

**FOCUSED REMEDIAL INVESTIGATION
FORMER SEKIU LOG SORTING YARD
SEKIU, WASHINGTON**

AUGUST 19, 2009

**FOR
RAYONIER PROPERTIES, LLC**

**Focused Remedial Investigation
Former Sekiu Log Sorting Yard
Sekiu, Washington
File No. 0137-018-00**

August 19, 2009

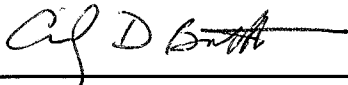
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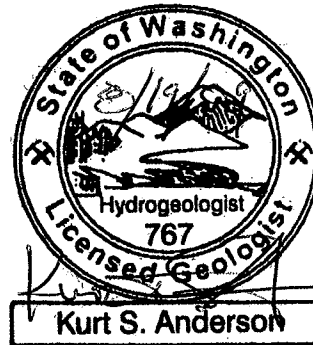
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EXECUTIVE SUMMARY

This report presents the results of a Focused Remedial Investigation (RI) at the Rayonier Properties, LLC (Rayonier) Former Sekiu Log Sorting Yard in Sekiu, Washington (the subject property). Petroleum-contaminated soil and groundwater were discovered at the subject property in 2007, at which time it was reported to the Washington State Department of Ecology (Ecology). The petroleum impacts appear to be related to historical releases of Bunker C fuel. Rayonier performed a limited source removal action in October 2007, followed by limited site assessment activities in March 2008. GeoEngineers was retained by Rayonier to complete the Focused RI activities in October 2008 through February 2009.

The RI activities included characterization of soil, groundwater and sediment in order to evaluate the vertical and lateral extent of petroleum- and polynuclear aromatic hydrocarbons (PAH)-contaminated soil and groundwater, and to evaluate potential transport from the subject property into the adjacent marine environment. Soil was sampled from twenty test pits and eleven direct-push boring explorations. Selected borings were completed as monitoring wells (ten total), and groundwater was sampled from these monitoring wells. Sediment was sampled at four locations in Clallam Bay just off the shoreline of the subject property.

SOIL AND GROUNDWATER CONDITIONS

Subsurface conditions encountered at the site consisted of unconsolidated gravel and silt ranging from ground surface to approximately 11 to 18 feet below ground surface (bgs). Beneath the silt and gravel was a dense, consolidated silt, sand, gravel unit of varying grain-size that was interpreted to be glacial till. Depths to groundwater ranged from approximately 4 to 16 feet bgs. Based on local topography, the location of Clallam Bay adjacent and east of the subject property, and information obtained during the Focused RI, groundwater flow is toward the east.

CONCEPTUAL SITE MODEL

The conceptual site model (CSM) for the subject property was developed to show distribution of hazardous substances at the subject property and the subsequent potential migration of those hazardous substances in environmental media. Bunker C was likely released at the subject property from historical below ground tanks and/or piping. Based on contaminant distribution at greater depths in the subsurface, rather than at the ground surface, it appears that release mechanisms were likely below-ground. Over time, Bunker C potentially migrated via preferential pathways and to groundwater where it was distributed laterally at the groundwater surface as light non-aqueous phase liquids (LNAPL), at the gravel/till contact as dense non-aqueous phase liquids (DNAPL), or both, and eventually migrated towards the shoreline with the direction of groundwater flow. Mobile free product was not detected.

PRELIMINARY CLEANUP LEVELS

Based on current and likely future property use, preliminary soil cleanup levels were based on unrestricted land use. Therefore, preliminary soil cleanup levels were developed using Ecology Model Toxics Control Act (MTCA) Method A and Method B cleanup levels for Bunker C-range petroleum hydrocarbons, non-carcinogenic PAHs, and carcinogenic PAHs.

Groundwater at, or potentially affected by, the subject property is not used for drinking water at this time and is not a reasonable future source of drinking water due the availability of a municipal water supply and due to its proximity to marine surface water. Surface water criteria are not available for gasoline-, diesel, and oil-range (Bunker C) petroleum hydrocarbons; therefore, the MTCA Method A groundwater cleanup levels for gasoline-, diesel- and oil-range (Bunker C) petroleum hydrocarbons were used for

comparison. For PAHs, preliminary groundwater cleanup levels were selected from available state and federal surface water criteria and the most conservative (lowest) applicable criteria were selected.

The Sediment Quality Standard (SQS) and Cleanup Screening Level (CSL) criteria established under the Sediment Management Standards (SMS) were used as the preliminary sediment cleanup levels for the subject property. No sediment cleanup levels have been established for petroleum hydrocarbons.

FOCUSED RI FINDINGS

Bunker C was detected at concentrations greater than the preliminary cleanup level in soil samples obtained from eleven explorations located in the northeastern portion of the subject property. PAHs were detected at concentrations greater than the preliminary cleanup levels in soil samples obtained at three of these explorations. Field observations and field screening in this portion of the subject property indicate the presence of NAPL in an approximately two to three foot zone above a sand/gravel and till contact. Bunker C also was detected at concentrations greater than the preliminary cleanup level in one monitoring well (MW-1) located in the northeastern portion of the subject property during the October 2008 and February 2009 groundwater sampling events. Non carcinogenic and carcinogenic PAHs, with the exception of benzo(a)pyrene, either were not detected or were detected at concentrations less than the cleanup levels in groundwater samples obtained from the monitoring wells. The method reporting limit for benzo(a)pyrene was greater than the most stringent surface water criteria.

Bunker C was detected in three sediment samples at two locations. There are no sediment cleanup levels/screening criteria for petroleum hydrocarbons. PAHs were detected in sediment samples at levels below the Sediment Management Standards (SMS) screening criteria indicating that these contaminants do not pose a threat to marine organisms.

SUMMARY

The lateral extent of Bunker C in soil at the subject property was delineated during the soil and sediment investigations. Higher concentrations of Bunker C correlated with field observations and field screening results; these data suggest the presence of NAPL in soil beneath the northeastern portion of the subject property. The apparent NAPL was observed at depths just above the sand/gravel and till contact, as conceptualized in the CSM. The distribution of observed NAPL likely indicates that residual soil and groundwater impacts identified during this study are a result of the former free product migration where petroleum (Bunker C) may have migrated as a mobile free product plume on top of groundwater and/or at the top of the till unit and from the upland source area(s) toward Clallam Bay. No evidence of continued mobility of free product was detected.

Bunker C and detected PAH concentrations did not exceed the preliminary cleanup levels at wells located downgradient of MW-1, including the shallow and deep well pairs located along the shoreline. The absence of Bunker C in downgradient wells supports the hypothesis that mobile free product currently is not present at the subject property. The detected Bunker C and PAHs in sediment likely indicate former Bunker C migration into the marine environment (as indicated in the CSM) or possibly contributions from incidental releases of Bunker C in the working harbor over time, but show that the Bunker C and PAHs have attenuated with time.

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1.0 INTRODUCTION

This report presents the results of a Focused Remedial Investigation (RI) at the Rayonier Properties, LLC (Rayonier) Former Sekiu Log Sorting Yard in Sekiu, Washington (the subject property). Petroleum-contaminated soil and groundwater were discovered at the subject property in 2007, at which time it was reported to the Washington State Department of Ecology (Ecology). The petroleum impacts appear to be related to historical releases of Bunker C fuel. Rayonier performed a limited source removal action in October 2007, followed by limited site assessment activities in March 2008.

Rayonier's previous source removal and assessment activities provided important information about subsurface conditions beneath the site, but did not investigate or mitigate the full extent of petroleum-related impacts. GeoEngineers was retained by Rayonier to complete the Focused RI. The purpose of this Focused RI was to evaluate the entire property for impacts associated with the historical release(s) of Bunker C.

2.0 SITE DESCRIPTION AND BACKGROUND

2.1 LOCATION AND DESCRIPTION

The former Sekiu log sorting yard (subject property) is located in Clallam County, Washington, as shown on the Vicinity Map, Figure 1. The property is listed as Clallam County tax parcel 123219-210150-0000. The subject property is approximately one acre in size and is predominantly vacant gravel or grass lots, with the exception of mobile homes located along the western property boundary. An asphalt access road from Front Street connects to several gravel access roads that run the length of the subject property. The gravel and grass lots (vacant portion of the property) are used as a parking area for self-contained recreational vehicles (RV) for several months of the year. We understand that the current property owner's future plans for the subject property is for continued use as RV camping.

The subject property is bounded to the north by a RV hook-up facility (RV campground), to the east by Clallam Bay, to the south by the City of Sekiu Publicly Owned Treatment Works (POTW) facility and to the west by Front Street. The ground surface at the subject property is relatively flat, and a steep hill and ridgeline are present west of Front Street. According to the current property owner, the U.S. Army Corps of Engineers constructed a rock retaining wall along the entire eastern property boundary approximately five years ago to protect the property from ongoing tidal erosion. The rock retaining wall is approximately 10 feet in height. Two active sewer lines run parallel with each other and the shoreline approximately 5 to 10 feet west of the rock retaining wall and trend north to south along the eastern portion of the subject property. The sewer lines are eight and 12 inches in diameter and connect with the POTW south of the subject property. Site features, including the approximate location of the sewer lines, are shown in Figure 2.

2.2 BACKGROUND AND HISTORY

Based on information provided by Rayonier, the subject property was formerly owned by Rayonier Western Forest Resources and was used from the early 1900s through the early 1970s as a log sorting and transfer yard. During this time, locomotives were maintained and fueled at the subject property.

Facilities at the site included Bunker C fuel storage tanks and associated piping, as well as a boiler facility.

2.2.1 Potential Historical Source Areas

Although the petroleum impacts appear to be related to historical releases of Bunker C fuel, the exact source of the contamination at the subject property has not been confirmed. The fueling and maintenance of locomotives, the transfer of fuel, the storage of Bunker C fuel in underground and/or aboveground storage tanks and activities associated with the on-site boiler facility may have contributed to the past release or releases of petroleum. Based on historical site photographs, the majority of these operations occurred in the northern portion of the property.

2.3 SUMMARY OF PREVIOUS SITE CHARACTERIZATION STUDIES

2.3.1 Limited Source Removal (October 2007)

Rayonier completed limited soil cleanup activities in October 2007 in the northeastern portion of the property. These activities included the excavation and off-site disposal of approximately 1,250 tons of petroleum-impacted soil. The excavation extended to a depth of approximately 19 feet below the ground surface (bgs). During excavation activities, approximately 7 to 10 feet of clean overburden was observed above approximately 9 to 12 feet of petroleum-contaminated soil. Based on field screening, Rayonier reported that soil at approximately 19 feet bgs yielded no physical evidence of petroleum contamination. Because of the unknown lateral extent of petroleum contamination at the time of the limited source removal activities, excavation activities were terminated and the excavation was backfilled.

2.3.2 Limited Site Investigation (March 2008)

Rayonier returned to the subject property in March 2008 to conduct focused site assessment activities. During these site assessment activities, Rayonier completed fifteen direct-push borings and obtained soil and groundwater samples. The approximate locations of the borings are shown in Figure 2. A total of ten soil samples and two groundwater samples were submitted for chemical analysis of diesel- and oil-range petroleum hydrocarbons quantified both as diesel-range petroleum hydrocarbons and as Bunker C using Ecology Method NWTPH-Dx, polycyclic aromatic hydrocarbons (PAHs) using U.S. Environmental Protection Agency (EPA) Method 8270D and benzene, ethylbenzene, toluene and xylenes (BETX) using EPA Method 8021B.

Analytical data from this previous study identified petroleum-related contamination in soil beneath the subject property as follows:

- Bunker C-range petroleum hydrocarbons (Bunker C) were detected at concentrations greater than the MTCA Method A cleanup level in a soil sample obtained from boring PP-11 at approximately 12 to 13 feet bgs and at boring PP-13 at approximately 15 to 16 feet bgs.
- PAHs (including carcinogenic PAHs) were reported at concentrations greater than the MTCA Method A cleanup level in a soil sample obtained from boring PP-11 at approximately 12 to 13 feet bgs.
- BETX either was not detected or was detected at concentrations less than the MTCA Method A soil cleanup levels.

Diesel-range and Bunker C-range petroleum hydrocarbons appear to have been quantified and reported separately by the analytical laboratory. A review of the analytical chromatograms from the March 2008 soil sampling indicates that diesel- and oil-range petroleum hydrocarbons were detected at carbon ranges

indicative of Bunker C (C10 to C38). There does not appear to be an indication of a separate diesel-range fuel outside of the Bunker C. For the purposes of this report, detected diesel- and oil-range hydrocarbons are interpreted to be Bunker C.

Petroleum-related contamination was also identified in groundwater at one location during the March 2008 investigation, as follows:

- Grab-groundwater samples were obtained from borings PP-5 and P-11. Bunker C-range petroleum hydrocarbons were detected at PP-11 at a concentration above the MTCA Method A cleanup level. Petroleum hydrocarbons were not detected in the groundwater sample obtained at boring PP-5.
- Benzene, toluene, and ethylbenzene were not detected in the two groundwater samples tested.

Soil and groundwater chemical analytical data from the March 2008 site assessment activities are summarized in Table 1.

2.4 SITE GEOLOGY AND HYDROGEOLOGY

Information pertaining to subsurface conditions was obtained during the limited site assessments completed by Rayonier and the Focused RI explorations discussed in Section 3.0 below. In general, subsurface conditions encountered at the site consisted of an unconsolidated gravel and silt at various depths from the ground surface to depths ranging from approximately 11 to 18 feet bgs. Wooden and concrete structures and debris were observed in several test pits completed as part of Focused RI (discussed in more detail below). The silt and gravel was interpreted to be relatively recent fill material mixed and interbedded with native gravel and sand beach deposits. Beneath the silt and gravel was a dense, consolidated silt, sand, gravel unit of varying grain-size that was interpreted to be glacial till. The glacial till unit was encountered in explorations from depths of approximately 11 to 18 feet bgs.

Based on the geologic map for the area (Snively et al., 1993) a sandstone unit (Makah Formation) and a Pleistocene glacial drift unit are mapped in the vicinity of the subject property. The very dense silty sand with gravel unit encountered at the bottom of our explorations is interpreted to be the glacial till mapped by Snively et al. (1993).

Groundwater was encountered at depths ranging from approximately 4 to 16 feet bgs during the Focused RI. Based on local topography, the location of Clallam Bay adjacent and east of the subject property, and information obtained during the Focused RI, groundwater flow is toward the east.

2.5 SITE CONTAMINANTS OF POTENTIAL CONCERN

Contaminants of potential concern (COPCs) in soil and groundwater beneath the subject property include those constituents commonly associated with Bunker C that were previously detected at concentrations exceeding MTCA Method A cleanup levels. COPCs for the subject property include total petroleum hydrocarbons (TPH) quantified as Bunker C, and non-carcinogenic and carcinogenic PAHs.

2.6 CONCEPTUAL SITE MODEL

The conceptual site model (CSM) for the subject property was developed to show the distribution of hazardous substances at the subject property and the subsequent potential migration of those hazardous substances in environmental media. Bunker C was likely released at the subject property from historical below ground tanks and/or piping. Potential historic migration pathways were considered in development of the RI exploration program. Contaminant distribution at greater depths in the subsurface, rather than at

the ground surface, supports the model that release mechanisms were likely below-ground or at a previous working surface that was at a lower elevation and subsequently covered with clean fill material. Over time, Bunker C migrated via preferential pathways and to groundwater where it was distributed laterally at the groundwater surface as light non-aqueous phase liquids (LNAPL), at the gravel/till contact as dense non-aqueous phase liquids (DNAPL), or both, and eventually migrated towards the shoreline with the direction of groundwater flow. The CSM is presented as Figure 3. No evidence of continued mobility of free product was detected.

2.7 PRELIMINARY CLEANUP LEVELS

In accordance with MTCA, development of preliminary cleanup levels includes identifying potential exposure pathways for human and environmental impacts based on the planned land use. The subject property is currently zoned commercial, and future zoning is not anticipated to change. As noted previously (Section 2.1), the subject property is currently used for RV camping during several months of the year, and the current property owner plans to continue using the subject property for RV camping.

2.7.1 Preliminary Soil Cleanup Levels

The subject property is currently accessible to the general public. Based on current and likely future zoning and property use, preliminary soil cleanup levels were based on unrestricted land use. Therefore, preliminary cleanup levels were developed using MTCA Method A for Bunker C-range petroleum hydrocarbons, and Method B cleanup levels for non-carcinogenic PAHs and carcinogenic PAHs. During the evaluation of remedial alternatives, cleanup levels and/or risk-based remediation levels for specific land uses and associated institutional controls may be considered as a component of cleanup alternative development and evaluation.

Based on the proximity of the subject property to surface water, and because groundwater may be assumed unsuitable for use as drinking water, MTCA Method B soil cleanup levels developed for protection of surface water using MTCA's fixed-parameter three-phase partitioning model calculations (MTCASGL workbook) (WAC 173-340-747(4)(b)) were considered. However, because only low levels of non-carcinogenic PAHs have been detected in groundwater at the subject property, the three-phase partitioning calculations were not completed at this time. Carcinogenic PAHs were evaluated using the total toxic equivalency concentration (TEC) method as outlined in WAC 173-340-708(8)(e).

Preliminary soil cleanup levels are presented with the analytical data obtained during the Focused RI in Tables 3 and 4.

Evaluation of the terrestrial ecological evaluation (TEE) criteria was conducted pursuant to WAC 173-340-7490. We assessed whether or not the site would qualify for an exclusion of the TEE. Based on the criteria, the subject property does not qualify for an exclusion, but can be addressed through the simplified TEE approach. Soil screening levels based on the protection of ecological receptors were obtained from MTCA 173-340-900 (Table 749-2) in accordance with the process for simplified TEEs. Because Bunker C is not a listed constituent in Table 749-1, diesel-range petroleum hydrocarbons and benzo(a)pyrene were used as surrogates for Bunker C for the TEE screening levels.

Comparison of soil analytical results to site-specific residual saturation calculations will be discussed and considered in a future feasibility study for the subject property.

2.7.2 Preliminary Groundwater Cleanup Levels

Groundwater at, or potentially affected by, the subject property is not used for drinking water at this time and is not a reasonable future source of drinking water due to the availability of a municipal water supply and, in accordance with WAC 173-340-720(2)(d), due to its proximity to marine surface water. The potential exposure pathways for Site groundwater include:

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

Preliminary groundwater cleanup levels were selected from available state and federal surface water criteria according to WAC 173-340-730(3). The most conservative (lowest) applicable published values were selected from the following regulatory criteria.

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

Preliminary groundwater cleanup levels are presented with the analytical data obtained during the Focused RI in Tables 5 and 6.

Surface water criteria are not available for gasoline-, diesel, and oil-range (Bunker C) petroleum hydrocarbons. Therefore, as recommended in WAC 173-340-730(3)(b)(iii)(C), the MTCA Method A groundwater cleanup levels for gasoline-, diesel- and oil-range (Bunker C) petroleum hydrocarbons were used for comparison.

2.7.3 Preliminary Sediment Cleanup Levels

The Sediment Quality Standard (SQS) and Cleanup Screening Level (CSL) criteria established under the Sediment Management Standards (SMS) (WAC 173-204) were used as the preliminary sediment cleanup levels for the subject property. No cleanup levels have been established for petroleum hydrocarbons.

3.0 FOCUSED REMEDIAL INVESTIGATION

3.1 FOCUSED REMEDIAL INVESTIGATION

Focused RI activities were completed by GeoEngineers in October 2008 and February 2009. The RI activities included characterization of soil, groundwater and sediment to evaluate the vertical and lateral extent of petroleum- and PAH-contaminated soil and groundwater, and to evaluate potential transport from the subject property into the adjacent marine environment. Soil was sampled from the test pit and direct-push boring explorations. Selected borings were completed as monitoring wells, and groundwater was sampled from these monitoring wells. Sediment was sampled in Clallam Bay using a vibracore sampling device deployed from a 36-foot boat.

3.2 SUBSURFACE INVESTIGATION

The subsurface investigation was completed on October 20 through 25, 2008, and included:

- Completion of twenty test pits to a depth of approximately 5 to 16 feet bgs;
- Completion of eleven direct-push borings to a depth ranging between 12 and 20 feet bgs; and
- Installation of monitoring wells in ten of the eleven direct-push borings.

The approximate locations of the test pits, borings completed as monitoring wells and the boring that was not completed as a monitoring well (GEI-9) are shown in Figure 4. A sediment investigation was completed on February 19 and 20, 2009, and included:

- Completion of three sediment core samples and collection of four sediment samples.

Sediment samples were collected using a vibracore sampling device deployed from a 36-foot boat. The approximate locations of the sediment samples are shown in Figure 5.

3.2.1 Soil Investigation

3.2.1.1 Test Pits

The test pits (TP-1 through TP-20) were completed on October 21 and 22, 2008, using a backhoe operated by Bruch and Bruch Contractors. Initial test pit locations were completed in areas likely to be impacted as based on previous site explorations. Subsequent locations were stepped outward until the lateral extent of contamination was identified based on field screening results. Once the lateral extent of contamination was assessed, additional test pits were completed to fill data gaps. Access to the property to the north was not granted by the property owner.

Test pits were completed to maximum depths of approximately 16 feet bgs. Discrete soil samples were obtained from each test pit at depths between three and 16 feet bgs for field screening and possible chemical analysis, with two exceptions: soil samples were not obtained from TP-4 and TP-15 because of excessive caving of the sidewalls. Field screening was conducted on the discrete samples using visual, water sheen and headspace vapor screening methods. Field screening procedures and the field exploration program (including test pit logs) are discussed in Appendix A.

Based on field screening results, evidence of petroleum-contamination was observed in the following test pits: TP-1, TP-5, TP-6, TP-10, TP-11, TP-12, TP-16, TP-17 and TP-20. Petroleum-contamination was generally observed at depths ranging from 11 feet bgs to the base of the test pits (between 13 and 16 feet bgs), except at TP-11 and TP-12 where contamination was observed from approximately 1 foot bgs to 5 feet bgs (TP-11) and from approximately 8 feet bgs to the base of the test pit at 9.5 feet bgs (TP-12). In general, non-aqueous phase liquid (NAPL) was present in a 2- to 3-foot zone above the sand/gravel and till contact. Based on field observations of open test pits, free product was not observed seeping from test pit sidewalls or accumulating on groundwater, indicating that mobile free product is most likely not present at the subject property. Based on current distribution, it appears the NAPL was mobile historically, but was no longer mobile once equilibrium/residual saturation conditions were reached. Depths and occurrences of NAPL within the petroleum impacted area are indicated on Figure 6.

Soil samples were selected for chemical analysis from test pits based on the following guidelines:

- From soil with field screening evidence of petroleum contamination and/or NAPL.
- From the clean overburden soil to evaluate the vertical extent of petroleum contamination.

- From clean soil located beneath soil with field screening evidence of petroleum contamination to evaluate the vertical extent of petroleum contamination.
- From test pits with no field screening evidence of petroleum contamination, one soil sample was obtained from approximately the same depth, where possible, where potentially contaminated soil was observed in adjacent test pits to evaluate the lateral extent of petroleum contamination.

Soil samples were placed in two separate 4-ounce laboratory-prepared glass jars. One jar was submitted to Libby Environmental's (Libby) on-site mobile laboratory for immediate testing of Bunker C using Ecology Method NWTPH-Dx. The other 4-ounce jar was submitted to Libby's fixed laboratory located in Olympia, Washington, for chemical analysis of Total Petroleum Hydrocarbons by Ecology Method Northwest Total Petroleum Hydrocarbon Identification (NWTPH-HCID); diesel- and oil-range petroleum hydrocarbons (quantified as Bunker C) using Ecology Method NWTPH-Dx and PAHs using Ecology Method 8270C on a standard turn-around time. Analytical results are summarized in Section 3.3, "Chemical Analytical Results."

3.2.1.2 Direct-Push Borings

The direct-push borings (MW-1 through MW-5, MW-6S, MW-6D, MW-7S, MW-7D, MW-8 and GEI-9) were completed on October 23 and 24, 2008, using a direct-push drill rig operated by ESN Drilling of Olympia, Washington. The borings were completed to define the vertical extent of contaminated soil beneath the smear zone and to install groundwater monitoring wells. Boring locations were determined based on the results of test pit explorations. Ten of the eleven direct-push borings were completed as monitoring wells. Monitoring well construction details are summarized in Table 2.

The direct-push borings were completed to depths of up to 20 feet bgs. Discrete soil samples were obtained from each boring at depths between 2.5 and 20 feet bgs for field screening and possible chemical analysis. Field screening was conducted on the discrete samples using visual, water sheen and headspace vapor screening methods; Results are summarized in Table 3. Field screening procedures and the field exploration program (including boring logs) are discussed in Appendix A.

The field screening results indicated moderate to heavy sheens and visible evidence of petroleum contamination in boring MW-1 at a depth of approximately 12 feet bgs. Observations in MW-7S and MW-7D suggested the potential presence of residual NAPL in soil from depths of approximately 14 feet to 16 feet bgs. The NAPL appeared black and sticky and was present as interstitial coatings on sand and gravel.

A glacial till unit was observed at the base of each boring at a depth ranging between approximately 11 and 18 feet bgs. The glacial till yielded no field screening evidence of petroleum contamination. Soil samples with one or more of the following characteristics were chosen for chemical analysis:

- From each boring with field screening evidence of petroleum contamination to evaluate the lateral extent of petroleum contamination on the subject property.
- From clean soil located beneath soil with field screening evidence of petroleum contamination to evaluate the vertical extent of petroleum contamination.

Samples were placed in two separate 4-ounce laboratory-prepared glass jars. One jar of selected soil samples was submitted to Libby's on-site mobile laboratory for immediate testing of Bunker C oil using Ecology Method NWTPH-Dx. The other 4-ounce jar was submitted to Libby's fixed laboratory located in Olympia, Washington, for chemical analysis of diesel- and oil-range petroleum hydrocarbons quantified as Bunker C using Ecology Method NWTPH-Dx and/or PAHs using Ecology Method 8270

SIM on a standard turn-around time. Analytical results are summarized in Section 3.3, “Chemical Analytical Results.”

3.2.2 Groundwater Investigation

The objective of the monitoring wells was to evaluate groundwater conditions within the apparent Bunker C source area, and at locations upgradient, downgradient and crossgradient of the source area. Monitoring wells were constructed in ten of the eleven direct-push soil borings using 10-foot pre-packed well screens. Monitoring wells were developed immediately after completion and sampled at least 24 hours after development. Top of casing elevations were measured using a closed loop laser level survey. Monitoring well construction logs, development and sampling procedures are described in Attachment A, and monitoring well construction details are summarized in Table 2.

The monitoring wells were installed with shallow well screen depths, and at two locations along the shoreline (downgradient), two well pairs were installed with shallow and deep well screen depths, in order to evaluate the concentration of dissolved-phase constituents in groundwater laterally and vertically within the shallow aquifer, and for assessment of vertical head gradients. Eight of the monitoring wells (MW-1, MW-2, MW-3, MW-4, MW-5, MW-6S, MW-7S and MW-8) have shallow screens, which span the estimated seasonal high and low groundwater tables. The depths of the shallow well screens range from approximately 5 to 15 feet bgs. The purpose of the shallow wells is to monitor the potential presence of LNAPL and to evaluate dissolved phase petroleum concentrations within the former smear zone. The intended purpose of the well pairs is to evaluate potential dissolved-phase differences vertically within the saturated zone. Two of the monitoring wells (MW-6D and MW-7D) have deep screens that were positioned below the groundwater table at depths immediately above the glacial till unit. The base of the deep well screens ranged from 16 to 18 feet bgs and the well screens were two feet in length. The purpose of the deep wells is to monitor the potential presence of DNAPL. Furthermore, the deep borings allowed for evaluation of the soil conditions overlying the till unit. The two deep monitoring wells (MW-6D and MW-7D) are co-located with two shallow wells (MW-6S and MW-7S) along the eastern property boundary near the property boundary with Clallam Bay.

Two rounds of groundwater sampling have been completed at the subject property, one on October 24 and 25, 2008, and the other on February 18 and 19, 2009. During both sampling events, a petroleum odor was observed while sampling MW-6S and MW-6D. Petroleum odors were not noted during sampling of the other wells. The depth to groundwater in the monitoring wells ranged from approximately 3.5 to 16.3 feet bgs. Groundwater elevations were measured from the tops-of-casings and are summarized in Table 2. The predominant groundwater flow direction was to the east towards Clallam Bay. A slight vertical head gradient was observed in the MW-6S/D and MW-7S/D well pairs during the October 2008 monitoring event (slack tide moving to high tide) and at MW-6S/D during the February 2009 monitoring event (low tide).

Groundwater samples were obtained using low-flow purging and sampling methodologies. Each groundwater sample was placed directly into a laboratory-prepared, labeled sample container and was placed into a cooler with ice. The groundwater samples obtained on October 24 and 25, 2008, were submitted to Libby’s laboratory in Olympia, Washington, for chemical analysis of diesel- and oil-range petroleum hydrocarbons quantified as Bunker C, and PAHs. The groundwater samples obtained on February 18 and 19, 2009, were submitted to the Analytical Resources Incorporated (ARI) laboratory in Tukwila, Washington, for analytical testing of diesel- and oil-range petroleum hydrocarbons quantified as Bunker C, and PAHs. Analytical results are summarized in Section 3.3, “Chemical Analytical Results.”

3.2.3 Sediment Characterization

The objective of the sediment investigation was to delineate the eastern extent of Bunker C and PAHs and to evaluate the potential migration of Bunker C into the marine environment. During the October 2008 upland subsurface investigation, Bunker C was observed in an approximately two to three foot zone of saturated soil at depths immediately overlying glacial till. Based on field screening and chemical analytical data at upland locations, the glacial till unit was not impacted. To evaluate the potential migration of Bunker C into the marine environment at the sediment/till contact, sediment cores were placed at locations where the till unit was anticipated to intersect bay sediment. As depicted in the CSM (Figure 3), investigation results showed that the glacial till outcropped close to the shoreline in an active tidal and wave action erosion zone. Bay sediment was encountered further off-shore where tidal and wave action allowed for sediment deposition on top of the glacial till.

Sediment cores were attempted at six general locations along a northern and southern transect at approximately 30, 60 and 120 feet from shore. The southern transect was located off-shore of monitoring well MW-7S/MW-7D well pair. Sediment coring locations were measured in the field using a hand-held Trimble global positioning system (GPS) unit with sub-meter accuracy. Sediment cores were obtained using a vibracore sediment sampling device.

Sediment samples were obtained at three general locations (R1, R2, and R3) and refusal was met at numerous locations (e.g. R1-B, R1-C, etc.). Refusal at borings attempted closest to the shoreline was caused by very hard substrates (glacial till). Refusal at other locations further off-shore was caused by hard substrates (glacial till or large gravels and cobbles), the presence of submerged wooden pilings and very dense sands. Sediment cores generally consisted of a very dense sand to silty sand, with the exception of a small section of glacial till retrieved at location R2-C. Field screening evidence of petroleum contamination was not observed in the sediment samples. Sediment coring locations are shown in Figure 5.

Sediment cores were held on the boat deck for later processing on shore (after completion of remaining coring locations). Where sufficient sample volume was obtained, sediment cores were characterized and field-screened in 1-foot sections below mudline. Sediment samples were submitted for chemical analytical testing from sediment samples immediately overlying the till contact to evaluate potential contaminant migration at the sediment/till contact (sufficient sample volume was obtained at one location only, R1-A). Samples from surface sediments (at depths of 0 to 10 centimeters below mudline) were submitted for chemical testing to evaluate potential impacts to surface sediment and invertebrate fauna.

A stainless steel trowel was used to obtain samples from the sediment cores. Samples were homogenized in a stainless steel bowl prior to placing into laboratory-supplied sample containers. Samples were placed into a cooler with ice and submitted under chain-of-custody procedures to Analytical Resources Inc. in Tukwila, Washington, for chemical analytical testing of diesel- and oil-range petroleum hydrocarbons (quantified as Bunker C), PAHs and total organic carbon (TOC). Additional sample volumes were placed on hold pending further analysis for the entire suite of SMS chemicals. Analytical results are summarized in Section 3.3, "Chemical Analytical Results."

3.3 CHEMICAL ANALYTICAL RESULTS

3.3.1 Soil

A total of forty-six soil samples were obtained from the test pits and soil borings for chemical analysis of one or more of the following:

- Gasoline, diesel-, oil- and mineral oil-range petroleum hydrocarbons using Ecology Method NWTPH-HCID;
- Bunker C-, diesel-, oil-range petroleum hydrocarbons using Ecology Method NWTPH-Dx with silica gel cleanup (quantified as Bunker C and also as heavy oil for 10 samples); and
- PAHs using EPA Method 8270C.

The results of the HCID testing indicated the presence of Bunker C-range petroleum hydrocarbons. Heavy oil range petroleum hydrocarbons were detected in one sample, TP-1-6.0. For the remaining soil samples, Bunker C either was not detected or was detected at concentrations less than the preliminary cleanup levels (the MTCA Method A cleanup level of 2,000 milligrams per kilogram [mg/kg]) with the following exceptions:

Test Pit / Boring ID	Sample Name		Depth
TP-1	TP-1-6.0	TP-1-12.0	6 to 7 and 11 to 12 feet bgs
TP-5	TP-5-8.0	TP-5-10.0	8 to 10.5 feet bgs
TP-6	TP-6-11.0	TP-6-13.0	11 to 13 feet bgs
TP-10	TP-10-12.5	TP-10-13.5	12.5 to 14.5 feet bgs
TP-11	TP-11-3.0		3 to 3.5 feet bgs
TP-12	TP-12-9.5		9 to 9.5 feet bgs
TP-16	TP-16-9.0	TP-16-15.0	9 to 15 feet bgs
TP-17	TP-17-9.5	TP-17-12.5	9.5 to 12.5 feet bgs
TP-20	TP-20-7.0		7 to 7.5 feet bgs
MW-1	GEI-1-12.0		12 feet bgs
MW-7D	GEI-7D-15.0		15 feet bgs

PAHs either were not detected or were detected at concentrations less than the preliminary cleanup level with the following exceptions.

- Sample TP-6-13.0 obtained from TP-6 at approximately 13 feet bgs.
- Samples TP-10-5.5 and TP-10-12.5 obtained from TP-10 at approximately 5.5 and 12.5 feet bgs.
- Sample GEI-7D-15.0 obtained from MW-7D at approximately 15 feet bgs.

The detected PAHs exceeded the preliminary TEC cleanup levels at these three locations: TP-6, TP-10, GEI-7D.

Soil chemical analytical data are presented in the laboratory reports in Appendix B and summarized in Tables 3 and 4. Figure 6 summarizes the samples with contaminant concentrations greater than the MTCA Method A cleanup levels.

3.3.2 Groundwater

Groundwater was sampled in nine of the ten monitoring wells on October 24 and 25, 2008, and February 18 and 19, 2009. At MW-6S, there was not a sufficient volume of water for sampling. The groundwater samples obtained in October 2008 were submitted to Libby and the groundwater samples obtained in February 2009 were submitted to ARI for chemical analysis of diesel- and oil-range petroleum hydrocarbons (quantified as Bunker C) using Ecology Method NWTPH-Dx and PAHs using EPA Method 8270D.

Bunker C-range petroleum hydrocarbons were not detected in the groundwater samples submitted for chemical analysis with the following exception:

- Bunker C range hydrocarbons were detected at MW-1 at concentrations greater than the MTCA Method A cleanup level. Bunker C was detected in October 2008 at a concentration of 4,400 micrograms per liter (µg/L) and in February 2009 at a concentration of 1,000 µg/L.
- Non-carcinogenic PAHs either were not detected or were detected at concentrations less than the preliminary cleanup levels in water samples submitted for chemical analysis. The detected non-carcinogenic PAHs were also below the most stringent surface water criteria.
- Carcinogenic PAHs were not detected above the method reporting limits. However, the method reporting limits are greater than the most stringent surface water standards for benzo(a)pyrene and the TEC, which is driven by the toxicity equivalency factor (TEF) for benzo(a)pyrene.

Groundwater chemical analytical data are presented in the laboratory reports in Appendix B and summarized in Tables 5 and 6. Figure 7 shows the location of the sample (MW-1) with contaminant concentrations greater than the MTCA Method A cleanup level.

3.3.3 Sediment

A total of four sediment samples (R1-S, R1-D, R2-S and R3-S) were obtained at three locations (R1-A, R2-C, and R3-A) on February 19 and 20, 2009. Sediment samples were submitted to ARI for chemical analysis of diesel- and heavy oil-range petroleum hydrocarbons quantified as Bunker C using Ecology Method NWTPH-Dx and PAHs using EPA Method 8270D.

Bunker C-range petroleum hydrocarbons were not detected in the sediment sample (R2-S), and Bunker C range hydrocarbons were detected in samples R1-S, R1-D and R3-S. There are no sediment cleanup standards for petroleum hydrocarbons in sediment.

PAH results were below the SMS and the AET screening criteria for the four sediment samples.

PAH results were normalized to the total organic carbon (TOC), in accordance with the Puget Sound Estuary Program (PSEP; 1986) and SMS guidance. PAH data were evaluated by 1) comparing the organic carbon-normalized result against the Washington State SMS SQS and CSL criteria, and 2) comparing the dry weight (non-normalized) result against the Puget Sound Estuary Program (PSEP) Apparent Effects Threshold (AET) criteria (PSEP, 1986), because an elevated TOC value was detected in one sample. The organic carbon was normalized in accordance with Ecology guidelines (Ecology 1992).

Sediment chemical analytical data are presented in the laboratory reports in Appendix B and summarized in Tables 7 and 8. Sediment sample depths and Bunker C results are summarized on Figure 6.

3.4 SUMMARY OF SITE ASSESSMENT FINDINGS

Based on the chemical analytical results of the October 2008 and February 2009 site assessment activities, the following findings are noted.

3.4.1 Soil

Bunker C was detected at concentrations greater than the preliminary cleanup level in soil samples obtained from nine of the test pits and two of the borings completed at the subject property. The test pits and borings where Bunker C oil is present in soil are located in the northeastern portion of the subject property. Additional investigations were not completed to the north because the property owner denied access. Field observations and field screening in this portion of the subject property indicate the presence of NAPL in an approximately two to three foot zone above the sand/gravel and till contact. Mobile free product was not detected. An analysis of Bunker C residual saturation will be presented in a future feasibility study for the subject property.

PAHs were detected at concentrations greater than the preliminary cleanup levels in soil samples obtained from two test pits and one boring completed at the subject property. The test pits and the boring are located in the northeastern portion of the subject property, and the PAH exceedances appear to be associated with Bunker C exceedances.

A comparison of the soil analytical data to MTCA screening values for a simplified TEE, using diesel-range petroleum hydrocarbons and benzo(a)pyrene as surrogates for Bunker C, since Bunker C is not a TEE-listed constituent, indicates that diesel-range concentrations detected on the subject property are greater than the associated TEE criterion. It is anticipated that future remedial activities will mitigate the petroleum hydrocarbon concentrations that exceed the TEE criteria.

3.4.2 Groundwater

Bunker C was detected at concentrations greater than the preliminary cleanup level in monitoring well MW-1 during the October 2008 and February 2009 sampling events. MW-1 is located in the northeastern portion of the subject property where elevated Bunker C concentrations are present in soil.

Carcinogenic PAHs were not detected above the method reporting limits. While adequate for the purpose of this site investigation, the method reporting limits were greater than the most stringent applicable surface water cleanup levels for benzo(a)pyrene and the cPAH TEC. Non-carcinogenic PAHs either were not detected or were detected at concentrations less than the cleanup levels in each of the monitoring wells sampled.

Bunker C and detected non-carcinogenic PAH concentrations did not exceed the preliminary cleanup levels at wells located downgradient of MW-1, including the shallow and deep well pairs located along the shoreline. The absence of Bunker C in downgradient wells supports the hypothesis that mobile free product currently is not present at the subject property.

3.4.3 Sediment

Bunker C was detected in three sediment samples at two locations. There are no sediment cleanup levels/screening criteria for petroleum hydrocarbons.

PAHs were detected in sediment samples at levels below the SMS and AET screening criteria indicating that these contaminants do not pose a threat to marine organisms.

The detected Bunker C and PAHs concentrations likely indicate former Bunker C migration into the marine environment (as indicated in the CSM) or possibly contributions from incidental releases of Bunker C in the working harbor over time, but show that the Bunker C and PAHs have attenuated with time. The data and field observations do not indicate the presence of mobile free product.

3.4.4 Summary

The lateral extent of Bunker C in the subsurface at the subject property was delineated during the soil, groundwater, and sediment investigations. Delineation to the north onto the adjacent property was not completed because property access was denied. Higher concentrations of Bunker C correlated with field observations and field screening results; these data suggest the presence of NAPL in soil beneath the northeastern portion of the subject property. The apparent NAPL was observed at depths just above the sand/gravel and till contact, as conceptualized in the CSM (Figure 3). The distribution of observed NAPL likely indicates that residual soil and groundwater impacts identified during this study are a result of the former free product migration where petroleum (Bunker C) may have migrated as a mobile free product plume on top of groundwater and/or at the top of the till unit and from the upland source area(s) toward Clallam Bay, and/or potentially from incidental releases into the bay. Monitoring well observations suggest that mobile free product is not currently present at the site.

4.0 LIMITATIONS

We have prepared this report for the exclusive use of Rayonier, LLC and their authorized agents. No other party may rely on the product of our services unless we agree in advance and in writing to such reliance. This is to provide our firm with reasonable protection against open-ended liability claims by third parties with whom there would otherwise be no contractual limits to their actions.

Within the limitations of scope, schedule, and budget, our services have been executed in accordance with our Master Services Agreement with Rayonier dated June 21, 2007, and with generally accepted environmental science and engineering practices in this area at the time this document was prepared. No warranty or other conditions, express or implied, should be understood.

Please refer to Appendix C titled “Report Limitations and Guidelines for Use” for additional information pertaining to use of this report.

5.0 REFERENCES

- Geologic Map: Snively, P.D., Jr., MacLeod, N.S. and Niem, A.R., 1993, Geologic map of the Cape Flattery, Clallam Bay, Ozette Lake, and lake Pleasant Quadrangles, Northwestern Olympic Peninsula, Washington, U.S. Geological Survey, Miscellaneous Investigations Series I-1946, with major contributions by D.L. Minasian, J.E. Pearl, and W.W. Rau; scale 1:48,000.
- Puget Sound Estuary Program Sediment Quality Values Refinement: volume 1. 1988 Update and Evaluation of Puget Sound AET, Final Report, September 1988. Prepared for U.S. Environmental Protection Agency.
- Washington State Department of Ecology (Ecology), 1992. Technical Information Memorandum. Organic Carbon Normalization of Sediment Data, December 1992.

TABLE 1A
SUMMARY OF SOIL ANALYTICAL RESULTS FROM MARCH 2008 SITE INVESTIGATION¹
RAYONIER SEKIU PROJECT
SEKIU, WASHINGTON

Parameter (method)	MTCA Method A Soil Cleanup Levels (mg/kg)	Sample Designation / Depth Interval (feet bgs) / Date									
		PP-1 15.5-16.0	PP-3 13.0-14.0	PP-4 15.5-16.0	PP-5 15.5-16.0	PP-7 12.0-12.5	PP-7 15.5-16.0	PP-11 12.0-13.0	PP-12 12.0-16.0	PP-13 15.0-16.0	PP-15 12.0-13.0
		3/25/08	3/25/08	3/25/08	3/25/08	3/25/08	3/25/08	3/26/08	3/26/08	3/26/08	3/26/08
Soil Analytical Results (mg/kg)											
TPH ²											
Bunker C	2,000	230	250	31 U	960	840	32 U	13,000	29 U	23,000	100
Non-carcinogenic PAHs ³											
Naphthalene	5	0.180	0.064 U	0.066 U	0.063 U	0.065 U	0.22	3.8	0.064 U	0.19 U	0.066 U
1-Methylnaphthalene		0.140	0.064 U	0.066 U	0.063 U	0.065 U	0.93	16.0	0.064 U	0.35	0.066 U
2-Methylnaphthalene		0.300	0.064 U	0.066 U	0.063 U	0.065	0.057	11.0	0.064 U	0.4	0.066 U
Acenaphthylene	--	0.066 U	0.064 U	0.066 U	0.063 U	0.065 U	0.064 U	0.46 U	0.064 U	0.19 U	0.066 U
Acenaphthene	--	0.066 U	0.064 U	0.066 U	0.072	0.065 U	0.11	4.7	0.064 U	0.21	0.066 U
Fluorene	--	0.066 U	0.064 U	0.066 U	0.081	0.065 U	0.15	5.8	0.064 U	0.76	0.066 U
Phenanthrene	--	0.066 U	0.064 U	0.066 U	0.063 U	0.065 U	0.31	13	0.064 U	1.3	0.066 U
Anthracene	--	0.066 U	0.064 U	0.066 U	0.17	0.065 U	0.064 U	2.9	0.064 U	0.19 U	0.066 U
Fluoranthene	--	0.066 U	0.064 U	0.066 U	0.066	0.065 U	0.086	8.7	0.064 U	0.19 U	0.066 U
Pyrene	--	0.066 U	0.064 U	0.066 U	0.29	0.065 U	0.12	8.4	0.064 U	0.45	0.066 U
Benzo(g,h,i)perylene	--	0.066 U	0.064 U	0.066 U	0.063 U	0.065 U	0.064 U	0.46 U	0.064 U	0.19 U	0.066 U
Carcinogenic PAHs ³											
Benzo(a)anthracene	--	0.066 U	0.064 U	0.066 U	0.09	0.065 U	0.064 U	2.2	0.064 U	0.19 U	0.066 U
Benzo(a)pyrene	0.1	0.066 U	0.064 U	0.066 U	0.063 U	0.065 U	0.064 U	1.2	0.064 U	0.19 U	0.066 U
Benzo(b)fluoranthene	--	0.066 U	0.064 U	0.066 U	0.063 U	0.065 U	0.064 U	1.4	0.064 U	0.19 U	0.066 U
Benzo(k)fluoranthene	--	0.066 U	0.064 U	0.066 U	0.063 U	0.065 U	0.064 U	0.64	0.064 U	0.19 U	0.066 U
Chrysene	--	0.066 U	0.064 U	0.066 U	0.18	0.065 U	0.064 U	4.1	0.064 U	0.62	0.066 U
Dibenz(a,h)anthracene	--	0.066 U	0.064 U	0.066 U	0.063 U	0.065 U	0.064 U	0.46 U	0.064 U	0.19 U	0.066 U
Indeno(1,2,3-cd)pyrene	--	0.066 U	0.064 U	0.066 U	0.063 U	0.065 U	0.064 U	0.46 U	0.064 U	0.19 U	0.066 U
VOCs ⁴											
Benzene	0.03	--	--	--	--	0.019 U	0.023 U	0.047 U	0.023 U	0.034 U	0.033 U
Toluene	7	--	--	--	--	0.019 U	0.023 U	0.047 U	0.023 U	0.034 U	0.033 U
Ethylbenzene	6	--	--	--	--	0.019 U	0.023 U	0.047 U	0.023 U	0.034 U	0.033 U
Xylenes (total)	9	--	--	--	--	0.019 U	0.023 U	0.160	0.023 U	0.034 U	0.033 U

Notes:

¹Sample locations are shown on Figure 2. Samples were obtained by Rayonier and submitted to Analytical Resources Inc. Laboratory in Tukwila, Washington.

²Analyzed by Ecology Method NWTPH-Dx with a silica gel cleanup.

³PAHs analyzed by EPA Method 8270D

⁴VOCs = Volatile Organic Compounds analyzed by Method 8021B.

bgs = below ground surface

U = below detection limits

-- = not analyzed

mg/kg = milligrams per kilogram

Bold text indicates detected result.

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TABLE 1B
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS FROM MARCH 2008 SITE INVESTIGATION¹
RAYONIER SEKIU PROJECT
SEKIU, WASHINGTON

Parameter (method)	MTCA Method A Groundwater Cleanup Levels (µg/l)	Sample Designation / Depth Interval (feet bgs) / Date									
		PP-1 15.5-16.0	PP-3 13.0-14.0	PP-4 15.5-16.0	PP-5 15.5-16.0	PP-7 12.0-12.5	PP-7 15.5-16.0	PP-11 12.0-13.0	PP-12 12.0-16.0	PP-13 15.0-16.0	PP-15 12.0-13.0
		3/25/08	3/25/08	3/25/08	3/25/08	3/25/08	3/25/08	3/26/08	3/26/08	3/26/08	3/26/08
Groundwater Analytical Results (ug/L)											
TPH ²											
Bunker C	500	--	--	--	250 U	--	--	120,000	--	--	--
VOCs ³											
Benzene	5	--	--	--	0.025 U	--	--	0.025 U	--	--	--
Toluene	1,000	--	--	--	0.025 U	--	--	0.025 U	--	--	--
Ethylbenzene	700	--	--	--	0.025 U	--	--	0.025 U	--	--	--
Xylenes (total)	1,000	--	--	--	0.025 U	--	--	0.31	--	--	--

Notes:

¹Sample locations are shown on Figure 2. Samples were obtained by Rayonier and submitted to Analytical Resources Inc. Laboratory in Tukwila, Washington.

²Analyzed by Ecology Method NWTPH-Dx with a silica gel cleanup.

³VOCs = Volatile Organic Compounds analyzed by Method 8021B.

bgs = below ground surface

U = below detection limits

-- = not analyzed

ug/L = micrograms per liter

Bold text indicates detected result.

[https://www.geoextranet.com/0013701800/GEO/Draft/Summary Report/SekiuTables.xls](https://www.geoextranet.com/0013701800/GEO/Draft/Summary%20Report/SekiuTables.xls)

TABLE 2
GROUNDWATER ELEVATIONS AND MONITORING WELL CONSTRUCTION
 RAYONIER SEKIU PROJECT
 SEKIU, WASHINGTON

Well No.	Casing Elevation ¹ (feet)	Casing Depth (feet bgs)	Date	Time ²	Depth to Water (feet bgs)	Feet of Water	Depth to Product	Product Thickness	Water Table Elevation (feet)
MW-1	15.74	14.00	10/25/2008	8:15	9.15	4.85	N/A	N/A	6.59
			2/18/2009	14:30	9.25	4.75	N/A	N/A	6.49
MW-2	15.55	15.30	10/25/2008	8:00	11.09	4.21	N/A	N/A	4.46
			2/18/2009	14:00	11.45	3.85	N/A	N/A	4.10
MW-3	21.89	13.40	10/25/2008	8:10	7.87	5.53	N/A	N/A	14.02
			2/18/2009	14:20	8.35	5.05	N/A	N/A	13.54
MW-4	15.58	15.15	10/25/2008	7:30	9.91	5.24	N/A	N/A	5.67
			2/18/2009	14:40	10.36	4.79	N/A	N/A	5.22
MW-5	15.52	12.50	10/25/2008	8:05	3.5	9.00	N/A	N/A	12.02
			2/18/2009	14:10	5.02	7.48	N/A	N/A	10.50
MW-6S	16.65	16.45	10/25/2008	7:35	16.33	0.12	N/A	N/A	0.32
			2/18/2009	14:45	16.20	0.25	N/A	N/A	0.45
MW-6D	16.19	19.49	10/25/2008	7:40	16.14	3.35	N/A	N/A	0.05
			2/18/2009	14:50	16.03	3.46	N/A	N/A	0.16
MW-7S	15.99	20.00	10/25/2008	7:45	15.44	4.56	N/A	N/A	0.55
			2/18/2009	14:55	15.40	4.60	N/A	N/A	0.59
MW-7D	15.90	18.35	10/25/2008	7:50	15.50	2.85	N/A	N/A	0.40
			2/18/2009	15:00	15.30	3.05	N/A	N/A	0.60
MW-8	15.33	19.14	10/25/2008	7:55	14.15	4.99	N/A	N/A	1.18
			2/18/2009	13:50	15.90	3.24	N/A	N/A	-0.57

Notes:

¹Top of casing measurements were surveyed using a laser level and rod relative to an arbitrary site datum (100 feet); the arbitrary datum was adjusted to the ground surface elevation (15 feet above mean sea level) that was measured from the land survey completed on November 26, 2008.

²Depths to water measured on October 25, 2008 were approximately during slack tide. Tidal information from local tide charts indicated Low Tide at 5:03 (0.89') and High Tide at 11:45 (7.14'). Depths to water measured on February 18, 2009 were approximately during low tide. Tidal information from local tide charts indicated Low Tide at 14:24 (1.8') and High Tide at 21:11 (5.4').

bgs = below ground surface

<https://www.geoextranet.com/0013701800/GEO/Draft/Summary Report/SekiTables.xls>

TABLE 3A
SUMMARY OF SOIL ANALYTICAL RESULTS - TOTAL PETROLEUM HYDROCARBONS AND FIELD SCREENING¹
RAYONIER SEKIU PROJECT
SEKIU, WASHINGTON

Sample Location	Sample Name	Sample Depth (feet bgs)	Field Screening ²		Sample Date	Petroleum Hydrocarbons ³ (mg/kg)				
			Sheen	Headspace (ppm)		Gasoline Range Hydrocarbons	Diesel Range Hydrocarbons	Heavy Oil Range Hydrocarbons	Bunker C Range Hydrocarbons	Mineral Oil Range Hydrocarbons
TP-2	TP-2-4.0	4	MS	0	10/22/2008	20.0 U	50.0 U	100.0 U	--	100.0 U
TP-6	TP-6-13.0	13	HS	0	10/21/2008	20.0 U	50.0 U	100.0 U	>100	--
TP-10	TP-10-12.5	12.5	HS	4	10/21/2008	20.0 U	50.0 U	100.0 U	100.0 U	--
TP-11	TP-11-3.0	3	HS	6	10/21/2008	20.0 U	50.0 U	100.0 U	>100	--

Notes:

¹Sample locations are shown on the attached site plan. Samples submitted to Libby Environmental Chemistry Laboratory in Olympia, Washington.

²Field Screening Methods are described in Attachment A

³Petroleum hydrocarbons analyzed by Northwest Total Petroleum Hydrocarbon Identification (NWTPH-HCID).

mg/kg = milligrams per kilogram

bgs = below ground surface

NS = no sheen, SS = slight sheen, MS = moderate sheen, HS = heavy sheen

Bold text indicates analyte was detected

ppm = parts per million

U = analyte was not detected at method reporting limit

-- = Not analyzed for specified analyte

[https://www.geoextranet.com/0013701800/GEO/Draft/Summary Report/SekiTables.xls](https://www.geoextranet.com/0013701800/GEO/Draft/Summary%20Report/SekiTables.xls)

TABLE 3B
SUMMARY OF SOIL ANALYTICAL RESULTS - TOTAL PETROLEUM HYDROCARBONS AND FIELD SCREENING¹
RAYONIER SEKIU PROJECT
SEKIU, WASHINGTON

Sample Location ²	Sample Name	Sample Depth (feet bgs)	Field Screening ²		Sample Date	Petroleum Hydrocarbons (mg/kg) ³	
			Sheen	Headspace (ppm)		Bunker C Range Hydrocarbons	Heavy Oil Range Hydrocarbons
TP-1	TP-1-6.0 ³	6	HS	0	10/21/2008	25,200	--
TP-1	TP-1-6.0 ³	6	HS	0	10/21/2008	40 U	16,000
TP-1	TP-1-10.0 ³	10	NS	0	10/21/2008	40 U	--
TP-1	TP-1-10.0 ³	10	NS	0	10/21/2008	40 U	40 U
TP-1	TP-1-10.0 DUP	10	NS	0	10/21/2008	40 U	--
TP-1	TP-1-12.0	12	HS	4	10/21/2008	16,400	--
TP-2	TP-2-4.0	4	MS	0	10/22/2008	--	--
TP-2	TP-2-12.0	12	SS	0	10/22/2008	40 U	--
TP-3	TP-3-3.0	3	NS	0	10/21/2008	1,100	--
TP-3	TP-3-8.0	8	NS	0	10/21/2008	40 U	--
TP-5	TP-5-8.0	8	MS	0	10/21/2008	7,160	--
TP-5	TP-5-10.0	10	HS	0	10/21/2008	8,160	--
TP-6	TP-6-9.0	9	NS	0	10/21/2008	40 U	--
TP-6	TP-6-11.0	11	MS	0	10/21/2008	18,900	--
TP-6	TP-6-13.0	13	HS	0	10/21/2008	136,000	--
TP-7	TP-7-6.0	6	NS	0	10/22/2008	--	--
TP-8	TP-8-10.0	10	NS	0	10/22/2008	--	--
TP-9	TP-9-7.5	8	NS	0	10/21/2008	40 U	--
TP-9	TP-9-10.5	10.5	NS	0	10/21/2008	40 U	--
TP-10	TP-10-5.5	6	NS	0	10/21/2008	40 U	--
TP-10	TP-10-12.5	13	HS	4	10/21/2008	19,300	--
TP-10	TP-10-13.5	14	HS	4	10/21/2008	2,460	--
TP-11	TP-11-3.0	3	HS	6	10/21/2008	103,000	--
TP-11	TP-11-14.0	14	HS	2	10/21/2008	710	--
TP-11	TP-11-16.0	16	NS	0	10/21/2008	40 U	--
TP-12	TP-12-9.5	10	HS	6	10/21/2008	37,400	--
TP-13	TP-13-11.0	11	NS	0	10/22/2008	40 U	--
TP-13	TP-13-7.0	7	NS	0	10/22/2008	40 U	--
TP-14	TP-14-12.5	13	NS	0	10/22/2008	40 U	--
TP-16	TP-16-4.0	4	SS	0	10/22/2008	40 U	--
TP-16	TP-16-15.0	15	HS	2	10/22/2008	2,740	--
TP-16	TP-16-9.0	9	HS	11	10/22/2008	7,710	--
TP-17	TP-17-9.5	10	MS	0	10/22/2008	75,800	--
TP-17	TP-17-12.5	13	HS	2	10/22/2008	58,700	--
TP-18	TP-18-11.5	12	NS	0	10/22/2008	40 U	--
TP-18	TP-18-16.0	16	NS	0	10/22/2008	--	--
TP-19	TP-19-3.0	3	NS	0	10/22/2008	--	--
TP-20	TP-20-7.0	7	MS	0	10/22/2008	6,750	--
TP-20	TP-20-10.0	10	MS	0	10/22/2008	--	--

Sample Location ²	Sample Name	Sample Depth (feet bgs)	Field Screening ²		Sample Date	Petroleum Hydrocarbons (mg/kg) ³	
			Sheen	Headspace (ppm)		Bunker C Range Hydrocarbons	Heavy Oil Range Hydrocarbons
MW-1	GEI-1-12.0	12	MS	0	10/24/2008	3,210	40 U
MW-1	GEI-1-16.0	16	NS	0	10/24/2008	40 U	40 U
MW-2	GEI-2-12.0	12	NS	0	10/23/2008	40 U	--
MW-2	GEI-2-17.0	17	NS	0	10/23/2008	40 U	--
MW-3	GEI-3-12.0	12	NS	0	10/23/2008	40 U	40 U
MW-3	GEI-3-19.0	19	NS	0	10/23/2008	40 U	40 U
MW-4	GEI-4-11.0	11	NS	0	10/23/2008	40 U	--
MW-4	GEI-4-16.0	16	NS	0	10/23/2008	40 U	--
MW-5	GEI-5-10.0	10	NS	0	10/23/2008	40 U	--
MW-5	GEI-5-14.0	14	NS	0	10/23/2008	40 U	--
MW-6S	GEI-6S-11.0	11	SS	0	10/24/2008	40 U	40 U
MW-6D	GEI-6D-17.0	17	NS	0	10/24/2008	40 U	40 U
MW-7D	GEI-7D-15.0	15	HS	0	10/24/2008	8,820	40 U
MW-7D	GEI-7D-18.0	18	NS	0	10/24/2008	40 U	40 U
MW-8	GEI-8-15.0	15	NS	0	10/23/2008	40 U	--
GEI-9	GEI-9-10.0	10	NS	0	10/23/2008	40 U	--
MTCA Method A Cleanup Levels						2,000	2,000

Notes:

¹Sample locations are shown on the attached site plan. Samples were submitted to Libby Environmental Chemistry Laboratory in Olympia, Washington.

²Field Screening Methods are described in Attachment A

³Analyzed by Ecology Method NWTPH-Dx with a silica gel cleanup and quantified as Bunker C. Samples with heavy oil reported also were analyzed by Method NWTPH-Dx quantified as both Bunker C and oil-range petroleum hydrocarbons.

U = analyte was not detected at method reporting limit

-- = Not analyzed for specified analyte

mg/kg = milligrams per kilogram

bgs = below ground surface

NS = no sheen, SS = slight sheen, MS = moderate sheen, HS = heavy sheen

Bold text indicates analyte was detected

ppm = parts per million

<https://www.geoextranet.com/0013701800/GEO/Draft/Summary Report/SekiuTables.xls>

TABLE 4
SUMMARY OF SOIL ANALYTICAL RESULTS - POLYCYCLIC AROMATIC HYDROCARBONS¹
RAYONIER SEKIU PROJECT
SEKIU, WASHINGTON

Sample Location	Sample Name	Sample Depth (feet bgs)	Sample Date	Non-Carcinogenic PAHs ² (mg/kg)											Carcinogenic PAHs ² (mg/kg)							TEC
				1-Methyl naphthalene	2-Methyl naphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benzo(g,h,i) perylene	Fluoranthene	Fluorene	Naphthalene	Phenanthrene	Pyrene	Benzo(a) anthracene	Benzo(a)pyrene	Benzo(b) fluoranthene	Benzo(k) fluoranthene	Chrysene	Dibenz(a,h) anthracene	Indeno(1,2,3-cd)pyrene	
TP-2	TP-2-4.0	4	10/22/2008	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	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.0604 U
TP-2	TP-2-12.0	12	10/22/2008	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	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.0604 U
TP-6	TP-6-9.0	9	10/21/2008	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	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.0604 U
TP-6	TP-6-13.0	13	10/21/2008	1	1.6	1.1	1.3	1.9	0.2	2.6	2.2	1	2.1	2.6	2.3	0.7	1.7	1.2	0.5	0.08 U	0.08 U	1.233
TP-9	TP-9-7.5	7.5	10/21/2008	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	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.0604 U
TP-9	TP-9-10.5	10.5	10/21/2008	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	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.0604 U
TP-10	TP-10-5.5	5.5	10/21/2008	1.2	0.1 U	0.2	0.1 U	3.2	0.1 U	6.4	4.4	0.1 U	3.4	6.4	3.4	1	2.5	0.6	1.9	0.08 U	0.5	1.723
TP-10	TP-10-12.5	12.5	10/21/2008	2.3	0.1 U	0.1 U	0.1 U	0.6	0.2	0.4	0.1 U	0.1 U	1.1	1.6	1	0.5	0.9	0.7	0.8	0.1	0.1	0.788
TP-13	TP-13-7.0	7	10/22/2008	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	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.0604 U
TP-13	TP-13-11.0	11	10/22/2008	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	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.0604 U
MW-1	GEI-1-12.0	12	10/24/2008	1.4	0.1 U	0.1 U	0.1 U	0.2	0.1 U	0.1 U	0.5	0.1 U	0.5	0.3	0.1	0.08 U	0.09	0.08 U	0.08 U	0.08 U	0.08 U	0.0714
MW-6S	GEI-6S-11.0	11	10/24/2008	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	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.0604 U
MW-6D	GEI-6D-17.0	17	10/24/2008	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	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.0604 U
MW-7D	GEI-7D-15.0	15	10/24/2008	0.1 U	1.5	0.1 U	0.1 U	17	0.3	2.2	0.1 U	0.1	5.2	1.3	1.6	2.1	1.4	1.2	0.8	0.08 U	0.08 U	2.536
MW-7D	GEI-7D-18.0	18	10/24/2008	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	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.08 U	0.0604 U
MTCA Method B Soil ³				--	320	4,800	--	24,000	--	3,200	3,200	1,600*	--	2,400	--	--	--	--	--	--	--	0.14

Notes:
¹Sample locations are shown on the attached site plan. Samples submitted to Libby Environmental Chemistry Laboratory in Olympia, Washington.
²PAHs = Polycyclic aromatic hydrocarbons analyzed by Method 8270 D.
³MTCA Method B standard formula value [WAC 173-340-740(3)(b)(iii)]
bgs = below ground surface
Bold text indicates analyte was detected
U = anlayte was not detected at method reporting limit
mg/kg = milligrams per kilogram
-- = No cleanup criteria established
MTCA = Model Toxics Control Act
TEC = total toxic equivalent concentration . Calculated using one-half non-detect values (method reporting limit). cPAH cleanup level based on total TEC methodology for cPAHs.

TABLE 5
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS - TOTAL PETROLEUM HYDROCARBONS¹
RAYONIER SEKIU PROJECT
SEKIU, WASHINGTON

Sample Location	Sample Name	Sample Date	Petroleum Hydrocarbons (ug/L) ²		
			Bunker C Range Hydrocarbons	Diesel Range Hydrocarbons	Heavy Oil Range Hydrocarbons
MW-1	MW-1	10/25/2008	4,400	--	--
	MW-1-090219	02/19/2009	1,000	250 U	500 U
MW-2	MW-2	10/25/2008	200 U	--	--
	MW-2-090219	02/19/2009	500 U	250 U	500 U
MW-3	MW-3	10/25/2008	200 U	--	--
	MW-3-090219	02/19/2009	500 U	250 U	500 U
MW-4	MW-4	10/25/2008	200 U	--	--
	MW-4-090219	02/19/2009	500 U	250 U	500 U
MW-5	MW-5	10/25/2008	200 U	--	--
	MW-5-090219	02/19/2009	500 U	250 U	500 U
MW-6D	MW-6D	10/25/2008	200 U	--	--
	MW-6D-090219	02/19/2009	500 U	250 U	500 U
MW-7S	MW-7S	10/25/2008	200 U	--	--
	MW-7S-090219	02/19/2009	500 U	250 U	500 U
MW-7D	MW-7D	10/25/2008	200 U	--	--
	MW-7D-090219	02/19/2009	500 U	250 U	500 U
MW-8	MW-8	10/25/2008	200 U	--	--
	MW-8-090219	02/19/2009	500 U	250 U	500 U
MTCA Method A Cleanup Levels			500	500	500

Notes:

¹Sample locations are shown on the attached site plan. Samples obtained in October 2008 were submitted to Libby Environmental Chemistry Laboratory in Olympia, Washington, and in February 2009 were submitted to Analytical Resources Inc. Laboratory in Tukwila, Washington.

²Analyzed by Ecology Method NWTPH-Dx with a silica gel cleanup and quantified as Bunker C. Samples with diesel and heavy oil reported also were analyzed by Method NWTPH-Dx quantified as diesel- and oil-range petroleum hydrocarbons.

MTCA = Model Toxics Control Act

U = analyte was not detected at method reporting limit

ug/L = micrograms per liter

Bold text indicates analyte was detected

-- = Not analyzed for specified analyte

<https://www.geoextranet.com/0013701800/GEO/Draft/Summary Report/SekiuTables.xls>

TABLE 6
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS - POLYCYCLIC AROMATIC HYDROCARBONS¹
RAYONIER SEKIU PROJECT
SEKIU, WASHINGTON

Sample Location	Sample Date	Non-Carcinogenic PAHs ² (ug/L)												Carcinogenic PAHs ² (ug/L)							TEC
		Dibenzofuran	1-Methyl naphthalene	2-Methyl naphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benzo(g,h,i) perylene	Fluoranthene	Fluorene	Naphthalene	Phenanthrene	Pyrene	Benzo(a) anthracene	Benzo(a) pyrene	Benzo(b) fluoranthene	Benzo(k) fluoranthene	Chrysene	Dibenz(a,h) anthracene	Indeno(1,2,3-cd) pyrene	
MW-1	10/25/2008	--	4.4	3.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	1.8	0.5 U	0.5 U	0.5 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0
	02/19/2009	0.1 U	0.78	0.1	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.11	0.23	0.1 U	0.12	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0
MW-2	10/25/2008	--	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	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0
	02/19/2009	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	0.1 U	0.1 U	0.1 U	0.1 U	0
MW-3	10/25/2008	--	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	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0
	02/19/2009	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	0.1 U	0.1 U	0.1 U	0.1 U	0
MW-4	10/25/2008	--	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	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0
	02/19/2009	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	0.1 U	0.1 U	0.1 U	0.1 U	0
MW-5	10/25/2008	--	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	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0
	02/19/2009	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	0.1 U	0.1 U	0.1 U	0.1 U	0
MW-6D	10/25/2008	--	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	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0
	02/19/2009	0.1 U	0.1 U	0.1 U	0.19	0.1 U	0.1 U	0.1 U	0.1 U	0.1	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
MW-7D	10/25/2008	--	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	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0
	02/19/2009	0.16	0.1	0.1 U	0.97	0.1 U	0.24	0.1 U	0.1 U	0.41	0.1 U	0.1 U	0.16	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0
MW-7S	10/25/2008	--	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	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0
	02/19/2009	0.11	0.1 U	0.1 U	0.8	0.1 U	0.14	0.1 U	0.1 U	0.25	0.1 U	0.1 U	0.11	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0
MW-8	10/25/2008	--	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	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0
	02/19/2009	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	0.1 U	0.1 U	0.1 U	0.1 U	0
Aquatic Life Marine Chronic ³		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Human Health Marine ⁴		--	--	--	990	--	40,000	--	140	5,300	--	--	4,000	0.018							
MTCA Method B Surface Water ⁵		--	--	--	640	--	26,000	--	90	3,500	4,900*	--	2,600	0.03							

Notes:

¹Sample locations are shown on the attached site plan. Samples obtained in October 2008 were submitted to Libby Environmental Chemistry Laboratory in Olympia, Washington, and in February 2009 were submitted to Analytical Resources Inc. Laboratory in Tukwila, Washington.

²PAHs = Polycyclic aromatic hydrocarbons analyzed by Method 8270 D.

³Lowest available aquatic life marine chronic criteria from Chapter 173-201A, Clean Water Act Section 304, and National Toxics Rule (40 CFR 131)

⁴Surface water criteria are the lowest available human health marine criteria from Clean Water Act Section 304 and National Toxics Rule (40 CFR 131).

⁵MTCA Method B surface water standard formula value [WAC 173-340-730(3)(b)(iii)]

ug/L = micrograms per liter

U = anlyte was not detected at method reporting limit

Bold text indicates analyte was detected

-- = Not analyzed for specified analyte or cleanup criteria not established

MTCA = Model Toxics Control Act

* = cleanup level based on total naphthalenes, which is the sum of 1-methylnaphthalene, 2-methylnaphthalene, and naphthalenes.

TEC = total toxic equivalent concentration . cPAH cleanup level based on TEC methodology for cPAHs.

TABLE 7
SUMMARY OF SEDIMENT ANALYTICAL RESULTS
TOTAL PETROLEUM HYDROCARBONS¹
RAYONIER SEKIU PROJECT
SEKIU, WASHINGTON

Sample Location	Sample Name	Sample Depth (feet below mudline)	Sample Date	Petroleum Hydrocarbons ² (mg/kg)		
				Diesel Range Hydrocarbons	Heavy Oil Range Hydrocarbons	Bunker C Range Hydrocarbons
R1-A	R1-S	0-1	02/20/2009	15	41	80
R1-A	R1-D	3-4	02/20/2009	7.9	14	33
R2-C	R2-S	0-1	02/20/2009	6.0 U	12 U	12 U
R3-A	R3-S	0-1	02/20/2009	17	30	68

Notes:

¹Sample locations are shown on the attached site plan. Samples were submitted to Analytical Resources Inc. Laboratory in Tukwila, Washington.

²Analyzed by Ecology Method NWTPH-Dx with a silica gel cleanup and quantified as Bunker C. Samples also were analyzed by Method NWTPH-Dx quantified as diesel- and oil-range petroleum hydrocarbons.

mg/kg = milligrams per kilogram

U = analyte was not detected at method reporting limit

Bold text indicates analyte was detected

<https://www.geoextranet.com/0013701800/GEO/Draft/Summary Report/SekiTables.xls>

TABLE 8
SUMMARY OF SEDIMENT ANALYTICAL RESULTS - POLYCYCLIC AROMATIC HYDROCARBONS¹
RAYONIER SEKIU PROJECT
SEKIU, WASHINGTON

Sample Name	R1-D norm	R1-S norm	R1-S-Dil norm	R2-s norm	R3-S norm	R3-S-Dil norm	Sediment Management Standards (SMS)	
Sample Locations	R1-A	R1-A	R1-A	R2-C	R3-A	R3-A	Sediment Quality Standards (SQS) WAC 173-204-320)	Sediment Cleanup Screening Level (CSL) WAC 173-204-520
Sample Date	02/20/2009	02/20/2009	02/20/2009	02/20/2009	02/20/2009	02/20/2009		
	mg/kg OC	mg/kg OC	mg/kg OC	mg/kg OC	mg/kg OC	mg/kg OC		
Total organic carbon (%) ³	1.78	9.64	9.64	0.28	2.17	2.17		
LPAH⁴								
Total LPAH ⁴	16.70	1.75	1.74	11.15	14.01	66.36	370	780
Acenaphthylene	0.29	0.05 U	0.10 U	1.69 U	2.26 U	11.06 U	66	66
Acenaphthene	3.03	0.20	0.19	1.69 U	2.26 U	11.06 U	16	57
Anthracene	1.85	0.94	0.88	1.69 U	2.26 U	11.06 U	220	1,200
Fluorene	0.67	0.08	0.10 U	1.69 U	2.26 U	11.06 U	23	79
Naphthalene	8.99	0.18	0.17	2.70	2.26 U	11.06 U	99	170
Phenanthrene	1.85	0.30	0.30	1.69 U	2.72	11.06 U	100	480
2-Methylnaphthalene	1.46	0.08	0.10 U	1.69 U	2.26 U	11.06 U	38	64
HPAH⁵								
Total HPAH ⁵	49.12	19.34	19.36	16.91	23.92	110.60	960	5,300
Benz[a]anthracene	4.66	1.02	0.93	1.69 U	2.26 U	11.06 U	110	270
Benzo(a)pyrene	1.24	0.24	0.22	1.69 U	2.26 U	11.06 U	99	210
Benzo(b)fluoranthene	1.35	0.29	0.25	1.69 U	2.26 U	11.06 U	--	--
Benzo(k)fluoranthene	1.35	0.29	0.25	1.69 U	2.26 U	11.06 U	--	--
Total Benzofluoranthenes ⁶	2.70	0.58	0.50	3.38	4.52	22.12	230	450
Benzo(ghi)perylene	0.32	0.06	0.10 U	1.69 U	2.26 U	11.06 U	31	78
Chrysene	3.71	0.64	0.60	1.69 U	2.26 U	11.06 U	110	460
Dibenzo(a,h)anthracene	0.27 U	0.05 U	0.10 U	1.69 U	2.26 U	11.06 U	12	33
Fluoranthene	19.10	8.61 E	8.71	1.69 U	3.59	11.06 U	160	1,200
Indeno(1,2,3-cd)pyrene	0.27	0.05 U	0.10 U	1.69 U	2.26 U	11.06 U	34	88
Pyrene	16.85	8.09 E	8.09	1.69	2.26 U	11.06 U	1,000	1,400
1-Methylnaphthalene	0.96	0.06	0.10 U	1.69 U	2.26 U	11.06 U	--	--
Dibenzofuran	0.67	0.07	0.10 U	1.69 U	2.26 U	11.06 U	15	58

Notes:

¹Sample locations are shown on the attached site plan. Samples obtained in February 2009 were submitted to Analytical Resources Inc. Laboratory in Tukwila, Washington.

²This table summarizes sediment sample analytical results with reference to the Sediment Management Standards (SMS) Sediment Quality Standards (SQS) and/or Cleanup Screening Level (CSL).

³The listed chemical parameter criteria represent concentrations in parts per million, "normalized," or expressed, on a total organic carbon basis. To normalize to total organic carbon, the dry weight concentration for each parameter is divided by the decimal fraction representing the percent total organic carbon content of the sediment.

⁴The LPAH criterion represents the sum of the following "low molecular weight polynuclear aromatic hydrocarbon" compounds: Naphthalene, Acenaphthylene, Acenaphthene, Fluorene, Phenanthrene, and Anthracene. The LPAH criterion is not the sum of the criteria values for the individual LPAH compounds as listed.

⁵The HPAH criterion represents the sum of the following "high molecular weight polynuclear aromatic hydrocarbon" compounds: Fluoranthene, Pyrene, Benzo(a)anthracene, Chrysene, Total Benzofluoranthenes, Benzo(a)pyrene, Indeno(1,2,3-c,d)pyrene, Dibenz(a,h) anthracene, and Benzo(g,h,i)perylene. The HPAH criterion is not the sum of the criteria values for the individual HPAH compounds as listed.

⁶The benzofluoranthenes criterion represents the sum of the concentrations of the "B," and "K" isomers.

mg/kg OC = milligrams per kilogram normalized to organic carbon

Bold text indicates analyte was detected

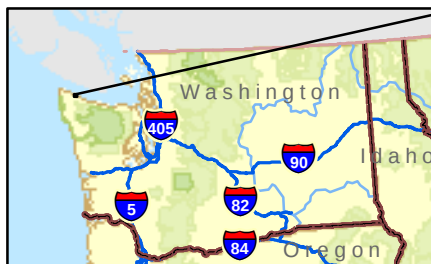
U = Compound was not detected at reporting limit

E = Value was estimated and reanalyzed

[https://www.geoextranet.com/0013701800/GEO/Draft/Summary Report/SekiTables.xls](https://www.geoextranet.com/0013701800/GEO/Draft/Summary%20Report/SekiTables.xls)

Map Revised: August 14, 2008 MM2

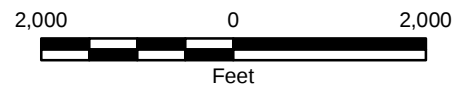
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Notes:

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Data Sources: ESRI Data & Maps, Street Maps 2005
Transverse Mercator, Zone 10 N North, North American Datum 1983
North arrow oriented to grid north



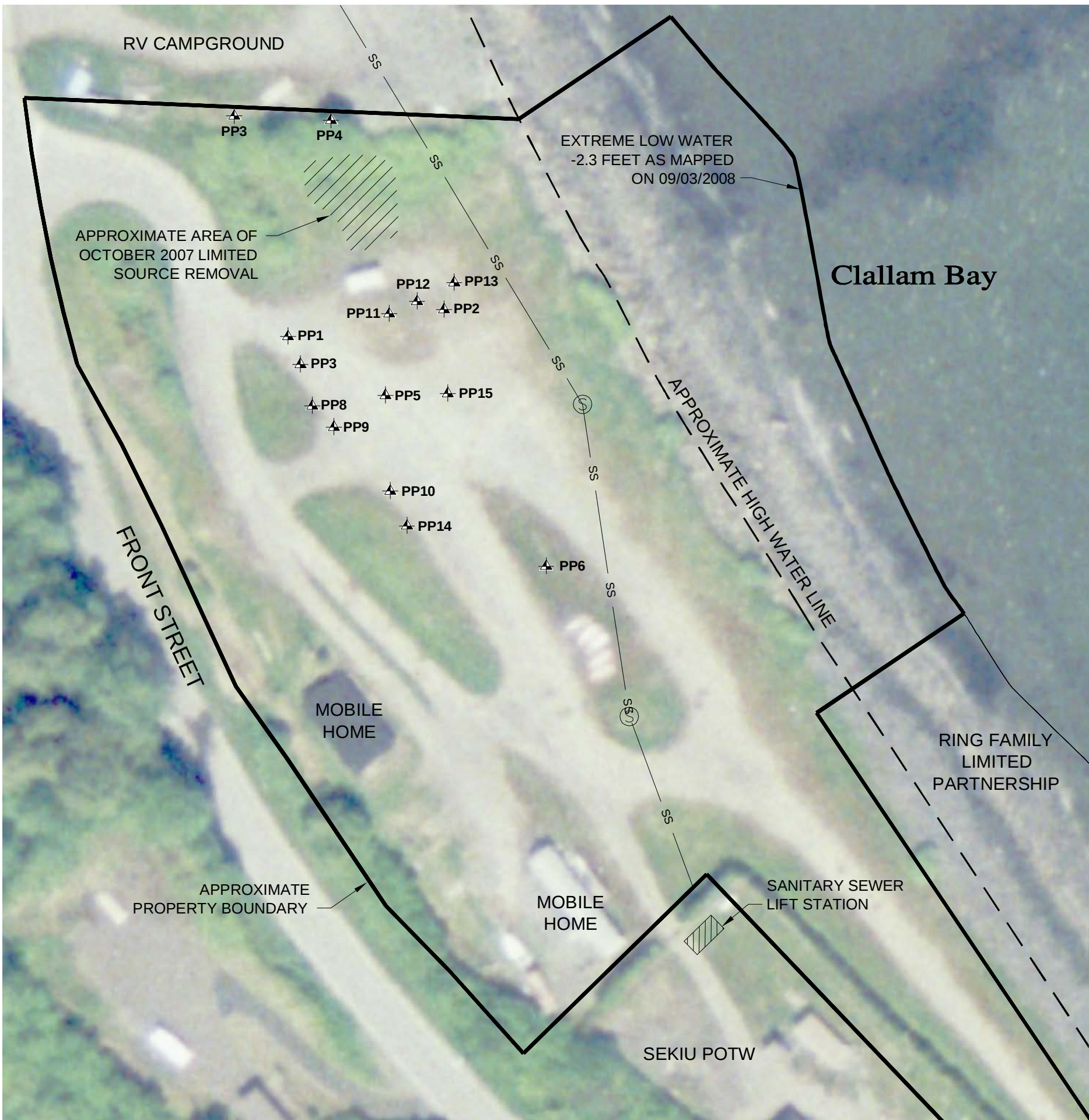
Vicinity Map

Former Sekiu Log Sorting Yard
Clallam County
Sekiu , Washington



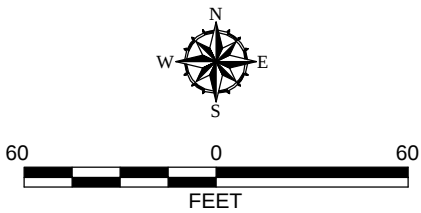
Figure 1

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Legend

- PP14**  Approximate Location of Previous Boring (completed by Rayonier in March 2008)
- Note: These boring locations were obtained with a hand-held global positioning system (GPS) unit with an accuracy of $\pm 30'$.
-  Existing Sanitary Sewer
-  Approximate Location of Manhole
- POTW** Publicly Owned Treatment Works

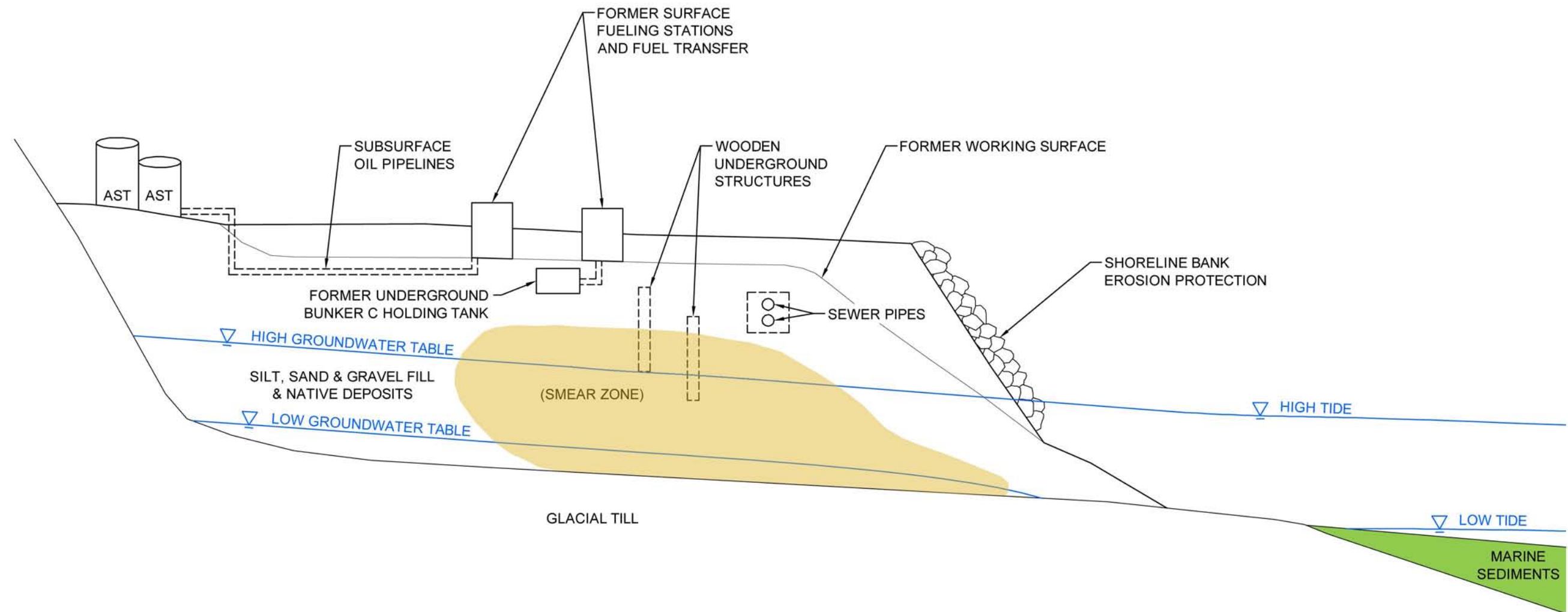


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- Reference: Drawing NTI-2000-RAYO0803-ROS.dwg, received via email on 11/26/2008.

Site Plan Approximate Boring Locations - March 2008	
Former Sekiu Log Sorting Yard Sekiu, Washington	
GEOENGINEERS 	Figure 2

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Legend

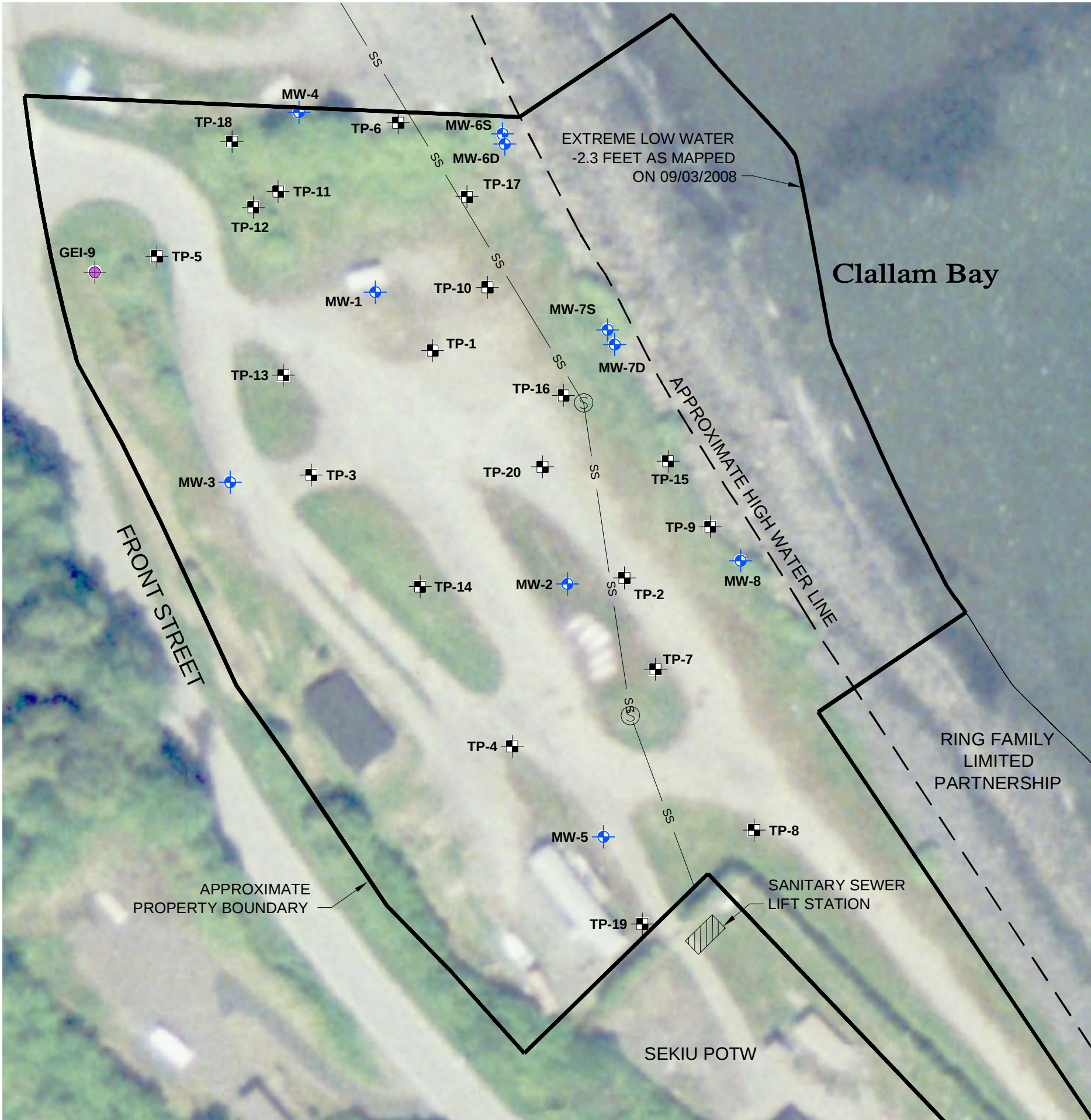
- Zone where residual Bunker C observed in soil
- LNAPL = Light Non-Aqueous Phase Liquids
- DNAPL = Dense Non-Aqueous Phase Liquids
- AST = Above ground Storage Tank

Notes

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Conceptual Site Model	
Former Sekiu Log Spring Yard Sekiu, Washington	
GEOENGINEERS 	Figure 3

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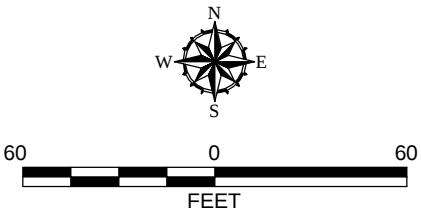


Legend

- GEI-9 Approximate Direct Push Boring Location (completed by GeoEngineers in October 2008)
- MW-1 Approximate Monitoring Well Location (completed by GeoEngineers in October 2008)
- TP-1 Approximate Test Pit Location (completed by GeoEngineers in October 2008)
- ss — Existing Sanitary Sewer
- Ⓢ Approximate Location of Manhole
- POTW Publicly Owned Treatment Works

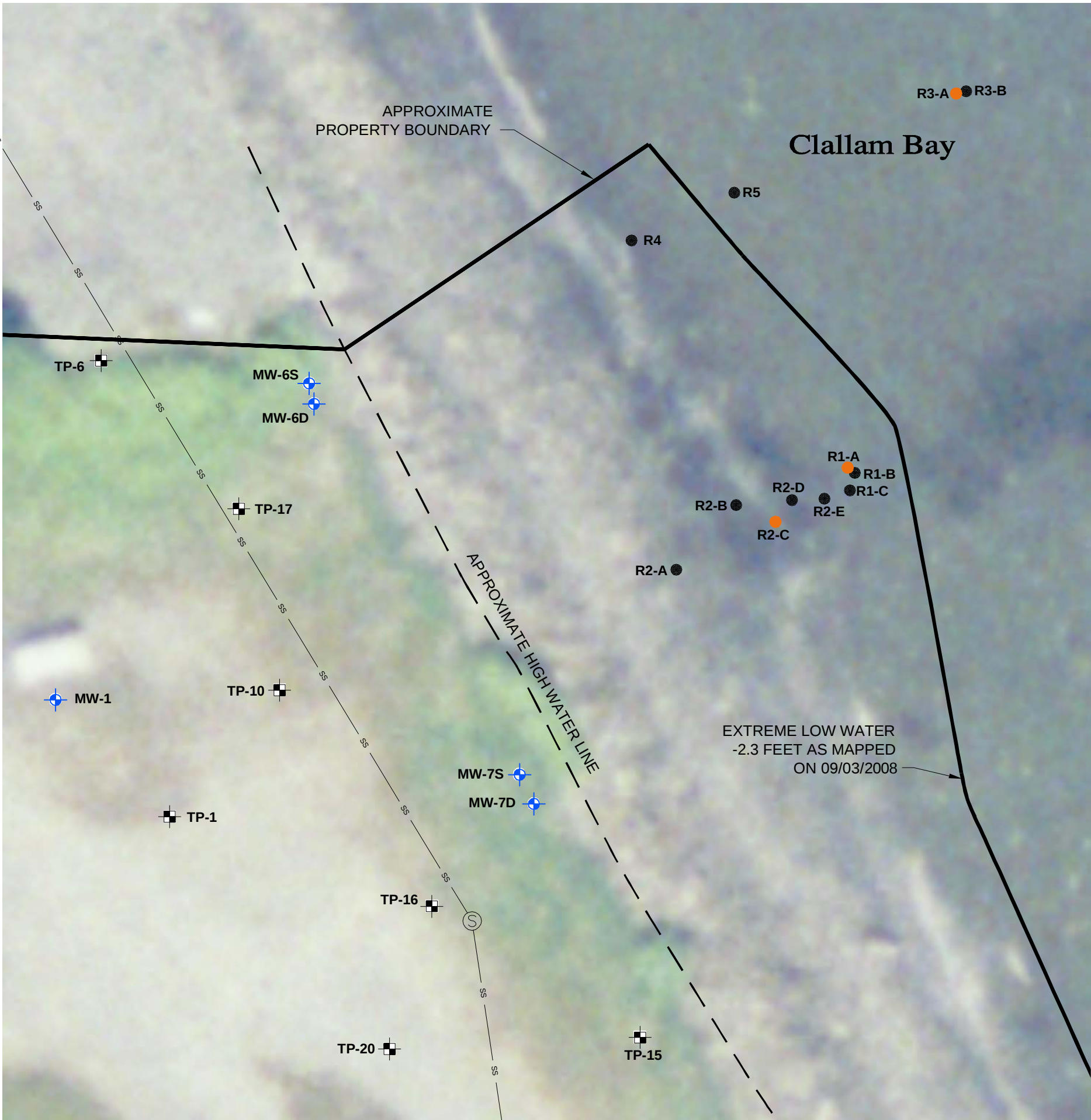
Notes

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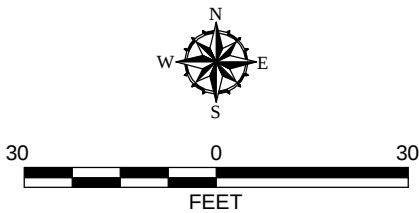
Approximate Boring Locations - October 2008	
Former Sekiu Log Sorting Yard Sekiu, Washington	
GEOENGINEERS	Figure 4

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Legend

- R2-C (orange dot) Approximate Sediment Sample Location (completed by GeoEngineers in February 2009)
- R2-A (black dot) Approximate Location of Sediment Cores where refusal was met (completed by GeoEngineers in February 2009)
- MW-1 (blue crosshair) Approximate Monitoring Well Location (completed by GeoEngineers in October 2008)
- TP-1 (black crosshair) Approximate Test Pit Location (completed by GeoEngineers in October 2008)
- ss — Existing Sanitary Sewer
- POTW Publicly Owned Treatment Works

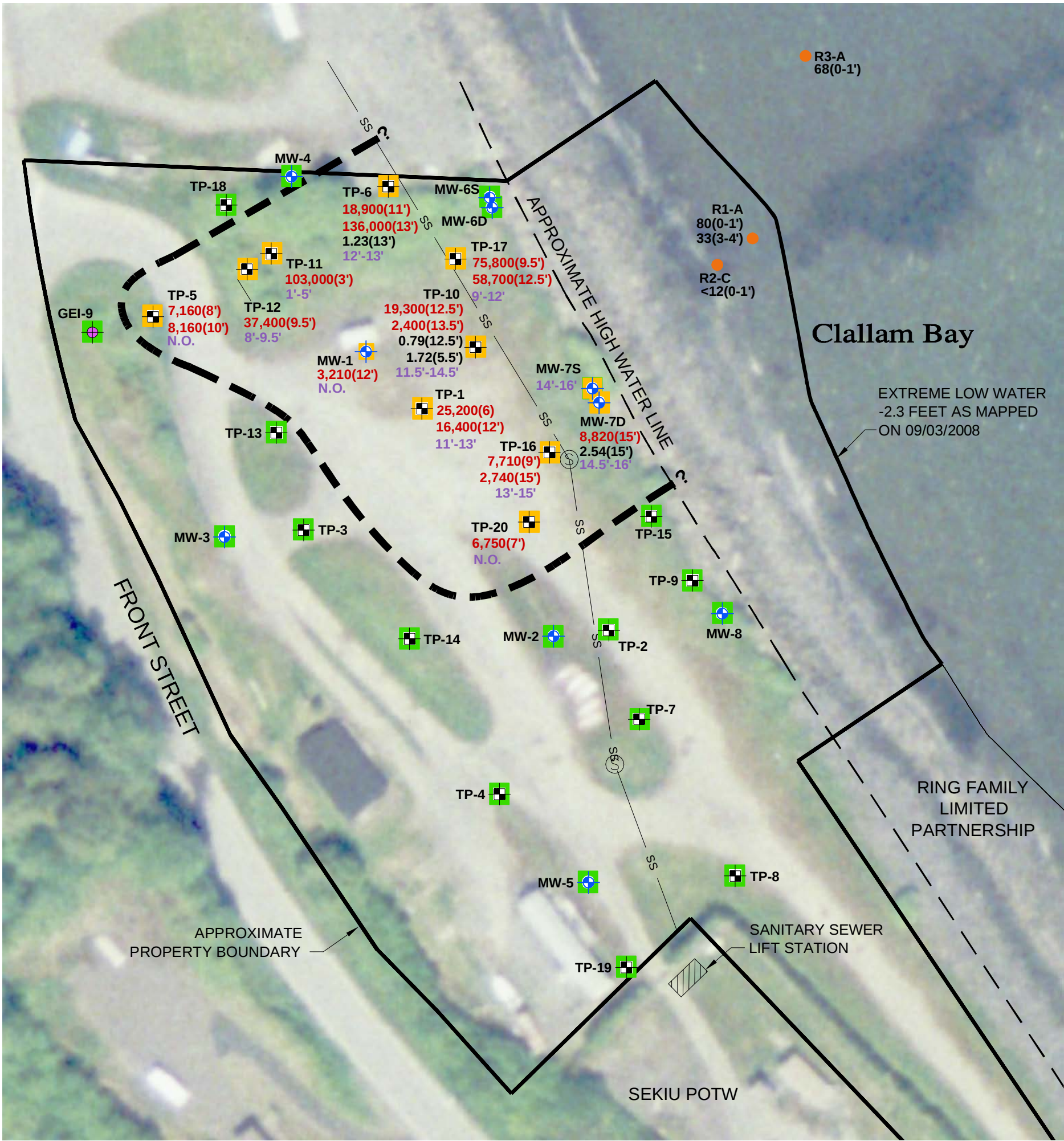


Notes

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- Reference: Drawing NTI-2000-RAYO0803-ROS.dwg, received via email on 11/26/2008.

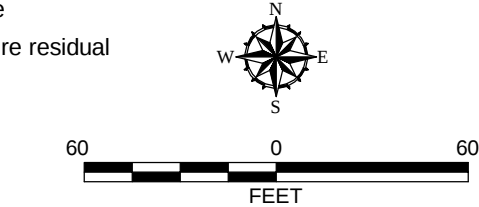
Approximate Sediment Sample Locations February 2009	
Former Sekiu Log Sorting Yard Sekiu, Washington	
GEOENGINEERS 	Figure 5

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Legend

- Soil sample with constituent concentration less than detection limits or detected at a concentration less than the MTCA cleanup level and no NAPL observed
- Soil sample with field screening evidence of Bunker C and/or constituent detected at a concentration greater than the MTCA cleanup level (Bunker C = 2,000 mg/Kg; cPAHs TEC = 0.14 mg/Kg)
- GEI-9 Approximate Direct Push Boring Location
- MW-1 Approximate Monitoring Well Location
- TP-1 Approximate Test Pit Location
- R2-C Approximate Sediment Sample Location
- mg/Kg milligrams/Kilogram
- Approximate extent of Bunker C exceeding MTCA Method A cleanup levels in soil
- 10,000(6') Bunker C concentration in soil (mg/Kg) and sample depth (Feet)
- 1.79(6') Total carcinogenic polycyclic aromatic hydrocarbons (cPAHs) concentration in soil (mg/Kg TEC) and sample depth (Feet)
- <12(0-1') Bunker C concentration in sediment (mg/Kg) and sample depth (feet) below mudline
- 11'-13' Approximate depth interval (Feet) where residual Bunker C (NAPL) observed in soil
- N.O. Bunker C (NAPL) not observed
- ss — Existing Sanitary Sewer
- MTCA Model Toxics Control Act
- NAPL Non-aqueous phase liquid
- TEC Total toxic equivalent concentration
- POTW Publicly Owned Treatment Works

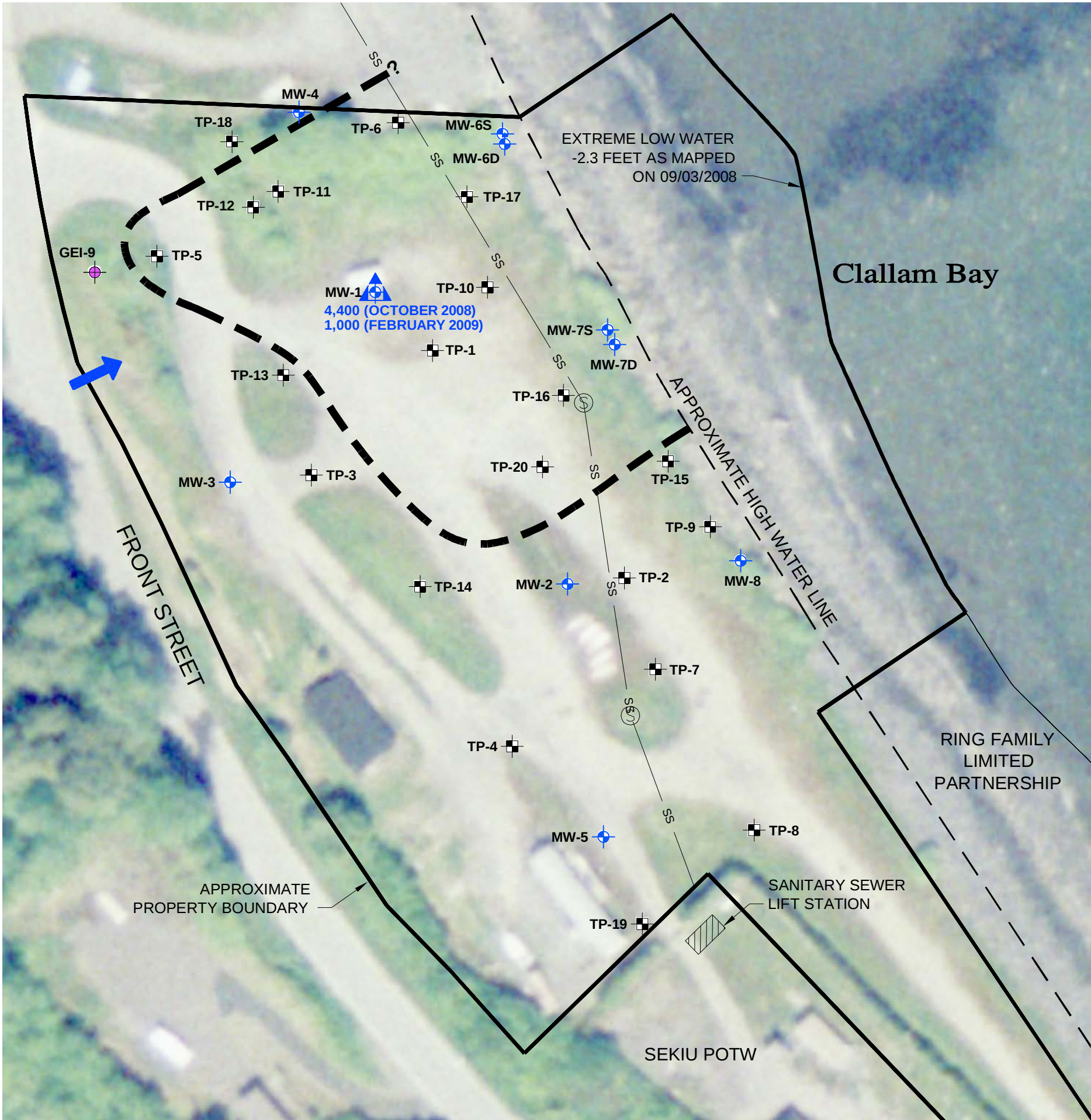


Notes

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- Reference: Drawing NTI-2000-RAYO0803-ROS.dwg, received via email on 11/26/2008.

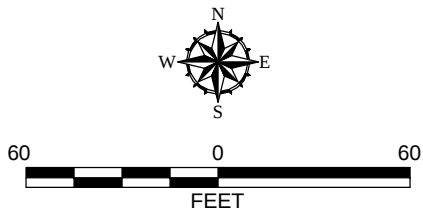
Summary of MTCA Cleanup Level Exceedances in Soil and Bunker C Results in Sediment	
Former Sekiu Log Sorting Yard Sekiu, Washington	
GEOENGINEERS	Figure 6

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Legend

- Groundwater sample with constituent detected at a concentration greater than MTCA Method A cleanup level (Bunker C = 500 µg/L)
- GEI-9 Approximate Direct Push Boring Location
- MW-1 Approximate Monitoring Well Location
- TP-1 Approximate Test Pit Location
- µg/L micrograms/Liter
- Approximate extent of Bunker C in soil
- 4,400 Bunker C concentration in groundwater (µg/L)
- ss — Existing Sanitary Sewer
- MTCA Model Toxics Control Act
- POTW Publicly Owned Treatment Works
- Approximate Groundwater Flow Direction Measured October 2008 and February 2009



Notes

- The locations of all features shown are approximate.
 - 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.
- Reference: Drawing NTI-2000-RAYO0803-ROS.dwg, received via email on 11/26/2008.

Summary of MTCA Method A Exceedances in Groundwater	
Former Sekiu Log Sorting Yard Sekiu, Washington	
GEOENGINEERS 	Figure 7



APPENDIX A ***FIELD PROCEDURES AND EXPLORATION LOGS***

APPENDIX A FIELD PROCEDURES AND EXPLORATION LOGS

FIELD SCREENING AND SOIL SAMPLING PROCEDURES

Subsurface conditions at the subject property were evaluated by drilling eleven borings using a truck-mounted direct-push drilling equipment operated by ESN Drilling of Olympia, Washington, and completing 20 test pits using equipment operated by Burch and Burch. A representative from our staff selected the boring and test pit locations, and observed and classified the soil encountered. Soil in the borings was visually classified in general accordance with American Society for Testing and Materials (ASTM) D-2488-90, which is described in Figure A-1. A key to the boring log symbols also is presented in Figure A-1. A detailed log was prepared for each soil boring and test pit. The boring and test pit logs are presented in Figures A-2 through A-35.

Continuous soil samples were obtained from the soil borings. Soil samples were obtained for characterization from the direct-push borings at selected depth intervals. Representative soil from each sampling interval was retained for field screening and potential chemical analysis. Selected samples were placed in laboratory-prepared jars, completely filled to eliminate headspace. Samples were kept cool during transport to the testing laboratory. Chain-of-custody procedures were observed during transport of the samples.

Soil samples obtained from the explorations were obtained using either a stainless steel trowel or a clean nitrile disposable glove to collect soil and place it in a 4-ounce (oz) laboratory prepared jar, filled to minimize headspace. The samples were placed in an iced cooler pending transport to the analytical laboratory. All sample containers were submitted to either Libby Environmental's mobile laboratory located on the site or to their fixed laboratory in Olympia, Washington, for analysis. Samples were kept cool during transport to the testing laboratory. Chain-of-custody procedures were observed during transport of the samples to the testing laboratory. Equipment used to obtain soil samples was decontaminated prior to each use using a Liqui-Nox[®] solution and a distilled water rinse.

Soil samples were obtained in the field for screening of potential petroleum-related contamination using visual examination and sheen screening. Visual screening consists of observing the soil for stains indicative of petroleum-related contamination. Visual screening generally is more effective when contamination is present in high concentrations or when it is related to heavy petroleum hydrocarbons. Water sheen screening involves placing soil in water and observing the water surface for signs of sheen. Sheen classifications are as follows:

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

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

GROUNDWATER MONITORING

Monitoring Well Completion

Each well is a one-inch-diameter, schedule 40 polyvinyl chloride (PVC) well casing in the direct-push borings. The eight shallow wells have approximately 10-foot-long, machine-slotted (0.010-inch slot width), pre-packed screens positioned within the zone of seasonal groundwater fluctuation. The two deep wells have shorter screens (approximately 5 feet long) positioned at the bottom of the casings, directly on top of the glacial till. The pre-packed sand filter adjacent to the well screen were comprised of 10/20 silica sand. When necessary, additional 10/20 silica sand was placed around the filter pack and solid well casing to a depth approximately 2 feet above the top of the screen. Hydrated bentonite was placed above the sand pack to form a surface seal. A traffic-rated, above-ground or a flush-mount monument was placed at the top of the casing, depending on the location of the well on the subject property. Protective bollards were placed around each above-ground monument.

Monitoring Well Development

Each of the monitoring wells was developed immediately after completion by purging with a submersible pump and dedicated tubing. Development activities at each well were continued until at least 10 well volumes of water were purged, turbidity was less than 50 nephelometric turbidity unit (NTU) or the well went dry, whichever occurred first. Following development the wells were allowed to sit for at least 24 hours before they were sampled.

Depth to Groundwater

The depths to the groundwater table relative to ground surface were measured using an electric water level indicator. The electric indicator was cleaned with a Liqui-Nox® solution wash and a distilled water rinse prior to use in each well. The presence or absence of free product was noted in each well and used a stainless steel rod or plugged dedicated tubing for dense non-aqueous phase liquids (DNAPL).

Groundwater Sampling

Groundwater samples were obtained with a peristaltic pump, new plastic tubing, a flow-through cell and water parameter analyzer after at least three well volumes of water were removed from each well casing, the well was purged dry or monitored parameters such as dissolved oxygen, temperature and conductivity stabilized over time indicating that groundwater from outside of the well casing is being removed from the well. The water samples were transferred in the field to laboratory-prepared sample containers and kept cool during transport to the testing laboratory. The sample containers were filled completely to eliminate headspace in the container. Chain-of-custody procedures were followed in transporting the water samples to the testing laboratory.

MONITORING WELL SURVEYING

The elevation of each monitoring well casing was surveyed relative to an assumed site datum (the top of the sewer cap) using a laser level (not a licensed professional survey).

SEDIMENT SAMPLING PROCEDURES

Sediment coring locations were measured in the field using a handheld Trimble GPS unit. Sediment cores were obtained using a vibracore sediment sampling device.

Sediment samples were obtained in one-foot sections below mudline for characterization and field screening. Sediment cores were held on the boat deck for later processing on shore (following completion of remaining coring locations).

A stainless steel trowel was used to obtain samples from the sediment cores. Samples were homogenized in a stainless steel bowl prior to placing into laboratory-supplied sample containers. Samples were placed into a cooler with ice and submitted under chain-of-custody procedures to Analytical Resources Inc. (Tukwila, Washington) for chemical analytical testing.

SOIL CLASSIFICATION CHART

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

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

Sampler Symbol Descriptions

	2.4-inch I.D. split barrel
	Standard Penetration Test (SPT)
	Shelby tube
	Piston
	Direct-Push
	Bulk or grab

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

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

ADDITIONAL MATERIAL SYMBOLS

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



Measured groundwater level in exploration, well, or piezometer



Groundwater observed at time of exploration



Perched water observed at time of exploration



Measured free product in well or piezometer

Stratigraphic Contact



Distinct contact between soil strata or geologic units



Gradual change between soil strata or geologic units



Approximate location of soil strata change within a geologic soil unit

Laboratory / Field Tests

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

Sheen Classification

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

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

KEY TO EXPLORATION LOGS

Logged by: JAS

Surface Elevation (ft): _____

[illegible]

Notes: See Figure A-1 for explanation of symbols.

The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

LOG OF TEST PIT TP-1



Project: Rayonier, Former Sekiu Log Sorting Yard

Project Location: Sekiu, Washington

Project Number: 0137-018-00

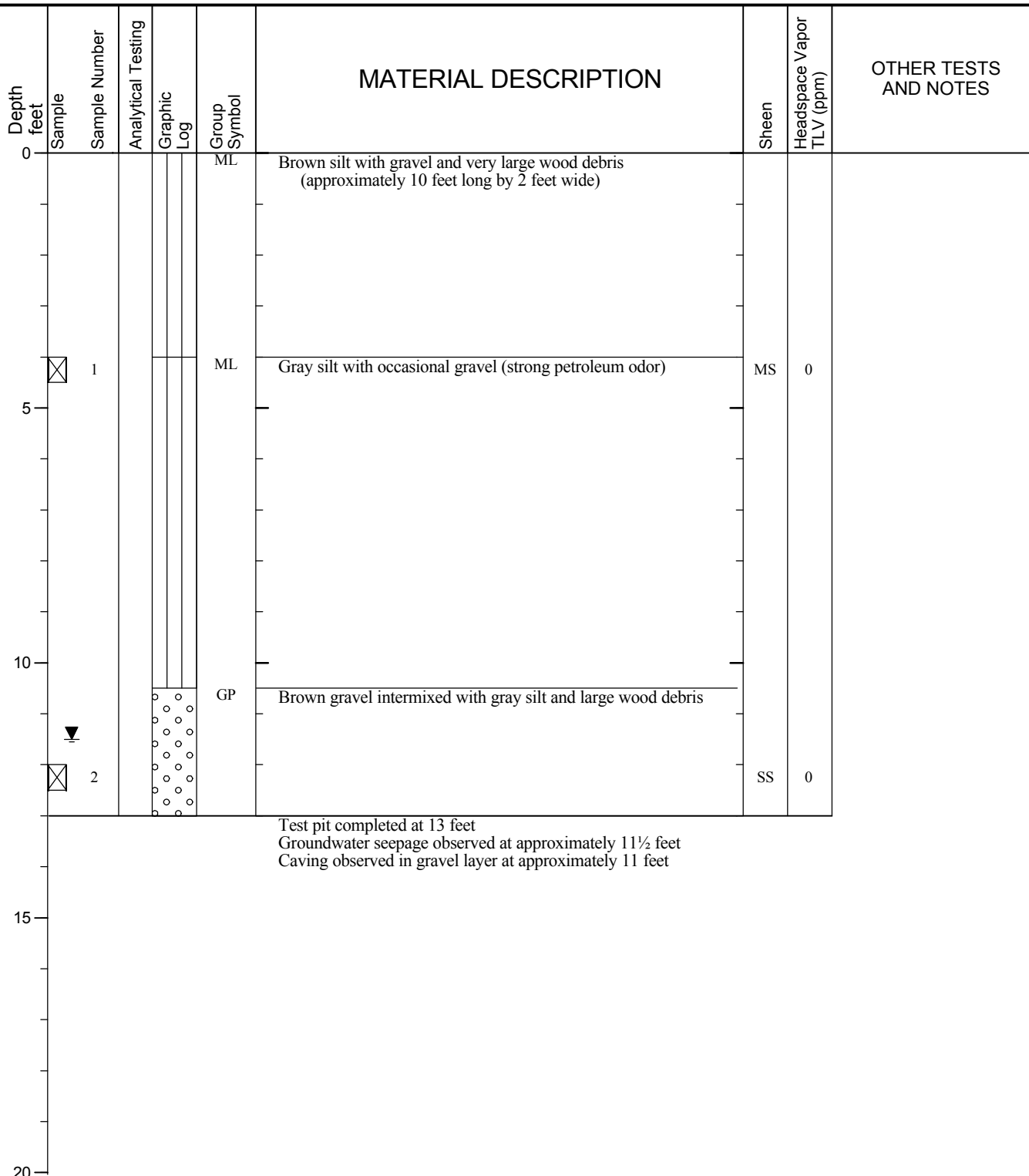
Figure A-2
Sheet 1 of 1

Date Excavated: 10/22/08

Logged by: JAS

Equipment: Backhoe

Surface Elevation (ft):



Notes: See Figure A-1 for explanation of symbols.

The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

LOG OF TEST PIT TP-2

Project: Rayonier, Former Sekiu Log Sorting Yard
 Project Location: Sekiu, Washington
 Project Number: 0137-018-00

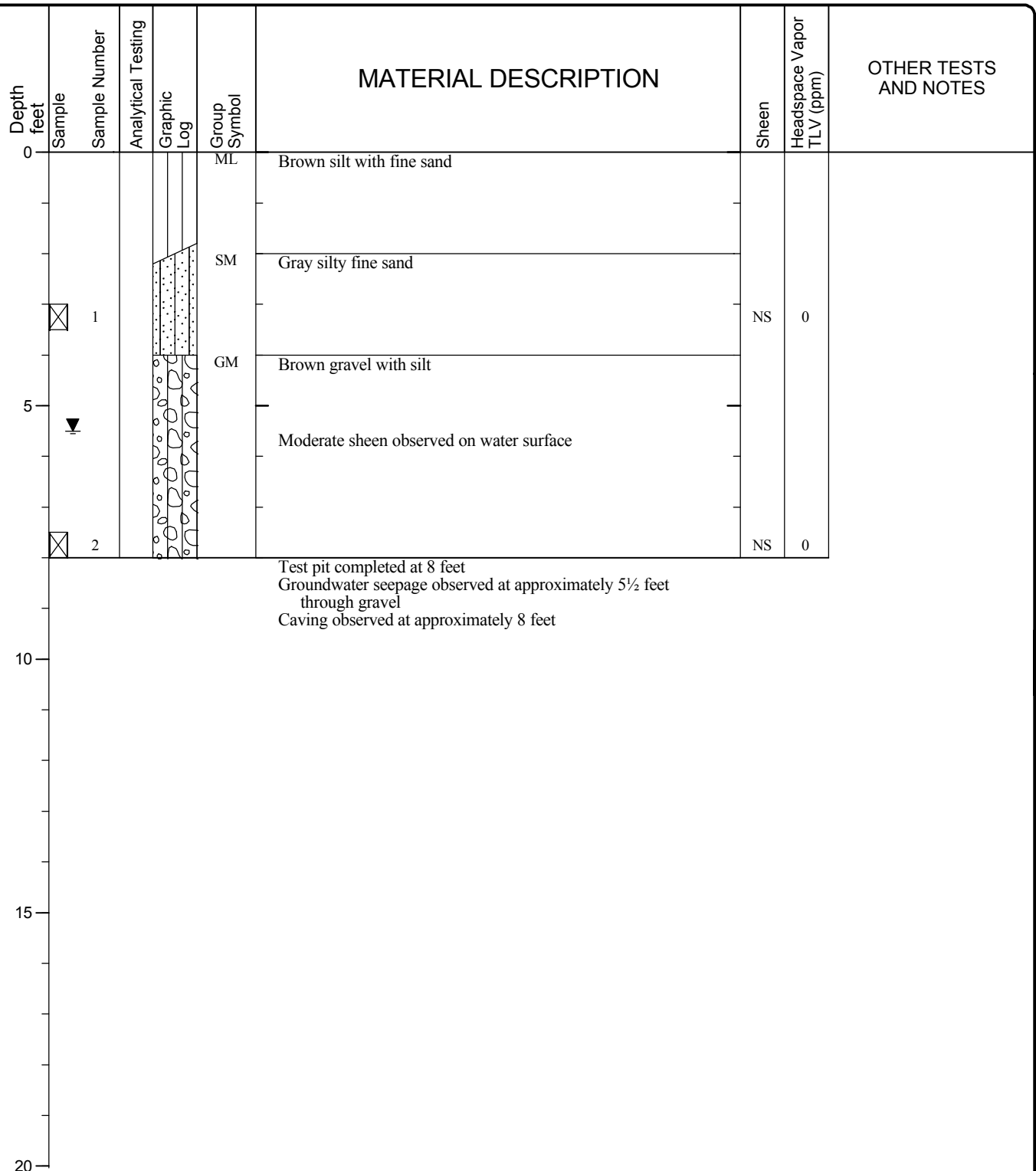
Figure A-3
 Sheet 1 of 1

Date Excavated: 10/22/08

Logged by: JAS

Equipment: Backhoe

Surface Elevation (ft):



Notes: See Figure A-1 for explanation of symbols.

The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

LOG OF TEST PIT TP-3

Project: Rayonier, Former Sekiu Log Sorting Yard

Project Location: Sekiu, Washington

Project Number: 0137-018-00

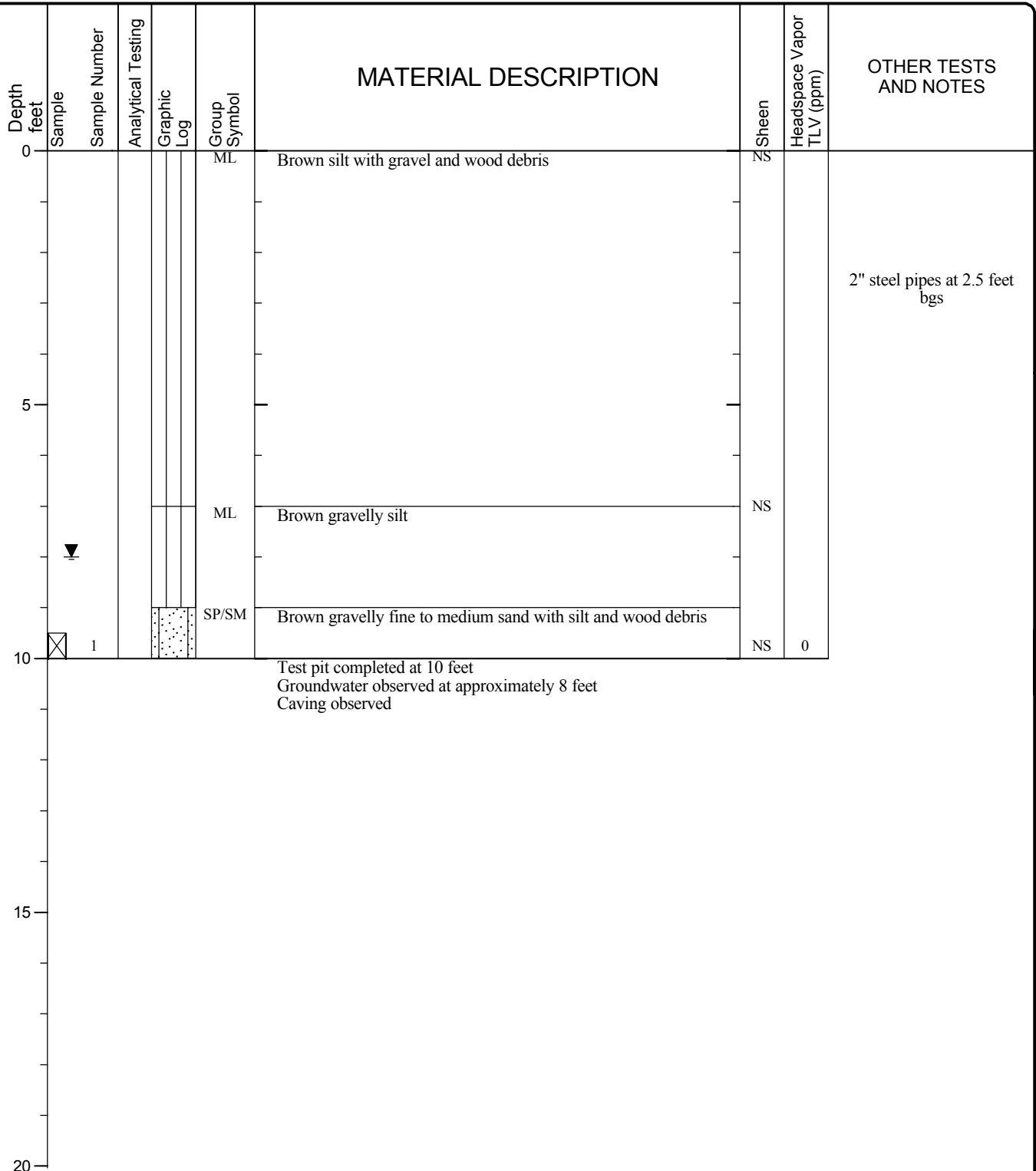
Figure A-4
Sheet 1 of 1

Date Excavated: 10/22/08

Logged by: JAS

Equipment: Backhoe

Surface Elevation (ft):



Notes: See Figure A-1 for explanation of symbols.

The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

LOG OF TEST PIT TP-4



Project: Rayonier, Former Sekiu Log Sorting Yard

Project Location: Sekiu, Washington

Project Number: 0137-018-00

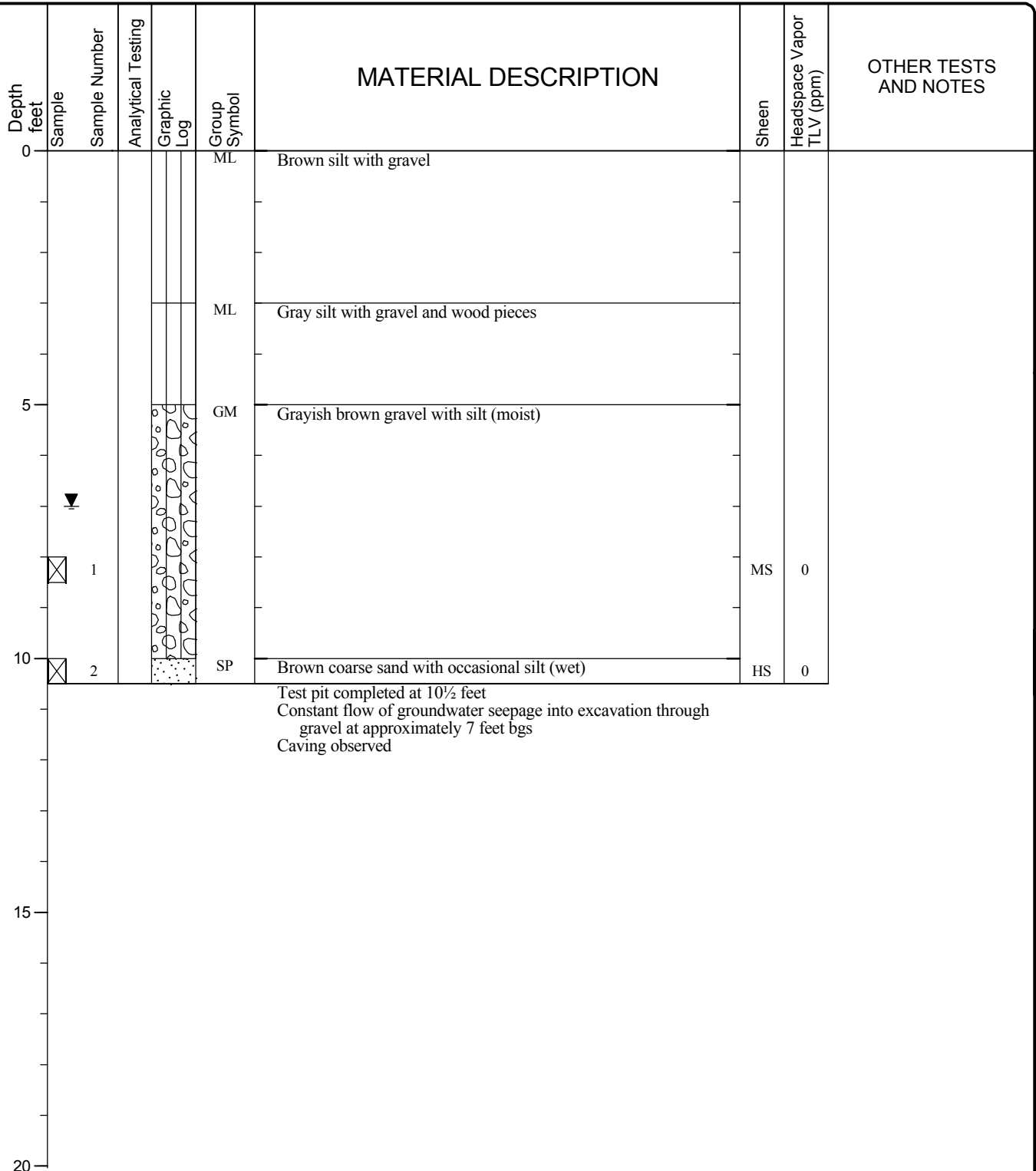
Figure A-5
Sheet 1 of 1

Date Excavated: 10/22/08

Logged by: JAS

Equipment: Backhoe

Surface Elevation (ft):



Notes: See Figure A-1 for explanation of symbols.

The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

LOG OF TEST PIT TP-5



Project: Rayonier, Former Sekiu Log Sorting Yard

Project Location: Sekiu, Washington

Project Number: 0137-018-00

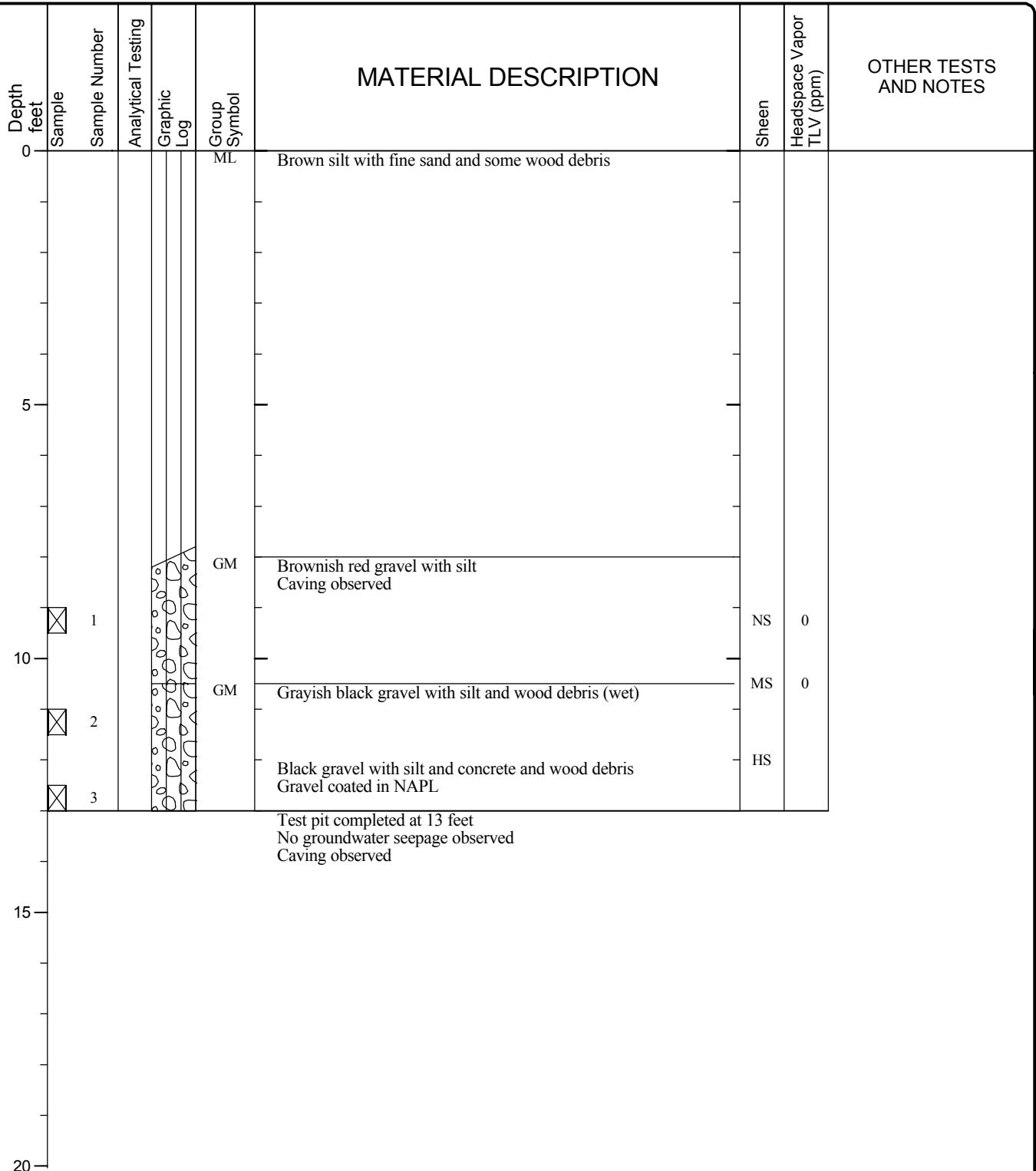
Figure A-6
Sheet 1 of 1

Date Excavated: 10/22/08

Logged by: JAS

Equipment: Backhoe

Surface Elevation (ft):



Notes: See Figure A-1 for explanation of symbols.

The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

LOG OF TEST PIT TP-6



Project: Rayonier, Former Sekiu Log Sorting Yard
 Project Location: Sekiu, Washington
 Project Number: 0137-018-00

Figure A-7
 Sheet 1 of 1

Date Excavated: 10/22/08

Logged by: JAS

Equipment: Backhoe

Surface Elevation (ft):

Depth feet	Sample	Sample Number	Analytical Testing	Graphic Log	Group Symbol	MATERIAL DESCRIPTION	Sheen	Headspace Vapor TLV (ppm)	OTHER TESTS AND NOTES
0					GM	Brown silty gravel with occasional wood debris (dry)			
5						Metal debris and concrete pieces			
10	☒	1					NS	0	
15									
20									

Notes: See Figure A-1 for explanation of symbols.

The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

LOG OF TEST PIT TP-7



Project: Rayonier, Former Sekiu Log Sorting Yard

Project Location: Sekiu, Washington

Project Number: 0137-018-00

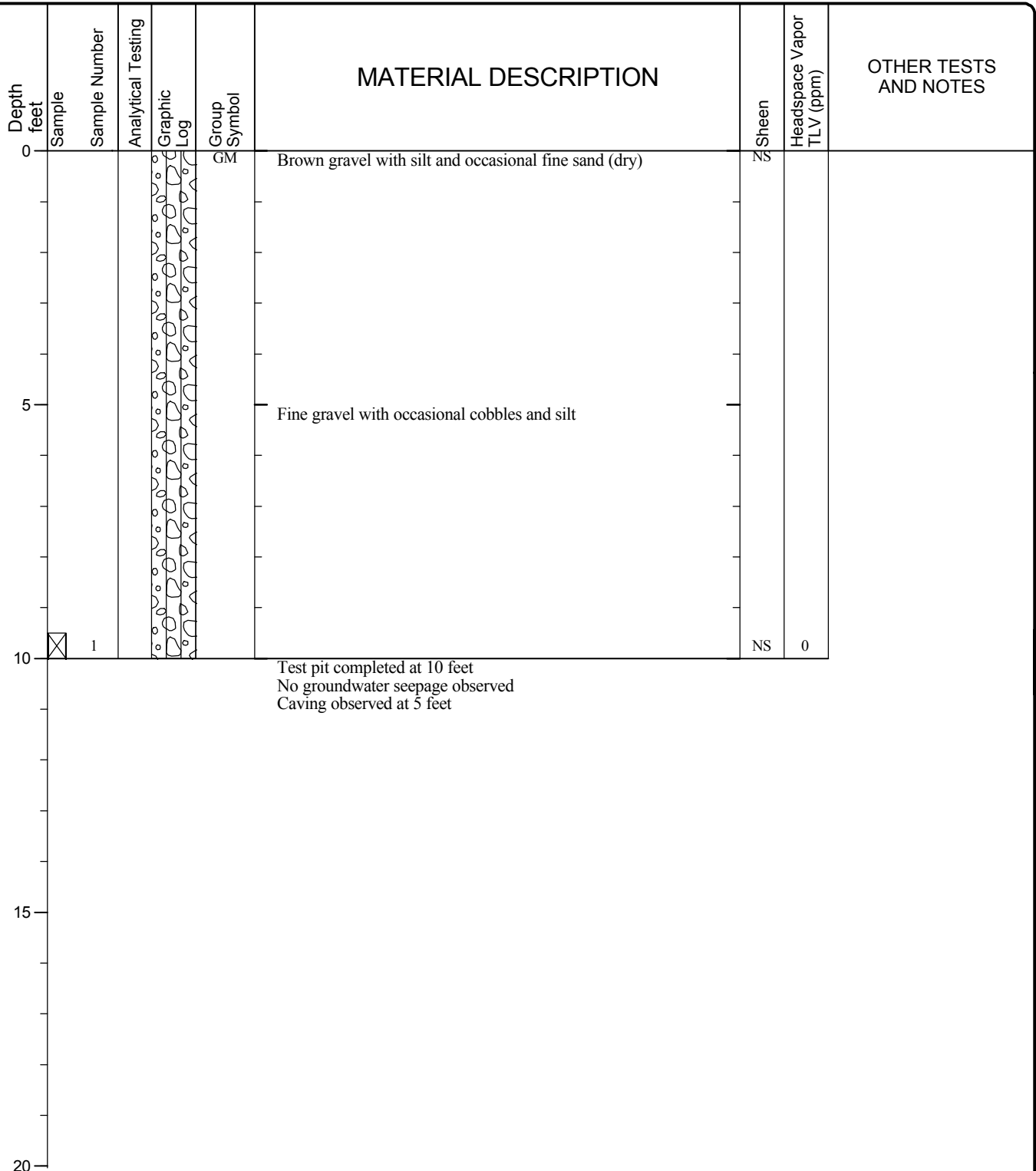
Figure A-8
Sheet 1 of 1

Date Excavated: 10/22/08

Logged by: JAS

Equipment: Backhoe

Surface Elevation (ft):



Notes: See Figure A-1 for explanation of symbols.

The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

LOG OF TEST PIT TP-8



Project: Rayonier, Former Sekiu Log Sorting Yard

Project Location: Sekiu, Washington

Project Number: 0137-018-00

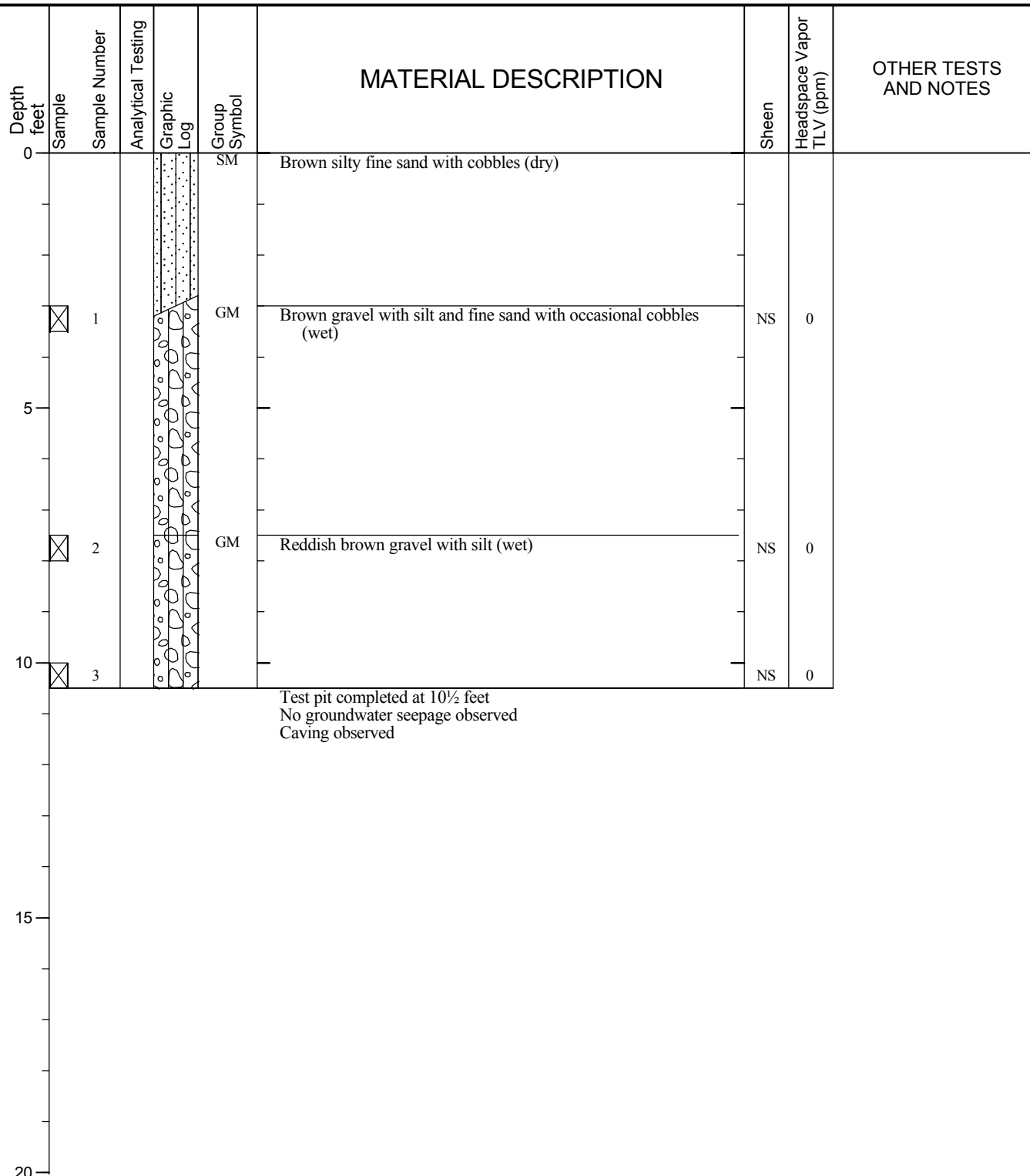
Figure A-9
Sheet 1 of 1

Date Excavated: 10/22/08

Logged by: JAS

Equipment: Backhoe

Surface Elevation (ft):



Notes: See Figure A-1 for explanation of symbols.

The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

LOG OF TEST PIT TP-9

Project: Rayonier, Former Sekiu Log Sorting Yard
 Project Location: Sekiu, Washington
 Project Number: 0137-018-00

Figure A-10
 Sheet 1 of 1

Date Excavated: 10/22/08

Logged by: JAS

Equipment: Backhoe

Surface Elevation (ft):

Depth feet	Sample	Sample Number	Analytical Testing	Graphic Log	Group Symbol	MATERIAL DESCRIPTION	Sheen	Headspace Vapor TLV (ppm)	OTHER TESTS AND NOTES
0					ML	Brown silt with fine sand			
5	⊗	1				Black silt with fine sand with occasional gravel, concrete pieces (gravel size approximately 6 to 8 inches) and metal debris (dry)	NS	0	
						Brown silt with fine sand and gravel Wood debris and concrete pieces			
10					GP	Brown gravel with silt (wet)			
	⊗	2				Gray gravel with silt and wood debris NAPL coating gravel (dry)			(strong petroleum odor)
	⊗	3				Gray gravel with silt (very wet)	HS	4	(strong petroleum odor)
	⊗	4					HS	4	
15						Test pit completed at 14.5 feet Groundwater seepage observed at approximately 13 feet bgs Caving observed	HS		
20									

Notes: See Figure A-1 for explanation of symbols.

The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

LOG OF TEST PIT TP-10



Project: Rayonier, Former Sekiu Log Sorting Yard

Project Location: Sekiu, Washington

Project Number: 0137-018-00

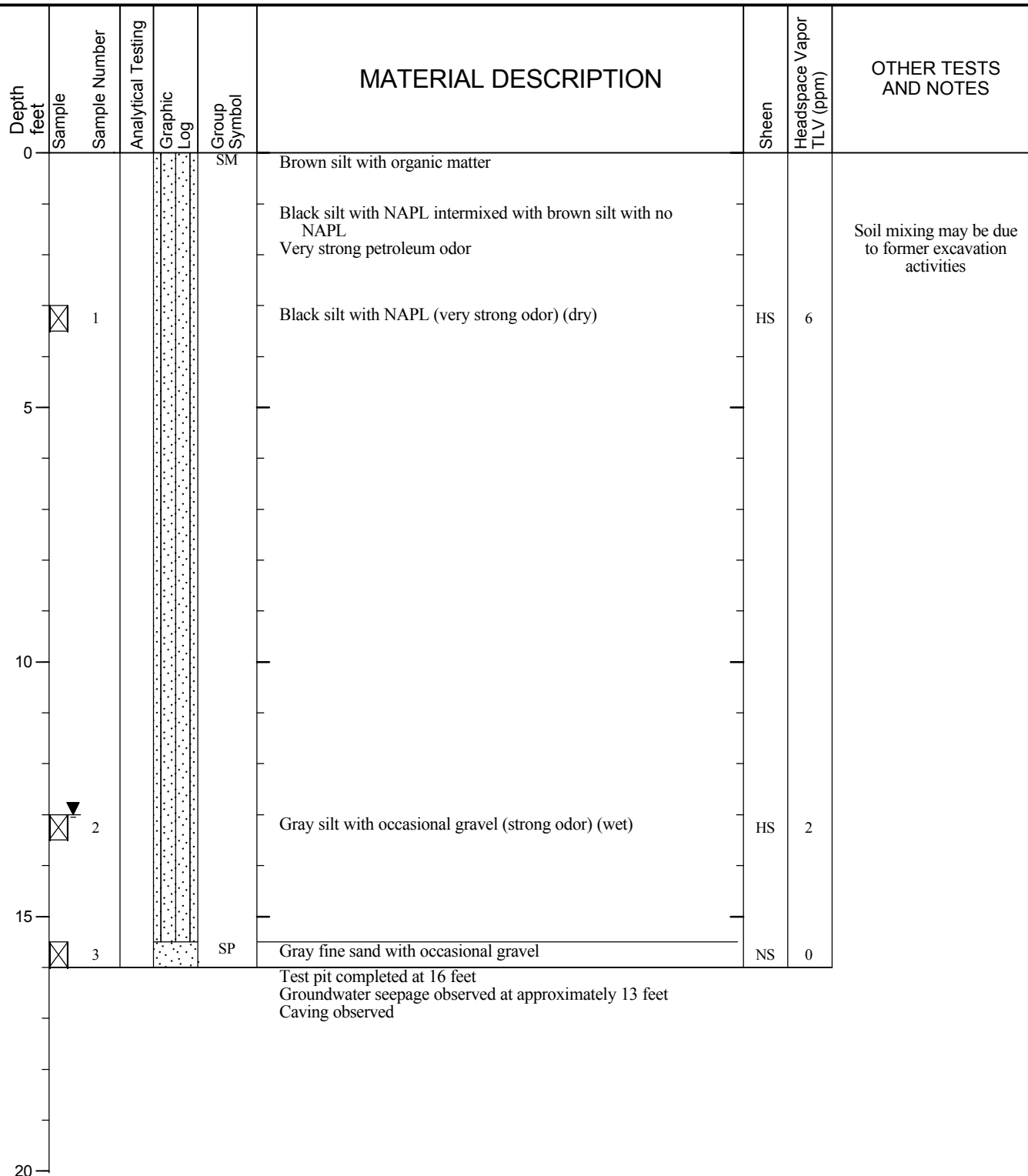
Figure A-11
Sheet 1 of 1

Date Excavated: 10/22/08

Logged by: JAS

Equipment: Backhoe

Surface Elevation (ft):



Notes: See Figure A-1 for explanation of symbols.

The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

LOG OF TEST PIT TP-11



Project: Rayonier, Former Sekiu Log Sorting Yard
 Project Location: Sekiu, Washington
 Project Number: 0137-018-00

Figure A-12
 Sheet 1 of 1

Date Excavated: 10/22/08

Logged by: JAS

Equipment: Backhoe

Surface Elevation (ft):

Depth feet	Sample Number	Analytical Testing	Graphic Log	Group Symbol	MATERIAL DESCRIPTION	Sheen	Headspace Vapor TLV (ppm)	OTHER TESTS AND NOTES
0				ML	Brown silt with fine sand and occasional gravel			
5								
				ML	Grayish black silt with gravel NAPL and groundwater seeping from sidewall at approximately 8 feet			
10	1					HS	6	CA
15								
20								

Notes: See Figure A-1 for explanation of symbols.

The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

LOG OF TEST PIT TP-12



Project: Rayonier, Former Sekiu Log Sorting Yard

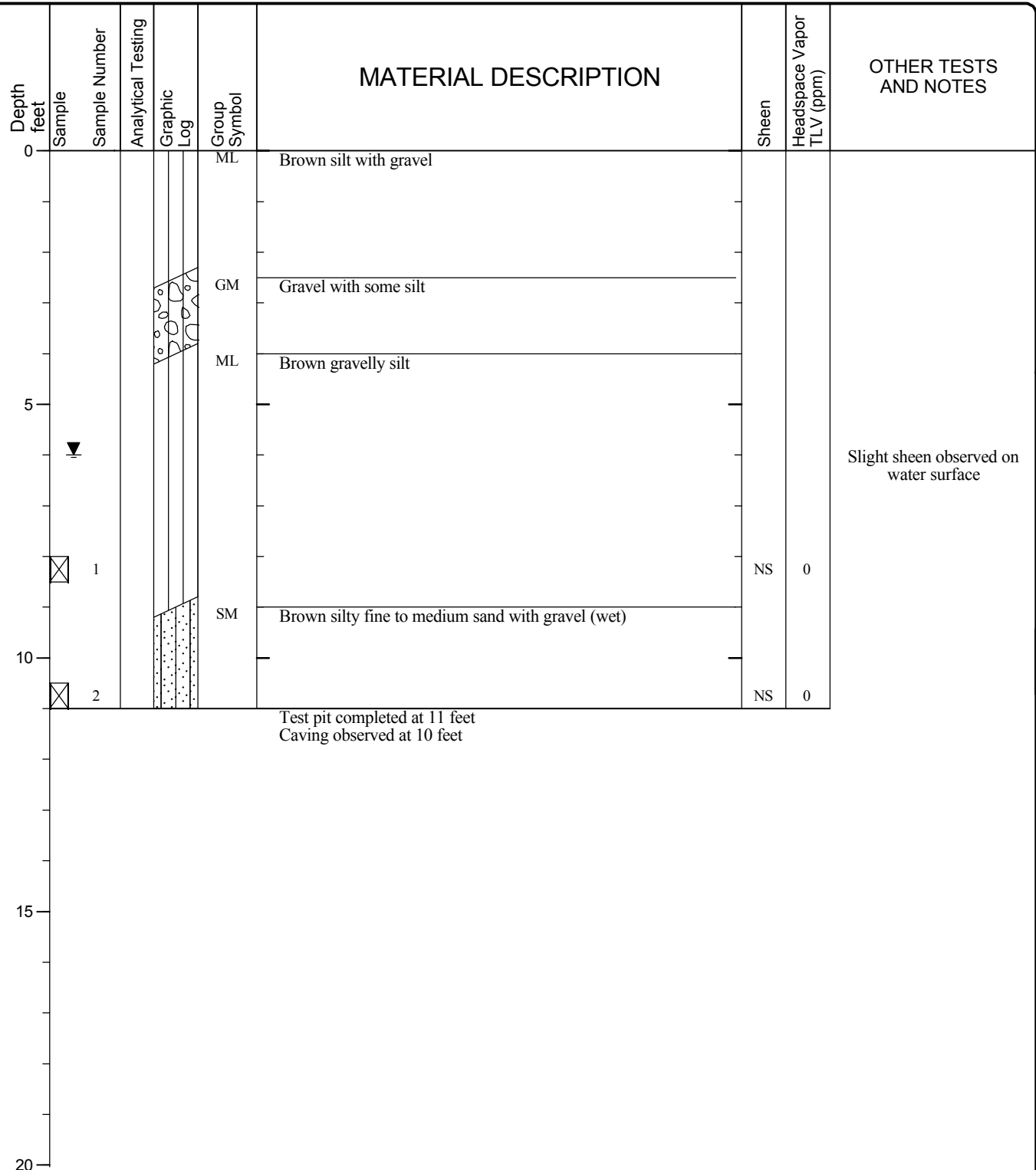
Project Location: Sekiu, Washington

Project Number: 0137-018-00

Figure A-13
Sheet 1 of 1

Logged by: JAS

Surface Elevation (ft): _____



Notes: See Figure A-1 for explanation of symbols.

The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

LOG OF TEST PIT TP-13



Project: Rayonier, Former Sekiu Log Sorting Yard

Project Location: Sekiu, Washington

Project Number: 0137-018-00

Figure A-14
Sheet 1 of 1

Date Excavated: 10/22/08

Logged by: JAS

Equipment: Backhoe

Surface Elevation (ft):

Depth feet	Sample	Sample Number	Analytical Testing	Graphic Log	Group Symbol	MATERIAL DESCRIPTION	Sheen	Headspace Vapor TLV (ppm)	OTHER TESTS AND NOTES
0					ML	Brown silt with fine to coarse gravel and occasional cobbles	NS		
5					ML	Gray silt with gravel	NS	0	
					ML	Brown gravelly silt	NS	0	
10					ML	Brown gravelly silt with fine to medium sand			
12 1/2	☒	1					NS	0	

Test pit completed at 12½ feet
 Groundwater seepage observed at 6½ feet
 Caving observed at 12½ feet

Notes: See Figure A-1 for explanation of symbols.

The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

LOG OF TEST PIT TP-14

Project: Rayonier, Former Sekiu Log Sorting Yard
 Project Location: Sekiu, Washington
 Project Number: 0137-018-00

Figure A-15
 Sheet 1 of 1

Date Excavated: 10/22/08

Logged by: JAS

Equipment: Backhoe

Surface Elevation (ft):

Depth feet	Sample Number	Analytical Testing	Graphic Log	Group Symbol	MATERIAL DESCRIPTION	Sheen	Headspace Vapor TLV (ppm)	OTHER TESTS AND NOTES
0				ML	Brown silt with gravel and subangular cobbles	NS	0	
5				GM	Brown gravel with silt (round, coarse gravel) (dry)	NS	0	
10					Test pit completed at 8 feet due to caving No groundwater seepage observed Caving observed			
15								
20								

Notes: See Figure A-1 for explanation of symbols.

The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

LOG OF TEST PIT TP-15

Project: Rayonier, Former Sekiu Log Sorting Yard

Project Location: Sekiu, Washington

Project Number: 0137-018-00

Figure A-16
Sheet 1 of 1

Date Excavated: 10/22/08

Logged by: JAS

Equipment: Backhoe

Surface Elevation (ft):

Depth feet	Sample	Sample Number	Analytical Testing	Graphic Log	Group Symbol	MATERIAL DESCRIPTION	Sheen	Headspace Vapor TLV (ppm)	OTHER TESTS AND NOTES
0					ML	Brown silt with gravel and cobbles			
5	☒	1			ML	Gray silt with gravel, glass pieces, concrete pieces and wood debris (strong petroleum odor)	SS	0	
					GM	Gray silty gravel with metal pipes (very strong petroleum odor)			
					GM	Black silty gravel with wood debris (very strong petroleum odor)			
10	☒	2				Approximately 6 foot long piece of wood coated in NAPL	HS	11	
					GM	Gray silty gravel with NAPL (wet)			
15	☒	3				Test pit completed at 15 feet Groundwater seepage observed at 14 feet Caving observed at 15 feet	HS	2	
20									

Notes: See Figure A-1 for explanation of symbols.

The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

LOG OF TEST PIT TP-16



Project: Rayonier, Former Sekiu Log Sorting Yard

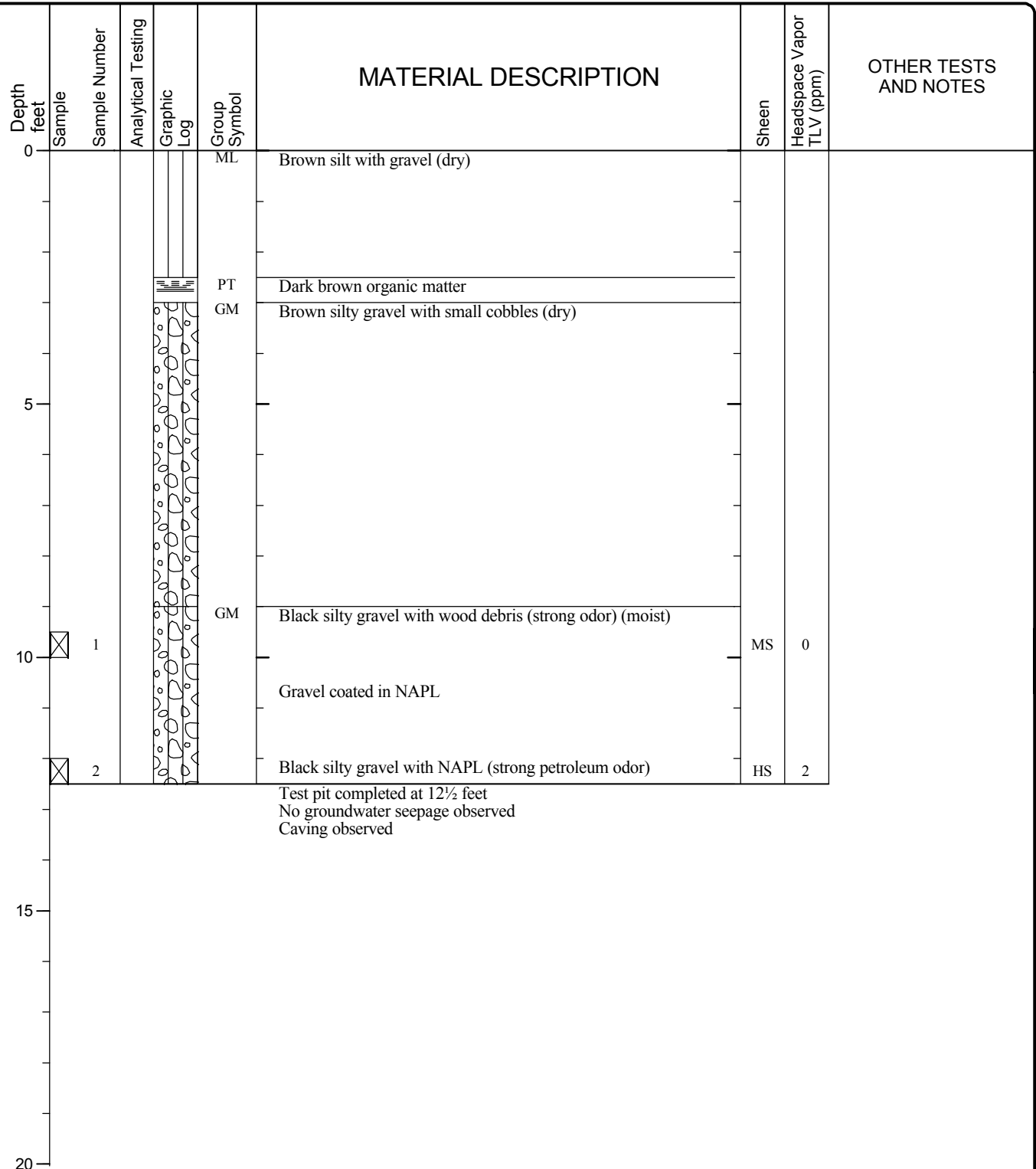
Project Location: Sekiu, Washington

Project Number: 0137-018-00

Figure A-17
Sheet 1 of 1

Logged by: JAS

Surface Elevation (ft): _____



Notes: See Figure A-1 for explanation of symbols.

The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

LOG OF TEST PIT TP-17



Project: Rayonier, Former Sekiu Log Sorting Yard

Project Location: Sekiu, Washington

Project Number: 0137-018-00

Figure A-18
Sheet 1 of 1

Date Excavated: 10/22/08

Logged by: JAS

Equipment: Backhoe

Surface Elevation (ft):

Depth feet	Sample Number	Analytical Testing	Graphic Log	Group Symbol	MATERIAL DESCRIPTION	Sheen	Headspace Vapor TLV (ppm)	OTHER TESTS AND NOTES
0				ML	Light brown silt with occasional gravel			
5								
10					Brown gravelly silt			
	1				Brownish gray gravelly silt	NS	0	
					Brownish gray gravelly silt with fine sand			
15								
	2					NS	0	
20					Test pit completed at 16 feet No groundwater seepage observed Caving observed at 16 feet			

Notes: See Figure A-1 for explanation of symbols.

The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

LOG OF TEST PIT TP-18



Project: Rayonier, Former Sekiu Log Sorting Yard
 Project Location: Sekiu, Washington
 Project Number: 0137-018-00

Figure A-19
 Sheet 1 of 1

Date Excavated: 10/22/08

Logged by: JAS

Equipment: Backhoe

Surface Elevation (ft):

Depth feet	Sample	Sample Number	Analytical Testing	Graphic Log	Group Symbol	MATERIAL DESCRIPTION	Sheen	Headspace Vapor TLV (ppm)	OTHER TESTS AND NOTES
0					ML	Brown gravelly silt (dry)			
	☒	1					NS	0	2" steel pipes at 2.5 feet bgs
5						Test pit completed at 5 feet No groundwater seepage observed No caving observed			
10									
15									
20									

Notes: See Figure A-1 for explanation of symbols.

The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

LOG OF TEST PIT TP-19



Project: Rayonier, Former Sekiu Log Sorting Yard

Project Location: Sekiu, Washington

Project Number: 0137-018-00

Figure A-20
Sheet 1 of 1

Logged by: JAS

Surface Elevation (ft): _____

[illegible]

Notes: See Figure A-1 for explanation of symbols.

The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 0.5 foot.

LOG OF TEST PIT TP-20



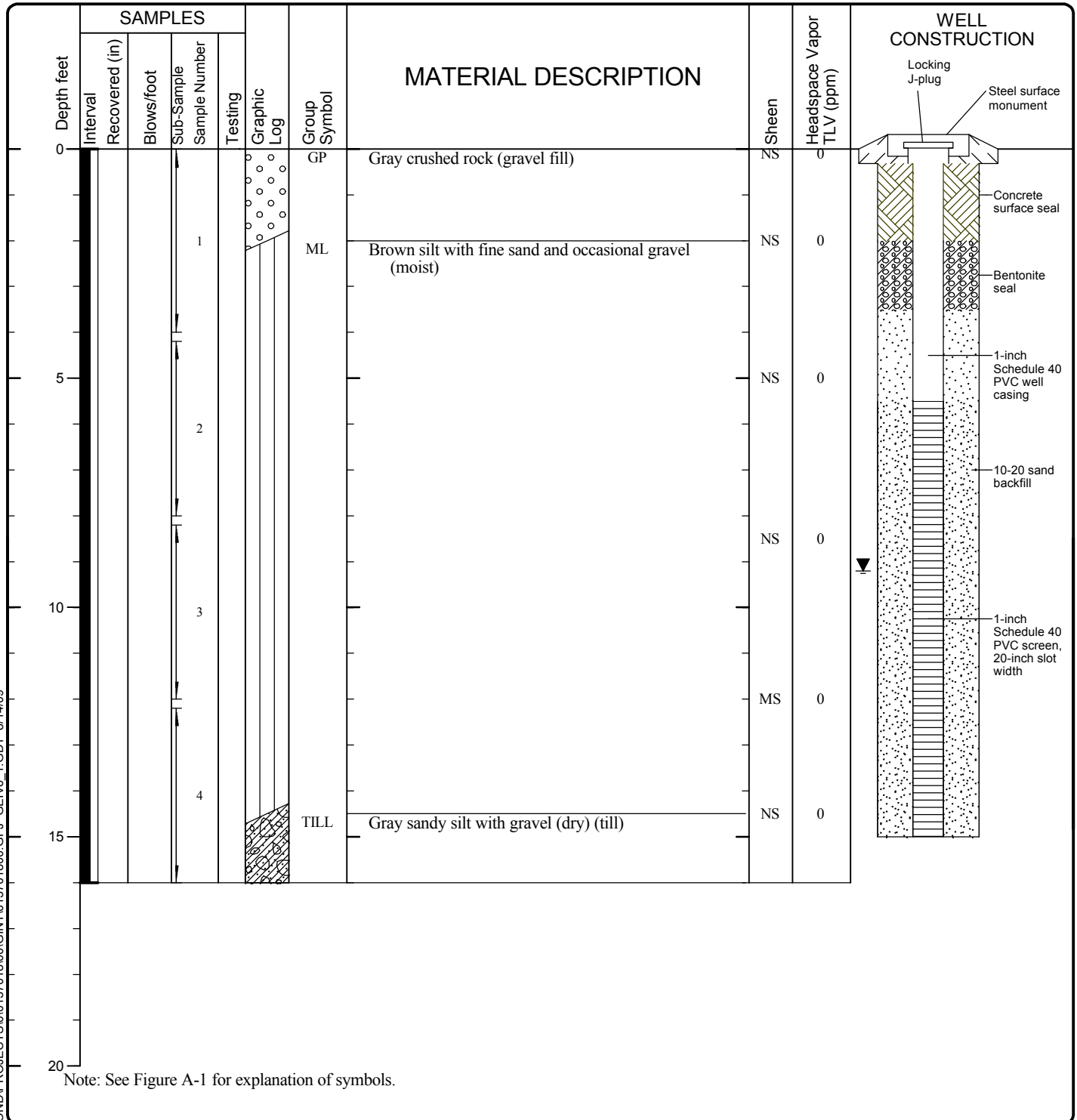
Project: Rayonier, Former Sekiu Log Sorting Yard

Project Location: Sekiu, Washington

Project Number: 0137-018-00

Figure A-21
Sheet 1 of 1

Date(s) Drilled	10/24/08	Logged By	JAS	Checked By	JAS
Drilling Contractor	ESN	Drilling Method	Direct Push	Sampling Methods	Continuous
Auger Data		Hammer Data		Drilling Equipment	
Total Well Depth (ft)	15	Ground Surface Elevation (ft)		Groundwater Level (ft)	9.2
Vertical Datum	N/A	Datum/System	N/A N/A	Easting(x): Northing(y):	



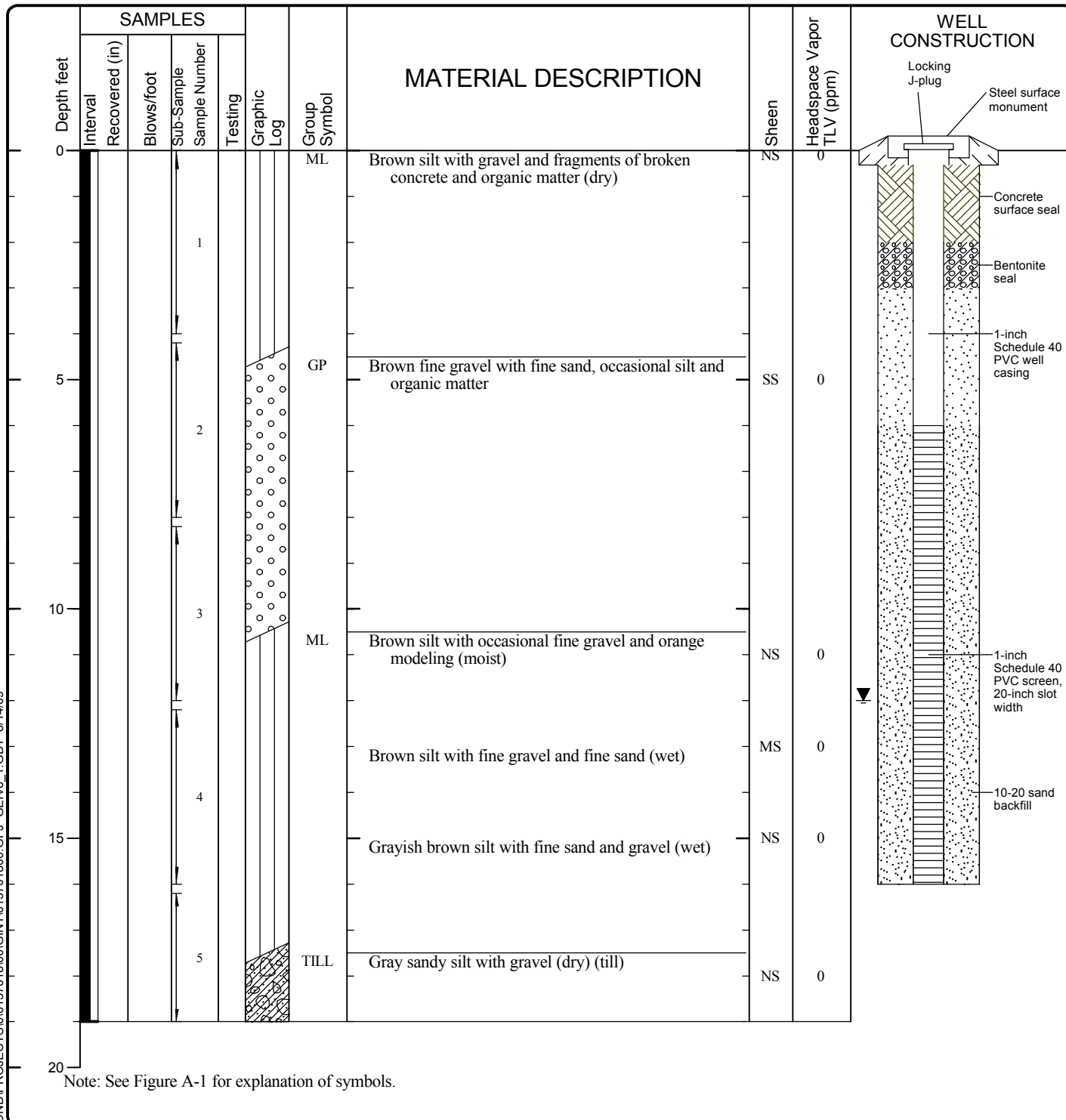
LOG OF MONITORING WELL MW-1



Project: Rayonier, Former Sekiu Log Sorting Yard
 Project Location: Sekiu, Washington
 Project Number: 0137-018-00

Figure A-22
 Sheet 1 of 1

Date(s) Drilled	10/24/08	Logged By	JAS	Checked By	JAS
Drilling Contractor	ESN	Drilling Method	Direct Push	Sampling Methods	Continuous
Auger Data		Hammer Data		Drilling Equipment	
Total Well Depth (ft)	16	Ground Surface Elevation (ft)		Groundwater Level (ft)	12
Vertical Datum	N/A	Datum/System	N/A	Easting(x): Northing(y):	



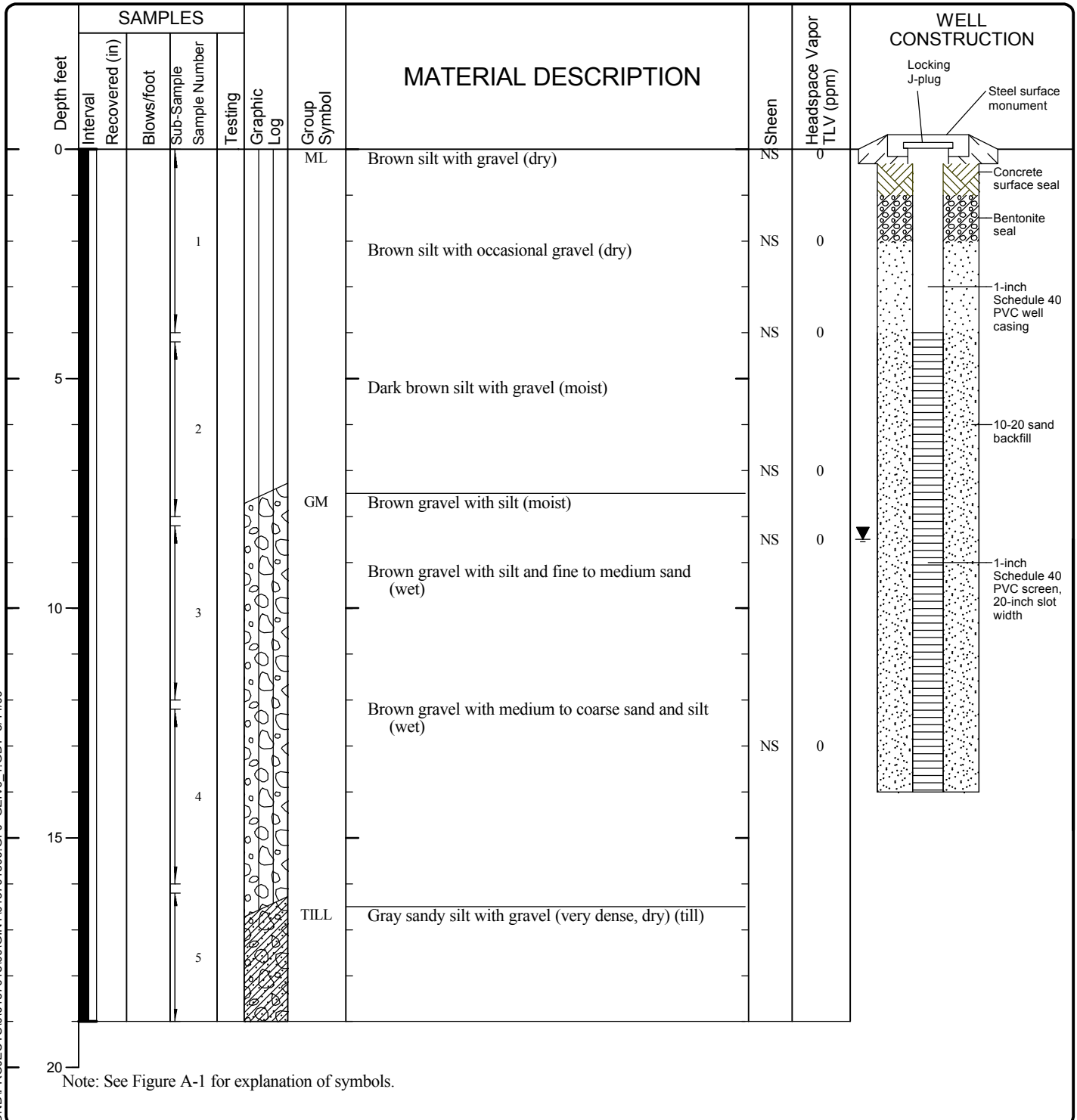
LOG OF MONITORING WELL MW-2



Project: Rayonier, Former Sekiu Log Sorting Yard
 Project Location: Sekiu, Washington
 Project Number: 0137-018-00

Figure A-23
 Sheet 1 of 1

Date(s) Drilled	10/24/08	Logged By	JAS	Checked By	JAS
Drilling Contractor	ESN	Drilling Method	Direct Push	Sampling Methods	Continuous
Auger Data		Hammer Data		Drilling Equipment	
Total Well Depth (ft)	14	Ground Surface Elevation (ft)		Groundwater Level (ft)	8.5
Vertical Datum	N/A	Datum/System	N/A N/A	Easting(x): Northing(y):	



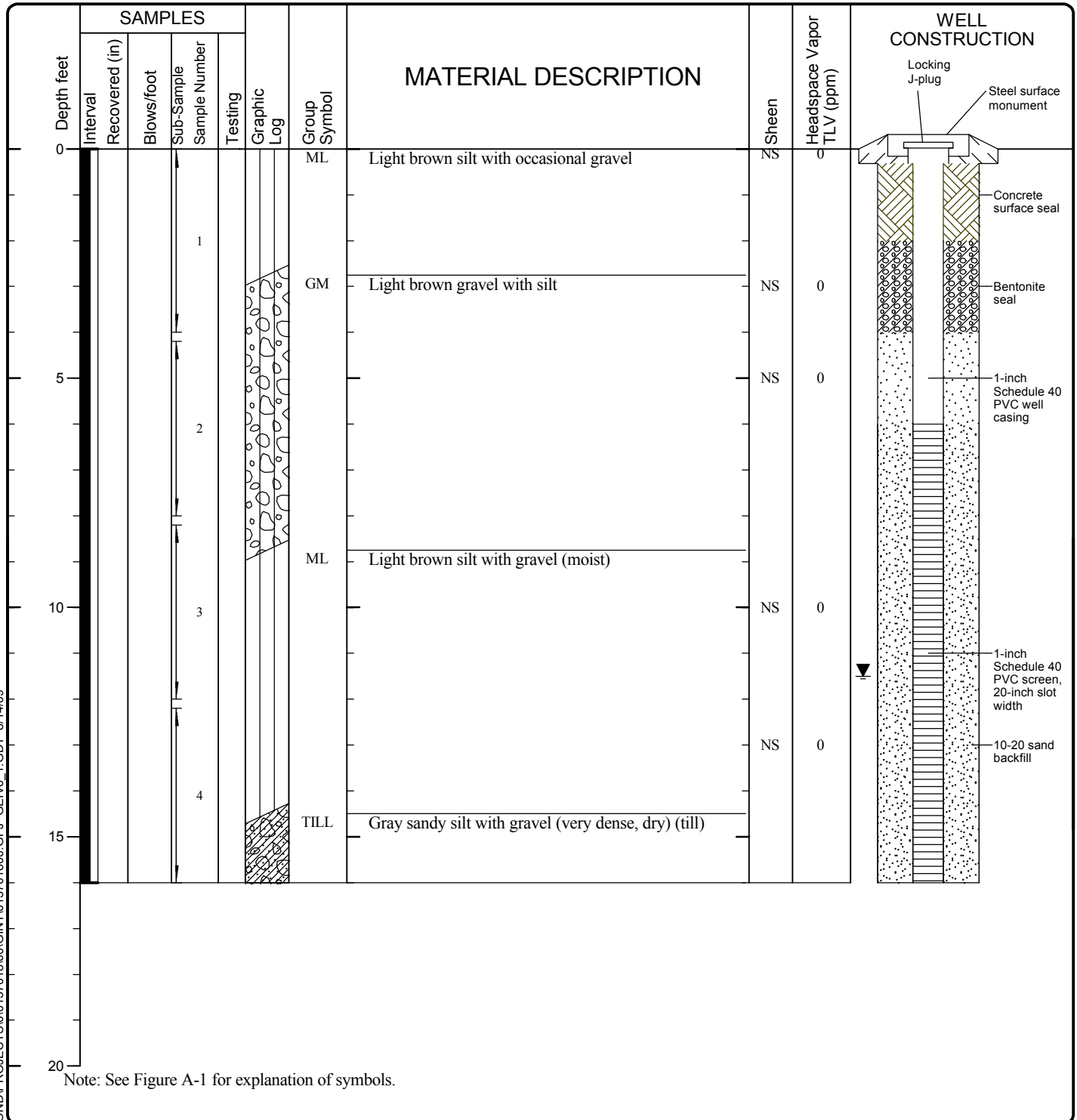
LOG OF MONITORING WELL MW-3



Project: Rayonier, Former Sekiu Log Sorting Yard
 Project Location: Sekiu, Washington
 Project Number: 0137-018-00

Figure A-24
 Sheet 1 of 1

Date(s) Drilled	10/24/08	Logged By	JAS	Checked By	JAS
Drilling Contractor	ESN	Drilling Method	Direct Push	Sampling Methods	Continuous
Auger Data		Hammer Data		Drilling Equipment	
Total Well Depth (ft)	16	Ground Surface Elevation (ft)		Groundwater Level (ft)	11.5
Vertical Datum	N/A	Datum/System	N/A N/A	Easting(x): Northing(y):	



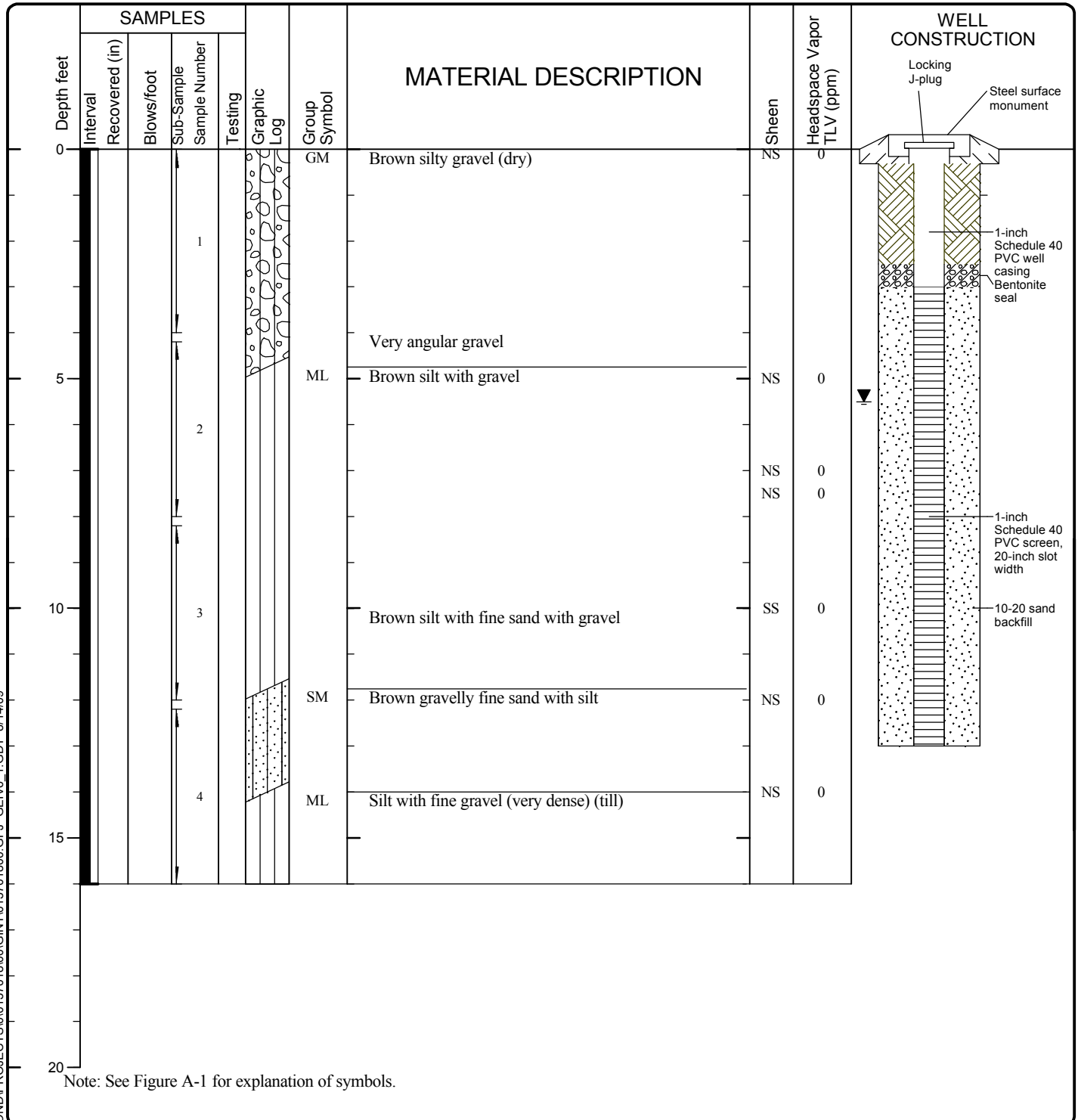
LOG OF MONITORING WELL MW-4



Project: Rayonier, Former Sekiu Log Sorting Yard
 Project Location: Sekiu, Washington
 Project Number: 0137-018-00

Figure A-25
 Sheet 1 of 1

Date(s) Drilled	10/24/08	Logged By	JAS	Checked By	JAS
Drilling Contractor	ESN	Drilling Method	Direct Push	Sampling Methods	Continuous
Auger Data		Hammer Data		Drilling Equipment	
Total Well Depth (ft)	13	Ground Surface Elevation (ft)		Groundwater Level (ft)	5.5
Vertical Datum	N/A	Datum/System	N/A N/A	Easting(x): Northing(y):	



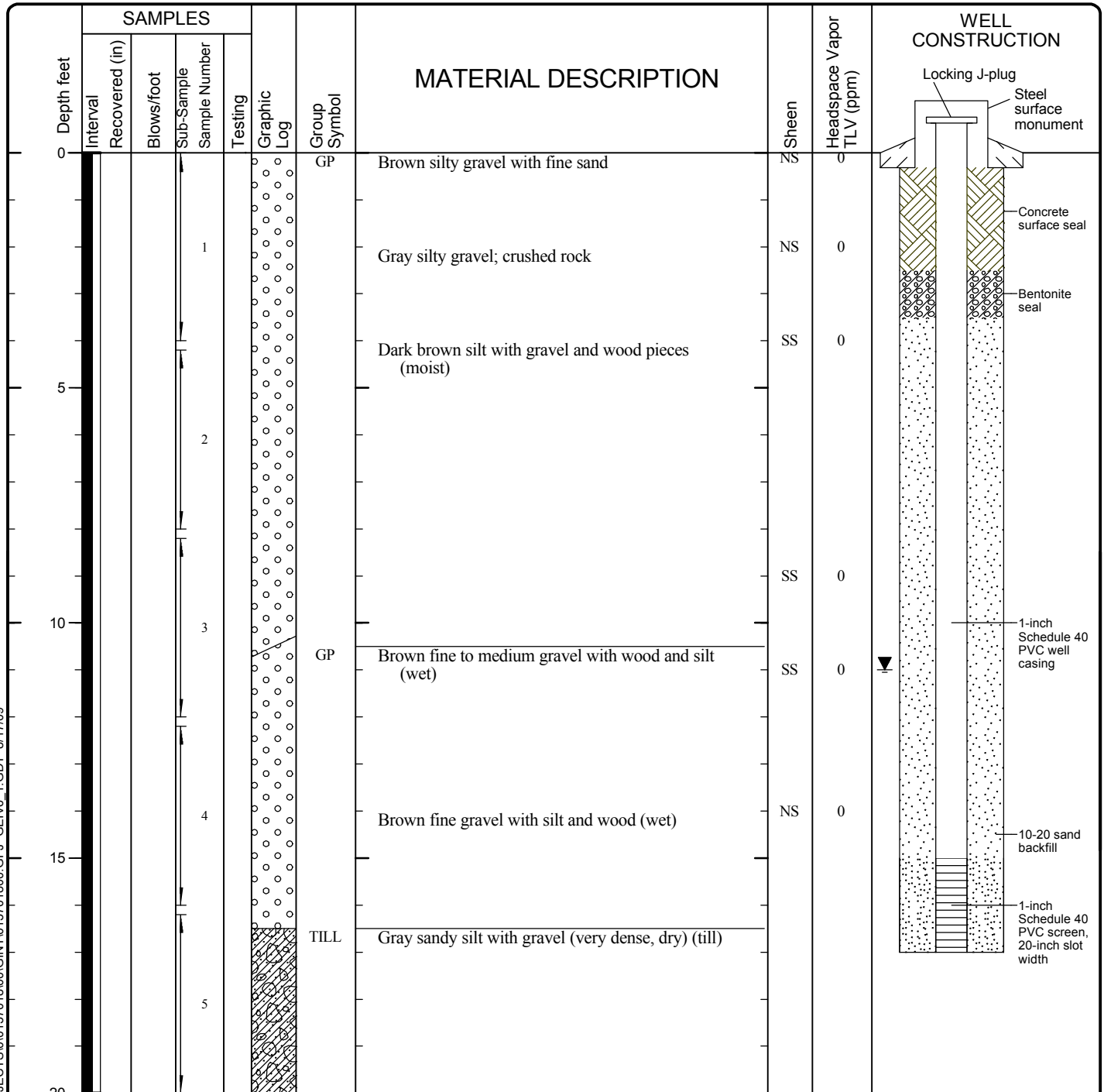
LOG OF MONITORING WELL MW-5



Project: Rayonier, Former Sekiu Log Sorting Yard
 Project Location: Sekiu, Washington
 Project Number: 0137-018-00

Figure A-26
 Sheet 1 of 1

Date(s) Drilled	10/24/08	Logged By	JAS	Checked By	JAS
Drilling Contractor	ESN	Drilling Method	Direct Push	Sampling Methods	Continuous
Auger Data		Hammer Data		Drilling Equipment	
Total Well Depth (ft)	14	Ground Surface Elevation (ft)		Groundwater Level (ft)	11
Vertical Datum	N/A	Datum/System	N/A	Easting(x):	
			N/A	Northing(y):	



Note: See Figure A-1 for explanation of symbols.

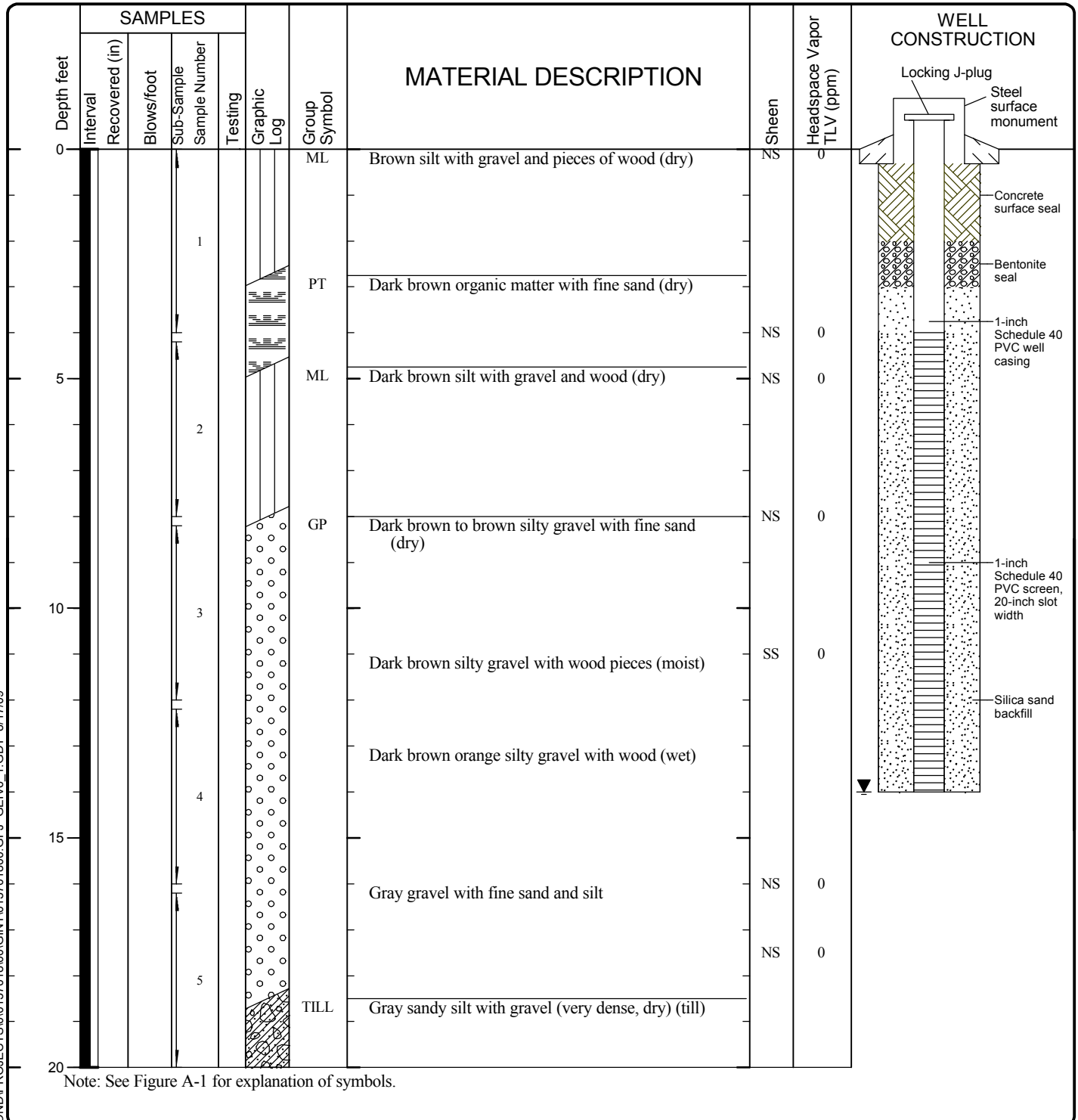
LOG OF MONITORING WELL MW-6S



Project: Rayonier, Former Sekiu Log Sorting Yard
 Project Location: Sekiu, Washington
 Project Number: 0137-018-00

Figure A-27
 Sheet 1 of 1

Date(s) Drilled	10/24/08	Logged By	JAS	Checked By	JAS
Drilling Contractor	ESN	Drilling Method	Direct Push	Sampling Methods	Continuous
Auger Data		Hammer Data		Drilling Equipment	
Total Well Depth (ft)	17	Ground Surface Elevation (ft)		Groundwater Level (ft)	14
Vertical Datum	N/A	Datum/System	N/A N/A	Easting(x): Northing(y):	



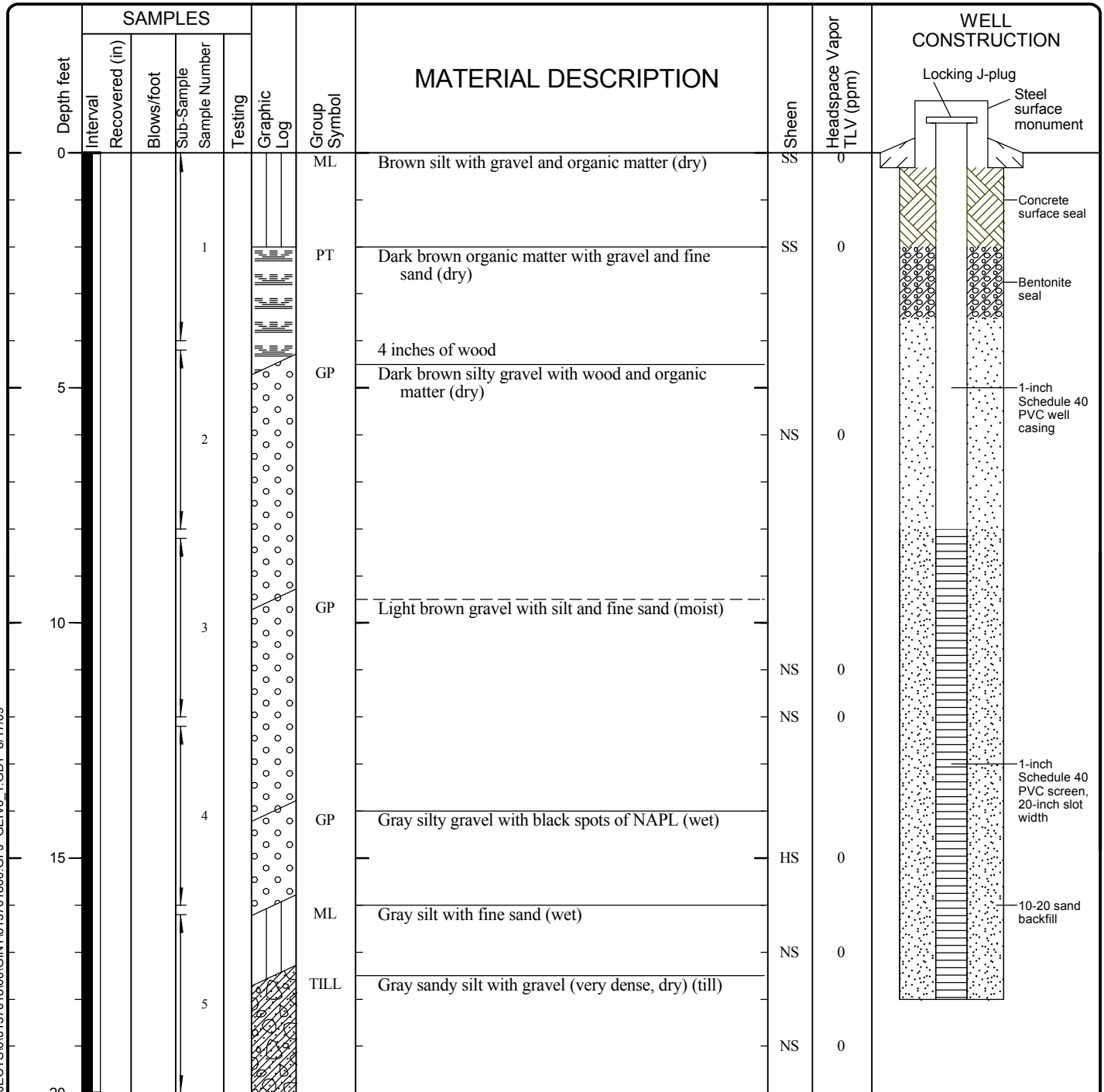
LOG OF MONITORING WELL MW-6D



Project: Rayonier, Former Sekiu Log Sorting Yard
 Project Location: Sekiu, Washington
 Project Number: 0137-018-00

Figure A-28
 Sheet 1 of 1

Date(s) Drilled	10/24/08	Logged By	JAS	Checked By	JAS
Drilling Contractor	ESN	Drilling Method	Direct Push	Sampling Methods	Continuous
Auger Data		Hammer Data		Drilling Equipment	
Total Well Depth (ft)	18	Ground Surface Elevation (ft)		Groundwater Level (ft)	Not Encountered
Vertical Datum	N/A	Datum/System	N/A N/A	Easting(x): Northing(y):	



Note: See Figure A-1 for explanation of symbols.

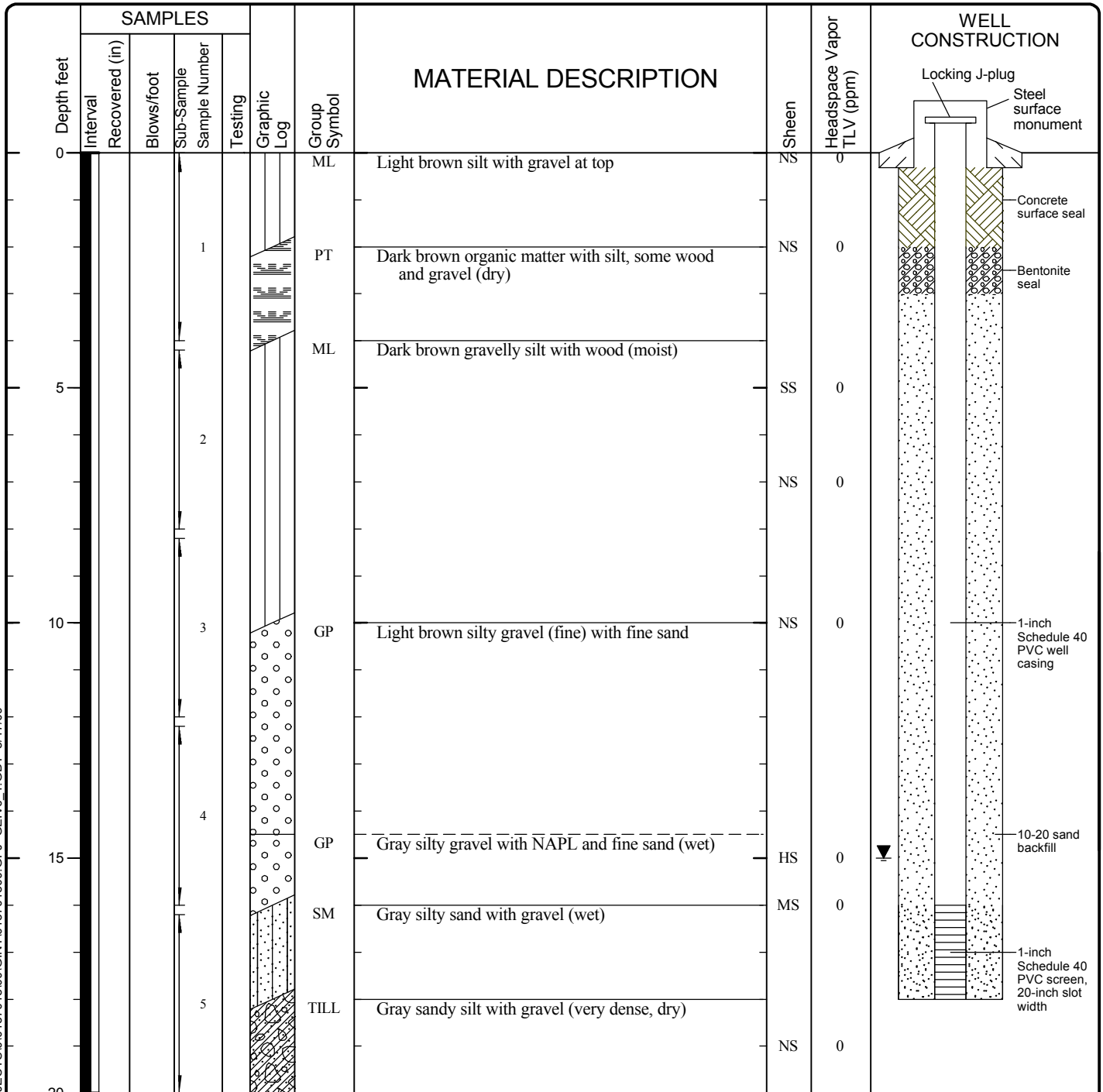
LOG OF MONITORING WELL MW-7S



Project: Rayonier, Former Sekiu Log Sorting Yard
 Project Location: Sekiu, Washington
 Project Number: 0137-018-00

Figure A-29
 Sheet 1 of 1

Date(s) Drilled	10/24/08	Logged By	JAS	Checked By	JAS
Drilling Contractor	ESN	Drilling Method	Direct Push	Sampling Methods	Continuous
Auger Data		Hammer Data		Drilling Equipment	
Total Well Depth (ft)	18	Ground Surface Elevation (ft)		Groundwater Level (ft)	15
Vertical Datum	N/A	Datum/System	N/A N/A	Easting(x): Northing(y):	



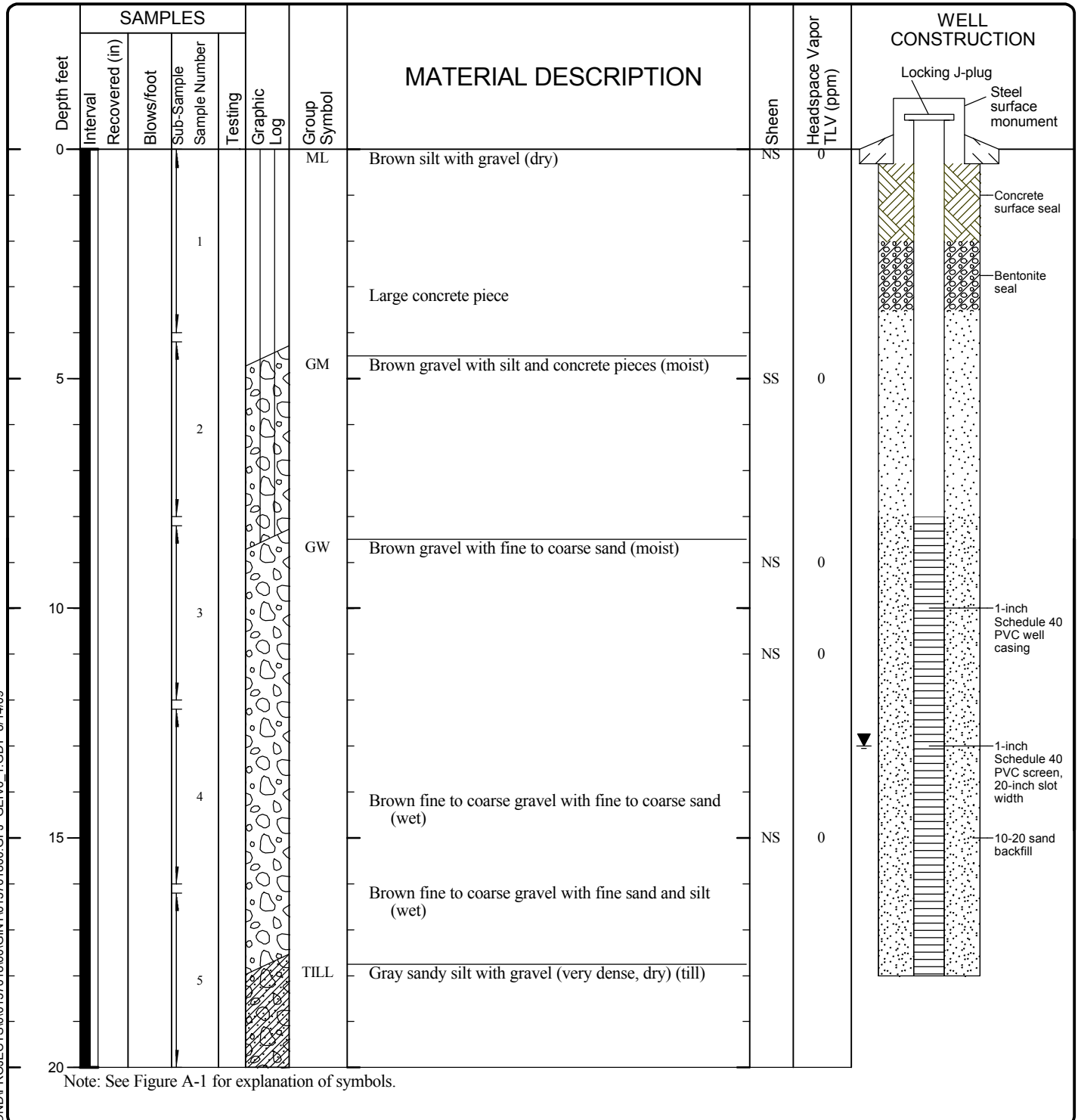
LOG OF MONITORING WELL MW-7D



Project: Rayonier, Former Sekiu Log Sorting Yard
 Project Location: Sekiu, Washington
 Project Number: 0137-018-00

Figure A-30
 Sheet 1 of 1

Date(s) Drilled	10/24/08	Logged By	JAS	Checked By	JAS
Drilling Contractor	ESN	Drilling Method	Direct Push	Sampling Methods	Continuous
Auger Data		Hammer Data		Drilling Equipment	
Total Well Depth (ft)	18	Ground Surface Elevation (ft)		Groundwater Level (ft)	13
Vertical Datum	N/A	Datum/System	N/A N/A	Easting(x): Northing(y):	



LOG OF MONITORING WELL MW-8



Project: Rayonier, Former Sekiu Log Sorting Yard
 Project Location: Sekiu, Washington
 Project Number: 0137-018-00

Figure A-31
 Sheet 1 of 1

Date(s) Drilled	10/24/08	Logged By	JAS	Checked By	JAS
Drilling Contractor	ESN	Drilling Method	Direct Push	Sampling Methods	Continuous
Auger Data		Hammer Data		Drilling Equipment	
Total Depth (ft)	12	Surface Elevation (ft)		Groundwater Level (ft. bgs)	8
Vertical Datum	N/A	Datum/ System	N/A N/A	Easting(x): Northing(y):	

Depth feet	SAMPLES					Water Level	Graphic Log	Group Symbol	MATERIAL DESCRIPTION	Sheen	Headspace Vapor TLV (ppm)	NOTES
	Interval	Recovered (in)	Blows/foot	Sub-Sample Number	Testing							
0								ML	Brown silt with fine sand, gravel and organic matter	NS	0	
1				1								
2				2								
3				3								
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												

Note: See Figure A-1 for explanation of symbols.

LOG OF BORING GEI-9



Project: Rayonier, Former Sekiu Log Sorting Yard
Project Location: Sekiu, Washington
Project Number: 0137-018-00

Figure A-32
Sheet 1 of 1

Date(s) Drilled	2/20/09	Logged By	AJR	Checked By	CDB
Drilling Contractor	Research Support Services	Drilling Method	Vibracore	Sampling Methods	Vibracore 4-inch acrylic sleeve
Auger Data	N/A	Hammer Data	N/A	Drilling Equipment	
Total Depth (ft)	1.5	Surface Elevation (ft)	N/A	Groundwater Level (ft. bgs)	Not Encountered
Vertical Datum	N/A	Datum/ System	N/A N/A	Easting(x): Northing(y):	

Depth feet	SAMPLES					Water Level	Graphic Log	Group Symbol	MATERIAL DESCRIPTION	Sheen	Headspace Vapor TLV (ppm)	NOTES
	Interval	Recovered (in)	Blows/foot	Sub-Sample Number	Testing							
0	18			1				ML/SM	Gray/brown silty fine sand with gravel (very hard) (glacial till)	NS		
Refusal at 1.5 feet below mudline												
5												

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

LOG OF BORING R-2			
	Project:	Rayonier, Former Sekiu Log Sorting Yard	
	Project Location:	Sekiu, Washington	
	Project Number:	0137-018-00	
			FIGURE A-34 Sheet 1 of 1

Date(s) Drilled	2/19/09	Logged By	AJR	Checked By	CDB
Drilling Contractor	Research Support Services	Drilling Method	Vibracore	Sampling Methods	Vibracore 4-inch acrylic sleeve
Auger Data	N/A	Hammer Data	N/A	Drilling Equipment	
Total Depth (ft)	1.5	Surface Elevation (ft)	N/A	Groundwater Level (ft. bgs)	Not Encountered
Vertical Datum	N/A	Datum/ System	N/A N/A	Easting(x): Northing(y):	

Depth feet	SAMPLES					Water Level	Graphic Log	Group Symbol	MATERIAL DESCRIPTION	Sheen	Headspace Vapor TLV (ppm)	NOTES
	Interval	Recovered (in)	Blows/foot	Sub-Sample Number	Testing							
0	12			1				ML/SM	Gray silt with fine to medium sand and wood debris; occasional gravel	NS		
Refusal at 1.5 feet below mudline												
5												

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

LOG OF BORING R-3			
	Project:	Rayonier, Former Sekiu Log Sorting Yard	
	Project Location:	Sekiu, Washington	
	Project Number:	0137-018-00	
			FIGURE A-35 Sheet 1 of 1

APPENDIX B
CHEMICAL ANALYTICAL PROGRAM AND
CHEMICAL ANALYTICAL DATA





Libby Environmental, Inc.

4139 Libby Road N.E., Olympia, WA 98506-2518

GeoEngineers

NOV 12 2008

November 7, 2008

Routing ☐ ☐ ☐
File ☐ ☐ ☐

Cindy Bartlett
GeoEngineers
8410 154TH Avenue NE
Redmond, WA 98052

Dear Ms. Bartlett:

Please find enclosed the analytical data report for the Rayonier - Sekiu Project located in Sekiu, Washington. Mobile Lab Services were conducted on October 21 – 23, 2008. Soil samples were received and analyzed for Diesel by NWTPH-Dx and Hydrocarbon Identification by NWTPH-HCID.

The results of the analyses are summarized in the attached tables. Applicable detection limits and QA/QC data are included. An invoice for this analytical work is also enclosed. All soil samples are reported on a dry weight basis.

Libby Environmental, Inc. appreciates the opportunity to have provided analytical services for this project. If you have any further questions about the data report, please give me a call. It was a pleasure working with you on this project, and we are looking forward to the next opportunity to work together.

Sincerely,

Sherry L. Chilcutt
President
Libby Environmental, Inc.

LIBBY ENVIRONMENTAL CHEMISTRY LABORATORY

SEKIU PROJECT

Sekiu, Washington

GeoEngineers, Inc.

Client Project #0137-018-00

Libby Project No.L-081021-10

Hydrocarbon Identification by NWTPH-HCID for Soil

Sample Number	Date Analyzed	Surrogate Recovery (%)	Gasoline (mg/kg)	Diesel (mg/kg)	Mineral Oil (mg/kg)	Heavy Oil (mg/kg)
Method Blank	10/22/2008	99.1	nd	nd	nd	nd
TP-2-4.0	10/22/2008	101	nd	nd	nd	nd
Practical Quantitation Limit			20	50	100	100

"nd" Indicates not detected at listed detection limits.

"D" Indicates detected above the listed detection limit.

"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (2-F Biphenyl): 65% TO 135%

ANALYSES PERFORMED BY: Deanna Donovan

LIBBY ENVIRONMENTAL CHEMISTRY LABORATORY

Sekiu PROJECT
Sekiu, WA
GeoEngineers
Client Project #0137-018-00
Libby Project No.L-081021-10

Analyses of Bunker C (NWTPH-Dx) in Soil

Sample Number	Date Analyzed	Surrogate Recovery (%)	Bunker C (mg/kg)
Method Blank	10/21/2008	94.3	nd
Method Blank	10/22/2008	99.1	nd
TP-9-7.5	10/21/2008	86.4	nd
TP-9-10.5	10/21/2008	99.7	nd
TP-10-5.5	10/21/2008	87.6	nd
TP-10-12.5	10/21/2008	int	19300
TP-10-13.5	10/21/2008	int	2460
TP-6-11.0	10/21/2008	int	18900
TP-6-13.0	10/21/2008	int	136000
TP-6-9.0	10/21/2008	125	nd
TP-6-9.0 dup	10/22/2008	111	nd
TP-12-9.5	10/21/2008	int	37400
TP-11-3.0	10/21/2008	int	103000
TP-11-14.0	10/21/2008	125	710
TP-11-16.0	10/21/2008	115	nd
TP-5-8.0	10/21/2008	int	7160
TP-5-10.0	10/21/2008	int	8160
TP-3-3.0	10/21/2008	int	1100
TP-3-8.0	10/21/2008	100	nd
TP-1-6.0	10/22/2008	int	25200
TP-1-10.0	10/21/2008	103	nd
TP-1-10.0 dup	10/22/2008	104	nd
TP-1-12.0	10/21/2008	int	16400
Practical Quantitation Limit			40

"nd" Indicates not detected at the listed detection limits.

"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (2-F Biphenyl): 65% TO 135%

ANALYSES PERFORMED BY: Deanna Donovan

LIBBY ENVIRONMENTAL CHEMISTRY LABORATORY

Sekiu PROJECT
Sekiu, WA
GeoEngineers
Client Project #0137-018-00
Libby Project No.L-081021-10

Analyses of Bunker C (NWTPH-Dx) in Soil

Sample Number	Date Analyzed	Surrogate Recovery (%)	Bunker C (mg/kg)
Method Blank	10/22/2008	99.1	nd
TP-2-12.0	10/22/2008	100	nd
TP-16-4.0	10/22/2008	81.7	nd
TP-16-9.0	10/22/2008	int	7710
TP-16-15.0	10/22/2008	int	2740
Duplicate-1	10/22/2008	int	17300
TP-17-9.5	10/22/2008	int	75800
TP-17-12.5	10/22/2008	int	58700
TP-18-11.5	10/22/2008	120	nd
TP-20-7.0	10/22/2008	int	6750
TP-20-7.0 dup	10/22/2008	int	5670
Practical Quantitation Limit			40

"nd" Indicates not detected at the listed detection limits.

"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (2-F Biphenyl): 65% TO 135%

ANALYSES PERFORMED BY: Deanna Donovan

LIBBY ENVIRONMENTAL CHEMISTRY LABORATORY

Sekiu PROJECT
Sekiu, WA
GeoEngineers
Client Project #0137-018-00
Libby Project No.L-081021-10

Analyses of Bunker C (NWTPH-Dx) in Soil

Sample Number	Date Analyzed	Surrogate Recovery (%)	Bunker C (mg/kg)
Method Blank	10/23/2008	110	nd
GEI-3-12.0	10/23/2008	109	nd
GEI-3-19.0	10/23/2008	117	nd
GEI-4-11.0	10/23/2008	109	nd
GEI-4-16.0	10/23/2008	88	nd
GEI-5-10.0	10/23/2008	103	nd
GEI-5-14.0	10/23/2008	95	nd
GEI-8-15.0	10/23/2008	107	nd
GEI-8-15.0 Dup	10/23/2008	96	nd
GEI-2-12.0	10/23/2008	115	nd
GEI-2-17.0	10/23/2008	100	nd
GEI-2-17.0 Dup	10/23/2008	110	nd
GEI-9-10.0	10/23/2008	112	nd
Practical Quantitation Limit			40

"nd" Indicates not detected at the listed detection limits.

"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (2-F Biphenyl): 65% TO 135%

ANALYSES PERFORMED BY: Deanna Donovan

Libby Environmental, Inc.

4139 Libby Road NE
Olympia, WA 98506
Ph: 360-352-2110
Fax: 360-352-4154

Chain of Custody Record

Date: 10-21-2008 Page: 1 of 2

Client: Geofra, neers
Address: 8410 154th Ave. NE, Redmond
Phone: 425.861.6000 Fax: 425.861.6050
Client Project #: 0137.018.00
Project Manager: Andy Bartlett
Project Name: Raymond - Sekiu
Location: Sekiu, WA
Collector: Jessica Smith Date of Collection: 10-21-08

Sample Number	Depth	Time	Sample Type	Container Type	VOA 8021B	VOA 8021B BTEX Only	SEM VOL 8260	NWTPH-HCID	NWTPH-GX	NWTPH-DX	PAH 8270	PCBs 8082	MTCA 5 Metals	Field Note/# Containers	
1 TP-9-7.5	7.5	7:58	S	4.07										mobile lab, log	
2 TP-9-10.5	10.5	8:20	S												
3 TP-10-5.5	5.5	8:55	S												
4 TP-10-12.5	12.5	9:15	S												
5 TP-10-13.5	13.5	9:30	S												
6 TP-6-9.0	9.0	10:05	S												
7 TP-6-11.0	11.0	10:15	S												
8 TP-6-13.0	13.0	10:25	S												
9 TP-11-3.0	3.0	11:10	S												
10 TP-11-14.0	14.0	11:25	S												
11 TP-11-16.0	16.0	11:35	S												
12 TP-12-9.5	9.5	11:00	S												
13 TP-5-8.0	8.0	11:30	S												
14 TP-5-10.0	10.0	11:45	S												
15 TP-3-3.0	3.0	12:55	S												
16 TP-3-8.0	8.0	12:50	S												
17 TP-1-6.0	6.0	1:20	S												
18 TP-1-10.0	10.0	1:30	S												
Relinquished by: <u>[Signature]</u> Date / Time: <u>10/21/08 1700</u>					Received by: <u>[Signature]</u> Date / Time: <u>10/21/08 1700</u>					Sample Receipt:					Remarks:
Relinquished by: <u>[Signature]</u> Date / Time: <u>10/21/08 1700</u>					Received by: <u>[Signature]</u> Date / Time: <u>10/21/08 1700</u>					Good Condition?					
										Cold?					
										Seals Intact?					
Relinquished by: <u>[Signature]</u> Date / Time: <u>10/21/08 1700</u>					Received by: <u>[Signature]</u> Date / Time: <u>10/21/08 1700</u>					Total Number of Containers					TAT 24HR 48HR Day

Libby Environmental, Inc.

4139 Libby Road NE
Olympia, WA 98506
Ph: 360-352-2110
Fax: 360-352-4154

Chain of Custody Record

Date: 10.21.2008 Page: 2 of 2

Client: GeoEngineers
Address: 8410 154th Ave NE
Phone: 425.861.6000 Fax: 425.861.6050
Client Project #: 0137.018.00

Project Manager: Andy Platt
Project Name: Rampart - Sekiu
Location: Sekiu, WA
Collector: Jessica Smith

Date of Collection: 10.21.2008

Sample Number	Depth	Time	Sample Type	Container Type	VOA 8021B	VOA 8021B BTEX Only	SEMI VOL 8270	VOA 8260	NWTPH-HCID	NWTPH-GX	NWTPH-DX	NWTPH-DX EXL	PAH 8270	PCBs 8082	MTCA 5 Metals	Field Note/# Containers			
1	TP-1-12.0	10.21.1140	S	4oz.												mobile lab			
2																			
3																			
4																			
5																			
6																			
7																			
8																			
9																			
10																			
11																			
12																			
13																			
14																			
15																			
16																			
17																			
18																			
Relinquished by:	Date / Time		Received by:		Date / Time		Remarks:												
Relinquished by:	10.21.08 1700		Received by:		10/21/08 1700														
Relinquished by:	Date / Time		Received by:		Date / Time		Sample Receipt:												
Relinquished by:	Date / Time		Received by:		Date / Time		Good Condition?												
Relinquished by:	Date / Time		Received by:		Date / Time		Cold?												
Relinquished by:	Date / Time		Received by:		Date / Time		Seals Intact?												
Relinquished by:	Date / Time		Received by:		Date / Time		Total Number of Containers												
							TAT							24HR		48HR		Day	

Libby Environmental, Inc.

4139 Libby Road NE
Olympia, WA 98506
Ph: 360-352-2110
Fax: 360-352-4154

Chain of Custody Record

Date: 10.17.2008 Page: 1 of 4

Project Manager: Cindy Bastlett

Project Name: Knappton Seku

Location: Seku, WA

Collector: Jessica Smith

Date of Collection: 10.22.2008

Client: Groffmeiers

Address: 8410 15th Ave NE

Phone: 425-861-6000 Fax: 425-861-6050

Client Project # 0137 018 00

Sample Number	Depth	Time	Sample Type	Container Type	VOA 8021B	VOA 8021B BTEX Only	SEMI VOL 8270	NWTPH-HCID	NWTPH-GX	NWTPH-DX	NWTPH-DX EXL	PCBs 8082	MTCA 5 Metals	Field Note/# Containers
1 TP-13-7.0	7.0	8:35	S	4.02										
2 TP-13-11.0	11.0	8:45	S											
3 TP-14-12.5	12.5	09:10												
4 TP-8-10.0	10.0	10:00												
5 TP-7-4.0	4.0	10:30												
6 TP-7-12.0	12.0	10:45												
7 TP-16-4.0	4.0	11:15												
8 TP-16-9.0	9.0	11:30												
9 TP-16-15.0	15.0	11:55												
10 Duplicate 1														
11 TP-17-9.5	9.5	12:40												
12 TP-17-17.5	17.5	12:55												
13 TP-18-11.5	11.5	1:25												
14 TP-18-16.0	16.0	1:35												
15 TP-19-3.0	3.0	2:15												
16 TP-7-6.0	6.0	7:35												
17 TP-20-7.0	7.0	3:05												
18 TP-20-10.0	10.0	3:15												

Relinquished by: [Signature] Date / Time: 10/23/08 18:30 Received by: [Signature] Date / Time: 10/23/08 19:30

Relinquished by: [Signature] Date / Time: 10/23/08 18:30 Received by: [Signature] Date / Time: 10/23/08 19:30

Relinquished by: [Signature] Date / Time: 10/23/08 18:30 Received by: [Signature] Date / Time: 10/23/08 19:30

Remarks: Sample Receipt: Good Condition? Cold? Seals Intact? Total Number of Containers: TAT 24HR 48HR Day

Libby Environmental, Inc.

4139 Libby Road NE
Olympia, WA 98506
Ph: 360-352-2110
Fax: 360-352-4154

Chain of Custody Record

Date: 10.27.08 Page: 2 of 2
Project Manager: Andy Bartlett
Project Name: Raymond - Sekin
Location: Sekin Washington
Collector: Jessica Smith Date of Collection: 10.27.08

Sample Number	Depth	Time	Sample Type	Container Type	VOA 8021B	VOA 8021B BTEX Only	SEMI VOL 8270	NWTPH-HCID	NWTPH-GX	NWTPH-DX	NWTPH-DX EXL	PAH 8270	PCB's 8082	MTCA 5 Metals	Field Note/# Containers																			
1	TP-4-9.5	9.5	5	402											1 on 10/23 DWP																			
2																																		
3																																		
4																																		
5																																		
6																																		
7																																		
8																																		
9																																		
10																																		
11																																		
12																																		
13																																		
14																																		
15																																		
16																																		
17																																		
18																																		
Relinquished by: <u>[Signature]</u>					Date / Time: <u>10.23.08 18:30</u>					Received by: <u>Belinda Brown</u>					Date / Time: <u>10/23/08 1835</u>					Sample Receipt:					Remarks:									
Relinquished by:					Date / Time:					Received by:					Date / Time:					Good Condition?					Cold?									
Relinquished by:					Date / Time:					Received by:					Date / Time:					Seals Intact?					Total Number of Containers					TAT 24HR 48HR Day				

Libby Environmental, Inc.

4139 Libby Road NE
Olympia, WA 98506
Ph: 360-352-2110
Fax: 360-352-4154

Chain of Custody Record

Date: 10/23/2008 Page: 1 of 1

Client: Eco-Enterprise
Address: 2410 154th Ave NE Redmond,
Phone: 425 861-6000 Fax: 425 861 6050
Client Project # 0137 018 00

Project Manager: Cindy Bartlett
Project Name: Ranger- Sekw
Location: Sekw WA
Collector: Jessica Smith Date of Collection: 10/23/2008

Sample Number	Depth	Time	Sample Type	Container Type	VOA 8021B VOA 8021B BTEX Only	SEMI VOL 8270	NWTPH-HCID	NWTPH-GX	NWTPH-DX	PAH 8270	PCBS 8082	MTCA 5 Metals	Field Note/# Containers
1 GEI-5-5.0	5.0	9:55	4.0										
2 GEI-5-6.0	6.0	10:00											
3 GEI-5-10.0	10.0	10:05											
4 GEI-5-4.0	4.0	10:15											
5 GEI-3-7.0	7.0	11:20											
6 GEI-3-12.0	12.0	11:35											
7 GEI-4-11.0	11.0	12:55											
8 GEI-4-16.0	16.0	1:00											
9 GEI-3-17.0	17.0	1:40											
10 GEI-8-7.0	7.0	14:30											
11 GEI-8-15.0	15.0	14:45											
12 GEI-2-18.0	18.0	15:00											
13 GEI-2-7.5	7.5	16:28											
14 GEI-2-12.0	12.0	16:40											
15 GEI-9-10.0	10.0	17:20											
16 GEI-2-17.0	17.0												
17													
18													

Relinquished by: [Signature] Date / Time: 10/23/08 18:35

Relinquished by: [Signature] Date / Time: 10/23/08 18:35

Relinquished by: [Signature] Date / Time: 10/23/08 18:35

Received by: [Signature] Date / Time: 10/23/08 18:35

Received by: [Signature] Date / Time: 10/23/08 18:35

Received by: [Signature] Date / Time: 10/23/08 18:35

Sample Receipt:

Good Condition? ☐

Cold? ☐

Seals Intact? ☐

Total Number of Containers

Remarks:

TAT 24HR 48HR Day



Libby Environmental, Inc.

4139 Libby Road N.E., Olympia, WA 98506-2518

November 12, 2008

Cindy Bartlett
GeoEngineers
8410 154TH Avenue NE
Redmond, WA 98052

Dear Ms. Bartlett:

Please find enclosed the analytical data report for the Rayonier - Sekiu Project located in Sekiu, Washington. Soil and water samples were received and analyzed for Hydrocarbon Identification by NWTPH-HCID, Diesel & Oil by NWTPH-Dx/Dx Extended, and Polyaromatic Hydrocarbons by 8270C on November 3 - 7, 2008.

The results of the analyses are summarized in the attached tables. Applicable detection limits and QA/QC data are included. An invoice for this analytical work is also enclosed. All soil samples are reported on a dry weight basis.

Libby Environmental, Inc. appreciates the opportunity to have provided analytical services for this project. If you have any further questions about the data report, please give me a call. It was a pleasure working with you on this project, and we are looking forward to the next opportunity to work together.

Sincerely,

Sherry L. Chilcutt
President
Libby Environmental, Inc.

LIBBY ENVIRONMENTAL CHEMISTRY LABORATORY

SEKIU PROJECT

Sekiu, Washington

GeoEngineers

Client Project #0137-018-00

Libby Project No.L-081030-1

Hydrocarbon Identification by NWTPH-HCID for Soil

Sample Number	Date Analyzed	Surrogate Recovery (%)	Gasoline (mg/kg)	Diesel (mg/kg)	Bunker C (mg/kg)	Heavy Oil (mg/kg)
Method Blank	11/4/2008	116	nd	nd	nd	nd
TP-10-12.5	11/4/2008	int	nd	nd	D	nd
TP-6-13.0	11/4/2008	int	nd	nd	D	nd
TP-11-3.0	11/4/2008	int	nd	nd	D	nd
TP-11-3.0 Dup	11/4/2008	int	nd	nd	D	nd
Reporting Limit			20	50	100	100

"nd" Indicates not detected at listed detection limits.

"D" Indicates detected above the listed detection limit.

"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (2-F Biphenyl): 65% TO 135%

ANALYSES PERFORMED BY: Athanasius

LIBBY ENVIRONMENTAL CHEMISTRY LABORATORY

SEKIU PROJECT

Sekiu, Washington

GeoEngineers

Client Project #0137-018-00

Libby Project No.L-081030-1

Analyses of Bunker C & Oil (NWTPH-Dx Extended) in Soil

Sample Number	Date Analyzed	Surrogate Recovery (%)	Bunker C (mg/kg)	Oil (mg/kg)
Method Blank	11/3/2008	108	nd	nd
Method Blank	11/4/2008	95	nd	nd
Method Blank	11/6/2008	113	nd	nd
TP-1-10.0	11/3/2008	105	nd	nd
GEI-1-16.0	11/3/2008	107	nd	nd
GEI-6S-11.0	11/3/2008	106	nd	nd
GEI-6D-17.0	11/3/2008	102	nd	nd
GEI-7D-18.0	11/3/2008	111	nd	nd
GEI-7D-18.0 Dup	11/3/2008	91	nd	nd
GEI-1-12.0	11/4/2008	int	3210	nd
GEI-7D-15.0	11/4/2008	int	8820	nd
TP-1-6.0	11/6/2008	133	nd	16000
Practical Quantitation Limit			40	40

"nd" Indicates not detected at the listed detection limits.

"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (2-F Biphenyl): 65% TO 135%

ANALYSES PERFORMED BY: Athanasius

LIBBY ENVIRONMENTAL CHEMISTRY LABORATORY

SEKIU PROJECT
Sekiu, Washington
GeoEngineers
Client Project #0137-018-00
Libby Project No.L-081030-1

Analyses of Bunker C (NWTPH-Dx) in Water

Sample Number	Date Analyzed	Surrogate Recovery (%)	Bunker C (ug/l)
Method Blank	11/4/2008	95	nd
MW-3	11/4/2008	123	nd
MW-4	11/4/2008	96	nd
MW-6D	11/4/2008	113	nd
MW-7D	11/4/2008	84	nd
MW-7S	11/4/2008	123	nd
MW-8	11/4/2008	84	nd
Practical Quantitation Limit			400

"nd" Indicates not detected at the listed detection limits.

"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (2-F Biphenyl): 65% TO 135%

ANALYSES PERFORMED BY: Athanasius

LIBBY ENVIRONMENTAL CHEMISTRY LABORATORY

SEKIU PROJECT
Sekiu, Washington
GeoEngineers
Client Project #0137-018-00
Libby Project No.L-081030-1

Analyses of Bunker C (NWTPH-Dx) in Water

Sample Number	Date Analyzed	Surrogate Recovery (%)	Bunker C (ug/l)
Method Blank	11/7/2008	129	nd
MW-1	11/7/2008	124	4400
MW-2	11/7/2008	108	nd
MW-5	11/7/2008	130	nd
Practical Quantitation Limit			400

"nd" Indicates not detected at the listed detection limits.

"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (2-F Biphenyl): 65% TO 135%

ANALYSES PERFORMED BY: Athanasius



Fremont

Analytical

2930 Westlake Ave N Suite 100
Seattle, WA 98109
T: (206) 352-3790
F: (206) 352-7178
info@fremontanalytical.com

Libby Environmental
Attn: Sherry Chilcutt
4139 Libby Road NE
Olympia, WA 98506

RE: Rayonier - Sekiu
Fremont Project No: CHM081027-2

November 7th, 2008

Sherry:

Enclosed are the analytical results for the **Rayonier - Sekiu** soil & water samples submitted to Fremont Analytical on October 28th, 2008.

The samples were received in good condition –in the proper containers, properly sealed, labeled and within holding time. The soil samples were contained 4oz jars and the water samples in 1L Ambers. The cooler temperatures upon receipt were 6.4°C, 6.0°C & 5.5°C, which is within the laboratory recommended cooler temperature range (<4°C - 10°C). The samples were analyzed and stored in a refrigeration unit at the USEPA-recommended temperature of 4°C ± 2°C. There were no sample receipt issues to report.

Examination of these soil samples was conducted for the presence of the following:

- ***Polyaromatic Hydrocarbons in Soil & Water by EPA Method 8270C***

This application was performed under Washington State Department of Ecology accreditation parameters. All appropriate Quality Assurance / Quality Control method parameters have been applied.

Notations for Method 8270C – Surrogate Recoveries:

- **Sample ID: TP-2-12.0 - 2-Fluorobiphenyl:** The surrogate recovery slightly exceed the laboratory control limits. However the Laboratory Control Sample (LCS), the Matrix Spike (MS), Matrix Spike Duplicate (MSD) & the second surrogate were all within range, demonstrating the analysis in control. In addition, the sample was "non-detect." No further action is required.
- **Sample ID: TP-9-7.50 - p-Terphenyl:** The surrogate recovery slightly exceed the laboratory control limits. However the Laboratory Control Sample (LCS), the Matrix Spike (MS), Matrix Spike Duplicate (MSD) & the second surrogate were all within range, demonstrating the analysis in control. In addition, the sample was "non-detect." No further action is required.

Please contact the laboratory if you should have any questions about the report.

Thank you for using Fremont Analytical!

Sincerely,

Michael Dee
Sr. Chemist / Principal
mikedee@fremontanalytical.com

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Analysis of Polyaromatic Hydrocarbons in Soil by EPA Method 8270C

Project: Sekiu - Rayonier
Client: Libby Environmental
Client Project #: N/A
Lab Project #: CHM081027-2

EPA 8270C (mg/kg)	MRL	Method Blank	LCS	GEI-1-12.0	GEI-1-16.0	Duplicate		GEI-6S-11.0
						GEI-1-16.0	RPD %	
Date Extracted		11/4/08	11/4/08	11/4/08	11/4/08	11/4/08		11/4/08
Date Analyzed		11/4/08	11/4/08	11/4/08	11/4/08	11/4/08		11/4/08
Matrix				Soil	Soil	Soil		Soil
Naphthalene	0.1	nd		nd	0.5	0.5	9%	nd
1-Methylnaphthalene	0.1	nd		1.4	0.1	0.1	26%	nd
2-Methylnaphthalene	0.1	nd		nd	0.1	0.1	0%	nd
Acenaphthene	0.1	nd	135%	nd	nd	nd		nd
Acenaphthylene	0.1	nd		nd	nd	nd		nd
Fluorene	0.1	nd		0.5	nd	nd		nd
Phenanthrene	0.1	nd		0.5	nd	nd		nd
Anthracene	0.1	nd		0.2	nd	nd		nd
Fluoranthene	0.1	nd		nd	nd	nd		nd
Pyrene	0.1	nd	125%	0.3	nd	nd		nd
Benzo(a)anthracene	0.08	nd		0.10	nd	nd		nd
Chrysene	0.08	nd		nd	nd	nd		nd
Benzo(b)fluoranthene	0.08	nd		0.09	nd	nd		nd
Benzo(k)fluoranthene	0.08	nd		nd	nd	nd		nd
Benzo(a)pyrene	0.08	nd		nd	nd	nd		nd
Indeno(1,2,3-cd)pyrene	0.08	nd		nd	nd	nd		nd
Dibenzo(a,h)anthracene	0.08	nd		nd	nd	nd		nd
Benzo(g,h,i)perylene	0.1	nd		nd	nd	nd		nd
Total PAH Carcinogens				0.2	0.0	0.0		0.0

Total PAH Carcinogens Defined as:
Benzo(a)anthracene, Chrysene, Benzo(b)fluoranthene,
Benzo(k)fluoranthene, Benzo(a)pyrene,
Indeno(1,2,3-cd)pyrene & Dibenzo(a,h)anthracene

Surrogate Recovery

(Surr 1) 2-Fluorobiphenyl	112%	109%	100%	79%	77%	127%
(Surr 2) p-Terphenyl	124%	89%	129%	107%	127%	127%

"nd" Indicates not detected at listed reporting limits
"int" Indicates that interference prevents determination
"J" Indicates estimated value
"MRL" Indicates Method Reporting Limit
"LCS" Indicates Laboratory Control Sample
"MS" Indicates Matrix Spike
"MSD" Indicates Matrix Spike Duplicate
"RPD" Indicates Relative Percent Difference

Samples may be run under SIM
Acceptable RPD is determined to be less than 30%
Acceptable Recovery Limits:
Surrogates = 65% to 135%
LCS, LCSD = 50% to 150%
Surrogates and Spike Concentration = 25 ug/L



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Analysis of Polyaromatic Hydrocarbons in Soil by EPA Method 8270C

Project: Sekiu - Rayonier
Client: Libby Environmental
Client Project #: N/A
Lab Project #: CHM081027-2

EPA 8270C (mg/kg)	MRL	Duplicate					
		GEI-6D-17.0	GEI-7D-15.0	GEI-7D-18.0	TP-13-7.0	TP-13-7.0	TP-13-11.0
Date Extracted		11/4/08	11/4/08	11/4/08	11/4/08	11/4/08	11/4/08
Date Analyzed		11/4/08	11/4/08	11/4/08	11/4/08	11/4/08	11/4/08
Matrix		Soil	Soil	Soil	Soil	Soil	Soil
Naphthalene	0.1	nd	0.1	nd	nd	nd	nd
1-Methylnaphthalene	0.1	nd	nd	nd	nd	nd	nd
2-Methylnaphthalene	0.1	nd	1.5	nd	nd	nd	nd
Acenaphthene	0.1	nd	nd	nd	nd	nd	nd
Acenaphthylene	0.1	nd	nd	nd	nd	nd	nd
Fluorene	0.1	nd	nd	nd	nd	nd	nd
Phenanthrene	0.1	nd	5.2	nd	nd	nd	nd
Anthracene	0.1	nd	17	nd	nd	nd	nd
Fluoranthene	0.1	nd	2.2	nd	nd	nd	nd
Pyrene	0.1	nd	1.3	nd	nd	nd	nd
Benzo(a)anthracene	0.08	nd	1.6	nd	nd	nd	nd
Chrysene	0.08	nd	0.8	nd	nd	nd	nd
Benzo(b)fluoranthene	0.08	nd	1.4	nd	nd	nd	nd
Benzo(k)fluoranthene	0.08	nd	1.2	nd	nd	nd	nd
Benzo(a)pyrene	0.08	nd	2.1	nd	nd	nd	nd
Indeno(1,2,3-cd)pyrene	0.08	nd	nd	nd	nd	nd	nd
Dibenzo(a,h)anthracene	0.08	nd	nd	nd	nd	nd	nd
Benzo(g,h,i)perylene	0.1	nd	0.3	nd	nd	nd	nd
Total PAH Carcinogens		0.0	7.1	0.0	0.0	0.0	0.0

Total PAH Carcinogens Defined as:
Benzo(a)anthracene, Chrysene, Benzo(b)fluoranthene,
Benzo(k)fluoranthene, Benzo(a)pyrene,
Indeno(1,2,3-cd)pyrene & Dibenzo(a,h)anthracene

Surrogate Recovery

(Surr 1) 2-Fluorobiphenyl	106%	135%	134%	106%	79%	132%
(Surr 2) p-Terphenyl	133%	95%	113%	120%	122%	131%

"nd" Indicates not detected at listed reporting limits
"int" Indicates that interference prevents determination
"J" Indicates estimated value
"MRL" Indicates Method Reporting Limit
"LCS" Indicates Laboratory Control Sample
"MS" Indicates Matrix Spike
"MSD" Indicates Matrix Spike Duplicate
"RPD" Indicates Relative Percent Difference

Samples may be run under SIM
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Acceptable Recovery Limits:
Surrogates = 65% to 135%
LCS, LCSD = 50% to 150%
Surrogates and Spike Concentration = 25 ug/L



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Analysis of Polyaromatic Hydrocarbons in Soil by EPA Method 8270C

Project: Sekiu - Rayonier
Client: Libby Environmental
Client Project #: N/A
Lab Project #: CHM081027-2

EPA 8270C (mg/kg)	MRL	TP-2-4.0	TP-2-12.0	TP-9-7.5	TP-9-10.5	TP-10-5.5	TP-10-12.5
Date Extracted		11/4/08	11/4/08	11/4/08	11/4/08	11/4/08	11/4/08
Date Analyzed		11/4/08	11/4/08	11/4/08	11/4/08	11/4/08	11/4/08
Matrix		Soil	Soil	Soil	Soil	Soil	Soil
Naphthalene	0.1	nd	nd	nd	nd	nd	nd
1-Methylnaphthalene	0.1	nd	nd	nd	nd	1.2	2.3
2-Methylnaphthalene	0.1	nd	nd	nd	nd	nd	nd
Acenaphthene	0.1	nd	nd	nd	nd	0.2	nd
Acenaphthylene	0.1	nd	nd	nd	nd	nd	nd
Fluorene	0.1	nd	nd	nd	nd	4.4	nd
Phenanthrene	0.1	nd	nd	nd	nd	3.4	1.1
Anthracene	0.1	nd	nd	nd	nd	3.2	0.6
Fluoranthene	0.1	nd	nd	nd	nd	6.4	0.4
Pyrene	0.1	nd	nd	nd	nd	6.4	1.6
Benzo(a)anthracene	0.08	nd	nd	nd	nd	3.4	1.0
Chrysene	0.08	nd	nd	nd	nd	1.9	0.8
Benzo(b)fluoranthene	0.08	nd	nd	nd	nd	2.5	0.9
Benzo(k)fluoranthene	0.08	nd	nd	nd	nd	0.6	0.7
Benzo(a)pyrene	0.08	nd	nd	nd	nd	1.0	0.5
Indeno(1,2,3-cd)pyrene	0.08	nd	nd	nd	nd	0.5	0.1
Dibenzo(a,h)anthracene	0.08	nd	nd	nd	nd	nd	0.1
Benzo(g,h,i)perylene	0.1	nd	nd	nd	nd	nd	0.2
Total PAH Carcinogens		0.0	0.0	0.0	0.0	9.9	4.1

Total PAH Carcinogens Defined as:

Benzo(a)anthracene, Chrysene, Benzo(b)fluoranthene,
Benzo(k)fluoranthene, Benzo(a)pyrene,
Indeno(1,2,3-cd)pyrene & Dibenzo(a,h)anthracene

Surrogate Recovery

(Surr 1) 2-Fluorobiphenyl	117%	138%	70%	135%	78%	78%
(Surr 2) p-Terphenyl	118%	125%	136%	134%	130%	126%

"nd" Indicates not detected at listed reporting limits

"int" Indicates that interference prevents determination

"J" Indicates estimated value

"MRL" Indicates Method Reporting Limit

"LCS" Indicates Laboratory Control Sample

"MS" Indicates Matrix Spike

"MSD" Indicates Matrix Spike Duplicate

"RPD" Indicates Relative Percent Difference

Samples may be run under SIM

Acceptable RPD is determined to be less than 30%

Acceptable Recovery Limits:

Surrogates = 65% to 135%

LCS, LCSD = 50% to 150%

Surrogates and Spike Concentration = 25 ug/L



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Analysis of Polyaromatic Hydrocarbons in Soil by EPA Method 8270C

Project: Sekiu - Rayonier
Client: Libby Environmental
Client Project #: N/A
Lab Project #: CHM081027-2

		MS		MSD		
EPA 8270C (mg/kg)	MRL	TP-6-9.0	TP-6-13.0	TP-13-7.0	TP-13-7.0	RPD %
Date Extracted		11/4/08	11/4/08	11/4/08	11/4/08	
Date Analyzed		11/4/08	11/4/08	11/5/08	11/5/08	
Matrix		Soil	Soil	Soil	Soil	
Naphthalene	0.1	nd	1.0			
1-Methylnaphthalene	0.1	nd	1.0			
2-Methylnaphthalene	0.1	nd	1.6			
Acenaphthene	0.1	nd	1.1	77%	88%	13%
Acenaphthylene	0.1	nd	1.3			
Fluorene	0.1	nd	2.2			
Phenanthrene	0.1	nd	2.1			
Anthracene	0.1	nd	1.9			
Fluoranthene	0.1	nd	2.6			
Pyrene	0.1	nd	2.6	116%	108%	7%
Benzo(a)anthracene	0.08	nd	2.3			
Chrysene	0.08	nd	0.5			
Benzo(b)fluoranthene	0.08	nd	1.7			
Benzo(k)fluoranthene	0.08	nd	1.2			
Benzo(a)pyrene	0.08	nd	0.7			
Indeno(1,2,3-cd)pyrene	0.08	nd	nd			
Dibenzo(a,h)anthracene	0.08	nd	nd			
Benzo(g,h,i)perylene	0.1	nd	0.2			
Total PAH Carcinogens		0.0	6.4			

Total PAH Carcinogens Defined as:
Benzo(a)anthracene, Chrysene, Benzo(b)fluoranthene,
Benzo(k)fluoranthene, Benzo(a)pyrene,
Indeno(1,2,3-cd)pyrene & Dibenzo(a,h)anthracene

Surrogate Recovery

(Surr 1) 2-Fluorobiphenyl	133%	66%	88%	89%
(Surr 2) p-Terphenyl	125%	96%	134%	123%

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"MSD" Indicates Matrix Spike Duplicate
"RPD" Indicates Relative Percent Difference

Samples may be run under SIM
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Acceptable Recovery Limits:
Surrogates = 65% to 135%
LCS, LCSD = 50% to 150%
Surrogates and Spike Concentration = 25 ug/L



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Analysis of Polyaromatic Hydrocarbons in Soil by EPA Method 8270C

Project: Sekiu - Rayonier
Client: Libby Environmental
Client Project #: N/A
Lab Project #: CHM081027-2

EPA 8270C (mg/kg)	MS		MSD	
	MRL	GEI-6S-11.0	GEI-6S-11.0	RPD %
Date Extracted		11/4/08	11/4/08	
Date Analyzed		11/5/08	11/5/08	
Matrix		Soil	Soil	
Naphthalene	0.1			
1-Methylnaphthalene	0.1			
2-Methylnaphthalene	0.1			
Acenaphthene	0.1	80%	85%	5%
Acenaphthylene	0.1			
Fluorene	0.1			
Phenanthrene	0.1			
Anthracene	0.1			
Fluoranthene	0.1			
Pyrene	0.1	68%	89%	27%
Benzo(a)anthracene	0.08			
Chrysene	0.08			
Benzo(b)fluoranthene	0.08			
Benzo(k)fluoranthene	0.08			
Benzo(a)pyrene	0.08			
Indeno(1,2,3-cd)pyrene	0.08			
Dibenzo(a,h)anthracene	0.08			
Benzo(g,h,i)perylene	0.1			

Total PAH Carcinogens

Total PAH Carcinogens Defined as:

Benzo(a)anthracene, Chrysene, Benzo(b)fluoranthene,
Benzo(k)fluoranthene, Benzo(a)pyrene,
Indeno(1,2,3-cd)pyrene & Dibenzo(a,h)anthracene

Surrogate Recovery

(Surr 1) 2-Fluorobiphenyl	89%	93%
(Surr 2) p-Terphenyl	114%	119%

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"MSD" Indicates Matrix Spike Duplicate
"RPD" Indicates Relative Percent Difference

Samples may be run under SIM

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Acceptable Recovery Limits:

Surrogates = 65% to 135%

LCS, LCSD = 50% to 150%

Surrogates and Spike Concentration = 25 ug/L



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Analysis of Polyaromatic Hydrocarbons in Water by EPA Method 8270C

Project: Sekiu - Rayonier
Client: Libby Environmental
Client Project #: N/A
Lab Project #: CHM081027-2

EPA 8270C (ug/L)	MRL	Method Blank	LCS	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6D
Date Extracted	11/3/08	11/3/08	11/3/08	11/3/08	11/3/08	11/3/08	11/3/08	11/3/08	11/3/08
Date Analyzed	11/3/08	11/3/08	11/3/08	11/3/08	11/3/08	11/3/08	11/3/08	11/3/08	11/3/08
Matrix				Water	Water	Water	Water	Water	Water
Naphthalene	0.5	nd		nd	nd	nd	nd	nd	nd
1-Methylnaphthalene	0.5	nd		4.4	nd	nd	nd	nd	nd
2-Methylnaphthalene	0.5	nd		3.5	nd	nd	nd	nd	nd
Acenaphthene	0.5	nd	116%	nd	nd	nd	nd	nd	nd
Acenaphthylene	0.5	nd		nd	nd	nd	nd	nd	nd
Fluorene	0.5	nd		1.8	nd	nd	nd	nd	nd
Phenanthrene	0.5	nd		nd	nd	nd	nd	nd	nd
Anthracene	0.5	nd		nd	nd	nd	nd	nd	nd
Fluoranthene	0.5	nd		nd	nd	nd	nd	nd	nd
Pyrene	0.5	nd	95%	nd	nd	nd	nd	nd	nd
Benzo(a)anthracene	0.1	nd		nd	nd	nd	nd	nd	nd
Chrysene	0.1	nd		nd	nd	nd	nd	nd	nd
Benzo(b)fluoranthene	0.1	nd		nd	nd	nd	nd	nd	nd
Benzo(k)fluoranthene	0.1	nd		nd	nd	nd	nd	nd	nd
Benzo(a)pyrene	0.1	nd		nd	nd	nd	nd	nd	nd
Indeno(1,2,3-cd)pyrene	0.1	nd		nd	nd	nd	nd	nd	nd
Dibenzo(a,h)anthracene	0.1	nd		nd	nd	nd	nd	nd	nd
Benzo(g,h,i)perylene	0.5	nd		nd	nd	nd	nd	nd	nd
Total PAH Carcinogens				0.0	0.0	0.0	0.0	0.0	0.0

Total PAH Carcinogens Defined as:

Benzo(a)anthracene, Chrysene, Benzo(b)fluoranthene,
Benzo(k)fluoranthene, Benzo(a)pyrene,
Indeno(1,2,3-cd)pyrene & Dibenzo(a,h)anthracene

Surrogate Recovery

(Surr 1) 2-Fluorobiphenyl	112%	120%	109%	114%	99%	101%	135%	98%
(Surr 2) p-Terphenyl	125%	113%	115%	120%	121%	127%	119%	117%

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"MSD" Indicates Matrix Spike Duplicate
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Samples may be run under SIM

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LCS, LCSD = 50% to 150%

Surrogates and Spike Concentration = 25 ug/L



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Analysis of Polyaromatic Hydrocarbons in Water by EPA Method 8270C

Project: Sekiu - Rayonier
Client: Libby Environmental
Client Project #: N/A
Lab Project #: CHM081027-2

EPA 8270C (ug/L)	MRL	MW-7D	MW-7S	MW-8	Duplicate	MS	MSD	RPD %
					MW-8	MW-8	MW-8	
Date Extracted		11/3/08	11/3/08	11/3/08	11/3/08	11/3/08	11/3/08	
Date Analyzed		11/3/08	11/3/08	11/3/08	11/3/08	11/3/08	11/3/08	
Matrix		Water	Water	Water	Water	Soil	Soil	
Naphthalene	0.5	nd	nd	nd	nd			
1-Methylnaphthalene	0.5	nd	nd	nd	nd			
2-Methylnaphthalene	0.5	nd	nd	nd	nd			
Acenaphthene	0.5	nd	nd	nd	nd	106%	121%	13%
Acenaphthylene	0.5	nd	nd	nd	nd			
Fluorene	0.5	nd	nd	nd	nd			
Phenanthrene	0.5	nd	nd	nd	nd			
Anthracene	0.5	nd	nd	nd	nd			
Fluoranthene	0.5	nd	nd	nd	nd			
Pyrene	0.5	nd	nd	nd	nd	102%	99%	3%
Benzo(a)anthracene	0.1	nd	nd	nd	nd			
Chrysene	0.1	nd	nd	nd	nd			
Benzo(b)fluoranthene	0.1	nd	nd	nd	nd			
Benzo(k)fluoranthene	0.1	nd	nd	nd	nd			
Benzo(a)pyrene	0.1	nd	nd	nd	nd			
Indeno(1,2,3-cd)pyrene	0.1	nd	nd	nd	nd			
Dibenzo(a,h)anthracene	0.1	nd	nd	nd	nd			
Benzo(g,h,i)perylene	0.5	nd	nd	nd	nd			
Total PAH Carcinogens		0.0	0.0	0.0	0.0			

Total PAH Carcinogens Defined as:

Benzo(a)anthracene, Chrysene, Benzo(b)fluoranthene,
Benzo(k)fluoranthene, Benzo(a)pyrene,
Indeno(1,2,3-cd)pyrene & Dibenzo(a,h)anthracene

Surrogate Recovery

(Surr 1) 2-Fluorobiphenyl	99%	111%	107%	131%	104%	138%
(Surr 2) p-Terphenyl	116%	119%	114%	102%	124%	120%

"nd" Indicates not detected at listed reporting limits
"int" Indicates that interference prevents determination
"J" Indicates estimated value
"MRL" Indicates Method Reporting Limit
"LCS" Indicates Laboratory Control Sample
"MS" Indicates Matrix Spike
"MSD" Indicates Matrix Spike Duplicate
"RPD" Indicates Relative Percent Difference

Samples may be run under SIM
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Acceptable Recovery Limits:
Surrogates = 65% to 135%
LCS, LCSD = 50% to 150%
Surrogates and Spike Concentration = 25 ug/L

Libby Environmental, Inc.

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Olympia, WA 98506
Ph 360-352-2110
Fax 360-352-4154

Chain of Custody Record

Date 10/31/08 Page 1 of 2

Project Manager Sherry Chulavitt

Project Name Raymer - Sevin

Location _____

Collector _____ Date of Collection _____

Client Project # _____

Libby Env.
(see above)

Address _____

Phone _____ Fax _____

Sample Number	Depth	Time	Sample Type	Container Type	Field Note# Containers
1 TP-9-7.5		10/24	Soil	400 jar	
2 TP-9-12.5					
3 TP-10-5.5					
4 TP-10-12.5					
5 TP-6-9.0					
6 TP-6-13.0					
7 TP-13-7.0		10/22			
8 TP-13-11.0					
9 TP-2-4.0					
10 TP-2-12.0					
11 GEI-1-16.0		10/24			
12 GEI-1-6S-11					
13 GEI-6D-17.0					
14 GEI-7D-15.0					
15 GEI-7D-15.0					
16 GEI-7D-15.0					
17 MW-1		10/25	H ₂ O	Amber	
18 MW-2					

Sample Receipt	Date / Time	Remarks
Received by <u>[Signature]</u>	10/31/08	Std
Relinquished by <u>[Signature]</u>	10/31/08 11:25A	
Relinquished by _____	Date / Time _____	
Relinquished by _____	Date / Time _____	

Good Condition?	Seals Intact?	Total Number of Containers	IAI	24-HR	48-HR	5-Day

Libby Environmental, Inc.

4139 Libby Road NE
Olympia, WA 98506

Ph 350-352-2110
Fax 350-352-4154

Chain of Custody Record

Date: 10/31/08 Page 2 of 2

Project Manager: Sherry Chalkoff

Project Name: RAYMOND SEKIN

Location:

Collector:

Date of Collection:

Client: Libby Env. (see above)

Address:

Phone:

Fax:

Client Project #

Sample Number	Depth	Time	Sample Type	Container Type	Field Note/Containers
1 MW-3		10/25	Hex	Amber	
2 MW-4					
3 MW-5					
4 MW-6D					
5 MW-7D					
6 MW-7S					
7 MW-8					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					

Sample Receipt	Date / Time	Received by	Remarks
Good Condition?			Std
Cold?			
Seals intact?			
Total Number of Containers			TAT 24HR 48HR 5-Day

Chain of Custody Record

Page 20

100
 90
 80
 70
 60
 50
 40
 30
 20
 10
 0

[illegible]

Collector: *Wesley Smith* Date of Collection: *10/2/05*

Sample Number	Depth	Time	Sample Type	Container Type	VOL 807E	VOL 807B BTEX ONLY	SEM VOL 8270	INT PHC-H	INT PHC-X	INT PHC-HX	INT PHC-LX EA	PCBS 8082	MTCA 5 1000	Field Note/Containers	Remarks
1 TP 7-7.5	7.5	1258	S	401											
2 TP 7-10.5	10.5	0820	S												
3 TP 10-5.5	5.5	855	S												
4 TP 10-13.5	13.5	915	S												
5 TP 10-13.5	13.5	930	S												
6 TP 6-9.0	9.0	1023	S												
7 TP 6-11.0	11.0	1015	S												
8 TP 6-13.0	13.0	025	S												
9 TP 11-3.0	3.0	110	S												
10 TP 11-11.0	11.0	025	S												
11 TP 11-16.0	16.0	1135	S												
12 TP 12-9.5	9.5	1100	S												
13 TP 5-3.0	3.0	1130	S												
14 TP 5-10.0	10.0	1145	S												
15 TP 3-3.0	3.0	1235	S												
16 TP 1-8.0	8.0	1250	S												
17 TP 1-6.0	6.0	1250	S												
18 TP 1-10.0	10.0	1250	S												

Relinquished by: 

Relinquished by: 

Relinquished by: 

Date / Time: 10/27/08 11:30

Date / Time: 10/28/08 1610

Date / Time: 10/28/08 1610

Sample Receipt

Good Condition? ☒

Seals Intact? ☒

Total Number of Containers: 18

Relinquished by: 

Relinquished by: 

Relinquished by: 

Date / Time: 10/27/08 11:30

Date / Time: 10/28/08 1610

Date / Time: 10/28/08 1610

Sample Receipt

Good Condition? ☒

Seals Intact? ☒

Total Number of Containers: 18

Libby Environmental, Inc.

4139 Libby Road NE
Olympia, WA 98505

Ph 360-352-2110
Fax 360-352-4154

Chain of Custody Record

Date 10-21-2008 Page 2 of 2
 Project Manager Chris Bartholomew
 Project Name Bayou de l'Est
 Location Sevier, WA
 Collector Jessica Smith Date of Collection 10-21-08

Sample Number	Depth	Time	Sample Type	Container Type	Field Notes/Containers
1	10.21	140	S	1.0Z	185
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					

Relinquished by [Signature] Date / Time 10/21/08 1400
 Retrieved by [Signature] Date / Time 10/21/08 1410
 Requisitioned by [Signature] Date / Time 10/21/08 1400
 Date / Time 10/21/08 1400

Sample Receipt
 Client Complaint? 777
 Chain of Custody? 777
 Total Number of Containers 18

Remarks

TAI 24HR 48HR 5 Day

Chain of Custody Record

Ph: 360-352-2110
Fax: 360-352-4154

Date 10/23/2008 Page 1 of 2
Project Manager: Carol Bartlett
Project Name: Haystack School
Location: Sequoia WA
Collector: David G. Smith Date of Collection: 9/7/2008

[illegible]

Chain of Custody Record

Ph 360-352-2110
Fax 360-352-4164

1000

61.650

Page 2 of 2

Bastille

5-5610

Date of Collection 10.22.08

Sample Number	Depth	Time	Sample Type	Container Type	VOL 8027B VOL 8027B BTEX ONLY	SEM VOL 8270 VOL 8260	NWTPH-HCID NWTPH-GX	NWTPH-DX NWTPH-DX EXT	PCEB 8082 PAH 8270	MICA Metals	Field Note # Containers
1 17-4-9.5	9.5		SOL	LOT							1 lot
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											

Requested by: [Signature] Date: 10.17.08 Time: 11:50

Received by: [Signature] Date: 10/28/08 Time: 10:10

Requested by: [Signature] Date: [] Time: []

Received by: [Signature] Date: [] Time: []

Remarks:

Sample Receipt

Good Condition?

Cold?

Seals Intact?

Total Number of Containers: 18

Chain of Custody Record

PH 360 352.2110

Fax 360-352-4154

12

10/11/2019

[illegible]

061:0002 1897.08.08 0430

100:245:1000

8041

Baptist

James C. Smith

01/05/2000

State of California

100

100

103

Sample Number	Depth	Time	Sample Type	Container Type	VOL 802/B VOL 802/B BTEX ONLY	SEM VOL 8270	NMTPH-ACID	NMTPH-DX	NMTPH-DX EN	PCBS 8092	MCHA 5 Male	Field Note # Containers
1 GEL-S-5.0	5.0	9:55	Sol	Loz								1 box
2 GC-S-6.0	6.0	10:00										
3 GEL-S-10.0	10.0	10:05										
4 GEL-S-14.0	14.0	10:15										
5 GEL-S-17.0	17.0	11:20										
6 GEL-S-12.0	12.0	11:35										
7 GEL-S-11.0	11.0	12:55										
8 GEL-S-16.0	16.0	1:00										
9 GEL-S-17.0	17.0	1:40										
10 GEL-S-7.0	7.0	14:30										
11 GEL-S-15.0	15.0	14:45										
12 GEL-S-18.0	18.0	15:00										
13 GEL-S-7.5	7.5	16:28										
14 GEL-S-12.0	12.0	16:40										
15 GEL-S-10.0	10.0	17:00	A									
16 GEL-S-17.0	17.0		X									
17												
18												

Requested by: 

Received by: 

Date / Time: 10/27/08/14:50

Date / Time: 10/28/08/10:00

Requested by: 

Received by: 

Date / Time: 10/27/08/14:50

Date / Time: 10/28/08/10:00

Libby Environmental, Inc.

4149 Libby Road NE
Olympia WA 98506
Ph 360-352-2110
Fax 360-352-4154

Chain of Custody Record

Date 12-14-08 Page 1 of 1
Project Manager Emily Bartlett
Project Name Remedial Action Site Investigation
Location Selkirk, WA
Collector Jessica Savary Date of Collection 10-24-08

Client Geological Services
Address 8010 18th Ave NE
Phone 425-861-6006 Fax 425-861-6050
Client Project # 0157018-00

Sample Number	Depth	Time	Sample Type	Container Type	VCA 8021B	VCA 8021B BTEX ONLY	INWTPH-HOLD	INWTPH-DX	INWTPH-DX EM	PCBs 8082	MTCA 5 Metals	Field Note# Containers
1 GEL-1-12-0	17.5	07:50	Soil	7-402								
2 GEL-1-16-0	16.0	08:10										
3 GEL-6S-5-0	5.0	07:00										
4 GEL-6S-11-0	11.0	09:40										
5 GEL-6S-16-0	16.0	07:50										
6 GEL-6D-12-0	12.0	10:50										
7 GEL-6D-17-0	17.0	11:20										
8 GEL-7S-7-0	7.0	13:50										
9 GEL-7S-15-0	15.0	11:05										
10 GEL-7S-17-0	17.0	11:15										
11 GEL-7D-6-0	6.0	2:30										
12 GEL-7D-8-0	8.0	12:00										
13 GEL-7D-15-0	15.0	15:00										
14 GEL-7D-8-0	8.0	17:00										
15												
16												
17												
18												

Requested by [Signature] Date / Time 10-27-08 11:30
 Received by [Signature] Date / Time 10-28-08 16:10
 Requested by [Signature] Date / Time 10-27-08 11:30
 Received by [Signature] Date / Time 10-28-08 16:10
 Requested by [Signature] Date / Time 10-27-08 11:30
 Received by [Signature] Date / Time 10-28-08 16:10

Sample Receipt
 Used Container? Y
 Seals intact? Y
 Total Number of Containers 107 1A1 24HR 48HR 5 Day

Libby Environmental, Inc.

4139 Libby Road NE
Olympia, WA 98506
Ph 360-352-2110
Fax 360-352-4154

Chain of Custody Record

Date 10-25-08 Page 1 of 1

Client GeoEnvironments
Address 8410 15th Ave NE
Phone 425-861-6000 Fax 425-861-6050

Project Manager Andy Partlett
Project Name Silver Ranger
Location Silver, WA

Client Project # 037-918-00 Collector Jessica Smith Date of Collection 10-24-08

Sample Number	Depth	Time	Sample Type	Container Type	Field Note/Containers
1 MW-1			Water	250 mL	
2 MW-2					
3 MW-3					
4 MW-4					
5 MW-5					
6 MW-6D					
7 MW-6S					
8 MW-7D					
9 MW-7S					
10 MW-8					
11					
12					
13					
14					
15					
16					
17					
18					

Relinquished By [Signature] Date / Time 10-27-08 11:50

Relinquished By [Signature] Date / Time 10-27-08 11:50

Relinquished By [Signature] Date / Time 10-27-08 11:50

Remarks Cont. 174PS
6.4°C
6.0°C
5.5°C

Sample Receipt
Good Condition? Y
Cool? Y
Seals Intact? Y
Total Number of Containers 10 1A1 24HR 48HR 5 Day

Libby Environmental, Inc.

4139 Libby Road NE
Olympia, WA 98506
Ph 360-352-2110
Fax 360-352-4154

Chain of Custody Record

Date 10-21-08 Page 1 of 2
Project Manager: Gordy Bartlett
Project Name: Remediation - pluv
Location: Seely's Wf.
Collector: Yessica Smith Date of Collection: 10-21-08

Client: Geotronics
Address: 8410 154th Ave NE Redmond
Phone: 425-811-6000 Fax: 425-861-6030
Client Project #: 0137-018-00

Sample Number	Depth	Time	Sample Type	Container Type	Field Note # Containers	Remarks
1 TP-9-7.5	7.5	0758	S	100		
2 TP-9-10.5	10.5	0820	S	1		
3 TP-10-5.5	5.5	0855	S			
4 TP-10-12.5	12.5	0915	S			
5 TP-10-13.5	13.5	0930	S			
6 TP-6-9.0	9.0	1005	S			
7 TP-6-11.0	11.0	1015	S			
8 TP-6-13.0	13.0	1045	S			
9 TP-11-3.0	3.0	1110	S			
10 TP-11-14.0	14.0	1125	S			
11 TP-11-16.0	16.0	1135	S			
12 TP-12-9.5	9.5	1100	S			
13 TP-5-2.0	2.0	1130	S			
14 TP-5-10.0	10.0	1145	S			
15 TP-3-3.0	3.0	1255	S			
16 TP-3-8.0	8.0	1250	S			
17 TP-1-6.0	6.0	1200	S			
18 TP-1-10.0	10.0	1230	S			

Sample Receipt	Date / Time	Remarks
Received by: <u>[Signature]</u>	Date / Time: <u>10/28/08 11:40</u>	
Relinquished by: <u>[Signature]</u>	Date / Time: <u>10/27/08 11:50</u>	
Relinquished by: <u>[Signature]</u>	Date / Time: <u>10/08 12:50</u>	

Sample Receipt	Date / Time	Remarks
Received by: <u>[Signature]</u>	Date / Time: <u>10/30/08 12:50</u>	
Relinquished by: <u>[Signature]</u>	Date / Time: <u>10/30/08 12:50</u>	

Sample Receipt	Date / Time	Remarks
Received by: <u>[Signature]</u>	Date / Time: <u>10/30/08 12:50</u>	
Relinquished by: <u>[Signature]</u>	Date / Time: <u>10/30/08 12:50</u>	

Libby Environmental, Inc.

4130 Libby Road NE
Olympia, WA 98506
Ph 360-352-7110
Fax 360-352-4154

Chain of Custody Record

Date 10/27/2008 Page 2 of 2

Client Greenway
Address 8410 154th Ave NE
Phone 425-861-6000 Fax 425-861-6000
Client Project # 037-013-00

Project Manager Andy Barthel
Project Name Bayou - Sekiu
Location Sekiu, WA
Collector John Smith Date of Collection 10/21/08

Sample Number	Depth	Time	Sample Type	Container Type	VOA 8021B	VOA 8021B BTEX Only	SEM VDL 8270	NMTPH-HOLD	NMTPH-GX	NMTPH-DX	NMTPH-DX ETL	PAH 8270	PCBS 8082	MTC & Metals	Field Note# Containers
1	12-0	1:40	5	102											185
2															
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
14															
15															
16															
17															
18															

Relinquished by [Signature] Date / Time 10/27/08 11:50

Relinquished by [Signature] Date / Time 10/28/08 11:40

Relinquished by [Signature] Date / Time 10/28/08 11:50

Received by [Signature] Date / Time 10/28/08 11:40

Received by [Signature] Date / Time 10/28/08 11:50

Received by [Signature] Date / Time 10/28/08 11:50

Good Condition? 777

Cold? 777

Seals Intact? 777

Total Number of Containers 182 TAT 24HR 48HR 5 Day

Libby Environmental, Inc.

4139 Libby Road NE
Olympia, WA 98506
Ph: 360-352-2110
Fax: 360-352-4154

Chain of Custody Record

Date: 10/23/08 Page 1 of 1
Project Manager: Cindy Partolotti
Project Name: Sebalds Bay
Location: Sebalds Bay, WA
Collector: Jessica Smith Date of Collection: 10/24/08

Client: GeoEngineers
Address: 8410 154th Ave. NE
Phone: 425-861-6000 Fax: 425-861-6050
Client Project #: 0137-018-00

Sample Number	Depth	Time	Sample Type	Container Type	Field Note/Containers
1 MW-1			water	4250	
2 MW-2				ml	
3 MW-3					
4 MW-4					
5 MW-5					
6 MW-6D					
7 MW-6S					
8 MW-7D					
9 MW-7S					
10 MW-8					
11					
12					
13					
14					
15					
16					
17					
18					

Relinquished by	Date / Time	Received by	Date / Time	Sample Receipt	Remarks
[Signature]	10/27/08 11:50	[Signature]	10/28/08 11:10	Good Condition? ☒	Cold Chain Maps: 6.4°C
[Signature]	10/30/08 12:50	[Signature]	10/30/08 12:50	Color? ☒	6.0°C
[Signature]		[Signature]		Seals Intact? ☒	5.5°C

Total Number of Containers: 107 TAT 24HR 48HR 5-Day

9

*

Chain of Custody Record

Ph 360-352-2110
Fax 360-352-4114

876-000000

Rec'd # 0137 01302

Date: 10-27-2008 Page: 1 of 7
Project Manager: Carolyn Partlett
Project Name: Baywood School
Location: Skagit County, WA
Collector: Jessica Smith Date of Collection: 10-27-2008

[illegible][illegible]



Libby Environmental, Inc.

4139 Libby Road N.E., Olympia, WA 98506-2518

December 10, 2008

Cindy Bartlett
GeoEngineers
8410 154TH Avenue NE
Redmond, WA 98052

Dear Ms. Bartlett:

Please find enclosed the analytical data report for the Rayonier - Sekiu Project located in Sekiu, Washington. Soil samples were received on October 22, 2008, extracted on November 26, 2008 and analyzed for Diesel & Oil by NWTPH-Dx/Dx Extended on December 4, 2008.

The results of the analyses are summarized in the attached tables. Applicable detection limits and QA/QC data are included. An invoice for this analytical work is also enclosed. All soil samples are reported on a dry weight basis.

Libby Environmental, Inc. appreciates the opportunity to have provided analytical services for this project. If you have any further questions about the data report, please give me a call. It was a pleasure working with you on this project, and we are looking forward to the next opportunity to work together.

Sincerely,

Sherry L. Chilcutt
President
Libby Environmental, Inc.

LIBBY ENVIRONMENTAL CHEMISTRY LABORATORY

RAYONIER SEKIU PROJECT

Sekiu, Washington

GeoEngineers, Inc.

Client Project #0137.018.00

Analyses of Bunker C (NWTPH-Dx/Dx Extended) in Soil

Sample Number	Date Analyzed	Surrogate Recovery (%)	Bunker C (mg/kg)
Method Blank	12/4/2008	98.9	nd
TP-13-7.0	12/4/2008	106.1	nd
TP-13-7.0 Dup	12/4/2008	89.6	nd
TP-13-11.0	12/4/2008	103.6	nd
TP-14-12.5	12/4/2008	85.2	nd
Practical Quantitation Limit			40

"nd" Indicates not detected at the listed detection limits.

"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (2-F Biphenyl): 65% TO 135%

ANALYSES PERFORMED BY: Athanasius

Libby Environmental, Inc.

4139 Libby Road NE
Olympia, WA 98506
Ph: 360-352-2110
Fax: 360-352-4154

Client: Goffmaners
Address: 8410 16th Ave NE
Phone: 425 861 6000 Fax: 425 861 6050
Client Project # 0137.018.00

Chain of Custody Record

Date: 10.22.2008 Page: 1 of 4
Project Manager: Gandy Bartlett
Project Name: Kanawab Seku
Location: Seku, WA
Collector: Jessica Smith Date of Collection: 10.22.2008

Sample Number	Depth	Time	Sample Type	Container Type	VOL 8021B	VOL 8021B BTEX Only	SEM VOL 8270	NWTPH-HCID	NWTPH-GX	NWTPH-DX	PAH 8270	PCBS 8082	MTCA 5 Metals	Field Note# Containers
1 TP-13-7.0	7.0	8:35	S	4.0Z										
2 TP-13-11.0	11.0	8:45	S											
3 TP-14-12.5	12.5	09:10												
4 TP-8-10.0	10.0	10:00												
5 TP-2-4.0	4.0	10:30												
6 TP-2-12.0	12.0	10:45												
7 TP-16-4.0	4.0	11:5												
8 TP-16-9.0	9.0	11:30												
9 TP-16-15.0	15.0	11:55												
10 Duplicate														
11 TP-17-9.5	9.5	12:40												
12 TP-17-12.5	12.5	12:55												
13 TP-18-11.5	11.5	1:25												
14 TP-18-16.0	16.0	1:35												
15 TP-19-3.0	3.0	2:15												
16 TP-7-6.0	6.0	2:35												
17 TP-20-7.0	7.0	3:05												
18 TP-20-10.0	10.0	3:15												
Relinquished by: <u>[Signature]</u> Date / Time: <u>10.23.08 18:30</u>					Received by: <u>[Signature]</u> Date / Time: <u>10.23.08 18:30</u>					Remarks:				
Relinquished by: <u>[Signature]</u> Date / Time: <u>10.23.08 18:30</u>					Received by: <u>[Signature]</u> Date / Time: <u>10.23.08 18:30</u>					Sample Receipt:				
Relinquished by: <u>[Signature]</u> Date / Time: <u>10.23.08 18:30</u>					Received by: <u>[Signature]</u> Date / Time: <u>10.23.08 18:30</u>					Good Condition?				
Relinquished by: <u>[Signature]</u> Date / Time: <u>10.23.08 18:30</u>					Received by: <u>[Signature]</u> Date / Time: <u>10.23.08 18:30</u>					Cold?				
Relinquished by: <u>[Signature]</u> Date / Time: <u>10.23.08 18:30</u>					Received by: <u>[Signature]</u> Date / Time: <u>10.23.08 18:30</u>					Seals Intact?				
Relinquished by: <u>[Signature]</u> Date / Time: <u>10.23.08 18:30</u>					Received by: <u>[Signature]</u> Date / Time: <u>10.23.08 18:30</u>					Total Number of Containers				
Relinquished by: <u>[Signature]</u> Date / Time: <u>10.23.08 18:30</u>					Received by: <u>[Signature]</u> Date / Time: <u>10.23.08 18:30</u>					TAT 24HR 48H 5-Day				



Analytical Resources, Incorporated

Analytical Chemists and Consultants

March 9, 2009

Cindy Bartlett
GeoEngineers, Inc.
Plaza 600 Building
600 Stewart Suite 1700
Seattle, WA 98101

RE: Project: Sekui – Former Log Sorting Yard, 0137.018.00
ARI Job No.: ON75

Dear Cindy:

Please find enclosed the original Chain-of-Custody (COC) record, sample receipt documentation, and the final analytical results from the project referenced above.

Analytical Resources Inc. (ARI) accepted nine water samples on February 23, 2009 under the ARI job number referenced above. For further details regarding sample receipt, please refer to the enclosed Cooler Receipt Form.

The samples were analyzed for SIM PAH and NWTPH-Dx, as requested on the COC.

The LCS percent recovery of Benzo(a)anthracene was outside the control limits high for LCS-022509. The LCSD percent recovery was within control limits. No corrective action was required.

There were no other anomalies associated with the analyses of these samples.

An electronic copy of this report and all supporting raw data will remain on file with ARI. Should you have any questions or problems, please feel free to contact me at your convenience.

Sincerely,

ANALYTICAL RESOURCES, INC.

Cheronne Oreiro
Project Manager

-For-

Susan D. Dunnihoo
Director, Client Services
206-695-6207
sue@arilabs.com

Enclosures

cc: eFile ON75

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number:	Turn-around Requested:	Page: 1 of 1
ARI Client Company:	Phone:	Ice Present?
Geotek Engineers	425.861.6000	02.19.09
Client Contact:		No. of Coolers: 2
Client Project Name:		Cooler Temps:
Sekw - Farmer - Log Sorting Yard		
Client Project #:		
0137.018.00		



Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested				Notes/Comments
MW-1	02.19.09		water	4	X	X			
MW-2									
MW-3									
MW-4									
MW-5	02.18.09								
MW-6D	02.19.09								
MW-7S									
MW-7D									
MW-8									
Comments/Special Instructions					Relinquished by: (Signature)	Received by: (Signature)			
					Printed Name: Jessica Smith	Printed Name: Jonathan Walter			
					Company: GEL	Company: ARI			
					Date & Time: 02.23.09 1415	Date & Time: 2/23/09 1415			

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: GeoEngineers

Project Name: Seki - Former log Sorting Yard

COC No: _____

Delivered by: Hand

Assigned ARI Job No: 0N75

Tracking No: _____

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler? YES ☒ NO ☒ 2 coolers
Were custody papers included with the cooler? YES ☒ NO ☐
Were custody papers properly filled out (ink, signed, etc.) YES ☒ NO ☐
Record cooler temperature (recommended 2.0-6.0 °C for chemistry 13.1-13.4 °C / 7.8-19.9

Cooler Accepted by: JW Date: 2/23/09 Time: 1415

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler? YES ☐ NO ☒
What kind of packing material was used? BW
Was sufficient ice used (if appropriate)? YES ☐ NO ☐
Were all bottles sealed in individual plastic bags? YES ☐ NO ☒
Did all bottle arrive in good condition (unbroken)? YES ☒ NO ☐
Were all bottle labels complete and legible? 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 checklist) YES ☐ NO ☒
Were all VOC vials free of air bubbles? ☒ NA YES ☐ NO ☐
Was sufficient amount of sample sent in each bottle? YES ☒ NO ☐

Samples Logged by: JW Date: 2/23/09 Time: _____

**** Notify Project Manager of discrepancies or concerns ****

Explain discrepancies or negative responses:

By: _____

Date: _____

ORGANICS ANALYSIS DATA SHEET

PNAs by SW8270D-SIM GC/MS

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Sample ID: MW-1

SAMPLE

Lab Sample ID: ON75A

LIMS ID: 09-5216

Matrix: Water

Data Release Authorized: 

Reported: 03/04/09

QC Report No: ON75-GeoEngineers

Project: Sekiu- Former Log Sorting Yard

Event: 0137.018.00

Date Sampled: 02/19/09

Date Received: 02/23/09

Date Extracted: 02/25/09

Date Analyzed: 03/02/09 14:41

Instrument/Analyst: NT1/YZ

Sample Amount: 500 mL

Final Extract Volume: 0.5 mL

Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	0.10	0.23
91-57-6	2-Methylnaphthalene	0.10	0.10
90-12-0	1-Methylnaphthalene	0.10	0.78
208-96-8	Acenaphthylene	0.10	< 0.10 U
83-32-9	Acenaphthene	0.10	< 0.10 U
86-73-7	Fluorene	0.10	0.11
85-01-8	Phenanthrene	0.10	< 0.10 U
120-12-7	Anthracene	0.10	< 0.10 U
206-44-0	Fluoranthene	0.10	< 0.10 U
129-00-0	Pyrene	0.10	0.12
56-55-3	Benzo (a) anthracene	0.10	< 0.10 U
218-01-9	Chrysene	0.10	< 0.10 U
205-99-2	Benzo (b) fluoranthene	0.10	< 0.10 U
207-08-9	Benzo (k) fluoranthene	0.10	< 0.10 U
50-32-8	Benzo (a) pyrene	0.10	< 0.10 U
193-39-5	Indeno (1,2,3-cd) pyrene	0.10	< 0.10 U
53-70-3	Dibenz (a,h) anthracene	0.10	< 0.10 U
191-24-2	Benzo (g,h,i) perylene	0.10	< 0.10 U
132-64-9	Dibenzofuran	0.10	< 0.10 U

Reported in $\mu\text{g/L}$ (ppb)**SIM Semivolatile Surrogate Recovery**

d10-2-Methylnaphthalene	73.0%
d14-Dibenzo (a,h) anthracene	49.3%

ORGANICS ANALYSIS DATA SHEET

PNA's by SW8270D-SIM GC/MS

Page 1 of 1

Sample ID: MW-2

SAMPLE

Lab Sample ID: ON75B

LIMS ID: 09-5217

Matrix: Water

Data Release Authorized:

Reported: 03/04/09

QC Report No: ON75-GeoEngineers

Project: Sekiu- Former Log Sorting Yard

Event: 0137.018.00

Date Sampled: 02/19/09

Date Received: 02/23/09

Date Extracted: 02/25/09

Date Analyzed: 03/02/09 15:04

Instrument/Analyst: NT1/YZ

Sample Amount: 500 mL

Final Extract Volume: 0.5 mL

Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	0.10	< 0.10 U
91-57-6	2-Methylnaphthalene	0.10	< 0.10 U
90-12-0	1-Methylnaphthalene	0.10	< 0.10 U
208-96-8	Acenaphthylene	0.10	< 0.10 U
83-32-9	Acenaphthene	0.10	< 0.10 U
86-73-7	Fluorene	0.10	< 0.10 U
85-01-8	Phenanthrene	0.10	< 0.10 U
120-12-7	Anthracene	0.10	< 0.10 U
206-44-0	Fluoranthene	0.10	< 0.10 U
129-00-0	Pyrene	0.10	< 0.10 U
56-55-3	Benzo(a)anthracene	0.10	< 0.10 U
218-01-9	Chrysene	0.10	< 0.10 U
205-99-2	Benzo(b)fluoranthene	0.10	< 0.10 U
207-08-9	Benzo(k)fluoranthene	0.10	< 0.10 U
50-32-8	Benzo(a)pyrene	0.10	< 0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10	< 0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10	< 0.10 U
191-24-2	Benzo(g,h,i)perylene	0.10	< 0.10 U
132-64-9	Dibenzofuran	0.10	< 0.10 U

Reported in $\mu\text{g/L}$ (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene 71.7%
d14-Dibenzo(a,h)anthracene 85.3%

ORGANICS ANALYSIS DATA SHEET

PNAs by SW8270D-SIM GC/MS

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Sample ID: MW-3

SAMPLE

Lab Sample ID: ON75C

LIMS ID: 09-5218

Matrix: Water

Data Release Authorized: 

Reported: 03/04/09

QC Report No: ON75-GeoEngineers

Project: Sekiu- Former Log Sorting Yard

Event: 0137.018.00

Date Sampled: 02/19/09

Date Received: 02/23/09

Date Extracted: 02/25/09

Date Analyzed: 03/02/09 15:27

Instrument/Analyst: NT1/YZ

Sample Amount: 500 mL

Final Extract Volume: 0.5 mL

Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	0.10	< 0.10 U
91-57-6	2-Methylnaphthalene	0.10	< 0.10 U
90-12-0	1-Methylnaphthalene	0.10	< 0.10 U
208-96-8	Acenaphthylene	0.10	< 0.10 U
83-32-9	Acenaphthene	0.10	< 0.10 U
86-73-7	Fluorene	0.10	< 0.10 U
85-01-8	Phenanthrene	0.10	< 0.10 U
120-12-7	Anthracene	0.10	< 0.10 U
206-44-0	Fluoranthene	0.10	< 0.10 U
129-00-0	Pyrene	0.10	< 0.10 U
56-55-3	Benzo(a)anthracene	0.10	< 0.10 U
218-01-9	Chrysene	0.10	< 0.10 U
205-99-2	Benzo(b)fluoranthene	0.10	< 0.10 U
207-08-9	Benzo(k)fluoranthene	0.10	< 0.10 U
50-32-8	Benzo(a)pyrene	0.10	< 0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10	< 0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10	< 0.10 U
191-24-2	Benzo(g,h,i)perylene	0.10	< 0.10 U
132-64-9	Dibenzofuran	0.10	< 0.10 U

Reported in $\mu\text{g/L}$ (ppb)SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	72.3%
d14-Dibenzo(a,h)anthracene	85.3%

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS
Page 1 of 1



Sample ID: MW-4
SAMPLE

Lab Sample ID: ON75D

LIMS ID: 09-5219

Matrix: Water

Data Release Authorized: *[Signature]*

Reported: 03/04/09

QC Report No: ON75-GeoEngineers

Project: Sekiu- Former Log Sorting Yard

Event: 0137.018.00

Date Sampled: 02/19/09

Date Received: 02/23/09

Date Extracted: 02/25/09

Date Analyzed: 03/02/09 15:50

Instrument/Analyst: NT1/YZ

Sample Amount: 500 mL

Final Extract Volume: 0.5 mL

Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	0.10	< 0.10 U
91-57-6	2-Methylnaphthalene	0.10	< 0.10 U
90-12-0	1-Methylnaphthalene	0.10	< 0.10 U
208-96-8	Acenaphthylene	0.10	< 0.10 U
83-32-9	Acenaphthene	0.10	< 0.10 U
86-73-7	Fluorene	0.10	< 0.10 U
85-01-8	Phenanthrene	0.10	< 0.10 U
120-12-7	Anthracene	0.10	< 0.10 U
206-44-0	Fluoranthene	0.10	< 0.10 U
129-00-0	Pyrene	0.10	< 0.10 U
56-55-3	Benzo(a)anthracene	0.10	< 0.10 U
218-01-9	Chrysene	0.10	< 0.10 U
205-99-2	Benzo(b)fluoranthene	0.10	< 0.10 U
207-08-9	Benzo(k)fluoranthene	0.10	< 0.10 U
50-32-8	Benzo(a)pyrene	0.10	< 0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10	< 0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10	< 0.10 U
191-24-2	Benzo(g,h,i)perylene	0.10	< 0.10 U
132-64-9	Dibenzofuran	0.10	< 0.10 U

Reported in $\mu\text{g/L}$ (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene 74.3%
d14-Dibenzo(a,h)anthracene 86.3%

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS
Page 1 of 1



Sample ID: MW-5
SAMPLE

Lab Sample ID: ON75E

LIMS ID: 09-5220

Matrix: Water

Data Release Authorized: *[Signature]*

Reported: 03/04/09

QC Report No: ON75-GeoEngineers

Project: Sekiu- Former Log Sorting Yard

Event: 0137.018.00

Date Sampled: 02/19/09

Date Received: 02/23/09

Date Extracted: 02/25/09

Date Analyzed: 03/02/09 16:12

Instrument/Analyst: NT1/YZ

Sample Amount: 500 mL

Final Extract Volume: 0.5 mL

Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	0.10	< 0.10 U
91-57-6	2-Methylnaphthalene	0.10	< 0.10 U
90-12-0	1-Methylnaphthalene	0.10	< 0.10 U
208-96-8	Acenaphthylene	0.10	< 0.10 U
83-32-9	Acenaphthene	0.10	< 0.10 U
86-73-7	Fluorene	0.10	< 0.10 U
85-01-8	Phenanthrene	0.10	< 0.10 U
120-12-7	Anthracene	0.10	< 0.10 U
206-44-0	Fluoranthene	0.10	< 0.10 U
129-00-0	Pyrene	0.10	< 0.10 U
56-55-3	Benzo(a)anthracene	0.10	< 0.10 U
218-01-9	Chrysene	0.10	< 0.10 U
205-99-2	Benzo(b)fluoranthene	0.10	< 0.10 U
207-08-9	Benzo(k)fluoranthene	0.10	< 0.10 U
50-32-8	Benzo(a)pyrene	0.10	< 0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10	< 0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10	< 0.10 U
191-24-2	Benzo(g,h,i)perylene	0.10	< 0.10 U
132-64-9	Dibenzofuran	0.10	< 0.10 U

Reported in $\mu\text{g/L}$ (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene 70.7%
d14-Dibenzo(a,h)anthracene 85.7%

ORGANICS ANALYSIS DATA SHEET

PNAs by SW8270D-SIM GC/MS

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Sample ID: MW-6D

SAMPLE

Lab Sample ID: ON75F

LIMS ID: 09-5221

Matrix: Water

Data Release Authorized: 

Reported: 03/04/09

QC Report No: ON75-GeoEngineers

Project: Sekiu- Former Log Sorting Yard

Event: 0137.018.00

Date Sampled: 02/19/09

Date Received: 02/23/09

Date Extracted: 02/25/09

Date Analyzed: 03/02/09 16:35

Instrument/Analyst: NT1/YZ

Sample Amount: 500 mL

Final Extract Volume: 0.5 mL

Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	0.10	< 0.10 U
91-57-6	2-Methylnaphthalene	0.10	< 0.10 U
90-12-0	1-Methylnaphthalene	0.10	< 0.10 U
208-96-8	Acenaphthylene	0.10	< 0.10 U
83-32-9	Acenaphthene	0.10	0.19
86-73-7	Fluorene	0.10	0.10
85-01-8	Phenanthrene	0.10	< 0.10 U
120-12-7	Anthracene	0.10	< 0.10 U
206-44-0	Fluoranthene	0.10	< 0.10 U
129-00-0	Pyrene	0.10	< 0.10 U
56-55-3	Benzo(a)anthracene	0.10	< 0.10 U
218-01-9	Chrysene	0.10	< 0.10 U
205-99-2	Benzo(b)fluoranthene	0.10	< 0.10 U
207-08-9	Benzo(k)fluoranthene	0.10	< 0.10 U
50-32-8	Benzo(a)pyrene	0.10	< 0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10	< 0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10	< 0.10 U
191-24-2	Benzo(g,h,i)perylene	0.10	< 0.10 U
132-64-9	Dibenzofuran	0.10	< 0.10 U

Reported in $\mu\text{g/L}$ (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	67.3%
d14-Dibenzo(a,h)anthracene	90.3%

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS
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Sample ID: MW-7S
SAMPLE

Lab Sample ID: ON75G

LIMS ID: 09-5222

Matrix: Water

Data Release Authorized: *[Signature]*

Reported: 03/04/09

QC Report No: ON75-GeoEngineers

Project: Sekiu- Former Log Sorting Yard

Event: 0137.018.00

Date Sampled: 02/19/09

Date Received: 02/23/09

Date Extracted: 02/25/09

Date Analyzed: 03/02/09 16:58

Instrument/Analyst: NT1/YZ

Sample Amount: 500 mL

Final Extract Volume: 0.5 mL

Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	0.10	< 0.10 U
91-57-6	2-Methylnaphthalene	0.10	< 0.10 U
90-12-0	1-Methylnaphthalene	0.10	< 0.10 U
208-96-8	Acenaphthylene	0.10	< 0.10 U
83-32-9	Acenaphthene	0.10	0.80
86-73-7	Fluorene	0.10	0.25
85-01-8	Phenanthrene	0.10	< 0.10 U
120-12-7	Anthracene	0.10	0.14
206-44-0	Fluoranthene	0.10	< 0.10 U
129-00-0	Pyrene	0.10	0.11
56-55-3	Benzo(a)anthracene	0.10	< 0.10 U
218-01-9	Chrysene	0.10	< 0.10 U
205-99-2	Benzo(b)fluoranthene	0.10	< 0.10 U
207-08-9	Benzo(k)fluoranthene	0.10	< 0.10 U
50-32-8	Benzo(a)pyrene	0.10	< 0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10	< 0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10	< 0.10 U
191-24-2	Benzo(g,h,i)perylene	0.10	< 0.10 U
132-64-9	Dibenzofuran	0.10	0.11

Reported in $\mu\text{g/L}$ (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	67.3%
d14-Dibenzo(a,h)anthracene	87.0%

ORGANICS ANALYSIS DATA SHEET

PNAs by SW8270D-SIM GC/MS

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Sample ID: MW-7D

SAMPLE

Lab Sample ID: ON75H

LIMS ID: 09-5223

Matrix: Water

Data Release Authorized: *AB*

Reported: 03/04/09

QC Report No: ON75-GeoEngineers

Project: Sekiu- Former Log Sorting Yard

Event: 0137.018.00

Date Sampled: 02/19/09

Date Received: 02/23/09

Date Extracted: 02/25/09

Date Analyzed: 03/02/09 17:21

Instrument/Analyst: NT1/YZ

Sample Amount: 500 mL

Final Extract Volume: 0.5 mL

Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	0.10	< 0.10 U
91-57-6	2-Methylnaphthalene	0.10	< 0.10 U
90-12-0	1-Methylnaphthalene	0.10	0.10
208-96-8	Acenaphthylene	0.10	< 0.10 U
83-32-9	Acenaphthene	0.10	0.97
86-73-7	Fluorene	0.10	0.41
85-01-8	Phenanthrene	0.10	< 0.10 U
120-12-7	Anthracene	0.10	0.24
206-44-0	Fluoranthene	0.10	< 0.10 U
129-00-0	Pyrene	0.10	0.16
56-55-3	Benzo(a)anthracene	0.10	< 0.10 U
218-01-9	Chrysene	0.10	< 0.10 U
205-99-2	Benzo(b)fluoranthene	0.10	< 0.10 U
207-08-9	Benzo(k)fluoranthene	0.10	< 0.10 U
50-32-8	Benzo(a)pyrene	0.10	< 0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10	< 0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10	< 0.10 U
191-24-2	Benzo(g,h,i)perylene	0.10	< 0.10 U
132-64-9	Dibenzofuran	0.10	0.16

Reported in $\mu\text{g/L}$ (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	70.3%
d14-Dibenzo(a,h)anthracene	91.7%

ORGANICS ANALYSIS DATA SHEET

PNAs by SW8270D-SIM GC/MS

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Sample ID: MW-8

SAMPLE

Lab Sample ID: ON75I

LIMS ID: 09-5224

Matrix: Water

Data Release Authorized: 

Reported: 03/04/09

QC Report No: ON75-GeoEngineers

Project: Sekiu- Former Log Sorting Yard

Event: 0137.018.00

Date Sampled: 02/19/09

Date Received: 02/23/09

Date Extracted: 02/25/09

Date Analyzed: 03/02/09 17:44

Instrument/Analyst: NT1/YZ

Sample Amount: 500 mL

Final Extract Volume: 0.5 mL

Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	0.10	< 0.10 U
91-57-6	2-Methylnaphthalene	0.10	< 0.10 U
90-12-0	1-Methylnaphthalene	0.10	< 0.10 U
208-96-8	Acenaphthylene	0.10	< 0.10 U
83-32-9	Acenaphthene	0.10	< 0.10 U
86-73-7	Fluorene	0.10	< 0.10 U
85-01-8	Phenanthrene	0.10	< 0.10 U
120-12-7	Anthracene	0.10	< 0.10 U
206-44-0	Fluoranthene	0.10	< 0.10 U
129-00-0	Pyrene	0.10	< 0.10 U
56-55-3	Benzo(a)anthracene	0.10	< 0.10 U
218-01-9	Chrysene	0.10	< 0.10 U
205-99-2	Benzo(b)fluoranthene	0.10	< 0.10 U
207-08-9	Benzo(k)fluoranthene	0.10	< 0.10 U
50-32-8	Benzo(a)pyrene	0.10	< 0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10	< 0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10	< 0.10 U
191-24-2	Benzo(g,h,i)perylene	0.10	< 0.10 U
132-64-9	Dibenzofuran	0.10	< 0.10 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene 67.7%

d14-Dibenzo(a,h)anthracene 86.0%

SIM SW8270 SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: ON75-GeoEngineers
Project: Sekiu- Former Log Sorting Yard
0137.018.00

Client ID	MNP	DBA	TOT OUT
MB-022509	71.7%	93.7%	0
LCS-022509	71.7%	107%	0
LCSD-022509	73.7%	93.3%	0
MW-1	73.0%	49.3%	0
MW-2	71.7%	85.3%	0
MW-3	72.3%	85.3%	0
MW-4	74.3%	86.3%	0
MW-5	70.7%	85.7%	0
MW-6D	67.3%	90.3%	0
MW-7S	67.3%	87.0%	0
MW-7D	70.3%	91.7%	0
MW-8	67.7%	86.0%	0

	LCS/MB LIMITS	QC LIMITS
(MNP) = d10-2-Methylnaphthalene	(49-113)	(44-112)
(DBA) = d14-Dibenzo(a,h)anthracene	(49-132)	(10-138)

Prep Method: SW3520C
Log Number Range: 09-5216 to 09-5224

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS
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Sample ID: LCS-022509
 LAB CONTROL SAMPLE

Lab Sample ID: LCS-022509
 LIMS ID: 09-5216
 Matrix: Water
 Data Release Authorized: *[Signature]*
 Reported: 03/04/09

QC Report No: ON75-GeoEngineers
 Project: Sekiu- Former Log Sorting Yard
 Event: 0137.018.00
 Date Sampled: NA
 Date Received: NA

Date Extracted LCS/LCSD: 02/25/09

Sample Amount LCS: 500 mL

Date Analyzed LCS: 03/02/09 13:33

Final Extract Volume LCS: 0.50 mL

LCSD: 03/02/09 13:56

LCSD: 500 mL

LCSD: 0.50 mL

Instrument/Analyst LCS: NT1/YZ

Dilution Factor LCS: 1.00

LCSD: NT1/YZ

LCSD: 1.00

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Naphthalene	2.08	3.00	69.3%	2.21	3.00	73.7%	6.1%
2-Methylnaphthalene	2.06	3.00	68.7%	2.22	3.00	74.0%	7.5%
1-Methylnaphthalene	2.03	3.00	67.7%	2.18	3.00	72.7%	7.1%
Acenaphthylene	2.31	3.00	77.0%	2.41	3.00	80.3%	4.2%
Acenaphthene	2.27	3.00	75.7%	2.37	3.00	79.0%	4.3%
Fluorene	2.51	3.00	83.7%	2.65	3.00	88.3%	5.4%
Phenanthrene	2.71	3.00	90.3%	2.61	3.00	87.0%	3.8%
Anthracene	2.81	3.00	93.7%	2.67	3.00	89.0%	5.1%
Fluoranthene	3.24	3.00	108%	3.10	3.00	103%	4.4%
Pyrene	3.28	3.00	109%	2.95	3.00	98.3%	10.6%
Benzo(a)anthracene	3.36	3.00	112%	3.10	3.00	103%	8.0%
Chrysene	3.12	3.00	104%	2.82	3.00	94.0%	10.1%
Benzo(b)fluoranthene	3.44	3.00	115%	3.23	3.00	108%	6.3%
Benzo(k)fluoranthene	3.13	3.00	104%	2.62	3.00	87.3%	17.7%
Benzo(a)pyrene	2.78	3.00	92.7%	2.44	3.00	81.3%	13.0%
Indeno(1,2,3-cd)pyrene	2.70	3.00	90.0%	2.45	3.00	81.7%	9.7%
Dibenz(a,h)anthracene	2.99	3.00	99.7%	2.60	3.00	86.7%	14.0%
Benzo(g,h,i)perylene	3.08	3.00	103%	2.75	3.00	91.7%	11.3%
Dibenzofuran	2.32	3.00	77.3%	2.41	3.00	80.3%	3.8%

Reported in µg/L (ppb)

RPD calculated using sample concentrations per SW846.

SIM Semivolatile Surrogate Recovery

	LCS	LCSD
d10-2-Methylnaphthalene	71.7%	73.7%
d14-Dibenzo(a,h)anthracene	107%	93.3%

ORGANICS ANALYSIS DATA SHEET

PNAs by SW8270D-SIM GC/MS

Page 1 of 1

Sample ID: MB-022509

METHOD BLANK

Lab Sample ID: MB-022509

LIMS ID: 09-5216

Matrix: Water

Data Release Authorized: 

Reported: 03/04/09

QC Report No: ON75-GeoEngineers

Project: Sekiu- Former Log Sorting Yard

Event: 0137.018.00

Date Sampled: NA

Date Received: NA

Date Extracted: 02/25/09

Sample Amount: 500 mL

Date Analyzed: 03/02/09 13:10

Final Extract Volume: 0.5 mL

Instrument/Analyst: NT1/YZ

Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	0.10	< 0.10 U
91-57-6	2-Methylnaphthalene	0.10	< 0.10 U
90-12-0	1-Methylnaphthalene	0.10	< 0.10 U
208-96-8	Acenaphthylene	0.10	< 0.10 U
83-32-9	Acenaphthene	0.10	< 0.10 U
86-73-7	Fluorene	0.10	< 0.10 U
85-01-8	Phenanthrene	0.10	< 0.10 U
120-12-7	Anthracene	0.10	< 0.10 U
206-44-0	Fluoranthene	0.10	< 0.10 U
129-00-0	Pyrene	0.10	< 0.10 U
56-55-3	Benzo(a)anthracene	0.10	< 0.10 U
218-01-9	Chrysene	0.10	< 0.10 U
205-99-2	Benzo(b)fluoranthene	0.10	< 0.10 U
207-08-9	Benzo(k)fluoranthene	0.10	< 0.10 U
50-32-8	Benzo(a)pyrene	0.10	< 0.10 U
193-39-5	Indeno(1,2,3-cd)pyrene	0.10	< 0.10 U
53-70-3	Dibenz(a,h)anthracene	0.10	< 0.10 U
191-24-2	Benzo(g,h,i)perylene	0.10	< 0.10 U
132-64-9	Dibenzofuran	0.10	< 0.10 U

Reported in $\mu\text{g/L}$ (ppb)SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene 71.7%

d14-Dibenzo(a,h)anthracene 93.7%

ORGANICS ANALYSIS DATA SHEET

TOTAL DIESEL RANGE HYDROCARBONS

NWTPHD by GC/FID-Silica and Acid Cleaned

Page 1 of 2

Matrix: Water

QC Report No: ON75-GeoEngineers

Project: Sekiu- Former Log Sorting Yard

0137.018.00

Data Release Authorized: *[Signature]*

Reported: 03/05/09

ARI ID	Sample ID	Extraction Date	Analysis Date	EFV DL	Range	RL	Result
MB-022508 09-5216	Method Blank HC ID: ---	02/25/08	03/04/09 FID4A	1.00 1.0	Diesel Motor Oil Bunker C o-Terphenyl	0.25 0.50 0.50	< 0.25 U < 0.50 U < 0.50 U 78.9%
ON75A 09-5216	MW-1 HC ID: DRO/MOTOR OIL	02/25/09	03/04/09 FID4A	1.00 1.0	Diesel Motor Oil Bunker C o-Terphenyl	0.25 0.50 0.50	< 0.25 U < 0.50 U 1.0 54.2%
ON75B 09-5217	MW-2 HC ID: ---	02/25/09	03/04/09 FID4A	1.00 1.0	Diesel Motor Oil Bunker C o-Terphenyl	0.25 0.50 0.50	< 0.25 U < 0.50 U < 0.50 U 86.7%
ON75C 09-5218	MW-3 HC ID: ---	02/25/09	03/04/09 FID4A	1.00 1.0	Diesel Motor Oil Bunker C o-Terphenyl	0.25 0.50 0.50	< 0.25 U < 0.50 U < 0.50 U 84.7%
ON75D 09-5219	MW-4 HC ID: ---	02/25/09	03/04/09 FID4A	1.00 1.0	Diesel Motor Oil Bunker C o-Terphenyl	0.25 0.50 0.50	< 0.25 U < 0.50 U < 0.50 U 89.6%
ON75E 09-5220	MW-5 HC ID: ---	02/25/09	03/04/09 FID4A	1.00 1.0	Diesel Motor Oil Bunker C o-Terphenyl	0.25 0.50 0.50	< 0.25 U < 0.50 U < 0.50 U 84.9%
ON75F 09-5221	MW-6D HC ID: ---	02/25/09	03/04/09 FID4A	1.00 1.0	Diesel Motor Oil Bunker C o-Terphenyl	0.25 0.50 0.50	< 0.25 U < 0.50 U < 0.50 U 77.6%
ON75G 09-5222	MW-7S HC ID: ---	02/25/09	03/04/09 FID4A	1.00 1.0	Diesel Motor Oil Bunker C o-Terphenyl	0.25 0.50 0.50	< 0.25 U < 0.50 U < 0.50 U 75.6%
ON75H 09-5223	MW-7D HC ID: ---	02/25/09	03/04/09 FID4A	1.00 1.0	Diesel Motor Oil Bunker C o-Terphenyl	0.25 0.50 0.50	< 0.25 U < 0.50 U < 0.50 U 74.2%
ON75I 09-5224	MW-8 HC ID: ---	02/25/09	03/04/09 FID4A	1.00 1.0	Diesel Motor Oil Bunker C o-Terphenyl	0.25 0.50 0.50	< 0.25 U < 0.50 U < 0.50 U 82.4%

ORGANICS ANALYSIS DATA SHEET

TOTAL DIESEL RANGE HYDROCARBONS

NWTPHD by GC/FID-Silica and Acid Cleaned

Page 2 of 2

Matrix: Water

QC Report No: ON75-GeoEngineers

Project: Sekiu- Former Log Sorting Yard
0137.018.00

Data Release Authorized: *[Signature]*

Reported: 03/05/09

ARI ID	Sample ID	Extraction Date	Analysis Date	EFV DL	Range	RL	Result
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Reported in mg/L (ppm)

EFV-Effective Final Volume in mL.

DL-Dilution of extract prior to analysis.

RL-Reporting limit.

Diesel quantitation on total peaks in the range from C12 to C24.

Motor Oil quantitation on total peaks in the range from C24 to C38.

Bunker C quantitation on total peaks in the range from C10 to C38.

HC ID: DRO/RRO indicate results of organics or additional hydrocarbons in ranges are not identifiable.

Analytical Resources Inc.
TPH Quantitation Report

PC
3/5/09

Data file: /chem3/fid4a.i/20090304.b/0304a033.d
Method: /chem3/fid4a.i/20090304.b/ftphfid4a.m
Instrument: fid4a.i
Operator: JR

ARI ID: ON75MBW1
Client ID: ON75MBW1
Injection: 04-MAR-2009 17:48

Report Date: 03/05/2009

Dilution Factor: 1

Macro: 04-MAR-2009

Calibration Dates: Gas:27-JAN-2009 Diesel:04-MAR-2009 M.Oil:04-MAR-2009

FID:4A RESULTS

Compound	RT	Shift	Height	Area	Range	Total Area	Conc
Toluene	1.404	0.003	26433	56869	GAS (Tol-C12)	275351	9
C8	1.491	-0.028	15544	18859	DIESEL (C12-C24)	575440	49
C10	2.187	0.007	22447	14332	M.OIL (C24-C38)	413652	44*
C12	2.702	0.000	1771	1200	AK-102 (C10-C25)	653716	46
C14	3.134	0.007	2622	4495	AK-103 (C25-C36)	372530	65*
C16	3.488	-0.008	3743	5617	OR.DIES (C10-C28)	765522	53
C18	3.845	-0.002	5597	4097	OR.MOIL (C28-C40)	319294	44*
C20	4.260	-0.008	77923	86549			
C22	4.638	-0.009	4762	4373			
C24	4.959	-0.001	3415	1960			
C25	5.086	-0.008	3370	2508			
C26	5.209	-0.009	2986	3795			
C28	5.436	-0.004	4051	2645			
C32	5.837	-0.004	5465	6249			
C34	6.060	-0.008	5632	7735	BUNKERC (C10-C38)	1058211	146*
Filter Peak	6.346	-1.364	972673	1038776			
C36	6.296	-0.044	5780	11307			
C38	6.673	-0.010	2328	9309			
C40	7.139	-0.001	936	1441			
o-terph	4.028	-0.002	998576	551450	JET-A (C10-C18)	425815	34
Triacon Surr	5.639	-0.004	1205099	585119			

* Indicates Filter Peak subtracted

Range Times: NW Diesel (2.702 - 4.960) AK102 (2.18 - 5.09) Jet A (2.18 - 3.85)
NW M.Oil (4.96 - 6.68) AK103 (5.09 - 6.34) OR Diesel (2.18 - 5.44)

Surrogate	Area	Amount	%Rec
o-Terphenyl	551450	35.5	78.9
Triacontane	585119	36.6	81.2

Analyte	RF	Curve Date
o-Terph Surr	15529.5	04-MAR-2009
Triacon Surr	16008.5	04-MAR-2009
Gas	29969.0	27-JAN-2009
Diesel	11833.0	04-MAR-2009
Motor Oil	9446.0	04-MAR-2009
AK102	14323.0	04-MAR-2009
AK103	5772.2	06-FEB-2009
JetA	12632.0	07-JAN-2009
OR Diesel	14494.0	
OR M.Oil	7304.0	
Bunker C	7267.4	04-MAR-2009

Data File: /chem3/fid4a.i/20090304.b/0304a033.d

Date : 04-MAR-2009 17:48

Client ID: 0N75HBM4

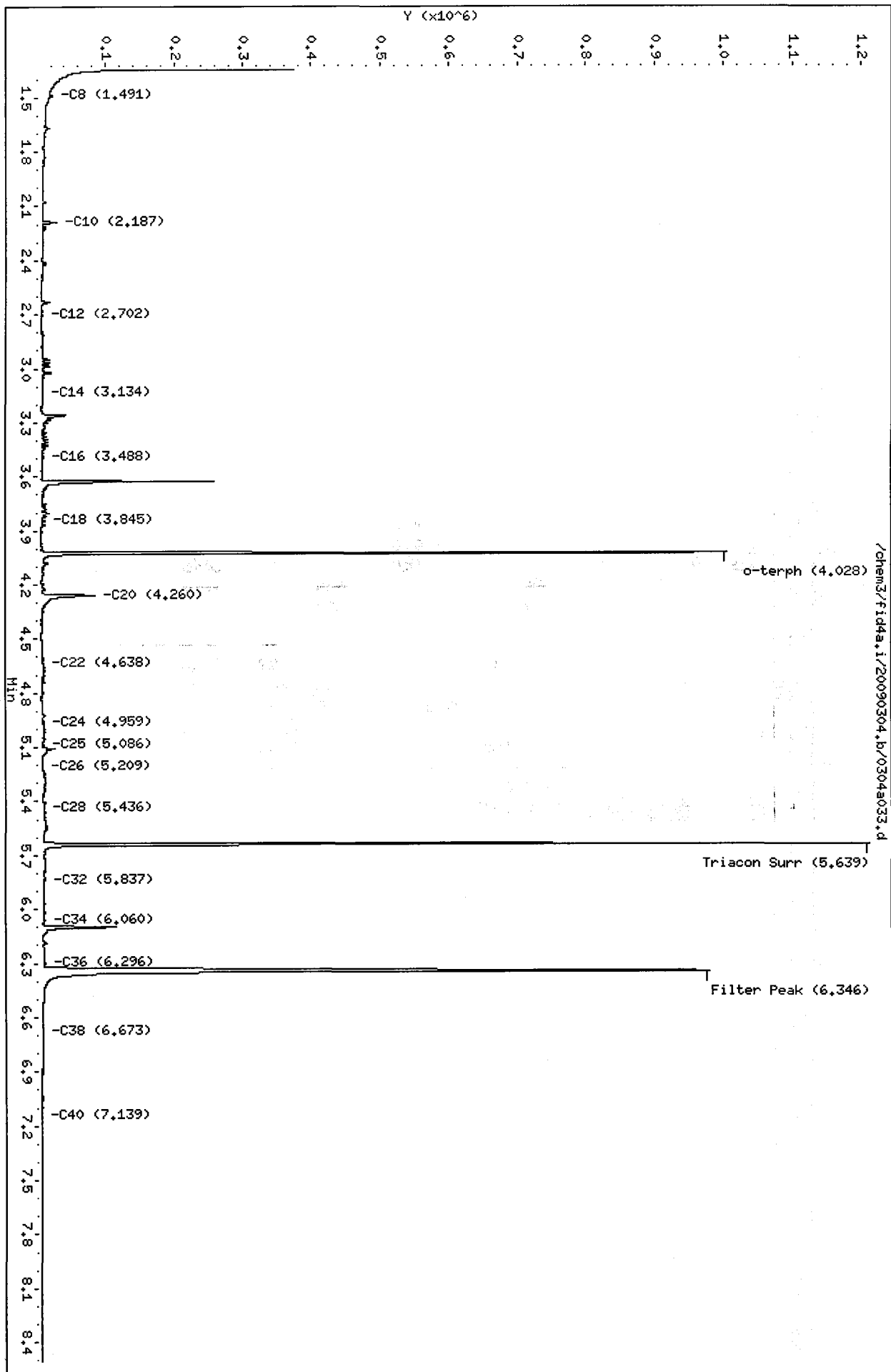
Sample Info: 0N75HBM4

Column phase: RTX-1

Instrument: fid4a.i

Operator: JR

Column diameter: 2.00



Analytical Resources Inc.
TPH Quantitation Report

PC
3/5/09

Data file: /chem3/fid4a.i/20090304.b/0304a036.d
Method: /chem3/fid4a.i/20090304.b/ftphfid4a.m
Instrument: fid4a.i

ARI ID: ON75A
Client ID: MW-1
Injection: 04-MAR-2009 18:30

Operator: JR

Report Date: 03/05/2009

Dilution Factor: 1

Macro: 04-MAR-2009

Calibration Dates: Gas:27-JAN-2009 Diesel:04-MAR-2009 M.Oil:04-MAR-2009

FID:4A RESULTS

Compound	RT	Shift	Height	Area	Range	Total Area	Conc
Toluene	1.403	0.002	21476	44735	GAS (Tol-C12)	238709	8
C8	1.541	0.023	5634	11826	DIESEL (C12-C24)	1368719	116
C10	2.186	0.006	20583	12379	M.OIL (C24-C38)	2344921	248*
C12	2.701	-0.001	2336	1749	AK-102 (C10-C25)	1464951	102
C14	3.131	0.003	5891	5633	AK-103 (C25-C36)	1989282	345*
C16	3.493	-0.003	8173	7951	OR.DIES (C10-C28)	2093100	144
C18	3.843	-0.003	12643	10672	OR.MOIL (C28-C40)	1774826	243*
C20	4.256	-0.011	78117	74164			
C22	4.647	0.000	14326	6778			
C24	4.958	-0.002	17265	12057			
C25	5.087	-0.007	19487	19159			
C26	5.213	-0.005	22414	29993			
C28	5.439	-0.001	30381	24134			
C32	5.839	-0.002	30511	45096			
C34	6.062	-0.006	22894	44430	BUNKERC (C10-C38)	3769916	519*
Filter Peak	6.349	-1.360	1110691	1215733			
C36	6.296	-0.044	17832	23051			
C38	6.677	-0.006	10343	38722			
C40	7.123	-0.017	4135	9321			
o-terph	4.025	-0.005	700410	379730	JET-A (C10-C18)	622694	49
Triacon Surr	5.640	-0.003	876227	393111			

* Indicates Filter Peak subtracted

Range Times: NW Diesel(2.702 - 4.960) AK102(2.18 - 5.09) Jet A(2.18 - 3.85)
NW M.Oil(4.96 - 6.68) AK103(5.09 - 6.34) OR Diesel(2.18 - 5.44)

Surrogate	Area	Amount	%Rec
o-Terphenyl	379730	24.5	54.3
Triacontane	393111	24.6	54.6

Analyte	RF	Curve Date
o-Terph Surr	15529.5	04-MAR-2009
Triacon Surr	16008.5	04-MAR-2009
Gas	29969.0	27-JAN-2009
Diesel	11833.0	04-MAR-2009
Motor Oil	9446.0	04-MAR-2009
AK102	14323.0	04-MAR-2009
AK103	5772.2	06-FEB-2009
JetA	12632.0	07-JAN-2009
OR Diesel	14494.0	
OR M.Oil	7304.0	
Bunker C	7267.4	04-MAR-2009

Data File: /chem3/fid4a.i/20090304.b/0304a036.d

Date : 04-MAR-2009 18:30

Client ID: MW-1

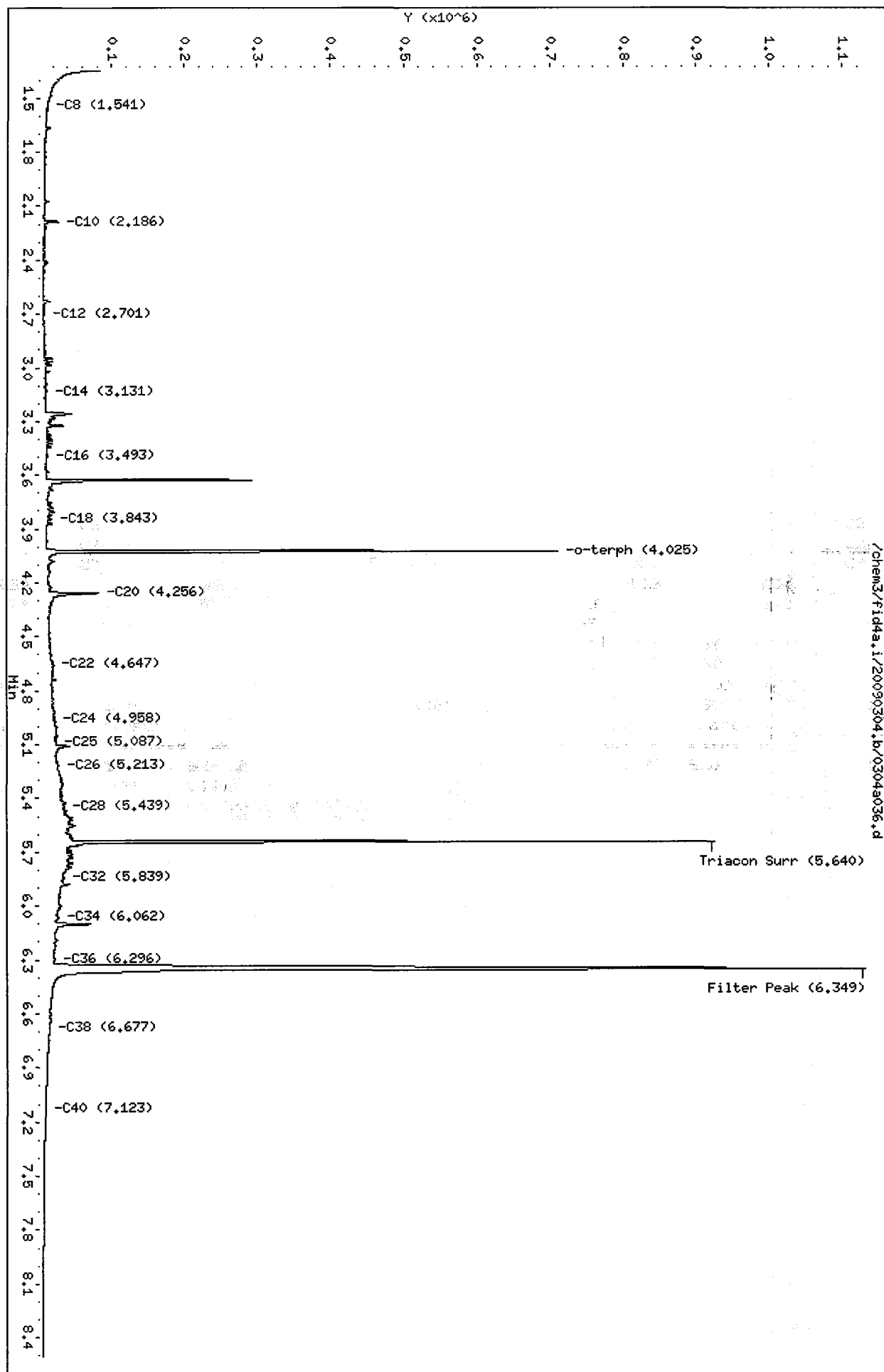
Sample Info: ON75A

Column phase: RTX-1

Instrument: fid4a.i

Operator: JR

Column diameter: 2.00



CLEANED TPHD SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: ON75-GeoEngineers
Project: Sekiu- Former Log Sorting Yard
0137.018.00

<u>Client ID</u>	<u>OTER</u>	<u>TOT OUT</u>
MB-022508	78.9%	0
LCS-022508	78.4%	0
LCSD-022508	81.6%	0
MW-1	54.2%	0
MW-2	86.7%	0
MW-3	84.7%	0
MW-4	89.6%	0
MW-5	84.9%	0
MW-6D	77.6%	0
MW-7S	75.6%	0
MW-7D	74.2%	0
MW-8	82.4%	0

	LCS/MB LIMITS	QC LIMITS
(OTER) = o-Terphenyl	(49-118)	(45-112)

Prep Method: SW3510C
Log Number Range: 09-5216 to 09-5224

ORGANICS ANALYSIS DATA SHEET

NWTPHD by GC/FID-Silica and Acid Cleaned

Page 1 of 1

Sample ID: LCS-022508

LCS/LCSD

Lab Sample ID: LCS-022508

LIMS ID: 09-5216

Matrix: Water

Data Release Authorized: *[Signature]*

Reported: 03/05/09

QC Report No: ON75-GeoEngineers

Project: Sekiu- Former Log Sorting Yard

0137.018.00

Date Sampled: 02/19/09

Date Received: 02/23/09

Date Extracted LCS/LCSD: 02/25/08

Sample Amount LCS: 500 mL

LCSD: 500 mL

Date Analyzed LCS: 03/04/09 18:02

Final Extract Volume LCS: 1.0 mL

LCSD: 03/04/09 18:16

LCSD: 1.0 mL

Instrument/Analyst LCS: FID/PKC

Dilution Factor LCS: 1.00

LCSD: FID/PKC

LCSD: 1.00

Range	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Diesel	1.82	3.00	60.7%	1.96	3.00	65.3%	7.4%

TPHD Surrogate Recovery

	LCS	LCSD
o-Terphenyl	78.4%	81.6%

Results reported in mg/L

RPD calculated using sample concentrations per SW846.

Analytical Resources Inc.
TPH Quantitation Report

PC
3/5/09

Data file: /chem3/fid4a.i/20090304.b/0304a034.d
Method: /chem3/fid4a.i/20090304.b/ftphfid4a.m
Instrument: fid4a.i

ARI ID: ON75LCSW1
Client ID: ON75LCSW1
Injection: 04-MAR-2009 18:02

Operator: JR

Report Date: 03/05/2009

Dilution Factor: 1

Macro: 04-MAR-2009

Calibration Dates: Gas:27-JAN-2009 Diesel:04-MAR-2009 M.Oil:04-MAR-2009

FID:4A RESULTS

Compound	RT	Shift	Height	Area	Range	Total Area	Conc
Toluene	1.405	0.004	34757	49289	GAS (Tol-C12)	2353557	79
C8	1.521	0.002	17984	18875	DIESEL (C12-C24)	10768303	910
C10	2.181	0.001	167179	122790	M.OIL (C24-C38)	477311	51*
C12	2.704	0.002	357511	190829	AK-102 (C10-C25)	12599257	880
C14	3.128	0.000	542862	235264	AK-103 (C25-C36)	417092	72*
C16	3.496	0.000	632491	329224	OR.DIES (C10-C28)	12811919	884
C18	3.852	0.005	434820	235759	OR.MOIL (C28-C40)	236514	32*
C20	4.271	0.004	284865	265202			
C22	4.649	0.001	112000	100147			
C24	4.960	0.000	48448	39759			
C25	5.093	-0.001	29853	23701			
C26	5.217	-0.001	17849	15199			
C28	5.442	0.002	6514	10851			
C32	5.835	-0.006	3478	3440			
C34	6.072	0.005	4391	5989	BUNKERC (C10-C38)	13033368	1793*
Filter Peak	6.357	-1.352	789557	834058			
C36	6.309	-0.032	4566	6803			
C38	6.688	0.005	1752	8236			
C40	7.148	0.008	752	530			
o-terph	4.036	0.006	1026928	547849	JET-A (C10-C18)	9463978	749
Triacon Surr	5.649	0.006	1207826	586299			

* Indicates Filter Peak subtracted

Range Times: NW Diesel (2.702 - 4.960) AK102 (2.18 - 5.09) Jet A (2.18 - 3.85)
NW M.Oil (4.96 - 6.68) AK103 (5.09 - 6.34) OR Diesel (2.18 - 5.44)

Surrogate	Area	Amount	%Rec
o-Terphenyl	547849	35.3	78.4
Triacotane	586299	36.6	81.4

Analyte	RF	Curve Date
o-Terph Surr	15529.5	04-MAR-2009
Triacon Surr	16008.5	04-MAR-2009
Gas	29969.0	27-JAN-2009
Diesel	11833.0	04-MAR-2009
Motor Oil	9446.0	04-MAR-2009
AK102	14323.0	04-MAR-2009
AK103	5772.2	06-FEB-2009
JetA	12632.0	07-JAN-2009
OR Diesel	14494.0	
OR M.Oil	7304.0	
Bunker C	7267.4	04-MAR-2009

Data File: /chem3/fid4a.i/20090304.b/0304a034.d

Date : 04-MAR-2009 18:02

Client ID: 0N75LCSM4

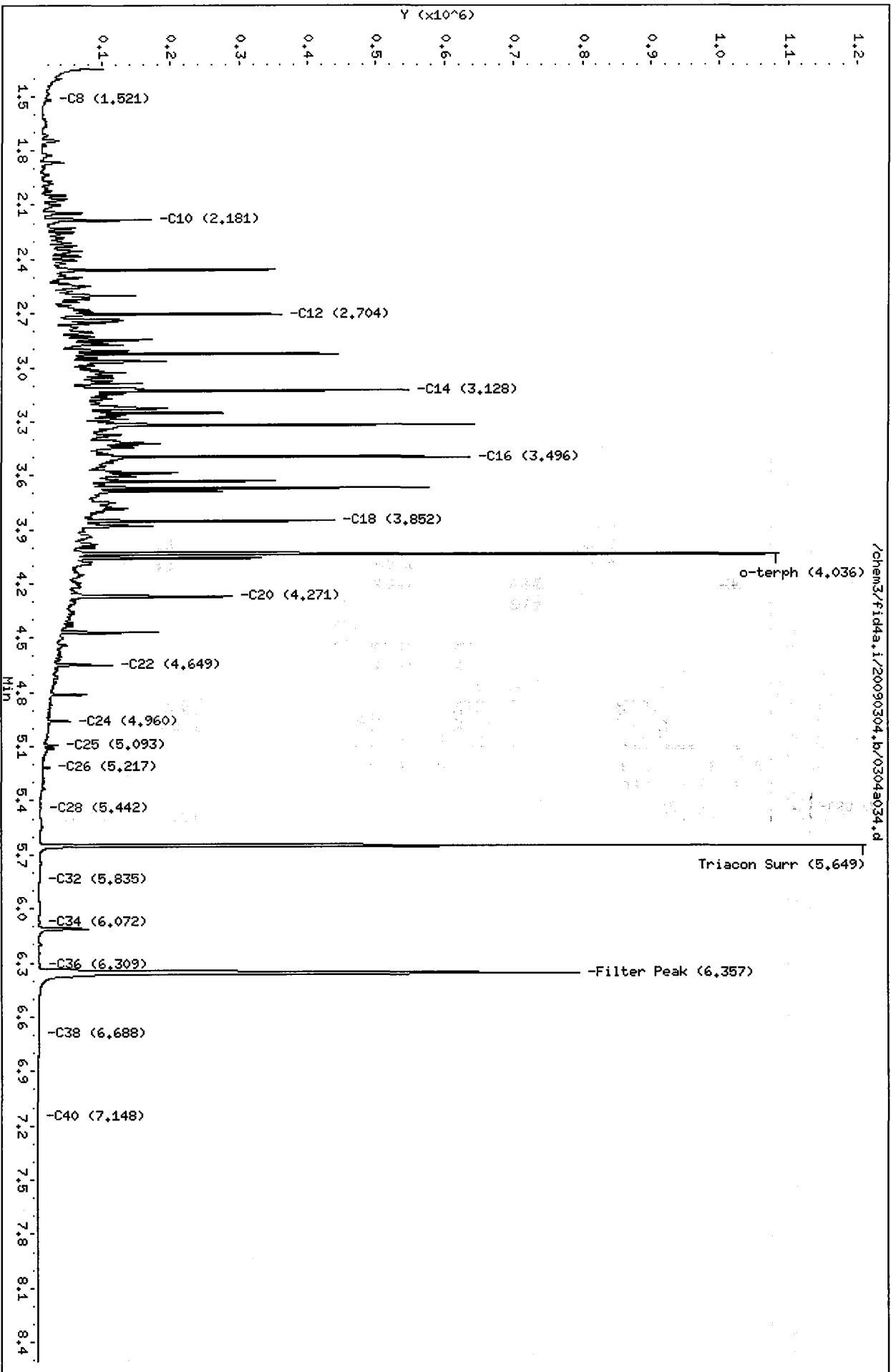
Sample Info: 0N75LCSM4

Column phase: RTX-1

Instrument: fid4a.i

Operator: JR

Column diameter: 2.00



Analytical Resources Inc.
TPH Quantitation Report

PC
3/5/09

Data file: /chem3/fid4a.i/20090304.b/0304a035.d
Method: /chem3/fid4a.i/20090304.b/ftphfid4a.m
Instrument: fid4a.i

ARI ID: ON75LCSDW1
Client ID: ON75LCSDW1
Injection: 04-MAR-2009 18:16

Operator: JR

Report Date: 03/05/2009

Dilution Factor: 1

Macro: 04-MAR-2009

Calibration Dates: Gas:27-JAN-2009 Diesel:04-MAR-2009 M.Oil:04-MAR-2009

FID:4A RESULTS

Compound	RT	Shift	Height	Area	Range	Total Area	Conc
Toluene	1.405	0.004	39828	53570	GAS (Tol-C12)	2520504	84
C8	1.522	0.003	19161	20347	DIESEL (C12-C24)	11581621	979
C10	2.182	0.002	179042	130392	M.OIL (C24-C38)	604496	64*
C12	2.704	0.002	382972	204215	AK-102 (C10-C25)	13535209	945
C14	3.128	0.001	593201	250318	AK-103 (C25-C36)	566982	98*
C16	3.497	0.001	685317	299780	OR.DIES (C10-C28)	13815898	953
C18	3.852	0.006	454283	252547	OR.MOIL (C28-C40)	321641	44*
C20	4.272	0.004	301239	296442			
C22	4.650	0.002	116403	100381			
C24	4.961	0.002	52058	41718			
C25	5.094	0.000	31482	24040			
C26	5.218	0.000	19437	17260			
C28	5.442	0.002	7415	10601			
C32	5.845	0.004	4900	5490			
C34	6.069	0.001	5732	7552	BUNKERC (C10-C38)	14122613	1943*
Filter Peak	6.358	-1.351	1069081	1169360			
C36	6.306	-0.034	5840	9805			
C38	6.685	0.001	2187	10169			
C40	7.138	-0.002	884	915			
o-terph	4.036	0.006	1061606	569803	JET-A (C10-C18)	10203912	808
Triacon Surr	5.647	0.004	1238066	601019			

* Indicates Filter Peak subtracted

Range Times: NW Diesel (2.702 - 4.960) AK102 (2.18 - 5.09) Jet A (2.18 - 3.85)
NW M.Oil (4.96 - 6.68) AK103 (5.09 - 6.34) OR Diesel (2.18 - 5.44)

Surrogate	Area	Amount	%Rec
o-Terphenyl	569803	36.7	81.5
Triacontane	601019	37.5	83.4

Analyte	RF	Curve Date
o-Terph Surr	15529.5	04-MAR-2009
Triacon Surr	16008.5	04-MAR-2009
Gas	29969.0	27-JAN-2009
Diesel	11833.0	04-MAR-2009
Motor Oil	9446.0	04-MAR-2009
AK102	14323.0	04-MAR-2009
AK103	5772.2	06-FEB-2009
JetA	12632.0	07-JAN-2009
OR Diesel	14494.0	
OR M.Oil	7304.0	
Bunker C	7267.4	04-MAR-2009

Data File: /chem3/fid4a.i/20090304.b/0304a035.d

Date : 04-MAR-2009 18:16

Client ID: 0N75LCSDM1

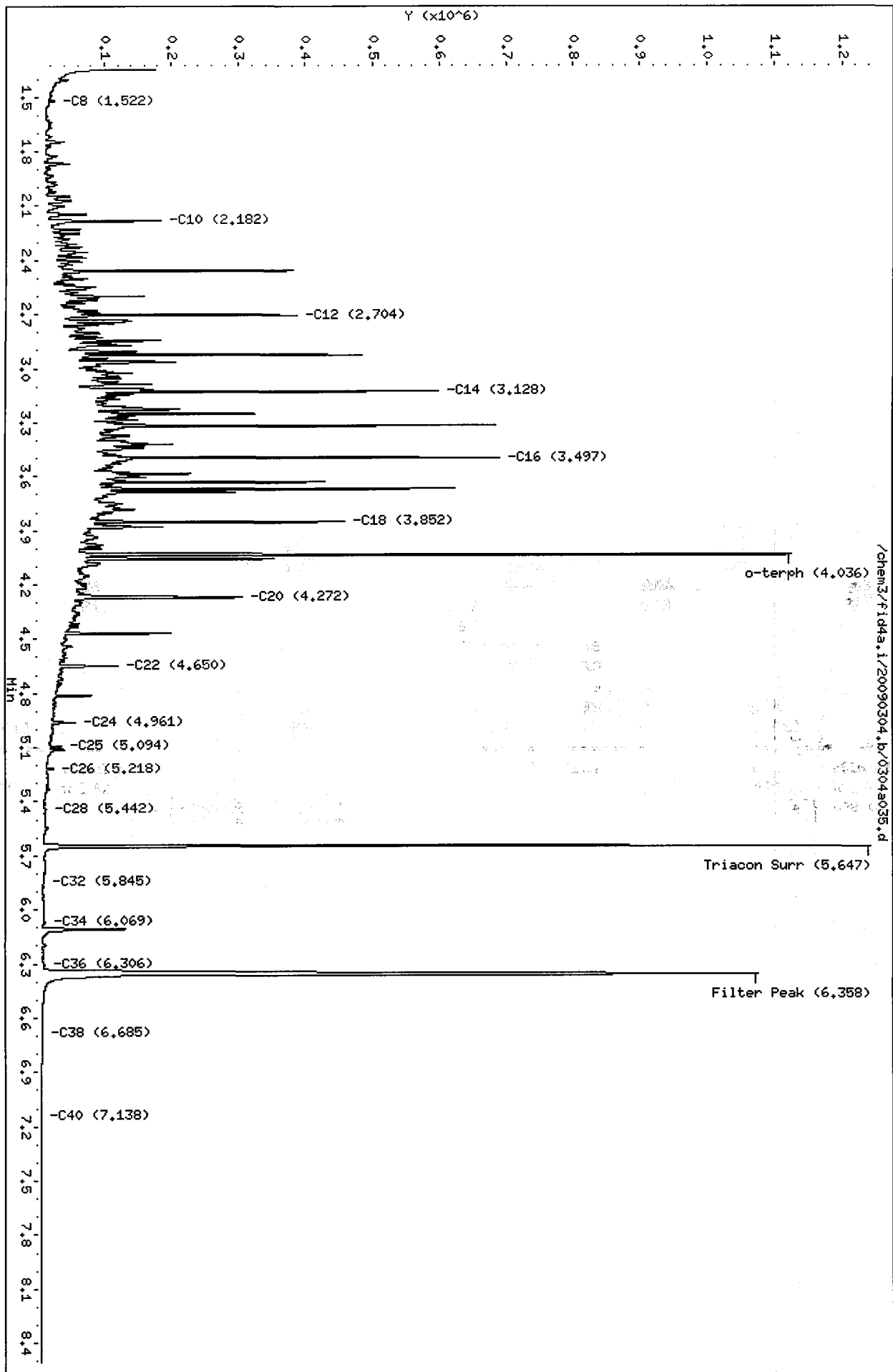
Sample Info: 0N75LCSDM1

Column phase: RTX-1

Instrument: fid4a.i

Operator: JR

Column diameter: 2.00



TOTAL DIESEL RANGE HYDROCARBONS-EXTRACTION REPORT

Matrix: Water

Date Received: 02/23/09

ARI Job: ON75

Project: Sekiu- Former Log Sorting Yard

0137.018.00

ARI ID	Client ID	Samp Amt	Final Vol	Prep Date
09-5216-022508MB1	Method Blank	500 mL	1.00 mL	02/25/08
09-5216-022508LCS1	Lab Control	500 mL	1.00 mL	02/25/08
09-5216-022508LCSD1	Lab Control Dup	500 mL	1.00 mL	02/25/08
09-5216-ON75A	MW-1	500 mL	1.00 mL	02/25/09
09-5217-ON75B	MW-2	500 mL	1.00 mL	02/25/09
09-5218-ON75C	MW-3	500 mL	1.00 mL	02/25/09
09-5219-ON75D	MW-4	500 mL	1.00 mL	02/25/09
09-5220-ON75E	MW-5	500 mL	1.00 mL	02/25/09
09-5221-ON75F	MW-6D	500 mL	1.00 mL	02/25/09
09-5222-ON75G	MW-7S	500 mL	1.00 mL	02/25/09
09-5223-ON75H	MW-7D	500 mL	1.00 mL	02/25/09
09-5224-ON75I	MW-8	500 mL	1.00 mL	02/25/09



Analytical Resources, Incorporated
Analytical Chemists and Consultants

March 11, 2009

Cindy Bartlett
GeoEngineers, Inc.
Plaza 600 Building
600 Stewart Suite 1700
Seattle, WA 98101

RE: Project: Sekui
ARI Job No.: ON71

Dear Cindy:

Please find enclosed the original Chain-of-Custody (COC) record, sample receipt documentation, and the final analytical results from the project referenced above.

Analytical Resources Inc. (ARI) accepted four sediment samples on February 20, 2009 under the ARI job number referenced above. Please note that select sample containers were archived upon receipt, as requested on the COC. For further details regarding sample receipt, please refer to the enclosed Cooler Receipt Form.

The samples were analyzed for SIM PAHs, NWTPH-Dx, and TOC, as requested on the COC.

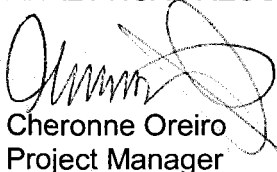
The internal standard area of Chrysene-d12 was outside the control limit high for sample **R3-S** at a ten fold dilution. The sample was re-analyzed at a fifty fold dilution and all internal standard areas were within control limits. Both sets of results have been submitted in this report for review. No further corrective action was required.

There were no other anomalies associated with the analyses of these samples.

An electronic copy of this report and all supporting raw data will remain on file with ARI. Should you have any questions or problems, please feel free to contact me at your convenience.

Sincerely,

ANALYTICAL RESOURCES, INC.



Cheronne Oreiro
Project Manager

-For-

Susan D. Dunnihoo
Director, Client Services
206-695-6207
sue@arilabs.com

Enclosures

cc: eFile ON71

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

Page: 1	of 1
Date: 2/2/09	Ice Present?
No. of Coolers:	Cooler Temps:

ARI Assigned Number:	DNT1	Turn-around Requested:	Normal
ARI Client Company:	Greengrass	Phone:	503-624-9274
Client Contact:	Cindy Barlett		
Client Project Name:	Seismic		
Client Project #:		Samplers:	12

[illegible]

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.



Cooler Receipt Form

ARI Client: Geo Engineers

Project Name: Sekio

COC No: _____

Delivered by: Hand

Assigned ARI Job No: ON71

Tracking No: _____

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 ☐
Record cooler temperature (recommended 2.0-6.0 °C for chemistry) 7.2 °C

Cooler Accepted by: JH Date: 2/21/09 Time: 11:55

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler? YES ☒ NO ☐
What kind of packing material was used? ICE/BW
Was sufficient ice used (if appropriate)? YES ☒ NO ☐
Were all bottles sealed in individual plastic bags? YES ☒ NO ☐
Did all bottle arrive in good condition (unbroken)? YES ☒ NO ☐
Were all bottle labels complete and legible? 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 checklist) YES ☒ NO ☐
Were all VOC vials free of air bubbles? NA YES ☒ NO ☐
Was sufficient amount of sample sent in each bottle? YES ☒ NO ☐

Samples Logged by: JW Date: 2/23/09 Time: 0745

**** Notify Project Manager of discrepancies or concerns ****

Explain discrepancies or negative responses:

R2-S had no preserved sulfide jar. COC also reads R2-S while jars labeled as R2.
R3-S seven jars provided Bix listed on COC.
Sample split from R2-S TCC jar and preserved for total sulfide.
Client left dirt all over the outside of the jars.

By: JW

Date: 2/23/09

ORGANICS ANALYSIS DATA SHEET

PNAs by SW8270D-SIM GC/MS

Page 1 of 1

Sample ID: R1-S

SAMPLE

Lab Sample ID: ON71A

LIMS ID: 09-5188

Matrix: Sediment

Data Release Authorized: 

Reported: 03/09/09

QC Report No: ON71-GeoEngineers

Project: Sekiu

Event: NA

Date Sampled: 02/20/09

Date Received: 02/21/09

Date Extracted: 02/26/09

Date Analyzed: 03/02/09 18:53

Instrument/Analyst: NT1/YZ

GPC Cleanup: No

Silica Gel Cleanup: Yes

Alumina Cleanup: No

Sample Amount: 10.1 g-dry-wt

Final Extract Volume: 0.5 mL

Dilution Factor: 1.00

Percent Moisture: 40.9%

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	5.0	17
91-57-6	2-Methylnaphthalene	5.0	7.4
90-12-0	1-Methylnaphthalene	5.0	5.9
208-96-8	Acenaphthylene	5.0	< 5.0 U
83-32-9	Acenaphthene	5.0	19
86-73-7	Fluorene	5.0	7.9
85-01-8	Phenanthrene	5.0	29
120-12-7	Anthracene	5.0	91
206-44-0	Fluoranthene	5.0	830 E
129-00-0	Pyrene	5.0	780 E
56-55-3	Benzo (a) anthracene	5.0	98
218-01-9	Chrysene	5.0	62
205-99-2	Benzo (b) fluoranthene	5.0	28
207-08-9	Benzo (k) fluoranthene	5.0	28
50-32-8	Benzo (a) pyrene	5.0	23
193-39-5	Indeno (1,2,3-cd) pyrene	5.0	< 5.0 U
53-70-3	Dibenz (a,h) anthracene	5.0	< 5.0 U
191-24-2	Benzo (g,h,i) perylene	5.0	5.4
132-64-9	Dibenzofuran	5.0	6.4

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene 89.7%

d14-Dibenzo (a,h) anthracene 93.0%

ORGANICS ANALYSIS DATA SHEET

PNAs by SW8270D-SIM GC/MS

Page 1 of 1

Sample ID: R1-S

DILUTION

Lab Sample ID: ON71A

LIMS ID: 09-5188

Matrix: Sediment

Data Release Authorized: *mw*

Reported: 03/09/09

QC Report No: ON71-GeoEngineers

Project: Sekiu

Event: NA

Date Sampled: 02/20/09

Date Received: 02/21/09

Date Extracted: 02/26/09

Date Analyzed: 03/04/09 13:10

Instrument/Analyst: NT1/YZ

GPC Cleanup: No

Silica Gel Cleanup: Yes

Alumina Cleanup: No

Sample Amount: 10.1 g-dry-wt

Final Extract Volume: 0.5 mL

Dilution Factor: 2.00

Percent Moisture: 40.9%

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	9.9	16
91-57-6	2-Methylnaphthalene	9.9	< 9.9 U
90-12-0	1-Methylnaphthalene	9.9	< 9.9 U
208-96-8	Acenaphthylene	9.9	< 9.9 U
83-32-9	Acenaphthene	9.9	18
86-73-7	Fluorene	9.9	< 9.9 U
85-01-8	Phenanthrene	9.9	29
120-12-7	Anthracene	9.9	85
206-44-0	Fluoranthene	9.9	840
129-00-0	Pyrene	9.9	780
56-55-3	Benzo (a) anthracene	9.9	90
218-01-9	Chrysene	9.9	58
205-99-2	Benzo (b) fluoranthene	9.9	24
207-08-9	Benzo (k) fluoranthene	9.9	24
50-32-8	Benzo (a) pyrene	9.9	21
193-39-5	Indeno (1,2,3-cd) pyrene	9.9	< 9.9 U
53-70-3	Dibenz (a,h) anthracene	9.9	< 9.9 U
191-24-2	Benzo (g,h,i) perylene	9.9	< 9.9 U
132-64-9	Dibenzofuran	9.9	< 9.9 U

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene 84.7%

d14-Dibenzo (a,h) anthracene 85.3%

ORGANICS ANALYSIS DATA SHEET

PNAs by SW8270D-SIM GC/MS

Page 1 of 1

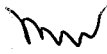
Sample ID: R1-D

SAMPLE

Lab Sample ID: ON71B

LIMS ID: 09-5189

Matrix: Sediment

Data Release Authorized: 

Reported: 03/09/09

QC Report No: ON71-GeoEngineers

Project: Sekiu

Event: NA

Date Sampled: 02/20/09

Date Received: 02/21/09

Date Extracted: 02/26/09

Date Analyzed: 03/02/09 19:15

Instrument/Analyst: NT1/YZ

GPC Cleanup: No

Silica Gel Cleanup: Yes

Alumina Cleanup: No

Sample Amount: 10.5 g-dry-wt

Final Extract Volume: 0.5 mL

Dilution Factor: 1.00

Percent Moisture: 25.9%

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	4.8	160
91-57-6	2-Methylnaphthalene	4.8	26
90-12-0	1-Methylnaphthalene	4.8	17
208-96-8	Acenaphthylene	4.8	5.2
83-32-9	Acenaphthene	4.8	54
86-73-7	Fluorene	4.8	12
85-01-8	Phenanthrene	4.8	33
120-12-7	Anthracene	4.8	33
206-44-0	Fluoranthene	4.8	340
129-00-0	Pyrene	4.8	300
56-55-3	Benzo (a) anthracene	4.8	83
218-01-9	Chrysene	4.8	66
205-99-2	Benzo (b) fluoranthene	4.8	24
207-08-9	Benzo (k) fluoranthene	4.8	24
50-32-8	Benzo (a) pyrene	4.8	22
193-39-5	Indeno (1,2,3-cd) pyrene	4.8	4.8
53-70-3	Dibenz (a,h) anthracene	4.8	< 4.8 U
191-24-2	Benzo (g,h,i) perylene	4.8	5.7
132-64-9	Dibenzofuran	4.8	12

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene 91.0%

d14-Dibenzo (a,h) anthracene 92.3%

ORGANICS ANALYSIS DATA SHEET

PNAs by SW8270D-SIM GC/MS

Page 1 of 1

Sample ID: R2-S

SAMPLE

Lab Sample ID: ON71C

LIMS ID: 09-5190

Matrix: Sediment

Data Release Authorized: *mw*

Reported: 03/09/09

QC Report No: ON71-GeoEngineers

Project: Sekiu

Event: NA

Date Sampled: 02/20/09

Date Received: 02/21/09

Date Extracted: 02/26/09

Date Analyzed: 03/02/09 19:38

Instrument/Analyst: NT1/YZ

GPC Cleanup: No

Silica Gel Cleanup: Yes

Alumina Cleanup: No

Sample Amount: 10.7 g-dry-wt

Final Extract Volume: 0.5 mL

Dilution Factor: 1.00

Percent Moisture: 17.6%

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	4.7	7.5
91-57-6	2-Methylnaphthalene	4.7	< 4.7 U
90-12-0	1-Methylnaphthalene	4.7	< 4.7 U
208-96-8	Acenaphthylene	4.7	< 4.7 U
83-32-9	Acenaphthene	4.7	< 4.7 U
86-73-7	Fluorene	4.7	< 4.7 U
85-01-8	Phenanthrene	4.7	< 4.7 U
120-12-7	Anthracene	4.7	< 4.7 U
206-44-0	Fluoranthene	4.7	< 4.7 U
129-00-0	Pyrene	4.7	4.7
56-55-3	Benzo(a)anthracene	4.7	< 4.7 U
218-01-9	Chrysene	4.7	< 4.7 U
205-99-2	Benzo(b)fluoranthene	4.7	< 4.7 U
207-08-9	Benzo(k)fluoranthene	4.7	< 4.7 U
50-32-8	Benzo(a)pyrene	4.7	< 4.7 U
193-39-5	Indeno(1,2,3-cd)pyrene	4.7	< 4.7 U
53-70-3	Dibenz(a,h)anthracene	4.7	< 4.7 U
191-24-2	Benzo(g,h,i)perylene	4.7	< 4.7 U
132-64-9	Dibenzofuran	4.7	< 4.7 U

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene 95.0%

d14-Dibenzo(a,h)anthracene 96.3%

Sample ID: R3-S
SAMPLE

Lab Sample ID: ON71D
LIMS ID: 09-5191
Matrix: Sediment
Data Release Authorized: *WV*
Reported: 03/09/09

QC Report No: ON71-GeoEngineers
Project: Sekiu
Event: NA
Date Sampled: 02/20/09
Date Received: 02/21/09

Date Extracted: 02/26/09
Date Analyzed: 03/04/09 13:32
Instrument/Analyst: NT1/YZ
GPC Cleanup: No
Silica Gel Cleanup: Yes
Alumina Cleanup: No

Sample Amount: 10.2 g-dry-wt
Final Extract Volume: 0.5 mL
Dilution Factor: 10.0
Percent Moisture: 41.1%

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	49	< 49 U
91-57-6	2-Methylnaphthalene	49	< 49 U
90-12-0	1-Methylnaphthalene	49	< 49 U
208-96-8	Acenaphthylene	49	< 49 U
83-32-9	Acenaphthene	49	< 49 U
86-73-7	Fluorene	49	< 49 U
85-01-8	Phenanthrene	49	59
120-12-7	Anthracene	49	< 49 U
206-44-0	Fluoranthene	49	78
129-00-0	Pyrene	49	< 49 U
56-55-3	Benzo(a)anthracene	49	< 49 U
218-01-9	Chrysene	49	< 49 U
205-99-2	Benzo(b)fluoranthene	49	< 49 U
207-08-9	Benzo(k)fluoranthene	49	< 49 U
50-32-8	Benzo(a)pyrene	49	< 49 U
193-39-5	Indeno(1,2,3-cd)pyrene	49	< 49 U
53-70-3	Dibenz(a,h)anthracene	49	< 49 U
191-24-2	Benzo(g,h,i)perylene	49	< 49 U
132-64-9	Dibenzofuran	49	< 49 U

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene 86.7%
d14-Dibenzo(a,h)anthracen 86.7%

ORGANICS ANALYSIS DATA SHEET

PNAs by SW8270D-SIM GC/MS

Page 1 of 1

Sample ID: R3-S

DILUTION

Lab Sample ID: ON71D

LIMS ID: 09-5191

Matrix: Sediment

Data Release Authorized: 

Reported: 03/09/09

QC Report No: ON71-GeoEngineers

Project: Sekiu

Event: NA

Date Sampled: 02/20/09

Date Received: 02/21/09

Date Extracted: 02/26/09

Date Analyzed: 03/04/09 14:07

Instrument/Analyst: NT1/YZ

GPC Cleanup: No

Silica Gel Cleanup: Yes

Alumina Cleanup: No

Sample Amount: 10.2 g-dry-wt

Final Extract Volume: 0.5 mL

Dilution Factor: 50.0

Percent Moisture: 41.1%

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	240	< 240 U
91-57-6	2-Methylnaphthalene	240	< 240 U
90-12-0	1-Methylnaphthalene	240	< 240 U
208-96-8	Acenaphthylene	240	< 240 U
83-32-9	Acenaphthene	240	< 240 U
86-73-7	Fluorene	240	< 240 U
85-01-8	Phenanthrene	240	< 240 U
120-12-7	Anthracene	240	< 240 U
206-44-0	Fluoranthene	240	< 240 U
129-00-0	Pyrene	240	< 240 U
56-55-3	Benzo(a)anthracene	240	< 240 U
218-01-9	Chrysene	240	< 240 U
205-99-2	Benzo(b)fluoranthene	240	< 240 U
207-08-9	Benzo(k)fluoranthene	240	< 240 U
50-32-8	Benzo(a)pyrene	240	< 240 U
193-39-5	Indeno(1,2,3-cd)pyrene	240	< 240 U
53-70-3	Dibenz(a,h)anthracene	240	< 240 U
191-24-2	Benzo(g,h,i)perylene	240	< 240 U
132-64-9	Dibenzofuran	240	< 240 U

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene D

d14-Dibenzo(a,h)anthracene D

SIM SW8270 SURROGATE RECOVERY SUMMARY

Matrix: Sediment

QC Report No: ON71-GeoEngineers
Project: Sekiu

Client ID	MNP	DBA	TOT OUT
MB-022609	97.3%	111%	0
LCS-022609	87.3%	102%	0
R1-S	89.7%	93.0%	0
R1-S DL	84.7%	85.3%	0
R1-D	91.0%	92.3%	0
R2-S	95.0%	96.3%	0
R3-S	86.7%	86.7%	0
R3-S DL	D	D	0

LCS/MB LIMITS QC LIMITS

(MNP) = d10-2-Methylnaphthalene (44-100) (37-106)
(DBA) = d14-Dibenzo(a,h)anthracene (46-121) (16-118)

Prep Method: SW3546
Log Number Range: 09-5188 to 09-5191

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS
Page 1 of 1



Sample ID: LCS-022609
LAB CONTROL SAMPLE

Lab Sample ID: LCS-022609
LIMS ID: 09-5188
Matrix: Sediment
Data Release Authorized: *[Signature]*
Reported: 03/09/09

QC Report No: ON71-GeoEngineers
Project: Sekiu
Event: NA
Date Sampled: NA
Date Received: NA

Date Extracted: 02/26/09
Date Analyzed LCS: 03/02/09 18:30
Instrument/Analyst LCS: NT1/YZ

Sample Amount LCS: 10.0 g-dry-wt
Final Extract Volume LCS: 0.50 mL
Dilution Factor LCS: 1.00

Analyte	LCS	Spike Added	Recovery
Naphthalene	124	150	82.7%
2-Methylnaphthalene	129	150	86.0%
1-Methylnaphthalene	126	150	84.0%
Acenaphthylene	137	150	91.3%
Acenaphthene	132	150	88.0%
Fluorene	143	150	95.3%
Phenanthrene	128	150	85.3%
Anthracene	143	150	95.3%
Fluoranthene	144	150	96.0%
Pyrene	142	150	94.7%
Benzo(a)anthracene	151	150	101%
Chrysene	135	150	90.0%
Benzo(b)fluoranthene	158	150	105%
Benzo(k)fluoranthene	132	150	88.0%
Benzo(a)pyrene	142	150	94.7%
Indeno(1,2,3-cd)pyrene	128	150	85.3%
Dibenz(a,h)anthracene	137	150	91.3%
Benzo(g,h,i)perylene	148	150	98.7%
Dibenzofuran	132	150	88.0%

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene 87.3%
d14-Dibenzo(a,h)anthracen 102%

ORGANICS ANALYSIS DATA SHEET

PNAs by SW8270D-SIM GC/MS

Page 1 of 1

Sample ID: MB-022609

METHOD BLANK

Lab Sample ID: MB-022609

LIMS ID: 09-5188

Matrix: Sediment

Data Release Authorized: *WW*

Reported: 03/09/09

QC Report No: ON71-GeoEngineers

Project: Sekiu

Event: NA

Date Sampled: NA

Date Received: NA

Date Extracted: 02/26/09

Date Analyzed: 03/02/09 18:07

Instrument/Analyst: NT1/YZ

GPC Cleanup: No

Silica Gel Cleanup: Yes

Alumina Cleanup: No

Sample Amount: 10.0 g-dry-wt

Final Extract Volume: 0.5 mL

Dilution Factor: 1.00

Percent Moisture: NA

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	5.0	< 5.0 U
91-57-6	2-Methylnaphthalene	5.0	< 5.0 U
90-12-0	1-Methylnaphthalene	5.0	< 5.0 U
208-96-8	Acenaphthylene	5.0	< 5.0 U
83-32-9	Acenaphthene	5.0	< 5.0 U
86-73-7	Fluorene	5.0	< 5.0 U
85-01-8	Phenanthrene	5.0	< 5.0 U
120-12-7	Anthracene	5.0	< 5.0 U
206-44-0	Fluoranthene	5.0	< 5.0 U
129-00-0	Pyrene	5.0	< 5.0 U
56-55-3	Benzo(a)anthracene	5.0	< 5.0 U
218-01-9	Chrysene	5.0	< 5.0 U
205-99-2	Benzo(b)fluoranthene	5.0	< 5.0 U
207-08-9	Benzo(k)fluoranthene	5.0	< 5.0 U
50-32-8	Benzo(a)pyrene	5.0	< 5.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	5.0	< 5.0 U
53-70-3	Dibenz(a,h)anthracene	5.0	< 5.0 U
191-24-2	Benzo(g,h,i)perylene	5.0	< 5.0 U
132-64-9	Dibenzofuran	5.0	< 5.0 U

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene 97.3%

d14-Dibenzo(a,h)anthracen 111%

ORGANICS ANALYSIS DATA SHEET

TOTAL DIESEL RANGE HYDROCARBONS

NWTPHD by GC/FID-Silica and Acid Cleaned

Page 1 of 1

Matrix: Sediment

QC Report No: ON71-GeoEngineers

Project: Sekiu

Data Release Authorized: 

Reported: 03/05/09

ARI ID	Sample ID	Extraction Date	Analysis Date	EFV DL	Range	RL	Result
MB-030309 09-5188	Method Blank HC ID: ---	03/03/09	03/04/09 FID4A	1.00 1.0	Diesel Motor Oil Bunker C o-Terphenyl	5.0 10 10	< 5.0 U < 10 U < 10 U 104%
ON71A 09-5188	R1-S HC ID: DRO/MOTOR OIL	03/03/09	03/04/09 FID4A	1.00 1.0	Diesel Motor Oil Bunker C o-Terphenyl	8.4 17 17	15 41 80 106%
ON71B 09-5189	R1-D HC ID: DRO/RRO	03/03/09	03/04/09 FID4A	1.00 1.0	Diesel Motor Oil Bunker C o-Terphenyl	6.4 13 13	7.9 14 33 95.6%
ON71C 09-5190	R2-S HC ID: ---	03/03/09	03/04/09 FID4A	1.00 1.0	Diesel Motor Oil Bunker C o-Terphenyl	6.0 12 12	< 6.0 U < 12 U < 12 U 105%
ON71D 09-5191	R3-S HC ID: DRO/RRO	03/03/09	03/04/09 FID4A	1.00 1.0	Diesel Motor Oil Bunker C o-Terphenyl	7.8 16 16	17 30 68 105%

Reported in mg/kg (ppm)

EFV-Effective Final Volume in mL.

DL-Dilution of extract prior to analysis.

RL-Reporting limit.

Diesel quantitation on total peaks in the range from C12 to C24.

Motor Oil quantitation on total peaks in the range from C24 to C38.

Bunker C quantitation on total peaks in the range from C10 to C38.

HC ID: DRO/RRO indicate results of organics or additional hydrocarbons in ranges are not identifiable.

Analytical Resources Inc.
TPH Quantitation Report

PC
3/5/09

Data file: /chem3/fid4a.i/20090304.b/0304a049.d
Method: /chem3/fid4a.i/20090304.b/ftphfid4a.m
Instrument: fid4a.i

ARI ID: ON71MBS1
Client ID: ON71MBS1
Injection: 04-MAR-2009 21:33

Operator: JR

Report Date: 03/05/2009

Dilution Factor: 1

Macro: 04-MAR-2009

Calibration Dates: Gas:27-JAN-2009 Diesel:04-MAR-2009 M.Oil:04-MAR-2009

FID:4A RESULTS

Compound	RT	Shift	Height	Area	Range	Total Area	Conc
Toluene	1.457	0.056	12269	18468	GAS (Tol-C12)	371016	12
C8	1.506	-0.013	12103	26135	DIESEL (C12-C24)	79224	7
C10	2.172	-0.008	4227	8328	M.OIL (C24-C38)	51601	5
C12	2.702	0.000	3411	3235	AK-102 (C10-C25)	165318	12
C14	3.131	0.003	945	554	AK-103 (C25-C36)	45893	8
C16	3.502	0.006	1756	1427	OR.DIES (C10-C28)	170468	12
C18	3.844	-0.002	536	329	OR.MOIL (C28-C40)	52007	7
C20	4.265	-0.002	374	251			
C22	4.651	0.004	449	353			
C24	4.956	-0.004	270	134			
C25	5.101	0.007	274	408			
C26	5.219	0.001	404	332			
C28	5.440	0.001	1045	804			
C32	5.850	0.009	1042	2076			
C34	6.075	0.008	529	350	BUNKERC (C10-C38)	216414	30
Filter Peak	7.705	-0.005	129	194			
C36	6.343	0.002	415	186			
C38	6.677	-0.006	327	325			
C40	7.133	-0.008	223	122			
o-terph	4.030	0.000	1189157	730573	JET-A (C10-C18)	152349	12
Triacon Surr	5.645	0.002	1446080	721639			

Range Times: NW Diesel(2.702 - 4.960) AK102(2.18 - 5.09) Jet A(2.18 - 3.85)
NW M.Oil(4.96 - 6.68) AK103(5.09 - 6.34) OR Diesel(2.18 - 5.44)

Surrogate	Area	Amount	%Rec
o-Terphenyl	730573	47.0	104.5
Triacotane	721639	45.1	100.2

Analyte	RF	Curve Date
o-Terph Surr	15529.5	04-MAR-2009
Triacon Surr	16008.5	04-MAR-2009
Gas	29969.0	27-JAN-2009
Diesel	11833.0	04-MAR-2009
Motor Oil	9446.0	04-MAR-2009
AK102	14323.0	04-MAR-2009
AK103	5772.2	06-FEB-2009
JetA	12632.0	07-JAN-2009
OR Diesel	14494.0	
OR M.Oil	7304.0	
Bunker C	7267.4	04-MAR-2009

Data File: /chem3/fid4a.i/20090304.b/0304a049.d

Date : 04-MAR-2009 21:33

Client ID: 0N71HBS1

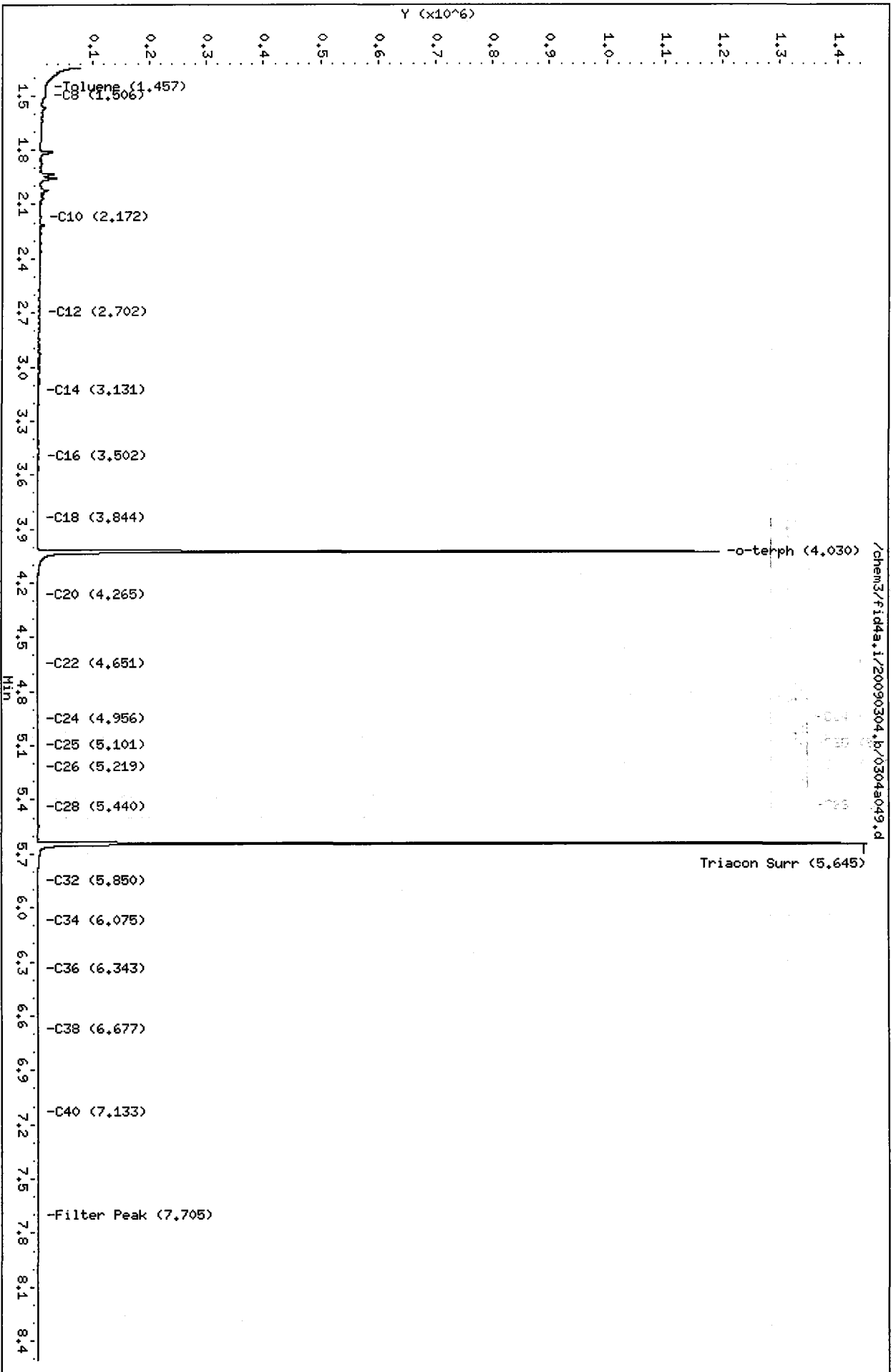
Sample Info: 0N71HBS1

Column phase: RTX-1

Instrument: fid4a.i

Operator: JR

Column diameter: 2.00



Analytical Resources Inc.
TPH Quantitation Report

PC
3/5/09

Data file: /chem3/fid4a.i/20090304.b/0304a051.d
Method: /chem3/fid4a.i/20090304.b/ftphfid4a.m
Instrument: fid4a.i
Operator: JR
Report Date: 03/05/2009
Macro: 04-MAR-2009
Calibration Dates: Gas:27-JAN-2009 Diesel:04-MAR-2009 M.Oil:04-MAR-2009

ARI ID: ON71A
Client ID: R1-S
Injection: 04-MAR-2009 22:02
Dilution Factor: 1

FID:4A RESULTS

Compound	RT	Shift	Height	Area	Range	Total Area	Conc
Toluene	1.408	0.007	22537	61846	GAS (Tol-C12)	380205	13
C8	1.500	-0.019	12437	30376	DIESEL (C12-C24)	1052779	89
C10	2.184	0.004	3697	3873	M.OIL (C24-C38)	2290793	243
C12	2.703	0.002	5995	3759	AK-102 (C10-C25)	1170020	82
C14	3.133	0.005	4750	4885	AK-103 (C25-C36)	2109189	365
C16	3.496	0.000	8195	6447	OR.DIES (C10-C28)	1909762	132
C18	3.845	-0.001	10292	13485	OR.MOIL (C28-C40)	1606820	220
C20	4.269	0.001	9887	10740			
C22	4.647	-0.001	14269	24092			
C24	4.960	0.000	15129	11147			
C25	5.093	-0.001	21045	22645			
C26	5.230	0.012	16922	12860			
C28	5.455	0.015	28422	25608			
C32	5.844	0.003	25185	43239			
C34	6.062	-0.006	16334	36290	BUNKERC (C10-C38)	3438920	473
Filter Peak	7.730	0.020	995	567			
C36	6.362	0.021	10363	34772			
C38	6.651	-0.032	7616	27436			
C40	7.135	-0.005	3074	5459			
o-terph	4.031	0.001	1318335	740880	JET-A (C10-C18)	463578	37
Triacon Surr	5.647	0.004	1485367	736070			

Range Times: NW Diesel(2.702 - 4.960) AK102(2.18 - 5.09) Jet A(2.18 - 3.85)
NW M.Oil(4.96 - 6.68) AK103(5.09 - 6.34) OR Diesel(2.18 - 5.44)

Surrogate	Area	Amount	%Rec
o-Terphenyl	740880	47.7	106.0
Triacontane	736070	46.0	102.2

Analyte	RF	Curve Date
o-Terph Surr	15529.5	04-MAR-2009
Triacon Surr	16008.5	04-MAR-2009
Gas	29969.0	27-JAN-2009
Diesel	11833.0	04-MAR-2009
Motor Oil	9446.0	04-MAR-2009
AK102	14323.0	04-MAR-2009
AK103	5772.2	06-FEB-2009
JetA	12632.0	07-JAN-2009
OR Diesel	14494.0	
OR M.Oil	7304.0	
Bunker C	7267.4	04-MAR-2009

Data File: /chem3/fid4a.i/20090304.b/0304a051.d

Date : 04-MAR-2009 22:02

Client ID: RL-S

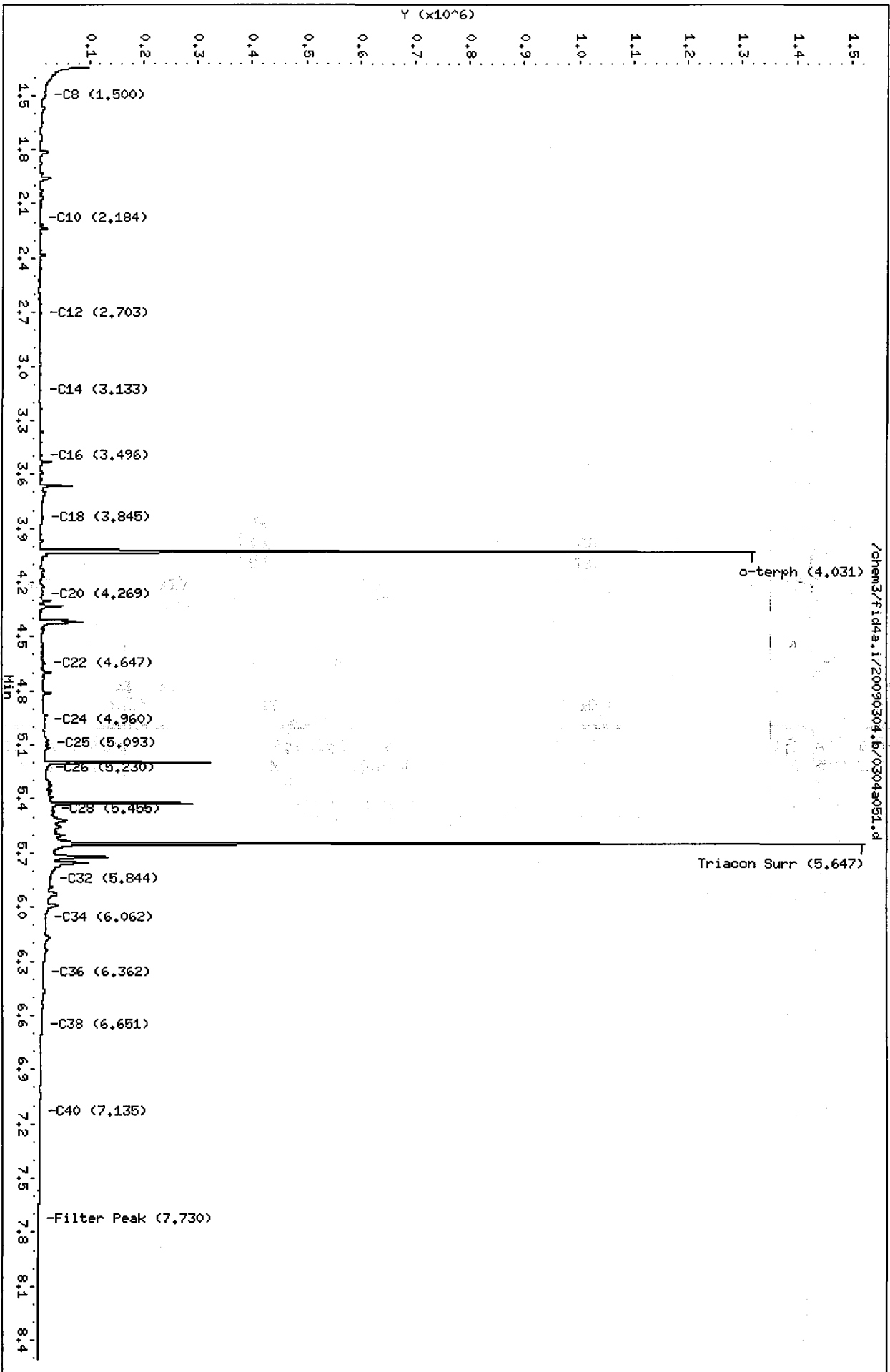
Sample Info: 0N71A

Column phase: RTX-1

Instrument: fid4a.i

Operator: JR

Column diameter: 2.00



Analytical Resources Inc.
TPH Quantitation Report

PC
3/5/09

Data file: /chem3/fid4a.i/20090304.b/0304a052.d
Method: /chem3/fid4a.i/20090304.b/ftphfid4a.m
Instrument: fid4a.i

ARI ID: ON71B
Client ID: R1-D
Injection: 04-MAR-2009 22:16

Operator: JR

Report Date: 03/05/2009

Dilution Factor: 1

Macro: 04-MAR-2009

Calibration Dates: Gas:27-JAN-2009 Diesel:04-MAR-2009 M.Oil:04-MAR-2009

FID:4A RESULTS

Compound	RT	Shift	Height	Area	Range	Total Area	Conc
Toluene	----				GAS (Tol-C12)	266358	9
C8	1.498	-0.020	11525	33915	DIESEL (C12-C24)	717083	61
C10	2.183	0.003	3866	4237	M.OIL (C24-C38)	1043123	110
C12	2.702	0.000	5840	4385	AK-102 (C10-C25)	842190	59
C14	3.133	0.006	4373	7958	AK-103 (C25-C36)	1005771	174
C16	3.499	0.003	8415	6809	OR.DIES (C10-C28)	1393532	96
C18	3.850	0.004	7703	9029	OR.MOIL (C28-C40)	507543	69
C20	4.273	0.006	6565	6535			
C22	4.650	0.003	7936	10990			
C24	4.963	0.003	10201	7275			
C25	5.094	0.000	13620	11926			
C26	5.198	-0.020	495171	218170			
C28	5.456	0.016	12968	34835			
C32	5.839	-0.002	9128	14851			
C34	----				BUNKERC (C10-C38)	1877464	258
Filter Peak	7.729	0.019	313	673			
C36	6.357	0.017	3213	14853			
C38	6.633	-0.050	1927	6209			
C40	7.138	-0.002	761	1115			
o-terph	4.036	0.006	1191806	667608	JET-A (C10-C18)	396477	31
Triacon Surr	5.642	-0.001	1335960	635538			

Range Times: NW Diesel(2.702 - 4.960) AK102(2.18 - 5.09) Jet A(2.18 - 3.85)
NW M.Oil(4.96 - 6.68) AK103(5.09 - 6.34) OR Diesel(2.18 - 5.44)

Surrogate	Area	Amount	%Rec
o-Terphenyl	667608	43.0	95.5
Triacontane	635538	39.7	88.2

Analyte	RF	Curve Date
o-Terph Surr	15529.5	04-MAR-2009
Triacon Surr	16008.5	04-MAR-2009
Gas	29969.0	27-JAN-2009
Diesel	11833.0	04-MAR-2009
Motor Oil	9446.0	04-MAR-2009
AK102	14323.0	04-MAR-2009
AK103	5772.2	06-FEB-2009
JetA	12632.0	07-JAN-2009
OR Diesel	14494.0	
OR M.Oil	7304.0	
Bunker C	7267.4	04-MAR-2009

Data File: /chem3/fid4a.i/20090304.b/0304a052.d

Date : 04-MAR-2009 22:16

Client ID: RL-D

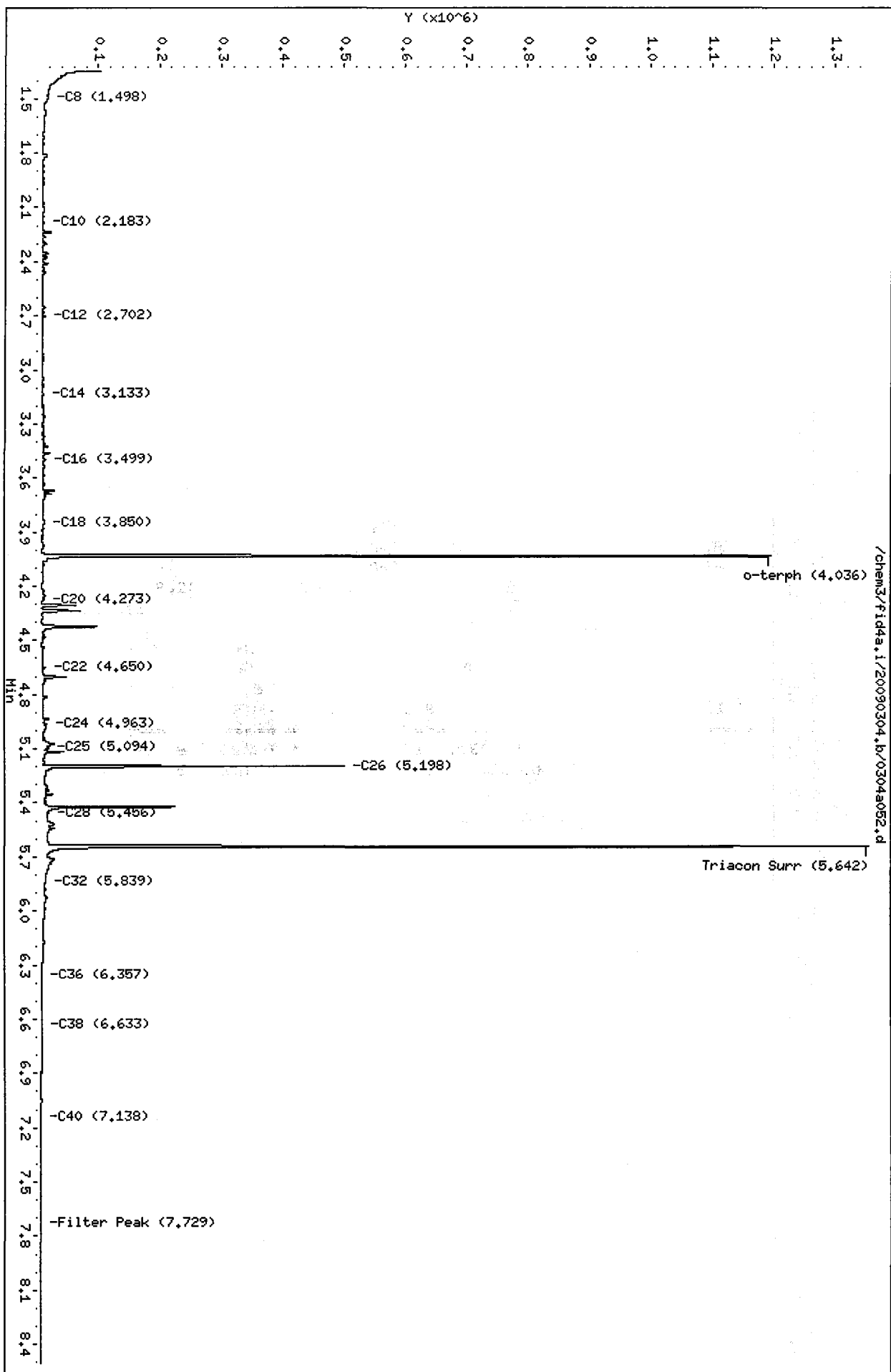
Sample Info: ON71B

Column phase: RTX-1

Instrument: fid4a.i

Operator: JR

Column diameter: 2.00



Analytical Resources Inc.
TPH Quantitation Report

PL
3/5/09

Data file: /chem3/fid4a.i/20090304.b/0304a053.d

ARI ID: ON71C

Method: /chem3/fid4a.i/20090304.b/ftphfid4a.m

Client ID: R2-S

Instrument: fid4a.i

Injection: 04-MAR-2009 22:30

Operator: JR

Report Date: 03/05/2009

Dilution Factor: 1

Macro: 04-MAR-2009

Calibration Dates: Gas:27-JAN-2009 Diesel:04-MAR-2009 M.Oil:04-MAR-2009

FID:4A RESULTS

Compound	RT	Shift	Height	Area	Range	Total Area	Conc
Toluene	1.406	0.005	21618	46842	GAS (Tol-C12)	376717	13
C8	1.500	-0.018	10602	29297	DIESEL (C12-C24)	247924	21
C10	2.184	0.004	4104	3826	M.OIL (C24-C38)	258009	27
C12	2.703	0.001	4814	3932	AK-102 (C10-C25)	355033	25
C14	3.136	0.008	2736	3639	AK-103 (C25-C36)	240050	42
C16	3.503	0.007	3467	6350	OR.DIES (C10-C28)	426597	29
C18	3.851	0.005	3354	4026	OR.MOIL (C28-C40)	194135	27
C20	4.273	0.006	2819	2886			
C22	4.652	0.005	2530	3557			
C24	4.966	0.006	2767	3292			
C25	5.097	0.003	3623	4939			
C26	5.219	0.001	3900	5111			
C28	5.439	-0.001	5412	6966			
C32	5.839	-0.002	4438	7295			
C34	6.034	-0.033	3318	21280	BUNKERC (C10-C38)	609485	84
Filter Peak	7.717	0.008	210	193			
C36	6.338	-0.003	1438	600			
C38	6.697	0.014	888	1532			
C40	7.143	0.003	420	336			
o-terph	4.037	0.007	1269108	736297	JET-A (C10-C18)	256850	20
Triacon Surr	5.642	-0.001	1441366	740214			

Range Times: NW Diesel (2.702 - 4.960) AK102 (2.18 - 5.09) Jet A (2.18 - 3.85)
NW M.Oil (4.96 - 6.68) AK103 (5.09 - 6.34) OR Diesel (2.18 - 5.44)

Surrogate	Area	Amount	%Rec
o-Terphenyl	736297	47.4	105.4
Triacontane	740214	46.2	102.8

Analyte	RF	Curve Date
o-Terph Surr	15529.5	04-MAR-2009
Triacon Surr	16008.5	04-MAR-2009
Gas	29969.0	27-JAN-2009
Diesel	11833.0	04-MAR-2009
Motor Oil	9446.0	04-MAR-2009
AK102	14323.0	04-MAR-2009
AK103	5772.2	06-FEB-2009
JetA	12632.0	07-JAN-2009
OR Diesel	14494.0	
OR M.Oil	7304.0	
Bunker C	7267.4	04-MAR-2009

Data File: /chem3/fid4a.i/20090304.b/0304a053.d

Date : 04-MAR-2009 22:30

Client ID: R2-S

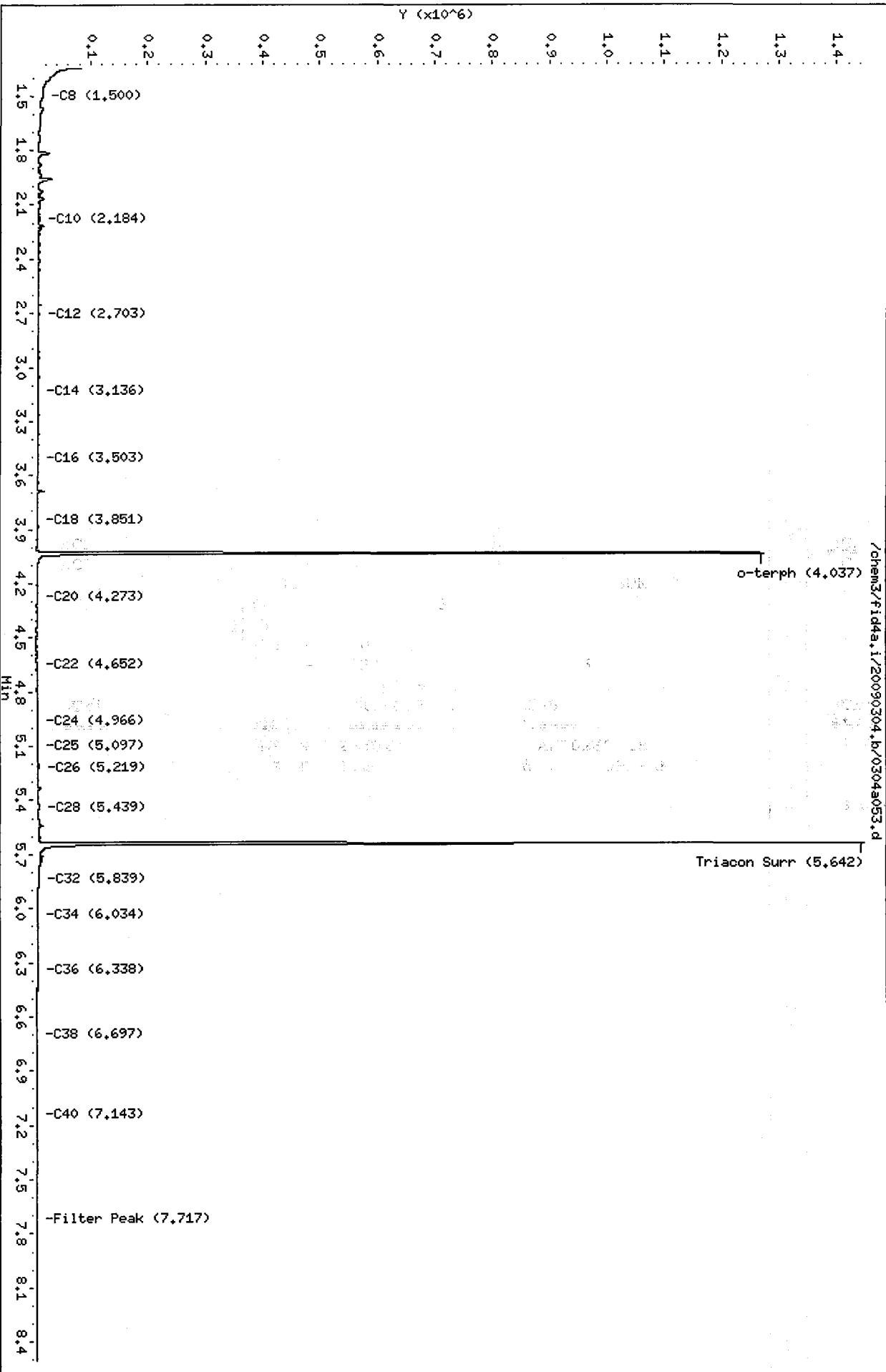
Sample Info: 0N71C

Column phase: RTX-1

Instrument: fid4a.i

Operator: JR

Column diameter: 2.00



Analytical Resources Inc.
TPH Quantitation Report

PL
3/5/09

Data file: /chem3/fid4a.i/20090304.b/0304a054.d

ARI ID: ON71D

Method: /chem3/fid4a.i/20090304.b/ftphfid4a.m

Client ID: R3-S

Instrument: fid4a.i

Injection: 04-MAR-2009 22:44

Operator: JR

Report Date: 03/05/2009

Dilution Factor: 1

Macro: 04-MAR-2009

Calibration Dates: Gas:27-JAN-2009 Diesel:04-MAR-2009 M.Oil:04-MAR-2009

FID:4A RESULTS

Compound	RT	Shift	Height	Area	Range	Total Area	Conc
Toluene	1.407	0.006	24433	33245	GAS (Tol-C12)	329742	11
C8	1.544	0.026	5329	5914	DIESEL (C12-C24)	1275782	108
C10	2.183	0.003	3023	3338	M.OIL (C24-C38)	1788964	189
C12	2.702	0.001	3751	2379	AK-102 (C10-C25)	1393521	97
C14	3.134	0.006	2825	2969	AK-103 (C25-C36)	1691495	293
C16	3.496	0.000	5932	4281	OR.DIES (C10-C28)	2018007	139
C18	3.845	-0.001	8592	9417	OR.MOIL (C28-C40)	1198054	164
C20	4.267	0.000	9043	8519			
C22	4.647	0.000	14133	16100			
C24	4.960	0.000	12947	14459			
C25	5.093	-0.001	19324	21355			
C26	5.197	-0.021	370251	189647			
C28	5.423	-0.017	198499	149044			
C32	5.840	-0.001	16302	11469			
C34	6.098	0.030	8530	11419	BUNKERC (C10-C38)	3169818	436
Filter Peak	7.764	0.054	416	707			
C36	6.359	0.019	6267	28809			
C38	----						
C40	----						
o-terph	4.031	0.002	1304461	731490	JET-A (C10-C18)	331274	26
Triacon Surr	5.644	0.001	1448208	695704			

ppm
ppm

Range Times: NW Diesel(2.702 - 4.960) AK102(2.18 - 5.09) Jet A(2.18 - 3.85)
NW M.Oil(4.96 - 6.68) AK103(5.09 - 6.34) OR Diesel(2.18 - 5.44)

Surrogate	Area	Amount	%Rec
o-Terphenyl	731490	47.1	104.7
Triacontane	695704	43.5	96.6

Analyte	RF	Curve Date
o-Terph Surr	15529.5	04-MAR-2009
Triacon Surr	16008.5	04-MAR-2009
Gas	29969.0	27-JAN-2009
Diesel	11833.0	04-MAR-2009
Motor Oil	9446.0	04-MAR-2009
AK102	14323.0	04-MAR-2009
AK103	5772.2	06-FEB-2009
JetA	12632.0	07-JAN-2009
OR Diesel	14494.0	
OR M.Oil	7304.0	
Bunker C	7267.4	04-MAR-2009

Data File: /chem3/fid4a.i/20090304.b/0304a054.d

Date : 04-MAR-2009 22:44

Client ID: R3-S

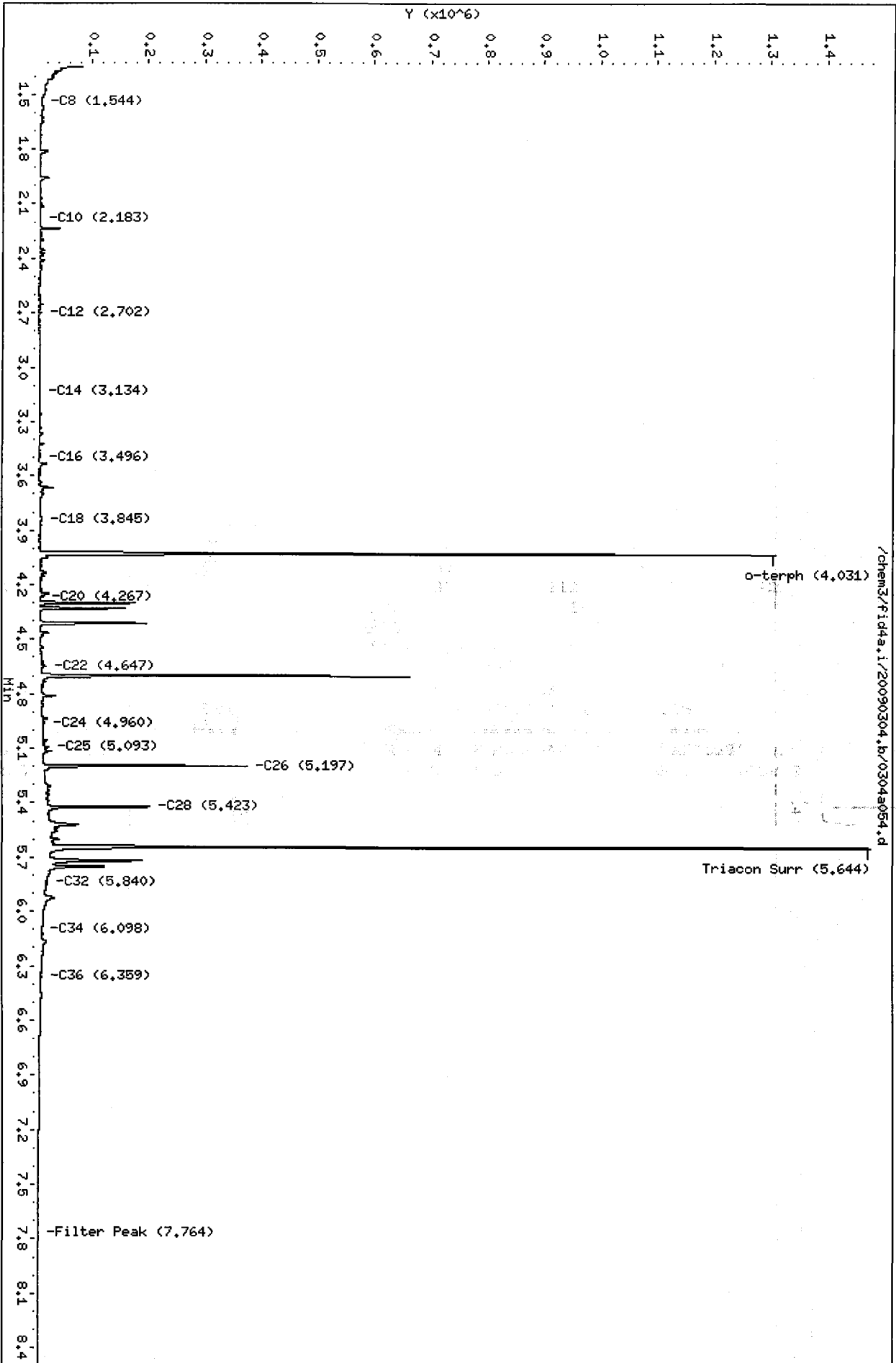
Sample Info: 0N71D

Column phase: RTX-1

Instrument: fid4a.i

Operator: JR

Column diameter: 2.00



CLEANED TPHD SURROGATE RECOVERY SUMMARY

Matrix: Sediment

QC Report No: ON71-GeoEngineers
Project: Sekiu

<u>Client ID</u>	<u>OTER</u>	<u>TOT OUT</u>
MB-030309	104%	0
LCS-030309	74.2%	0
R1-S	106%	0
R1-D	95.6%	0
R2-S	105%	0
R3-S	105%	0

	<u>LCS/MB LIMITS</u>	<u>QC LIMITS</u>
(OTER) = o-Terphenyl	(62-118)	(49-125)

Prep Method: SW3510C
Log Number Range: 09-5188 to 09-5191

ORGANICS ANALYSIS DATA SHEET

NWTPHD by GC/FID-Silica and Acid Cleaned

Sample ID: LCS-030309

Page 1 of 1

LAB CONTROL

Lab Sample ID: LCS-030309

QC Report No: ON71-GeoEngineers

LIMS ID: 09-5188

Project: Sekiu

Matrix: Sediment

Data Release Authorized: 

Date Sampled: 02/20/09

Reported: 03/11/09

Date Received: 02/21/09

Date Extracted: 03/03/09

Sample Amount: 10.0 g

Date Analyzed: 03/04/09 21:48

Final Extract Volume: 1.0 mL

Instrument/Analyst: FID/PKC

Dilution Factor: 1.0

Range	Lab Control	Spike Added	Recovery
Diesel	96.4	150	64.3%

TPHD Surrogate Recovery

o-Terphenyl	74.2%
-------------	-------

Results reported in mg/kg

Analytical Resources Inc.
TPH Quantitation Report

PC
3/5/09

Data file: /chem3/fid4a.i/20090304.b/0304a050.d

ARI ID: ON71LCSS1

Method: /chem3/fid4a.i/20090304.b/ftphfid4a.m

Client ID: ON71LCSS1

Instrument: fid4a.i

Injection: 04-MAR-2009 21:48

Operator: JR

Report Date: 03/05/2009

Dilution Factor: 1

Macro: 04-MAR-2009

Calibration Dates: Gas:27-JAN-2009 Diesel:04-MAR-2009 M.Oil:04-MAR-2009

FID:4A RESULTS

Compound	RT	Shift	Height	Area	Range	Total Area	Conc
Toluene	1.410	0.009	30668	60747	GAS (Tol-C12)	2640464	88
C8	1.525	0.007	15154	27801	DIESEL (C12-C24)	11409811	964
C10	2.183	0.003	175210	104741	M.OIL (C24-C38)	237894	25
C12	2.702	0.001	386464	195301	AK-102 (C10-C25)	13427022	937
C14	3.125	-0.002	537454	228980	AK-103 (C25-C36)	232163	40
C16	3.493	-0.003	611834	278019	OR.DIES (C10-C28)	13613870	939
C18	3.846	0.000	409981	230039	OR.MOIL (C28-C40)	57585	8
C20	4.266	-0.002	252308	184866			
C22	4.645	-0.002	104362	91834			
C24	4.959	0.000	45041	45176			
C25	5.093	-0.001	26405	32647			
C26	5.218	0.000	15986	18355			
C28	5.443	0.003	5231	6139			
C32	5.838	-0.004	1414	1168			
C34	6.114	0.046	1072	2394	BUNKERC (C10-C38)	13664917	1880
Filter Peak	7.715	0.006	110	184			
C36	6.325	-0.016	634	1538			
C38	6.681	-0.002	376	429			
C40	7.153	0.012	212	307			
o-terph	4.030	0.000	991911	519366	JET-A (C10-C18)	10183304	806
Triacon Surr	5.649	0.006	999514	518528			

Range Times: NW Diesel(2.702 - 4.960) AK102(2.18 - 5.09) Jet A(2.18 - 7.385)
NW M.Oil(4.96 - 6.68) AK103(5.09 - 6.34) OR Diesel(2.18 - 5.44)

Surrogate	Area	Amount	%Rec
o-Terphenyl	519366	33.4	74.3
Triacotane	518528	32.4	72.0

Analyte	RF	Curve Date
o-Terph Surr	15529.5	04-MAR-2009
Triacon Surr	16008.5	04-MAR-2009
Gas	29969.0	27-JAN-2009
Diesel	11833.0	04-MAR-2009
Motor Oil	9446.0	04-MAR-2009
AK102	14323.0	04-MAR-2009
AK103	5772.2	06-FEB-2009
JetA	12632.0	07-JAN-2009
OR Diesel	14494.0	
OR M.Oil	7304.0	
Bunker C	7267.4	04-MAR-2009

Data File: /chem3/fid4a.i/20090304.b/0304a050.d

Date : 04-MAR-2009 21:48

Client ID: 0N71LCSS1

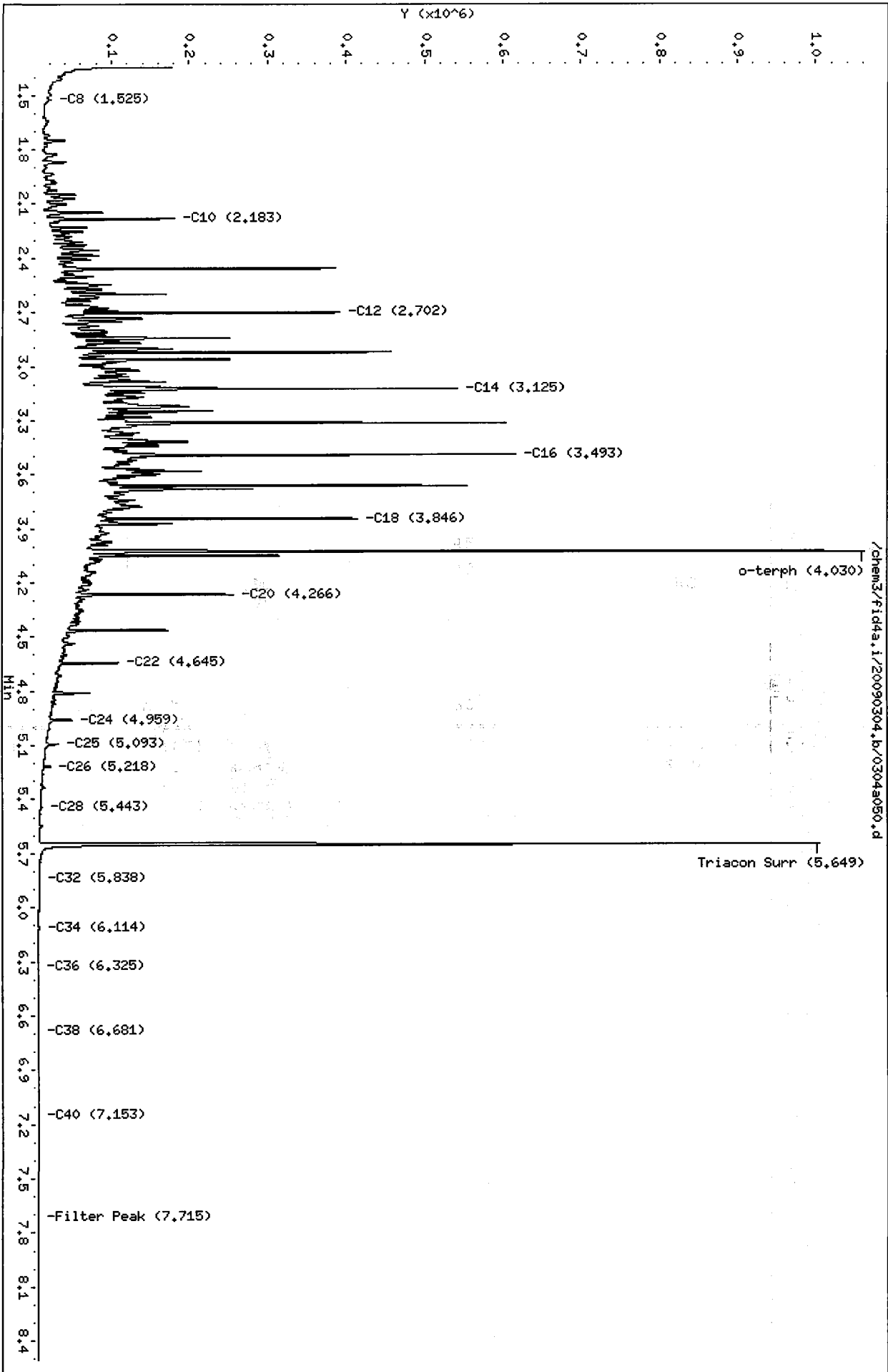
Sample Info: 0N71LCSS1

Column phase: RTX-1

Instrument: fid4a.i

Operator: JR

Column diameter: 2.00



TOTAL DIESEL RANGE HYDROCARBONS-EXTRACTION REPORT

Matrix: Sediment
Date Received: 02/21/09

ARI Job: ON71
Project: Sekiu

ARI ID	Client ID	Client Amt	Final Vol	Basis	Prep Date
09-5188-030309MB1	Method Blank	10.0 g	1.00 mL	-	03/03/09
09-5188-030309LCS1	Lab Control	10.0 g	1.00 mL	-	03/03/09
09-5188-ON71A	R1-S	5.93 g	1.00 mL	D	03/03/09
09-5189-ON71B	R1-D	7.75 g	1.00 mL	D	03/03/09
09-5190-ON71C	R2-S	8.31 g	1.00 mL	D	03/03/09
09-5191-ON71D	R3-S	6.38 g	1.00 mL	D	03/03/09

Basis: D=Dry Weight W=As Received
Diesel Extraction Report

SAMPLE RESULTS-CONVENTIONALS
ON71-GeoEngineers



Matrix: Sediment
Data Release Authorized: *ML*
Reported: 02/26/09

Project: Sekiu
Event: NA
Date Sampled: 02/20/09
Date Received: 02/21/09

Client ID: R1-S
ARI ID: 09-5188 ON71A

Analyte	Date	Method	Units	RL	Sample
Total Solids	02/23/09 022309#1	EPA 160.3	Percent	0.01	58.10
Total Organic Carbon	02/24/09 022409#1	Plumb, 1981	Percent	0.198	9.64

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
ON71-GeoEngineers



Matrix: Sediment
Data Release Authorized: *[Signature]*
Reported: 02/26/09

Project: Sekiu
Event: NA
Date Sampled: 02/20/09
Date Received: 02/21/09

Client ID: R1-D
ARI ID: 09-5189 ON71B

Analyte	Date	Method	Units	RL	Sample
Total Solids	02/23/09 022309#1	EPA 160.3	Percent	0.01	72.50
Total Organic Carbon	02/24/09 022409#1	Plumb, 1981	Percent	0.020	1.78

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
ON71-GeoEngineers



Matrix: Sediment
Data Release Authorized: 
Reported: 02/26/09

Project: Sekiu
Event: NA
Date Sampled: 02/20/09
Date Received: 02/21/09

Client ID: R2-S
ARI ID: 09-5190 ON71C

Analyte	Date	Method	Units	RL	Sample
Total Solids	02/23/09 022309#1	EPA 160.3	Percent	0.01	78.50
Total Organic Carbon	02/24/09 022409#1	Plumb, 1981	Percent	0.020	0.278

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
ON71-GeoEngineers



Matrix: Sediment
Data Release Authorized: 
Reported: 02/26/09

Project: Sekiu
Event: NA
Date Sampled: 02/20/09
Date Received: 02/21/09

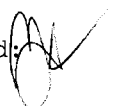
Client ID: R3-S
ARI ID: 09-5191 ON71D

Analyte	Date	Method	Units	RL	Sample
Total Solids	02/23/09 022309#1	EPA 160.3	Percent	0.01	57.40
Total Organic Carbon	02/24/09 022409#1	Plumb, 1981	Percent	0.020	2.17

RL Analytical reporting limit
U Undetected at reported detection limit

MS/MSD RESULTS-CONVENTIONALS
ON71-GeoEngineers



Matrix: Sediment
Data Release Authorized: 
Reported: 02/26/09

Project: Sekiu
Event: NA
Date Sampled: 02/20/09
Date Received: 02/21/09

Analyte	Date	Units	Sample	Spike	Spike Added	Recovery
ARI ID: ON71A Client ID: R1-S						
Total Organic Carbon	02/24/09	Percent	9.64	20.1	9.72	107.6%

REPLICATE RESULTS-CONVENTIONALS
ON71-GeoEngineers



Matrix: Sediment
Data Release Authorized: 
Reported: 02/26/09

Project: Sekiu
Event: NA
Date Sampled: 02/20/09
Date Received: 02/21/09

Analyte	Date	Units	Sample	Replicate(s)	RPD/RSD
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ARI ID: ON71A Client ID: R1-S

Total Solids	02/23/09	Percent	58.10	58.00 58.20	0.2%
Total Organic Carbon	02/24/09	Percent	9.64	9.54 9.38	1.4%

LAB CONTROL RESULTS-CONVENTIONALS
ON71-GeoEngineers



Matrix: Sediment
Data Release Authorized: 
Reported: 02/26/09

Project: Sekiu
Event: NA
Date Sampled: NA
Date Received: NA

Analyte	Date	Units	LCS	Spike Added	Recovery
Total Organic Carbon	02/24/09	Percent	0.539	0.500	107.8%

METHOD BLANK RESULTS-CONVENTIONALS
ON71-GeoEngineers



Matrix: Sediment
Data Release Authorized: 
Reported: 02/26/09

Project: Sekiu
Event: NA
Date Sampled: NA
Date Received: NA

Analyte	Date	Units	Blank
Total Solids	02/23/09	Percent	< 0.01 U
Total Organic Carbon	02/24/09	Percent	< 0.020 U

STANDARD REFERENCE RESULTS-CONVENTIONALS
ON71-GeoEngineers



Matrix: Sediment
Data Release Authorized: 
Reported: 02/26/09

Project: Sekiu
Event: NA
Date Sampled: NA
Date Received: NA

Analyte/SRM ID	Date	Units	SRM	True Value	Recovery
Total Organic Carbon NIST #8704	02/24/09	Percent	3.24	3.35	96.7%

APPENDIX C
REPORT LIMITATIONS AND GUIDELINES FOR USE



APPENDIX C REPORT LIMITATION AND GUIDELINES FOR USE¹

This appendix provides information to help you manage your risks with respect to the use of this report.

READ THESE PROVISIONS CLOSELY

Some clients, design professionals and contractors may not recognize that the geoscience practices (geotechnical engineering, geology and environmental science) are far less exact than other engineering and natural science disciplines. This lack of understanding can create unrealistic expectations that could lead to disappointments, claims and disputes. GeoEngineers includes these explanatory “limitations” provisions in our reports to help reduce such risks. Please confer with GeoEngineers if you are unclear how these “Report Limitations and Guidelines for Use” apply to your project or site.

ENVIRONMENTAL SERVICES ARE PERFORMED FOR SPECIFIC PURPOSES, PERSONS AND PROJECTS

This report has been prepared for the exclusive use by Rayonier, their authorized agents and regulatory agencies as part of their evaluation of environmental conditions at the subject site. This report is not intended for use by others, and the information contained herein is not applicable to other sites.

GeoEngineers structures our services to meet the specific needs of our clients. For example, an environmental site assessment or remedial action study conducted for a property owner may not fulfill the needs of a prospective purchaser of the same property. Because each environmental study is unique, each environmental report is unique, prepared solely for the specific client and project site. No one except Rayonier should rely on this environmental report without first conferring with GeoEngineers. This report should not be applied for any purpose or project except the one originally contemplated.

THIS ENVIRONMENTAL REPORT IS BASED ON A UNIQUE SET OF PROJECT-SPECIFIC FACTORS

This report applies to the former Sekiu log sorting yard located in Clallam County, Sekiu, Washington. GeoEngineers considered a number of unique, project-specific factors when establishing the scope of services for this project and report. Unless GeoEngineers specifically indicates otherwise, do not rely on this report if it was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

If important changes are made after the date of this report, GeoEngineers should be given the opportunity to review our interpretations and recommendations and provide written modifications or confirmation, as appropriate.

RELIANCE CONDITIONS FOR THIRD PARTIES

No other party may rely on the product of our services unless we agree in advance and in writing to such reliance. This is to provide our firm with reasonable protection against open-ended liability claims by third parties with whom there would otherwise be no contractual limits to their actions.

¹ Developed based on material provided by ASFE, Professional Firms Practicing in the GeoSciences, www.asfe.org.

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ENVIRONMENTAL REGULATIONS ARE ALWAYS EVOLVING

Some substances may be present in the site vicinity in quantities or under conditions that may have led, or may lead, to contamination of the subject site, but are not included in current local, state or federal regulatory definitions of hazardous substances or do not otherwise present current potential liability. GeoEngineers cannot be responsible if the standards for appropriate inquiry, or regulatory definitions of hazardous substance, change or if more stringent environmental standards are developed in the future.

SUBSURFACE CONDITIONS CAN CHANGE

This environmental report is based on conditions that existed at the time the study was performed. The findings and conclusions of this report may be affected by the passage of time, by manmade events such as construction on or adjacent to the site, by new releases of hazardous substances, or by natural events such as floods, earthquakes, slope instability or groundwater fluctuations. Always contact GeoEngineers before applying this report to determine if it is still applicable.

MOST ENVIRONMENTAL FINDINGS ARE PROFESSIONAL OPINIONS

Our interpretations of subsurface conditions, remedial alternatives and remedial costs are based on field observations and chemical analytical data from the sampling locations at the site documented in this report. Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. GeoEngineers reviewed field and laboratory data and then applied our professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ – sometimes significantly – from those indicated in this report. There is always a potential that areas of contamination exist in portions of the site that were not sampled or tested during site characterization studies. Our report, conclusions and interpretations should not be construed as a warranty of the subsurface conditions or related remedial costs.