	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	--	0.02 U	--	--	--	--	--	--
Xylenes	9		0.002 J	--	--	--	0.06 U	--	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	--	0.06 U	--	--	--	--	--	--

Notes:

[1] Results of analyzed volatile organic compounds (VOCs) other than benzene, ethylbenzene, toluene and xylenes (BETX) are reported in Table 11.

[2] Proposed soil cleanup levels are referenced from Table 2.

[3] Sample locations are shown in Figure 14.

[4] Cleanup level for gasoline-range petroleum hydrocarbon is 30 mg/kg if benzene is present and 100 mg/kg if benzene is not present.

U = The analyte was not detected at a concentration greater than the identified reporting limit.

x = The pattern of peaks present is not indicative of diesel.

y = The pattern of peaks present is not indicative of motor oil.

-- = not analyzed

mg/kg = milligrams per kilogram

☐ Yellow border indicates that the method reporting limit was greater than the proposed cleanup level.

☐ Red border and bold text indicates that the analyte was detected at a concentration greater than the proposed cleanup level.

Table 8

Summary of Soil Chemical Analytical Results

Petroleum Hydrocarbons and BETX[1]

Reliable Steel Site
Olympia, Washington

Analyte	Proposed Soil Cleanup Levels[2]	Location[3]	RI-19	RI-21		RI-25	RI-26	RI-27	RI-28	RI-29	RI-30	S-1	S-2	S-4	S-6	S-7	S-8	S-9	S-10
		Sample ID	RI-19	RI-21	RI-21	RI-25	RI-26	RI-27	RI-28	RI-29	RI-30	S-1	S-2	S-4	S-6	S-7	S-8	S-9	S-10
		Depth (feet)	4	3	6	6	6	6	6	8	6	7	7	7	4.5	7	4-8	6	4-8
		Date	7/8/10	7/8/10	7/8/10	7/8/10	7/8/10	7/13/10	7/8/10	7/8/10	7/8/10	10/15/05	10/15/05	10/15/05	10/15/05	10/15/05	10/15/05	10/15/05	10/15/05
Petroleum Hydrocarbons (mg/kg)																			
Gasoline-range	30/100 [4]		--	--	--	--	--	--	--	--	--	--	--	10 U	--	10 U	--	--	--
Diesel-range	2,000		82	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	20 U	20 U	--	20 U	--	**8,900**	1,200	20 U
Heavy-oil range	2,000		250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U	40 U	40 U	--	40 U	--	40 U	40 U	40 U
Mineral oil-range	4,000		--	--	--	--	--	--	--	--	--	40 U	40 U	--	40 U	--	40 U	40 U	40 U
BETX (mg/kg)																			
Benzene	0.03		--	--	--	--	--	--	--	--	--	--	--	0.02 U	--	0.02 U	--	--	--
Ethylbenzene	6		--	--	--	--	--	--	--	--	--	--	--	0.05 U	--	0.05 U	--	--	--
Toluene	7		--	--	--	--	--	--	--	--	--	--	--	0.05 U	--	0.05 U	--	--	--
Xylenes	9		--	--	--	--	--	--	--	--	--	--	--	0.05 U	--	0.05 U	--	--	--

Notes:

[1] Results of analyzed volatile organic compounds (VOCs) other than benzene, ethylbenzene, toluene and xylenes (BETX) are reported in Table 11.

[2] Proposed soil cleanup levels are referenced from Table 2.

[3] Sample locations are shown in Figure 14.

[4] Cleanup level for gasoline-range petroleum hydrocarbon is 30 mg/kg if benzene is present and 100 mg/kg if benzene is not present.

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y = The pattern of peaks present is not indicative of motor oil.

-- = not analyzed

mg/kg = milligrams per kilogram

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Table 8

Summary of Soil Chemical Analytical Results

Petroleum Hydrocarbons and BETX[1]

Reliable Steel Site
Olympia, Washington

	Proposed Soil Cleanup Levels[2]	Location[3]	S-11	S-13		S-14	S-15	S-17	S-18	S-21	S-22	S-23	S-24	S-25	S-26	RGB1		RGB2	RGB3
		Sample ID	S-11	S-13	S-13	S-14	S-15	S-17	S-18	S-21	S-22	S-23	S-24	S-25	S-26	RGB1-S	RGB1-4	RGB2-S	RGB3-S
		Depth (feet)	4-8	6	10	4-8	5-8	7	Surface	3	8	4-8	3	3	4-8	Surface	4	Surface	Surface
Analyte		Date	10/15/05	10/15/05	10/15/05	10/15/05	10/15/05	10/15/05	10/15/05	10/15/05	10/15/05	10/15/05	10/15/05	10/15/05	10/15/05	2/8/08	2/8/08	2/8/08	2/8/08
Petroleum Hydrocarbons (mg/kg)																			
Gasoline-range	30/100 [4]		--	106	6,000	--	--	--	100	--	--	--	490	--	--	2 U	--	--	2 U
Diesel-range	2,000		8,700	20 U	20 U	20 U	20 U	20 U	180	20 U	20 U	20 U	500	20 U	20 U	50 U	50 U	50 U	50 U
Heavy-oil range	2,000		40 U	40 U	40 U	40 U	40 U	40 U	1,000	56	40 U	40 U	1,200	40 U	40 U	250 U	250 U	250 U	250 U
Mineral oil-range	4,000		40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U	--	--	--	--
BETX (mg/kg)																			
Benzene	0.03		--	0.02 U	--	--	--	--	0.02 U	--	--	--	--	--	--	0.03 U	--	--	0.03 U
Ethylbenzene	6		--	0.05 U	--	--	--	--	0.05 U	--	--	--	--	--	--	0.05 U	--	--	0.05 U
Toluene	7		--	0.05 U	--	--	--	--	0.05 U	--	--	--	--	--	--	0.05 U	--	--	0.05 U
Xylenes	9		--	0.05 U	--	--	--	--	0.05 U	--	--	--	--	--	--	0.063	--	--	0.079

Notes:

[1] Results of analyzed volatile organic compounds (VOCs) other than benzene, ethylbenzene, toluene and xylenes (BETX) are reported in Table 11.

[2] Proposed soil cleanup levels are referenced from Table 2.

[3] Sample locations are shown in Figure 14.

[4] Cleanup level for gasoline-range petroleum hydrocarbon is 30 mg/kg if benzene is present and 100 mg/kg if benzene is not present.

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y = The pattern of peaks present is not indicative of motor oil.

-- = not analyzed

mg/kg = milligrams per kilogram

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Table 8

Summary of Soil Chemical Analytical Results

Petroleum Hydrocarbons and BETX[1]

Reliable Steel Site
Olympia, Washington

Analyte	Proposed Soil Cleanup Levels[2]	Location[3]	RGB4	RGB5		RGB6	RGB7		RGB8	RGB9	RGB10			RGB11	RGB12	RGB13	RGB14	RGB15
		Sample ID	RGB4-S	RGB5-5-6	RGB5-8	RGB6-6	RGB7-6-7	RGB7-12	RGB8-5	RGB9-5	RGB10-S	RGB10-5	RGB10-11	RGB11-5	RGB12-4	RGB13-4	RGB14-4	RGB15-4
		Depth (feet)	Surface	5-6	8	6	6-7	12	5	5	Surface	5	11	5	4	4	4	4
		Date	2/8/08	2/8/08	2/8/08	2/8/08	2/8/08	2/8/08	2/8/08	2/11/08	2/11/08	2/11/08	2/11/08	2/11/08	2/11/08	2/11/08	2/11/08	2/11/08
Petroleum Hydrocarbons (mg/kg)																		
Gasoline-range	30/100 [4]		--	--	--	--	--	--	12	--	7	14	2 U	2 U	2 U	2 U	2 U	2 U
Diesel-range	2,000		180 x	2,600	50 U	50 U	15,000	50 U	50 U	50 U	--	--	--	--	--	--	130 x	110 x
Heavy-oil range	2,000		390	250 U	250 U	250 U	400 y	250 U	250 U	250 U	--	--	--	--	--	--	580	440
Mineral oil-range	4,000		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BETX (mg/kg)																		
Benzene	0.03		--	0.02 U	--	--	0.02 U	--	--	--	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.02 U	0.02 U
Ethylbenzene	6		--	0.02 U	--	--	0.02 U	--	--	--	0.05 U	0.059	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.02 U
Toluene	7		--	0.02 U	--	--	0.15	--	--	--	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.02 U	0.02 U
Xylenes	9		--	0.06 U	--	--	0.37	--	--	--	0.15	0.21	0.1 U	0.1 U	0.1 U	0.1 U	0.06 U	0.06 U

Notes:

[1] Results of analyzed volatile organic compounds (VOCs) other than benzene, ethylbenzene, toluene and xylenes (BETX) are reported in Table 11.

[2] Proposed soil cleanup levels are referenced from Table 2.

[3] Sample locations are shown in Figure 14.

[4] Cleanup level for gasoline-range petroleum hydrocarbon is 30 mg/kg if benzene is present and 100 mg/kg if benzene is not present.

U = The analyte was not detected at a concentration greater than the identified reporting limit.

x = The pattern of peaks present is not indicative of diesel.

y = The pattern of peaks present is not indicative of motor oil.

-- = not analyzed

mg/kg = milligrams per kilogram

☐ Yellow border indicates that the method reporting limit was greater than the proposed cleanup level.

☐ Red border and bold text indicates that the analyte was detected at a concentration greater than the proposed cleanup level.

Table 8

Summary of Soil Chemical Analytical Results

Petroleum Hydrocarbons and BETX[1]

Reliable Steel Site
Olympia, Washington

		Location[3]	RGB16		RGB17	RGB18	RGB19	U1	U2	Mt. Pit	PS Grit	MW8	MW9	Ditch1		Ditch2			GP-1		
	Proposed Soil Cleanup Levels[2]	Sample ID	RGB16-6	RGB16-10	RGB17-5	RGB18-5	RGB19-12	U1	U2	Mt. Pit	PS Grit	MW8-5	MW9-S	Ditch1-S	Ditch1-2.5	Ditch2-S	Ditch2-2.5	Ditch2-5.5	GP-1 (2-2.5)	GP (4-4.5)	GP-1 (6-6.5)
		Depth (feet)	6	10	5	5	12	5	4	Surface	Surface	5	Surface	Surface	2.5	Surface	2.5	5.5	2-2.5	4-4.5	6-6.5
Analyte		Date	2/11/08	2/11/08	2/11/08	2/11/08	2/11/08	6/3/04	6/3/04	5/7/04	2/8/08	2/8/08	2/8/08	2/11/08	2/11/08	2/11/08	2/11/08	3/4/08	8/25/2010	8/25/2010	8/25/2010
Petroleum Hydrocarbons (mg/kg)																					
Gasoline-range	30/100[4]		22	--	--	2 U	2 U	--	--	--	--	12	--	2 U	2 U	2 U	14	--	8.6 U	47 U	--
Diesel-range	2,000		**3,600**	50 U	50 U	--	50 U	**16,500**	10 U	59.2	50 U	50 U	420 x	110 x	160 x	220 x	**5,000**	50 U	30.4	60.9	--
Heavy-oil range	2,000		250 U	250 U	250 U	--	250 U	278	25 U	140	250 U	250 U	860	440	250 U	810	1,600	250 U	198	481	--
Mineral oil-range	4,000		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BETX (mg/kg)																					
Benzene	0.03		0.02 U	--	--	0.03 U	0.03 U	--	--	--	--	0.03 U	--	0.03 U	0.03 U	0.03 U	0.03 U	--	0.0047 U	0.019 U	--
Ethylbenzene	6		0.02 U	--	--	0.05 U	0.05 U	--	--	--	--	0.05 U	--	0.05 U	0.05 U	0.05 U	0.05 U	--	0.0047 U	0.019 U	--
Toluene	7		0.02 U	--	--	0.05 U	0.05 U	--	--	--	--	0.05 U	--	0.05 U	0.05 U	0.05 U	0.05 U	--	0.0047 U	0.0342	--
Xylenes	9		0.06 U	--	--	0.1 U	0.1 U	--	--	--	--	0.38	--	0.1 U	0.1 U	0.1 U	0.1 U	--	0.014 U	0.0567 U	--

Notes:

[1] Results of analyzed volatile organic compounds (VOCs) other than benzene, ethylbenzene, toluene and xylenes (BETX) are reported in Table 11.

[2] Proposed soil cleanup levels are referenced from Table 2.

[3] Sample locations are shown in Figure 14.

[4] Cleanup level for gasoline-range petroleum hydrocarbon is 30 mg/kg if benzene is present and 100 mg/kg if benzene is not present.

U = The analyte was not detected at a concentration greater than the identified reporting limit.

x = The pattern of peaks present is not indicative of diesel.

y = The pattern of peaks present is not indicative of motor oil.

-- = not analyzed

mg/kg = milligrams per kilogram

☐ Yellow border indicates that the method reporting limit was greater than the proposed cleanup level.

☐ Red border and bold text indicates that the analyte was detected at a concentration greater than the proposed cleanup level.

Table 9

Summary of Soil Chemical Analytical Results
Polycyclic Aromatic Hydrocarbons (PAHs)[1]

Reliable Steel Site
Olympia, Washington

		Location[3]	EC-4		EC-5	EC-6		EC-7	EC-9		EC-10	RI-2	RI-4	RI-6	RI-8
		Sample ID	EC-4	EC-4	EC-5	EC-6	EC-6	EC-7	EC-9	EC-9	EC-10	RI-2	RI-4	RI-6	RI-8
	Proposed Soil Cleanup Levels[2]	Depth (feet)	0-1	3-4	0-0.5	0-1	2-3	2-3	0-1	2-2.6	0-0.5	0-1	0-0.5	0-1	0-1.5
Analyte		Date	4/10/2013	4/10/2013	4/10/2013	4/10/2013	4/10/2013	4/10/2013	4/10/2013	4/10/2013	4/10/2013	7/13/10	7/13/10	7/13/10	7/13/10
Non-carcinogenic PAHs (mg/kg)															
2-Methylnaphthalene	320		0.059 U	0.035 U	0.027 U	0.15 U	0.031 U	0.032	0.47	0.1 J	0.028 U	--	--	--	--
Acenaphthene	4,800		0.03 U	0.017 U	0.014 U	0.057 J	0.016 U	0.016 U	0.7	0.04 J	0.014 U	0.01 U	0.35	0.016	0.01 U
Acenaphthylene	NE		0.024 J	0.017 U	0.014 U	0.071 J	0.016 U	0.02	0.046	0.083	0.014 U	0.01 U	0.019	0.01 U	0.01 U
Anthracene	24,000		0.016 J	0.017 U	0.018	0.24	0.0073 J	0.03	1.2	0.15	0.0048 J	0.01 U	0.51	0.028	0.01 U
Benzo(g,h,i)perylene	NE		0.1	0.021 J	0.21	0.32	0.031	0.11	1	0.27	0.044	0.024	0.7	0.037	0.017
Fluoranthene	3,200		0.19	0.013 J	0.42	2	0.065	0.26	6.6	0.78	0.054	0.012	2.1	0.12	0.039
Fluorene	3,200		0.03 U	0.017 U	0.014 U	0.056 J	0.016 U	0.016 U	0.83	0.035 J	0.014 U	0.01 U	0.25	0.012	0.01 U
Naphthalene	5		0.059 U	0.035 U	0.027 U	0.15 U	0.031 U	0.032 U	1	0.095 J	0.028 U	0.01 U	0.15	0.01 U	0.01 U
Phenanthrene	NE		0.032	0.017 U	0.096	0.89	0.024	0.14	4.7	0.42	0.021	0.01	2	0.11	0.023
Pyrene	2,400		0.2	0.005 J	0.43	1.9	0.072	0.25	4.5	0.67	0.043	0.013	1.8	0.11	0.034
Carcinogenic PAHs (mg/kg)															
Benz(a)anthracene	1.4		0.096	0.017 U	0.22	0.77	0.022	0.093	**2.7**	0.37	0.018	0.01 U	0.85	0.051	0.021
Chrysene	140		0.12	0.017 U	0.3	1.4	0.043	0.16	3	0.52	0.037	0.013	0.99	0.062	0.024
Benzo(b)fluoranthene	1.4		0.15	0.017 U	0.37	1.3	0.044	0.17	**3.7**	0.69	0.062	0.022	1.1	0.064	0.029
Benzo(k)fluoranthene	14		0.074	0.017 U	0.13	0.56	0.014 J	0.053	1.2	0.23	0.023	0.01 U	0.46	0.028	0.01
Benzo(a)pyrene	0.1		**0.14**	0.017 U	**0.29**	**0.74**	0.025	**0.12**	**2.7**	**0.47**	0.041	0.011	**0.6**	0.054	0.022
Indeno(1,2,3-cd)pyrene	1.4		0.12	0.031 J	0.22	0.42	0.039	0.12	1.2	0.35	0.053	0.024	0.68	0.037	0.017
Dibenz(a,h)anthracene	0.14		0.045 J	0.035 U	0.053	**0.16**	0.031 U	0.04	**0.4**	0.12	0.023 J	0.01 U	**0.15**	0.01 U	0.01 U
cPAH TEC[4]	0.1		**0.19**	0.02	**0.39**	**1.08**	0.04	**0.17**	**3.65**	**0.65**	0.06	0.02	**0.93**	0.07	0.03

Notes:

[1] Polycyclic aromatic hydrocarbons (PAHs) are reported in this table. Results for semi-volatile organic compounds (SVOCs) other than PAHs are reported in Table 10.

[2] Proposed soil cleanup levels are referenced from Table 2.

[3] Sample locations are shown in Figure 16.

[4] Calculated using toxic equivalency factor (TEF) methodology relative to benzo(a)pyrene. cPAHs that were not detected were assigned a value of one half of the method reporting limit for these calculations.

U = The analyte was not detected at a concentration greater than the identified reporting limit.

J = The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl = The analyte result in the laboratory control sample was out of control limits. The reported concentration should be considered an estimate.

jr = The RPD result in laboratory control sample associated with the analyte was out of control limits. The reported concentration should be considered an estimate.

ve = The value reported exceeded the calibration range established for the analyte. The reported concentration should be considered an estimate.

NE = not established

-- = not analyzed

mg/kg = milligrams per kilogram

☐ Yellow border indicates that the method reporting limit was greater than the proposed cleanup level.

☐ Red border and bold text indicates that the analyte was detected at a concentration greater than the proposed cleanup level.

Table 9

Summary of Soil Chemical Analytical Results
Polycyclic Aromatic Hydrocarbons (PAHs)[1]

Reliable Steel Site
Olympia, Washington

Analyte	Proposed Soil Cleanup Levels[2]	Location[3]	RI-10	RI-11	RI-12	RI-15		RI-17			RI-18	RI-19		
		Sample ID	RI-10	RI-11	RI-12	RI-15	RI-15	RI-17	RI-17	RI-17	RI-18	RI-19	RI-19	RI-19
		Depth (feet)	0.5	0-1.5	1	0.5	2.5	0.5	3	5	0.5	0.5	3	4
		Date	7/8/10	7/13/10	7/8/10	7/8/10	7/8/10	7/8/10	7/8/10	7/8/10	7/8/10	7/8/10	7/8/10	7/8/10
Non-carcinogenic PAHs (mg/kg)														
2-Methylnaphthalene	320		--	--	--	--	--	--	--	--	--	--	--	--
Acenaphthene	4,800		--	0.2 U	--	--	--	--	--	0.01 U	--	--	--	0.01 U
Acenaphthylene	NE		--	0.2 U	--	--	--	--	--	0.01 U	--	--	--	0.01 U
Anthracene	24,000		--	0.2 U	--	--	--	--	--	0.01 U	--	--	--	0.01 U
Benzo(g,h,i)perylene	NE		--	0.29	--	--	--	--	--	0.01 U	--	--	--	0.01 U
Fluoranthene	3,200		--	0.2 U	--	--	--	--	--	0.01 U	--	--	--	0.01 U
Fluorene	3,200		--	0.2 U	--	--	--	--	--	0.01 U	--	--	--	0.01 U
Naphthalene	5		--	0.2 U	--	--	--	--	--	0.01 U	--	--	--	0.01 U
Phenanthrene	NE		--	0.61	--	--	--	--	--	0.01 U	--	--	--	0.01 U
Pyrene	2,400		--	0.2 U	--	--	--	--	--	0.01 U	--	--	--	0.01 U
Carcinogenic PAHs (mg/kg)														
Benz(a)anthracene	1.4		0.043	0.2 U	0.01 U	0.021	0.27	0.022	0.15	0.01 U	0.31	0.01 U	1.2	0.01 U
Chrysene	140		0.11	0.78	0.02	0.054	0.3	0.028	0.18	0.01 U	0.53	0.01 U	2 ve	0.01 U
Benzo(b)fluoranthene	1.4		0.38	0.23	0.023	0.051	0.29	0.028	0.29	0.01 U	0.71	0.012	**2 ve**	0.01 U
Benzo(k)fluoranthene	14		0.064	0.2 U	0.01 U	0.017	0.11	0.011	0.096	0.01 U	0.21	0.01 U	0.64	0.01 U
Benzo(a)pyrene	0.1		**0.32**	0.2 U	0.015	0.018	**0.28**	0.024	**0.23**	0.01 U	**0.41**	0.01 U	**1.50**	0.01 U
Indeno(1,2,3-cd)pyrene	1.4		0.47	0.2 U	0.015	0.021	0.15	0.015	0.14	0.01 U	0.37	0.01 U	1	0.01 U
Dibenz(a,h)anthracene	0.14		0.093	0.2 U	0.01 U	0.01 U	0.041	0.01 U	0.035	0.01 U	0.1	0.01 U	**0.25**	0.01 U
cPAH TEC[4]	0.1		**0.43**	**0.17**	0.02	0.03	**0.37**	0.03	**0.30**	0.01	**0.59**	0.01	**2.03**	0.01 U

Notes:

[1] Polycyclic aromatic hydrocarbons (PAHs) are reported in this table. Results for semi-volatile organic compounds (SVOCs) other than PAHs are reported in Table 10.

[2] Proposed soil cleanup levels are referenced from Table 2.

[3] Sample locations are shown in Figure 16.

[4] Calculated using toxic equivalency factor (TEF) methodology relative to benzo(a)pyrene. cPAHs that were not detected were assigned a value of one half of the method reporting limit for these calculations.

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J = The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl = The analyte result in the laboratory control sample was out of control limits. The reported concentration should be considered an estimate.

jr = The RPD result in laboratory control sample associated with the analyte was out of control limits. The reported concentration should be considered an estimate.

ve = The value reported exceeded the calibration range established for the analyte. The reported concentration should be considered an estimate.

NE = not established

-- = not analyzed

mg/kg = milligrams per kilogram

☐ Yellow border indicates that the method reporting limit was greater than the proposed cleanup level.

☐ Red border and bold text indicates that the analyte was detected at a concentration greater than the proposed cleanup level.

Table 9

Summary of Soil Chemical Analytical Results

Polycyclic Aromatic Hydrocarbons (PAHs)[1]

Reliable Steel Site
Olympia, Washington

Analyte	Proposed Soil Cleanup Levels[2]	Location[3]	RI-20		RI-21	RI-22			RI-23		RI-24		RI-25		RI-26		RI-27	
		Sample ID	RI-20	RI-20	RI-21	RI-22	RI-22	RI-22	RI-23	RI-23	RI-24	RI-24	RI-25	RI-25	RI-26	RI-26	RI-27	RI-27
		Depth (feet)	0.5	1.5-2.5	0.5	0.5	2	3	0.5	2.5	0.5	2.5	1	3	0.5	2.5	0-0.5	2.5-3.5
		Date	7/13/10	7/13/10	7/8/10	7/8/10	7/8/10	7/8/10	7/8/10	7/8/10	7/8/10	7/8/10	7/8/10	7/8/10	7/8/10	7/8/10	7/13/10	7/13/10
Non-carcinogenic PAHs (mg/kg)																		
2-Methylnaphthalene	320		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Acenaphthene	4,800		0.011	0.13	--	--	--	0.01 U	--	0.6	--	--	--	0.1 U	--	--	0.01 U	0.01 U
Acenaphthylene	NE		0.01 U	0.1 U	--	--	--	0.01 U	--	0.48	--	--	--	0.1 U	--	--	0.01 U	0.01 U
Anthracene	24,000		0.029	0.55	--	--	--	0.01 U	--	0.42	--	--	--	0.21	--	--	0.01 U	0.01 U
Benzo(g,h,i)perylene	NE		0.16	0.37	--	--	--	0.01 U	--	0.63	--	--	--	0.74	--	--	0.023	0.054
Fluoranthene	3,200		0.48	1.7	--	--	--	0.033	--	0.55	--	--	--	1.8	--	--	0.057	0.12
Fluorene	3,200		0.01 U	0.16	--	--	--	0.01 U	--	0.48	--	--	--	0.1 U	--	--	0.01 U	0.01 U
Naphthalene	5		0.01 U	0.22	--	--	--	0.01 U	--	1.3	--	--	--	0.1 U	--	--	0.01 U	0.01 U
Phenanthrene	NE		0.17	1.5	--	--	--	0.01 U	--	0.96	--	--	--	0.59	--	--	0.056	0.045
Pyrene	2,400		0.41	1.5	--	--	--	0.029	--	0.42	--	--	--	1.5	--	--	0.054	0.14
Carcinogenic PAHs (mg/kg)																		
Benz(a)anthracene	1.4		0.18	0.65	0.01 U	0.43	1.2	0.017	0.26	0.18	0.15	0.015	0.21	1	0.33	0.01 U	0.026	0.052
Chrysene	140		0.33	0.93	0.015	0.58	1.5	0.016	0.36	0.28	0.2	0.02	0.28	1.2	0.47	0.01 U	0.04	0.11
Benzo(b)fluoranthene	1.4		0.37	0.82	0.018	0.65	**1.6**	0.019	0.48	0.4	0.23	0.023	0.31	**1.6**	0.55	0.01 U	0.047	0.11
Benzo(k)fluoranthene	14		0.12	0.3	0.01 U	0.23	0.52	0.01 U	0.18	0.09	0.084	0.01 U	0.11	0.47	0.21	0.01 U	0.013	0.031
Benzo(a)pyrene	0.1		**0.20**	**0.62**	0.01 U	**0.47**	**1.20**	0.012	**0.36**	**0.19**	**0.16**	0.015	**0.23**	**1.10**	**0.42**	0.01 U	0.029	0.063
Indeno(1,2,3-cd)pyrene	1.4		0.17	0.37	0.01 U	0.33	0.74	0.01 U	0.28	0.36	0.12	0.013	0.18	0.86	0.34	0.01 U	0.023	0.05
Dibenz(a,h)anthracene	0.14		0.039	0.1 U	0.01 U	0.08	**0.18**	0.01 U	0.067	0.064	0.033	0.01 U	0.044	**0.22**	0.087	0.01 U	0.01 U	0.011
cPAH TEC[4]	0.1		**0.29**	**0.85**	0.01	**0.65**	**1.64**	0.02	**0.49**	**0.30**	**0.22**	0.02	**0.32**	**1.53**	**0.58**	0.01 U	0.04	0.09

Notes:

[1] Polycyclic aromatic hydrocarbons (PAHs) are reported in this table. Results for semi-volatile organic compounds (SVOCs) other than PAHs are reported in Table 10.

[2] Proposed soil cleanup levels are referenced from Table 2.

[3] Sample locations are shown in Figure 16.

[4] Calculated using toxic equivalency factor (TEF) methodology relative to benzo(a)pyrene. cPAHs that were not detected were assigned a value of one half of the method reporting limit for these calculations.

U = The analyte was not detected at a concentration greater than the identified reporting limit.

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jr = The RPD result in laboratory control sample associated with the analyte was out of control limits. The reported concentration should be considered an estimate.

ve = The value reported exceeded the calibration range established for the analyte. The reported concentration should be considered an estimate.

NE = not established

-- = not analyzed

mg/kg = milligrams per kilogram

☐ Yellow border indicates that the method reporting limit was greater than the proposed cleanup level.

☐ Red border and bold text indicates that the analyte was detected at a concentration greater than the proposed cleanup level.

Table 9

Summary of Soil Chemical Analytical Results
Polycyclic Aromatic Hydrocarbons (PAHs)[1]

Reliable Steel Site
Olympia, Washington

Analyte	Proposed Soil Cleanup Levels[2]	Location[3]	RI-28		RI-29		RI-30		RI-31	RGB1	RGB2		RGB3		RGB4			
		Sample ID	RI-28	RI-28	RI-29	RI-29	RI-30	RI-30	RI-31	RGB1-S	RGB2-S	RGB2-3.5	RGB3-S	RGB3-4	RGB4-S	RGB4-1	RGB4-1.5	RGB4-4
		Depth (feet)	0.5	3.5	0.5	4	0.5	4	2.5-3.5	Surface	Surface	3.5	Surface	4	Surface	1	1.5	4
		Date	7/8/10	7/8/10	7/8/10	7/8/10	7/8/10	7/8/10	7/13/10	2/8/08	2/8/08	2/8/08	2/8/08	2/8/08	2/8/08	3/4/08	3/4/08	2/8/08
Non-carcinogenic PAHs (mg/kg)																		
2-Methylnaphthalene	320		--	--	--	--	--	--	--	0.03 U	0.03 U	0.03 U	0.031	0.03 U	0.3 U	0.3 U	0.3 U	0.03 U
Acenaphthene	4,800		--	--	--	--	--	--	0.01 U	0.03 U	0.03 U	0.03 U	0.083	0.03 U	2.2	0.3 U	0.3 U	0.03 U
Acenaphthylene	NE		--	--	--	--	--	--	0.01 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	1.7	0.45	0.3 U	0.03 U
Anthracene	24,000		--	--	--	--	--	--	0.01 U	0.03 U	0.04	0.03 U	0.18	0.03 U	3.1	1.4	0.3 U	0.03 U
Benzo(g,h,i)perylene	NE		--	--	--	--	--	--	0.01 U	0.035	0.099	0.03 U	0.27	0.03 U	2.8	2.6	0.85	0.03 U
Fluoranthene	3,200		--	--	--	--	--	--	0.01 U	0.14	0.33	0.03 U	1.3	0.03 U	74 ve	8.9	2.2	0.03 U
Fluorene	3,200		--	--	--	--	--	--	0.01 U	0.03 U	0.03 U	0.03 U	0.083	0.03 U	2	0.3 U	0.3 U	0.03 U
Naphthalene	5		--	--	--	--	--	--	0.01 U	0.031	0.03 U	0.03 U	0.071	0.03 U	0.3 U	0.3 U	0.3 U	0.03 U
Phenanthrene	NE		--	--	--	--	--	--	0.01 U	0.065	0.23	0.03 U	0.82	0.03 U	34	3.6	0.88	0.03 U
Pyrene	2,400		--	--	--	--	--	--	0.01 U	0.081	0.24	0.03 U	1	0.03 U	49	11	2.2	0.03 U
Carcinogenic PAHs (mg/kg)																		
Benz(a)anthracene	1.4		0.34	0.01 U	0.19	0.077	0.015	0.05	0.01 U	0.057	0.12	0.03 U	0.53	0.03 U	**5.80**	**1.90**	0.94	0.03 U
Chrysene	140		0.49	0.01 U	0.25	0.11	0.02	0.086	0.01 U	0.048	0.17	0.03 U	0.6	0.03 U	18	6	1.4	0.03 U
Benzo(b)fluoranthene	1.4		0.58	0.01 U	0.35	0.15	0.025	0.078	0.01 U	0.079 jr	0.18 jr	0.03 U	0.57 jr	0.03 U	**12 jr**	**4.6**	1.4	0.03 U
Benzo(k)fluoranthene	14		0.17	0.01 U	0.12	0.046	0.01 U	0.028	0.01 U	0.03 U	0.078 jl	0.03 U	0.25 jl	0.03 U	5 jl	1.2	0.55	0.03 U
Benzo(a)pyrene	0.1		**0.39**	0.01 U	**0.26**	**0.11**	0.018	0.049	0.01 U	0.036	**0.14**	0.03 U	**0.49**	0.03 U	**4.4**	**2.4**	**1.1**	0.03 U
Indeno(1,2,3-cd)pyrene	1.4		0.28	0.01 U	0.2	0.083	0.014	0.03	0.01 U	0.032	0.095	0.03 U	0.28	0.03 U	**3.1**	**2.2**	0.85	0.03 U
Dibenz(a,h)anthracene	0.14		0.097	0.01 U	0.046	0.02	0.01 U	0.01	0.01 U	0.03 U	0.033	0.03 U	0.09	0.03 U	1.5 U	0.4	0.3 U	0.03 U
cPAH TEC[4]	0.1		**0.54**	0.01 U	**0.35**	**0.15**	0.02	0.07	0.01 U	0.053	**0.19**	0.03 U	**0.67**	0.03 U	**7.17**	**3.49**	**1.49**	0.03 U

Notes:

[1] Polycyclic aromatic hydrocarbons (PAHs) are reported in this table. Results for semi-volatile organic compounds (SVOCs) other than PAHs are reported in Table 10.

[2] Proposed soil cleanup levels are referenced from Table 2.

[3] Sample locations are shown in Figure 16.

[4] Calculated using toxic equivalency factor (TEF) methodology relative to benzo(a)pyrene. cPAHs that were not detected were assigned a value of one half of the method reporting limit for these calculations.

U = The analyte was not detected at a concentration greater than the identified reporting limit.

J = The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl = The analyte result in the laboratory control sample was out of control limits. The reported concentration should be considered an estimate.

jr = The RPD result in laboratory control sample associated with the analyte was out of control limits. The reported concentration should be considered an estimate.

ve = The value reported exceeded the calibration range established for the analyte. The reported concentration should be considered an estimate.

NE = not established

-- = not analyzed

mg/kg = milligrams per kilogram

🟨 Yellow border indicates that the method reporting limit was greater than the proposed cleanup level.

🟥 Red border and bold text indicates that the analyte was detected at a concentration greater than the proposed cleanup level.

Table 9

Summary of Soil Chemical Analytical Results

Polycyclic Aromatic Hydrocarbons (PAHs)[1]

Reliable Steel Site
Olympia, Washington

Analyte	Proposed Soil Cleanup Levels[2]	Location[3]	RGB5	RGB7	RGB16	RGB17	RGB18		RGB19	PS Grit	MW9		Ditch1		Ditch2		GP-1		
		Sample ID	RGB5-5-6	RGB7-6-7	RGB16-6	RGB17-5	RGB18-5	RGB18-10	RGB19-12	PS Grit	MW9-S	MW9-4	Ditch1-S	Ditch1-2.5	Ditch2-S	Ditch2-2.5	GP-1 (2-2.5)	GP (4-4.5)	GP-1 (6-6.5)
		Depth (feet)	5-6	6-7	6	5	5	10	12	Surface	Surface	4	Surface	2.5	Surface	2.5	2-2.5	4-4.5	6-6.5
		Date	2/8/08	2/8/08	2/11/08	2/11/08	2/11/08	2/11/08	2/11/08	2/8/08	2/8/08	2/8/08	2/11/08	2/11/08	2/11/08	2/11/08	8/25/2010	8/25/2010	8/25/2010
Non-carcinogenic PAHs (mg/kg)																			
2-Methylnaphthalene	320		--	--	0.3 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.0111	0.0178 U	0.0451 U
Acenaphthene	4,800		0.1 U	0.92	0.46	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	2.3	0.0087 U	0.0178 U	0.0451 U
Acenaphthylene	NE		0.1 U	0.1 U	0.3 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	1.5 U	0.0087 U	0.0178 U	0.0451 U
Anthracene	24,000		0.1 U	0.1 U	0.3 U	0.03 U	0.034	0.03 U	0.03 U	0.03 U	0.3 U	0.3 U	0.3 U	0.7	0.38	1.5 U	0.0087 U	0.0178 U	0.0451 U
Benzo(g,h,i)perylene	NE		0.1 U	0.1 U	0.3 U	0.03 U	0.099 J	0.03 U	0.03 U	0.03 U	0.88	0.31	0.59	1.1	0.47	1.5 U	0.0087 U	0.0178 U	0.0451 U
Fluoranthene	3,200		0.1 U	0.1 U	0.3 U	0.03 U	0.32	0.03 U	0.03 U	0.074	3.2	1.4	1.4	4	1.3	1.5 U	0.0087 U	0.0237	0.0540
Fluorene	3,200		0.1 U	3.3	0.3 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.0087 U	0.0178 U	0.0451 U
Naphthalene	5		0.1 U	0.1 U	0.3 U	0.03 U	0.03 U	0.03 U	0.03 U	0.49	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.0242	0.0267	0.0677
Phenanthrene	NE		0.1 U	4.5	0.3 U	0.03 U	0.14	0.03 U	0.03 U	0.049	1.6	0.45	0.86	2.1	1.9	0.3 U	0.0114	0.0302	0.0451 U
Pyrene	2,400		0.1 U	0.12	0.3 U	0.03 U	0.33	0.03 U	0.03 U	0.05	2.2	1.4	1.1	3.3	1.2	2.3	0.0087 U	0.0178 U	0.0625
Carcinogenic PAHs (mg/kg)																			
Benz(a)anthracene	1.4		0.1 U	0.1 U	0.3 U	0.03 U	0.13	0.03 U	0.03 U	0.03 U	1.2	0.7	0.6	**1.60**	0.53	1.5 U	0.0087 U	0.0178 U	0.0451 U
Chrysene	140		0.1 U	0.1 U	0.3 U	0.03 U	0.19	0.03 U	0.03 U	0.033	1.6	0.82	0.69	1.8	0.74	1.5 U	0.0087 U	0.0178 U	0.0451 U
Benzo(b)fluoranthene	1.4		0.1 U	0.1 U	0.3 U	0.03 U	0.19 jr J	0.03 U	0.03 U	0.03 U	**1.7 jr**	0.64	0.64 jr	**1.8 jr**	0.68 jr	1.5 U	0.0087 U	0.0178 U	0.0451 U
Benzo(k)fluoranthene	14		0.1 U	0.1 U	0.3 U	0.03 U	0.064 jl J	0.03 U	0.03 U	0.03 U	0.74 jl	0.33 ca	0.35 jl	0.88 jl	0.3 U	0.3 U	0.0087 U	0.0178 U	0.0451 U
Benzo(a)pyrene	0.1		0.1 U	0.1 U	0.3 U	0.03 U	**0.17 J**	0.03 U	0.03 U	0.03 U	**1.20**	**0.67**	**0.66**	**1.80**	**0.55**	1.5 U	0.0087 U	0.0178 U	0.0451 U
Indeno(1,2,3-cd)pyrene	1.4		0.1 U	0.1 U	0.3 U	0.03 U	0.091 J	0.03 U	0.03 U	0.03 U	0.92	0.33	0.46	1.1	0.39	0.3 U	0.0087 U	0.0178 U	0.0451 U
Dibenz(a,h)anthracene	0.14		0.1 U	0.1 U	0.3 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	**0.32**	0.3 U	0.3 U	0.34	0.3 U	0.3 U	0.0087 U	0.0178 U	0.0451 U
cPAH TEC[4]	0.1		0.1 U	0.1 U	0.3 U	0.03 U	**0.22**	0.03 U	0.03 U	0.0003	**1.70**	**0.88**	**0.87**	**2.39**	**0.72**	1.5 U	0.0044	0.0089	0.0226

Notes:

[1] Polycyclic aromatic hydrocarbons (PAHs) are reported in this table. Results for semi-volatile organic compounds (SVOCs) other than PAHs are reported in Table 10.

[2] Proposed soil cleanup levels are referenced from Table 2.

[3] Sample locations are shown in Figure 16.

[4] Calculated using toxic equivalency factor (TEF) methodology relative to benzo(a)pyrene. cPAHs that were not detected were assigned a value of one half of the method reporting limit for these calculations.

U = The analyte was not detected at a concentration greater than the identified reporting limit.

J = The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl = The analyte result in the laboratory control sample was out of control limits. The reported concentration should be considered an estimate.

jr = The RPD result in laboratory control sample associated with the analyte was out of control limits. The reported concentration should be considered an estimate.

ve = The value reported exceeded the calibration range established for the analyte. The reported concentration should be considered an estimate.

NE = not established

-- = not analyzed

mg/kg = milligrams per kilogram

🟨 Yellow border indicates that the method reporting limit was greater than the proposed cleanup level.

🟥 Red border and bold text indicates that the analyte was detected at a concentration greater than the proposed cleanup level.

Table 10

Summary of Soil Chemical Analytical Data

Phthalates and Other Semi-volatile Organic Compounds (SVOCs)[1]

Reliable Steel Site

Olympia, Washington

Analyte	Proposed Soil Cleanup Levels[2]	Location[3]	EC-4		EC-5	EC-6		EC-7	EC-9		EC-10	RGB1	RGB2		RGB3		RGB4			
		Sample ID	EC-4	EC-4	EC-5	EC-6	EC-6	EC-7	EC-9	EC-9	EC-10	RGB1-S	RGB2-S	RGB2-3.5	RGB3-S	RGB3-4	RGB4-S	RGB4-1	RGB4-1.5	RGB4-4
		Depth (feet)	0-1	3-4	0-0.5	0-1	2-3	2-3	0-1	2-2.6	0-0.5	Surface	Surface	3.5	Surface	4	Surface	1	1.5	4
		Date	4/10/2013	4/10/2013	4/10/2013	4/10/2013	4/10/2013	4/10/2013	4/10/2013	4/10/2013	4/10/2013	2/8/08	2/8/08	2/8/08	2/8/08	2/8/08	2/8/08	3/4/08	3/4/08	2/8/08
SVOCs (mg/kg)																				
1,2,4-Trichlorobenzene	35		0.059 U	0.035 U	0.027 U	0.15 U	0.031 U	0.032 U	0.056 U	0.012 U	0.028 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.3 U	0.3 U	0.3 U	0.03 U
1,2-Dichlorobenzene	72,000		0.12 U	0.069 U	0.054 U	0.3 U	0.063 U	0.064 U	0.11 U	0.023 U	0.056 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.3 U	0.3 U	0.3 U	0.03 U
1,3-Dichlorobenzene	NE		0.12 U	0.069 U	0.054 U	0.3 U	0.063 U	0.064 U	0.11 U	0.023 U	0.056 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.3 U	0.3 U	0.3 U	0.03 U
1,4-Dichlorobenzene	NE		0.12 U	0.069 U	0.054 U	0.3 U	0.063 U	0.064 U	0.11 U	0.023 U	0.056 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.3 U	0.3 U	0.3 U	0.03 U
2,4,5-Trichlorophenol	8,000		0.12 U	0.069 U	0.054 U	0.3 U	0.063 U	0.064 U	0.11 U	0.023 U	0.056 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	3 U	3 U	3 U	0.3 U
2,4,6-Trichlorophenol	81		0.12 U	0.069 U	0.054 U	0.3 U	0.063 U	0.064 U	0.11 U	0.023 U	0.056 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	3 U	3 U	3 U	0.3 U
2,4-Dichlorophenol	240		0.3 U	0.17 U	0.14 U	0.75 U	0.16 U	0.16 U	0.28 U	0.58 U	0.14 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	3 U	3 U	3 U	0.3 U
2,4-Dimethylphenol	1,600		0.3 U	0.17 U	0.14 U	0.75 U	0.16 U	0.16 U	0.28 U	0.58 U	0.14 UJ	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	3 U	3 U	3 U	0.3 U
2,4-Dinitrophenol	160		REJ	REJ	REJ	REJ	REJ	REJ	REJ	REJ	0.14 UJ	0.9 U	0.9 U	0.9 U	0.9 U	0.9 U	9 U	9 U	9 U	0.9 U
2,4-Dinitrotoluene	160		0.12 U	0.069 U	0.054 U	0.3 U	0.063 U	0.064 U	0.11 U	0.23 U	0.056 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.3 U	0.3 U	0.3 U	0.03 U
2,6-Dinitrotoluene	81		0.12 U	0.069 U	0.054 U	0.3 U	0.063 U	0.064 U	0.11 U	0.12 U	0.056 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.3 U	0.3 U	0.3 U	0.03 U
2-Chloronaphthalene	6,400		0.059 U	0.035 U	0.027 U	0.15 U	0.031 U	0.032 U	0.056 U	0.23 U	0.028 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.3 U	0.3 U	0.3 U	0.03 U
2-Chlorophenol	400		0.12 U	0.069 U	0.054 U	0.3 U	0.063 U	0.064 U	0.11 U	0.23 U	0.056 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	3 U	3 U	3 U	0.3 U
2-Methylphenol	4,000		0.3 U	0.17 U	0.14 U	0.75 U	0.16 U	0.16 U	0.28 U	0.58 U	0.14 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	3 U	3 U	3 U	0.3 U
2-Nitroaniline	800		0.59 U	0.35 U	0.27 U	1.5 U	0.31 U	0.32 U	0.56 U	1.2 U	0.28 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.3 U	0.3 U	0.3 U	0.03 U
2-Nitrophenol	NE		0.059 U	0.035 U	0.027 U	0.15 U	0.031 U	0.032 U	0.056 U	0.12 U	0.028 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	3 U	3 U	3 U	0.3 U
3-Nitroaniline	NE		0.59 UJ	0.35 UJ	0.27 UJ	1.5 U	0.31 UJ	0.32 UJ	0.56 UJ	1.2 UJ	0.28 UJ	0.9 U	0.9 U	0.9 U	0.9 U	0.9 U	9 U	9 U	9 U	0.9 U
4,6-Dinitro-2-methylphenol	NE		0.12 UJ	0.069 UJ	0.054 UJ	0.3 U	0.063 UJ	0.064 UJ	0.11 UJ	0.23 UJ	0.056 UJ	0.9 U	0.9 U	0.9 U	0.9 U	0.9 U	9 U	9 U	9 U	0.9 U
4-Bromophenyl phenyl ether	NE		0.059 U	0.035 U	0.027 U	0.15 U	0.031 U	0.032 U	0.056 U	0.12 U	0.028 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.3 U	0.3 U	0.3 U	0.03 U
4-Chloro-3-methylphenol	NE		0.3 U	0.17 U	0.14 U	0.75 U	0.16 U	0.16 U	0.28 U	0.58 U	0.14 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	3 U	3 U	3 U	0.3 U
4-Chloroaniline	5		1.2 U	0.69 UJ	0.54 U	REJ	0.63 U	640 U	REJ	REJ	0.56 U	3 U	3 U	3 U	3 U	3 U	30 U	30 U	30 U	3 U
4-Chlorophenyl phenyl ether	NE		0.03 U	0.17 U	0.014 U	0.075 U	0.016 U	0.016 U	0.028 U	0.058 U	0.014 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.3 U	0.3 U	0.3 U	0.03 U
4-Methylphenol	400		0.3 U	0.17 U	0.14 U	0.75 U	0.16 U	0.16 U	0.064 J	0.58 U	0.14 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	3 U	3 U	3 U	0.3 U
4-Nitroaniline	NE		0.12 U	0.069 U	0.054 U	0.3 U	0.063 U	0.064 U	0.11 U	0.23 U	0.056 U	0.9 U	0.9 U	0.9 U	0.9 U	0.9 U	9 U	9 U	9 U	0.9 U
Benzoic acid	320,000		0.59 UJ	0.35 UJ	0.27 UJ	1.5 UJ	0.31 UJ	0.32 UJ	0.56 UJ	1.2 UJ	0.28 UJ	3 U	3 U	3 U	3 U	3 U	30 U	30 U	30 U	3 U
Benzyl alcohol	8,000		0.3 UJ	0.17 UJ	0.14 UJ	0.75 UJ	0.16 UJ	0.16 UJ	0.28 UJ	0.58 UJ	0.14 UJ	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.3 U	0.3 U	0.3 U	0.03 U
Benzyl butyl phthalate	530		0.059 U	0.035 U	0.027 U	0.15 U	0.031 U	0.032 U	0.18	0.12 U	0.028 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.3 U	0.3 U	0.3 U	0.03 U
Bis(2-chloroethoxy)methane	NE		0.3 U	0.017 U	0.014 U	0.075 U	0.016 U	0.016 U	0.028 U	0.058 U	0.014 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.3 U	0.3 U	0.3 U	0.03 U
Bis(2-chloroethyl) ether	0.91		0.059 U	0.035 U	0.027 U	0.075 U	0.031 U	0.032 U	0.056 U	0.12 U	0.028 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.3 U	0.3 U	0.3 U	0.03 U
Bis(2-chloroisopropyl) ether	NE		0.03 U	0.017 U	0.014 U	0.075 U	0.016 U	0.016 U	0.028 U	0.058 U	0.014 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.3 U	0.3 U	0.3 U	0.03 U
Bis(2-ethylhexyl) phthalate	71		0.059 U	0.035 U	0.17	0.47 U	0.042	0.12	6.4	0.55	0.059	0.3 U	0.3 U	0.3 U	0.46	0.3 U	15 U	3 U	3 U	0.3 U
Carbazole	NE		0.059 UJ	0.035 UJ	0.02 J	0.35 J	0.0082 J	0.047 J	2 J	0.19 J	0.015 J	0.06 U	0.06 U	0.06 U	0.12	0.06 U	7.1	1.1	0.6 U	0.06 U
Dibenzofuran	81		0.059 U	0.035 U	0.027 U	0.043 J	0.031 U	0.032 U	0.6	0.053 J	0.028 U	0.03 U	0.03 U	0.03 U	0.048	0.03 U	1.5 U	0.3 U	0.3 U	0.03 U
Diethyl phthalate	64,000		0.03 U	0.017 U	0.014 U	0.075 U	0.016 U	0.016 U	0.028 U	0.058 U	0.014 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.3 U	0.3 U	0.3 U	0.03 U
Dimethyl phthalate	NE		0.03 U	0.017 U	0.014 U	0.075 U	0.016 U	0.016 U	0.028 U	0.058 U	0.014 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.3 U	0.3 U	0.3 U	0.03 U
Di-n-butyl phthalate	8,000		0.032 U	0.02 U	0.015 U	0.19 U	0.02 U	0.029 U	0.083 U	0.087 U	0.02 U	0.067	0.051	0.03 U	0.03 U	0.03 U	0.3 U	0.3 U	0.3 U	0.03 U
Di-n-octyl phthalate	NE		0.3 UJ	0.17 U	0.14 U	0.75 U	0.16 U	0.16 U	0.28 U	0.58 U	0.14 U	0.03 U	0.03 U	0.03 U	0.26	0.03 U	0.3 U	0.3 U	0.3 U	0.03 U
Hexachlorobenzene	0.63		0.03 U	0.017 U	0.014 U	0.075 U	0.016 U	0.016 U	0.028 U	0.058 U	0.014 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.3 U	0.3 U	0.3 U	0.03 U
Hexachlorobutadiene	13		0.12 U	0.069 U	0.054 U	0.3 UJ	0.063 U	0.064 U	0.11 U	0.23 UJ	0.056 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.3 U	0.3 U	0.3 U	0.03 U
Hexachlorocyclopentadiene	480		0.12 U	0.069 U	0.054 U	0.3 U	0.063 U	0.064 U	0.11 U	0.23 U	0.056 UJ	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	0.9 U	0.9 U	0.9 U	0.09 U
Hexachloroethane	71		0.03 U	0.017 U	0.014 U	0.075 U	0.016 U	0.016 U	0.028 U	0.058 U	0.014 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.3 U	0.3 U	0.3 U	0.03 U
Isophorone	1,100		0.059 U	0.035 U	0.027 U	0.15 U	0.031 U	0.032 U	0.056 U	0.12 U	0.028 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.3 U	0.3 U	0.3 U	0.03 U
Nitrobenzene	160		0.03 U	0.017 U	0.014 U	0.075 U	0.016 U	0.016 U	0.028 U	0.058 U	0.014 UJ	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.3 U	0.3 U	0.3 U	0.03 U
N-Nitroso-di-n-propylamine	0.14		0.03 UJ	0.017 UJ	0.014 UJ	0.075 UJ	0.016 UJ	0.016 U	0.028 UJ	0.058 UJ	0.014 UJ	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.3 U	0.3 U	0.3 U	0.03 U
N-Nitrosodiphenylamine	200		0.059 U	0.035 U	0.027 U	0.15 U	0.031 U	0.032 U	0.056 U	0.12 U	0.028 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.6 U	0.6 U	0.6 U	0.06 U
Pentachlorophenol	2.5		0.3 U	0.17 U	0.14 U	0.53 J	0.16 U	0.062 J	0.28 U	0.58 U	0.14 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	3 U	4.2	3 U	0.3 U
Phenol	24,000		0.12 U	0.069 UJ	0.054 U	REJ	0.063 U	0.064 U	REJ	REJ	0.056 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	3 U	3 U	3 U	0.3 U

Notes:

[1] Semi-volatile organic compounds (SVOCs) excluding polycyclic aromatic hydrocarbons (PAHs) are reported in this table. Results for PAHs are reported in Table 9.

[2] Proposed soil cleanup levels are referenced from Table 2.

[3] Sample locations are shown in Figure 17.

☐ Yellow border indicates that the method reporting limit was greater than the proposed cleanup level.

☐ Red border and bold text indicates that the analyte was detected at a concentration greater than the proposed cleanup level.

REJ = Results rejected based on analytical quality control.

U = The analyte was not detected at a concentration greater than the identified reporting limit.

NE = Cleanup criteria not established

mg/kg = milligrams per kilogram

Table 10

Summary of Soil Chemical Analytical Data

Semi-volatile Organic Compounds (SVOCs)[1]

Reliable Steel Site

Olympia, Washington

Analyte	Proposed Soil Cleanup Levels[2]	Location[3]	RGB16	RGB17	RGB1	RGB18		RGB19	PS Grit	MW9		Ditch1		Ditch2	
		Sample ID	RGB16-6	RGB17-5	RGB1-S	RGB18-5	RGB18-10	RGB19-12	PS Grit	MW9-S	MW9-4	Ditch1-S	Ditch1-2.5	Ditch2-S	Ditch2-2.5
		Depth (feet)	6	5	Surface	5	10	12	Surface	Surface	4	Surface	2.5	Surface	2.5
		Date	2/11/08	2/11/08	2/8/08	2/11/08	2/11/08	2/11/08	2/8/08	2/8/08	2/8/08	2/11/08	2/11/08	2/11/08	2/11/08
SVOCs (mg/kg)															
1,2,4-Trichlorobenzene	35		0.3 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
1,2-Dichlorobenzene	72,000		0.3 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
1,3-Dichlorobenzene	NE		0.3 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
1,4-Dichlorobenzene	NE		0.3 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
2,4,5-Trichlorophenol	8,000		3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	3 U	3 U	3 U	3 U	3 U	3 U
2,4,6-Trichlorophenol	81		3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	3 U	3 U	3 U	3 U	3 U	3 U
2,4-Dichlorophenol	240		3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	3 U	3 U	3 U	3 U	3 U	3 U
2,4-Dimethylphenol	1,600		3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	3 U	3 U	3 U	3 U	3 U	3 U
2,4-Dinitrophenol	160		9 U	0.9 U	0.9 U	0.9 U	0.9 U	0.9 U	0.9 U	9 U	9 U	9 U	9 U	9 U	9 U
2,4-Dinitrotoluene	160		0.3 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
2,6-Dinitrotoluene	81		0.3 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
2-Chloronaphthalene	6,400		0.3 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
2-Chlorophenol	400		3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	3 U	3 U	3 U	3 U	3 U	3 U
2-Methylphenol	4,000		3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	3 U	3 U	3 U	3 U	3 U	3 U
2-Nitroaniline	800		0.3 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
2-Nitrophenol	NE		3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	3 U	3 U	3 U	3 U	3 U	3 U
3-Nitroaniline	NE		9 U	0.9 U	0.9 U	0.9 U	0.9 U	0.9 U	0.9 U	9 U	9 U	9 U	9 U	9 U	9 U
4,6-Dinitro-2-methylphenol	NE		9 U	0.9 U	0.9 U	0.9 U	0.9 U	0.9 U	0.9 U	9 U	9 U	9 U	9 U	9 U	9 U
4-Bromophenyl phenyl ether	NE		0.3 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
4-Chloro-3-methylphenol	NE		3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	3 U	3 U	3 U	3 U	3 U	3 U
4-Chloroaniline	5		30 U	3 U	3 U	3 U	3 U	3 U	3 U	30 U	30 U	30 U	30 U	30 U	30 U
4-Chlorophenyl phenyl ether	NE		0.3 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
4-Methylphenol	400		3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	3 U	3 U	3 U	3 U	3 U	3 U
4-Nitroaniline	NE		9 U	0.9 U	0.9 U	0.9 U	0.9 U	0.9 U	0.9 U	9 U	9 U	9 U	9 U	9 U	9 U
Benzoic acid	320,000		30 U	3 U	3 U	3 U	3 U	3 U	3 U	30 U	30 U	30 U	30 U	30 U	30 U
Benzyl alcohol	8,000		0.3 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Benzyl butyl phthalate	530		0.3 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.29	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Bis(2-chloroethoxy)methane	NE		0.3 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Bis(2-chloroethyl) ether	0.91		0.3 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Bis(2-chloroisopropyl) ether	NE		0.3 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Bis(2-ethylhexyl) phthalate	71		0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	8.9	0.3 U	0.79	5.2	1.3	0.3 U
Carbazole	NE		0.6 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U
Dibenzofuran	81		0.3 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Diethyl phthalate	64,000		0.3 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Dimethyl phthalate	NE		0.3 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Di-n-butyl phthalate	8,000		0.3 U	0.03 U	0.067	0.03 U	0.03 U	0.03 U	0.04	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Di-n-octyl phthalate	NE		0.3 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.3	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Hexachlorobenzene	0.63		0.3 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Hexachlorobutadiene	13		0.3 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Hexachlorocyclopentadiene	480		0.9 U	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	0.09 U	0.9 U	0.9 U	0.9 U	0.9 U	0.9 U	0.9 U
Hexachloroethane	71		0.3 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Isophorone	1,100		0.3 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Nitrobenzene	160		0.3 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
N-Nitroso-di-n-propylamine	0.14		0.3 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
N-Nitrosodiphenylamine	200		0.6 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U
Pentachlorophenol	2.5		3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	3 U	3 U	3 U	3 U	3 U	3 U
Phenol	24,000		3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	3 U	3 U	3 U	3 U	3 U	3 U

Notes:

[1] Semi-volatile organic compounds (SVOCs) excluding polycyclic aromatic hydrocarbons (PAHs) are reported in this table. Results for PAHs are reported in Table 9.

[2] Proposed soil cleanup levels are referenced from Table 2.

[3] Sample locations are shown in Figure 17.

☐ Yellow border indicates that the method reporting limit was greater than the proposed cleanup level.

☐ Red border and bold text indicates that the analyte was detected at a concentration greater than the proposed cleanup level.

U = The analyte was not detected at a concentration greater than the identified reporting limit.

NE = Cleanup criteria not established

mg/kg = milligrams per kilogram

Table 11

Summary of Soil Chemical Analytical Results
Volatile Organic Compounds (VOCs)[1]

Reliable Steel Site
Olympia, Washington

	Proposed Soil Cleanup Levels[2]	Location[3]	EC-1	S-13	S-18	RGB1	RGB3	RGB10			RGB11	RGB12	RGB13	RGB18	RGB19	MW8	Ditch1		Ditch2	
		Sample ID	EC-1(0-0.4)	S-13	S-18	RGB1-S	RGB3-S	RGB10-S	RGB10-5	RGB10-11	RGB11-5	RGB12-4	RGB13-4	RGB18-5	RGB19-12	MW8-5	Ditch1-S	Ditch1-2.5	Ditch2-S	Ditch2-2.5
		Depth (feet)	0-0.4	6	Surface	Surface	Surface	Surface	5	11	5	4	4	5	12	5	Surface	2.5	Surface	2.5
Analyte		Date	4/10/13	10/15/05	10/15/05	2/8/08	2/8/08	2/11/08	2/11/08	2/11/08	2/11/08	2/11/08	2/11/08	2/11/08	2/11/08	2/8/08	2/11/08	2/11/08	2/11/08	2/11/08
VOCs (mg/kg)																				
1,1,1,2-Tetrachloroethane	38		0.001 UJ	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
1,1,1-Trichloroethane	2		0.001 UJ	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
1,1,2,2-Tetrachloroethane	5		0.001 UJ	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
1,1,2-Trichloroethane	18		0.001 UJ	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
1,1-Dichloroethane	16,000		0.001 UJ	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
1,1-Dichloroethene	4,000		0.001 UJ	--	--	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
1,1-Dichloropropene	NE		0.001 UJ	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
1,2,3-Trichlorobenzene	NE		0.001 UJ	0.05 U	0.05 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
1,2,3-Trichloropropane	0.033		0.001 UJ	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
1,2,4-Trichlorobenzene	35		0.001 UJ	0.05 U	0.05 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
1,2,4-Trimethylbenzene	NE		0.001 J	0.05 U	0.05 U	0.05 U	0.05 U	0.27	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.13	0.05 U	0.05 U	0.05 U	0.05 U
1,2-Dibromo-3-chloropropane	1.3		0.001 UJ	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
1,2-Dibromoethane (EDB)	0.005		0.001 UJ	0.005 U	0.005 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
1,2-Dichlorobenzene	7,200		0.001 UJ	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
1,2-Dichloroethane (EDC)	11		0.001 UJ	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
1,2-Dichloropropane	NE		0.001 UJ	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
1,3,5-Trimethylbenzene	800		0.001 J	0.05 U	0.05 U	0.05 U	0.05 U	0.063	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.093	0.05 U	0.05 U	0.05 U	0.05 U
1,3-Dichlorobenzene	NE		0.001 UJ	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
1,3-Dichloropropane	NE		0.001 UJ	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
1,4-Dichlorobenzene	NE		0.001 UJ	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
2,2-Dichloropropane	NE		0.001 UJ	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
2-Butanone (MEK)	48,000		0.001 UJ	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
2-Chlorotoluene	1,600		0.001 UJ	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
2-Hexanone	NE		0.001 UJ	0.05 U	0.05 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
4-Chlorotoluene	NE		0.001 UJ	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
4-Methyl-2-pentanone	6,400		0.001 UJ	0.05 U	0.05 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Acetone	72,000		0.002 UJ	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Bromobenzene	NE		0.001 UJ	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Bromochloromethane	NE		0.001 UJ	0.05 U	0.05 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Bromodichloromethane	16		0.001 UJ	--	--	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Bromoform	130		0.001 UJ	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Bromomethane	110		0.001 UJ	0.05 U	0.05 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Carbon Tetrachloride	14		0.001 UJ	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Chlorobenzene	1,600		0.001 UJ	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Chloroethane	NE		0.001 UJ	0.05 U	0.05 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Chloroform	800		0.001 UJ	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Chloromethane	NE		0.001 UJ	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
cis-1,2-Dichloroethene	160		0.001 UJ	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
cis-1,3-Dichloropropene	NE		0.001 UJ	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Dibromochloromethane	12		0.001 UJ	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Dibromodichloromethane	NE		0.001 UJ	0.05 U	0.05 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Dibromomethane	800		0.001 UJ	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U

Table 11

Summary of Soil Chemical Analytical Results

Volatile Organic Compounds (VOCs)[1]

Reliable Steel Site

Olympia, Washington

	Proposed Soil Cleanup Levels[2]	Location[3]	EC-1	S-13	S-18	RGB1	RGB3	RGB10			RGB11	RGB12	RGB13	RGB18	RGB19	MW8	Ditch1		Ditch2	
		Sample ID	EC-1(0-0.4)	S-13	S-18	RGB1-S	RGB3-S	RGB10-S	RGB10-5	RGB10-11	RGB11-5	RGB12-4	RGB13-4	RGB18-5	RGB19-12	MW8-5	Ditch1-S	Ditch1-2.5	Ditch2-S	Ditch2-2.5
		Depth (feet)	0-0.4	6	Surface	Surface	Surface	Surface	5	11	5	4	4	5	12	5	Surface	2.5	Surface	2.5
Analyte		Date	4/10/13	10/15/05	10/15/05	2/8/08	2/8/08	2/11/08	2/11/08	2/11/08	2/11/08	2/11/08	2/11/08	2/11/08	2/11/08	2/8/08	2/11/08	2/11/08	2/11/08	2/11/08
VOCs continued (mg/kg)																				
Dichlorodifluoromethane	16,000		0.001 UJ	0.05 U	0.05 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Dichloroethylene	720		0.001 UJ	0.05 U	0.05 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Hexachlorobutadiene	13		0.001 UJ	0.05 U	0.05 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Hexane	4,800		0.001 UJ	--	--	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Isopropylbenzene	8,000		0.001 UJ	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Methyl t-butyl ether (MTBE)	0.1		0.001 UJ	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Methylene chloride	0.02		0.001 UJ	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	**0.78 Ic**	0.5 U	0.5 U
Naphthalene	5		0.001 UJ	0.05 U	0.05 U	0.05 U	0.05 U	1.3	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
n-Butylbenzene	NE		0.001 UJ	0.05 U	0.05 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
n-Propylbenzene	8,000		0.001 UJ	90	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
p-Isopropyltoluene	NE		0.001 UJ	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
sec-Butylbenzene	NE		0.001 UJ	340	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Styrene	16,000		0.001 UJ	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
tert-Butylbenzene	NE		0.001 UJ	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Tetrachloroethene	0.05		0.001 UJ	0.02 U	0.02 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U
trans-1,2-Dichloroethene	1,600		0.001 UJ	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
trans-1,3-Dichloropropene	NE		0.001 UJ	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Trichloroethene	0.03		0.001 UJ	0.02 U	0.02 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U
Trichlorofluoromethane	24,000		0.001 UJ	0.05 U	0.05 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Vinyl chloride	0.67		0.001 UJ	0.01 U	0.01 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U

Notes:

[1] Volatile Organic Compounds (VOCs) excluding benzene, ethylbenzene, toluene and xylenes (BETX) are reported in this table. Results for BETX are reported in Table 8.

[2] Proposed soil cleanup levels are referenced from Table 2.

[3] Sample locations are shown in Figure 5.

U = The analyte was not detected at a concentration greater than the identified reporting limit.

NE = Cleanup criteria not established

Ic = The analyte is a common laboratory contaminant

mg/kg = milligrams per kilogram

☐ Yellow border indicates that the method reporting limit was greater than the proposed cleanup level.

☐ Red border and bold text indicates that the analyte was detected at a concentration greater than the proposed cleanup level.

Table 12

Summary of Soil Chemical Analytical Data

Polychlorinated Biphenyls (PCBs)

Reliable Steel Site
Olympia, Washington

		Location[2]	RI-2	RGB5
	Proposed Soil Cleanup Levels[1]	Sample ID	RI-2-0-1	RGB5-5-6
		Depth (feet)	0-1	5-6
Analyte		Date	7/13/2010	2/8/2008
PCB Aroclors (mg/kg)				
1221	NE		0.1 U	0.1 U
1232	NE		0.1 U	0.1 U
1016	5.6		0.1 U	0.1 U
1242	NE		0.1 U	0.1 U
1248	NE		0.1 U	0.1 U
1254	0.5		0.1 U	**0.6**
1260	0.5		0.1 U	0.1 U
1262	NE		--	0.1 U
Total PCBs	0.5		0.1 U	**0.6**

Notes:

[1] Proposed soil cleanup levels are referenced from Table 2.

[2] Sample locations are shown in Figure 5.

U = The analyte was not detected at a concentration greater than the identified reporting limit.

NE = not established

-- = not analyzed

mg/kg = milligrams per kilogram

□ Yellow border indicates that the method reporting limit was greater than the proposed cleanup level.

□ Red border and bold text indicates that the analyte was detected at a concentration greater than the proposed cleanup level.

Table 13

Summary of Shoreline Material Chemical Analytical Results

Metals and Petroleum Hydrocarbons (Results compared to Proposed Soil Cleanup Levels)

Reliable Steel Site
Olympia, Washington

Analyte	Proposed Soil Cleanup Levels[1]	Location[2]	S1	S3	BS-1	S-3	MS-1
		Sample ID	S1	S3	BS-1	S-3	MS-1
		Depth	2	2	Surface	4-8	4
		Date	6/3/2004	6/3/2004	12/22/2005	10/15/2005	12/22/2005
Metals (mg/kg)							
Arsenic	20		14.6	**70**	5 U	5 U	5 U
Barium	16,000		87	52.6	--	--	--
Cadmium	2		**5.13**	0.803	1 U	1 U	1 U
Chromium	2,000		127	253	15	5 U	32
Copper	3,000		435	1,790	--	--	--
Lead	250		**533**	99.8	**360**	5 U	28
Mercury	2		0.362	0.1 U	0.5 U	0.5 U	0.5 U
Selenium	400		1.21	0.538	--	--	--
Silver	400		0.5 U	0.5 U	--	--	--
Petroleum Hydrocarbons (mg/kg)							
Diesel Range	2,000		--	--	--	<20	--
Heavy-oil Range	2,000		--	--	--	<40	--
Mineral-oil Range	4,000		--	--	--	<40	--

Notes:

[1] Proposed soil cleanup levels are referenced from Table 2.

[2] Sample locations are shown in Figure 4.

U = The analyte was not detected at a concentration greater than the identified reporting limit.

-- = not analyzed

mg/kg = milligrams per kilogram

🟨 Yellow border indicates that the method reporting limit was greater than the proposed cleanup level.

🟥 Red border and bold text indicates that the analyte was detected at a concentration greater than the proposed cleanup level.

Table 14

Summary of Groundwater Chemical Analytical Results

Metals

Reliable Steel Site
Olympia, Washington

Analytes	Proposed Groundwater Cleanup Levels[1]	Location[2]	MW-1		MW-2		MW-3		MW-4		MW-5		MW-6		MW-7		MW-8			MW-9		
		Sample ID	MW-1		MW-2		MW-3		MW-4		MW-5		MW-6		MW-7		MW-8		MW-10 [3]	MW-9		
		Date	2/19/08	10/6/10	2/19/08	10/6/10	2/19/08	10/6/10	2/19/08	10/6/10	2/19/08	10/6/10	2/19/08	10/6/10	2/19/08	10/6/10	2/19/08	10/6/10	10/6/10	2/19/08	10/6/10	4/10/13
Dissolved Metals (µg/l)																						
Arsenic	5		1.16	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2.66	3.48	3.48	**7.01**	**6.11**	**5.66**	**15.3**	**23.7**	**22.3**	1 U	1 U	--
Cadmium	8.8		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	1 U	1 U	1 U	1 U	1 U	1 U	--
Chromium III	50		12.2	1 U	17	1 U	31	1 U	26.3	1 U	28.4	1.19	34.6	1.39	42.5	1.32	16	2.83	3.08	19.5	1 U	--
Copper	2.4		1 U	1 U	1 U	1 U	1.09	1.43	1 U	1 U	1 U	1.9	**5.52**	**11.6**	**9.21**	**10.5**	**40.3**	**36**	**33.8**	1 U	1.18	--
Lead	8.1		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	1 U	1 U	1 U	1 U	1 U	1 U	--
Mercury	NE		0.2 U	0.025 U	0.2 U	0.025 U	0.2 U	0.025 U	0.2 U	0.025 U	0.2 U	0.025 U	0.2 U	0.025 U	0.2 U	0.025 U	0.2 U	0.025 U	0.025 U	0.2 U	0.025 U	0.002 UJ
Zinc	81		1 U	7.94	1 U	1.82	1 U	2.01	1.13	1.57	1 U	3.93	1 U	3.41	3.48	5.4	2.82	3.52	3.76	1 U	1.99	--
Total Metals (µg/l)																						
Arsenic	NE		--	1 U	--	1 U	--	1.11	--	1 U	--	8	--	8.8	--	7.29	--	24.3	26.4	--	1 U	--
Cadmium	NE		--	1 U	--	1 U	--	1 U	--	1 U	--	1 U	--	1 U	--	1 U	--	10 U	10 U	--	1 U	--
Chromium III	NE		--	1 U	--	1 U	--	1 U	--	1 U	--	2.78	--	2.07	--	1.52	--	19.7	11	--	1 U	--
Copper	NE		--	1 U	--	1 U	--	1.44	--	1 U	--	2.14	--	13.1	--	9.52	--	37.6	34.2	--	1.03	--
Lead	NE		--	1 U	--	1 U	--	1 U	--	1 U	--	1 U	--	1.03	--	1 U	--	10 U	10 U	--	1 U	--
Mercury	0.025		--	0.025 U	--	0.025 U	--	0.025 U	--	0.025 U	--	0.025 U	--	0.025 U	--	0.025 U	--	0.025 U	0.025 U	--	**0.029**	0.002 U
Zinc	NE		--	43.7	--	2.76	--	3.22	--	3.38	--	7.46	--	7.65	--	14.8	--	42.7	32.7	--	7.32	--

Notes:

[1] Proposed groundwater cleanup levels are referenced from Table 3.

[2] Sample locations are shown in Figure 13.

[3] Duplicate of groundwater sample MW-8 obtained on 10/06/2010.

U = The analyte was not detected at a concentration greater than the identified reporting limit.

-- = not analyzed

µg/l = micrograms per liter

🟨 Yellow border indicates that the method reporting limit was greater than the proposed cleanup level.

🟥 Red border and bold text indicates that the analyte was detected at a concentration greater than the proposed cleanup level.

Table 15

Summary of Groundwater Chemical Analytical Results

Petroleum Hydrocarbons and BETX[1]

Reliable Steel Site
Olympia, Washington

	Proposed Groundwater Cleanup	Location[3]	MW-1		MW-2		MW-3		MW-4		MW-5		MW-6		MW-7		MW-8			MW-9	
		Sample ID	MW-1		MW-2		MW-3		MW-4		MW-5		MW-6		MW-7		MW-8		MW-10[5]	MW-9	
Analyte	**Levels[2]**	**Date**	2/19/08	10/6/10	2/19/08	10/6/10	2/19/08	10/6/10	2/19/08	10/6/10	2/19/08	10/6/10	2/19/08	10/6/10	2/19/08	10/6/10	2/19/08	10/6/10	10/6/10	2/19/08	10/6/10
Petroleum Hydrocarbons (µg/l)																					
Gasoline-Range	800/1,000[4]		100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	120	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U
Diesel-Range	500		50 U	50 U	50 U	50 U	50 U	50 U	**61,000**	190	160	50 U	380	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
Heavy Oil-Range	500		250 U	250 U	250 U	250 U	250 U	250 U	**3,300 y**	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U
BETX (µg/l)																					
Benzene	22.66		1 U	0.35 U	1 U	0.35 U	1 U	0.35 U	1 U	0.35 U	1 U	0.35 U	1 U	0.35 U	1 U	0.35 U	1 U	0.35 U	0.35 U	1 U	0.52
Ethylbenzene	2,100		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	1 U	1 U	1 U	1 U	1 U	1 U
Toluene	15,000		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	1 U	1 U	1 U	1 U	1 U	1 U
m,p-Xylene	1,000		2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
o-Xylene	1,000		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	1 U	1 U	1 U	1 U	1 U	1 U

Notes:

[1] Benzene, ethylbenzene, toluene and xylenes (BETX) are reported in this table. Results for volatile organic compounds (VOCs) other than than BETX are reported in Table 18.

[2] Proposed groundwater cleanup levels are referenced from Table 3.

[3] Sample locations are shown in Figures 14 and 15.

[4] Cleanup level for gasoline-range petroleum hydrocarbon is 800 µg/l if benzene is present and 1000 µg/l if benzene is not present.

[5] Split of groundwater sample MW-8 obtained on 10/06/2010.

U = The analyte was not detected at a concentration greater than the identified reporting limit.

y = The pattern of peaks present is not indicative of motor oil.

NE = not established

µg/l = micrograms per liter

🟨 Yellow border indicates that the method reporting limit was greater than the proposed cleanup level.

🟥 Red border and bold text indicates that the analyte was detected at a concentration greater than the proposed cleanup level.

Table 16

Summary of Groundwater Chemical Analytical Results

Polycyclic Aromatic Hydrocarbons (PAHs)[1]

Reliable Steel Site
Olympia, Washington

Analyte	Proposed Groundwater Cleanup Levels[2]	Location[3]	MW-1		MW-2		MW-3		MW-4		MW-5			MW-6		MW-7			MW-8					MW-9		
		Sample ID	MW-1		MW-2		MW-3		MW-4		MW-5			MW-6		MW-7			MW-8			MW-10 [4]	MW-10 [5]	MW-9		
		Date	2/19/08	10/6/10	2/19/08	10/6/10	2/19/08	10/6/10	2/19/08	10/6/10	2/19/08	10/6/10	4/10/13	2/19/08	10/6/10	2/19/08	10/6/10	4/10/13	2/19/08	10/6/10	4/10/13	10/6/10	4/10/13	2/19/08	10/6/10	4/10/13
Non-carcinogenic PAHs (µg/l)																										
Acenaphthene	990		1 U	--	1 U	--	1 U	--	1 U	--	1 U	--	0.27	1 U	--	1 U	--	0.017	1 U	--	0.010 U	--	0.010 U	1 U	--	1.1
Acenaphthylene	NE		1 U	--	1 U	--	1 U	--	1 U	--	1 U	--	0.010 U	1 U	--	1 U	--	0.0080 J	1 U	--	0.010 U	--	0.010 U	1 U	--	0.010 U
Anthracene	25,926		1 U	--	1 U	--	1 U	--	1 U	--	1 U	--	0.010 U	1 U	--	1 U	--	0.0099 U	1 U	--	0.010 U	--	0.010 U	1 U	--	0.010 U
Benzo(g,h,i)perylene	NE		1 U	--	1 U	--	1 U	--	1 U	--	1 U	--	0.010 U	1 U	--	1 U	--	0.0099 U	1 U	--	0.010 U	--	0.010 U	1 U	--	0.010 U
Fluoranthene	140		1 U	--	1 U	--	1 U	--	1 U	--	1 U	--	0.010 U	1 U	--	1 U	--	0.028	1 U	--	0.010 U	--	0.010 U	1.1	--	0.016 U
Fluorene	3,457		1 U	--	1 U	--	1 U	--	10 U	--	1 U	--	0.010 UJ	1 U	--	1 U	--	0.014 J	1 U	--	0.010 U	--	0.010 U	1 U	--	0.038 J
Naphthalene	4,938		1 U	--	1 U	--	1 U	--	1 U	--	1 U	--	0.010 U	1 U	--	1 U	--	0.018	1 U	--	0.011 U	--	0.010 U	1.2	--	0.010 U
Phenanthrene	NE		1 U	--	1 U	--	1 U	--	10 U	--	1 U	--	0.010 U	1 U	--	1 U	--	0.014	1 U	--	0.010 U	--	0.010 U	1 U	--	0.72
Pyrene	2,593		1 U	--	1 U	--	1 U	--	1 U	--	1 U	--	0.018 U	1 U	--	1 U	--	0.023	1 U	--	0.010 U	--	0.010 U	1	--	0.015
Carcinogenic PAHs (µg/l)																										
Benz(a)anthracene	0.018		1 U	0.018 U	1 U	0.018 U	1 U	0.018 U	1 U	0.018 U	1 U	0.018 U	0.010 U	1 U	**0.022**	1 U	0.018 U	0.011 U	1 U	0.018 U	0.010 U	0.018 U	0.010 U	1 U	0.018 U	0.010 U
Chrysene	0.018		1 U	0.018 U	1 U	0.018 U	1 U	0.018 U	1 U	0.018 U	1 U	0.018 U	0.010 U	1 U	0.018	1 U	0.018 U	0.0082 J	1 U	0.018 U	0.010 U	0.018 U	0.010 U	1 U	0.018 U	0.010 U
Benzo(b)fluoranthene	0.018		1 U	0.018 U	1 U	0.018 U	1 U	0.018 U	1 U	0.018 U	1 U	0.018 U	0.010 U	1 U	0.018 U	1 U	0.018 U	0.0068 J	1 U	0.018 U	0.010 U	0.018 U	0.010 U	1 U	0.018 U	0.010 U
Benzo(k)fluoranthene	0.018		1 U	0.018 U	1 U	0.018 U	1 U	0.018 U	1 U	0.018 U	1 U	0.018 U	0.010 U	1 U	0.018 U	1 U	0.018 U	0.0087 J	1 U	0.018 U	0.010 U	0.018 U	0.010 U	1 U	0.018 U	0.010 U
Benzo(a)pyrene	0.018		1 U	0.018 U	1 U	0.018 U	1 U	0.018 U	1 U	0.018 U	1 U	0.018 U	0.010 U	1 U	0.018 U	1 U	0.018 U	0.012	1 U	0.018 U	0.010 U	0.018 U	0.010 U	1 U	0.018 U	0.010 U
Indeno(1,2,3-cd)pyrene	0.018		1 U	0.018 U	1 U	0.018 U	1 U	0.018 U	1 U	0.018 U	1 U	0.018 U	0.010 U	1 U	0.018 U	1 U	0.018 U	0.0052 J	1 U	0.018 U	0.010 U	0.018 U	0.010 U	1 U	0.018 U	0.010 U
Dibenz(a,h)anthracene	0.018		1 U	0.018 U	1 U	0.018 U	1 U	0.018 U	1 U	0.018 U	1 U	0.018 U	0.010 U	1 U	0.018 U	1 U	0.018 U	0.0099 U	1 U	0.018 U	0.010 U	0.018 U	0.010 U	1 U	0.018 U	0.010 U
cPAH TEC[6]	0.018		0.76 U	0.014 U	0.76 U	0.014 U	0.76 U	0.014 U	0.76 U	0.014 U	0.76 U	0.014 U	0.0053 U	0.76 U	0.015	0.76 U	0.014 U	0.0148	0.76 U	0.014 U	0.0053	0.014 U	0.0053	0.76 U	0.014 U	0.0053

Notes:

[1] Polycyclic aromatic hydrocarbons (PAHs) are reported in this table. Results for semi-volatile organic compounds (SVOCs) other than PAHs are reported in Table 17.

[2] Proposed groundwater cleanup levels are referenced from Table 3.

[3] Sample locations are shown in Figure 16.

[4] Duplicate of groundwater sample MW-8 obtained on 10/06/2010.

[5] Duplicate of groundwater sample MW-8 obtained on 4/10/2013.

[6] 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 listed method reporting limit for these calculations.

U = The analyte was not detected at a concentration greater than the identified reporting limit.

NE = not established

µg/l = micrograms per liter

🟨 Yellow border indicates that the method reporting limit was greater than the proposed cleanup level.

🟥 Red border and bold text indicates that the analyte was detected at a concentration greater than the proposed cleanup level.

Table 17

Summary of Groundwater Chemical Analytical Results

Phthalates and Other Semi-volatile Organic Compounds (SVOCs)[1]

Reliable Steel Site
Olympia, Washington

Analyte	Proposed Groundwater Cleanup Levels[2]	Location[3]	MW-1	MW-2	MW-3	MW-4	MW-5		MW-6	MW-7		MW-8			MW-9	
		Sample ID	MW-1	MW-2	MW-3	MW-4	MW-5		MW-6	MW-7		MW-8		MW-10 [5]	MW-9	
		Date	2/19/08	2/19/08	2/19/08	2/19/08	2/19/08	4/10/13	2/19/08	2/19/08	4/10/13	2/19/08	4/10/13	4/10/13	2/19/08	4/10/13
SVOCs (µg/l)																
1-Methylnaphthalene	NE		--	--	--	--	--	0.010 U	--	--	0.0099 U	--	0.010 U	0.010 U	--	0.047
1,2,4-Trichlorobenzene	70		1 U	1 U	1 U	1 U	1 U	--	1 U	1 U	--	1 U	--	--	1 U	--
1,2-Dichlorobenzene	1,300		1 U	1 U	1 U	1 U	1 U	--	1 U	1 U	--	1 U	--	--	1 U	--
1,3-Dichlorobenzene	960		1 U	1 U	1 U	1 U	1 U	--	1 U	1 U	--	1 U	--	--	1 U	--
1,4-Dichlorobenzene	190		1 U	1 U	1 U	1 U	1 U	--	1 U	1 U	--	1 U	--	--	1 U	--
2,4,5-Trichlorophenol	3,600		10 U	10 U	10 U	10 U	10 U	--	10 U	10 U	--	10 U	--	--	10 U	--
2,4,6-Trichlorophenol	2.4		10 U	10 U	10 U	10 U	10 U	--	10 U	10 U	--	10 U	--	--	10 U	--
2,4-Dichlorophenol	191		10 U	10 U	10 U	10 U	10 U	--	10 U	10 U	--	10 U	--	--	10 U	--
2,4-Dimethylphenol	553		10 U	10 U	10 U	10 U	10 U	--	10 U	10 U	--	10 U	--	--	10 U	--
2,4-Dinitrophenol	3,457		30 U	30 U	30 U	30 U	30 U	--	30 U	30 U	--	30 U	--	--	30 U	--
2,4-Dinitrotoluene	3.4		1 U	1 U	1 U	1 U	1 U	--	1 U	1 U	--	1 U	--	--	1 U	--
2,6-Dinitrotoluene	NE		1 U	1 U	1 U	1 U	1 U	--	1 U	1 U	--	1 U	--	--	1 U	--
2-Chloronaphthalene	1,027		1 U	1 U	1 U	1 U	1 U	--	1 U	1 U	--	1 U	--	--	1 U	--
2-Chlorophenol	96.74		10 U	10 U	10 U	10 U	10 U	--	10 U	10 U	--	10 U	--	--	10 U	--
2-Methylnaphthalene	NE		1 U	1 U	1 U	10 U	1 U	0.010 U	1 U	1 U	0.0099 U	1 U	0.010 U	0.010 U	1 U	0.010 U
2-Methylphenol	NE		10 U	10 U	10 U	10 U	10 U	--	10 U	10 U	--	10 U	--	--	10 U	--
2-Nitroaniline	NE		1 U	1 U	1 U	1 U	1 U	--	1 U	1 U	--	1 U	--	--	1 U	--
2-Nitrophenol	NE		10 U	10 U	10 U	10 U	10 U	--	10 U	10 U	--	10 U	--	--	10 U	--
3-Nitroaniline	NE		3 U	3 U	3 U	3 U	3 U	--	3 U	3 U	--	3 U	--	--	3 U	--
4,6-Dinitro-2-methylphenol	NE		30 U	30 U	30 U	30 U	30 U	--	30 U	30 U	--	30 U	--	--	30 U	--
4-Bromophenyl phenyl ether	NE		1 U	1 U	1 U	1 U	1 U	--	1 U	1 U	--	1 U	--	--	1 U	--
4-Chloro-3-methylphenol	NE		10 U	10 U	10 U	10 U	10 U	--	10 U	10 U	--	10 U	--	--	10 U	--
4-Chloroaniline	NE		3 U	3 U	3 U	3 U	3 U	--	3 U	3 U	--	3 U	--	--	3 U	--
4-Chlorophenyl phenyl ether	NE		1 U	1 U	1 U	1 U	1 U	--	1 U	1 U	--	1 U	--	--	1 U	--
4-Methylphenol	NE		10 U	10 U	10 U	10 U	10 U	--	10 U	10 U	--	10 U	--	--	10 U	--
4-Nitroaniline	NE		10 U	10 U	10 U	10 U	10 U	--	10 U	10 U	--	10 U	--	--	10 U	--
4-Nitrophenol	NE		10 U	10 U	10 U	10 U	10 U	--	10 U	10 U	--	10 U	--	--	10 U	--
Benzoic acid	NE		100 U	100 U	100 U	100 U	100 U	--	100 U	100 U	--	100 U	--	--	100 U	--
Benzyl alcohol	NE		1 U	1 U	1 U	1 U	1 U	--	1 U	1 U	--	1 U	--	--	1 U	--
Butyl Benzyl phthalate	1,900		1 U	1 U	1 U	1 U	1 U	0.20 U	1 U	1 U	0.21 U	1 U	0.21 U	0.20 U	1 U	0.20 U
Bis(2-chloroethoxy)methane	NE		1 U	1 U	1 U	1 U	1 U	--	1 U	1 U	--	1 U	--	--	1 U	--
Bis(2-chloroethyl) ether	0.53		1 U	1 U	1 U	1 U	1 U	--	1 U	1 U	--	1 U	--	--	1 U	--
Bis(2-chloroisopropyl) ether	42,000		1 U	1 U	1 U	1 U	1 U	--	1 U	1 U	--	1 U	--	--	1 U	--
Bis(2-ethylhexyl) phthalate	2.2		10 U	10 U	10 U	110 ve	10 U	0.30 U	10 U	10 U	0.51 U	10 U	0.28 U	0.29 U	10 U	1.1
Carbazole	NE		1 U	1 U	1 U	1 U	1 U	--	1 U	1 U	--	1 U	--	--	1 U	--
Dibenzofuran	NE		1 U	1 U	1 U	1 U	1 U	--	1 U	1 U	--	1 U	--	--	1 U	--
Diethyl phthalate	28,412		1 U	1 U	1 U	1 U	1 U	0.20 U	1 U	1 U	0.20 U	1 U	0.21 U	0.20 U	1 U	0.20 U
Dimethyl phthalate	1,100,000		1 U	1 U	1 U	1 U	1 U	0.20 U	1 U	1 U	0.20 U	1 U	0.21 U	0.20 U	1 U	0.20 U
Di-n-butyl phthalate	2,913		1 U	1 U	1 U	1 U	1 U	0.25 U	1 U	1 U	0.20 U	1 U	0.21 U	0.20 U	1 U	0.20 U
Di-n-octyl phthalate	NE		1 U	1 U	1 U	1 U	1 U	0.20 U	1 U	1 U	0.20 U	1 U	0.21 U	0.20 U	1 U	0.20 U
Hexachlorobenzene	0.00083		1 U	1 U	1 U	1 U	1 U	--	1 U	1 U	--	1 U	--	--	1 U	--
Hexachlorobutadiene	18		1 U	1 U	1 U	1 U	1 U	--	1 U	1 U	--	1 U	--	--	1 U	--
Hexachlorocyclopentadiene	1,100		3 U	3 U	3 U	3 U	3 U	--	3 U	3 U	--	3 U	--	--	3 U	--
Hexachloroethane	3.3		1 U	1 U	1 U	1 U	1 U	--	1 U	1 U	--	1 U	--	--	1 U	--
Isophorone	600		1 U	1 U	1 U	1 U	1 U	--	1 U	1 U	--	1 U	--	--	1 U	--

Table 17

Summary of Groundwater Chemical Analytical Results

Phthalates and Other Semi-volatile Organic Compounds (SVOCs)[1]

Reliable Steel Site
Olympia, Washington

Analyte	Proposed Groundwater Cleanup Levels[2]	**Location[3]**	MW-1	MW-2	MW-3	MW-4	MW-5		MW-6	MW-7		MW-8			MW-9	
		Sample ID	MW-1	MW-2	MW-3	MW-4	MW-5		MW-6	MW-7		MW-8		MW-10[5]	MW-9	
		Date	2/19/08	2/19/08	2/19/08	2/19/08	2/19/08	4/10/13	2/19/08	2/19/08	4/10/13	2/19/08	4/10/13	4/10/13	2/19/08	4/10/13
SVOCs continued (µg/l)																
Nitrobenzene	690		1 U	1 U	1 U	1 U	1 U	--	1 U	1 U	--	1 U	--	--	1 U	--
N-Nitroso-di-n-propylamine	0.51		1 U	1 U	1 U	1 U	1 U	--	1 U	1 U	--	1 U	--	--	1 U	--
N-Nitrosodiphenylamine	6		1 U	1 U	1 U	1 U	1 U	--	1 U	1 U	--	1 U	--	--	1 U	--
Pentachlorophenol	1.47		10 U	10 U	10 U	10 U	10 U	--	10 U	10 U	--	10 U	--	--	10 U	--
Phenol	556,000		10 U	10 U	10 U	10 U	10 U	--	10 U	10 U	--	10 U	--	--	10 U	--

Notes:

[1] Semi-volatile organic compounds (SVOCs) excluding polycyclic aromatic hydrocarbons (PAHs) are reported in this table. Results for PAHs are reported in Table 16.

[2] Proposed groundwater cleanup levels are referenced from Table 3.

[3] Sample locations are shown in Figure 17.

[4] Duplicate of groundwater sample MW-8 obtained on 10/06/2010.

[5] Duplicate of groundwater sample MW-8 obtained on 4/10/2013.

NE = not established

U = The analyte was not detected at a concentration greater than the identified reporting limit.

ve = The value reported exceeded the calibration range established for the analyte. The reported concentration should be considered an estimate.

-- = not analyzed

µg/l = micrograms per liter

☐ Yellow border indicates that the method reporting limit was greater than the proposed cleanup level.

☐ Red border and bold text indicates that the analyte was detected at a concentration greater than the proposed cleanup level.

Table 18

Summary of Groundwater Chemical Analytical Results

Volatile Organic Compounds (VOCs)[1]

Reliable Steel Site
Olympia, Washington

	Proposed Groundwater Cleanup Levels[2]	Location[3]	MW-1		MW-2		MW-3		MW-4		MW-5		MW-6		MW-7		MW-8			MW-9	
		Sample ID	MW-1		MW-2		MW-3		MW-4		MW-5		MW-6		MW-7		MW-8		MW-10[4]	MW-9	
Analyte		Date	2/19/08	10/6/10	2/19/08	10/6/10	2/19/08	10/6/10	2/19/08	10/6/10	2/19/08	10/6/10	2/19/08	10/6/10	2/19/08	10/6/10	2/19/08	10/6/10	10/6/10	2/19/08	10/6/10
VOCs (µg/l)																					
1,1,1,2-Tetrachloroethane	NE		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	1 U	1 U	1 U	1 U	1 U	1 U
1,1,1-Trichloroethane	926,000		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	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2,2-Tetrachloroethane	4		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	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2-Trichloroethane	16		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	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethane	NE		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	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethene	3.2		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	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloropropene	NE		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	1 U	1 U	1 U	1 U	1 U	1 U
1,2,3-Trichlorobenzene	NE		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	1 U	1 U	1 U	1 U	1 U	1 U
1,2,3-Trichloropropane	NE		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	1 U	1 U	1 U	1 U	1 U	1 U
1,2,4-Trichlorobenzene	70		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	1 U	1 U	1 U	1 U	1 U	1 U
1,2,4-Trimethylbenzene	NE		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	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dibromo-3-chloropropane	NE		1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	10 U	1 U	10 U
1,2-Dibromoethane (EDB)	NE		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	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichlorobenzene	1,300		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	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloroethane (EDC)	37		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	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloropropane	15		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	1 U	1 U	1 U	1 U	1 U	1 U
1,3,5-Trimethylbenzene	NE		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	1 U	1 U	1 U	1 U	1 U	1 U
1,3-Dichlorobenzene	960		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	1 U	1 U	1 U	1 U	1 U	1 U
1,3-Dichloropropane	NE		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	1 U	1 U	1 U	1 U	1 U	1 U
1,4-Dichlorobenzene	190		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	1 U	1 U	1 U	1 U	1 U	1 U
2,2-Dichloropropane	NE		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	1 U	1 U	1 U	1 U	1 U	1 U
2-Butanone (MEK)	NE		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Chlorotoluene	NE		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	1 U	1 U	1 U	1 U	1 U	1 U
2-Hexanone	NE		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Chlorotoluene	NE		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	1 U	1 U	1 U	1 U	1 U	1 U
4-Methyl-2-pentanone	NE		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Acetone	NE		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromobenzene	NE		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	1 U	1 U	1 U	1 U	1 U	1 U
Bromodichloromethane	NE		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	1 U	1 U	1 U	1 U	1 U	1 U
Bromoform	140		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	1 U	1 U	1 U	1 U	1 U	1 U
Bromomethane	968		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	1 U	1 U	1 U	1 U	1 U	1 U
Carbon Tetrachloride	1.6		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	1 U	1 U	1 U	1 U	1 U	1 U
Chlorobenzene	1,600		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	1 U	1 U	1 U	1 U	1 U	1 U
Chloroethane	NE		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	1 U	1 U	1 U	1 U	1 U	1 U
Chloroform	470		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	1 U	1 U	1 U	1 U	1 U	1 U
Chloromethane	NE		1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	1 U	10 U	10 U	1 U	10 U
cis-1,2-Dichloroethene	NE		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	1 U	1 U	1 U	1 U	1 U	1 U
cis-1,3-Dichloropropene	NE		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	1 U	1 U	1 U	1 U	1 U	1 U
Dibromochloromethane	13		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	1 U	1 U	1 U	1 U	1 U	1 U
Dibromomethane	NE		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	1 U	1 U	1 U	1 U	1 U	1 U
Dichlorodifluoromethane	NE		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	1 U	1 U	1 U	1 U	1 U	1 U
Hexachlorobutadiene	18		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	1 U	1 U	1 U	1 U	1 U	1 U
Isopropylbenzene (Cumene)	NE		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	1 U	1 U	1 U	1 U	1 U	1 U
Methyl t-butyl ether	NE		--	1 U	--	1 U	--	1 U	--	1 U	--	1 U	--	1 U	--	1 U	--	1 U	1 U	--	1 U

Table 18

Summary of Groundwater Chemical Analytical Results

Volatile Organic Compounds (VOCs)[1]

Reliable Steel Site
Olympia, Washington

	Proposed Groundwater Cleanup Levels[2]	**Location[3]**	MW-1		MW-2		MW-3		MW-4		MW-5		MW-6		MW-7		MW-8			MW-9	
		Sample ID	MW-1		MW-2		MW-3		MW-4		MW-5		MW-6		MW-7		MW-8		MW-10[4]	MW-9	
Analyte		**Date**	2/19/08	10/6/10	2/19/08	10/6/10	2/19/08	10/6/10	2/19/08	10/6/10	2/19/08	10/6/10	2/19/08	10/6/10	2/19/08	10/6/10	2/19/08	10/6/10	10/6/10	2/19/08	10/6/10
VOCs continued (μg/l)																					
Methylene chloride	590		7 lc	5 U	5 U	5 U	5 U	5 U	5.6 lc	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	6.2 lc	5 U
Naphthalene	4,938		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	1 U	1 U	1 U	1 U	1 U	1 U
n-Propylbenzene	NE		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	1 U	1 U	1 U	1 U	1 U	1 U
p-Isopropyltoluene	NE		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	1 U	1 U	1 U	1 U	1 U	1 U
sec-Butylbenzene	NE		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	1 U	1 U	1 U	1 U	1 U	1 U
Styrene	NE		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	1 U	1 U	1 U	1 U	1 U	1 U
tert-Butylbenzene	NE		1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Tetrachloroethene	3.3		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	1 U	1 U	1 U	1 U	1 U	1 U
trans-1,2-Dichloroethene	10,000		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	1 U	1 U	1 U	1 U	1 U	1 U
trans-1,3-Dichloropropene	NE		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	1 U	1 U	1 U	1 U	1 U	1 U
Trichloroethene	12.7		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	1 U	1 U	1 U	1 U	1 U	1 U
Trichlorofluoromethane	NE		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	1 U	1 U	1 U	1 U	1 U	1 U
Vinyl chloride	2.4		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U

Notes:

[1] Volatile Organic Compounds (VOCs) excluding benzene, ethylbenzene, toluene, and xylenes (BETX) are reported in this table. Results for BETX are reported in Table 15.

[2] Proposed groundwater cleanup levels are referenced from Table 3.

[3] Sample locations are shown in Figure 5.

[4] Duplicate of groundwater sample MW-8 obtained on 10/06/2010.

U = The analyte was not detected at a concentration greater than the identified reporting limit.

lc = The analyte is a common laboratory contaminant

NE = not established

-- = not analyzed

μg/l = micrograms per liter

□ Yellow border indicates that the method reporting limit was greater than the proposed cleanup level.

□ Red border and bold text indicates that the analyte was detected at a concentration greater than the proposed cleanup level.

Table 19

Summary of Stormwater Chemical Analytical Results

Metals and Water Quality Parameters

Reliable Steel Site
Olympia, Washington

Analyte	Proposed Stormwater Screening Levels[1]	Location[2]	SW-1		SW-2		SW-3	SW-4
		Sample ID	SW-1	RI-SW-1	SW-2	RI-SW-2	RI-SW-3	RI-SW-4
		Date	3/3/08	9/16/10	3/3/08	9/16/10	9/16/10	9/16/10
Water Quality Parameters								
pH (standard pH units)	5-9		--	7	--	7	7	7.5
Turbidity (NTU)	25		--	**92.6**	--	8.11	10.1	14.1
Dissolved Metals (µg/l)								
Arsenic	5		--	1 U	--	1 U	1.09	1.11
Cadmium	8.8		--	1 U	--	1 U	1 U	1 U
Chromium (total)	50		--	1 U	--	1 U	1 U	1 U
Copper	2.4		--	**5.26**	--	**3.56**	**7.05**	**5.32**
Lead	8.1		--	1 U	--	1 U	1 U	1 U
Mercury	NE		--	0.025 U	--	0.025 U	0.025 U	0.025 U
Zinc	81		--	14.4	--	68.2	59.9	22.3
Total Metals (µg/l)								
Arsenic	150		10 U	1.43	1.18	1 U	2.21	1.61
Cadmium	2.1		10 U	1 U	1 U	1 U	1 U	1 U
Chromium (total)	NE		43.5	7.91	14.6	1.14	1.7	2.48
Copper	14		**251**	**30.6**	**68.1**	6.26	12.8	**16**
Lead	81.6		**129**	17.5	29.3	1 U	1.04	7.35
Mercury	0.025		0.2 U	**0.4**	0.2 U	**0.038**	0.025 U	0.025 U
Zinc	117		**5,550**	**335**	**2,470**	**142**	90.5	77.1

Notes:

[1] Proposed stormwater screening levels are referenced from Table 4.

[2] Sample locations are shown in Figure 13.

U = The analyte was not detected at a concentration greater than the identified reporting limit.

-- = not analyzed

NE = not established

NTU = nephelometric turbidity units

µg/l = micrograms per liter

🟨 Yellow border indicates that the method reporting limit was greater than the proposed screening level.

🟥 Red border and bold text indicates that the analyte was detected at a concentration greater than the proposed screening level.

Table 20

Summary of Stormwater Chemical Analytical Results

Petroleum Hydrocarbons

Reliable Steel Site
Olympia, Washington

Analyte	Proposed Stormwater Screening Levels[1]	Location[2]	SW-1		SW-2	SW-3	SW-4
		Sample ID	SW-1	RI-SW-1	RI-SW-2	RI-SW-3	RI-SW-4
		Date	3/3/08	9/16/10	9/16/10	9/16/10	9/16/10
Petroleum Hydrocarbons (µg/l)							
Gasoline-Range	800/1,000		100 U	--	--	--	--
Diesel-Range	500		220 x	50 U	50 U	50 U	50 U
Heavy-oil Range	500		670	250 U	250 U	250 U	250 U

Notes:

[1] Proposed stormwater screening levels are referenced from Table 4.

[2] Sample locations are shown in Figures 14 and 15.

U = The analyte was not detected at a concentration greater than the identified reporting limit.

x = The pattern of peaks present is not indicative of diesel.

-- = not analyzed

µg/l = micrograms per liter

□ Yellow border indicates that the method reporting limit was greater than the proposed screening level.

□ Red border and bold text indicates that the analyte was detected at a concentration greater than the proposed screening level.

Table 21

Summary of Stormwater Chemical Analytical Results
Polycyclic Aromatic Hydrocarbons (PAHs)[1]

Reliable Steel Site
Olympia, Washington

Analytes	Proposed Stormwater Cleanup Levels[2]	Location[3]	SW-1		SW-2	SW-3	SW-4
		Sample ID	SW-1	RI-SW-1	RI-SW-2	RI-SW-3	RI-SW-4
		Date	3/3/08	9/16/10	9/16/10	9/16/10	9/16/10
Non-carcinogenic PAHs (µg/l)							
Acenaphthene	990		1 U	--	--	--	--
Acenaphthylene	NE		1 U	--	--	--	--
Anthracene	25,926		1 U	--	--	--	--
Benzo(g,h,i)perylene	NE		1 U	--	--	--	--
Fluoranthene	140		1 U	--	--	--	--
Fluorene	3,457		1 U	--	--	--	--
Naphthalene	4,938		1 U	--	--	--	--
Phenanthrene	NE		1 U	--	--	--	--
Pyrene	2,593		1 U	--	--	--	--
Carcinogenic PAHs (µg/l)							
Benz(a)anthracene	0.018		1 U	**0.065**	0.018 U	0.018 U	0.018 U
Chrysene	0.018		1 U	**0.12**	0.018 U	0.018 U	0.018 U
Benzo(b)fluoranthene	0.018		1 U	**0.069**	0.018 U	0.018 U	0.018 U
Benzo(k)fluoranthene	0.018		1 U	**0.14**	0.018 U	0.018 U	0.018 U
Benzo(a)pyrene	0.018		1 U	**0.047**	0.018 U	0.018 U	0.018 U
Indeno(1,2,3-cd)pyrene	0.018		1 U	**0.086**	0.018 U	0.018 U	0.018 U
Dibenz(a,h)anthracene	0.018		1 U	0.018	0.018 U	0.018 U	0.018 U
cPAH TEC[4]	0.018		0.76 U	**0.086**	0.014 U	0.014 U	0.014 U

Notes:

[1] Polycyclic aromatic hydrocarbons (PAHs) are reported in this table. Results for semi-volatile organic compounds (SVOCs) other than PAHs are reported in Table 22.

[2] Proposed stormwater screening levels are referenced from Table 4.

[3] Sample locations are shown in Figure 16.

[4] Calculated using toxic equivalency factor (TEF) methodology relative to benzo(a)pyrene. cPAHs that were not detected were assigned a value of one half of the method reporting limit for these calculations.

U = The analyte was not detected at a concentration greater than the identified reporting limit.

-- = not analyzed

µg/l = micrograms per liter

🟨 Yellow border indicates that the method reporting limit was greater than the proposed screening level.

🟥 Red border and bold text indicates that the analyte was detected at a concentration greater than the proposed screening level.

Table 22

Summary of Stormwater Chemical Analytical Results
Phthalates and Other Semi-volatile Organic Compounds (SVOCs)[1]

Reliable Steel Site
Olympia, Washington

Analyte	Proposed Stormwater Screening Levels[2]	Location[3]	SW-1		SW-2	SW-3	SW-4
		Sample ID	SW-1	RI-SW-1	RI-SW-2	RI-SW-3	RI-SW-4
		Date	3/3/08	9/16/10	9/16/10	9/16/10	9/16/10
SVOCs (µg/l)							
1,2,4-Trichlorobenzene	70		1 U	--	--	--	--
1,2-Dichlorobenzene	1,300		1 U	--	--	--	--
1,3-Dichlorobenzene	960		1 U	--	--	--	--
1,4-Dichlorobenzene	190		1 U	--	--	--	--
2,4,5-Trichlorophenol	3,600		10 U	--	--	--	--
2,4,6-Trichlorophenol	2.4		10 U	--	--	--	--
2,4-Dichlorophenol	191		10 U	--	--	--	--
2,4-Dimethylphenol	553		10 U	--	--	--	--
2,4-Dinitrophenol	3,457		30 U	--	--	--	--
2,4-Dinitrotoluene	3.4		1 U	--	--	--	--
2,6-Dinitrotoluene	NE		1 U	--	--	--	--
2-Chloronaphthalene	1,027		1 U	--	--	--	--
2-Chlorophenol	96.74		10 U	--	--	--	--
2-Methylnaphthalene	NE		1 U	--	--	--	--
2-Methylphenol	NE		10 U	--	--	--	--
2-Nitroaniline	NE		1 U	--	--	--	--
2-Nitrophenol	NE		10 U	--	--	--	--
3-Nitroaniline	NE		3 U	--	--	--	--
4,6-Dinitro-2-methylphenol	NE		30 U	--	--	--	--
4-Bromophenyl phenyl ether	NE		1 U	--	--	--	--
4-Chloro-3-methylphenol	NE		10 U	--	--	--	--
4-Chloroaniline	NE		3 U	--	--	--	--
4-Chlorophenyl phenyl ether	NE		1 U	--	--	--	--
4-Methylphenol	NE		10 U	--	--	--	--
4-Nitroaniline	NE		10 U	--	--	--	--
4-Nitrophenol	NE		10 U	--	--	--	--
Benzoic acid	NE		100 U	--	--	--	--
Benzyl alcohol	NE		1 U	--	--	--	--
Benzyl butyl phthalate	1,900		1 U	1 U	1 U	1 U	1 U
Bis(2-chloroethoxy)methane	NE		1 U	--	--	--	--
Bis(2-chloroethyl) ether	0.53		1 U	--	--	--	--

Table 22

Summary of Stormwater Chemical Analytical Results
Phthalates and Other Semi-volatile Organic Compounds (SVOCs)[1]

Reliable Steel Site
Olympia, Washington

Analyte	Proposed Stormwater Screening Levels[2]	Location[3]	SW-1		SW-2	SW-3	SW-4
		Sample ID	SW-1	RI-SW-1	RI-SW-2	RI-SW-3	RI-SW-4
		Date	3/3/08	9/16/10	9/16/10	9/16/10	9/16/10
SVOCs continued (µg/l)							
Bis(2-chloroisopropyl) ether	42,000		1 U	--	--	--	--
Bis(2-ethylhexyl) phthalate	2.2		10 U	10 U	10 U	10 U	10 U
Carbazole	NE		1 U	--	--	--	--
Dibenzofuran	NE		1 U	--	--	--	--
Diethyl phthalate	28,412		1 U	--	--	--	--
Dimethyl phthalate	1,100,000		1 U	1 U	1 U	1 U	1 U
Di-n-butyl phthalate	2,913		1 U	1 U	1 U	1 U	1 U
Di-n-octyl phthalate	NE		1 U	1 U	1 U	1 U	1 U
Hexachlorobenzene	1.0		1 U	--	--	--	--
Hexachlorobutadiene	18		1 U	--	--	--	--
Hexachlorocyclopentadiene	1,100		3 U	--	--	--	--
Hexachloroethane	3.3		1 U	--	--	--	--
Isophorone	600		1 U	--	--	--	--
Nitrobenzene	690		1 U	--	--	--	--
N-Nitroso-di-n-propylamine	0.51		1 U	--	--	--	--
N-Nitrosodiphenylamine	6		1 U	--	--	--	--
Pentachlorophenol	1.47		10 U	--	--	--	--
Phenol	556,000		10 U	--	--	--	--

Notes:

[1] Semi-volatile organic compounds (SVOCs) excluding polycyclic aromatic hydrocarbons (PAHs) are reported in this table. Results for PAHs are reported in Table 21.

[2] Proposed stormwater screening levels are referenced from Table 4.

[3] Sample locations are shown in Figure 17.

U = The analyte was not detected at a concentration greater than the identified reporting limit.

NE = not established

-- = not analyzed

µg/l = micrograms per liter

☐ Yellow border indicates that the method reporting limit was greater than the proposed screening level.

☐ Red border and bold text indicates that the analyte was detected at a concentration greater than the proposed screening level.

Table 23

Summary of Sediment Chemical Analytical Results

SMS Analytes (Results compared to SQS and CSL)

Reliable Steel Site
Olympia, Washington

	SMS[1]		Location[4]	EC-11	Sed.1	Sed.2	Sed.3	RGS-1	RGS-1	RGS-1	RGS-2
	SQS[2]	CSL[3]	Sample ID	EC-11(2-3.2)	Sed.1	Sed.2	Sed.3	RGS-1	RGS-1	RGS-1	RGS-2
Analyte			Depth	2-3.2 ft.	Surface	Surface	Surface	Surface	2-4 ft.	6-8 ft.	Surface
Conventionals											
Percent Fines (<62um) (%)	NE	NE		--	--	--	--	--	28	38.3	10.8
Preserved Total Solids (%)	NE	NE		--	--	--	--	--	--	--	--
Total Solids (%)	NE	NE		--	--	--	--	66.8	68.1	70.1	75.1
N-Ammonia (mg-N/kg)	NE	NE		--	--	--	--	2.91	--	--	3.87
Total sulfides (mg/kg)	NE	NE		--	--	--	--	308	--	--	132
Total Volatile Solids (%)	NE	NE		--	--	--	--	--	--	--	--
Total organic carbon (%)	NE	NE		--	--	--	--	1.29	1.68	1.21	1.75
Metals (mg/kg DW)											
Arsenic	57	93		--	3.57	3.05	1.96	7 U	7 U	7 U	6 U
Barium	NE	NE		--	21.8	70.3	77.4	--	--	--	--
Cadmium	5.1	6.7		--	1.11	0.5 U	0.5 U	1.2	1	1.4	0.6
Chromium (total)	260	270		--	23.3	28.9	20.5	20.8	20.3	24.6	30.2
Copper	390	390		--	24.4	38.6	11.7	20.5	14.4	16.1	25.4
Lead	450	530		--	59.6	73.7	42.8	33	4	3	41
Mercury	0.41	0.59		0.0455 J	0.1 U	0.118	0.1 U	0.09	0.07 U	0.05 U	0.21
Selenium	NE	NE		--	0.5 U	0.556	0.5 U	--	--	--	--
Silver	6.1	6.1		--	0.5 U	0.5 U	0.5 U	0.4 U	0.4 U	0.4 U	0.4 U
Zinc	410	960		--	--	--	--	209	42	30	270
Butyltin in Porewater (µg/l)											
Tributyltin Ion	0.15[5]			--	--	--	--	--	--	--	--
Petroleum Hydrocarbons (mg/kg DW)											
Gasoline-Range	NE			--	--	--	--	--	--	--	--
Diesel-Range	NE			--	--	--	--	23	--	--	14
Heavy Oil-Range	NE			--	--	--	--	62	--	--	36
Total petroleum hydrocarbons[6]	100[7]			--	--	--	--	85	--	--	50
LPAH[8] (mg/kg OC)											
1-Methylnaphthalene	NE	NE		--	--	--	--	--	1.19 U	1.653 U	--
2-Methylnaphthalene	38	64		--	--	--	--	1.6279	1.19 U	1.653 U	1.143 U
Acenaphthene	16	57		--	--	--	--	13.953	1.19 U	1.653 U	5.657
Acenaphthylene	66	66		--	--	--	--	1.5504 U	1.19 U	1.653 U	1.143 U
Anthracene	220	1,200		--	--	--	--	23.256	1.19 U	1.653 U	9.143
Fluorene	23	79		--	--	--	--	9.3023	1.19 U	1.653 U	4
Naphthalene	99	170		--	--	--	--	2.6357	1.19 U	1.653 U	1.429
Phenanthrene	100	480		--	--	--	--	77.519	2.024	1.653 U	37.71
Low Molecular Weight PAH	370	780		--	--	--	--	124.03 T	2.024 T	1.653 T	57.14 T
HPAH[9] (mg/kg OC)											
Benzo(a)anthracene	110	270		--	--	--	--	60.465	1.31	1.653 U	25.71
Benzo(a)pyrene	99	210		--	--	--	--	66.667	1.429	1.653 U	28
Benzo(b+k)fluoranthene	230	450		--	--	--	--	116.28	1.429	1.653 U	50.29
Benzo(g,h,i)perylene	31	78		--	--	--	--	26.357	1.19 U	1.653 U	10.29
Chrysene	110	460		--	--	--	--	68.992	1.488	1.653 U	30.29
Dibenzo(a,h)anthracene	12	33		--	--	--	--	18.6	0.369	0.512 U	6.286
Fluoranthene	160	1,200		--	--	--	--	124.03	3.155	1.653 U	62.86
Indeno(1, 2, 3-cd)pyrene	34	88		--	--	--	--	29.457	1.19 U	1.653 U	10.86
Pyrene	1,000	1,400		--	--	--	--	93.023	2.44	1.653 U	44
High Molecular Weight PAH	960	5,300		--	--	--	--	604.65 T	11.62 T	1.653 T	268.6 T
Chlorinated Hydrocarbons (mg/kg OC)											
1, 2, 4-Trichlorobenzene	0.81	1.8		--	--	--	--	0.4574 U	0.369 U	0.512 U	0.343 U
1, 2-Dichlorobenzene	2.3	2.3		--	--	--	--	4.57 U	0.369 U	0.512 U	0.343 U
1, 4-Dichlorobenzene	3.1	9		--	--	--	--	4.57 U	0.369 U	0.512 U	0.343 U
1, 3-Dichlorobenzene	NE	NE		--	--	--	--	--	1.19 U	1.653 U	--
Phthalates (mg/kg OC)											
Bis(2-ethylhexyl) phthalate	47	78		--	--	--	--	116.3	4.881	1.653 U	55.43
Butylbenzyl phthalate	4.9	64		--	--	--	--	5.19	0.952 U	1.322 U	3.886
Dibutyl phthalate	220	1,700		--	--	--	--	1.938	1.19 U	1.653 U	3.2
Diethyl phthalate	61	110		--	--	--	--	1.5504 U	1.19 U	1.653 U	1.143 U
Dimethyl phthalate	53	53		--	--	--	--	0.4574 U	1.19 U	1.653 U	0.343 U
Di-n-octyl phthalte	58	4,500		--	--	--	--	1.5504 U	1.19 U	1.653 U	1.143 U
Ionizable Organics (mg/kg DW)											
2, 4-Dimethylphenol	0.029	0.029		--	--	--	--	0.0059 U	0.006 U	0.006 U	0.006 U
2-Methylphenol	0.063	0.063		--	--	--	--	0.0059 U	0.006 U	0.006 U	0.006 U
4-Methylphenol	0.67	0.67		--	--	--	--	0.02 U	0.02 U	0.02 U	0.02 U
Pentachlorophenol	0.36	0.69		--	--	--	--	0.03 U	0.1 U	0.099 U	0.03 U
Phenol	0.42	1.2		--	--	--	--	0.29	0.02 U	0.02 U	0.36
Benzoic acid	0.65	0.65		--	--	--	--	0.2 U	0.2 U	0.2 U	0.2 U
Benzyl alcohol	0.057	0.073		--	--	--	--	0.02 U	0.031 U	0.031 U	0.02 U
Miscellaneous Extractables (mg/kg OC)											
Dibenzofuran	15	58		--	--	--	--	4.4961	1.19 U	1.653 U	2.114
Hexachlorobutadiene	3.9	6.2		--	--	--	--	0.4574 U	0.369 U	0.512 U	0.343 U
Hexachlorobenzene	0.38	2.3		--	--	--	--	0.46 U	0.37 U	0.51 U	0.343 U
N-Nitrosodiphenylamine	11	11		--	--	--	--	0.4574 U	0.369 U	0.512 U	0.343 U
Polychlorinated Biphenyls (mg/kg OC)											
Total PCBs	12	65		--	--	--	--	--	--	--	--

Table 23

Summary of Sediment Chemical Analytical Results
SMS Analytes (Results compared to SQS and CSL)

Reliable Steel Site
Olympia, Washington

	SMS[1]		Location[4]	RGS-2	RGS-3	RGS-4	RGS-5	RGS-6	RGS-7	RGS-7	RGS-7
	SQS[2]	CSL[3]	Sample ID	RGS-2	RGS-3	RGS-4	RGS-5	RGS-6	RGS-7	RGS-7	RGS-7
Analyte			Depth	0-2 ft.	Surface	Surface	Surface	Surface	Surface	0-2 ft.	2-4 ft.
Conventionals											
Percent Fines (<62um) (%)	NE	NE		18.5	--	--	--	--	--	24.6	28.9
Preserved Total Solids (%)	NE	NE		--	--	--	--	--	--	--	--
Total Solids (%)	NE	NE		73.8	74	69.1	75.4	76.6	75.8	59	68.8
N-Ammonia (mg-N/kg)	NE	NE		--	--	--	--	--	4.44	--	--
Total sulfides (mg/kg)	NE	NE		--	--	--	--	--	104	--	--
Total Volatile Solids (%)	NE	NE		--	--	3.05	2.35	1.74	1.55	--	--
Total organic carbon (%)	NE	NE		1.47	2.03	1.19	1.64	0.481	0.81	5.63	3.36
Metals (mg/kg DW)											
Arsenic	57	93		6 U	--	7 U	6 U	7 U	6 U	9 U	20 U
Barium	NE	NE		--	--	--	--	--	--	--	--
Cadmium	5.1	6.7		0.8	--	0.5	0.5	0.3 U	0.3 U	0.8	0.8
Chromium (total)	260	270		29.9	--	16.1	18	0.86	34.9	34.3	26
Copper	390	390		23.9	--	22.2	18.2	35.8	27.9	47.6	46
Lead	450	530		27	--	17	10	20	58	90	11
Mercury	0.41	0.59		0.08	--	0.06	0.05 U	0.06 U	0.14	0.89	1.19
Selenium	NE	NE		--	--	--	--	--	--	--	--
Silver	6.1	6.1		0.4 U	--	0.4 U	0.4 U	0.4 U	0.4 U	0.5 U	1 U
Zinc	410	960		206	--	66	45	153	343	218	59
Butyltin in Porewater (µg/l)											
Tributyltin Ion	0.15[5]			--	--	0.019 U	--	0.019 U	0.019 U	--	--
Petroleum Hydrocarbons (mg/kg DW)											
Gasoline-Range	NE			--	--	--	--	--	--	--	--
Diesel-Range	NE			--	--	19	53	21	26	--	--
Heavy Oil-Range	NE			--	--	87	77	54	69	--	--
Total petroleum hydrocarbons[6]	100[7]			--	--	106 [10]	130[11]	75	95	--	--
LPAH[8] (mg/kg OC)											
1-Methylnaphthalene	NE	NE		1.361 U	--	--	--	--	--	0.355 U	0.595 U
2-Methylnaphthalene	38	64		1.361 U	0.985 U	1.681 U	1.22 U	4.158 U	2.469 U	0.355 U	0.595 U
Acenaphthene	16	57		4.762	1.675	2.185	3.171	12.06	21	1.172	0.595 U
Acenaphthylene	66	66		1.361 U	0.985 U	1.681 U	1.22 U	4.158 U	2.469 U	0.391	0.595 U
Anthracene	220	1,200		8.163	2.906	8.403	10.37	22.87	33.33	2.309	0.595 U
Fluorene	23	79		3.673	1.281	2.437	2.622	10.4	13.58	0.977	0.595 U
Naphthalene	99	170		1.361	0.985 U	1.681 U	1.22 U	4.158 U	2.963	0.675	0.595 U
Phenanthrene	100	480		29.93	11.82	26.89	67.07	141.4	135.8	8.703	1.131
Low Molecular Weight PAH	370	780		47.89 T	17.73 T	40.34 T	85.37 T	187.1 T	209.9 T	14.23 T	1.131 T
HPAH[9] (mg/kg OC)											
Benzo(a)anthracene	110	270		21.09	9.852	22.69	37.2	91.48	85.19	7.105	7.738
Benzo(a)pyrene	99	210		21.77	10.84	16.81	24.39	85.24	93.83	7.815	0.863
Benzo(b+k)fluoranthene	230	450		39.46	19.7	33.61	51.22	170.5	172.8	15.28	1.518
Benzo(g,h,i)perylene	31	78		7.483	3.054	2.437	3.78	16.01	17.28	2.131	0.595 U
Chrysene	110	460		23.81	11.82	27.73	48.17	118.5	106.2	9.059	0.923
Dibenzo(a,h)anthracene	12	33		4.626	3.005	1.681 U	2.622	9.148	22.2	3.02	0.238
Fluoranthene	160	1,200		50.34	24.63	63.87	122	249.5	172.8	15.81	2.083
Indeno(1, 2, 3-cd)pyrene	34	88		9.524	3.448	6.555	9.756	37.4	43.2	2.664	0.595 U
Pyrene	1,000	1,400		35.37	19.21	52.1	97.56	195.4	172.8	15.45	1.905
High Molecular Weight PAH	960	5,300		213.5 T	103.4 T	226.9 T	396.3 T	977.1 T	888.9 T	78.33 T	8.304 T
Chlorinated Hydrocarbons (mg/kg OC)											
1, 2, 4-Trichlorobenzene	0.81	1.8		0.422 U	0.3 U	0.84 UJ	0.598 UJ	4.16 U	2.47 U	0.107 U	0.179 U
1, 2-Dichlorobenzene	2.3	2.3		0.422 U	0.3 U	1.681 U	1.22 U	4.16 U	2.47 U	0.107 U	0.179 U
1, 4-Dichlorobenzene	3.1	9		0.422 U	0.3 U	1.681 U	1.22 U	4.16 U	2.469 U	0.107 U	0.179 U
1, 3-Dichlorobenzene	NE	NE		1.361 U	--	--	--	--	--	0.355 U	0.595 U
Phthalates (mg/kg OC)											
Bis(2-ethylhexyl) phthalate	47	78		39.46	17.24	18.49	1.341	18.5	209.9	33.75	2.768
Butylbenzyl phthalate	4.9	64		1.497	0.64	1.681 U	1.22 U	7.90	3.457	0.515	0.476 U
Dibutyl phthalate	220	1,700		1.769	0.985 U	1.681 U	1.22 U	4.158 U	11.11	0.799	0.595 U
Diethyl phthalate	61	110		1.361 U	0.985 U	1.681 U	1.22 U	4.158 U	2.469 U	0.355 U	0.595 U
Dimethyl phthalate	53	53		1.361 U	0.3 U	1.681 U	1.22 U	4.158 U	2.469 U	0.355 U	0.595 U
Di-n-octyl phthalte	58	4,500		1.361 U	0.985 U	1.681 U	1.22 U	4.158 U	2.469 U	0.355 U	0.595 U
Ionizable Organics (mg/kg DW)											
2, 4-Dimethylphenol	0.029	0.029		0.006 U	0.006 U	0.02 U	0.02	0.02 U	0.02 U	0.006 U	0.006 U
2-Methylphenol	0.063	0.063		0.006 U	0.006 U	0.02 U	0.02 U	0.02 U	0.02 U	0.006 U	0.006 U
4-Methylphenol	0.67	0.67		0.02 U	0.002 U	0.02 U	0.11 U	0.02 U	0.02 U	0.02 U	0.02 U
Pentachlorophenol	0.36	0.69		0.1 U	0.003 U	0.099 U	0.098 U	0.098 U	0.099 U	0.1 U	0.99 U
Phenol	0.42	1.2		0.02 U	0.23	0.02 U	0.021 J J	0.02 U	0.23 J J	0.035	0.02 U
Benzoic acid	0.65	0.65		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Benzyl alcohol	0.057	0.073		0.031 U	0.02 U	0.02 U	0.02 U	0.046	0.02 U	0.031 U	0.031 U
Miscellaneous Extractables (mg/kg OC)											
Dibenzofuran	15	58		1.769	0.985 U	1.681 U	1.22 U	4.574	6.42	0.462	0.595 U
Hexachlorobutadiene	3.9	6.2		0.422 U	0.3 U	0.084 U	0.061 U	0.208 U	0.123 U	0.107 U	0.179 U
Hexachlorobenzene	0.38	2.3		0.42 U	0.3 U	0.084 U	0.061 U	0.208 U	0.123 U	0.107 U	0.179 U
N-Nitrosodiphenylamine	11	11		0.422 U	0.3 U	1.681 U	1.22 U	4.158 U	2.469 U	0.107 U	0.179 U
Polychlorinated Biphenyls (mg/kg OC)											
Total PCBs	12	65		--	--	1.681 UT	1.159 UT	19.33 T	11.85 T	--	--

Table 23

Summary of Sediment Chemical Analytical Results
SMS Analytes (Results compared to SQS and CSL)

Reliable Steel Site
Olympia, Washington

	SMS[1]		Location[4]	RGS-8	RGS-8	RGS-8	RGS-9	RGS-10	RGS-11	T1-Sed	T1B-Sed
	SQS[2]	CSL[3]	Sample ID	RGS-8	RGS-8	RGS-8	RGS-9	RGS-10	RGS-11	T1-Sed	T1B-Sed
Analyte			Depth	Surface	2-4 ft.	6-8 ft.	Surface	Surface	Surface	Surface	Surface
Conventionals											
Percent Fines (<62um) (%)	NE	NE		--	24.5	42.5	25.1	26.8	28.3	11.81	27.29
Preserved Total Solids (%)	NE	NE		--	--	--	--	--	--	--	--
Total Solids (%)	NE	NE		78.2	75.7	71	58.1	56.2	53.1	73.7	53
N-Ammonia (mg-N/kg)	NE	NE		--	--	--	4.96	4.85	5.44	--	--
Total sulfides (mg/kg)	NE	NE		--	--	--	316	400	339	--	--
Total Volatile Solids (%)	NE	NE		1.93	--	--		--	--	2.84	12.4
Total organic carbon (%)	NE	NE		0.37	0.5	0.8	2.16	1.53	3.06	0.77	5.82
Metals (mg/kg DW)											
Arsenic	57	93		6 U	6 U	7 U	8 U	8 U	10 U	2.59 J	4.44 J
Barium	NE	NE		--	--	--	--	--	--	--	--
Cadmium	5.1	6.7		0.3 U	0.6	1.1	1.4	1.5	1.4	0.72	1.16
Chromium (total)	260	270		26.8	14.6	22.8	18.1	22.7	18	20.4 J	24.2 J
Copper	390	390		32	14.2	15	24.1	50.6	22.8	16.8 J	41.4 J
Lead	450	530		54	3 U	3 U	12	23	12	34.6	52.7
Mercury	0.41	0.59		0.15	0.06 U	0.06 U	0.12	0.14	0.14	0.092	0.314
Selenium	NE	NE		--	--	--	--	--	--	--	--
Silver	6.1	6.1		0.4 U	0.4 U	0.4 U	0.5 U	0.5 U	0.6 U	0.11	0.21
Zinc	410	960		382	22	31	62	127	62	260 J	182 J
Butyltin in Porewater (µg/l)											
Tributyltin Ion	0.15[5]			0.019 U	--	--	--	--	--	--	--
Petroleum Hydrocarbons (mg/kg DW)											
Gasoline-Range	NE			--	--	--	--	--	--	--	--
Diesel-Range	NE			64	--	--	17	20	19	--	--
Heavy Oil-Range	NE			160	--	--	48	61	54	--	--
Total petroleum hydrocarbons[6]	100[7]			224	--	--	65	81	73	--	--
LPAH[8] (mg/kg OC)											
1-Methylnaphthalene	NE	NE		--	4 U	2.5 U	0.926 U	1.307 U	0.654 U	--	--
2-Methylnaphthalene	38	64		9.72973	4 U	2.5 U	0.926 U	1.307 U	0.654 U	1.039	0.481 J
Acenaphthene	16	57		45.9	4 U	2.5 U	1.157	3.399	0.654 U	8.442	3.608
Acenaphthylene	66	66		5.40541 U	4 U	2.5 U	0.926 U	1.307 U	0.654 U	1.104	0.644
Anthracene	220	1,200		91.8919	4 U	2.5 U	4.028	5.49	0.654 U	18.18	6.701
Fluorene	23	79		40.5	4 U	2.5 U	1.019	2.68	0.654 U	7.143	2.405
Naphthalene	99	170		16.2162	4 U	2.5 U	0.926 U	1.307 U	0.654 U	2.597	0.997
Phenanthrene	100	480		324.3	4 U	2.5 U	12.5	21.57	2.255	70.13	24.05
Low Molecular Weight PAH	370	780		513.5 T	4 UT	2.5 UT	18.7 T	33.14 T	2.255 T	108.6 T	38.49 T
HPAH[9] (mg/kg OC)											
Benzo(a)anthracene	110	270		210.8	4 U	6.875	10.19	16.34	1.928	63.64	18.9
Benzo(a)pyrene	99	210		248.649	4 U	4	8.333	16.99	2.124	62.34	18.9
Benzo(b+k)fluoranthene	230	450		459.459	4 U	3.125	14.35	30.72	4.02	105.2	30.76
Benzo(g,h,i)perylene	31	78		35.1	4 U	2.5 U	2.685	6.013	0.817	37.7	11.68
Chrysene	110	460		251.4	4 U	6.25	11.11	18.95	2.386	71.43	20.62
Dibenzo(a,h)anthracene	12	33		45.9459	1.2 U	0.75 U	0.556	2.81	0.49	9.481	2.749
Fluoranthene	160	1,200		513.5	5.4	3.5	25.93	37.91	4.575	119.5	37.8
Indeno(1, 2, 3-cd)pyrene	34	88		86.5	4 U	2.5 U	2.87	7.19	0.948	40.3	12.37
Pyrene	1,000	1,400		405.405	4 U	6	17.13	27.45	3.595	107.8	36.08
High Molecular Weight PAH	960	5,300		2,243 T	5.4 T	29.75 T	93.15 T	164.4 T	20.88 T	617.3 T	189.9 T
Chlorinated Hydrocarbons (mg/kg OC)											
1, 2, 4-Trichlorobenzene	0.81	1.8		5.41 U	1.20 U	0.75 U	0.278 U	0.392 U	0.196 U	0.273 U	0.258 U
1, 2-Dichlorobenzene	2.3	2.3		5.41 U	1.2 U	0.75 U	0.278 U	0.392 U	0.196 U	0.234 U	0.223 U
1, 4-Dichlorobenzene	3.1	9		5.41 U	1.2 U	0.75 U	0.278 U	0.392 U	0.196 U	0.338 U	0.309 U
1, 3-Dichlorobenzene	NE	NE		--	4 U	2.5 U	0.926 U	1.307 U	0.654 U	0.286 U	0.275 U
Phthalates (mg/kg OC)											
Bis(2-ethylhexyl) phthalate	47	78		5,135	4 U	2.5 U	7.407	41.18	8.497	181.8	56.7
Butylbenzyl phthalate	4.9	64		6.22	3 U	1.875 U	0.741 U	1.111	0.49 U	5.45	0.979
Dibutyl phthalate	220	1,700		29.7297	4 U	2.5 U	0.926 U	20.92	0.654 U	2.078	0.43 U
Diethyl phthalate	61	110		5.40541 U	4 U	2.5 U	0.926 U	1.307 U	0.654 U	0.623 U	0.584 U
Dimethyl phthalate	53	53		5.40541 U	4 U	2.5 U	0.926 U	1.307 U	0.654 U	0.325 U	0.292 U
Di-n-octyl phthalte	58	4,500		5.40541 U	4 U	2.5 U	0.926 U	1.307 U	0.654 U	0.221 U	0.206 U
Ionizable Organics (mg/kg DW)											
2, 4-Dimethylphenol	0.029	0.029		0.02 U	0.006 U	0.006 U	0.006 U	0.006 U	0.006 U	0.008 U	0.05 U
2-Methylphenol	0.063	0.063		0.02 U	0.006 U	0.006 U	0.006 U	0.006 U	0.006 U	0.005 U	0.033 U
4-Methylphenol	0.67	0.67		0.088	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.007	0.073
Pentachlorophenol	0.36	0.69		0.099 U	0.99 U	0.99 U	0.99 U	0.1 U	0.1 U	0.012 U	0.081 U
Phenol	0.42	1.2		0.066 J	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.011	0.039 J
Benzoic acid	0.65	0.65		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.14 U	0.91 U
Benzyl alcohol	0.057	0.073		0.02 U	0.031 U	0.031 U	0.031 U	0.031 U	0.031 U	0.005 U	0.035 U
Miscellaneous Extractables (mg/kg OC)											
Dibenzofuran	15	58		23.78	4 U	2.5 U	0.926 U	1.307 U	0.654 U	3.117	1.065
Hexachlorobutadiene	3.9	6.2		0.54054 U	1.2 U	0.75 U	0.278 U	0.392 U	0.196 U	0.247 U	0.241 U
Hexachlorobenzene	0.38	2.3		0.54 U	1.20 U	0.75 U	0.278 U	0.39 U	0.196 U	0.377 U	0.344 U
N-Nitrosodiphenylamine	11	11		5.40541 U	1.2 U	0.75 U	0.278 U	0.392 U	0.196 U	0.39 U	0.361 U
Polychlorinated Biphenyls (mg/kg OC)											
Total PCBs	12	65		T	--	--	--	--	--	1.948 T	2.062 T

Table 23

Summary of Sediment Chemical Analytical Results
SMS Analytes (Results compared to SQS and CSL)

Reliable Steel Site
Olympia, Washington

	SMS[1]		Location[4]	BI-S32	GS-04	RI-S-1	RI-S-2	RI-S-2	RI-S-2
	SQS[2]	CSL[3]	Sample ID	BI-S32	GS-04	RI-S-1	RI-S-2	RI-S-2	RI-S-2
Analyte			Depth	Surface	Surface	Surface	Surface	2-4 ft	4-6 ft
Conventionals									
Percent Fines (<62um) (%)	NE	NE		78.5	--	--	--	--	--
Preserved Total Solids (%)	NE	NE		--	--	45.7	68.6	--	--
Total Solids (%)	NE	NE		38.5	--	44.7	73.9	--	--
N-Ammonia (mg-N/kg)	NE	NE		7.88	15.6	20	11.9	--	--
Total sulfides (mg/kg)	NE	NE		6.02	487	1550	18.2	--	--
Total Volatile Solids (%)	NE	NE		12.4	--	7.56	2.09	--	--
Total organic carbon (%)	NE	NE		4.28	3.10	2.83	1.63	--	--
Metals (mg/kg DW)									
Arsenic	57	93		6.74 J	22 U	--	--	--	--
Barium	NE	NE		--	--	--	--	--	--
Cadmium	5.1	6.7		2.32	2.2	--	--	--	--
Chromium (total)	260	270		36.3 J	35.5	--	--	--	--
Copper	390	390		51.1 J	50.2	--	--	--	--
Lead	450	530		52.8	43.5	--	--	--	--
Mercury	0.41	0.59		0.187	0.23	--	--	0.75	0.12
Selenium	NE	NE		--	--	--	--	--	--
Silver	6.1	6.1		0.52	2.2 U	--	--	--	--
Zinc	410	960		133 J	166	--	--	--	--
Butyltin in Porewater (µg/l)									
Tributyltin Ion	0.15[5]			0.041 U	--	--	--	--	--
Petroleum Hydrocarbons (mg/kg DW)									
Gasoline-Range	NE			--	--	22 U	--	--	--
Diesel-Range	NE			--	--	55 U	--	--	--
Heavy Oil-Range	NE			--	--	100 U	--	--	--
Total petroleum hydrocarbons[6]	100[7]			--	--	100 UT	--	--	--
LPAH[8] (mg/kg OC)									
1-Methylnaphthalene	NE	NE		--	--	--	--	--	--
2-Methylnaphthalene	38	64		0.42056 J	18.7097 U	0.70671 U	13	–	–
Acenaphthene	16	57		1.82243	18.71 U	1.2	29	–	–
Acenaphthylene	66	66		0.74766	18.7097 U	0.70671 U	1.226994 U	–	–
Anthracene	220	1,200		3.50467	18.7097 U	2.8	49	–	–
Fluorene	23	79		1.4486	18.7097 U	1.2	28	–	–
Naphthalene	99	170		1.51869	18.7097 U	0.56537 J	9.2	–	–
Phenanthrene	100	480		16.1215	29.3548	8.5	310	–	–
Low Molecular Weight PAH	370	780		24.7664 T	29.3548 T	13.9929 JT	440 T	–	–
HPAH[9] (mg/kg OC)									
Benzo(a)anthracene	110	270		11.4486	27.0968	6.7	210	–	–
Benzo(a)pyrene	99	210		11.9159	27.7419	7.1	200	–	–
Benzo(b+k)fluoranthene	230	450		22.8972	32.2581	14	330	–	–
Benzo(g,h,i)perylene	31	78		7.24299	18.7097 U	3.5	98	–	–
Chrysene	110	460		15.1869	35.4839	10	270	–	–
Dibenzo(a,h)anthracene	12	33		1.79907	18.71 U	1.2	42	–	–
Fluoranthene	160	1,200		32.7103	54.8387	15	370	–	–
Indeno(1, 2, 3-cd)pyrene	34	88		7.94393	18.7097 U	3.9	100	–	–
Pyrene	1,000	1,400		28.0374	48.3871	13	330	–	–
High Molecular Weight PAH	960	5,300		139.182 T	170.968 T	75.0177 T	2,000 T	–	–
Chlorinated Hydrocarbons (mg/kg OC)									
1, 2, 4-Trichlorobenzene	0.81	1.8		0.18224 U	18.71 U	--	--	--	--
1, 2-Dichlorobenzene	2.3	2.3		0.15888 U	18.71 U	--	--	--	--
1, 4-Dichlorobenzene	3.1	9		0.23131 U	18.71 U	--	--	--	--
1, 3-Dichlorobenzene	NE	NE		0.19626 U	18.7097 U	--	--	--	--
Phthalates (mg/kg OC)									
Bis(2-ethylhexyl) phthalate	47	78		32.7103	93.548	--	--	--	--
Butylbenzyl phthalate	4.9	64		0.79439	18.71 U	--	--	--	--
Dibutyl phthalate	220	1,700		0.77103	18.7097 U	--	--	--	--
Diethyl phthalate	61	110		0.44393 U	18.7097 U	--	--	--	--
Dimethyl phthalate	53	53		0.21963 U	18.7097 U	--	--	--	--
Di-n-octyl phthalte	58	4,500		0.1472 U	18.7097 U	--	--	--	--
Ionizable Organics (mg/kg DW)									
2, 4-Dimethylphenol	0.029	0.029		0.029 U	0.58 U	--	--	--	--
2-Methylphenol	0.063	0.063		0.018 U	0.58 U	--	--	--	--
4-Methylphenol	0.67	0.67		0.04	0.58 U	--	--	--	--
Pentachlorophenol	0.36	0.69		0.045 U	3.50 U	--	--	--	--
Phenol	0.42	1.2		0.017 J	0.58 U	--	--	--	--
Benzoic acid	0.65	0.65		0.5 U	3.50 U	--	--	--	--
Benzyl alcohol	0.057	0.073		0.02 U	0.58 U	--	--	--	--
Miscellaneous Extractables (mg/kg OC)									
Dibenzofuran	15	58		0.70093	18.71 U	--	--	--	--
Hexachlorobutadiene	3.9	6.2		0.17056 U	18.71 U	--	--	--	--
Hexachlorobenzene	0.38	2.3		0.25701 U	18.71 U	--	--	--	--
N-Nitrosodiphenylamine	11	11		0.28037 U	112.9 U	--	--	--	--
Polychlorinated Biphenyls (mg/kg OC)									
Total PCBs	12	65		6.30841 T	6.12903 UT	--	--	--	--

Table 23

Summary of Sediment Chemical Analytical Results
SMS Analytes (Results compared to SQS and CSL)

Reliable Steel Site
Olympia, Washington

Analyte	SMS[1] SQS[2]	SMS[1] CSL[3]	Location[4]	RI-S-3				RI-S-4			RI-S-5	RI-S-6	RI-S-7
			Sample ID	RI-S-3	RI-S-3	RI-S-3	RI-S-3	RI-S-4	RI-S-4	RI-S-4	RI-S-5	RI-S-6	RI-S-7
			Depth	Surface	2-4 ft	4-6 ft	6-8 ft	Surface	2-4 ft	4-6 ft	Surface	Surface	Surface
Conventionals													
Percent Fines (<62um) (%)	NE	NE		--	--	--	--	--	--	--	--	--	--
Preserved Total Solids (%)	NE	NE		80.4	--	--	--	74.2	--	--	78.5	76	77.5
Total Solids (%)	NE	NE		75.1	--	--	--	73.7	--	--	75.3	76.1	73.2
N-Ammonia (mg-N/kg)	NE	NE		4.5	--	--	--	6.59	--	--	0.97	2.65	1.79
Total sulfides (mg/kg)	NE	NE		62.9	--	--	--	825	--	--	6.49	220	338
Total Volatile Solids (%)	NE	NE		1.36	--	--	--	1.66	--	--	1.56	1.32	1.47
Total organic carbon (%)	NE	NE		0.558	--	--	--	0.684	--	--	0.64	0.963	0.942
Metals (mg/kg DW)													
Arsenic	57	93		--	--	--	--	--	--	--	--	--	--
Barium	NE	NE		--	--	--	--	--	--	--	--	--	--
Cadmium	5.1	6.7		--	--	--	--	--	--	--	--	--	--
Chromium (total)	260	270		--	--	--	--	--	--	--	--	--	--
Copper	390	390		--	--	--	--	--	--	--	--	--	--
Lead	450	530		--	--	--	--	--	--	--	--	--	--
Mercury	0.41	0.59		0.08	0.61	1.06	0.26	--	0.03 U	0.04	--	--	--
Selenium	NE	NE		--	--	--	--	--	--	--	--	--	--
Silver	6.1	6.1		--	--	--	--	--	--	--	--	--	--
Zinc	410	960		--	--	--	--	--	--	--	--	--	--
Butyltin in Porewater (µg/l)													
Tributyltin Ion	0.15[5]			--	--	--	--	--	--	--	--	--	--
Petroleum Hydrocarbons (mg/kg DW)													
Gasoline-Range	NE			--	--	--	--	--	--	--	22 U	--	--
Diesel-Range	NE			--	--	--	--	--	--	--	55 U	--	--
Heavy Oil-Range	NE			--	--	--	--	--	--	--	100 U	--	--
Total petroleum hydrocarbons[6]	100[7]			--	--	--	--	--	--	--	100 UT	--	--
LPAH[8] (mg/kg OC)													
1-Methylnaphthalene	NE	NE		--	--	--	--	--	--	--	--	--	--
2-Methylnaphthalene	38	64		3.584 U	--	--	--	14.0351 U	--	--	2.9688 U	1.869 J	3.9
Acenaphthene	16	57		9.7	--	--	--	23	--	--	15	12	18
Acenaphthylene	66	66		3.584 U	--	--	--	14.0351 U	--	--	2.9688 U	2.077 U	2.017
Anthracene	220	1,200		17	--	--	--	260	--	--	28	22	30
Fluorene	23	79		7.5	--	--	--	26	--	--	6.9	9.4	16
Naphthalene	99	170		2.151 J	--	--	--	14.0351 U	--	--	1.875 J	2.6	11
Phenanthrene	100	480		73	--	--	--	500	--	--	110	73	93
Low Molecular Weight PAH	370	780		110 JT	--	--	--	809.942 T	--	--	160 JT	120 JT	170
HPAH[9] (mg/kg OC)													
Benzo(a)anthracene	110	270		56	--	--	--	660	--	--	130	53	66
Benzo(a)pyrene	99	210		65	--	--	--	450	--	--	110	60	71
Benzo(b+k)fluoranthene	230	450		120	--	--	--	760	--	--	190	110	120
Benzo(g,h,i)perylene	31	78		15	--	--	--	180	--	--	66	15	45
Chrysene	110	460		65	--	--	--	670	--	--	130	58	71
Dibenzo(a,h)anthracene	12	33		7.5	--	--	--	86	--	--	22	7.9	16
Fluoranthene	160	1,200		110	--	--	--	1,000	--	--	200	91	110
Indeno(1, 2, 3-cd)pyrene	34	88		17	--	--	--	200	--	--	66	18	45
Pyrene	1,000	1,400		95	--	--	--	1000	--	--	190	79	110
High Molecular Weight PAH	960	5,300		550 T	--	--	--	5,000 T	--	--	1,100 T	500 T	640 T
Chlorinated Hydrocarbons (mg/kg OC)													
1, 2, 4-Trichlorobenzene	0.81	1.8		--	--	--	--	--	--	--	--	--	--
1, 2-Dichlorobenzene	2.3	2.3		--	--	--	--	--	--	--	--	--	--
1, 4-Dichlorobenzene	3.1	9		--	--	--	--	--	--	--	--	--	--
1, 3-Dichlorobenzene	NE	NE		--	--	--	--	--	--	--	--	--	--
Phthalates (mg/kg OC)													
Bis(2-ethylhexyl) phthalate	47	78		--	--	--	--	--	--	--	--	--	--
Butylbenzyl phthalate	4.9	64		--	--	--	--	--	--	--	--	--	--
Dibutyl phthalate	220	1,700		--	--	--	--	--	--	--	--	--	--
Diethyl phthalate	61	110		--	--	--	--	--	--	--	--	--	--
Dimethyl phthalate	53	53		--	--	--	--	--	--	--	--	--	--
Di-n-octyl phthalte	58	4,500		--	--	--	--	--	--	--	--	--	--
Ionizable Organics (mg/kg DW)													
2, 4-Dimethylphenol	0.029	0.029		--	--	--	--	--	--	--	--	--	--
2-Methylphenol	0.063	0.063		--	--	--	--	--	--	--	--	--	--
4-Methylphenol	0.67	0.67		--	--	--	--	--	--	--	--	--	--
Pentachlorophenol	0.36	0.69		--	--	--	--	--	--	--	--	--	--
Phenol	0.42	1.2		--	--	--	--	--	--	--	--	--	--
Benzoic acid	0.65	0.65		--	--	--	--	--	--	--	--	--	--
Benzyl alcohol	0.057	0.073		--	--	--	--	--	--	--	--	--	--
Miscellaneous Extractables (mg/kg OC)													
Dibenzofuran	15	58		--	--	--	--	--	--	--	--	--	--
Hexachlorobutadiene	3.9	6.2		--	--	--	--	--	--	--	--	--	--
Hexachlorobenzene	0.38	2.3		--	--	--	--	--	--	--	--	--	--
N-Nitrosodiphenylamine	11	11		--	--	--	--	--	--	--	--	--	--
Polychlorinated Biphenyls (mg/kg OC)													
Total PCBs	12	65		--	--	--	--	--	--	--	--	--	--

Table 23

Summary of Sediment Chemical Analytical Results

SMS Analytes (Results compared to SQS and CSL)

Reliable Steel Site
Olympia, Washington

Notes:

[1] Washington State Sediment Management Standards.

[2] Sediment Quality Standards (SQS) referenced from Table 5.

[3] Cleanup Screening Level (CSL) referenced from Table 5.

[4] Sample locations are shown in Figure 5.

[5] Dredged Material Management Program (DMMP) screening level.

[6] Total petroleum hydrocarbons is the sum of detected concentrations of diesel- and oil-range petroleum hydrocarbons.

[7] Cleanup level based on Ecology recommendation.

[8] Low Molecular weight polycyclic aromatic hydrocarbons.

[9] High Molecular weight polycyclic aromatic hydrocarbons.

[10] An additional sample, RI-S-1. was collected from this location to evaluate the total petroleum hydrocarbon concentration. Total petroleum hydrocarbons were not detected at this location in the additional sample.

[11] Review of chromatogram for this sample indicates diesel and oil were present. The screening criteria was compared to individual petroleum hydrocarbons and diesel and heavy oil concentrations are less than the screening criteria.

U = The analyte was not detected at a concentration greater than the identified reporting limit.

J = The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

T = Calculated sum of individual compounds or congeners.

NE = Criteria not established for this analyte

-- = not analyzed

DW = Dry weight

OC = Organic carbon normalized

mg/kg = milligrams per kilogram

µg/l = micrograms per liter

Gray shading indicates that the organic carbon content of the sample was between 0.5 and 3.5 percent and therefore, the organic carbon normalized SQS and CSL criteria apply to the result for this sample.

☐ Yellow bordering indicates that the method reporting limit was above SQS and/or CSL.

☐ Blue border and bold text indicates that the analyte was detected at a concentration greater than SQS but less than the CSL.

☐ Red bordering and bolding indicates analyte was detected at a concentration above CSL.

Table 24

Summary of Sediment Chemical Analytical Results
SMS Analytes (Results compared to LAET and 2LAET)

Reliable Steel Site
Olympia, Washington

Analyte	SMS[1]		Location[4]	EC-11	Sed.1	Sed.2	Sed.3	RGS-1		
	LAET[2]	2LAET[3]	Sample ID	EC-11(2-3.2)	Sed.1	Sed.2	Sed.3	RGS-1	RGS-1	RGS-1
			Depth	2-3.2 ft.	Surface	Surface	Surface	Surface	2-4 ft.	6-8 ft.
Conventionals										
Percent Fines (<62um) (%)	NE	NE		--	--	--	--	--	28	38.3
Preserved Total Solids (%)	NE	NE		--	--	--	--	--	--	--
Total Solids (%)	NE	NE		--	--	--	--	66.8	68.1	70.1
N-Ammonia (mg-N/kg)	NE	NE		--	--	--	--	2.91	--	--
Total sulfides (mg/kg)	NE	NE		--	--	--	--	308	--	--
Total Volatile Solids (%)	NE	NE		--	--	--	--	--	--	--
Total organic carbon (%)	NE	NE		--	--	--	--	1.29	1.68	1.21
Metals (mg/kg DW)										
Arsenic	57	93		--	3.57	3.05	1.96	7 U	7 U	7 U
Barium	NE	NE		--	21.8	70.3	77.4	--	--	--
Cadmium	5.1	6.7		--	1.11	0.5 U	0.5 U	1.2	1	1.4
Chromium (total)	260	270		--	23.3	28.9	20.5	20.8	20.3	24.6
Copper	390	390		--	24.4	38.6	11.7	20.5	14.4	16.1
Lead	450	530		--	59.6	73.7	42.8	33	4	3
Mercury	0.41	0.59		0.046 J	0.1 U	0.118	0.1 U	0.09	0.07 U	0.05 U
Selenium	NE	NE		--	0.5 U	0.556	0.5 U	--	--	--
Silver	6.1	6.1		--	0.5 U	0.5 U	0.5 U	0.4 U	0.4 U	0.4 U
Zinc	410	960		--	--	--	--	209	42	30
Butyltin in Porewater (µg/l)										
Tributyltin Ion	0.15[5]			--	--	--	--	--	--	--
Petroleum Hydrocarbons (mg/kg DW)										
Gasoline-Range	NE			--	--	--	--	--	--	--
Diesel-Range	NE			--	--	--	--	23	--	--
Heavy Oil-Range	NE			--	--	--	--	62	--	--
Total petroleum hydrocarbons[6]	100[7]			--	--	--	--	85	--	--
LPAH[8] (mg/kg DW)										
1-Methylnaphthalene	NE	NE		--	--	--	--	--	0.02 U	0.02 U
2-Methylnaphthalene	0.67	0.67		--	--	--	--	0.021	0.02 U	0.02 U
Acenaphthene	0.5	0.5		--	--	--	--	0.18	0.02 U	0.02 U
Acenaphthylene	1.3	1.3		--	--	--	--	0.02 U	0.02 U	0.02 U
Anthracene	0.96	0.96		--	--	--	--	0.3	0.02 U	0.02 U
Fluorene	0.54	0.54		--	--	--	--	0.12	0.02 U	0.02 U
Naphthalene	2.1	2.1		--	--	--	--	0.034	0.02 U	0.02 U
Phenanthrene	1.5	1.5		--	--	--	--	1	0.034	0.02 U
Low Molecular Weight PAH	5.2	5.2		--	--	--	--	1.6 T	0.034 T	0.02 T
HPAH[9] (mg/kg DW)										
Benzo(a)anthracene	1.3	1.6		--	--	--	--	0.78	0.022	0.02 U
Benzo(a)pyrene	1.6	1.6		--	--	--	--	0.86	0.024	0.02 U
Benzo(b+k)fluoranthene	3.2	3.6		--	--	--	--	1.5	0.024	0.02 U
Benzo(g,h,i)perylene	0.67	0.72		--	--	--	--	0.34	0.02 U	0.02 U
Chrysene	1.4	2.8		--	--	--	--	0.89	0.025	0.02 U
Dibenzo(a,h)anthracene	0.23	0.23		--	--	--	--	**0.24**	0.0062	0.006 U
Fluoranthene	1.7	2.5		--	--	--	--	1.6	0.053	0.02 U
Indeno(1, 2, 3-cd)pyrene	0.6	0.69		--	--	--	--	0.38	0.02 U	0.02 U
Pyrene	2.6	3.3		--	--	--	--	1.2	0.041	0.02 U
High Molecular Weight PAH	12	17		--	--	--	--	7.8 T	0.1952 T	0.02 T
Chlorinated Hydrocarbons (mg/kg DW)										
1, 2, 4-Trichlorobenzene	0.031	0.051		--	--	--	--	0.0059 U	0.0062 U	0.006 U
1, 2-Dichlorobenzene	0.035	0.05		--	--	--	--	0.059 U	0.0062 U	0.006 U
1, 4-Dichlorobenzene	0.11	0.11		--	--	--	--	0.059 U	0.0062 U	0.006 U
1, 3-Dichlorobenzene	0.17	NE		--	--	--	--	--	0.02 U	0.02 U
Phthalates (mg/kg DW)										
Bis(2-ethylhexyl) phthalate	1.3	3.1		--	--	--	--	1.5	0.082	0.02 U
Butylbenzyl phthalate	0.063	0.9		--	--	--	--	0.067	0.016 U	0.016 U
Dibutyl phthalate	1.4	5.1		--	--	--	--	0.025	0.02 U	0.02 U
Diethyl phthalate	0.2	1.2		--	--	--	--	0.02 U	0.02 U	0.02 U
Dimethyl phthalate	0.071	0.16		--	--	--	--	0.0059 U	0.02 U	0.02 U
Di-n-octyl phthalte	6.2	6.2		--	--	--	--	0.02 U	0.02 U	0.02 U
Ionizable Organics (mg/kg DW)										
2, 4-Dimethylphenol	0.029	0.029		--	--	--	--	0.0059 U	0.0062 U	0.006 U
2-Methylphenol	0.063	0.063		--	--	--	--	0.0059 U	0.0062 U	0.006 U
4-Methylphenol	0.67	0.67		--	--	--	--	0.02 U	0.02 U	0.02 U
Pentachlorophenol	0.36	0.69		--	--	--	--	0.03 U	0.1 U	0.099 U
Phenol	0.42	1.2		--	--	--	--	0.29	0.02 U	0.02 U
Benzoic acid	0.65	0.65		--	--	--	--	0.2 U	0.2 U	0.2 U
Benzyl alcohol	0.057	0.073		--	--	--	--	0.02 U	0.031 U	0.031 U
Miscellaneous Extractables (mg/kg DW)										
Dibenzofuran	0.54	0.54		--	--	--	--	0.058	0.02 U	0.02 U
Hexachlorobutadiene	0.011	0.12		--	--	--	--	0.0059 U	0.0062 U	0.006 U
Hexachlorobenzene	0.022	0.07		--	--	--	--	0.0059 U	0.0062 U	0.006 U
N-Nitrosodiphenylamine	0.028	0.04		--	--	--	--	0.0059 U	0.0062 U	0.006 U
Polychlorinated Biphenyls (mg/kg DW)										
Total PCBs	0.13	1.0		--	--	--	--	--	--	--

Table 24

Summary of Sediment Chemical Analytical Results

SMS Analytes (Results compared to LAET and 2LAET)

Reliable Steel Site
Olympia, Washington

	SMS[1]		Location[4]	RGS-2		RGS-3	RGS-4	RGS-5	RGS-6	RGS-7		
	LAET[2]	2LAET[3]	Sample ID	RGS-2	RGS-2	RGS-3	RGS-4	RGS-5	RGS-6	RGS-7	RGS-7	RGS-7
Analyte			Depth	Surface	0-2 ft.	Surface	Surface	Surface	Surface	Surface	0-2 ft.	2-4 ft.
Conventionals												
Percent Fines (<62um) (%)	NE	NE		10.8	18.5	--	--	--	--	--	24.6	28.9
Preserved Total Solids (%)	NE	NE		--	--	--	--	--	--	--	--	--
Total Solids (%)	NE	NE		75.1	73.8	74	69.1	75.4	76.6	75.8	59	68.8
N-Ammonia (mg-N/kg)	NE	NE		3.87	--	--	--	--	--	4.44	--	--
Total sulfides (mg/kg)	NE	NE		132	--	--	--	--	--	104	--	--
Total Volatile Solids (%)	NE	NE		--	--	--	3.05	2.35	1.74	1.55	--	--
Total organic carbon (%)	NE	NE		1.75	1.47	2.03	1.19	1.64	0.481	0.81	5.63	3.36
Metals (mg/kg DW)												
Arsenic	57	93		6 U	6 U	--	7 U	6 U	7 U	6 U	9 U	20 U
Barium	NE	NE		--	--	--	--	--	--	--	--	--
Cadmium	5.1	6.7		0.6	0.8	--	0.5	0.5	0.3 U	0.3 U	0.8	0.8
Chromium (total)	260	270		30.2	29.9	--	16.1	18	0.86	34.9	34.3	26
Copper	390	390		25.4	23.9	--	22.2	18.2	35.8	27.9	47.6	46
Lead	450	530		41	27	--	17	10	20	58	90	11
Mercury	0.41	0.59		0.21	0.08	--	0.06	0.05 U	0.06 U	0.14	0.89	1.19
Selenium	NE	NE		--	--	--	--	--	--	--	--	--
Silver	6.1	6.1		0.4 U	0.4 U	--	0.4 U	0.4 U	0.4 U	0.4 U	0.5 U	1 U
Zinc	410	960		270	206	--	66	45	153	343	218	59
Butyltin in Porewater (µg/l)												
Tributyltin Ion	0.15[5]			--	--	--	0.019 U	--	0.019 U	0.019 U	--	--
Petroleum Hydrocarbons (mg/kg DW)												
Gasoline-Range	NE			--	--	--	--	--	--	--	--	--
Diesel-Range	NE			14	--	--	19	53	21	26	--	--
Heavy Oil-Range	NE			36	--	--	87	77	54	69	--	--
Total petroleum hydrocarbons[6]	100[7]			50	--	--	106	130[10]	75	95	--	--
LPAH[8] (mg/kg DW)												
1-Methylnaphthalene	NE	NE		--	0.02 U	--	--	--	--	--	0.02 U	0.02 U
2-Methylnaphthalene	0.67	0.67		0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Acenaphthene	0.5	0.5		0.099	0.07	0.034	0.026	0.052	0.058	0.17	0.066	0.02 U
Acenaphthylene	1.3	1.3		0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.022	0.02 U
Anthracene	0.96	0.96		0.16	0.12	0.059	0.1	0.17	0.11	0.27	0.13	0.02 U
Fluorene	0.54	0.54		0.07	0.054	0.026	0.029	0.043	0.05	0.11	0.055	0.02 U
Naphthalene	2.1	2.1		0.025	0.02	0.02 U	0.02 U	0.02 U	0.02 U	0.024	0.038	0.02 U
Phenanthrene	1.5	1.5		0.66	0.44	0.24	0.32	1.1	0.68	1.1	0.49	0.038
Low Molecular Weight PAH	5.2	5.2		1 T	0.704 T	0.36 T	0.48 T	1.4 T	0.9 T	1.7 T	0.801 T	0.038 T
HPAH[9] (mg/kg DW)												
Benzo(a)anthracene	1.3	1.6		0.45	0.31	0.2	0.27	0.61	0.44	0.69	0.4	0.26
Benzo(a)pyrene	1.6	1.6		0.49	0.32	0.22	0.2	0.4	0.41	0.76	0.44	0.029
Benzo(b+k)fluoranthene	3.2	3.6		0.88	0.58	0.4	0.4	0.84	0.82	1.4	0.86	0.051
Benzo(g,h,i)perylene	0.67	0.72		0.18	0.11	0.062	0.029	0.062	0.077	0.14	0.12	0.02 U
Chrysene	1.4	2.8		0.53	0.35	0.24	0.33	0.79	0.57	0.86	0.51	0.031
Dibenzo(a,h)anthracene	0.23	0.23		0.11	0.068	0.061	0.02 U	0.043	0.044	0.18	0.17	0.008
Fluoranthene	1.7	2.5		1.1	0.74	0.5	0.76	2	1.2	1.4	0.89	0.07
Indeno(1, 2, 3-cd)pyrene	0.6	0.69		0.19	0.14	0.07	0.078	0.16	0.18	0.35	0.15	0.02 U
Pyrene	2.6	3.3		0.77	0.52	0.39	0.62	1.6	0.94	1.4	0.87	0.064
High Molecular Weight PAH	12	17		4.7 T	3.138 T	2.1 T	2.7 T	6.5 T	4.7 T	7.2 T	4.41 T	0.279 T
Chlorinated Hydrocarbons (mg/kg DW)												
1, 2, 4-Trichlorobenzene	0.031	0.051		0.006 U	0.006 U	0.006 U	0.01 UJ	0.01 UJ	0.02 U	0.02 U	0.006 U	0.006 U
1, 2-Dichlorobenzene	0.035	0.05		0.006 U	0.006 U	0.006 U	0.02 U	0.02 U	0.02 U	0.02 U	0.006 U	0.006 U
1, 4-Dichlorobenzene	0.11	0.11		0.006 U	0.006 U	0.006 U	0.02 U	0.02 U	0.02 U	0.02 U	0.006 U	0.006 U
1, 3-Dichlorobenzene	0.17	NE		--	0.02 U	--	--	--	--	--	0.02 U	0.02 U
Phthalates (mg/kg DW)												
Bis(2-ethylhexyl) phthalate	1.3	3.1		0.97	0.58	0.35	0.22	0.022	0.089	1.7	1.9	0.093
Butylbenzyl phthalate	0.063	0.9		0.068	0.022	0.013	0.02 U	0.02 U	0.038	0.028	0.029	0.016 U
Dibutyl phthalate	1.4	5.1		0.056	0.026	0.02 U	0.02 U	0.02 U	0.02 U	0.09	0.045	0.02 U
Diethyl phthalate	0.2	1.2		0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Dimethyl phthalate	0.071	0.16		0.006 U	0.02 U	0.006 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Di-n-octyl phthalte	6.2	6.2		0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Ionizable Organics (mg/kg DW)												
2, 4-Dimethylphenol	0.029	0.029		0.006 U	0.006 U	0.006 U	0.02 U	0.02	0.02 U	0.02 U	0.006 U	0.006 U
2-Methylphenol	0.063	0.063		0.006 U	0.006 U	0.006 U	0.02 U	0.02 U	0.02 U	0.02 U	0.006 U	0.006 U
4-Methylphenol	0.67	0.67		0.02 U	0.02 U	0.002 U	0.02 U	0.11 U	0.02 U	0.02 U	0.02 U	0.02 U
Pentachlorophenol	0.36	0.69		0.03 U	0.1 U	0.003 U	0.099 U	0.098 U	0.098 U	0.099 U	0.1 U	0.99 U
Phenol	0.42	1.2		0.36	0.02 U	0.23	0.02 U	0.021 J	0.02 U	0.23 J	0.035	0.02 U
Benzoic acid	0.65	0.65		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Benzyl alcohol	0.057	0.073		0.02 U	0.031 U	0.02 U	0.02 U	0.02 U	0.046	0.02 U	0.031 U	0.031 U
Miscellaneous Extractables (mg/kg DW)												
Dibenzofuran	0.54	0.54		0.037	0.026	0.02 U	0.02 U	0.02 U	0.022	0.052	0.026	0.02 U
Hexachlorobutadiene	0.011	0.12		0.006 U	0.006 U	0.006 U	0.001 U	0.001 U	0.001 U	0.001 U	0.006 U	0.006 U
Hexachlorobenzene	0.022	0.07		0.006 U	0.006 U	0.006 U	0.001 U	0.001 U	0.001 U	0.001 U	0.006 U	0.006 U
N-Nitrosodiphenylamine	0.028	0.04		0.006 U	0.006 U	0.006 U	0.02 U	0.02 U	0.02 U	0.02 U	0.006 U	0.006 U
Polychlorinated Biphenyls (mg/kg DW)												
Total PCBs	0.13	1.0		--	--	--	0.02 UT	0.019 UT	0.093 T	0.096 T	--	--

Table 24

Summary of Sediment Chemical Analytical Results

SMS Analytes (Results compared to LAET and 2LAET)

Reliable Steel Site
Olympia, Washington

	SMS[1]		Location[4]	RGS-8			RGS-9	RGS-10	RGS-11	T1-Sed	T1B-Sed
	LAET[2]	2LAET[3]	Sample ID	RGS-8	RGS-8	RGS-8	RGS-9	RGS-10	RGS-11	T1-Sed	T1B-Sed
Analyte			Depth	Surface	2-4 ft.	6-8 ft.	Surface	Surface	Surface	Surface	Surface
Conventionals											
Percent Fines (<62um) (%)	NE	NE		--	24.5	42.5	25.1	26.8	28.3	11.81	27.29
Preserved Total Solids (%)	NE	NE		--	--	--	--	--	--	--	--
Total Solids (%)	NE	NE		78.2	75.7	71	58.1	56.2	53.1	73.7	53
N-Ammonia (mg-N/kg)	NE	NE		--	--	--	4.96	4.85	5.44	--	--
Total sulfides (mg/kg)	NE	NE		--	--	--	316	400	339	--	--
Total Volatile Solids (%)	NE	NE		1.93	--	--		--	--	2.84	12.4
Total organic carbon (%)	NE	NE		0.37	0.5	0.8	2.16	1.53	3.06	0.77	5.82
Metals (mg/kg DW)											
Arsenic	57	93		6 U	6 U	7 U	8 U	8 U	10 U	2.59 J	4.44 J
Barium	NE	NE		--	--	--	--	--	--	--	--
Cadmium	5.1	6.7		0.3 U	0.6	1.1	1.4	1.5	1.4	0.72	1.16
Chromium (total)	260	270		26.8	14.6	22.8	18.1	22.7	18	20.4 J	24.2 J
Copper	390	390		32	14.2	15	24.1	50.6	22.8	16.8 J	41.4 J
Lead	450	530		54	3 U	3 U	12	23	12	34.6	52.7
Mercury	0.41	0.59		0.15	0.06 U	0.06 U	0.12	0.14	0.14	0.092	0.314
Selenium	NE	NE		--	--	--	--	--	--	--	--
Silver	6.1	6.1		0.4 U	0.4 U	0.4 U	0.5 U	0.5 U	0.6 U	0.11	0.21
Zinc	410	960		382	22	31	62	127	62	260 J	182 J
Butyltin in Porewater (µg/l)											
Tributyltin Ion	0.15[5]			0.019 U	--	--	--	--	--	--	--
Petroleum Hydrocarbons (mg/kg DW)											
Gasoline-Range	NE			--	--	--	--	--	--	--	--
Diesel-Range	NE			64	--	--	17	20	19	--	--
Heavy Oil-Range	NE			160	--	--	48	61	54	--	--
Total petroleum hydrocarbons[6]	100[7]			224	--	--	65	81	73	--	--
LPAH[8] (mg/kg DW)											
1-Methylnaphthalene	NE	NE		--	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	--	--
2-Methylnaphthalene	0.67	0.67		0.036	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.008	0.028 J
Acenaphthene	0.5	0.5		0.17	0.02 U	0.02 U	0.025	0.052	0.02 U	0.065	0.21
Acenaphthylene	1.3	1.3		0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.009	0.038
Anthracene	0.96	0.96		0.34	0.02 U	0.02 U	0.087	0.084	0.02 U	0.14	0.39
Fluorene	0.54	0.54		0.15	0.02 U	0.02 U	0.022	0.041	0.02 U	0.055	0.14
Naphthalene	2.1	2.1		0.06	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02	0.058
Phenanthrene	1.5	1.5		1.2	0.02 U	0.02 U	0.27	0.33	0.069	0.54	1.4
Low Molecular Weight PAH	5.2	5.2		1.9 T	0.02 UT	0.02 UT	0.404 T	0.507 T	0.069 T	0.837 T	2.24 T
HPAH[9] (mg/kg DW)											
Benzo(a)anthracene	1.3	1.6		0.78	0.02 U	0.055	0.22	0.25	0.059	0.49	1.1
Benzo(a)pyrene	1.6	1.6		0.92	0.02 U	0.032	0.18	0.26	0.065	0.48	1.1
Benzo(b+k)fluoranthene	3.2	3.6		1.7	0.02 U	0.025	0.31	0.47	0.123	0.81	1.79
Benzo(g,h,i)perylene	0.67	0.72		0.13	0.02 U	0.02 U	0.058	0.092	0.025	0.29	0.68
Chrysene	1.4	2.8		0.93	0.02 U	0.05	0.24	0.29	0.073	0.55	1.2
Dibenzo(a,h)anthracene	0.23	0.23		0.17	0.006 U	0.006 U	0.012	0.043	0.015	0.073	0.16
Fluoranthene	1.7	2.5		1.9	0.027	0.028	0.56	0.58	0.14	0.92	2.2
Indeno(1, 2, 3-cd)pyrene	0.6	0.69		0.32	0.02 U	0.02 U	0.062	0.11	0.029	0.31	0.72
Pyrene	2.6	3.3		1.5	0.02 U	0.048	0.37	0.42	0.11	0.83	2.1
High Molecular Weight PAH	12	17		8.3 T	0.027 T	0.238 T	2.012 T	2.515 T	0.639 T	4.753 T	11.05 T
Chlorinated Hydrocarbons (mg/kg DW)											
1, 2, 4-Trichlorobenzene	0.031	0.051		0.02 U	0.006 U	0.006 U	0.006 U	0.006 U	0.006 U	0.002 U	0.015 U
1, 2-Dichlorobenzene	0.035	0.05		0.02 U	0.006 U	0.006 U	0.006 U	0.006 U	0.006 U	0.002 U	0.013 U
1, 4-Dichlorobenzene	0.11	0.11		0.02 U	0.006 U	0.006 U	0.006 U	0.006 U	0.006 U	0.003 U	0.018 U
1, 3-Dichlorobenzene	0.17	NE		--	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.002 U	0.016 U
Phthalates (mg/kg DW)											
Bis(2-ethylhexyl) phthalate	1.3	3.1		19	0.02 U	0.02 U	0.16	0.63	0.26	1.40	3.3
Butylbenzyl phthalate	0.063	0.9		0.023	0.015 U	0.015 U	0.016 U	0.017	0.015 U	0.042	0.057
Dibutyl phthalate	1.4	5.1		0.11	0.02 U	0.02 U	0.02 U	0.32	0.02 U	0.016	0.025 U
Diethyl phthalate	0.2	1.2		0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.005 U	0.034 U
Dimethyl phthalate	0.071	0.16		0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.003 U	0.017 U
Di-n-octyl phthalte	6.2	6.2		0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.002 U	0.012 U
Ionizable Organics (mg/kg DW)											
2, 4-Dimethylphenol	0.029	0.029		0.02 U	0.006 U	0.006 U	0.006 U	0.006 U	0.006 U	0.008 U	0.05 U
2-Methylphenol	0.063	0.063		0.02 U	0.006 U	0.006 U	0.006 U	0.006 U	0.006 U	0.005 U	0.033 U
4-Methylphenol	0.67	0.67		0.088	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.007	0.073
Pentachlorophenol	0.36	0.69		0.099 U	0.99 U	0.99 U	0.99 U	0.1 U	0.1 U	0.012 U	0.081 U
Phenol	0.42	1.2		0.066 J	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.011	0.039 J
Benzoic acid	0.65	0.65		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.14 U	0.91 U
Benzyl alcohol	0.057	0.073		0.02 U	0.031 U	0.031 U	0.031 U	0.031 U	0.031 U	0.005 U	0.035 U
Miscellaneous Extractables (mg/kg DW)											
Dibenzofuran	0.54	0.54		0.088	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.024	0.062
Hexachlorobutadiene	0.011	0.12		0.002 U	0.006 U	0.006 U	0.006 U	0.006 U	0.006 U	0.002 U	0.014 U
Hexachlorobenzene	0.022	0.07		0.002 U	0.006 U	0.006 U	0.006 U	0.006 U	0.006 U	0.003 U	0.02 U
N-Nitrosodiphenylamine	0.028	0.04		0.02 U	0.006 U	0.006 U	0.006 U	0.006 U	0.006 U	0.003 U	0.021 U
Polychlorinated Biphenyls (mg/kg DW)											
Total PCBs	0.13	1.0		0.068 T	--	--	--	--	--	0.015 T	0.12 T

Table 24

Summary of Sediment Chemical Analytical Results

SMS Analytes (Results compared to LAET and 2LAET)

Reliable Steel Site
Olympia, Washington

	SMS[1]		Location[4]	BI-S32	GS-04	RI-S-1	RI-S-2		
	LAET[2]	2LAET[3]	Sample ID	BI-S32	GS-04	RI-S-1	RI-S-2	RI-S-2	RI-S-2
Analyte			Depth	Surface	Surface	Surface	Surface	2-4 ft	4-6 ft
Conventionals									
Percent Fines (<62um) (%)	NE	NE		78.5	--	--	--	--	--
Preserved Total Solids (%)	NE	NE		--	--	45.7	68.6	--	--
Total Solids (%)	NE	NE		38.5	--	44.7	73.9	--	--
N-Ammonia (mg-N/kg)	NE	NE		7.88	15.6	20	11.9	--	--
Total sulfides (mg/kg)	NE	NE		6.02	487	1550	18.2	--	--
Total Volatile Solids (%)	NE	NE		12.4	--	7.56	2.09	--	--
Total organic carbon (%)	NE	NE		4.28	3.10	2.83	1.63	--	--
Metals (mg/kg DW)									
Arsenic	57	93		6.74 J	22 U	--	--	--	--
Barium	NE	NE		--	--	--	--	--	--
Cadmium	5.1	6.7		2.32	2.2	--	--	--	--
Chromium (total)	260	270		36.3 J	35.5	--	--	--	--
Copper	390	390		51.1 J	50.2	--	--	--	--
Lead	450	530		52.8	43.5	--	--	--	--
Mercury	0.41	0.59		0.187	0.23	--	--	0.75	0.12
Selenium	NE	NE		--	--	--	--	--	--
Silver	6.1	6.1		0.52	2.2 U	--	--	--	--
Zinc	410	960		133 J	166	--	--	--	--
Butyltin in Porewater (μg/l)									
Tributyltin Ion	0.15[5]			0.041 U	--	--	--	--	--
Petroleum Hydrocarbons (mg/kg DW)									
Gasoline-Range	NE			--	--	22 U	--	--	--
Diesel-Range	NE			--	--	55 U	--	--	--
Heavy Oil-Range	NE			--	--	100 U	--	--	--
Total petroleum hydrocarbons[6]	100[7]			--	--	100 UT	--	--	--
LPAH[8] (mg/kg DW)									
1-Methylnaphthalene	NE	NE		--	--	--	--	--	--
2-Methylnaphthalene	0.67	0.67		0.018 J	0.58 U	0.020 U	0.212	–	–
Acenaphthene	0.5	0.5		0.078	0.58 U	0.034	0.473	–	–
Acenaphthylene	1.3	1.3		0.032	0.58 U	0.020 U	0.020 U	–	–
Anthracene	0.96	0.96		0.15	0.58 U	0.079	0.799	–	–
Fluorene	0.54	0.54		0.062	0.58 U	0.034	0.456	–	–
Naphthalene	2.1	2.1		0.065	0.58 U	0.016 J	0.150	–	–
Phenanthrene	1.5	1.5		0.69	0.91	0.241	5.05	–	–
Low Molecular Weight PAH	5.2	5.2		1.06 T	0.91 T	0.396 JT	7.17 T	–	–
HPAH[9] (mg/kg DW)									
Benzo(a)anthracene	1.3	1.6		0.49	0.84	0.190	3.42	–	–
Benzo(a)pyrene	1.6	1.6		0.51	0.86	0.201	3.26	–	–
Benzo(b+k)fluoranthene	3.2	3.6		0.98	1	0.396	5.38	–	–
Benzo(g,h,i)perylene	0.67	0.72		0.31	0.58 U	0.099	1.60	–	–
Chrysene	1.4	2.8		0.65	1.1	0.283	4.40	–	–
Dibenzo(a,h)anthracene	0.23	0.23		0.077	0.58 U	0.034	0.68	–	–
Fluoranthene	1.7	2.5		1.4	1.7	0.425	6.03	–	–
Indeno(1, 2, 3-cd)pyrene	0.6	0.69		0.34	0.58 U	0.110	1.63	–	–
Pyrene	2.6	3.3		1.2	1.5	0.368	5.38	–	–
High Molecular Weight PAH	12	17		5.957 T	5.3 T	2.123 T	32.6 T	–	–
Chlorinated Hydrocarbons (mg/kg DW)									
1, 2, 4-Trichlorobenzene	0.031	0.051		0.0078 U	0.58 U	--	--	--	--
1, 2-Dichlorobenzene	0.035	0.05		0.0068 U	0.58 U	--	--	--	--
1, 4-Dichlorobenzene	0.11	0.11		0.0099 U	0.58 U	--	--	--	--
1, 3-Dichlorobenzene	0.17	NE		0.0084 U	0.58 U	--	--	--	--
Phthalates (mg/kg DW)									
Bis(2-ethylhexyl) phthalate	1.3	3.1		1.40	2.90	--	--	--	--
Butylbenzyl phthalate	0.063	0.9		0.034	0.58 U	--	--	--	--
Dibutyl phthalate	1.4	5.1		0.033	0.58 U	--	--	--	--
Diethyl phthalate	0.2	1.2		0.019 U	0.58 U	--	--	--	--
Dimethyl phthalate	0.071	0.16		0.0094 U	0.58 U	--	--	--	--
Di-n-octyl phthalte	6.2	6.2		0.0063 U	0.58 U	--	--	--	--
Ionizable Organics (mg/kg DW)									
2, 4-Dimethylphenol	0.029	0.029		0.029 U	0.58 U	--	--	--	--
2-Methylphenol	0.063	0.063		0.018 U	0.58 U	--	--	--	--
4-Methylphenol	0.67	0.67		0.04	0.58 U	--	--	--	--
Pentachlorophenol	0.36	0.69		0.045 U	3.50 U	--	--	--	--
Phenol	0.42	1.2		0.017 J	0.58 U	--	--	--	--
Benzoic acid	0.65	0.65		0.5 U	3.50 U	--	--	--	--
Benzyl alcohol	0.057	0.073		0.02 U	0.58 U	--	--	--	--
Miscellaneous Extractables (mg/kg DW)									
Dibenzofuran	0.54	0.54		0.03	0.58 U	--	--	--	--
Hexachlorobutadiene	0.011	0.12		0.0073 U	0.58 U	--	--	--	--
Hexachlorobenzene	0.022	0.07		0.011 U	0.58 U	--	--	--	--
N-Nitrosodiphenylamine	0.028	0.04		0.012 U	3.50 U	--	--	--	--
Polychlorinated Biphenyls (mg/kg DW)									
Total PCBs	0.13	1.0		0.27 T	0.19 UT	--	--	--	--

Table 24

Summary of Sediment Chemical Analytical Results

SMS Analytes (Results compared to LAET and 2LAET)

Reliable Steel Site
Olympia, Washington

	SMS[1]		Location[4]	RI-S-3				RI-S-4			RI-S-5	RI-S-6	RI-S-7
	LAET[2]	2LAET[3]	Sample ID	RI-S-3	RI-S-3	RI-S-3	RI-S-3	RI-S-4	RI-S-4	RI-S-4	RI-S-5	RI-S-6	RI-S-7
Analyte			Depth	Surface	2-4 ft	4-6 ft	6-8 ft	Surface	2-4 ft	4-6 ft	Surface	Surface	Surface
Conventionals													
Percent Fines (<62um) (%)	NE	NE		--	--	--	--	--	--	--	--	--	--
Preserved Total Solids (%)	NE	NE		80.4	--	--	--	74.2	--	--	78.5	76	77.5
Total Solids (%)	NE	NE		75.1	--	--	--	73.7	--	--	75.3	76.1	73.2
N-Ammonia (mg-N/kg)	NE	NE		4.5	--	--	--	6.59	--	--	0.97	2.65	1.79
Total sulfides (mg/kg)	NE	NE		62.9	--	--	--	825	--	--	6.49	220	338
Total Volatile Solids (%)	NE	NE		1.36	--	--	--	1.66	--	--	1.56	1.32	1.47
Total organic carbon (%)	NE	NE		0.558	--	--	--	0.684	--	--	0.64	0.963	0.942
Metals (mg/kg DW)													
Arsenic	57	93		--	--	--	--	--	--	--	--	--	--
Barium	NE	NE		--	--	--	--	--	--	--	--	--	--
Cadmium	5.1	6.7		--	--	--	--	--	--	--	--	--	--
Chromium (total)	260	270		--	--	--	--	--	--	--	--	--	--
Copper	390	390		--	--	--	--	--	--	--	--	--	--
Lead	450	530		--	--	--	--	--	--	--	--	--	--
Mercury	0.41	0.59		0.08	0.61	1.06	0.26	--	0.03 U	0.04	--	--	--
Selenium	NE	NE		--	--	--	--	--	--	--	--	--	--
Silver	6.1	6.1		--	--	--	--	--	--	--	--	--	--
Zinc	410	960		--	--	--	--	--	--	--	--	--	--
Butyltin in Porewater (µg/l)													
Tributyltin Ion	0.15[5]			--	--	--	--	--	--	--	--	--	--
Petroleum Hydrocarbons (mg/kg DW)													
Gasoline-Range	NE			--	--	--	--	--	--	--	22 U	--	--
Diesel-Range	NE			--	--	--	--	--	--	--	55 U	--	--
Heavy Oil-Range	NE			--	--	--	--	--	--	--	100 U	--	--
Total petroleum hydrocarbons[6]	100[7]			--	--	--	--	--	--	--	100 UT	--	--
LPAH[8] (mg/kg DW)													
1-Methylnaphthalene	NE	NE		--	--	--	--	--	--	--	--	--	--
2-Methylnaphthalene	0.67	0.67		0.0200 U	--	--	--	0.096 U	--	--	0.019 U	0.018 J	0.037
Acenaphthene	0.5	0.5		0.054	--	--	--	0.157	--	--	0.096	0.116	0.170
Acenaphthylene	1.3	1.3		0.0200 U	--	--	--	0.096 U	--	--	0.019 U	0.020 U	0.019
Anthracene	0.96	0.96		0.095	--	--	--	1.78	--	--	0.179	0.212	0.283
Fluorene	0.54	0.54		0.042	--	--	--	0.178	--	--	0.044	0.091	0.151
Naphthalene	2.1	2.1		0.012 J	--	--	--	0.096 U	--	--	0.012 J	0.025	0.104
Phenanthrene	1.5	1.5		0.407	--	--	--	3.42	--	--	0.704	0.703	0.876
Low Molecular Weight PAH	5.2	5.2		0.614 JT	--	--	--	5.54 T	--	--	1.024 JT	1.156 JT	1.601
HPAH[9] (mg/kg DW)													
Benzo(a)anthracene	1.3	1.6		0.312	--	--	--	4.51	--	--	0.832	0.510	0.622
Benzo(a)pyrene	1.6	1.6		0.363	--	--	--	3.08	--	--	0.704	0.578	0.669
Benzo(b+k)fluoranthene	3.2	3.6		0.670	--	--	--	5.20	--	--	1.216	1.059	1.130
Benzo(g,h,i)perylene	0.67	0.72		0.084	--	--	--	1.23	--	--	0.422	0.144	0.424
Chrysene	1.4	2.8		0.363	--	--	--	4.58	--	--	0.832	0.559	0.669
Dibenzo(a,h)anthracene	0.23	0.23		0.042	--	--	--	0.59	--	--	0.141	0.076	0.151
Fluoranthene	1.7	2.5		0.614	--	--	--	6.84	--	--	1.280	0.876	1.036
Indeno(1, 2, 3-cd)pyrene	0.6	0.69		0.095	--	--	--	1.37	--	--	0.422	0.173	0.424
Pyrene	2.6	3.3		0.530	--	--	--	6.84	--	--	1.216	0.761	1.036
High Molecular Weight PAH	12	17		3.069 T	--	--	--	34.2 T	--	--	7.040 T	4.815 T	6.029
Chlorinated Hydrocarbons (mg/kg DW)													
1, 2, 4-Trichlorobenzene	0.031	0.051		--	--	--	--	--	--	--	--	--	--
1, 2-Dichlorobenzene	0.035	0.05		--	--	--	--	--	--	--	--	--	--
1, 4-Dichlorobenzene	0.11	0.11		--	--	--	--	--	--	--	--	--	--
1, 3-Dichlorobenzene	0.17	NE		--	--	--	--	--	--	--	--	--	--
Phthalates (mg/kg DW)													
Bis(2-ethylhexyl) phthalate	1.3	3.1		--	--	--	--	--	--	--	--	--	--
Butylbenzyl phthalate	0.063	0.9		--	--	--	--	--	--	--	--	--	--
Dibutyl phthalate	1.4	5.1		--	--	--	--	--	--	--	--	--	--
Diethyl phthalate	0.2	1.2		--	--	--	--	--	--	--	--	--	--
Dimethyl phthalate	0.071	0.16		--	--	--	--	--	--	--	--	--	--
Di-n-octyl phthalte	6.2	6.2		--	--	--	--	--	--	--	--	--	--
Ionizable Organics (mg/kg DW)													
2, 4-Dimethylphenol	0.029	0.029		--	--	--	--	--	--	--	--	--	--
2-Methylphenol	0.063	0.063		--	--	--	--	--	--	--	--	--	--
4-Methylphenol	0.67	0.67		--	--	--	--	--	--	--	--	--	--
Pentachlorophenol	0.36	0.69		--	--	--	--	--	--	--	--	--	--
Phenol	0.42	1.2		--	--	--	--	--	--	--	--	--	--
Benzoic acid	0.65	0.65		--	--	--	--	--	--	--	--	--	--
Benzyl alcohol	0.057	0.073		--	--	--	--	--	--	--	--	--	--
Miscellaneous Extractables (mg/kg DW)													
Dibenzofuran	0.54	0.54		--	--	--	--	--	--	--	--	--	--
Hexachlorobutadiene	0.011	0.12		--	--	--	--	--	--	--	--	--	--
Hexachlorobenzene	0.022	0.07		--	--	--	--	--	--	--	--	--	--
N-Nitrosodiphenylamine	0.028	0.04		--	--	--	--	--	--	--	--	--	--
Polychlorinated Biphenyls (mg/kg DW)													
Total PCBs	0.13	1.0		--	--	--	--	--	--	--	--	--	--

Table 24

Summary of Sediment Chemical Analytical Results

SMS Analytes (Results compared to LAET and 2LAET)

Reliable Steel Site
Olympia, Washington

Notes:

[1] Washington State Sediment Management Standards.

[2] Lowest Apparent Effects Threshold (LAET) referenced from Table 4.

[3] Second Lowest Apparent Effects Threshold (2LAET) referenced from Table 4.

[4] Sample locations are shown in Figure 4.

[5] Dredged Material Management Program (DMMP) screening level.

[6] Total petroleum hydrocarbons is the sum of detected concentrations of diesel- and heavy oil-range petroleum hydrocarbons.

[7] Cleanup level based on Ecology recommendation.

[8] Low Molecular weight polycyclic aromatic hydrocarbons.

[9] High Molecular weight polycyclic aromatic hydrocarbons.

[10] Review of chromatogram for this sample indicates diesel and heavy oil were present. The screening criteria was compared to individual petroleum hydrocarbons and diesel and heavy oil concentrations are less than the screening criteria.

U = The analyte was not detected at a concentration greater than the identified reporting limit.
J = The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.
T = Calculated sum of individual compounds or congeners.
NE = not established
-- = not analyzed
DW = Dry weight
mg/kg = milligrams per kilogram
μg/l = micrograms per liter

Gray shading indicates that the organic carbon content of the sample was lower than 0.5 percent or greater than 3.5 percent and therefore, the dry weight LAET and 2LAET criteria apply to the results for this sample.

☐ Yellow border indicates that the method reporting limit was above LAET and/or 2LAET.
☐ Blue border and bold text indicates that the analyte was detected at a concentration greater than LAET but less than the 2LAET.
☐ Red border and bold text indicates that the analyte was detected at a concentration above 2LAET.

Table 25

Summary of Sediment Chemical Analytical Results

Phthalates From Locations Adjacent to Site (Results compared to LAET and 2LAET)

Reliable Steel Site
Olympia, Washington

	SMS[1]		Location[4]	BI		GS		
	LAET[2]	2LAET[3]	Sample ID	BI-S5	BI-S7	GS-01	GS-02	GS-03
Analyte			Depth	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm
Phthalates (mg/kg DW)								
Bis(2-ethylhexyl) phthalate	1.3	3.1		0.057 T	0.120 T	0.73 U	0.42 J	0.23 J
Butylbenzyl phthalate	0.063	0.9		0.013 U	0.014 U	0.73 U	0.71 U	0.65 U
Dibutyl phthalate	1.4	5.1		0.099	0.091	0.1 J	0.099 J	0.093 J
Diethyl phthalate	0.2	1.2		0.03	0.0058 T	0.73 U	0.71 U	0.65 U
Dimethyl phthalate	0.071	0.16		0.013 U	0.014 U	0.73 U	0.71 U	0.65 U
Di-n-octyl phthalte	6.2	6.2		0.013 U	0.014 U	0.73 U	0.71 U	0.65 U

Notes:

[1] Washington State Sediment Management Standards

[2] Lowest Apparent Effects Threshold (LAET) referenced from Table 4.

[3] Second Lowest Apparent Effects Threshold (2LAET) referenced from Table 4.

[4] Sample locations are shown in Figure 17B.

U = The analyte was not detected at a concentration greater than the identified reporting limit.

J = The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

T = Calculated sum of individual compounds or congeners

DW = dry weight

mg/kg = milligrams per kilogram

cm = centimeter

Gray shading indicates that the organic carbon content of the sample was lower than 0.5 percent or greater than 3.5 percent and therefore, the dry weight LAET and 2LAET criteria apply to the results for this sample.

☐ Yellow border indicates that the method reporting limit was above LAET and/or 2LAET.

☐ Blue border and bold text indicates that the analyte was detected at a concentration greater than LAET but less than the 2LAET.

☐ Red border and bold text indicates that the analyte was detected at a concentration above 2LAET.

Table 26

Summary of Metal Debris Chemical Analytical Results
Metals (Results compared to Proposed Sediment Cleanup Levels)

Reliable Steel Site
Olympia, Washington

	SMS[1]		Location[4]	S1	S3	BS-1
			Sample ID	S1	S3	BS-1
	SQS[2]	CSL[3]	Depth	2	2	Surface
Analyte			Date	6/3/2004	6/3/2004	12/22/2005
Metals (mg/kg)						
Arsenic	57	93		14.6	**70**	5 U
Barium	NE	NE		87	52.6	--
Cadmium	5.1	6.7		**5.13**	0.803	1 U
Chromium	260	270		127	253	15
Copper	390	390		**435**	**1,790**	--
Lead	450	530		**533**	99.8	360
Mercury	0.41	0.59		0.362	0.1 U	0.50 U
Selenium	NE	NE		1.21	0.538	--
Silver	6.1	6.1		0.5 U	0.5 U	--

Notes:

[1] Washington State Sediment Management Standards (Chapter 173-204 Washington Administrative Code [WAC]).

[2] Sediment Quality Standards (SQS) referenced from Table 5.

[3] Cleanup Screening Level (CSL) referenced from Table 5.

[4] Sample locations are shown in Figure 13.

U = The analyte was not detected at a concentration greater than the identified reporting limit.

NE = not established

-- = not analyzed

mg/kg = milligrams per kilogram

☐ Yellow border indicates that the method reporting limit was above SQS and/or CSL.

☐ Blue border and bold text indicates that the analyte was detected at a concentration greater than SQS but less than the CSL.

☐ Red border and bold text indicates that the analyte was detected at a concentration above CSL.

TABLE 27

SITE SPECIFIC APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARS)

REVISED RI/FS

RELIABLE STEEL, OLYMPIA, WASHINGTON

Authorizing Statute	Implementing Regulation	Description	Rationale
Potential Chemical-Specific ARARs			
National Toxics Rule; 33 USC 1251	Water Quality Standards; 40 CFR 131.36(b)(1)	Establishes surface water quality standards that protect aquatic life and human health. Washington adopted these standards in Chapter 173-201A WAC.	Potentially applicable to surface water and potentially relevant and appropriate to stormwater runoff, groundwater, and sediment that may impact surface water quality.
Washington State Water Pollution Control Act; Chapter 90.48 RCW	Water Quality Standards for Surface Waters; Chapter 173-201A WAC	Establishes narrative and numeric surface water quality standards for waters of the state.	Potentially applicable to surface water and potentially relevant and appropriate to stormwater runoff, groundwater, and sediment that may impact surface water quality.
Clean Water Act; 33 USC 1251-1387	Section 304a of the Clean Water Act; WAC 173-340-730(2)(b)(i)(B)	Establishes surface water quality standards that protect aquatic life and human health. Washington adopted these standards in Chapter 173-201A WAC.	Potentially applicable to surface water and potentially relevant and appropriate to stormwater runoff, groundwater, and sediment that may impact surface water quality.
Hazardous Waste Management; Chapter 70.105D RCW	Washington Model Toxics Control Act Cleanup Regulation; Chapter 173-340 WAC	Establishes groundwater, surface water, and soil cleanup levels.	Potentially applicable to contaminated soil, groundwater, surface water, and sediment at the Site.
WA Water Pollution Control Act; Chapter 90.48 RCW	Washington Sediment Management Standards; Chapter 173-204 WAC	Establishes sediment cleanup levels.	Potentially applicable to contaminated sediment at the Site.
Potential Location-Specific ARARs			
Shoreline Management Act of 1971; Chapter 90.58 RCW	Shoreline Management Act; Chapters 173-18, 173-22, and 173-27 WAC.	The substantive requirements of this statute and its implementing regulations apply to activities within 200 feet of shorelines in the state.	Proposed remedial actions must be consistent with the approved Washington State coastal zone management program.
Construction Projects in State Waters; Chapter 77.55 RCW	Hydraulic Code Rules; Chapter 220-110 WAC	Apply to work conducted in Puget Sound or within the designated shoreline that changes the natural flow or bed of the water body (and therefore has the potential to affect fish habitat).	May apply to remedial actions that take place on the shoreline.
Endangered Species Act; 16 USC 1531 et seq.	Endangered Species Act; 50 CFR Parts 17, 222, and 402	Act protects fish, wildlife, and plant species whose existence is threatened or endangered.	Applies to cleanup actions that may affect a listed threatened or endangered species or designated critical habitat.
Potential Action-Specific ARARs			
Hazardous Waste Management; Chapter 70.105D RCW	Selection of Cleanup Actions; WAC 173-340-350	Minimum requirements and procedures for conducting remedial investigation and feasibility studies.	Applicable to remedial action selection and implementation.
Hazardous Waste Management; Chapter 70.105D RCW	Institutional Controls; WAC 173-340-440	Institutional control requirements.	Potentially applicable to remedial action selection and implementation.
Hazardous Waste Management; Chapter 70.105D RCW	Compliance Monitoring Requirements; WAC 173-340-410, -720(9), -730(7), -740(7), and -745(8)	Compliance monitoring requirements for soil, groundwater, and surface water.	Potentially applicable to remedial action selection and implementation.

Potential Action-Specific ARARs			
Ecology Area of Contamination Policy	8/20/1991 Interprogram Policy	Allows movement/placement of excavated contaminated material within the regulated site without triggering dangerous waste designation.	Could be applicable for containment remedial alternatives.
Washington State Water Pollution Control Act; Chapter 90.48 RCW	Ecology Construction Stormwater General Permit	Requires obtaining a NPDES permit, development of Stormwater Pollution Prevention Plan (SWPPP) and implementation of a sediment erosion and pollution prevention controls.	Applies to construction activities that disturb one or more acres.
Water Well Construction; Chapter 18.104 RCW	Minimum Standards for Construction and Maintenance of Wells; Chapter 173-160 WAC	Applies to the construction and maintenance of monitoring wells	Potentially applicable to wells constructed for groundwater withdrawal and monitoring and decommissioning of existing or future wells.
Hazardous Waste Management; Chapter 70.105 RCW	Dangerous Waste Regulations; Chapter 173-303 WAC	Applies if dangerous wastes are generated during remedial program	These regulations must be fully complied with for any off site disposal of waste determined to be dangerous waste. This would only apply to upland remedial options as dredged sediment is exempt from waste classification.
Washington State Water Pollution Control Act; Chapter 90.48 RCW	NPDES Permit Program; Chapter 173-220 WAC	Applicable to the discharge of pollutants and other wastes and materials to the surface waters of the state	NPDES may be required for discharges related to ongoing remedial actions or discharge of stormwater/drainage.
State Environmental Policy Act (SEPA); Chapter 43.21C.110 RCW	SEPA Rules; Chapter 197-11 WAC	Applies if future construction/remedial action occurs at the site	Applies if future construction/ remedial action occurs at the site.
Solid Waste Management; Chapter 43.21A RCW	Minimum Functional Standards for Solid Waste Handling WAC 173-304	Establishes minimum functional standards for the handling of solid waste.	Applies if non-dangerous wastes are generated during remedial action
Transportation of Hazardous Material; 49 USC 5101-5127	Hazardous Materials Regulations; 49 CFR Parts 171 through 180	Regulations that govern the transportation of hazardous materials.	Applies to any hazardous materials transported off-site as part of remediation.
Hazardous Waste-Land Disposal Restrictions; USEPA	40 CFR 268/22 CCR 66268	Establishes land disposal restrictions and treatment standards for hazardous wastes applicable to generators.	Any hazardous wastes generated as a result of on-site activities or by treatment systems must meet land disposal restriction requirements.
Washington State Water Pollution Control Act; Chapter 90.48 RCW	Federal Water Pollution Control Act Certification; Chapter 173-225 WAC	Applies to activities that may result in a discharge into navigable waters.	Applies to remedial actions that may result in a discharge into navigable waters (i.e., dredging). \\
Washington State Water Pollution Control Act; Chapter 90.48 RCW	Mixing Zones; WAC 173-201A-400	Applies to the allowable size and location of a mixing zone.	Potentially applicable to remedial alternatives that would require substantive compliance with NPDES permit requirements.

Potential Action-Specific ARARs			
Washington State Water Pollution Control Act; Chapter 90.48 RCW	Short Term Modifications (to State Water Quality Criteria); Chapter 173-201A-410	Criteria may be modified for a specific water body on a short-term basis when necessary to accommodate essential activities, respond to emergencies, or to otherwise protect the public interest, even though such activities may result in a temporary reduction.	Potentially applicable to remedial alternatives involving excavation/dredging of sediment.
USACE permit	Section 404 Permit Program	Applies to dredging or filling in the waters of the U.S.	A permit will be required to perform dredging of contaminated sediment and/or placing fill associated with sediment capping or backfilling of dredged areas.
Archeological and Historic Preservation	Federal Archeological and Historical Preservation Act; 16 USCA 496a-1	The Archeological and Historical Preservation Act (16 USCA 496a-1) would be applicable in areas or potential cultural resources if any subject materials are discovered during site excavation and dredging activities.	Potentially applicable for remedial alternatives that include excavation and dredging activities.
Washington State Clean Air Act; Chapter 70.94 RCW	General Requirements for Air Pollution Sources; Chapter 173-400 WAC. Controls for New Sources of Toxic Air Pollutants; Chapter 173-460 WAC	Establishes technically feasible and reasonably attainable standards and rules generally applicable to the control and/or prevention of the emission of air contaminants.	May apply to remedial alternatives that produce emissions to air.

TABLE 28

SOIL REMEDIATION TECHNOLOGY SCREENING

REVISED RI/FS

RELIABLE STEEL, OLYMPIA, WASHINGTON

(SHADED REMEDIATION TECHNOLOGIES ARE RETAINED FOR FURTHER EVALUATION)

General Response Action	Remediation Technology	Process Option	Description	Effectiveness	Implementability	Relative Cost	Summary of Screening
No Action	No Action	None	No institutional or engineering controls or treatment.	Not effective for protecting human health and environment.	Implementable but not acceptable to the general public or government agencies.	None	Sometimes used as a baseline for comparison. Not retained.
Institutional Controls/ Access Control	Institutional Control	Deed Notification/ Restriction and Fencing/ Warning Signage	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 activities and uses of the site. Construct or maintain existing site fencing and signage to control site access by the general public thereby reducing potential exposure to contaminants.	Effectiveness for protection of human health would depend on enforcement of and compliance with deed restrictions. Not applicable for ecological risks.	Technically implementable. Specific legal requirements and authority would need to be met. Signage would be easily implemented, but would require maintenance to ensure effectiveness.	Low capital	Potentially applicable in combination with other technologies. Retained.
Soil Containment	Capping	Surface Cap	Installation of surface cap over contaminated soil areas to reduce contaminant migration (i.e., erosion of soil) and to prevent exposure. Caps may include asphalt or concrete paving, synthetic membranes, soil, and 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.	Moderate capital. Low O&M.	Applicable technology where contaminants pose little threat to groundwater. Retained.
Soil Removal/Disposal	Removal with Land Disposal	Excavation and Landfill	Excavation of contaminated soil using common excavation methods. Excavation on steep portions of site may require shoring, building foundations may have to be removed. Deep excavations may require dewatering. Disposal of impacted soil at a permitted, off-site landfill.	Effective for complete range of contaminant groups.	Technically implementable using common excavation and transport methods. Impacted soil must be profiled for disposal and pre-treatment may be required for some soil.	Moderate to high capital. Negligible O&M.	Applicable in all areas of the site. Retained.
Soil Removal with Ex Situ Soil Treatment	Physical/Chemical Treatment	Stabilization	Contaminants are physically bound or enclosed within a stabilized mass using Portland cement or another pozzolanic material. This technology has been reliably demonstrated for contaminants such as heavy metals.	Stabilization is a common and effective technology for reducing the leachability of metals in soil. This technology may be effective in immobilizing polycyclic aromatic hydrocarbons (PAH)- or VOC-contaminated soils at the Site, but there is some uncertainty related to the rate of contaminant release over time. This technology is less permanent because contaminants are left on-Site.	Technically implementable. However most processes result in significant increase in volume. This technology would also require significant mobilization of equipment to the Site.	Moderate to high capital. Low O&M. Moderate cost relative to other ex situ physical/chemical options. Due to the relatively low volume of metals-contaminated soil at the Site, this technology would have a high cost per cubic yard.	Potentially applicable for metals-impacted soil, and uncertainty associated with effectiveness for other contaminants at the Site. Difficult to implement. High cost per cubic yard relative to offsite disposal. Not retained.
		Soil Washing	Wash soil with water-based surfactants, detergents, acids, etc., to remove chemicals from soil particles. Treat or dispose of high chemical concentration residuals fluids.	Most effective for high-concentration inorganic chemicals, semi-volatile organic compounds (SVOCs) and fuels. Removal of organics adsorbed to clay-sized particles may be difficult.	Difficult to implement for complex waste mixtures. Complex mixtures of contaminants can make formulation of washing fluids difficult. Residuals may be difficult to extract from matrix and may require additional treatment/disposal.	High capital and O&M. High cost relative to other ex situ physical/chemical options.	Difficult to implement. Difficult to formulate washing fluids for complex waste mixtures. Soils may remain toxic due to difficulty extracting residual fluids. Not retained.
		Incineration	High temperatures, 871-1,204 ° C (1,600-2,200 ° F), are used to combust (in the presence of oxygen) organic constituents in hazardous wastes.	Effective for destroying hydrocarbons. Not effective for inorganic chemicals.	Technically implementable. Incineration would be accomplished at a permitted off-site facility.	High capital and high O&M. High cost relative to other ex situ options.	High cost relative to other ex situ technologies and not effective for metals. Not retained.
		Thermal Desorption	Wastes are heated within a continuous flow reactor to 320 to 560 ° C to volatilize organic contaminants. A carrier gas or vacuum system transports volatilized organics to the gas treatment system.	Effective for 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.	High capital. High O&M. Lower cost than incineration.	High cost relative other ex situ technologies. Extensive preparation for treatment will be required. Not retained.
	Biological Treatment	Biopiles	Excavated soils are mixed with soil amendments and placed on a treatment area that includes leachate collection systems and a form of aeration.	Solid-phase (soil) process is most effective for non-halogenated VOCs and fuel hydrocarbons. Not effective for metals.	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. Not effective for metals. Not retained.
		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. Not effective for treatment of metals.	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. Not effective for metals. Not retained.

General Response Action	Remediation Technology	Process Option	Description	Effectiveness	Implementability	Relative Cost	Summary of Screening
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 non-halogenated 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.	Slow technology. Not effective for metals or other recalcitrant contaminants. Not retained.
		Natural Attenuation	Natural processes such as volatilization, biodegradation, adsorption, and chemical reactions with soil materials can reduce contaminant concentrations to acceptable levels.	Generally not effective for quickly reducing risk to human health and ongoing threats to groundwater. Shallow metals can be reduced through natural uptake by native plants. Effectiveness is highest in combination with other technologies as a final step to achieve cleanup levels when risks to human health and the environment are low.	Technically implementable. Monitoring may be required to ensure adequate reduction rate. May require institutional controls during treatment period.	Negligible capital. Low O&M. Low cost relative to other in situ options.	Slow technology. Can be effective for areas of residual hydrocarbons in soil and groundwater. Not retained.
	Phytoremediation	Phytoextraction	Plants, called "Hyperaccumulators" have the capacity to extract and store large amounts of contaminants (metals, hydrocarbons etc.) from soil and use them as nutrients during metabolism. Phytoremediation typically involves interaction of plant roots and microorganisms associated with them to remediate soil. Phytoextraction applicability has been demonstrated for individual site contaminants, but the effectiveness at treating all of the target metals under site conditions is unproven.	Technology has been effective in laboratory or field studies for removal of arsenic, copper, iron, nickel, and zinc. Most effective for treatment of sites with low to moderate levels of shallow soil contamination over large areas. Phytoextraction applicability has been demonstrated for individual site contaminants, but the effectiveness at treating all of the target metals under site conditions is unproven. Phytoextraction may be effective in treating PAHs at the Site but would require pilot testing. The combined suite of metals and organic contaminants present at the site may be treatable but would require extensive pilot testing over a long period to confirm.	Technically implementable. However, there has been little commercial application. Soil amendments including use of fertilizers, water, chelating agents to assist binding, and disposal of accumulated waste materials or plant materials may be necessary. Pilot testing that would be required will significantly delay implementation of full-scale remediation.	Moderate capital and O&M. High cost relative to other in situ options.	Site use may be amenable to plantings. Effectiveness not certain without completion of long-term field pilot testing. Not retained.
	Physical/Chemical Treatment	Soil Flushing	The extraction of contaminants from soil with aqueous solution accomplished by passing fluid through in-place soils using an injection or infiltration process. Extraction fluids must be recovered from underlying aquifer.	Effective for VOCs, PAHs and inorganic chemicals. Presence of fine grained soils limits effectiveness.	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. Not retained.
		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.	Effective for 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.	High capital and O&M. High cost relative to other in situ options.	Generally not effective for non-volatile contaminants and metals. Not retained.

TABLE 29

SEDIMENT REMEDIAL TECHNOLOGY SCREENING

REVISED RI/FS

RELIABLE STEEL, OLYMPIA, WASHINGTON

(SHADED REMEDIAL TECHNOLOGIES ARE RETAINED FOR FURTHER EVALUATION)

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	Sometimes used as a baseline for comparison. Not retained.
Institutional Controls	Institutional Control	Deed Notification/ Restriction and Fencing/ Warning Signage	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 activities and uses of the site. Construct or maintain existing site fencing and signage to control site access by the general public thereby reducing potential exposure to contaminants.	May be effective in conjunction with other remedial measures to mitigate potential impacts to human and ecological receptors. Effectiveness for protection of human health would depend on enforcement of and compliance with deed restrictions. Not applicable for ecological risks	Technically implementable. Specific legal requirements and authority would need to be met. Signage would be easily implemented, but would require maintenance to ensure effectiveness.	Low capital.	Potentially applicable in combination with other technologies. Retained.
Natural Recovery	Monitored Natural Recovery (MNR)	Long-Term Monitoring of Natural Processes in Sediment	Use of ongoing, naturally occurring processes to contain, destroy, or reduce the bioavailability or toxicity of contaminants in sediment. Involves monitoring over time to confirm that risk-reduction processes are occurring and a contingency plan, if the expected processes are not occurring. These processes may include physical, biological, and chemical mechanisms that act together to reduce the risk posed by the contaminants.	Based on a study performed in Budd Inlet, moderate sedimentation rates (approximately 0.7 to 0.9 cm/yr) occur in the West Bay. Some contaminants in sediment are more resistance to biodegradation and dissolution. Therefore, MNR alone would likely have relatively low effectiveness and would not protect human health and the environment in the short term.	Implementable but long-term monitoring would be required.	Low capital. Long-term monitoring costs.	Likely effective for organic contaminants in areas of adequate deposition of cleaner sediment. Not effective in areas of erosion or no/low deposition rates. Not effective as a stand-alone technology, but may be combined with other remediation technologies. Retained.
	Enhanced Natural Recovery (ENR)	Placement of Thin-Layer of Sand or Thin-Layer of Amended Sand (i.e., Activated Carbon or Other Amendments)	Enhancement of MNR through placement of a thin layer of sand and/or other suitable material typically between about 6- to 12-inches thick (ENR variant may include mixing carbon amendments to enhance remediation). ENR material typically mixes with underlying shallow substrate through bioturbation to reduce contaminant levels and/or promote contaminant degradation.	May be effective. Based on a study performed in Budd Inlet, moderate sedimentation rates (approximately 0.7 to 0.9 cm/yr) occur in the West Bay. Most of the Site and the contaminated sediment are located in the intertidal areas of the Site where there are more erosive forces.	Implementable, but may be difficult to keep material in place within the intertidal area. Long-term monitoring would be required.	Moderate capital. Long-term monitoring costs.	Likely effective for organic contaminants in areas of adequate deposition. Not expected to be effective in intertidal areas due to expected erosion. Not retained.
Sediment Containment	Capping	Placement of 3-feet of Aggregate on Top of Contaminated Sediment	Containment for sediment involves placing an engineered aggregate cap to isolate contaminated material. In the aquatic environment, the cap must be designed to withstand erosive forces generated by tidal and wave action and must be thick enough to provide the required isolation of the material contained by the cap.	Effective for preventing direct contact exposure and for containing contaminated sediment. Aquatic caps are designed using methods developed by the U.S. Army Corps of Engineers. Digging (such as for clams) would need to be prohibited in capped areas.	Technically implementable. Aquatic caps have been successfully constructed in multiple Puget Sound locations. Some dredging may be needed to place the cap and keep existing shoreline elevations.	Moderate capital. Moderate O&M but dependent on the design of the cap.	Applicable for containment contaminated sediment. Retained.
Sediment Removal/Disposal	Removal and Disposal at Landfill	Dredging/Excavation with Disposal at Landfill and Backfill With Aggregate Materials	Dredging/excavation of contaminated sediment using both land-based and water-based methods. Land-based removal would include use of land-based excavation equipment and transport vehicles (ex. dump trucks) operated from the shoreline during low tides when the work area is exposed. Water-based removal would include use of a barge-mounted clamshell dredge and a material barge for dredge sediment transport. Dredged/excavated sediment would be transported and disposed of at a permitted, off-site landfill.	Effective for range of contaminant groups. However, dredging in conjunction with capping may be required where the contaminated sediment cannot be completely removed due to access issues or where a cap is to be placed without changing the surface elevation.	Technically implementable. Dredging is commonly used in the marine environment to remove contaminated sediment. Contaminated sediment must be profiled to verify that the materials meet land disposal restrictions.	Moderate to high capital. Low O&M if all contaminated sediment is removed.	Common removal and disposal method for contaminated sediment. Retained.
	Removal and Open-water Disposal at a Suitable Non-Dispersive DMMP Disposal Site	Dredging/Excavation, Transport With Bottom-Dump Barge, and Disposal at Open-water Disposal Site	Dredging of contaminated sediment using common dredging methods. Removal of sediment performed from the water using barge-mounted clamshell dredge and a bottom-dump barge for dredge sediment transport and disposal. Sediment targeted for open-water disposal would require a suitability determination from the DMMP.	Effective for removal and disposal of sediment with moderate to low contaminant concentrations and limited or no debris. Approval for open-water disposal expected to be difficult for contaminated sediment at Site.	Technically implementable. Impacted sediment must be profiled to verify that the materials meet DMMP suitability criteria. Dredging is commonly used in the marine environment to remove contaminated sediment.	Low to moderate capital cost depending on the degree of rehandling required. Low O&M if all contaminated sediment is removed.	Approval for open water disposal of site sediment expected to be difficult. Not retained.
In Situ Sediment Treatment	Bioremediation	Enhanced Biological Oxidation/Reduction	Bioremediation uses natural microbiological processes to degrade or transform organic chemicals in the sediment environment. Nutrients and potential electron donors/acceptors are provided while controlling temperature and pH to stimulate existing microorganisms to grow and use chemicals as a source of food and energy. LimnofixTM is an example bioremediation technology that degrades organic contaminants (e.g., PAHs, TPH).	Generally not effective for inorganic contaminants (metals).	Implementable, but would be difficult to implement in intertidal areas.	Moderate to high capital. Monitoring would be required.	Not effective for addressing contaminants at the Site. Not retained.
	Stabilization	In Situ Solidification and Stabilization (ISS)	This technology involves immobilizing contaminants by physically binding or enclosing the sediment within a stabilized mass, or chemically treating the contaminants. Portland cement, lime, pozzolans, or other additives are mixed with the sediment in situ to encapsulate the sediment and/or reduce the solubility, mobility, and toxicity of the contaminants.	May be effective for addressing contaminants, but may have negative affects to habitat. There are relatively few case histories to establish the potential effectiveness of this technology in sediment.	Implementable, but long-term stability may be an issue.	Moderate to high capital.	May not be effective and implementation may be difficult. Not retained.

TABLE 30

SUMMARY OF REMEDIAL ALTERNATIVES

REVISED RI/FS
RELIABLE STEEL, OLYMPIA, WASHINGTON

Site Area	Matrix	Contaminants Exceeding Proposed Cleanup Levels	CLEANUP ACTION ALTERNATIVE COMPONENTS			
			REMEDIAL ALTERNATIVE 1 Upland Area and Marine Area Capping	REMEDIAL ALTERNATIVE 2 Upland Area Capping and Marine Area Hot Spot Removal	REMEDIAL ALTERNATIVE 3 Upland Area Capping and Marine Area Removal	REMEDIAL ALTERNATIVE 4 Upland Area and Marine Area Removal
Upland Area	Soil	Metals, Petroleum Hydrocarbons, and Polycyclic Aromatic Hydrocarbons (PAHs)	Site preparation including demolition of existing structures in the upland area. Excavation and off-site disposal of metals-contaminated soil and metal debris contributing to contamination in groundwater. Excavation and off-site disposal of gasoline-contaminated soil located within and adjacent to the former Maintenance Building. Decommissioning and removal of underground storage tank (UST) and associated diesel-contaminated soil located adjacent to the former Tank Shop. Capping with a 2-foot thick soil or aggregate cap or infrastructure/pavement cap over contaminated soil to limit potential exposure of human and ecological receptors to contaminants in the upland area of the Site. Implementation of institutional controls such as deed restrictions for contaminated soil left in place.	Site preparation including demolition of existing structures in the upland area. Excavation and off-site disposal of metals-contaminated soil and metal debris contributing to contamination in groundwater. Excavation and off-site disposal of gasoline-contaminated soil located within and adjacent to the former Maintenance Building. Decommissioning and removal of UST and associated diesel-contaminated soil located adjacent to the former Tank Shop. Capping with a 2-foot thick soil or aggregate cap or infrastructure/pavement cap over contaminated soil to limit potential exposure of human and ecological receptors to contaminants in the upland area of the Site. Implementation of institutional controls such as deed restrictions for contaminated soil left in place.	Site preparation including demolition of existing structures in the upland area. Excavation and off-site disposal of metals-contaminated soil and metal debris contributing to contamination in groundwater. Excavation and off-site disposal of gasoline-contaminated soil located within and adjacent to the former Maintenance Building. Decommissioning and removal of UST and associated diesel-contaminated soil located adjacent to the former Tank Shop. Capping with a 2-foot thick soil or aggregate cap or infrastructure/pavement cap over contaminated soil to limit potential exposure of human and ecological receptors to contaminants in the upland area of the Site. Implementation of institutional controls such as deed restrictions for contaminated soil left in place.	Site preparation including demolition of existing structures in the upland area. Excavation and off-site disposal of metals-contaminated soil and metal debris contributing to contamination in groundwater. Decommissioning and removal of UST and associated diesel-contaminated soil located adjacent to the former Tank Shop. Excavation and off-site disposal of contaminated soil from the upland area to remove all soil with contaminant concentrations greater than the cleanup levels.
	Groundwater	Metals	Installation of monitoring wells to monitor the natural attenuation of groundwater after completion of metal debris and metals contaminated soil removal.	Installation of monitoring wells to monitor the natural attenuation of groundwater after completion of metal debris and metals contaminated soil removal.	Installation of monitoring wells to monitor the natural attenuation of groundwater after completion of metal debris and metals contaminated soil removal.	No action because all source material is expected to be removed from the upland areas of the Site.
	Stormwater Runoff	Metals and PAHs	Removal and replacement of the existing stormwater collection and conveyance system to limit transport of contaminated upland media (i.e. soil, groundwater, and stormwater runoff) to surface water and sediment in the marine area.	Removal and replacement of the existing stormwater collection and conveyance system to limit transport of contaminated upland media (i.e. soil, groundwater, and stormwater runoff) to surface water and sediment in the marine area.	Removal and replacement of the existing stormwater collection and conveyance system to limit transport of contaminated upland media (i.e. soil, groundwater, and stormwater runoff) to surface water and sediment in the marine area.	Replacement of the existing stormwater collection and conveyance system as part of redevelopment to meet current stormwater requirements.
Marine Area	Sediment	Metals, Petroleum Hydrocarbons, PAHs, and Phthalates	Site preparation including demolition of existing structures in the marine area. Place a 3-foot thick aggregate cap over contaminated sediment to limit potential exposure of human and ecological receptors to contaminants in the marine area. Monitoring the natural recovery of contaminated sediment outside the sediment cap area. Implementation of institutional controls such as deed restrictions for contaminated sediment left in place.	Site preparation including demolition of existing structures in the marine area. Removal and off-site disposal of the most contaminated sediment (hot spot areas) located in the marine area of the Site. Monitoring the natural recovery of contaminated sediment outside the sediment hot spot removal. Implementation of institutional controls such as deed restrictions for contaminated sediment left in place.	Site preparation including demolition of existing structures in the marine area. Removal and off-site disposal of sediment with multiple contaminants at concentrations greater than Sediment Quality Standards. Monitoring the natural recovery of contaminated sediment outside the sediment removal area. Implementation of institutional controls such as deed restrictions for contaminated sediment left in place.	Site preparation including demolition of existing structures in the marine area. Removal and off-site disposal of sediment with multiple contaminants at concentrations greater than Sediment Quality Standards. Monitoring the natural recovery of contaminated sediment outside the sediment removal area. Implementation of institutional controls such as deed restrictions for contaminated sediment left in place.

TABLE 31

SUMMARY OF EVALUATION AND COMPARISON OF REMEDIAL ALTERNATIVES

REVISED RI/FS
RELIABLE STEEL, OLYMPIA, WASHINGTON

Alternative Description	ALTERNATIVE 1 Marine Area and Upland Area Capping	ALTERNATIVE 2 Upland Area Capping and Marine Area Hot Spot Removal	ALTERNATIVE 3 Upland Area Capping and Marine Area Removal	ALTERNATIVE 4 Upland Area and Marine Area Removal
Alternative Ranking Under MTCA				
1. 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 capping, limited removal, natural recovery, and institutional controls.	Yes - Alternative would protect human health and the environment through a combination of capping, removal, natural attenuation/recovery, and institutional controls.	Yes - Alternative would protect human health and the environment through a combination of capping, removal, natural attenuation/recovery, and institutional controls.	Yes - Alternative would protect human health and the environment through a combination of removal and natural attenuation/recovery.
Compliance With Cleanup Standards	Yes - Alternative would require long term monitoring to ensure compliance with cleanup standards.	Yes - Alternative would require long term monitoring to ensure compliance with cleanup standards.	Yes - Alternative would require long term monitoring to ensure compliance with cleanup standards.	Yes - Alternative would require long term monitoring to ensure compliance with cleanup standards.
Compliance With Applicable State and Federal Regulations	Yes - Alternative complies with state and federal regulation.	Yes - Alternative complies with state and federal regulation.	Yes - Alternative complies with state and federal regulation.	Yes - Alternative complies with state and federal regulation.
Provision for Compliance Monitoring	Yes - Alternative includes provisions for monitoring of the upland and marine area caps to ensure containment of capped material, to assess the natural attenuation of groundwater concentrations, and to assess the natural recovery of sediment.	Yes - Alternative includes provisions for monitoring of the upland area cap to ensure containment of capped material, to assess the natural attenuation of groundwater concentrations, and to assess the natural recovery of sediment.	Yes - Alternative includes provisions for monitoring of the upland area cap to ensure containment of capped material, to assess the natural attenuation of groundwater concentrations, and to assess the natural recovery of sediment.	Yes - Alternative includes provisions for monitoring to assess the natural recovery of sediment.
2. Restoration Time Frame				
	Time frame for design, permitting, and construction of remedial actions is relatively short. The time frame for natural recovery is moderate. The time frame for long-term monitoring and maintenance is indefinite as the remedial actions will be required to be maintained into the future.	Time frame for design, permitting, and construction of remedial actions is relatively short. The time frame for natural recovery is moderate. The time frame for long-term monitoring and maintenance is indefinite as the remedial actions will be required to be maintained into the future.	Time frame for design, permitting, and construction of remedial actions is relatively short. The time frame for natural recovery is moderate. The time frame for long-term monitoring and maintenance is indefinite as the remedial actions will be required to be maintained into the future.	Time frame for design, permitting, and construction of remedial actions is relatively short. The time frame for natural recovery is moderate. The time frame for long-term monitoring and maintenance is moderate as most contaminated material would be removed from the Site.
3. Disproportionate Cost Analysis Criteria				
Protectiveness	Score = 3 Achieves a medium level of overall protectiveness as a result of capping upland and marine areas. Upland soil and the majority of contaminated sediment would effectively be isolated from human and ecological receptors. Longterm protectiveness reliant on effective implementation of institutional controls (deed restrictions).	Score = 3 Achieves a medium-high level of overall protectiveness as a result of capping the upland area and removal of the most contaminated sediment at the Site. Upland soil would be isolated from human and ecological receptors. Longterm protectiveness reliant on effective implementation of institutional controls (deed restrictions).	Score = 4 Achieves a medium-high level of overall protectiveness as a result of capping the upland area and removal of the greatest quantity of contaminated sediment. Upland soil would be isolated from human and ecological receptors. Longterm protectiveness reliant on effective implementation of institutional controls (deed restrictions).	Score = 5 Achieves a high level of overall protectiveness as a result of removal of contaminated soil and sediment at the Site.
Permanence	Score = 2 Achieves reduction of toxicity and mobility of hazardous substances at the Site by containment of contaminated soil and sediment with limited overall reduction in the mass of contaminants. The quantity of impacted soil and sediment allowed to remain on site is greater than with Alternatives 2 through 4.	Score = 4 Achieves permanent reduction of toxicity and mobility of hazardous substances at the Site by containment of contaminated soil and removal and offsite disposal of the most contaminated sediment from the marine area. The quantity of contaminated soil and sediment allowed to remain on site is less than Alternative 1 but greater than Alternatives 3 and 4.	Score = 4 Achieves permanent reduction of toxicity and mobility of hazardous substances at the Site by containment of contaminated soil and removal and offsite disposal of the largest quantity of contaminated sediment from the marine area. The quantity of contaminated soil and sediment allowed to remain on site is less than Alternatives 1 and 2 but greater than Alternative 4.	Score = 5 Achieves permanent reduction of mass, toxicity, and mobility of hazardous substances at the Site. All contaminated soil will be removed from the Site. The quantity of contaminated sediment to remain on site is less than Alternatives 1 through 3.
Long-Term Effectiveness	Score = 2 Prevents contact with contaminated soil and sediment by human and ecological receptors but removes a limited quantity of hazardous substances from the Site. Long term effectiveness reliant on monitoring and maintenance of capped areas.	Score = 3 Prevents contact with contaminated soil and sediment by human and ecological receptors and removes hazardous substances from the marine area of the Site. Long term effectiveness reliant on monitoring and maintenance of capped areas.	Score = 3 Prevents contact with contaminated soil and sediment by human and ecological receptors and removes hazardous substances from the marine area of the Site. Long term effectiveness reliant on monitoring and maintenance of capped areas.	Score = 5 Removes all contaminated soil from the upland area. Future development in the upland would not be restricted. Most contaminated sediment removed from Site.

Management of Short-Term Risks	Score = 4 Involves capping of soil and sediment in the upland and marine areas of the Site. The construction methods required under this alternative are well established and capable of reducing short-term risks.	Score = 3 Involves capping of soil and removal of sediment in the shoreline area of the Site. The construction methods required under this alternative are well established and capable of reducing short-term risks. There is some additional risk associated with sediment dredging and movement of contaminants during dredging operations.	Score = 3 Involves capping of soil and removal of sediment in the shoreline area of the Site. The construction methods required under this alternative are well established and capable of reducing short-term risks. There is some additional risk associated with sediment dredging and movement of contaminants during dredging operations.	Score = 3 Involves extensive soil and sediment removal across the Site. The construction methods required under this alternative are well established and capable of reducing short-term risks.
Technical and Administrative Implementability	Score = 1 Capping of upland and marine areas is a common approach for remediation of contaminated Sites. Placement of a cap in the nearshore marine area will cause loss of aquatic habitat that would likely necessitate mitigation in order to obtain approval of the remedial alternative. This is a significant implementability issue for capping of the marine area as proposed in this alternative.	Score = 4 Capping of the upland area and hot spot removal in the marine area are common approaches for remediation of contaminated Sites. Common construction methods and equipment are used.	Score = 3 Capping of the upland area and removal of contaminated sediment in the marine area are common approaches for remediation of contaminated Sites. Common construction methods and equipment are used.	Score = 3 Removal of contaminated soil from the upland area and removal of contaminated sediment in the marine area are common approaches for remediation of contaminated Sites. Common construction methods and equipment are used.
Consideration of Public Concerns	Score = 2 Addresses the exposure of human and ecological receptors to contaminated soil, groundwater, stormwater runoff, and sediment. Contaminated soil and sediment would remain on site require implementation of institutional controls and impose limitations on future use and development of the property.	Score = 3 Addresses the exposure of human and ecological receptors to contaminated soil, groundwater, stormwater runoff, and sediment. Includes removal and offsite disposal of the most contaminated sediment from the marine area. Contaminated soil and sediment would remain on site requiring implementation of institutional controls and would impose limitations on future use and development of the property.	Score = 3 Addresses the exposure of human and ecological receptors to contaminated soil, groundwater, stormwater runoff, and sediment. Includes removal and offsite disposal of the largest quantity of contaminated sediment from the marine area. Contaminated soil and sediment would remain on site requiring implementation of institutional controls and would impose limitations on future use and development of the property.	Score = 4 Addresses soil and sediments that poses risk to human health and the environment.

Table 32

Cost Estimate - Remedial Alternative 1 - Upland Area and Marine Area Capping

Reliable Steel Revised RI/FS
Olympia, Washington

ITEM No.	DESCRIPTION	PLAN QUANT	UNIT	UNIT PRICE	AMOUNT (2013$)	NOTES
Design, Permitting, and Administrative Costs						
1	Design and Permitting	1	LS	$150,000.00	$150,000	Prepare design, contracting documents, permit applications for in-water work.
2	Institutional Controls	1	LS	$50,000.00	$50,000	Develop restrictive covenants for contamination left in place, implement signage and other notifications.
				Subtotal	**$200,000**	
				Pre-Construction Total	**$200,000**	
Mobilization, Site Preparation, Demolition and Restoration						
3	Mobilization/Site Controls/Demobilization	1	LS	$167,000.00	$167,000	Estimated as 10% of construction capital costs.
4	Temporary Erosion and Sediment Control	1	LS	$15,000.00	$15,000	Environmental controls to be in place during construction.
5	Demolition	1	LS	$304,000.00	$304,000	Demolition, removal and disposal of upland and marine area structures, foundations, debris, etc.
6	Site Restoration	1	LS	$20,000.00	$20,000	Includes vegetative planting and hydroseed for capped/backfilled areas.
				Subtotal	**$506,000**	
Soil Removal and Disposal of Sources to Groundwater						
7	Former Maintenance Building Contaminated Soil Excavation and Stockpiling (to 2 ft bgs)	770	CY	$8.00	$6,200	Excavation of shallow soil (to 2 ft bgs)
8	Former Maintenance Building Contaminated Soil (non-haz) Transport and Disposal at Approved Off-Site Facility	1,100	TON	$60.00	$66,000	Assumes 75% of total excavated volume will be suitable for disposal at Subtitle D landfill. Assumes 20% volume expansion from bank to loose soil.
9	Former Maintenance Building Contaminated Soil (haz) Transport and Disposal at Approved Off-Site Facility	370	TON	$225.00	$83,300	Assumes 25% of total excavated requires disposal at Subtitle C landfill. Assumes 20% volume expansion from bank to loose soil.
10	Former Maintenance Building Import, Backfill, Grade and Compact Clean Material	1,200	TON	$12.00	$14,400	
11	Metal Debris Area Excavation and Stockpiling (to 3 ft	470	CY	$12.00	$5,600	Metal debris area along shoreline.
12	Metal Debris Area Contaminated Soil (non-haz) Transport and Disposal at Approved Off-Site Facility	680	TON	$60.00	$40,800	Assumes 75% of total excavated volume will be suitable for disposal at Subtitle D landfill. Assumes 20% volume expansion from bank to loose soil.
13	Metal Debris Area Contaminated Soil (haz) Transport and Disposal at Approved Off-Site Facility	230	TON	$225.00	$51,800	Assumes 25% of total excavated requires disposal at Subtitle C landfill. Assumes 20% volume expansion from
14	Metal Debris Area Backfill, Import, Grade and Compact Clean Material	750	TON	$12.00	$9,000	
				Subtotal	**$277,100**	
UST Decommission, Removal and Disposal						
15	UST Decommission, Removal and Disposal	1	LS	$10,000.00	$10,000	Removal of UST in accordance with applicable regulations.
16	Contaminated Soil Excavation and Stockpiling (to 7 ft bgs) Adjacent to UST	680	CY	$8.00	$5,400	Excavation of soil (to 7 ft bgs)
17	Contaminated Soil (non-haz) Transport and Disposal at Approved Off-Site Facility	1,300	TON	$60.00	$78,000	Assumes disposal all excavated soil is suitable for disposal at Subtitle D landfill. Assumes 20% volume expansion from bank to loose soil.
				Subtotal	**$93,400**	
Soil Removal and Disposal of Gasoline-Contaminated Areas						
18	Soil Excavation and Stockpiling	140	CY	$8.00	$1,100	Excavation of gasoline-contaminated soil.
19	Contaminated Soil (non-haz) Transport and Disposal at Approved Off-Site Facility	280	TON	$60.00	$16,800	
20	Backfill, Import, Grade and Compact Clean Material	230	TON	$12.00	$2,800	
				Subtotal	**$20,700**	
Upland Soil Capping						
21	Install Upland Geotextile	7,600	SY	$5.50	$41,800	For soil cap only.
22	Place 2-foot Lift of Fill in Upland Cap Areas	8,100	TON	$12.00	$97,200	Assumes 50% of cap area will be soil cap.
23	Asphalt Paving	3,800	SY	$24.00	$91,200	Assumes 25% of cap area will be asphalt pavement cap.
				Subtotal	**$230,200**	
Stormwater Conveyance System						
24	Stormwater System Piping and Catch Basins	1	LS	$156,000.00	$156,000	
25	Transport and Disposal of Excavated Soil During Trenching at Approved Off-Site Facility (non haz)	2,100	TON	$60.00	$126,000	Assumes soil is contaminated and cannot be used for backfill. Assumes acceptable at Subtitle D permitted
				Subtotal	**$282,000**	
Groundwater Monitoring						
26	Install Monitoring Wells	4	EA	$3,000.00	$12,000	Assumes installation of 4 wells.
27	Perform Initial 4 Quarterly Monitoring Events	4	EA	$7,050.00	$28,200	Monitor for TPH, PAHs, metals and SVOCs.
28	Perform Annual Monitoring Events For 4 Years	4	EA	$7,050.00	$25,000	Monitor for TPH, PAHs, metals and SVOCs. Total cost is discounted for net present value based on 5% discount rate.
				Subtotal	**$65,200**	
Sediment Capping						
29	Import and Place Granular Marine Backfill Material	5,500	CY	$36.00	$198,000	Assumes 3-foot thick cap.
30	Import and Place Shoreline Revetment	350	LF	$205.00	$71,800	Assumes revetment with bedding stone and armor stone for shoreline stabilization.
				Subtotal	**$269,800**	
Sediment Monitored Natural Recovery						
31	Perform Initial 2 Semi-Annual Monitoring Events	2	EA	$12,500.00	$25,000	Assume monitoring will be conducted from boat. Monitor for TPH, PAHs, metals and SVOCs.
32	Perform Annual Monitoring Events For 6 Years	6	EA	$12,500.00	$63,911	Assume monitoring will be conducted from boat. Monitor for TPH, PAHs, metals and SVOCs. Total cost is discounted for net present value based on 5% discount rate.
				Subtotal	**$88,911**	
	Contractor Overhead (Based on total of Tasks 3-32)	10.00%	%		$183,331	Contractor Overhead applied to construction items.
	Sales Tax (Based on total of Tasks 1-32)	8.2%	%		$166,732	Sales Tax applied to sum of construction items and construction overhead.
				Total Purchase and Installation Subtotal	**$2,183,374**	
	Construction Management and Field Monitoring	10.0%	%		$218,337	
	Construction Contingency (Conceptual Design Level)	25.0%	%		$600,428	
				Construction Total	**$3,002,139**	
				OVERALL PROJECT TOTAL COSTS	**$3,202,000**	

Table 33

Cost Estimate - Remedial Alternative 2 - Upland Area Capping and Marine Area Hot Spot Removal

Reliable Steel Revised RI/FS
Olympia, Washington

ITEM No.	DESCRIPTION	PLAN QUANT	UNIT	UNIT PRICE	AMOUNT (2013$)	NOTE
Design, Permitting, and Administrative Costs						
1	Design and Permitting	1	LS	$150,000.00	$150,000	Prepare design, contracting documents, permit applications for in-water work.
2	Institutional Controls	1	LS	$50,000.00	$50,000	Develop restrictive covenants for contamination left in place, implement signage and other notifications.
				Subtotal	**$200,000**	
				Pre-Construction Total	**$200,000**	
Mobilization, Site Preparation, Demolition and Restoration						
3	Mobilization/Site Controls/Demobilization	1	LS	$203,000.00	$203,000	Estimated as 10% of construction capital costs.
4	Temporary Erosion and Sediment Control	1	LS	$15,000.00	$15,000	Environmental controls to be in place during construction.
5	Demolition	1	LS	$304,000.00	$304,000	Demolition, removal and disposal of upland and marine area structures, foundations, debris, etc.
6	Site Restoration	1	LS	$20,000.00	$20,000	Includes vegetative planting and hydroseed for capped/backfilled areas.
				Subtotal	**$542,000**	
Soil Removal and Disposal of Sources to Groundwater						
7	Former Maintenance Building Contaminated Soil Excavation and Stockpiling (to 2 ft bgs)	770	CY	$8.00	$6,200	Excavation of shallow soil (to 2 ft bgs)
8	Former Maintenance Building Contaminated Soil (non-haz) Transport and Disposal at Approved Off-Site Facility	1,100	TON	$60.00	$66,000	Assumes disposal at Subtitle D landfill. Assumes 20% volume expansion from bank to loose soil.
9	Former Maintenance Building Contaminated Soil (haz) Transport and Disposal at Approved Off-Site Facility	370	TON	$225.00	$83,300	Assumes 25% of total excavated requires disposal at Subtitle C landfill. Assumes 20% volume expansion from bank to loose soil.
10	Former Maintenance Building Import, Backfill, Grade and Compact Clean Material	1,200	TON	$12.00	$14,400	Assumes 20% volume expansion from bank to loose soil.
11	Metal Debris Area Excavation and Stockpiling (to 3 ft bgs)	470	CY	$12.00	$5,600	Metal debris area along shoreline.
12	Metal Debris Area Contaminated Soil (non-haz) Transport and Disposal at Approved Off-Site Facility	680	TON	$60.00	$40,800	Assumes disposal at Subtitle D landfill. Assumes 20% volume expansion from bank to loose soil.
13	Metal Debris Area Contaminated Soil (haz) Transport and Disposal at Approved Off-Site Facility	230	TON	$225.00	$51,800	Assumes 25% of total excavated requires disposal at Subtitle C landfill. Assumes 20% volume expansion from bank to loose soil.
14	Metal Debris Area Backfill, Import, Grade and Compact Clean Material	750	TON	$12.00	$9,000	
				Subtotal	**$277,100**	
UST Decommission, Removal and Disposal						
15	UST Decommission, Removal and Disposal	1	LS	$10,000.00	$10,000	Removal of UST in accordance with applicable regulations.
16	Contaminated Soil Excavation and Stockpiling (to 7 ft bgs) Adjacent to UST	680	CY	$8.00	$5,400	
17	Contaminated Soil (non-haz) Transport and Disposal at Approved Off-Site Facility	1,300	TON	$60.00	$78,000	Assumes all excavated soil is suitable for disposal at Subtitle D landfill. Assumes 20% volume expansion from bank to loose soil.
				Subtotal	**$93,400**	
Soil Removal and Disposal of Gasoline-Contaminated Areas						
18	Soil Excavation and Stockpiling	140	CY	$8.00	$1,100	Excavation of gasoline-contaminated soil.
19	Contaminated Soil (non-haz) Transport and Disposal at Approved Off-Site Facility	280	TON	$60.00	$16,800	
20	Backfill, Import, Grade and Compact Clean Material	230	TON	$12.00	$2,800	
				Subtotal	**$20,700**	
Upland Soil Capping						
21	Install Upland Geotextile	7,600	SY	$5.50	$41,800	For soil cap only.
22	Place 2-foot Lift of Fill in Upland Cap Areas	8,100	TON	$12.00	$97,200	Assumes 50% of cap area will be soil cap.
23	Asphalt Paving	3,800	SY	$24.00	$91,200	Assumes 25% of cap area will be asphalt pavement cap.
				Subtotal	**$230,200**	
Stormwater Conveyance System						
24	Stormwater System Piping and Catch Basins	1	LS	$156,000.00	$156,000	
25	Contaminated Soil (non-haz) Transport and Disposal at Approved Off-Site Facility	2,100	TON	$60.00	$126,000	Assumes soil is contaminated and cannot be used for backfill. Assumes acceptable at Subtitle D permitted landfill.
				Subtotal	**$282,000**	
Groundwater Monitoring						
26	Install Monitoring Wells	4	EA	$3,000.00	$12,000	Assumes installation of 4 wells.
27	Perform Initial 4 Quarterly Monitoring Events	4	EA	$7,050.00	$28,200	Monitor for TPH, PAHs, metals and SVOCs.
28	Perform Annual Monitoring Events For 4 Years	4	EA	$7,050.00	$25,000	Monitor for TPH, PAHs, metals and SVOCs. Total cost is discounted for net present value based on 5% discount rate.
				Subtotal	**$65,200**	
Sediment Hot Spot Removal						
29	Dredging/Excavation and Stockpiling of Sediments	2,500	CY	$25.00	$62,500	Assumes dredging/excavation using land-based equipment. Dewatering is included in unit cost.
30	Temporary Sheet Pile for Dredging	430	LF	$310.00	$133,300	Temporary sheet pile wall installed to dredge/excavate without tidal inundation.
31	Contaminated Sediment (non-haz) Transport and Disposal at Approved Off-Site Facility	4,800	TON	$60.00	$288,000	Assumes all dredged material is suitable for disposal at Subtitle D landfill. Assumes 20% volume expansion from bank to loose soil.
32	Import and Place Granular Marine Backfill Material	2,500	CY	$36.00	$90,000	
33	Import and Place Shoreline Revetment	350	LF	$205.00	$71,800	Assumes revetment with bedding stone and armor stone for shoreline stabilization.
				Subtotal	**$645,600**	
Sediment Monitored Natural Recovery						
34	Perform Initial 2 Semi-Annual Monitoring Events	2	EA	$12,500.00	$25,000	Assume monitoring will be conducted from boat. Monitor for TPH, PAHs, metals and SVOCs.
35	Perform Annual Monitoring Events For 5 Years	5	EA	$12,500.00	$54,119	Assume monitoring will be conducted from boat. Monitor for TPH, PAHs, metals and SVOCs. Total cost is discounted for net present value based on 5% discount rate.
				Subtotal	**$79,119**	
	Contractor Overhead (Based on total of Tasks 3-35)	10.00%	%		$223,532	Contractor Overhead applied to construction items.
	Sales Tax (Based on total of Tasks 1-35)	8.2%	%		$199,696	Sales Tax applied to sum of construction items and construction overhead.
	Total Purchase and Installation Subtotal				**$2,658,547**	
	Construction Management and Field Monitoring	10.0%	%		$265,855	
	Construction Contingency (Conceptual Design Level)	25.0%	%		$731,100	
				Construction Total	**$3,655,502**	
				OVERALL PROJECT TOTAL COSTS	**$3,856,000**	

Table 34

Cost Estimate - Remedial Alternatives 3 - Upland Area Capping and Marine Area Removal

Reliable Steel Revised RI/FS
Olympia, Washington

ITEM No.	DESCRIPTION	PLAN QUANT	UNIT	UNIT PRICE	AMOUNT (2013$)	NOTE
Design, Permitting, and Administrative Costs						
1	Design and Permitting	1	LS	$150,000.00	$150,000	Prepare design, contracting documents, permit applications for in-water work.
2	Institutional Controls	1	LS	$50,000.00	$50,000	Develop restrictive covenants for contamination left in place, implement signage and other notifications.
				Subtotal	**$200,000**	
				Pre-Construction Total	**$200,000**	
Mobilization, Site Preparation, Demolition and Restoration						
3	Mobilization/Site Controls/Demobilization	1	LS	$254,000.00	$254,000	Estimated as 10% of construction capital costs.
4	Temporary Erosion and Sediment Control	1	LS	$15,000.00	$15,000	Environmental controls to be in place during construction.
5	Demolition	1	LS	$304,000.00	$304,000	Demolition, removal and disposal of upland and marine area structures, foundations, debris, etc.
6	Site Restoration	1	LS	$20,000.00	$20,000	Includes vegetative planting and hydroseed for capped/backfilled areas.
				Subtotal	**$593,000**	
Soil Removal and Disposal of Sources to Groundwater						
7	Former Maintenance Building Contaminated Soil Excavation and Stockpiling (to 2 ft bgs)	770	CY	$8.00	$6,200	Excavation of shallow soil (to 2 ft bgs)
8	Former Maintenance Building Contaminated Soil (non-haz) Transport and Disposal at Approved Off-Site Facility	1,100	TON	$60.00	$66,000	Assumes disposal at Subtitle D landfill. Assumes 20% volume expansion from bank to loose soil.
9	Former Maintenance Building Contaminated Soil (haz) Transport and Disposal at Approved Off-Site Facility	370	TON	$225.00	$83,300	Assumes 25% of total excavated requires disposal at Subtitle C landfill. Assumes 20% volume expansion from bank to loose soil.
10	Former Maintenance Building Import, Backfill, Grade and Compact Clean Material	1,200	TON	$12.00	$14,400	Assumes 20% volume expansion from bank to loose soil.
11	Metal Debris Area Excavation and Stockpiling (to 3 ft bgs)	470	CY	$12.00	$5,600	Metals debris area along shoreline.
12	Metal Debris Area Contaminated Soil (non-haz) Transport and Disposal at Approved Off-Site Facility	680	TON	$60.00	$40,800	Assumes disposal at Subtitle D landfill. Assumes 20% volume expansion from bank to loose soil.
13	Metal Debris Area Contaminated Soil (haz) Transport and Disposal at Approved Off-Site Facility	230	TON	$225.00	$51,800	Assumes 25% of total excavated requires disposal at Subtitle C landfill. Assumes 20% volume expansion from bank to loose soil.
14	Metal Debris Area Backfill, Import, Grade and Compact Clean Material	750	TON	$12.00	$9,000	
				Subtotal	**$277,100**	
UST Decommission, Removal and Disposal						
15	UST Decommission, Removal and Disposal	1	LS	$10,000.00	$10,000	Removal of UST in accordance with applicable regulations.
16	Contaminated Soil Excavation and Stockpiling (to 7 ft bgs) Adjacent to UST	680	CY	$8.00	$5,400	
17	Contaminated Soil (non-haz) Transport and Disposal at Approved Off-Site Facility	1,300	TON	$60.00	$78,000	Assumes disposal all excavated soil is suitable for disposal at Subtitle D landfill. Assumes 20% volume expansion from bank to loose soil.
				Subtotal	**$93,400**	
Soil Removal and Disposal of Gasoline-Contaminated Areas						
18	Soil Excavation and Stockpiling	140	CY	$8.00	$1,100	Excavation of gasoline-contaminated soil.
19	Contaminated Soil (non-haz) Transport and Disposal at Approved Off-Site Facility	280	TON	$60.00	$16,800	
20	Backfill, Import, Grade and Compact Clean Material	230	TON	$12.00	$2,800	
				Subtotal	**$20,700**	
Upland Soil Capping						
21	Install Upland Geotextile	7,600	SY	$5.50	$41,800	For soil cap only.
22	Place 2-foot Lift of Fill in Upland Cap Areas	8,100	TON	$12.00	$97,200	Assumes 50% of cap area will be soil cap.
23	Asphalt Paving	3,800	SY	$24.00	$91,200	Assumes 25% of cap area will be asphalt pavement cap.
				Subtotal	**$230,200**	
Stormwater Conveyance System						
24	Stormwater System Piping and Catch Basins	1	LS	$156,000.00	$156,000	
25	Contaminated Soil (non-haz) Transport and Disposal at Approved Off-Site Facility	2,100	TON	$60.00	$126,000	Assumes soil is contaminated and cannot be used for backfill. Assumes acceptable at Subtitle D permitted landfill.
					$282,000	
Groundwater Monitoring						
26	Install Monitoring Wells	4	EA	$3,000.00	$12,000	Assumes installation of 4 wells.
27	Perform Initial 4 Quarterly Monitoring Events	4	EA	$7,050.00	$28,200	Monitor for TPH, PAHs, metals and SVOCs.
28	Perform Annual Monitoring Events For 4 Years	4	EA	$7,050.00	$25,000	Monitor for TPH, PAHs, metals and SVOCs. Total cost is discounted for net present value based on 5% discount rate.
				Subtotal	**$65,200**	
Sediment Removal						
29	Dredging/Excavation and Stockpiling of Sediments	5,200	CY	$25.00	$130,000	Assumes dredging/excavation using land-based equipment. Dewatering is included in unit cost.
30	Temporary Sheet Pile for Dredging	530	LF	$310.00	$164,300	Temporary sheet pile wall installed to dredge/excavate without tidal inundation.
31	Contaminated Sediment (non-haz) Transport and Disposal at Approved Off-Site Facility	10,000	TON	$60.00	$600,000	Assumes all dredged material is suitable for disposal at Subtitle D landfill. Assumes 20% volume expansion from bank to loose soil.
32	Import and Place Granular Marine Backfill Material	5,200	CY	$36.00	$187,200	
33	Import and Place Shoreline Revetment	350	LF	$205.00	$71,800	Assumes revetment with bedding stone and armor stone for shoreline stabilization.
				Subtotal	**$1,153,300**	
Sediment Monitored Natural Recovery						
34	Perform Initial 2 Semi-Annual Monitoring Events	2	EA	$12,500.00	$25,000	Assume monitoring will be conducted from boat. Monitor for TPH, PAHs, metals and SVOCs.
35	Perform Annual Monitoring Events For 5 Years	5	EA	$12,500.00	$54,119	Assume monitoring will be conducted from boat. Monitor for TPH, PAHs, metals and SVOCs. Total cost is discounted for net present value based on 5% discount rate.
				Subtotal	**$79,119**	
	Contractor Overhead (Based on total of Tasks 3-35)	10.00%	%		$279,402	Contractor Overhead applied to construction items.
	Sales Tax (Based on total of Tasks 1-35)	8.2%	%		$245,510	Sales Tax applied to sum of construction items and construction overhead.
				Total Purchase and Installation Subtotal	**$3,318,930**	
	Construction Management and Field Monitoring	10.0%	%		$331,893	
	Construction Contingency (Conceptual Design Level)	25.0%	%		$912,706	
				Construction Total	**$4,563,529**	
				OVERALL PROJECT TOTAL COSTS	**$4,764,000**	

Table 35

Cost Estimate - Remedial Alternative 4 - Upland Area and Marine Removal

Reliable Steel Revised RI/FS
Olympia, Washington

ITEM No.	DESCRIPTION	PLAN QUANT	UNIT	UNIT PRICE	AMOUNT (2013$)	NOTE
Design, Permitting, and Administrative Costs						
1	Design and Permitting	1	LS	$150,000.00	$150,000	Prepare design, contracting documents, permit applications for in-water work.
2	Institutional Controls	1	LS	$10,000.00	$10,000	Develop restrictive covenants for contamination left in place, implement signage and other notifications.
				Subtotal	**$160,000**	
				Pre-Construction Total	**$160,000**	
Mobilization, Site Preparation, Demolition and Restoration						
3	Mobilization/Site Controls/Demobilization	1	LS	$524,000.00	$524,000	Estimated as 10% of construction capital costs.
4	Temporary Erosion and Sediment Control	1	LS	$15,000.00	$15,000	Environmental controls to be in place during construction.
5	Demolition	1	LS	$304,000.00	$304,000	Demolition, removal and disposal of upland and marine area structures, foundations, debris, etc.
6	Site Restoration	1	LS	$20,000.00	$20,000	Includes vegetative planting and hydroseed for capped/backfilled areas.
				Subtotal	**$863,000**	
Metals Debris Removal Along Shoreline						
7	Metal Debris Area Excavation and Stockpiling (to 3 ft bgs)	470	CY	$12.00	$5,600	Metals debris area along shoreline.
8	Metal Debris Area Contaminated Soil (non-haz) Transport and Disposal at Approved Off-Site Facility	680	TON	$60.00	$40,800	Assumes disposal at Subtitle D landfill. Assumes 20% volume expansion from bank to loose soil.
9	Metal Debris Area Contaminated Soil (haz) Transport and Disposal at Approved Off-Site Facility	230	TON	$225.00	$51,800	Assumes 25% of total excavated requires disposal at Subtitle C landfill. Assumes 20% volume expansion from bank to loose soil.
10	Metal Debris Area Import, Backfill, Grade and Compact Clean Material	750	TON	$12.00	$9,000	
				Subtotal	**$107,200**	
UST Decommission, Removal and Disposal						
11	UST Decommission, Removal and Disposal	1	LS	$10,000.00	$10,000	Removal of UST in accordance with applicable regulations.
12	Contaminated Soil Excavation and Stockpiling (to 7 ft bgs) Adjacent to UST	680	CY	$8.00	$5,400	
13	Contaminated Soil (non-haz) Transport and Disposal at Approved Off-Site Facility	1,300	TON	$60.00	$78,000	Assumes disposal all excavated soil is suitable for disposal at Subtitle D landfill. Assumes 20% volume expansion from bank to loose soil.
				Subtotal	**$93,400**	
Upland Soil Removal						
14	Contaminated Soil Excavation and Stockpiling	24,000	CY	$8.00	$192,000	
15	Contaminated Soil (non-haz) Transport and Disposal at Approved Off-Site Facility	45,600	TON	$60.00	$2,736,000	Assumes disposal all excavated soil is suitable for disposal at Subtitle D landfill. Assumes 20% volume expansion from bank to loose soil.
16	Contaminated Soil (haz) Transport and Disposal at Approved Off-Site Facility	370	TON	$225.00	$83,300	Assumes 25% of total excavated from former Maintenance building requires disposal at Subtitle C landfill. Assumes 20% volume expansion from bank to loose soil.
17	Backfill, Grade and Compact Clean Material	38,300	TON	$12.00	$459,600	
				18	**$3,470,900**	
Sediment Removal						
18	Dredging/Excavation and Stockpiling of Sediments	5,200	CY	$25.00	$130,000	Assumes dredging/excavation using land-based equipment. Dewatering is included in unit cost.
19	Temporary Sheet Pile for Dredging	530	LF	$310.00	$164,300	Temporary sheet pile wall installed to dredge/excavate without tidal inundation.
20	Contaminated Sediment (non-haz) Transport and Disposal at Approved Off-Site Facility	10,000	TON	$60.00	$600,000	Assumes all dredged material is suitable for disposal at Subtitle D landfill. Assumes 20% volume expansion from bank to loose soil.
21	Import and Place Granular Marine Backfill Material	5,200	CY	$36.00	$187,200	
22	Import and Place Shoreline Revetment	350	LF	$205.00	$71,800	Assumes revetment with bedding stone and armor stone for shoreline stabilization.
				Subtotal	**$1,153,300**	
Sediment Monitored Natural Recovery						
23	Perform Initial 2 Semi-Annual Monitoring Events	2	EA	$12,500.00	$25,000	Assume monitoring will be conducted from boat. Monitor for TPH, PAHs, metals and SVOCs.
24	Perform Annual Monitoring Events For 5 Years	5	EA	$12,500.00	$54,119	Assume monitoring will be conducted from boat. Monitor for TPH, PAHs, metals and SVOCs. Total cost is discounted for net present value based on 5% discount rate.
				Subtotal	**$79,119**	
	Contractor Overhead (Based on total of Tasks 3-24)	10.00%	%		$576,692	Contractor Overhead applied to construction items.
	Sales Tax (Based on total of Tasks 1-24)	8.2%	%		$486,007	Sales Tax applied to sum of construction items and construction overhead.
				Total Purchase and Installation Subtotal	**$6,829,618**	
	Construction Management and Field Monitoring	10.0%	%		$682,962	
	Construction Contingency (Conceptual Design Level)	25.0%	%		$1,878,145	
				Construction Total	**$9,390,725**	
				OVERALL PROJECT TOTAL COSTS	**$9,551,000**	

TABLE 36

SUMMARY OF MTCA EVALUATION AND RANKING OF REMEDIAL ACTION ALTERNATIVES

REVISED RI/FS

RELIABLE STEEL

OLYMPIA, WASHINGTON

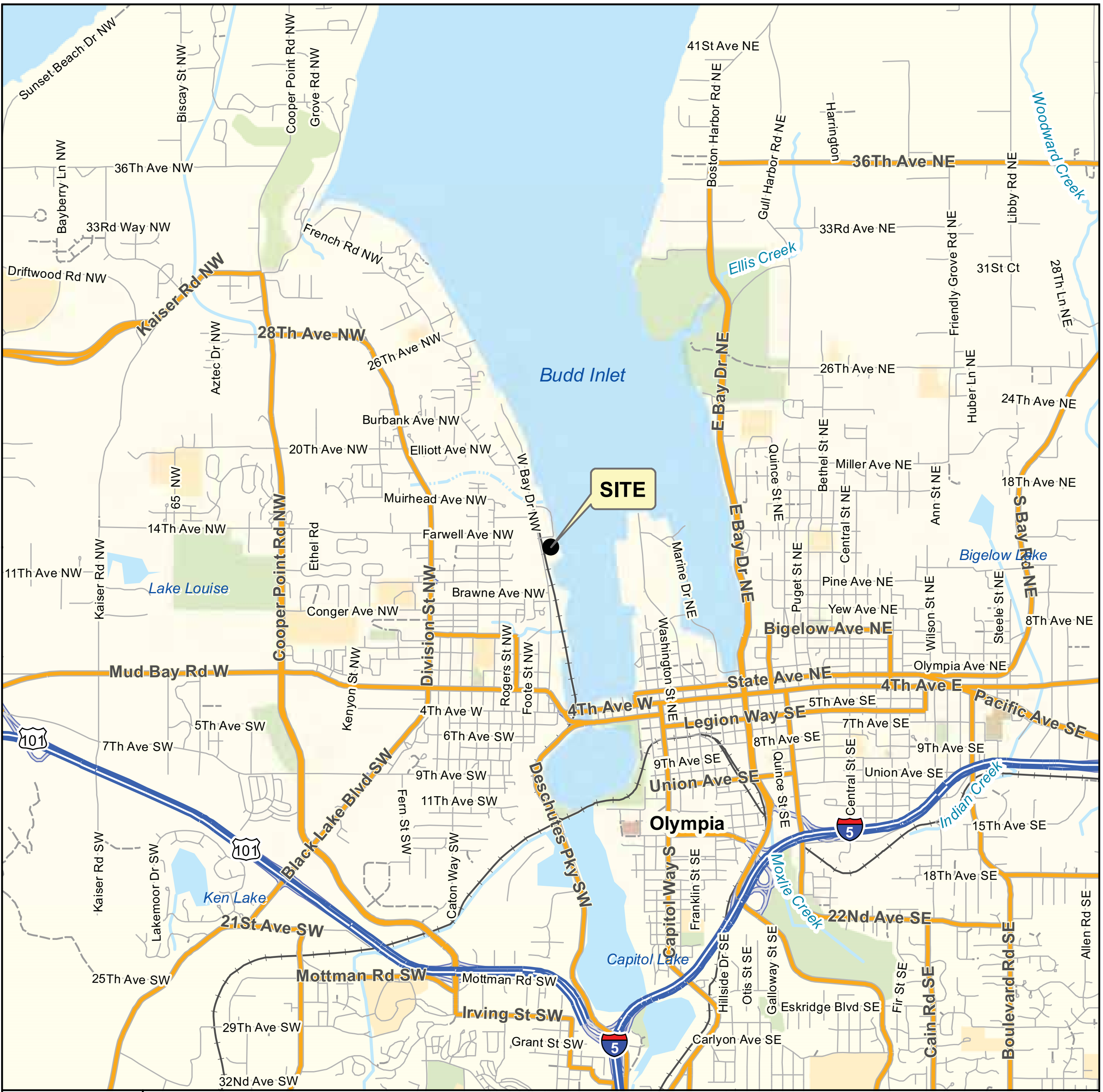
Alternative Number	ALTERNATIVE 1 Upland Area and Marine Area Capping	ALTERNATIVE 2 Upland Area Capping, Marine Area Hot Spot Removal	ALTERNATIVE 3 Upland Area Capping, Marine Area Removal	ALTERNATIVE 4 Upland Area and Marine Area Removal
Alternative Ranking Under MTCA				
1. Compliance with MTCA Threshold Criteria	YES	YES	YES	YES
2. Restoration Time Frame	Design/construction - Short Natural attenuation/recovery - Moderate	Design/construction - Short Natural attenuation/recovery - Moderate	Design/construction - Short Natural attenuation/recovery - Moderate	Design/construction - Short Natural recovery - Moderate
3. DCA Relative Benefits Ranking	4th	Tied - 2nd	Tied - 2nd	1st
Protectiveness	3	3	4	5
Permanence	2	4	4	5
Long-Term Effectiveness	2	3	3	5
Management of Short-Term Risks	4	3	3	3
Technical and Administrative Implementability	1	4	3	3
Consideration of Public Concerns	2	3	3	4
Total of Scores	**14**	**20**	**20**	**25**
4. Disproportionate Cost Analysis (DCA)				
Probable Remedy Cost (+50%/-30%, rounded)	$3,202,000	$3,856,000	$4,764,000	$9,551,000
Costs Disproportionate to Incremental Benefits	NA (1)	NO	NO	YES
Practicability of Remedy	Not Practicable (2)	Practicable	Practicable	Practicable
Remedy Permanent to Maximum Extent Practicable	Yes (3)	Yes (3)	Yes (3)	Yes
Overall Alternative Ranking	**3rd**	**1st**	**2nd**	**Costs disproportionate; not ranked**

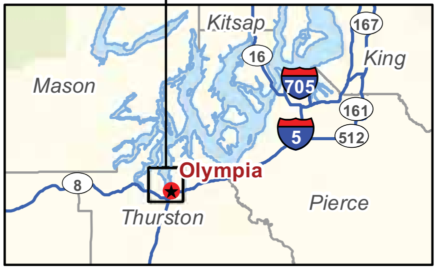
Notes:

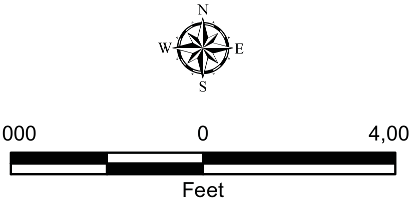
1 Not applicable since this is the lowest cost alternative.

2 Not practicable due to potential permitting and mitigation requirements associated with marine cap approach.

3 May require modification due to future land use or development.







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.
3. It is unlawful to copy or reproduce all or any part thereof, whether for personal use or resale, without permission.

Data Sources: ESRI Data & Maps

Projection: NAD 1983 UTM Zone 10N

Path: \\tac\projects\0\0504085\GIS\050408500_VicinityMap.mxd Map Revised: 25 January 2013 amanza

Vicinity Map

Reliable Steel Site
Olympia, Washington

GeoEngineers

Figure 1

TACO:IWH : SCY

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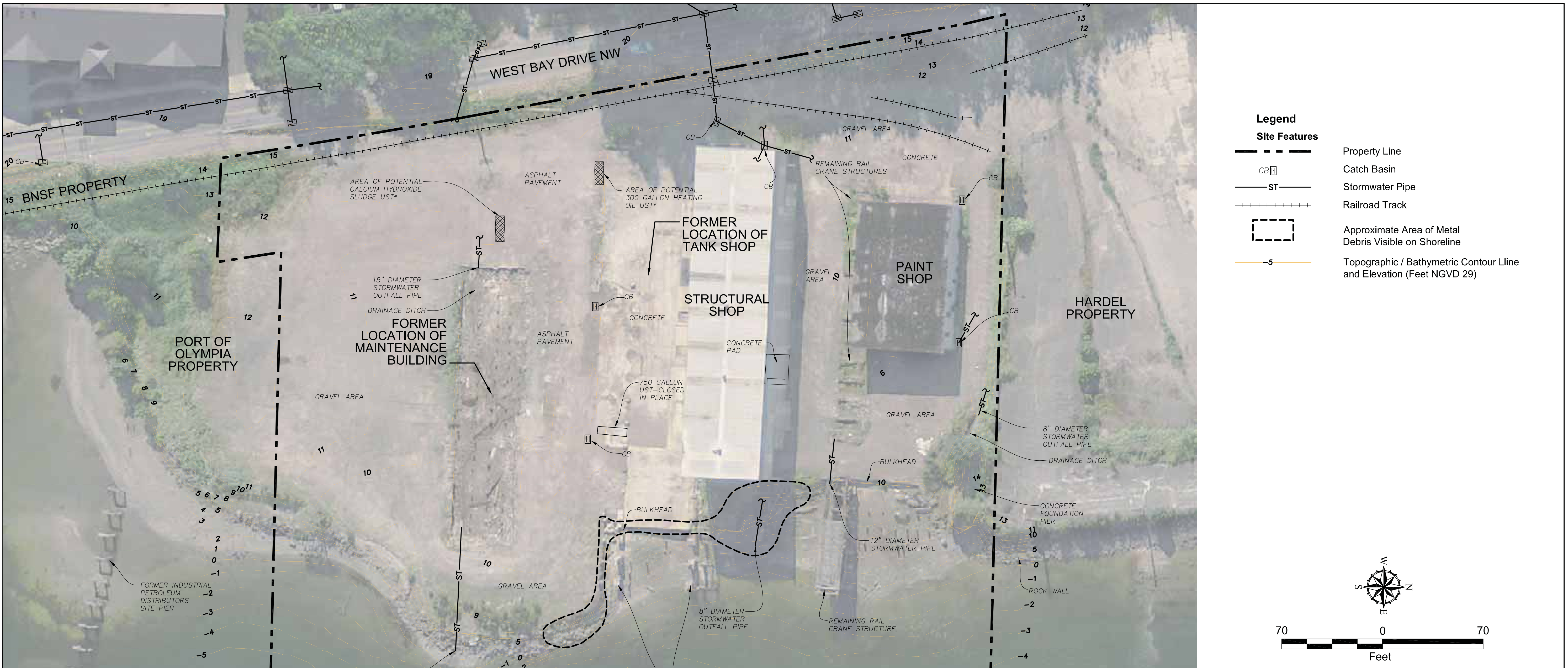


Notes:

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. 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.
3. * Areas of potential USTs identified by geophysical survey (GPR and EM) on 3/3/2008.

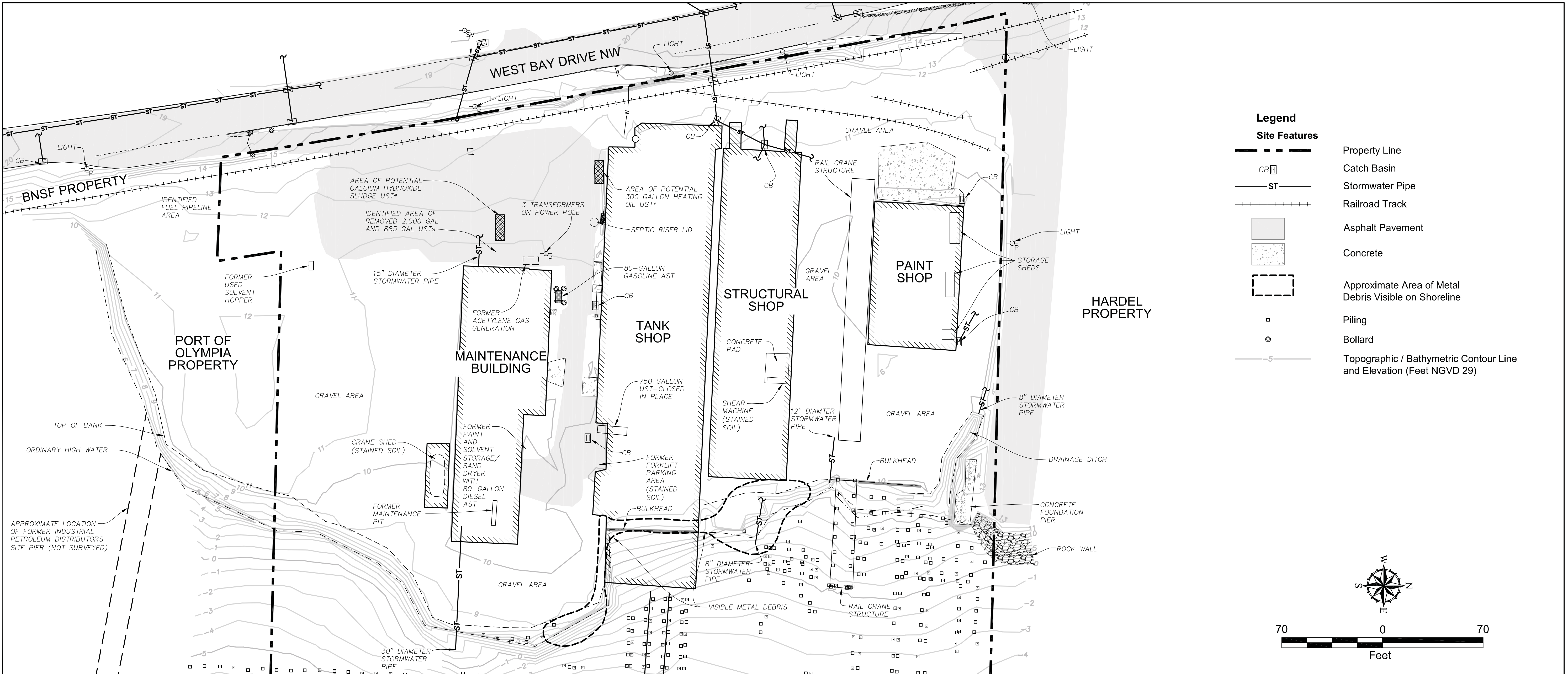
Reference: Survey drawing provided by Hatton Godat Pantier Engineers and Surveyors, Inc. (11-17-08 survey) and aerial photo provided by Thurston County (2012 aerial). The aerial photo is oblique, and the features shown on the aerial do not exactly match those shown on the survey drawing.

Existing Site Conditions

Reliable Steel Site
Olympia, Washington

GEOENGINEERS

Figure 2



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. 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.
3. * Areas of potential USTs identified by geophysical survey (GPR and EM) on 3/3/2008.

Reference: Survey drawing provided by Hatton Godat Pantier Engineers and Surveyors, Inc. (11-17-08 survey).

Previous Site Conditions

Reliable Steel Site
Olympia, Washington

GeoEngineers

Figure 3

TACO:IWH : SCY

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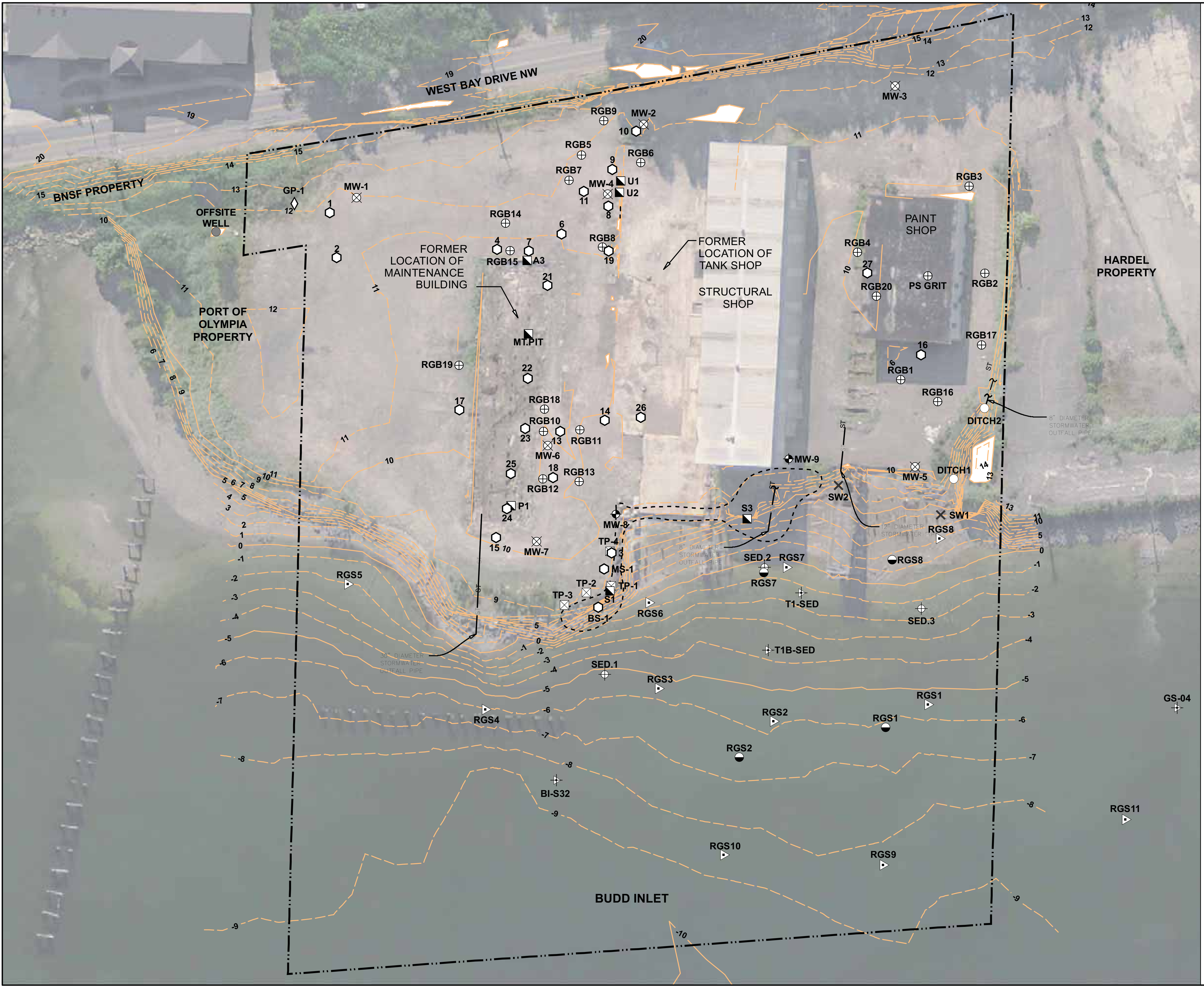

Legend

Sample Type and Source

◩ DOF Soil Sample Location (2007)

⊕ DOF Sediment Sample Location (2007)

☒ DOF Test Pit Sample Location (2007)

✛ Ecology Surface Sediment Sample Location (2008)

○ Greylock Ditch Sample Location

◆ Greylock Monitoring Well (2008)

⊕ Greylock Soil Sample Location (2008)

◐ Greylock Sediment Core Sample Location (2008)

△ Greylock Surface Sediment Sample Location (2007, 2008)

✕ Greylock Stormwater Sample Location (2008)

⊠ Stemen Monitoring Well (2007)

⬡ Stemen Sample Location (2005, 2006)

◇ ARCADIS Sample Location (2013)

● Unknown

Site Features

—ST— Stormwater Pipe

—·· Property Line

—5— Topographic/Bathymetric Contour Line and Elevation (feet NGVD29)

▭ Approximate Area of Metal Debris Visible on Shoreline

70 0 70

Feet

Data Source: Drawing provided by HATTON GODAT PANTIER. Aerial image from Thurston County, 2012.

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.

Previous Investigation Locations

Reliable Steel Site
Olympia, Washington

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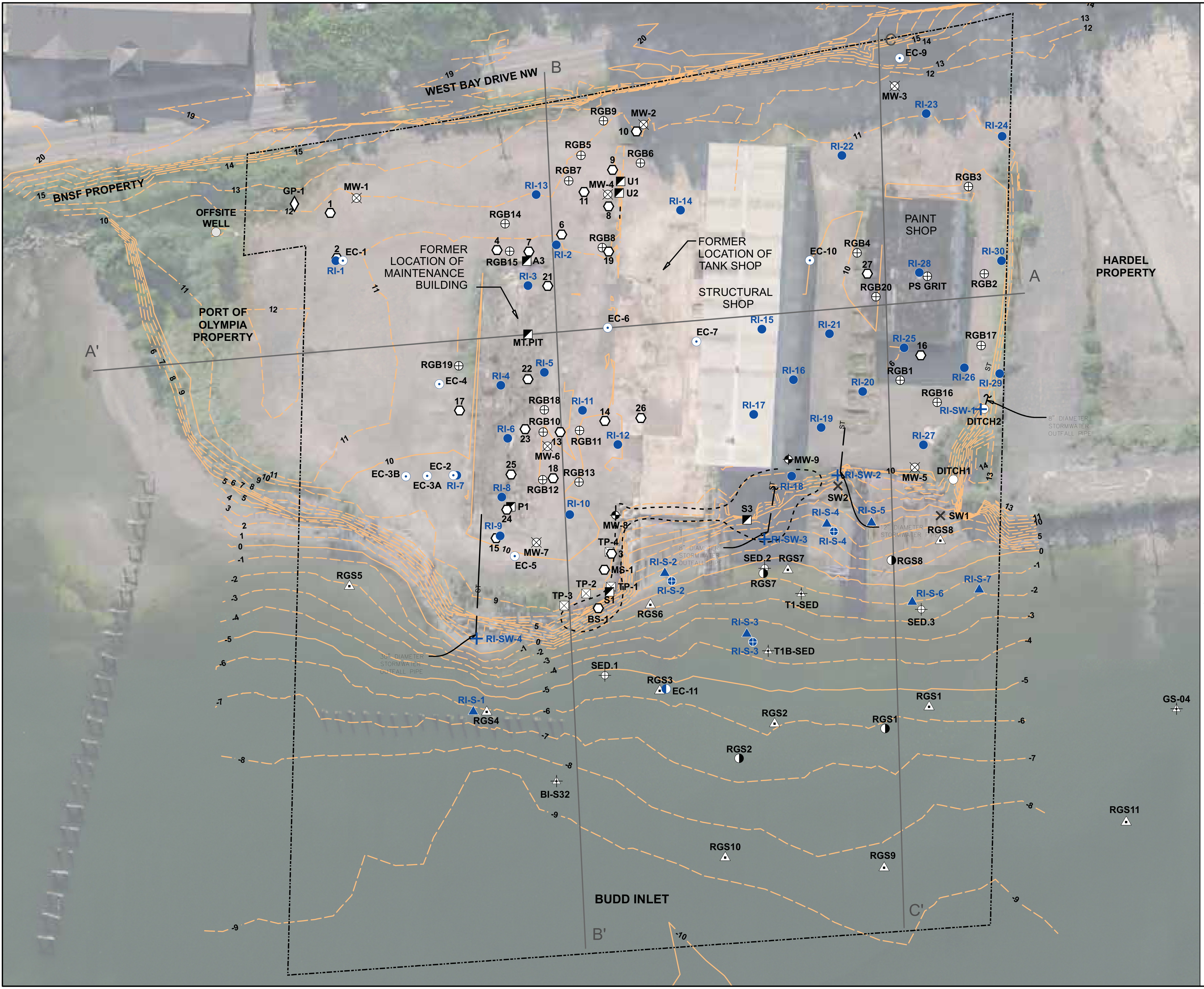
Figure 4

Path: P:\0\0504085\GIS\050408500_PreviousInvestigations_ed.mxd Map Revised: 16 July 2013 ccabrera



Path: P:\0\0504085\GIS\050408500_RemedialInvestigation.mxd Map Revised: 16 July 2013 ccabrera

Legend

Remedial Investigation Locations-LEGEND

- ● Remedial Investigation Soil Boring Location (Greylock 2010)
- ⊕ Remedial Investigation Sediment Core Sample Location (Greylock 2010)
- ✕ Remedial Investigation Stormwater Sample Location (Greylock 2010)
- ▲ Remedial Investigation Surface Sediment Sample Location (Greylock 2010)
- ⊙ Supplemental Investigation Soil Boring Location (Ecology 2013)
- ◐ Supplemental Investigation Sediment Core Location (Ecology 2013)

Previous Investigation Locations-LEGEND

- ◩ DOF Soil Sample Location (2007)
- ⊕ DOF Sediment Sample Location (2007)
- ☒ DOF Test Pit Sample Location (2007)
- ▲ Ecology Surface Sediment Sample Location(2008)
- ○ Greylock Ditch Sample Location
- ◈ Greylock Monitoring Well (2008)
- ⊕ Greylock Soil Sample Location (2008)
- ◑ Greylock Sediment Core Sample Location (2008)
- △ Greylock Surface Sediment Sample Location (2007, 2008)
- ✕ Greylock Stormwater Sample Location (2008)
- ☒ Stemen Monitoring Well (2007)
- ⬡ Stemen Sample Location (2005, 2006)
- ◇ ARCADIS Sample Location (2013)
- ○ Unknown

Site Features

- ST Stormwater Pipe
- Property Line
- Approximate Area of Metal Debris Visible on Shoreline
- 5 Topographic/Bathymetric Contour Line and Elevation (feet NGVD29)
- A A' Cross Section Locations

Data Source: Drawing provided by HATTON GODAT PANTIER.
Aerial image from Thurston County, 2012.

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.

Remedial Investigation Locations

Reliable Steel Site
Olympia, Washington

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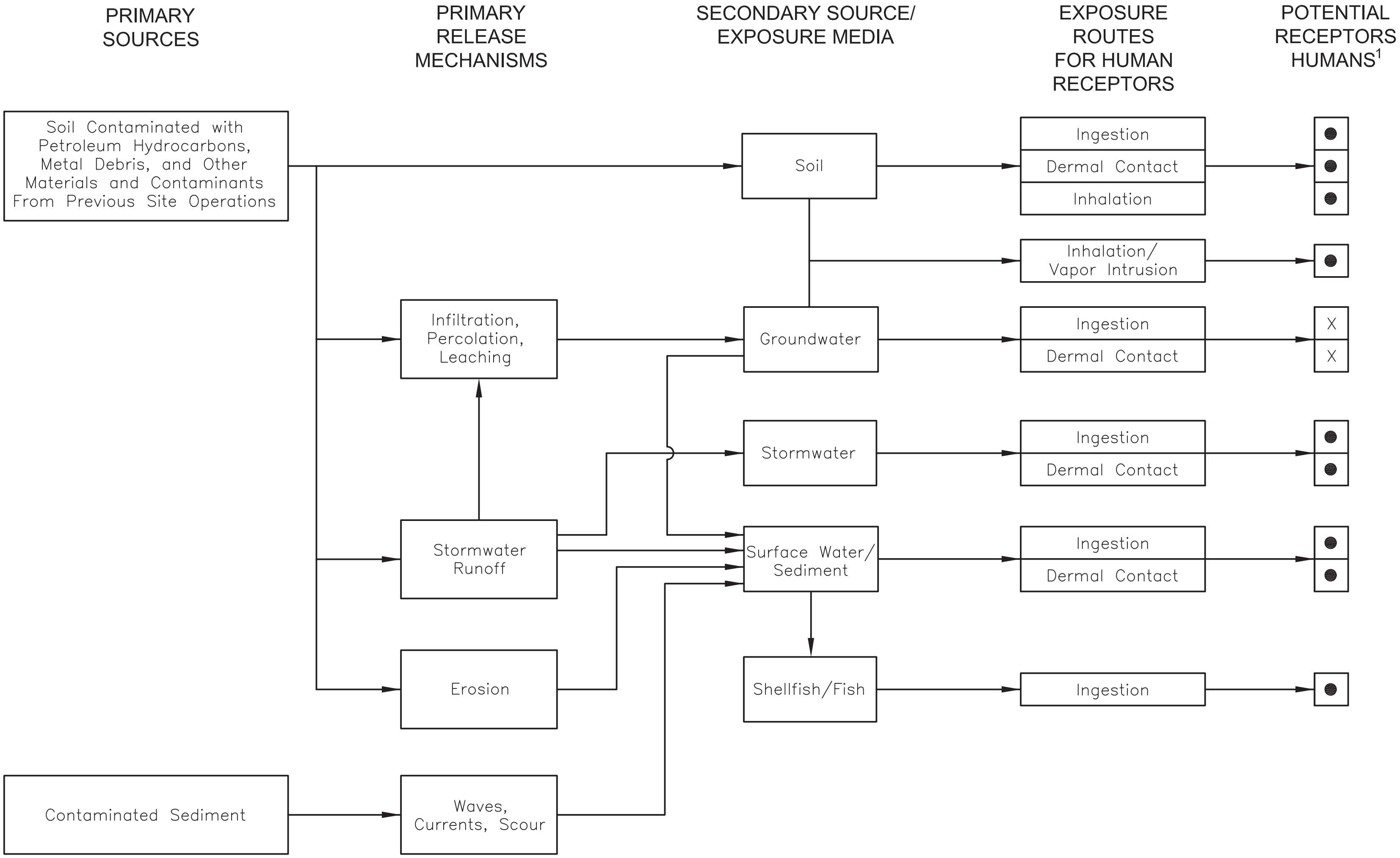
Figure 5



Notes:

● Complete Exposure Pathway

X Potentially Complete But Insignificant Exposure Pathway

1 Future Commercial Workers, Residents, and Visitors

Notes:

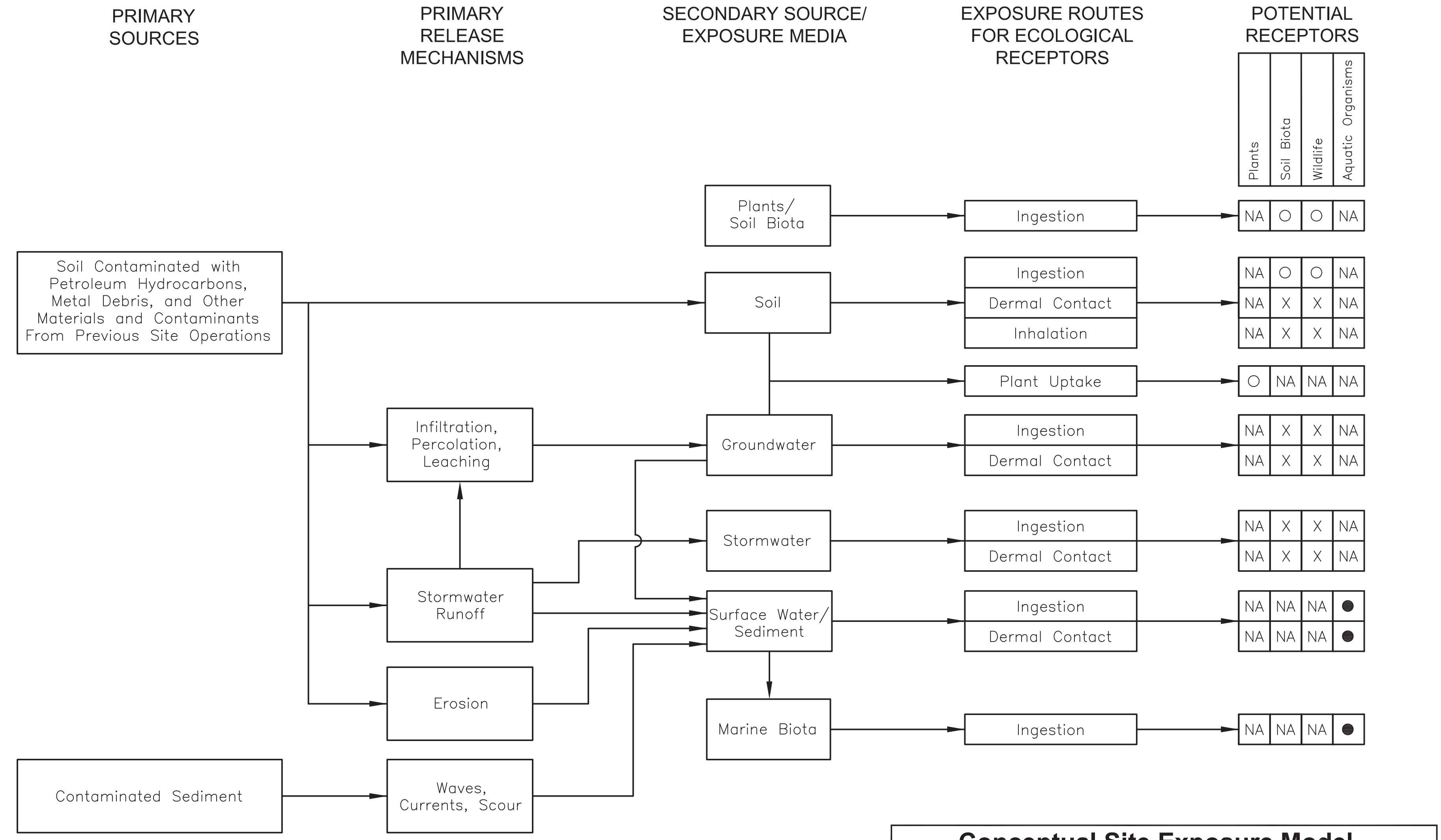
1. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. can not guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this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

Conceptual Site Exposure Model - Human Receptors

Reliable Steel Site
Olympia, Washington

GeoEngineers

Figure 6



SECONDARY SOURCE/ EXPOSURE MEDIA	EXPOSURE ROUTES FOR ECOLOGICAL RECEPTORS	Plants	Soil Biota	Wildlife	Aquatic Organisms
Plants/ Soil Biota	Ingestion	NA	○	○	NA
Soil	Ingestion	NA	○	○	NA
	Dermal Contact	NA	X	X	NA
	Inhalation	NA	X	X	NA
	Plant Uptake	○	NA	NA	NA
Groundwater	Ingestion	NA	X	X	NA
	Dermal Contact	NA	X	X	NA
Stormwater	Ingestion	NA	X	X	NA
	Dermal Contact	NA	X	X	NA
Surface Water/ Sediment	Ingestion	NA	NA	NA	●
	Dermal Contact	NA	NA	NA	●
Marine Biota	Ingestion	NA	NA	NA	●

Notes:

●	Complete Exposure Pathway
○	Incomplete Exposure Pathway
X	Potentially Complete But Insignificant Exposure Pathway
NA	Not Applicable

Notes:
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Conceptual Site Exposure Model - Ecological Receptors

Reliable Steel Site
Olympia, Washington

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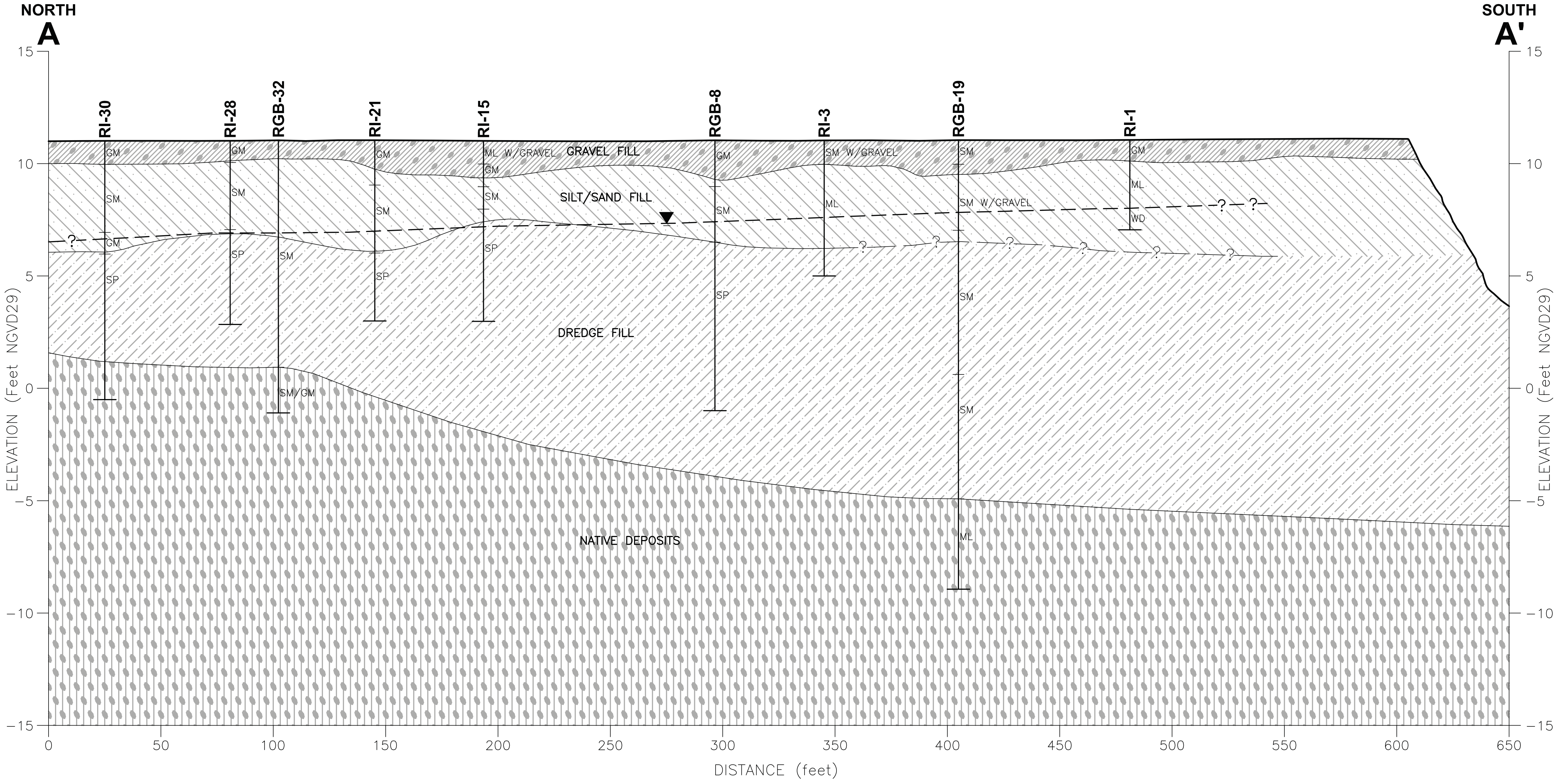
Figure 7



Notes:
1. The subsurface conditions shown are based on interpolation between widely spaced explorations and should be considered approximate. Actual subsurface conditions may vary from those shown.
2. Refer to Figure 5 for location of Cross Section.
3. This figure is for informational purposes only. It is intended to assist in the identification of features discussed in an attached document. Data were compiled from sources identified in the document attached. The data sources do not guarantee these data are accurate or complete. There may have been updates to the data since the publication of this figure. This figure is a copy of a master document. The master hard copy is stored by GeoEngineers, Inc. and will serve as the official document of record.
4. Vertical datum is NGVD 29, feet.

EXPLANATION:

RI-3 / RGB-19	APPROXIMATE INVESTIGATION LOCATION AND LOCATION DESIGNATION
SM	SOIL TYPE
—	SOIL CONTACT
— — ▼ — —	APPROXIMATE GROUNDWATER ELEVATION DURING HIGH TIDE ON SEPTEMBER 16, 2010
▨	GRAVEL FILL
▨	SILT/SAND FILL
▨	DREDGE FILL
▨	NATIVE DEPOSITS

50 0 50
Horizontal Scale in Feet
5 0 5
Vertical Scale in Feet
Vertical Exaggeration: 10X

Cross Section A-A'

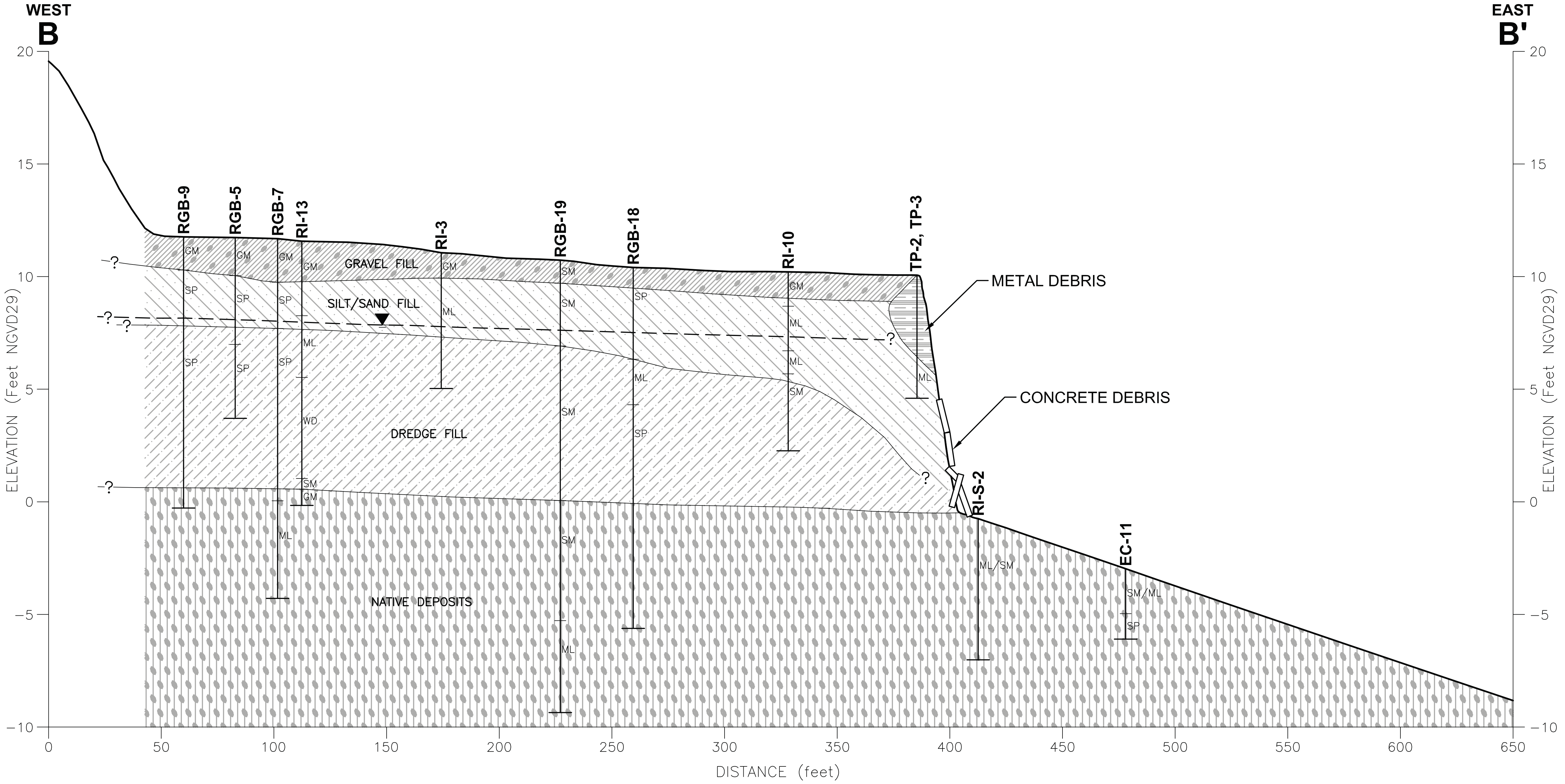
Reliable Steel Site
Olympia, Washington

GEOENGINEERS

Figure 8

TACO:GRL : SCY

W:\Tacoma\Projects\0\0504085\00\CAD\050408500_T200_F8_F9_F10.dwg\TAB:F8 modified on Jun 17, 2013 - 7:06am



Notes:

1. The subsurface conditions shown are based on interpolation between widely spaced explorations and should be considered approximate. Actual subsurface conditions may vary from those shown.
2. Refer to Figure 5 for location of Cross Section.
3. This figure is for informational purposes only. It is intended to assist in the identification of features discussed in an attached document. Data were compiled from sources identified in the document attached. The data sources do not guarantee these data are accurate or complete. There may have been updates to the data since the publication of this figure. This figure is a copy of a master document. The master hard copy is stored by GeoEngineers, Inc. and will serve as the official document of record.
4. Vertical datum is NGVD 29, feet.

EXPLANATION:

RI-3 / RGB-19	APPROXIMATE INVESTIGATION LOCATION AND LOCATION DESIGNATION
SM	SOIL TYPE
─┼─	SOIL CONTACT
— — ▼ — —	APPROXIMATE GROUNDWATER ELEVATION DURING HIGH TIDE ON SEPTEMBER 16, 2010

▨	GRAVEL FILL
▤	METAL DEBRIS
▧	SILT/SAND FILL
▨	DREDGE FILL
▦	NATIVE DEPOSITS

50 0 50
Horizontal Scale in Feet
5 0 5
Vertical Scale in Feet
Vertical Exaggeration: 10X

Cross Section B-B'

Reliable Steel Site
Olympia, Washington

GEOENGINEERS

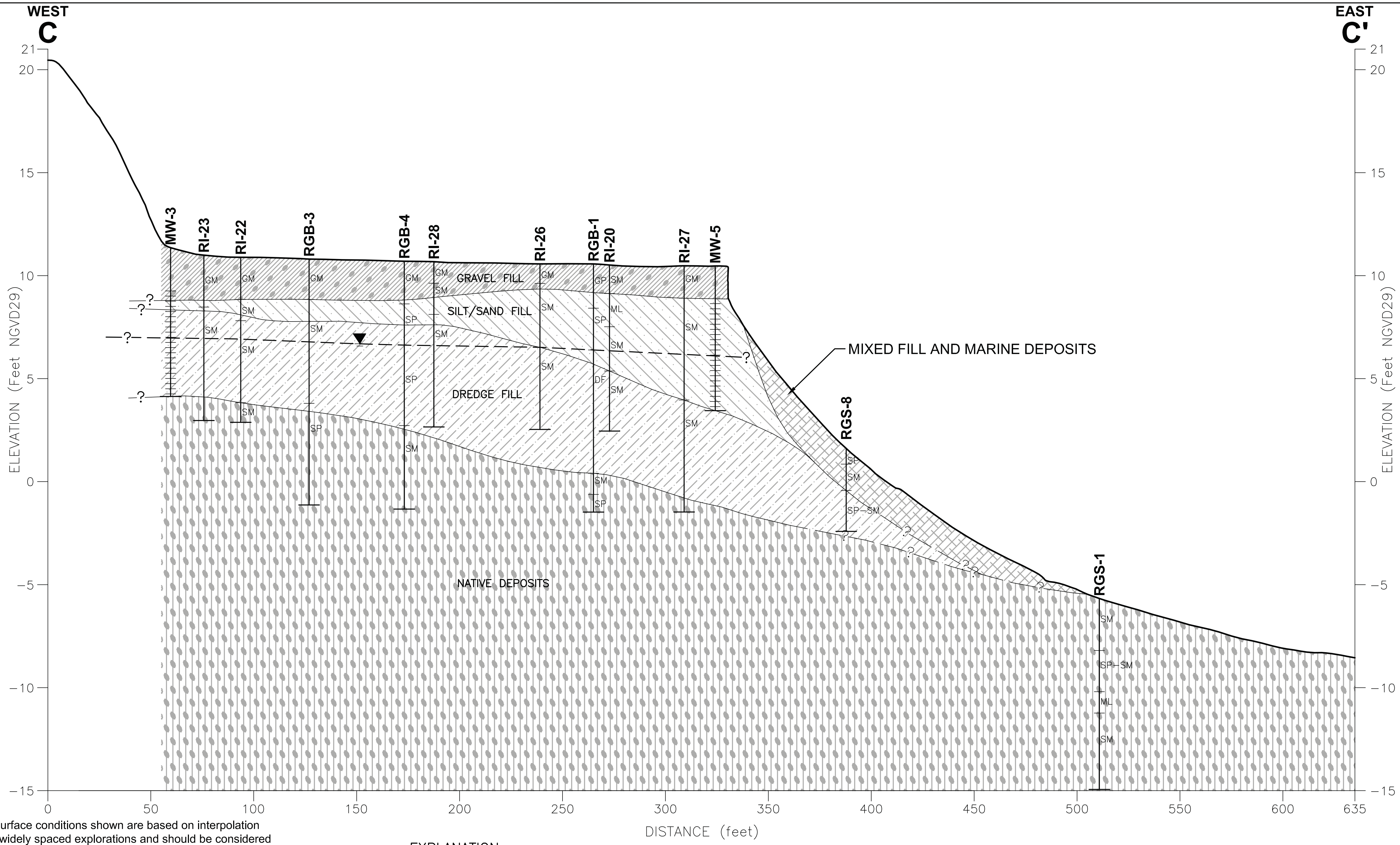
Figure 9

TACO:GRL : SCY

W:\Tacoma\Projects\0\0504085\00\CAD\050408500_T200_F8_F9_F10.dwg\TAB:F9 modified on Jun 17, 2013 - 7:07am

TACO:GRL : SCY

W:\Tacoma\Projects\0\0504085\00\CAD\050408500_T200_F8_F9_F10.dwg\TAB:F10 modified on Jun 17, 2013 - 7:07am



Notes:
1. The subsurface conditions shown are based on interpolation between widely spaced explorations and should be considered approximate. Actual subsurface conditions may vary from those shown.
2. Refer to Figure 5 for location of Cross Section.
3. This figure is for informational purposes only. It is intended to assist in the identification of features discussed in an attached document. Data were compiled from sources identified in the document attached. The data sources do not guarantee these data are accurate or complete. There may have been updates to the data since the publication of this figure. This figure is a copy of a master document. The master hard copy is stored by GeoEngineers, Inc. and will serve as the official document of record.
4. Vertical datum is NGVD 29, feet.

EXPLANATION:

RI-22 / RGB-3	APPROXIMATE INVESTIGATION LOCATION AND LOCATION DESIGNATION
SM	SOIL TYPE
───	SOIL CONTACT
─ ─ ▼ ─ ─	APPROXIMATE GROUNDWATER ELEVATION DURING HIGH TIDE ON SEPTEMBER 16, 2010
▨	GRAVEL FILL
▨	SILT/SAND FILL
▨	MIXED FILL AND MARINE DEPOSITS
▨	DREDGE FILL
▨	NATIVE DEPOSITS

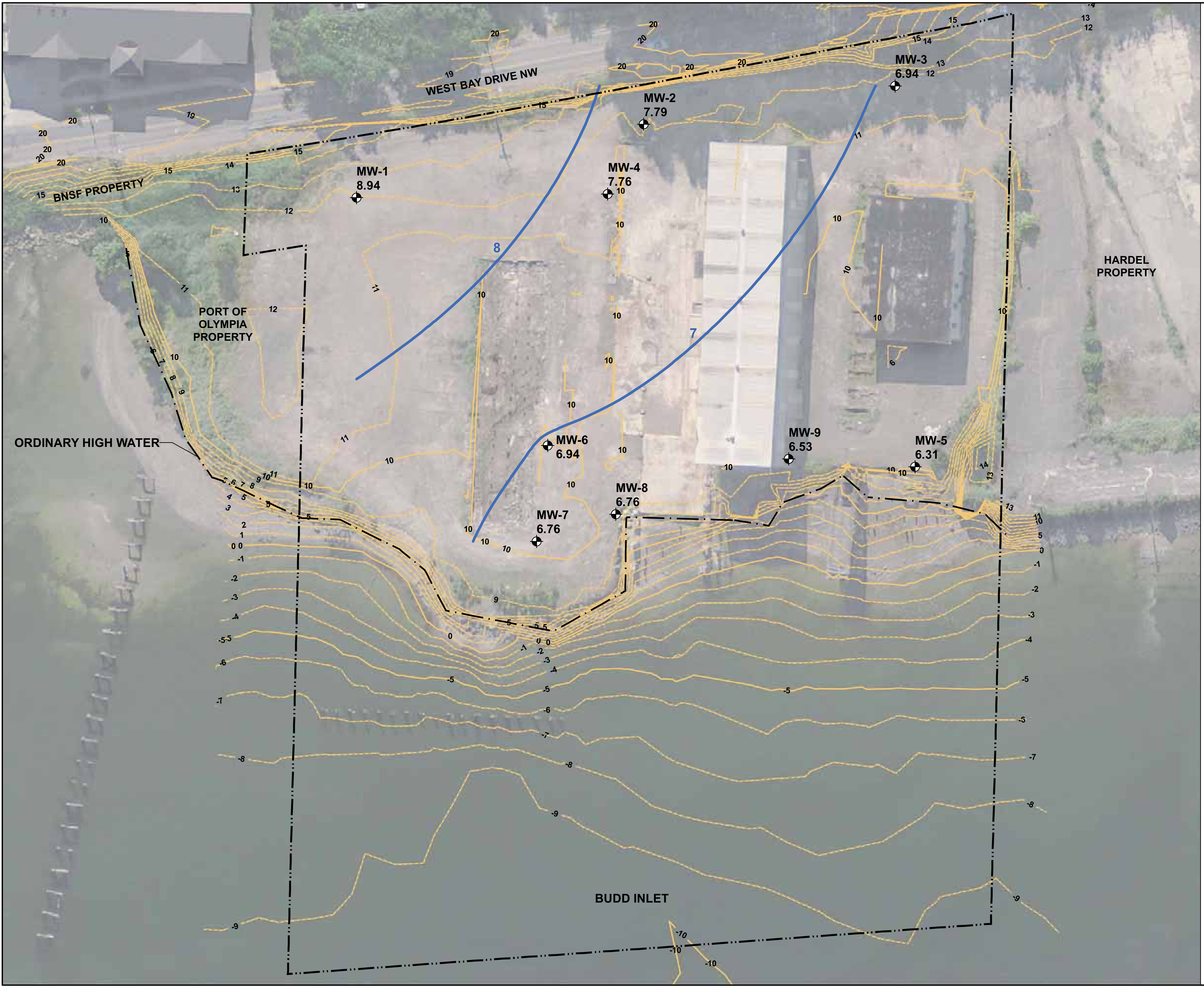
50 0 50
Horizontal Scale in Feet
5 0 5
Vertical Scale in Feet
Vertical Exaggeration: 10X

Cross Section C-C'

Reliable Steel Site
Olympia, Washington

GEOENGINEERS

Figure 10



Legend

7.76 Monitoring Well Location and Groundwater Elevation (feet NGVD29)[3]

Property Line

Ordinary High Water Line

Groundwater Contour Line and Elevation (feet NGVD29)[3]

5 Topographic/Bathymetric Contour Line and Elevation (feet NGVD29)

70 0 70

Feet

Data Source: Aerial image from Thurston County, 2012.

Notes:
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3. Groundwater elevations and countour lines adapted from Greylock 2011.

Generalized Groundwater Contours High Tide (September 16, 2010)

Reliable Steel Site
Olympia, Washington

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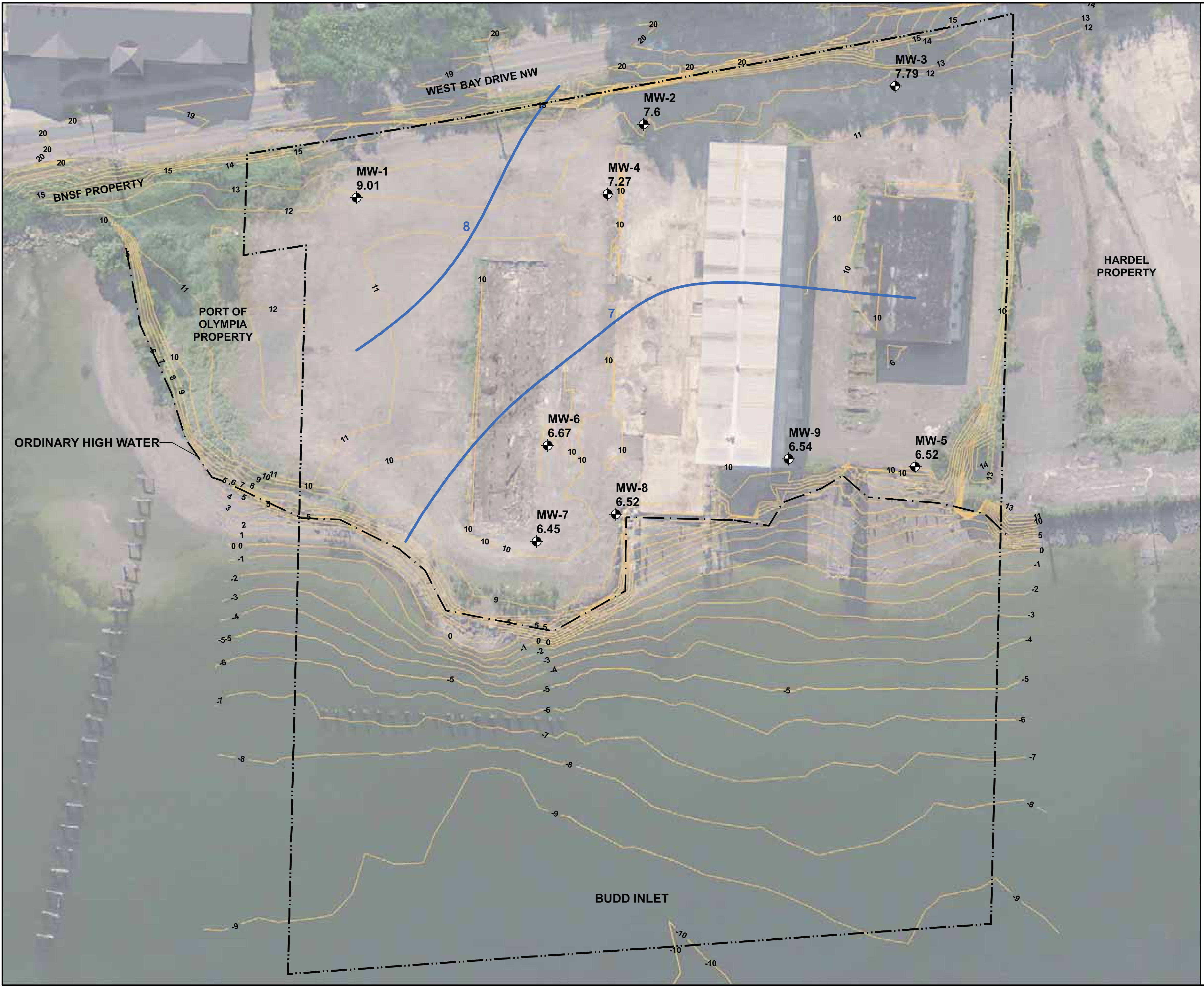
Figure 11

Path: P:\0\0504085\GIS\050408500_GroundwaterContours_HighTide.mxd Map Revised: 16 July 2013 ccabrera



Legend

7.27 ⊕ Monitoring Well Location and Groundwater Elevation (feet NGVD29)^3

-·- Property Line

-·· Ordinary High Water Line

— Groundwater Contour Line and Elevation (feet NGVD29)^3

5 Topographic/Bathymetric Contour Line and Elevation (feet NGVD29)

W N E S

70 0 70

Feet

Data Source: Aerial image from Thurston County, 2012.

Notes:

1. The locations of all features shown are approximate.
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3. Groundwater elevations and contour lines adapted from Greylock 2011.

Generalized Groundwater Contours Low Tide (October 6, 2010)

Reliable Steel Site
Olympia, Washington

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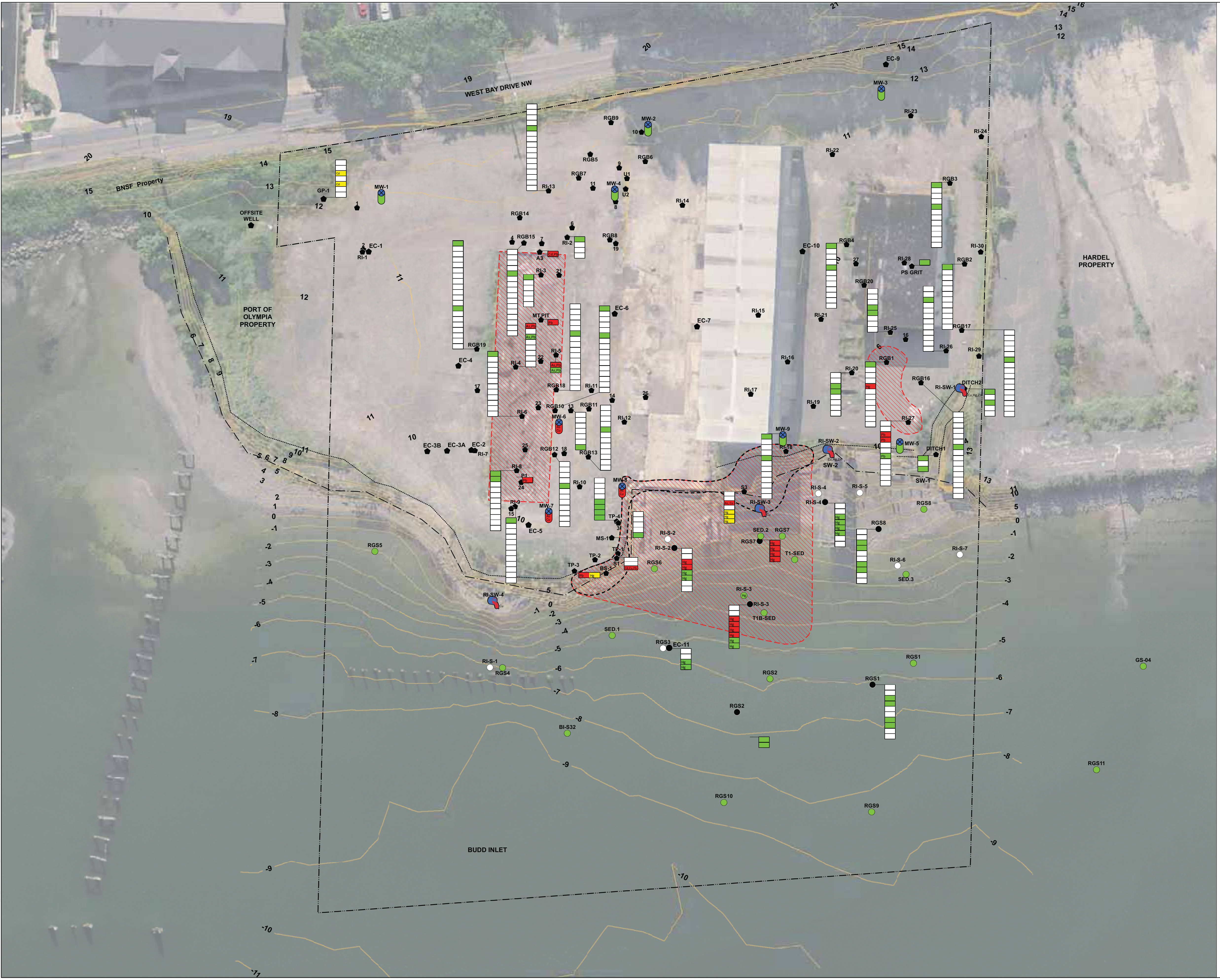
Figure 12

Path: P:\0\0504085\GIS\050408500_GroundwaterContours_LowTide.mxd Map Revised: 16 July 2013 ccabrera



Legend

- — ·· — Property Line
- ········ Top of Bank
- — · — Ordinary High Water
- ⬚ Approximate Area of Metal Debris Visible on Shoreline
- —5— Topographic/Bathymetric Contour Line and Elevation (feet NGVD29)

Sampling Location Type

- ⬟ Soil Sampling Location [1]
- ⊗ Groundwater Monitoring Well Location
- Stormwater Sampling Location
- ○ Surface Sediment Sampling Location [2]
- ● Subsurface Sediment Sampling Location [1]

Sample Depth Interval [1]

Each box represents a 1-foot sample depth interval. The total number of boxes indicates the total depth[3] of subsurface exploration.

Analyte

As	Arsenic
Cd	Cadmium
Cu	Copper
Pb	Lead
Hg	Mercury

Nature and Extent of Contamination

- ☐ No shading[4] of the sampling location/depth interval indicates a sample was either not obtained or not analyzed for metals.
- 🟥 Red shading[4] of the sampling location/depth interval indicates that the identified analyte was detected at a concentration greater than the proposed cleanup/screening level.
- 🟩 Green shading[4] of the sampling location/depth interval indicates that the identified analyte was detected at a concentration less than the proposed cleanup/screening level. If no analyte is identified within the shading, As, Cd[5], Cu[6], Pb and Hg were either not detected or detected at concentrations less than the proposed cleanup/screening levels.
- 🟨 Yellow shading[4] of sampling location/interval indicates that the metals detection limit for one or more analytes was above the proposed cleanup/screening levels.
- ▨ Red hatching represents estimated area of soil/sediment exceeding proposed cleanup levels for metals.

Notes:

1 Sample depth intervals are shown for soil sampling locations and subsurface sediment sampling locations for which metals analysis was performed.

2 Surface sediment samples were generally collected from 0 to 10 cm below the mud line.

3 At locations for which the total depth of subsurface exploration is not known, the depth of the deepest sample obtained at the location represents the total depth of exploration.

4 Color shading of sampling locations/intervals presented in this figure is based on comparison of chemical analytical results of:
*Soil samples (obtained landward of OHW line) to proposed soil cleanup levels.
*Sediment samples (obtained waterward of OHW line) to proposed sediment cleanup levels.
*Samples obtained along the shoreline of metal debris to proposed soil and sediment cleanup levels.
*Groundwater samples (most recent samples analyzed at the sampling locations) to proposed groundwater cleanup levels.
*Stormwater samples (most recent samples analyzed at the sampling locations) to proposed screening levels.

5 Cadmium analysis was not performed on soil, groundwater, stormwater and sediment samples collected by Greylock Consulting in 2011.

6 Copper analysis was not performed at sampling locations S-13, BS-1, MS-1 and Sand Grit.

7 Proposed cleanup and screening levels are presented in Tables 2 through 5.The chemical analytical results for metals are presented in Tables 6, 13, 14, 19, 23, and 25.

70 35 0 70

Feet

Data Source: Aerial image from Thurston County, 2012.

General Notes:
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Extent of Metals Contamination

Reliable Steel Site
Olympia, Washington

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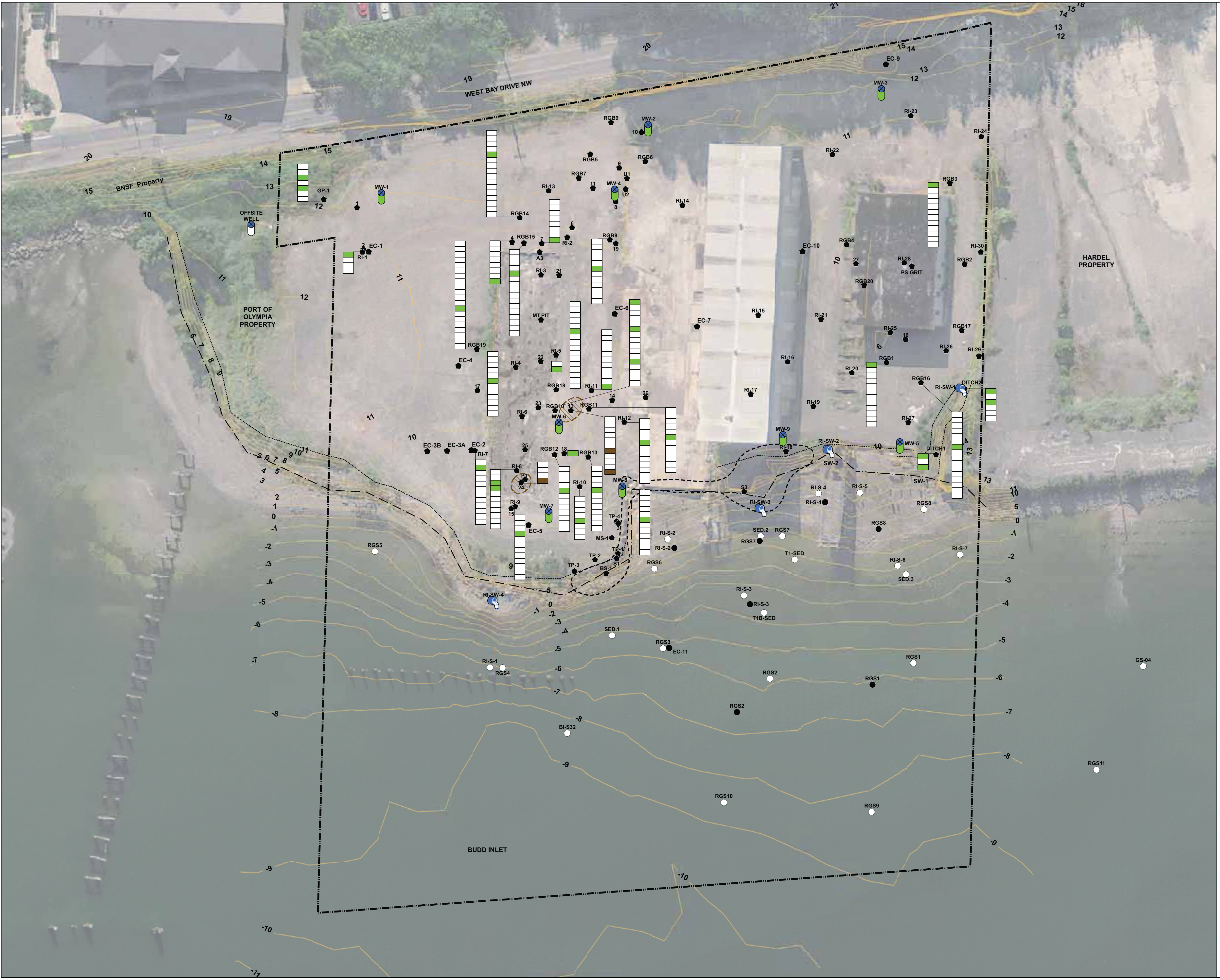
Figure 13

Path: P:\0\0504085\GIS\050408500_RI_ChemResults_Metals.mxd Map Revised: 17 July 2013 ccabrera



Legend

- Property Line
- Top of Bank
- Ordinary High Water
- Approximate Area of Metal Debris Visible on Shoreline
- 5 Topographic/Bathymetric Contour Line and Elevation (feet NGVD29)

Sampling Location

- ⬟ Soil Sampling Location [1]
- Groundwater Monitoring Well Location
- Stormwater Sampling Location
- ○ Surface Sediment Sampling Location [2]
- ● Subsurface Sediment Sampling Location [1]

Sampling Interval [1]

Each box represents 1-foot sampling interval. Total number of boxes indicates the total depth[3] of subsurface exploration.

Nature and Extent of Contamination

- ☐ No shading[4] of sampling location/interval indicates sample was either not obtained or not analyzed for gasoline-range petroleum hydrocarbons.
- 🟫 Brown shading[4] of sampling location/interval indicates that the gasoline-range petroleum hydrocarbons were detected at a concentration greater than the proposed cleanup/screening level.
- 🟩 Green shading[4] of sampling location/interval indicates that gasoline-range petroleum hydrocarbons were detected at a concentration less than the proposed cleanup/screening level.
- ▨ Brown hatching represents estimated area of soil/sediment exceeding proposed cleanup level for gasoline-range petroleum hydrocarbons.

Notes:

1 Sampling intervals are shown for soil sampling locations and subsurface sediment sampling locations for which gasoline-range petroleum hydrocarbons analysis was performed.

2 Surface sediment samples were generally collected from 0 to 10 cm below the mud line.

3 Locations for which total depth of subsurface exploration is unknown, depth of the deepest sample obtained at such location represents total depth.

4 Color shading of sampling locations/intervals presented in this figure is based on comparison of chemical analytical results of:
*Soil samples (obtained landward of OHW line) to proposed soil cleanup levels.
*Sediment samples (obtained waterward of OHW line) to proposed sediment cleanup levels.
*Samples obtained along the shoreline of metal debris to proposed soil and sediment cleanup levels.
*Groundwater samples (most recent samples analyzed at the sampling locations) to proposed groundwater cleanup levels.
*Stormwater samples (most recent samples analyzed at the sampling locations) to proposed screening levels.

5 Proposed cleanup and screening levels are presented in Tables 2 through 5. Chemical analytical results for gasoline-range petroleum hydrocarbons are presented in Tables 8, 15, 20 and 23.

70 35 0 70

Feet

Data Source: Aerial image from Thurston County, 2012.

General 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. 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.

Extent of Gasoline Contamination

Reliable Steel Site
Olympia, Washington

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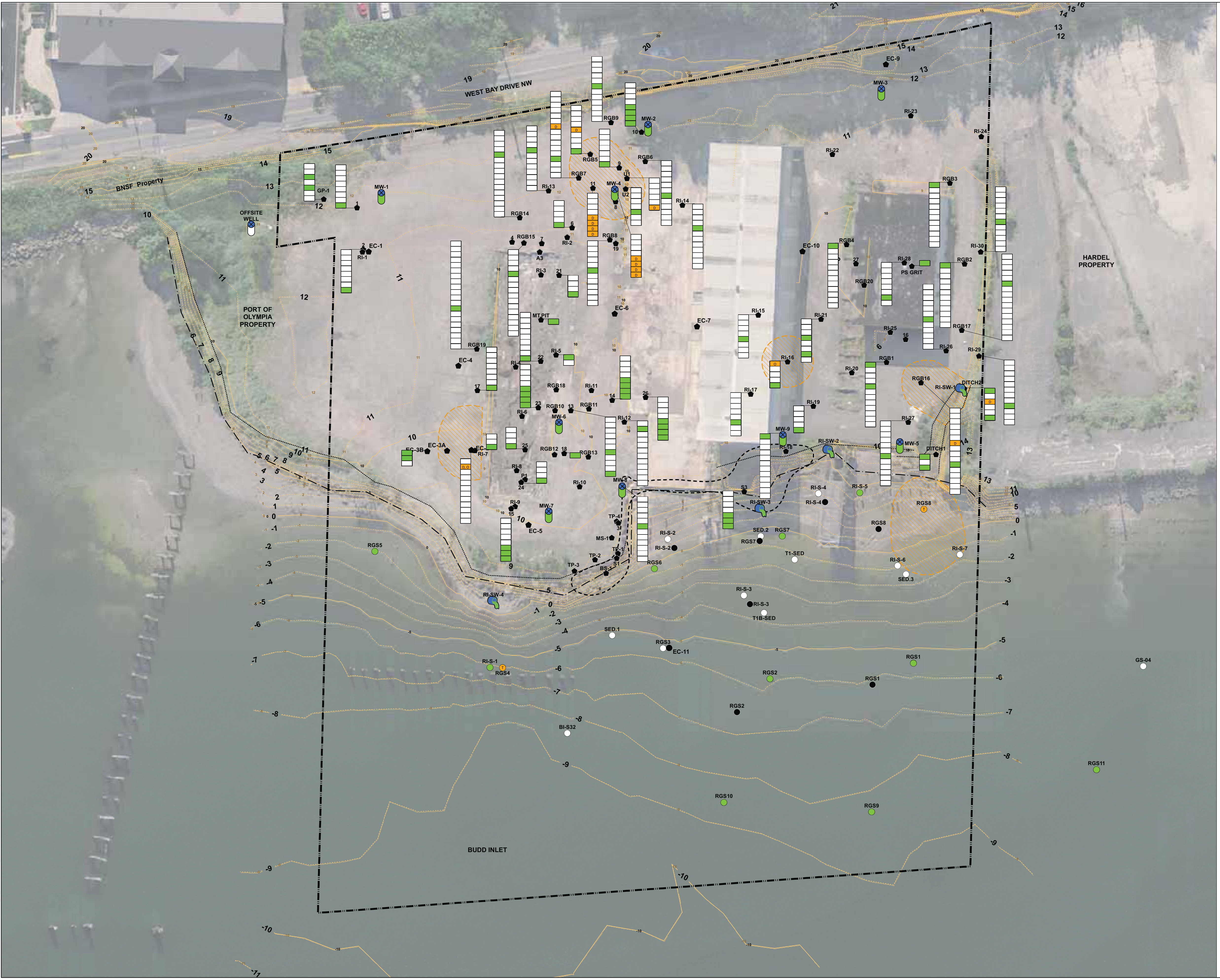
Figure 14

Path: P:\0\0504085\GIS\0504085_RI_ChemResults_Gas.mxd Map Revised: 17 July 2013 ccabrera



Path: P:\0\0504085\GIS\050408500_RI_ChemResults_Diesel.mxd   Map Revised: 17 July 2013   ccabrera

Legend

- ▬ ·· ▬ Property Line
- ········ Top of Bank
- — · — Ordinary High Water
- ⬚ Approximate Area of Shoreline Metal Debris Visible on Shoreline
- — 5 — Topographic/Bathymetric Contour Line and Elevation (feet NGVD29)

Sampling Location

- ⬟ Soil Sampling Location [1]
- ⊗ Groundwater Monitoring Well Location
- Stormwater Sampling Location
- ○ Surface Sediment Sampling Location [2]
- ● Subsurface Sediment Sampling Location [1]

Sampling Interval [1]

Each box represents 1-foot sampling interval.
Total number of boxes indicates the total depth[3]
of subsurface exploration.

Analyte

D Diesel-range petroleum hydrocarbons
O Heavy oil-range petroleum hydrocarbons
T Total petroleum hydrocarbons
(sum of diesel-range and heavy oil-range petroleum hydrocarbons)

Nature and Extent of Contamination

☐ No shading[4] of sampling location/interval indicates sample was either not obtained or not analyzed for diesel-range and oil-range petroleum hydrocarbons.

🟧 Orange shading[4] of sampling location/interval indicates that the identified analyte was detected at a concentration greater than the proposed cleanup/screening level.

🟩 Green shading[4] of sampling location/interval indicates that the diesel-range and oil-range petroleum hydrocarbons were detected at concentrations less than the proposed cleanup/screening levels.

▨ Orange hatching represents estimated area of soil/sediment exceeding proposed cleanup levels for diesel-range and oil-range petroleum hydrocarbons.

Notes:

1 Sampling intervals are shown for soil sampling locations and subsurface sediment sampling locations for which diesel-range and oil-range petroleum hydrocarbon analysis was performed.

2 Surface sediment samples were generally collected from 0 to 10 cm below the mud line.

3 Locations for which total depth of subsurface exploration is unknown, depth of the deepest sample obtained at such location represents total depth.

4 Color shading of sampling locations/intervals presented in this figure is based on comparison of chemical analytical results of:
*Soil samples (obtained landward of OHW line) to proposed soil cleanup levels.
*Sediment samples (obtained waterward of OHW line) to proposed sediment cleanup levels.
*Samples obtained along the shoreline of metal debris to proposed soil and sediment cleanup levels.
*Groundwater samples (most recent samples analyzed at the sampling locations) to proposed groundwater cleanup levels.
*Stormwater samples (most recent samples analyzed at the sampling locations) to proposed screening levels.

5 Proposed cleanup and screening levels are presented in Tables 2 through 5. Chemical analytical results for diesel-range and oil-range petroleum hydrocarbons are presented in Tables 8, 13, 15, 20, 23 and 25 through 24.

W
S N
E

70 35 0 70
Feet

Data Source: Aerial image from Thurston County, 2012.

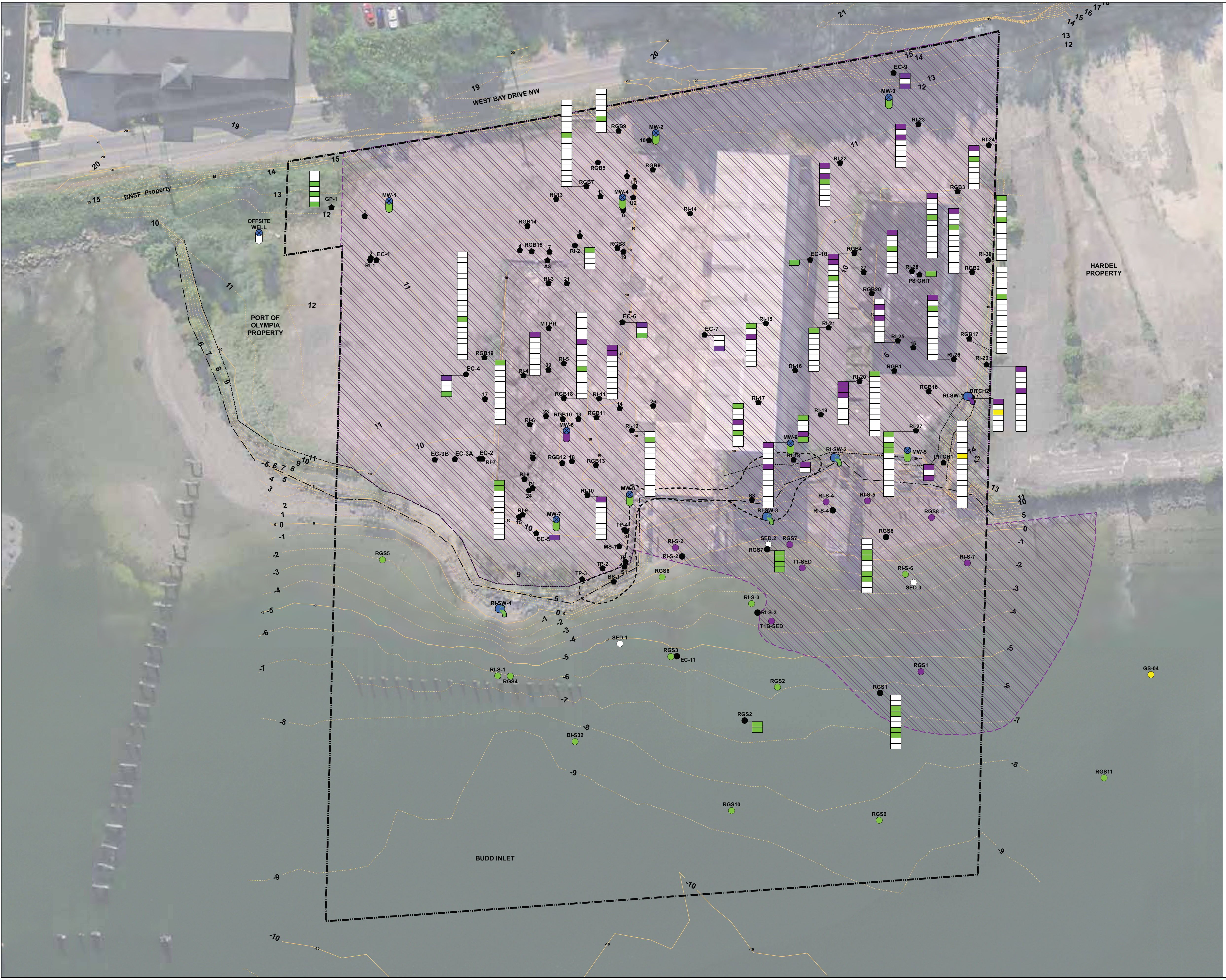
General Notes:
1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored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

Extent of Diesel and Heavy Oil Contamination

Reliable Steel Site
Olympia, Washington

GeoEngineers

Figure 15



Legend

- Property Line
- Top of Bank
- Ordinary High Water
- Approximate Area of Metal Debris Visible on Shoreline
- 5 Topographic/Bathymetric Contour Line and Elevation (feet NGVD29)

Sampling Location

- ⬟ Soil Sampling Location [1]
- Groundwater Monitoring Well Location
- Stormwater Sampling Location
- ○ Surface Sediment Sampling Location [2]
- ● Subsurface Sediment Sampling Location [1]

Sampling Interval [1]

Each box represents 1-foot sampling interval.
Total number of boxes indicates the total depth[3]
of subsurface exploration.

Nature and Extent of Contamination

- ☐ No shading[4] of sampling location/interval indicates sample was either not obtained or not analyzed for Polycyclic Aromatic Hydrocarbons (PAHs).
- 🟪 Purple shading[4] of sampling location/interval indicates that the PAHs were detected at concentrations greater than the proposed cleanup/ screening levels.
- 🟩 Green shading[4] of sampling location/interval indicates that the PAHs were detected at concentrations less than the proposed cleanup/ screening levels.
- 🟨 Yellow shading[4] of sampling location/interval indicates that the PAH detection limit for one or more analytes was above the proposed cleanup/screening levels.
- ▨ Purple hatching represents estimated area of soil/sediment exceeding proposed cleanup level for PAHs.

Notes:

1 Sampling intervals are shown for soil sampling locations and subsurface sediment sampling locations for which PAH analysis was performed.

2 Surface sediment samples were generally collected from 0 to 10 cm below the mud line.

3 Locations for which total depth of subsurface exploration is unknown, depth of the deepest sample obtained at such location represents total depth.

4 Color shading of sampling locations/intervals presented in this figure is based on comparison of chemical analytical results of:
*Soil samples (obtained landward of OHW line) to proposed soil cleanup levels.
*Sediment samples (obtained waterward of OHW line) to proposed sediment cleanup levels.
*Samples obtained along the shoreline of metal debris to proposed soil and sediment cleanup levels.
*Groundwater samples (most recent samples analyzed at the sampling locations) to proposed groundwater cleanup levels.
*Stormwater samples (most recent samples analyzed at the sampling locations) to proposed screening levels.

5 Proposed cleanup/screening levels are presented in Tables 2 through 5. Chemical analytical results for PAHs are presented in Tables 9, 16, 21, 23 and 24.

70 35 0 70
Feet

Data Source: Aerial image from Thurston County, 2012.

General 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. 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.

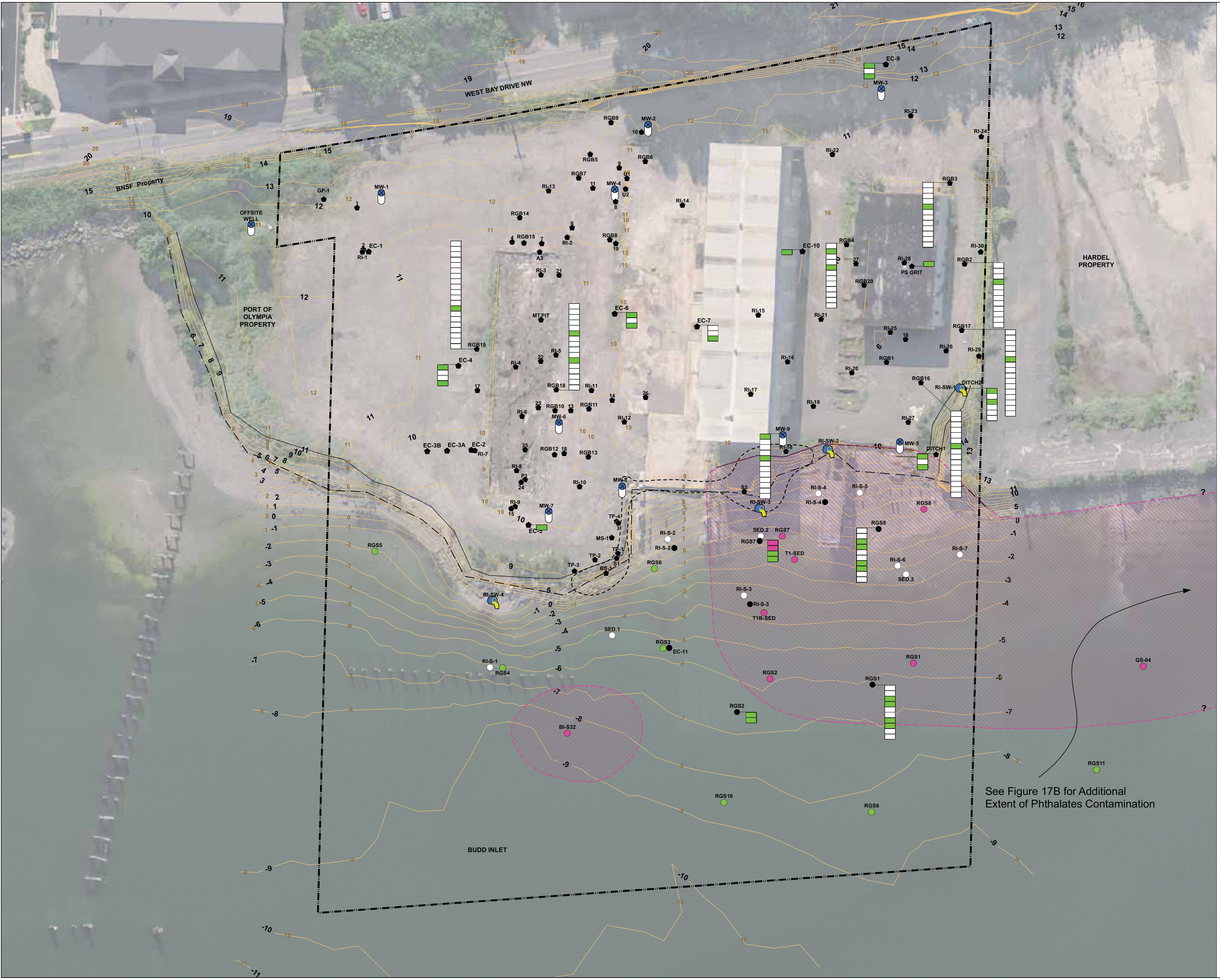
Extent of PAHs Contamination

Reliable Steel Site
Olympia, Washington

GEOENGINEERS

Figure 16

Path: P:\0\0504085\GIS\050408500_RI_ChemResults_PAH.mxd Map Revised: 17 July 2013 ccabrera



See Figure 17B for Additional Extent of Phthalates Contamination

Legend

Property Line

Top of Bank

Ordinary High Water

Approximate Area of Metal Debris Visible on Shoreline

5 Topographic/Bathymetric Contour Line and Elevation (feet NGVD29)

Sampling Location Type

⬟ Soil Sampling Location [1]

Groundwater Monitoring Well Location

Stormwater Sampling Location

○ Surface Sediment Sampling Location [2]

● Subsurface Sediment Sampling Location [1]

Sample Depth Interval [1]

Each box represents a 1-foot sample depth interval. The total number of boxes indicates the total depth[3] of subsurface exploration.

Nature and Extent of Contamination

☐ No shading[4] of the sampling location/depth interval indicates a sample was either not obtained or not analyzed for phthalates.

🟥 Pink shading[4] of the sampling location/depth interval indicates that phthalates were detected at concentrations greater than the proposed cleanup/screening levels.

🟩 Green shading[4] of sampling location/depth interval indicates that phthalates were detected at concentrations less than the proposed cleanup/screening levels.

🟨 Yellow shading[4] of the sampling location/depth interval indicates that the laboratory method reporting limit for phthalates was above the proposed screening/cleanup levels.

▨ Pink hatching represents estimated area of soil/sediment exceeding proposed cleanup level for phthalates.

Notes:

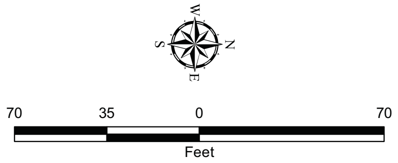
1 Sample depth intervals are shown for soil sampling locations and subsurface sediment sampling locations for which phthalates analysis was performed.

2 Surface sediment samples were generally collected from 0 to 10 cm below the mud line.

3 At locations for which the total depth of subsurface exploration is not known, the depth of the deepest sample obtained at the location represents the total depth of exploration.

4 Color shading of sampling locations/intervals presented in this figure is based on comparison of chemical analytical results of:
*Soil samples (obtained landward of OHW line) to proposed soil cleanup levels.
*Sediment samples (obtained waterward of OHW line) to proposed sediment cleanup levels.
*Samples obtained along the shoreline of metal debris to proposed soil and sediment cleanup levels.
*Groundwater samples (most recent samples analyzed at the sampling locations) to proposed groundwater cleanup levels.
*Stormwater samples (most recent samples analyzed at the sampling locations) to proposed screening levels.

5 Proposed cleanup and screening levels are presented in Tables 2 through 5. The chemical analytical results for phthalates are presented in Tables 9, 15, 19, 23 and 24.



Data Source: Aerial image from Thurston County, 2012.

General 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. 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.

Extent of Phthalates Contamination

Reliable Steel Site
Olympia, Washington

GEOENGINEERS

Figure 17A

Path: P:\0\0504085\GIS\050408500_RI_ChemResults_Phthalates.mxd Map Revised: 18 July 2013 ccabrera

Legend

- Property Line
- Top of Bank
- Ordinary High Water
- Approximate Area of Metal Debris Visible on Shoreline
- 5 Topographic/Bathymetric Contour Line and Elevation (feet NGVD29)

Sampling Location Type

- ○ Surface Sediment Sampling Location [2]
- ● Subsurface Sediment Sampling Location [1]

Sample Depth Interval [1]

Each box represents a 1-foot sample depth interval. The total number of boxes indicates the total depth[3] of subsurface exploration.

Nature and Extent of Contamination

- ☐ No shading[4] of the sampling location/depth interval indicates a sample was either not obtained or not analyzed for phthalates.
- 🟪 Pink shading[4] of the sampling location/depth interval indicates that phthalates were detected at concentrations greater than the proposed cleanup/screening levels.
- 🟩 Green shading[4] of sampling location/depth interval indicates that phthalates were detected at concentrations less than the proposed cleanup/screening levels.
- 🟨 Yellow shading[4] of the sampling location/depth interval indicates that the laboratory method reporting limit for phthalates was above the proposed screening/cleanup levels.
- ▨ Pink hatching represents estimated area of soil/sediment exceeding proposed cleanup level for phthalates.

Notes:

1 Sample depth intervals are shown for soil sampling locations and subsurface sediment sampling locations for which phthalates analysis was performed.

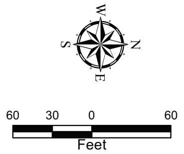
2 Surface sediment samples were generally collected from 0 to 10 cm below the mud line.

3 At locations for which the total depth of subsurface exploration is not known, the depth of the deepest sample obtained at the location represents the total depth of exploration.

4 Color shading of sampling locations/intervals presented in this figure is based on comparison of chemical analytical results of:
*Soil samples (obtained landward of OHW line) to proposed soil cleanup levels.
*Sediment samples (obtained waterward of OHW line) to proposed sediment cleanup levels.
*Samples obtained along the shoreline of metal debris to proposed soil and sediment cleanup levels.
*Groundwater samples (most recent samples analyzed at the sampling locations) to proposed groundwater cleanup levels.
*Stormwater samples (most recent samples analyzed at the sampling locations) to proposed screening levels.

5 Proposed cleanup and screening levels are presented in Tables 2 through 5. The chemical analytical results for phthalates are presented in Tables 9, 15, 19, 23 and 24.

6 The chemical analytical results for sample locations shown in Figure 17B but not in Figure 17A are in Appendix C.



Data Source: Aerial image from Thurston County, 2012.

General 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. 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.

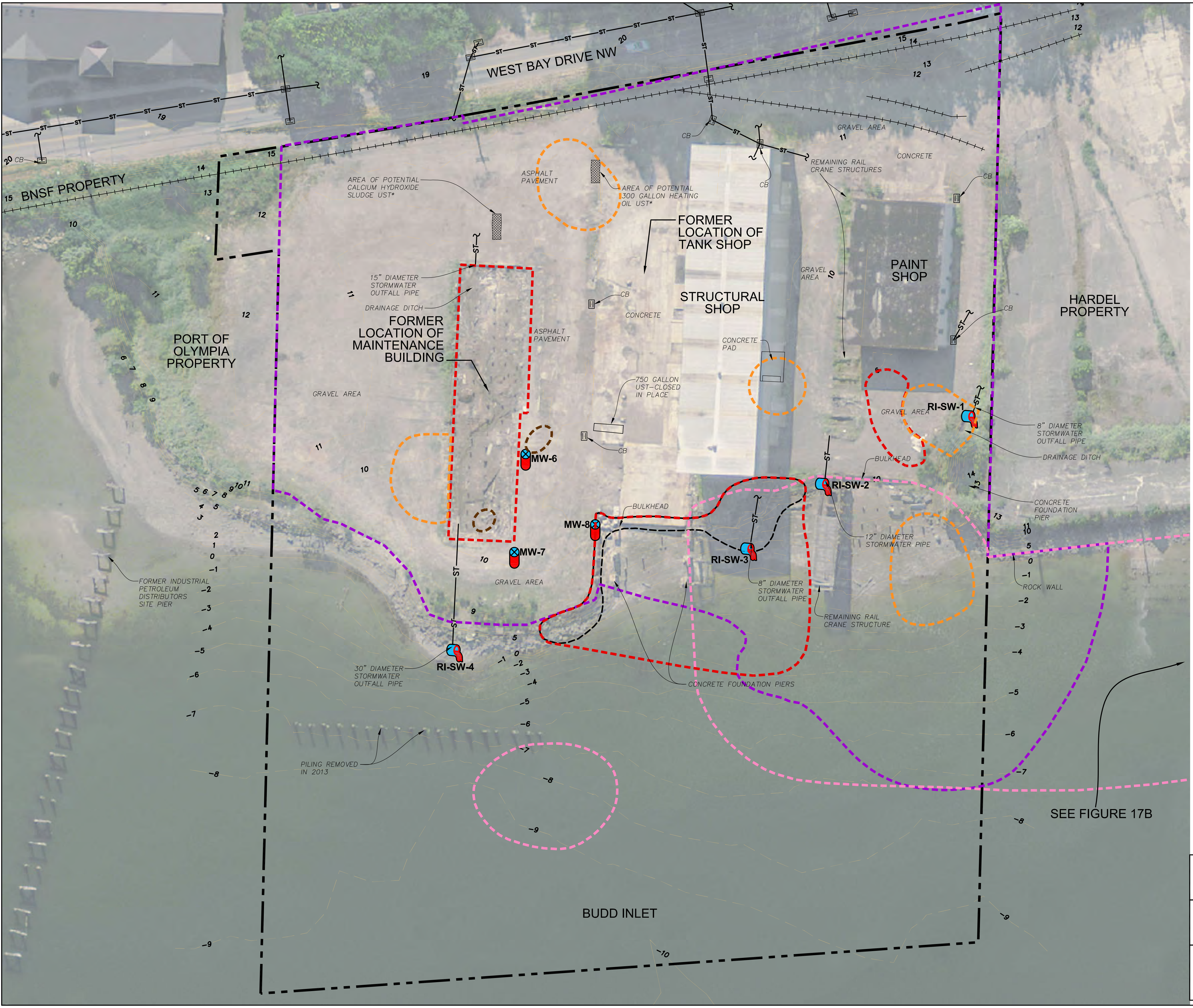
Extent of Phthalates Contamination

Reliable Steel Site
Olympia, Washington

GEOENGINEERS

Figure 17B

Path: P:\0\0504085\GIS\050408500_RI_ChemResults_Phthalates_Area2.mxd Map Revised: 18 July 2013 tkauhi



TACO:IWH : SCY

W:\Tacoma\Projects\0\0504085\00\CAD\050408500_T200_F18.dwg\TAB:F18 modified on Jul 16, 2013 - 10:40am

Legend

Site Features

— - —	Property Line
CB ▯	Catch Basin
—ST—	Stormwater Pipe
┼┼┼┼┼┼┼	Railroad Track
—5—	Topographic / Bathymetric Contour Line and Elevation (Feet NGVD 29)

Nature and Extent of Contamination

▭	Approximate area of metal debris visible on shoreline exceeding proposed cleanup levels for metals
🟥	Red dashed line represents estimated area of soil/sediment exceeding proposed cleanup levels for metals
🟫	Brown dashed line represents estimated area of soil exceeding proposed cleanup levels for gasoline-range petroleum hydrocarbons
🟧	Orange dashed line represents estimated area of soil/sediment exceeding proposed cleanup levels for diesel-range and oil-range petroleum hydrocarbons
🟪	Purple dashed line represents estimated area of soil/sediment exceeding proposed cleanup levels for PAHs
▭	Pink dashed line represents estimated area of sediment exceeding proposed cleanup levels for phthalates
●	Represents monitoring well location where groundwater exceeds proposed cleanup levels for metals
●	Represents outfall location where stormwater exceeds proposed screening levels for PAHs and/or metals

70 0 70
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. 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.
3. * Areas of potential USTs identified by geophysical survey (GPR and EM) on 3/3/2008.

Reference: Survey drawing provided by Hatton Godat Pantier Engineers and Surveyors, Inc. (11-17-08 survey) and aerial photo provided by Thurston County (2012 aerial). The aerial photo is oblique, and the features shown on the aerial do not exactly match those shown on the survey drawing.

Locations and Media Requiring Cleanup Action Evaluation

Reliable Steel Site
Olympia, Washington

GEOENGINEERS

Figure 18

Legend

Site Features

▬ ▪ ▬	Property Line
CB ▯	Catch Basin
—ST—	Stormwater Pipe
++++++++	Railroad Track

Remedial Alternatives

▨	Upland Area Soil and Metal Debris Removal
🟧	UST and Associated Diesel-Contaminated Soil Removal
🟩	Upland Area Capping
🟦	Marine Area Capping

Upland Area Additional Actions:

1. Demolition of existing structures and infrastructure (i.e. building structures, concrete foundations and slabs, piling, etc).
2. Stormwater conveyance system removal and replacement.
3. Groundwater natural attenuation monitoring.

Marine Area Additional Actions:

1. Demolition of existing buttresses, foundations and remnant debris.
2. Shoreline stabilization and habitat enhancement incorporated into remedial actions.

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. 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.
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Reference: Survey drawing provided by Hatton Godat Pantier Engineers and Surveyors, Inc. (11-17-08 survey) and aerial photo provided by Thurston County (2012 aerial). The aerial photo is oblique, and the features shown on the aerial do not exactly match those shown on the survey drawing.

Alternative 1: Upland Area and Marine Area Capping

Reliable Steel Site
Olympia, Washington

GEOENGINEERS

Figure 19

TACO:BJT : SCY

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Legend

Site Features

Property Line

CB Catch Basin

ST Stormwater Pipe

Railroad Track

Remedial Alternatives

▨ Upland Area Soil and Metal Debris Removal

▨ UST and Associated Diesel-Contaminated Soil Removal

🟩 Upland Area Capping

🟥 Marine Area Sediment Hot Spot Removal

Upland Area Additional Actions:

1. Demolition of existing structures and infrastructure (i.e. building structures, concrete foundations and slabs, piling, etc).
2. Stormwater conveyance system removal and replacement.
3. Groundwater natural attenuation monitoring.

Marine Area Additional Actions:

1. Demolition of existing buttresses, foundations and remnant debris.
2. Shoreline stabilization and habitat enhancement incorporated into remedial actions.

70 0 70

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. 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.
3. * Areas of potential USTs identified by geophysical survey (GPR and EM) on 3/3/2008.

Reference: Survey drawing provided by Hatton Godat Pantier Engineers and Surveyors, Inc. (11-17-08 survey) and aerial photo provided by Thurston County (2012 aerial). The aerial photo is oblique, and the features shown on the aerial do not exactly match those shown on the survey drawing.

Alternative 2: Upland Area Capping and Marine Area Hot Spot Removal

Reliable Steel Site
Olympia, Washington

GEOENGINEERS

Figure 20

TACO:BJT : SCY

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Legend

Site Features

- Property Line
- Catch Basin
- Stormwater Pipe
- Railroad Track

Remedial Alternatives

- Upland Area Soil and Metal Debris Removal
- 🟧 UST and Associated Diesel-Contaminated Soil Removal
- 🟩 Upland Area Capping
- 🟥 Marine Area Sediment Removal

Upland Area Additional Actions:

1. Demolition of existing structures and infrastructure (i.e. building structures, concrete foundations and slabs, piling, etc).
2. Stormwater conveyance system removal and replacement.
3. Groundwater natural attenuation monitoring.

Marine Area Additional Actions:

1. Demolition of existing buttresses, foundations and remnant debris.
2. Shoreline stabilization and habitat enhancement incorporated into remedial actions.

70 0 70

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. 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.
3. * Areas of potential USTs identified by geophysical survey (GPR and EM) on 3/3/2008.

Reference: Survey drawing provided by Hatton Godat Pantier Engineers and Surveyors, Inc. (11-17-08 survey) and aerial photo provided by Thurston County (2012 aerial). The aerial photo is oblique, and the features shown on the aerial do not exactly match those shown on the survey drawing.

Alternative 3: Upland Area Capping and Marine Area Removal

Reliable Steel Site
Olympia, Washington

GEOENGINEERS

Figure 21

TACO:BJT : SCY

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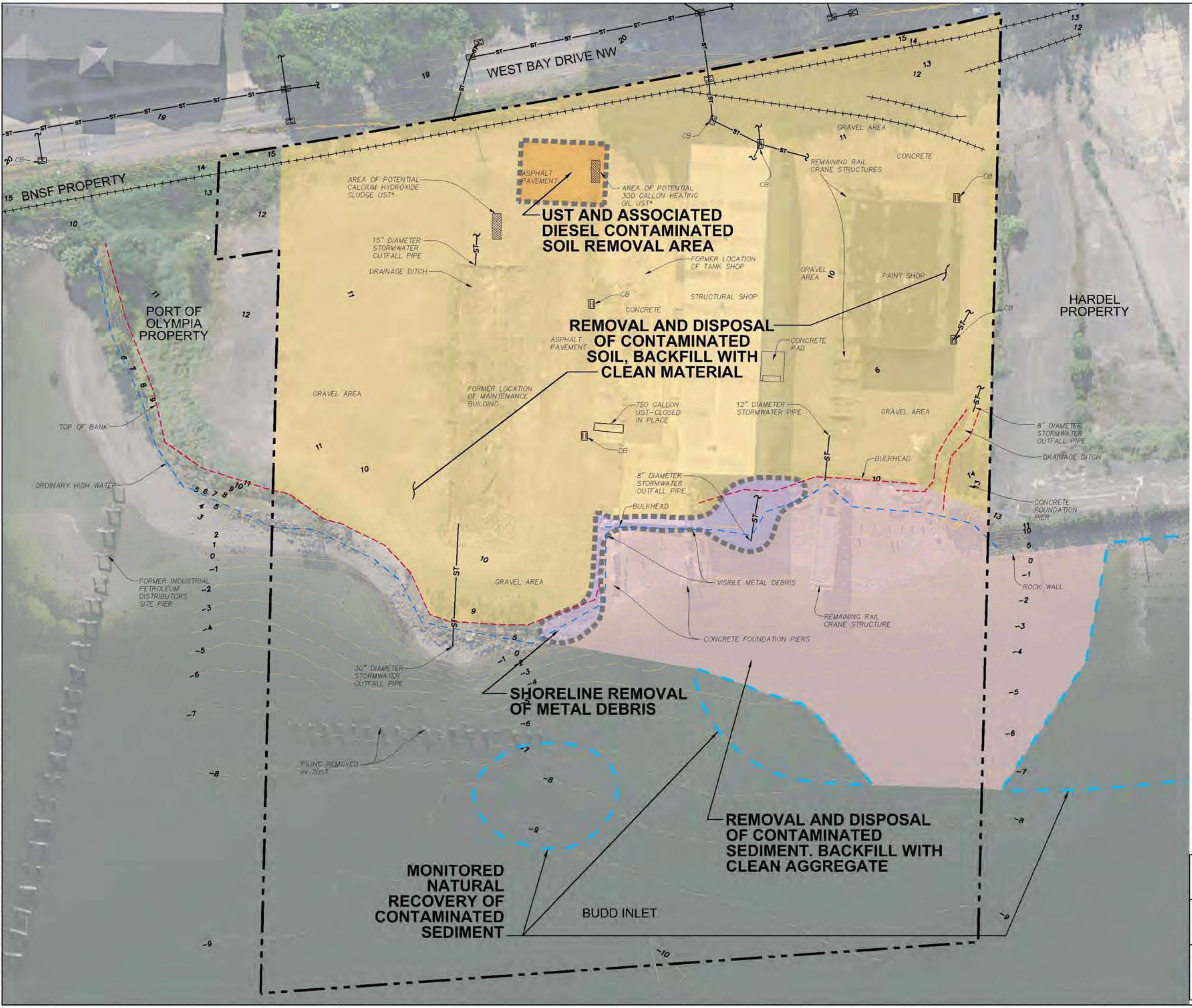


TACO:BJT : SCY

W:\Tacoma\Projects\0\0504085\00\CAD\050408500_T200_FS_F22.dwg\TAB:F22 modified on Jul 17, 2013 - 12:40pm

Legend

Site Features

- Property Line
- Catch Basin
- Stormwater Pipe
- Railroad Track

Remedial Alternatives

- Shoreline Metal Debris Removal
- UST and Associated Diesel-Contaminated Soil Removal
- Upland Area Soil Removal
- Marine Area Sediment Removal

Upland Area Additional Actions:

1. Demolition of existing structures and infrastructure (i.e. building structures, concrete foundations and slabs, piling, etc).
2. Stormwater conveyance system removal and replacement.
3. Groundwater natural attenuation monitoring.

Marine Area Additional Actions:

1. Demolition of existing buttresses, foundations and remnant debris.
2. Shoreline stabilization and habitat enhancement incorporated into remedial actions.

70 0 70

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. 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.
3. * Areas of potential USTs identified by geophysical survey (GPR and EM) on 3/3/2008.

Reference: Survey drawing provided by Hatton Godat Pantier Engineers and Surveyors, Inc. (11-17-08 survey) and aerial photo provided by Thurston County (2012 aerial). The aerial photo is oblique, and the features shown on the aerial do not exactly match those shown on the survey drawing.

Alternative 4: Upland Area and Marine Area Removal

Reliable Steel Site
Olympia, Washington

GEOENGINEERS

Figure 22

APPENDIX A

Investigation Logs

Upland

Well Completion Log

Project Number	Boring Number	Sheet
060112	MW-1	1 of 1

Project Name Former Reliable Steel

Location Olympia, WA

Driller/Method ESN / Direct Push

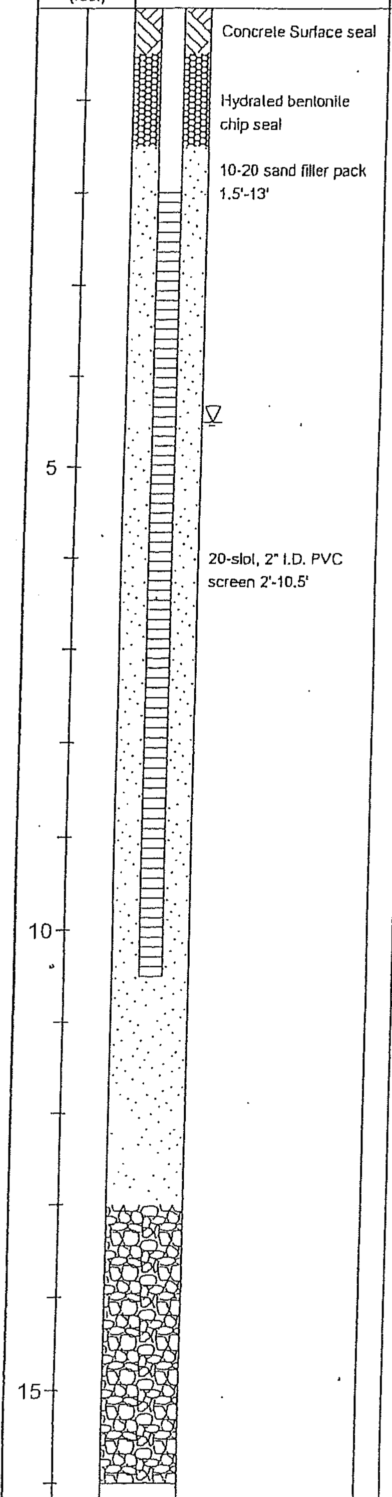
Sampling Method Direct Push

Ground Surface Elev

Depth to Water (Ft. BGS)

Start/Finish Date 6/14/2006

Depth / Elevation (feet)	Borehole Completion	Sample Type/ID	Tests	PID (ppm)	Blows/ 6"	Material Type	Description	Depth (ft)



Sampler Type:

▢ No Recovery

PID - Photoionization Detector (Headspace Measurement)

Static Water Level

Water Level (ATD)

Logged by: RRH

Approved by: LLC

Figure No

Well Completion Log

Project Number	Boring Number	Sheet
060112	**MW-2**	1 of 1

Project Name Former Reliable Steel

cation Olympia, WA

ler/Method ESN / Direct Push

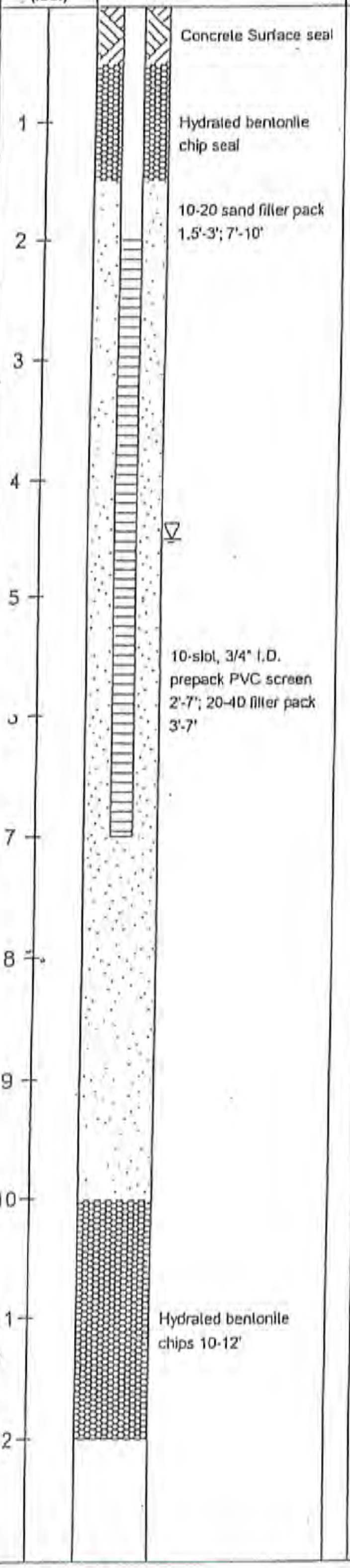
Sampling Method Direct Push

Ground Surface Elev

Depth to Water (Ft. BGS)

Start/Finish Date 6/14/2006

Depth / Elevation (feet)	Borehole Completion	Sample Type/ID	Tests	PID (ppm)	Blows/ 6"	Material Type	Description	Depth (ft)



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

Sampler Type:

☐ No Recovery

PID - Photoionization Detector (Headspace Measurement)

⊻ Static Water Level

▽ Water Level (ATD)

Logged by: RRH

Approved by: LLC

Figure No

Well Completion Log

Project Number	Boring Number	Sheet
060112	**MW-3**	1 of 1

Project Name Former Reliable Steel

Location Olympia, WA

Driller/Method ESN / Direct Push

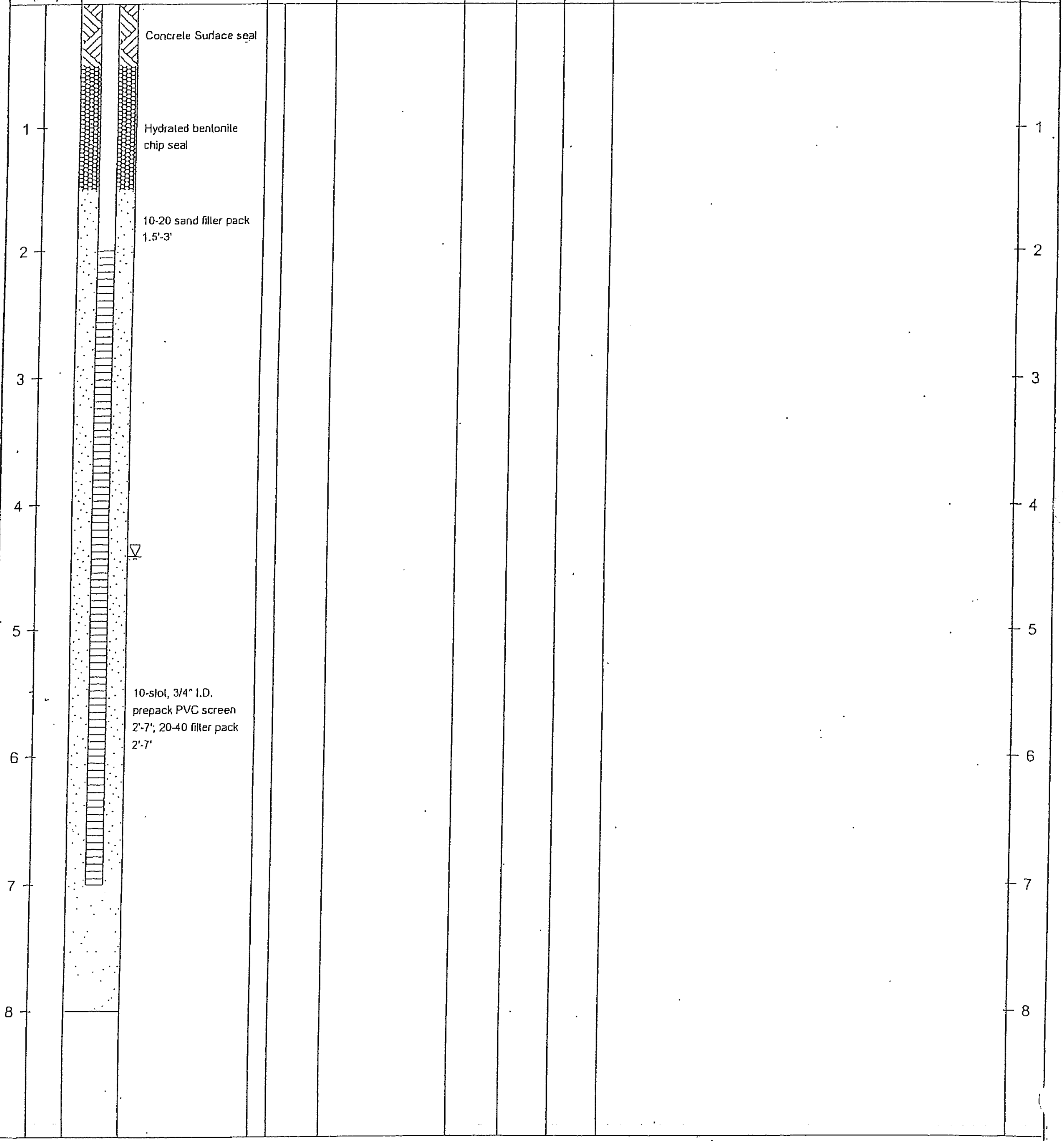
Sampling Method Direct Push

Ground Surface Elev

Depth to Water (Ft. BGS)

Start/Finish Date 6/14/2006

Depth / Elevation (feet)	Borehole Completion	Sample Type/ID	Tests	PID (ppm)	Blows/ 6"	Material Type	Description	Depth (ft)



Sampler Type:

☐ No Recovery

PID - Photoionization Detector (Headspace Measurement)

Static Water Level

Water Level (ATD)

Logged by: RRH

Approved by: LLC

Figure No.

W-4

RESOURCE PROTECTION WELL REPORT

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

CURRENT Notice of Intent No. R65201

Construction/Decommission ("x" in circle)

☒ struction

○ Decommission ORIGINAL INSTALLATION Notice of Intent Number 205680

Type of Well ("x" in circle)

☒ Resource Protection

○ Geotech Soil Boring

Consulting Firm Stemen Environmental

Unique Ecology Well ID Tag No: ALT965

Property Owner BoJo Investments LLC

Site Address 1215 Westbay Dr.

City Olympia County: Thurston

Location SW 1/4 SE 1/4 Sec 10 Twn 18N R 2 [✓ EWM] or WWM circle one

Lat/Long (s, t, r still REQUIRED) Lat Deg ______ Lat Min/Sec ______

Long Deg ______ Long Min/Sec ______

Tax Parcel No. ______

Cased or Uncased Diameter 2" Static Level 5'

Work/Decommission Start Date 7-7-06

Work/Decommission Completed Date 7-7-06

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept sponsibility for construction of this well, and its compliance with all Washington ell construction standards. Materials used and the information reported above are ue to my best knowledge and belief.

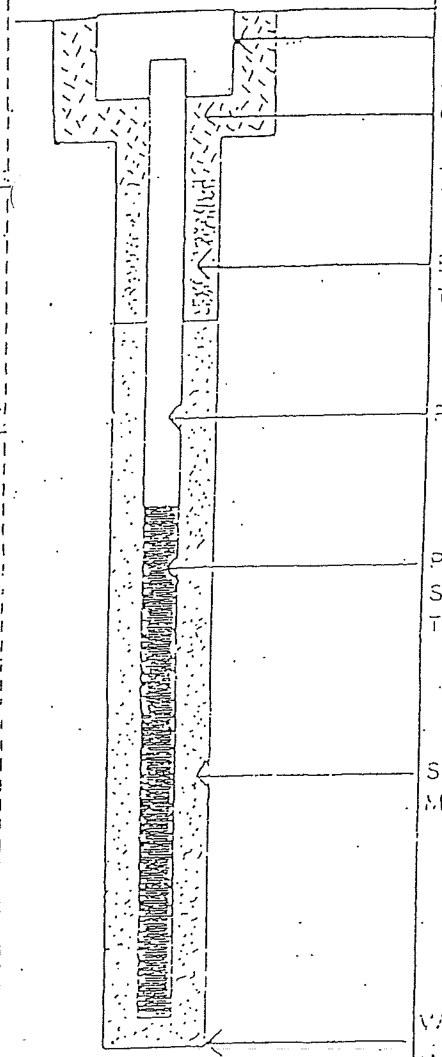
☒ Driller ☐ Engineer ☐ Trainee Name (Print) Don Harden

Driller/Engineer/Trainee Signature

Driller or Trainee License No. 2802

If trainee, licensed driller's signature and License no. ______

Construction/Design



Well Data

MONUMENT TYPE: 8" Flush

CONCRETE SURFACE SEAL: 0-1'

2' x 9" Overdrilled Annular

BACKFILL: 1-2
TYPE: Bentonite

PVC BLANK: 0-3'

PVC SCREEN: 3-8
SLOT SIZE: .010
TYPE: Sched 40 PVC

SAND PACK: 2-8'
MATERIAL: 10/20 Silica Sand

WELL DEPTH: 8'
Method: D.P
Diameter: 3"

Formation Description

0-8' Sand w/ Sea Shells

≈5' H2O

Scale 1" = N/A

Page 2 of 2

ECY 050-12 (Rev 2/01)

The Department of Ecology does NOT Warranty

Well Completion Log

Project Number	Boring Number	Sheet
060112	MW-5	1 of 1

Project Name Former Reliable Steel

Location Olympia, WA

Driller/Method ESN / Direct Push

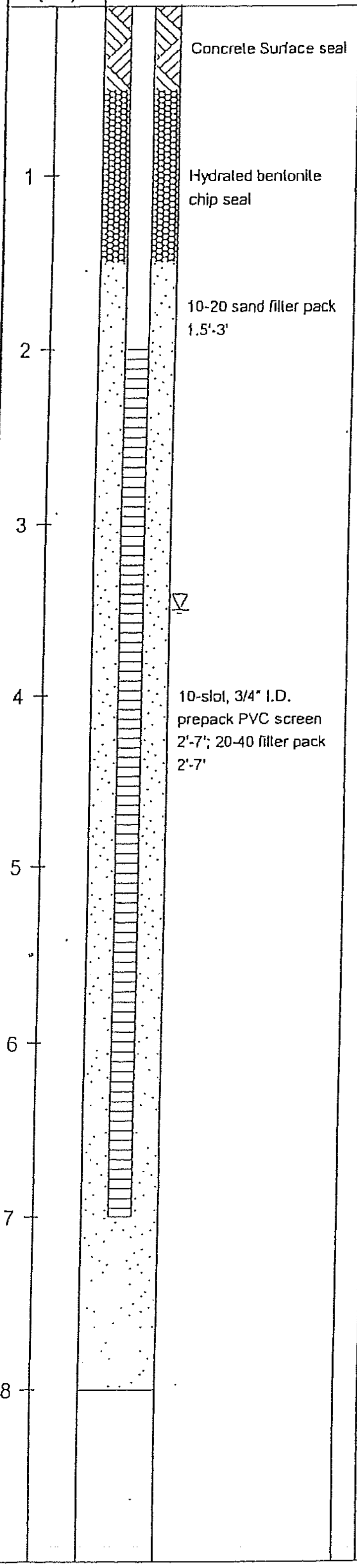
Sampling Method Direct Push

Ground Surface Elev

Depth to Water (Ft. BGS)

Start/Finish Date 6/14/2006

Depth / Elevation (feet)	Borehole Completion	Sample Type/ID	Tests	PID (ppm)	Blows/ 6"	Material Type	Description	Depth (ft)



1
2
3
4
5
6
7
8

Sampler Type:

▢ No Recovery

PID - Photoionization Detector (Headspace Measurement)

▼ Static Water Level

▽ Water Level (ATD)

Logged by: RRH

Approved by: LLC

Figure No.

JV BORING NO LOGO RELIABLE STEEL 060112.GPJ December 20, 2006

MW-6

RESOURCE PROTECTION WELL REPORT

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

CURRENT
Notice of Intent No. R65201

onstruction/Decommission ("x" in circle)
Construction
) Decommission ORIGINAL INSTALLATION Notice of Intent Number 205679

Type of Well ("x" in circle)
● Resource Protection
○ Geotech Soil Boring

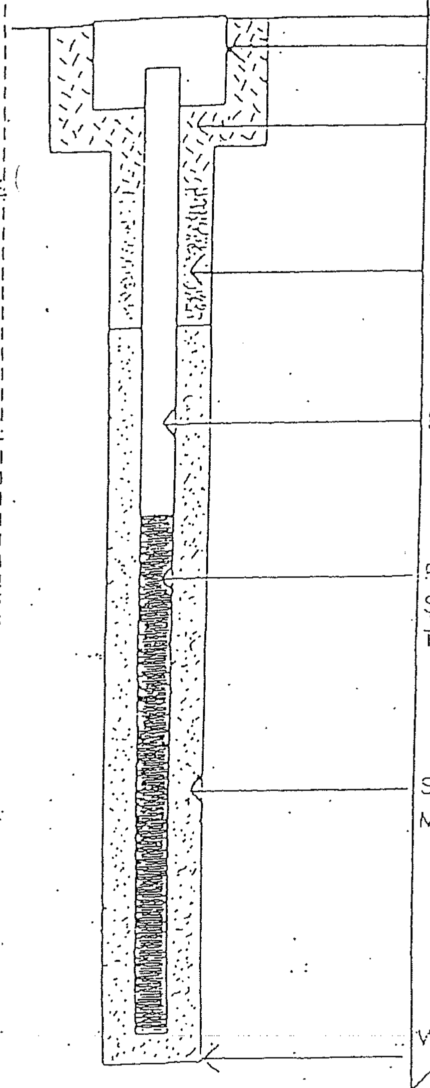
Consulting Firm Stemen Environmental
Unique Ecology Well ID APL 983
Tag No:

Property Owner BoJo Investments LLC
Site Address 1218 Westbay Dr.
City Olympia County: Thurston
Location SW 1/4 SE 1/4 Sec 10 Twn 18N R 2 [✓ EWM] or WWM circle one
Lat/Long (s, t, r still REQUIRED) Lat Deg ___ Lat Min/Sec ___
Long Deg ___ Long Min/Sec ___
Tax Parcel No.
Cased or Uncased Diameter 2" Static Level 4 1/2'
Work/Decommission Start Date 7-7-06
Work/Decommission Completed Date 7-7-06

ELL CONSTRUCTION CERTIFICATION: I constructed and/or accept sponsibility for construction of this well, and its compliance with all Washington ell construction standards. Materials used and the information reported above are ue to my best knowledge and belief.

☒ Driller ☐ Engineer ☐ Trainee Name (Print) Don Harden
riller/Engineer/Trainee Signature Dn
riller or Trainee License No. 2802
f trainee, licensed driller's ignature and License no.

Construction/Design | Well Data | Formation Description



MONUMENT TYPE: 8" Flush
CONCRETE SURFACE SEAL: 0-1'
3'x9" Overdrilled Annular
BACKFILL: 1-2'
TYPE: Bentonite
PVC BLANK: 0-3'
PVC SCREEN: 3-13'
SLOT SIZE: .010
TYPE: ~~10/20~~ Sch 40 PVC
SAND PACK: 2-13'
MATERIAL: 10/20 silica Sand
WELL DEPTH: 13'
Method: D.P
Diameter: 3"

0-4' Silt
4-12' Med Sand w/ Sea Shells

≚ 4 1/2' H_2O

'06 SEP 21
DEPT. OF ECOLOGY FISCAL

RECEIVED
SEP 25 2006
DEPARTMENT OF ECOLOGY
WELL DRILLING UNIT

Scale 1"= N/A Page 1 of 2

ECY 050-12 (Rev 2/01)

Well Completion Log

Project Number	Boring Number	Sheet
060112	**MW-7**	1 of 1

Project Name Former Reliable Steel

Location Olympia, WA

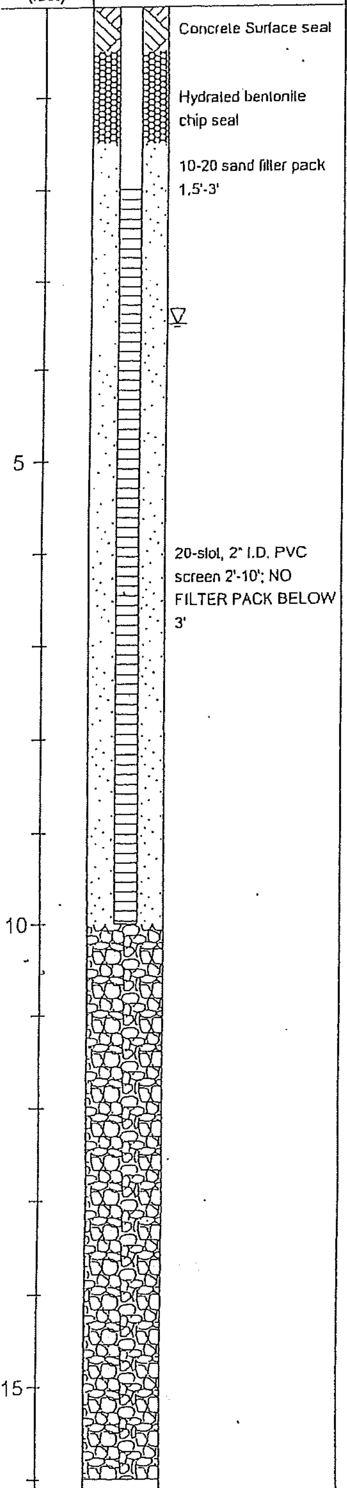
Driller/Method ESN / Direct Push

Sampling Method Direct Push

Ground Surface Elev

Depth to Water (Ft. BGS)

Start/Finish Date 6/14/2006

Depth / Elevation (feet)	Borehole Completion	Sample Type/ID	Tests	PID (ppm)	Blows/ 6"	Material Type	Description	Depth (ft)
5 10 15								5 10 15

Sampler Type:

▢ No Recovery

PID - Photoionization Detector (Headspace Measurement)

$\underline{\mathbf{\Upsilon}}$ Static Water Level

$\underline{\nabla}$ Water Level (ATD)

Logged by: RRH

Approved by: LLC

Figure No.

GREYLOCK CONSULTING LLC

Water Resources & Environmental Services

Project: West Bay Reliable 0508 **Job #:** 0370 **Boring #:** RGB-1

Location: 1218 West Bay Drive NW, Olympia, WA **Approximate Elevation:** Not Surveyed

Subcontractor/Equipment: ESN Northwest **Drilling Method:** Direct Push Probe

Date: 2/8/2008; 8:41 **Logged By:** S. Dudziak

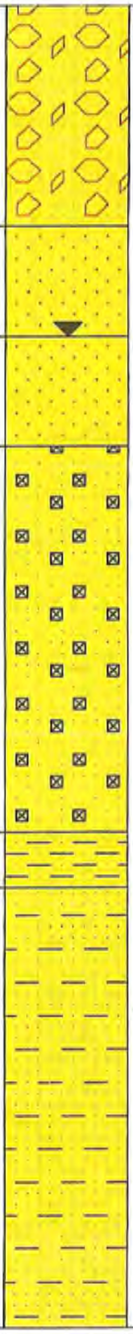
Depth (ft.)	Soil Description	Lithology	Color	Time	Sample Number	Comments
0	SAND		Black	843	RGB1-S	Sand Blast Grit on Surface
	Sand and Gravel		Brown			
	Sand		Brown			
	Sand with Shells		Gray	859	RGB1-4	Wet @ 4 ft; No Odor
5						
				913	RGB1-8	
10	Silty Sand		Gray			
	Gravelly Sand		Gray			

LOG OF BOREHOLE

GREYLOCK CONSULTING LLC

Water Resources & Environmental Services

Project: West Bay Reliable 0508	**Job #:** 0370
Boring #: RGB-2	
Location: 1218 West Bay Drive NW, Olympia, WA	**Approximate Elevation:** Not Surveyed
Subcontractor/Equipment: ESN Northwest	**Drilling Method:** Direct Push Probe
Date: 2/8/2008; 9:26	**Logged By:** S. Dudziak



Depth (ft.)	Soil Description	Lithology	Color	Time	Sample Number	Comments
0	Sand and Gravel		Brown	926	RGB2-S	
	Sand		Brown			
	Sand	▼	Gray	932	RGB2-3.5	Wet @ 3 ft; No Odor
5	Sand with Shells		Gray			
	Sandy Silt		Gray			
10	Silty Sand with shells		Gray			

LOG OF BOREHOLE

GREYLOCK CONSULTING LLC

Water Resources & Environmental Services

Project: West Bay Reliable 0508
Job #: 0370
Boring #: RGB-3
Location: 1218 West Bay Drive NW, Olympia, WA
Approximate Elevation: Not Surveyed
Subcontractor/Equipment: ESN Northwest
Drilling Method: Direct Push Probe
Date: 2/8/2008; 9:50
Logged By: S. Dudziak

Depth (ft.)	Soil Description	Lithology	Color	Time	Sample Number	Comments
0	Sand and Gravel		Brown	955	RGB3-S	Sand Blast Grit on Surface
5	Sand		Light Brown	1016	RGB3-4	Wet @ 4 ft; No Odor, No Sheen
	Sand with Shells		Gray			
	Silty Sand		Gray	1026	RGB3-8	
10	Sand with Shells		Gray			

LOG OF BOREHOLE

GREYLOCK CONSULTING LLC

Water Resources & Environmental Services

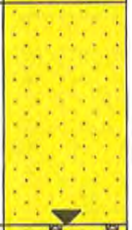
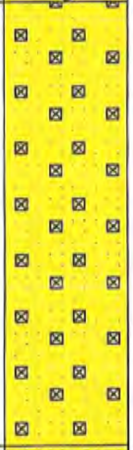
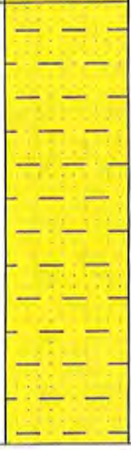
Page 1

Project: West Bay Reliable 0508 **Job #:** 0370 **Boring #:** RGB-4

Location: 1218 West Bay Drive NW, Olympia, WA **Approximate Elevation:** Not Surveyed

Subcontractor/Equipment: ESN Northwest **Drilling Method:** Direct Push Probe

Date: 2/8/2008;10:44 **Logged By:** S. Dudziak

Depth (ft.)	Soil Description	Lithology	Color	Time	Sample Number	Comments
0	Sand and Gravel		Brown	1044	RGB4-S	Some sheen on surface
	Sand		Light Brown			
5	Sand with Shells		Gray	1051	RGB4-4	Wet @ 4 ft; No Odor, No Sheen Only 0.5 ft of recovery from 4 - 8 ft core
10	Silty Sand with Shells		Gray	1058	RGB4-9	No Odor, No Sheen

GREYLOCK CONSULTING LLC

Water Resources & Environmental Services

Project: West Bay Reliable 0508 | **Job #:** 0370 | **Boring #:** RGB-5

Location: 1218 West Bay Drive NW, Olympia, WA | **Approximate Elevation:** Not Surveyed

Subcontractor/Equipment: ESN Northwest | **Drilling Method:** Direct Push Probe

Date: 2/8/2008;11:16 | **Logged By:** S. Dudziak

Depth (ft.)	Soil Description	Lithology	Color	Time	Sample Number	Comments
0	Silty Gravel		Brown			Asphalt on surface
	Sand Fine		Gray			
	Sand Fine	▼	Gray to Brown			Wet @ 4.5 ft; No Odor
5	Sand with Shells			1129	RGB5-5	Petroleum Odor @ 5 ft
						Shells make up most of the 5 to 8 ft core
			Whitish	1138	RGB5-8	No Odor @ 8 ft

LOG OF BOREHOLE

GREYLOCK CONSULTING LLC

Water Resources & Environmental Services

Project: West Bay Reliable 0508
Job #: 0370
Boring #: RGB-6

Location: 1218 West Bay Drive NW, Olympia, WA
Approximate Elevation: Not Surveyed

Subcontractor/Equipment: ESN Northwest
Drilling Method: Direct Push Probe

Date: 2/8/2008;11:50
Logged By: S. Dudziak

Depth (ft.)	Soil Description	Lithology	Color	Time	Sample Number	Comments
0	Gravel	▽				
5	No Recovery 2 - 6 ft Assumed to be Sand based on surrounding borings	▼				Wet @ 6 ft No Odor, No Sheen
	Sand with Shells	⊠	Lt Brown	1155	RGB6-6	
10	Sand with Shells	⊠	Gray	1159	RGB6-9	
	Brick	▦	Red			

GREYLOCK CONSULTING LLC

Water Resources & Environmental Services

Project: West Bay Reliable 0508	**Job #:** 0370	**Boring #:** RGB-7
Location: 1218 West Bay Drive NW, Olympia, WA	**Approximate Elevation:** Not Surveyed	
Subcontractor/Equipment: ESN Northwest	**Drilling Method:** Direct Push Probe	
Date: 2/8/2008;13:00	**Logged By:** S. Dudziak	

Depth (ft.)	Soil Description	Lithology	Color	Time	Sample Number	Comments
0	Gravel	△	Lt Brown			
	No Recovery 2 - 4 ft Assumed to be Sand based on surrounding borings					
	Sand with Shells	⊠	Gray			
5		⊠ ▼				Wet @ 5 ft ; Slight Petroleum Odor
		⊠		1309	RGB7-6	Strong Petroleum Odor @ 6 ft
10		⊠				
	No Recovery 12 to 15 ft Assumed to be Sand		Gray	1321	RGB7-12	Slight Petroleum Odor @ 12 ft
15	Silt	▤	Gray			No Odor @ 15 ft

GREYLOCK CONSULTING LLC

Water Resources & Environmental Services

Project: West Bay Reliable 0508	**Job #:** 0370 **Boring #:** RGB-8
Location: 1218 West Bay Drive NW, Olympia, WA	**Approximate Elevation:** Not Surveyed
Subcontractor/Equipment: ESN Northwest	**Drilling Method:** Direct Push Probe
Date: 2/8/2008;13:25	**Logged By:** S. Dudziak

Depth (ft.)	Soil Description	Lithology	Color	Time	Sample Number	Comments
0	Topsoil	🟫	Brown			
	Sand	🟨	Brown			
	Sand with Shells	⊠	Gray to Whitish			
5				1332	RGB8-5	Wet @ 5 ft; No Odor
10						

Project: West Bay Reliable 0508 **Job #:** 0370 **Boring #:** RGB-8

Location: 1218 West Bay Drive NW, Olympia, WA **Approximate Elevation:** Not Surveyed

Subcontractor/Equipment: ESN Northwest **Drilling Method:** Direct Push Probe

Date: 2/8/2008;13:25 **Logged By:** S. Dudziak

Depth (ft.)	Soil Description	Lithology	Color	Time	Sample Number	Comments
0	Topsoil	↓	Brown			
	Sand	⋯	Brown			
5	Sand with Shells	⊠	Gray to Whitish	1332	RGB8-5	Wet @ 5 ft; No Odor
10						

GREYLOCK CONSULTING LLC

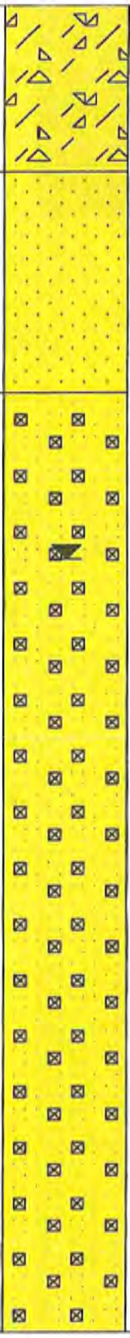
Water Resources & Environmental Services

Project: West Bay Reliable 0508 **Job #:** 0370 **Boring #:** RGB-9

Location: 1218 West Bay Drive NW, Olympia, WA **Approximate Elevation:** Not Surveyed

Subcontractor/Equipment: ESN Northwest **Drilling Method:** Direct Push Probe

Date: 2/11/2008;8:40 **Logged By:** S. Dudziak



Depth (ft.)	Soil Description	Lithology	Color	Time	Sample Number	Comments
0	Silty Gravel		Dk Gray			
	Sand Fine		Lt Brown			
	Sand with Shells		White to Pinkish			
5			Gray	851	RGB9-5	Wet @ 5 ft; No Odor, No Sheen
				855	RGB9-8	
10						

GREYLOCK CONSULTING LLC

Water Resources & Environmental Services

LOG OF BOREHOLE

Page 1

Project: West Bay Reliable 0508
Job #: 0370
Boring #: RGB-10

Location: 1218 West Bay Drive NW, Olympia, WA
Approximate Elevation: Not Surveyed

Subcontractor/Equipment: ESN Northwest
Drilling Method: Direct Push Probe

Date: 2/11/2008; 9:18
Logged By: S. Dudziak

Depth (ft.)	Soil Description	Lithology	Color	Time	Sample Number	Comments
0	Sand Fine		Brown	921	RGB10-S	
5	Silt		Green to Gray	928	RGB10-5	Wet @ 5 ft; Slight Odor (unsure of odor type)
	Sand with Shells		Gray to White			No Odor
10						
				938	RGB10-11	
15				943	RGB10-15	

LOG OF BOREHOLE

GREYLOCK CONSULTING LLC

Water Resources & Environmental Services

Project: West Bay Reliable 0508
Job #: 0370
Boring #: RGB-11

Location: 1218 West Bay Drive NW, Olympia, WA
Approximate Elevation: Not Surveyed

Subcontractor/Equipment: ESN Northwest
Drilling Method: Direct Push Probe

Date: 2/11/2008; 9:51
Logged By: S. Dudziak

Depth (ft.)	Soil Description	Lithology	Color	Time	Sample Number	Comments
0	Silty Gravel		Brown		RGB10-S	
	Silt		Blue Gray			
	Gravelly Silt		Dk Brown	958	RGB11-4	Wet @4 ft; No Odor
5	Silt		Gray	1002	RGB11-5	
10	Sand with Shells		Lt Gray	1008	RGB11-10	

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Water Resources & Environmental Services

Project: West Bay Reliable 0508	**Job #:** 0370 · **Boring #:** RGB-12
Location: 1218 West Bay Drive NW, Olympia, WA	**Approximate Elevation:** Not Surveyed
Subcontractor/Equipment: ESN Northwest	**Drilling Method:** Direct Push Probe
Date: 2/11/2008; 10:14	**Logged By:** S. Dudziak

Depth (ft.)	Soil Description	Lithology	Color	Time	Sample Number	Comments
0	Sand and Gravel		Brown			
	Sandy Silt		Gray			
	Sand Fine		Brown			
	Silt		Gray			
	Gravelly Sand			1017	RGB12-4	Wet @4 ft; Slight Odor (unsure of type)
5			Gray			
	Sand with Shells					
10			Gray	1027	RGB12-10	No Odor

LOG OF BOREHOLE

GREYLOCK CONSULTING LLC

Water Resources & Environmental Services

Project: West Bay Reliable 0508
Job #: 0370
Boring #: RGB-13

Location: 1218 West Bay Drive NW, Olympia, WA
Approximate Elevation: Not Surveyed

Subcontractor/Equipment: ESN Northwest
Drilling Method: Direct Push Probe

Date: 2/11/2008; 10:47
Logged By: S. Dudziak

Depth (ft.)	Soil Description	Lithology	Color	Time	Sample Number	Comments
0	Silty Gravel		Brown			
	Silt : Compact		Lt Brown			
	Sandy Silt with Gravel	▼		1054	RGB13-4	Wet @4 ft; No Odor
	Silt		Gray			
5	Sand with Shells		Gray			
10						

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Water Resources & Environmental Services

Project: West Bay Reliable 0508
Job #: 0370
Boring #: RGB-14
Location: 1218 West Bay Drive NW, Olympia, WA
Approximate Elevation: Not Surveyed
Subcontractor/Equipment: ESN Northwest
Drilling Method: Direct Push Probe
Date: 2/11/2008; 12:45
Logged By: S. Dudziak

Depth (ft.)	Soil Description	Lithology	Color	Time	Sample Number	Comments
0	Silty Gravel		Brown			
	2 - 4 ft No Recovery					
	Clayey Silt With Wood		Green Brown	1253	RGB14-4	Wet @4 ft; No Odor Loose wood, Large chunks
5	Wood		Brown			
10						
	Silty Clay		Gray			
	Silt					
	Wood					
	Sand with Shells		Gray			
15						

LOG OF BOREHOLE

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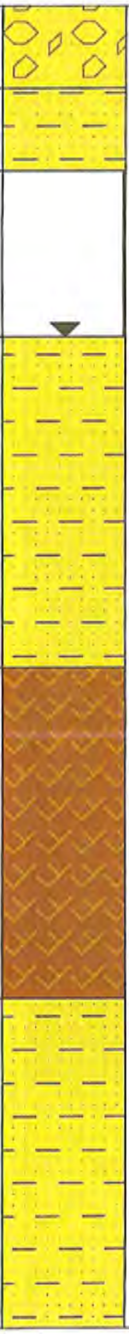
Water Resources & Environmental Services

Project: West Bay Reliable 0508
Job #: 0370
Boring #: RGB-15
Location: 1218 West Bay Drive NW, Olympia, WA
Approximate Elevation: Not Surveyed
Subcontractor/Equipment: ESN Northwest
Drilling Method: Direct Push Probe
Date: 2/11/2008; 13:24
Logged By: S. Dudziak



Depth (ft.)	Soil Description	Lithology	Color	Time	Sample Number	Comments
0	Sand and Gravel		Brown			
	Silty Sand		Brown			
	2 - 4 ft No Recovery					
5	Silty Sand	▼	Gray	1336	RGB15-4	Wet @4 ft; No Odor
10	Wood		Brown			Wood Chips
15	Silty Sand with Gravel and Shells		Gray			

GREYLOCK CONSULTING LLC

Water Resources & Environmental Services

LOG OF BOREHOLE

Project: West Bay Reliable 0508

Job #: 0370

Boring #: RGB-16

Location: 1218 West Bay Drive NW, Olympia, WA

Approximate Elevation: Not Surveyed

Subcontractor/Equipment: ESN Northwest

Drilling Method: Direct Push Probe

Date: 2/11/2008; 14:15

Logged By: S. Dudziak

Depth (ft.)	Soil Description	Lithology	Color	Time	Sample Number	Comments
0	Gravel		Brown			
	Sand		Lt Brown			
						Dry @ 4 ft; No Odor or Sheen
5						
	Sand		Gray			Wet @ 5.5 ft; Petroleum Sheen and Odor from 5.5 to 8 ft
				1426	RGB16-6	
	Silty Sand		Gray			
10				1428	RGB16-10	No Petroleum Odor or Sheen @ 10 ft
	Silty Sand with Shells		Gray			No Petroleum Odor or Sheen @ 12 ft
15						

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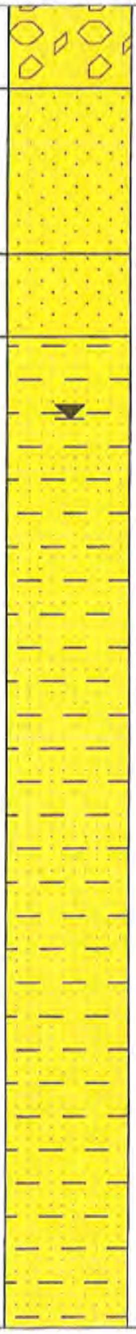
Water Resources & Environmental Services

Project: West Bay Reliable 0508
Job #: 0370
Boring #: RGB-17
Location: 1218 West Bay Drive NW, Olympia, WA
Approximate Elevation: Not Surveyed
Subcontractor/Equipment: ESN Northwest
Drilling Method: Direct Push Probe
Date: 2/11/2008; 14:40
Logged By: S. Dudziak



Depth (ft.)	Soil Description	Lithology	Color	Time	Sample Number	Comments
0	Sand and Gravel		Brown			
	Sand		Brown			
	Sand		Gray			
	Silty Sand with Shells		Gray			Dry @ 4 ft; No Odor or Sheen
5				1455	RGB17-5	Wet @ 5 ft; No Odor, No Sheen
			Gray			
10				1500	RGB17-10	No Odor or Sheen @ 10 ft
15						

GREYLOCK CONSULTING LLC
Water Resources & Environmental Services

LOG OF BOREHOLE

Project: West Bay Reliable 0508
Job #: 0370
Boring #: RGB-18
Location: 1218 West Bay Drive NW, Olympia, WA
Approximate Elevation: Not Surveyed
Subcontractor/Equipment: ESN Northwest
Drilling Method: Direct Push Probe
Date: 2/11/2008; 15:10
Logged By: S. Dudziak

Depth (ft.)	Soil Description	Lithology	Color	Time	Sample Number	Comments
0	Sand		Lt Brown			
4	Silt					Dry @ 4 ft; No Odor, No Sheen
5		▼	Gray w/ White	1515	RGB18-5	Wet @ 5 ft; No Odor, No Sheen
						Soft Gray Silt with white layers from 5 to 6 ft (consistency of bentonite)
6	Sand with Shells					
			Gray			
10			Gray	1530	RGB18-10	No Odor or Sheen @ 10 ft
15						

GREYLOCK *C*ONSULTING LLC

Water Resources & Environmental Services

Project: West Bay Reliable 0508
Job #: 0370
Boring #: RGB-19

Location: 1218 West Bay Drive NW, Olympia, WA
Approximate Elevation: Not Surveyed

Subcontractor/Equipment: ESN Northwest
Drilling Method: Direct Push Probe

Date: 2/11/2008; 15:42
Logged By: S. Dudziak

Depth (ft.)	Soil Description	Lithology	Color	Time	Sample Number	Comments
0	Topsoil		Lt Brown	1544	RGB19-S	
	Silty Sand					
	Silty Sand with Gravel	▼	Lt Brown			
5 10	Silty Sand		Gray	1546	RGB19-4	Wet @ 4ft; No Odor, No Sheen
15	Silty Sand		Jet Black	1550	RGB19-12	Unusual color @ 10.5; Sand is jet black (similar to coal)
	Silt		Black to Green			
20	Silt		Green Gray	1610	RGB19-18	

LOG OF BOREHOLE

GREYLOCK CONSULTING LLC

Water Resources & Environmental Services

Project: West Bay Reliable 0508
Job #: 0370
Boring #: RGB-20

Location: 1218 West Bay Drive NW, Olympia, WA
Approximate Elevation: Not Surveyed

Subcontractor/Equipment: ESN Northwest
Drilling Method: Sampling with Stainless Steel Spoon

Date: 3/4/2008; 14:45
Logged By: S. Dudziak

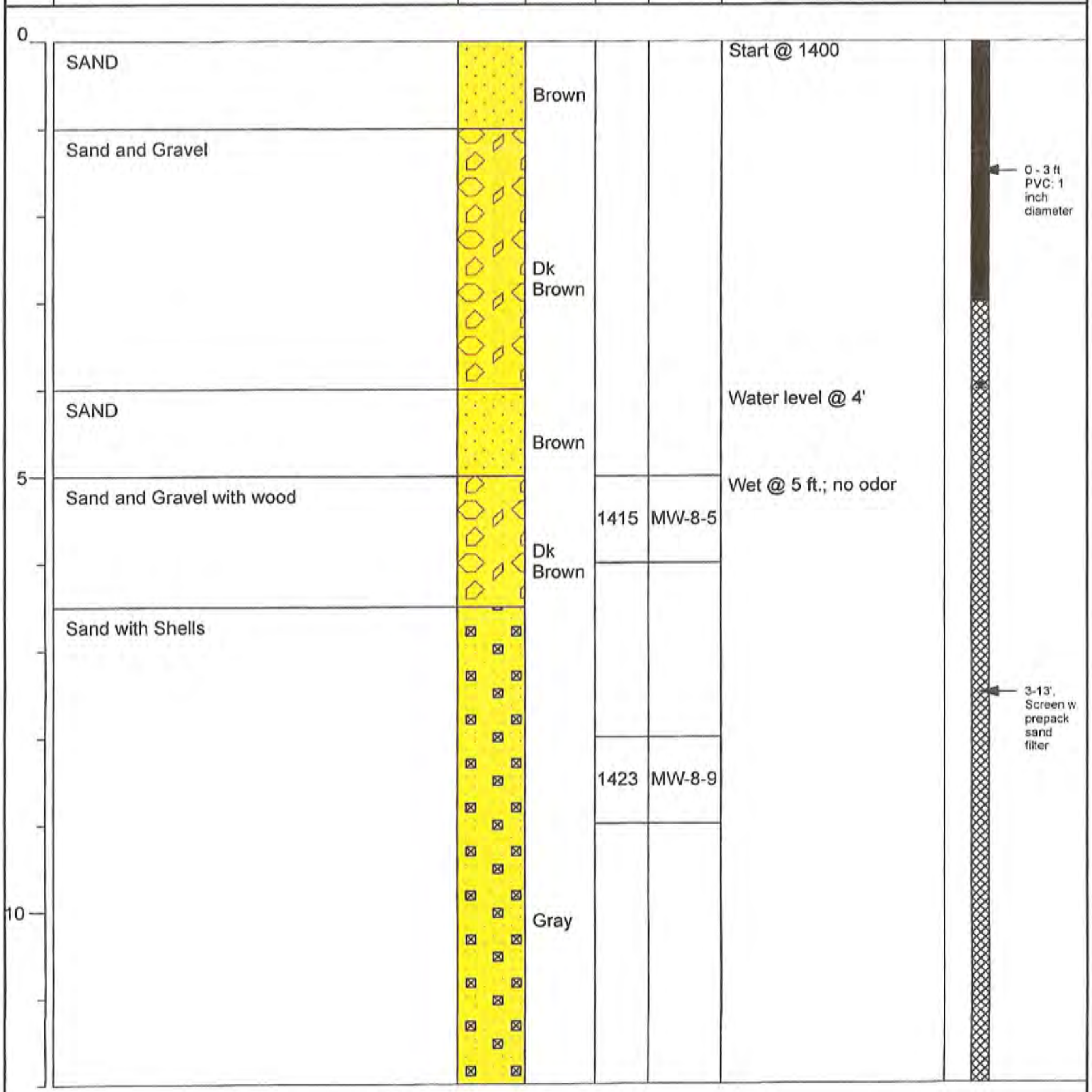
Depth (ft.)	Soil Description	Lithology	Color	Time	Sample Number	Comments
0	Sand	▨	Brown	1445	RGB20-S	Surface sample at entrance of shed where previous transformer was located.

LOG OF BOREHOLE

GREYLOCK CONSULTING LLC

Water Resources & Environmental Services

Project: West Bay Reliable 0508
Job #: 0370
Boring #: MW-8
Location: 1218 West Bay Drive NW, Olympia, WA
Approximate Elevation: Not Surveyed
Subcontractor/Equipment: ESN Northwest
Drilling Method: Direct Push Probe
Date: 2/8/2008
Logged By: S. Dudziak



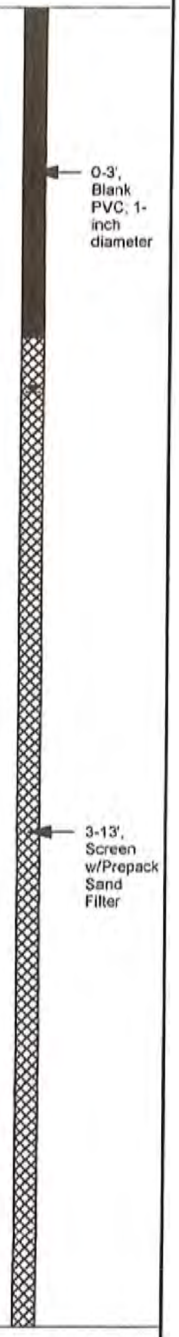
Depth (ft.)	Soil Description	Lithology	Color	Time	Sample Number	Comments	Well Construction
0	SAND		Brown			Start @ 1400	
	Sand and Gravel		Dk Brown				0 - 3 ft PVC; 1 inch diameter
	SAND		Brown			Water level @ 4'	
5	Sand and Gravel with wood		Dk Brown	1415	MW-8-5	Wet @ 5 ft.; no odor	
	Sand with Shells		Gray	1423	MW-8-9		3-13', Screen w prepack sand filter
10							

GREYLOCK CONSULTING LLC

Water Resources & Environmental Services

Project: West Bay Reliable 0508
Job #: 0370
Boring #: MW-9
Location: 1218 West Bay Drive NW, Olympia, WA
Approximate Elevation: Not Surveyed
Subcontractor/Equipment: ESN Northwest
Drilling Method: Direct Push Probe
Date: 2/8/2008
Logged By: S. Dudziak

Depth (ft.)	Soil Description	Lithology	Color	Time	Sample Number	Comments	Well Construction
0	Sand and Gravel		Reddish on Surface	1542	MW-9-S	Start @ 1540	
	Sand		Gray			Water level @ 3.5 ft; No Odor, No Sheen	
	Sand		Brown	1551	MW-9-4	1.5 inch piece of metal @ 4 ft	
5	Sand with Shells		Gray				
10			Gray				



GREYLOCK *C*ONSULTING LLC

Water Resources & Environmental Services

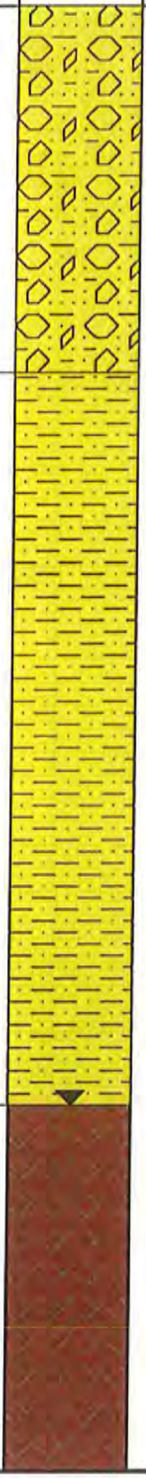
LOG OF BOREHOLE

Project: BOJO
Job #: 0398
Boring #: RI-1

Location: 1218 NW West Bay Dr. Olympia, WA
Approximate Elevation: Not Surveyed

Subcontractor/Equipment: ESN Probe Rig
Drilling Method: Direct Push

Date: 7/13/10
Logged By: S. Dudziak

Depth (ft.)	Soil Description	Lithology	Color	Time	Sample Number	Comments
0	Silty Sandy Gravel (GM)		Light Brown			Only 20% recovery @ 0 to 1 ft Not enough for sample
	Silt (ML)		Gray	0937	RI1 1-2	
	Wood Chips					Wet @ 3 ft. No odor, no sheen

GREYLOCK CONSULTING LLC

Water Resources & Environmental Services

LOG OF BOREHOLE

Project: BOJO
Job #: 0398
Boring #: RI-2
Location: 1218 NW West Bay Dr. Olympia, WA
Approximate Elevation: Not Surveyed
Subcontractor/Equipment: ESN Probe Rig
Drilling Method: Direct Push
Date: 7/13/10
Logged By: S. Dudziak

Depth (ft.)	Soil Description	Lithology	Color	Time	Sample Number	Comments
0	Silty Sandy Gravel (GM)		Light Brown			No white material 0 to 1.5 ft
				1102	RI-2	
	Silt (ML)		Gray			No odor, no sheen
				1104	RI-2	

LOG OF BOREHOLE

GREYLOCK CONSULTING LLC

Water Resources & Environmental Services

Project: BOJO
Job #: 0398
Boring #: RI-3

Location: 1218 NW West Bay Dr. Olympia, WA
Approximate Elevation: Not Surveyed

Subcontractor/Equipment: ESN Probe Rig
Drilling Method: Direct Push

Date: 7/13/10
Logged By: S. Dudziak

Depth (ft.)	Soil Description	Lithology	Color	Time	Sample Number	Comments
0	Gravelly Silty Sand (SM)	▨	Gray Brown	1300	RI-3 0-0.5	Top of ground is 2 ft below floor of Maintenance Building
			White	1302	RI-3 0.5-1	White layer observed 0.5 to 1 ft; tested with HCl, no fizz observed
	Sandy Silt (ML)	▨	Gray	1305	RI-3 1-2	
	No Recovery					
	Sandy Silt (ML)	▨	Gray	1310	RI-3 4-5	
5				1312	RI-3 5-6	

Project: BOJO	**Job #:** 0398	**Boring #:** RI-4
Location: 1218 NW West Bay Dr. Olympia, WA	**Approximate Elevation:** Not Surveyed	
Subcontractor/Equipment: ESN Probe Rig	**Drilling Method:** Direct Push	
Date: 7/13/10	**Logged By:** S. Dudziak	

Depth (ft.)	Soil Description	Lithology	Color	Time	Sample Number	Comments
0	Sandy Silt (ML)	▨	Brown	1324	RI-4 0-0.5	Top of ground is 2 ft below floor of Maintenance Building
			Olive			No white layer observed.
			Olive	1326	RI-4 2-3	
			Olive	1330	RI-4 3-4	
			Olive			
5						
			Dark Gray			Shells observed @ 7 ft.

GREYLOCK CONSULTING LLC

Water Resources & Environmental Services

LOG OF BOREHOLE

Project: BOJO
Job #: 0398
Boring #: RI-5/5A

Location: 1218 NW West Bay Dr. Olympia, WA
Approximate Elevation: Not Surveyed

Subcontractor/Equipment: ESN Probe Rig
Drilling Method: Direct Push

Date: 7/13/10
Logged By: S. Dudziak

Depth (ft.)	Soil Description	Lithology	Color	Time	Sample Number	Comments
0	Silty Sandy Gravel (GM)		Light Brown	1250	RI-5 0-1	Top of ground is 2 ft below floor of Maintenance Building No white material observed on surface.
	Silty Sandy Gravel (GM)		Black	1252	RI-5/5A 1-2	Moderate petroleum odor @ 1 ft Refusal @ 2 ft. Moved over 1 ft (RI-5A), redrilled. Refusal again at 2 ft.

GREYLOCK CONSULTING LLC

Water Resources & Environmental Services

LOG OF BOREHOLE

Project: BOJO

Job #: 0398

Boring #: RI-6

Location: 1218 NW West Bay Dr. Olympia, WA

Approximate Elevation: Not Surveyed

Subcontractor/Equipment: ESN Probe Rig

Drilling Method: Direct Push

Date: 7/13/10

Logged By: S. Dudziak

Depth (ft.)	Soil Description	Lithology	Color	Time	Sample Number	Comments
0	Silty Sand (SM) with Gravel	▨	Olive	1406	RI-6 0-1	Top of ground is approx. 3 ft below floor of building. No white material observed at surface.
	No Recovery					
	Sandy Silt (SM)	▨	Light Brown	1410	RI-6 4-5	
5	Silt (ML)	▨	Olive	1412	RI-6 5-6	
	No Recovery					
10	Sandy Silt (SM) with Gravel	▨	Olive			
	Silty Sand (SM) with Shells	▨	Gray			

GREYLOCK *C*ONSULTING LLC

Water Resources & Environmental Services

Project: BOJO
Job #: 0398
Boring #: RI-7/7A

Location: 1218 NW West Bay Dr. Olympia, WA
Approximate Elevation: Not Surveyed

Subcontractor/Equipment: ESN Probe Rig
Drilling Method: Direct Push

Date: 7/13/10
Logged By: S. Dudziak

Depth (ft.)	Soil Description	Lithology	Color	Time	Sample Number	Comments
0	Silty Sandy Gravel (GM)		Light Brown			Only 1 ft of recovery (3 to 4 bgs) during first attempt. Moderate petroleum odor. After drilling to depth, moved over 1 ft and redrilled (7A) to collect shallow samples
				1129	RI-7A-1	
				1131	RI-7A-2	
		▼				
	Sandy Silt (SM)		Gray	1122	RI-7-4.5	Wet @ 4 ft. No sheen
5						
	Silty Sand (SM) with layers of brick		Med. Brown			
	Silty Sand (SM) with gravel and pieces of brick		Med. Brown			
10						

Project: BOJO	**Job #:** 0398	**Boring #:** RI-8
Location: 1218 NW West Bay Dr. Olympia, WA	**Approximate Elevation:** Not Surveyed	
Subcontractor/Equipment: ESN Probe Rig	**Drilling Method:** Direct Push	
Date: 7/13/10	**Logged By:** S. Dudziak	

Depth (ft.)	Soil Description	Lithology	Color	Time	Sample Number	Comments
0	Sandy Silt (ML)		Olive Gray	1209	RI-8 0-1.5	Top of ground is 4 ft below floor of Maintenance Building No white material observed on surface. Soil is wet @ surface.
			Olive	1211	RI-8 2.5-3.5	
5						
				1213	RI-8 5.5-6	
	Silt (ML)		Olive			
				1216	RI-8-7	
				1223	RI-8-9	
			Dark Gray			
10			Gray			
						Refusal @ 11 ft

GREYLOCK CONSULTING LLC

Water Resources & Environmental Services

Project: BOJO
Job #: 0398
Boring #: RI-9

Location: 1218 NW West Bay Dr. Olympia, WA
Approximate Elevation: Not Surveyed

Subcontractor/Equipment: ESN Probe Rig
Drilling Method: Direct Push

Date: 7/13/10
Logged By: S. Dudziak

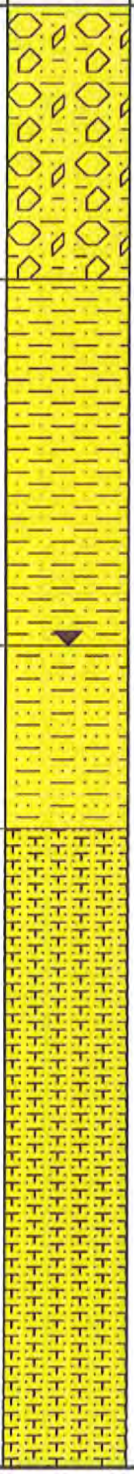
Depth (ft.)	Soil Description	Lithology	Color	Time	Sample Number	Comments
0	Gravelly Silty Sand (SM)	▨	Light Brown	0957	RI9 - 0-1	
	Fine Sand (SM)	░	Light Brown	0959	RI9 - 1-2	
				1001	RI9 - 2-3	
	Gravelly Silty Sand (SM)	▨ ▼	Gray	1003/ 1005	RI9 - 3-4 RI9A-3	Not enough sample in RI-9 for VOAs. Moved over 1 ft, redrilled to 4 ft to collect VOAs (sample RI9A-3)
5	Gravelly Silty Sand (SM)	▨	Med. Brown			Wet @ 4 ft. No odor, no sheen
10	Gravelly Silty Sand (SM)	▨	Light Brown			
	Silt (ML)	▤	Gray			

Project: BOJO **Job #:** 0398 **Boring #:** RI-10

Location: 1218 NW West Bay Dr. Olympia, WA **Approximate Elevation:** Not Surveyed

Subcontractor/Equipment: ESN Probe Rig **Drilling Method:** Direct Push

Date: 7/8/10 **Logged By:** S. Dudziak



Depth (ft.)	Soil Description	Lithology	Color	Time	Sample Number	Comments
0	Silty Sandy Gravel (GM)		Lt. Brown	1550	RI10-0.5	No white material observed
	Silt (ML)		Med. Brown	1556	RI10 - 2	
	Sandy Silt (ML)		Dk. Brown	1551	RI10 - 4	Wet @ 3.5 ft. Slight hydrocarbon odor from 3.5 to 4.5 ft
	Silty Sand (SM) with shells		Gray			
5						No odor @ 5 ft
						Refusal @ 8 ft

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Water Resources & Environmental Services

LOG OF BOREHOLE

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Project: BOJO **Job #:** 0398 **Boring #:** RI-12

Location: 1218 NW West Bay Dr. Olympia, WA **Approximate Elevation:** Not Surveyed

Subcontractor/Equipment: ESN Probe Rig **Drilling Method:** Direct Push

Date: 7/8/10 **Logged By:** S. Dudziak

Depth (ft.)	Soil Description	Lithology	Color	Time	Sample Number	Comments
0	Silt and Gravel (GM)		Red			No recovery 0 to 0.5 ft
				1515	RI12 - 1	
	Sandy Silt (ML) with gravel		Red			
	Sand (SM) with shells		Med. Brown			
				1518	RI12 - 3	
		▼				
				1512	RI12 - 4	Wet @ 3 ft. No odor, no sheen
	Silty Sand (SM)		Gray			
5						
	Silty Sand (SM) with shells		Gray			
10						

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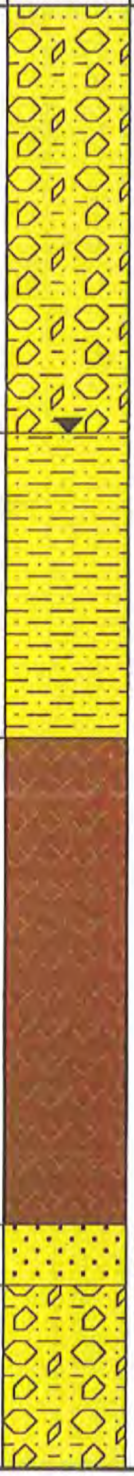
Water Resources & Environmental Services

LOG OF BOREHOLE

Project: BOJO
Job #: 0398
Boring #: RI-13
Location: 1218 NW West Bay Dr. Olympia, WA
Approximate Elevation: Not Surveyed
Subcontractor/Equipment: ESN Probe Rig
Drilling Method: Direct Push
Date: 7/13/10
Logged By: S. Dudziak



Depth (ft.)	Soil Description	Lithology	Color	Time	Sample Number	Comments
0	Silty Sandy Gravel (GM)		Gray			
	Silt (ML)		Gray	1050	RI-13	Water @ 3.5 ft. No odor, no sheen
5						
	Wood					No odor, no sheen
10	Sand (SM)		Dark Brown			
	Silty Sandy Gravel (GM)		Gray			

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LOG OF BOREHOLE

Project: BOJO | **Job #:** 0398 | **Boring #:** RI-14

Location: 1218 NW West Bay Dr. Olympia, WA

Approximate Elevation: Not Surveyed

Subcontractor/Equipment: ESN Probe Rig

Drilling Method: Direct Push

Date: 7/12/10

Logged By: S. Dudziak

Depth (ft.)	Soil Description	Lithology	Color	Time	Sample Number	Comments
0	Concrete	▦				
	Sand (SP)		Light Brown			No odor
	Sand (SM) with lot of shells		Brown			
		▼		1423	RI14	Wet @ 4 ft No odor, no sheen
5						
	Sand (SM) with lots of shells		Gray			
10						

LOG OF BOREHOLE

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Project: BOJO	**Job #:** 0398	**Boring #:** RI-15
Location: 1218 NW West Bay Dr. Olympia, WA	**Approximate Elevation:** Not Surveyed	
Subcontractor/Equipment: ESN Probe Rig	**Drilling Method:** Direct Push	
Date: 7/8/10	**Logged By:** S. Dudziak	

Depth (ft.)	Soil Description	Lithology	Color	Time	Sample Number	Comments
0	Silt (ML) with gravel		Red Brown	1451	RI15 - 0.5	
	Silty Sandy Gravel (GM)		Dark Brown	1453	RI15 - 2.5	
	Silty Sand (SM)		Gray and White			
	Silty Sand (SM) with shells	▼	Lt Brown	1456	RI15 - 4	Wet @ 3.5 ft.
5						

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Project: BOJO **Job #:** 0398 **Boring #:** RI-16

Location: 1218 NW West Bay Dr. Olympia, WA **Approximate Elevation:** Not Surveyed

Subcontractor/Equipment: ESN Probe Rig **Drilling Method:** Direct Push

Date: 7/8/10 **Logged By:** S. Dudziak

Depth (ft.)	Soil Description	Lithology	Color	Time	Sample Number	Comments
0	Gravelly Silty Sand (SM)	▨	Reddish Brown	1424	RI16 - 0.5	
	Gravelly Silty Sand (SM)	▨	Med. Brown			1 in. chunk of silver metal observed (possibly aluminum)
	Sandy Silt (ML) with gravel	▤	Dark Brown			
		▼		1428	RI16 - 4	Wet @ 3.5 ft, No odor, No sheen.
						Hit refusal (concrete) @ 4.5 ft

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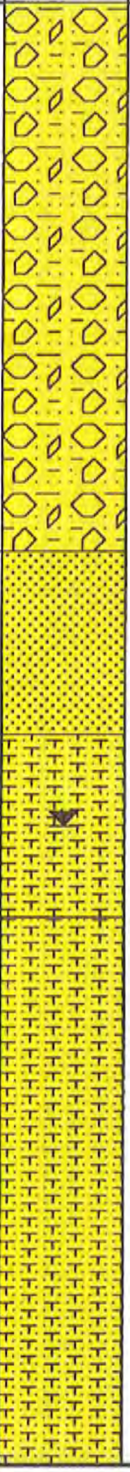
LOG OF BOREHOLE

Project: BOJO
Job #: 0398
Boring #: RI-17
Location: 1218 NW West Bay Dr. Olympia, WA
Approximate Elevation: Not Surveyed
Subcontractor/Equipment: ESN / Probe Rig
Drilling Method: Direct Push
Date: 7/8/10
Logged By: S. Dudziak



Depth (ft.)	Soil Description	Lithology	Color	Time	Sample Number	Comments
0	Silty Sandy Gravel (GM)		Light Brown	1410	RI17 - 0.5	
				1415	RI17 - 3	
	Fine Sand (SM)		Light Brown			
	Silty Sand (SM)		Med. Brown	1420	RI17 - 5	Wet at 4.5 ft. No odor, No sheen
5	Silty Sand (SM) with shells		Gray			

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Water Resources & Environmental Services

LOG OF BOREHOLE

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Project: BOJO
Job #: 0398
Boring #: RI-18

Location: 1218 NW West Bay Dr. Olympia, WA
Approximate Elevation: Not Surveyed

Subcontractor/Equipment: ESN / Probe Rig
Drilling Method: Direct Push

Date: 7/8/10
Logged By: S. Dudziak

Depth (ft.)	Soil Description	Lithology	Color	Time	Sample Number	Comments
0	Silty Sandy Gravel (GM)	▨	Lt Brown	1342	RI18 - 0.5	Two attempts to drill at this location. Hit refusal (slag) at 2 ft both times.

LOG OF BOREHOLE

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Project: BOJO	**Job #:** 0398	**Boring #:** RI-19
Location: 1218 NW West Bay Dr. Olympia, WA	**Approximate Elevation:** Not Surveyed	
Subcontractor/Equipment: ESN / Probe Rig	**Drilling Method:** Direct Push	
Date: 7/8/10	**Logged By:** S. Dudziak	

Depth (ft.)	Soil Description	Lithology	Color	Time	Sample Number	Comments
0	Silty Sandy Gravel (GM)		Med. brown	1334	RI19 - 0.5	
	Chalk like material	▼	Yellow	1338	RI19 - 3	
	Concrete					Moist @ 3 ft, No Odor, No Sheen
	Silty Sandy Gravel (GM)		Med. brown	1336	RI19 - 4	Two attempts to drill at this location. Hit refusal at 4 ft both times.

LOG OF BOREHOLE

Project: BOJO
Job #: 0398
Boring #: RI-20
Location: 1218 NW West Bay Dr. Olympia, WA
Approximate Elevation: Not Surveyed
Subcontractor/Equipment: ESN Probe Rig
Drilling Method: Direct Push
Date: 7/13/10
Logged By: S. Dudziak

Depth (ft.)	Soil Description	Lithology	Color	Time	Sample Number	Comments
0	Sand (SM) with roots		Light Brown	0916	RI20 - 0-0.5	
	Sandy Silt (ML)		Light Brown	0918	RI20 - 1.5-2.5	
		▼		0921	RI20 - 2.5-3.5	Wet at 2.5 ft No odor, no sheen
	Silty Sand (SM)		Gray			
				0923	RI20 - 3.5-4.5	
5	Silty Sand (SM) with shells		Gray	0925	RI20 - 4.5-5.5	

LOG OF BOREHOLE

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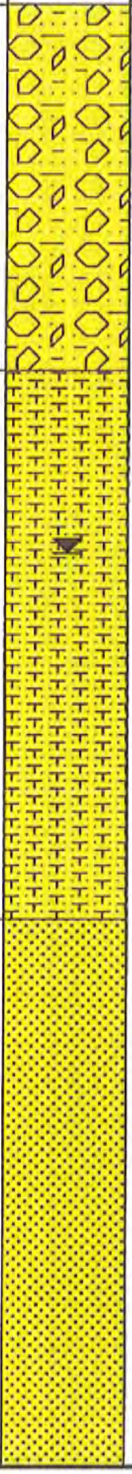
Project: BOJO **Job #:** 0398 **Boring #:** RI-21

Location: 1218 NW West Bay Dr. Olympia, WA **Approximate Elevation:** Not Surveyed

Subcontractor/Equipment: ESN / Probe Rig **Drilling Method:** Direct Push

Date: 7/8/10 **Logged By:** S. Dudziak

Depth (ft.)	Soil Description	Lithology	Color	Time	Sample Number	Comments
0	Silty Sandy Gravel (GM)		Med. brown	1326	RI21 - 0.5	
	Silty Sand (SM)		Med. brown			
				1327	RI21 - 3	Wet @ 3 ft, No odor, No sheen
5	Fine Sand (SM) with shells		Gray			
				1329	RI21 - 6	

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Project: BOJO	**Job #:** 0398	**Boring #:** RI-22
Location: 1218 NW West Bay Dr. Olympia, WA	**Approximate Elevation:** Not Surveyed	
Subcontractor/Equipment: ESN Probe Rig	**Drilling Method:** Direct Push	
Date: 7/8/10	**Logged By:** S. Dudziak	

Depth (ft.)	Soil Description	Lithology	Color	Time	Sample Number	Comments
0	Silty Sandy Gravel (GM)	▨	Dark Brown	915	RI22 - 0.5	
				913	RI22 - 2	
	Fine Sand (SM)	▨	Light Brown			
				920	RI22 - 3	
5	Fine Sand (SM) with shells	▼ ▨	Light Brown			Wet @3 ft. No odor, No sheen
	Silty Sand (SM)	▨	Light Brown			

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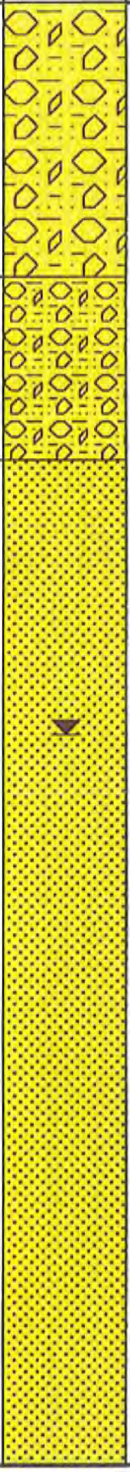
Project: BOJO
Job #: 0398
Boring #: RI-23

Location: 1218 NW West Bay Dr. Olympia, WA
Approximate Elevation: Not Surveyed

Subcontractor/Equipment: ESN / Probe Rig
Drilling Method: Direct Push

Date: 7/8/10
Logged By: S. Dudziak

Depth (ft.)	Soil Description	Lithology	Color	Time	Sample Number	Comments
0	Silty Sandy Gravel (GM)		Med. Brown	940	RI23 - 0.5	
	Gravel and Sand (GM) with wood		Med. Brown	930	RI23 - 2.5	Wood contains strong creosote odor from 1.5 to 2.5 ft
	Fine Sand (SM) with shells		Med. Brown	933	RI23 - 3.5	Wet @ 4 ft. No sheen, no odor at @ 4 ft
5						



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Project: BOJO
Job #: 0398
Boring #: RI-24
Location: 1218 NW West Bay Dr. Olympia, WA
Approximate Elevation: Not Surveyed
Subcontractor/Equipment: ESN / Probe Rig
Drilling Method: Direct Push
Date: 7/8/10
Logged By: S. Dudziak

Depth (ft.)	Soil Description	Lithology	Color	Time	Sample Number	Comments
0	Gravel and Sand (GM)		Light brown	953	RI24 - 0.5	
	Silty Sandy Gravel (GM) with wood		Dark brown	954 955	RI24 - 2.5 RI24 - 3	
	Sand (SP) with shells	▼	Med. brown			Wet @ 3 ft, No odor, No sheen @ 3 ft.
5						
	Sandy Silt (ML)		Med. brown			

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Project: BOJO
Job #: 0398
Boring #: RI-25
Location: 1218 NW West Bay Dr. Olympia, WA
Approximate Elevation: Not Surveyed
Subcontractor/Equipment: ESN / Probe Rig
Drilling Method: Direct Push
Date: 7/8/10
Logged By: S. Dudziak

Depth (ft.)	Soil Description	Lithology	Color	Time	Sample Number	Comments
0	Silty Sandy Gravel (GM)	▨	Med. brown	1228	RI25 - 0.5	
				1234	RI25 -1	
	Silty Sand (SM)	▨	Med. brown			
				1236	RI25 - 3	
		▼				Wet @ 3 ft, No odor, No sheen
				1238	RI25 - 4	
	Silty Sand (SM)	▨	Gray			
5						
				1240	RI25 - 6	

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Project: BOJO
Job #: 0398
Boring #: RI-26
Location: 1218 NW West Bay Dr. Olympia, WA
Approximate Elevation: Not Surveyed
Subcontractor/Equipment: ESN / Probe Rig
Drilling Method: Direct Push
Date: 7/8/10
Logged By: S. Dudziak

Depth (ft.)	Soil Description	Lithology	Color	Time	Sample Number	Comments
0	Silty Sandy Gravel (GM)	▨	Dark brown	1055	RI26 - 0.5	
	Fine Sand (SM)	▨	Light brown			
				1058	RI26 - 2.5	
	Fine Sand (SM) With shells	▨ ▼	Light brown			Wet @ 3 ft, No odor, No sheen.
	Silty Sand (SM) with shells	▨	Grayish brown			
5						
				1059	RI26 - 6	
10						

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Project: BOJO **Job #:** 0398 **Boring #:** RI-27

Location: 1218 NW West Bay Dr. Olympia, WA **Approximate Elevation:** Not Surveyed

Subcontractor/Equipment: ESN Probe Rig **Drilling Method:** Direct Push

Date: 7/13/10 **Logged By:** S. Dudziak

Depth (ft.)	Soil Description	Lithology	Color	Time	Sample Number	Comments
0	Silty Sandy Gravel (GM)		Light Brown	0840	RI27 0-0.5	
	Gravel (GP)		Gray			
	Silty Sand (SM)		Light Brown			
	Silty Sand (SM)	▼	Gray	0842	RI27 2.5-3.5	No odor, no sheen Water at 3.5 ft.
5	Silty Sand (SM)		Med. Brown	0845	RI27 5-6	
10	Silty Sand (SM) with shells		Gray			

Project: BOJO
Job #: 0398
Boring #: RI-28

Location: 1218 NW West Bay Dr. Olympia WA
Approximate Elevation: Not Surveyed

Subcontractor/Equipment: ESN / Probe Rig
Drilling Method: Direct Push

Date: 7/8/10
Logged By: S. Dudziak

Depth (ft.)	Soil Description	Lithology	Color	Time	Sample Number	Comments
0	Silty Sandy Gravel (GM)		Dark brown	1002	RI28 - 0.5	
	Fine Sand (SM)		Light brown			
	Sand (SM) with shell lenses	▼	Light brown			Wet @ 2.5 ft, No odor, No sheen.
				1013	RI28 - 3.5	
	Sand (SM) with shells		Med. brown			
5						
				1015	RI28 - 6	

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Project: BOJO **Job #:** 0398 **Boring #:** RI-29

Location: 1218 NW West Bay Dr. Olympia, WA **Approximate Elevation:** Not Surveyed

Subcontractor/Equipment: ESN / Probe Rig **Drilling Method:** Direct Push

Date: 7/8/10 **Logged By:** S. Dudziak

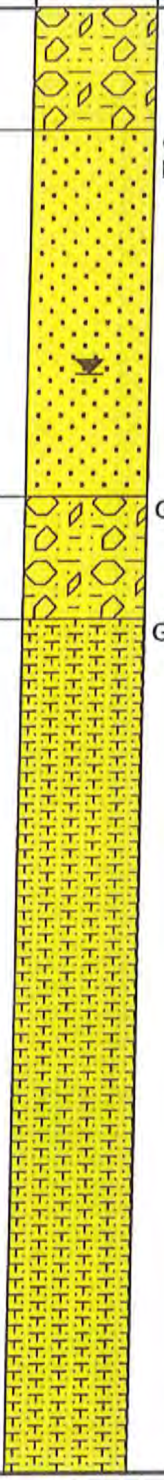
Depth (ft.)	Soil Description	Lithology	Color	Time	Sample Number	Comments
0	Silty Sandy Gravel (GM)		Med. brown	1254	RI29 - 0.5	
	Silty Sand (SM) with shells		Brown Gray	1256	RI29 - 2.5	
				1258	RI29 - 4	Wet @ 3.5 ft, No odor, No sheen.
	Silty Sand (SM) with shells		Gray			
5						
				1312	RI29 - 8	Slight sheen @ 8ft
10						
				1315	RI29 -12	

Project: BOJO
Job #: 0398
Boring #: RI-30

Location: 1218 NW West Bay Dr. Olympia, WA
Approximate Elevation: Not Surveyed

Subcontractor/Equipment: ESN / Probe Rig
Drilling Method: Direct Push

Date: 7/8/10
Logged By: S. Dudziak



Depth (ft.)	Soil Description	Lithology	Color	Time	Sample Number	Comments
0	Silty Sandy Gravel (GM)		Med. brown	1055	RI30 - 0.5	
	Sand (SM) with shells		Grayish brown			
		▼				Wet @ 3 ft, No odor, No sheen.
				1058	RI30 - 4	
	Silty Sandy Gravel (GM)		Gray			
5	Silty Sand (SM) with shells		Gray			
				1059	RI30 - 6	
10						

Soil Boring and Sample Log

Project: Reliable Steel
Boring #: EC-1
Date: 4/10/13
Logged by: S. Teel
Driller:
Drilling Method: Hand Auger
LAT DD: 47 03 19.6 LONG DD:122 54 48.1 NAD83HARN
Ground surface elevation:
Vertical Datum:

Depth BGS (feet)	Formation Description (color, grain size, moisture content, density, %fines)	Sample Interval	Sample Info
0			
	Sandy GRAVEL (GP) dark brown (10YR3/3). 0.0 ppm PID	0-0.4'	1345 hrs, 1304044-10
0.5			
	Hand auger refusal @ 0.4'		
1			
1.5			
2			
2.5			
3			
3.5			
4			
4.5			
5			

Soil Boring and Sample Log

Project: Reliable Steel

Boring #: EC-2

Date: 4/10/13

Logged by: S. Teel

Driller:

Drilling Method: Hand Auger

LAT DD: 47 03 20.4 LONG DD:122 54 45.9 NAD83HARN

Ground surface elevation:

Vertical Datum:

Depth BGS (feet)	Formation Description (color, grain size, moisture content, density, %fines)	Sample Interval	Sample Info
			Same or very similar to proposed map location.
0	Coarse Driveway Gravel 0-0.2' Silty Sandy GRAVEL (GC).	0-1'	
0.5	TPH odor obvious from 0.5' to 1.5.'		
1			
1.5			
2	Clay (CH), plastic, fat, trace fine gravel, some minor black staining, No evidence of TPH contamination, no sheen, 0.0 ppm on PID.	2-3'	1700 hrs, 1304044--13
2.5			
3			
3.5			
4			
4.5			
5			

Soil Boring and Sample Log

Project: Reliable Steel | Boring #: EC-3A | Date: 4/11/13 | Logged by: S. Teel

Driller: | Drilling Method: Hand Auger | LAT DD: 47 03 20.3 LONG DD:122 54 46.0 NAD83HARN

Ground surface elevation: | Vertical Datum:

Depth BGS (feet)	Formation Description (color, grain size, moisture content, density, %fines)	Sample Interval	Sample Info
			Located 20' South of EC-2.
0	Sandy GRAVEL (GP). Gravels are fine to coarse (small cobble), med.-coarse sand, dry, brown to dark brown (10YR4/3), some TPH odor.	0-1'	
0.5			
1			
1.5			
2			
2.5			
3			
3.5			
4			
4.5			
5			

Soil Boring and Sample Log

Project: Reliable Steel	Boring #: EC-3B	Date: 4/11/13	Logged by: S. Teel

Driller:	Drilling Method: Hand Auger	LAT DD: 47 03 19.9 LONG DD:122 54 45.9 NAD83HARN

Ground surface elevation:	Vertical Datum:

Depth BGS (feet)	Formation Description (color, grain size, moisture content, density, %fines)	Sample Interval	Sample Info
			Located 35' South of EC-2.
0	Gravelly SAND(SP) to sandy GRAVEL (GP), Slight odor, no sheen, grayish brown (10YR5/2) to dark yellowish brown (10YR4/4). 0.0 ppm on PID.	0-1'	1000 hrs, 1304044-14
0.5			
1	Fine SAND (SP), some medium sand and ~15% fine gravel, None to slight sheen, 0.0 ppm on PID, very dark grayish brown (10YR3/2).	1-2'	1003 hrs, 1304044-15
1.5			
2	Gravelly fine SAND (SP), trace wood fragments, one small brick Fragment, slightly moist, very dark grayish brown (10YR3/2), 0.0 ppm on PID.	2-2.4'	1015 hrs, Archive
2.5	Hand auger refusal @ 2.4'.		
3			
3.5			
4			
4.5			
5			

Soil Boring and Sample Log

Project: Reliable Steel

Boring #: EC-4

Date: 4/10/13

Logged by: S. Teel

Driller:

Drilling Method: Hand Auger

LAT DD: 47 03 20.5 LONG DD:122 54 46.9 NAD83HARN

Ground surface elevation:

Vertical Datum:

Depth BGS (feet)	Formation Description (color, grain size, moisture content, density, %fines)	Sample Interval	Sample Info
			Same or very similar to proposed map location.
0	Clayey SAND (SC) very dark grayish brown (10YR3/2), some fine gravel, moist.	0-1'	1512 hrs, 1304044--11
0.5			
1	Gravelly, med.-coarse SAND (SP), gravels are fine to coarse, some iron staining, 0.0 ppm on PID, moist, very dark grayish brown (10YR3/2).	1-2'	1520 hrs, Archive
1.5			
2	Gravelly, med.-coarse SAND (SP), similar to above, wet, gravels still fine to coarse but are generally finer than above, very dark grayish brown (10YR3/2, 0.0 ppm on PID.	2-3'	1537 hrs, Archive
2.5	Color change to gray (10YR5/1) @ ~2.9'		
3	Gravelly SAND (SC) with fines. Gravels are fine size, 0.0 ppm on PID. Sawdust and fine size wood chips @3.8'.	3-4'	1600 hrs, 1304044--12
3.5			
4			
4.5			
5			

Soil Boring and Sample Log

Project: Reliable Steel

Boring #: EC-5

Date: 4/10/13

Logged by: S. Teel

Driller:

Drilling Method: Hand Auger

LAT DD: 47 03 20.7 LONG DD:122 54 45.3 NAD83HARN

Ground surface elevation:

Vertical Datum:

Depth BGS (feet)	Formation Description (color, grain size, moisture content, density, %fines) .	Sample Interval	Sample Info
			Same or very similar to proposed map location.
0	Sandy GRAVEL (GP) dark brown (10YR3/3).	0-0.5'	1400 hrs, 1304044--09
0.5	Hand auger refusal @ 0.5'		
1			
1.5			
2			
2.5			
3			
3.5			
4			
4.5			
5			

Soil Boring and Sample Log

Project: Reliable Steel
Boring #: EC-6
Date: 4/10/13
Logged by: S. Teel
Driller:
Drilling Method: Hand Auger
LAT DD: 47 03 21.3 LONG DD:122 54 47.4 NAD83HARN
Ground surface elevation:
Vertical Datum:

Depth BGS (feet)	Formation Description (color, grain size, moisture content, density, %fines)	Sample Interval	Sample Info
			Same or very similar to proposed map location.
0	Organic Soil, 0-0.2’ Fine SAND (SP) very dark grayish brown (10YR3/2), abundant shell fragments, some metal fragments (fill).	0-1’	1315 hrs, 1304044--07
0.5			
1	Fine SAND (SP), very dark grayish brown (10YR3/2), much less shell fragments from 1.5-2’.	1-2’	1322 hrs, Archive
1.5			
2	Fine SAND (SP) very moist, with abundant shell fragments, very dark grayish brown (10YR3/2), no evidence of staining or contamination.	2-3’	1330 hrs, 1304044--08
2.5			
3			
3.5			
4			
4.5			
5			

Soil Boring and Sample Log

Project: Reliable Steel | Boring #: EC-7 | Date: 4/10/13 | Logged by: S. Teel

Driller: | Drilling Method: Hand Auger | LAT DD: 47 03 22.1 LONG DD:122 54 47.6 NAD83HARN

Ground surface elevation: | Vertical Datum:

Depth BGS (feet)	Formation Description (color, grain size, moisture content, density, %fines)	Sample Interval	Sample Info
			142' from west end of bld., 87.4' from east end of bld.
0	Gravelly SAND (SP) med-coarse sand, fine gravel, slightly moist, no evidence of contamination, no staining, trace shell fragments, trace metal fragments (fill). Moist color dark reddish brown (5YR3/2).	0-1.2'	1140 hrs, Archive
0.5			
1	SAND (SP) fine-med. w/ fine gravel, very dark grayish brown (10YR3/2), very moist to wet	1.2-2'	1200 hrs, Archive
1.5			
2	SAND (SP) fine, trace medium size, with shell fragments and trace metal fragments (nail), very dark grayish brown (10YR3/2), Wet (fill).	2-3'	1210 hrs, 1304044--06
2.5			
3			
3.5			
4			
4.5			
5			

Soil Boring and Sample Log

Project: Reliable Steel

Boring #: EC-8

Date: 4/11/13

Logged by: S. Teel

Driller:

Drilling Method: Hand Auger

LAT DD: 47 03 21.8 LONG DD:122 54 49.9 NAD83HARN

Ground surface elevation:

Vertical Datum:

Depth BGS (feet)	Formation Description (color, grain size, moisture content, density, %fines)	Sample Interval	Sample Info
			Same or very similar to proposed map location.
0	Hand auger refusal.		
0.5			
1			
1.5			
2			
2.5			
3			
3.5			
4			
4.5			
5			

Soil Boring and Sample Log

Project: Reliable Steel	Boring #: EC-9	Date: 4/11/13	Logged by: S. Teel
Driller:	Drilling Method: Hand Auger	LAT DD: 47 03 23.4 LONG DD:122 54 50.3 NAD83HARN	
Ground surface elevation:		Vertical Datum:	

Depth BGS (feet)	Formation Description (color, grain size, moisture content, density, %fines)	Sample Interval	Sample Info
	Moved 3.5' east of mapped sample location. Map location was within one set of RR tracks. Sample location was between the two sets of tracks.		
0	Topsoil 0-0.2' Fine SAND (SP), some gravel, trace fines, some organic material dark brown (10YR3/3). 0.2 ppm on PID.	0-1'	1110 hrs, 1304044-16
0.5			
1	Gravelly fine SAND (SP), similar to above, fine gravel size, dark brown (10YR3/3). 0.0 ppm on PID.	1-2'	1115 hrs, Archive
1.5			
2	Gravelly fine SAND (SP), similar to above, fine gravel size, very dark grayish brown (10YR3/2). Trace magnetic fragments, 0.0 ppm on PID.	2-2.6'	1122 hrs, 1304044-17
2.5	Hand auger refusal @ 2.6'.		
3			
3.5			
4			
4.5			
5			

Soil Boring and Sample Log

Project: Reliable Steel

Boring #: EC-10

Date: 4/11/13

Logged by: S. Teel

Driller:

Drilling Method: Hand Auger

LAT DD: 47 03 21.1 LONG DD:122 54 48.8 NAD83HARN

Ground surface elevation:

Vertical Datum:

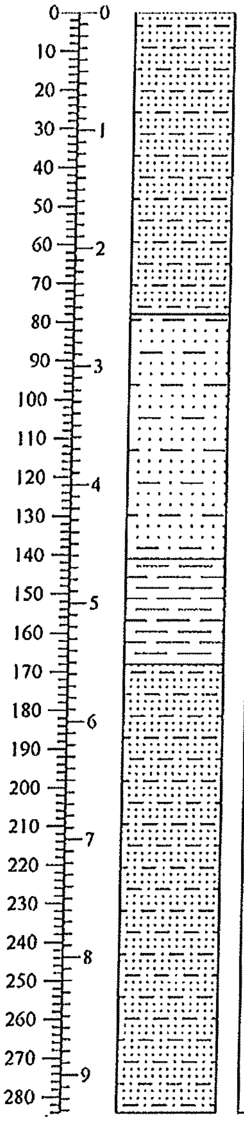
Depth BGS (feet)	Formation Description (color, grain size, moisture content, density, %fines)	Sample Interval	Sample Info
			Located close to building wall.
0	Topsoil 0-0.05' Sandy GRAVEL (GP), moist, very dark grayish brown (10YR3/2).	0-0.5'	1145 hrs, 1304044-18
0.5	Hand auger refusal @0.5'		
1			
1.5			
2			
2.5			
3			
3.5			
4			
4.5			
5			

Marine

SEDIMENT CORE LOG

PROJECT: Reliable Steel Supplemental Investigation **CORE ID:** Station 1 Page 1 of 1

Collection Date:	2/5/08	Logged By:	Jonathan Reeve
Core Processing Date:	2/6/08 14:40	Mudline Elevation (ft):	
Core Tube:	9.3'	Easting:	47.056549781
Core Drive Length:	10.0'	Northing:	-122.912068923
		Coordinate System:	WGS 1984

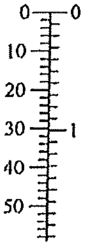
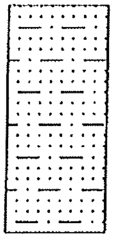


Core Depth (cm/ft)	Lithology	Core Description	Sample ID
		silty Sand: Medium to dark grayish brown, 40% silt, very fine to medium grained, loose, very large shell fragments (6cm wide) and processed wood (4cm long) on top of sediment, below is abundant sawdust, shell fragments, trace processed wood to 38cm. 38-45cm is 100% sawdust. Below 45cm is occasional sawdust and up to 4cm long cedar debris. Strong initial sulfide odor upon opening core, then moderate. No sheens.	
		Sand w/silt: Medium gray, fine to medium grained, dense to very dense, silt content varies from 5-20%, then gradually transitions into silty sand below 120cm. No odors or sheens.	
		Silt: Light olive gray, very soft, wet, low plasticity, no odors or sheens.	
		silty Sand: Medium grayish brown, very fine to fine grained, loose to dense, silt varies from 20-40%, decreasing with depth, some sawdust 180-186cm, trace shells, occasional 2cm wide shell fragments below 268cm, One cedar chunk @ 262cm, faint sulfide odor, no sheens.	

SEDIMENT CORE LOG

PROJECT: Reliable Steel Supplemental Investigation **CORE ID:** Station 2 Page 1 of 1

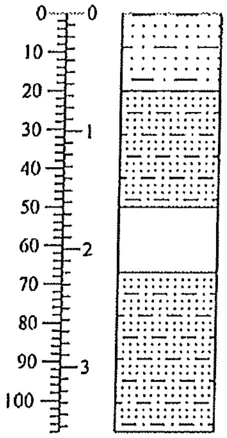
Collection Date:	2/5/08 12:18	Logged By:	Jonathan Reeve
Core Processing Date:	2/6/08 11:00	Mudline Elevation (ft):	6'
Core Tube:	2.1'	Easting:	47.056251809
Core Drive Length:	10'	Northing:	-122.911992513
		Coordinate System:	WGS 1984

Core Depth (cm/ft)	Lithology	Core Description	Sample ID
		Sand w/silt: Blueish gray to dark greenish brown, 10-25% silt, sand is medium to coarse grained, loose to dense, angular grains, large clam at 18cm (10cm wide), trace 2cm wide clams & clam debris below. Occasional sawdust throughout. Color is darkest at 12-20cm with some blast sand & lightest at bottom. Generally stiffening downwards. Strong anaerobic sulfide odor, no sheens.	

SEDIMENT CORE LOG

PROJECT: Reliable Steel Supplemental Investigation **CORE ID:** Station 7 Page 1 of 1

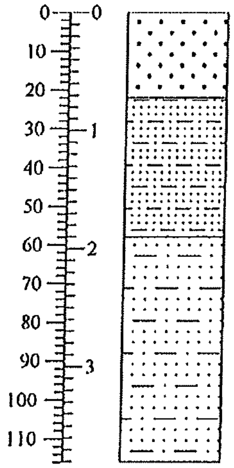
Collection Date:	2/5/08 16:00	Logged By:	Jonathan Reeve
Core Processing Date:	2/6/08 12:30	Mudline Elevation (ft):	6'
Core Tube:	4'	Easting:	47.05630073
Core Drive Length:	4'	Northing:	-122.912438512
		Coordinate System:	WGS 1984



Core Depth (cm/ft)	Lithology	Core Description	Sample ID
		Sand w/silt: Black to very dark gray, 5-20% silt, sand is fine to medium grained, very loose, wet, some black blast sand, trace round gravel, occasional shell debris and one 4cm wide clam, one 0.5cm long coronomid, trace wood debris, faint indistinct odor, no sheens.	
		silty Sand: Dark gray to medium greenish gray, 40-50% silt, sand is fine to coarse grained, very loose to loose. Silt increases downwards, is low plasticity. Sawdust starts at 36cm, increases downwards to 50% of volume. moderately strong anaerobic sulfide odor associated with green silt, no sheens.	
		debris: 80-95% sawdust, interstitial sediment is silty sand from overlying interval.	
		silty Sand: Very dark gray and medium greenish brownish gray (olive), 30-40% silt, sand is very fine to fine grained, very loose to very dense. Very dark gray section from 70-79cm is very wet, very loose, strong sulfide odor, some sawdust debris. Below is olive colored, sandier, firm to stiff with trace wood and shell debris, moderately strong sulfide odor, no sheens. Becomes very dense below 96cm, possibly compacted.	

SEDIMENT CORE LOG

PROJECT:	Reliable Steel Supplemental Investigation	**CORE ID:**	Station 8	Page 1 of 1
Collection Date:	2/5/08	Logged By:	Jonathan Reeve	
Core Processing Date:	2/6/08 13:30	Mudline Elevation (ft):		
Core Tube:	7.8'	Easting:	47.056509226	
Core Drive Length:	10.0'	Northing:	-122.912561817	
		Coordinate System:	WGS 1984	



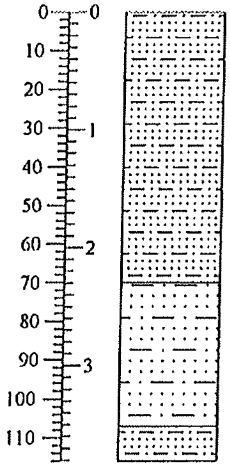
Core Depth (cm/ft)	Lithology	Core Description	Sample ID
		Sand: Light yellowish brown to black to light gray, colors occur in that order at 9,13,22cm, coarse grained, very loose to dense, angular grains, quartz rich in light gray section, trace glass and plastic grains @ top of core, top section (to 9cm) is tidally exposed and shows some oxidation, trace shells in black sediments, no odors or sheens.	
		silty Sand: Light to medium greenish gray, 40-60% silt (more often sand), very dense to occiasionaly loose, very fine to fine grained, density decreasing downwards, silt is low plasticity, no odors or sheens, trace shell debris.	
		Sand w/silt: Light to medium gray, 10-20% silt, sand is very fine to fine grained, dense to very dense. 60-110cm is less dense, abundant shell fragments, occasional large fragments (4cm wide), followed by very dense, very fine grained sand with no shells. 7cm long processed wood piece at 131cm, no odors or sheens.	

SEDIMENT CORE LOG

PROJECT: Reliable Steel Supplemental Investigation **CORE ID:** Station 9 Page 1 of 1

integral

Collection Date:	2/5/08	Logged By:	Jonathan Reeve
Core Processing Date:	2/6/08 17:50	Mudline Elevation (ft):	
Core Tube:	8.3'	Easting:	47.056537802
Core Drive Length:	10.0'	Northing:	-122.911723553
		Coordinate System:	WGS 1984



Core Depth (cm/ft)	Lithology	Core Description	Sample ID
		silty Sand: Medium greenish brown, fine grained, loose to dense, 4cm long processed wood fragment at 11cm, abundant sawdust throughout, silt (30-50%) is highly anaerobic, very strong sulfide odor, no sheen.	
		Sand w/silt: Medium greenish brownish gray, 20% silt, sand is medium to coarse grained, loose, 50-70% sawdust by volume, occasional cedar chunks 3cm long, very strong sulfide odor, no sheens.	
		silty Sand: Medium greenish brown, 40% silt, sand is very fine to fine grained, dense to very dense, stiffness decreasing with depth, trace sawdust to 150cm then occasional small shell fragments, strong sulfide odor, no sheens.	

SEDIMENT CORE LOG

PROJECT: Reliable Steel Supplemental Investigation **CORE ID:** Station 10 Page 1 of 1

Collection Date: 2/5/08

Core Processing Date: 2/6/08 16:30

Core Tube: 6.9'

Core Drive Length: 9'

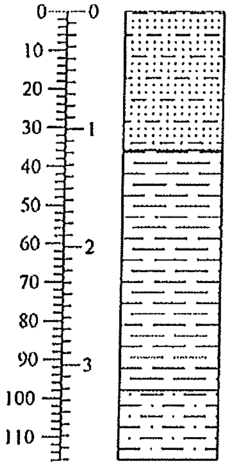
Logged By: Jonathan Reeve

Mudline Elevation (ft):

Easting: 47.056250222

Northing: -122.911721282

Coordinate System: WGS 1984

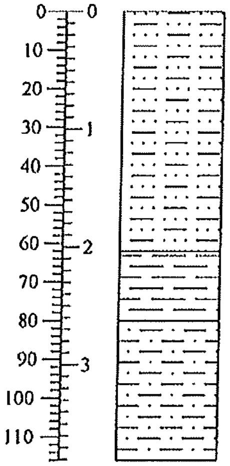


Core Depth (cm/ft)	Lithology	Core Description	Sample ID
		silty Sand: Dark brownish gray, 40% silt, sand is fine to medium grained, very loose to loose, trace shells, sulfide odor, no sheens.	
		Silt: Light olive gray, very soft to firm, very wet to moist, low plasticity. 36-49cm is moist, soft, 49-53cm is moist, firm, 53-63cm is very wet, very soft, 63-98cm is wet, soft. Weak sulfide odor, no sheens.	
		Silt w/sand: Medium brownish gray, 5-10% very fine sand, soft to firm, low to medium plasticity, occasional sawdust from 122-130cm, trace shells below 150cm, transitioning to 40% very fine sand, firm at 190cm with occasional 2cm shell fragments and one 4cm long cedar chunk at 185cm. No odors or sheens.	

SEDIMENT CORE LOG

PROJECT: Reliable Steel Supplemental Investigation **CORE ID:** Station 11 Page 1 of 1

Collection Date:	2/5/08	**Logged By:**	Jonathan Reeve
Core Processing Date:	2/6/08 17:15	**Mudline Elevation (ft):**	
Core Tube:	9.2'	**Easting:**	47.056987336
Core Drive Length:	10.0'	**Northing:**	-122.911905372
		Coordinate System:	WGS 1984



Core Depth (cm/ft)	Lithology	Core Description	Sample ID
		sandy Silt: Light gray to brown, 20-40% very fine sand, soft to firm, low moisture, no plasticity. Top is brown with sawdust and shell debris. 7-42cm is light gray, stiff then soft, siltier, 42-62cm is brown, sandier, trace sawdust. Faint sulfide odor, no sheens.	
		Silt: Light olive gray, soft, moist, low plasticity, No odors or sheens.	
		Silt w/sand: Brown to light gray, 5-20% very fine sand, firm, low moist, low plasticity, transitioning from brown to light gray at 136cm, trace shells, sawdust 80-100cm, abundant sawdust at 126-135cm, No odors or sheens.	

LOG OF BOREHOLE

GREYLOCK *C*ONSULTING LLC

Water Resources & Environmental Services

Project: BOJO
Job #: 0398
Boring #: RI-S-2

Location: 1218 NW West Bay Dr. Olympia, WA
Approximate Elevation: Not Surveyed

Subcontractor/Equipment: ESN Probe Rig
Drilling Method: Direct Push

Date: 7/12/10
Logged By: S. Dudziak

Depth (ft.)	Soil Description	Lithology	Color	Comments
0	Silty Sand (SM) with shells	▨	Very Dark Gray	coarse grained sand at surface
			Dark Gray	
5				1 inch lense of wood @ 5 ft
			Dark Gray	
				bottom of boring is silt

GREYLOCK CONSULTING LLC

Water Resources & Environmental Services

LOG OF BOREHOLE

Project: BOJO **Job #:** 0398 **Boring #:** RI-S-3

Location: 1218 NW West Bay Dr. Olympia, WA **Approximate Elevation:** Not Surveyed

Subcontractor/Equipment: ESN Probe Rig **Drilling Method:** Direct Push

Date: 7/12/10 **Logged By:** S. Dudziak

Depth (ft.)	Soil Description	Lithology	Color	Comments
0	Silty Sand (SM) with shells		Very Dark Gray	No Odor, No Wood
	Silt (ML)		Gray	
5	Sand (SM)		Very Dark Gray	
	Silt (ML)		Gray	

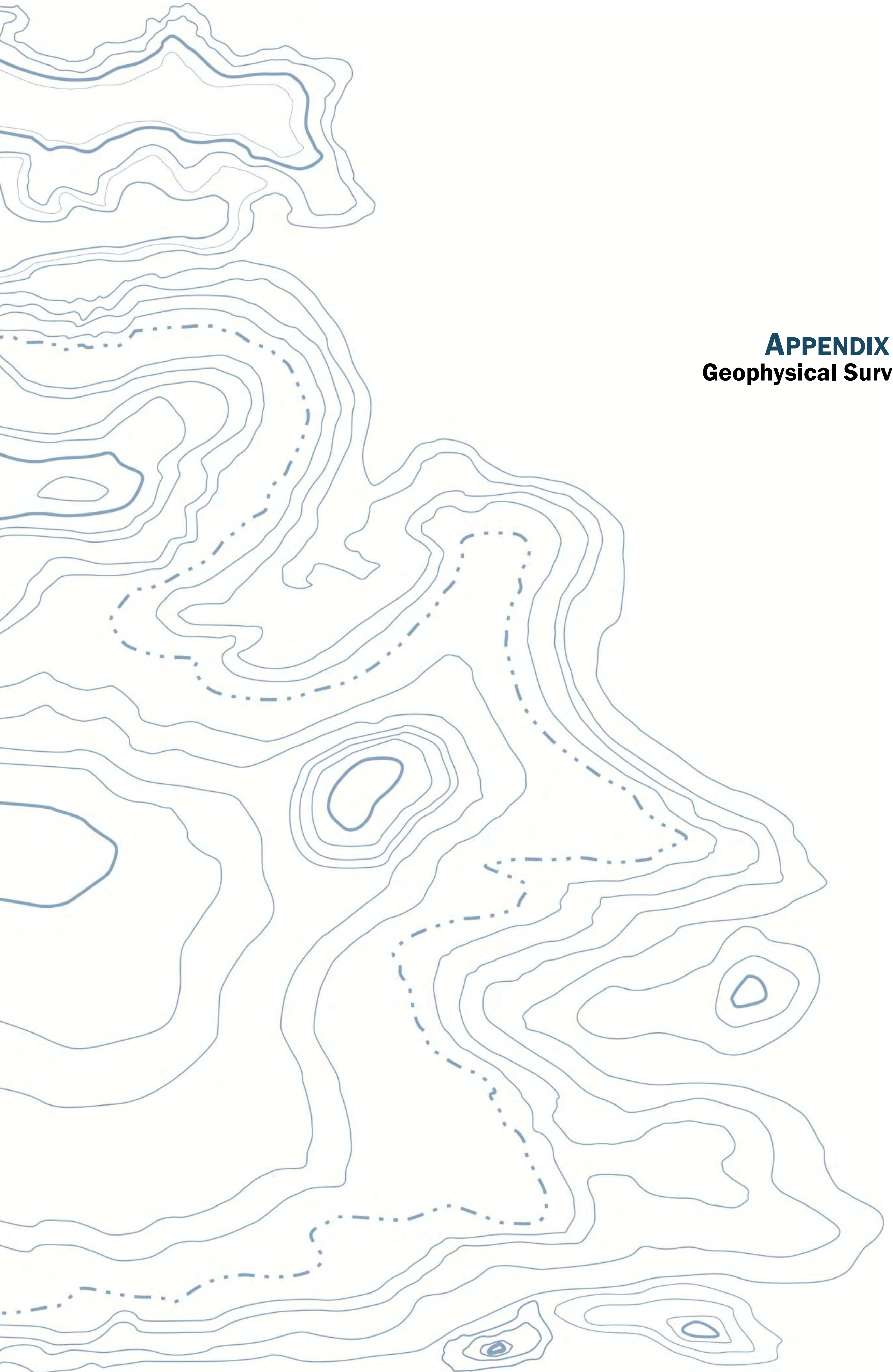
Project: BOJO
Job #: 0398
Boring #: RI-S-4
Location: 1218 NW West Bay Dr. Olympia, WA
Approximate Elevation: Not Surveyed
Subcontractor/Equipment: ESN Probe Rig
Drilling Method: Direct Push
Date: 7/12/10
Logged By: S. Dudziak

Depth (ft.)	Soil Description	Lithology	Color	Comments
0	Sand (SM) with broken shells		Black	No odor, 6- in piece of wood @ surface
	Silt (ML)		Gray	
	Sand (SM) with shells		Black	Coarse sand @ 2 - 3 ft
5	Silty Sand (SM) with shells		Gray	
	Silt (ML)		Gray	

Soil Boring and Sample Log

Project: Reliable Steel
Boring #: EC-11
Date: 4/11/13
Logged by: S. Teel
Driller:
Drilling Method: Hand Auger
LAT DD: 47 03 22.0 LONG DD:122 54 44.0 NAD83HARN
Ground surface elevation:
Vertical Datum:

Depth BGS (feet)	Formation Description (color, grain size, moisture content, density, %fines)	Sample Interval	Sample Info
			Sediment Sample.
0	Black (2.5Y2/0) muddy fine SAND (SM) to sandy SILT (ML) with abundant shell fragments.	0-2’	1315 hrs, Archive
0.5			
1			
1.5			
2	Fine SAND (SP), dark gray (2.5Y4/0).	2-3.2’	1340 hrs, 1304044-19
2.5	Hand auger refusal @ 3.2’.		
3			
3.5			
4			
4.5			
5			



APPENDIX B
Geophysical Survey

GEOPHYSICAL INVESTIGATION REPORT

RELIABLE STEEL SITE
OLYMPIA, WASHINGTON

FOR

GREYLOCK CONSULTING
FEDERAL WAY, WASHINGTON

MARCH 2008

PHILIP H. DUOOS
GEOPHYSICAL CONSULTANT

PHILIP H. DUOOS **GEOPHYSICAL CONSULTANT**

March 3, 2008

Our Ref 813-08

Ms. Suzzane Dudziak
Greylock Consulting
P.O. Box 23254
Federal Way, WA 98093

REPORT: Geophysical Investigation
Reliable Steel Site, Olympia, Washington

Dear Ms. Dudziak,

This letter report summarizes the results of the geophysical investigation that I performed on February 6-7. The primary purpose of the investigation was to determine if any underground storage tanks (USTs) were present in the areas of interest. Interpretation of the data also indicated several linear trends (possible pipes or foundations), but locating all of the possible pipes and utilities was not the purpose of this investigation.

The areas of interest were investigated using electromagnetic (EM-61 electromagnetics) and ground penetrating radar (GPR) methods. A brief description of the methods is attached.

INTERPRETATION RESULTS

Three areas were investigated at the site. The large outside area was investigated with both methods, and the two smaller areas were investigated only with the GPR due to the proximity of nearby metal that would severely affect the EM-61 data.

The first small area investigated was in the vicinity of the raised concrete slab inside the main building along the south wall. The area below the slab was scanned with the GPR, as well as the area to the south of the slab outside the building. No large GPR targets typical of USTs were observed in this area. An employee at the site mentioned that an above-ground storage tank had previously been located on top of the concrete slab.

The second small area is located outside the north wall of the maintenance shop near a small doorway (see attached Figure 2). The limited amount of area made scanning difficult, but no large GPR targets typical of a UST were observed. This area was reported to contain a UST which had previously been removed. The surface of the ground in the survey area looked to be more disturbed than the surrounding area, perhaps indicating the excavated area.

The Geophysical Results Map (Figure 1) shows the interpretation results for the large area at the site including the locations of the reference baseline grid marks and visible features at the site. Initial results were provided to you prior to your drilling soon after the geophysical field work was performed. Some additional features have been added based on further interpretation of the data.

The EM-61 High Resolution Metal Detector was used to perform a detailed survey of the large area. The EM-61 data indicated several anomalous zones with possible buried metal. One very strong anomaly was observed and confirmed by the GPR to indicate a single large object (probable UST) near coordinate 95E, 40S. The High Anomalous Zone near coordinate 60E, 20N is probably an effect from the small diesel UST located in this area. This zone is opposite the "UST" paint mark on the door rail, and is also in an area where the north edge of asphalt is settling. The ditch between the asphalt and the corrugated steel wall of the building prevented gathering accurate data near the building. The UST may be adjacent to the building or perhaps below the building.

The Moderate Anomalous Zones indicate moderate amounts of buried metal objects. The GPR data in these areas did not indicate any single large target, but numerous small targets with depths primarily ranging from 1.5 to 5 feet deep. The large moderate zone near 50E, 40S is associated with deeper penetration of the GPR signal and scattered targets at depth (from 2' to 10') in the GPR data. This may be an area of coarser fill material with some metal, construction debris, etc.

The Low Anomalous Zones indicate smaller amounts of possible buried metal. The presence of slag waste may also contribute to the anomalous zones. The remainder of the survey area may have small amounts of scattered buried metal. A contour map of the EM-61 data is provided on Figure 3, which also shows the response to nearby metal such as the buildings, trash bins, etc.

A strong flat reflection observed in the GPR data may indicate the possible septic drain field near 80E, 20S. Linear features (possible pipes) seem to extend from the possible drain field to the buildings. Linear features that are queried are questionable. The water line and electrical line shown on the map were located by others. Please note that detailed locating of underground utilities was beyond the scope of this investigation.

METHODOLOGY

The detailed EM survey was performed using a Geonics EM-61 High Resolution Metal Detector with data digitally recorded and downloaded to a laptop computer. EM-61 data were recorded at approximate 1-foot intervals along survey lines usually spaced 5 feet apart. GPR data were obtained using a GSSI SIR 3000 Digital Radar with a 400 MHz antenna. The GPR data were obtained along survey lines spaced 5 feet apart and oriented in two directions over the large area of interest. A spacing of 2 feet between lines was used in the two smaller areas (on the concrete slab and near the small warehouse door). Maximum depth of investigation of the GPR was about 12 feet in the southwest portion of the large area. Other areas may have had shallower maximum depths, but large objects about 5 feet and shallower should have been detected by the GPR.

The surveys were referenced to numerous reference baselines that were marked using tape measures and pink or white spray paint. Line 20N of the reference grid is oriented parallel to and 5' south of the wall of the main building. The initial reference point of 50E, 24N is located at the southwest corner of the concrete footing at the east edge of the large door.

The use of the EM-61 and GPR provided a rapid and non-intrusive means of investigating the area of interest for possible USTs and other features. One large EM anomaly coincides with a large GPR target and is a probable UST. Other features of possible interest were also observed. However, because of the numerous variables involved in geophysical investigations, there is a possibility that some features may not have been detected. Only direct observations using test pits or other means can ultimately characterize subsurface conditions.

Please contact me if you have any questions or comments regarding this information, or if you require further assistance. I appreciated the opportunity to work with you on this project and look forward to providing you with geophysical services in the future.

Sincerely,

Philip H. Duoos
Geophysical Consultant

State of Washington Licensed Geologist
581
Philip H. Duoos

DESCRIPTION OF METHODS

ELECTROMAGNETICS (EM-61)

The EM-61 is a high-resolution metal detector that can detect both ferrous and non-ferrous metallic objects. It is a rapid, wheel-mounted system requiring one operator, and digitally records data at a high density (usually at 1-foot intervals or less along a survey line).

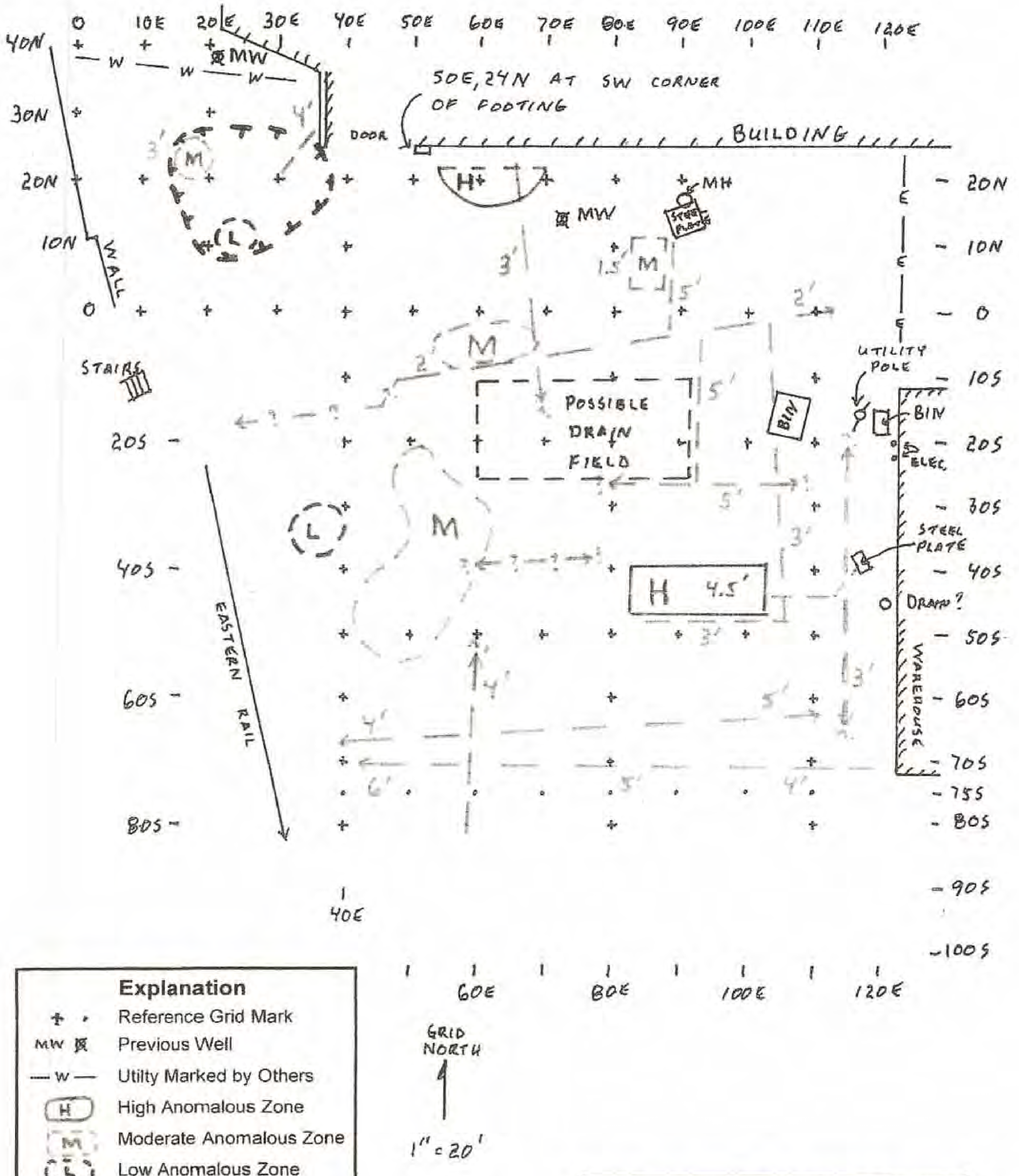
The EM-61 utilizes time-domain EM theory, and uses a pulsed primary magnetic field to induce EM currents in metallic objects below the instrument. The decay of these currents over time is measured by two receiver coils, and digitally recorded for further processing. The relative response of the anomalies on the two coils can often be evaluated to provide a depth estimate of the buried metal. The EM-61 can detect a 55 gallon drums at depths of over 5 feet, and will also respond to small shallow objects only inches in diameter.

The EM-61 is not affected by changes in subsurface conductivity due to soil and moisture conditions. It is also less sensitive than other methods to surface metal such as buildings, fences, and vehicles as it is focused to detect objects directly below (and above) the receiver coils. However, this also requires that spacing between survey lines should be small to provide adequate coverage.

GROUND PENETRATING RADAR

Some of the uses of GPR include locating buried tanks and drums, delineating boundaries of landfills and trenches, and defining voids and geologic stratigraphy. Although other techniques can also provide this information, GPR is less affected by cultural interferences such as overhead powerlines, buildings, and fences. GPR can also provide higher resolution of the target in many cases. A variety of antennas can be used depending on subsurface conditions and the objective of the survey. Resolution of shallow objects requires higher frequencies, while lower frequencies work better for deeper investigations.

Several factors can affect the effectiveness of the GPR method including reinforced concrete at the surface, the presence of highly conductive materials (such as clays and water), the size, depth, and physical property of the target and; in stratigraphic investigations, the conductivity contrast between stratigraphic units. The presence of numerous buried objects may mask objects and/or stratigraphy below.



Explanation

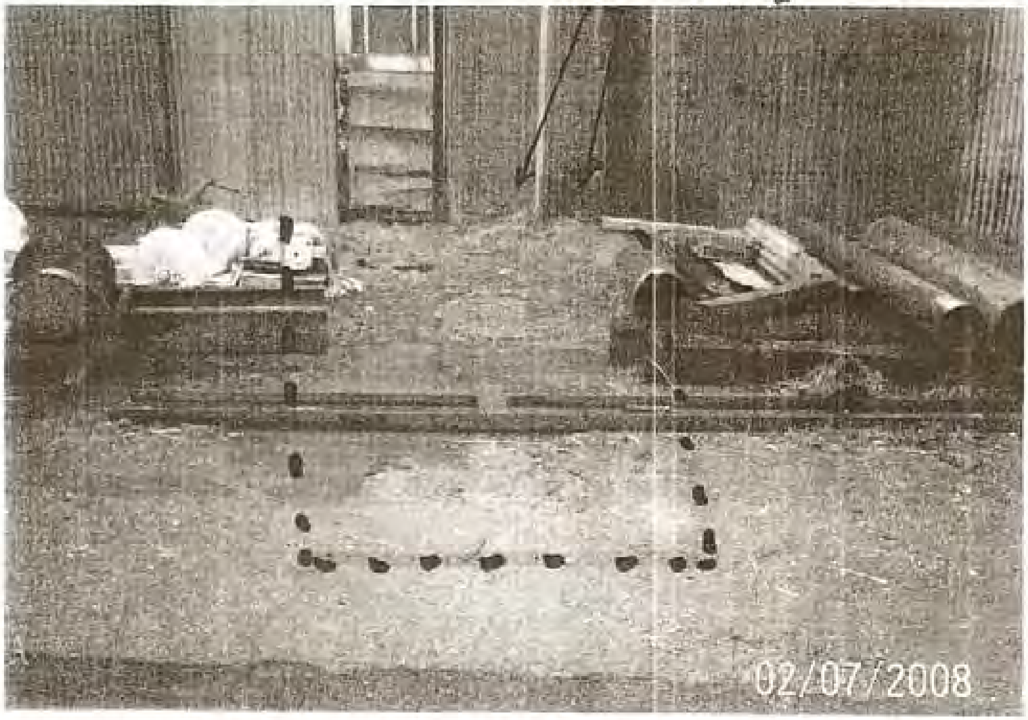
+ ·	Reference Grid Mark
MW ☒	Previous Well
— w —	Utilty Marked by Others
(H)	High Anomalous Zone
M	Moderate Anomalous Zone
(L)	Low Anomalous Zone
– – –	Linear Feature
┬ ┬	Former Excavation
⌐ ¬	Possible Drain Field

Depths (feet) to tops of targets observed on GPR data are shown.

GEOPHYSICAL RESULTS
Reliable Steel Site
Olympia, Washington
Philip H. Duoos, Geophysical Consultant, 3/3/2008

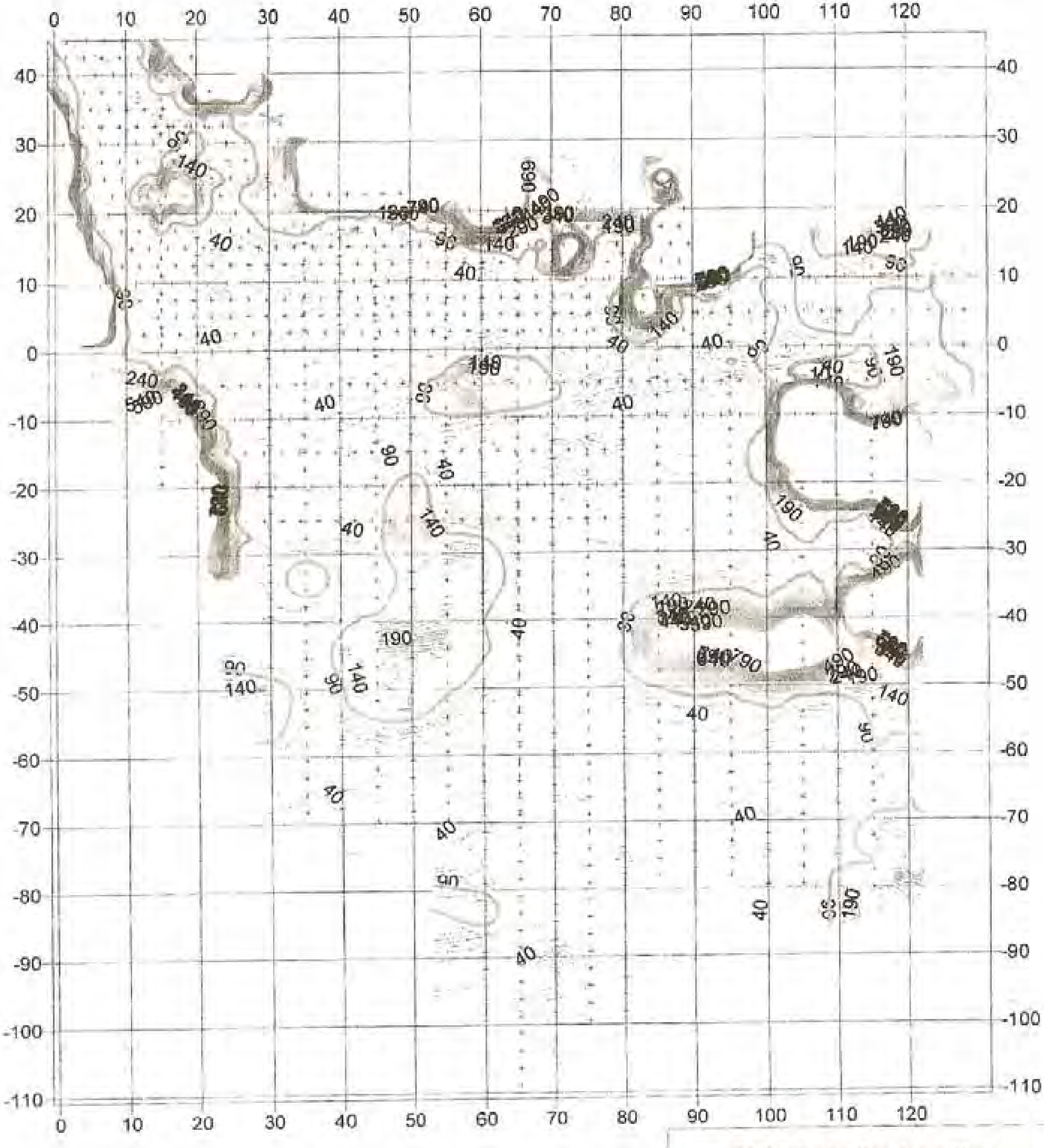
Figure 1

REFERENCE
MARKS AT 2'



Small Survey Area by Warehouse
View to the South
Reliable Steel Site
Olympia, Washigton
Philip H. Duoos, Geophysical Consultant, 3/3/2008

Figure 2



Grid North

↑

Scale: 1" = 20'

EM-61 Data Contour Map
Reliable Steel Site
Olympia, Washington

Bottom Coil Data
Range: -10 to 800 mV
Contour Interval: 10 mV
Green contour at 100 mV

Figure 3

APPENDIX C

Analytical Laboratory Reports from Greylock Consulting and Ecology Investigations

Greylock

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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July 22, 2010

Suzanne Dudziak, Project Manager
Greylock Consulting, LLC
720 S 33rd St, Suite 210
Federal Way, WA 98003

Dear Ms. Dudziak:

Included are the results from the testing of material submitted on July 9, 2010 from the BOJO, F&BI 007113 project. There are 48 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
NAA0722R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on July 9, 2010 by Friedman & Bruya, Inc. from the Greylock Consulting, LLC BOJO, F&BI 007113 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Greylock Consulting, LLC
007113-01	RI-22-0.5'
007113-02	RI-22-2'
007113-03	RI-22-3'
007113-04	RI-23-0.5'
007113-05	RI-23-2.5'
007113-06	RI-23-3.5'
007113-07	RI-24-0.5'
007113-08	RI-24-2.5'
007113-09	RI-24-3'
007113-10	RI-28-0.5'
007113-11	RI-28-3.5'
007113-12	RI-28-6'
007113-13	RI-26-0.5'
007113-14	RI-26-2.5'
007113-15	RI-26-6'
007113-16	RI-30-0.5'
007113-17	RI-30-4'
007113-18	RI-30-6'
007113-19	RI-25-0.5'
007113-20	RI-25-1.0'
007113-21	RI-25-3'
007113-22	RI-25-4'
007113-23	RI-25-6'
007113-24	RI-29-0.5'
007113-25	RI-29-2.5'
007113-26	RI-29-4'
007113-27	RI-29-8'
007113-28	RI-29-12'
007113-29	RI-21-0.5'
007113-30	RI-21-3'
007113-31	RI-21-6'
007113-32	RI-19-0.5'
007113-33	RI-19-3'
007113-34	RI-19-4'
007113-35	RI-18-0.5'
007113-36	RI-17-0.5'
007113-37	RI-17-5'
007113-38	RI-17-3'

CASE NARRATIVE

This case narrative encompasses samples received on July 9, 2010 by Friedman & Bruya, Inc. from the Greylock Consulting, LLC BOJO, F&BI 007113 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Greylock Consulting, LLC
007113-39	RI-16-0.5'
007113-40	RI-16-4'
007113-41	RI-15-0.5'
007113-42	RI-15-2.5'
007113-43	RI-15-4'
007113-44	RI-12-1'
007113-45	RI-12-3'
007113-46	RI-12-4'
007113-47	RI-10-0.5'
007113-48	RI-10-2'
007113-49	RI-10-4'
007113-50	RI-12-4'

The samples RI-26-2.5', RI-25-3', and RI-25-4' were sent to Amtest for tin analysis. The report generated by Amtest will be forwarded to your office upon receipt.

All quality control requirements were acceptable.

Date of Report: 07/22/10
Date Received: 07/09/10
Project: BOJO, F&BI 007113
Date Extracted: 07/16/10
Date Analyzed: 07/16/10

RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND TPH AS GASOLINE USING EPA METHOD 8021B AND NWTPH-Gx

Results Reported on a Dry Weight Basis
Results Reported as mg/kg (ppm)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 50-150)
RI-10-4’ 007113-49	<0.02	<0.02	<0.02	<0.06	<2	109
RI-12-4’ 007113-50	<0.02	<0.02	<0.02	<0.06	<2	98
Method Blank 00-1073 MB	<0.02	<0.02	<0.02	<0.06	<2	95

Date of Report: 07/22/10
Date Received: 07/09/10
Project: BOJO, F&BI 007113
Date Extracted: 07/19/10
Date Analyzed: 07/20/10

RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

Results Reported on a Dry Weight Basis
Results Reported as mg/kg (ppm)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 50-150)
RI-17-5’ 007113-37	<50	<250	86
Method Blank 00-1087 MB	<50	<250	88

Date of Report: 07/22/10
Date Received: 07/09/10
Project: BOJO, F&BI 007113
Date Extracted: 07/15/10 and 07/20/10
Date Analyzed: 07/16/10 and 07/17/10 and 07/20/10

RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

Sample Extracts Passed Through a Silica Gel Column Prior to Analysis

Results Reported on a Dry Weight Basis
Results Reported as mg/kg (ppm)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 50-150)
RI-28-6’ 007113-12	<50	<250	81
RI-26-6’ 007113-15	<50	<250	80
RI-30-6’ 007113-18	<50	<250	84
RI-25-6’ 007113-23	<50	<250	81
RI-29-8’ 007113-27	<50	<250	82
RI-21-3’ 007113-30	<50	<250	90
RI-21-6’ 007113-31	<50	<250	68
RI-19-4’ 007113-34	82	<250	71
RI-16-0.5’ 007113-39	1,400 x	8,600	76

Date of Report: 07/22/10
Date Received: 07/09/10
Project: BOJO, F&BI 007113
Date Extracted: 07/15/10 and 07/20/10
Date Analyzed: 07/16/10 and 07/17/10 and 07/20/10

RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

Sample Extracts Passed Through a Silica Gel Column Prior to Analysis

Results Reported on a Dry Weight Basis
Results Reported as mg/kg (ppm)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 50-150)
RI-15-4’ 007113-43	<50	<250	75
RI-12-1’ 007113-44	<50	<250	98
Method Blank 00-1065 MB	<50	<250	77
Method Blank 00-1087 MB2	<50	<250	117

Analysis For Total Metals By EPA Method 200.8

Client ID:	RI-26-2.5'	Client:	Greylock Consulting, LLC
Date Received:	07/09/10	Project:	BOJO, F&BI 007113
Date Extracted:	07/16/10	Lab ID:	007113-14
Date Analyzed:	07/19/10	Data File:	007113-14.056
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	101	60	125
Indium	94	60	125
Holmium	96	60	125

Analyte:	Concentration mg/kg (ppm)
Chromium	7.11
Copper	4.96
Zinc	241
Arsenic	3.51
Lead	3.30

Analysis For Total Metals By EPA Method 200.8

Client ID:	RI-25-3'	Client:	Greylock Consulting, LLC
Date Received:	07/09/10	Project:	BOJO, F&BI 007113
Date Extracted:	07/16/10	Lab ID:	007113-21
Date Analyzed:	07/19/10	Data File:	007113-21.046
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	104	60	125
Indium	92	60	125
Holmium	96	60	125

Analyte:	Concentration mg/kg (ppm)
Chromium	8.98
Copper	47.8
Zinc	1,030
Arsenic	1.55
Lead	3.77

Analysis For Total Metals By EPA Method 200.8

Client ID:	RI-25-4’	Client:	Greylock Consulting, LLC
Date Received:	07/09/10	Project:	BOJO, F&BI 007113
Date Extracted:	07/16/10	Lab ID:	007113-22
Date Analyzed:	07/19/10	Data File:	007113-22.057
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	105	60	125
Indium	94	60	125
Holmium	98	60	125

Analyte:	Concentration mg/kg (ppm)
Chromium	10.6
Copper	75.8
Zinc	979
Arsenic	1.54
Lead	3.95

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Greylock Consulting, LLC
Date Received:	07/09/10	Project:	BOJO, F&BI 007113
Date Extracted:	07/16/10	Lab ID:	I0-379 mb
Date Analyzed:	07/19/10	Data File:	I0-379 mb.044
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	96	60	125
Indium	91	60	125
Holmium	90	60	125

Analyte:	Concentration mg/kg (ppm)
Chromium	<1
Copper	<1
Zinc	<1
Arsenic	<1
Lead	<1

Date of Report: 07/22/10
Date Received: 07/09/10
Project: BOJO, F&BI 007113
Date Extracted: 07/16/10
Date Analyzed: 07/16/10

RESULTS FROM THE ANALYSIS OF THE SOIL SAMPLES FOR TOTAL MERCURY USING EPA METHOD 1631E

Results Reported on a Dry Weight Basis
Results Reported as mg/kg (ppm)

Sample ID Laboratory ID	Total Mercury
RI-26-2.5’ 007113-14	<0.2
RI-25-3’ 007113-21	<0.2
RI-25-4’ 007113-22	<0.2
Method Blank	<0.2

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	RI-17-3'	Client:	Greylock Consulting, LLC
Date Received:	07/09/10	Project:	BOJO, F&BI 007113
Date Extracted:	07/21/10	Lab ID:	007113-38 1/5
Date Analyzed:	07/21/10	Data File:	072109.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	99	50	150
Benzo(a)anthracene-d12	99	35	159

Compounds:	Concentration mg/kg (ppm)
Benz(a)anthracene	0.15
Chrysene	0.18
Benzo(a)pyrene	0.23
Benzo(b)fluoranthene	0.29
Benzo(k)fluoranthene	0.096
Indeno(1,2,3-cd)pyrene	0.14
Dibenz(a,h)anthracene	0.035

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	Method Blank	Client:	Greylock Consulting, LLC
Date Received:	07/09/10	Project:	BOJO, F&BI 007113
Date Extracted:	07/21/10	Lab ID:	00-1094 mb 1/5
Date Analyzed:	07/21/10	Data File:	072108.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	86	50	150
Benzo(a)anthracene-d12	83	35	159

Compounds:	Concentration mg/kg (ppm)
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	RI-22-0.5'	Client:	Greylock Consulting, LLC
Date Received:	07/09/10	Project:	BOJO, F&BI 007113
Date Extracted:	07/15/10	Lab ID:	007113-01 1/5
Date Analyzed:	07/19/10	Data File:	071915.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	107	50	150
Benzo(a)anthracene-d12	138	35	159

Compounds:	Concentration mg/kg (ppm)
Benz(a)anthracene	0.43
Chrysene	0.58
Benzo(a)pyrene	0.47
Benzo(b)fluoranthene	0.65
Benzo(k)fluoranthene	0.23
Indeno(1,2,3-cd)pyrene	0.33
Dibenz(a,h)anthracene	0.080

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	RI-22-2’	Client:	Greylock Consulting, LLC
Date Received:	07/09/10	Project:	BOJO, F&BI 007113
Date Extracted:	07/15/10	Lab ID:	007113-02 1/50
Date Analyzed:	07/19/10	Data File:	071921.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	132	50	150
Benzo(a)anthracene-d12	109	35	159

Compounds:	Concentration mg/kg (ppm)
Benz(a)anthracene	1.2
Chrysene	1.5
Benzo(a)pyrene	1.2
Benzo(b)fluoranthene	1.6
Benzo(k)fluoranthene	0.52
Indeno(1,2,3-cd)pyrene	0.74
Dibenz(a,h)anthracene	0.18

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	RI-23-0.5'	Client:	Greylock Consulting, LLC
Date Received:	07/09/10	Project:	BOJO, F&BI 007113
Date Extracted:	07/15/10	Lab ID:	007113-04 1/5
Date Analyzed:	07/19/10	Data File:	071916.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	105	50	150
Benzo(a)anthracene-d12	115	35	159

Compounds:	Concentration mg/kg (ppm)
Benz(a)anthracene	0.26
Chrysene	0.36
Benzo(a)pyrene	0.36
Benzo(b)fluoranthene	0.48
Benzo(k)fluoranthene	0.18
Indeno(1,2,3-cd)pyrene	0.28
Dibenz(a,h)anthracene	0.067

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	RI-24-0.5'	Client:	Greylock Consulting, LLC
Date Received:	07/09/10	Project:	BOJO, F&BI 007113
Date Extracted:	07/15/10	Lab ID:	007113-07 1/5
Date Analyzed:	07/19/10	Data File:	071909.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	103	50	150
Benzo(a)anthracene-d12	131	35	159

Compounds:	Concentration mg/kg (ppm)
Benz(a)anthracene	0.15
Chrysene	0.20
Benzo(a)pyrene	0.16
Benzo(b)fluoranthene	0.23
Benzo(k)fluoranthene	0.084
Indeno(1,2,3-cd)pyrene	0.12
Dibenz(a,h)anthracene	0.033

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	RI-24-2.5'	Client:	Greylock Consulting, LLC
Date Received:	07/09/10	Project:	BOJO, F&BI 007113
Date Extracted:	07/15/10	Lab ID:	007113-08 1/5
Date Analyzed:	07/19/10	Data File:	071910.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	95	50	150
Benzo(a)anthracene-d12	105	35	159

Compounds:	Concentration mg/kg (ppm)
Benz(a)anthracene	0.015
Chrysene	0.020
Benzo(a)pyrene	0.015
Benzo(b)fluoranthene	0.023
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	0.013
Dibenz(a,h)anthracene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	RI-28-0.5'	Client:	Greylock Consulting, LLC
Date Received:	07/09/10	Project:	BOJO, F&BI 007113
Date Extracted:	07/15/10	Lab ID:	007113-10 1/5
Date Analyzed:	07/19/10	Data File:	071911.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	103	50	150
Benzo(a)anthracene-d12	126	35	159

Compounds:	Concentration mg/kg (ppm)
Benz(a)anthracene	0.34
Chrysene	0.49
Benzo(a)pyrene	0.39
Benzo(b)fluoranthene	0.58
Benzo(k)fluoranthene	0.17
Indeno(1,2,3-cd)pyrene	0.28
Dibenz(a,h)anthracene	0.097

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	RI-28-3.5’	Client:	Greylock Consulting, LLC
Date Received:	07/09/10	Project:	BOJO, F&BI 007113
Date Extracted:	07/15/10	Lab ID:	007113-11 1/5
Date Analyzed:	07/19/10	Data File:	071912.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	102	50	150
Benzo(a)anthracene-d12	104	35	159

Compounds:	Concentration mg/kg (ppm)
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	RI-26-0.5'	Client:	Greylock Consulting, LLC
Date Received:	07/09/10	Project:	BOJO, F&BI 007113
Date Extracted:	07/15/10	Lab ID:	007113-13 1/5
Date Analyzed:	07/19/10	Data File:	071917.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	109	50	150
Benzo(a)anthracene-d12	121	35	159

Compounds:	Concentration mg/kg (ppm)
Benz(a)anthracene	0.33
Chrysene	0.47
Benzo(a)pyrene	0.42
Benzo(b)fluoranthene	0.55
Benzo(k)fluoranthene	0.21
Indeno(1,2,3-cd)pyrene	0.34
Dibenz(a,h)anthracene	0.087

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	RI-26-2.5'	Client:	Greylock Consulting, LLC
Date Received:	07/09/10	Project:	BOJO, F&BI 007113
Date Extracted:	07/15/10	Lab ID:	007113-14 1/5
Date Analyzed:	07/19/10	Data File:	071913.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	104	50	150
Benzo(a)anthracene-d12	111	35	159

Compounds:	Concentration mg/kg (ppm)
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID: RI-30-0.5’
Date Received: 07/09/10
Date Extracted: 07/15/10
Date Analyzed: 07/19/10
Matrix: Soil
Units: mg/kg (ppm)

Client: Greylock Consulting, LLC
Project: BOJO, F&BI 007113
Lab ID: 007113-16 1/5
Data File: 071920.D
Instrument: GCMS6
Operator: YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	112	50	150
Benzo(a)anthracene-d12	116	35	159

Compounds:	Concentration mg/kg (ppm)
Benz(a)anthracene	0.015
Chrysene	0.020
Benzo(a)pyrene	0.018
Benzo(b)fluoranthene	0.025
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	0.014
Dibenz(a,h)anthracene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	RI-30-4'	Client:	Greylock Consulting, LLC
Date Received:	07/09/10	Project:	BOJO, F&BI 007113
Date Extracted:	07/15/10	Lab ID:	007113-17 1/5
Date Analyzed:	07/19/10	Data File:	071919.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	105	50	150
Benzo(a)anthracene-d12	105	35	159

Compounds:	Concentration mg/kg (ppm)
Benz(a)anthracene	0.050
Chrysene	0.086
Benzo(a)pyrene	0.049
Benzo(b)fluoranthene	0.078
Benzo(k)fluoranthene	0.028
Indeno(1,2,3-cd)pyrene	0.030
Dibenz(a,h)anthracene	0.010

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	RI-25-1.0'	Client:	Greylock Consulting, LLC
Date Received:	07/09/10	Project:	BOJO, F&BI 007113
Date Extracted:	07/15/10	Lab ID:	007113-20 1/5
Date Analyzed:	07/19/10	Data File:	071914.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	106	50	150
Benzo(a)anthracene-d12	141	35	159

Compounds:	Concentration mg/kg (ppm)
Benz(a)anthracene	0.21
Chrysene	0.28
Benzo(a)pyrene	0.23
Benzo(b)fluoranthene	0.31
Benzo(k)fluoranthene	0.11
Indeno(1,2,3-cd)pyrene	0.18
Dibenz(a,h)anthracene	0.044

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	RI-29-0.5'	Client:	Greylock Consulting, LLC
Date Received:	07/09/10	Project:	BOJO, F&BI 007113
Date Extracted:	07/15/10	Lab ID:	007113-24 1/5
Date Analyzed:	07/16/10	Data File:	071618.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	104	50	150
Benzo(a)anthracene-d12	112	35	159

Compounds:	Concentration mg/kg (ppm)
Benz(a)anthracene	0.19
Chrysene	0.25
Benzo(a)pyrene	0.26
Benzo(b)fluoranthene	0.35
Benzo(k)fluoranthene	0.12
Indeno(1,2,3-cd)pyrene	0.20
Dibenz(a,h)anthracene	0.046

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	RI-29-4'	Client:	Greylock Consulting, LLC
Date Received:	07/09/10	Project:	BOJO, F&BI 007113
Date Extracted:	07/15/10	Lab ID:	007113-26 1/5
Date Analyzed:	07/16/10	Data File:	071619.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	104	50	150
Benzo(a)anthracene-d12	105	35	159

Compounds:	Concentration mg/kg (ppm)
Benz(a)anthracene	0.077
Chrysene	0.11
Benzo(a)pyrene	0.11
Benzo(b)fluoranthene	0.15
Benzo(k)fluoranthene	0.046
Indeno(1,2,3-cd)pyrene	0.083
Dibenz(a,h)anthracene	0.020

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	RI-21-0.5'	Client:	Greylock Consulting, LLC
Date Received:	07/09/10	Project:	BOJO, F&BI 007113
Date Extracted:	07/15/10	Lab ID:	007113-29 1/5
Date Analyzed:	07/16/10	Data File:	071609.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	94	50	150
Benzo(a)anthracene-d12	102	35	159

Compounds:	Concentration mg/kg (ppm)
Benz(a)anthracene	<0.01
Chrysene	0.015
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	0.018
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	RI-19-0.5’	Client:	Greylock Consulting, LLC
Date Received:	07/09/10	Project:	BOJO, F&BI 007113
Date Extracted:	07/15/10	Lab ID:	007113-32 1/5
Date Analyzed:	07/16/10	Data File:	071606.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	92	50	150
Benzo(a)anthracene-d12	91	35	159

Compounds:	Concentration mg/kg (ppm)
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	0.012
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	RI-19-3'	Client:	Greylock Consulting, LLC
Date Received:	07/09/10	Project:	BOJO, F&BI 007113
Date Extracted:	07/15/10	Lab ID:	007113-33 1/5
Date Analyzed:	07/16/10	Data File:	071616.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	104	50	150
Benzo(a)anthracene-d12	111	35	159

Compounds:	Concentration mg/kg (ppm)
Benz(a)anthracene	1.2
Chrysene	2.0 ve
Benzo(a)pyrene	1.5
Benzo(b)fluoranthene	2.0 ve
Benzo(k)fluoranthene	0.64
Indeno(1,2,3-cd)pyrene	1.0
Dibenz(a,h)anthracene	0.25

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	RI-19-3'	Client:	Greylock Consulting, LLC
Date Received:	07/09/10	Project:	BOJO, F&BI 007113
Date Extracted:	07/15/10	Lab ID:	007113-33 1/50
Date Analyzed:	07/19/10	Data File:	071918.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	99	50	150
Benzo(a)anthracene-d12	123	35	159

Compounds:	Concentration mg/kg (ppm)
Benz(a)anthracene	1.2
Chrysene	1.9
Benzo(a)pyrene	1.4
Benzo(b)fluoranthene	1.9
Benzo(k)fluoranthene	0.67
Indeno(1,2,3-cd)pyrene	1.0
Dibenz(a,h)anthracene	0.25

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	RI-18-0.5'	Client:	Greylock Consulting, LLC
Date Received:	07/09/10	Project:	BOJO, F&BI 007113
Date Extracted:	07/15/10	Lab ID:	007113-35 1/5
Date Analyzed:	07/16/10	Data File:	071617.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	101	50	150
Benzo(a)anthracene-d12	108	35	159

Compounds:	Concentration mg/kg (ppm)
Benz(a)anthracene	0.31
Chrysene	0.53
Benzo(a)pyrene	0.41
Benzo(b)fluoranthene	0.71
Benzo(k)fluoranthene	0.21
Indeno(1,2,3-cd)pyrene	0.37
Dibenz(a,h)anthracene	0.10

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	RI-17-0.5'	Client:	Greylock Consulting, LLC
Date Received:	07/09/10	Project:	BOJO, F&BI 007113
Date Extracted:	07/15/10	Lab ID:	007113-36 1/5
Date Analyzed:	07/16/10	Data File:	071611.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	120	50	150
Benzo(a)anthracene-d12	107	35	159

Compounds:	Concentration mg/kg (ppm)
Benz(a)anthracene	0.022
Chrysene	0.028
Benzo(a)pyrene	0.024
Benzo(b)fluoranthene	0.028
Benzo(k)fluoranthene	0.011
Indeno(1,2,3-cd)pyrene	0.015
Dibenz(a,h)anthracene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	RI-15-0.5’	Client:	Greylock Consulting, LLC
Date Received:	07/09/10	Project:	BOJO, F&BI 007113
Date Extracted:	07/15/10	Lab ID:	007113-41 1/5
Date Analyzed:	07/16/10	Data File:	071612.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	99	50	150
Benzo(a)anthracene-d12	102	35	159

Compounds:	Concentration mg/kg (ppm)
Benz(a)anthracene	0.021
Chrysene	0.054
Benzo(a)pyrene	0.018
Benzo(b)fluoranthene	0.051
Benzo(k)fluoranthene	0.017
Indeno(1,2,3-cd)pyrene	0.021
Dibenz(a,h)anthracene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	RI-15-2.5'	Client:	Greylock Consulting, LLC
Date Received:	07/09/10	Project:	BOJO, F&BI 007113
Date Extracted:	07/15/10	Lab ID:	007113-42 1/5
Date Analyzed:	07/16/10	Data File:	071614.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	94	50	150
Benzo(a)anthracene-d12	106	35	159

Compounds:	Concentration mg/kg (ppm)
Benz(a)anthracene	0.27
Chrysene	0.30
Benzo(a)pyrene	0.28
Benzo(b)fluoranthene	0.29
Benzo(k)fluoranthene	0.11
Indeno(1,2,3-cd)pyrene	0.15
Dibenz(a,h)anthracene	0.041

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	RI-12-1’	Client:	Greylock Consulting, LLC
Date Received:	07/09/10	Project:	BOJO, F&BI 007113
Date Extracted:	07/15/10	Lab ID:	007113-44 1/5
Date Analyzed:	07/16/10	Data File:	071613.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	113	50	150
Benzo(a)anthracene-d12	112	35	159

Compounds:	Concentration mg/kg (ppm)
Benz(a)anthracene	<0.01
Chrysene	0.020
Benzo(a)pyrene	0.015
Benzo(b)fluoranthene	0.023
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	0.015
Dibenz(a,h)anthracene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	RI-10-0.5'	Client:	Greylock Consulting, LLC
Date Received:	07/09/10	Project:	BOJO, F&BI 007113
Date Extracted:	07/15/10	Lab ID:	007113-47 1/5
Date Analyzed:	07/16/10	Data File:	071615.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	104	50	150
Benzo(a)anthracene-d12	110	35	159

Compounds:	Concentration mg/kg (ppm)
Benz(a)anthracene	0.043
Chrysene	0.11
Benzo(a)pyrene	0.32
Benzo(b)fluoranthene	0.38
Benzo(k)fluoranthene	0.064
Indeno(1,2,3-cd)pyrene	0.47
Dibenz(a,h)anthracene	0.093

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	Method Blank	Client:	Greylock Consulting, LLC
Date Received:	Not Applicable	Project:	BOJO, F&BI 007113
Date Extracted:	07/15/10	Lab ID:	00-1060 mb2 1/5
Date Analyzed:	07/19/10	Data File:	071908.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	103	50	150
Benzo(a)anthracene-d12	110	35	159

Compounds:	Concentration mg/kg (ppm)
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	Method Blank	Client:	Greylock Consulting, LLC
Date Received:	Not Applicable	Project:	BOJO, F&BI 007113
Date Extracted:	07/15/10	Lab ID:	00-1066 mb 1/5
Date Analyzed:	07/16/10	Data File:	071605.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	102	50	150
Benzo(a)anthracene-d12	112	35	159

Compounds:	Concentration mg/kg (ppm)
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01

Date of Report: 07/22/10
Date Received: 07/09/10
Project: BOJO, F&BI 007113

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES, AND TPH AS GASOLINE USING EPA METHOD 8021B AND NWTPH-Gx

Laboratory Code: 007172-02 (Duplicate)

Analyte	Reporting Units	(Wet Wt) Sample Result	(Wet Wt) Duplicate Result	Relative Percent Difference (Limit 20)
Benzene	mg/kg (ppm)	<0.02	<0.02	nm
Toluene	mg/kg (ppm)	<0.02	<0.02	nm
Ethylbenzene	mg/kg (ppm)	<0.02	<0.02	nm
Xylenes	mg/kg (ppm)	<0.06	<0.06	nm
Gasoline	mg/kg (ppm)	3	<2	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	mg/kg (ppm)	0.5	84	69-120
Toluene	mg/kg (ppm)	0.5	92	70-117
Ethylbenzene	mg/kg (ppm)	0.5	89	65-123
Xylenes	mg/kg (ppm)	1.5	87	66-120
Gasoline	mg/kg (ppm)	10	90	71-131

Date of Report: 07/22/10
Date Received: 07/09/10
Project: BOJO, F&BI 007113

QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: 007205-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	(Wet wt) Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	mg/kg (ppm)	5,000	<50	95	94	63-146	1

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Diesel Extended	mg/kg (ppm)	5,000	94	79-144

Date of Report: 07/22/10
Date Received: 07/09/10
Project: BOJO, F&BI 007113

QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: 007113-12 (Matrix Spike) Silica Gel

Analyte	Reporting Units	Spike Level	(Wet wt) Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	mg/kg (ppm)	5,000	<50	80	78	73-135	3

Laboratory Code: Laboratory Control Sample Silica Gel

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Diesel Extended	mg/kg (ppm)	5,000	80	74-139

Date of Report: 07/22/10
Date Received: 07/09/10
Project: BOJO, F&BI 007113

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR TOTAL METALS USING EPA METHOD 200.8

Laboratory Code: 007113-21 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Chromium	mg/kg (ppm)	50	8.98	100	98	51-132	2
Copper	mg/kg (ppm)	50	47.8	113 b	98 b	53-123	14
Zinc	mg/kg (ppm)	50	1,030	553 b	250 b	40-135	75 b
Arsenic	mg/kg (ppm)	10	1.55	101	108	44-151	7
Lead	mg/kg (ppm)	20	3.77	101	99	65-126	2

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Chromium	mg/kg (ppm)	50	107	79-125
Copper	mg/kg (ppm)	50	100	86-114
Zinc	mg/kg (ppm)	50	103	79-120
Arsenic	mg/kg (ppm)	10	103	80-120
Lead	mg/kg (ppm)	20	107	81-120

Date of Report: 07/22/10
Date Received: 07/09/10
Project: BOJO, F&BI 007113

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR TOTAL MERCURY USING EPA METHOD 1631E

Laboratory Code: 007113-21 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Mercury	mg/kg (ppm)	0.125	<0.2	94	98	45-162	4

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Mercury	mg/kg (ppm)	0.125	95	63-144

Date of Report: 07/22/10
Date Received: 07/09/10
Project: BOJO, F&BI 007113

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR PNA'S BY EPA METHOD 8270D SIM

Laboratory Code: 007143-05 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Benz(a)anthracene	mg/kg (ppm)	0.17	0.18	56 b	65 b	47-113	15
Chrysene	mg/kg (ppm)	0.17	0.33	43 b	57 b	45-122	28 b
Benzo(b)fluoranthene	mg/kg (ppm)	0.17	0.37	35 b	41 b	24-145	16
Benzo(k)fluoranthene	mg/kg (ppm)	0.17	0.12	63 b	75 b	51-118	17
Benzo(a)pyrene	mg/kg (ppm)	0.17	0.20	66 b	68 b	30-134	3
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.17	0.17	77 b	78 b	40-138	1
Dibenz(a,h)anthracene	mg/kg (ppm)	0.17	0.039	84 b	96 b	51-122	13

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benz(a)anthracene	mg/kg (ppm)	0.17	88	58-108
Chrysene	mg/kg (ppm)	0.17	95	61-112
Benzo(b)fluoranthene	mg/kg (ppm)	0.17	91	54-119
Benzo(k)fluoranthene	mg/kg (ppm)	0.17	90	61-123
Benzo(a)pyrene	mg/kg (ppm)	0.17	89	52-112
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.17	97	44-133
Dibenz(a,h)anthracene	mg/kg (ppm)	0.17	91	57-119

Date of Report: 07/22/10
Date Received: 07/09/10
Project: BOJO, F&BI 007113

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR PNA'S BY EPA METHOD 8270D SIM

Laboratory Code: 007140-02 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Benz(a)anthracene	mg/kg (ppm)	0.17	<0.01	101	101	47-113	0
Chrysene	mg/kg (ppm)	0.17	<0.01	105	105	45-122	0
Benzo(b)fluoranthene	mg/kg (ppm)	0.17	<0.01	103	107	24-145	4
Benzo(k)fluoranthene	mg/kg (ppm)	0.17	<0.01	118	112	51-118	5
Benzo(a)pyrene	mg/kg (ppm)	0.17	<0.01	104	101	30-134	3
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.17	<0.01	128	131	40-138	2
Dibenz(a,h)anthracene	mg/kg (ppm)	0.17	<0.01	104	109	51-122	5

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Benz(a)anthracene	mg/kg (ppm)	0.17	83	83	58-108	0
Chrysene	mg/kg (ppm)	0.17	92	92	61-112	0
Benzo(b)fluoranthene	mg/kg (ppm)	0.17	82	82	54-119	0
Benzo(k)fluoranthene	mg/kg (ppm)	0.17	93	93	61-123	0
Benzo(a)pyrene	mg/kg (ppm)	0.17	86	86	52-112	0
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.17	91	91	44-133	0
Dibenz(a,h)anthracene	mg/kg (ppm)	0.17	92	92	57-119	0

Date of Report: 07/22/10
Date Received: 07/09/10
Project: BOJO, F&BI 007113

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR PNA'S BY EPA METHOD 8270D SIM

Laboratory Code: 007113-32 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Benz(a)anthracene	mg/kg (ppm)	0.17	<0.01	81	89	47-113	9
Chrysene	mg/kg (ppm)	0.17	<0.01	85	92	45-122	8
Benzo(b)fluoranthene	mg/kg (ppm)	0.17	0.012	88	101	24-145	14
Benzo(k)fluoranthene	mg/kg (ppm)	0.17	<0.01	88	95	51-118	8
Benzo(a)pyrene	mg/kg (ppm)	0.17	<0.01	82	91	30-134	10
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.17	<0.01	86	88	40-138	2
Dibenz(a,h)anthracene	mg/kg (ppm)	0.17	<0.01	84	86	51-122	2

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benz(a)anthracene	mg/kg (ppm)	0.17	93	58-108
Chrysene	mg/kg (ppm)	0.17	98	61-112
Benzo(b)fluoranthene	mg/kg (ppm)	0.17	104	54-119
Benzo(k)fluoranthene	mg/kg (ppm)	0.17	101	61-123
Benzo(a)pyrene	mg/kg (ppm)	0.17	93	52-112
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.17	106	44-133
Dibenz(a,h)anthracene	mg/kg (ppm)	0.17	95	57-119

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

A1 – More than one compound of similar molecule structure was identified with equal probability.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for this range fell outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte indicated may be due to carryover from previous sample injections.

d - The sample was diluted. Detection limits may be raised due to dilution.

ds - The sample was diluted. Detection limits are raised due to dilution and surrogate recoveries may not be meaningful.

dv - Insufficient sample was available to achieve normal reporting limits and limits are raised accordingly.

fb - Analyte present in the blank and the sample.

fc – The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. The variability is attributed to sample inhomogeneity.

ht - Analysis performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of normal control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j – The result is below normal reporting limits. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The analyte result in the laboratory control sample is out of control limits. The reported concentration should be considered an estimate.

jr - The rpd result in laboratory control sample associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the compound indicated is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc – The sample was received in a container not approved by the method. The value reported should be considered an estimate.

pr – The sample was received with incorrect preservation. The value reported should be considered an estimate.

ve - Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

007113

SAMPLE CHAIN OF CUSTODY

ME 07/09/10 A05/VS1

Send Report To
Company Greylock
Address 720 S. 333rd St, Ste 210
City, State, ZIP Federal way, WA 98003
Phone # 253-661-3520 Fax #

SAMPLERS (signature)

PROJECT NAME/NO. BOJO

PO #

REMARKS * Hold for Instruction
* COC generated in lab
metals list is As, Cr, Cu, Pb, Hg, Sn, Zn (NP) 7/9/10

Page # 1 of 5

TURNAROUND TIME
☐ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
☐ Dispose after 30 days
☐ Return samples
☒ Will call with instructions

						ANALYSES REQUESTED											
Sample ID	Lab ID	Date	Time	Sample Type	# of containers	TPH-Diesel w/SG	TPH-Gasoline	BTEX by 8021B	VOCs by 8260	SVOCs by 8270	HFS	Metals	cPAHs				Notes
RI-22-0.5'	01	7-8-10	09:15	soil	1								X				X-per SD 7/14/10 me
RI-22-2'	02		09:13		1								X				
RI-22-3'	03		09:20		1												
RI-23-0.5'	04		09:40		1								X				
RI 23-2.5'	05		0930		1												
RI-23-3.5'	06		0933		1												
RI-24-0.5'	07		09:53		1								X				
RI-24-2.5'	08		09:54		1								X				
RI-24-3'	09		09:55		1												
RI-28-0.5'	10		09:02		1								X				

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	See attached	Original COC	→		→
Received by:		Nhan Phan	FeBI	7/9/10	1350
Relinquished by:					
Received by:					

FORMS\COC\COC.DOC

Samples received at 5 °C

007113

SAMPLE CHAIN OF CUSTODY

ME 07/09/10 A05/VS1

Send Report To
Company Greylock
Address 720 S. 333rd St, Ste 210
City, State, ZIP Federal way, WA 98003
Phone # 253-661-3520 Fax #

SAMPLERS (signature)
PROJECT NAME/NO. BOJO
PO #
REMARKS * Hold for Instruction
* COC generated in lab (NP) 7/9/10

Page # 2 of 5
TURNAROUND TIME
☐ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
☐ Dispose after 30 days
☐ Return samples
☒ Will call with instructions

						ANALYSES REQUESTED											
Sample ID	Lab ID	Date	Time	Sample Type	# of containers	TPH-Diesel TSG	TPH-Gasoline	BTEX by 8021B	VOCs by 8260	SVOCs by 8270	HFS	Metals	cPAHs				Notes
RI-28-3.5'	11	7-8-10	10:13	Soil	1								X				
RI-28-6'	12		10:15		1	X											
RI-26-0.5'	13		10:28		1								X				
RI-26-2.5'	14		10:30		1							X	X				
RI-26-6'	15		10:32		1	X											
RI-30-0.5'	16		10:55		1								X				
RI-30-4'	17		10:58		1								X				
RI-30-6'	18		10:59		1	X											
RI-25-0.5	19		1228		1												
RI-25-1.0'	20		1234		1								X				

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Relinquished by:	See attached	Original	COC		→
Received by:		Nhan Phan	FeBI	7/9/10	1350
Relinquished by:					
Received by:					

FORMS\COC\COC.DOC

Samples received at 5 °C

007113

SAMPLE CHAIN OF CUSTODY

ME 07/09/10 A05/VS1

Send Report To
Company Greylock
Address 720 S. 333rd St, Ste 210
City, State, ZIP Federal Way, WA 98003
Phone # 253-661-3520 Fax #

SAMPLERS (signature)

PROJECT NAME/NO. BOJO

PO #

REMARKS * Hold for Instruction
* COC generated in lab NP 7/9/10

Page # 3 of 5

TURNAROUND TIME
☐ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
☐ Dispose after 30 days
☐ Return samples
☒ Will call with instructions

						ANALYSES REQUESTED											
Sample ID	Lab ID	Date	Time	Sample Type	# of containers	TPH-Diesel w/SGL	TPH-Gasoline	BTEX by 8021B	VOCs by 8260	SVOCs by 8270	HFS	Metals	cPAHs				Notes
RI-25-3'	21	7-8-10	1236	soil	1							X					
RI-25-4'	22		12:38		1							X					
RI-25-6'	23		12:40		1	X											
RI-29-0.5'	24		12:54		1								X				
RI-29-2.5'	25		12:56		1												
RI-29-4'	26		12:58		1								X				
RI-29-8'	27		13:42		1	X											
RI-29-12'	28		13:15		1												
RI-21-0.5'	29		13:26		1								X				
RI-21-3'	30		13:27		1	X											

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Relinquished by:	See attached	Original	COC →		
Received by:		Nhan Phan	FeBI	7/9/10	1350
Relinquished by:					
Received by:					

FORMS\COC\COC.DOC

Samples received at 5 °C

007113

SAMPLE CHAIN OF CUSTODY ME 07/09/10 A05/VS1

Page # 4 of 5

Send Report To
Company Greylock
Address 720 S. 333rd st, Ste 210
City, State, ZIP Federal way, WA 98003
Phone # 253-661-3520 Fax #

SAMPLERS (*signature*)

PROJECT NAME/NO.	PO #
BOJO	

REMARKS * Hold for Instruction
* coc generated in lab NP 7/9/10

TURNAROUND TIME
☐ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
☐ Dispose after 30 days
☐ Return samples
☒ Will call with instructions

Sample ID	Lab ID	Date	Time	Sample Type	# of containers	TPH-Diesel w/SG	TPH-Gasoline	BTEX by 8021B	VOCs by 8260	SVOCs by 8270	HFS	cPAHs	Metals					Notes ① -
RI-21-6'	31	7-8-10	13:29	Soil	1	X												Per SD
RI-19-0.5'	32		13:34		1							X						07/19/10 ②
RI 19-3'	33		13:38		1							X						
RI-19-4'	34		13:36		1	X												
RI-18-0.5'	35		13:42		1							X						
RI-17-0.5'	36		14:10		1							X						
RI-17-5'	37		14:15		1	X												
RI-17-3'	38		~~14~~ 14:20		1							X						
RI-16-0.5'	39		14:24		1	X												
RI-16-4'	40		14:28		1													

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Relinquished by:	See attached	Original	COC		→
Received by:		Nhan Phan	FeBI	7/9/10	1350
Relinquished by:					
Received by:					

FORMS\COC\COC.DOC

Samples received at 5 °C

007113

SAMPLE CHAIN OF CUSTODY ME 07/09/10

A05/VS1

Send Report To
Company Grey lock
Address 720 S. 333rd St, Ste 210
City, State, ZIP Federal Way, WA 98003
Phone # 253-661-3520 Fax #

SAMPLERS (*signature*)

PROJECT NAME/NO. BOJO

PO #

REMARKS * Hold for Instruction
* COC generated in lab (NP) 7/9/10

Page # 5 of 5

TURNAROUND TIME
☐ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
☐ Dispose after 30 days
☐ Return samples
☒ Will call with instructions

						ANALYSES REQUESTED												
Sample ID	Lab ID	Date	Time	Sample Type	# of containers	TPH-Diesel 7/Sg	TPH-Gasoline	BTEX by 8021B	VOCs by 8260	SVOCs by 8270	HFS	Metals	cPAHs					Notes
RI-15-0.5'	41	7-8-10	1451	Soil	1								X					
RI-15-2.5'	42		1453		1								X					
RI-15-4'	43		14:56		1	X												
RI-12-1'	44		15:15		1	X							X					
RI-12-3'	45		15:18		1													
RI-12-4'	46		15:12		1													
RI-10-0.5'	47		15:50		1								X					
RI-10-2'	48		15:56		1													
RI-10-4'	49 A-D		15:51		4		X	X										
RI-12-4'	50 A-D		15:25		4		Y	X										

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SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: See attached	Original COC	——		→
Received by:	Nhan Phan	FeBI	7/9/10	1350
Relinquished by:				
Received by:				

FORMS\COC\COC.DOC

Samples received at 5 °C

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Charlene Morrow, M.S.
Yelena Aravkina, M.S.
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3012 16th Avenue West
Seattle, WA 98119-2029
TEL: (206) 285-8282
FAX: (206) 283-5044
e-mail: fbi@isomedia.com

August 2, 2010

Suzanne Dudziak, Project Manager
Greylock Consulting, LLC
720 S 33rd St, Suite 210
Federal Way, WA 98003

Dear Ms. Dudziak:

Included are the results from the testing of material submitted on July 13, 2010 from the BOJO, F&BI 007143 project. There are 37 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
NAA0729R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on July 13, 2010 by Friedman & Bruya, Inc. from the Greylock Consulting, LLC BOJO, F&BI 007143 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Greylock Consulting, LLC
007143-01	RI-14-4'
007143-02	RI-27-0-.5'
007143-03	RI-27-2.5-3.5'
007143-04	RI-27-6'
007143-05	RI-20-0.5'
007143-06	RI-20-1.5-2.5'
007143-07	RI-20-2.5-3.5'
007143-08	RI-20-3.5-4.5'
007143-09	RI-20-4.5-5.5'
007143-10	RI-1-0-1'
007143-11	RI-1-1-2'
007143-12	RI-9-0-1'
007143-13	RI-9-1-2
007143-14	RI-9-2-3'
007143-15	RI-9-3-4'
007143-16	RI-9A-3'
007143-17	RI-11-0-1.5'
007143-18	RI-11-10'
007143-19	RI-13-4'
007143-20	RI-2-0-1'
007143-21	RI-2-2-2.5'
007143-22	RI-7-4.5'
007143-23	RI-7A-1'
007143-24	RI-7A-2'
007143-25	RI-7A-1'
007143-26	RI-8-0-1.5'
007143-27	RI-8-2.5-3.5'
007143-28	RI-8-5.5-6'
007143-29	RI-8-7'
007143-30	RI-8-9'
007143-31	RI-5-0-1'
007143-32	RI-5/5A-1-2'
007143-33	RI-3-0-.5'
007143-34	RI-3-.5-1'
007143-35	RI-3-1-2'
007143-36	RI-3-4-5'
007143-37	RI-3-5-6'
007143-38	RI-4-0-.5'
007143-39	RI-4-2-3'

CASE NARRATIVE

This case narrative encompasses samples received on July 13, 2010 by Friedman & Bruya, Inc. from the Greylock Consulting, LLC BOJO, F&BI 007143 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Greylock Consulting, LLC
007143-40	RI-4-3-4'
007143-41	RI-6-0-1'
007143-42	RI-6-4-5'
007143-43	RI-6-5-6'
007143-44	RI-31-2.5'-3.5'
007143-45	RI-CB1

The samples RI-27-2.5-3.5', RI-20-2.5-3.5', RI-20-3.5-4.5', RI-9-0-1', RI-2-0-1', RI-8-0-1.5', RI-5-0-1', RI-3-0-.5', RI-4-0-.5', RI-6-0-1', and RI-31-2.5'-3.5' were sent to Amtest for tin analysis. The report generated by Amtest will be forwarded to your office upon receipt.

All quality control requirements were acceptable.

Date of Report: 08/02/10
Date Received: 07/13/10
Project: BOJO, F&BI 007143
Date Extracted: 07/21/10
Date Analyzed: 07/23/10 and 07/26/10

RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND TPH AS GASOLINE USING EPA METHOD 8021B AND NWTPH-Gx

Results Reported on a Dry Weight Basis
Results Reported as mg/kg (ppm)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 50-132)
RI-1-0-1’ 007143-10	<0.02	<0.02	<0.02	<0.06	<2	65
RI-9A-3’ 007143-16	<0.02	<0.02	<0.02	<0.06	<2	60
RI-11-10’ 007143-18	<0.02	<0.02	<0.02	<0.06	<2	63
RI-7A-1’ 007143-25	<0.02	<0.02	<0.02	<0.06	<2	57
RI-8-2.5-3.5’ 007143-27	<0.02	<0.02	<0.02	<0.06	<2	61
RI-5/5A-1-2’ 007143-32	<0.02	<0.02	<0.02	<0.06	3.3	97
RI-6-5-6’ 007143-43	<0.02	<0.02	<0.02	<0.06	<2	55
Method Blank 00-1076 MB	<0.02	<0.02	<0.02	<0.06	<2	58

Date of Report: 08/02/10
Date Received: 07/13/10
Project: BOJO, F&BI 007143
Date Extracted: 07/21/10
Date Analyzed: 07/22/10

RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

Sample Extracts Passed Through a Silica Gel Column Prior to Analysis

Results Reported on a Dry Weight Basis
Results Reported as mg/kg (ppm)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 50-150)
RI-14-4’ 007143-01	<50	<250	87
RI-27-6’ 007143-04	<50	<250	86
RI-13-4’ 007143-19	<50	<250	95
RI-7A-1’ 007143-23	2,700 x	7,300	90
RI-5-0-1’ 007143-31	480 x	930	86
Method Blank 00-1093 MB	<50	<250	91

Analysis For Total Metals By EPA Method 200.8

Client ID:	RI-27-2.5-3.5’	Client:	Greylock Consulting, LLC
Date Received:	07/13/10	Project:	BOJO, F&BI 007143
Date Extracted:	07/20/10	Lab ID:	007143-03
Date Analyzed:	07/21/10 13:09:08	Data File:	007143-03.056
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	116	60	125
Indium	98	60	125
Holmium	98	60	125

Analyte:	Concentration mg/kg (ppm)
Chromium	27.5
Copper	62.7
Zinc	1,190
Arsenic	9.94
Lead	551

Analysis For Total Metals By EPA Method 200.8

Client ID:	RI-20-2.5-3.5'	Client:	Greylock Consulting, LLC
Date Received:	07/13/10	Project:	BOJO, F&BI 007143
Date Extracted:	07/20/10	Lab ID:	007143-07
Date Analyzed:	07/21/10 13:13:01	Data File:	007143-07.057
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	103	60	125
Indium	94	60	125
Holmium	94	60	125

Analyte:	Concentration mg/kg (ppm)
Chromium	11.4
Copper	12.6
Zinc	70.1
Arsenic	4.42
Lead	2.13

Analysis For Total Metals By EPA Method 200.8

Client ID:	RI-20-3.5-4.5’	Client:	Greylock Consulting, LLC
Date Received:	07/13/10	Project:	BOJO, F&BI 007143
Date Extracted:	07/20/10	Lab ID:	007143-08
Date Analyzed:	07/21/10 13:16:53	Data File:	007143-08.058
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	100	60	125
Indium	96	60	125
Holmium	94	60	125

Analyte:	Concentration mg/kg (ppm)
Chromium	5.40
Copper	4.44
Zinc	15.8
Arsenic	2.04
Lead	1.28

Analysis For Total Metals By EPA Method 200.8

Client ID:	RI-9-0-1’	Client:	Greylock Consulting, LLC
Date Received:	07/13/10	Project:	BOJO, F&BI 007143
Date Extracted:	07/20/10	Lab ID:	007143-12
Date Analyzed:	07/21/10 12:57:31	Data File:	007143-12.053
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	111	60	125
Indium	99	60	125
Holmium	101	60	125

Analyte:	Concentration mg/kg (ppm)
Chromium	17.8
Copper	39.2
Zinc	75.4
Arsenic	2.19
Lead	13.3

Analysis For Total Metals By EPA Method 200.8

Client ID:	RI-2-0-1'	Client:	Greylock Consulting, LLC
Date Received:	07/13/10	Project:	BOJO, F&BI 007143
Date Extracted:	07/20/10	Lab ID:	007143-20
Date Analyzed:	07/21/10 13:20:46	Data File:	007143-20.059
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	105	60	125
Indium	99	60	125
Holmium	96	60	125

Analyte:	Concentration mg/kg (ppm)
Chromium	12.0
Copper	13.5
Zinc	83.0
Arsenic	3.12
Lead	42.1

Analysis For Total Metals By EPA Method 200.8

Client ID:	RI-8-0-1.5’	Client:	Greylock Consulting, LLC
Date Received:	07/13/10	Project:	BOJO, F&BI 007143
Date Extracted:	07/20/10	Lab ID:	007143-26
Date Analyzed:	07/21/10 13:24:39	Data File:	007143-26.060
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	105	60	125
Indium	94	60	125
Holmium	97	60	125

Analyte:	Concentration mg/kg (ppm)
Chromium	24.8
Copper	31.0
Zinc	102
Arsenic	4.27
Lead	61.0

Analysis For Total Metals By EPA Method 200.8

Client ID:	RI-5-0-1’	Client:	Greylock Consulting, LLC
Date Received:	07/13/10	Project:	BOJO, F&BI 007143
Date Extracted:	07/20/10	Lab ID:	007143-31 x10
Date Analyzed:	07/29/10 17:20:25	Data File:	007143-31 x10.056
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	118	60	125
Indium	104	60	125
Holmium	103	60	125

Analyte:	Concentration mg/kg (ppm)
Chromium	82.8
Copper	423
Zinc	1,610
Arsenic	31.6
Lead	710

Analysis For Total Metals By EPA Method 200.8

Client ID:	RI-3-0-.5'	Client:	Greylock Consulting, LLC
Date Received:	07/13/10	Project:	BOJO, F&BI 007143
Date Extracted:	07/20/10	Lab ID:	007143-33
Date Analyzed:	07/21/10 13:36:18	Data File:	007143-33.063
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	107	60	125
Indium	92	60	125
Holmium	93	60	125

Analyte:	Concentration mg/kg (ppm)
Chromium	132
Copper	828
Zinc	893
Arsenic	14.5
Lead	223

Analysis For Total Metals By EPA Method 200.8

Client ID:	RI-4-0-.5'	Client:	Greylock Consulting, LLC
Date Received:	07/13/10	Project:	BOJO, F&BI 007143
Date Extracted:	07/20/10	Lab ID:	007143-38 x10
Date Analyzed:	07/29/10 17:24:18	Data File:	007143-38 x10.057
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	116	60	125
Indium	104	60	125
Holmium	99	60	125

Analyte:	Concentration mg/kg (ppm)
Chromium	280
Copper	188
Zinc	857
Arsenic	25.8
Lead	596

Analysis For Total Metals By EPA Method 200.8

Client ID:	RI-6-0-1'	Client:	Greylock Consulting, LLC
Date Received:	07/13/10	Project:	BOJO, F&BI 007143
Date Extracted:	07/20/10	Lab ID:	007143-41
Date Analyzed:	07/21/10 13:44:03	Data File:	007143-41.065
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	108	60	125
Indium	92	60	125
Holmium	94	60	125

Analyte:	Concentration mg/kg (ppm)
Chromium	10.1
Copper	23.4
Zinc	39.6
Arsenic	3.40
Lead	13.2

Analysis For Total Metals By EPA Method 200.8

Client ID:	RI-31-2.5'-3.5'	Client:	Greylock Consulting, LLC
Date Received:	07/13/10	Project:	BOJO, F&BI 007143
Date Extracted:	07/20/10	Lab ID:	007143-44
Date Analyzed:	07/21/10 13:47:56	Data File:	007143-44.066
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	99	60	125
Indium	93	60	125
Holmium	93	60	125

Analyte:	Concentration mg/kg (ppm)
Chromium	6.27
Copper	4.44
Zinc	60.6
Arsenic	1.35
Lead	1.38

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Greylock Consulting, LLC
Date Received:	NA	Project:	BOJO, F&BI 007143
Date Extracted:	07/20/10	Lab ID:	I0-386 mb
Date Analyzed:	07/21/10 12:49:46	Data File:	I0-386 mb.051
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	96	60	125
Indium	96	60	125
Holmium	95	60	125

Analyte:	Concentration mg/kg (ppm)
Chromium	<1
Copper	<1
Zinc	<1
Arsenic	<1
Lead	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Greylock Consulting, LLC
Date Received:	NA	Project:	BOJO, F&BI 007143
Date Extracted:	07/20/10	Lab ID:	I0-386 mb
Date Analyzed:	07/29/10 17:12:41	Data File:	I0-386 mb.054
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	108	60	125
Indium	100	60	125
Holmium	98	60	125

Analyte:	Concentration mg/kg (ppm)
Chromium	<1
Copper	<1
Zinc	<1
Arsenic	<1
Lead	<1

Date of Report: 08/02/10
Date Received: 07/13/10
Project: BOJO, F&BI 007143
Date Extracted: 07/20/10
Date Analyzed: 07/21/10

RESULTS FROM THE ANALYSIS OF THE SOIL SAMPLES FOR TOTAL MERCURY USING EPA METHOD 1631E

Results Reported on a Dry Weight Basis
Results Reported as mg/kg (ppm)

Sample ID Laboratory ID	Total Mercury
RI-27-2.5-3.5’ 007143-03	1.2
RI-20-2.5-3.5’ 007143-07	<0.2
RI-20-3.5-4.5’ 007143-08	<0.2
RI-9-0-1’ 007143-12	<0.2
RI-2-0-1’ 007143-20	<0.2
RI-8-0-1.5’ 007143-26	<0.2
RI-5-0-1’ 007143-31	0.2
RI-3-0-.5’ 007143-33	<0.2
RI-4-0-.5’ 007143-38	<0.2
RI-6-0-1’ 007143-41	<0.2
RI-31-2.5’-3.5’ 007143-44	<0.2
Method Blank	<0.2

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	RI-27-0-.5'	Client:	Greylock Consulting, LLC
Date Received:	07/13/10	Project:	BOJO, F&BI 007143
Date Extracted:	07/21/10	Lab ID:	007143-02 1/5
Date Analyzed:	07/21/10	Data File:	072113.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	91	50	150
Benzo(a)anthracene-d12	92	35	159

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	0.056
Anthracene	<0.01
Fluoranthene	0.057
Pyrene	0.054
Benz(a)anthracene	0.026
Chrysene	0.040
Benzo(a)pyrene	0.029
Benzo(b)fluoranthene	0.047
Benzo(k)fluoranthene	0.013
Indeno(1,2,3-cd)pyrene	0.023
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	0.023

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	RI-27-2.5-3.5'	Client:	Greylock Consulting, LLC
Date Received:	07/13/10	Project:	BOJO, F&BI 007143
Date Extracted:	07/21/10	Lab ID:	007143-03 1/5
Date Analyzed:	07/21/10	Data File:	072117.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	96	50	150
Benzo(a)anthracene-d12	91	35	159

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	0.045
Anthracene	<0.01
Fluoranthene	0.12
Pyrene	0.14
Benz(a)anthracene	0.052
Chrysene	0.11
Benzo(a)pyrene	0.063
Benzo(b)fluoranthene	0.11
Benzo(k)fluoranthene	0.031
Indeno(1,2,3-cd)pyrene	0.050
Dibenz(a,h)anthracene	0.011
Benzo(g,h,i)perylene	0.054

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	RI-20-0.5'	Client:	Greylock Consulting, LLC
Date Received:	07/13/10	Project:	BOJO, F&BI 007143
Date Extracted:	07/21/10	Lab ID:	007143-05 1/5
Date Analyzed:	07/21/10	Data File:	072110.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	88	50	150
Benzo(a)anthracene-d12	89	35	159

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	0.011
Fluorene	<0.01
Phenanthrene	0.17
Anthracene	0.029
Fluoranthene	0.48
Pyrene	0.41
Benz(a)anthracene	0.18
Chrysene	0.33
Benzo(a)pyrene	0.20
Benzo(b)fluoranthene	0.37
Benzo(k)fluoranthene	0.12
Indeno(1,2,3-cd)pyrene	0.17
Dibenz(a,h)anthracene	0.039
Benzo(g,h,i)perylene	0.16

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	RI-20-1.5-2.5'	Client:	Greylock Consulting, LLC
Date Received:	07/13/10	Project:	BOJO, F&BI 007143
Date Extracted:	07/21/10	Lab ID:	007143-06 1/50
Date Analyzed:	07/23/10	Data File:	072310.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	92	50	150
Benzo(a)anthracene-d12	88	35	159

Compounds:	Concentration mg/kg (ppm)
Naphthalene	0.22
Acenaphthylene	<0.1
Acenaphthene	0.13
Fluorene	0.16
Phenanthrene	1.5
Anthracene	0.55
Fluoranthene	1.7
Pyrene	1.5
Benz(a)anthracene	0.65
Chrysene	0.93
Benzo(b)fluoranthene	0.82
Benzo(k)fluoranthene	0.30
Benzo(a)pyrene	0.62
Indeno(1,2,3-cd)pyrene	0.37
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	0.37

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	RI-11-0-1.5'	Client:	Greylock Consulting, LLC
Date Received:	07/13/10	Project:	BOJO, F&BI 007143
Date Extracted:	07/21/10	Lab ID:	007143-17 1/100
Date Analyzed:	07/21/10	Data File:	072120.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	146	50	150
Benzo(a)anthracene-d12	115	35	159

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.2
Acenaphthylene	<0.2
Acenaphthene	<0.2
Fluorene	<0.2
Phenanthrene	0.61
Anthracene	<0.2
Fluoranthene	<0.2
Pyrene	<0.2
Benz(a)anthracene	<0.2
Chrysene	0.78
Benzo(a)pyrene	<0.2
Benzo(b)fluoranthene	0.23
Benzo(k)fluoranthene	<0.2
Indeno(1,2,3-cd)pyrene	<0.2
Dibenz(a,h)anthracene	<0.2
Benzo(g,h,i)perylene	0.29

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	RI-2-0-1'	Client:	Greylock Consulting, LLC
Date Received:	07/13/10	Project:	BOJO, F&BI 007143
Date Extracted:	07/21/10	Lab ID:	007143-20 1/5
Date Analyzed:	07/23/10	Data File:	072231.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	113	50	150
Benzo(a)anthracene-d12	95	35	159

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	0.010
Anthracene	<0.01
Fluoranthene	0.012
Pyrene	0.013
Benz(a)anthracene	<0.01
Chrysene	0.013
Benzo(b)fluoranthene	0.022
Benzo(k)fluoranthene	<0.01
Benzo(a)pyrene	0.011
Indeno(1,2,3-cd)pyrene	0.024
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	0.024

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	RI-8-0-1.5'	Client:	Greylock Consulting, LLC
Date Received:	07/13/10	Project:	BOJO, F&BI 007143
Date Extracted:	07/21/10	Lab ID:	007143-26 1/5
Date Analyzed:	07/21/10	Data File:	072115.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	93	50	150
Benzo(a)anthracene-d12	86	35	159

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	0.023
Anthracene	<0.01
Fluoranthene	0.039
Pyrene	0.034
Benz(a)anthracene	0.021
Chrysene	0.024
Benzo(a)pyrene	0.022
Benzo(b)fluoranthene	0.029
Benzo(k)fluoranthene	0.010
Indeno(1,2,3-cd)pyrene	0.017
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	0.017

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	RI-4-0-.5'	Client:	Greylock Consulting, LLC
Date Received:	07/13/10	Project:	BOJO, F&BI 007143
Date Extracted:	07/21/10	Lab ID:	007143-38 1/5
Date Analyzed:	07/23/10	Data File:	072320.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	93	50	150
Benzo(a)anthracene-d12	94	35	159

Compounds:	Concentration mg/kg (ppm)
Naphthalene	0.15
Acenaphthylene	0.019
Acenaphthene	0.35
Fluorene	0.25
Phenanthrene	2.0
Anthracene	0.51
Fluoranthene	2.1
Pyrene	1.8
Benz(a)anthracene	0.85
Chrysene	0.99
Benzo(a)pyrene	0.60
Benzo(b)fluoranthene	1.1
Benzo(k)fluoranthene	0.46
Indeno(1,2,3-cd)pyrene	0.68
Dibenz(a,h)anthracene	0.15
Benzo(g,h,i)perylene	0.70

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	RI-6-0-1’	Client:	Greylock Consulting, LLC
Date Received:	07/13/10	Project:	BOJO, F&BI 007143
Date Extracted:	07/21/10	Lab ID:	007143-41 1/5
Date Analyzed:	07/23/10	Data File:	072308.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	98	50	150
Benzo(a)anthracene-d12	96	35	159

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	0.016
Fluorene	0.012
Phenanthrene	0.11
Anthracene	0.028
Fluoranthene	0.12
Pyrene	0.11
Benz(a)anthracene	0.051
Chrysene	0.062
Benzo(a)pyrene	0.054
Benzo(b)fluoranthene	0.064
Benzo(k)fluoranthene	0.028
Indeno(1,2,3-cd)pyrene	0.037
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	0.037

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	RI-31-2.5'-3.5'	Client:	Greylock Consulting, LLC
Date Received:	07/13/10	Project:	BOJO, F&BI 007143
Date Extracted:	07/21/10	Lab ID:	007143-44 1/5
Date Analyzed:	07/23/10	Data File:	072309.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	92	50	150
Benzo(a)anthracene-d12	94	35	159

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	Method Blank	Client:	Greylock Consulting, LLC
Date Received:	NA	Project:	BOJO, F&BI 007143
Date Extracted:	07/21/10	Lab ID:	00-1094 mb 1/5
Date Analyzed:	07/21/10	Data File:	072108.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	86	50	150
Benzo(a)anthracene-d12	83	35	159

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Date of Report: 08/02/10
Date Received: 07/13/10
Project: BOJO, F&BI 007143
Date Extracted: 07/21/10
Date Analyzed: 07/23/10

RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR PCBs REPORTED AS AROCLORS USING EPA METHOD 8082A

Results Reported on a Dry Weight Basis
Results Reported as mg/kg (ppm)

Sample ID Laboratory ID	Aroclor 1221	1232	1016	1242	1248	1254	1260	Surrogate (% Rec.) (Limit 50-150)
RI-2-0-1' 007143-20	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	112
Method Blank	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	107

Date of Report: 08/02/10
Date Received: 07/13/10
Project: BOJO, F&BI 007143

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES, AND TPH AS GASOLINE USING EPA METHOD 8021B AND NWTPH-Gx

Laboratory Code: 007199-01 (Duplicate)

Analyte	Reporting Units	(Wet Wt) Sample Result	(Wet Wt) Duplicate Result	Relative Percent Difference (Limit 20)
Benzene	mg/kg (ppm)	<0.02	<0.02	nm
Toluene	mg/kg (ppm)	<0.02	<0.02	nm
Ethylbenzene	mg/kg (ppm)	<0.02	<0.02	nm
Xylenes	mg/kg (ppm)	<0.06	<0.06	nm
Gasoline	mg/kg (ppm)	<2	<2	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	mg/kg (ppm)	0.5	83	66-121
Toluene	mg/kg (ppm)	0.5	86	72-128
Ethylbenzene	mg/kg (ppm)	0.5	84	69-132
Xylenes	mg/kg (ppm)	1.5	85	69-131
Gasoline	mg/kg (ppm)	10	125	61-153

Date of Report: 08/02/10
Date Received: 07/13/10
Project: BOJO, F&BI 007143

QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: 007143-04 (Matrix Spike)

Analyte	Reporting Units	Spike Level	(Wet wt) Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	mg/kg (ppm)	5,000	<50	82	87	73-135	6

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Diesel Extended	mg/kg (ppm)	5,000	84	74-139

Date of Report: 08/02/10
Date Received: 07/13/10
Project: BOJO, F&BI 007143

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR TOTAL METALS USING EPA METHOD 200.8

Laboratory Code: 007143-12 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Chromium	mg/kg (ppm)	50	17.8	95 b	88 b	51-132	8
Copper	mg/kg (ppm)	50	39.2	119 b	63 b	53-123	62 b
Zinc	mg/kg (ppm)	50	75.4	134 b	105 b	40-135	24 b
Arsenic	mg/kg (ppm)	10	2.19	107 b	100 b	44-151	7
Lead	mg/kg (ppm)	20	13.3	111 b	106 b	65-126	5

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Chromium	mg/kg (ppm)	50	90	79-125
Copper	mg/kg (ppm)	50	98	86-114
Zinc	mg/kg (ppm)	50	106	79-120
Arsenic	mg/kg (ppm)	10	108	80-120
Lead	mg/kg (ppm)	20	102	81-120

Date of Report: 08/02/10
Date Received: 07/13/10
Project: BOJO, F&BI 007143

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR TOTAL MERCURY USING EPA METHOD 1631E

Laboratory Code: 007143-12 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Mercury	mg/kg (ppm)	0.125	<0.2	110	105	45-162	5

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Mercury	mg/kg (ppm)	0.125	134	63-144

Date of Report: 08/02/10
Date Received: 07/13/10
Project: BOJO, F&BI 007143

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR PNA'S BY EPA METHOD 8270D SIM

Laboratory Code: 007143-05 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	mg/kg (ppm)	0.17	<0.01	83	86	33-140	4
Acenaphthylene	mg/kg (ppm)	0.17	<0.01	83	86	43-128	4
Acenaphthene	mg/kg (ppm)	0.17	0.011	81	83	58-108	2
Fluorene	mg/kg (ppm)	0.17	<0.01	75	78	57-113	4
Phenanthrene	mg/kg (ppm)	0.17	0.17	77 b	80 b	45-124	4
Anthracene	mg/kg (ppm)	0.17	0.029	72	76	42-132	5
Fluoranthene	mg/kg (ppm)	0.17	0.48	37 b	46 b	50-125	22 b
Pyrene	mg/kg (ppm)	0.17	0.41	47 b	61 b	41-135	26 b
Benz(a)anthracene	mg/kg (ppm)	0.17	0.18	56 b	65 b	47-113	15
Chrysene	mg/kg (ppm)	0.17	0.33	43 b	57 b	45-122	28 b
Benzo(b)fluoranthene	mg/kg (ppm)	0.17	0.37	35 b	41 b	24-145	16
Benzo(k)fluoranthene	mg/kg (ppm)	0.17	0.12	63 b	75 b	51-118	17
Benzo(a)pyrene	mg/kg (ppm)	0.17	0.20	66 b	68 b	30-134	3
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.17	0.17	77 b	78 b	40-138	1
Dibenz(a,h)anthracene	mg/kg (ppm)	0.17	0.039	84 b	96 b	51-122	13
Benzo(g,h,i)perylene	mg/kg (ppm)	0.17	0.16	75 b	78 b	54-115	4

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Naphthalene	mg/kg (ppm)	0.17	92	72-112
Acenaphthylene	mg/kg (ppm)	0.17	93	63-110
Acenaphthene	mg/kg (ppm)	0.17	91	70-111
Fluorene	mg/kg (ppm)	0.17	84	69-110
Phenanthrene	mg/kg (ppm)	0.17	91	68-111
Anthracene	mg/kg (ppm)	0.17	86	67-110
Fluoranthene	mg/kg (ppm)	0.17	91	62-114
Pyrene	mg/kg (ppm)	0.17	90	61-114
Benz(a)anthracene	mg/kg (ppm)	0.17	88	58-108
Chrysene	mg/kg (ppm)	0.17	95	61-112
Benzo(b)fluoranthene	mg/kg (ppm)	0.17	91	54-119
Benzo(k)fluoranthene	mg/kg (ppm)	0.17	90	61-123
Benzo(a)pyrene	mg/kg (ppm)	0.17	89	52-112
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.17	97	44-133
Dibenz(a,h)anthracene	mg/kg (ppm)	0.17	91	57-119
Benzo(g,h,i)perylene	mg/kg (ppm)	0.17	90	60-116

Date of Report: 08/02/10
Date Received: 07/13/10
Project: BOJO, F&BI 007143

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR POLYCHLORINATED BIPHENYLS AS AROCLOR 1016/1260 BY EPA METHOD 8082A

Laboratory Code: 007212-08 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Aroclor 1016	mg/kg (ppm)	<0.1	<0.1	nm
Aroclor 1260	mg/kg (ppm)	<0.1	<0.1	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	% Recovery LCS	% Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Aroclor 1016	mg/kg (ppm)	0.8	95	93	60-142	2
Aroclor 1260	mg/kg (ppm)	0.8	106	101	63-144	5

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

A1 – More than one compound of similar molecule structure was identified with equal probability.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for this range fell outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte indicated may be due to carryover from previous sample injections.

d - The sample was diluted. Detection limits may be raised due to dilution.

ds - The sample was diluted. Detection limits are raised due to dilution and surrogate recoveries may not be meaningful.

dv - Insufficient sample was available to achieve normal reporting limits and limits are raised accordingly.

fb - Analyte present in the blank and the sample.

fc – The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. The variability is attributed to sample inhomogeneity.

ht - Analysis performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of normal control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j – The result is below normal reporting limits. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The analyte result in the laboratory control sample is out of control limits. The reported concentration should be considered an estimate.

jr - The rpd result in laboratory control sample associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the compound indicated is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc – The sample was received in a container not approved by the method. The value reported should be considered an estimate.

pr – The sample was received with incorrect preservation. The value reported should be considered an estimate.

ve - Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

007143

Chain of Custody Record & Laboratory Analysis Request

ME 07/13/10 VSI/A05

~~Analytical Resources, Incorporated~~
~~Analytical Chemists and Consultants~~
~~4611 South 134th Place, Suite 100~~
~~Tukwila, WA 98168~~
~~206-695-6200 206-695-6201 (fax)~~

ARI Assigned Number:

Turn-around Requested: Standard

~~ARI~~ Client Company:

Phone: 253-266-2838

Client Contact: 720 S 333rd St Ste 210 Federal Way WA 98003

Client Project Name: B050

Client Project #: B050

Samplers: Mark Willoughby & Suzann

Page: 1 of 5

Date: 7-13-10

Ice Present? Y

No. of Coolers: 1

Cooler Temps:

Hold for Instructions

Sample ID	Date	Time	Matrix	No. Containers	Dx	w/ BTEX	Metals	PAH	PCB	VOC		Lab ID	Notes/Comments
RI-14 -4'	7-12-10	1423	S	1	X							01	
RI-27-0-.5'	7-13-10	0840		1				X				02	
RI-27-2½-3½'		0842		1 2 ml			X	X				03	
RI-27 -6'		0845		1	X							04	
RI-20 -0.5'		0916		1				X				05	
RI-20-1½-2½'		0918		1				X				06	
RI-20 -2½-3½'		0921		1	~~X~~	08	X					07	
RI-20-3½-4½'		0923		1	~~X~~		X					08	
RI-20 -4½-5½'		0925		1								09	
RI-1 -0-1'		0935		1		X						10	

Samples received at 2 °C

Comments/Special Instructions

Relinquished by:	Received by:	Relinquished by:	Received by:
(Signature) Mark Willoughby	(Signature)	(Signature)	(Signature)
Printed Name: Mark Willoughby	Printed Name: Michael Erdahl	Printed Name:	Printed Name:
Company: GREYLOCK	Company: FEB...	Company:	Company:
Date & Time: 7-13-10/1724	Date & Time: 7/13/10 1724	Date & Time:	Date & Time:

Limits of Liability: *ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.*

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

004145

Chain of Custody Record & Laboratory Analysis Request

ME 07/13/10

VSI /A05

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

~~ARI~~ Assigned Number:

Turn-around Requested: Standard

~~ARI~~ Client Company:

Phone: 253-286-2838

Client Contact: 720 S ~~Fed~~ 333rd St Ste 210 Federal Way WA 98023

Client Project Name: 5050

Client Project #: 5050

Samplers: Mark Willoughby & Suzann

Page: 2 of 5

Date: 7-13-10

Ice Present? Y

No. of Coolers: 1

Cooler Temps:

Analysis Requested: Hold for Instructions

Sample ID	Date	Time	Matrix	No. Containers	Dx	G/BTEX	Metals	PAH	PCB	VOC		Lab ID	Notes/Comments
RI-1-1-2'	7-13-10	0937	S	4								11 A-D	
RI-9-0-1'	↓	0957	↓	1			X					12	
RI-9-1-2'		0959		1								13	
RI-9-2-3'		1001		1								14	
RI9-3-4'		1003		1								15	
RI-9A-3'		1005		5		X						16A-E	
RI-11-0-1½'		1024		2				X				17A-B	
RI-11-10'		1030		4		X						18 A-D	
RI-13-4'		1050		1	X							-19	Samples received at 2 °C

Comments/Special Instructions:

Relinquished by:	Received by:	Relinquished by:	Received by:
(Signature) Mark Willoughby	(Signature)	(Signature)	(Signature)
Printed Name: Mark Willoughby	Printed Name: Michael Erdahl	Printed Name:	Printed Name:
Company: GreyLock	Company: FEBin	Company:	Company:
Date & Time: 7-13-10 / 1724	Date & Time: 7/13/10 1724	Date & Time:	Date & Time:

Limits of Liability: *ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.*

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

007143

SAMPLE CHAIN OF CUSTODY

ME 07/13/10

VSI/AOS

Send Report To
Company Greylock
Address 120 S 333rd St Ste 210
City, State, ZIP Federal Way WA 98003
Phone # 253-266-2888 Fax #

SAMPLERS (signature) Mark Willoughby
PROJECT NAME/NO. BOJO
PO #
REMARKS Hold for instructions

Page # 3 of 5

TURNAROUND TIME
☒ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
☐ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

						ANALYSES REQUESTED												
Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260	PAHs ~~SVOCs~~ by 8270	HFS	PCB	Metals					Notes
RI-2-0-1'	20	7-13-10	1102	S	1					X		X	X					
RI-2-2'-2½'	21		1104		1													
RI-7-4½'	22		1122		1													
RI-7A-1'	23		1129		1	X												
RI-7A-2'	24		1131		1													
RI-7A-1'	25 A-D		1133		4		X	X										
RI-8-0-1½'	26		1209		1					X			X					
RI-8-2½-3½	27		1211		1		X	X										
RI-8-5½-6	28		1213		1													
RI-8-7'	29		1216		1													

Samples received at 2 °C

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Mark Willoughby	Mark Willoughby	Greylock	7.13.10	1724
Received by:	Michael Erdahl	FBI	(	1724
Relinquished by:				
Received by:				

FORMS\COC\COC.DOC

007143

SAMPLE CHAIN OF CUSTODY

ME 07/13/10 VS1/A05

Page # 4 of 5

Send Report To
Company Greylock
Address 710 S 333rd St Ste 210
City, State, ZIP Federal Way 98003
Phone # 253-2662838 Fax #

SAMPLERS (*signature*) Mark Willoughby

PROJECT NAME/NO. BOJO

PO #

REMARKS
Hold for instructions

TURNAROUND TIME
☑ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
☐ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

						ANALYSES REQUESTED												
Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260	PAHs ~~SVOCs~~ by 8270	HFS	PCB	Metals					Notes
RI-8-9'	30	7-13-10	1223	S	1													
RI-5-0-1'	31		1250		1	X							X					
RI-5/5A-1-2'	~~28~~ 32 AD		1252		4		X	X										
RI-3-0-.5'	33 ~~29~~		1300		1								X					
RI-3-.5-1'	~~30~~ 34		1302		1													
RI-3-1-2'	35		1305		1													
RI-3-4-5'	36		1310		1													
RI-3-5-6	37		1312		1													
RI-4-0-.5'	38		1324		1					X			X					
RI-4-2-3'	39		1326		1													

Samples received at 2 °C

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Mark Willoughby	Mark Willoughby	Greylock	7-13-10	1724
Received by:	Michael Erdahl	FBI	1	1724
Relinquished by:				
Received by:				

FORMS\COC\COC.DOC

007143

SAMPLE CHAIN OF CUSTODY ME 07/13/10

VSI/ A05

Page # 5 of 5

Send Report To

Company Grey Lock

Address 720 S 333rd St Ste 210

City, State, ZIP Federal WAY WA 98003

Phone # 253-766-2888 Fax #

SAMPLERS (signature) Mark Willoughby

PROJECT NAME/NO.	PO #
BOSO	

REMARKS
Hold for Instructions

TURNAROUND TIME
☒ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
☐ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

						ANALYSES REQUESTED												
Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260	PAHs ~~SVOCs~~ by 8270	HFS	PCB	Metals					Notes
RI-4-3-4'	40	7-13-10	1330	S	1													
RI-6-0-1'	41		1406		1					X			X					
RI-6-4-5'	42		1410		1													
RI-6-5-6'	43		1412		1		X	X										
RI-31-2½-3½'	44		0842		1					X			X					
RI-CB1	45		0909		1													ND 7-13-10 Added in lab

Samples received at 2 °C

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Mark Willoughby	Mark Willoughby	Greylock	7-13-10	1720
Received by:	Michael Erdahl	FEB	1	1
Relinquished by:				
Received by:				

FORMS\COC\COC.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Charlene Morrow, M.S.
Yelena Aravkina, M.S.
Bradley T. Benson, B.S.
Kurt Johnson, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
TEL: (206) 285-8282
FAX: (206) 283-5044
e-mail: fbi@isomedia.com

January 6, 2011

Suzanne Dudziak, Project Manager
Greylock Consulting, LLC
720 S 333rd St, Suite 210
Federal Way, WA 98003

Dear Ms. Dudziak:

Included are the additional results from the testing of material submitted on October 8, 2010 from the Bojo RI/FS, F&BI 010099 project. There is 1 page included in this report.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
GRL0106R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on October 8, 2010 by Friedman & Bruya, Inc. from the Greylock Consulting, LLC Bojo RI/FS project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Greylock Consulting, LLC
010099-01	MW-1
010099-02	MW-2
010099-03	MW-3
010099-04	MW-4
010099-05	MW-5
010099-06	MW-6
010099-07	MW-7
010099-08	MW-8
010099-09	MW-9
010099-10	MW-10
010099-11	Trip Blank

The samples were sent to Aquatic Research for TDS analysis. Review of the enclosed report indicates that all quality assurance were acceptable.

All quality control requirements were acceptable.

AQUATIC RESEARCH INCORPORATED
LABORATORY & CONSULTING SERVICES
3927 AURORA AVENUE NORTH, SEATTLE, WA 98103
PHONE: (206) 632-2715 FAX: (206) 632-2417

CASE FILE NUMBER: FBI007-48 **PAGE 1**
REPORT DATE: 01/04/11
DATE SAMPLED: 10/06/10 **DATE RECEIVED:** 12/29/10
FINAL REPORT, LABORATORY ANALYSIS OF SELECTED PARAMETERS ON WATER SAMPLES FROM FRIEDMAN & BRUYA, INC. / PROJECT NO. 010099

CASE NARRATIVE

Ten water samples were received by the laboratory in good condition and analyzed according to the chain of custody. Samples were received and analyzed outside of the holding time. No difficulties were encountered in the preparation or analysis of these samples. Sample data follows while QA/QC data is contained on subsequent pages.

SAMPLE DATA

SAMPLE ID	TDS (mg/L)
MW-1	115
MW-2	202
MW-3	417
MW-4	208
MW-5	672
MW-6	2503
MW-7	1717
MW-8	6099
MW-9	408
MW-10	6016

AQUATIC RESEARCH INCORPORATED
LABORATORY & CONSULTING SERVICES
3927 AURORA AVENUE NORTH, SEATTLE, WA 98103
PHONE: (206) 632-2715 FAX: (206) 632-2417

CASE FILE NUMBER: **FBI007-48** **PAGE 3**
REPORT DATE: **01/04/11**
DATE SAMPLED: **10/06/10** **DATE RECEIVED:** **12/29/10**
FINAL REPORT, LABORATORY ANALYSIS OF SELECTED PARAMETERS ON WATER SAMPLES FROM FRIEDMAN & BRUYA, INC. / PROJECT NO. 010099

QA/QC DATA

QC PARAMETER	TDS (mg/L)
METHOD	SM18 2540C
DATE ANALYZED	01/03/11
DETECTION LIMIT	5.0
DUPLICATE	
SAMPLE ID	MW-10
ORIGINAL	6016
DUPLICATE	6371
RPD	5.73%
SPIKE SAMPLE	
SAMPLE ID	
ORIGINAL	
SPIKED SAMPLE	
SPIKE ADDED	
% RECOVERY	NA
QC CHECK	
FOUND	
TRUE	
% RECOVERY	NA
BLANK	<5.0

RPD = RELATIVE PERCENT DIFFERENCE.
NA = NOT APPLICABLE OR NOT AVAILABLE.
NC = NOT CALCULABLE DUE TO ONE OR MORE VALUES BEING BELOW THE DETECTION LIMIT.
OR = RECOVERY NOT CALCULABLE DUE TO SPIKE SAMPLE OUT OF RANGE OR SPIKE TOO LOW RELATIVE TO SAMPLE CONCENTRATION.

SUBMITTED BY:

Steven Lazoff
Laboratory Director

010099

SAMPLE CHAIN OF CUSTODY

ME 10/08/10

1 V4/BE4/C05

Send Report To
Company Greylock Consulting
Address 720 S 333rd St, Ste 210
City, State, ZIP Federal Way WA 98003
Phone # 253 661 3520 Fax #

SAMPLERS (signature) Mark Willoughby
PROJECT NAME/NO. B050 RI/FS
PO #

REMARKS * Metals = Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Zinc
** NWTPHDx with silica gel acid wash cleanup

Page # 1 of
TURNAROUND TIME
X Standard (2 Weeks)
RUSH
Rush charges authorized by

SAMPLE DISPOSAL
Dispose after 30 days
Return samples
Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260	SVOCs by 8270	HFS	Total Metals *	Dissolved Metals *	cPAHs & phthalates by 8270 SIM		TDS		Notes
MW-1	01 A-H	10-6-10	9:45	Water	8	X	X		X			X	X	X		Ⓧ		Ⓧ-per SD 12/29/10 MG
MW-2	02 A-H	10-6-10	15:30	Water	8	↓	↓		↓			↓	↓	↓		↓		
MW-3	03 A-H	10-6-10	10:55	Water	8	↓	↓		↓			↓	↓	↓		↓		
MW-4	04 A-H	10-6-10	16:55	↓	8	↓	↓		↓			↓	↓	↓		↓		
MW-5	05 A-H	10-6-10	13:05	↓	8	↓	↓		↓			↓	↓	↓		↓		
MW-6	06 A-H	10-6-10	16:15	↓	8	↓	↓		↓			↓	↓	↓		↓		
MW-7	07 A-H	10-6-10	13:10	↓	8	↓	↓		↓			↓	↓	↓		↓		
MW-8	08 A-H	10-6-10	14:00	↓	8	↓	↓		↓			↓	↓	↓		↓		
MW-9	09 A-H	10-6-10	14:45	↓	8	↓	↓		↓			↓	↓	↓		↓		
MW-10	10 A-H	10-6-10	14:00	↓	8	↓	↓		↓			↓	↓	↓		↓		WP 10/8
Trip Blank	11 A-F	—	—	water	6													* Added in lab

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Mark Willoughby	Mark Willoughby	Greylock	10-6-10	5:15 PM
Received by:	Chris Cass	Greylock	10-6-10	5:15 PM
Relinquished by: Chris Cass	Chris Cass	Greylock	10/7/10	10:00
Received by:	Kurt Johnson	F&B	10/7/10	10:00

FORMS\COC\COC.DOC

Samples received at 3 °C

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Charlene Morrow, M.S.
Yelena Aravkina, M.S.
Bradley T. Benson, B.S.
Kurt Johnson, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
TEL: (206) 285-8282
FAX: (206) 283-5044
e-mail: fbi@isomedia.com

January 10, 2011

Suzanne Dudziak, Project Manager
Greylock Consulting, LLC
720 S 33rd St, Suite 210
Federal Way, WA 98003

Dear Ms. Dudziak:

Included is the amended report from the testing of material submitted on October 7, 2010 from the BOJO RI/FS, F&BI 010099 project. Per your request, the cPAH reporting limits have been lowered.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
GRL1025R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Charlene Morrow, M.S.
Yelena Aravkina, M.S.
Bradley T. Benson, B.S.
Kurt Johnson, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
TEL: (206) 285-8282
FAX: (206) 283-5044
e-mail: fbi@isomedia.com

October 25, 2010

Suzanne Dudziak, Project Manager
Greylock Consulting, LLC
720 S 33rd St, Suite 210
Federal Way, WA 98003

Dear Ms. Dudziak:

Included are the results from the testing of material submitted on October 7, 2010 from the BOJO RI/FS, F&BI 010099 project. There are 60 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
GRL1025R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on October 7, 2010 by Friedman & Bruya, Inc. from the Greylock Consulting, LLC BOJO RI/FS, F&BI 010099 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Greylock Consulting, LLC
010099-01	MW-1
010099-02	MW-2
010099-03	MW-3
010099-04	MW-4
010099-05	MW-5
010099-06	MW-6
010099-07	MW-7
010099-08	MW-8
010099-09	MW-9
010099-10	MW-10
010099-11	Trip Blank

The NWTPH-Gx laboratory control sample exceeded the acceptance criteria. No analyte was detected in the samples, therefore the data were acceptable.

All other quality control requirements were acceptable.

Date of Report: 10/25/10
Date Received: 10/07/10
Project: BOJO RI/FS, F&BI 010099
Date Extracted: 10/14/10
Date Analyzed: 10/14/10

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS GASOLINE USING METHOD NWTPH-Gx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Gasoline Range	Surrogate (% Recovery) (Limit 51-134)
MW-1 010099-01	<100	67
MW-2 010099-02	<100	66
MW-3 010099-03	<100	70
MW-4 010099-04	<100	61
MW-5 010099-05	<100	67
MW-6 010099-06	<100	75
MW-7 010099-07	<100	76
MW-8 010099-08	<100	75
MW-9 010099-09	<100	75
MW-10 010099-10	<100	65
Method Blank 00-1617 MB	<100	67

Date of Report: 10/25/10
Date Received: 10/07/10
Project: BOJO RI/FS, F&BI 010099
Date Extracted: 10/11/10
Date Analyzed: 10/15/10

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

Sample Extracts Passed Through a Silica Gel Column Prior to Analysis

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 51-134)
MW-1 010099-01	<50	<250	86
MW-2 010099-02	<50	<250	73
MW-3 010099-03	<50	<250	86
MW-4 010099-04	190	<250	76
MW-5 010099-05	<50	<250	82
MW-6 010099-06	<50	<250	71
MW-7 010099-07	<50	<250	91
MW-8 010099-08	<50	<250	90
MW-9 010099-09	<50	<250	87

Date of Report: 10/25/10
Date Received: 10/07/10
Project: BOJO RI/FS, F&BI 010099
Date Extracted: 10/11/10
Date Analyzed: 10/15/10

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

Sample Extracts Passed Through a Silica Gel Column Prior to Analysis

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 51-134)
MW-10 010099-10	<50	<250	87
Method Blank 00-1626 MB	<50	<250	92

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW-1	Client:	Greylock Consulting, LLC
Date Received:	10/07/10	Project:	BOJO RI/FS, F&BI 010099
Date Extracted:	10/12/10	Lab ID:	010099-01
Date Analyzed:	10/13/10	Data File:	010099-01.010
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	83	60	125
Indium	81	60	125
Holmium	84	60	125

Analyte:	Concentration ug/L (ppb)
Chromium	<1
Copper	<1
Zinc	43.7
Arsenic	<1
Cadmium	<1
Lead	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW-2	Client:	Greylock Consulting, LLC
Date Received:	10/07/10	Project:	BOJO RI/FS, F&BI 010099
Date Extracted:	10/12/10	Lab ID:	010099-02
Date Analyzed:	10/13/10	Data File:	010099-02.013
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	86	60	125
Indium	84	60	125
Holmium	85	60	125

Analyte:	Concentration ug/L (ppb)
Chromium	<1
Copper	<1
Zinc	2.76
Arsenic	<1
Cadmium	<1
Lead	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW-3	Client:	Greylock Consulting, LLC
Date Received:	10/07/10	Project:	BOJO RI/FS, F&BI 010099
Date Extracted:	10/12/10	Lab ID:	010099-03
Date Analyzed:	10/13/10	Data File:	010099-03.014
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	93	60	125
Indium	81	60	125
Holmium	91	60	125

Analyte:	Concentration ug/L (ppb)
Chromium	<1
Copper	1.44
Zinc	3.22
Arsenic	1.11
Cadmium	<1
Lead	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW-4	Client:	Greylock Consulting, LLC
Date Received:	10/07/10	Project:	BOJO RI/FS, F&BI 010099
Date Extracted:	10/12/10	Lab ID:	010099-04
Date Analyzed:	10/13/10	Data File:	010099-04.035
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	111	60	125
Indium	101	60	125
Holmium	107	60	125

Analyte:	Concentration ug/L (ppb)
Chromium	<1
Copper	<1
Zinc	3.38
Arsenic	<1
Cadmium	<1
Lead	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW-5	Client:	Greylock Consulting, LLC
Date Received:	10/07/10	Project:	BOJO RI/FS, F&BI 010099
Date Extracted:	10/12/10	Lab ID:	010099-05
Date Analyzed:	10/13/10	Data File:	010099-05.036
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	107	60	125
Indium	95	60	125
Holmium	102	60	125

Analyte:	Concentration ug/L (ppb)
Chromium	2.78
Copper	2.14
Zinc	7.46
Arsenic	8.00
Cadmium	<1
Lead	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW-6	Client:	Greylock Consulting, LLC
Date Received:	10/07/10	Project:	BOJO RI/FS, F&BI 010099
Date Extracted:	10/12/10	Lab ID:	010099-06
Date Analyzed:	10/13/10	Data File:	010099-06.037
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	91	60	125
Indium	77	60	125
Holmium	89	60	125

Analyte:	Concentration ug/L (ppb)
Chromium	2.07
Copper	13.1
Zinc	7.65
Arsenic	8.80
Cadmium	<1
Lead	1.03

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW-7	Client:	Greylock Consulting, LLC
Date Received:	10/07/10	Project:	BOJO RI/FS, F&BI 010099
Date Extracted:	10/12/10	Lab ID:	010099-07
Date Analyzed:	10/13/10	Data File:	010099-07.038
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	94	60	125
Indium	77	60	125
Holmium	89	60	125

Analyte:	Concentration ug/L (ppb)
Chromium	1.52
Copper	9.52
Zinc	14.8
Arsenic	7.29
Cadmium	<1
Lead	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW-8	Client:	Greylock Consulting, LLC
Date Received:	10/07/10	Project:	BOJO RI/FS, F&BI 010099
Date Extracted:	10/12/10	Lab ID:	010099-08 x10
Date Analyzed:	10/13/10	Data File:	010099-08 x10.059
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	95	60	125
Indium	83	60	125
Holmium	89	60	125

Analyte:	Concentration ug/L (ppb)
Chromium	19.7
Copper	37.6
Zinc	42.7
Arsenic	24.3
Cadmium	<10
Lead	<10

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW-9	Client:	Greylock Consulting, LLC
Date Received:	10/07/10	Project:	BOJO RI/FS, F&BI 010099
Date Extracted:	10/12/10	Lab ID:	010099-09
Date Analyzed:	10/13/10	Data File:	010099-09.061
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	95	60	125
Indium	83	60	125
Holmium	91	60	125

Analyte:	Concentration ug/L (ppb)
Chromium	<1
Copper	1.03
Zinc	7.32
Arsenic	<1
Cadmium	<1
Lead	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW-10	Client:	Greylock Consulting, LLC
Date Received:	10/07/10	Project:	BOJO RI/FS, F&BI 010099
Date Extracted:	10/12/10	Lab ID:	010099-10 x10
Date Analyzed:	10/13/10	Data File:	010099-10 x10.060
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	98	60	125
Indium	80	60	125
Holmium	93	60	125

Analyte:	Concentration ug/L (ppb)
Chromium	11.0
Copper	34.2
Zinc	32.7
Arsenic	26.4
Cadmium	<10
Lead	<10

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Greylock Consulting, LLC
Date Received:	NA	Project:	BOJO RI/FS, F&BI 010099
Date Extracted:	10/12/10	Lab ID:	I0-576 mb
Date Analyzed:	10/13/10	Data File:	I0-576 mb.008
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	84	60	125
Indium	83	60	125
Holmium	87	60	125

Analyte:	Concentration ug/L (ppb)
Chromium	<1
Copper	<1
Zinc	<1
Arsenic	<1
Cadmium	<1
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW-1	Client:	Greylock Consulting, LLC
Date Received:	10/07/10	Project:	BOJO RI/FS, F&BI 010099
Date Extracted:	10/12/10	Lab ID:	010099-01
Date Analyzed:	10/15/10	Data File:	010099-01.014
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	99	60	125
Indium	94	60	125
Holmium	94	60	125

Analyte:	Concentration ug/L (ppb)
Chromium	<1
Copper	<1
Zinc	7.94
Arsenic	<1
Cadmium	<1
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW-2	Client:	Greylock Consulting, LLC
Date Received:	10/07/10	Project:	BOJO RI/FS, F&BI 010099
Date Extracted:	10/12/10	Lab ID:	010099-02
Date Analyzed:	10/15/10	Data File:	010099-02.039
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	108	60	125
Indium	97	60	125
Holmium	100	60	125

Analyte:	Concentration ug/L (ppb)
Chromium	<1
Copper	<1
Zinc	1.82
Arsenic	<1
Cadmium	<1
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW-3	Client:	Greylock Consulting, LLC
Date Received:	10/07/10	Project:	BOJO RI/FS, F&BI 010099
Date Extracted:	10/12/10	Lab ID:	010099-03
Date Analyzed:	10/15/10	Data File:	010099-03.023
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	110	60	125
Indium	96	60	125
Holmium	99	60	125

Analyte:	Concentration ug/L (ppb)
Chromium	<1
Copper	1.43
Zinc	2.01
Arsenic	<1
Cadmium	<1
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW-4	Client:	Greylock Consulting, LLC
Date Received:	10/07/10	Project:	BOJO RI/FS, F&BI 010099
Date Extracted:	10/12/10	Lab ID:	010099-04
Date Analyzed:	10/15/10	Data File:	010099-04.024
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	107	60	125
Indium	96	60	125
Holmium	101	60	125

Analyte:	Concentration ug/L (ppb)
Chromium	<1
Copper	<1
Zinc	1.57
Arsenic	<1
Cadmium	<1
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW-5	Client:	Greylock Consulting, LLC
Date Received:	10/07/10	Project:	BOJO RI/FS, F&BI 010099
Date Extracted:	10/12/10	Lab ID:	010099-05
Date Analyzed:	10/15/10	Data File:	010099-05.027
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	104	60	125
Indium	93	60	125
Holmium	100	60	125

Analyte:	Concentration ug/L (ppb)
Chromium	1.19
Copper	1.90
Zinc	3.93
Arsenic	3.48
Cadmium	<1
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW-6	Client:	Greylock Consulting, LLC
Date Received:	10/07/10	Project:	BOJO RI/FS, F&BI 010099
Date Extracted:	10/12/10	Lab ID:	010099-06
Date Analyzed:	10/15/10	Data File:	010099-06.028
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	100	60	125
Indium	80	60	125
Holmium	92	60	125

Analyte:	Concentration ug/L (ppb)
Chromium	1.39
Copper	11.6
Zinc	3.41
Arsenic	7.01
Cadmium	<1
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW-7	Client:	Greylock Consulting, LLC
Date Received:	10/07/10	Project:	BOJO RI/FS, F&BI 010099
Date Extracted:	10/12/10	Lab ID:	010099-07
Date Analyzed:	10/15/10	Data File:	010099-07.040
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	95	60	125
Indium	81	60	125
Holmium	88	60	125

Analyte:	Concentration ug/L (ppb)
Chromium	1.32
Copper	10.5
Zinc	5.40
Arsenic	5.66
Cadmium	<1
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW-8	Client:	Greylock Consulting, LLC
Date Received:	10/07/10	Project:	BOJO RI/FS, F&BI 010099
Date Extracted:	10/12/10	Lab ID:	010099-08
Date Analyzed:	10/15/10	Data File:	010099-08.030
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	93	60	125
Indium	68	60	125
Holmium	81	60	125

Analyte:	Concentration ug/L (ppb)
Chromium	2.83
Copper	36.0
Zinc	3.52
Arsenic	23.7
Cadmium	<1
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW-9	Client:	Greylock Consulting, LLC
Date Received:	10/07/10	Project:	BOJO RI/FS, F&BI 010099
Date Extracted:	10/12/10	Lab ID:	010099-09
Date Analyzed:	10/15/10	Data File:	010099-09.041
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	105	60	125
Indium	91	60	125
Holmium	96	60	125

Analyte:	Concentration ug/L (ppb)
Chromium	<1
Copper	1.18
Zinc	1.99
Arsenic	<1
Cadmium	<1
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW-10	Client:	Greylock Consulting, LLC
Date Received:	10/07/10	Project:	BOJO RI/FS, F&BI 010099
Date Extracted:	10/12/10	Lab ID:	010099-10
Date Analyzed:	10/15/10	Data File:	010099-10.032
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	89	60	125
Indium	66	60	125
Holmium	80	60	125

Analyte:	Concentration ug/L (ppb)
Chromium	3.08
Copper	33.8
Zinc	3.76
Arsenic	22.3
Cadmium	<1
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Greylock Consulting, LLC
Date Received:	NA	Project:	BOJO RI/FS, F&BI 010099
Date Extracted:	10/12/10	Lab ID:	I0-577 mb
Date Analyzed:	10/15/10	Data File:	I0-577 mb.018
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	108	60	125
Indium	100	60	125
Holmium	97	60	125

Analyte:	Concentration ug/L (ppb)
Chromium	<1
Copper	<1
Zinc	<1
Arsenic	<1
Cadmium	<1
Lead	<1

Date of Report: 10/25/10
Date Received: 10/07/10
Project: BOJO RI/FS, F&BI 010099
Date Extracted: 10/12/10
Date Analyzed: 10/13/10

RESULTS FROM THE ANALYSIS OF THE WATER SAMPLES FOR DISSOLVED MERCURY USING EPA METHOD 1631E

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Dissolved Mercury
MW-1 010099-01	<0.025
MW-2 010099-02	<0.025
MW-3 010099-03	<0.025
MW-4 010099-04	<0.025
MW-5 010099-05	<0.025
MW-6 010099-06	<0.025
MW-7 010099-07	<0.025
MW-8 010099-08	<0.025
MW-9 010099-09	<0.025
MW-10 010099-10	<0.025
Method Blank	<0.025

Date of Report: 10/25/10
Date Received: 10/07/10
Project: BOJO RI/FS, F&BI 010099
Date Extracted: 10/12/10
Date Analyzed: 10/13/10

RESULTS FROM THE ANALYSIS OF THE WATER SAMPLES FOR TOTAL MERCURY USING EPA METHOD 1631E

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Total Mercury
MW-1 010099-01	<0.025
MW-2 010099-02	<0.025
MW-3 010099-03	<0.025
MW-4 010099-04	<0.025
MW-5 010099-05	<0.025
MW-6 010099-06	<0.025
MW-7 010099-07	<0.025
MW-8 010099-08	<0.025
MW-9 010099-09	0.029
MW-10 010099-10	<0.025
Method Blank	<0.025

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-1	Client:	Greylock Consulting, LLC
Date Received:	10/07/10	Project:	BOJO RI/FS, F&BI 010099
Date Extracted:	10/12/10	Lab ID:	010099-01
Date Analyzed:	10/13/10	Data File:	101237.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	63	127
Toluene-d8	97	60	129
4-Bromofluorobenzene	114	51	145

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	<0.2	Dibromochloromethane	<1
Bromomethane	<1	1,2-Dibromoethane (EDB)	<1
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<10	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Methylene chloride	<5	o-Xylene	<1
Methyl t-butyl ether (MTBE)	<1	Styrene	<1
trans-1,2-Dichloroethene	<1	Isopropylbenzene	<1
1,1-Dichloroethane	<1	Bromoform	<1
2,2-Dichloropropane	<1	n-Propylbenzene	<1
cis-1,2-Dichloroethene	<1	Bromobenzene	<1
Chloroform	<1	1,3,5-Trimethylbenzene	<1
2-Butanone (MEK)	<10	1,1,2,2-Tetrachloroethane	<1
1,2-Dichloroethane (EDC)	<1	1,2,3-Trichloropropane	<1
1,1,1-Trichloroethane	<1	2-Chlorotoluene	<1
1,1-Dichloropropene	<1	4-Chlorotoluene	<1
Carbon tetrachloride	<1	tert-Butylbenzene	<1
Benzene	<0.35	1,2,4-Trimethylbenzene	<1
Trichloroethene	<1	sec-Butylbenzene	<1
1,2-Dichloropropane	<1	p-Isopropyltoluene	<1
Bromodichloromethane	<1	1,3-Dichlorobenzene	<1
Dibromomethane	<1	1,4-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dichlorobenzene	<1
cis-1,3-Dichloropropene	<1	1,2-Dibromo-3-chloropropane	<10
Toluene	<1	1,2,4-Trichlorobenzene	<1
trans-1,3-Dichloropropene	<1	Hexachlorobutadiene	<1
1,1,2-Trichloroethane	<1	Naphthalene	<1
2-Hexanone	<10	1,2,3-Trichlorobenzene	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID: MW-2
Date Received: 10/07/10
Date Extracted: 10/12/10
Date Analyzed: 10/13/10
Matrix: Water
Units: ug/L (ppb)

Client: Greylock Consulting, LLC
Project: BOJO RI/FS, F&BI 010099
Lab ID: 010099-02
Data File: 101238.D
Instrument: GCMS4
Operator: VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	63	127
Toluene-d8	96	60	129
4-Bromofluorobenzene	114	51	145

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	<0.2	Dibromochloromethane	<1
Bromomethane	<1	1,2-Dibromoethane (EDB)	<1
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<10	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Methylene chloride	<5	o-Xylene	<1
Methyl t-butyl ether (MTBE)	<1	Styrene	<1
trans-1,2-Dichloroethene	<1	Isopropylbenzene	<1
1,1-Dichloroethane	<1	Bromoform	<1
2,2-Dichloropropane	<1	n-Propylbenzene	<1
cis-1,2-Dichloroethene	<1	Bromobenzene	<1
Chloroform	<1	1,3,5-Trimethylbenzene	<1
2-Butanone (MEK)	<10	1,1,2,2-Tetrachloroethane	<1
1,2-Dichloroethane (EDC)	<1	1,2,3-Trichloropropane	<1
1,1,1-Trichloroethane	<1	2-Chlorotoluene	<1
1,1-Dichloropropene	<1	4-Chlorotoluene	<1
Carbon tetrachloride	<1	tert-Butylbenzene	<1
Benzene	<0.35	1,2,4-Trimethylbenzene	<1
Trichloroethene	<1	sec-Butylbenzene	<1
1,2-Dichloropropane	<1	p-Isopropyltoluene	<1
Bromodichloromethane	<1	1,3-Dichlorobenzene	<1
Dibromomethane	<1	1,4-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dichlorobenzene	<1
cis-1,3-Dichloropropene	<1	1,2-Dibromo-3-chloropropane	<10
Toluene	<1	1,2,4-Trichlorobenzene	<1
trans-1,3-Dichloropropene	<1	Hexachlorobutadiene	<1
1,1,2-Trichloroethane	<1	Naphthalene	<1
2-Hexanone	<10	1,2,3-Trichlorobenzene	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-3	Client:	Greylock Consulting, LLC
Date Received:	10/07/10	Project:	BOJO RI/FS, F&BI 010099
Date Extracted:	10/12/10	Lab ID:	010099-03
Date Analyzed:	10/13/10	Data File:	101239.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	63	127
Toluene-d8	97	60	129
4-Bromofluorobenzene	115	51	145

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	<0.2	Dibromochloromethane	<1
Bromomethane	<1	1,2-Dibromoethane (EDB)	<1
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<10	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Methylene chloride	<5	o-Xylene	<1
Methyl t-butyl ether (MTBE)	<1	Styrene	<1
trans-1,2-Dichloroethene	<1	Isopropylbenzene	<1
1,1-Dichloroethane	<1	Bromoform	<1
2,2-Dichloropropane	<1	n-Propylbenzene	<1
cis-1,2-Dichloroethene	<1	Bromobenzene	<1
Chloroform	<1	1,3,5-Trimethylbenzene	<1
2-Butanone (MEK)	<10	1,1,2,2-Tetrachloroethane	<1
1,2-Dichloroethane (EDC)	<1	1,2,3-Trichloropropane	<1
1,1,1-Trichloroethane	<1	2-Chlorotoluene	<1
1,1-Dichloropropene	<1	4-Chlorotoluene	<1
Carbon tetrachloride	<1	tert-Butylbenzene	<1
Benzene	<0.35	1,2,4-Trimethylbenzene	<1
Trichloroethene	<1	sec-Butylbenzene	<1
1,2-Dichloropropane	<1	p-Isopropyltoluene	<1
Bromodichloromethane	<1	1,3-Dichlorobenzene	<1
Dibromomethane	<1	1,4-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dichlorobenzene	<1
cis-1,3-Dichloropropene	<1	1,2-Dibromo-3-chloropropane	<10
Toluene	<1	1,2,4-Trichlorobenzene	<1
trans-1,3-Dichloropropene	<1	Hexachlorobutadiene	<1
1,1,2-Trichloroethane	<1	Naphthalene	<1
2-Hexanone	<10	1,2,3-Trichlorobenzene	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-4	Client:	Greylock Consulting, LLC
Date Received:	10/07/10	Project:	BOJO RI/FS, F&BI 010099
Date Extracted:	10/12/10	Lab ID:	010099-04
Date Analyzed:	10/13/10	Data File:	101240.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	63	127
Toluene-d8	97	60	129
4-Bromofluorobenzene	104	51	145

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	<0.2	Dibromochloromethane	<1
Bromomethane	<1	1,2-Dibromoethane (EDB)	<1
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<10	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Methylene chloride	<5	o-Xylene	<1
Methyl t-butyl ether (MTBE)	<1	Styrene	<1
trans-1,2-Dichloroethene	<1	Isopropylbenzene	<1
1,1-Dichloroethane	<1	Bromoform	<1
2,2-Dichloropropane	<1	n-Propylbenzene	<1
cis-1,2-Dichloroethene	<1	Bromobenzene	<1
Chloroform	<1	1,3,5-Trimethylbenzene	<1
2-Butanone (MEK)	<10	1,1,2,2-Tetrachloroethane	<1
1,2-Dichloroethane (EDC)	<1	1,2,3-Trichloropropane	<1
1,1,1-Trichloroethane	<1	2-Chlorotoluene	<1
1,1-Dichloropropene	<1	4-Chlorotoluene	<1
Carbon tetrachloride	<1	tert-Butylbenzene	<1
Benzene	<0.35	1,2,4-Trimethylbenzene	<1
Trichloroethene	<1	sec-Butylbenzene	<1
1,2-Dichloropropane	<1	p-Isopropyltoluene	<1
Bromodichloromethane	<1	1,3-Dichlorobenzene	<1
Dibromomethane	<1	1,4-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dichlorobenzene	<1
cis-1,3-Dichloropropene	<1	1,2-Dibromo-3-chloropropane	<10
Toluene	<1	1,2,4-Trichlorobenzene	<1
trans-1,3-Dichloropropene	<1	Hexachlorobutadiene	<1
1,1,2-Trichloroethane	<1	Naphthalene	<1
2-Hexanone	<10	1,2,3-Trichlorobenzene	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID: MW-5
Date Received: 10/07/10
Date Extracted: 10/12/10
Date Analyzed: 10/13/10
Matrix: Water
Units: ug/L (ppb)

Client: Greylock Consulting, LLC
Project: BOJO RI/FS, F&BI 010099
Lab ID: 010099-05
Data File: 101241.D
Instrument: GCMS4
Operator: VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	98	63	127
Toluene-d8	96	60	129
4-Bromofluorobenzene	107	51	145

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	<0.2	Dibromochloromethane	<1
Bromomethane	<1	1,2-Dibromoethane (EDB)	<1
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<10	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Methylene chloride	<5	o-Xylene	<1
Methyl t-butyl ether (MTBE)	<1	Styrene	<1
trans-1,2-Dichloroethene	<1	Isopropylbenzene	<1
1,1-Dichloroethane	<1	Bromoform	<1
2,2-Dichloropropane	<1	n-Propylbenzene	<1
cis-1,2-Dichloroethene	<1	Bromobenzene	<1
Chloroform	<1	1,3,5-Trimethylbenzene	<1
2-Butanone (MEK)	<10	1,1,2,2-Tetrachloroethane	<1
1,2-Dichloroethane (EDC)	<1	1,2,3-Trichloropropane	<1
1,1,1-Trichloroethane	<1	2-Chlorotoluene	<1
1,1-Dichloropropene	<1	4-Chlorotoluene	<1
Carbon tetrachloride	<1	tert-Butylbenzene	<1
Benzene	<0.35	1,2,4-Trimethylbenzene	<1
Trichloroethene	<1	sec-Butylbenzene	<1
1,2-Dichloropropane	<1	p-Isopropyltoluene	<1
Bromodichloromethane	<1	1,3-Dichlorobenzene	<1
Dibromomethane	<1	1,4-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dichlorobenzene	<1
cis-1,3-Dichloropropene	<1	1,2-Dibromo-3-chloropropane	<10
Toluene	<1	1,2,4-Trichlorobenzene	<1
trans-1,3-Dichloropropene	<1	Hexachlorobutadiene	<1
1,1,2-Trichloroethane	<1	Naphthalene	<1
2-Hexanone	<10	1,2,3-Trichlorobenzene	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-6	Client:	Greylock Consulting, LLC
Date Received:	10/07/10	Project:	BOJO RI/FS, F&BI 010099
Date Extracted:	10/12/10	Lab ID:	010099-06
Date Analyzed:	10/13/10	Data File:	101242.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	63	127
Toluene-d8	96	60	129
4-Bromofluorobenzene	108	51	145

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	<0.2	Dibromochloromethane	<1
Bromomethane	<1	1,2-Dibromoethane (EDB)	<1
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<10	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Methylene chloride	<5	o-Xylene	<1
Methyl t-butyl ether (MTBE)	<1	Styrene	<1
trans-1,2-Dichloroethene	<1	Isopropylbenzene	<1
1,1-Dichloroethane	<1	Bromoform	<1
2,2-Dichloropropane	<1	n-Propylbenzene	<1
cis-1,2-Dichloroethene	<1	Bromobenzene	<1
Chloroform	<1	1,3,5-Trimethylbenzene	<1
2-Butanone (MEK)	<10	1,1,2,2-Tetrachloroethane	<1
1,2-Dichloroethane (EDC)	<1	1,2,3-Trichloropropane	<1
1,1,1-Trichloroethane	<1	2-Chlorotoluene	<1
1,1-Dichloropropene	<1	4-Chlorotoluene	<1
Carbon tetrachloride	<1	tert-Butylbenzene	<1
Benzene	<0.35	1,2,4-Trimethylbenzene	<1
Trichloroethene	<1	sec-Butylbenzene	<1
1,2-Dichloropropane	<1	p-Isopropyltoluene	<1
Bromodichloromethane	<1	1,3-Dichlorobenzene	<1
Dibromomethane	<1	1,4-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dichlorobenzene	<1
cis-1,3-Dichloropropene	<1	1,2-Dibromo-3-chloropropane	<10
Toluene	<1	1,2,4-Trichlorobenzene	<1
trans-1,3-Dichloropropene	<1	Hexachlorobutadiene	<1
1,1,2-Trichloroethane	<1	Naphthalene	<1
2-Hexanone	<10	1,2,3-Trichlorobenzene	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-7	Client:	Greylock Consulting, LLC
Date Received:	10/07/10	Project:	BOJO RI/FS, F&BI 010099
Date Extracted:	10/12/10	Lab ID:	010099-07
Date Analyzed:	10/13/10	Data File:	101243.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	63	127
Toluene-d8	97	60	129
4-Bromofluorobenzene	110	51	145

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	<0.2	Dibromochloromethane	<1
Bromomethane	<1	1,2-Dibromoethane (EDB)	<1
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<10	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Methylene chloride	<5	o-Xylene	<1
Methyl t-butyl ether (MTBE)	<1	Styrene	<1
trans-1,2-Dichloroethene	<1	Isopropylbenzene	<1
1,1-Dichloroethane	<1	Bromoform	<1
2,2-Dichloropropane	<1	n-Propylbenzene	<1
cis-1,2-Dichloroethene	<1	Bromobenzene	<1
Chloroform	<1	1,3,5-Trimethylbenzene	<1
2-Butanone (MEK)	<10	1,1,2,2-Tetrachloroethane	<1
1,2-Dichloroethane (EDC)	<1	1,2,3-Trichloropropane	<1
1,1,1-Trichloroethane	<1	2-Chlorotoluene	<1
1,1-Dichloropropene	<1	4-Chlorotoluene	<1
Carbon tetrachloride	<1	tert-Butylbenzene	<1
Benzene	<0.35	1,2,4-Trimethylbenzene	<1
Trichloroethene	<1	sec-Butylbenzene	<1
1,2-Dichloropropane	<1	p-Isopropyltoluene	<1
Bromodichloromethane	<1	1,3-Dichlorobenzene	<1
Dibromomethane	<1	1,4-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dichlorobenzene	<1
cis-1,3-Dichloropropene	<1	1,2-Dibromo-3-chloropropane	<10
Toluene	<1	1,2,4-Trichlorobenzene	<1
trans-1,3-Dichloropropene	<1	Hexachlorobutadiene	<1
1,1,2-Trichloroethane	<1	Naphthalene	<1
2-Hexanone	<10	1,2,3-Trichlorobenzene	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-8	Client:	Greylock Consulting, LLC
Date Received:	10/07/10	Project:	BOJO RI/FS, F&BI 010099
Date Extracted:	10/12/10	Lab ID:	010099-08
Date Analyzed:	10/13/10	Data File:	101244.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	104	63	127
Toluene-d8	96	60	129
4-Bromofluorobenzene	109	51	145

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	<0.2	Dibromochloromethane	<1
Bromomethane	<1	1,2-Dibromoethane (EDB)	<1
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<10	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Methylene chloride	<5	o-Xylene	<1
Methyl t-butyl ether (MTBE)	<1	Styrene	<1
trans-1,2-Dichloroethene	<1	Isopropylbenzene	<1
1,1-Dichloroethane	<1	Bromoform	<1
2,2-Dichloropropane	<1	n-Propylbenzene	<1
cis-1,2-Dichloroethene	<1	Bromobenzene	<1
Chloroform	<1	1,3,5-Trimethylbenzene	<1
2-Butanone (MEK)	<10	1,1,2,2-Tetrachloroethane	<1
1,2-Dichloroethane (EDC)	<1	1,2,3-Trichloropropane	<1
1,1,1-Trichloroethane	<1	2-Chlorotoluene	<1
1,1-Dichloropropene	<1	4-Chlorotoluene	<1
Carbon tetrachloride	<1	tert-Butylbenzene	<1
Benzene	<0.35	1,2,4-Trimethylbenzene	<1
Trichloroethene	<1	sec-Butylbenzene	<1
1,2-Dichloropropane	<1	p-Isopropyltoluene	<1
Bromodichloromethane	<1	1,3-Dichlorobenzene	<1
Dibromomethane	<1	1,4-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dichlorobenzene	<1
cis-1,3-Dichloropropene	<1	1,2-Dibromo-3-chloropropane	<10
Toluene	<1	1,2,4-Trichlorobenzene	<1
trans-1,3-Dichloropropene	<1	Hexachlorobutadiene	<1
1,1,2-Trichloroethane	<1	Naphthalene	<1
2-Hexanone	<10	1,2,3-Trichlorobenzene	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-9	Client:	Greylock Consulting, LLC
Date Received:	10/07/10	Project:	BOJO RI/FS, F&BI 010099
Date Extracted:	10/12/10	Lab ID:	010099-09
Date Analyzed:	10/13/10	Data File:	101245.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	63	127
Toluene-d8	96	60	129
4-Bromofluorobenzene	108	51	145

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	<0.2	Dibromochloromethane	<1
Bromomethane	<1	1,2-Dibromoethane (EDB)	<1
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<10	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Methylene chloride	<5	o-Xylene	<1
Methyl t-butyl ether (MTBE)	<1	Styrene	<1
trans-1,2-Dichloroethene	<1	Isopropylbenzene	<1
1,1-Dichloroethane	<1	Bromoform	<1
2,2-Dichloropropane	<1	n-Propylbenzene	<1
cis-1,2-Dichloroethene	<1	Bromobenzene	<1
Chloroform	<1	1,3,5-Trimethylbenzene	<1
2-Butanone (MEK)	<10	1,1,2,2-Tetrachloroethane	<1
1,2-Dichloroethane (EDC)	<1	1,2,3-Trichloropropane	<1
1,1,1-Trichloroethane	<1	2-Chlorotoluene	<1
1,1-Dichloropropene	<1	4-Chlorotoluene	<1
Carbon tetrachloride	<1	tert-Butylbenzene	<1
Benzene	0.52	1,2,4-Trimethylbenzene	<1
Trichloroethene	<1	sec-Butylbenzene	<1
1,2-Dichloropropane	<1	p-Isopropyltoluene	<1
Bromodichloromethane	<1	1,3-Dichlorobenzene	<1
Dibromomethane	<1	1,4-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dichlorobenzene	<1
cis-1,3-Dichloropropene	<1	1,2-Dibromo-3-chloropropane	<10
Toluene	<1	1,2,4-Trichlorobenzene	<1
trans-1,3-Dichloropropene	<1	Hexachlorobutadiene	<1
1,1,2-Trichloroethane	<1	Naphthalene	<1
2-Hexanone	<10	1,2,3-Trichlorobenzene	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	MW-10	Client:	Greylock Consulting, LLC
Date Received:	10/07/10	Project:	BOJO RI/FS, F&BI 010099
Date Extracted:	10/12/10	Lab ID:	010099-10
Date Analyzed:	10/13/10	Data File:	101246.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	63	127
Toluene-d8	95	60	129
4-Bromofluorobenzene	109	51	145

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	<0.2	Dibromochloromethane	<1
Bromomethane	<1	1,2-Dibromoethane (EDB)	<1
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<10	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Methylene chloride	<5	o-Xylene	<1
Methyl t-butyl ether (MTBE)	<1	Styrene	<1
trans-1,2-Dichloroethene	<1	Isopropylbenzene	<1
1,1-Dichloroethane	<1	Bromoform	<1
2,2-Dichloropropane	<1	n-Propylbenzene	<1
cis-1,2-Dichloroethene	<1	Bromobenzene	<1
Chloroform	<1	1,3,5-Trimethylbenzene	<1
2-Butanone (MEK)	<10	1,1,2,2-Tetrachloroethane	<1
1,2-Dichloroethane (EDC)	<1	1,2,3-Trichloropropane	<1
1,1,1-Trichloroethane	<1	2-Chlorotoluene	<1
1,1-Dichloropropene	<1	4-Chlorotoluene	<1
Carbon tetrachloride	<1	tert-Butylbenzene	<1
Benzene	<0.35	1,2,4-Trimethylbenzene	<1
Trichloroethene	<1	sec-Butylbenzene	<1
1,2-Dichloropropane	<1	p-Isopropyltoluene	<1
Bromodichloromethane	<1	1,3-Dichlorobenzene	<1
Dibromomethane	<1	1,4-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dichlorobenzene	<1
cis-1,3-Dichloropropene	<1	1,2-Dibromo-3-chloropropane	<10
Toluene	<1	1,2,4-Trichlorobenzene	<1
trans-1,3-Dichloropropene	<1	Hexachlorobutadiene	<1
1,1,2-Trichloroethane	<1	Naphthalene	<1
2-Hexanone	<10	1,2,3-Trichlorobenzene	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Greylock Consulting, LLC
Date Received:	NA	Project:	BOJO RI/FS, F&BI 010099
Date Extracted:	10/12/10	Lab ID:	001640 mb
Date Analyzed:	10/12/10	Data File:	101222.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	97	63	127
Toluene-d8	95	60	129
4-Bromofluorobenzene	112	51	145

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	<0.2	Dibromochloromethane	<1
Bromomethane	<1	1,2-Dibromoethane (EDB)	<1
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<10	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Methylene chloride	<5	o-Xylene	<1
Methyl t-butyl ether (MTBE)	<1	Styrene	<1
trans-1,2-Dichloroethene	<1	Isopropylbenzene	<1
1,1-Dichloroethane	<1	Bromoform	<1
2,2-Dichloropropane	<1	n-Propylbenzene	<1
cis-1,2-Dichloroethene	<1	Bromobenzene	<1
Chloroform	<1	1,3,5-Trimethylbenzene	<1
2-Butanone (MEK)	<10	1,1,2,2-Tetrachloroethane	<1
1,2-Dichloroethane (EDC)	<1	1,2,3-Trichloropropane	<1
1,1,1-Trichloroethane	<1	2-Chlorotoluene	<1
1,1-Dichloropropene	<1	4-Chlorotoluene	<1
Carbon tetrachloride	<1	tert-Butylbenzene	<1
Benzene	<0.35	1,2,4-Trimethylbenzene	<1
Trichloroethene	<1	sec-Butylbenzene	<1
1,2-Dichloropropane	<1	p-Isopropyltoluene	<1
Bromodichloromethane	<1	1,3-Dichlorobenzene	<1
Dibromomethane	<1	1,4-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dichlorobenzene	<1
cis-1,3-Dichloropropene	<1	1,2-Dibromo-3-chloropropane	<10
Toluene	<1	1,2,4-Trichlorobenzene	<1
trans-1,3-Dichloropropene	<1	Hexachlorobutadiene	<1
1,1,2-Trichloroethane	<1	Naphthalene	<1
2-Hexanone	<10	1,2,3-Trichlorobenzene	<1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW-1	Client:	Greylock Consulting, LLC
Date Received:	10/07/10	Project:	BOJO RI/FS, F&BI 010099
Date Extracted:	10/11/10	Lab ID:	010099-01
Date Analyzed:	10/15/10	Data File:	101512.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	100	50	150
Benzo(a)anthracene-d12	79	50	129

Compounds:	Concentration ug/L (ppb)
Benz(a)anthracene	<0.018
Chrysene	<0.018
Benzo(a)pyrene	<0.018
Benzo(b)fluoranthene	<0.018
Benzo(k)fluoranthene	<0.018
Indeno(1,2,3-cd)pyrene	<0.018
Dibenz(a,h)anthracene	<0.018

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW-2	Client:	Greylock Consulting, LLC
Date Received:	10/07/10	Project:	BOJO RI/FS, F&BI 010099
Date Extracted:	10/11/10	Lab ID:	010099-02
Date Analyzed:	10/15/10	Data File:	101517.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	97	50	150
Benzo(a)anthracene-d12	84	50	129

Compounds:	Concentration ug/L (ppb)
Benz(a)anthracene	<0.018
Chrysene	<0.018
Benzo(a)pyrene	<0.018
Benzo(b)fluoranthene	<0.018
Benzo(k)fluoranthene	<0.018
Indeno(1,2,3-cd)pyrene	<0.018
Dibenz(a,h)anthracene	<0.018

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW-3	Client:	Greylock Consulting, LLC
Date Received:	10/07/10	Project:	BOJO RI/FS, F&BI 010099
Date Extracted:	10/11/10	Lab ID:	010099-03
Date Analyzed:	10/15/10	Data File:	101513.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	98	50	150
Benzo(a)anthracene-d12	87	50	129

Compounds:	Concentration ug/L (ppb)
Benz(a)anthracene	<0.018
Chrysene	<0.018
Benzo(a)pyrene	<0.018
Benzo(b)fluoranthene	<0.018
Benzo(k)fluoranthene	<0.018
Indeno(1,2,3-cd)pyrene	<0.018
Dibenz(a,h)anthracene	<0.018

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW-4	Client:	Greylock Consulting, LLC
Date Received:	10/07/10	Project:	BOJO RI/FS, F&BI 010099
Date Extracted:	10/11/10	Lab ID:	010099-04
Date Analyzed:	10/15/10	Data File:	101520.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	98	50	150
Benzo(a)anthracene-d12	86	50	129

Compounds:	Concentration ug/L (ppb)
Benz(a)anthracene	<0.018
Chrysene	<0.018
Benzo(a)pyrene	<0.018
Benzo(b)fluoranthene	<0.018
Benzo(k)fluoranthene	<0.018
Indeno(1,2,3-cd)pyrene	<0.018
Dibenz(a,h)anthracene	<0.018

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID: MW-5
Date Received: 10/07/10
Date Extracted: 10/11/10
Date Analyzed: 10/21/10
Matrix: Water
Units: ug/L (ppb)

Client: Greylock Consulting, LLC
Project: BOJO RI/FS, F&BI 010099
Lab ID: 010099-05
Data File: 102023.D
Instrument: GCMS6
Operator: YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	73	50	150
Benzo(a)anthracene-d12	67	50	129

Compounds:	Concentration ug/L (ppb)
Benz(a)anthracene	<0.018
Chrysene	<0.018
Benzo(a)pyrene	<0.018
Benzo(b)fluoranthene	<0.018
Benzo(k)fluoranthene	<0.018
Indeno(1,2,3-cd)pyrene	<0.018
Dibenz(a,h)anthracene	<0.018

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW-6	Client:	Greylock Consulting, LLC
Date Received:	10/07/10	Project:	BOJO RI/FS, F&BI 010099
Date Extracted:	10/11/10	Lab ID:	010099-06
Date Analyzed:	10/21/10	Data File:	102024.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	86	50	150
Benzo(a)anthracene-d12	83	50	129

Compounds:	Concentration ug/L (ppb)
Benz(a)anthracene	0.022
Chrysene	0.018
Benzo(a)pyrene	<0.018
Benzo(b)fluoranthene	<0.018
Benzo(k)fluoranthene	<0.018
Indeno(1,2,3-cd)pyrene	<0.018
Dibenz(a,h)anthracene	<0.018
Dibenz(a,h)anthracene	<0.018

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW-7	Client:	Greylock Consulting, LLC
Date Received:	10/07/10	Project:	BOJO RI/FS, F&BI 010099
Date Extracted:	10/11/10	Lab ID:	010099-07
Date Analyzed:	10/15/10	Data File:	101519.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	99	50	150
Benzo(a)anthracene-d12	61	50	129

Compounds:	Concentration ug/L (ppb)
Benz(a)anthracene	<0.018
Chrysene	<0.018
Benzo(a)pyrene	<0.018
Benzo(b)fluoranthene	<0.018
Benzo(k)fluoranthene	<0.018
Indeno(1,2,3-cd)pyrene	<0.018
Dibenz(a,h)anthracene	<0.018

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW-8	Client:	Greylock Consulting, LLC
Date Received:	10/07/10	Project:	BOJO RI/FS, F&BI 010099
Date Extracted:	10/11/10	Lab ID:	010099-08
Date Analyzed:	10/15/10	Data File:	101514.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	98	50	150
Benzo(a)anthracene-d12	43 ip	50	129

Compounds:	Concentration ug/L (ppb)
Benz(a)anthracene	<0.018
Chrysene	<0.018
Benzo(a)pyrene	<0.018
Benzo(b)fluoranthene	<0.018
Benzo(k)fluoranthene	<0.018
Indeno(1,2,3-cd)pyrene	<0.018
Dibenz(a,h)anthracene	<0.018

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW-9	Client:	Greylock Consulting, LLC
Date Received:	10/07/10	Project:	BOJO RI/FS, F&BI 010099
Date Extracted:	10/11/10	Lab ID:	010099-09
Date Analyzed:	10/15/10	Data File:	101515.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	108	50	150
Benzo(a)anthracene-d12	100	50	129

Compounds:	Concentration ug/L (ppb)
Benz(a)anthracene	<0.018
Chrysene	<0.018
Benzo(a)pyrene	<0.018
Benzo(b)fluoranthene	<0.018
Benzo(k)fluoranthene	<0.018
Indeno(1,2,3-cd)pyrene	<0.018
Dibenz(a,h)anthracene	<0.018

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	MW-10	Client:	Greylock Consulting, LLC
Date Received:	10/07/10	Project:	BOJO RI/FS, F&BI 010099
Date Extracted:	10/11/10	Lab ID:	010099-10
Date Analyzed:	10/15/10	Data File:	101516.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	99	50	150
Benzo(a)anthracene-d12	45 ip	50	129

Compounds:	Concentration ug/L (ppb)
Benz(a)anthracene	<0.018
Chrysene	<0.018
Benzo(a)pyrene	<0.018
Benzo(b)fluoranthene	<0.018
Benzo(k)fluoranthene	<0.018
Indeno(1,2,3-cd)pyrene	<0.018
Dibenz(a,h)anthracene	<0.018

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	Method Blank	Client:	Greylock Consulting, LLC
Date Received:	NA	Project:	BOJO RI/FS, F&BI 010099
Date Extracted:	10/11/25	Lab ID:	00-1625 mb
Date Analyzed:	10/15/10	Data File:	101507.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	92	50	150
Benzo(a)anthracene-d12	87	50	129

Compounds:	Concentration ug/L (ppb)
Benz(a)anthracene	<0.018
Chrysene	<0.018
Benzo(a)pyrene	<0.018
Benzo(b)fluoranthene	<0.018
Benzo(k)fluoranthene	<0.018
Indeno(1,2,3-cd)pyrene	<0.018
Dibenz(a,h)anthracene	<0.018

Date of Report: 10/25/10
Date Received: 10/07/10
Project: BOJO RI/FS, F&BI 010099

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TPH AS GASOLINE USING METHOD NWTPH-Gx

Laboratory Code: 010099-02 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference (Limit 20)
Gasoline	ug/L (ppb)	<100	<100	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Gasoline	ug/L (ppb)	1,000	139 vo	69-134

Date of Report: 10/25/10
Date Received: 10/07/10
Project: BOJO RI/FS, F&BI 010099

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: Laboratory Control Sample Silica Gel

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	96	97	58-134	1

Date of Report: 10/25/10
Date Received: 10/07/10
Project: BOJO RI/FS, F&BI 010099

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL METALS USING EPA METHOD 200.8

Laboratory Code: 010099-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Chromium	ug/L (ppb)	20	<1	95	106	67-132	11
Copper	ug/L (ppb)	20	<1	102	98	50-144	4
Zinc	ug/L (ppb)	50	43.7	87 b	109 b	46-148	22 b
Arsenic	ug/L (ppb)	10	<1	110	108	56-167	2
Cadmium	ug/L (ppb)	5	<1	101	104	86-118	3
Lead	ug/L (ppb)	10	<1	106	102	76-125	4

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Chromium	ug/L (ppb)	20	94	66-135
Copper	ug/L (ppb)	20	98	66-134
Zinc	ug/L (ppb)	50	90	57-135
Arsenic	ug/L (ppb)	10	105	55-128
Cadmium	ug/L (ppb)	5	104	66-135
Lead	ug/L (ppb)	10	102	67-135

Date of Report: 10/25/10
Date Received: 10/07/10
Project: BOJO RI/FS, F&BI 010099

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED METALS USING EPA METHOD 200.8

Laboratory Code: 010099-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Chromium	ug/L (ppb)	20	<1	122	106	67-132	14
Copper	ug/L (ppb)	20	<1	111	110	50-144	1
Zinc	ug/L (ppb)	50	7.94	121	122	46-148	1
Arsenic	ug/L (ppb)	10	<1	119	121	56-167	2
Cadmium	ug/L (ppb)	5	<1	108	113	86-118	5
Lead	ug/L (ppb)	10	<1	115	107	76-125	7

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Chromium	ug/L (ppb)	20	114	66-135
Copper	ug/L (ppb)	20	114	66-134
Zinc	ug/L (ppb)	50	119	57-135
Arsenic	ug/L (ppb)	10	114	55-128
Cadmium	ug/L (ppb)	5	119	66-135
Lead	ug/L (ppb)	10	111	67-135

Date of Report: 10/25/10
Date Received: 10/07/10
Project: BOJO RI/FS, F&BI 010099

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED MERCURY USING EPA METHOD 1631E

Laboratory Code: 010099-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Mercury	ug/L (ppb)	0.5	<0.2	89	100	48-160	12

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Mercury	ug/L (ppb)	0.5	98	79-126

Date of Report: 10/25/10
Date Received: 10/07/10
Project: BOJO RI/FS, F&BI 010099

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL MERCURY USING EPA METHOD 1631E

Laboratory Code: 010099-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Mercury	ug/L (ppb)	0.5	<0.025	97	100	48-160	3

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Mercury	ug/L (ppb)	0.5	107	79-126

Date of Report: 10/25/10
Date Received: 10/07/10
Project: BOJO RI/FS, F&BI 010099

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 010099-08 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Dichlorodifluoromethane	ug/L (ppb)	50	<10	81	10-172
Chloromethane	ug/L (ppb)	50	<10	75	25-166
Vinyl chloride	ug/L (ppb)	50	<0.2	74	36-166
Bromomethane	ug/L (ppb)	50	<1	79	47-169
Chloroethane	ug/L (ppb)	50	<1	93	46-160
Trichlorofluoromethane	ug/L (ppb)	50	<1	65	44-165
Acetone	ug/L (ppb)	250	<10	93	10-182
1,1-Dichloroethene	ug/L (ppb)	50	<1	89	60-136
Methylene chloride	ug/L (ppb)	50	<5	85	67-132
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	<1	95	74-127
trans-1,2-Dichloroethene	ug/L (ppb)	50	<1	98	72-129
1,1-Dichloroethane	ug/L (ppb)	50	<1	97	70-128
2,2-Dichloropropane	ug/L (ppb)	50	<1	61	43-154
cis-1,2-Dichloroethene	ug/L (ppb)	50	<1	95	71-127
Chloroform	ug/L (ppb)	50	<1	96	65-132
2-Butanone (MEK)	ug/L (ppb)	250	<10	95	10-129
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	<1	96	69-133
1,1,1-Trichloroethane	ug/L (ppb)	50	<1	101	60-146
1,1-Dichloropropene	ug/L (ppb)	50	<1	95	69-133
Carbon tetrachloride	ug/L (ppb)	50	<1	90	56-152
Benzene	ug/L (ppb)	50	<0.35	89	76-123
Trichloroethene	ug/L (ppb)	50	<1	89	66-135
1,2-Dichloropropane	ug/L (ppb)	50	<1	94	78-125
Bromodichloromethane	ug/L (ppb)	50	<1	95	61-150
Dibromomethane	ug/L (ppb)	50	<1	95	66-141
4-Methyl-2-pentanone	ug/L (ppb)	250	<10	93	10-134
cis-1,3-Dichloropropene	ug/L (ppb)	50	<1	88	74-134
Toluene	ug/L (ppb)	50	<1	96	76-122
trans-1,3-Dichloropropene	ug/L (ppb)	50	<1	87	76-130
1,1,2-Trichloroethane	ug/L (ppb)	50	<1	98	68-131
2-Hexanone	ug/L (ppb)	250	<10	104	10-142
1,3-Dichloropropane	ug/L (ppb)	50	<1	98	71-128
Tetrachloroethene	ug/L (ppb)	50	<1	90	73-129
Dibromochloromethane	ug/L (ppb)	50	<1	103	70-139
1,2-Dibromoethane (EDB)	ug/L (ppb)	50	<1	99	69-134
Chlorobenzene	ug/L (ppb)	50	<1	91	77-122
Ethylbenzene	ug/L (ppb)	50	<1	84	69-135
1,1,1,2-Tetrachloroethane	ug/L (ppb)	50	<1	97	73-137
m,p-Xylene	ug/L (ppb)	100	<2	82	69-135
o-Xylene	ug/L (ppb)	50	<1	92	68-137
Styrene	ug/L (ppb)	50	<1	89	71-133
Isopropylbenzene	ug/L (ppb)	50	<1	84	65-142
Bromoform	ug/L (ppb)	50	<1	98	65-142
n-Propylbenzene	ug/L (ppb)	50	<1	80	58-144
Bromobenzene	ug/L (ppb)	50	<1	92	75-124
1,3,5-Trimethylbenzene	ug/L (ppb)	50	<1	83	66-137
1,1,2,2-Tetrachloroethane	ug/L (ppb)	50	<1	96	51-154
1,2,3-Trichloropropane	ug/L (ppb)	50	<1	93	53-150
2-Chlorotoluene	ug/L (ppb)	50	<1	88	66-127
4-Chlorotoluene	ug/L (ppb)	50	<1	87	65-130
tert-Butylbenzene	ug/L (ppb)	50	<1	89	65-137
1,2,4-Trimethylbenzene	ug/L (ppb)	50	<1	88	59-146
sec-Butylbenzene	ug/L (ppb)	50	<1	84	64-140
p-Isopropyltoluene	ug/L (ppb)	50	<1	90	65-141
1,3-Dichlorobenzene	ug/L (ppb)	50	<1	89	72-123
1,4-Dichlorobenzene	ug/L (ppb)	50	<1	89	69-126
1,2-Dichlorobenzene	ug/L (ppb)	50	<1	91	69-128
1,2-Dibromo-3-chloropropane	ug/L (ppb)	50	<10	106	32-164
1,2,4-Trichlorobenzene	ug/L (ppb)	50	<1	99	76-132
Hexachlorobutadiene	ug/L (ppb)	50	<1	92	60-143
Naphthalene	ug/L (ppb)	50	<1	105	44-164
1,2,3-Trichlorobenzene	ug/L (ppb)	50	<1	101	70-143

Date of Report: 10/25/10
Date Received: 10/07/10
Project: BOJO RI/FS, F&BI 010099

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Dichlorodifluoromethane	ug/L (ppb)	50	88	93	25-158	6
Chloromethane	ug/L (ppb)	50	77	82	45-156	6
Vinyl chloride	ug/L (ppb)	50	76	87	50-154	13
Bromomethane	ug/L (ppb)	50	84	95	55-143	12
Chloroethane	ug/L (ppb)	50	82	89	58-146	8
Trichlorofluoromethane	ug/L (ppb)	50	88	96	50-150	9
Acetone	ug/L (ppb)	250	96	95	60-155	1
1,1-Dichloroethene	ug/L (ppb)	50	89	92	67-136	3
Methylene chloride	ug/L (ppb)	50	83	85	39-148	2
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	95	96	64-147	1
trans-1,2-Dichloroethene	ug/L (ppb)	50	98	98	68-128	0
1,1-Dichloroethane	ug/L (ppb)	50	98	97	79-121	1
2,2-Dichloropropane	ug/L (ppb)	50	90	82	58-153	9
cis-1,2-Dichloroethene	ug/L (ppb)	50	97	97	80-123	0
Chloroform	ug/L (ppb)	50	97	97	80-121	0
2-Butanone (MEK)	ug/L (ppb)	250	100	101	57-149	1
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	96	96	73-132	0
1,1,1-Trichloroethane	ug/L (ppb)	50	98	102	83-130	4
1,1-Dichloropropene	ug/L (ppb)	50	97	97	77-129	0
Carbon tetrachloride	ug/L (ppb)	50	100	102	75-158	2
Benzene	ug/L (ppb)	50	91	91	72-127	0
Trichloroethene	ug/L (ppb)	50	93	92	80-120	1
1,2-Dichloropropane	ug/L (ppb)	50	96	96	77-123	0
Bromodichloromethane	ug/L (ppb)	50	97	97	81-133	0
Dibromomethane	ug/L (ppb)	50	96	97	82-125	1
4-Methyl-2-pentanone	ug/L (ppb)	250	94	96	70-140	2
cis-1,3-Dichloropropene	ug/L (ppb)	50	97	95	82-132	2
Toluene	ug/L (ppb)	50	96	96	72-122	0
trans-1,3-Dichloropropene	ug/L (ppb)	50	98	96	80-136	2
1,1,2-Trichloroethane	ug/L (ppb)	50	98	97	75-124	1
2-Hexanone	ug/L (ppb)	250	100	101	64-152	1
1,3-Dichloropropane	ug/L (ppb)	50	98	97	76-126	1
Tetrachloroethene	ug/L (ppb)	50	93	92	76-121	1
Dibromochloromethane	ug/L (ppb)	50	103	102	84-133	1
1,2-Dibromoethane (EDB)	ug/L (ppb)	50	99	98	82-125	1
Chlorobenzene	ug/L (ppb)	50	95	95	83-114	0
Ethylbenzene	ug/L (ppb)	50	87	88	77-124	1
1,1,1,2-Tetrachloroethane	ug/L (ppb)	50	97	98	84-127	1
m,p-Xylene	ug/L (ppb)	100	87	86	83-125	1
o-Xylene	ug/L (ppb)	50	95	94	86-121	1
Styrene	ug/L (ppb)	50	95	94	85-127	1
Isopropylbenzene	ug/L (ppb)	50	87	87	87-122	0
Bromoform	ug/L (ppb)	50	106	105	74-136	1
n-Propylbenzene	ug/L (ppb)	50	84	84	74-126	0
Bromobenzene	ug/L (ppb)	50	95	94	80-121	1
1,3,5-Trimethylbenzene	ug/L (ppb)	50	87	87	80-126	0
1,1,2,2-Tetrachloroethane	ug/L (ppb)	50	94	96	66-126	2
1,2,3-Trichloropropane	ug/L (ppb)	50	92	93	67-124	1
2-Chlorotoluene	ug/L (ppb)	50	90	90	77-127	0
4-Chlorotoluene	ug/L (ppb)	50	90	90	78-128	0
tert-Butylbenzene	ug/L (ppb)	50	91	92	85-122	1
1,2,4-Trimethylbenzene	ug/L (ppb)	50	92	92	82-125	0
sec-Butylbenzene	ug/L (ppb)	50	88	88	80-125	0
p-Isopropyltoluene	ug/L (ppb)	50	96	96	82-127	0
1,3-Dichlorobenzene	ug/L (ppb)	50	94	93	85-116	1
1,4-Dichlorobenzene	ug/L (ppb)	50	94	94	84-121	0
1,2-Dichlorobenzene	ug/L (ppb)	50	96	95	85-116	1
1,2-Dibromo-3-chloropropane	ug/L (ppb)	50	105	107	57-141	2
1,2,4-Trichlorobenzene	ug/L (ppb)	50	106	103	72-130	3
Hexachlorobutadiene	ug/L (ppb)	50	103	99	53-141	4
Naphthalene	ug/L (ppb)	50	105	104	64-133	1
1,2,3-Trichlorobenzene	ug/L (ppb)	50	104	102	65-136	2

Date of Report: 10/25/10
Date Received: 10/07/10
Project: BOJO RI/FS, F&BI 010099

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR PNA'S BY EPA METHOD 8270D SIM

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Benz(a)anthracene	ug/L (ppb)	5	73	76	65-102	4
Chrysene	ug/L (ppb)	5	81	85	66-103	5
Benzo(b)fluoranthene	ug/L (ppb)	5	86	91	66-112	6
Benzo(k)fluoranthene	ug/L (ppb)	5	93	102	64-116	9
Benzo(a)pyrene	ug/L (ppb)	5	85	92	61-108	8
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	5	72	83	50-120	14
Dibenz(a,h)anthracene	ug/L (ppb)	5	73	86	51-115	16

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

A1 – More than one compound of similar molecule structure was identified with equal probability.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for this range fell outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte indicated may be due to carryover from previous sample injections.

d - The sample was diluted. Detection limits may be raised due to dilution.

ds - The sample was diluted. Detection limits are raised due to dilution and surrogate recoveries may not be meaningful.

dv - Insufficient sample was available to achieve normal reporting limits and limits are raised accordingly.

fb - Analyte present in the blank and the sample.

fc – The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. The variability is attributed to sample inhomogeneity.

ht - Analysis performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of normal control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j – The result is below normal reporting limits. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The analyte result in the laboratory control sample is out of control limits. The reported concentration should be considered an estimate.

jr - The rpd result in laboratory control sample associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the compound indicated is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc – The sample was received in a container not approved by the method. The value reported should be considered an estimate.

pr – The sample was received with incorrect preservation. The value reported should be considered an estimate.

ve - Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Charlene Morrow, M.S.
Yelena Aravkina, M.S.
Bradley T. Benson, B.S.
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January 21, 2011

Suzanne Dudziak, Project Manager
Greylock Consulting, LLC
720 S 33rd St, Suite 210
Federal Way, WA 98003

Dear Ms. Dudziak:

Included are the amended results from the testing of material submitted on September 17, 2010 from the Reliable Steel, F&BI 009162 project. Per your request, the PAH and mercury reporting limits were lowered.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
GRL0930R.DOC

FRIEDMAN & BRUYA, INC.

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September 30, 2010

Suzanne Dudziak, Project Manager
Greylock Consulting, LLC
720 S 33rd St, Suite 210
Federal Way, WA 98003

Dear Ms. Dudziak:

Included are the results from the testing of material submitted on September 17, 2010 from the Reliable Steel, F&BI 009162 project. There are 34 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
GRL0930R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on September 17, 2010 by Friedman & Bruya, Inc. from the Greylock Consulting, LLC Reliable Steel, F&BI 009162 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Greylock Consulting, LLC
009162-01	RI-SW-1
009162-02	RI-SW-2
009162-03	RI-SW-3
009162-04	RI-SW-4

The 8270D internal standard failed the acceptance criteria in sample RI-SW-1 and RI-SW-4 for di-n-octyl phthalate. The data were flagged accordingly.

The 8270C laboratory control sample and laboratory control sample duplicate failed the relative percent difference for hexachlorocyclopentadiene. The analyte was not analyzed for, therefore the data were acceptable.

All other quality control requirements were acceptable.

Date of Report: 09/30/10
Date Received: 09/17/10
Project: Reliable Steel, F&BI 009162
Date Extracted: 09/17/10
Date Analyzed: 09/20/10

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

Sample Extracts Passed Through a Silica Gel Column Prior to Analysis

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 51-134)
RI-SW-1 009162-01	<50	<250	65
RI-SW-2 009162-02	<50	<250	64
RI-SW-3 009162-03	<50	<250	70
RI-SW-4 009162-04	<50	<250	86
Method Blank 00-1483 MB	<50	<250	70

Date of Report: 09/30/10
Date Received: 09/17/10
Project: Reliable Steel, F&BI 009162
Date Analyzed: 09/17/10

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TURBIDITY USING METHOD SM2130B

Results Reported as NTU

Sample ID Laboratory ID	Date Sampled	Time Sampled	Turbidity
RI-SW-1 009162-01	09/16/10	10:30	92.6
RI-SW-2 009162-02	09/16/10	10:20	8.11
RI-SW-3 009162-03	09/16/10	10:09	10.1
RI-SW-4 009162-04	09/16/10	09:57	14.1
Method Blank			<0.5

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	RI-SW-1	Client:	Greylock Consulting, LLC
Date Received:	09/17/10	Project:	Reliable Steel, F&BI 009162
Date Extracted:	09/17/10	Lab ID:	009162-01
Date Analyzed:	09/23/10	Data File:	009162-01.015
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	92	60	125
Indium	95	60	125
Holmium	96	60	125

Analyte:	Concentration ug/L (ppb)
Chromium	<1
Copper	5.26
Zinc	14.4
Arsenic	<1
Cadmium	<1
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	RI-SW-2	Client:	Greylock Consulting, LLC
Date Received:	09/17/10	Project:	Reliable Steel, F&BI 009162
Date Extracted:	09/17/10	Lab ID:	009162-02
Date Analyzed:	09/23/10	Data File:	009162-02.012
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	94	60	125
Indium	93	60	125
Holmium	93	60	125

Analyte:	Concentration ug/L (ppb)
Chromium	<1
Copper	3.56
Zinc	68.2
Arsenic	<1
Cadmium	<1
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	RI-SW-3	Client:	Greylock Consulting, LLC
Date Received:	09/17/10	Project:	Reliable Steel, F&BI 009162
Date Extracted:	09/17/10	Lab ID:	009162-03
Date Analyzed:	09/23/10	Data File:	009162-03.016
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	89	60	125
Indium	96	60	125
Holmium	100	60	125

Analyte:	Concentration ug/L (ppb)
Chromium	<1
Copper	7.05
Zinc	59.9
Arsenic	1.09
Cadmium	<1
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	RI-SW-4	Client:	Greylock Consulting, LLC
Date Received:	09/17/10	Project:	Reliable Steel, F&BI 009162
Date Extracted:	09/17/10	Lab ID:	009162-04
Date Analyzed:	09/23/10	Data File:	009162-04.017
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	87	60	125
Indium	97	60	125
Holmium	95	60	125

Analyte:	Concentration ug/L (ppb)
Chromium	<1
Copper	5.32
Zinc	22.3
Arsenic	1.11
Cadmium	<1
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Greylock Consulting, LLC
Date Received:	NA	Project:	Reliable Steel, F&BI 009162
Date Extracted:	09/17/10	Lab ID:	I0-516 mb
Date Analyzed:	09/23/10	Data File:	I0-516 mb.010
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	98	60	125
Indium	90	60	125
Holmium	92	60	125

Analyte:	Concentration ug/L (ppb)
Chromium	<1
Copper	<1
Zinc	<1
Arsenic	<1
Cadmium	<1
Lead	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	RI-SW-1	Client:	Greylock Consulting, LLC
Date Received:	09/17/10	Project:	Reliable Steel, F&BI 009162
Date Extracted:	09/17/10	Lab ID:	009162-01
Date Analyzed:	09/21/10	Data File:	009162-01.071
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	106	60	125
Indium	111	60	125
Holmium	103	60	125

Analyte:	Concentration ug/L (ppb)
Chromium	7.91
Copper	30.6
Zinc	335
Arsenic	1.43
Cadmium	<1
Lead	17.5

Analysis For Total Metals By EPA Method 200.8

Client ID:	RI-SW-2	Client:	Greylock Consulting, LLC
Date Received:	09/17/10	Project:	Reliable Steel, F&BI 009162
Date Extracted:	09/17/10	Lab ID:	009162-02
Date Analyzed:	09/21/10	Data File:	009162-02.056
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	98	60	125
Indium	107	60	125
Holmium	109	60	125

Analyte:	Concentration ug/L (ppb)
Chromium	1.14
Copper	6.26
Zinc	142
Arsenic	<1
Cadmium	<1
Lead	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	RI-SW-3	Client:	Greylock Consulting, LLC
Date Received:	09/17/10	Project:	Reliable Steel, F&BI 009162
Date Extracted:	09/17/10	Lab ID:	009162-03
Date Analyzed:	09/21/10	Data File:	009162-03.068
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	103	60	125
Indium	98	60	125
Holmium	105	60	125

Analyte:	Concentration ug/L (ppb)
Chromium	1.70
Copper	12.8
Zinc	90.5
Arsenic	2.21
Cadmium	<1
Lead	1.04

Analysis For Total Metals By EPA Method 200.8

Client ID:	RI-SW-4	Client:	Greylock Consulting, LLC
Date Received:	09/17/10	Project:	Reliable Steel, F&BI 009162
Date Extracted:	09/17/10	Lab ID:	009162-04
Date Analyzed:	09/21/10	Data File:	009162-04.069
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	103	60	125
Indium	102	60	125
Holmium	98	60	125

Analyte:	Concentration ug/L (ppb)
Chromium	2.48
Copper	16.0
Zinc	77.1
Arsenic	1.61
Cadmium	<1
Lead	7.35

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Greylock Consulting, LLC
Date Received:	NA	Project:	Reliable Steel, F&BI 009162
Date Extracted:	09/17/10	Lab ID:	I0-515 mb
Date Analyzed:	09/21/10	Data File:	I0-515 mb.054
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	108	60	125
Indium	108	60	125
Holmium	106	60	125

Analyte:	Concentration ug/L (ppb)
Chromium	<1
Copper	<1
Zinc	<5
Arsenic	<1
Cadmium	<1
Lead	<1

Date of Report: 09/30/10
Date Received: 09/17/10
Project: Reliable Steel, F&BI 009162
Date Extracted: 09/17/10
Date Analyzed: 09/20/10

RESULTS FROM THE ANALYSIS OF THE WATER SAMPLES FOR DISSOLVED MERCURY USING EPA METHOD 1631E

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Dissolved Mercury
RI-SW-1 009162-01	<0.025
RI-SW-2 009162-02	<0.025
RI-SW-3 009162-03	<0.025
RI-SW-4 009162-04	<0.025
Method Blank	<0.025

Date of Report: 09/30/10
Date Received: 09/17/10
Project: Reliable Steel, F&BI 009162
Date Extracted: 09/17/10
Date Analyzed: 09/20/10

RESULTS FROM THE ANALYSIS OF THE WATER SAMPLES FOR TOTAL MERCURY USING EPA METHOD 1631E

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Total Mercury
RI-SW-1 009162-01	0.4
RI-SW-2 009162-02	0.038
RI-SW-3 009162-03	<0.025
RI-SW-4 009162-04	<0.025
Method Blank	<0.025

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	RI-SW-1	Client:	Greylock Consulting, LLC
Date Received:	09/17/10	Project:	Reliable Steel, F&BI 009162
Date Extracted:	09/17/10	Lab ID:	009162-01
Date Analyzed:	09/22/10	Data File:	092213.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	73	50	150
Benzo(a)anthracene-d12	90	50	129

Compounds:	Concentration ug/L (ppb)
Benz(a)anthracene	0.065
Chrysene	0.12
Benzo(a)pyrene	0.069
Benzo(b)fluoranthene	0.14
Benzo(k)fluoranthene	0.047
Indeno(1,2,3-cd)pyrene	0.086
Dibenz(a,h)anthracene	0.018

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	RI-SW-2	Client:	Greylock Consulting, LLC
Date Received:	09/17/10	Project:	Reliable Steel, F&BI 009162
Date Extracted:	09/17/10	Lab ID:	009162-02
Date Analyzed:	09/22/10	Data File:	092211.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	78	50	150
Benzo(a)anthracene-d12	91	50	129

Compounds:	Concentration ug/L (ppb)
Benz(a)anthracene	<0.018
Chrysene	<0.018
Benzo(a)pyrene	<0.018
Benzo(b)fluoranthene	<0.018
Benzo(k)fluoranthene	<0.018
Indeno(1,2,3-cd)pyrene	<0.018
Dibenz(a,h)anthracene	<0.018

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	RI-SW-3	Client:	Greylock Consulting, LLC
Date Received:	09/17/10	Project:	Reliable Steel, F&BI 009162
Date Extracted:	09/17/10	Lab ID:	009162-03
Date Analyzed:	09/22/10	Data File:	092212.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	71	50	150
Benzo(a)anthracene-d12	91	50	129

Compounds:	Concentration ug/L (ppb)
Benz(a)anthracene	<0.018
Chrysene	<0.018
Benzo(a)pyrene	<0.018
Benzo(b)fluoranthene	<0.018
Benzo(k)fluoranthene	<0.018
Indeno(1,2,3-cd)pyrene	<0.018
Dibenz(a,h)anthracene	<0.018

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	RI-SW-4	Client:	Greylock Consulting, LLC
Date Received:	09/17/10	Project:	Reliable Steel, F&BI 009162
Date Extracted:	09/17/10	Lab ID:	009162-04
Date Analyzed:	09/22/10	Data File:	092210.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	77	50	150
Benzo(a)anthracene-d12	96	50	129

Compounds:	Concentration ug/L (ppb)
Benz(a)anthracene	<0.018
Chrysene	<0.018
Benzo(a)pyrene	<0.018
Benzo(b)fluoranthene	<0.018
Benzo(k)fluoranthene	<0.018
Indeno(1,2,3-cd)pyrene	<0.018
Dibenz(a,h)anthracene	<0.018

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	Method Blank	Client:	Greylock Consulting, LLC
Date Received:	Not Applicable	Project:	Reliable Steel, F&BI 009162
Date Extracted:	09/17/10	Lab ID:	00-1482 mb
Date Analyzed:	09/20/10	Data File:	092006.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	94	50	150
Benzo(a)anthracene-d12	90	50	129

Compounds:	Concentration ug/L (ppb)
Benz(a)anthracene	<0.018
Chrysene	<0.018
Benzo(a)pyrene	<0.018
Benzo(b)fluoranthene	<0.018
Benzo(k)fluoranthene	<0.018
Indeno(1,2,3-cd)pyrene	<0.018
Dibenz(a,h)anthracene	<0.018

Analysis For Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	RI-SW-1	Client:	Greylock Consulting, LLC
Date Received:	09/17/10	Project:	Reliable Steel, F&BI 009162
Date Extracted:	09/17/10	Lab ID:	009162-01
Date Analyzed:	09/23/10	Data File:	092230.D
Matrix:	Water	Instrument:	GCMS3
Units:	ug/L (ppb)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	50	27	76
Phenol-d6	45	13	58
Nitrobenzene-d5	102	55	115
2-Fluorobiphenyl	95	51	113
2,4,6-Tribromophenol	49	28	107
Terphenyl-d14	85	45	119

Compounds:	Concentration ug/L (ppb)
Dimethyl phthalate	<1
Di-n-butyl phthalate	<1
Benzyl butyl phthalate	<1
Bis(2-ethylhexyl) phthalate	<10
Di-n-octyl phthalate	<1 J

Analysis For Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	RI-SW-2	Client:	Greylock Consulting, LLC
Date Received:	09/17/10	Project:	Reliable Steel, F&BI 009162
Date Extracted:	09/17/10	Lab ID:	009162-02
Date Analyzed:	09/23/10	Data File:	092228.D
Matrix:	Water	Instrument:	GCMS3
Units:	ug/L (ppb)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	59	27	76
Phenol-d6	48	13	58
Nitrobenzene-d5	99	55	115
2-Fluorobiphenyl	89	51	113
2,4,6-Tribromophenol	65	28	107
Terphenyl-d14	83	45	119

Compounds:	Concentration ug/L (ppb)
Dimethyl phthalate	<1
Di-n-butyl phthalate	<1
Benzyl butyl phthalate	<1
Bis(2-ethylhexyl) phthalate	<10
Di-n-octyl phthalate	<1

Analysis For Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	RI-SW-3	Client:	Greylock Consulting, LLC
Date Received:	09/17/10	Project:	Reliable Steel, F&BI 009162
Date Extracted:	09/17/10	Lab ID:	009162-03
Date Analyzed:	09/23/10	Data File:	092231.D
Matrix:	Water	Instrument:	GCMS3
Units:	ug/L (ppb)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	55	27	76
Phenol-d6	42	13	58
Nitrobenzene-d5	98	55	115
2-Fluorobiphenyl	93	51	113
2,4,6-Tribromophenol	67	28	107
Terphenyl-d14	87	45	119

Compounds:	Concentration ug/L (ppb)
Dimethyl phthalate	<1
Di-n-butyl phthalate	<1
Benzyl butyl phthalate	<1
Bis(2-ethylhexyl) phthalate	<10
Di-n-octyl phthalate	<1

Analysis For Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	RI-SW-4	Client:	Greylock Consulting, LLC
Date Received:	09/17/10	Project:	Reliable Steel, F&BI 009162
Date Extracted:	09/17/10	Lab ID:	009162-04
Date Analyzed:	09/23/10	Data File:	092229.D
Matrix:	Water	Instrument:	GCMS3
Units:	ug/L (ppb)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	54	27	76
Phenol-d6	47	13	58
Nitrobenzene-d5	102	55	115
2-Fluorobiphenyl	96	51	113
2,4,6-Tribromophenol	54	28	107
Terphenyl-d14	88	45	119

Compounds:	Concentration ug/L (ppb))
Dimethyl phthalate	<1
Di-n-butyl phthalate	<1
Benzyl butyl phthalate	<1
Bis(2-ethylhexyl) phthalate	<10
Di-n-octyl phthalate	<1 J

Analysis For Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	Method Blank	Client:	Greylock Consulting, LLC
Date Received:	Not Applicable	Project:	Reliable Steel, F&BI 009162
Date Extracted:	09/17/10	Lab ID:	00-1477 mb2
Date Analyzed:	09/23/10	Data File:	092227.D
Matrix:	Water	Instrument:	GCMS3
Units:	ug/L (ppb)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	57	27	76
Phenol-d6	44	13	58
Nitrobenzene-d5	99	55	115
2-Fluorobiphenyl	88	51	113
2,4,6-Tribromophenol	63	28	107
Terphenyl-d14	79	45	119

Compounds:	Concentration ug/L (ppb)
Dimethyl phthalate	<1
Di-n-butyl phthalate	<1
Benzyl butyl phthalate	<1
Bis(2-ethylhexyl) phthalate	<10
Di-n-octyl phthalate	<1

Date of Report: 09/30/10
Date Received: 09/17/10
Project: Reliable Steel, F&BI 009162

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: Laboratory Control Sample Silica Gel

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	76	63	58-134	19

Date of Report: 09/30/10
Date Received: 09/17/10
Project: Reliable Steel, F&BI 009162

QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TURBIDITY USING METHOD SM2130B

Laboratory Code: 009162-02 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference	Acceptance Criteria
Turbidity	NTU	8.11	8.08	0	0-20

Date of Report: 09/30/10
Date Received: 09/17/10
Project: Reliable Steel, F&BI 009162

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED METALS USING EPA METHOD 200.8

Laboratory Code: 009162-02 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Chromium	ug/L (ppb)	20	<1	98	99	67-132	1
Copper	ug/L (ppb)	20	3.56	111	107	50-144	4
Zinc	ug/L (ppb)	50	68.2	103 b	73 b	46-148	34 b
Arsenic	ug/L (ppb)	10	<1	108	106	56-167	2
Cadmium	ug/L (ppb)	5	<1	111	100	86-118	10
Lead	ug/L (ppb)	10	<1	106	106	76-125	0

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Chromium	ug/L (ppb)	20	104	66-135
Copper	ug/L (ppb)	20	103	66-134
Zinc	ug/L (ppb)	50	113	57-135
Arsenic	ug/L (ppb)	10	105	55-128
Cadmium	ug/L (ppb)	5	107	66-135
Lead	ug/L (ppb)	10	124	67-135

Date of Report: 09/30/10
Date Received: 09/17/10
Project: Reliable Steel, F&BI 009162

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL METALS USING EPA METHOD 200.8

Laboratory Code: 009162-02 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Chromium	ug/L (ppb)	20	1.14	108	118	67-132	9
Copper	ug/L (ppb)	20	6.26	105 b	99 b	50-144	6 b
Zinc	ug/L (ppb)	50	142	90 b	99 b	46-148	10 b
Arsenic	ug/L (ppb)	10	<1	105	97	56-167	8
Cadmium	ug/L (ppb)	5	<1	107	112	86-118	5
Lead	ug/L (ppb)	10	<1	108	110	76-125	2

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Chromium	ug/L (ppb)	20	115	66-135
Copper	ug/L (ppb)	20	117	66-134
Zinc	ug/L (ppb)	50	106	57-135
Arsenic	ug/L (ppb)	10	107	55-128
Cadmium	ug/L (ppb)	5	108	66-135
Lead	ug/L (ppb)	10	110	67-135

Date of Report: 09/30/10
Date Received: 09/17/10
Project: Reliable Steel, F&BI 009162

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED MERCURY USING EPA METHOD 1631E

Laboratory Code: 009162-02 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Mercury	ug/L (ppb)	0.5	<0.2	100	96	48-160	4

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Mercury	ug/L (ppb)	0.5	104	79-126

Date of Report: 09/30/10
Date Received: 09/17/10
Project: Reliable Steel, F&BI 009162

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL MERCURY USING EPA METHOD 1631E

Laboratory Code: 009162-02 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Mercury	ug/L (ppb)	0.5	<0.2	112	108	48-160	4

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Mercury	ug/L (ppb)	0.5	106	79-126

Date of Report: 09/30/10
Date Received: 09/17/10
Project: Reliable Steel, F&BI 009162

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR PNA'S BY EPA METHOD 8270D SIM

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Benz(a)anthracene	ug/L (ppb)	5	71	77	65-102	8
Chrysene	ug/L (ppb)	5	78	83	66-103	6
Benzo(b)fluoranthene	ug/L (ppb)	5	80	85	66-112	6
Benzo(k)fluoranthene	ug/L (ppb)	5	77	89	64-116	14
Benzo(a)pyrene	ug/L (ppb)	5	77	86	61-108	11
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	5	72	88	50-120	20
Dibenz(a,h)anthracene	ug/L (ppb)	5	71	87	51-115	20

Date of Report: 09/30/10
Date Received: 09/17/10
Project: Reliable Steel, F&BI 009162

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR SEMIVOLATILES BY EPA METHOD 8270D

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Phenol	ug/L (ppb)	75	29	29	20-59	0
2-Chlorophenol	ug/L (ppb)	75	95	91	43-101	4
1,4-Dichlorobenzene	ug/L (ppb)	50	75	78	45-103	4
2-Methylphenol	ug/L (ppb)	75	72	67	43-93	7
N-Nitroso-di-n-propylamine	ug/L (ppb)	50	82	68	45-114	19
3-Methylphenol + 4-Methylphenol	ug/L (ppb)	150	97	96	70-130	1
2-Nitrophenol	ug/L (ppb)	75	72	74	50-104	3
2,4-Dimethylphenol	ug/L (ppb)	75	84	87	38-94	4
Benzoic acid	ug/L (ppb)	75	15	13	10-53	14
2,4-Dichlorophenol	ug/L (ppb)	75	87	90	51-104	3
1,2,4-Trichlorobenzene	ug/L (ppb)	50	79	79	45-110	0
Naphthalene	ug/L (ppb)	50	74	79	42-115	7
4-Chloro-3-methylphenol	ug/L (ppb)	75	95	90	46-107	5
Hexachlorocyclopentadiene	ug/L (ppb)	50	48	59	23-131	21 vo
2,4,6-Trichlorophenol	ug/L (ppb)	75	87	92	47-118	6
2,4,5-Trichlorophenol	ug/L (ppb)	75	83	86	48-110	4
Acenaphthene	ug/L (ppb)	50	77	79	41-114	3
2,4-Dinitrophenol	ug/L (ppb)	75	75	74	44-118	1
2,4-Dinitrotoluene	ug/L (ppb)	50	85	86	46-119	1
4-Nitrophenol	ug/L (ppb)	75	49	44	15-66	11
4,6-Dinitro-2-methylphenol	ug/L (ppb)	75	76	78	38-134	3
Hexachlorobenzene	ug/L (ppb)	50	72	72	37-110	0
Pentachlorophenol	ug/L (ppb)	75	71	74	40-122	4
Pyrene	ug/L (ppb)	50	84	83	35-115	1
Benzo(a)pyrene	ug/L (ppb)	50	84	88	39-121	5

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

A1 – More than one compound of similar molecule structure was identified with equal probability.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for this range fell outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte indicated may be due to carryover from previous sample injections.

d - The sample was diluted. Detection limits may be raised due to dilution.

ds - The sample was diluted. Detection limits are raised due to dilution and surrogate recoveries may not be meaningful.

dv - Insufficient sample was available to achieve normal reporting limits and limits are raised accordingly.

fb - Analyte present in the blank and the sample.

fc – The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. The variability is attributed to sample inhomogeneity.

ht - Analysis performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of normal control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j – The result is below normal reporting limits. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The analyte result in the laboratory control sample is out of control limits. The reported concentration should be considered an estimate.

jr - The rpd result in laboratory control sample associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the compound indicated is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc – The sample was received in a container not approved by the method. The value reported should be considered an estimate.

pr – The sample was received with incorrect preservation. The value reported should be considered an estimate.

ve - Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

9 August 2010

Suzanne Dudziak
Greylock Consulting, LLC
P.O. Box 23254
Federal Way, WA 98093

RE: Project: BOJO
ARI Job No. RD77

Dear Suzanne:

Please find enclosed the chain-of-custody (COC) record and the final results for the sample from the project referenced above. Analytical Resources, Inc. (ARI) accepted nineteen soil samples on July 12, 2010. Six samples were placed on hold and thirteen samples were analyzed for PAHs, NWTPH-HCID, total metals and conventional-chemistry parameters as requested on the COC.

A matrix spike (MS) was prepared and analyzed for total mercury in conjunction with sample RIS2-2-4'. The percent recovery for mercury was low following the initial analysis of the MS. Since the percent recoveries for mercury were within acceptable QC limits for the corresponding LCS/LCSD, it was concluded that the sample matrix was the cause of the low MS recovery. No corrective actions were taken.

The remaining analyses proceeded without incident of note.

A copy of these reports and all raw data will remain on file at ARI. If you have questions or require further information, please contact me at your convenience.

Sincerely,

ANALYTICAL RESOURCES, INC.

Mark D. Harris
Project Manager
206/695-6210
<mark@arilabs.com>

Enclosures

cc: File RD77

MDH/bc

1 of 47

Chain of Custody Record & Laboratory Analysis Request

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

ARI Assigned Number: RD77	Turn-around Requested: Standard
ARI Client Company: Greylock	Phone: 253-266-2838
Client Contact: Suzann Dudziak 720 S 333 Federal WAY	
Client Project Name:	
Client Project #: B050	Samplers: Mark Willoughby, Suzann Dudziak

Page: 1	of 2
Date: 7-12-10	Ice Present? YES
No. of Coolers: 1	Cooler Temps: 11.6

Sample ID	Date	Time	Matrix	No. Containers	Total Solids	TOC	TVS	Bulk Ammonia	Sulfide	PAHs	Mercury		Notes/Comments
													E-Mail results to greylockllc@comcast.net
RIS2 -Surface	7-12-10	1106	S	3	X	X	X	X	X	X			
RIS2 - 0-2'		1153		1									Archive
RIS2 2-4'		1051		1							X		
RIS2 4-6'		1054		1							X		
RIS2 6-8'		1056		1									Archive
RIS3 Surface		1038		3	X	X	X	X	X	X			
RIS3 0-2'		1122		1									Archive
RIS3 2-4'		1124		1							X		
RIS3 4-6'		1125		1							X		
RIS3 6-8'		1127		1									Archive

Comments/Special Instructions

	Relinquished by:	Received by:	Relinquished by:	Received by:
(Signature)	Mark Willoughby			
Printed Name:	Mark Willoughby	A. Volgardsen		
Company:	Greylock	ARI		
Date & Time:	7-12-10 / 1600	7/12/10 1600		

Limits of Liability: *ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.*

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

Chain of Custody Record & Laboratory Analysis Request

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

ARI Assigned Number: RD77	Turn-around Requested: Standard	Page: 2 of 2	
ARI Client Company: Grey Lock	Phone: 253-266-2838	Date: 7-12-10	Ice Present? yes
Client Contact: Suzann Dudziak 720 S 333 Federal Way		No. of Coolers: 1	Cooler Temps: 11.6
Client Project Name:			
Client Project #: B050	Samplers: Mark Willoughby, Suzann Dudziak		

Sample ID	Date	Time	Matrix	No. Containers	Total solids	TOC	TVS	Bulk Ammonia	Sulfide	PAH	Mercury	HCID	Notes/Comments
RI S4 - Surface	7-12-10	1305	S	3	X	X	X	X	X	X			Email results to greylockllc@comcast.net
RI S4 0-2'		1144		1									Archive
RI S4 2-4'		1146		1							X		
RI S4 4-6'		1148		1							X		
RI S4 6-8'		1150		1									Archive
RI S5 - surface		1312		4	X	X	X	X	X	X		X	
RI S6 - Surface		1206		3									
RI S7 - Surface		1030		3									
RI S1 - surface	↓	1200	↓	4	X	X	X	X	X	X		X	

Comments/Special Instructions

Relinquished by:	Received by:	Relinquished by:	Received by:
(Signature) Mark Willoughby	(Signature)	(Signature)	(Signature)
Printed Name: Mark Willoughby	Printed Name: A. Volgardsen	Printed Name:	Printed Name:
Company: Grey Lock	Company: ARI	Company:	Company:
Date & Time: 7-12-10 / 1600	Date & Time: 7/12/10 1600	Date & Time:	Date & Time:

Limits of Liability: *ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.*

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Greylock

COC No(s): ______ NA

Assigned ARI Job No: RD77

Project Name: ______

Delivered by: Fed-Ex UPS Courier [✓ Hand Delivered] Other: ______

Tracking No: ______ NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler?	YES	[✓ NO]
Were custody papers included with the cooler?	[✓ YES]	NO
Were custody papers properly filled out (ink, signed, etc.)	[✓ YES]	NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry)........ 11.6

If cooler temperature is out of compliance fill out form 00070F

Temp Gun ID#: 90877952

Cooler Accepted by: AV Date: 7/12/10 Time: 1100

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler?		YES	[✓ NO]
Was sufficient ice used (if appropriate)?	NA	YES	[✓ NO]
Were all bottles sealed in individual plastic bags?		YES	[✓ NO]
Did all bottles arrive in good condition (unbroken)?		[✓ YES]	NO
Were all bottle labels complete and legible?		[✓ YES]	NO
Did the number of containers listed on COC match with the number of containers received?		[✓ YES]	NO
Did all bottle labels and tags agree with custody papers?		YES	[✓ NO]
Were all bottles used correct for the requested analyses?		[✓ YES]	NO
Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)...	[✓ NA]	YES	NO
Were all VOC vials free of air bubbles?	[✓ NA]	YES	NO
Was sufficient amount of sample sent in each bottle?		[✓ YES]	NO
Date VOC Trip Blank was made at ARI	[✓ NA]		

What kind of packing material was used? ... Bubble Wrap [✓ Wet Ice] Gel Packs Baggies Foam Block Paper Other: ______

Was Sample Split by ARI : [✓ NA] YES Date/Time: ______ Equipment: ______ Split by: ______

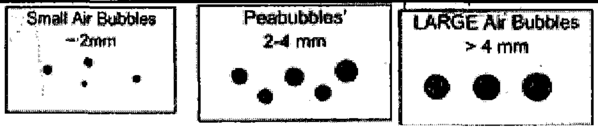
Samples Logged by: JM Date: 7/12/10 Time: 1720

***** Notify Project Manager of discrepancies or concerns *****

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC
RI55-Surf	RI55-Surface		
RI56-S	RI56-Surface		

Additional Notes, Discrepancies, & Resolutions:

By: JM Date: 7/12/10



Small → "sm"
Peabubbles → "pb"
Large → "lg"
Headspace → "hs"

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Temperature Compliance Form

Cooler#: 1 **Temperature(°C):** 11.6

Sample ID	**Bottle Count**	**Bottle Type**
All samples associated		
with this cooler		
are outside temp.		
Compliance.		

Cooler#: **Temperature(°C):**

Sample ID	**Bottle Count**	**Bottle Type**

Cooler#: **Temperature(°C):**

Sample ID	**Bottle Count**	**Bottle Type**

Cooler#: **Temperature(°C):**

Sample ID	**Bottle Count**	**Bottle Type**

Completed by: JM Date: 7/12/10 Time: 1750

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Data Reporting Qualifiers

Effective 7/10/2009

Inorganic Data

U	Indicates that the target analyte was not detected at the reported concentration
*	Duplicate RPD is not within established control limits
B	Reported value is less than the CRDL but ≥ the Reporting Limit
N	Matrix Spike recovery not within established control limits
NA	Not Applicable, analyte not spiked
H	The natural concentration of the spiked element is so much greater than the concentration spiked that an accurate determination of spike recovery is not possible
L	Analyte concentration is ≤5 times the Reporting Limit and the replicate control limit defaults to ±1 RL instead of the normal 20% RPD

Organic Data

U	Indicates that the target analyte was not detected at the reported concentration
*	Flagged value is not within established control limits
B	Analyte detected in an associated Method Blank at a concentration greater than one-half of ARI's Reporting Limit or 5% of the regulatory limit or 5% of the analyte concentration in the sample.
J	Estimated concentration when the value is less than ARI's established reporting limits
D	The spiked compound was not detected due to sample extract dilution
E	Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.
Q	Indicates a detected analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20%RSD, <20%Drift or minimum RRF).
S	Indicates an analyte response that has saturated the detector. The calculated concentration is not valid; a dilution is required to obtain valid quantification of the analyte

NA	The flagged analyte was not analyzed for
NR	Spiked compound recovery is not reported due to chromatographic interference
NS	The flagged analyte was not spiked into the sample
M	Estimated value for an analyte detected and confirmed by an analyst but with low spectral match parameters. This flag is used only for GC-MS analyses
M2	The sample contains PCB congeners that do not match any standard Aroclor pattern. The PCBs are identified and quantified as the Aroclor whose pattern most closely matches that of the sample. The reported value is an estimate.
N	The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification"
Y	The analyte is not detected at or above the reported concentration. The reporting limit is raised due to chromatographic interference. The Y flag is equivalent to the U flag with a raised reporting limit.
C	The analyte was positively identified on only one of two chromatographic columns. Chromatographic interference prevented a positive identification on the second column
P	The analyte was detected on both chromatographic columns but the quantified values differ by ≥40% RPD with no obvious chromatographic interference

Geotechnical Data

A	The total of all fines fractions. This flag is used to report total fines when only sieve analysis is requested and balances total grain size with sample weight.
F	Samples were frozen prior to particle size determination
SM	Sample matrix was not appropriate for the requested analysis. This normally refers to samples contaminated with an organic product that interferes with the sieving process and/or moisture content, porosity and saturation calculations
SS	Sample did not contain the proportion of "fines" required to perform the pipette portion of the grain size analysis
W	Weight of sample in some pipette aliquots was below the level required for accurate weighting

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Sample ID: MB-072210
METHOD BLANK

Lab Sample ID: MB-072210
LIMS ID: 10-16367
Matrix: Sediment
Data Release Authorized:
Reported: 07/27/10

QC Report No: RD77-Greylock Consulting, LLC
Project: BOJO

Date Sampled: NA
Date Received: NA

Date Extracted: 07/22/10
Date Analyzed: 07/23/10 19:40
Instrument/Analyst: NT4/JZ
GPC Cleanup: No
Alumina: No
Silica Gel: Yes

Sample Amount: 25.0 g
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: NA

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	20	< 20 U
91-57-6	2-Methylnaphthalene	20	< 20 U
208-96-8	Acenaphthylene	20	< 20 U
83-32-9	Acenaphthene	20	< 20 U
86-73-7	Fluorene	20	< 20 U
85-01-8	Phenanthrene	20	< 20 U
120-12-7	Anthracene	20	< 20 U
206-44-0	Fluoranthene	20	< 20 U
129-00-0	Pyrene	20	< 20 U
56-55-3	Benzo(a)anthracene	20	< 20 U
218-01-9	Chrysene	20	< 20 U
50-32-8	Benzo(a)pyrene	20	< 20 U
193-39-5	Indeno(1,2,3-cd)pyrene	20	< 20 U
53-70-3	Dibenz(a,h)anthracene	20	< 20 U
191-24-2	Benzo(g,h,i)perylene	20	< 20 U
TOTBFA	Total Benzofluoranthenes	20	< 20 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery	
d14-p-Terphenyl	82.4%
2-Fluorobiphenyl	64.0%

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PSDDA PNAs by 8270D PNA GC/MS
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Sample ID: RIS2-Surface
SAMPLE

Lab Sample ID: RD77A
LIMS ID: 10-16364
Matrix: Sediment
Data Release Authorized:
Reported: 07/27/10

QC Report No: RD77-Greylock Consulting, LLC
Project: BOJO

Date Sampled: 07/12/10
Date Received: 07/12/10

Date Extracted: 07/22/10
Date Analyzed: 07/23/10 21:21
Instrument/Analyst: NT4/JZ
GPC Cleanup: No
Alumina: No
Silica Gel: Yes

Sample Amount: 25.3 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 24.2%

CAS Number	Analyte	RL	Result
91-20-3	**Naphthalene**	**20**	**120**
91-57-6	**2-Methylnaphthalene**	**20**	**170**
208-96-8	Acenaphthylene	20	< 20 U
83-32-9	**Acenaphthene**	**20**	**390**
86-73-7	**Fluorene**	**20**	**380**
85-01-8	**Phenanthrene**	**20**	**1,900 ES**
120-12-7	**Anthracene**	**20**	**560**
206-44-0	**Fluoranthene**	**20**	**2,300 ES**
129-00-0	**Pyrene**	**20**	**1,900 ES**
56-55-3	**Benzo(a)anthracene**	**20**	**1,900 ES**
218-01-9	**Chrysene**	**20**	**1,900 ES**
50-32-8	**Benzo(a)pyrene**	**20**	**2,000 ES**
193-39-5	**Indeno(1,2,3-cd)pyrene**	**20**	**640**
53-70-3	**Dibenz(a,h)anthracene**	**20**	**280**
191-24-2	**Benzo(g,h,i)perylene**	**20**	**560**
TOTBFA	**Total Benzofluoranthenes**	**20**	**3,600 ES**

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery	
d14-p-Terphenyl	85.6%
2-Fluorobiphenyl	78.4%

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Sample ID: RIS2-Surface
DILUTION

Lab Sample ID: RD77A
LIMS ID: 10-16364
Matrix: Sediment
Data Release Authorized:
Reported: 07/27/10

QC Report No: RD77-Greylock Consulting, LLC
Project: BOJO

Date Sampled: 07/12/10
Date Received: 07/12/10

Date Extracted: 07/22/10
Date Analyzed: 07/27/10 01:40
Instrument/Analyst: NT4/JZ
GPC Cleanup: No
Alumina: No
Silica Gel: Yes

Sample Amount: 25.3 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 5.00
Percent Moisture: 24.2%

CAS Number	Analyte	RL	Result
91-20-3	**Naphthalene**	**99**	**150**
91-57-6	**2-Methylnaphthalene**	**99**	**210**
208-96-8	Acenaphthylene	99	< 99 U
83-32-9	**Acenaphthene**	**99**	**480**
86-73-7	**Fluorene**	**99**	**460**
85-01-8	**Phenanthrene**	**99**	**5,000**
120-12-7	**Anthracene**	**99**	**800**
206-44-0	**Fluoranthene**	**99**	**6,100**
129-00-0	**Pyrene**	**99**	**5,400**
56-55-3	**Benzo(a)anthracene**	**99**	**3,400**
218-01-9	**Chrysene**	**99**	**4,400**
50-32-8	**Benzo(a)pyrene**	**99**	**3,200**
193-39-5	**Indeno(1,2,3-cd)pyrene**	**99**	**1,700**
53-70-3	**Dibenz(a,h)anthracene**	**99**	**680**
191-24-2	**Benzo(g,h,i)perylene**	**99**	**1,600**
TOTBFA	**Total Benzofluoranthenes**	**99**	**5,400**

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery	
d14-p-Terphenyl	101%
2-Fluorobiphenyl	97.0%

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Sample ID: RIS3-Surface
SAMPLE

Lab Sample ID: RD77B
LIMS ID: 10-16365
Matrix: Sediment
Data Release Authorized:
Reported: 07/27/10

QC Report No: RD77-Greylock Consulting, LLC
Project: BOJO

Date Sampled: 07/12/10
Date Received: 07/12/10

Date Extracted: 07/22/10
Date Analyzed: 07/23/10 21:54
Instrument/Analyst: NT4/JZ
GPC Cleanup: No
Alumina: No
Silica Gel: Yes

Sample Amount: 25.2 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 19.2%

CAS Number	Analyte	RL	Result	
91-20-3	**Naphthalene**	**20**	**12**	**J**
91-57-6	2-Methylnaphthalene	20	< 20	U
208-96-8	Acenaphthylene	20	< 20	U
83-32-9	**Acenaphthene**	**20**	**54**	
86-73-7	**Fluorene**	**20**	**42**	
85-01-8	**Phenanthrene**	**20**	**410**	
120-12-7	**Anthracene**	**20**	**96**	
206-44-0	**Fluoranthene**	**20**	**610**	
129-00-0	**Pyrene**	**20**	**530**	
56-55-3	**Benzo(a)anthracene**	**20**	**310**	
218-01-9	**Chrysene**	**20**	**360**	
50-32-8	**Benzo(a)pyrene**	**20**	**360**	
193-39-5	**Indeno(1,2,3-cd)pyrene**	**20**	**93**	
53-70-3	**Dibenz(a,h)anthracene**	**20**	**42**	
191-24-2	**Benzo(g,h,i)perylene**	**20**	**84**	
TOTBFA	**Total Benzofluoranthenes**	**20**	**680**	

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery	
d14-p-Terphenyl	78.4%
2-Fluorobiphenyl	66.0%

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Sample ID: RIS4-Surface
SAMPLE

Lab Sample ID: RD77C
LIMS ID: 10-16366
Matrix: Sediment
Data Release Authorized:
Reported: 07/27/10

QC Report No: RD77-Greylock Consulting, LLC
Project: BOJO

Date Sampled: 07/12/10
Date Received: 07/12/10

Date Extracted: 07/22/10
Date Analyzed: 07/27/10 02:20
Instrument/Analyst: NT4/JZ
GPC Cleanup: No
Alumina: No
Silica Gel: Yes

Sample Amount: 25.9 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 5.00
Percent Moisture: 23.5%

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	96	< 96 U
91-57-6	2-Methylnaphthalene	96	< 96 U
208-96-8	Acenaphthylene	96	< 96 U
83-32-9	**Acenaphthene**	**96**	**160**
86-73-7	**Fluorene**	**96**	**180**
85-01-8	**Phenanthrene**	**96**	**3,400**
120-12-7	**Anthracene**	**96**	**1,800**
206-44-0	**Fluoranthene**	**96**	**7,000**
129-00-0	**Pyrene**	**96**	**6,900**
56-55-3	**Benzo(a)anthracene**	**96**	**4,500**
218-01-9	**Chrysene**	**96**	**4,600**
50-32-8	**Benzo(a)pyrene**	**96**	**3,100**
193-39-5	**Indeno(1,2,3-cd)pyrene**	**96**	**1,400**
53-70-3	**Dibenz(a,h)anthracene**	**96**	**590**
191-24-2	**Benzo(g,h,i)perylene**	**96**	**1,200**
TOTBFA	**Total Benzofluoranthenes**	**96**	**5,200**

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery	
d14-p-Terphenyl	88.4%
2-Fluorobiphenyl	79.4%

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Sample ID: RIS5-Surface
SAMPLE

Lab Sample ID: RD77D
LIMS ID: 10-16367
Matrix: Sediment
Data Release Authorized:
Reported: 07/27/10

QC Report No: RD77-Greylock Consulting, LLC
Project: BOJO

Date Sampled: 07/12/10
Date Received: 07/12/10

Date Extracted: 07/22/10
Date Analyzed: 07/26/10 21:37
Instrument/Analyst: NT4/JZ
GPC Cleanup: No
Alumina: No
Silica Gel: Yes

Sample Amount: 26.2 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 17.4%

CAS Number	Analyte	RL	Result	
91-20-3	**Naphthalene**	**19**	**12**	J
91-57-6	2-Methylnaphthalene	19	< 19	U
208-96-8	Acenaphthylene	19	< 19	U
83-32-9	**Acenaphthene**	**19**	**93**	
86-73-7	**Fluorene**	**19**	**44**	
85-01-8	**Phenanthrene**	**19**	**680**	
120-12-7	**Anthracene**	**19**	**180**	
206-44-0	**Fluoranthene**	**19**	**1,300**	
129-00-0	**Pyrene**	**19**	**1,200**	
56-55-3	**Benzo(a)anthracene**	**19**	**800**	
218-01-9	**Chrysene**	**19**	**800**	
50-32-8	**Benzo(a)pyrene**	**19**	**730**	
193-39-5	**Indeno(1,2,3-cd)pyrene**	**19**	**420**	
53-70-3	**Dibenz(a,h)anthracene**	**19**	**140**	
191-24-2	**Benzo(g,h,i)perylene**	**19**	**420**	
TOTBFA	**Total Benzofluoranthenes**	**19**	**1,200**	

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery	
d14-p-Terphenyl	105%
2-Fluorobiphenyl	85.6%

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Sample ID: RIS6-Surface
SAMPLE

Lab Sample ID: RD77E
LIMS ID: 10-16368
Matrix: Sediment
Data Release Authorized:
Reported: 07/27/10

QC Report No: RD77-Greylock Consulting, LLC
Project: BOJO

Date Sampled: 07/12/10
Date Received: 07/12/10

Date Extracted: 07/22/10
Date Analyzed: 07/23/10 23:01
Instrument/Analyst: NT4/JZ
GPC Cleanup: No
Alumina: No
Silica Gel: Yes

Sample Amount: 25.7 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 18.9%

CAS Number	Analyte	RL	Result	
91-20-3	**Naphthalene**	**20**	**25**	
91-57-6	**2-Methylnaphthalene**	**20**	**18**	**J**
208-96-8	Acenaphthylene	20	< 20	U
83-32-9	**Acenaphthene**	**20**	**120**	
86-73-7	**Fluorene**	**20**	**91**	
85-01-8	**Phenanthrene**	**20**	**700**	
120-12-7	**Anthracene**	**20**	**210**	
206-44-0	**Fluoranthene**	**20**	**880**	
129-00-0	**Pyrene**	**20**	**760**	
56-55-3	**Benzo(a)anthracene**	**20**	**510**	
218-01-9	**Chrysene**	**20**	**560**	
50-32-8	**Benzo(a)pyrene**	**20**	**580**	
193-39-5	**Indeno(1,2,3-cd)pyrene**	**20**	**170**	
53-70-3	**Dibenz(a,h)anthracene**	**20**	**76**	
191-24-2	**Benzo(g,h,i)perylene**	**20**	**140**	
TOTBFA	**Total Benzofluoranthenes**	**20**	**1,100**	

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery	
d14-p-Terphenyl	80.0%
2-Fluorobiphenyl	72.4%

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Sample ID: RIS7-Surface
SAMPLE

Lab Sample ID: RD77F
LIMS ID: 10-16369
Matrix: Sediment
Data Release Authorized:
Reported: 07/27/10

QC Report No: RD77-Greylock Consulting, LLC
Project: BOJO

Date Sampled: 07/12/10
Date Received: 07/12/10

Date Extracted: 07/22/10
Date Analyzed: 07/26/10 23:40
Instrument/Analyst: NT4/JZ
GPC Cleanup: No
Alumina: No
Silica Gel: Yes

Sample Amount: 25.8 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 19.5%

CAS Number	Analyte	RL	Result
91-20-3	**Naphthalene**	**19**	**100**
91-57-6	**2-Methylnaphthalene**	**19**	**37**
208-96-8	Acenaphthylene	19	< 19 U
83-32-9	**Acenaphthene**	**19**	**170**
86-73-7	**Fluorene**	**19**	**150**
85-01-8	**Phenanthrene**	**19**	**880**
120-12-7	**Anthracene**	**19**	**280**
206-44-0	**Fluoranthene**	**19**	**1,000**
129-00-0	**Pyrene**	**19**	**1,000**
56-55-3	**Benzo(a)anthracene**	**19**	**620**
218-01-9	**Chrysene**	**19**	**670**
50-32-8	**Benzo(a)pyrene**	**19**	**670**
193-39-5	**Indeno(1,2,3-cd)pyrene**	**19**	**420**
53-70-3	**Dibenz(a,h)anthracene**	**19**	**150**
191-24-2	**Benzo(g,h,i)perylene**	**19**	**420**
TOTBFA	**Total Benzofluoranthenes**	**19**	**1,100**

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery	
d14-p-Terphenyl	86.4%
2-Fluorobiphenyl	77.6%

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Sample ID: RIS1-Surface
SAMPLE

Lab Sample ID: RD77G
LIMS ID: 10-16370
Matrix: Sediment
Data Release Authorized:
Reported: 07/27/10

QC Report No: RD77-Greylock Consulting, LLC
Project: BOJO

Date Sampled: 07/12/10
Date Received: 07/12/10

Date Extracted: 07/22/10
Date Analyzed: 07/27/10 00:21
Instrument/Analyst: NT4/JZ
GPC Cleanup: No
Alumina: No
Silica Gel: Yes

Sample Amount: 25.5 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 55.8%

CAS Number	Analyte	RL	Result	
91-20-3	**Naphthalene**	**20**	**16**	**J**
91-57-6	2-Methylnaphthalene	20	< 20	U
208-96-8	Acenaphthylene	20	< 20	U
83-32-9	**Acenaphthene**	**20**	**34**	
86-73-7	**Fluorene**	**20**	**33**	
85-01-8	**Phenanthrene**	**20**	**240**	
120-12-7	**Anthracene**	**20**	**78**	
206-44-0	**Fluoranthene**	**20**	**420**	
129-00-0	**Pyrene**	**20**	**380**	
56-55-3	**Benzo(a)anthracene**	**20**	**190**	
218-01-9	**Chrysene**	**20**	**290**	
50-32-8	**Benzo(a)pyrene**	**20**	**200**	
193-39-5	**Indeno(1,2,3-cd)pyrene**	**20**	**110**	
53-70-3	**Dibenz(a,h)anthracene**	**20**	**35**	
191-24-2	**Benzo(g,h,i)perylene**	**20**	**98**	
TOTBFA	**Total Benzofluoranthenes**	**20**	**410**	

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery	
d14-p-Terphenyl	82.0%
2-Fluorobiphenyl	76.8%

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Sample ID: RIS5-Surface
MS/MSD

Lab Sample ID: RD77D
LIMS ID: 10-16367
Matrix: Sediment
Data Release Authorized:
Reported: 07/27/10

QC Report No: RD77-Greylock Consulting, LLC
Project: BOJO

Date Sampled: 07/12/10
Date Received: 07/12/10

Date Extracted MS/MSD: 07/22/10

Date Analyzed MS: 07/26/10 22:18
MSD: 07/26/10 22:59
Instrument/Analyst MS: NT4/JZ
MSD: NT4/JZ
GPC Cleanup: No
Silica Gel Cleanup: Yes

Sample Amount MS: 26.0 g-dry-wt
MSD: 25.9 g-dry-wt
Final Extract Volume MS: 0.5 mL
MSD: 0.5 mL
Dilution Factor MS: 1.00
MSD: 1.00
Alumina Cleanup: No

Analyte	**Sample**	**MS**	**Spike Added-MS**	**MS Recovery**	**MSD**	**Spike Added-MSD**	**MSD Recovery**	**RPD**
Naphthalene	12.2	362	481	72.7%	318	483	63.3%	12.9%
2-Methylnaphthalene	< 19.1	399	481	83.0%	343	483	71.0%	15.1%
Acenaphthylene	< 19.1	417	481	86.7%	346	483	71.6%	18.6%
Acenaphthene	93.3	492	481	82.9%	420	483	67.6%	15.8%
Fluorene	43.7	476	481	89.9%	400	483	73.8%	17.4%
Phenanthrene	677	1130	481	94.2%	952	483	56.9%	17.1%
Anthracene	175	625	481	93.6%	537	483	74.9%	15.1%
Fluoranthene	1340	1640	481	62.4%	1460	483	24.8%	11.6%
Pyrene	1220	1460	481	49.9%	1280	483	12.4%	13.1%
Benzo(a)anthracene	795	1140	481	71.7%	1070	483	56.9%	6.3%
Chrysene	802	1090	481	59.9%	1020	483	45.1%	6.6%
Benzo(a)pyrene	730	996	481	55.3%	943	483	44.1%	5.5%
Indeno(1,2,3-cd)pyrene	416	854	481	91.1%	766	483	72.5%	10.9%
Dibenz(a,h)anthracene	137	707	481	119%	610	483	97.9%	14.7%
Benzo(g,h,i)perylene	419	849	481	89.4%	745	483	67.5%	13.0%
Total Benzofluoranthenes	1160	1780	481	129%	1630	483	97.3%	8.8%

Results reported in µg/kg
RPD calculated using sample concentrations per SW846.

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Sample ID: RIS5-Surface
MATRIX SPIKE

Lab Sample ID: RD77D
LIMS ID: 10-16367
Matrix: Sediment
Data Release Authorized:
Reported: 07/27/10

QC Report No: RD77-Greylock Consulting, LLC
Project: BOJO

Date Sampled: 07/12/10
Date Received: 07/12/10

Date Extracted: 07/22/10
Date Analyzed: 07/26/10 22:18
Instrument/Analyst: NT4/JZ
GPC Cleanup: No
Alumina: No
Silica Gel: Yes

Sample Amount: 26.0 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 17.4%

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	19	---
91-57-6	2-Methylnaphthalene	19	---
208-96-8	Acenaphthylene	19	---
83-32-9	Acenaphthene	19	---
86-73-7	Fluorene	19	---
85-01-8	Phenanthrene	19	---
120-12-7	Anthracene	19	---
206-44-0	Fluoranthene	19	---
129-00-0	Pyrene	19	---
56-55-3	Benzo(a)anthracene	19	---
218-01-9	Chrysene	19	---
50-32-8	Benzo(a)pyrene	19	---
193-39-5	Indeno(1,2,3-cd)pyrene	19	---
53-70-3	Dibenz(a,h)anthracene	19	---
191-24-2	Benzo(g,h,i)perylene	19	---
TOTBFA	Total Benzofluoranthenes	19	---

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery	
d14-p-Terphenyl	100%
2-Fluorobiphenyl	89.6%

FORM I

ANALYTICAL
RESOURCES
INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PNAs by 8270D PNA GC/MS
Page 1 of 1

Sample ID: RIS5-Surface
MATRIX SPIKE DUPLICATE

Lab Sample ID: RD77D
LIMS ID: 10-16367
Matrix: Sediment
Data Release Authorized:
Reported: 07/27/10

QC Report No: RD77-Greylock Consulting, LLC
Project: BOJO

Date Sampled: 07/12/10
Date Received: 07/12/10

Date Extracted: 07/22/10
Date Analyzed: 07/26/10 22:59
Instrument/Analyst: NT4/JZ
GPC Cleanup: No
Alumina: No
Silica Gel: Yes

Sample Amount: 25.9 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: 17.4%

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	19	---
91-57-6	2-Methylnaphthalene	19	---
208-96-8	Acenaphthylene	19	---
83-32-9	Acenaphthene	19	---
86-73-7	Fluorene	19	---
85-01-8	Phenanthrene	19	---
120-12-7	Anthracene	19	---
206-44-0	Fluoranthene	19	---
129-00-0	Pyrene	19	---
56-55-3	Benzo(a)anthracene	19	---
218-01-9	Chrysene	19	---
50-32-8	Benzo(a)pyrene	19	---
193-39-5	Indeno(1,2,3-cd)pyrene	19	---
53-70-3	Dibenz(a,h)anthracene	19	---
191-24-2	Benzo(g,h,i)perylene	19	---
TOTBFA	Total Benzofluoranthenes	19	---

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery	
d14-p-Terphenyl	85.2%
2-Fluorobiphenyl	76.8%

FORM I

ORGANICS ANALYSIS DATA SHEET
PSDDA PNAs by SW8270D GC/MS
Page 1 of 1

Sample ID: LCS-072210
LCS/LCSD

Lab Sample ID: LCS-072210
LIMS ID: 10-16367
Matrix: Sediment
Data Release Authorized:
Reported: 07/27/10

QC Report No: RD77-Greylock Consulting, LLC
Project: BOJO

Date Sampled: NA
Date Received: 07/12/10

Date Extracted LCS/LCSD: 07/22/10

Date Analyzed LCS: 07/23/10 20:14
LCSD: 07/23/10 20:47
Instrument/Analyst LCS: NT4/JZ
LCSD: NT4/JZ
GPC Cleanup: No
Silica Gel Cleanup: Yes

Sample Amount LCS: 25.0 g
LCSD: 25.0 g
Final Extract Volume LCS: 0.50 mL
LCSD: 0.50 mL
Dilution Factor LCS: 1.00
LCSD: 1.00
Alumina Cleanup: No

Analyte	**LCS**	**Spike Added-LCS**	**LCS Recovery**	**LCSD**	**Spike Added-LCSD**	**LCSD Recovery**	**RPD**
Naphthalene	286	500	57.2%	293	500	58.6%	2.4%
2-Methylnaphthalene	302	500	60.4%	316	500	63.2%	4.5%
Acenaphthylene	316	500	63.2%	313	500	62.6%	1.0%
Acenaphthene	301	500	60.2%	299	500	59.8%	0.7%
Fluorene	334	500	66.8%	327	500	65.4%	2.1%
Phenanthrene	367	500	73.4%	356	500	71.2%	3.0%
Anthracene	372	500	74.4%	354	500	70.8%	5.0%
Fluoranthene	414	500	82.8%	398	500	79.6%	3.9%
Pyrene	369	500	73.8%	362	500	72.4%	1.9%
Benzo(a)anthracene	402	500	80.4%	392	500	78.4%	2.5%
Chrysene	390	500	78.0%	377	500	75.4%	3.4%
Benzo(a)pyrene	377	500	75.4%	361	500	72.2%	4.3%
Indeno(1,2,3-cd)pyrene	257	500	51.4%	226	500	45.2%	12.8%
Dibenz(a,h)anthracene	279	500	55.8%	249	500	49.8%	11.4%
Benzo(g,h,i)perylene	208	500	41.6%	180	500	36.0%	14.4%
Total Benzofluoranthenes	899	1000	89.9%	878	1000	87.8%	2.4%

Semivolatile Surrogate Recovery

	LCS	**LCSD**
d14-p-Terphenyl	84.0%	82.8%
2-Fluorobiphenyl	63.2%	64.0%

Results reported in µg/kg
RPD calculated using sample concentrations per SW846.

FORM III

Data File: /chem3/nt4.i/20100726.b/07261001.d
Report Date: 27-Jul-2010 13:51

Analytical Resources, Inc.

CONTINUING CALIBRATION COMPOUNDS

Instrument ID: nt4.i
Lab File ID: 07261001.d
Analysis Type:
Lab Sample ID: CC0726
Method: /chem3/nt4.i/20100726.b/SW846100719.m

Injection Date: 26-JUL-2010 20:55
Init. Cal. Date(s): 19-JUL-2010 19-JUL-2010
Init. Cal. Times: 16:18 19:48
Quant Type: ISTD

07/27/10

COMPOUND	RRF / AMOUNT	RF25	CCAL RRF25	MIN RRF	%D / %DRIFT	MAX %D / %DRIFT	CURVE TYPE
$ 1 2-Fluorophenol	1.08371	1.09888	1.09888	0.010	1.39943	20.00000	Averaged
$ 2 Phenol-d5	1.06604	1.09623	1.09623	0.010	2.83184	20.00000	Averaged
3 Phenol	1.37947	1.38578	1.38578	0.100	0.45742	20.00000	Averaged
$ 5 2-Chlorophenol-d4	1.14386	1.16949	1.16949	0.010	2.24094	20.00000	Averaged
4 Bis(2-Chloroethyl)ether	1.02875	0.96958	0.96958	0.700	-5.75194	20.00000	Averaged
6 2-Chlorophenol	1.31278	1.32907	1.32907	0.800	1.24072	20.00000	Averaged
7 1,3-Dichlorobenzene	1.49159	1.45889	1.45889	0.010	-2.19190	20.00000	Averaged
9 1,4-Dichlorobenzene	1.50653	1.48356	1.48356	0.010	-1.52502	20.00000	Averaged
$ 10 1,2-Dichlorobenzene-d4	0.85327	0.85475	0.85475	0.010	0.17403	20.00000	Averaged
12 1,2-Dichlorobenzene	1.40311	1.37250	1.37250	0.010	-2.18151	20.00000	Averaged
11 Benzyl alcohol	0.78176	0.75331	0.75331	0.010	-3.64000	20.00000	Averaged
14 2,2'-oxybis(1-Chloropropane	0.96702	0.90808	0.90808	0.010	-6.09524	20.00000	Averaged
13 2-Methylphenol	1.05383	1.07082	1.07082	0.700	1.61229	20.00000	Averaged
17 Hexachloroethane	0.55799	0.53620	0.53620	0.300	-3.90558	20.00000	Averaged
16 N-Nitroso-di-n-propylamine	0.72131	0.65816	0.65816	0.500	-8.75496	20.00000	Averaged
15 4-Methylphenol	1.09383	1.13115	1.13115	0.600	3.41148	20.00000	Averaged
$ 18 Nitrobenzene-d5	0.30955	0.31928	0.31928	0.010	3.14316	20.00000	Averaged
19 Nitrobenzene	0.30648	0.30203	0.30203	0.200	-1.45164	20.00000	Averaged
20 Isophorone	0.50898	0.48754	0.48754	0.300	-4.21204	20.00000	Averaged
21 2-Nitrophenol	0.19148	0.21938	0.21938	0.100	14.57157	20.00000	Averaged
22 2,4-Dimethylphenol	0.34090	0.34883	0.34883	0.200	2.32496	20.00000	Averaged
23 Bis(2-Chloroethoxy)methane	0.35475	0.34821	0.34821	0.050	-1.84481	20.00000	Averaged
24 Benzoic acid	49.35014	50.00000	0.27059	0.010	-1.29972	20.00000	Linear
25 2,4-Dichlorophenol	0.29949	0.33763	0.33763	0.100	12.73258	20.00000	Averaged
26 1,2,4-Trichlorobenzene	0.33353	0.34642	0.34642	0.010	3.86208	20.00000	Averaged
28 Naphthalene	0.94898	0.95630	0.95630	0.100	0.77172	20.00000	Averaged
29 4-Chloroaniline	0.37840	0.37582	0.37582	0.010	-0.68132	20.00000	Averaged
30 Hexachlorobutadiene	0.18923	0.19930	0.19930	0.010	5.32113	20.00000	Averaged
31 4-Chloro-3-methylphenol	0.27464	0.30023	0.30023	0.200	9.31795	20.00000	Averaged
32 2-Methylnaphthalene	0.64492	0.66096	0.66096	0.300	2.48769	20.00000	Averaged
33 Hexachlorocyclopentadiene	0.29263	0.33100	0.33100	0.001	13.11085	20.00000	Averaged
34 2,4,6-Trichlorophenol	0.36003	0.39947	0.39947	0.200	10.95536	20.00000	Averaged
35 2,4,5-Trichlorophenol	0.36654	0.41322	0.41322	0.200	12.73484	20.00000	Averaged
$ 36 2-Fluorobiphenyl	1.22512	1.26158	1.26158	0.010	2.97605	20.00000	Averaged
37 2-Chloronaphthalene	1.08775	1.10338	1.10338	0.700	1.43636	20.00000	Averaged

Analytical Resources, Inc.

CONTINUING CALIBRATION COMPOUNDS

Instrument ID: nt4.i Injection Date: 26-JUL-2010 20:55
Lab File ID: 07261001.d Init. Cal. Date(s): 19-JUL-2010 19-JUL-2010
Analysis Type: Init. Cal. Times: 16:18 19:48
Lab Sample ID: CC0726 Quant Type: ISTD
Method: /chem3/nt4.i/20100726.b/SW846100719.m

COMPOUND	RRF / AMOUNT	RF25	CCAL RRF25	MIN RRF	%D / %DRIFT	MAX %D / %DRIFT	CURVE TYPE	
38 2-Nitroaniline	0.21001	0.22312	0.22312	0.010	6.24276	20.00000	Averaged	
39 Dimethylphthalate	1.27768	1.24316	1.24316	0.010	-2.70193	20.00000	Averaged	
40 Acenaphthylene	1.64077	1.64643	1.64643	0.900	0.34551	20.00000	Averaged	
41 2,6-Dinitrotoluene	0.28751	0.30068	0.30068	0.100	4.58184	20.00000	Averaged	
43 3-Nitroaniline	0.25351	0.26707	0.26707	0.010	5.34810	20.00000	Averaged	
44 Acenaphthene	1.06825	1.03913	1.03913	0.100	-2.72615	20.00000	Averaged	
45 2,4-Dinitrophenol	62.74462	50.00000	0.21642	0.030	25.48924	20.00000	Quadratic	<-
46 Dibenzofuran	1.42396	1.41154	1.41154	0.800	-0.87164	20.00000	Averaged	
47 4-Nitrophenol	0.17920	0.19052	0.19052	0.010	6.31735	20.00000	Averaged	
48 2,4-Dinitrotoluene	0.37910	0.40329	0.40329	0.200	6.38094	20.00000	Averaged	
50 Diethylphthalate	1.32169	1.25505	1.25505	0.010	-5.04160	20.00000	Averaged	
49 Fluorene	1.23204	1.24331	1.24331	0.100	0.91516	20.00000	Averaged	
51 4-Chlorophenyl-phenylether	0.59756	0.61558	0.61558	0.100	3.01524	20.00000	Averaged	
52 4-Nitroaniline	0.27464	0.27449	0.27449	0.010	-0.05412	20.00000	Averaged	
53 4,6-Dinitro-2-methylphenol	0.13800	0.17196	0.17196	0.001	24.61258	20.00000	Averaged	<-
54 N-Nitrosodiphenylamine	0.56415	0.57445	0.57445	0.010	1.82657	20.00000	Averaged	
$ 55 2,4,6-Tribromophenol	0.14302	0.16851	0.16851	0.010	17.81730	20.00000	Averaged	
56 4-Bromophenyl-phenylether	0.20445	0.21798	0.21798	0.100	6.62112	20.00000	Averaged	
57 Hexachlorobenzene	0.20941	0.22416	0.22416	0.100	7.04250	20.00000	Averaged	
58 Pentachlorophenol	0.14268	0.15918	0.15918	0.010	11.55794	20.00000	Averaged	
60 Phenanthrene	1.03607	1.01708	1.01708	0.700	-1.83289	20.00000	Averaged	
61 Anthracene	1.05988	1.04669	1.04669	0.700	-1.24422	20.00000	Averaged	
62 Carbazole	0.96311	0.92329	0.92329	0.010	-4.13450	20.00000	Averaged	
63 Di-n-butylphthalate	1.22802	1.24697	1.24697	0.010	1.54329	20.00000	Averaged	
64 Fluoranthene	1.07347	1.11118	1.11118	0.600	3.51278	20.00000	Averaged	
65 Pyrene	1.26819	1.26562	1.26562	0.600	-0.20255	20.00000	Averaged	
$ 66 Terphenyl-d14	0.77444	0.81198	0.81198	0.010	4.84859	20.00000	Averaged	
67 Butylbenzylphthalate	0.64359	0.63773	0.63773	0.010	-0.91108	20.00000	Averaged	
68 Benzo(a)anthracene	1.17238	1.17838	1.17838	0.800	0.51242	20.00000	Averaged	
70 3,3'-Dichlorobenzidine	0.37917	0.43032	0.43032	0.010	13.48951	20.00000	Averaged	
71 Chrysene	1.14746	1.12610	1.12610	0.700	-1.86147	20.00000	Averaged	
72 bis(2-Ethylhexyl)phthalate	0.56782	0.59315	0.59315	0.010	4.46061	20.00000	Averaged	
73 Di-n-octylphthalate	0.99436	0.98612	0.98612	0.010	-0.82806	20.00000	Averaged	
74 Benzo(b)fluoranthene	1.24491	1.19660	1.19660	0.700	-3.88089	20.00000	Averaged	
75 Benzo(k)fluoranthene	1.26106	1.24148	1.24148	0.700	-1.55236	20.00000	Averaged	

Data File: /chem3/nt4.i/20100726.b/07261001.d
Report Date: 27-Jul-2010 13:51

Analytical Resources, Inc.

CONTINUING CALIBRATION COMPOUNDS

Instrument ID: nt4.i
Lab File ID: 07261001.d
Analysis Type:
Lab Sample ID: CC0726
Method: /chem3/nt4.i/20100726.b/SW846100719.m

Injection Date: 26-JUL-2010 20:55
Init. Cal. Date(s): 19-JUL-2010 19-JUL-2010
Init. Cal. Times: 16:18 19:48
Quant Type: ISTD

COMPOUND	RRF / AMOUNT	RF25	CCAL RRF25	MIN RRF	%D / %DRIFT	MAX %D / %DRIFT	CURVE TYPE
187 Total Benzofluoranthenes	1.18021	1.15704	1.15704	0.010	-1.96364	20.00000	Averaged
76 Benzo(a)pyrene	1.10432	1.11218	1.11218	0.700	0.71160	20.00000	Averaged
78 Indeno(1,2,3-cd)pyrene	1.18581	1.35494	1.35494	0.500	14.26307	20.00000	Averaged
79 Dibenzo(a,h)anthracene	0.95329	1.13239	1.13239	0.400	18.78772	20.00000	Averaged
80 Benzo(g,h,i)perylene	1.01362	1.18507	1.18507	0.500	16.91455	20.00000	Averaged
90 N-Nitrosodimethylamine	0.58263	0.54141	0.54141	0.010	-7.07431	20.00000	Averaged
103 Pyridine	1.00478	0.97989	0.97989	0.010	-2.47719	20.00000	Averaged
91 Aniline	1.43987	1.33572	1.33572	0.010	-7.23320	20.00000	Averaged
105 1-methylnaphthalene	0.63176	0.64739	0.64739	0.010	2.47446	20.00000	Averaged
93 Benzidine	0.36642	0.24253	0.24253	0.010	-33.80981	20.00000	Averaged <-
111 Azobenzene (1,2-DP-Hydrazin	0.98849	0.92105	0.92105	0.010	-6.82292	20.00000	Averaged
143 1,4-Dioxane	0.38541	0.34295	0.34295	0.010	-11.01621	20.00000	Averaged
$ 137 d8-1,4-Dioxane	0.40092	0.36169	0.36169	0.010	-9.78398	20.00000	Averaged
151 1,2,4,5-Tetrachlorobenzene	0.52596	0.55264	0.55264	0.010	5.07305	20.00000	Averaged
120 2,3,4,6-Tetrachlorophenol	0.30346	0.33524	0.33524	0.010	10.47429	20.00000	Averaged
144 alpha-Terpineol	0.16728	0.16129	0.16129	0.010	-3.58441	20.00000	Averaged
98 Retene	0.42500	0.43410	0.43410	0.010	2.13984	20.00000	Averaged
133 Butylatedhydroxytoluene	0.95262	0.97339	0.97339	0.010	2.17980	20.00000	Averaged
115 Tributyl Phosphate	0.75899	0.75841	0.75841	0.010	-0.07673	20.00000	Averaged
116 Dibutyl Phenyl Phosphate	0.62360	0.63677	0.63677	0.010	2.11174	20.00000	Averaged
117 Butyl Diphenyl Phosphate	0.20453	0.20384	0.20384	0.010	-0.33339	20.00000	Averaged
118 Triphenyl Phosphate	0.20267	0.21796	0.21796	0.010	7.54333	20.00000	Averaged
123 Acetophenone	0.42468	0.42737	0.42737	0.010	0.63381	20.00000	Averaged
179 n-Decane	0.80058	0.76235	0.76235	0.010	-4.77541	20.00000	Averaged
180 n-Octadecane	0.27487	0.25866	0.25866	0.010	-5.89691	20.00000	Averaged
168 Pentachlorobenzene	0.41668	0.43428	0.43428	0.010	4.22369	20.00000	Averaged
113 Diphenyl Oxide	1.07610	1.08263	1.08263	0.010	0.60676	20.00000	Averaged
112 Biphenyl	1.23719	1.25585	1.25585	0.010	1.50842	20.00000	Averaged
110 Tetrachloroguaiacol	0.11666	0.12729	0.12729	0.010	9.11755	20.00000	Averaged
109 3,4,5-Trichloroguaiacol	0.11995	0.13189	0.13189	0.010	9.95255	20.00000	Averaged
181 3,4,6-Trichloroguaiacol	0.14104	0.15949	0.15949	0.010	13.08474	20.00000	Averaged
108 4,5,6-Trichloroguaiacol	0.12525	0.13718	0.13718	0.010	9.53061	20.00000	Averaged
184 3,4-Dichloroguaiacol	0.20702	0.22408	0.22408	0.010	8.24409	20.00000	Averaged
107 4,5-Dichloroguaiacol	0.29115	0.32545	0.32545	0.010	11.78409	20.00000	Averaged
182 4,6-Dichloroguaiacol	0.25695	0.26254	0.26254	0.010	2.17622	20.00000	Averaged

Analytical Resources, Inc.

CONTINUING CALIBRATION COMPOUNDS

Instrument ID: nt4.i Injection Date: 26-JUL-2010 20:55
Lab File ID: 07261001.d Init. Cal. Date(s): 19-JUL-2010 19-JUL-2010
Analysis Type: Init. Cal. Times: 16:18 19:48
Lab Sample ID: CC0726 Quant Type: ISTD
Method: /chem3/nt4.i/20100726.b/SW846100719.m

			CCAL	MIN		MAX	
COMPOUND	RRF / AMOUNT	RF25	RRF25	RRF	%D / %DRIFT	%D / %DRIFT	CURVE TYPE
185 4-Chloroguaiacol	0.60532	0.58920	0.58920	0.010	-2.66429	20.00000	Averaged
106 Guaiacol	1.06610	1.05880	1.05880	0.010	-0.68518	20.00000	Averaged

ANALYTICAL
RESOURCES
INCORPORATED

ORGANICS ANALYSIS DATA SHEET
NWTPH-HCID Method by GC/FID
Page 1 of 1
Matrix: Sediment

QC Report No: RD77-Greylock Consulting, LLC
Project: BOJO

Data Release Authorized:
Reported: 07/16/10

ARI ID	Sample ID	Extraction Date	Analysis Date	DL	Range	Result
MB-071510	Method Blank	07/15/10	07/15/10	1.0	Gas	< 20 U
10-16367					Diesel	< 50 U
					Oil	< 100 U
					o-Terphenyl	113%
RD77D	RIS5-Surface	07/15/10	07/15/10	1.0	Gas	< 20 U
10-16367	HC ID: ---				Diesel	< 50 U
					Oil	< 100 U
					o-Terphenyl	106%
RD77DDP	RIS5-Surface	07/15/10	07/15/10	1.0	Gas	< 20 U
10-16367	HC ID: ---				Diesel	< 50 U
					Oil	< 100 U
					o-Terphenyl	107%
RD77G	RIS1-Surface	07/15/10	07/15/10	1.0	Gas	< 22 U
10-16370	HC ID: ---				Diesel	< 55 U
					Oil	< 110 U
					o-Terphenyl	114%

Reported in mg/kg (ppm)

Gas value based on total peaks in the range from Toluene to C12.
Diesel value based on the total peaks in the range from C12 to C24.
Oil value based on the total peaks in the range from C24 to C38.

FORM I

METHOD BLANK RESULTS-CONVENTIONALS
RD77-Greylock Consulting, LLC

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 08/06/10

Project: NA
Event: BOJO
Date Sampled: NA
Date Received: NA

Analyte	Date	Units	Blank
Total Solids	07/13/10	Percent	< 0.01 U
Preserved Total Solids	07/14/10	Percent	< 0.01 U
Total Volatile Solids	07/13/10	Percent	< 0.01 U
N-Ammonia	07/15/10	mg-N/kg	< 0.10 U
Sulfide	07/15/10	mg/kg	< 1.00 U
Total Organic Carbon	07/19/10 08/05/10	Percent	< 0.020 U < 0.020 U

SAMPLE RESULTS-CONVENTIONALS
RD77-Greylock Consulting, LLC

Matrix: Sediment
Data Release Authorized:
Reported: 08/06/10

Project: NA
Event: BOJO
Date Sampled: 07/12/10
Date Received: 07/12/10

Client ID: RIS2-Surface
ARI ID: 10-16364 RD77A

Analyte	Date	Method	Units	RL	Sample
Total Solids	07/13/10 071310#1	EPA 160.3	Percent	0.01	73.90
Preserved Total Solids	07/14/10 071410#1	EPA 160.3	Percent	0.01	68.60
Total Volatile Solids	07/13/10 071310#1	EPA 160.4	Percent	0.01	2.09
N-Ammonia	07/15/10 071510#1	EPA 350.1M	mg-N/kg	0.13	11.9
Sulfide	07/15/10 071510#1	EPA 376.2	mg/kg	1.42	18.2
Total Organic Carbon	08/05/10 080510#1	Plumb,1981	Percent	0.020	1.63

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
RD77-Greylock Consulting, LLC

Matrix: Sediment
Data Release Authorized:
Reported: 08/06/10

Project: NA
Event: BOJO
Date Sampled: 07/12/10
Date Received: 07/12/10

Client ID: RIS3-Surface
ARI ID: 10-16365 RD77B

Analyte	Date	Method	Units	RL	Sample
Total Solids	07/13/10 071310#1	EPA 160.3	Percent	0.01	75.10
Preserved Total Solids	07/14/10 071410#1	EPA 160.3	Percent	0.01	80.40
Total Volatile Solids	07/13/10 071310#1	EPA 160.4	Percent	0.01	1.36
N-Ammonia	07/15/10 071510#1	EPA 350.1M	mg-N/kg	0.13	4.50
Sulfide	07/15/10 071510#1	EPA 376.2	mg/kg	5.87	62.9
Total Organic Carbon	07/19/10 071910#1	Plumb,1981	Percent	0.020	0.558

RL	Analytical reporting limit
U	Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

Matrix: Sediment
Data Release Authorized:
Reported: 08/06/10

Project: NA
Event: BOJO
Date Sampled: 07/12/10
Date Received: 07/12/10

Client ID: RIS4-Surface
ARI ID: 10-16366 RD77C

Analyte	**Date**	**Method**	**Units**	**RL**	**Sample**
Total Solids	07/13/10 071310#1	EPA 160.3	Percent	0.01	73.70
Preserved Total Solids	07/14/10 071410#1	EPA 160.3	Percent	0.01	74.20
Total Volatile Solids	07/13/10 071310#1	EPA 160.4	Percent	0.01	1.66
N-Ammonia	07/15/10 071510#1	EPA 350.1M	mg-N/kg	0.12	6.59
Sulfide	07/15/10 071510#1	EPA 376.2	mg/kg	66.5	825
Total Organic Carbon	07/19/10 071910#1	Plumb,1981	Percent	0.020	0.684

RL	Analytical reporting limit
U	Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
RD77-Greylock Consulting, LLC

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 08/06/10

Project: NA
Event: BOJO
Date Sampled: 07/12/10
Date Received: 07/12/10

Client ID: RIS5-Surface
ARI ID: 10-16367 RD77D

Analyte	**Date**	**Method**	**Units**	**RL**	**Sample**
Total Solids	07/13/10 071310#1	EPA 160.3	Percent	0.01	75.30
Preserved Total Solids	07/14/10 071410#1	EPA 160.3	Percent	0.01	78.50
Total Volatile Solids	07/13/10 071310#1	EPA 160.4	Percent	0.01	1.56
N-Ammonia	07/15/10 071510#1	EPA 350.1M	mg-N/kg	0.12	0.97
Sulfide	07/15/10 071510#1	EPA 376.2	mg/kg	1.21	6.49
Total Organic Carbon	07/19/10 071910#1	Plumb,1981	Percent	0.020	0.640

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
RD77-Greylock Consulting, LLC

Matrix: Sediment
Data Release Authorized:
Reported: 08/06/10

Project: NA
Event: BOJO
Date Sampled: 07/12/10
Date Received: 07/12/10

Client ID: RIS6-Surface
ARI ID: 10-16368 RD77E

Analyte	**Date**	**Method**	**Units**	**RL**	**Sample**
Total Solids	07/13/10 071310#1	EPA 160.3	Percent	0.01	76.10
Preserved Total Solids	07/14/10 071410#1	EPA 160.3	Percent	0.01	76.00
Total Volatile Solids	07/13/10 071310#1	EPA 160.4	Percent	0.01	1.32
N-Ammonia	07/15/10 071510#1	EPA 350.1M	mg-N/kg	0.13	2.65
Sulfide	07/15/10 071510#1	EPA 376.2	mg/kg	12.4	220
Total Organic Carbon	07/19/10 071910#1	Plumb,1981	Percent	0.020	0.963

RL	Analytical reporting limit
U	Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
RD77-Greylock Consulting, LLC

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 08/06/10

Project: NA
Event: BOJO
Date Sampled: 07/12/10
Date Received: 07/12/10

Client ID: RIS7-Surface
ARI ID: 10-16369 RD77F

Analyte	**Date**	**Method**	**Units**	**RL**	**Sample**
Total Solids	07/13/10 071310#1	EPA 160.3	Percent	0.01	73.20
Preserved Total Solids	07/14/10 071410#1	EPA 160.3	Percent	0.01	77.50
Total Volatile Solids	07/13/10 071310#1	EPA 160.4	Percent	0.01	1.47
N-Ammonia	07/15/10 071510#1	EPA 350.1M	mg-N/kg	0.12	1.79
Sulfide	07/15/10 071510#1	EPA 376.2	mg/kg	63.0	338
Total Organic Carbon	07/19/10 071910#1	Plumb,1981	Percent	0.020	0.942

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
RD77-Greylock Consulting, LLC

ANALYTICAL
RESOURCES
INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 08/06/10

Project: NA
Event: BOJO
Date Sampled: 07/12/10
Date Received: 07/12/10

Client ID: RIS1-Surface
ARI ID: 10-16370 RD77G

Analyte	**Date**	**Method**	**Units**	**RL**	**Sample**
Total Solids	07/13/10 071310#1	EPA 160.3	Percent	0.01	44.70
Preserved Total Solids	07/14/10 071410#1	EPA 160.3	Percent	0.01	45.70
Total Volatile Solids	07/13/10 071310#1	EPA 160.4	Percent	0.01	7.56
N-Ammonia	07/15/10 071510#1	EPA 350.1M	mg-N/kg	0.22	20.0
Sulfide	07/15/10 071510#1	EPA 376.2	mg/kg	102	1,550
Total Organic Carbon	08/05/10 080510#1	Plumb,1981	Percent	0.020	2.83

RL	Analytical reporting limit
U	Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

MS/MSD RESULTS-CONVENTIONALS
RD77-Greylock Consulting, LLC

Matrix: Sediment
Data Release Authorized:
Reported: 08/06/10

Project: NA
Event: BOJO
Date Sampled: 07/12/10
Date Received: 07/12/10

Analyte	Date	Units	Sample	Spike	Spike Added	Recovery
ARI ID: RD77B Client ID: RIS3-Surface						
Total Organic Carbon	07/19/10	Percent	0.558	1.60	1.09	95.4%
ARI ID: RD77D Client ID: RIS5-Surface						
N-Ammonia	07/15/10	mg-N/kg	0.97	123	123	99.0%
Sulfide	07/15/10	mg/kg	6.49	173	148	112.5%

REPLICATE RESULTS-CONVENTIONALS
RD77-Greylock Consulting, LLC

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 08/06/10

Project: NA
Event: BOJO
Date Sampled: 07/12/10
Date Received: 07/12/10

Analyte	**Date**	**Units**	**Sample**	**Replicate(s)**	**RPD/RSD**
ARI ID: RD77B Client ID: RIS3-Surface					
Total Solids	07/13/10	Percent	75.10	76.00 75.20	0.7%
Total Volatile Solids	07/13/10	Percent	1.36	1.34 1.32	1.5%
Total Organic Carbon	07/19/10	Percent	0.558	0.606 0.537	6.2%
ARI ID: RD77D Client ID: RIS5-Surface					
Preserved Total Solids	07/14/10	Percent	78.50	78.20	0.4%
N-Ammonia	07/15/10	mg-N/kg	0.97	0.96 0.96	0.6%
Sulfide	07/15/10	mg/kg	6.49	5.97	8.3%

LAB CONTROL RESULTS-CONVENTIONALS
RD77-Greylock Consulting, LLC

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 08/06/10

Project: NA
Event: BOJO
Date Sampled: NA
Date Received: NA

Analyte/Method	QC ID	Date	Units	LCS	Spike Added	Recovery
Sulfide EPA 376.2	PREP	07/15/10	mg/kg	7.57	6.44	117.5%
Total Organic Carbon	ICVL	07/19/10	Percent	0.093	0.100	93.0%
Plumb,1981	ICVL	08/05/10		0.100	0.100	100.0%

Soil Lab Control Report-RD77

STANDARD REFERENCE RESULTS-CONVENTIONALS
RD77-Greylock Consulting, LLC

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 08/06/10

Project: NA
Event: BOJO
Date Sampled: NA
Date Received: NA

Analyte/SRM ID	Date	Units	SRM	True Value	Recovery
N-Ammonia SPEX 28-24AS	07/15/10	mg-N/kg	100	100	100.0%
Total Organic Carbon NIST #8704	07/19/10	Percent	3.77	3.35	112.5%
	08/05/10		3.68	3.35	109.9%

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
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Sample ID: METHOD BLANK

Lab Sample ID: RD77MB
LIMS ID: 10-16372
Matrix: Sediment
Data Release Authorized:
Reported: 07/19/10

QC Report No: RD77-Greylock Consulting, LLC
Project: BOJO

Date Sampled: NA
Date Received: NA

Percent Total Solids: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
CLP	07/14/10	7471A	07/16/10	7439-97-6	Mercury	0.02	0.02	U

U-Analyte undetected at given RL
RL-Reporting Limit

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: RIS2-2-4'
SAMPLE

Lab Sample ID: RD77H
LIMS ID: 10-16371
Matrix: Sediment
Data Release Authorized:
Reported: 07/19/10

QC Report No: RD77-Greylock Consulting, LLC
Project: BOJO

Date Sampled: 07/12/10
Date Received: 07/12/10

Percent Total Solids: 69.2%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
CLP	07/14/10	7471A	07/16/10	**7439-97-6**	**Mercury**	0.03	**0.75**	

U-Analyte undetected at given RL
RL-Reporting Limit

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: RIS2-4-6'
SAMPLE

Lab Sample ID: RD77I
LIMS ID: 10-16372
Matrix: Sediment
Data Release Authorized:
Reported: 07/19/10

QC Report No: RD77-Greylock Consulting, LLC
Project: BOJO

Date Sampled: 07/12/10
Date Received: 07/12/10

Percent Total Solids: 64.9%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
CLP	07/14/10	7471A	07/16/10	**7439-97-6**	**Mercury**	0.03	**0.12**	

U-Analyte undetected at given RL
RL-Reporting Limit

FORM-I

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: RIS3-2-4'
SAMPLE

Lab Sample ID: RD77J
LIMS ID: 10-16373
Matrix: Sediment
Data Release Authorized:
Reported: 07/19/10

QC Report No: RD77-Greylock Consulting, LLC
Project: BOJO

Date Sampled: 07/12/10
Date Received: 07/12/10

Percent Total Solids: 69.8%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
CLP	07/14/10	7471A	07/16/10	**7439-97-6**	**Mercury**	0.03	**0.61**	

U-Analyte undetected at given RL
RL-Reporting Limit

FORM-I

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: RIS3-4-6'
SAMPLE

Lab Sample ID: RD77K
LIMS ID: 10-16374
Matrix: Sediment
Data Release Authorized:
Reported: 07/19/10

QC Report No: RD77-Greylock Consulting, LLC
Project: BOJO

Date Sampled: 07/12/10
Date Received: 07/12/10

Percent Total Solids: 63.2%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
CLP	07/14/10	7471A	07/16/10	**7439-97-6**	**Mercury**	0.03	**1.06**	

U-Analyte undetected at given RL
RL-Reporting Limit

FORM-I

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: RIS4-2-4'
SAMPLE

Lab Sample ID: RD77L
LIMS ID: 10-16375
Matrix: Sediment
Data Release Authorized:
Reported: 07/19/10

QC Report No: RD77-Greylock Consulting, LLC
Project: BOJO

Date Sampled: 07/12/10
Date Received: 07/12/10

Percent Total Solids: 76.5%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
CLP	07/14/10	7471A	07/16/10	7439-97-6	Mercury	0.03	0.03	U

U-Analyte undetected at given RL
RL-Reporting Limit

FORM-I

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
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Sample ID: RIS4-4-6'
SAMPLE

Lab Sample ID: RD77M
LIMS ID: 10-16376
Matrix: Sediment
Data Release Authorized:
Reported: 07/19/10

QC Report No: RD77-Greylock Consulting, LLC
Project: BOJO

Date Sampled: 07/12/10
Date Received: 07/12/10

Percent Total Solids: 81.6%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
CLP	07/14/10	7471A	07/16/10	**7439-97-6**	**Mercury**	0.02	**0.04**	

U-Analyte undetected at given RL
RL-Reporting Limit

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: RIS2-2-4'
MATRIX SPIKE

Lab Sample ID: RD77H
LIMS ID: 10-16371
Matrix: Sediment
Data Release Authorized
Reported: 07/19/10

QC Report No: RD77-Greylock Consulting, LLC
Project: BOJO

Date Sampled: 07/12/10
Date Received: 07/12/10

MATRIX SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Spike	Spike Added	% Recovery	Q
Mercury	7471A	0.75	0.91	0.254	63.0%	N

Reported in mg/kg-dry

N-Control Limit Not Met
H-% Recovery Not Applicable, Sample Concentration Too High
NA-Not Applicable, Analyte Not Spiked

Percent Recovery Limits: 75-125%

ANALYTICAL
RESOURCES
INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: RIS2-2-4'
DUPLICATE

Lab Sample ID: RD77H
LIMS ID: 10-16371
Matrix: Sediment
Data Release Authorized:
Reported: 07/19/10

QC Report No: RD77-Greylock Consulting, LLC
Project: BOJO

Date Sampled: 07/12/10
Date Received: 07/12/10

MATRIX DUPLICATE QUALITY CONTROL REPORT

Analyte	**Analysis Method**	**Sample**	**Duplicate**	**RPD**	**Control Limit**	**Q**
Mercury	7471A	0.75	0.70	6.9%	+/- 20%	

Reported in mg/kg-dry

*-Control Limit Not Met
L-RPD Invalid, Limit = Detection Limit

FORM-VI

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: LAB CONTROL

Lab Sample ID: RD77LCS
LIMS ID: 10-16372
Matrix: Sediment
Data Release Authorized:
Reported: 07/19/10

QC Report No: RD77-Greylock Consulting, LLC
Project: BOJO

Date Sampled: NA
Date Received: NA

BLANK SPIKE/BLANK SPIKE DUPLICATE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike Found	Spike Dup Found	Spike Added	Spike Recovery	Spike Dup Recovery	RPD	Q
Mercury	7471A	0.54	0.54	0.50	108%	108%	0.0%	

Reported in mg/kg-dry

N-Control limit not met
Control Limits: 80-120%

Chain of Custody Record & Laboratory Analysis Request

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

ARI Assigned Number: RO77
Turn-around Requested: Standard
ARI Client Company: Greylock
Phone: 253-266-2838
Client Contact: Suzann Dudziak
720 S 333 Federal WAY
Client Project Name:
Client Project #: BoJO
Samplers: Mark Willoughby, Suzann Dudziak
Page: 1 of 2
Date: 7-12-10
Ice Present? YES
No. of Coolers: 1
Cooler Temps: 11.6

					Analysis Requested								Notes/Comments
Sample ID	Date	Time	Matrix	No. Containers	Total Solids	TOC	TVS	Bulk Ammonia	Sulfide	PAHs	Mercury		E-Mail results to greylock llc @ comcast.net
RIS2 -Surface	7-12-10	1106	S	3	X	X	X	X	X	X			
RIS2 - 0-2'		1153		1									Archive
RIS2 2-4'		1051		1							X		
RIS2 4-6'		1054		1							X		
RIS2 6-8'		1056		1									Archive
RIS3 Surface		1038		3	X	X	X	X	X	X			
RIS3 0-2'		1122		1									Archive
RIS3 2-4'		1124		1							X		
RIS3 4-6'		1125		1							X		
RIS3 6-8'		1127		1									Archive

Comments/Special Instructions

Relinquished by:	Received by:	Relinquished by:	Received by:
(Signature) Mark Willou	(Signature)	(Signature)	(Signature)
Printed Name: Mark Willoughby	Printed Name: A. Volgardsen	Printed Name:	Printed Name:
Company: Greylock	Company: ARI	Company:	Company:
Date & Time: 7-12-10 / 1600	Date & Time: 7/12/10 1600	Date & Time:	Date & Time:

Limits of Liability: *ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.*

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

Chain of Custody Record & Laboratory Analysis Request

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

ARI Assigned Number: RD77
Turn-around Requested: Standard
ARI Client Company: Grey Lock
Phone: 253-266-2838
Client Contact: Suzann Dudziak 720 S 333 Federal WAY
Client Project Name:
Client Project #: B050
Samplers: Mark Willoughby, Suzann Dudziak

Page: 2 of 2
Date: 7-12-10
Ice Present? yes
No. of Coolers: 1
Cooler Temps: 11.6

Sample ID	Date	Time	Matrix	No. Containers	Total solids	TOC	TVS	Bulk Ammonia	Sulfide	PAH	Mercury	HCID	Notes/Comments
													Email results to greylockllc comcast.net
RI S4 - Surface	7-12-10	1305	S	3	X	X	X	X	X	X			
RI S4 0-2'		1144		1									Archive
RI S4 2-4'		1146		1							X		
RI S4 4-6'		1148		1							X		
RI S4 6-8'		1150		1									Archive
RI S5 - surface		1312		4	X	X	X	X	X	X		X	
RI S6 - Surface		1206		3									
RI S7 - Surface		1030		3									
RI S1 - Surface		1200		4	X	X	X	X	X	X		X	

Comments/Special Instructions

Relinquished by: (Signature) Mark Willoughby	Received by: (Signature)	Relinquished by: (Signature)	Received by: (Signature)
Printed Name: Mark Willoughby	Printed Name: A. Volgardsen	Printed Name:	Printed Name:
Company: Grey Lock	Company: ARI	Company:	Company:
Date & Time: 7-12-10 / 1600	Date & Time: 7/12/10 1600	Date & Time:	Date & Time:

Limits of Liability: *ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.*

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

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Sample ID: RIS2-2-4'
SAMPLE

Lab Sample ID: RD77H
LIMS ID: 10-16371
Matrix: Sediment
Data Release Authorized:
Reported: 07/19/10

QC Report No: RD77-Greylock Consulting, LLC
Project: BOJO

Date Sampled: 07/12/10
Date Received: 07/12/10

Percent Total Solids: 69.2%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
CLP	07/14/10	7471A	07/16/10	**7439-97-6**	**Mercury**	0.03	**0.75**	

U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: RIS2-4-6'
SAMPLE

Lab Sample ID: RD77I
LIMS ID: 10-16372
Matrix: Sediment
Data Release Authorized:
Reported: 07/19/10

QC Report No: RD77-Greylock Consulting, LLC
Project: BOJO

Date Sampled: 07/12/10
Date Received: 07/12/10

Percent Total Solids: 64.9%

Prep Meth	**Prep Date**	**Analysis Method**	**Analysis Date**	**CAS Number**	**Analyte**	**RL**	**mg/kg-dry**	**Q**
CLP	07/14/10	7471A	07/16/10	**7439-97-6**	**Mercury**	0.03	**0.12**	

U-Analyte undetected at given RL
RL-Reporting Limit

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: RIS3-2-4'
SAMPLE

Lab Sample ID: RD77J
LIMS ID: 10-16373
Matrix: Sediment
Data Release Authorized:
Reported: 07/19/10

QC Report No: RD77-Greylock Consulting, LLC
Project: BOJO

Date Sampled: 07/12/10
Date Received: 07/12/10

Percent Total Solids: 69.8%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
CLP	07/14/10	7471A	07/16/10	**7439-97-6**	**Mercury**	0.03	**0.61**	

U-Analyte undetected at given RL
RL-Reporting Limit

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: RIS3-4-6'
SAMPLE

Lab Sample ID: RD77K
LIMS ID: 10-16374
Matrix: Sediment
Data Release Authorized:
Reported: 07/19/10

QC Report No: RD77-Greylock Consulting, LLC
Project: BOJO

Date Sampled: 07/12/10
Date Received: 07/12/10

Percent Total Solids: 63.2%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
CLP	07/14/10	7471A	07/16/10	**7439-97-6**	**Mercury**	0.03	1.06	

U-Analyte undetected at given RL
RL-Reporting Limit

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: RIS4-2-4'
SAMPLE

Lab Sample ID: RD77L
LIMS ID: 10-16375
Matrix: Sediment
Data Release Authorized:
Reported: 07/19/10

QC Report No: RD77-Greylock Consulting, LLC
Project: BOJO

Date Sampled: 07/12/10
Date Received: 07/12/10

Percent Total Solids: 76.5%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
CLP	07/14/10	7471A	07/16/10	7439-97-6	Mercury	0.03	0.03	U

U-Analyte undetected at given RL
RL-Reporting Limit

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: RIS4-4-6'
SAMPLE

Lab Sample ID: RD77M
LIMS ID: 10-16376
Matrix: Sediment
Data Release Authorized:
Reported: 07/19/10

QC Report No: RD77-Greylock Consulting, LLC
Project: BOJO

Date Sampled: 07/12/10
Date Received: 07/12/10

Percent Total Solids: 81.6%

Prep Meth	**Prep Date**	**Analysis Method**	**Analysis Date**	**CAS Number**	**Analyte**	**RL**	**mg/kg-dry**	**Q**
CLP	07/14/10	7471A	07/16/10	**7439-97-6**	**Mercury**	0.02	**0.04**	

U-Analyte undetected at given RL
RL-Reporting Limit

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: RIS2-2-4'
DUPLICATE

Lab Sample ID: RD77H
LIMS ID: 10-16371
Matrix: Sediment
Data Release Authorized:
Reported: 07/19/10

QC Report No: RD77-Greylock Consulting, LLC
Project: BOJO

Date Sampled: 07/12/10
Date Received: 07/12/10

MATRIX DUPLICATE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Duplicate	RPD	Control Limit	Q
Mercury	7471A	0.75	0.70	6.9%	+/- 20%	

Reported in mg/kg-dry

*-Control Limit Not Met
L-RPD Invalid, Limit = Detection Limit

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: RIS2-2-4'
MATRIX SPIKE

Lab Sample ID: RD77H
LIMS ID: 10-16371
Matrix: Sediment
Data Release Authorized:
Reported: 07/19/10

QC Report No: RD77-Greylock Consulting, LLC
Project: BOJO

Date Sampled: 07/12/10
Date Received: 07/12/10

MATRIX SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Spike	Spike Added	% Recovery	Q
Mercury	7471A	0.75	0.91	0.254	63.0%	N

Reported in mg/kg-dry

N-Control Limit Not Met
H-% Recovery Not Applicable, Sample Concentration Too High
NA-Not Applicable, Analyte Not Spiked

Percent Recovery Limits: 75-125%

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: LAB CONTROL

Lab Sample ID: RD77LCS
LIMS ID: 10-16372
Matrix: Sediment
Data Release Authorized:
Reported: 07/19/10

QC Report No: RD77-Greylock Consulting, LLC
Project: BOJO

Date Sampled: NA
Date Received: NA

BLANK SPIKE/BLANK SPIKE DUPLICATE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike Found	Spike Dup Found	Spike Added	Spike Recovery	Spike Dup Recovery	RPD	Q
Mercury	7471A	0.54	0.54	0.50	108%	108%	0.0%	

Reported in mg/kg-dry

N-Control limit not met
Control Limits: 80-120%

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: METHOD BLANK

Lab Sample ID: RD77MB
LIMS ID: 10-16372
Matrix: Sediment
Data Release Authorized:
Reported: 07/19/10

QC Report No: RD77-Greylock Consulting, LLC
Project: BOJO

Date Sampled: NA
Date Received: NA

Percent Total Solids: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry	Q
CLP	07/14/10	7471A	07/16/10	7439-97-6	Mercury	0.02	0.02	U

U-Analyte undetected at given RL
RL-Reporting Limit

Ecology

Manchester Environmental Laboratory

7411 Beach Dr E, Port Orchard, Washington 98366

Case Narrative

April 18, 2013

Subject: Reliable Steel

Samples: 1304044-10

Officer: Pam Marti

By: Dolores Montgomery

VOA

Analytical Method

The samples were analyzed following a modification of EPA Method 8260C.

Holding Times

All samples were received in good condition, within the proper temperature <6° C and were prepared and analyzed within method holding times.

Instrument Tuning

Calibration against BFB is acceptable for the initial calibration, continuing calibrations and all associated samples.

Initial Calibration

The initial calibration (ICAL), Initial Calibration Verification (ICV) and back calculations (BC) were within QC limits with the following exceptions:

The lowest calibration point of 1 ug/Kg was dropped for dichlorodifluoromethane and acetone. The reporting limit was raised to 2 ug/Kg for these two analytes.

Continuing Calibrations

All analytes were within QC limits.

Internal Standards

All internal standard retention times and areas were within QC limits with the following exceptions:

Internal standards chlorobenzene-D5 and 1,4-dichlorobenzene were recovered low. The sample was re-analyzed utilizing all three submitted sample plugs with similar results. Since recoveries are acceptable for the blank and blank spikes, matrix interference is the probable cause of the low recoveries. Due to the low internal standard recoveries, combined with the unacceptable surrogate recoveries, all results for the sample were qualified J for detects and UJ for non-detects.

Method Blanks

No target analytes were detected in the laboratory method blank.

Surrogates

All surrogate percent recoveries were within QC limits with the following exception:

1,2-dichloroethane-D4 was recovered high and p-bromofluorobenzene was recovered low in sample 1304044-10. As noted in the internal standard section, all data for the sample was qualified J/UJ based on sample matrix interference.

Laboratory Control Samples

All recoveries and RPD's were within QC limits.

Matrix Spiked Samples

N/A

Qualitative Identification

The spectra of the reported samples were within QC limits and matched the reference spectra.

Data Qualifiers

Code	Definition
E	Reported result is an estimate because it exceeds the calibration range.
G	Value is likely greater than result reported; result is an estimated minimum value.

J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
N	The analysis indicates the present of an analyte for which there is presumptive evidence to make a "tentative identification".
NJ	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.
NAF	Not analyzed for.
NC	Not calculated.
REJ	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.
U	The analyte was not detected at or above the reported sample quantitation limit.
UJ	The analyte was not detected at or above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately measure the analyte in the sample.
bold	The analyte was present in the sample. (Visual aid to locate detected compounds on the analytical report.)

Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Volatile Organics Analysis

Project: Reliable Steel

Field ID: EC-1(0-0.4)

Work Order: 1304044
Project Officer: Marti, Pam
Initial Vol: 5.37 g
Final Vol: 5 mL

Lab ID #: 1304044-10
Collected: 4/10/2013
Prep Method: SW5035
Analysis Method: SW8260
% Solids: 91.40%

Batch ID: B13D120
Prepared: 4/17/2013
Analyzed: 4/17/2013
Matrix: Sediment/Soil
Units: ug/Kg dw

CAS#	Analyte	Result	Qualifier	RL	MDL
630-20-6	1,1,1,2-Tetrachloroethane	1.02	UJ	1.02	0.36
71-55-6	1,1,1-Trichloroethane	1.02	UJ	1.02	0.37
79-34-5	1,1,2,2-Tetrachloroethane	1.02	UJ	1.02	0.33
79-00-5	1,1,2-Trichloroethane	1.02	UJ	1.02	0.45
76-13-1	1,1,2-Trichlorotrifluoroethane	1.02	UJ	1.02	0.45
75-34-3	1,1-Dichloroethane	1.02	UJ	1.02	0.43
75-35-4	1,1-Dichloroethene	1.02	UJ	1.02	0.47
563-58-6	1,1-Dichloropropene	1.02	UJ	1.02	0.43
87-61-6	1,2,3-Trichlorobenzene	1.02	UJ	1.02	0.47
96-18-4	1,2,3-Trichloropropane	1.02	UJ	1.02	0.45
120-82-1	1,2,4-Trichlorobenzene	1.02	UJ	1.02	0.54
95-63-6	**1,2,4-Trimethylbenzene**	**0.62**	**J**	1.02	0.43
96-12-8	1,2-Dibromo-3-Chloropropane	1.02	UJ	1.02	0.36
106-93-4	1,2-Dibromoethane (EDB)	1.02	UJ	1.02	0.38
95-50-1	1,2-Dichlorobenzene	1.02	UJ	1.02	0.49
107-06-2	1,2-Dichloroethane	1.02	UJ	1.02	0.36
78-87-5	1,2-Dichloropropane	1.02	UJ	1.02	0.42
108-67-8	**1,3,5-Trimethylbenzene**	**0.56**	**J**	1.02	0.44
541-73-1	1,3-Dichlorobenzene	1.02	UJ	1.02	0.47
142-28-9	1,3-Dichloropropane	1.02	UJ	1.02	0.42
106-46-7	1,4-Dichlorobenzene	1.02	UJ	1.02	0.51
594-20-7	2,2-Dichloropropane	1.02	UJ	1.02	0.31
78-93-3	2-Butanone	1.02	UJ	1.02	0.73
95-49-8	2-Chlorotoluene	1.02	UJ	1.02	0.51
591-78-6	2-Hexanone	1.02	UJ	1.02	0.37
106-43-4	4-Chlorotoluene	1.02	UJ	1.02	0.42
108-10-1	4-Methyl-2-pentanone	1.02	UJ	1.02	0.39
67-64-1	Acetone	2.04	UJ	2.04	
71-43-2	Benzene	1.02	UJ	1.02	0.48
108-86-1	Bromobenzene	1.02	UJ	1.02	0.42
74-97-5	Bromochloromethane	1.02	UJ	1.02	0.45
75-27-4	Bromodichloromethane	1.02	UJ	1.02	0.36
75-25-2	Bromoform	1.02	UJ	1.02	0.31
74-83-9	Bromomethane	1.02	UJ	1.02	0.44
75-15-0	Carbon Disulfide	1.02	UJ	1.02	0.40
56-23-5	Carbon Tetrachloride	1.02	UJ	1.02	0.36
108-90-7	Chlorobenzene	1.02	UJ	1.02	0.45
75-00-3	Chloroethane	1.02	UJ	1.02	0.35
67-66-3	Chloroform	1.02	UJ	1.02	0.37
74-87-3	Chloromethane	1.02	UJ	1.02	0.19
156-59-2	Cis-1,2-Dichloroethene	1.02	UJ	1.02	0.45
10061-01-5	Cis-1,3-Dichloropropene	1.02	UJ	1.02	0.36
124-48-1	Dibromochloromethane	1.02	UJ	1.02	0.31
74-95-3	Dibromomethane	1.02	UJ	1.02	0.46
75-71-8	Dichlorodifluoromethane	2.04	UJ	2.04	1.51
60-29-7	Ethyl Ether	1.02	UJ	1.02	0.43
100-41-4	**Ethylbenzene**	**0.33**	**J**	1.02	0.38
87-68-3	Hexachlorobutadiene	1.02	UJ	1.02	0.52
67-72-1	Hexachloroethane	1.02	UJ	1.02	0.37

Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Volatile Organics Analysis

Project: Reliable Steel **Field ID: EC-1(0-0.4)**

Work Order: 1304044	Lab ID #: 1304044-10	Batch ID: B13D120
Project Officer: Marti, Pam	Collected: 4/10/2013	Prepared: 4/17/2013
Initial Vol: 5.37 g	Prep Method: SW5035	Analyzed: 4/17/2013
Final Vol: 5 mL	Analysis Method: SW8260	Matrix: Sediment/Soil
	% Solids: 91.40%	Units: ug/Kg dw

CAS#	Analyte	Result	Qualifier	RL	MDL
98-82-8	Isopropylbenzene (Cumene)	1.02	UJ	1.02	0.43
179601-23-1	**m,p-Xylene**	**1.76**	**J**	2.04	0.76
74-88-4	Methyl Iodide	1.02	UJ	1.02	0.46
1634-04-4	Methyl t-butyl ether	1.02	UJ	1.02	0.47
75-09-2	Methylene Chloride	1.02	UJ	1.02	0.45
91-20-3	Naphthalene	1.02	UJ	1.02	0.41
104-51-8	n-Butylbenzene	1.02	UJ	1.02	0.41
103-65-1	n-Propylbenzene	1.02	UJ	1.02	0.48
95-47-6	**o-Xylene**	**0.66**	**J**	1.02	0.35
76-01-7	Pentachloroethane	1.02	UJ	1.02	0.39
99-87-6	p-Isopropyltoluene	1.02	UJ	1.02	0.37
135-98-8	Sec-Butylbenzene	1.02	UJ	1.02	0.40
100-42-5	Styrene	1.02	UJ	1.02	0.32
98-06-6	Tert-Butylbenzene	1.02	UJ	1.02	0.42
127-18-4	Tetrachloroethene	1.02	UJ	1.02	0.39
109-99-9	Tetrahydrofuran	1.02	UJ	1.02	0.85
108-88-3	**Toluene**	**1.90**	**J**	1.02	0.47
156-60-5	Trans-1,2-Dichloroethene	1.02	UJ	1.02	0.41
10061-02-6	Trans-1,3-Dichloropropene	1.02	UJ	1.02	0.35
110-57-6	Trans-1,4-Dichloro-2-butene	1.02	UJ	1.02	0.33
79-01-6	Trichloroethene	1.02	UJ	1.02	0.43
75-69-4	Trichlorofluoromethane	1.02	UJ	1.02	0.42
75-01-4	Vinyl Chloride	1.02	UJ	1.02	0.39

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
2199-69-1	**1,2-Dichlorobenzene-D4**	**10.2**	10.0	**102**	80-120
17060-07-0	**1,2-Dichloroethane-D4**	**14.4**	10.0	**144**	80-120
540-36-3	**1,4-Difluorobenzene**	**10.5**	10.0	**105**	80-120
460-00-4	**p-Bromofluorobenzene**	**7.05**	10.0	**71**	80-120
2037-26-5	**Toluene-D8**	**11.2**	10.0	**112**	80-120

Authorized by: ______________ **Release Date:** 04|23|13 Printed: 4/23/2013

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Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Volatile Organics Analysis

Project: Reliable Steel **QC Type : Method Blank**

Work Order: 1304044
Project Officer: Marti, Pam
Initial Vol: 5 g
Final Vol: 5 mL

Lab ID #: B13D120-BLK1
Prep Method: SW5035
Analysis Method: SW8260
Source Field ID: Blank

Batch ID: B13D120
Prepared: 4/17/2013
Analyzed: 4/17/2013
Matrix: Sediment/Soil
Units: ug/Kg dw

CAS#	Analyte	Result	Qualifier	RL	MDL
630-20-6	1,1,1,2-Tetrachloroethane	1.00	U	1.00	0.35
71-55-6	1,1,1-Trichloroethane	1.00	U	1.00	0.36
79-34-5	1,1,2,2-Tetrachloroethane	1.00	U	1.00	0.32
79-00-5	1,1,2-Trichloroethane	1.00	U	1.00	0.45
76-13-1	1,1,2-Trichlorotrifluoroethane	1.00	U	1.00	0.44
75-34-3	1,1-Dichloroethane	1.00	U	1.00	0.43
75-35-4	1,1-Dichloroethene	1.00	U	1.00	0.46
563-58-6	1,1-Dichloropropene	1.00	U	1.00	0.42
87-61-6	1,2,3-Trichlorobenzene	1.00	U	1.00	0.46
96-18-4	1,2,3-Trichloropropane	1.00	U	1.00	0.44
120-82-1	1,2,4-Trichlorobenzene	1.00	U	1.00	0.53
95-63-6	1,2,4-Trimethylbenzene	1.00	U	1.00	0.42
96-12-8	1,2-Dibromo-3-Chloropropane	1.00	U	1.00	0.35
106-93-4	1,2-Dibromoethane (EDB)	1.00	U	1.00	0.37
95-50-1	1,2-Dichlorobenzene	1.00	U	1.00	0.48
107-06-2	1,2-Dichloroethane	1.00	U	1.00	0.35
78-87-5	1,2-Dichloropropane	1.00	U	1.00	0.41
108-67-8	1,3,5-Trimethylbenzene	1.00	U	1.00	0.44
541-73-1	1,3-Dichlorobenzene	1.00	U	1.00	0.46
142-28-9	1,3-Dichloropropane	1.00	U	1.00	0.41
106-46-7	1,4-Dichlorobenzene	1.00	U	1.00	0.50
594-20-7	2,2-Dichloropropane	1.00	U	1.00	0.30
78-93-3	2-Butanone	1.00	U	1.00	0.72
95-49-8	2-Chlorotoluene	1.00	U	1.00	0.50
591-78-6	2-Hexanone	1.00	U	1.00	0.37
106-43-4	4-Chlorotoluene	1.00	U	1.00	0.41
108-10-1	4-Methyl-2-pentanone	1.00	U	1.00	0.38
67-64-1	Acetone	2.00	U	2.00	
71-43-2	Benzene	1.00	U	1.00	0.47
108-86-1	Bromobenzene	1.00	U	1.00	0.41
74-97-5	Bromochloromethane	1.00	U	1.00	0.45
75-27-4	Bromodichloromethane	1.00	U	1.00	0.35
75-25-2	Bromoform	1.00	U	1.00	0.31
74-83-9	Bromomethane	1.00	U	1.00	0.43
75-15-0	Carbon Disulfide	1.00	U	1.00	0.39
56-23-5	Carbon Tetrachloride	1.00	U	1.00	0.35
108-90-7	Chlorobenzene	1.00	U	1.00	0.44
75-00-3	Chloroethane	1.00	U	1.00	0.35
67-66-3	Chloroform	1.00	U	1.00	0.36
74-87-3	Chloromethane	1.00	U	1.00	0.19
156-59-2	Cis-1,2-Dichloroethene	1.00	U	1.00	0.44
10061-01-5	Cis-1,3-Dichloropropene	1.00	U	1.00	0.36
124-48-1	Dibromochloromethane	1.00	U	1.00	0.31
74-95-3	Dibromomethane	1.00	U	1.00	0.45
75-71-8	Dichlorodifluoromethane	2.00	U	2.00	1.48
60-29-7	Ethyl Ether	1.00	U	1.00	0.42
100-41-4	Ethylbenzene	1.00	U	1.00	0.37
87-68-3	Hexachlorobutadiene	1.00	U	1.00	0.51
67-72-1	Hexachloroethane	1.00	U	1.00	0.36

Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Volatile Organics Analysis

Project: Reliable Steel

QC Type : Method Blank

Work Order: 1304044
Project Officer: Marti, Pam
Initial Vol: 5 g
Final Vol: 5 mL

Lab ID #: B13D120-BLK1
Prep Method: SW5035
Analysis Method: SW8260
Source Field ID: Blank

Batch ID: B13D120
Prepared: 4/17/2013
Analyzed: 4/17/2013
Matrix: Sediment/Soil
Units: ug/Kg dw

CAS#	Analyte	Result	Qualifier	RL	MDL
98-82-8	Isopropylbenzene (Cumene)	1.00	U	1.00	0.42
179601-23-1	m,p-Xylene	2.00	U	2.00	0.74
74-88-4	Methyl Iodide	1.00	U	1.00	0.45
1634-04-4	Methyl t-butyl ether	1.00	U	1.00	0.46
75-09-2	Methylene Chloride	1.00	U	1.00	0.44
91-20-3	Naphthalene	1.00	U	1.00	0.41
104-51-8	n-Butylbenzene	1.00	U	1.00	0.40
103-65-1	n-Propylbenzene	1.00	U	1.00	0.47
95-47-6	o-Xylene	1.00	U	1.00	0.35
76-01-7	Pentachloroethane	1.00	U	1.00	0.38
99-87-6	p-Isopropyltoluene	1.00	U	1.00	0.37
135-98-8	Sec-Butylbenzene	1.00	U	1.00	0.39
100-42-5	Styrene	1.00	U	1.00	0.31
98-06-6	Tert-Butylbenzene	1.00	U	1.00	0.41
127-18-4	Tetrachloroethene	1.00	U	1.00	0.38
109-99-9	Tetrahydrofuran	1.00	U	1.00	0.84
108-88-3	Toluene	1.00	U	1.00	0.46
156-60-5	Trans-1,2-Dichloroethene	1.00	U	1.00	0.40
10061-02-6	Trans-1,3-Dichloropropene	1.00	U	1.00	0.35
110-57-6	Trans-1,4-Dichloro-2-butene	1.00	U	1.00	0.32
79-01-6	Trichloroethene	1.00	U	1.00	0.42
75-69-4	Trichlorofluoromethane	1.00	U	1.00	0.42
75-01-4	Vinyl Chloride	1.00	U	1.00	0.38

<u>Surrogate Recovery:</u>

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
2199-69-1	**1,2-Dichlorobenzene-D4**	**10.7**	10.0	**107**	80-120
17060-07-0	**1,2-Dichloroethane-D4**	**12.0**	10.0	**120**	80-120
540-36-3	**1,4-Difluorobenzene**	**10.5**	10.0	**105**	80-120
460-00-4	**p-Bromofluorobenzene**	**9.20**	10.0	**92**	80-120
2037-26-5	**Toluene-D8**	**9.56**	10.0	**96**	80-120

Authorized by: ______________________ **Release Date:** 04/23/13

Printed:
4/23/2013

Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Volatile Organics Analysis

Project: Reliable Steel **QC Type : LCS**

Work Order: 1304044
Project Officer: Marti, Pam
Initial Vol: 5 g
Final Vol: 5 mL

Lab ID #: B13D120-BS1
Prep Method: SW5035
Analysis Method: SW8260
Source Field ID: LCS

Batch ID: B13D120
Prepared: 4/17/2013
Analyzed: 4/17/2013
Matrix: Sediment/Soil
Units: ug/Kg dw

Analyte	Result	Spike Level	RL	%Rec	%Rec Limits
1,1,1,2-Tetrachloroethane	9.6	10.0	1.00	96	75-125
1,1,1-Trichloroethane	9.6	10.0	1.00	96	75-125
1,1,2,2-Tetrachloroethane	10.6	10.0	1.00	106	75-125
1,1,2-Trichloroethane	10.5	10.0	1.00	105	75-125
1,1,2-Trichlorotrifluoroethane	9.8	10.0	1.00	98	75-125
1,1-Dichloroethane	9.9	10.0	1.00	99	75-125
1,1-Dichloroethene	9.6	10.0	1.00	96	75-125
1,1-Dichloropropene	9.8	10.0	1.00	98	75-125
1,2,3-Trichlorobenzene	10.1	10.0	1.00	101	75-125
1,2,3-Trichloropropane	10.3	10.0	1.00	103	75-125
1,2,4-Trichlorobenzene	10.2	10.0	1.00	102	75-125
1,2,4-Trimethylbenzene	10.2	10.0	1.00	102	75-125
1,2-Dibromo-3-Chloropropane	10.9	10.0	1.00	109	75-125
1,2-Dibromoethane (EDB)	10.9	10.0	1.00	109	75-125
1,2-Dichlorobenzene	10.2	10.0	1.00	102	75-125
1,2-Dichloroethane	10.5	10.0	1.00	105	75-125
1,2-Dichloropropane	10.3	10.0	1.00	103	75-125
1,3,5-Trimethylbenzene	9.5	10.0	1.00	95	75-125
1,3-Dichlorobenzene	10.0	10.0	1.00	100	75-125
1,3-Dichloropropane	10.6	10.0	1.00	106	75-125
1,4-Dichlorobenzene	10.0	10.0	1.00	100	75-125
2,2-Dichloropropane	9.5	10.0	1.00	95	75-125
2-Butanone	10.7	10.0	1.00	107	60-140
2-Chlorotoluene	10.2	10.0	1.00	102	75-125
2-Hexanone	10.1	10.0	1.00	101	60-140
4-Chlorotoluene	10.1	10.0	1.00	101	60-140
4-Methyl-2-pentanone	10.1	10.0	1.00	101	60-140
Acetone	9.7	10.0	2.00	97	60-140
Benzene	10.0	10.0	1.00	100	75-125
Bromobenzene	10.2	10.0	1.00	102	75-125
Bromochloromethane	10.4	10.0	1.00	104	75-125
Bromodichloromethane	9.9	10.0	1.00	99	75-125
Bromoform	10.2	10.0	1.00	102	75-125
Bromomethane	10.1	10.0	1.00	101	60-140
Carbon Disulfide	9.8	10.0	1.00	98	75-125
Carbon Tetrachloride	9.5	10.0	1.00	95	75-125
Chlorobenzene	9.9	10.0	1.00	99	75-125
Chloroethane	10.3	10.0	1.00	103	75-125
Chloroform	10.2	10.0	1.00	102	75-125
Chloromethane	9.8	10.0	1.00	98	60-140
Cis-1,2-Dichloroethene	10.2	10.0	1.00	102	75-125
Cis-1,3-Dichloropropene	10.0	10.0	1.00	100	75-125
Dibromochloromethane	10.0	10.0	1.00	100	75-125
Dibromomethane	10.7	10.0	1.00	107	75-125
Dichlorodifluoromethane	10.0	10.0	2.00	100	60-140
Ethyl Ether	10.6	10.0	1.00	106	75-125
Ethylbenzene	10.2	10.0	1.00	102	75-125
Hexachlorobutadiene	10.0	10.0	1.00	100	75-125
Hexachloroethane	8.7	10.0	1.00	87	75-125

Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Volatile Organics Analysis

Project: Reliable Steel **QC Type : LCS**

Work Order: 1304044	Lab ID #: B13D120-BS1	Batch ID: B13D120
Project Officer: Marti, Pam	Prep Method: SW5035	Prepared: 4/17/2013
Initial Vol: 5 g	Analysis Method: SW8260	Analyzed: 4/17/2013
Final Vol: 5 mL	Source Field ID: LCS	Matrix: Sediment/Soil
		Units: ug/Kg dw

Analyte	Result	Spike Level	RL	%Rec	%Rec Limits
Isopropylbenzene (Cumene)	**9.7**	10.0	1.00	**97**	75-125
m,p-Xylene	**20.1**	20.0	2.00	**101**	75-125
Methyl Iodide	**10.2**	10.0	1.00	**102**	75-125
Methyl t-butyl ether	**10.5**	10.0	1.00	**105**	75-125
Methylene Chloride	**9.6**	10.0	1.00	**96**	60-140
Naphthalene	**10.6**	10.0	1.00	**106**	75-125
n-Butylbenzene	**9.4**	10.0	1.00	**94**	75-125
n-Propylbenzene	**9.9**	10.0	1.00	**99**	75-125
o-Xylene	**9.9**	10.0	1.00	**99**	75-125
Pentachloroethane	**9.9**	10.0	1.00	**99**	75-125
p-Isopropyltoluene	**10.0**	10.0	1.00	**100**	75-125
Sec-Butylbenzene	**9.9**	10.0	1.00	**99**	75-125
Styrene	**10.0**	10.0	1.00	**100**	75-125
Tert-Butylbenzene	**9.6**	10.0	1.00	**96**	75-125
Tetrachloroethene	**9.8**	10.0	1.00	**98**	75-125
Tetrahydrofuran	**10.8**	10.0	1.00	**108**	75-125
Toluene	**9.9**	10.0	1.00	**99**	75-125
Trans-1,2-Dichloroethene	**10.0**	10.0	1.00	**100**	75-125
Trans-1,3-Dichloropropene	**10.2**	10.0	1.00	**102**	75-125
Trans-1,4-Dichloro-2-butene	**10.3**	10.0	1.00	**103**	75-125
Trichloroethene	**9.7**	10.0	1.00	**97**	75-125
Trichlorofluoromethane	**9.7**	10.0	1.00	**97**	75-125
Vinyl Chloride	**9.7**	10.0	1.00	**97**	60-140

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
2199-69-1	1,2-Dichlorobenzene-D4	**10.0**	10.0	**100**	80-120
17060-07-0	1,2-Dichloroethane-D4	**10.4**	10.0	**104**	80-120
540-36-3	1,4-Difluorobenzene	**9.97**	10.0	**100**	80-120
460-00-4	p-Bromofluorobenzene	**10.1**	10.0	**101**	80-120
2037-26-5	Toluene-D8	**10.0**	10.0	**100**	80-120

Authorized by: ____________ **Release Date:** 04/23/13

Printed:
4/23/2013

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Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Volatile Organics Analysis

Project: Reliable Steel

QC Type : LCS Dup

Work Order: 1304044
Project Officer: Marti, Pam
Initial Vol: 5 g
Final Vol: 5 mL

Lab ID #: B13D120-BSD1
Prep Method: SW5035
Analysis Method: SW8260
Source Field ID: LCS Dup

Batch ID: B13D120
Prepared: 4/17/2013
Analyzed: 4/17/2013
Matrix: Sediment/Soil
Units: ug/Kg dw

Analyte	Sample Result	Spike Level	%Rec	RPD	%Rec Limits	RPD Limit
1,1,1,2-Tetrachloroethane	9.2	10.0	92	4	75-125	30
1,1,1-Trichloroethane	9.6	10.0	96	0.2	75-125	30
1,1,2,2-Tetrachloroethane	10.4	10.0	104	1	75-125	30
1,1,2-Trichloroethane	10.3	10.0	103	1	75-125	30
1,1,2-Trichlorotrifluoroethane	10.0	10.0	100	1	75-125	30
1,1-Dichloroethane	10.0	10.0	100	0.7	75-125	30
1,1-Dichloroethene	10.1	10.0	101	5	75-125	30
1,1-Dichloropropene	9.8	10.0	98	0.2	75-125	30
1,2,3-Trichlorobenzene	9.8	10.0	98	3	75-125	30
1,2,3-Trichloropropane	10.2	10.0	102	1	75-125	30
1,2,4-Trichlorobenzene	9.6	10.0	96	6	75-125	30
1,2,4-Trimethylbenzene	10.0	10.0	100	2	75-125	30
1,2-Dibromo-3-Chloropropane	10.4	10.0	104	4	75-125	30
1,2-Dibromoethane (EDB)	10.6	10.0	106	3	75-125	30
1,2-Dichlorobenzene	10.0	10.0	100	1	75-125	30
1,2-Dichloroethane	10.3	10.0	103	2	75-125	30
1,2-Dichloropropane	10.3	10.0	103	0.06	75-125	30
1,3,5-Trimethylbenzene	9.5	10.0	95	0.7	75-125	30
1,3-Dichlorobenzene	9.9	10.0	99	1	75-125	30
1,3-Dichloropropane	10.2	10.0	102	4	75-125	30
1,4-Dichlorobenzene	9.8	10.0	98	2	75-125	30
2,2-Dichloropropane	9.1	10.0	91	4	75-125	30
2-Butanone	10.4	10.0	104	3	60-140	40
2-Chlorotoluene	10.3	10.0	103	1	75-125	30
2-Hexanone	9.8	10.0	98	3	60-140	40
4-Chlorotoluene	10.0	10.0	100	1	60-140	40
4-Methyl-2-pentanone	9.7	10.0	97	4	60-140	40
Acetone	10.9	10.0	109	12	60-140	40
Benzene	10.0	10.0	100	0.3	75-125	30
Bromobenzene	10.1	10.0	101	0.6	75-125	30
Bromochloromethane	10.4	10.0	104	0.4	75-125	40
Bromodichloromethane	9.6	10.0	96	3	75-125	30
Bromoform	9.9	10.0	99	3	75-125	30
Bromomethane	9.7	10.0	97	4	60-140	40
Carbon Disulfide	9.9	10.0	99	1	75-125	30
Carbon Tetrachloride	9.1	10.0	91	4	75-125	30
Chlorobenzene	9.9	10.0	99	0.02	75-125	30
Chloroethane	10.0	10.0	100	3	75-125	30
Chloroform	10.1	10.0	101	1	75-125	30
Chloromethane	9.9	10.0	99	0.9	60-140	40
Cis-1,2-Dichloroethene	10.4	10.0	104	2	75-125	30
Cis-1,3-Dichloropropene	9.7	10.0	97	4	75-125	30
Dibromochloromethane	9.8	10.0	98	2	75-125	30
Dibromomethane	10.5	10.0	105	1	75-125	30
Dichlorodifluoromethane	10.2	10.0	102	2	60-140	40
Ethyl Ether	10.6	10.0	106	0.9	75-125	30
Ethylbenzene	10.1	10.0	101	1	75-125	30
Hexachlorobutadiene	9.6	10.0	96	4	75-125	30
Hexachloroethane	8.2	10.0	82	6	75-125	30

Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Volatile Organics Analysis

Project: Reliable Steel **QC Type : LCS Dup**

Work Order: 1304044
Project Officer: Marti, Pam
Initial Vol: 5 g
Final Vol: 5 mL

Lab ID #: B13D120-BSD1
Prep Method: SW5035
Analysis Method: SW8260
Source Field ID: LCS Dup

Batch ID: B13D120
Prepared: 4/17/2013
Analyzed: 4/17/2013
Matrix: Sediment/Soil
Units: ug/Kg dw

Analyte	Sample Result	Spike Level	%Rec	RPD	%Rec Limits	RPD Limit
Isopropylbenzene (Cumene)	9.7	10.0	97	0.02	75-125	30
m,p-Xylene	19.8	20.0	99	1	75-125	40
Methyl Iodide	10.1	10.0	101	0.6	75-125	30
Methyl t-butyl ether	10.1	10.0	101	4	75-125	30
Methylene Chloride	9.6	10.0	96	0.5	60-140	40
Naphthalene	10.2	10.0	102	3	75-125	30
n-Butylbenzene	9.2	10.0	92	2	75-125	30
n-Propylbenzene	9.9	10.0	99	0.6	75-125	30
o-Xylene	10.0	10.0	100	0.4	75-125	30
Pentachloroethane	9.2	10.0	92	7	75-125	30
p-Isopropyltoluene	10.0	10.0	100	0.4	75-125	30
Sec-Butylbenzene	10.0	10.0	100	2	75-125	30
Styrene	9.8	10.0	98	2	75-125	30
Tert-Butylbenzene	9.8	10.0	98	2	75-125	30
Tetrachloroethene	10.1	10.0	101	3	75-125	30
Tetrahydrofuran	10.5	10.0	105	2	75-125	30
Toluene	10.0	10.0	100	0.5	75-125	30
Trans-1,2-Dichloroethene	10.2	10.0	102	1	75-125	30
Trans-1,3-Dichloropropene	9.6	10.0	96	6	75-125	30
Trans-1,4-Dichloro-2-butene	9.5	10.0	95	8	75-125	30
Trichloroethene	9.8	10.0	98	0.8	75-125	30
Trichlorofluoromethane	9.7	10.0	97	0.1	75-125	30
Vinyl Chloride	10.0	10.0	100	3	60-140	40

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
2199-69-1	1,2-Dichlorobenzene-D4	10.1	10.0	101	80-120
17060-07-0	1,2-Dichloroethane-D4	10.3	10.0	103	80-120
540-36-3	1,4-Difluorobenzene	9.98	10.0	100	80-120
460-00-4	p-Bromofluorobenzene	10.0	10.0	100	80-120
2037-26-5	Toluene-D8	10.0	10.0	100	80-120

Authorized by: ______________ **Release Date:** 04/23/13

Printed:
4/23/2013

Manchester Environmental Laboratory

7411 Beach Dr E, Port Orchard, Washington 98366

Case Narrative

May 2, 2013

Subject: Reliable Steel Project

Samples: 1304044-13, 14 and 15

Officer: Pam Marti

By: Bob Carrell

NWTPH-Dx

Analytical Method(s):

The samples were extracted following a modification of EPA method 3535A. The extracts were analyzed following the NWTPH-Dx method.

Holding Times

The samples were received in good condition, within the proper temperature of <6°C and were prepared and analyzed within the method holding times, except for sample 1304077-13 which was extracted one day after the fourteen day holding time had expired. Although that is not expected to affect the results, QC requirements insist on all data for that sample to be qualified as estimates.

Initial Calibration

The initial calibration (ICAL) and back calculations (BC) were within QC limits. An initial calibration verification (ICV) was performed along with the calibration standards when they were initially produced that consisted of the previous stock standard prepared at 1000ng/uL.

Continuing Calibration

All continuing calibration verifications (CCVs) were within QC limits.

Method Blanks

No target analytes detected in the laboratory method blank.

Surrogate

The surrogate percent recoveries were within the QC limits.

Laboratory Control Sample(s)

The percent recoveries and RPDs were within the QC limits.

Matrix Spiked Samples

None requested.

Duplicate Samples

None requested.

Comments

There were no other QC concerns.

Data Qualifiers

Code	Definition
E	Reported result is an estimate because it exceeds the calibration range.
G	Value is likely greater than result reported; result is an estimated minimum value.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
N	The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification".
NJ	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represent its approximate concentration.
NAF	Not analyzed for.
NC	Not calculated.

REJ	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.
U	The analyte was not detected at or above the reported sample quantitation limit.
UJ	The analyte was not detected at or above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately measure the analyte in the sample.
bold	The analyte was present in the sample. (Visual aid to locate detected compounds on the analytical report.)

Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Semi-volatile petroleum products

Project: Reliable Steel **Field ID: EC-2(2-3)**

Work Order: 1304044
Project Officer: Marti, Pam
Initial Vol: 10.254 g
Final Vol: 3 mL

Lab ID #: 1304044-13
Collected: 04/10/2013
Prep Method: SW3541
Analysis Method: NWTPH-DX
% Solids: 77.22%

Batch ID: B13D219
Prepared: 04/25/2013
Analyzed: 04/29/2013
Matrix: Sediment/Soil
Units: mg/Kg dw

CAS#	Analyte	Result	Qualifier	RL	MDL
68476-34-6	#2 Diesel	19	UJ	19	
LUBE-OIL	**Lube Oil**	**290**	J	48	

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
629-99-2	**Pentacosane**	**19.0**	17.7	**108**	50-150

Authorized by: ____________ **Release Date:** 5-2-13

Printed:
05/02/2013

Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Semi-volatile petroleum products

Project: Reliable Steel **Field ID: EC-3B(0-1)**

Work Order: 1304044
Project Officer: Marti, Pam
Initial Vol: 10.572 g
Final Vol: 3 mL

Lab ID #: 1304044-14
Collected: 04/11/2013
Prep Method: SW3541
Analysis Method: NWTPH-DX
% Solids: 88.55%

Batch ID: B13D219
Prepared: 04/25/2013
Analyzed: 04/29/2013
Matrix: Sediment/Soil
Units: mg/Kg dw

CAS#	Analyte	Result	Qualifier	RL	MDL
68476-34-6	#2 Diesel	16	U	16	
LUBE-OIL	**Lube Oil**	**99**		41	

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
629-99-2	**Pentacosane**	**17.8**	15.0	**119**	50-150

Authorized by: ________ **Release Date:** 5-2-13

Printed:
05/02/2013

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Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Semi-volatile petroleum products

Project: Reliable Steel

Field ID: EC-3B(1-2)

Work Order: 1304044
Project Officer: Marti, Pam
Initial Vol: 10.241 g
Final Vol: 3 mL

Lab ID #: 1304044-15
Collected: 04/11/2013
Prep Method: SW3541
Analysis Method: NWTPH-DX
% Solids: 92.58%

Batch ID: B13D219
Prepared: 04/25/2013
Analyzed: 04/29/2013
Matrix: Sediment/Soil
Units: mg/Kg dw

CAS#	Analyte	Result	Qualifier	RL	MDL
68476-34-6	#2 Diesel	16	U	16	
LUBE-OIL	Lube Oil	40	U	40	

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
629-99-2	Pentacosane	**17.2**	14.8	**117**	50-150

Authorized by: ______________________ **Release Date:** 5-2-13

Printed:
05/02/2013

Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Semi-volatile petroleum products

Project: Reliable Steel **QC Type : Method Blank**

Work Order: 1304044
Project Officer: Marti, Pam
Initial Vol: 10 g
Final Vol: 3 mL

Lab ID #: B13D219-BLK1
Prep Method: SW3541
Analysis Method: NWTPH-DX
Source Field ID: Blank

Batch ID: B13D219
Prepared: 04/25/2013
Analyzed: 04/29/2013
Matrix: Sediment/Soil
Units: mg/Kg dw

CAS#	Analyte	Result	Qualifier	RL	MDL
68476-34-6	#2 Diesel	15	U	15	
LUBE-OIL	Lube Oil	38	U	38	

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
629-99-2	Pentacosane	**13.9**	14.0	**99**	50-150

Authorized by: ______________ **Release Date:** 5-2-13

Printed:
05/02/2013

Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Semi-volatile petroleum products

Project: Reliable Steel **QC Type : LCS**

Work Order: 1304044
Project Officer: Marti, Pam
Initial Vol: 10 g
Final Vol: 3 mL

Lab ID #: B13D219-BS1
Prep Method: SW3541
Analysis Method: NWTPH-DX
Source Field ID: LCS

Batch ID: B13D219
Prepared: 04/25/2013
Analyzed: 04/29/2013
Matrix: Sediment/Soil
Units: mg/Kg dw

Analyte	Result	Spike Level	RL	%Rec	%Rec Limits
Lube Oil	**306**	300	38	**102**	70-130

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
629-99-2	Pentacosane	**15.4**	14.0	**110**	50-150

Authorized by: **Release Date:** 5-2-13 Printed: 05/02/2013

Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Semi-volatile petroleum products

Project: Reliable Steel **QC Type : LCS Dup**

Work Order: 1304044
Project Officer: Marti, Pam
Initial Vol: 10 g
Final Vol: 3 mL

Lab ID #: B13D219-BSD1
Prep Method: SW3541
Analysis Method: NWTPH-DX
Source Field ID: LCS Dup

Batch ID: B13D219
Prepared: 04/25/2013
Analyzed: 04/29/2013
Matrix: Sediment/Soil
Units: mg/Kg dw

Analyte	Sample Result	Spike Level	%Rec	RPD	%Rec Limits	RPD Limit
Lube Oil	**316**	300	**105**	**3**	70-130	40

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
629-99-2	Pentacosane	**15.7**	14.0	**112**	50-150

Authorized by: ______________ Release Date: 5-2-13

Printed: 05/02/2013

Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Semi-volatile petroleum products

Project: Reliable Steel **QC Type : Duplicate**

Work Order: 1304044	Lab ID #: B13D219-DUP1	Batch ID: B13D219
Project Officer: Marti, Pam	Prep Method: SW3541	Prepared: 04/25/2013
Initial Vol: 10.215 g	Analysis Method: NWTPH-DX	Analyzed: 04/29/2013
Final Vol: 3 mL	Source Field ID: EC-3B(1-2)	Matrix: Sediment/Soil
	Source Lab ID #: 1304044-15	Units: mg/Kg dw

Analyte	Sample Result	Sample Qual	Source Result	Source Qual	RPD	RPD Limit
#2 Diesel	16	U	16	U	NC	50
Lube Oil	40	U	40	U	NC	50

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
629-99-2	Pentacosane	**17.5**	14.8	**118**	50-150

Authorized by: ____________ Release Date: 5-2-13

Printed: 05/02/2013

Manchester Environmental Laboratory

7411 Beach Drive E, Port Orchard, Washington 98366

Case Narrative

April 29, 2013

Project: Metals Reliable Steel

Work Order: 1304044

Project Manager: Marti, Pam

By: Dean Momohara

Summary

The laboratory followed EPA 245.7 for the preparation and analysis of mercury and EPA 245.5 for the preparation and analysis of mercury.

All analyses requested were evaluated by established regulatory quality assurance guidelines.

Sample Information

The samples were received at the Manchester Laboratory on 4/11/2013 and 4/12/2013. The coolers were received within the proper temperature range of 0°C - 6°C. The samples were received in good condition. Two samples were received and assigned laboratory identification numbers 04 and 19.

Holding Times

The laboratory performed all analyses within their hold times.

Calibration

The instruments were calibrated following the appropriate methods. All initial and continuing calibration verification checks were within the acceptance limits. All initial and continuing calibration blank checks were within the acceptance limits. All standard residuals were within acceptance limits. All r-values were within acceptance limits.

The instruments were calibrated with NIST traceable standards and verified to be in calibration with a second source NIST traceable standard. Oven drying temperatures were monitored before and after drying.

Method Blanks

No analytically significant levels of analyte were detected in the method blanks associated with these samples.

Laboratory Control Samples

All laboratory control sample recoveries were within the acceptance limits.

Replicates

All associated duplicate relative percent differences of samples with concentrations greater than 5 times the reporting limit were within the acceptance limits.

Matrix Spikes

All matrix spike (MS) recoveries were within the acceptance limits except for mercury.

One of the MS/MSD recoveries for sample 19 was outside of the acceptance limits due to sample inhomogeneity. The MS/MSD recoveries for sample 04 for mercury were outside of the acceptance limits due to matrix interference. The source samples were qualified as estimates.

Internal Standards

NA

Other Quality Assurance Measures and Issues

U - The analyte was not detected at or above the reported result.

J - The analyte was positively identified. The associated numerical result is an estimate.

UJ - The analyte was not detected at or above the reported estimated result.

bold - The analyte was present in the sample. (Visual Aid to locate detected compounds on report sheet.)

Please call Dean Momohara at (360) 871-8808 to further discuss this project.

cc: Project File

Washington State Department of Ecology
Manchester Environmental Laboratory
Final Analysis Report for
Mercury

Project Name: Reliable Steel

Work Order: 1304044
Project Officer: Marti, Pam
Date Collected: 04/11/2013

Analyte: Mercury
Method: EPA245.5
Date Analyzed: 04/26/2013

Matrix: Sediment/Soil
Units: mg/Kg dw

Sample #	Sample ID	Result	Qualifier	RL	MDL	Collected	Analyzed	Batch ID
1304044-19	**EC-11(2-3.2)**	**0.0455**	J	0.0047	0.0007	04/11/13	04/26/13	B13D201

QC Results for Batch ID: B13D201

Method Blank	Sample ID	Result	Qualifer	RL	MDL	Analyzed
B13D201-BLK1	Blank	0.0036	U	0.0036	0.0005	04/26/13

Sample #	QC Sample	Result	Spike Level	Source Sample	Source Result	%Rec	%Rec Limits	RPD	RPD Limit
B13D201-BS1	LCS	0.081	0.072			113	85-115		
B13D201-MS1	Matrix Spike	0.175	0.102	1304044-19	0.045	127	75-125		
B13D201-MSD1	Matrix Spike Dup	0.156	0.101	1304044-19	0.045	109	75-125	12	20

Authorized by: Dm

Release Date: 4/30/13

Washington State Department of Ecology
Manchester Environmental Laboratory
Final Analysis Report for
Mercury

Project Name: Reliable Steel

Work Order: 1304044
Project Officer: Marti, Pam
Date Collected: 04/10/2013

Analyte: Mercury
Method: EPA245.7
Date Analyzed: 04/22/2013

Matrix: Water
Units: ug/L

Sample #	Sample ID	Result	Qualifier	RL	MDL	Collected	Analyzed	Batch ID
1304044-04	BOJOMW-9	0.0020	U	0.0020	0.0014	04/10/13	04/22/13	B13D132

QC Results for Batch ID: B13D132

Method Blank	Sample ID	Result	Qualifer	RL	MDL	Analyzed
B13D132-BLK1	Blank	0.0020	U	0.0020	0.0014	04/22/13

Sample #	QC Sample	Result	Spike Level	Source Sample	Source Result	%Rec	%Rec Limits	RPD	RPD Limit
B13D132-BS1	LCS	0.011	0.01			110	80-120		
B13D132-MS1	Matrix Spike	0.016	0.01	1304011-13	0.006	94	75-125		
B13D132-MSD1	Matrix Spike Dup	0.016	0.01	1304011-13	0.006	94	75-125	0.3	20

Authorized by: Dn

Release Date: 4/30/13

Washington State Department of Ecology
Manchester Environmental Laboratory
Final Analysis Report for
Mercury, Dissolved

Project Name: Reliable Steel

Work Order: 1304044
Project Officer: Marti, Pam
Date Collected: 04/10/2013

Analyte: Mercury
Method: EPA245.7
Date Analyzed: 04/22/2013

Matrix: Water
Units: ug/L

Sample #	Sample ID	Result	Qualifier	RL	MDL	Collected	Analyzed	Batch ID
1304044-04	BOJOMW-9	0.0020	UJ	0.0020		04/10/13	04/22/13	B13D145

QC Results for Batch ID: B13D145

Method Blank	Sample ID	Result	Qualifer	RL	MDL	Analyzed
B13D145-BLK1	Blank	0.0020	U	0.0020		04/22/13

Sample #	QC Sample	Result	Spike Level	Source Sample	Source Result	%Rec	%Rec Limits	RPD	RPD Limit
B13D145-BS1	LCS	0.010	0.01			101	80-120		
B13D145-MS1	Matrix Spike	0.007	0.01	1304044-04	0.0020 U	66	75-115		
B13D145-MSD1	Matrix Spike Dup	0.007	0.01	1304044-04	0.0020 U	67	75-115	3	20

Authorized by: DM

Release Date: 4/30/13

Manchester Environmental Laboratory

7411 Beach Dr E, Port Orchard, Washington 98366

Case Narrative

June 14, 2013

Subject: Reliable Steel

Samples: 1304044-06 – 09, 11, 12, 16, 17, 18

Officer: Pam Marti

By: John Weakland

BNAs by GCMS

Analytical Method(s)

The samples were extracted following a modification of EPA Method 3541. The extracts were then analyzed following a modification of EAP Method 8270D.

Holding Times

All samples were received in good condition, within the proper temperature <6° C and were prepared and analyzed within method holding times.

Instrument Tuning

Calibration against DFTPP is acceptable for the initial calibration, continuing calibrations and all associated samples.

Initial Calibration

The initial calibration (ICAL), Initial Calibration Verification (ICV) and back calculations (BC) were within QC limits with the following exceptions. The MRLs for some compounds were raised in order to meet ICAL, BC or ICV criteria.

Benzyl alcohol, 3-Nitroaniline, Carbazole and Cholesterol exceeded the ICAL limits.

The BCs for benzyl alcohol, N-Nitrosodi-n-propylamine, 3-Nitroaniline, Carbazole and Cholesterol were below QC limits. The BCs for 4,6-Dinitro-2-Methylphenol, Triethyl citrate, and Tris(2-chloroethyl) phosphate were above QC limits, but since none of the analytes were detected no qualifiers were added.

The ICV for Carbazole was below QC limits.

The samples and were qualified according to Table 1 below.

Table 1

Compound	Sample IDs	Qual
Benzyl alcohol 3-Nitroaniline Cholesterol N-Nitrosopropylamine	1304044-06, 07, 08, 09, 11, 12, 16, 17, 18, B13E058-BLK1, B13E058-DUP1	UJ
Carbazole	1304044-11, 12, B13E058-BLK1	UJ
	1304044-06, 07, 16, 17, B13E058-DUP1	J

Continuing Calibration

All continuing calibration verifications (CCVs) were within QC limits with the following exceptions. The responses for 3-Nitroaniline, Carbazole and Cholesterol exceeded QC limits for CCV1.

The responses for 3-Nitroaniline, Carbazole, Cholesterol, Bisphenol A and 3B-Coprostanol exceeded QC limits for CCV2.

The responses for 3-Nitroaniline, Carbazole, Cholesterol, Bisphenol A and 3B-Coprostanol, 2,4-Dinitrophenol, Triclosan, n-Nitrosodi propylamine, 4-Methylphenol, and Hexachlorocyclopentadiene exceeded QC limits for CCV3.

The response for Bisphenol A exceeded QC limits for CCV4.

Many of the analytes were qualified for other reasons. Additional qualifiers were added according to Table 2 below.

Table 2

Compound	Sample IDs	Qual
Hexachlorocyclopentadiene	1304044-07, 17	UJ

Internal Standards

All Internal standard retention times and areas are within QC limits.

Method Blanks

Common laboratory contaminant Di-n-butyl phthalate was present in the laboratory method blank below the Method Reporting Limit (MRL). The samples were qualified as shown in Table 3.

Table 3

Compound	Sample IDs	Qual
Di-n-butyl phthatlate	1304044-06, 07, 08, 09, 11, 12, 16, 17, 18, B13E058-DUP1	U

Surrogates

The surrogate percent recoveries were within QC limits with the following exceptions. 4,6-Dinitro-2-methylphenol-d2 exceeded QC limits in samples B13E058-BLK1, B13E058-BS1, B13E058-BSD1, and 1304044-18. 4-Chloroaniline-d4 exceeded QC limits in samples 1304044-07, 12, 16 and 17. 2,4-Dichlorophenol-d3 exceeded QC limits in sample 1304044-17.

Some of the analytes were already qualified for other reasons and no further qualification was necessary. Sample results were qualified as shown in Table 4 below.

Table 4

Compound	Sample IDs	Qual
4-Chloroaniline	1304044-12	UJ
	1304044-07, 16, 17	REJ
2,4-Dichlorophenol	1304044-17	UJ

Laboratory Control Samples

The percent recoveries and relative percent differences for the LCS and LCS Dup were within QC limits with the following exceptions.

The recoveries for Benzoic Acid, 2,4-Dinitrophenol, 4-Nitrophenol, 4,6-Dinitro-2-Methylphenol, Triethyl citrate, Tris(2-chloroethyl) phosphate, Caffeine, Cholesterol and Carbazole were outside of established QC limits for the LCS and/or LCS Dup. The percent recoveries of 3-Nitroaniline could not be calculated and were qualified NC.

The RPDs for 4-Nitrophenol, 4,6-Dinitro-2-Methylphenol, Tris(2-chloroethyl) phosphate, Caffeine, Carbazole, and Bisphenol A were outside of established QC limits. The RPD for 3-Nitroaniline could not be calculated and was qualified NC.

The samples were qualified according to Table 5 below.

Table 5

Compound	Sample IDs	Qual
Benzoic Acid 4-Nitrophenol 4,6-Dinitrophenol-2-Methylphenol Tris(2-chloroethyl) phosphate	1304044-06, 07, 08, 09, 11, 12, 16, 17, 18, B13E058-BLK1, B13E058-DUP1	UJ
Caffiene	1304044-06, 07, 08, 09, 11, 12, 16, 17, B13E058-BLK1, B13E058-DUP1	UJ
2,4-Dinitrophenol Triethyl citrate	1304044-06, 07, 08, 09, 11, 12, 16, 17, 18, B13E058-BLK1, B13E058-DUP1	REJ
Bisphenol A	1304044-07, 16, 17, 18	J

Matrix Spiked Samples

Sample 1304044-18, Field ID: EC-4(0-1), was used as the source for the Matrix Spike/Matrix Spike Duplicate (MS/MSD). The percent recoveries and RPDs of both MS/MSD were within QC limits with the following exceptions.

The recoveries for 2,4-Dimethylphenol, Benzoic Acid, Hexachlorocyclopentadiene, 2,4-Dinitrophenol, Triethyl citrate, Caffeine, and Carbazole were outside of established QC limits for the MS and/or MSD. The percent recoveries of 3-Nitroaniline could not be calculated and were qualified NC.

The RPD for 4-Nitroaniline was outside of established QC limits. The RPD for 3-Nitroaniline could not be calculated and was qualified NC.

The source sample was qualified according to Table 6 below.

Table 6

Compound	Sample IDs	Qual
Caffeine	1304044-18	REJ
2,4-Dimethylphenol Triethyl citrate Hexachlorocyclopentadiene 2,4-Dinitrophenol	1304044-18	UJ

Duplicate Samples

Sample 1304044-06, Field ID: EC-7(2-3), was used as the source of the duplicate B13E058-DUP1. The RPDs of the sample duplicate were within QC limits with the following exceptions. The RPD of Benz[a]anthracene exceeded QC limits and the sample result for 1304044-06 was quailed J, estimated value.

Qualitative Identification

The spectra of the reported samples were within QC limits and matched the reference spectra.

Comments

The initial analysis of the samples was performed on a GCMS experiencing electronic problems and could not be reported. All of the samples and batch QC were reanalyzed with an upgraded instrument that included new electronics and source for the mass spectrometer.

However, to minimize reporting the analytical results, we did not hold up the samples until a final Method Detection Limit (MDL) study on the upgraded instrument was conducted. Consequently, the MDLs are not reported with the samples. Upon request, MEL will provide revised analytical reports with the updated MDLs. Note that all results reported below the MRL were manually qualified J, estimated value.

Data Qualifiers

Code	**Definition**
E	Reported result is an estimate because it exceeds the calibration range.
G	Value is likely greater than result reported; result is an estimated minimum value.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
N	The analysis indicates the present of an analyte for which there is presumptive evidence to make a "tentative identification".
NJ	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.
NAF	Not analyzed for.
NC	Not calculated.
REJ	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.
U	The analyte was not detected at or above the reported sample quantitation limit.
UJ	The analyte was not detected at or above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately measure the analyte in the sample.
bold	The analyte was present in the sample. (Visual aid to locate detected compounds on the analytical report.)

Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Base/Neutral/Acids

Project: Reliable Steel **Field ID: EC-7(2-3)**

Work Order: 1304044
Project Officer: Marti, Pam
Initial Vol: 20.562 g
Final Vol: 1 mL

Lab ID #: 1304044-06
Collected: 4/10/2013
Prep Method: SW3541
Analysis Method: SW8270
% Solids: 75.77%

Batch ID: B13E058
Prepared: 5/8/2013
Analyzed: 5/31/2013
Matrix: Sediment/Soil
Units: ug/Kg dw

CAS#	Analyte	Result	Qualifier	RL	MDL
120-82-1	1,2,4-Trichlorobenzene	32	U	32	
95-50-1	1,2-Dichlorobenzene	64	U	64	
122-66-7	1,2-Diphenylhydrazine	16	U	16	
541-73-1	1,3-Dichlorobenzene	64	U	64	
106-46-7	1,4-Dichlorobenzene	64	U	64	
90-12-0	1-Methylnaphthalene	32	U	32	
95-95-4	2,4,5-Trichlorophenol	64	U	64	
88-06-2	2,4,6-Trichlorophenol	64	U	64	
120-83-2	2,4-Dichlorophenol	160	U	160	
105-67-9	2,4-Dimethylphenol	160	U	160	
51-28-5	2,4-Dinitrophenol		REJ	160	
121-14-2	2,4-Dinitrotoluene	64	U	64	
606-20-2	2,6-Dinitrotoluene	64	U	64	
91-58-7	2-Chloronaphthalene	32	U	32	
95-57-8	2-Chlorophenol	64	U	64	
91-57-6	2-Methylnaphthalene	32	U	32	
95-48-7	2-Methylphenol	160	U	160	
88-74-4	2-Nitroaniline	320	U	320	
88-75-5	2-Nitrophenol	32	U	32	
91-94-1	3,3'-Dichlorobenzidine	64	U	64	
360-68-9	3B-Coprostanol	1300	U	1300	
99-09-2	3-Nitroaniline	320	UJ	320	
534-52-1	4,6-Dinitro-2-Methylphenol	64	UJ	64	
101-55-3	4-Bromophenyl phenyl ether	32	U	32	
59-50-7	4-Chloro-3-Methylphenol	160	U	160	
106-47-8	4-Chloroaniline	640	U	640	
7005-72-3	4-Chlorophenyl-Phenylether	16	U	16	
106-44-5	4-Methylphenol	160	U	160	
100-01-6	4-Nitroaniline	64	U	64	
100-02-7	4-Nitrophenol	160	UJ	160	
104-40-5	4-nonylphenol	64	U	64	
83-32-9	Acenaphthene	16	U	16	
208-96-8	**Acenaphthylene**	**20**		16	
120-12-7	**Anthracene**	**30**		16	
56-55-3	**Benz[a]anthracene**	**93**		16	
50-32-8	**Benzo(a)pyrene**	**120**		16	
205-99-2	**Benzo(b)fluoranthene**	**170**		16	
191-24-2	**Benzo(ghi)perylene**	**110**		32	
207-08-9	**Benzo(k)fluoranthene**	**53**		16	
65-85-0	Benzoic Acid	320	UJ	320	
100-51-6	Benzyl Alcohol	160	UJ	160	
108-60-1	Bis(2-chloro-1-methylethyl) ether	16	U	16	
111-91-1	Bis(2-Chloroethoxy)Methane	16	U	16	
111-44-4	Bis(2-Chloroethyl)Ether	32	U	32	
117-81-7	**Bis(2-Ethylhexyl) Phthalate**	**120**		32	
80-05-7	Bisphenol A	160	U	160	
85-68-7	Butyl benzyl phthalate	32	U	32	
58-08-2	Caffeine	32	UJ	32	
86-74-8	**Carbazole**	**47**	**J**	32	

Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Base/Neutral/Acids

Project: Reliable Steel **Field ID: EC-7(2-3)**

Work Order: 1304044
Project Officer: Marti, Pam
Initial Vol: 20.562 g
Final Vol: 1 mL

Lab ID #: 1304044-06
Collected: 4/10/2013
Prep Method: SW3541
Analysis Method: SW8270
% Solids: 75.77%

Batch ID: B13E058
Prepared: 5/8/2013
Analyzed: 5/31/2013
Matrix: Sediment/Soil
Units: ug/Kg dw

CAS#	Analyte	Result	Qualifier	RL	MDL
57-88-5	Cholesterol	1300	UJ	1300	
218-01-9	**Chrysene**	**160**		16	
53-70-3	**Dibenzo(a,h)anthracene**	**40**		32	
132-64-9	Dibenzofuran	32	U	32	
84-66-2	Diethyl phthalate	16	U	16	
131-11-3	Dimethyl phthalate	16	U	16	
84-74-2	Di-N-Butylphthalate	29	U	16	
117-84-0	Di-N-Octyl Phthalate	160	U	160	
206-44-0	**Fluoranthene**	**260**		16	
86-73-7	Fluorene	16	U	16	
118-74-1	Hexachlorobenzene	16	U	16	
87-68-3	Hexachlorobutadiene	64	U	64	
77-47-4	Hexachlorocyclopentadiene	64	U	64	
67-72-1	Hexachloroethane	16	U	16	
193-39-5	**Indeno(1,2,3-cd)pyrene**	**120**		32	
78-59-1	Isophorone	32	U	32	
91-20-3	Naphthalene	32	U	32	
98-95-3	Nitrobenzene	16	U	16	
621-64-7	N-Nitrosodi-n-propylamine	16	UJ	16	
86-30-6	N-Nitrosodiphenylamine	32	U	32	
87-86-5	**Pentachlorophenol**	**62**	**J**	160	
85-01-8	**Phenanthrene**	**140**		16	
108-95-2	Phenol	64	U	64	
129-00-0	**Pyrene**	**250**		16	
483-65-8	**Retene**	**20**		16	
3380-34-5	Triclosan	64	U	64	
77-93-0	Triethyl citrate		REJ	32	
115-96-8	Tris(2-chloroethyl) phosphate (TCEP)	16	UJ	16	

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
2199-69-1	1,2-Dichlorobenzene-D4	412	513	80	20-130
93951-74-7	2,4-Dichlorophenol-D3	363	513	71	50-150
93951-73-6	2-Chlorophenol-D4	472	513	92	20-130
321-60-8	2-Fluorobiphenyl	450	513	88	30-115
367-12-4	2-Fluorophenol	388	513	76	25-121
93951-78-1	2-Nitrophenol-D4	417	513	81	20-120
93951-76-9	4,6-Dinitro-2-methylphenol-D2	348	513	68	50-150
191656-33-4	4-Chloroaniline-D4	141	513	28	20-120
190780-66-6	4-Methylphenol-D8	413	513	81	50-150
93951-79-2	4-Nitrophenol-D4	226	513	44	20-120
93951-97-4	Acenaphthylene-D8	490	513	95	50-150
1719-06-8	Anthracene-D10	462	513	90	50-150
63466-71-7	Benzo(a)pyrene-D12	497	513	97	50-150
93952-02-4	Bis(2-Chloroethyl)Ether-D8	439	513	85	50-150
85448-30-2	Dimethylphthalate-D6	488	513	95	50-150
81103-79-9	Fluorene-D10	470	513	92	50-150
4165-60-0	Nitrobenzene-D5	471	513	92	23-130

Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Base/Neutral/Acids

Project: Reliable Steel **Field ID: EC-7(2-3)**

Work Order: 1304044
Project Officer: Marti, Pam
Initial Vol: 20.562 g
Final Vol: 1 mL

Lab ID #: 1304044-06
Collected: 4/10/2013
Prep Method: SW3541
Analysis Method: SW8270
% Solids: 75.77%

Batch ID: B13E058
Prepared: 5/8/2013
Analyzed: 5/31/2013
Matrix: Sediment/Soil
Units: ug/Kg dw

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
4165-62-2	Phenol-D5	417	513	81	24-113
1718-52-1	Pyrene-D10	522	513	102	50-150
1718-51-0	Terphenyl-D14	446	513	87	18-137

Authorized by: ______________________ Release Date: 6/14/13

Printed:
6/14/2013

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Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Base/Neutral/Acids

Project: Reliable Steel **Field ID: EC-6(0-1)**

Work Order: 1304044
Project Officer: Marti, Pam
Initial Vol: 20.001 g
Final Vol: 1 mL

Lab ID #: 1304044-07
Collected: 4/10/2013
Prep Method: SW3541
Analysis Method: SW8270
% Solids: 83.23%

Batch ID: B13E058
Prepared: 5/8/2013
Analyzed: 6/3/2013
Matrix: Sediment/Soil
Units: ug/Kg dw

CAS#	Analyte	Result	Qualifier	RL	MDL
120-82-1	1,2,4-Trichlorobenzene	150	U	150	
95-50-1	1,2-Dichlorobenzene	300	U	300	
122-66-7	1,2-Diphenylhydrazine	75	U	75	
541-73-1	1,3-Dichlorobenzene	300	U	300	
106-46-7	1,4-Dichlorobenzene	300	U	300	
90-12-0	1-Methylnaphthalene	150	U	150	
95-95-4	2,4,5-Trichlorophenol	300	U	300	
88-06-2	2,4,6-Trichlorophenol	300	U	300	
120-83-2	2,4-Dichlorophenol	750	U	750	
105-67-9	2,4-Dimethylphenol	750	U	750	
51-28-5	2,4-Dinitrophenol		REJ	750	
121-14-2	2,4-Dinitrotoluene	300	U	300	
606-20-2	2,6-Dinitrotoluene	300	U	300	
91-58-7	2-Chloronaphthalene	150	U	150	
95-57-8	2-Chlorophenol	300	U	300	
91-57-6	2-Methylnaphthalene	150	U	150	
95-48-7	2-Methylphenol	750	U	750	
88-74-4	2-Nitroaniline	1500	U	1500	
88-75-5	2-Nitrophenol	150	U	150	
91-94-1	3,3'-Dichlorobenzidine	300	U	300	
360-68-9	3B-Coprostanol	6000	U	6000	
99-09-2	3-Nitroaniline	1500	UJ	1500	
534-52-1	4,6-Dinitro-2-Methylphenol	300	UJ	300	
101-55-3	4-Bromophenyl phenyl ether	150	U	150	
59-50-7	4-Chloro-3-Methylphenol	750	U	750	
106-47-8	4-Chloroaniline		REJ	3000	
7005-72-3	4-Chlorophenyl-Phenylether	75	U	75	
106-44-5	4-Methylphenol	750	U	750	
100-01-6	4-Nitroaniline	300	U	300	
100-02-7	4-Nitrophenol	750	UJ	750	
104-40-5	4-nonylphenol	300	U	300	
83-32-9	**Acenaphthene**	**57**	**J**	75	
208-96-8	**Acenaphthylene**	**71**	**J**	75	
120-12-7	**Anthracene**	**240**		75	
56-55-3	**Benz[a]anthracene**	**770**		75	
50-32-8	**Benzo(a)pyrene**	**740**		75	
205-99-2	**Benzo(b)fluoranthene**	**1300**		75	
191-24-2	**Benzo(ghi)perylene**	**320**		150	
207-08-9	**Benzo(k)fluoranthene**	**560**		75	
65-85-0	Benzoic Acid	1500	UJ	1500	
100-51-6	Benzyl Alcohol	750	UJ	750	
108-60-1	Bis(2-chloro-1-methylethyl) ether	75	U	75	
111-91-1	Bis(2-Chloroethoxy)Methane	75	U	75	
111-44-4	Bis(2-Chloroethyl)Ether	150	U	150	
117-81-7	**Bis(2-Ethylhexyl) Phthalate**	**470**		150	
80-05-7	**Bisphenol A**	**890**	**J**	750	
85-68-7	Butyl benzyl phthalate	150	U	150	
58-08-2	Caffeine	150	UJ	150	
86-74-8	**Carbazole**	**350**	**J**	150	

Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Base/Neutral/Acids

Project: Reliable Steel **Field ID: EC-6(0-1)**

Work Order: 1304044
Project Officer: Marti, Pam
Initial Vol: 20.001 g
Final Vol: 1 mL

Lab ID #: 1304044-07
Collected: 4/10/2013
Prep Method: SW3541
Analysis Method: SW8270
% Solids: 83.23%

Batch ID: B13E058
Prepared: 5/8/2013
Analyzed: 6/3/2013
Matrix: Sediment/Soil
Units: ug/Kg dw

CAS#	Analyte	Result	Qualifier	RL	MDL
57-88-5	Cholesterol	6000	UJ	6000	
218-01-9	**Chrysene**	**1400**		75	
53-70-3	**Dibenzo(a,h)anthracene**	**160**		150	
132-64-9	**Dibenzofuran**	**43**	**J**	150	
84-66-2	Diethyl phthalate	75	U	75	
131-11-3	Dimethyl phthalate	75	U	75	
84-74-2	Di-N-Butylphthalate	190	U	75	
117-84-0	Di-N-Octyl Phthalate	750	U	750	
206-44-0	**Fluoranthene**	**2000**		75	
86-73-7	**Fluorene**	**56**	**J**	75	
118-74-1	Hexachlorobenzene	75	U	75	
87-68-3	Hexachlorobutadiene	300	UJ	300	
77-47-4	Hexachlorocyclopentadiene	300	U	300	
67-72-1	Hexachloroethane	75	U	75	
193-39-5	**Indeno(1,2,3-cd)pyrene**	**420**		150	
78-59-1	Isophorone	150	U	150	
91-20-3	Naphthalene	150	U	150	
98-95-3	Nitrobenzene	75	U	75	
621-64-7	N-Nitrosodi-n-propylamine	75	UJ	75	
86-30-6	N-Nitrosodiphenylamine	150	U	150	
87-86-5	**Pentachlorophenol**	**530**	**J**	750	
85-01-8	**Phenanthrene**	**890**		75	
108-95-2	Phenol		REJ	300	
129-00-0	**Pyrene**	**1900**		75	
483-65-8	**Retene**	**110**		75	
3380-34-5	Triclosan	300	U	300	
77-93-0	Triethyl citrate		REJ	150	
115-96-8	Tris(2-chloroethyl) phosphate (TCEP)	75	UJ	75	

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
2199-69-1	**1,2-Dichlorobenzene-D4**	**413**	481	**86**	20-130
93951-74-7	**2,4-Dichlorophenol-D3**	**247**	481	**51**	50-150
93951-73-6	**2-Chlorophenol-D4**	**434**	481	**90**	20-130
321-60-8	**2-Fluorobiphenyl**	**406**	481	**84**	30-115
367-12-4	**2-Fluorophenol**	**344**	481	**72**	25-121
93951-78-1	**2-Nitrophenol-D4**	**340**	481	**71**	20-120
93951-76-9	**4,6-Dinitro-2-methylphenol-D2**	**682**	481	**142**	50-150
191656-33-4	4-Chloroaniline-D4		481		20-120
190780-66-6	**4-Methylphenol-D8**	**436**	481	**91**	50-150
93951-79-2	**4-Nitrophenol-D4**	**480**	481	**100**	20-120
93951-97-4	**Acenaphthylene-D8**	**454**	481	**94**	50-150
1719-06-8	**Anthracene-D10**	**420**	481	**87**	50-150
63466-71-7	**Benzo(a)pyrene-D12**	**470**	481	**98**	50-150
93952-02-4	**Bis(2-Chloroethyl)Ether-D8**	**379**	481	**79**	50-150
85448-30-2	**Dimethylphthalate-D6**	**449**	481	**94**	50-150
81103-79-9	**Fluorene-D10**	**440**	481	**91**	50-150
4165-60-0	**Nitrobenzene-D5**	**378**	481	**79**	23-130

Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Base/Neutral/Acids

Project: Reliable Steel **Field ID: EC-6(0-1)**

Work Order: 1304044
Project Officer: Marti, Pam
Initial Vol: 20.001 g
Final Vol: 1 mL

Lab ID #: 1304044-07
Collected: 4/10/2013
Prep Method: SW3541
Analysis Method: SW8270
% Solids: 83.23%

Batch ID: B13E058
Prepared: 5/8/2013
Analyzed: 6/3/2013
Matrix: Sediment/Soil
Units: ug/Kg dw

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
4165-62-2	Phenol-D5	415	481	86	24-113
1718-52-1	Pyrene-D10	480	481	100	50-150
1718-51-0	Terphenyl-D14	412	481	86	18-137

Authorized by: ______ **Release Date:** 6/14/13

Printed: 6/14/2013

Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Base/Neutral/Acids

Project: Reliable Steel **Field ID: EC-6(2-3)**

Work Order: 1304044
Project Officer: Marti, Pam
Initial Vol: 20.293 g
Final Vol: 1 mL

Lab ID #: 1304044-08
Collected: 4/10/2013
Prep Method: SW3541
Analysis Method: SW8270
% Solids: 78.55%

Batch ID: B13E058
Prepared: 5/8/2013
Analyzed: 5/31/2013
Matrix: Sediment/Soil
Units: ug/Kg dw

CAS#	Analyte	Result	Qualifier	RL	MDL
120-82-1	1,2,4-Trichlorobenzene	31	U	31	
95-50-1	1,2-Dichlorobenzene	63	U	63	
122-66-7	1,2-Diphenylhydrazine	16	U	16	
541-73-1	1,3-Dichlorobenzene	63	U	63	
106-46-7	1,4-Dichlorobenzene	63	U	63	
90-12-0	1-Methylnaphthalene	31	U	31	
95-95-4	2,4,5-Trichlorophenol	63	U	63	
88-06-2	2,4,6-Trichlorophenol	63	U	63	
120-83-2	2,4-Dichlorophenol	160	U	160	
105-67-9	2,4-Dimethylphenol	160	U	160	
51-28-5	2,4-Dinitrophenol		REJ	160	
121-14-2	2,4-Dinitrotoluene	63	U	63	
606-20-2	2,6-Dinitrotoluene	63	U	63	
91-58-7	2-Chloronaphthalene	31	U	31	
95-57-8	2-Chlorophenol	63	U	63	
91-57-6	2-Methylnaphthalene	31	U	31	
95-48-7	2-Methylphenol	160	U	160	
88-74-4	2-Nitroaniline	310	U	310	
88-75-5	2-Nitrophenol	31	U	31	
91-94-1	3,3'-Dichlorobenzidine	63	U	63	
360-68-9	3B-Coprostanol	1300	U	1300	
99-09-2	3-Nitroaniline	310	UJ	310	
534-52-1	4,6-Dinitro-2-Methylphenol	63	UJ	63	
101-55-3	4-Bromophenyl phenyl ether	31	U	31	
59-50-7	4-Chloro-3-Methylphenol	160	U	160	
106-47-8	4-Chloroaniline	630	U	630	
7005-72-3	4-Chlorophenyl-Phenylether	16	U	16	
106-44-5	4-Methylphenol	160	U	160	
100-01-6	4-Nitroaniline	63	U	63	
100-02-7	4-Nitrophenol	160	UJ	160	
104-40-5	4-nonylphenol	63	U	63	
83-32-9	Acenaphthene	16	U	16	
208-96-8	Acenaphthylene	16	U	16	
120-12-7	**Anthracene**	**7.3**	**J**	16	
56-55-3	**Benz[a]anthracene**	**22**		16	
50-32-8	**Benzo(a)pyrene**	**25**		16	
205-99-2	**Benzo(b)fluoranthene**	**44**		16	
191-24-2	**Benzo(ghi)perylene**	**31**		31	
207-08-9	**Benzo(k)fluoranthene**	**14**	**J**	16	
65-85-0	Benzoic Acid	310	UJ	310	
100-51-6	Benzyl Alcohol	160	UJ	160	
108-60-1	Bis(2-chloro-1-methylethyl) ether	16	U	16	
111-91-1	Bis(2-Chloroethoxy)Methane	16	U	16	
111-44-4	Bis(2-Chloroethyl)Ether	31	U	31	
117-81-7	**Bis(2-Ethylhexyl) Phthalate**	**42**		31	
80-05-7	Bisphenol A	160	U	160	
85-68-7	Butyl benzyl phthalate	31	U	31	
58-08-2	Caffeine	31	UJ	31	
86-74-8	**Carbazole**	**8.2**	**J**	31	

Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Base/Neutral/Acids

Project: Reliable Steel **Field ID: EC-6(2-3)**

Work Order: 1304044
Project Officer: Marti, Pam
Initial Vol: 20.293 g
Final Vol: 1 mL

Lab ID #: 1304044-08
Collected: 4/10/2013
Prep Method: SW3541
Analysis Method: SW8270
% Solids: 78.55%

Batch ID: B13E058
Prepared: 5/8/2013
Analyzed: 5/31/2013
Matrix: Sediment/Soil
Units: ug/Kg dw

CAS#	Analyte	Result	Qualifier	RL	MDL
57-88-5	Cholesterol	1300	UJ	1300	
218-01-9	**Chrysene**	**43**		16	
53-70-3	Dibenzo(a,h)anthracene	31	U	31	
132-64-9	Dibenzofuran	31	U	31	
84-66-2	Diethyl phthalate	16	U	16	
131-11-3	Dimethyl phthalate	16	U	16	
84-74-2	Di-N-Butylphthalate	20	U	16	
117-84-0	Di-N-Octyl Phthalate	160	U	160	
206-44-0	**Fluoranthene**	**65**		16	
86-73-7	Fluorene	16	U	16	
118-74-1	Hexachlorobenzene	16	U	16	
87-68-3	Hexachlorobutadiene	63	U	63	
77-47-4	Hexachlorocyclopentadiene	63	U	63	
67-72-1	Hexachloroethane	16	U	16	
193-39-5	**Indeno(1,2,3-cd)pyrene**	**39**		31	
78-59-1	Isophorone	31	U	31	
91-20-3	Naphthalene	31	U	31	
98-95-3	Nitrobenzene	16	U	16	
621-64-7	N-Nitrosodi-n-propylamine	16	UJ	16	
86-30-6	N-Nitrosodiphenylamine	31	U	31	
87-86-5	Pentachlorophenol	160	U	160	
85-01-8	**Phenanthrene**	**24**		16	
108-95-2	Phenol	63	U	63	
129-00-0	**Pyrene**	**72**		16	
483-65-8	**Retene**	**14**	**J**	16	
3380-34-5	Triclosan	63	U	63	
77-93-0	Triethyl citrate		REJ	31	
115-96-8	Tris(2-chloroethyl) phosphate (TCEP)	16	UJ	16	

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
2199-69-1	1,2-Dichlorobenzene-D4	420	502	84	20-130
93951-74-7	2,4-Dichlorophenol-D3	373	502	74	50-150
93951-73-6	2-Chlorophenol-D4	479	502	95	20-130
321-60-8	2-Fluorobiphenyl	442	502	88	30-115
367-12-4	2-Fluorophenol	394	502	79	25-121
93951-78-1	2-Nitrophenol-D4	415	502	83	20-120
93951-76-9	4,6-Dinitro-2-methylphenol-D2	357	502	71	50-150
191656-33-4	4-Chloroaniline-D4	172	502	34	20-120
190780-66-6	4-Methylphenol-D8	419	502	84	50-150
93951-79-2	4-Nitrophenol-D4	247	502	49	20-120
93951-97-4	Acenaphthylene-D8	487	502	97	50-150
1719-06-8	Anthracene-D10	452	502	90	50-150
63466-71-7	Benzo(a)pyrene-D12	485	502	97	50-150
93952-02-4	Bis(2-Chloroethyl)Ether-D8	446	502	89	50-150
85448-30-2	Dimethylphthalate-D6	479	502	95	50-150
81103-79-9	Fluorene-D10	473	502	94	50-150
4165-60-0	Nitrobenzene-D5	469	502	93	23-130

Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Base/Neutral/Acids

Project: Reliable Steel **Field ID: EC-6(2-3)**

Work Order: 1304044
Project Officer: Marti, Pam
Initial Vol: 20.293 g
Final Vol: 1 mL

Lab ID #: 1304044-08
Collected: 4/10/2013
Prep Method: SW3541
Analysis Method: SW8270
% Solids: 78.55%

Batch ID: B13E058
Prepared: 5/8/2013
Analyzed: 5/31/2013
Matrix: Sediment/Soil
Units: ug/Kg dw

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
4165-62-2	Phenol-D5	**406**	502	**81**	24-113
1718-52-1	Pyrene-D10	**531**	502	**106**	50-150
1718-51-0	Terphenyl-D14	**450**	502	**90**	18-137

Authorized by: ____________ Release Date: 6/14/13 Printed: 6/14/2013

Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Base/Neutral/Acids

Project: Reliable Steel **Field ID: EC-5(0-0.5)**

Work Order: 1304044
Project Officer: Marti, Pam
Initial Vol: 20.014 g
Final Vol: 1 mL

Lab ID #: 1304044-09
Collected: 4/10/2013
Prep Method: SW3541
Analysis Method: SW8270
% Solids: 91.85%

Batch ID: B13E058
Prepared: 5/8/2013
Analyzed: 5/31/2013
Matrix: Sediment/Soil
Units: ug/Kg dw

CAS#	Analyte	Result	Qualifier	RL	MDL
120-82-1	1,2,4-Trichlorobenzene	27	U	27	
95-50-1	1,2-Dichlorobenzene	54	U	54	
122-66-7	1,2-Diphenylhydrazine	14	U	14	
541-73-1	1,3-Dichlorobenzene	54	U	54	
106-46-7	1,4-Dichlorobenzene	54	U	54	
90-12-0	1-Methylnaphthalene	27	U	27	
95-95-4	2,4,5-Trichlorophenol	54	U	54	
88-06-2	2,4,6-Trichlorophenol	54	U	54	
120-83-2	2,4-Dichlorophenol	140	U	140	
105-67-9	2,4-Dimethylphenol	140	U	140	
51-28-5	2,4-Dinitrophenol		REJ	140	
121-14-2	2,4-Dinitrotoluene	54	U	54	
606-20-2	2,6-Dinitrotoluene	54	U	54	
91-58-7	2-Chloronaphthalene	27	U	27	
95-57-8	2-Chlorophenol	54	U	54	
91-57-6	2-Methylnaphthalene	27	U	27	
95-48-7	2-Methylphenol	140	U	140	
88-74-4	2-Nitroaniline	270	U	270	
88-75-5	2-Nitrophenol	27	U	27	
91-94-1	3,3'-Dichlorobenzidine	54	U	54	
360-68-9	3B-Coprostanol	1100	U	1100	
99-09-2	3-Nitroaniline	270	UJ	270	
534-52-1	4,6-Dinitro-2-Methylphenol	54	UJ	54	
101-55-3	4-Bromophenyl phenyl ether	27	U	27	
59-50-7	4-Chloro-3-Methylphenol	140	U	140	
106-47-8	4-Chloroaniline	540	U	540	
7005-72-3	4-Chlorophenyl-Phenylether	14	U	14	
106-44-5	4-Methylphenol	140	U	140	
100-01-6	4-Nitroaniline	54	U	54	
100-02-7	4-Nitrophenol	140	UJ	140	
104-40-5	4-nonylphenol	54	U	54	
83-32-9	Acenaphthene	14	U	14	
208-96-8	Acenaphthylene	14	U	14	
120-12-7	**Anthracene**	**18**		14	
56-55-3	**Benz[a]anthracene**	**220**		14	
50-32-8	**Benzo(a)pyrene**	**290**		14	
205-99-2	**Benzo(b)fluoranthene**	**370**		14	
191-24-2	**Benzo(ghi)perylene**	**210**		27	
207-08-9	**Benzo(k)fluoranthene**	**130**		14	
65-85-0	Benzoic Acid	270	UJ	270	
100-51-6	Benzyl Alcohol	140	UJ	140	
108-60-1	Bis(2-chloro-1-methylethyl) ether	14	U	14	
111-91-1	Bis(2-Chloroethoxy)Methane	14	U	14	
111-44-4	Bis(2-Chloroethyl)Ether	27	U	27	
117-81-7	**Bis(2-Ethylhexyl) Phthalate**	**170**		27	
80-05-7	Bisphenol A	140	U	140	
85-68-7	Butyl benzyl phthalate	27	U	27	
58-08-2	Caffeine	27	UJ	27	
86-74-8	**Carbazole**	**20**	**J**	27	

Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Base/Neutral/Acids

Project: Reliable Steel **Field ID: EC-5(0-0.5)**

Work Order: 1304044
Project Officer: Marti, Pam
Initial Vol: 20.014 g
Final Vol: 1 mL

Lab ID #: 1304044-09
Collected: 4/10/2013
Prep Method: SW3541
Analysis Method: SW8270
% Solids: 91.85%

Batch ID: B13E058
Prepared: 5/8/2013
Analyzed: 5/31/2013
Matrix: Sediment/Soil
Units: ug/Kg dw

CAS#	Analyte	Result	Qualifier	RL	MDL
57-88-5	Cholesterol	1100	UJ	1100	
218-01-9	**Chrysene**	**300**		14	
53-70-3	**Dibenzo(a,h)anthracene**	**53**		27	
132-64-9	Dibenzofuran	27	U	27	
84-66-2	Diethyl phthalate	14	U	14	
131-11-3	Dimethyl phthalate	14	U	14	
84-74-2	Di-N-Butylphthalate	15	U	14	
117-84-0	Di-N-Octyl Phthalate	140	U	140	
206-44-0	**Fluoranthene**	**420**		14	
86-73-7	Fluorene	14	U	14	
118-74-1	Hexachlorobenzene	14	U	14	
87-68-3	Hexachlorobutadiene	54	U	54	
77-47-4	Hexachlorocyclopentadiene	54	U	54	
67-72-1	Hexachloroethane	14	U	14	
193-39-5	**Indeno(1,2,3-cd)pyrene**	**220**		27	
78-59-1	Isophorone	27	U	27	
91-20-3	Naphthalene	27	U	27	
98-95-3	Nitrobenzene	14	U	14	
621-64-7	N-Nitrosodi-n-propylamine	14	UJ	14	
86-30-6	N-Nitrosodiphenylamine	27	U	27	
87-86-5	Pentachlorophenol	140	U	140	
85-01-8	**Phenanthrene**	**96**		14	
108-95-2	Phenol	54	U	54	
129-00-0	**Pyrene**	**430**		14	
483-65-8	Retene	14	U	14	
3380-34-5	Triclosan	54	U	54	
77-93-0	Triethyl citrate		REJ	27	
115-96-8	Tris(2-chloroethyl) phosphate (TCEP)	14	UJ	14	

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
2199-69-1	**1,2-Dichlorobenzene-D4**	**348**	435	**80**	20-130
93951-74-7	**2,4-Dichlorophenol-D3**	**313**	435	**72**	50-150
93951-73-6	**2-Chlorophenol-D4**	**392**	435	**90**	20-130
321-60-8	**2-Fluorobiphenyl**	**377**	435	**87**	30-115
367-12-4	**2-Fluorophenol**	**313**	435	**72**	25-121
93951-78-1	**2-Nitrophenol-D4**	**339**	435	**78**	20-120
93951-76-9	**4,6-Dinitro-2-methylphenol-D2**	**221**	435	**51**	50-150
191656-33-4	**4-Chloroaniline-D4**	**125**	435	**29**	20-120
190780-66-6	**4-Methylphenol-D8**	**345**	435	**79**	50-150
93951-79-2	**4-Nitrophenol-D4**	**145**	435	**33**	20-120
93951-97-4	**Acenaphthylene-D8**	**419**	435	**96**	50-150
1719-06-8	**Anthracene-D10**	**380**	435	**87**	50-150
63466-71-7	**Benzo(a)pyrene-D12**	**416**	435	**96**	50-150
93952-02-4	**Bis(2-Chloroethyl)Ether-D8**	**368**	435	**85**	50-150
85448-30-2	**Dimethylphthalate-D6**	**412**	435	**95**	50-150
81103-79-9	**Fluorene-D10**	**417**	435	**96**	50-150
4165-60-0	**Nitrobenzene-D5**	**386**	435	**89**	23-130

Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Base/Neutral/Acids

Project: Reliable Steel

Field ID: EC-5(0-0.5)

Work Order: 1304044
Project Officer: Marti, Pam
Initial Vol: 20.014 g
Final Vol: 1 mL

Lab ID #: 1304044-09
Collected: 4/10/2013
Prep Method: SW3541
Analysis Method: SW8270
% Solids: 91.85%

Batch ID: B13E058
Prepared: 5/8/2013
Analyzed: 5/31/2013
Matrix: Sediment/Soil
Units: ug/Kg dw

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
4165-62-2	Phenol-D5	351	435	81	24-113
1718-52-1	Pyrene-D10	454	435	104	50-150
1718-51-0	Terphenyl-D14	378	435	87	18-137

Authorized by: ______________________ Release Date: 6/14/13

Printed:
6/14/2013

Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Base/Neutral/Acids

Project: Reliable Steel **Field ID: EC-4(0-1)**

Work Order: 1304044	**Lab ID #: 1304044-11**	**Batch ID: B13E058**
Project Officer: Marti, Pam	**Collected: 4/10/2013**	**Prepared: 5/8/2013**
Initial Vol: 20.058 g	**Prep Method: SW3541**	**Analyzed: 6/2/2013**
Final Vol: 1 mL	**Analysis Method: SW8270**	**Matrix: Sediment/Soil**
	% Solids: 84.17%	**Units: ug/Kg dw**

CAS#	Analyte	Result	Qualifier	RL	MDL
120-82-1	1,2,4-Trichlorobenzene	59	U	59	
95-50-1	1,2-Dichlorobenzene	120	U	120	
122-66-7	1,2-Diphenylhydrazine	30	U	30	
541-73-1	1,3-Dichlorobenzene	120	U	120	
106-46-7	1,4-Dichlorobenzene	120	U	120	
90-12-0	1-Methylnaphthalene	59	U	59	
95-95-4	2,4,5-Trichlorophenol	120	U	120	
88-06-2	2,4,6-Trichlorophenol	120	U	120	
120-83-2	2,4-Dichlorophenol	300	U	300	
105-67-9	2,4-Dimethylphenol	300	U	300	
51-28-5	2,4-Dinitrophenol		REJ	300	
121-14-2	2,4-Dinitrotoluene	120	U	120	
606-20-2	2,6-Dinitrotoluene	120	U	120	
91-58-7	2-Chloronaphthalene	59	U	59	
95-57-8	2-Chlorophenol	120	U	120	
91-57-6	2-Methylnaphthalene	59	U	59	
95-48-7	2-Methylphenol	300	U	300	
88-74-4	2-Nitroaniline	590	U	590	
88-75-5	2-Nitrophenol	59	U	59	
91-94-1	3,3'-Dichlorobenzidine	120	U	120	
360-68-9	3B-Coprostanol	2400	U	2400	
99-09-2	3-Nitroaniline	590	UJ	590	
534-52-1	4,6-Dinitro-2-Methylphenol	120	UJ	120	
101-55-3	4-Bromophenyl phenyl ether	59	U	59	
59-50-7	4-Chloro-3-Methylphenol	300	U	300	
106-47-8	4-Chloroaniline	1200	U	1200	
7005-72-3	4-Chlorophenyl-Phenylether	30	U	30	
106-44-5	4-Methylphenol	300	U	300	
100-01-6	4-Nitroaniline	120	U	120	
100-02-7	4-Nitrophenol	300	UJ	300	
104-40-5	4-nonylphenol	120	U	120	
83-32-9	Acenaphthene	30	U	30	
208-96-8	**Acenaphthylene**	**24**	**J**	30	
120-12-7	**Anthracene**	**16**	**J**	30	
56-55-3	**Benz[a]anthracene**	**96**		30	
50-32-8	**Benzo(a)pyrene**	**140**		30	
205-99-2	**Benzo(b)fluoranthene**	**150**		30	
191-24-2	**Benzo(ghi)perylene**	**100**		59	
207-08-9	**Benzo(k)fluoranthene**	**74**		30	
65-85-0	Benzoic Acid	590	UJ	590	
100-51-6	Benzyl Alcohol	300	UJ	300	
108-60-1	Bis(2-chloro-1-methylethyl) ether	30	U	30	
111-91-1	Bis(2-Chloroethoxy)Methane	30	U	30	
111-44-4	Bis(2-Chloroethyl)Ether	59	U	59	
117-81-7	Bis(2-Ethylhexyl) Phthalate	59	U	59	
80-05-7	Bisphenol A	300	U	300	
85-68-7	Butyl benzyl phthalate	59	U	59	
58-08-2	Caffeine	59	UJ	59	
86-74-8	Carbazole	59	UJ	59	

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Project: Reliable Steel **Field ID: EC-4(0-1)**

Work Order: 1304044
Project Officer: Marti, Pam
Initial Vol: 20.058 g
Final Vol: 1 mL

Lab ID #: 1304044-11
Collected: 4/10/2013
Prep Method: SW3541
Analysis Method: SW8270
% Solids: 84.17%

Batch ID: B13E058
Prepared: 5/8/2013
Analyzed: 6/2/2013
Matrix: Sediment/Soil
Units: ug/Kg dw

CAS#	Analyte	Result	Qualifier	RL	MDL
57-88-5	Cholesterol	2400	UJ	2400	
218-01-9	**Chrysene**	**120**		30	
53-70-3	**Dibenzo(a,h)anthracene**	**45**	J	59	
132-64-9	Dibenzofuran	59	U	59	
84-66-2	Diethyl phthalate	30	U	30	
131-11-3	Dimethyl phthalate	30	U	30	
84-74-2	Di-N-Butylphthalate	32	U	30	
117-84-0	Di-N-Octyl Phthalate	300	U	300	
206-44-0	**Fluoranthene**	**190**		30	
86-73-7	Fluorene	30	U	30	
118-74-1	Hexachlorobenzene	30	U	30	
87-68-3	Hexachlorobutadiene	120	U	120	
77-47-4	Hexachlorocyclopentadiene	120	U	120	
67-72-1	Hexachloroethane	30	U	30	
193-39-5	**Indeno(1,2,3-cd)pyrene**	**120**		59	
78-59-1	Isophorone	59	U	59	
91-20-3	Naphthalene	59	U	59	
98-95-3	Nitrobenzene	30	U	30	
621-64-7	N-Nitrosodi-n-propylamine	30	UJ	30	
86-30-6	N-Nitrosodiphenylamine	59	U	59	
87-86-5	Pentachlorophenol	300	U	300	
85-01-8	**Phenanthrene**	**32**		30	
108-95-2	Phenol	120	U	120	
129-00-0	**Pyrene**	**200**		30	
483-65-8	Retene	30	U	30	
3380-34-5	Triclosan	120	U	120	
77-93-0	Triethyl citrate		REJ	59	
115-96-8	Tris(2-chloroethyl) phosphate (TCEP)	30	UJ	30	

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
2199-69-1	1,2-Dichlorobenzene-D4	417	474	88	20-130
93951-74-7	2,4-Dichlorophenol-D3	327	474	69	50-150
93951-73-6	2-Chlorophenol-D4	465	474	98	20-130
321-60-8	2-Fluorobiphenyl	432	474	91	30-115
367-12-4	2-Fluorophenol	394	474	83	25-121
93951-78-1	2-Nitrophenol-D4	372	474	78	20-120
93951-76-9	4,6-Dinitro-2-methylphenol-D2	303	474	64	50-150
191656-33-4	4-Chloroaniline-D4	186	474	39	20-120
190780-66-6	4-Methylphenol-D8	385	474	81	50-150
93951-79-2	4-Nitrophenol-D4	298	474	63	20-120
93951-97-4	Acenaphthylene-D8	476	474	100	50-150
1719-06-8	Anthracene-D10	448	474	94	50-150
63466-71-7	Benzo(a)pyrene-D12	481	474	102	50-150
93952-02-4	Bis(2-Chloroethyl)Ether-D8	425	474	90	50-150
85448-30-2	Dimethylphthalate-D6	475	474	100	50-150
81103-79-9	Fluorene-D10	465	474	98	50-150
4165-60-0	Nitrobenzene-D5	459	474	97	23-130

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Project: Reliable Steel **Field ID: EC-4(0-1)**

Work Order: 1304044	Lab ID #: 1304044-11	Batch ID: B13E058
Project Officer: Marti, Pam	Collected: 4/10/2013	Prepared: 5/8/2013
Initial Vol: 20.058 g	Prep Method: SW3541	Analyzed: 6/2/2013
Final Vol: 1 mL	Analysis Method: SW8270	Matrix: Sediment/Soil
	% Solids: 84.17%	Units: ug/Kg dw

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
4165-62-2	Phenol-D5	412	474	87	24-113
1718-52-1	Pyrene-D10	518	474	109	50-150
1718-51-0	Terphenyl-D14	436	474	92	18-137

Authorized by: ____________________ **Release Date:** 6/14/13

Printed:
6/14/2013

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Project: Reliable Steel

Field ID: EC-4(3-4)

Work Order: 1304044
Project Officer: Marti, Pam
Initial Vol: 20.237 g
Final Vol: 1 mL

Lab ID #: 1304044-12
Collected: 4/10/2013
Prep Method: SW3541
Analysis Method: SW8270
% Solids: 71.20%

Batch ID: B13E058
Prepared: 5/8/2013
Analyzed: 5/31/2013
Matrix: Sediment/Soil
Units: ug/Kg dw

CAS#	Analyte	Result	Qualifier	RL	MDL
120-82-1	1,2,4-Trichlorobenzene	35	U	35	
95-50-1	1,2-Dichlorobenzene	69	U	69	
122-66-7	1,2-Diphenylhydrazine	17	U	17	
541-73-1	1,3-Dichlorobenzene	69	U	69	
106-46-7	1,4-Dichlorobenzene	69	U	69	
90-12-0	1-Methylnaphthalene	35	U	35	
95-95-4	2,4,5-Trichlorophenol	69	U	69	
88-06-2	2,4,6-Trichlorophenol	69	U	69	
120-83-2	2,4-Dichlorophenol	170	U	170	
105-67-9	2,4-Dimethylphenol	170	U	170	
51-28-5	2,4-Dinitrophenol		REJ	170	
121-14-2	2,4-Dinitrotoluene	69	U	69	
606-20-2	2,6-Dinitrotoluene	69	U	69	
91-58-7	2-Chloronaphthalene	35	U	35	
95-57-8	2-Chlorophenol	69	U	69	
91-57-6	2-Methylnaphthalene	35	U	35	
95-48-7	2-Methylphenol	170	U	170	
88-74-4	2-Nitroaniline	350	U	350	
88-75-5	2-Nitrophenol	35	U	35	
91-94-1	3,3'-Dichlorobenzidine	69	U	69	
360-68-9	**3B-Coprostanol**	**1200**	**J**	1400	
99-09-2	3-Nitroaniline	350	UJ	350	
534-52-1	4,6-Dinitro-2-Methylphenol	69	UJ	69	
101-55-3	4-Bromophenyl phenyl ether	35	U	35	
59-50-7	4-Chloro-3-Methylphenol	170	U	170	
106-47-8	4-Chloroaniline	690	UJ	690	
7005-72-3	4-Chlorophenyl-Phenylether	17	U	17	
106-44-5	4-Methylphenol	170	U	170	
100-01-6	4-Nitroaniline	69	U	69	
100-02-7	4-Nitrophenol	170	UJ	170	
104-40-5	4-nonylphenol	69	U	69	
83-32-9	Acenaphthene	17	U	17	
208-96-8	Acenaphthylene	17	U	17	
120-12-7	Anthracene	17	U	17	
56-55-3	Benz[a]anthracene	17	U	17	
50-32-8	Benzo(a)pyrene	17	U	17	
205-99-2	Benzo(b)fluoranthene	17	U	17	
191-24-2	**Benzo(ghi)perylene**	**21**	**J**	35	
207-08-9	Benzo(k)fluoranthene	17	U	17	
65-85-0	Benzoic Acid	350	UJ	350	
100-51-6	Benzyl Alcohol	170	UJ	170	
108-60-1	Bis(2-chloro-1-methylethyl) ether	17	U	17	
111-91-1	Bis(2-Chloroethoxy)Methane	17	U	17	
111-44-4	Bis(2-Chloroethyl)Ether	35	U	35	
117-81-7	Bis(2-Ethylhexyl) Phthalate	35	U	35	
80-05-7	Bisphenol A	170	U	170	
85-68-7	Butyl benzyl phthalate	35	U	35	
58-08-2	Caffeine	35	UJ	35	
86-74-8	Carbazole	35	UJ	35	

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Project: Reliable Steel **Field ID: EC-4(3-4)**

Work Order: 1304044
Project Officer: Marti, Pam
Initial Vol: 20.237 g
Final Vol: 1 mL

Lab ID #: 1304044-12
Collected: 4/10/2013
Prep Method: SW3541
Analysis Method: SW8270
% Solids: 71.20%

Batch ID: B13E058
Prepared: 5/8/2013
Analyzed: 5/31/2013
Matrix: Sediment/Soil
Units: ug/Kg dw

CAS#	Analyte	Result	Qualifier	RL	MDL
57-88-5	Cholesterol	1400	UJ	1400	
218-01-9	Chrysene	17	U	17	
53-70-3	Dibenzo(a,h)anthracene	35	U	35	
132-64-9	Dibenzofuran	35	U	35	
84-66-2	Diethyl phthalate	17	U	17	
131-11-3	Dimethyl phthalate	17	U	17	
84-74-2	Di-N-Butylphthalate	20	U	17	
117-84-0	Di-N-Octyl Phthalate	170	U	170	
206-44-0	**Fluoranthene**	**13**	**J**	17	
86-73-7	Fluorene	17	U	17	
118-74-1	Hexachlorobenzene	17	U	17	
87-68-3	Hexachlorobutadiene	69	U	69	
77-47-4	Hexachlorocyclopentadiene	69	U	69	
67-72-1	Hexachloroethane	17	U	17	
193-39-5	**Indeno(1,2,3-cd)pyrene**	**31**	**J**	35	
78-59-1	Isophorone	35	U	35	
91-20-3	Naphthalene	35	U	35	
98-95-3	Nitrobenzene	17	U	17	
621-64-7	N-Nitrosodi-n-propylamine	17	UJ	17	
86-30-6	N-Nitrosodiphenylamine	35	U	35	
87-86-5	Pentachlorophenol	170	U	170	
85-01-8	Phenanthrene	17	U	17	
108-95-2	Phenol	69	UJ	69	
129-00-0	**Pyrene**	**5.0**	**J**	17	
483-65-8	**Retene**	**370**		17	
3380-34-5	Triclosan	69	U	69	
77-93-0	Triethyl citrate		REJ	35	
115-96-8	Tris(2-chloroethyl) phosphate (TCEP)	17	UJ	17	

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
2199-69-1	**1,2-Dichlorobenzene-D4**	**425**	555	**77**	20-130
93951-74-7	**2,4-Dichlorophenol-D3**	**419**	555	**75**	50-150
93951-73-6	**2-Chlorophenol-D4**	**500**	555	**90**	20-130
321-60-8	**2-Fluorobiphenyl**	**466**	555	**84**	30-115
367-12-4	**2-Fluorophenol**	**416**	555	**75**	25-121
93951-78-1	**2-Nitrophenol-D4**	**439**	555	**79**	20-120
93951-76-9	**4,6-Dinitro-2-methylphenol-D2**	**311**	555	**56**	50-150
191656-33-4	**4-Chloroaniline-D4**	**73.0**	555	**13**	20-120
190780-66-6	**4-Methylphenol-D8**	**454**	555	**82**	50-150
93951-79-2	**4-Nitrophenol-D4**	**297**	555	**54**	20-120
93951-97-4	**Acenaphthylene-D8**	**507**	555	**91**	50-150
1719-06-8	**Anthracene-D10**	**478**	555	**86**	50-150
63466-71-7	**Benzo(a)pyrene-D12**	**495**	555	**89**	50-150
93952-02-4	**Bis(2-Chloroethyl)Ether-D8**	**463**	555	**83**	50-150
85448-30-2	**Dimethylphthalate-D6**	**506**	555	**91**	50-150
81103-79-9	**Fluorene-D10**	**491**	555	**88**	50-150
4165-60-0	**Nitrobenzene-D5**	**491**	555	**88**	23-130

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Project: Reliable Steel **Field ID: EC-4(3-4)**

Work Order: 1304044	**Lab ID #: 1304044-12**	**Batch ID: B13E058**
Project Officer: Marti, Pam	**Collected: 4/10/2013**	**Prepared: 5/8/2013**
Initial Vol: 20.237 g	**Prep Method: SW3541**	**Analyzed: 5/31/2013**
Final Vol: 1 mL	**Analysis Method: SW8270**	**Matrix: Sediment/Soil**
	% Solids: 71.20%	**Units: ug/Kg dw**

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
4165-62-2	Phenol-D5	448	555	81	24-113
1718-52-1	Pyrene-D10	533	555	96	50-150
1718-51-0	Terphenyl-D14	452	555	81	18-137

Authorized by: ____________ **Release Date:** 6/14/13 Printed: 6/14/2013

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Project: Reliable Steel **Field ID: EC-9(0-1)**

Work Order: 1304044	Lab ID #: 1304044-16	Batch ID: B13E058
Project Officer: Marti, Pam	Collected: 4/11/2013	Prepared: 5/8/2013
Initial Vol: 20.296 g	Prep Method: SW3541	Analyzed: 6/2/2013
Final Vol: 1 mL	Analysis Method: SW8270	Matrix: Sediment/Soil
	% Solids: 88.35%	Units: ug/Kg dw

CAS#	Analyte	Result	Qualifier	RL	MDL
120-82-1	1,2,4-Trichlorobenzene	56	U	56	
95-50-1	1,2-Dichlorobenzene	110	U	110	
122-66-7	1,2-Diphenylhydrazine	28	U	28	
541-73-1	1,3-Dichlorobenzene	110	U	110	
106-46-7	1,4-Dichlorobenzene	110	U	110	
90-12-0	**1-Methylnaphthalene**	**320**		56	
95-95-4	2,4,5-Trichlorophenol	110	U	110	
88-06-2	2,4,6-Trichlorophenol	110	U	110	
120-83-2	2,4-Dichlorophenol	280	U	280	
105-67-9	2,4-Dimethylphenol	280	U	280	
51-28-5	2,4-Dinitrophenol		REJ	280	
121-14-2	2,4-Dinitrotoluene	110	U	110	
606-20-2	2,6-Dinitrotoluene	110	U	110	
91-58-7	2-Chloronaphthalene	56	U	56	
95-57-8	2-Chlorophenol	110	U	110	
91-57-6	**2-Methylnaphthalene**	**470**		56	
95-48-7	2-Methylphenol	280	U	280	
88-74-4	2-Nitroaniline	560	U	560	
88-75-5	2-Nitrophenol	56	U	56	
91-94-1	3,3'-Dichlorobenzidine	110	U	110	
360-68-9	3B-Coprostanol	2200	U	2200	
99-09-2	3-Nitroaniline	560	UJ	560	
534-52-1	4,6-Dinitro-2-Methylphenol	110	UJ	110	
101-55-3	4-Bromophenyl phenyl ether	56	U	56	
59-50-7	4-Chloro-3-Methylphenol	280	U	280	
106-47-8	4-Chloroaniline		REJ	1100	
7005-72-3	4-Chlorophenyl-Phenylether	28	U	28	
106-44-5	**4-Methylphenol**	**64**	**J**	280	
100-01-6	4-Nitroaniline	110	U	110	
100-02-7	4-Nitrophenol	280	UJ	280	
104-40-5	4-nonylphenol	110	U	110	
83-32-9	**Acenaphthene**	**700**		28	
208-96-8	**Acenaphthylene**	**46**		28	
120-12-7	**Anthracene**	**1200**		28	
56-55-3	**Benz[a]anthracene**	**2700**		28	
50-32-8	**Benzo(a)pyrene**	**2700**		280	
205-99-2	**Benzo(b)fluoranthene**	**3700**		280	
191-24-2	**Benzo(ghi)perylene**	**1000**		56	
207-08-9	**Benzo(k)fluoranthene**	**1200**		28	
65-85-0	Benzoic Acid	560	UJ	560	
100-51-6	Benzyl Alcohol	280	UJ	280	
108-60-1	Bis(2-chloro-1-methylethyl) ether	28	U	28	
111-91-1	Bis(2-Chloroethoxy)Methane	28	U	28	
111-44-4	Bis(2-Chloroethyl)Ether	56	U	56	
117-81-7	**Bis(2-Ethylhexyl) Phthalate**	**6400**		56	
80-05-7	**Bisphenol A**	**540**	**J**	280	
85-68-7	**Butyl benzyl phthalate**	**180**		56	
58-08-2	Caffeine	56	UJ	56	
86-74-8	**Carbazole**	**2000**	**J**	56	

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Final Report for
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Project: Reliable Steel **Field ID: EC-9(0-1)**

Work Order: 1304044
Project Officer: Marti, Pam
Initial Vol: 20.296 g
Final Vol: 1 mL

Lab ID #: 1304044-16
Collected: 4/11/2013
Prep Method: SW3541
Analysis Method: SW8270
% Solids: 88.35%

Batch ID: B13E058
Prepared: 5/8/2013
Analyzed: 6/2/2013
Matrix: Sediment/Soil
Units: ug/Kg dw

CAS#	Analyte	Result	Qualifier	RL	MDL
57-88-5	Cholesterol	2200	UJ	2200	
218-01-9	**Chrysene**	**3000**		28	
53-70-3	**Dibenzo(a,h)anthracene**	**400**		56	
132-64-9	**Dibenzofuran**	**600**		56	
84-66-2	Diethyl phthalate	28	U	28	
131-11-3	Dimethyl phthalate	28	U	28	
84-74-2	Di-N-Butylphthalate	83	U	28	
117-84-0	Di-N-Octyl Phthalate	280	U	280	
206-44-0	**Fluoranthene**	**6600**		280	
86-73-7	**Fluorene**	**830**		28	
118-74-1	Hexachlorobenzene	28	U	28	
87-68-3	Hexachlorobutadiene	110	U	110	
77-47-4	Hexachlorocyclopentadiene	110	U	110	
67-72-1	Hexachloroethane	28	U	28	
193-39-5	**Indeno(1,2,3-cd)pyrene**	**1200**		56	
78-59-1	Isophorone	56	U	56	
91-20-3	**Naphthalene**	**1000**		56	
98-95-3	Nitrobenzene	28	U	28	
621-64-7	N-Nitrosodi-n-propylamine	28	UJ	28	
86-30-6	N-Nitrosodiphenylamine	56	U	56	
87-86-5	Pentachlorophenol	280	U	280	
85-01-8	**Phenanthrene**	**4700**		28	
108-95-2	Phenol		REJ	110	
129-00-0	**Pyrene**	**4500**		28	
483-65-8	**Retene**	**49**		28	
3380-34-5	Triclosan	110	U	110	
77-93-0	Triethyl citrate		REJ	56	
115-96-8	Tris(2-chloroethyl) phosphate (TCEP)	28	UJ	28	

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
2199-69-1	**1,2-Dichlorobenzene-D4**	**343**	446	**77**	20-130
93951-74-7	**2,4-Dichlorophenol-D3**	**326**	446	**73**	50-150
93951-73-6	**2-Chlorophenol-D4**	**390**	446	**87**	20-130
321-60-8	**2-Fluorobiphenyl**	**390**	446	**88**	30-115
367-12-4	**2-Fluorophenol**	**317**	446	**71**	25-121
93951-78-1	**2-Nitrophenol-D4**	**332**	446	**74**	20-120
93951-76-9	**4,6-Dinitro-2-methylphenol-D2**	**292**	446	**66**	50-150
191656-33-4	**4-Chloroaniline-D4**	**25.6**	446	**6**	20-120
190780-66-6	**4-Methylphenol-D8**	**335**	446	**75**	50-150
93951-79-2	**4-Nitrophenol-D4**	**451**	446	**101**	20-120
93951-97-4	**Acenaphthylene-D8**	**445**	446	**100**	50-150
1719-06-8	**Anthracene-D10**	**426**	446	**95**	50-150
63466-71-7	**Benzo(a)pyrene-D12**	**462**	446	**104**	50-150
93952-02-4	**Bis(2-Chloroethyl)Ether-D8**	**355**	446	**80**	50-150
85448-30-2	**Dimethylphthalate-D6**	**445**	446	**100**	50-150
81103-79-9	**Fluorene-D10**	**447**	446	**100**	50-150
4165-60-0	**Nitrobenzene-D5**	**386**	446	**86**	23-130

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Final Report for
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Project: Reliable Steel **Field ID: EC-9(0-1)**

Work Order: 1304044
Project Officer: Marti, Pam
Initial Vol: 20.296 g
Final Vol: 1 mL

Lab ID #: 1304044-16
Collected: 4/11/2013
Prep Method: SW3541
Analysis Method: SW8270
% Solids: 88.35%

Batch ID: B13E058
Prepared: 5/8/2013
Analyzed: 6/2/2013
Matrix: Sediment/Soil
Units: ug/Kg dw

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
4165-62-2	Phenol-D5	352	446	79	24-113
1718-52-1	Pyrene-D10	471	446	106	50-150
1718-51-0	Terphenyl-D14	392	446	88	18-137

Authorized by: ____________ **Release Date:** 6/14/13

Printed:
6/14/2013

Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Base/Neutral/Acids

Project: Reliable Steel **Field ID: EC-9(2-2.6)**

Work Order: 1304044
Project Officer: Marti, Pam
Initial Vol: 20.045 g
Final Vol: 1 mL

Lab ID #: 1304044-17
Collected: 4/11/2013
Prep Method: SW3541
Analysis Method: SW8270
% Solids: 85.55%

Batch ID: B13E058
Prepared: 5/8/2013
Analyzed: 6/3/2013
Matrix: Sediment/Soil
Units: ug/Kg dw

CAS#	Analyte	Result	Qualifier	RL	MDL
120-82-1	1,2,4-Trichlorobenzene	120	U	120	
95-50-1	1,2-Dichlorobenzene	230	U	230	
122-66-7	1,2-Diphenylhydrazine	58	U	58	
541-73-1	1,3-Dichlorobenzene	230	U	230	
106-46-7	1,4-Dichlorobenzene	230	U	230	
90-12-0	**1-Methylnaphthalene**	**89**	**J**	120	
95-95-4	2,4,5-Trichlorophenol	230	U	230	
88-06-2	2,4,6-Trichlorophenol	230	U	230	
120-83-2	2,4-Dichlorophenol	580	UJ	580	
105-67-9	2,4-Dimethylphenol	580	U	580	
51-28-5	2,4-Dinitrophenol		REJ	580	
121-14-2	2,4-Dinitrotoluene	230	U	230	
606-20-2	2,6-Dinitrotoluene	230	U	230	
91-58-7	2-Chloronaphthalene	120	U	120	
95-57-8	2-Chlorophenol	230	U	230	
91-57-6	**2-Methylnaphthalene**	**100**	**J**	120	
95-48-7	2-Methylphenol	580	U	580	
88-74-4	2-Nitroaniline	1200	U	1200	
88-75-5	2-Nitrophenol	120	U	120	
91-94-1	3,3'-Dichlorobenzidine	230	U	230	
360-68-9	3B-Coprostanol	4700	U	4700	
99-09-2	3-Nitroaniline	1200	UJ	1200	
534-52-1	4,6-Dinitro-2-Methylphenol	230	UJ	230	
101-55-3	4-Bromophenyl phenyl ether	120	U	120	
59-50-7	4-Chloro-3-Methylphenol	580	U	580	
106-47-8	4-Chloroaniline		REJ	2300	
7005-72-3	4-Chlorophenyl-Phenylether	58	U	58	
106-44-5	4-Methylphenol	580	U	580	
100-01-6	4-Nitroaniline	230	U	230	
100-02-7	4-Nitrophenol	580	UJ	580	
104-40-5	4-nonylphenol	230	U	230	
83-32-9	**Acenaphthene**	**40**	**J**	58	
208-96-8	**Acenaphthylene**	**83**		58	
120-12-7	**Anthracene**	**150**		58	
56-55-3	**Benz[a]anthracene**	**370**		58	
50-32-8	**Benzo(a)pyrene**	**470**		58	
205-99-2	**Benzo(b)fluoranthene**	**690**		58	
191-24-2	**Benzo(ghi)perylene**	**270**		120	
207-08-9	**Benzo(k)fluoranthene**	**230**		58	
65-85-0	Benzoic Acid	1200	UJ	1200	
100-51-6	Benzyl Alcohol	580	UJ	580	
108-60-1	Bis(2-chloro-1-methylethyl) ether	58	U	58	
111-91-1	Bis(2-Chloroethoxy)Methane	58	U	58	
111-44-4	Bis(2-Chloroethyl)Ether	120	U	120	
117-81-7	**Bis(2-Ethylhexyl) Phthalate**	**550**		120	
80-05-7	**Bisphenol A**	**670**	**J**	580	
85-68-7	Butyl benzyl phthalate	120	U	120	
58-08-2	Caffeine	120	UJ	120	
86-74-8	**Carbazole**	**190**	**J**	120	

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Project: Reliable Steel

Field ID: EC-9(2-2.6)

Work Order: 1304044
Project Officer: Marti, Pam
Initial Vol: 20.045 g
Final Vol: 1 mL

Lab ID #: 1304044-17
Collected: 4/11/2013
Prep Method: SW3541
Analysis Method: SW8270
% Solids: 85.55%

Batch ID: B13E058
Prepared: 5/8/2013
Analyzed: 6/3/2013
Matrix: Sediment/Soil
Units: ug/Kg dw

CAS#	Analyte	Result	Qualifier	RL	MDL
57-88-5	Cholesterol	4700	UJ	4700	
218-01-9	**Chrysene**	**520**		58	
53-70-3	**Dibenzo(a,h)anthracene**	**120**		120	
132-64-9	**Dibenzofuran**	**53**	J	120	
84-66-2	Diethyl phthalate	58	U	58	
131-11-3	Dimethyl phthalate	58	U	58	
84-74-2	Di-N-Butylphthalate	87	U	58	
117-84-0	Di-N-Octyl Phthalate	580	U	580	
206-44-0	**Fluoranthene**	**780**		58	
86-73-7	**Fluorene**	**35**	J	58	
118-74-1	Hexachlorobenzene	58	U	58	
87-68-3	Hexachlorobutadiene	230	UJ	230	
77-47-4	Hexachlorocyclopentadiene	230	U	230	
67-72-1	Hexachloroethane	58	U	58	
193-39-5	**Indeno(1,2,3-cd)pyrene**	**350**		120	
78-59-1	Isophorone	120	U	120	
91-20-3	**Naphthalene**	**95**	J	120	
98-95-3	Nitrobenzene	58	U	58	
621-64-7	N-Nitrosodi-n-propylamine	58	UJ	58	
86-30-6	N-Nitrosodiphenylamine	120	U	120	
87-86-5	Pentachlorophenol	580	U	580	
85-01-8	**Phenanthrene**	**420**		58	
108-95-2	Phenol		REJ	230	
129-00-0	**Pyrene**	**670**		58	
483-65-8	**Retene**	**440**		58	
3380-34-5	Triclosan	230	U	230	
77-93-0	Triethyl citrate		REJ	120	
115-96-8	Tris(2-chloroethyl) phosphate (TCEP)	58	UJ	58	

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
2199-69-1	**1,2-Dichlorobenzene-D4**	**458**	467	**98**	20-130
93951-74-7	**2,4-Dichlorophenol-D3**	**230**	467	**49**	50-150
93951-73-6	**2-Chlorophenol-D4**	**476**	467	**102**	20-130
321-60-8	**2-Fluorobiphenyl**	**427**	467	**92**	30-115
367-12-4	**2-Fluorophenol**	**369**	467	**79**	25-121
93951-78-1	**2-Nitrophenol-D4**	**368**	467	**79**	20-120
93951-76-9	**4,6-Dinitro-2-methylphenol-D2**	**535**	467	**115**	50-150
191656-33-4	**4-Chloroaniline-D4**	**40.5**	467	**9**	20-120
190780-66-6	**4-Methylphenol-D8**	**337**	467	**72**	50-150
93951-79-2	**4-Nitrophenol-D4**	**350**	467	**75**	20-120
93951-97-4	**Acenaphthylene-D8**	**480**	467	**103**	50-150
1719-06-8	**Anthracene-D10**	**422**	467	**90**	50-150
63466-71-7	**Benzo(a)pyrene-D12**	**492**	467	**105**	50-150
93952-02-4	**Bis(2-Chloroethyl)Ether-D8**	**452**	467	**97**	50-150
85448-30-2	**Dimethylphthalate-D6**	**482**	467	**103**	50-150
81103-79-9	**Fluorene-D10**	**464**	467	**99**	50-150
4165-60-0	**Nitrobenzene-D5**	**429**	467	**92**	23-130

Washington State Department of Ecology
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Final Report for
Base/Neutral/Acids

Project: Reliable Steel **Field ID: EC-9(2-2.6)**

Work Order: 1304044
Project Officer: Marti, Pam
Initial Vol: 20.045 g
Final Vol: 1 mL

Lab ID #: 1304044-17
Collected: 4/11/2013
Prep Method: SW3541
Analysis Method: SW8270
% Solids: 85.55%

Batch ID: B13E058
Prepared: 5/8/2013
Analyzed: 6/3/2013
Matrix: Sediment/Soil
Units: ug/Kg dw

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
4165-62-2	Phenol-D5	**436**	467	**94**	24-113
1718-52-1	Pyrene-D10	**478**	467	**102**	50-150
1718-51-0	Terphenyl-D14	**407**	467	**87**	18-137

Authorized by: ____________

Release Date: 6/14/13

Printed:
6/14/2013

Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Base/Neutral/Acids

Project: Reliable Steel **Field ID: EC-10(0-0.5)**

Work Order: 1304044
Project Officer: Marti, Pam
Initial Vol: 20.131 g
Final Vol: 1 mL

Lab ID #: 1304044-18
Collected: 4/11/2013
Prep Method: SW3541
Analysis Method: SW8270
% Solids: 89.32%

Batch ID: B13E058
Prepared: 5/8/2013
Analyzed: 6/2/2013
Matrix: Sediment/Soil
Units: ug/Kg dw

CAS#	Analyte	Result	Qualifier	RL	MDL
120-82-1	1,2,4-Trichlorobenzene	28	U	28	
95-50-1	1,2-Dichlorobenzene	56	U	56	
122-66-7	1,2-Diphenylhydrazine	14	U	14	
541-73-1	1,3-Dichlorobenzene	56	U	56	
106-46-7	1,4-Dichlorobenzene	56	U	56	
90-12-0	1-Methylnaphthalene	28	U	28	
95-95-4	2,4,5-Trichlorophenol	56	U	56	
88-06-2	2,4,6-Trichlorophenol	56	U	56	
120-83-2	2,4-Dichlorophenol	140	U	140	
105-67-9	2,4-Dimethylphenol	140	UJ	140	
51-28-5	2,4-Dinitrophenol	140	UJ	140	
121-14-2	2,4-Dinitrotoluene	56	U	56	
606-20-2	2,6-Dinitrotoluene	56	U	56	
91-58-7	2-Chloronaphthalene	28	U	28	
95-57-8	2-Chlorophenol	56	U	56	
91-57-6	2-Methylnaphthalene	28	U	28	
95-48-7	2-Methylphenol	140	U	140	
88-74-4	2-Nitroaniline	280	U	280	
88-75-5	2-Nitrophenol	28	U	28	
91-94-1	3,3'-Dichlorobenzidine	56	U	56	
360-68-9	3B-Coprostanol	1100	U	1100	
99-09-2	3-Nitroaniline	280	UJ	280	
534-52-1	4,6-Dinitro-2-Methylphenol	56	UJ	56	
101-55-3	4-Bromophenyl phenyl ether	28	U	28	
59-50-7	4-Chloro-3-Methylphenol	140	U	140	
106-47-8	4-Chloroaniline	560	U	560	
7005-72-3	4-Chlorophenyl-Phenylether	14	U	14	
106-44-5	4-Methylphenol	140	U	140	
100-01-6	4-Nitroaniline	56	U	56	
100-02-7	4-Nitrophenol	140	UJ	140	
104-40-5	4-nonylphenol		REJ	56	
83-32-9	Acenaphthene	14	U	14	
208-96-8	Acenaphthylene	14	U	14	
120-12-7	**Anthracene**	**4.8**	**J**	14	
56-5S-3	**Benz[a]anthracene**	**18**		14	
50-32-8	**Benzo(a)pyrene**	**41**		14	
205-99-2	**Benzo(b)fluoranthene**	**62**		14	
191-24-2	**Benzo(ghi)perylene**	**44**		28	
207-08-9	**Benzo(k)fluoranthene**	**23**		14	
65-85-0	Benzoic Acid	280	UJ	280	
100-51-6	Benzyl Alcohol	140	UJ	140	
108-60-1	Bis(2-chloro-1-methylethyl) ether	14	U	14	
111-91-1	Bis(2-Chloroethoxy)Methane	14	U	14	
111-44-4	Bis(2-Chloroethyl)Ether	28	U	28	
117-81-7	**Bis(2-Ethylhexyl) Phthalate**	**59**		28	
80-05-7	**Bisphenol A**	**160**	**J**	140	
85-68-7	Butyl benzyl phthalate	28	U	28	
58-08-2	Caffeine		REJ	28	
86-74-8	**Carbazole**	**15**	**J**	28	

Washington State Department of Ecology
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Final Report for
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Project: Reliable Steel **Field ID: EC-10(0-0.5)**

Work Order: 1304044
Project Officer: Marti, Pam
Initial Vol: 20.131 g
Final Vol: 1 mL

Lab ID #: 1304044-18
Collected: 4/11/2013
Prep Method: SW3541
Analysis Method: SW8270
% Solids: 89.32%

Batch ID: B13E058
Prepared: 5/8/2013
Analyzed: 6/2/2013
Matrix: Sediment/Soil
Units: ug/Kg dw

CAS#	Analyte	Result	Qualifier	RL	MDL
57-88-5	Cholesterol	1100	UJ	1100	
218-01-9	**Chrysene**	**37**		14	
53-70-3	**Dibenzo(a,h)anthracene**	**23**	**J**	28	
132-64-9	Dibenzofuran	28	U	28	
84-66-2	Diethyl phthalate	14	U	14	
131-11-3	Dimethyl phthalate	14	U	14	
84-74-2	Di-N-Butylphthalate	20	U	14	
117-84-0	Di-N-Octyl Phthalate	140	U	140	
206-44-0	**Fluoranthene**	**54**		14	
86-73-7	Fluorene	14	U	14	
118-74-1	Hexachlorobenzene	14	U	14	
87-68-3	Hexachlorobutadiene	56	U	56	
77-47-4	Hexachlorocyclopentadiene	56	UJ	56	
67-72-1	Hexachloroethane	14	U	14	
193-39-5	**Indeno(1,2,3-cd)pyrene**	**53**		28	
78-59-1	Isophorone	28	U	28	
91-20-3	Naphthalene	28	U	28	
98-95-3	Nitrobenzene	14	U	14	
621-64-7	N-Nitrosodi-n-propylamine	14	UJ	14	
86-30-6	N-Nitrosodiphenylamine	28	U	28	
87-86-5	Pentachlorophenol	140	U	140	
85-01-8	**Phenanthrene**	**21**		14	
108-95-2	Phenol	56	U	56	
129-00-0	**Pyrene**	**43**		14	
483-65-8	Retene	14	U	14	
3380-34-5	Triclosan	56	U	56	
77-93-0	Triethyl citrate	28	UJ	28	
115-96-8	Tris(2-chloroethyl) phosphate (TCEP)	14	UJ	14	

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
2199-69-1	**1,2-Dichlorobenzene-D4**	**331**	445	**74**	20-130
93951-74-7	**2,4-Dichlorophenol-D3**	**284**	445	**64**	50-150
93951-73-6	**2-Chlorophenol-D4**	**379**	445	**85**	20-130
321-60-8	**2-Fluorobiphenyl**	**363**	445	**82**	30-115
367-12-4	**2-Fluorophenol**	**307**	445	**69**	25-121
93951-78-1	**2-Nitrophenol-D4**	**299**	445	**67**	20-120
93951-76-9	**4,6-Dinitro-2-methylphenol-D2**	**159**	445	**36**	50-150
191656-33-4	**4-Chloroaniline-D4**	**227**	445	**51**	20-120
190780-66-6	**4-Methylphenol-D8**	**333**	445	**75**	50-150
93951-79-2	**4-Nitrophenol-D4**	**182**	445	**41**	20-120
93951-97-4	**Acenaphthylene-D8**	**401**	445	**90**	50-150
1719-06-8	**Anthracene-D10**	**391**	445	**88**	50-150
63466-71-7	**Benzo(a)pyrene-D12**	**425**	445	**96**	50-150
93952-02-4	**Bis(2-Chloroethyl)Ether-D8**	**346**	445	**78**	50-150
85448-30-2	**Dimethylphthalate-D6**	**407**	445	**92**	50-150
81103-79-9	**Fluorene-D10**	**400**	445	**90**	50-150
4165-60-0	**Nitrobenzene-D5**	**369**	445	**83**	23-130

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Final Report for
Base/Neutral/Acids

Project: Reliable Steel **Field ID: EC-10(0-0.5)**

Work Order: 1304044	**Lab ID #: 1304044-18**	**Batch ID: B13E058**
Project Officer: Marti, Pam	**Collected: 4/11/2013**	**Prepared: 5/8/2013**
Initial Vol: 20.131 g	**Prep Method: SW3541**	**Analyzed: 6/2/2013**
Final Vol: 1 mL	**Analysis Method: SW8270**	**Matrix: Sediment/Soil**
	% Solids: 89.32%	**Units: ug/Kg dw**

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
4165-62-2	**Phenol-D5**	**332**	445	**75**	24-113
1718-52-1	**Pyrene-D10**	**446**	445	**100**	50-150
1718-51-0	**Terphenyl-D14**	**377**	445	**85**	18-137

Authorized by: ____________ **Release Date:** 6/14/13 Printed: 6/14/2013

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Base/Neutral/Acids

Project: Reliable Steel **QC Type : Method Blank**

Work Order: 1304044
Project Officer: Marti, Pam
Initial Vol: 20 g
Final Vol: 1 mL

Lab ID #: B13E058-BLK1
Prep Method: SW3541
Analysis Method: SW8270
Source Field ID: Blank

Batch ID: B13E058
Prepared: 5/8/2013
Analyzed: 5/30/2013
Matrix: Sediment/Soil
Units: ug/Kg dw

CAS#	Analyte	Result	Qualifier	RL	MDL
120-82-1	1,2,4-Trichlorobenzene	25	U	25	
95-50-1	1,2-Dichlorobenzene	50	U	50	
122-66-7	1,2-Diphenylhydrazine	12	U	12	
541-73-1	1,3-Dichlorobenzene	50	U	50	
106-46-7	1,4-Dichlorobenzene	50	U	50	
90-12-0	1-Methylnaphthalene	25	U	25	
95-95-4	2,4,5-Trichlorophenol	50	U	50	
88-06-2	2,4,6-Trichlorophenol	50	U	50	
120-83-2	2,4-Dichlorophenol	120	U	120	
105-67-9	2,4-Dimethylphenol	120	U	120	
51-28-5	2,4-Dinitrophenol		REJ	120	
121-14-2	2,4-Dinitrotoluene	50	U	50	
606-20-2	2,6-Dinitrotoluene	50	U	50	
91-58-7	2-Chloronaphthalene	25	U	25	
95-57-8	2-Chlorophenol	50	U	50	
91-57-6	2-Methylnaphthalene	25	U	25	
95-48-7	2-Methylphenol	120	U	120	
88-74-4	2-Nitroaniline	250	U	250	
88-75-5	2-Nitrophenol	25	U	25	
91-94-1	3,3'-Dichlorobenzidine	50	U	50	
360-68-9	3B-Coprostanol	1000	U	1000	
99-09-2	3-Nitroaniline	250	UJ	250	
534-52-1	4,6-Dinitro-2-Methylphenol		REJ	50	
101-55-3	4-Bromophenyl phenyl ether	25	U	25	
59-50-7	4-Chloro-3-Methylphenol	120	U	120	
106-47-8	4-Chloroaniline	500	U	500	
7005-72-3	4-Chlorophenyl-Phenylether	12	U	12	
106-44-5	4-Methylphenol	120	U	120	
100-01-6	4-Nitroaniline	50	U	50	
100-02-7	4-Nitrophenol	120	UJ	120	
104-40-5	4-nonylphenol	50	U	50	
83-32-9	Acenaphthene	12	U	12	
208-96-8	Acenaphthylene	12	U	12	
120-12-7	Anthracene	12	U	12	
56-55-3	Benz[a]anthracene	12	U	12	
50-32-8	Benzo(a)pyrene	12	U	12	
205-99-2	Benzo(b)fluoranthene	12	U	12	
191-24-2	Benzo(ghi)perylene	25	U	25	
207-08-9	Benzo(k)fluoranthene	12	U	12	
65-85-0	Benzoic Acid	250	UJ	250	
100-51-6	Benzyl Alcohol	120	UJ	120	
108-60-1	Bis(2-chloro-1-methylethyl) ether	12	U	12	
111-91-1	Bis(2-Chloroethoxy)Methane	12	U	12	
111-44-4	Bis(2-Chloroethyl)Ether	25	U	25	
117-81-7	Bis(2-Ethylhexyl) Phthalate	25	U	25	
80-05-7	Bisphenol A	120	U	120	
85-68-7	Butyl benzyl phthalate	25	U	25	
58-08-2	Caffeine	25	UJ	25	
86-74-8	Carbazole	25	UJ	25	

Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Base/Neutral/Acids

Project: Reliable Steel **QC Type : Method Blank**

Work Order: 1304044
Project Officer: Marti, Pam
Initial Vol: 20 g
Final Vol: 1 mL

Lab ID #: B13E058-BLK1
Prep Method: SW3541
Analysis Method: SW8270
Source Field ID: Blank

Batch ID: B13E058
Prepared: 5/8/2013
Analyzed: 5/30/2013
Matrix: Sediment/Soil
Units: ug/Kg dw

CAS#	Analyte	Result	Qualifier	RL	MDL
57-88-5	Cholesterol	1000	UJ	1000	
218-01-9	Chrysene	12	U	12	
53-70-3	Dibenzo(a,h)anthracene	25	U	25	
132-64-9	Dibenzofuran	25	U	25	
84-66-2	Diethyl phthalate	12	U	12	
131-11-3	Dimethyl phthalate	12	U	12	
84-74-2	**Di-N-Butylphthalate**	**12**	**J**	**12**	
117-84-0	Di-N-Octyl Phthalate	120	U	120	
206-44-0	Fluoranthene	12	U	12	
86-73-7	Fluorene	12	U	12	
118-74-1	Hexachlorobenzene	12	U	12	
87-68-3	Hexachlorobutadiene	50	U	50	
77-47-4	Hexachlorocyclopentadiene	50	U	50	
67-72-1	Hexachloroethane	12	U	12	
193-39-5	Indeno(1,2,3-cd)pyrene	25	U	25	
78-59-1	Isophorone	25	U	25	
91-20-3	Naphthalene	25	U	25	
98-95-3	Nitrobenzene	12	U	12	
621-64-7	N-Nitrosodi-n-propylamine	12	UJ	12	
86-30-6	N-Nitrosodiphenylamine	25	U	25	
87-86-5	Pentachlorophenol	120	U	120	
85-01-8	Phenanthrene	12	U	12	
108-95-2	Phenol	50	U	50	
129-00-0	Pyrene	12	U	12	
483-65-8	Retene	12	U	12	
3380-34-5	Triclosan	50	U	50	
77-93-0	Triethyl citrate		REJ	25	
115-96-8	Tris(2-chloroethyl) phosphate (TCEP)	12	UJ	12	

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
2199-69-1	**1,2-Dichlorobenzene-D4**	**326**	400	**81**	20-130
93951-74-7	**2,4-Dichlorophenol-D3**	**275**	400	**69**	50-150
93951-73-6	**2-Chlorophenol-D4**	**367**	400	**92**	20-130
321-60-8	**2-Fluorobiphenyl**	**337**	400	**84**	30-115
367-12-4	**2-Fluorophenol**	**301**	400	**75**	25-121
93951-78-1	**2-Nitrophenol-D4**	**342**	400	**85**	20-120
93951-76-9	4,6-Dinitro-2-methylphenol-D2		400		50-150
191656-33-4	**4-Chloroaniline-D4**	**257**	400	**64**	20-120
190780-66-6	**4-Methylphenol-D8**	**236**	400	**59**	50-150
93951-79-2	**4-Nitrophenol-D4**	**109**	400	**27**	20-120
93951-97-4	**Acenaphthylene-D8**	**361**	400	**90**	50-150
1719-06-8	**Anthracene-D10**	**324**	400	**81**	50-150
63466-71-7	**Benzo(a)pyrene-D12**	**347**	400	**87**	50-150
93952-02-4	**Bis(2-Chloroethyl)Ether-D8**	**351**	400	**88**	50-150
85448-30-2	**Dimethylphthalate-D6**	**356**	400	**89**	50-150
81103-79-9	**Fluorene-D10**	**339**	400	**85**	50-150
4165-60-0	**Nitrobenzene-D5**	**369**	400	**92**	23-130

Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Base/Neutral/Acids

Project: Reliable Steel **QC Type : Method Blank**

Work Order: 1304044
Project Officer: Marti, Pam
Initial Vol: 20 g
Final Vol: 1 mL

Lab ID #: B13E058-BLK1
Prep Method: SW3541
Analysis Method: SW8270
Source Field ID: Blank

Batch ID: B13E058
Prepared: 5/8/2013
Analyzed: 5/30/2013
Matrix: Sediment/Soil
Units: ug/Kg dw

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
4165-62-2	Phenol-D5	329	400	82	24-113
1718-52-1	Pyrene-D10	414	400	104	50-150
1718-51-0	Terphenyl-D14	354	400	88	18-137

Authorized by: ____________________ **Release Date:** 6/14/13

Printed:
6/14/2013

Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Base/Neutral/Acids

Project: Reliable Steel **QC Type : LCS**

Work Order: 1304044
Project Officer: Marti, Pam
Initial Vol: 20 g
Final Vol: 1 mL

Lab ID #: B13E058-BS1
Prep Method: SW3541
Analysis Method: SW8270
Source Field ID: LCS

Batch ID: B13E058
Prepared: 5/8/2013
Analyzed: 5/30/2013
Matrix: Sediment/Soil
Units: ug/Kg dw

Analyte	Result	Spike Level	RL	%Rec	%Rec Limits
1,2,4-Trichlorobenzene	**409**	500	25	**82**	50-150
1,2-Dichlorobenzene	**416**	500	50	**83**	50-150
1,2-Diphenylhydrazine	**456**	500	12	**91**	50-150
1,3-Dichlorobenzene	**401**	500	50	**80**	50-150
1,4-Dichlorobenzene	**404**	500	50	**81**	50-150
1-Methylnaphthalene	**445**	500	25	**89**	50-150
2,4,5-Trichlorophenol	**404**	500	50	**81**	50-150
2,4,6-Trichlorophenol	**421**	500	50	**84**	50-150
2,4-Dichlorophenol	**391**	500	120	**78**	50-150
2,4-Dimethylphenol	**373**	500	120	**75**	50-150
2,4-Dinitrophenol	**128**	500	120	**26**	50-150
2,4-Dinitrotoluene	**469**	500	50	**94**	50-150
2,6-Dinitrotoluene	**441**	500	50	**88**	50-150
2-Chloronaphthalene	**456**	500	25	**91**	50-150
2-Chlorophenol	**400**	500	50	**80**	50-150
2-Methylnaphthalene	**444**	500	25	**89**	50-150
2-Methylphenol	**409**	500	120	**82**	50-150
2-Nitroaniline	**445**	500	250	**89**	50-150
2-Nitrophenol	**424**	500	25	**85**	50-150
3,3'-Dichlorobenzidine	**613**	500	50	**123**	50-150
3B-Coprostanol	**1100**	1000	1000	**110**	50-150
3-Nitroaniline		500		**NC**	50-150
4,6-Dinitro-2-Methylphenol	**204**	500	50	**41**	50-150
4-Bromophenyl phenyl ether	**455**	500	25	**91**	50-150
4-Chloro-3-Methylphenol	**403**	500	120	**81**	50-150
4-Chloroaniline	**416**	500	500	**83**	50-150
4-Chlorophenyl-Phenylether	**424**	500	12	**85**	50-150
4-Methylphenol	**415**	500	120	**83**	50-150
4-Nitroaniline	**375**	500	50	**75**	50-150
4-Nitrophenol	**369**	500	120	**74**	50-150
4-nonylphenol	**503**	500	50	**101**	50-150
Acenaphthene	**448**	500	12	**90**	50-150
Acenaphthylene	**491**	500	12	**98**	50-150
Anthracene	**492**	500	12	**98**	50-150
Benz[a]anthracene	**492**	500	12	**98**	50-150
Benzo(a)pyrene	**480**	500	12	**96**	50-150
Benzo(b)fluoranthene	**501**	500	12	**100**	50-150
Benzo(ghi)perylene	**492**	500	25	**98**	50-150
Benzo(k)fluoranthene	**498**	500	12	**100**	50-150
Benzoic Acid	**227**	1000	250	**23**	50-150
Benzyl Alcohol	**423**	500	120	**85**	50-150
Bis(2-chloro-1-methylethyl) ether	**438**	500	12	**88**	50-150
Bis(2-Chloroethoxy)Methane	**432**	500	12	**86**	50-150
Bis(2-Chloroethyl)Ether	**419**	500	25	**84**	50-150
Bis(2-Ethylhexyl) Phthalate	**471**	500	25	**94**	50-150
Bisphenol A	**497**	500	120	**99**	50-150
Butyl benzyl phthalate	**467**	500	25	**93**	50-150
Caffeine	**273**	500	25	**55**	50-150
Carbazole	**1430**	500	25	**286**	50-150

Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Base/Neutral/Acids

Project: Reliable Steel **QC Type : LCS**

Work Order: 1304044
Project Officer: Marti, Pam
Initial Vol: 20 g
Final Vol: 1 mL

Lab ID #: B13E058-BS1
Prep Method: SW3541
Analysis Method: SW8270
Source Field ID: LCS

Batch ID: B13E058
Prepared: 5/8/2013
Analyzed: 5/30/2013
Matrix: Sediment/Soil
Units: ug/Kg dw

Analyte	Result	Spike Level	RL	%Rec	%Rec Limits
Cholesterol	524	1000	1000	52	50-150
Chrysene	489	500	12	98	50-150
Dibenzo(a,h)anthracene	490	500	25	98	50-150
Dibenzofuran	460	500	25	92	50-150
Diethyl phthalate	490	500	12	98	50-150
Dimethyl phthalate	465	500	12	93	50-150
Di-N-Butylphthalate	483	500	12	97	50-150
Di-N-Octyl Phthalate	449	500	120	90	50-150
Fluoranthene	516	500	12	103	50-150
Fluorene	477	500	12	95	50-150
Hexachlorobenzene	468	500	12	94	50-150
Hexachlorobutadiene	416	500	50	83	50-150
Hexachlorocyclopentadiene	314	500	50	63	50-150
Hexachloroethane	410	500	12	82	50-150
Indeno(1,2,3-cd)pyrene	486	500	25	97	50-150
Isophorone	435	500	25	87	50-150
Naphthalene	433	500	25	87	50-150
Nitrobenzene	425	500	12	85	50-150
N-Nitrosodi-n-propylamine	447	500	12	89	50-150
N-Nitrosodiphenylamine	578	500	25	116	50-150
Pentachlorophenol	451	500	120	90	50-150
Phenanthrene	466	500	12	93	50-150
Phenol	412	500	50	82	50-150
Pyrene	482	500	12	96	50-150
Retene	490	500	12	98	50-150
Triclosan	472	500	50	94	50-150
Triethyl citrate	28.5	500	25	6	50-150
Tris(2-chloroethyl) phosphate (TCEP)	343	500	12	69	50-150

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
2199-69-1	1,2-Dichlorobenzene-D4	324	400	81	20-130
93951-74-7	2,4-Dichlorophenol-D3	337	400	84	50-150
93951-73-6	2-Chlorophenol-D4	380	400	95	20-130
321-60-8	2-Fluorobiphenyl	347	400	87	30-115
367-12-4	2-Fluorophenol	285	400	71	25-121
93951-78-1	2-Nitrophenol-D4	327	400	82	20-120
93951-76-9	4,6-Dinitro-2-methylphenol-D2	193	400	48	50-150
191656-33-4	4-Chloroaniline-D4	400	400	100	20-120
190780-66-6	4-Methylphenol-D8	347	400	87	50-150
93951-79-2	4-Nitrophenol-D4	211	400	53	20-120
93951-97-4	Acenaphthylene-D8	379	400	95	50-150
1719-06-8	Anthracene-D10	359	400	90	50-150
63466-71-7	Benzo(a)pyrene-D12	385	400	96	50-150
93952-02-4	Bis(2-Chloroethyl)Ether-D8	353	400	88	50-150
85448-30-2	Dimethylphthalate-D6	381	400	95	50-150
81103-79-9	Fluorene-D10	372	400	93	50-150
4165-60-0	Nitrobenzene-D5	375	400	94	23-130

Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Base/Neutral/Acids

Project: Reliable Steel **QC Type : LCS**

Work Order: 1304044
Project Officer: Marti, Pam
Initial Vol: 20 g
Final Vol: 1 mL

Lab ID #: B13E058-BS1
Prep Method: SW3541
Analysis Method: SW8270
Source Field ID: LCS

Batch ID: B13E058
Prepared: 5/8/2013
Analyzed: 5/30/2013
Matrix: Sediment/Soil
Units: ug/Kg dw

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
4165-62-2	Phenol-D5	346	400	86	24-113
1718-52-1	Pyrene-D10	392	400	98	50-150
1718-51-0	Terphenyl-D14	337	400	84	18-137

Authorized by: ______________________ **Release Date:** 6/14/13

Printed:
6/14/2013

Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Base/Neutral/Acids

Project: Reliable Steel **QC Type : LCS Dup**

Work Order: 1304044
Project Officer: Marti, Pam
Initial Vol: 20 g
Final Vol: 1 mL

Lab ID #: B13E058-BSD1
Prep Method: SW3541
Analysis Method: SW8270
Source Field ID: LCS Dup

Batch ID: B13E058
Prepared: 5/8/2013
Analyzed: 5/30/2013
Matrix: Sediment/Soil
Units: ug/Kg dw

Analyte	Sample Result	Spike Level	%Rec	RPD	%Rec Limits	RPD Limit
1,2,4-Trichlorobenzene	373	500	75	9	50-150	40
1,2-Dichlorobenzene	377	500	75	10	50-150	40
1,2-Diphenylhydrazine	411	500	82	10	50-150	40
1,3-Dichlorobenzene	367	500	73	9	50-150	40
1,4-Dichlorobenzene	366	500	73	10	50-150	40
1-Methylnaphthalene	398	500	80	11	50-150	40
2,4,5-Trichlorophenol	329	500	66	21	50-150	40
2,4,6-Trichlorophenol	367	500	73	14	50-150	40
2,4-Dichlorophenol	342	500	68	13	50-150	40
2,4-Dimethylphenol	336	500	67	10	50-150	40
2,4-Dinitrophenol	0.0	500	0	NC	50-150	40
2,4-Dinitrotoluene	406	500	81	14	50-150	40
2,6-Dinitrotoluene	391	500	78	12	50-150	40
2-Chloronaphthalene	407	500	81	11	50-150	40
2-Chlorophenol	353	500	71	12	50-150	40
2-Methylnaphthalene	402	500	80	10	50-150	40
2-Methylphenol	362	500	72	12	50-150	40
2-Nitroaniline	394	500	79	12	50-150	40
2-Nitrophenol	321	500	64	28	50-150	40
3,3'-Dichlorobenzidine	516	500	103	17	50-150	40
3B-Coprostanol	1050	1000	105	4	50-150	40
3-Nitroaniline		500	NC	NC	50-150	40
4,6-Dinitro-2-Methylphenol	85.0	500	17	82	50-150	40
4-Bromophenyl phenyl ether	417	500	83	9	50-150	40
4-Chloro-3-Methylphenol	392	500	78	3	50-150	40
4-Chloroaniline	329	500	66	NC	50-150	40
4-Chlorophenyl-Phenylether	377	500	75	12	50-150	40
4-Methylphenol	370	500	74	12	50-150	40
4-Nitroaniline	300	500	60	22	50-150	40
4-Nitrophenol	201	500	40	59	50-150	40
4-nonylphenol	443	500	89	13	50-150	40
Acenaphthene	398	500	80	12	50-150	40
Acenaphthylene	435	500	87	12	50-150	40
Anthracene	433	500	87	13	50-150	40
Benz[a]anthracene	434	500	87	13	50-150	40
Benzo(a)pyrene	427	500	85	12	50-150	40
Benzo(b)fluoranthene	440	500	88	13	50-150	40
Benzo(ghi)perylene	437	500	87	12	50-150	40
Benzo(k)fluoranthene	438	500	88	13	50-150	40
Benzoic Acid	227	1000	23	NC	50-150	40
Benzyl Alcohol	378	500	76	11	50-150	40
Bis(2-chloro-1-methylethyl) ether	399	500	80	9	50-150	40
Bis(2-Chloroethoxy)Methane	390	500	78	10	50-150	40
Bis(2-Chloroethyl)Ether	381	500	76	9	50-150	40
Bis(2-Ethylhexyl) Phthalate	419	500	84	12	50-150	40
Bisphenol A	253	500	51	65	50-150	40
Butyl benzyl phthalate	414	500	83	12	50-150	40
Caffeine	80.0	500	16	109	50-150	40
Carbazole	898	500	180	46	50-150	40

Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Base/Neutral/Acids

Project: Reliable Steel **QC Type : LCS Dup**

Work Order: 1304044
Project Officer: Marti, Pam
Initial Vol: 20 g
Final Vol: 1 mL

Lab ID #: B13E058-BSD1
Prep Method: SW3541
Analysis Method: SW8270
Source Field ID: LCS Dup

Batch ID: B13E058
Prepared: 5/8/2013
Analyzed: 5/30/2013
Matrix: Sediment/Soil
Units: ug/Kg dw

Analyte	Sample Result	Spike Level	%Rec	RPD	%Rec Limits	RPD Limit
Cholesterol	463	1000	46	NC	50-150	40
Chrysene	430	500	86	13	50-150	40
Dibenzo(a,h)anthracene	441	500	88	11	50-150	40
Dibenzofuran	408	500	82	12	50-150	40
Diethyl phthalate	424	500	85	14	50-150	40
Dimethyl phthalate	408	500	82	13	50-150	40
Di-N-Butylphthalate	414	500	83	16	50-150	40
Di-N-Octyl Phthalate	399	500	80	12	50-150	40
Fluoranthene	450	500	90	14	50-150	40
Fluorene	420	500	84	13	50-150	40
Hexachlorobenzene	426	500	85	9	50-150	40
Hexachlorobutadiene	382	500	76	8	50-150	40
Hexachlorocyclopentadiene	264	500	53	17	50-150	40
Hexachloroethane	367	500	73	11	50-150	40
Indeno(1,2,3-cd)pyrene	434	500	87	11	50-150	40
Isophorone	387	500	77	12	50-150	40
Naphthalene	392	500	78	10	50-150	40
Nitrobenzene	390	500	78	9	50-150	40
N-Nitrosodi-n-propylamine	398	500	80	12	50-150	40
N-Nitrosodiphenylamine	513	500	103	12	50-150	40
Pentachlorophenol	330	500	66	31	50-150	40
Phenanthrene	412	500	82	12	50-150	40
Phenol	365	500	73	12	50-150	40
Pyrene	418	500	84	14	50-150	40
Retene	426	500	85	14	50-150	40
Triclosan	393	500	79	18	50-150	40
Triethyl citrate	27.5	500	6	3	50-150	40
Tris(2-chloroethyl) phosphate (TCEP)	108	500	22	104	50-150	40

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
2199-69-1	1,2-Dichlorobenzene-D4	290	400	72	20-130
93951-74-7	2,4-Dichlorophenol-D3	295	400	74	50-150
93951-73-6	2-Chlorophenol-D4	327	400	82	20-130
321-60-8	2-Fluorobiphenyl	310	400	77	30-115
367-12-4	2-Fluorophenol	241	400	60	25-121
93951-78-1	2-Nitrophenol-D4	256	400	64	20-120
93951-76-9	4,6-Dinitro-2-methylphenol-D2	116	400	29	50-150
191656-33-4	4-Chloroaniline-D4	402	400	101	20-120
190780-66-6	4-Methylphenol-D8	305	400	76	50-150
93951-79-2	4-Nitrophenol-D4	190	400	47	20-120
93951-97-4	Acenaphthylene-D8	336	400	84	50-150
1719-06-8	Anthracene-D10	319	400	80	50-150
63466-71-7	Benzo(a)pyrene-D12	334	400	83	50-150
93952-02-4	Bis(2-Chloroethyl)Ether-D8	314	400	78	50-150
85448-30-2	Dimethylphthalate-D6	333	400	83	50-150
81103-79-9	Fluorene-D10	329	400	82	50-150
4165-60-0	Nitrobenzene-D5	334	400	83	23-130

Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Base/Neutral/Acids

Project: Reliable Steel **QC Type : LCS Dup**

Work Order: 1304044
Project Officer: Marti, Pam
Initial Vol: 20 g
Final Vol: 1 mL

Lab ID #: B13E058-BSD1
Prep Method: SW3541
Analysis Method: SW8270
Source Field ID: LCS Dup

Batch ID: B13E058
Prepared: 5/8/2013
Analyzed: 5/30/2013
Matrix: Sediment/Soil
Units: ug/Kg dw

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
4165-62-2	Phenol-D5	**302**	400	**75**	24-113
1718-52-1	Pyrene-D10	**342**	400	**85**	50-150
1718-51-0	Terphenyl-D14	**290**	400	**73**	18-137

Authorized by: ______________ **Release Date:** 6/14/13

Printed:
6/14/2013

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Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Base/Neutral/Acids

Project: Reliable Steel **QC Type : Duplicate**

Work Order: 1304044
Project Officer: Marti, Pam
Initial Vol: 20.212 g
Final Vol: 1 mL

Lab ID #: B13E058-DUP1
Prep Method: SW3541
Analysis Method: SW8270
Source Field ID: EC-7(2-3)
Source Lab ID #: 1304044-06

Batch ID: B13E058
Prepared: 5/8/2013
Analyzed: 5/31/2013
Matrix: Sediment/Soil
Units: ug/Kg dw

Analyte	Sample Result	Sample Qual	Source Result	Source Qual	RPD	RPD Limit
1,2,4-Trichlorobenzene	33	U	32	U	NC	40
1,2-Dichlorobenzene	65	U	64	U	NC	40
1,2-Diphenylhydrazine	16	U	16	U	NC	40
1,3-Dichlorobenzene	65	U	64	U	NC	40
1,4-Dichlorobenzene	65	U	64	U	NC	40
1-Methylnaphthalene	33	U	32	U	NC	40
2,4,5-Trichlorophenol	65	U	64	U	NC	40
2,4,6-Trichlorophenol	65	U	64	U	NC	40
2,4-Dichlorophenol	160	U	160	U	NC	40
2,4-Dimethylphenol	160	U	160	U	NC	40
2,4-Dinitrophenol		REJ		REJ	REJ	40
2,4-Dinitrotoluene	65	U	64	U	NC	40
2,6-Dinitrotoluene	65	U	64	U	NC	40
2-Chloronaphthalene	33	U	32	U	NC	40
2-Chlorophenol	65	U	64	U	NC	40
2-Methylnaphthalene	33	U	32	U	NC	40
2-Methylphenol	160	U	160	U	NC	40
2-Nitroaniline	330	U	320	U	NC	40
2-Nitrophenol	33	U	32	U	NC	40
3,3'-Dichlorobenzidine	65	U	64	U	NC	40
3B-Coprostanol	1300	U	1300	U	NC	40
3-Nitroaniline	330	UJ	320	UJ	NC	40
4,6-Dinitro-2-Methylphenol	65	UJ	64	UJ	NC	40
4-Bromophenyl phenyl ether	33	U	32	U	NC	40
4-Chloro-3-Methylphenol	160	U	160	U	NC	40
4-Chloroaniline	650	U	640	U	NC	40
4-Chlorophenyl-Phenylether	16	U	16	U	NC	40
4-Methylphenol	160	U	160	U	NC	40
4-Nitroaniline	65	U	64	U	NC	40
4-Nitrophenol	160	UJ	160	UJ	NC	40
4-nonylphenol	65	U	64	U	NC	40
Acenaphthene	**11.0**	**J**	16	U	NC	40
Acenaphthylene	**14.4**	**J**	**20**		NC	40
Anthracene	**37.6**		**30**		**24**	40
Benz[a]anthracene	**144**		**93**		**43**	40
Benzo(a)pyrene	**165**		**120**		**29**	40
Benzo(b)fluoranthene	**192**		**170**		**12**	40
Benzo(ghi)perylene	**134**		**110**		**22**	40
Benzo(k)fluoranthene	**66.8**		**53**		**23**	40
Benzoic Acid	330	UJ	320	UJ	NC	40
Benzyl Alcohol	160	UJ	160	UJ	NC	40
Bis(2-chloro-1-methylethyl) ether	16	U	16	U	NC	40
Bis(2-Chloroethoxy)Methane	16	U	16	U	NC	40
Bis(2-Chloroethyl)Ether	33	U	32	U	NC	40
Bis(2-Ethylhexyl) Phthalate	33	U	120		NC	40
Bisphenol A	160	U	160	U	NC	40
Butyl benzyl phthalate	33	U	32	U	NC	40
Caffeine	33	UJ	32	UJ	NC	40
Carbazole	**48.6**	**J**	**47**	**J**	**4**	40

Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Base/Neutral/Acids

Project: Reliable Steel **QC Type : Duplicate**

Work Order: 1304044	**Lab ID #: B13E058-DUP1**	**Batch ID: B13E058**
Project Officer: Marti, Pam	**Prep Method: SW3541**	**Prepared: 5/8/2013**
Initial Vol: 20.212 g	**Analysis Method: SW8270**	**Analyzed: 5/31/2013**
Final Vol: 1 mL	**Source Field ID: EC-7(2-3)**	**Matrix: Sediment/Soil**
	Source Lab ID #: 1304044-06	**Units: ug/Kg dw**

Analyte	Sample Result	Sample Qual	Source Result	Source Qual	RPD	RPD Limit
Cholesterol	1300	UJ	1300	UJ	NC	40
Chrysene	**194**		**160**		**21**	40
Dibenzo(a,h)anthracene	33	U	40		NC	40
Dibenzofuran	33	U	32	U	NC	40
Diethyl phthalate	16	U	16	U	NC	40
Dimethyl phthalate	16	U	16	U	NC	40
Di-N-Butylphthalate	16	U	16	U	**39**	40
Di-N-Octyl Phthalate	160	U	160	U	NC	40
Fluoranthene	**274**		**260**		**5**	40
Fluorene	**8.5**	**J**	16	U	NC	40
Hexachlorobenzene	16	U	16	U	NC	40
Hexachlorobutadiene	65	U	64	U	NC	40
Hexachlorocyclopentadiene	65	U	64	U	NC	40
Hexachloroethane	16	U	16	U	NC	40
Indeno(1,2,3-cd)pyrene	**138**		**120**		**16**	40
Isophorone	33	U	32	U	NC	40
Naphthalene	33	U	32	U	NC	40
Nitrobenzene	16	U	16	U	NC	40
N-Nitrosodi-n-propylamine	16	UJ	16	UJ	NC	40
N-Nitrosodiphenylamine	33	U	32	U	NC	40
Pentachlorophenol	**58.8**	**J**	**62**	**J**	NC	40
Phenanthrene	**150**		**140**		**9**	40
Phenol	65	U	64	U	NC	40
Pyrene	**340**		**250**		**31**	40
Retene	**20.8**		**20**		**5**	40
Triclosan	65	U	64	U	NC	40
Triethyl citrate		REJ		REJ	REJ	40
Tris(2-chloroethyl) phosphate (TCEP)	16	UJ	16	UJ	NC	40

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
2199-69-1	**1,2-Dichlorobenzene-D4**	**394**	522	**75**	20-130
93951-74-7	**2,4-Dichlorophenol-D3**	**346**	522	**66**	50-150
93951-73-6	**2-Chlorophenol-D4**	**443**	522	**85**	20-130
321-60-8	**2-Fluorobiphenyl**	**439**	522	**84**	30-115
367-12-4	**2-Fluorophenol**	**351**	522	**67**	25-121
93951-78-1	**2-Nitrophenol-D4**	**391**	522	**75**	20-120
93951-76-9	**4,6-Dinitro-2-methylphenol-D2**	**340**	522	**65**	50-150
191656-33-4	**4-Chloroaniline-D4**	**128**	522	**24**	20-120
190780-66-6	**4-Methylphenol-D8**	**320**	522	**61**	50-150
93951-79-2	**4-Nitrophenol-D4**	**182**	522	**35**	20-120
93951-97-4	**Acenaphthylene-D8**	**488**	522	**93**	50-150
1719-06-8	**Anthracene-D10**	**464**	522	**89**	50-150
63466-71-7	**Benzo(a)pyrene-D12**	**500**	522	**96**	50-150
93952-02-4	**Bis(2-Chloroethyl)Ether-D8**	**426**	522	**82**	50-150
85448-30-2	**Dimethylphthalate-D6**	**492**	522	**94**	50-150
81103-79-9	**Fluorene-D10**	**471**	522	**90**	50-150
4165-60-0	**Nitrobenzene-D5**	**450**	522	**86**	23-130

Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Base/Neutral/Acids

Project: Reliable Steel **QC Type : Duplicate**

Work Order: 1304044
Project Officer: Marti, Pam
Initial Vol: 20.212 g
Final Vol: 1 mL

Lab ID #: B13E058-DUP1
Prep Method: SW3541
Analysis Method: SW8270
Source Field ID: EC-7(2-3)
Source Lab ID #: 1304044-06

Batch ID: B13E058
Prepared: 5/8/2013
Analyzed: 5/31/2013
Matrix: Sediment/Soil
Units: ug/Kg dw

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
4165-62-2	Phenol-D5	375	522	72	24-113
1718-52-1	Pyrene-D10	539	522	103	50-150
1718-51-0	Terphenyl-D14	458	522	88	18-137

Authorized by: ____________________ **Release Date:** 6/14/13

Printed:
6/14/2013

Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Base/Neutral/Acids

Project: Reliable Steel **QC Type : Matrix Spike**

Work Order: 1304044
Project Officer: Marti, Pam
Initial Vol: 20.27 g
Final Vol: 1 mL

Lab ID #: B13E058-MS1
Prep Method: SW3541
Analysis Method: SW8270
Source Field ID: EC-10(0-0.5)
Source Lab ID #: 1304044-18

Batch ID: B13E058
Prepared: 5/8/2013
Analyzed: 5/30/2013
Matrix: Sediment/Soil
Units: ug/Kg dw

Analyte	Result	Spike Level	Source Result	%Rec	%Rec Limits
1,2,4-Trichlorobenzene	**386**	553	0.00	**70**	50-150
1,2-Dichlorobenzene	**378**	553	0.00	**68**	50-150
1,2-Diphenylhydrazine	**433**	553	0.00	**78**	50-150
1,3-Dichlorobenzene	**370**	553	0.00	**67**	50-150
1,4-Dichlorobenzene	**369**	553	0.00	**67**	50-150
1-Methylnaphthalene	**423**	553	0.00	**77**	50-150
2,4,5-Trichlorophenol	**402**	553	0.00	**73**	50-150
2,4,6-Trichlorophenol	**410**	553	0.00	**74**	50-150
2,4-Dichlorophenol	**364**	553	0.00	**66**	50-150
2,4-Dimethylphenol	**222**	553	0.00	**40**	50-150
2,4-Dinitrophenol	**206**	553	0.00	**37**	50-150
2,4-Dinitrotoluene	**449**	553	0.00	**81**	50-150
2,6-Dinitrotoluene	**427**	553	0.00	**77**	50-150
2-Chloronaphthalene	**428**	553	0.00	**77**	50-150
2-Chlorophenol	**363**	553	0.00	**66**	50-150
2-Methylnaphthalene	**421**	553	0.00	**76**	50-150
2-Methylphenol	**351**	553	0.00	**64**	50-150
2-Nitroaniline	**410**	553	0.00	**74**	50-150
2-Nitrophenol	**351**	553	0.00	**64**	50-150
3,3'-Dichlorobenzidine	**534**	553	0.00	**97**	50-150
3B-Coprostanol	**1470**	1110	0.00	**133**	50-150
3-Nitroaniline		553	0.00	**NC**	50-150
4,6-Dinitro-2-Methylphenol	**289**	553	0.00	**52**	50-150
4-Bromophenyl phenyl ether	**458**	553	0.00	**83**	50-150
4-Chloro-3-Methylphenol	**417**	553	0.00	**75**	50-150
4-Chloroaniline	**473**	553	0.00	**86**	50-150
4-Chlorophenyl-Phenylether	**415**	553	0.00	**75**	50-150
4-Methylphenol	**361**	553	0.00	**65**	50-150
4-Nitroaniline	**289**	553	0.00	**52**	50-150
4-Nitrophenol	**307**	553	0.00	**56**	50-150
4-nonylphenol	**481**	553	REJ	**87**	50-150
Acenaphthene	**437**	553	0.00	**79**	50-150
Acenaphthylene	**466**	553	0.00	**84**	50-150
Anthracene	**485**	553	**4.8**	**87**	50-150
Benz[a]anthracene	**515**	553	**18**	**90**	50-150
Benzo(a)pyrene	**491**	553	**41**	**81**	50-150
Benzo(b)fluoranthene	**540**	553	**62**	**86**	50-150
Benzo(ghi)perylene	**510**	553	**44**	**84**	50-150
Benzo(k)fluoranthene	**496**	553	**23**	**86**	50-150
Benzoic Acid	**252**	1110	0.00	**23**	50-150
Benzyl Alcohol	**389**	553	0.00	**70**	50-150
Bis(2-chloro-1-methylethyl) ether	**386**	553	0.00	**70**	50-150
Bis(2-Chloroethoxy)Methane	**391**	553	0.00	**71**	50-150
Bis(2-Chloroethyl)Ether	**380**	553	0.00	**69**	50-150
Bis(2-Ethylhexyl) Phthalate	**516**	553	**59**	**83**	50-150
Bisphenol A	**590**	553	**160**	**78**	50-150
Butyl benzyl phthalate	**473**	553	0.00	**86**	50-150
Caffeine	**0.0**	553	REJ	**0**	50-150
Carbazole	**1100**	553	**15**	**197**	50-150

Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Base/Neutral/Acids

Project: Reliable Steel **QC Type : Matrix Spike**

Work Order: 1304044
Project Officer: Marti, Pam
Initial Vol: 20.27 g
Final Vol: 1 mL

Lab ID #: B13E058-MS1
Prep Method: SW3541
Analysis Method: SW8270
Source Field ID: EC-10(0-0.5)
Source Lab ID #: 1304044-18

Batch ID: B13E058
Prepared: 5/8/2013
Analyzed: 5/30/2013
Matrix: Sediment/Soil
Units: ug/Kg dw

Analyte	Result	Spike Level	Source Result	%Rec	%Rec Limits
Cholesterol	1050	1110	0.00	95	50-150
Chrysene	522	553	37	88	50-150
Dibenzo(a,h)anthracene	488	553	23	84	50-150
Dibenzofuran	447	553	0.00	81	50-150
Diethyl phthalate	454	553	0.00	82	50-150
Dimethyl phthalate	450	553	0.00	82	50-150
Di-N-Butylphthalate	472	553	20	85	50-150
Di-N-Octyl Phthalate	459	553	0.00	83	50-150
Fluoranthene	577	553	54	95	50-150
Fluorene	466	553	0.00	84	50-150
Hexachlorobenzene	470	553	0.00	85	50-150
Hexachlorobutadiene	392	553	0.00	71	50-150
Hexachlorocyclopentadiene	260	553	0.00	47	50-150
Hexachloroethane	372	553	0.00	67	50-150
Indeno(1,2,3-cd)pyrene	502	553	53	81	50-150
Isophorone	398	553	0.00	72	50-150
Naphthalene	408	553	0.00	74	50-150
Nitrobenzene	391	553	0.00	71	50-150
N-Nitrosodi-n-propylamine	426	553	0.00	77	50-150
N-Nitrosodiphenylamine	534	553	0.00	97	50-150
Pentachlorophenol	448	553	0.00	81	50-150
Phenanthrene	492	553	21	85	50-150
Phenol	362	553	0.00	66	50-150
Pyrene	517	553	43	86	50-150
Retene	462	553	0.00	84	50-150
Triclosan	547	553	0.00	99	50-150
Triethyl citrate	77.1	553	0.00	14	50-150
Tris(2-chloroethyl) phosphate (TCEP)	322	553	0.00	58	50-150

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
2199-69-1	1,2-Dichlorobenzene-D4	301	442	68	20-130
93951-74-7	2,4-Dichlorophenol-D3	324	442	73	50-150
93951-73-6	2-Chlorophenol-D4	346	442	78	20-130
321-60-8	2-Fluorobiphenyl	336	442	76	30-115
367-12-4	2-Fluorophenol	274	442	62	25-121
93951-78-1	2-Nitrophenol-D4	285	442	64	20-120
93951-76-9	4,6-Dinitro-2-methylphenol-D2	273	442	62	50-150
191656-33-4	4-Chloroaniline-D4	464	442	105	20-120
190780-66-6	4-Methylphenol-D8	310	442	70	50-150
93951-79-2	4-Nitrophenol-D4	215	442	49	20-120
93951-97-4	Acenaphthylene-D8	370	442	84	50-150
1719-06-8	Anthracene-D10	363	442	82	50-150
63466-71-7	Benzo(a)pyrene-D12	398	442	90	50-150
93952-02-4	Bis(2-Chloroethyl)Ether-D8	322	442	73	50-150
85448-30-2	Dimethylphthalate-D6	378	442	86	50-150
81103-79-9	Fluorene-D10	378	442	86	50-150
4165-60-0	Nitrobenzene-D5	345	442	78	23-130

Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Base/Neutral/Acids

Project: Reliable Steel **QC Type : Matrix Spike**

Work Order: 1304044
Project Officer: Marti, Pam
Initial Vol: 20.27 g
Final Vol: 1 mL

Lab ID #: B13E058-MS1
Prep Method: SW3541
Analysis Method: SW8270
Source Field ID: EC-10(0-0.5)
Source Lab ID #: 1304044-18

Batch ID: B13E058
Prepared: 5/8/2013
Analyzed: 5/30/2013
Matrix: Sediment/Soil
Units: ug/Kg dw

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
4165-62-2	Phenol-D5	**312**	442	**71**	24-113
1718-52-1	Pyrene-D10	**408**	442	**92**	50-150
1718-51-0	Terphenyl-D14	**347**	442	**79**	18-137

Authorized by: ______________ **Release Date:** 6/14/13

Printed:
6/14/2013

Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Base/Neutral/Acids

Project: Reliable Steel **QC Type : Matrix Spike Dup**

Work Order: 1304044
Project Officer: Marti, Pam
Initial Vol: 20.232 g
Final Vol: 1 mL

Lab ID #: B13E058-MSD1
Prep Method: SW3541
Analysis Method: SW8270
Source Field ID: EC-10(0-0.5)
Source Lab ID #: 1304044-18

Batch ID: B13E058
Prepared: 5/8/2013
Analyzed: 5/30/2013
Matrix: Sediment/Soil
Units: ug/Kg dw

Analyte	Sample Result	Spike Level	Source Result	%Rec	RPD	%Rec Limits	RPD Limit
1,2,4-Trichlorobenzene	450	554	0.00	81	15	50-150	40
1,2-Dichlorobenzene	435	554	0.00	79	14	50-150	40
1,2-Diphenylhydrazine	464	554	0.00	84	7	50-150	40
1,3-Dichlorobenzene	426	554	0.00	77	14	50-150	40
1,4-Dichlorobenzene	425	554	0.00	77	14	50-150	40
1-Methylnaphthalene	479	554	0.00	87	12	50-150	40
2,4,5-Trichlorophenol	457	554	0.00	83	13	50-150	40
2,4,6-Trichlorophenol	476	554	0.00	86	15	50-150	40
2,4-Dichlorophenol	425	554	0.00	77	16	50-150	40
2,4-Dimethylphenol	271	554	0.00	49	20	50-150	40
2,4-Dinitrophenol	224	554	0.00	41	8	50-150	40
2,4-Dinitrotoluene	511	554	0.00	92	13	50-150	40
2,6-Dinitrotoluene	480	554	0.00	87	12	50-150	40
2-Chloronaphthalene	483	554	0.00	87	12	50-150	40
2-Chlorophenol	419	554	0.00	76	14	50-150	40
2-Methylnaphthalene	478	554	0.00	86	13	50-150	40
2-Methylphenol	403	554	0.00	73	14	50-150	40
2-Nitroaniline	455	554	0.00	82	11	50-150	40
2-Nitrophenol	410	554	0.00	74	16	50-150	40
3,3'-Dichlorobenzidine	581	554	0.00	105	8	50-150	40
3B-Coprostanol	1590	1110	0.00	144	8	50-150	40
3-Nitroaniline		554	0.00	NC	NC	50-150	40
4,6-Dinitro-2-Methylphenol	317	554	0.00	57	9	50-150	40
4-Bromophenyl phenyl ether	515	554	0.00	93	12	50-150	40
4-Chloro-3-Methylphenol	477	554	0.00	86	13	50-150	40
4-Chloroaniline	547	554	0.00	99	NC	50-150	40
4-Chlorophenyl-Phenylether	476	554	0.00	86	14	50-150	40
4-Methylphenol	417	554	0.00	75	14	50-150	40
4-Nitroaniline	442	554	0.00	80	42	50-150	40
4-Nitrophenol	363	554	0.00	66	17	50-150	40
4-nonylphenol	559	554	REJ	101	15	50-150	40
Acenaphthene	490	554	0.00	89	11	50-150	40
Acenaphthylene	515	554	0.00	93	10	50-150	40
Anthracene	532	554	4.8	95	9	50-150	40
Benz[a]anthracene	572	554	18	100	11	50-150	40
Benzo(a)pyrene	539	554	41	90	9	50-150	40
Benzo(b)fluoranthene	596	554	62	96	10	50-150	40
Benzo(ghi)perylene	562	554	44	94	10	50-150	40
Benzo(k)fluoranthene	539	554	23	93	8	50-150	40
Benzoic Acid	252	1110	0.00	23	NC	50-150	40
Benzyl Alcohol	457	554	0.00	83	16	50-150	40
Bis(2-chloro-1-methylethyl) ether	423	554	0.00	77	9	50-150	40
Bis(2-Chloroethoxy)Methane	445	554	0.00	80	13	50-150	40
Bis(2-Chloroethyl)Ether	432	554	0.00	78	13	50-150	40
Bis(2-Ethylhexyl) Phthalate	589	554	59	96	13	50-150	40
Bisphenol A	703	554	160	98	17	50-150	40
Butyl benzyl phthalate	527	554	0.00	95	11	50-150	40
Caffeine	14.6	554	REJ	3	NC	50-150	40
Carbazole	1070	554	15	191	3	50-150	40

Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Base/Neutral/Acids

Project: Reliable Steel **QC Type : Matrix Spike Dup**

Work Order: 1304044
Project Officer: Marti, Pam
Initial Vol: 20.232 g
Final Vol: 1 mL

Lab ID #: B13E058-MSD1
Prep Method: SW3541
Analysis Method: SW8270
Source Field ID: EC-10(0-0.5)
Source Lab ID #: 1304044-18

Batch ID: B13E058
Prepared: 5/8/2013
Analyzed: 5/30/2013
Matrix: Sediment/Soil
Units: ug/Kg dw

Analyte	Sample Result	Spike Level	Source Result	%Rec	RPD	%Rec Limits	RPD Limit
Cholesterol	1530	1110	0.00	138	37	50-150	40
Chrysene	586	554	37	99	12	50-150	40
Dibenzo(a,h)anthracene	545	554	23	94	11	50-150	40
Dibenzofuran	507	554	0.00	92	13	50-150	40
Diethyl phthalate	505	554	0.00	91	11	50-150	40
Dimethyl phthalate	500	554	0.00	90	11	50-150	40
Di-N-Butylphthalate	522	554	20	94	10	50-150	40
Di-N-Octyl Phthalate	494	554	0.00	89	7	50-150	40
Fluoranthene	646	554	54	107	11	50-150	40
Fluorene	525	554	0.00	95	12	50-150	40
Hexachlorobenzene	520	554	0.00	94	10	50-150	40
Hexachlorobutadiene	451	554	0.00	81	14	50-150	40
Hexachlorocyclopentadiene	349	554	0.00	63	29	50-150	40
Hexachloroethane	417	554	0.00	75	12	50-150	40
Indeno(1,2,3-cd)pyrene	562	554	53	92	11	50-150	40
Isophorone	448	554	0.00	81	12	50-150	40
Naphthalene	465	554	0.00	84	13	50-150	40
Nitrobenzene	448	554	0.00	81	14	50-150	40
N-Nitrosodi-n-propylamine	485	554	0.00	88	13	50-150	40
N-Nitrosodiphenylamine	584	554	0.00	105	9	50-150	40
Pentachlorophenol	497	554	0.00	90	10	50-150	40
Phenanthrene	534	554	21	93	8	50-150	40
Phenol	419	554	0.00	76	15	50-150	40
Pyrene	561	554	43	94	8	50-150	40
Retene	521	554	0.00	94	12	50-150	40
Triclosan	646	554	0.00	117	17	50-150	40
Triethyl citrate	82.8	554	0.00	15	7	50-150	40
Tris(2-chloroethyl) phosphate (TCEP)	351	554	0.00	63	9	50-150	40

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
2199-69-1	1,2-Dichlorobenzene-D4	345	443	78	20-130
93951-74-7	2,4-Dichlorophenol-D3	376	443	85	50-150
93951-73-6	2-Chlorophenol-D4	401	443	91	20-130
321-60-8	2-Fluorobiphenyl	381	443	86	30-115
367-12-4	2-Fluorophenol	316	443	71	25-121
93951-78-1	2-Nitrophenol-D4	344	443	78	20-120
93951-76-9	4,6-Dinitro-2-methylphenol-D2	297	443	67	50-150
191656-33-4	4-Chloroaniline-D4	475	443	107	20-120
190780-66-6	4-Methylphenol-D8	359	443	81	50-150
93951-79-2	4-Nitrophenol-D4	224	443	51	20-120
93951-97-4	Acenaphthylene-D8	408	443	92	50-150
1719-06-8	Anthracene-D10	408	443	92	50-150
63466-71-7	Benzo(a)pyrene-D12	444	443	100	50-150
93952-02-4	Bis(2-Chloroethyl)Ether-D8	364	443	82	50-150
85448-30-2	Dimethylphthalate-D6	424	443	96	50-150
81103-79-9	Fluorene-D10	426	443	96	50-150
4165-60-0	Nitrobenzene-D5	395	443	89	23-130

Washington State Department of Ecology
Manchester Environmental Laboratory
Final Report for
Base/Neutral/Acids

Project: Reliable Steel **QC Type : Matrix Spike Dup**

Work Order: 1304044
Project Officer: Marti, Pam
Initial Vol: 20.232 g
Final Vol: 1 mL

Lab ID #: B13E058-MSD1
Prep Method: SW3541
Analysis Method: SW8270
Source Field ID: EC-10(0-0.5)
Source Lab ID #: 1304044-18

Batch ID: B13E058
Prepared: 5/8/2013
Analyzed: 5/30/2013
Matrix: Sediment/Soil
Units: ug/Kg dw

Surrogate Recovery:

CAS#	Analyte	Result	Spike Level	% Rec.	% Rec. Limits
4165-62-2	Phenol-D5	362	443	82	24-113
1718-52-1	Pyrene-D10	453	443	102	50-150
1718-51-0	Terphenyl-D14	385	443	87	18-137

Authorized by: ______________________ **Release Date:** 6/14/13

Printed:
6/14/2013

APPENDIX D
Groundwater Level Measurements

Table 5. Groundwater Elevations
RELIABLE STEEL SITE
OLYMPIA, WASHINGTON

Sept. 16, 2010 (high tide)

Station	Time	MW Elevation (ft	Depth to Water (ft)	Groundwater Elevation (ft)
MW-1	1242	11.94	3.00	8.94
MW-2	1239	12.31	4.52	7.79
MW-3	1236	11.85	4.91	6.94
MW-4	1308	11.77	4.01	7.76
MW-5	1252	9.65	3.34	6.31
MW-6	1305	10.37	3.43	6.94
MW-7	1244	10.38	3.62	6.76
MW-8	1247	9.85	3.09	6.76
MW-9	1258	9.87	3.34	6.53

Oct. 6, 2010 (low tide)

Station	Time	MW Elevation (ft	Depth to Water (ft)	Groundwater Elevation (ft)
MW-1	838	11.94	2.93	9.01
MW-2	830	12.31	4.71	7.6
MW-3	823	11.85	4.06	7.79
MW-4	833	11.77	4.50	7.27
MW-5	853	9.65	3.13	6.52
MW-6	855	10.37	3.70	6.67
MW-7	843	10.38	3.93	6.45
MW-8	847	9.85	3.33	6.52
MW-9	851	9.87	3.33	6.54