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July 30, 2015

Mr. Jason Cook
Washington State Department of Ecology
Southwest Regional Office
P.O. Box 47775
Olympia, WA 98504-7775

SUBJECT: REQUEST FOR NO FURTHER ACTION LIKELY LETTER
Calhoun's Service Station (VCP ID SW1180)
Tacoma, Washington

Dear Jason:

Floyd|Snider has prepared this Request for No Further Action Likely Letter at the request of the Calhoun Estate in support of a No Further Action (NFA) likely determination for the site prior to conducting cleanup activities. The site investigation work described in this report was completed at the former Calhoun's Service Station located at 4540 Pacific Avenue in Tacoma, Washington. The purpose of the site investigation was to conduct precision characterization to fully delineate the vertical and lateral extent of soil impacts at the property. The results from the field activities were used to determine the most feasible cleanup action approach for impacted soil at the site, as described later in this letter.

PROPERTY HISTORY AND PREVIOUS ENVIRONMENTAL ASSESSMENTS

The property is located on the northwest corner of Pacific Avenue and South 46th Street in Tacoma, Washington. It has been used as a service station since at least 1926. According to existing reports, the property was initially known as the Melvin Tveten Gasoline Station, but by 1951, the station was redeveloped and reconfigured as Calhoun's Service Station (Aerotech 2011). The 1951 redevelopment consisted of demolishing the existing building, reconfiguring the service station facilities, constructing the current building with hydraulic hoists, and installing new underground storage tanks (USTs). In 1991, the station was decommissioned and all four USTs were removed (two 4,000-gallon gasoline tanks, one 6,000-gallon gasoline tank, and one 50- to 200-gallon waste oil tank). Approximately 250 cubic yards of petroleum-contaminated soil was removed from the UST basin and stockpiled within the southwestern corner of the property (Menotti Excavating 1993). The excavation was subsequently backfilled. Five stockpile samples were collected in April 1993 and all results were less than laboratory reporting limits. The stockpiled soil was transported off-site to be used as fill at an off-site location. In 2005, the fuel pumps were removed. Petroleum fuel is no longer stored on-site.

The property is currently leased to a tire sales and automotive repair shop, Llantera Sinaloa Tire Sales & Service. The site is located within a mixed-use commercial and residential area of Tacoma. Residential housing is adjacent to the west, east, and north of the property, and commercial businesses are located to the south and southeast. A public bus stop is located on Pacific Avenue on the east side of the property.

In July 2011, the site was entered into Washington State Department of Ecology's (Ecology's) Voluntary Cleanup Program (VCP). In December 2011, a Limited Phase II Investigation was conducted and seventeen soil borings (SB-1 through SB-17) were advanced within the approximate locations of the former waste oil UST, gasoline USTs, hydraulic hoists, and fuel dispensers, and within the footprint where the stockpiled soil was located. Soil analytical data indicate no petroleum-contaminated impacts in borings located within the former waste oil UST, former hydraulic hoists, and the former stockpile area. However, soil data from soil boring SB-16 indicate slight soil impacts in a limited and localized area at the base of the 1991 UST excavation at 12 feet below ground surface (bgs) and also within the vicinity of the fuel dispensers. In addition, water samples were collected from three boring locations (SB-9, SB-10, and SB-11) that encountered thin, isolated lenses of wet soil within the vicinity of the former fuel dispenser. Groundwater data from these three borings indicate gasoline-range organics (GRO) and/or benzene detections at concentrations exceeding their respective Model Toxics Control Act (MTCA) Method A cleanup levels (Aerotech 2011). Diesel- and heavy oil-range organics were not detected in any of the samples that were submitted for analysis. Water bearing zones were not encountered in the remaining boring locations.

In February 2012, a Limited and Targeted Phase III Subsurface Investigation was completed by Aerotech in order to further delineate soil and groundwater impacts. This investigation consisted of an additional twelve soil borings (SB-18 through SB-29) located within the vicinity of the former tank basin and former fuel dispenser, and within the southeastern portion of the property between the former tank basin and Pacific Avenue. GRO was detected at concentrations exceeding MTCA Method A cleanup levels in soil. In addition, thin lenses of wet soil were encountered in 4 of the 12 soil borings within the vicinity of the fuel dispensers and fuel lines. Water samples were collected from four borings, and GRO and/or benzene were detected at concentrations exceeding their respective MTCA Method A cleanup levels in borings SB-23, SB-25, and SB-28 (Aerotech 2012).

FIELD INVESTIGATION

In December 2014, Floyd|Snider completed additional site investigation activities in order to fully delineate residual hydrocarbon impacts on property soil. Field activities included public and private utility locates, ground penetrating radar survey (GPR), and 25 soil borings using a direct-push drill rig.

Prior to drilling activities, public and private utility locates and a GPR survey were conducted to identify below ground utilities and any remaining USTs associated with service station operations

prior to the site becoming the Calhoun Service Station. The GPR survey did not identify any other former UST basins or buried-in-place USTs beneath the property in accessible areas.

Soil borings SB-30 through SB-54 were advanced using a direct-push rig by Environmental Services Network of Olympia, Washington, between December 10 and 11, 2014. Borings were advanced from the ground surface to depths approximately between 15 and 20 feet bgs and were continuously logged according to the United Soil Classification System. Field soil boring logs are included as Attachment 1. Soil sample locations are shown on Figures 1 and 2.

All soil samples were field screened approximately every foot for indications of petroleum hydrocarbon impacts using a photoionization detector (PID). In addition, visual observations, such as staining and sheen, and olfactory indications of contamination were recorded on the soil logs. The presence of sheen was noted by placing a small amount of soil in a stainless steel bowl with water. Following field screening and the recording of soil descriptions, select soil samples were collected for analysis. Soil samples were collected and submitted for analysis at the depth with the highest impacts based on field screening indications. If all field screening indications were negative, then a soil sample was collected at the same depth of the highest impacts observed in adjacent soil borings. Select soil samples were collected at depths below residual petroleum impacts in order to define a maximum vertical extent. Soil samples were collected using U.S. Environmental Protection Agency (USEPA) Method 5035 and analyzed for the following:

- GRO by NWTPH-Gx
- Benzene, toluene, ethylbenzene, and total xylenes (BTEX) by USEPA Method 8021B

In addition, three soil samples with significant petroleum impacts, based on field observations, were analyzed for the following additional analyses:

- BTEX, methyl tert-butyl ether (MTBE), hexane, ethylene dibromide (EDB), and ethylene dichloride (EDC) by USEPA Method 8260C
- Semivolatile organic compounds(SVOCs) by USEPA Method 8270D SIM
- Extractable petroleum hydrocarbons (EPH) and volatile petroleum hydrocarbons (VPH) by Methods NWEPH and NWVPH

The results from the additional analyses are included in the laboratory data report (Attachment 2) and were used to calculate MTCA Method B cleanup levels for total petroleum hydrocarbons (TPH).

INVESTIGATION FINDINGS

Geology

The geology of the surrounding area is characterized by a thick sequence of Quaternary glacial and interglacial deposits that consist of till, outwash sands and gravels, and fine-grained

interglacial deposits. The subsurface lithology beneath the property typically consists of 0.5 to 1 foot of silty, sandy, gravelly fill that overlies soft to hard silt with low to high plasticity, up to 40 percent fine to medium sand, and occasionally organic debris and rounded gravel. The sandy silt is up to 14 feet thick and is occasionally interbedded with non-continuous lenses of silty sand. The silt layer overlies an olive gray to brown, silty, fine to medium sand with up to 40 percent silt and up to 10 percent fine to medium, rounded gravel. The silty sand layer is up to at least 9 feet in thickness and interpreted to be post-recessional lake bed deposits. Till is encountered beneath the silty sand layer at a depth of at least 17 feet bgs. The till consists of dry, very dense, silty, gravelly, fine- to coarse-grained sand. As described below, the till is extremely dense and serves to limit contaminant migration. A cross section from the pump island through the most contaminated portion of the property is included as Figure 3.

Groundwater

Borings were advanced during the wet season in December 2014 to depths up to 20 feet bgs, and evidence of groundwater was not encountered, even in the locations where water samples were able to be collected during the previous Aerotech sampling activities. Boring logs show that thin lenses of wet soil were occasionally encountered in silty sand layers overlying stiff, silt layers but were not present in all boring locations. These wet zones are randomly distributed, thin, and non-continuous, and were encountered at inconsistent depths ranging between 2 to 15 feet bgs. Based on field observations, it is our opinion that these wet zones are transitory (i.e., seasonal) and do not produce a substantial amount of water (saturated with enough recharge) to be classified as potable under the Washington Administrative Code (WAC) Chapter 173-340-720(2). It is likely that groundwater first occurs much deeper within the sandier outwash deposits that underlie the till. According to Ecology's well database, the regional groundwater aquifer is encountered at approximately 125 feet bgs and groundwater is generally not encountered within the upper 35 feet within the vicinity of the site. Well logs within the vicinity of the site were reviewed and collected from Ecology's well database and are included as Attachment 3.

Soil Impacts to Groundwater

Soil leaching to groundwater is a potential exposure pathway that must be evaluated due to the presence of soil contamination between 2 and 15 feet bgs. Thin, moist to wet zones exist within the upper 15 feet at the site. However, according to Ecology's well database, the regional groundwater aquifer is encountered at approximately 125 feet bgs. The thin wet zones encountered beneath the property are not used as a source of water for any purpose by any known individuals. These shallow, wet zones are random and do not produce a substantial amount of water to set a well screen and capture. Ecology's well database contains numerous well logs and soil borings within the vicinity of the site that show dry borings and decommissioned dry wells within the upper 35 feet bgs (Attachment 3).

In addition, field observations and soil analytical data indicate that petroleum impacts are not present at depths greater than 18 feet bgs, the approximate beginning depth of the till. Given that the till is likely 20 to 30 feet in thickness, the underlying deep aquifer cannot be affected by

the observed releases from the site. In other words, groundwater is not a potential exposure pathway at the site, as it occurs well below the deepest observed impact and the till, which is a barrier to downward contaminant migration.

Contaminants of Concern

The primary contaminants detected in soil at the site are GRO, benzene, ethylbenzene, and total xylenes. Detections are generally limited to the area east of the former tank basin and within the vicinity of the former fuel dispensers. Within the site, GRO, benzene, ethylbenzene, and total xylenes have been detected in soil at concentrations up to 4,900 milligrams per kilogram (mg/kg), 1.7 mg/kg, 23 mg/kg, and 69 mg/kg, respectively. Petroleum-impacted soil is encountered at depths ranging between 2 and 15 feet bgs. The most heavily impacted area is located to the east of the former UST basin, which is within the vicinity of the former fuel lines that supplied the dispensers (Figure 1). Petroleum impacts in soil do not extend beneath the building or off-property to the south, north, and northeast. Contaminated soil was encountered in soil boring SB-54, which is located at the southeastern property boundary adjacent to the sidewalk along Pacific Avenue. However, soil impacts in SB-54 were only encountered between 5 and 6 feet bgs. It is unlikely that significant soil impacts extend beneath Pacific Avenue. Soil analytical data are presented in Tables 1 and 2 and Figure 1. The laboratory analytical report is included as Attachment 2.

The site history indicates that the primary sources of soil contamination were from releases of petroleum products to the surface or subsurface soil via line leaks. Soil impacts were not observed or detected within the vicinity of the former waste oil UST and hydraulic hoists. The majority of impacted soil related to the former UST basin was removed in 1991. Remaining soil contamination is restricted to the area east of the former UST basin and within the vicinity of the fuel dispensers. These remaining impacts are likely related to leaks from the fuel lines and fuel dispensers with the greatest observed impacts in soil borings SB-25 and SB-35 (Figure 1).

CLEANUP LEVEL APPROACHES

Two cleanup approaches were developed for the site; these include: (1) the removal of petroleum-contaminated soil that exceeds MTCA Method A cleanup levels; and (2) the removal of petroleum-contaminated soil that exceeds site-specific MTCA Method B cleanup levels. According to Washington state cleanup regulations:

- MTCA Method A Approach may be used on sites involving relatively few hazardous substances or where cleanup action may be routine. Under MTCA Method A, cleanup levels are determined by the most stringent criteria specified under state and federal laws.
- MTCA Method B Approach is the universal method for determining cleanup levels at any site. For sites contaminated with petroleum hydrocarbons, MTCA Method B cleanup levels are determined by using the fractionated analytical approach for

petroleum. This approach involves testing of the samples to determine the product composition.

For this site, it is appropriate to develop MTCA Method B cleanup levels using an unrestricted land use soil direct contact exposure pathway using analytical data from three soil samples collected at the site and Ecology's *Workbook for Calculating Cleanup Levels for Petroleum Contaminated Sites* (MTCATPH11.1; Ecology 2007). The average of the three results is used as a site-specific MTCA Method B cleanup level for total TPH, along with Ecology's Cleanup Levels and Risk Calculation (CLARC) database (Ecology 2014). MTCA Method A and Method B cleanup levels are listed in the following table and the MTCA Method B inputs and results are included as Attachment 4.

Soil—Unrestricted Land Uses (mg/kg)

Hazardous Substance	MTCA Method A	Direct Contact MTCA Method B	Protection of Groundwater
Gasoline-Range Organics	30/100[1]	3,240 Calculated for Total TPH	NA
Diesel-Range Organics	2,000[2]		NA
Heavy Oil-Range Organics	2,000[2]		NA
Benzene	0.03	18	NA
Ethylbenzene	6	8,000	NA
Total Xylenes	9	16,000	NA
Naphthalene	5	1,600	NA

Note:
1 Cleanup level is 30 when benzene is present and 100 when benzene is not present.
2 Diesel fuel was never used at the site, and diesel- and heavy oil-range organics were not detected during the 2011 and 2012 site investigation.

Abbreviation:
NA Not applicable

MTCA METHOD A CLEANUP APPROACH

The MTCA Method A cleanup approach is to remove all petroleum-contaminated soil containing GRO, benzene, ethylbenzene, total xylenes, and/or naphthalene at concentrations exceeding MTCA Method A cleanup levels within the 15-foot bgs standard point of compliance. Exceedances were detected in soil borings SB-16, SB-25, SB-32, SB-33, SB-35, SB-38, SB-39, SB-42, SB-43, SB-46, SB-47, SB-50, SB-53, and SB-54. This approach uses the MTCA Method A cleanup level of

100 mg/kg for GRO because the removal of all soil with GRO concentrations greater than 100 mg/kg will also remove all soil with benzene detections.

This approach does not include re-excavating the remaining impacted soil within the former UST basin (SB-16). GRO was detected at a concentration of 150 mg/kg in soil boring SB-16 at 12 feet bgs. However, after removing all contaminated soil outside the former UST basin, all remaining soil samples will be in compliance. Because this last remaining exceedance is less than two times the MTCA Method A cleanup level, the MTCA statistical approach (WAC 173-340-740(7)(e)(i-ii)) can be used to determine that this area of the property is in compliance with cleanup standards. Utilizing this evaluation procedure, no single concentration shall be greater than two times the "cleanup level" (i.e., the MTCA Method A cleanup level of 100 mg/kg for GRO) and less than 10 percent of sample concentrations can exceed the soil "cleanup level." Therefore, no further excavation is necessary within the former UST basin.

The estimated area of soil with impacts exceeding MTCA Method A cleanup levels between the ground surface and 15 feet bgs is shown on Figure 2. The volume of petroleum-contaminated soil exceeding MTCA Method A cleanup levels is approximately 670 cubic yards, or 1,000 tons.

MTCA METHOD B CLEANUP APPROACH

A site-specific MTCA Method B cleanup level for total TPH of 3,240 mg/kg was calculated for soil within the upper 15 feet point of compliance. Only GRO was analyzed at the site because only gasoline fuel was stored at the site and diesel- and heavy oil-range organics were never detected in previous site investigation. Therefore, GRO concentrations are compared to the MTCA Method B cleanup level calculated for total TPH. MTCA Method B cleanup levels for BTEX and naphthalene were obtained from Ecology's CLARC database. MTCA Method B cleanup levels are based on direct contact. The water bearing zones encountered beneath the site do not meet the requirements to be classified as potable and soil impacts are not present below 18 feet bgs or within the till; therefore, protection of groundwater is not a concern. Petroleum-contaminated soil with concentrations exceeding MTCA Method B cleanup levels was detected in soil borings SB-25 and SB-35, at depths between 8 and 10 feet bgs.

The estimated area of soil impacts exceeding MTCA Method B cleanup levels between 5 and 15 feet bgs is shown on Figure 2. The volume of soil impacts exceeding MTCA Method B cleanup levels is approximately 150 cubic yards, or 225 tons.

PREFERRED APPROACH

Both MTCA Method A and Method B approaches meet MTCA criteria for evaluating and selecting a cleanup action under WAC 173-340-360(2)(a), which include protection of human health and the environment, compliance with cleanup standards, and compliance with applicable state and federal laws. In addition, both are permanent solutions to the maximum extent practicable, provide reasonable restoration timeframes, and do not rely on institutional controls. However, excavation and off-site disposal of soil exceeding the site-specific MTCA Method B cleanup levels is the preferred approach for the following reasons:

- **Shorter Restoration Timeframe:** The cleanup and restoration timeframe using the MTCA Method B approach will be shorter and cause less of an impact to the business. Every day that the site is closed due to construction will have a higher negative impact to the current business and property owner.
- **Cost**: Construction, soil analytical, and waste management costs will be considerably less.
- **Implementability:** The MTCA Method B approach is more easily implemented because there are fewer structural impediments, such as water, sewer, and electrical utilities, and roadways. The presence of these utilities will increase costs or prevent complete removal of contaminated soil using the MTCA Method A approach.

OVERVIEW OF CLEANUP ACTION APPROACH AND REMAINING DATA GAPS

The MTCA Method B approach was selected based on the nature and extent of contaminated soil exceeding MTCA Method B cleanup levels, exposure pathways and receptors, and the preference for the most feasible and permanent solution. In addition, the MTCA Method B approach is more easily implemented, will cost less, is the most permanent solution practicable, and will have the shortest restoration timeframe with less impacts to the current business and future property use. Specifically, the MTCA Method B approach was selected considering the following site characteristics:

- Soil between ground surface and 15 feet bgs and exceeding MTCA Method B cleanup levels is generally located within the vicinity of soil borings SB-25 and SB-35.
- Contaminated soil is not saturated or within a potable aquifer as defined by WAC 173-340-720(2).
- Contaminants in the soil do not reach the deep regional aquifer, which is present at depths below approximately 125 feet bgs.
- Institutional controls will not be necessary for future site use.

However, the proposed cleanup action to remove soil impacts exceeding MTCA Method B cleanup levels will leave impacted soil exceeding MTCA Method A cleanup levels, which addresses the direct contact pathway but may not be protective of indoor air. Therefore, the potential intrusion of soil vapors to indoor air for the current building and for a residential exposure pathways scenario must be evaluated. In addition, soil impacts that exceed MTCA Method A cleanup levels have not fully been delineated. Soil boring SB-54, adjacent to the southeast corner of the property contained GRO concentrations that exceed the MTCA Method A cleanup level between 5 and 6 feet bgs, which needs to be delineated to the east with an additional boring.

Based on the above, the following remedial actions and supplemental investigation have been prepared to meet the cleanup action objective of achieving a permanent cleanup and addressing the above data gaps in order to acquire an NFA for the site.

CLEANUP ACTIONS

To achieve the cleanup objective and acquire an NFA for the site, the cleanup actions and investigation activities will consist of the following:

- Acquiring appropriate permits
- Conducting a public and private utility locate
- Excavating petroleum-contaminated soil and disposing off-site
- Collecting confirmational samples
- Backfilling, compaction, and repaving
- Soil vapor sampling
- Delineating the extent of soil impacts exceeding MTCA Method A cleanup level to the east of soil boring SB-54
- Submitting a cleanup action report and requesting an NFA determination

Permits and Utility Locate

Prior to initiating cleanup actions, a grading permit will be obtained, a State Environmental Policy Action (SEPA) checklist will be submitted, and stormwater pollution prevention plan (SWPPP) will be prepared. In addition, a public and private utility locate will be conducted on the property and utilities within the excavation footprint will be removed and replaced.

Excavation and Off-Site Disposal

Excavation of petroleum-contaminated soil with concentrations exceeding MTCA Method B cleanup levels will generally be limited to the area within the vicinity of borings SB-25 and SB-35, as outlined in Figure 2. The excavation will not extend below the 15-foot point of compliance for soil (based on direct contact). In addition, the excavation limits will not endanger the stability of roads or buildings adjacent to the excavation.

Excavated soil will be collected from the excavator bucket and field screened for volatile hydrocarbons using odor detection, sheen test, and a PID in order to segregate contaminated soil requiring off-site disposal from non-impacted soil appropriate for reuse as backfill (discussed in further detail later in Stockpiled Soil for Reuse and Backfilling). Contaminated soil will either be placed directly into trucks for off-site disposal or, as necessary, placed on visqueen plastic sheeting and stockpiled on the property until trucks are available for off-site disposal. Contaminated soil removed from the site will be transported to the PRS Group in Tacoma, Washington for disposal and will be managed as “contaminated soils” consistent with the Solid Waste Handling Standards (WAC 173-350).

Compliance Monitoring

In conjunction with soil analytical data from the 2014 investigation, confirmational samples will be collected along the sidewalls and at the base of the excavation to ensure that MTCA Method B cleanup levels have been met laterally and vertically in all directions, such that no environmental covenants would be necessary. The final lateral dimensions and shape of the excavation will determine the actual number and location of soil samples. At a minimum, one soil sample will be collected from each sidewall every 15 feet laterally and at a depth between 5 and 10 feet or from areas where field screening indicates that contamination is either not present or present at very low levels. In addition, compliance samples from the base of the excavation will be collected every 100 square feet and within areas where previous analytical data or field observations encountered contamination. Appropriate sample collection depths will also be determined using the depths that contamination was encountered in previous borings within the vicinity. Soil samples will be analyzed for the following:

- GRO by NWTPH-Gx
- BTEX by USEPA Method 8021B

A courier from an analytical laboratory will pick up samples on a daily basis, and samples will be submitted with a 24-hour turn-around-time. The lateral extent of the excavation will be determined when hydrocarbon concentrations are less than their respective MTCA Method B cleanup levels. If analytical results from sidewall or base samples indicate the presence of hydrocarbons or benzene at concentrations exceeding their respective MTCA Method B cleanup levels, the excavation will continue laterally or vertically and the sidewall or base will be re-sampled until results verify compliance with the cleanup levels.

Management of Contaminated Soil

Contaminated soil will be loaded directly into trucks and transported off-site for disposal or stockpiled separately from soils that do not indicate any contamination via field screening and laboratory analytical confirmations. If it is required to leave contaminated soil in a stockpile overnight, the stockpile will be placed on and covered with visqueen and surrounded by hay bales, as required, to prevent impacts to stormwater runoff.

As the excavation proceeds, certain precautions will be implemented to protect human health and the environment, such as the following:

- All trucks will cover their bed loads with canvas or tarpaulin to prevent airborne transport of contaminated dust.
- Breathing zones will be monitored with a PID at periodic intervals throughout the duration of the field activities to ensure work safety.
- A SWPPP will be prepared to prevent contaminants entering stormwater during rain events.

- Site access restrictions will be maintained throughout the duration of the remedial activities through the use of temporary fencing to block off the excavation area if left open overnight.

Stockpiled Soil for Reuse and Backfilling

Stockpiled soil for reuse will be sampled and analyzed to determine its ultimate disposition consistent with Ecology's *Guidance for Remediation of Petroleum Contaminated Sites* (Ecology 2011). A minimum of three samples will be collected from each stockpile up to 100 cubic yards in volume, and five samples will be collected for stockpiles between 100 to 500 cubic yards in volume. Stockpile samples will be analyzed for the same constituents as the excavation samples. Stockpiles confirmed to be free of petroleum impacts in exceedance of MTCA Method A cleanup levels may be used as backfill, and stockpiles with detections exceeding MTCA Method A cleanup levels will be transported and disposed of off-site. Clean imported soil will be used to backfill the remaining excavation to grade. Backfill material will be compacted, and the excavation footprint will be repaved to match the original surface.

PROPOSED SUPPLEMENTAL INVESTIGATION

MTCA Method A Delineation

GRO was detected in soil boring SB-54 at 5.5 feet bgs with a concentration of 330 mg/kg, which exceeds MTCA Method A cleanup levels. The extent of GRO concentrations exceeding Method A CULs needs to be delineated to the east. During the excavation activities, a soil sample will be collected adjacent and to the east of soil boring SB-54 using the excavator bucket or a hand auger at approximately 5.5 feet bgs. The soil sample will be analyzed for the same constituents as the excavation samples. If concentrations exceed MTCA Method A cleanup levels, then a step-out boring will be advanced using a hand auger in the sidewalk to the east. Given the GRO concentration, lithology, and the thin zone of impacts observed in soil boring SB-54, one additional boring should be sufficient to delineate the extent of impacts exceeding MTCA Method A cleanup levels.

Soil Vapor Assessment

Most sites that meet MTCA Method A cleanup levels will have adequately addressed the vapor intrusion pathway. However, WAC 173-340-740(3)(b)(iii)(C)(I) specifies that whenever hydrocarbon concentrations are greater than concentrations derived for protection of groundwater, the soil to vapor pathway must be evaluated. Therefore, a Tier I Vapor Intrusion (VI) assessment will be completed following excavation activities. After excavation activities, two soil vapor points will be installed on the property to investigate soil vapor to indoor air. Soil vapor probes will be installed on the property at depths of 5 and 15 feet bgs, adjacent to the former pump island and within the vicinity of remaining contamination at concentrations greater than MTCA Method A cleanup levels. Both will be installed and sampled in accordance with the procedures outlined in Ecology's 2009 Guidance, *Soil Vapor Intrusion in Washington State: Investigation and Remedial Action* (VI Guidance; Ecology 2009).

Once the soil vapor probes have been installed and the seals have fully cured, sampling activities will commence (after a minimum of 48 hours) using 1-liter Summa canisters at a filling flow rate less than 167 milliliters per minute (ml/min) and a helium shroud to ensure that ambient air did not leak into the sample. Soil gas samples will be analyzed for the following:

- BTEX and naphthalenes using USEPA Modified Method TO-15 low level
- Helium using ASTM D 1946

Soil vapor concentrations will be compared to screening levels presented in Table B-1 of the Ecology VI Guidance. Per the guidance, if concentrations are greater than the screening levels during the Tier I VI assessment, a Tier II assessment will be conducted, which includes using the Johnson and Ettinger Model to predict maximum (i.e., worst case) concentrations to indoor air for a hypothetical residential dwelling.

REPORTING

Upon completion of the proposed investigation activities and remedial actions, a cleanup action report documenting the activities will be prepared. The report will include the following:

- A detailed description of the work performed
- Tables of laboratory analytical results
- A site figure with sampling locations and depths and the extent of the excavation
- Laboratory analytical reports and chain of custody forms

Following submittal of the supplemental investigation results and cleanup action report, and pending review and acceptance by Ecology, Floyd|Snider, on behalf of the Calhoun Estate, intends to request an NFA determination for the site.

REFERENCES

Aerotech Environmental Consulting, Inc. (Aerotech). 2011. *Limited Phase II: Limited and Targeted Subsurface Investigation Performed at Calhoun's Service Station*. 12 December.

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____. 2014. *Cleanup Levels and Risk Calculation (CLARC)*. https://fortress.wa.gov/ecy/clarc. Last accessed 7/29/2015.

Sincerely yours,
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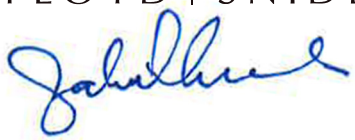


Gabe Cisneros, LG
Geologist

Encl: Table 1 2014 Soil Analytical Data – Gasoline-Range Organics and Benzene, Toluene, Ethylbenzene, and Xylenes
Table 2 2014 Soil Analytical Data – Gasoline-Range Organics, Volatile Organic Compounds, and Semivolatile Organic Compounds
Figure 1 Gasoline-Range Organics and Benzene in Soil, 2011–2014
Figure 2 Approximate Excavation Extents
Figure 3 Cross Section A-A'
Attachment 1 Soil Boring Logs
Attachment 2 Laboratory Report
Attachment 3 Ecology Database Well Logs
Attachment 4 Method B Calculations MTCATPH11.1

Tables

Table 1
2014 Soil Analytical Data – Gasoline-Range Organics and Benzene, Toluene, Ethylbenzene, and Xylenes

Analysis Method				NWTPH-Gx	USEPA 8021B			
			Analyte	Gasoline-Range Organics	Benzene	Toluene	Ethylbenzene	Xylene (total)
			Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Location	Sample ID	Sample Date	Depth (ft bgs)					
SB-30	SB-30-4.5	12/10/2014	4.5	19	0.02 U	0.02 U	0.02 U	0.06 U
SB-32	SB-32-14	12/10/2014	14	2,000 J	0.03 U[1]	0.05 U[1]	0.76 [1]	0.1 U[1]
SB-32	SB-32-17	12/10/2014	17	6.7	0.02 U	0.02 U	0.022	0.06 U
SB-33	SB-33-9	12/10/2014	9	2,700 J	0.14 [1]	0.24 [1]	6.6 [1]	14 [1]
SB-33	SB-33-17	12/10/2014	17	2 U	0.02 U	0.02 U	0.02 U	0.06 U
SB-34	SB-34-17	12/10/2014	17	2 U	0.02 U	0.02 U	0.02 U	0.06 U
SB-34	SB-34-6.5	12/10/2014	6.5	26	0.02 U	0.02 U	0.068	0.11
SB-35	SB-35-10	12/10/2014	10	**3,400** J	0.31 [1]	0.91 [1]	23 [1]	69 [1]
SB-36	SB-36-8	12/10/2014	8	2 U	0.02 U	0.02 U	0.02 U	0.06 U
SB-37	SB-37-7.5	12/10/2014	7.5	2 U	0.02 U	0.02 U	0.02 U	0.06 U
SB-38	SB-38-14	12/10/2014	14	2 U	0.02 U	0.02 U	0.02 U	0.06 U
SB-38	SB-38-8	12/10/2014	8	250	0.02 U	0.45	0.02 U	1.2
SB-39	SB-39-12	12/10/2014	12	330	0.02 U	0.94	0.02 U	2.6
SB-39	SB-39-14	12/10/2014	14	2 U	0.02 U	0.02 U	0.02 U	0.06 U
SB-40	SB-40-7	12/10/2014	7	2 U	0.02 U	0.02 U	0.02 U	0.06 U
SB-41	SB-41-6	12/10/2014	6	43	0.02 U	0.02 U	0.02 U	0.37
SB-41	SB-41-6D	12/10/2014	6	9.2	0.02 U	0.02 U	0.02 U	0.074
SB-42	SB-42-13	12/10/2014	13	1,400	0.15	3.1	9.8	5.9
SB-42	SB-42-15	12/10/2014	15	2 U	0.02 U	0.02 U	0.02 U	0.06 U
SB-43	SB-43-2	12/11/2014	2	190	0.02 U	0.2	0.02 U	1.6
SB-44	SB-44-12.5	12/11/2014	12.5	90	0.02 U	0.02 U	0.32	0.64
SB-45	SB-45-9.5	12/11/2014	9.5	2 U	0.02 U	0.02 U	0.02 U	0.06 U
SB-46	SB-46-15	12/11/2014	15	2,400	0.84	0.1 U	15	59
SB-46	SB-46-19.5	12/11/2014	19.5	2 U	0.02 U	0.02 U	0.02 U	0.06 U
SB-47	SB-47-7.5	12/11/2014	7.5	590	0.02 U	0.1 U	3.3	5.1
SB-48	SB-48-8.5	12/11/2014	8.5	2 U	0.02 U	0.02 U	0.02 U	0.06 U
SB-49	SB-49-13.5	12/11/2014	13.5	2 U	0.02 U	0.02 U	0.02 U	0.06 U
SB-50	SB-50-13	12/11/2014	13	380	0.11	0.02 U	2.3	4.5
SB-51	SB-51-7.5	12/11/2014	7.5	56	0.02 U	0.02 U	0.85	0.54
SB-52	SB-52-7.5	12/11/2014	7.5	6.5	0.02 U	0.03	0.04	0.06 U
SB-53	SB-53-10	12/11/2014	10	2,600	1.7	0.1 U	21	36
SB-54	SB-54-5.5	12/11/2014	5.5	330 J	0.02 U	0.02 U	2 J	3.2 J

Notes:

1 Analyzed by USEPA Method 8260C. Refer to Table 2.

3,400 Bold indicates a concentration that exceeds the site-specific MTCA Method B cleanup level of 3,240 mg/kg for TPH.

Abbreviations:

ft bgs Feet below ground surface
mg/kg Milligrams per kilogram
MTCA Model Toxics Control Act
TPH Total petroleum hydrocarbons

Qualifiers:

J Analyte was detected, concentration given is considered an estimate.
U Analyte was not detected, concentration given is the reporting limit.

Table 2
2014 Soil Analytical Data – Gasoline-Range Organics, Volatile Organic Compounds, and Semivolatile Organic Compounds

	Location	SB-32	SB-33	SB-35
	Sample ID	SB-32-14	SB-33-9	SB-35-10
	Sample Date	12/10/2014	12/10/2014	12/10/2014
	Depth (ft bgs)	14	9	10
Analytes	**Units**			
Total Petroleum Hydrocarbons by NWTPH-Gx				
Gasoline-Range Organics	mg/kg	2,000 J	2,700 J	3,400 J
Volatile Organic Compounds by USEPA 8260C				
Benzene	mg/kg	0.03 U	0.14	0.31
Ethylbenzene	mg/kg	0.76	6.6	23
Toluene	mg/kg	0.05 U	0.24	0.91
Xylene (meta & para)	mg/kg	0.1 U	10	45
Xylene (ortho)	mg/kg	0.05 U	4.1	24
1,2-Dibromoethane	mg/kg	0.05 U	0.05 U	0.05 U
1,2-Dichloroethane	mg/kg	0.05 U	0.05 U	0.05 U
Methyl Tert-Butyl Ether	mg/kg	0.05 U	0.05 U	0.05 U
n-Hexane	mg/kg	11	5.1	7.5
Semivolatile Organic Compounds by USEPA 8270D-SIM				
1-Methylnaphthalene	mg/kg	0.67	2.5	3.7
2-Methylnaphthalene	mg/kg	1.3	3.6	7.8
Acenaphthene	mg/kg	0.01 U	0.048	0.01
Acenaphthylene	mg/kg	0.01 U	0.01 U	0.01 U
Anthracene	mg/kg	0.01 U	0.01 U	0.01 U
Benzo(a)anthracene	mg/kg	0.01 U	0.01 U	0.01 U
Benzo(a)pyrene	mg/kg	0.01 U	0.01 U	0.01 U
Benzo(b)fluoranthene	mg/kg	0.01 U	0.01 U	0.01 U
Benzo(g,h,i)perylene	mg/kg	0.01 U	0.01 U	0.01 U
Benzo(k)fluoranthene	mg/kg	0.01 U	0.01 U	0.01 U
Chrysene	mg/kg	0.01 U	0.01 U	0.01 U
Dibenzo(a,h)anthracene	mg/kg	0.01 U	0.01 U	0.01 U
Fluoranthene	mg/kg	0.01 U	0.01 U	0.01 U
Fluorene	mg/kg	0.017	0.14	0.02
Indeno(1,2,3-cd)pyrene	mg/kg	0.01 U	0.01 U	0.01 U
Naphthalene	mg/kg	0.83	2.9	13
Phenanthrene	mg/kg	0.01 U	0.069	0.01 U
Pyrene	mg/kg	0.01 U	0.01 U	0.01 U

Abbreviations:

ft bgs Feet below ground surface

mg/kg Milligrams per kilogram

Qualifiers:

J Analyte was detected, concentration given is considered an estimate.

U Analyte was not detected, concentration given is the reporting limit.

Figures

Legend

- Soil Boring Location Sampled in December 2014
- Soil Boring Location Sampled 2011–2012
- Property Boundary
- All concentrations are less than MTCA Method A cleanup levels for soil.
- Concentrations exceed MTCA Method A cleanup levels for soil.
- Concentrations exceed MTCA Method B cleanup levels for soil.

MTCA Cleanup Level	GRO mg/kg	Benzene mg/kg
MTCA Method A	100	0.03
MTCA Method B	3,240	18

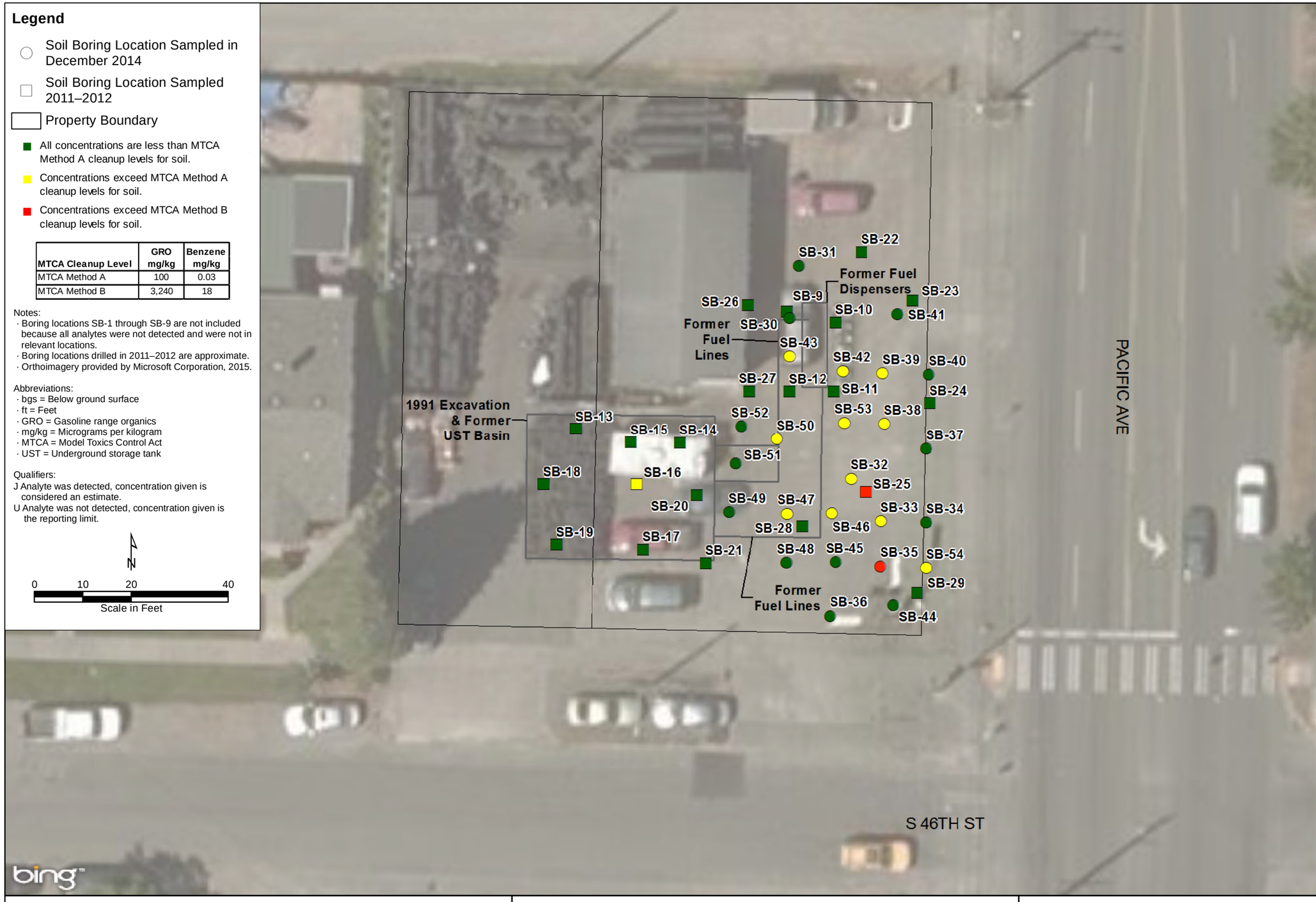
Notes:
- Boring locations SB-1 through SB-9 are not included because all analytes were not detected and were not in relevant locations.
- Boring locations drilled in 2011–2012 are approximate.
- Orthoimagery provided by Microsoft Corporation, 2015.

Abbreviations:
- bgs = Below ground surface
- ft = Feet
- GRO = Gasoline range organics
- mg/kg = Micrograms per kilogram
- MTCA = Model Toxics Control Act
- UST = Underground storage tank

Qualifiers:
J Analyte was detected, concentration given is considered an estimate.
U Analyte was not detected, concentration given is the reporting limit.

N

0 10 20 40
Scale in Feet



Location	Depth (ft bgs)	GRO mg/kg	Benzene mg/kg
SB-9	8	99	0.02 U
	17	10 U	0.02 U
SB-10	10	17	0.02 U
	16	10 U	0.02 U
SB-11	17	10 U	0.02 U
SB-12	8	36	0.02 U
	14	10 U	0.02 U
SB-13	14	10 U	0.02 U
SB-14	14	73	0.02 U
	17.5	10 U	0.02 U
SB-15	14	66	0.02 U
	18	10 U	0.02 U
SB-16	12	150	0.02 U
	18	15	0.02 U
SB-17	14	14	0.02 U
	18	10 U	0.02 U
SB-18	14	10 U	0.02 U
SB-19	14	10 U	0.02 U
SB-20	14	10 U	0.02 U
	18	10 U	0.02 U
SB-21	10	10 U	0.02 U
	18	10 U	0.02 U
SB-22	8	10 U	0.02 U
	10	10 U	0.02 U
SB-23	8	10 U	0.02 U
	10	10 U	0.02 U
SB-25	2	10 U	0.02 U
	8	4,900	0.02 U
	13	10 U	0.02 U
SB-26	8	10 U	0.02 U
SB-27	8	10 U	0.02 U
	14	10 U	0.02 U
SB-28	14	10 U	0.02 U
	18	10 U	0.02 U
SB-29	12	10 U	0.02 U
	18	10 U	0.02 U
SB-30	4.5	19	0.02 U
SB-32	14	2,000 J	0.03 U
	17	6.7	0.02 U
SB-33	9	2,700 J	0.14
	17	2 U	0.02 U
SB-34	17	2 U	0.02 U
	6.5	26	0.02 U
SB-35	10	3,400 J	0.31
SB-36	8	2 U	0.02 U
SB-37	7.5	2 U	0.02 U
SB-38	14	2 U	0.02 U
	8	250	0.02 U
SB-39	12	330	0.02 U
	14	2 U	0.02 U
SB-40	7	2 U	0.02 U
SB-41	6	43	0.02 U
	6	9.2	0.02 U
SB-42	13	1,400	0.15
	15	2 U	0.02 U
SB-43	2	190	0.02 U
SB-44	12.5	90	0.02 U
SB-45	9.5	2 U	0.02 U
SB-46	15	2,400	0.84
	19.5	2 U	0.02 U
SB-47	7.5	590	0.02 U
SB-48	8.5	2 U	0.02 U
SB-49	13.5	2 U	0.02 U
SB-50	13	380	0.11
SB-51	7.5	56	0.02 U
SB-52	7.5	6.5	0.02 U
SB-53	10	2,600	1.7
SB-54	5.5	330 J	0.02 U

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Tacoma, Washington

Figure 1
Gasoline-Range Organics and Benzene in Soil
2011–2014

I:\GIS\Projects\GTH-Calhoun\MXD\Site Investigation Report and Cleanup\Figure 1 GRO and Benzene.mxd
7/29/2015

Legend

- Soil Boring Location Sampled in December 2014
- Soil Boring Location Sampled 2011–2012

Utilities

- E — Electrical
- SS — Sewer
- W — Water
- Property Boundary
- A — Approach A: Estimated area of soil impacts greater than MTCA Method A cleanup levels between the ground surface and 15 feet bgs. The volume of petroleum-contaminated soil is approximately 670 cubic yards or 1,000 tons.
- B — Approach B: Estimated area of soil impacts greater than MTCA Method B cleanup levels between the ground surface and 15 feet bgs. The volume is approximately 150 cubic yards or 225 tons.
- **A—A'** Cross Section Transect
- All concentrations are less than MTCA Method A cleanup levels for soil.
- Concentrations exceed MTCA Method A cleanup levels for soil.
- Concentrations exceed MTCA Method B cleanup levels for soil.

· Boring locations drilled in 2011–2012 are approximate.
· Orthoimagery provided by Microsoft Corporation, 2015.

Abbreviations:
· bgs = Below ground surface
· MTCA = Model Toxics Control Act

N

0 10 20 40
Scale in Feet

Light Pole
A
A'
B
SB-22
SB-31
SB-23
SB-26
SB-9
SB-10
SB-41
SB-30
SB-43
SB-42
SB-39
SB-40
SB-27
SB-12
SB-11
SB-24
SB-13
SB-52
SB-53
SB-38
SB-15
SB-14
SB-50
SB-37
SB-51
SB-32
SB-18
SB-16
SB-25
SB-20
SB-49
SB-47
SB-33
SB-34
SB-19
SB-17
SB 28
SB-46
SB-21
SB-48
SB-45
SB-35
SB-54
SB 29
SB-36
SB-44
PACIFIC AVE
S 46TH ST
bing

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Tacoma, Washington

Figure 2
Approximate Excavation Extents

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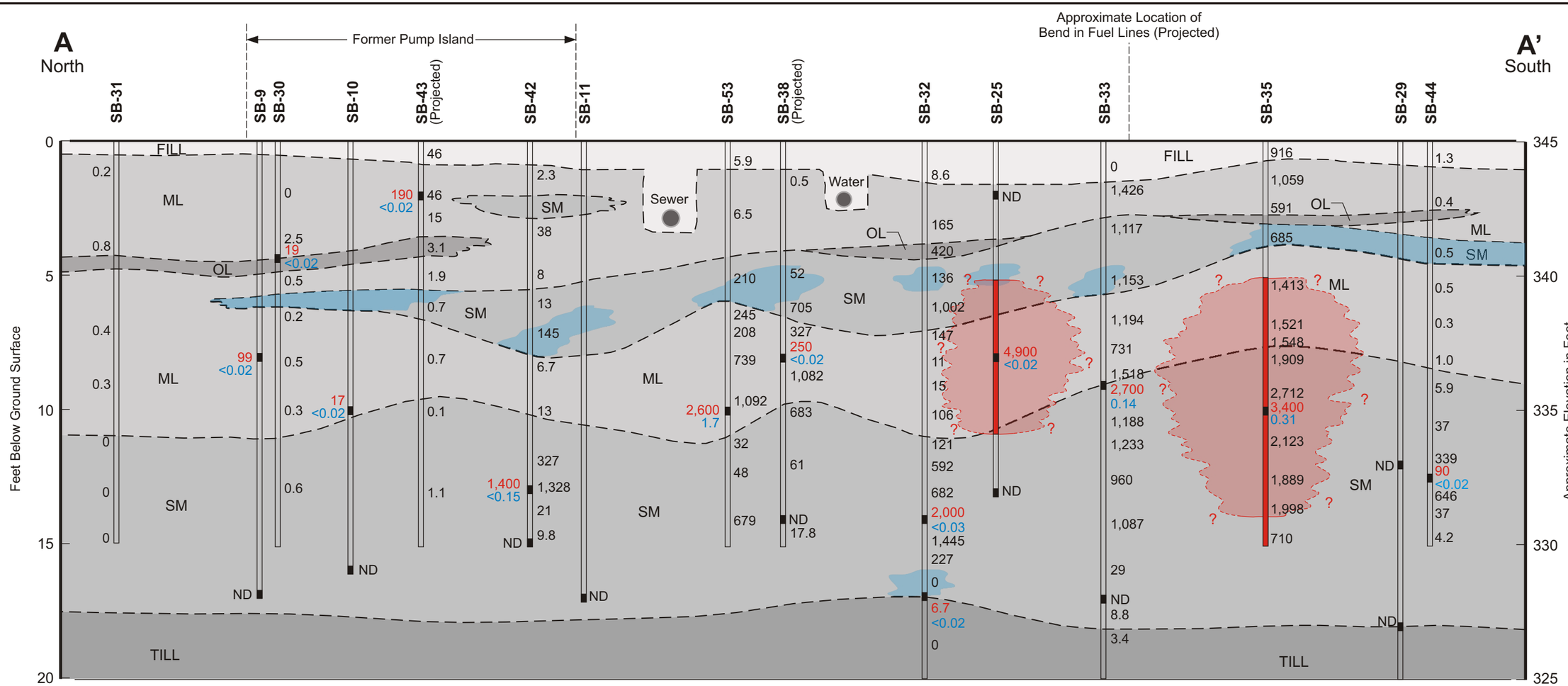
7/29/2015



LEGEND

Photoionization detector reading in parts per million (ppm)

136 — Boring Location

Sample Location

4,900 Gasoline-Range Organics Concentration in milligrams per kilogram (mg/kg)

<0.02 Benzene Concentration in milligrams per kilogram (mg/kg)

Approximate vertical and lateral extent of TPH impacts exceeding MTCA Method B cleanup levels (dashed where inferred)

Vertical extent of Total Petroleum Hydrocarbon (TPH) impacts exceeding Model Toxics Control Act (MTCA) Method B cleanup level

ND No analyte detected at or greater than laboratory detection limit

<10 Analyte not detected at or greater than given laboratory detection limit

FILL	Silty, sandy, gravelly FILL
ML	Light brown to olive gray and brown, soft to stiff SILT with up to 30% sand, 10% rounded gravel, and low to moderate plasticity
SM	Brown to dark brown and gray to olive gray, silty, very fine to medium SAND with up to 40% silt and 15% rounded gravel
OL	Dark brown, soft to firm, organic SILT with woody debris
TILL	Brown, very dense, silty, gravelly, fine to coarse SAND (TILL); dry
	Indicates wet soil

Horizontal Scale in Feet
0 6 12
0 4 8
Vertical Scale in Feet
Vertical Exaggeration x 1.5

MTCA Method B Cleanup Level
TPH (Gasoline-Range Organics) = 3,240 mg/kg
Benzene = 18 mg/kg

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Figure 3
Cross Section A-A'

G:Project\Clients\Floyd Snider\GTH Calhoun\Figure X.X

Attachment 1
Soil Boring Logs

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PROJECT: GTH-Calhoun	**LOCATION:** 4540 Pacific Ave Tacoma, WA	**BORING ID:** SB-30	
LOGGED BY: G. Cisneros	**BORING LOCATION:**		
DRILLED BY: ESN	**NORTHING:** 692269.522649	**EASTING:** 1159757.52452	
DRILLING EQUIPMENT: Geoprobe	**SURFACE ELEVATION:**	**COORDINATE SYSTEM:** NAD83 HARN, USCS WA	
DRILLING METHOD: Direct Push	**TOTAL DEPTH (ft bgs):** 15	**DEPTH TO WATER (ft bgs):** N/A	
SAMPLING METHOD/SAMPLER LENGTH: Continuous	**BORING DIAMETER:** 2"	**DRILL DATE:** 12/10/2014	

Depth (feet)	USCS Symbol	Soil Description and Observations (color, texture, moisture, **MAJOR CONSTITUENT**, odor, staining, sheen, debris, etc.)	Drive/ Recovery	# of Blows	PID (ppm)	Sample ID
0	Fill	Concrete top 2 inches.				
1	ML	Light brown, stiff, sandy **SILT** with 5% rounded gravel & 40% fine sand; no odor; no sheen.				
2					0.0	
3		Same as above; no odor; no sheen, moist.			0.0	
4	OL	Dark brown, organic **SILT**; no odor; no sheen.			2.5	
5	ML	Brown, soft **SILT** with 10% sand and no gravel; slight odor; no sheen; wet from 4.5 to 6 '.			0.5	SB-30-4.5 @0835
6		Olive green to greenish bluish, stiff **SILT** with 15% fine sand and 10% gravel; no odor; no sheen; moist.			0.2	
7					0.2	
8		Same as above; no odor; no sheen; moist.			0.5	
9		Brown, stiff **SILT** with 10% sand and 10% rounded gravel; no odor; no sheen; moist.			0.2	
10		Same as above; no odor; no sheen.				
11	SM	Olive green, silty fine **SAND** with 10% rounded gravel and 30% silt; no odor; no sheen; moist.			0.3	
12						
13		Same as above; no odor; no sheen; moist.			0.6	
14						
15						

ABBREVIATIONS:
ft bgs = feet below ground surface USCS = Unified Soil Classification System
ppm = parts per million ▼ = denotes groundwater table

NOTES:

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PROJECT: GTH-Calhoun	**LOCATION:** 4540 Pacific Ave Tacoma, WA	**BORING ID:** SB-31	
LOGGED BY: G. Cisneros	**BORING LOCATION:**		
DRILLED BY: ESN	**NORTHING:** 692280.374972	**EASTING:** 1159759.36139	
DRILLING EQUIPMENT: Geoprobe	**SURFACE ELEVATION:**	**COORDINATE SYSTEM:** NAD83 HARN, USCS WA	
DRILLING METHOD: Direct Push	**TOTAL DEPTH (ft bgs):** 15	**DEPTH TO WATER (ft bgs):** N/A	
SAMPLING METHOD/SAMPLER LENGTH: Continuous	**BORING DIAMETER:** 2"	**DRILL DATE:** 12/10/2014	

Depth (feet)	USCS Symbol	Soil Description and Observations (color, texture, moisture, **MAJOR CONSTITUENT**, odor, staining, sheen, debris, etc.)	Drive/ Recovery	# of Blows	PID (ppm)	Sample ID
0	Fill	Concrete top 2 inches. Silty, sandy, gravelly **FILL**.				
1	ML	Olive green, stiff, sandy **SILT** with 10% gravel; no odor; no sheen.			0.2	
2	ML	Brown, stiff, sandy **SILT** with 30% fine to medium sand and 10% rounded gravel.				
3	ML				0.4	
4	OL	Dark brown, soft to firm, organic **SILT** with woody debris, 25% sand, and no gravel; no odor; no sheen; moist to wet.			0.8	SB-31-4.5 @0920
5	ML	Brown, stiff **SILT** with 15% sand and 5% gravel; no odor; no sheen; moist.			0.3	
6	ML					
7	ML				0.4	
8	ML	Olive green, stiff **SILT** with 20% fine to medium sand and 5% gravel; no odor; no sheen; moist.			0.3	
9	ML				0.3	
10	ML	Olive brown, silt with 10% sand; no odor; no sheen; moist.			0.0	
11	SM	Brown, silty, fine to medium **SAND** with 10% rounded gravel and 30% silt; no odor; no sheen; moist.				
12	SM				0.0	
13	SM	Same as above; no odor; no sheen.				
14	SM				0.0	
15						

ABBREVIATIONS:
ft bgs = feet below ground surface
ppm = parts per million
USCS = Unified Soil Classification System
▼ = denotes groundwater table

NOTES:

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PROJECT: GTH-Calhoun	**LOCATION:** 4540 Pacific Ave Tacoma, WA	**BORING ID:** SB-32	
LOGGED BY: G. Cisneros	**BORING LOCATION:**		
DRILLED BY: ESN	**NORTHING:** 692236.424633	**EASTING:** 1159770.09356	
DRILLING EQUIPMENT: Geoprobe	**SURFACE ELEVATION:**	**COORDINATE SYSTEM:** NAD83 HARN, USCS WA	
DRILLING METHOD: Direct Push	**TOTAL DEPTH (ft bgs):** 20	**DEPTH TO WATER (ft bgs):** N/A	
SAMPLING METHOD/SAMPLER LENGTH: Continuous	**BORING DIAMETER:** 2"	**DRILL DATE:** 12/10/2014	

Depth (feet)	USCS Symbol	Soil Description and Observations (color, texture, moisture, **MAJOR CONSTITUENT**, odor, staining, sheen, debris, etc.)	Drive/ Recovery	# of Blows	PID (ppm)	Sample ID
0	Fill	Concrete top 2 inches. Brown, silty fine to medium sand with 10% rounded gravel and 30% silt; no odor; no sheen.				
2	ML	Olive green, sandy **SILT** with 5% gravel; slight odor; no sheen; moist.			8.6	
3					165.0	
4	OL	Dark brown **SILT** with woody debris.				
4	SM	Brown, silty, fine to medium **SAND** with 40% silt and 5% gravel; moderate odor; slight sheen; wet.			420.0	
5					136.0	
6		Same as above; moderate odor; moderate sheen; wet.			1,002.0	SB-32-6 @1000
7	ML	Brown, stiff **SILT** with moderate plasticity, 10% fine sand, and 5% rounded gravel; slight odor; moderate sheen; moist.			147.0	
8					11.1	
9		Same as above; no odor; no sheen.			15.0	
10					106.0	
11	SM	Gray, silty, fine to medium **SAND**; moderate odor; slight sheen; moist.			121.0	
12					592.0	
13					682.0	
14		Same as above; moderate odor; moderate sheen.			1,445.0	SB-32-14 @1005
15						
16 ▼		Same as above; slight odor; no sheen; wet to saturated.			227.0	
17	Till	Brown, very dense, silty, gravelly, fine to coarse **SAND** (TILL); no odor; no sheen; dry.			0.0	SB-32-17 @1010
18					0.0	
19						
20						

ABBREVIATIONS:
ft bgs = feet below ground surface
USCS = Unified Soil Classification System
ppm = parts per million
▼ = denotes groundwater table

NOTES:

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PROJECT: GTH-Calhoun	**LOCATION:** 4540 Pacific Ave Tacoma, WA	**BORING ID:** SB-33	
LOGGED BY: G. Cisneros	**BORING LOCATION:**		
DRILLED BY: ESN	**NORTHING:** 692227.728183	**EASTING:** 1159776.24366	
DRILLING EQUIPMENT: Geoprobe	**SURFACE ELEVATION:**	**COORDINATE SYSTEM:** NAD83 HARN, USCS WA	
DRILLING METHOD: Direct Push	**TOTAL DEPTH (ft bgs):** 20	**DEPTH TO WATER (ft bgs):** N/A	
SAMPLING METHOD/SAMPLER LENGTH: Continuous	**BORING DIAMETER:** 2"	**DRILL DATE:** 12/10/2014	

Depth (feet)	USCS Symbol	Soil Description and Observations (color, texture, moisture, **MAJOR CONSTITUENT**, odor, staining, sheen, debris, etc.)	Drive/ Recovery	# of Blows	PID (ppm)	Sample ID
0	Fill SM	Concrete top 2 inches. Brown, silty, fine to med **SAND** with 10% rounded gravel.			0.0	
1					1,426.0	
2	ML	Sandy **SILT**			1,117.0	
3	SM	Brown, silty, fine **SAND** with 5% gravel and 40% silt; slight odor; slight sheen ; moist				
4						
5		Same as above; slight odor; slight sheen; wet			1,153.0	
6	ML	Olive green, stiff **SILT** with 10% sand and 5% rounded gravel; slight odor; no sheen			1,194.0	
7						
8					731.0	
9	SM	Gray, silty, fine to med **SAND** with 30% silt and 10 % rounded gravel; strong odor; moderate sheen; moist.			1,518.0	SB-33-9 @1050
10					1,188.0	
11					1,233.0	
12						
13		Same as above; moderate odor; moderate sheen; wet			960.0	
14					1,018.0	
15					1,087.0	
16						
17		Same as above; slight odor; no sheen.			29.0	
18		Same as above; no odor; no sheen.			8.8	
19	Till	Brown, very dense, silty, gravelly **SAND** (Till); dry.			3.4	
20						

ABBREVIATIONS:
ft bgs = feet below ground surface USCS = Unified Soil Classification System
ppm = parts per million ▼ = denotes groundwater table

NOTES:

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PROJECT: GTH-Calhoun	**LOCATION:** 4540 Pacific Ave Tacoma, WA	**BORING ID:** SB-34	
LOGGED BY: G. Cisneros	**BORING LOCATION:**		
DRILLED BY: ESN	**NORTHING:** 692227.440839	**EASTING:** 1159785.64587	
DRILLING EQUIPMENT: Geoprobe	**SURFACE ELEVATION:**	**COORDINATE SYSTEM:** NAD83 HARN, USCS WA	
DRILLING METHOD: Direct Push	**TOTAL DEPTH (ft bgs):** 18	**DEPTH TO WATER (ft bgs):** N/A	
SAMPLING METHOD/SAMPLER LENGTH: Continuous	**BORING DIAMETER:** 2"	**DRILL DATE:** 12/10/2014	

Depth (feet)	USCS Symbol	Soil Description and Observations (color, texture, moisture, **MAJOR CONSTITUENT**, odor, staining, sheen, debris, etc.)	Drive/ Recovery	# of Blows	PID (ppm)	Sample ID
0		Concrete top 2 inches. No recovery 0-5'.				
5	OL	Dark brown, soft, organic **SILT** with woody debris.			190.1	
6	ML	Olive brown, stiff **SILT** with 5% sand and 5% gravel; no odor; no sheen; moist.			273.0	SB-34-6.5 @1135
7					260.0	
8	SM	Brown, silty, fine to medium **SAND** with 30% silt and 10% gravel; slight odor; no sheen; wet.			32.0	
10		Same as above; slight odor; no sheen; saturated.			155.0	
11					382.0	
12					160.0	
13		Same as above; increased silt content; slight odor; no sheen; moist.			62.0	
15		Same as above; moderate odor; slight sheen; saturated. ▼			902.0	
16	ML	Light brown, stiff **SILT** with 10% fine gravel and 10% sand; no odor; no sheen; moist.			15.0	
17					0.0	SB-34-17 @1145
18						

ABBREVIATIONS:
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PROJECT: GTH-Calhoun	**LOCATION:** 4540 Pacific Ave Tacoma, WA	**BORING ID:** SB-35	
LOGGED BY: G. Cisneros	**BORING LOCATION:**		
DRILLED BY: ESN	**NORTHING:** 692218.419003	**EASTING:** 1159776.1651	
DRILLING EQUIPMENT: Geoprobe	**SURFACE ELEVATION:**	**COORDINATE SYSTEM:** NAD83 HARN, USCS WA	
DRILLING METHOD: Direct Push	**TOTAL DEPTH (ft bgs):** 15	**DEPTH TO WATER (ft bgs):** N/A	
SAMPLING METHOD/SAMPLER LENGTH: Continuous	**BORING DIAMETER:** 2"	**DRILL DATE:** 12/10/2014	

Depth (feet)	USCS Symbol	Soil Description and Observations (color, texture, moisture, **MAJOR CONSTITUENT**, odor, staining, sheen, debris, etc.)	Drive/ Recovery	# of Blows	PID (ppm)	Sample ID
0		Concrete top 2 inches.			916.0	
	ML	Olive gray, stiff **SILT** with 10% sand and 5% gravel; no odor; no sheen.				
1					1,059.0	
2		Same as above; slight odor; no sheen; moist.			591.0	
3	OL	Dark brown, organic **SILT** with woody debris.				
	SM	Brown, coarse **SAND** with 15% **SILT**; slight odor; no sheen; wet.			685.0	
	ML	Olive gray, stiff, sandy **SILT** with slight odor; moderate sheen; moist.				
4						
5		Same as above; slight odor; no sheen.			1,413.0	
6					1,521.0	
7		Same as above; slight odor; no sheen; moist.				
	SM	Brown to gray, silty, fine to medium **SAND** with 30% silt and 10% gravel; moist; strong odor; moderate sheen.			1,548.0	
8					1,909.0	
9						
10		Same as above; strong odor; moderate sheen.			2,712.0	SB-35-10 @1220
11					2,123.0	
12					1,889.0	
13		Same as above; with decreasing silt content; slight odor; heavy sheen; moist.			1,998.0	
14					710.0	
15						

ABBREVIATIONS:
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PROJECT: GTH-Calhoun	**LOCATION:** 4540 Pacific Ave Tacoma, WA	**BORING ID:** SB-36	
LOGGED BY: G. Cisneros	**BORING LOCATION:**		
DRILLED BY: ESN	**NORTHING:** 692208.17513	**EASTING:** 1159765.74515	
DRILLING EQUIPMENT: Geoprobe	**SURFACE ELEVATION:**	**COORDINATE SYSTEM:** NAD83 HARN, USCS WA	
DRILLING METHOD: Direct Push	**TOTAL DEPTH (ft bgs):** 15	**DEPTH TO WATER (ft bgs):** N/A	
SAMPLING METHOD/SAMPLER LENGTH: Continuous	**BORING DIAMETER:** 2"	**DRILL DATE:** 12/10/2014	

Depth (feet)	USCS Symbol	Soil Description and Observations (color, texture, moisture, **MAJOR CONSTITUENT**, odor, staining, sheen, debris, etc.)	Drive/ Recovery	# of Blows	PID (ppm)	Sample ID
0	ML	Concrete top 2 inches. Light brown, sandy **SILT** with 10% gravel; no odor; no sheen; moist.			2.2	
1					1.1	
2	SW	Reddish brown, gravelly, silty, fine to coarse **SAND**; no odor; no sheen; wet.			0.2	
3	ML	Olive to brown, stiff **SILT** with 10% fine sand and 5% large gravel; no odor; no sheen; moist.			0.7	
4					0.5	
5		Same as above; no odor; no sheen; moist.			0.3	
6					0.7	
7		Same as above; with increasing sand content; no odor; no sheen.			0.5	
8	SM	Light brown, silty, fine **SAND** with 30% silt and 10% gravel; no odor; no sheen; moist.			0.7	SB-36-8 @1300
9					0.4	
10		Same as above; no odor; no sheen; moist.			0.5	
11						
12						
13						
14	ML	Brown, stiff, sandy **SILT**; no odor; no sheen; moist.			1.0	
15						

ABBREVIATIONS:
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PROJECT: GTH-Calhoun	**LOCATION:** 4540 Pacific Ave Tacoma, WA	**BORING ID:** SB-37	
LOGGED BY: G. Cisneros	**BORING LOCATION:**		
DRILLED BY: ESN	**NORTHING:** 692242.607506	**EASTING:** 1159785.64587	
DRILLING EQUIPMENT: Geoprobe	**SURFACE ELEVATION:**	**COORDINATE SYSTEM:** NAD83 HARN, USCS WA	
DRILLING METHOD: Direct Push	**TOTAL DEPTH (ft bgs):** 15	**DEPTH TO WATER (ft bgs):** N/A	
SAMPLING METHOD/SAMPLER LENGTH: Continuous	**BORING DIAMETER:** 2"	**DRILL DATE:** 12/10/2014	

Depth (feet)	USCS Symbol	Soil Description and Observations (color, texture, moisture, **MAJOR CONSTITUENT**, odor, staining, sheen, debris, etc.)	Drive/ Recovery	# of Blows	PID (ppm)	Sample ID
0	ML	Concrete top 2 inches. Brown, stiff, sandy **SILT** with 10% sand and 5% gravel; no odor; no sheen; moist.			0.2	
1					0.3	
2	OL	Dark brown, organic **SILT**.				
3		Dark brown with Fe+ oxidation mottled, soft **SILT** with 10% fine sand; no odor; no sheen; moist.			0.2	
4						
5	ML	Light brown to olive, stiff, sandy **SILT** with 40% sand and 5% rounded gravel; no odor; no sheen; moist to wet.			1.9	
6		Same as above; no odor; no sheen; moist. Increasing sand with depth.				
7					11.5	
8	SM	Brown, silty, fine **SAND** with 40% silt; no odor; no sheen; moist.			22.6	SB-37-7.5 @1330
9						
10						
11		Same as above; no odor; no sheen; moist.			12.9	SB-37-11 @1335
12						
13		Same as above; no odor; no sheen; moist.				
14						
15					4.8	

ABBREVIATIONS:
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PROJECT: GTH-Calhoun	**LOCATION:** 4540 Pacific Ave Tacoma, WA	**BORING ID:** SB-38	
LOGGED BY: G. Cisneros	**BORING LOCATION:**		
DRILLED BY: ESN	**NORTHING:** 692247.83944	**EASTING:** 1159776.87573	
DRILLING EQUIPMENT: Geoprobe	**SURFACE ELEVATION:**	**COORDINATE SYSTEM:** NAD83 HARN, USCS WA	
DRILLING METHOD: Direct Push	**TOTAL DEPTH (ft bgs):** 15	**DEPTH TO WATER (ft bgs):** N/A	
SAMPLING METHOD/SAMPLER LENGTH: Continuous	**BORING DIAMETER:** 2"	**DRILL DATE:** 12/10/2014	

Depth (feet)	USCS Symbol	Soil Description and Observations (color, texture, moisture, **MAJOR CONSTITUENT**, odor, staining, sheen, debris, etc.)	Drive/ Recovery	# of Blows	PID (ppm)	Sample ID
0	Fill	Silty, sandy, gravelly **FILL**.			0.5	
1		No recovery 1 to 5'.				
2						
3						
4						
5	SM	Dark brown, silty, fine to medium **SAND** with 30% silt; slight odor; slight sheen; wet.			52.0	
6					705.0	
7	ML	Olive gray, stiff **SILT** with 10% sand and moderate plasticity; moderate odor; moderate sheen; moist.			327.0	
8		Same as above; increasing sand content; moderate odor; moderate sheen; moist.			1,082.0	SB-38-8 @1400
9						
10	SM	Brown, silty, fine **SAND** with 30% silt; no odor; no sheen; moist.			683.0	
11						
12		Same as above; no odor; no sheen; moist.			61.0	
13						
14		Same as above; with 10% gravel; no odor; no sheen.			17.8	SB-38-14 @1405
15						

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PROJECT: GTH-Calhoun	**LOCATION:** 4540 Pacific Ave Tacoma, WA	**BORING ID:** SB-39	
LOGGED BY: G. Cisneros	**BORING LOCATION:**		
DRILLED BY: ESN	**NORTHING:** 692258.215538	**EASTING:** 1159776.59365	
DRILLING EQUIPMENT: Geoprobe	**SURFACE ELEVATION:**	**COORDINATE SYSTEM:** NAD83 HARN, USCS WA	
DRILLING METHOD: Direct Push	**TOTAL DEPTH (ft bgs):** 15	**DEPTH TO WATER (ft bgs):** N/A	
SAMPLING METHOD/SAMPLER LENGTH: Continuous	**BORING DIAMETER:** 2"	**DRILL DATE:** 12/10/2014	

Depth (feet)	USCS Symbol	Soil Description and Observations (color, texture, moisture, **MAJOR CONSTITUENT**, odor, staining, sheen, debris, etc.)	Drive/ Recovery	# of Blows	PID (ppm)	Sample ID
0	Concrete	Concrete top 6 inches.				
	Fill	Sandy, silty, gravelly **FILL**.			31.0	
1	ML	Gray to olive, sandy **SILT** with 30% sand and 10% gravel; slight odor; slight sheen.			663.0	
2						
					12.3	
3	OL	Dark brown organic **SILT** with woody debris.				
	ML	Dark brown, firm **SILT** with 5% fine sand and Fe oxidation mottling; no odor; no sheen; moist.			31.0	
4						
					588.0	
5		Same as above; increasing sand content; moist.				
6	SM	Dark brown, silty, fine **SAND** with 40% silt; slight odor; slight sheen; wet.			606.0	
	ML	Olive brown, sandy **SILT** with moderate plasticity, 30% fine sand and 5% gravel; slight odor; slight sheen; moist.			776.0	SB-39-7 @1440
7						
8					34.0	
9		Same as above; slight odor; slight sheen; moist.			17.0	
10	SM	Light brown silty **SAND** with 40% silt; slight odor; moderate sheen; moist.			75.0	
					1,051.0	
11		Same as above; slight odor; slight sheen; increasing silt with depth.			2,066.0	SB-39-12 @1445
12						
13	ML	Light brown, stiff, sandy **SILT** with low plasticity; no odor; no sheen; moist.			580.0	
					23.1	SB-39-14 @1450
14		Same as above; no odor; no sheen; moist.				
15						

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PROJECT: GTH-Calhoun	**LOCATION:** 4540 Pacific Ave Tacoma, WA	**BORING ID:** SB-40	
LOGGED BY: G. Cisneros	**BORING LOCATION:**		
DRILLED BY: ESN	**NORTHING:** 692257.940839	**EASTING:** 1159786.14587	
DRILLING EQUIPMENT: Geoprobe	**SURFACE ELEVATION:**	**COORDINATE SYSTEM:** NAD83 HARN, USCS WA	
DRILLING METHOD: Direct Push	**TOTAL DEPTH (ft bgs):** 15	**DEPTH TO WATER (ft bgs):** N/A	
SAMPLING METHOD/SAMPLER LENGTH: Continuous	**BORING DIAMETER:** 2"	**DRILL DATE:** 12/10/2014	

Depth (feet)	USCS Symbol	Soil Description and Observations (color, texture, moisture, **MAJOR CONSTITUENT**, odor, staining, sheen, debris, etc.)	Drive/ Recovery	# of Blows	PID (ppm)	Sample ID
0	GP / SP	Concrete top 3 inches. Gravel below concrete, 2 inches. Sand below gravel.			0.5	
1	ML	Reddish brown, soft, sandy **SILT** with 30% fine sand; no odor; no sheen; moist.			0.4	
2		No recovery 2 to 5 feet.				
3						
4						
5	ML	Light brown oxidized (reddish), sandy **SILT** with 5% gravel; no odor; no sheen; moist.			0.7	
6					0.3	
7		Same as above; no odor; no sheen; moist.			27.0	SB-40-7 @1510
8					0.5	
9		Same as above; increasing sand content with depth; no odor; no sheen; moist.			0.3	
10	SM	Olive gray, silty, fine **SAND** with 40% silt; no odor; no sheen; moist.				
11	ML	Olive brown, stiff, sandy **SILT** with 30% fine sand; no odor; no sheen; moist.			6.7	
12					3.2	
13						
14		Same as above; no odor; no sheen; moist.			11.3	
15						

ABBREVIATIONS:
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PROJECT: GTH-Calhoun	**LOCATION:** 4540 Pacific Ave Tacoma, WA	**BORING ID:** SB-41	
LOGGED BY: G. Cisneros	**BORING LOCATION:**		
DRILLED BY: ESN	**NORTHING:** 692270.383788	**EASTING:** 1159779.66184	
DRILLING EQUIPMENT: Geoprobe	**SURFACE ELEVATION:**	**COORDINATE SYSTEM:** NAD83 HARN, USCS WA	
DRILLING METHOD: Direct Push	**TOTAL DEPTH (ft bgs):** 15	**DEPTH TO WATER (ft bgs):** N/A	
SAMPLING METHOD/SAMPLER LENGTH: Continuous	**BORING DIAMETER:** 2"	**DRILL DATE:** 12/10/2014	

Depth (feet)	USCS Symbol	Soil Description and Observations (color, texture, moisture, **MAJOR CONSTITUENT**, odor, staining, sheen, debris, etc.)	Drive/ Recovery	# of Blows	PID (ppm)	Sample ID
0	Fill	Concrete top 2 inches. Gravelly, sandy fill.				
1	ML	Olive green, stiff **SILT** with 15% sand and 5% gravel; no odor; no sheen; moist.			43.0	
2					7.8	
3						
4						
5					3.6	
6		Olive to brownish green, stiff, sandy **SILT** with 30% sand and 5% gravel; no odor; no sheen; moist.			118.0	SB-41-6 @1530
7					1.1	
8		Same as above; no odor; no sheen; moist.			0.4	
9		Brown, stiff, sandy **SILT** with 40% sand and 5% gravel; no odor; no sheen; moist.				
10		Same as above; no odor; no sheen; moist.			4.5	
11					13.0	
12						
13					10.7	
14						
15						

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PROJECT: GTH-Calhoun	**LOCATION:** 4540 Pacific Ave Tacoma, WA	**BORING ID:** SB-42	
LOGGED BY: G. Cisneros	**BORING LOCATION:**		
DRILLED BY: ESN	**NORTHING:** 692258.679483	**EASTING:** 1159768.46859	
DRILLING EQUIPMENT: Geoprobe	**SURFACE ELEVATION:**	**COORDINATE SYSTEM:** NAD83 HARN, USCS WA	
DRILLING METHOD: Direct Push	**TOTAL DEPTH (ft bgs):** 15	**DEPTH TO WATER (ft bgs):** N/A	
SAMPLING METHOD/SAMPLER LENGTH: Continuous	**BORING DIAMETER:** 2"	**DRILL DATE:** 12/10/2014	

Depth (feet)	USCS Symbol	Soil Description and Observations (color, texture, moisture, **MAJOR CONSTITUENT**, odor, staining, sheen, debris, etc.)	Drive/ Recovery	# of Blows	PID (ppm)	Sample ID
0	Fill	Concrete top 2 inches. Silty, sandy, gravelly **FILL**.				
1	ML	Olive green, stiff, sandy **SILT** with 30% fine sand; no odor; no sheen; moist.			2.3	
2	SM	Brown, silty, fine to medium **SAND**; no odor; no sheen; wet.			0.2	
3	ML	Dark brown, firm **SILT** with woody debris and 10% fine sand; organic odor; no sheen; moist.			38.0	
4						
5		Same as above; no odor; no sheen; moist.			8.0	
6	SM	Brown, silty, gravelly, fine to medium **SAND** with 20% silt and 15% gravel; no odor; slight sheen; wet.			13.3	
7					145.0	
8	ML	Olive-brown, stiff **SILT** with 10% fine sand and 5% gravel; no odor; no sheen; moist.			6.7	
9						
10					13.1	
11	SM	Brown, silty, gravelly, fine **SAND** with 30% silt and 10% gravel; no odor; no sheen; moist.			6.9	
12					327.0	
13		Olive gray, silty **SAND** with 40% silt and 5% gravel; moderate odor; moderate sheen; moist.			1,328.0	SB-42-13 @0820
14	SM/ML	Olive gray silty **SAND**/sandy **SILT** with 5% gravel; no odor; no sheen.			21.0	
15					9.8	

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PROJECT: GTH-Calhoun	**LOCATION:** 4540 Pacific Ave Tacoma, WA	**BORING ID:** SB-43	
LOGGED BY: G. Cisneros	**BORING LOCATION:**		
DRILLED BY: ESN	**NORTHING:** 692261.676895	**EASTING:** 1159757.43684	
DRILLING EQUIPMENT: Geoprobe	**SURFACE ELEVATION:**	**COORDINATE SYSTEM:** NAD83 HARN, USCS WA	
DRILLING METHOD: Direct Push	**TOTAL DEPTH (ft bgs):** 15	**DEPTH TO WATER (ft bgs):** N/A	
SAMPLING METHOD/SAMPLER LENGTH: Continuous	**BORING DIAMETER:** 2"	**DRILL DATE:** 12/10/2014	

Depth (feet)	USCS Symbol	Soil Description and Observations (color, texture, moisture, **MAJOR CONSTITUENT**, odor, staining, sheen, debris, etc.)	Drive/ Recovery	# of Blows	PID (ppm)	Sample ID
0	Fill	Concrete top 2 inches. Silty, sandy, gravelly **FILL**.			46.0	
1	ML	Olive gray, stiff, sandy **SILT** with 15% sand; no odor; no sheen.			46.0	SB-43-2 @0850
2					15.0	
3		Same as above; slight odor; slight sheen between 2 and 2.5 feet; moist; 30% fine to medium sand between 2 and 2.5 feet.			3.1	
4	OL	Dark brown organic **SILT** layer; no odor; no sheen; moist.				SSB-43-3.5 @0855
	ML	Dark brown, soft **SILT**; no odor; no sheen; moist.				
5					1.9	
6	SM	Olive gray, silty, fine to medium **SAND**; no odor; no sheen; wet.			0.7	
7	ML	Olive green, stiff **SILT** with 5% fine sand; no odor; no sheen; moist.			0.5	
8					0.5	
9						
10	SM	Olive brown, silty, fine to medium **SAND** with 15% gravel and 30% silt; no odor; no sheen; moist.			1.0	
11						
12		Same as above; no odor; no sheen; moist.				
13	SM/ML	Olive gray, silty **SAND**/sandy **SILT** with 5% gravel; no odor; no sheen; moist.			1.1	
14						
15						

ABBREVIATIONS:
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PROJECT: GTH-Calhoun	**LOCATION:** 4540 Pacific Ave Tacoma, WA	**BORING ID:** SB-44	
LOGGED BY: G. Cisneros	**BORING LOCATION:**		
DRILLED BY: ESN	**NORTHING:** 692210.406398	**EASTING:** 1159778.84211	
DRILLING EQUIPMENT: Geoprobe	**SURFACE ELEVATION:**	**COORDINATE SYSTEM:** NAD83 HARN, USCS WA	
DRILLING METHOD: Direct Push	**TOTAL DEPTH (ft bgs):** 15	**DEPTH TO WATER (ft bgs):** N/A	
SAMPLING METHOD/SAMPLER LENGTH: Continuous	**BORING DIAMETER:** 2"	**DRILL DATE:** 12/10/2014	

Depth (feet)	USCS Symbol	Soil Description and Observations (color, texture, moisture, **MAJOR CONSTITUENT**, odor, staining, sheen, debris, etc.)	Drive/ Recovery	# of Blows	PID (ppm)	Sample ID
0	Fill	Concrete top 2 inches. Sandy, silty, gravelly **FILL**.			1.3	
1	ML	Light brown, sandy **SILT** with 30% sand; no odor; no sheen; moist.			0.4	
2	OL	Dark brown, organic **SILT**.			0.4	
3	ML	Light brown, sandy **SILT** with 40% sand; no odor; no sheen; moist.			0.5	
4	SM	Dark brown, silty, gravelly **SAND** with 20% silt and 15% fine rounded gravel; no odor; no sheen; wet.			0.3	
5	ML	Olive green, stiff **SILT** with 10% fine sand; no odor; no sheen; moist.			0.3	
6					0.3	
7		Brown, stiff, sandy **SILT** with 40% fine sand; no odor; no sheen; moist.			1.0	
8					5.9	
9	SM	Olive gray, silty, fine **SAND** with 30% silt and 10% rounded gravel; no odor; no sheen; moist.			1.2	
10					37.0	
11		Same as above; slight odor; no sheen; moist.			339.0	
12					646.0	SB-44-12.5 @0930
13					37.0	
14		Same as above; no odor; no sheen.				
15		Same as above; no odor; no sheen; moist.			4.2	

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PROJECT: GTH-Calhoun	**LOCATION:** 4540 Pacific Ave Tacoma, WA	**BORING ID:** SB-45	
LOGGED BY: G. Cisneros	**BORING LOCATION:**		
DRILLED BY: ESN	**NORTHING:** 692219.288636	**EASTING:** 1159767.00236	
DRILLING EQUIPMENT: Geoprobe	**SURFACE ELEVATION:**	**COORDINATE SYSTEM:** NAD83 HARN, USCS WA	
DRILLING METHOD: Direct Push	**TOTAL DEPTH (ft bgs):** 15	**DEPTH TO WATER (ft bgs):** N/A	
SAMPLING METHOD/SAMPLER LENGTH: Continuous	**BORING DIAMETER:** 2"	**DRILL DATE:** 12/10/2014	

Depth (feet)	USCS Symbol	Soil Description and Observations (color, texture, moisture, **MAJOR CONSTITUENT**, odor, staining, sheen, debris, etc.)	Drive/ Recovery	# of Blows	PID (ppm)	Sample ID
0	Fill	Concrete top 2 inches. Silty, sandy, gravelly **FILL**.			0.4	
1	SM	Dark brown, silty, fine to medium **SAND**; no odor; no sheen; wet.			0.4	
2	ML	Gray to olive gray, stiff **SILT** with 10% fine sand; no odor; no sheen; moist.			1.5	
3						
4						
5					0.4	
6		Olive gray, stiff **SILT** with 5% fine sand; no odor; no sheen; moist.			0.4	
7		Same as above; with increasing sand content with depth.			0.3	
8					0.5	
9	SM	Olive gray, silty, fine **SAND** with 5% rounded gravel and 30% silt; no odor; no sheen; moist.			15.8	SB-45-9.5 @1010
10					0.6	
11		Same as above; with increasing sand and decreasing silt; no odor; no sheen; wet.			3.7	
12					3.4	
13		Same as above; increasing silt content; no odor; no sheen; moist.			11.0	
14		Gray, silty, fine **SAND** with 40% silt and 10% gravel; no odor; no sheen; moist.			9.5	
15						

ABBREVIATIONS:
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PROJECT: GTH-Calhoun	**LOCATION:** 4540 Pacific Ave Tacoma, WA	**BORING ID:** SB-46	
LOGGED BY: G. Cisneros	**BORING LOCATION:**		
DRILLED BY: ESN	**NORTHING:** 692229.346571	**EASTING:** 1159766.08148	
DRILLING EQUIPMENT: Geoprobe	**SURFACE ELEVATION:**	**COORDINATE SYSTEM:** NAD83 HARN, USCS WA	
DRILLING METHOD: Direct Push	**TOTAL DEPTH (ft bgs):** 20	**DEPTH TO WATER (ft bgs):** N/A	
SAMPLING METHOD/SAMPLER LENGTH: Continuous	**BORING DIAMETER:** 2"	**DRILL DATE:** 12/10/2014	

Depth (feet)	USCS Symbol	Soil Description and Observations (color, texture, moisture, **MAJOR CONSTITUENT**, odor, staining, sheen, debris, etc.)	Drive/ Recovery	# of Blows	PID (ppm)	Sample ID
0	Fill	Concrete top 2 inches. Silty, sandy, gravelly **FILL**.			0.9	
1	ML	Brown olive, sandy **SILT**; no odor; no sheen; moist.			273.0	
2	SM	Dark brown, silty, fine to medium **SAND** with 10% gravel; slight odor; slight sheen; wet.			335.0	
3	ML	Olive green, stiff **SILT** with 10% fine sand; slight odor; slight sheen; moist.				
4						
5					208.0	
6		Olive gray, stiff, sandy **SILT** with 30% fine sand and 5% rounded gravel; slight odor; moderate sheen.			605.0	
7					46.0	
8		Brown, stiff **SILT** with 10% fine sand; slight odor; no sheen; moist.			6.0	
9	SM/ML	Grayish brown, sandy **SILT**/silty **SAND** with 10% gravel; slight odor; no sheen.			7.0	
10					50.0	
11		Gray, silty, fine to medium **SAND** with 10% gravel and 30% silt; moderate odor; moderate sheen; moist.			806.0	
12					1,814.0	
13		Same as above; strong odor; heavy sheen.			1,858.0	
14					1,995.0	
15	SM	Same as above; moderate odor; heavy sheen; moist.			2,368.0	SB-46-15 @1100
16		Same as above; moderate to strong odor; heavy sheen; moist.			938.0	
17					1,459.0	
18		Same as above; strong odor; heavy sheen; moist.			820.0	
19	Till	Light brown; very dense, silty, gravelly, fine to coarse **SAND** (Till); no odor; no sheen; dry.			0.0	SB-46-19.5 @1105
20						

ABBREVIATIONS:
ft bgs = feet below ground surface USCS = Unified Soil Classification System
ppm = parts per million ▼ = denotes groundwater table

NOTES:

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PROJECT: GTH-Calhoun	**LOCATION:** 4540 Pacific Ave Tacoma, WA	**BORING ID:** SB-47	
LOGGED BY: G. Cisneros	**BORING LOCATION:**		
DRILLED BY: ESN	**NORTHING:** 692229.238073	**EASTING:** 1159756.90815	
DRILLING EQUIPMENT: Geoprobe	**SURFACE ELEVATION:**	**COORDINATE SYSTEM:** NAD83 HARN, USCS WA	
DRILLING METHOD: Direct Push	**TOTAL DEPTH (ft bgs):** 20	**DEPTH TO WATER (ft bgs):** N/A	
SAMPLING METHOD/SAMPLER LENGTH: Continuous	**BORING DIAMETER:** 2"	**DRILL DATE:** 12/10/2014	

Depth (feet)	USCS Symbol	Soil Description and Observations (color, texture, moisture, **MAJOR CONSTITUENT**, odor, staining, sheen, debris, etc.)	Drive/ Recovery	# of Blows	PID (ppm)	Sample ID
0	Fill	Concrete top 2 inches. Silty, sandy, gravelly **FILL**.			748.0	
1	ML	Gray to brown, sandy **SILT** with 30% sand; slight odor; slight sheen; moist.			748.0	
2	SM	Dark brown, silty, fine to medium **SAND** with 10% gravel; moderate odor; moderate sheen; wet.			746.0	
3	ML	Olive gray, stiff **SILT** with 10% sand; slight odor; slight sheen; moist.				
4						
5	SM	Brown, silty, medium to coarse **SAND**; moderate odor; moderate sheen; moist to wet.			382.0	
6	ML	Olive green, stiff **SILT** with 10% sand; moderate odor; moderate sheen; moist.			1,387.0	
7					1,415.0	
8		Same as above; increasing sand content; moderate odor; moderate sheen; moist.			891.0	SB-47-7.5 @1145
9					861.0	
10		Same as above; 40% sand; moderate odor; moderate sheen; moist.			651.0	
11	SM	Grayish brown, silty, fine **SAND** with 10% fine rounded gravel; slight odor; slight sheen; moist.			756.0	
12					43.0	
13		Same as above; slight odor; slight sheen; moist.			379.0	
14		Same as above; no odor; no sheen; moist.			766.0	
15					215.0	
16		Same as above; increasing silt content; strong odor; moderate sheen; moist.			45.0	
17	ML	Light brown, hard, sandy **SILT** with 30% fine sand and 10% fine gravel; no odor; no sheen; moist.			16.8	
18		Same as above; no odor; no sheen.				
19	Till	Light brown, silty, gravelly, fine to coarse **SAND** (TILL); no odor; no sheen; dry.			1.5	
20						

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PROJECT: GTH-Calhoun	**LOCATION:** 4540 Pacific Ave Tacoma, WA	**BORING ID:** SB-48	
LOGGED BY: G. Cisneros	**BORING LOCATION:**		
DRILLED BY: ESN	**NORTHING:** 692219.180075	**EASTING:** 1159756.85993	
DRILLING EQUIPMENT: Geoprobe	**SURFACE ELEVATION:**	**COORDINATE SYSTEM:** NAD83 HARN, USCS WA	
DRILLING METHOD: Direct Push	**TOTAL DEPTH (ft bgs):** 15	**DEPTH TO WATER (ft bgs):** N/A	
SAMPLING METHOD/SAMPLER LENGTH: Continuous	**BORING DIAMETER:** 2"	**DRILL DATE:** 12/10/2014	

Depth (feet)	USCS Symbol	Soil Description and Observations (color, texture, moisture, **MAJOR CONSTITUENT**, odor, staining, sheen, debris, etc.)	Drive/ Recovery	# of Blows	PID (ppm)	Sample ID
0	Fill	Concrete top 2 inches. Silty, sandy, gravelly **FILL**.			0.5	
1	ML	Olive gray, stiff **SILT** with 10% sand; no odor; no sheen; moist.			0.5	
2	SM	Dark brown, silty, fine to medium **SAND**; no odor; no sheen; wet.			0.6	
3	ML	Olive light brown, stiff **SILT**; no odor; no sheen; moist.			0.6	
4					0.5	
5		Same as above; no odor; no sheen; moist.			0.7	
6	SM	Gray, silty, medium to coarse **SAND**, dense; no odor; no sheen; moist.			0.5	
7	ML	Olive, stiff sandy **SILT** with 10% sand; no odor; no sheen; moist.			0.5	
8					0.8	
9	SM	Gray, silty, fine **SAND** with 30% silt and 10% gravel; no odor; no sheen; saturated.			1.9	SB-48-8.5 @1240
10					1.4	
	ML	Brown, stiff **SILT** with 10% sand; no odor; no sheen.				
11 ▼	SM	Brown, loose, silty, fine to medium **SAND** with 10% gravel; no odor; no sheen; saturated.			1.0	
12	ML	Olive, stiff, **SILT** with 20% sand; no odor; no sheen; moist.			7.6	
13	SM	Gray, silty, fine **SAND** with 5% gravel; no odor; no sheen; moist.			3.0	
14					7.0	
15						

ABBREVIATIONS:
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PROJECT: GTH-Calhoun	**LOCATION:** 4540 Pacific Ave Tacoma, WA	**BORING ID:** SB-49	
LOGGED BY: G. Cisneros	**BORING LOCATION:**		
DRILLED BY: ESN	**NORTHING:** 692229.588007	**EASTING:** 1159744.89823	
DRILLING EQUIPMENT: Geoprobe	**SURFACE ELEVATION:**	**COORDINATE SYSTEM:** NAD83 HARN, USCS WA	
DRILLING METHOD: Direct Push	**TOTAL DEPTH (ft bgs):** 14	**DEPTH TO WATER (ft bgs):** N/A	
SAMPLING METHOD/SAMPLER LENGTH: Continuous	**BORING DIAMETER:** 2"	**DRILL DATE:** 12/10/2014	

Depth (feet)	USCS Symbol	Soil Description and Observations (color, texture, moisture, **MAJOR CONSTITUENT**, odor, staining, sheen, debris, etc.)	Drive/ Recovery	# of Blows	PID (ppm)	Sample ID
0	Fill	Concrete top 2 inches. Silty, sandy, gravelly **FILL**.			0.6	
1	ML	Brown, stiff, sandy **SILT**; no odor; no sheen; moist.				
2	SM	Dark brown, loose, silty, gravelly **SAND**; no odor; no sheen; moist.			0.6	
3	ML	Olive gray, stiff **SILT** with 10% sand; no odor; no sheen; moist.			0.4	
4						
5					0.6	
6		Brown, stiff **SILT** with moderate plasticity and 10% fine sand; no odor; no sheen; moist.			0.4	
7		Same as above with increasing sand content; no odor; no sheen; moist.			0.9	
8	SM	Olive gray, silty, fine **SAND** with 30% silt and 10% rounded gravel; slight odor; no sheen; moist.			74.0	
9					0.8	
10	SP	Brown, medium **SAND**; no odor; no sheen; moist.			0.8	
11	SM	Olive gray, silty, fine **SAND** with 30% silt and 10% rounded gravel; slight odor; no sheen; moist.			6.1	
12					78.0	
13					322.0	SB-49-13.5 @1315
14						

ABBREVIATIONS:
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PROJECT: GTH-Calhoun	**LOCATION:** 4540 Pacific Ave Tacoma, WA	**BORING ID:** SB-50	
LOGGED BY: G. Cisneros	**BORING LOCATION:**		
DRILLED BY: ESN	**NORTHING:** 692244.655025	**EASTING:** 1159754.8293	
DRILLING EQUIPMENT: Geoprobe	**SURFACE ELEVATION:**	**COORDINATE SYSTEM:** NAD83 HARN, USCS WA	
DRILLING METHOD: Direct Push	**TOTAL DEPTH (ft bgs):** 15	**DEPTH TO WATER (ft bgs):** N/A	
SAMPLING METHOD/SAMPLER LENGTH: Continuous	**BORING DIAMETER:** 2"	**DRILL DATE:** 12/10/2014	

Depth (feet)	USCS Symbol	Soil Description and Observations (color, texture, moisture, **MAJOR CONSTITUENT**, odor, staining, sheen, debris, etc.)	Drive/ Recovery	# of Blows	PID (ppm)	Sample ID
0	Fill	Concrete top 2 inches. Silty, sandy, gravelly **FILL**; slight odor.			1.0	
1	ML	Gray-brown, stiff, sandy **SILT** with 30% sand; slight odor; slight sheen; moist.				
2					23.4	
3	OL	Dark brown, organic **SILT** layer with woody debris.			14.1	
	SM	Dark brown, loose, silty, fine **SAND**; slight odor; slight sheen; wet.				
4						
5	ML	Olive gray, stiff **SILT** with 10% sand; slight odor; no sheen; moist.			19.7	
6	SM/ML	Gray, silty **SAND**/sandy **SILT**; slight odor; no sheen; moist.			96.4	
7	ML	Light brown, stiff, sandy **SILT** with 30% fine sand and 10% rounded gravel; slight odor; slight sheen; moist.			783.0	
8					175.0	
9					644.0	
10		Same as above; slight odor; no sheen; moist.			32.0	
11	SM	Gray, silty fine **SAND** with 30% silt and 10% gravel; moderate odor; moderate sheen; moist.			1,112.0	
12						
13		Same as above; strong odor; heavy sheen.			1,558.0	SB-50-13 @1345
14		Same as above; moderate odor; moderate sheen.			1,063.0	
		No recovery 14.2-15 feet.				
15						

ABBREVIATIONS:
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PROJECT: GTH-Calhoun	**LOCATION:** 4540 Pacific Ave Tacoma, WA	**BORING ID:** SB-51	
LOGGED BY: G. Cisneros	**BORING LOCATION:**		
DRILLED BY: ESN	**NORTHING:** 692239.626016	**EASTING:** 1159746.31976	
DRILLING EQUIPMENT: Geoprobe	**SURFACE ELEVATION:**	**COORDINATE SYSTEM:** NAD83 HARN, USCS WA	
DRILLING METHOD: Direct Push	**TOTAL DEPTH (ft bgs):** 15	**DEPTH TO WATER (ft bgs):** N/A	
SAMPLING METHOD/SAMPLER LENGTH: Continuous	**BORING DIAMETER:** 2"	**DRILL DATE:** 12/10/2014	

Depth (feet)	USCS Symbol	Soil Description and Observations (color, texture, moisture, **MAJOR CONSTITUENT**, odor, staining, sheen, debris, etc.)	Drive/ Recovery	# of Blows	PID (ppm)	Sample ID
0	Fill	Concrete top 2 inches. Silty, sandy, gravelly **FILL**			5.5	
1	ML	Light brown to olive, stiff **SILT** with 10% sand; no odor; no sheen; moist.				
2					1.1	
3	SM	Dark brown, silty, fine to med **SAND** with 10% gravel; no odor; no sheen; moist.				
	ML	Olive, stiff **SILT** with 10% sand; slight odor; moderate sheen.			1.4	
4						
5		Gray to olive, stiff **SILT** with 10% sand; slight odor; moderate sheen; moist.			38.9	
6					26.3	
7		Same as above; increasing sand with depth; moderate odor; slight sheen.			64.2	SB-51-7.5 @1405
8		Same as above; moderate odor; slight sheen; moist.			50.2	
9		Same as above; slight sheen; slight odor; moist.			4.3	
10					12.5	
11	SM	Olive gray, silty fine **SAND** with 30% silt and 10% gravel; slight odor; no sheen.			33.3	
12					36.5	
13		Same as above; no odor; no sheen; moist.				
14						
15						

ABBREVIATIONS:
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PROJECT: GTH-Calhoun	**LOCATION:** 4540 Pacific Ave Tacoma, WA	**BORING ID:** SB-52	
LOGGED BY: G. Cisneros	**BORING LOCATION:**		
DRILLED BY: ESN	**NORTHING:** 692247.297971	**EASTING:** 1159747.42981	
DRILLING EQUIPMENT: Geoprobe	**SURFACE ELEVATION:**	**COORDINATE SYSTEM:** NAD83 HARN, USCS WA	
DRILLING METHOD: Direct Push	**TOTAL DEPTH (ft bgs):** 15	**DEPTH TO WATER (ft bgs):** N/A	
SAMPLING METHOD/SAMPLER LENGTH: Continuous	**BORING DIAMETER:** 2"	**DRILL DATE:** 12/10/2014	

Depth (feet)	USCS Symbol	Soil Description and Observations (color, texture, moisture, **MAJOR CONSTITUENT**, odor, staining, sheen, debris, etc.)	Drive/ Recovery	# of Blows	PID (ppm)	Sample ID
0	Fill	Concrete top 2 inches. Silty, sandy, gravelly **FILL**.				
1	ML	Brown, stiff, sandy **SILT**; slight odor; slight sheen.			1.4	
2	SM	Dark brown, loose, silty, fine to medium **SAND** with 10% fine gravel; slight odor; slight sheen; wet.			2.0	
3	ML	Gray, stiff, sandy **SILT** with 15% sand; slight odor; slight sheen; moist.				
4						
5					18.7	
6		Olive gray, stiff **SILT** with 10% sand and 5% gravel; slight odor; slight sheen; moist.			14.7	
7		Same as above; slight odor; slight sheen; moist.			273.0	SB-52-7.5 @1455
8					158.0	
9		Same as above; slight odor; no sheen.			65.0	
10					13.5	
11	SM	Gray, silty, fine **SAND** with 10% gravel and 30% silt; no odor; no sheen.				
12					2.2	
13		Same as above; no odor; no sheen.				
14		Same as above; slight odor; no sheen.			4.8	
15						

ABBREVIATIONS:
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PROJECT: GTH-Calhoun	**LOCATION:** 4540 Pacific Ave Tacoma, WA	**BORING ID:** SB-53	
LOGGED BY: G. Cisneros	**BORING LOCATION:**		
DRILLED BY: ESN	**NORTHING:** 692248.007714	**EASTING:** 1159768.71578	
DRILLING EQUIPMENT: Geoprobe	**SURFACE ELEVATION:**	**COORDINATE SYSTEM:** NAD83 HARN, USCS WA	
DRILLING METHOD: Direct Push	**TOTAL DEPTH (ft bgs):** 15	**DEPTH TO WATER (ft bgs):** N/A	
SAMPLING METHOD/SAMPLER LENGTH: Continuous	**BORING DIAMETER:** 2"	**DRILL DATE:** 12/10/2014	

Depth (feet)	USCS Symbol	Soil Description and Observations (color, texture, moisture, **MAJOR CONSTITUENT**, odor, staining, sheen, debris, etc.)	Drive/ Recovery	# of Blows	PID (ppm)	Sample ID
0	Fill	Concrete top 2 inches. Silty, sandy, gravelly **FILL**.			5.9	
1	ML	Brown to olive, stiff **SILT** with 10% fine sand; no odor; no sheen; moist.				
2					6.5	
3		Woody debris at 2.5'.				
4						
5	SM	Dark brown, silty, fine to medium **SAND** with 10% fine gravel; moderate odor; slight sheen; wet.			210.0	
6	ML	Olive gray, stiff **SILT** with 10% fine sand; slight odor; slight sheen; moist.			245.0	
7					208.0	
8		Same as above; strong odor; moderate sheen.			739.0	
9						
10					1,092.0	SB-53-10 @1530
11	SM	Olive gray, silty, fine **SAND** with 10% gravel; strong odor; moderate sheen; moist.			32.0	
12					48.0	
13		Same as above; moderate odor; moderate sheen.			679.0	
14		Same as above; moderate odor; slight sheen.				
15						

ABBREVIATIONS:
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PROJECT: GTH-Calhoun	**LOCATION:** 4540 Pacific Ave Tacoma, WA	**BORING ID:** SB-54	
LOGGED BY: G. Cisneros	**BORING LOCATION:**		
DRILLED BY: ESN	**NORTHING:** 692218.107506	**EASTING:** 1159785.64587	
DRILLING EQUIPMENT: Geoprobe	**SURFACE ELEVATION:**	**COORDINATE SYSTEM:** NAD83 HARN, USCS WA	
DRILLING METHOD: Direct Push	**TOTAL DEPTH (ft bgs):** 15	**DEPTH TO WATER (ft bgs):** N/A	
SAMPLING METHOD/SAMPLER LENGTH: Continuous	**BORING DIAMETER:** 2"	**DRILL DATE:** 12/10/2014	

Depth (feet)	USCS Symbol	Soil Description and Observations (color, texture, moisture, **MAJOR CONSTITUENT**, odor, staining, sheen, debris, etc.)	Drive/ Recovery	# of Blows	PID (ppm)	Sample ID
0	Fill	Concrete top 2 inches. Silty, sandy, gravelly **FILL**.			2.6	
1					2.5	
2	OC	Dark organic **SILT** with woody debris.				
3	SM	Dark brown, loose, silty, fine to medium **SAND** with 10% fine gravel; no odor; no sheen; wet.			1.5	
4	ML	Brown, stiff **SILT** with 10% sand; no odor; no sheen; moist.				
5	SM	Gray, silty, medium to coarse **SAND** with 10% round gravel; slight odor; no sheen; moist.			693.0	
6	ML	Olive green, sandy **SILT** with 15% sand and 5% gravel; slight odor; slight sheen; moist.			41.0	SB-54-5.5 @1555
7		Light brown to gray, silty, fine **SAND** with 10% round gravel; no odor; no sheen; moist.			4.8	
8						
9						
10		Gray, silty, fine **SAND** with 10% rounded gravel; no odor; no sheen; moist.			8.9	
11	SM				7.7	
12		Same as above; no odor; no sheen.			6.3	
13						
14		Same as above; no odor; no sheen; moist.			3.7	
15					1.7	

ABBREVIATIONS:
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NOTES:

Attachment 2
Laboratory Report

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

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December 26, 2014

Gabriel Cisneros, Project Manager
Floyd-Snider
Two Union Square, Suite 600
601 Union St
Seattle, WA 98101

Dear Mr. Cisneros:

Included are the results from the testing of material submitted on December 12, 2014 from the GTH-Calhoun, F&BI 412214 project. There are 23 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
FDS1226R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on December 12, 2014 by Friedman & Bruya, Inc. from the Floyd-Snider GTH-Calhoun, F&BI 412214 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Floyd-Snider
412214 -01	SB-30-4.5
412214 -02	SB-31-4.5
412214 -03	SB-32-6
412214 -04	SB-32-14
412214 -05	SB-32-17
412214 -06	SB-33-9
412214 -07	SB-33-17
412214 -08	SB-34-6.5
412214 -09	SB-34-17
412214 -10	SB-35-10
412214 -11	SB-36-8
412214 -12	SB-37-7.5
412214 -13	SB-37-11
412214 -14	SB-38-8
412214 -15	SB-38-14
412214 -16	SB-39-7
412214 -17	SB-39-12
412214 -18	SB-39-14
412214 -19	SB-40-7
412214 -20	SB-41-6
412214 -21	SB-41-6D
412214 -22	SB-42-13
412214 -23	SB-42-15
412214 -24	SB-43-2
412214 -25	SB-43-3.5
412214 -26	SB-44-12.5
412214 -27	SB-44-15
412214 -28	SB-45-9.5
412214 -29	SB-46-19.5
412214 -30	SB-46-15
412214 -31	SB-48-8.5
412214 -32	SB-47-7.5
412214 -33	SB-49-13.5
412214 -34	SB-50-13
412214 -35	SB-51-7.5
412214 -36	SB-52-7.5

CASE NARRATIVE(continued)

This case narrative encompasses samples received on December 12, 2014 by Friedman & Bruya, Inc. from the Floyd-Snider GTH-Calhoun, F&BI 412214 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Floyd-Snider
412214 -37	SB-53-10
412214 -38	SB-53-10D
412214 -39	SB-54-5.5
412214 -40	Trip Blank

The samples SB-32-14, SB-33-9, and SB-35-10 were sent to Fremont for EPH/VPH analyses. Review of the enclosed report indicates that all quality assurance were acceptable.

All quality control requirements were acceptable.

Date of Report: 12/26/14
Date Received: 12/12/14
Project: GTH-Calhoun, F&BI 412214
Date Extracted: 12/12/14
Date Analyzed: 12/12/14

RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS GASOLINE USING METHOD NWTPH-Gx

Results Reported on a Dry Weight Basis
Results Reported as mg/kg (ppm)

Sample ID Laboratory ID	Gasoline Range	Surrogate (% Recovery) (Limit 50-150)
SB-32-14 412214-04 1/10	2,000	ip
SB-33-9 412214-06 1/10	2,700	ip
SB-35-10 412214-10 1/10	3,400	ip
Method Blank 04-2483 MB	<2	98

Date of Report: 12/26/14
Date Received: 12/12/14
Project: GTH-Calhoun, F&BI 412214
Date Extracted: 12/12/14
Date Analyzed: 12/12/14 and 12/22/14

RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND TPH AS GASOLINE USING METHODS 8021B AND NWTPH-Gx

Results Reported on a Dry Weight Basis
Results Reported as mg/kg (ppm)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 50-132)
SB-30-4.5 412214-01	<0.02	<0.02	<0.02	<0.06	19	94
SB-32-17 412214-05	<0.02	<0.02	0.022	<0.06	6.7	93
SB-33-17 412214-07	<0.02	<0.02	<0.02	<0.06	<2	92
SB-34-6.5 412214-08	<0.02	<0.02	0.068	0.11	26	93
SB-34-17 412214-09	<0.02	<0.02	<0.02	<0.06	<2	92
SB-36-8 412214-11	<0.02	<0.02	<0.02	<0.06	<2	92
SB-37-7.5 412214-12	<0.02	<0.02	<0.02	<0.06	<2	93
SB-38-8 412214-14	<0.02	0.45	<0.02	1.2	250	129
SB-38-14 412214-15	<0.02	<0.02	<0.02	<0.06	<2	93
SB-39-12 412214-17 1/5	<0.02	0.94	<0.02	2.6	330	86
SB-39-14 412214-18	<0.02	<0.02	<0.02	<0.06	<2	93
SB-40-7 412214-19	<0.02	<0.02	<0.02	<0.06	<2	93

Date of Report: 12/26/14
Date Received: 12/12/14
Project: GTH-Calhoun, F&BI 412214
Date Extracted: 12/12/14
Date Analyzed: 12/12/14 and 12/22/14

RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND TPH AS GASOLINE USING METHODS 8021B AND NWTPH-Gx

Results Reported on a Dry Weight Basis
Results Reported as mg/kg (ppm)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 50-132)
SB-41-6 412214-20	<0.02	<0.02	<0.02	0.37	43	96
SB-41-6D 412214-21	<0.02	<0.02	<0.02	0.074	9.2	81
SB-42-13 412214-22 1/5	0.15	3.1	9.8	5.9	1,400	122
SB-42-15 412214-23	<0.02	<0.02	<0.02	<0.06	<2	93
SB-43-2 412214-24	<0.02	0.20	<0.02	1.6	190	115
SB-44-12.5 412214-26	<0.02	<0.02	0.32	0.64	90	130
SB-45-9.5 412214-28	<0.02	<0.02	<0.02	<0.06	<2	103
SB-46-19.5 412214-29	<0.02	<0.02	<0.02	<0.06	<2	103
SB-46-15 412214-30 1/50	0.84	<0.1	15	59	2,400	132
SB-48-8.5 412214-31	<0.02	<0.02	<0.02	<0.06	<2	106
SB-47-7.5 412214-32 1/10	<0.02 j	<0.1	3.3	5.1	590	115
SB-49-13.5 412214-33	<0.02	<0.02	<0.02	<0.06	<2	111

Date of Report: 12/26/14
Date Received: 12/12/14
Project: GTH-Calhoun, F&BI 412214
Date Extracted: 12/12/14
Date Analyzed: 12/12/14 and 12/22/14

RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND TPH AS GASOLINE USING METHODS 8021B AND NWTPH-Gx

Results Reported on a Dry Weight Basis
Results Reported as mg/kg (ppm)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 50-132)
SB-50-13 412214-34 1/10	0.11	<0.02	2.3	4.5	380	121
SB-51-7.5 412214-35	<0.02	<0.02	0.85	0.54	56	130
SB-52-7.5 412214-36	<0.02	0.031	0.040	<0.06	6.5	113
SB-53-10 412214-37 1/50	1.7	<0.1	21	36	2,600	131
SB-54-5.5 412214-39	<0.02	<0.02	2.0	3.2	330	ip
Method Blank 04-2484 MB	<0.02	<0.02	<0.02	<0.06	<2	105
Method Blank 04-2483 MB	<0.02	<0.02	<0.02	<0.06	<2	92

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	SB-32-14	Client:	Floyd-Snider
Date Received:	12/12/14	Project:	GTH-Calhoun, F&BI 412214
Date Extracted:	12/12/14	Lab ID:	412214-04
Date Analyzed:	12/12/14	Data File:	121214.D
Matrix:	Soil	Instrument:	GCMS9
Units:	mg/kg (ppm) Dry Weight	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	90	111
Toluene-d8	106	64	137
4-Bromofluorobenzene	105	81	119

Compounds:	Concentration mg/kg (ppm)
Methyl t-butyl ether (MTBE)	<0.05
Benzene	<0.03
Toluene	<0.05
Ethylbenzene	0.76
m,p-Xylene	<0.1
o-Xylene	<0.05
1,2-Dichloroethane (EDC)	<0.05
1,2-Dibromoethane (EDB)	<0.05
Hexane	11

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	SB-33-9	Client:	Floyd-Snider
Date Received:	12/12/14	Project:	GTH-Calhoun, F&BI 412214
Date Extracted:	12/12/14	Lab ID:	412214-06
Date Analyzed:	12/12/14	Data File:	121217.D
Matrix:	Soil	Instrument:	GCMS9
Units:	mg/kg (ppm) Dry Weight	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	90	111
Toluene-d8	109	64	137
4-Bromofluorobenzene	107	81	119

Compounds:	Concentration mg/kg (ppm)
Methyl t-butyl ether (MTBE)	<0.05
Benzene	0.14
Toluene	0.24
Ethylbenzene	6.6
m,p-Xylene	10
o-Xylene	4.1
1,2-Dichloroethane (EDC)	<0.05
1,2-Dibromoethane (EDB)	<0.05
Hexane	5.1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	SB-35-10	Client:	Floyd-Snider
Date Received:	12/12/14	Project:	GTH-Calhoun, F&BI 412214
Date Extracted:	12/12/14	Lab ID:	412214-10
Date Analyzed:	12/12/14	Data File:	121218.D
Matrix:	Soil	Instrument:	GCMS9
Units:	mg/kg (ppm) Dry Weight	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	90	111
Toluene-d8	117	64	137
4-Bromofluorobenzene	110	81	119

Compounds:	Concentration mg/kg (ppm)
Methyl t-butyl ether (MTBE)	<0.05
Benzene	0.26
Toluene	0.85
Ethylbenzene	21 ve
m,p-Xylene	42 ve
o-Xylene	22 ve
1,2-Dichloroethane (EDC)	<0.05
1,2-Dibromoethane (EDB)	<0.05
Hexane	6.3

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	SB-35-10	Client:	Floyd-Snider
Date Received:	12/12/14	Project:	GTH-Calhoun, F&BI 412214
Date Extracted:	12/12/14	Lab ID:	412214-10 1/10
Date Analyzed:	12/12/14	Data File:	121216.D
Matrix:	Soil	Instrument:	GCMS9
Units:	mg/kg (ppm) Dry Weight	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	90	111
Toluene-d8	101	64	137
4-Bromofluorobenzene	97	81	119

Compounds:	Concentration mg/kg (ppm)
Methyl t-butyl ether (MTBE)	<0.5
Benzene	0.31
Toluene	0.91
Ethylbenzene	23
m,p-Xylene	45
o-Xylene	24
1,2-Dichloroethane (EDC)	<0.5
1,2-Dibromoethane (EDB)	<0.5
Hexane	7.5

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Floyd-Snider
Date Received:	Not Applicable	Project:	GTH-Calhoun, F&BI 412214
Date Extracted:	12/12/14	Lab ID:	04-2456 mb2
Date Analyzed:	12/12/14	Data File:	121207.D
Matrix:	Soil	Instrument:	GCMS9
Units:	mg/kg (ppm) Dry Weight	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	90	111
Toluene-d8	98	64	137
4-Bromofluorobenzene	101	81	119

Compounds:	Concentration mg/kg (ppm)
Methyl t-butyl ether (MTBE)	<0.05
Benzene	<0.03
Toluene	<0.05
Ethylbenzene	<0.05
m,p-Xylene	<0.1
o-Xylene	<0.05
1,2-Dichloroethane (EDC)	<0.05
1,2-Dibromoethane (EDB)	<0.05
Hexane	<0.25

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	SB-32-14	Client:	Floyd-Snider
Date Received:	12/12/14	Project:	GTH-Calhoun, F&BI 412214
Date Extracted:	12/22/14	Lab ID:	412214-04 1/5
Date Analyzed:	12/22/14	Data File:	122211.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm) Dry Weight	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	92	50	150
Benzo(a)anthracene-d12	99	35	159

Compounds:	Concentration mg/kg (ppm)
Naphthalene	0.83
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	0.017
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01
1-Methylnaphthalene	0.67
2-Methylnaphthalene	1.3

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	SB-33-9	Client:	Floyd-Snider
Date Received:	12/12/14	Project:	GTH-Calhoun, F&BI 412214
Date Extracted:	12/22/14	Lab ID:	412214-06 1/5
Date Analyzed:	12/22/14	Data File:	122208.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm) Dry Weight	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	91	50	150
Benzo(a)anthracene-d12	99	35	159

Compounds:	Concentration mg/kg (ppm)
Naphthalene	2.8 ve
Acenaphthylene	<0.01
Acenaphthene	0.048
Fluorene	0.13
Phenanthrene	0.069
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01
1-Methylnaphthalene	2.4 ve
2-Methylnaphthalene	3.5 ve

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	SB-33-9	Client:	Floyd-Snider
Date Received:	12/12/14	Project:	GTH-Calhoun, F&BI 412214
Date Extracted:	12/22/14	Lab ID:	412214-06 1/50
Date Analyzed:	12/22/14	Data File:	122214.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm) Dry Weight	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	122 d	50	150
Benzo(a)anthracene-d12	96 d	35	159

Compounds:	Concentration mg/kg (ppm)
Naphthalene	2.9
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	0.14
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1
1-Methylnaphthalene	2.5
2-Methylnaphthalene	3.6

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	SB-35-10	Client:	Floyd-Snider
Date Received:	12/12/14	Project:	GTH-Calhoun, F&BI 412214
Date Extracted:	12/22/14	Lab ID:	412214-10 1/5
Date Analyzed:	12/22/14	Data File:	122212.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm) Dry Weight	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	92	50	150
Benzo(a)anthracene-d12	97	35	159

Compounds:	Concentration mg/kg (ppm)
Naphthalene	21 ve J
Acenaphthylene	<0.01
Acenaphthene	0.010
Fluorene	0.020
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01
1-Methylnaphthalene	6.8 ve J
2-Methylnaphthalene	15 ve J

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	SB-35-10	Client:	Floyd-Snider
Date Received:	12/12/14	Project:	GTH-Calhoun, F&BI 412214
Date Extracted:	12/22/14	Lab ID:	412214-10 1/50
Date Analyzed:	12/22/14	Data File:	122215.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm) Dry Weight	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	121 d	50	150
Benzo(a)anthracene-d12	98 d	35	159

Compounds:	Concentration mg/kg (ppm)
Naphthalene	13
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1
1-Methylnaphthalene	3.7
2-Methylnaphthalene	7.8

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	Method Blank	Client:	Floyd-Snider
Date Received:	Not Applicable	Project:	GTH-Calhoun, F&BI 412214
Date Extracted:	12/22/14	Lab ID:	04-2500 mb 1/5
Date Analyzed:	12/22/14	Data File:	122204.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm) Dry Weight	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	85	50	150
Benzo(a)anthracene-d12	94	35	159

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01
1-Methylnaphthalene	<0.01
2-Methylnaphthalene	<0.01

Date of Report: 12/26/14
Date Received: 12/12/14
Project: GTH-Calhoun, F&BI 412214

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES, AND TPH AS GASOLINE USING METHOD 8021B AND NWTPH-Gx

Laboratory Code: 412234-01 (Duplicate)

Analyte	Reporting Units	Sample Result (Wet Wt)	Duplicate Result (Wet Wt)	RPD (Limit 20)
Benzene	mg/kg (ppm)	<0.02	<0.02	nm
Toluene	mg/kg (ppm)	<0.02	<0.02	nm
Ethylbenzene	mg/kg (ppm)	<0.02	<0.02	nm
Xylenes	mg/kg (ppm)	<0.06	<0.06	nm
Gasoline	mg/kg (ppm)	<2	<2	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	mg/kg (ppm)	0.5	94	66-121
Toluene	mg/kg (ppm)	0.5	96	72-128
Ethylbenzene	mg/kg (ppm)	0.5	100	69-132
Xylenes	mg/kg (ppm)	1.5	99	69-131
Gasoline	mg/kg (ppm)	20	100	61-153

Date of Report: 12/26/14
Date Received: 12/12/14
Project: GTH-Calhoun, F&BI 412214

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES, AND TPH AS GASOLINE USING METHOD 8021B AND NWTPH-Gx

Laboratory Code: 412214-11 (Duplicate)

Analyte	Reporting Units	Sample Result (Wet Wt)	Duplicate Result (Wet Wt)	RPD (Limit 20)
Benzene	mg/kg (ppm)	<0.02	<0.02	nm
Toluene	mg/kg (ppm)	<0.02	<0.02	nm
Ethylbenzene	mg/kg (ppm)	<0.02	<0.02	nm
Xylenes	mg/kg (ppm)	<0.06	<0.06	nm
Gasoline	mg/kg (ppm)	<2	<2	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	mg/kg (ppm)	0.5	87	69-120
Toluene	mg/kg (ppm)	0.5	86	70-117
Ethylbenzene	mg/kg (ppm)	0.5	88	65-123
Xylenes	mg/kg (ppm)	1.5	87	66-120
Gasoline	mg/kg (ppm)	20	95	71-131

Date of Report: 12/26/14
Date Received: 12/12/14
Project: GTH-Calhoun, F&BI 412214

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 412212-02 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Hexane	mg/kg (ppm)	2.5	<0.25	59	61	10-95	3
Methyl t-butyl ether (MTBE)	mg/kg (ppm)	2.5	<0.05	82	83	17-134	1
1,2-Dichloroethane (EDC)	mg/kg (ppm)	2.5	<0.05	81	80	22-124	1
Benzene	mg/kg (ppm)	2.5	<0.03	78	79	26-114	1
Toluene	mg/kg (ppm)	2.5	<0.05	84	84	34-112	0
1,2-Dibromoethane (EDB)	mg/kg (ppm)	2.5	<0.05	88	85	32-126	3
Ethylbenzene	mg/kg (ppm)	2.5	<0.05	87	88	38-111	1
m,p-Xylene	mg/kg (ppm)	5	<0.1	88	89	38-112	1
o-Xylene	mg/kg (ppm)	2.5	<0.05	91	92	38-113	1

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Hexane	mg/kg (ppm)	2.5	82	58-105
Methyl t-butyl ether (MTBE)	mg/kg (ppm)	2.5	88	72-122
1,2-Dichloroethane (EDC)	mg/kg (ppm)	2.5	85	80-109
Benzene	mg/kg (ppm)	2.5	83	75-107
Toluene	mg/kg (ppm)	2.5	85	79-112
1,2-Dibromoethane (EDB)	mg/kg (ppm)	2.5	90	83-116
Ethylbenzene	mg/kg (ppm)	2.5	89	81-114
m,p-Xylene	mg/kg (ppm)	5	91	82-115
o-Xylene	mg/kg (ppm)	2.5	93	81-116

Date of Report: 12/26/14
Date Received: 12/12/14
Project: GTH-Calhoun, F&BI 412214

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR PNA'S BY EPA METHOD 8270D SIM

Laboratory Code: 412214-06 1/5 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	mg/kg (ppm)	0.17	2.6 ve	0 b	67	44-129	nm
2-Methylnaphthalene	mg/kg (ppm)	0.17	3.3 ve	0 b	0 b	45-135	nm
1-Methylnaphthalene	mg/kg (ppm)	0.17	2.2 ve	0 b	28	64-115	nm
Acenaphthylene	mg/kg (ppm)	0.17	<0.01	105	111	52-121	6
Acenaphthene	mg/kg (ppm)	0.17	0.045	84 b	91 b	51-123	8 b
Fluorene	mg/kg (ppm)	0.17	0.12	69 b	80 b	37-137	15 b
Phenanthrene	mg/kg (ppm)	0.17	0.064	76 b	78 b	45-124	3 b
Anthracene	mg/kg (ppm)	0.17	<0.01	89	88	32-124	1
Fluoranthene	mg/kg (ppm)	0.17	<0.01	86	85	50-125	1
Pyrene	mg/kg (ppm)	0.17	<0.01	91	94	41-135	3
Benz(a)anthracene	mg/kg (ppm)	0.17	<0.01	93	93	23-144	0
Chrysene	mg/kg (ppm)	0.17	<0.01	90	91	45-122	1
Benzo(b)fluoranthene	mg/kg (ppm)	0.17	<0.01	84	85	31-144	1
Benzo(k)fluoranthene	mg/kg (ppm)	0.17	<0.01	94	94	45-130	0
Benzo(a)pyrene	mg/kg (ppm)	0.17	<0.01	86	88	39-128	2
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.17	<0.01	83	83	28-146	0
Dibenz(a,h)anthracene	mg/kg (ppm)	0.17	<0.01	85	85	46-129	0
Benzo(g,h,i)perylene	mg/kg (ppm)	0.17	<0.01	85	84	37-133	1

Date of Report: 12/26/14
Date Received: 12/12/14
Project: GTH-Calhoun, F&BI 412214

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR PNA'S BY EPA METHOD 8270D SIM

Laboratory Code: Laboratory Control Sample 1/5

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Naphthalene	mg/kg (ppm)	0.17	85	58-121
2-Methylnaphthalene	mg/kg (ppm)	0.17	87	58-123
1-Methylnaphthalene	mg/kg (ppm)	0.17	85	60-124
Acenaphthylene	mg/kg (ppm)	0.17	85	54-121
Acenaphthene	mg/kg (ppm)	0.17	84	54-123
Fluorene	mg/kg (ppm)	0.17	87	56-127
Phenanthrene	mg/kg (ppm)	0.17	83	55-122
Anthracene	mg/kg (ppm)	0.17	82	50-120
Fluoranthene	mg/kg (ppm)	0.17	87	54-129
Pyrene	mg/kg (ppm)	0.17	89	53-127
Benz(a)anthracene	mg/kg (ppm)	0.17	91	51-115
Chrysene	mg/kg (ppm)	0.17	89	55-129
Benzo(b)fluoranthene	mg/kg (ppm)	0.17	83	56-123
Benzo(k)fluoranthene	mg/kg (ppm)	0.17	94	54-131
Benzo(a)pyrene	mg/kg (ppm)	0.17	79	51-118
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.17	84	49-148
Dibenz(a,h)anthracene	mg/kg (ppm)	0.17	87	50-141
Benzo(g,h,i)perylene	mg/kg (ppm)	0.17	87	52-131

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

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

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

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Seattle, WA 98103
T: (206) 352-3790
F: (206) 352-7178
info@fremontanalytical.com

Friedman & Bruya
Michael Erdahl
3012 16th Ave. W.
Seattle, WA 98119

RE: 412214
Lab ID: 1412169

December 19, 2014

Attention Michael Erdahl:

Fremont Analytical, Inc. received 3 sample(s) on 12/12/2014 for the analyses presented in the following report.

Extractable Petroleum Hydrocarbons by NWEPH
Sample Moisture (Percent Moisture)
Volatile Petroleum Hydrocarbons by NWVPH

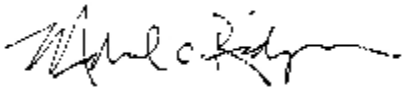
This report consists of the following:

- Case Narrative
- Analytical Results
- Applicable Quality Control Summary Reports
- Chain of Custody

All analyses were performed consistent with the Quality Assurance program of Fremont Analytical, Inc. Please contact the laboratory if you should have any questions about the results.

Thank you for using Fremont Analytical.

Sincerely,



Mike Ridgeway
President

Date: *12/19/2014*

CLIENT: Friedman & Bruya
Project: 412214
Lab Order: 1412169

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
1412169-001	SB-32-14	12/10/2014 10:05 AM	12/12/2014 3:19 PM
1412169-002	SB-33-9	12/10/2014 10:50 AM	12/12/2014 3:19 PM
1412169-003	SB-35-10	12/10/2014 12:20 PM	12/12/2014 3:19 PM

Note: If no "Time Collected" is supplied, a default of 12:00AM is assigned

Case Narrative

WO#: **1412169**
Date: **12/19/2014**

CLIENT: Friedman & Bruya
Project: 412214

I. SAMPLE RECEIPT:
Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:
Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report ("mg/kg-dry" or "ug/kg-dry").

Matrix Spike (MS) and MS Duplicate (MSD) samples are tested from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. The sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

III. ANALYSES AND EXCEPTIONS:
Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.

Analytical Report

WO#: **1412169**

Date Reported: **12/19/2014**

Client: Friedman & Bruya

Collection Date: 12/10/2014 10:05:00 AM

Project: 412214

Lab ID: 1412169-001

Matrix: Soil

Client Sample ID: SB-32-14

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Extractable Petroleum Hydrocarbons by NWEPH				Batch ID: 9572		Analyst: EC
Aliphatic Hydrocarbon (C8-C10)	161	5.69		mg/Kg-dry	1	12/17/2014 5:24:00 PM
Aliphatic Hydrocarbon (C10-C12)	104	5.69		mg/Kg-dry	1	12/17/2014 5:24:00 PM
Aliphatic Hydrocarbon (C12-C16)	23.0	5.69		mg/Kg-dry	1	12/17/2014 5:24:00 PM
Aliphatic Hydrocarbon (C16-C21)	ND	5.69		mg/Kg-dry	1	12/17/2014 5:24:00 PM
Aliphatic Hydrocarbon (C21-C34)	ND	5.69		mg/Kg-dry	1	12/17/2014 5:24:00 PM
Aromatic Hydrocarbon (C8-C10)	ND	5.69		mg/Kg-dry	1	12/18/2014 1:01:00 PM
Aromatic Hydrocarbon (C10-C12)	19.8	5.69		mg/Kg-dry	1	12/18/2014 1:01:00 PM
Aromatic Hydrocarbon (C12-C16)	8.49	5.69		mg/Kg-dry	1	12/18/2014 1:01:00 PM
Aromatic Hydrocarbon (C16-C21)	ND	5.69		mg/Kg-dry	1	12/18/2014 1:01:00 PM
Aromatic Hydrocarbon (C21-C34)	ND	5.69		mg/Kg-dry	1	12/18/2014 1:01:00 PM
Surr: 1-Chlorooctadecane	86.6	65-140		%REC	1	12/17/2014 5:24:00 PM
Surr: o-Terphenyl	96.9	65-140		%REC	1	12/18/2014 1:01:00 PM
Volatile Petroleum Hydrocarbons by NWVPH				Batch ID: 9601		Analyst: BC
Aliphatic Hydrocarbon (C5-C6)	35.5	30.8	D	mg/Kg-dry	20	12/17/2014 4:41:00 AM
Aliphatic Hydrocarbon (C6-C8)	226	30.8	D	mg/Kg-dry	20	12/17/2014 4:41:00 AM
Aliphatic Hydrocarbon (C8-C10)	117	30.8	D	mg/Kg-dry	20	12/17/2014 4:41:00 AM
Aliphatic Hydrocarbon (C10-C12)	ND	30.8	D	mg/Kg-dry	20	12/17/2014 4:41:00 AM
Aromatic Hydrocarbon (C8-C10)	164	30.8	D	mg/Kg-dry	20	12/17/2014 4:41:00 AM
Aromatic Hydrocarbon (C10-C12)	81.6	30.8	D	mg/Kg-dry	20	12/17/2014 4:41:00 AM
Aromatic Hydrocarbon (C12-C13)	14.0	1.54		mg/Kg-dry	1	12/16/2014 7:09:00 PM
Benzene	0.717	0.385		mg/Kg-dry	1	12/16/2014 7:09:00 PM
Toluene	1.15	0.385		mg/Kg-dry	1	12/16/2014 7:09:00 PM
Ethylbenzene	1.83	0.385		mg/Kg-dry	1	12/16/2014 7:09:00 PM
m,p-Xylene	1.74	0.385		mg/Kg-dry	1	12/16/2014 7:09:00 PM
o-Xylene	3.33	0.385		mg/Kg-dry	1	12/16/2014 7:09:00 PM
Naphthalene	4.25	0.385		mg/Kg-dry	1	12/16/2014 7:09:00 PM
Methyl tert-butyl ether (MTBE)	1.96	0.385		mg/Kg-dry	1	12/16/2014 7:09:00 PM
Surr: 1,4-Difluorobenzene	88.5	65-140		%REC	1	12/16/2014 7:09:00 PM
Surr: Bromofluorobenzene	117	65-140		%REC	1	12/16/2014 7:09:00 PM
Sample Moisture (Percent Moisture)				Batch ID: R18580		Analyst: KZ
Percent Moisture	14.4			wt%	1	12/15/2014 8:01:51 AM

Qualifiers:

B	Analyte detected in the associated Method Blank	D	Dilution was required
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not detected at the Reporting Limit
RL	Reporting Limit	S	Spike recovery outside accepted recovery limits

Analytical Report

WO#: **1412169**

Date Reported: **12/19/2014**

Client: Friedman & Bruya

Collection Date: 12/10/2014 10:50:00 AM

Project: 412214

Lab ID: 1412169-002

Matrix: Soil

Client Sample ID: SB-33-9

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Extractable Petroleum Hydrocarbons by NWEPH				Batch ID: 9572		Analyst: EC
Aliphatic Hydrocarbon (C8-C10)	185	10.1	D	mg/Kg-dry	2	12/18/2014 5:10:00 PM
Aliphatic Hydrocarbon (C10-C12)	181	10.1	D	mg/Kg-dry	2	12/18/2014 5:10:00 PM
Aliphatic Hydrocarbon (C12-C16)	99.4	5.04		mg/Kg-dry	1	12/17/2014 6:08:00 PM
Aliphatic Hydrocarbon (C16-C21)	13.6	5.04		mg/Kg-dry	1	12/17/2014 6:08:00 PM
Aliphatic Hydrocarbon (C21-C34)	ND	5.04		mg/Kg-dry	1	12/17/2014 6:08:00 PM
Aromatic Hydrocarbon (C8-C10)	34.8	5.04		mg/Kg-dry	1	12/18/2014 1:45:00 PM
Aromatic Hydrocarbon (C10-C12)	59.5	5.04		mg/Kg-dry	1	12/18/2014 1:45:00 PM
Aromatic Hydrocarbon (C12-C16)	39.2	5.04		mg/Kg-dry	1	12/18/2014 1:45:00 PM
Aromatic Hydrocarbon (C16-C21)	6.29	5.04		mg/Kg-dry	1	12/18/2014 1:45:00 PM
Aromatic Hydrocarbon (C21-C34)	ND	5.04		mg/Kg-dry	1	12/18/2014 1:45:00 PM
Surr: 1-Chlorooctadecane	68.7	65-140		%REC	1	12/17/2014 6:08:00 PM
Surr: o-Terphenyl	87.7	65-140		%REC	1	12/18/2014 1:45:00 PM
Volatile Petroleum Hydrocarbons by NWVPH				Batch ID: 9601		Analyst: BC
Aliphatic Hydrocarbon (C5-C6)	30.1	26.6	D	mg/Kg-dry	20	12/17/2014 5:48:00 AM
Aliphatic Hydrocarbon (C6-C8)	182	26.6	D	mg/Kg-dry	20	12/17/2014 5:48:00 AM
Aliphatic Hydrocarbon (C8-C10)	214	26.6	D	mg/Kg-dry	20	12/17/2014 5:48:00 AM
Aliphatic Hydrocarbon (C10-C12)	189	26.6	D	mg/Kg-dry	20	12/17/2014 5:48:00 AM
Aromatic Hydrocarbon (C8-C10)	310	26.6	D	mg/Kg-dry	20	12/17/2014 5:48:00 AM
Aromatic Hydrocarbon (C10-C12)	167	26.6	D	mg/Kg-dry	20	12/17/2014 5:48:00 AM
Aromatic Hydrocarbon (C12-C13)	52.3	26.6	D	mg/Kg-dry	20	12/17/2014 5:48:00 AM
Benzene	0.477	0.333		mg/Kg-dry	1	12/16/2014 10:31:00 PM
Toluene	1.13	0.333		mg/Kg-dry	1	12/16/2014 10:31:00 PM
Ethylbenzene	4.56	0.333		mg/Kg-dry	1	12/16/2014 10:31:00 PM
m,p-Xylene	6.65	0.333		mg/Kg-dry	1	12/16/2014 10:31:00 PM
o-Xylene	5.48	0.333		mg/Kg-dry	1	12/16/2014 10:31:00 PM
Naphthalene	8.73	0.333		mg/Kg-dry	1	12/16/2014 10:31:00 PM
Methyl tert-butyl ether (MTBE)	0.843	0.333		mg/Kg-dry	1	12/16/2014 10:31:00 PM
Surr: 1,4-Difluorobenzene	81.5	65-140		%REC	1	12/16/2014 10:31:00 PM
Surr: Bromofluorobenzene	97.3	65-140	D	%REC	20	12/17/2014 5:48:00 AM
Sample Moisture (Percent Moisture)				Batch ID: R18580		Analyst: KZ
Percent Moisture	9.99			wt%	1	12/15/2014 8:01:51 AM

Qualifiers:

B	Analyte detected in the associated Method Blank	D	Dilution was required
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not detected at the Reporting Limit
RL	Reporting Limit	S	Spike recovery outside accepted recovery limits

Analytical Report

WO#: **1412169**

Date Reported: **12/19/2014**

Client: Friedman & Bruya

Collection Date: 12/10/2014 12:20:00 PM

Project: 412214

Lab ID: 1412169-003

Matrix: Soil

Client Sample ID: SB-35-10

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Extractable Petroleum Hydrocarbons by NWEPH				Batch ID: 9572		Analyst: EC
Aliphatic Hydrocarbon (C8-C10)	127	5.28		mg/Kg-dry	1	12/17/2014 6:52:00 PM
Aliphatic Hydrocarbon (C10-C12)	109	5.28		mg/Kg-dry	1	12/17/2014 6:52:00 PM
Aliphatic Hydrocarbon (C12-C16)	18.0	5.28		mg/Kg-dry	1	12/17/2014 6:52:00 PM
Aliphatic Hydrocarbon (C16-C21)	ND	5.28		mg/Kg-dry	1	12/17/2014 6:52:00 PM
Aliphatic Hydrocarbon (C21-C34)	ND	5.28		mg/Kg-dry	1	12/17/2014 6:52:00 PM
Aromatic Hydrocarbon (C8-C10)	17.2	5.28		mg/Kg-dry	1	12/18/2014 2:42:00 PM
Aromatic Hydrocarbon (C10-C12)	25.0	5.28		mg/Kg-dry	1	12/18/2014 2:42:00 PM
Aromatic Hydrocarbon (C12-C16)	6.96	5.28		mg/Kg-dry	1	12/18/2014 2:42:00 PM
Aromatic Hydrocarbon (C16-C21)	ND	5.28		mg/Kg-dry	1	12/18/2014 2:42:00 PM
Aromatic Hydrocarbon (C21-C34)	ND	5.28		mg/Kg-dry	1	12/18/2014 2:42:00 PM
Surr: 1-Chlorooctadecane	96.0	65-140		%REC	1	12/17/2014 6:52:00 PM
Surr: o-Terphenyl	93.8	65-140		%REC	1	12/18/2014 2:42:00 PM
Volatile Petroleum Hydrocarbons by NWVPH				Batch ID: 9601		Analyst: BC
Aliphatic Hydrocarbon (C5-C6)	17.6	1.48		mg/Kg-dry	1	12/17/2014 1:53:00 AM
Aliphatic Hydrocarbon (C6-C8)	397	29.6	D	mg/Kg-dry	20	12/17/2014 9:05:00 AM
Aliphatic Hydrocarbon (C8-C10)	199	73.9	D	mg/Kg-dry	50	12/18/2014 1:03:00 PM
Aliphatic Hydrocarbon (C10-C12)	318	29.6	D	mg/Kg-dry	20	12/17/2014 9:05:00 AM
Aromatic Hydrocarbon (C8-C10)	622	73.9	D	mg/Kg-dry	50	12/18/2014 1:03:00 PM
Aromatic Hydrocarbon (C10-C12)	324	29.6	D	mg/Kg-dry	20	12/17/2014 9:05:00 AM
Aromatic Hydrocarbon (C12-C13)	56.2	29.6	D	mg/Kg-dry	20	12/17/2014 9:05:00 AM
Benzene	0.418	0.370		mg/Kg-dry	1	12/17/2014 1:53:00 AM
Toluene	1.20	0.370		mg/Kg-dry	1	12/17/2014 1:53:00 AM
Ethylbenzene	5.65	0.370		mg/Kg-dry	1	12/17/2014 1:53:00 AM
m,p-Xylene	12.8	0.370		mg/Kg-dry	1	12/17/2014 1:53:00 AM
o-Xylene	9.05	0.370		mg/Kg-dry	1	12/17/2014 1:53:00 AM
Naphthalene	19.5	0.370		mg/Kg-dry	1	12/17/2014 1:53:00 AM
Methyl tert-butyl ether (MTBE)	0.402	0.370		mg/Kg-dry	1	12/17/2014 1:53:00 AM
Surr: 1,4-Difluorobenzene	80.1	65-140		%REC	1	12/17/2014 1:53:00 AM
Surr: Bromofluorobenzene	106	65-140	D	%REC	20	12/17/2014 9:05:00 AM
Sample Moisture (Percent Moisture)				Batch ID: R18580		Analyst: KZ
Percent Moisture	10.7			wt%	1	12/15/2014 8:01:51 AM

Qualifiers:

B	Analyte detected in the associated Method Blank	D	Dilution was required
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not detected at the Reporting Limit
RL	Reporting Limit	S	Spike recovery outside accepted recovery limits

Work Order: 1412169
CLIENT: Friedman & Bruya
Project: 412214

QC SUMMARY REPORT

Extractable Petroleum Hydrocarbons by NWEPH

Sample ID: **1412084-001ADUP**	SampType: **DUP**			Units: **mg/Kg-dry**		Prep Date: **12/15/2014**		RunNo: **18673**		
Client ID: **BATCH**	Batch ID: **9572**					Analysis Date: **12/17/2014**		SeqNo: **372257**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aliphatic Hydrocarbon (C8-C10)	13.1	5.12						14.43	9.94	30	
Aliphatic Hydrocarbon (C10-C12)	8.57	5.12						9.301	8.23	30	
Aliphatic Hydrocarbon (C12-C16)	ND	5.12						0		30	
Aliphatic Hydrocarbon (C16-C21)	ND	5.12						0		30	
Aliphatic Hydrocarbon (C21-C34)	ND	5.12						0		30	
Surr: 1-Chlorooctadecane	3.80		4.093		92.8	65	140		0		

Sample ID: **LCS-9572**	SampType: **LCS**			Units: **mg/Kg**		Prep Date: **12/15/2014**		RunNo: **18673**		
Client ID: **LCSS**	Batch ID: **9572**					Analysis Date: **12/17/2014**		SeqNo: **372264**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aliphatic Hydrocarbon (C8-C10)	19.5	5.00	20.00	0	97.5	70	130				
Aliphatic Hydrocarbon (C10-C12)	9.94	5.00	10.00	0	99.4	70	130				
Aliphatic Hydrocarbon (C12-C16)	10.2	5.00	10.00	0	102	70	130				
Aliphatic Hydrocarbon (C16-C21)	10.3	5.00	10.00	0	103	70	130				
Aliphatic Hydrocarbon (C21-C34)	9.46	5.00	10.00	0	94.6	70	130				
Surr: 1-Chlorooctadecane	4.13		4.000		103	65	140				

Sample ID: **MB-9572**	SampType: **MBLK**			Units: **mg/Kg**		Prep Date: **12/15/2014**		RunNo: **18673**		
Client ID: **MBLKS**	Batch ID: **9572**					Analysis Date: **12/17/2014**		SeqNo: **372265**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aliphatic Hydrocarbon (C8-C10)	ND	5.00									
Aliphatic Hydrocarbon (C10-C12)	ND	5.00									
Aliphatic Hydrocarbon (C12-C16)	ND	5.00									
Aliphatic Hydrocarbon (C16-C21)	ND	5.00									
Aliphatic Hydrocarbon (C21-C34)	ND	5.00									
Surr: 1-Chlorooctadecane	3.81		4.000		95.3	65	140				

Qualifiers:

B	Analyte detected in the associated Method Blank	D	Dilution was required	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits	ND	Not detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Limit	S	Spike recovery outside accepted recovery limits

Work Order: 1412169
CLIENT: Friedman & Bruya
Project: 412214

QC SUMMARY REPORT

Extractable Petroleum Hydrocarbons by NWEPH

Sample ID: **MB-9572**	SampType: **MBLK**	Units: **mg/Kg**	Prep Date: **12/15/2014**	RunNo: **18673**
Client ID: **MBLKS**	Batch ID: **9572**		Analysis Date: **12/17/2014**	SeqNo: **372265**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Sample ID: **LCS-9572**	SampType: **LCS**	Units: **mg/Kg**	Prep Date: **12/15/2014**	RunNo: **18673**
Client ID: **LCSS**	Batch ID: **9572**		Analysis Date: **12/18/2014**	SeqNo: **372269**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aromatic Hydrocarbon (C8-C10)	9.62	5.00	10.00	0	96.2	70	130				
Aromatic Hydrocarbon (C10-C12)	9.16	5.00	10.00	0	91.6	70	130				
Aromatic Hydrocarbon (C12-C16)	10.1	5.00	10.00	0	101	70	130				
Aromatic Hydrocarbon (C16-C21)	10.2	5.00	10.00	0	102	70	130				
Aromatic Hydrocarbon (C21-C34)	9.77	5.00	10.00	0	97.7	70	130				
Surr: o-Terphenyl	3.61		4.000		90.2	65	140				

Sample ID: **MB-9572**	SampType: **MBLK**	Units: **mg/Kg**	Prep Date: **12/15/2014**	RunNo: **18673**
Client ID: **MBLKS**	Batch ID: **9572**		Analysis Date: **12/18/2014**	SeqNo: **372270**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aromatic Hydrocarbon (C8-C10)	ND	5.00									
Aromatic Hydrocarbon (C10-C12)	ND	5.00									
Aromatic Hydrocarbon (C12-C16)	ND	5.00									
Aromatic Hydrocarbon (C16-C21)	ND	5.00									
Aromatic Hydrocarbon (C21-C34)	ND	5.00									
Surr: o-Terphenyl	3.88		4.000		97.1	65	140				

Qualifiers:

B	Analyte detected in the associated Method Blank	D	Dilution was required	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits	ND	Not detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Limit	S	Spike recovery outside accepted recovery limits

Date: *12/19/2014*

Work Order: 1412169
CLIENT: Friedman & Bruya
Project: 412214

QC SUMMARY REPORT

Extractable Petroleum Hydrocarbons by NWEPH

Sample ID: **1412084-001ADUP** SampType: **DUP** Units: **mg/Kg-dry** Prep Date: **12/15/2014** RunNo: **18673**
Client ID: **BATCH** Batch ID: **9572** Analysis Date: **12/18/2014** SeqNo: **372368**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aromatic Hydrocarbon (C8-C10)	ND	5.12						0		30	
Aromatic Hydrocarbon (C10-C12)	ND	5.12						0		30	
Aromatic Hydrocarbon (C12-C16)	ND	5.12						0		30	
Aromatic Hydrocarbon (C16-C21)	ND	5.12						0		30	
Aromatic Hydrocarbon (C21-C34)	ND	5.12						0		30	
Surr: o-Terphenyl	4.23		4.093		103	65	140		0		

Qualifiers:

B	Analyte detected in the associated Method Blank	D	Dilution was required	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits	ND	Not detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Limit	S	Spike recovery outside accepted recovery limits

Work Order: 1412169
CLIENT: Friedman & Bruya
Project: 412214

QC SUMMARY REPORT

Volatile Petroleum Hydrocarbons by NWVPH

Sample ID: **1412169-001BDUP** SampType: **DUP** Units: **mg/Kg-dry** Prep Date: **12/16/2014** RunNo: **18676**
Client ID: **SB-32-14** Batch ID: **9601** Analysis Date: **12/16/2014** SeqNo: **372313**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aliphatic Hydrocarbon (C5-C6)	88.6	1.54		0	0			85.49	3.59	25	E
Aliphatic Hydrocarbon (C6-C8)	274	1.54		0	0			268.1	2.23	25	E
Aliphatic Hydrocarbon (C8-C10)	166	1.54		0	0			145.1	13.2	25	E
Aliphatic Hydrocarbon (C10-C12)	77.0	1.54		0	0			88.17	13.5	25	E
Aromatic Hydrocarbon (C8-C10)	151	1.54		0	0			151.8	0.262	25	E
Aromatic Hydrocarbon (C10-C12)	92.4	1.54		0	0			92.38	0.0234	25	E
Aromatic Hydrocarbon (C12-C13)	15.8	1.54		0	0			13.97	12.5	25	
Benzene	0.678	0.385		0	0			0.7169	5.61	25	
Toluene	1.18	0.385		0	0			1.149	2.78	25	
Ethylbenzene	2.41	0.385		0	0			1.826	27.4	25	R
m,p-Xylene	1.69	0.385		0	0			1.743	3.33	25	
o-Xylene	3.44	0.385		0	0			3.331	3.20	25	
Naphthalene	3.78	0.385		0	0			4.252	11.8	25	
Methyl tert-butyl ether (MTBE)	1.96	0.385		0	0			1.962	0.222	25	
Surr: 1,4-Difluorobenzene	1.69		1.927		87.5	65	140		0		
Surr: Bromofluorobenzene	2.26		1.927		117	65	140		0		

NOTES:
E - Estimated value. The amount exceeds the linear working range of the instrument.
R - High RPD (Ethylbenzene).

Sample ID: **1412169-002BMS** SampType: **MS** Units: **mg/Kg-dry** Prep Date: **12/16/2014** RunNo: **18676**
Client ID: **SB-33-9** Batch ID: **9601** Analysis Date: **12/17/2014** SeqNo: **372316**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aliphatic Hydrocarbon (C5-C6)	56.9	1.33	19.98	35.53	107	70	130				E
Aliphatic Hydrocarbon (C6-C8)	238	1.33	6.661	216.6	319	70	130				SE
Aliphatic Hydrocarbon (C8-C10)	254	1.33	6.661	231.7	336	70	130				SE
Aliphatic Hydrocarbon (C10-C12)	134	1.33	6.661	116.9	251	70	130				SE
Aromatic Hydrocarbon (C8-C10)	267	1.33	26.64	242.1	91.8	70	130				E

Qualifiers:

B	Analyte detected in the associated Method Blank	D	Dilution was required	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits	ND	Not detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Limit	S	Spike recovery outside accepted recovery limits

Work Order: 1412169
CLIENT: Friedman & Bruya
Project: 412214

QC SUMMARY REPORT

Volatile Petroleum Hydrocarbons by NWVPH

Sample ID: **1412169-002BMS** SampType: **MS** Units: **mg/Kg-dry** Prep Date: **12/16/2014** RunNo: **18676**
Client ID: **SB-33-9** Batch ID: **9601** Analysis Date: **12/17/2014** SeqNo: **372316**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aromatic Hydrocarbon (C10-C12)	151	1.33	6.661	170.3	-295	70	130				SE
Aromatic Hydrocarbon (C12-C13)	50.9	1.33	6.661	51.34	-6.89	70	130				SE
Benzene	6.97	0.333	6.661	0.4772	97.5	70	130				
Toluene	7.90	0.333	6.661	1.125	102	70	130				
Ethylbenzene	9.92	0.333	6.661	4.565	80.4	70	130				
m,p-Xylene	18.4	0.333	13.32	6.646	88.6	70	130				E
o-Xylene	9.92	0.333	6.661	5.484	66.6	70	130				S
Naphthalene	23.4	0.333	6.661	8.727	220	70	130				SE
Methyl tert-butyl ether (MTBE)	6.44	0.333	6.661	0.8426	84.0	70	130				
Surr: 1,4-Difluorobenzene	1.39		1.665		83.5	65	140				
Surr: Bromofluorobenzene	3.97		1.665		238	65	140				S

NOTES:
E - Estimated value. The amount exceeds the linear working range of the instrument.
S - High surrogate recovery attributed to TPH interference. See parent sample.
S - Analyte concentration too high for accurate MS recovery.

Sample ID: **LCS-9601** SampType: **LCS** Units: **mg/Kg** Prep Date: **12/16/2014** RunNo: **18676**
Client ID: **LCSS** Batch ID: **9601** Analysis Date: **12/16/2014** SeqNo: **372321**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aliphatic Hydrocarbon (C5-C6)	28.7	2.00	30.00	0	95.8	70	130				
Aliphatic Hydrocarbon (C6-C8)	10.7	2.00	10.00	0	107	70	130				
Aliphatic Hydrocarbon (C8-C10)	11.4	2.00	10.00	0	114	70	130				
Aliphatic Hydrocarbon (C10-C12)	8.80	2.00	10.00	0	88.0	70	130				
Aromatic Hydrocarbon (C8-C10)	41.9	2.00	40.00	0	105	70	130				
Aromatic Hydrocarbon (C10-C12)	7.36	2.00	10.00	0	73.6	70	130				
Aromatic Hydrocarbon (C12-C13)	7.32	2.00	10.00	0	73.2	70	130				
Benzene	9.37	0.500	10.00	0	93.7	70	130				
Toluene	9.35	0.500	10.00	0	93.5	70	130				

Qualifiers:

B	Analyte detected in the associated Method Blank	D	Dilution was required	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits	ND	Not detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Limit	S	Spike recovery outside accepted recovery limits

Work Order: 1412169
CLIENT: Friedman & Bruya
Project: 412214

QC SUMMARY REPORT

Volatile Petroleum Hydrocarbons by NWVPH

Sample ID: **LCS-9601** SampType: **LCS** Units: **mg/Kg** Prep Date: **12/16/2014** RunNo: **18676**
Client ID: **LCSS** Batch ID: **9601** Analysis Date: **12/16/2014** SeqNo: **372321**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Ethylbenzene	9.36	0.500	10.00	0	93.6	70	130				
m,p-Xylene	18.7	0.500	15.00	0	125	70	130				
o-Xylene	9.17	0.500	10.00	0	91.7	70	130				
Naphthalene	9.03	0.500	10.00	0	90.3	70	130				
Methyl tert-butyl ether (MTBE)	9.17	0.500	10.00	0	91.7	70	130				
Surr: 1,4-Difluorobenzene	2.42		2.500		96.7	65	140				
Surr: Bromofluorobenzene	2.32		2.500		93.0	65	140				

Sample ID: **MB-9601** SampType: **MBLK** Units: **mg/Kg** Prep Date: **12/16/2014** RunNo: **18676**
Client ID: **MBLKS** Batch ID: **9601** Analysis Date: **12/16/2014** SeqNo: **372322**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aliphatic Hydrocarbon (C5-C6)	ND	2.00		0	0						
Aliphatic Hydrocarbon (C6-C8)	ND	2.00		0	0						
Aliphatic Hydrocarbon (C8-C10)	ND	2.00		0	0						
Aliphatic Hydrocarbon (C10-C12)	ND	2.00		0	0						
Aromatic Hydrocarbon (C8-C10)	ND	2.00		0	0						
Aromatic Hydrocarbon (C10-C12)	ND	2.00		0	0						
Aromatic Hydrocarbon (C12-C13)	ND	2.00		0	0						
Benzene	ND	0.500		0	0						
Toluene	ND	0.500		0	0						
Ethylbenzene	ND	0.500		0	0						
m,p-Xylene	ND	0.500		0	0						
o-Xylene	ND	0.500		0	0						
Naphthalene	ND	0.500		0	0						
Methyl tert-butyl ether (MTBE)	ND	0.500		0	0						
Surr: 1,4-Difluorobenzene	2.55		2.500		102	65	140				
Surr: Bromofluorobenzene	2.80		2.500		112	65	140				

Qualifiers:

B	Analyte detected in the associated Method Blank	D	Dilution was required	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits	ND	Not detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Limit	S	Spike recovery outside accepted recovery limits

Date: *12/19/2014*

Work Order: 1412169
CLIENT: Friedman & Bruya
Project: 412214

QC SUMMARY REPORT

Volatile Petroleum Hydrocarbons by NWVPH

Sample ID: **MB-9601**	SampType: **MBLK**	Units: **mg/Kg**	Prep Date: **12/16/2014**	RunNo: **18676**
Client ID: **MBLKS**	Batch ID: **9601**		Analysis Date: **12/16/2014**	SeqNo: **372322**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Sample ID: **CCV-9601C**	SampType: **CCV**	Units: **mg/Kg**	Prep Date: **12/18/2014**	RunNo: **18676**
Client ID: **CCV**	Batch ID: **9601**		Analysis Date: **12/18/2014**	SeqNo: **372381**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aliphatic Hydrocarbon (C8-C10)	170	2.00	200.0	0	85.1	80	120				
Aromatic Hydrocarbon (C8-C10)	826	2.00	800.0	0	103	80	120				
Surr: 1,4-Difluorobenzene	51.9		50.00		104	65	140				
Surr: Bromofluorobenzene	48.8		50.00		97.6	65	140				

Qualifiers:

B	Analyte detected in the associated Method Blank	D	Dilution was required	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits	ND	Not detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Limit	S	Spike recovery outside accepted recovery limits

Sample Log-In Check List

Client Name:	**FB**	Work Order Number:	**1412169**
Logged by:	**Erica Silva**	Date Received:	**12/12/2014 3:19:00 PM**

Chain of Custody

1.	Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
2.	How was the sample delivered?	FedEx		

Log In

3.	Coolers are present?	Yes ☐	No ☑	NA ☐
	Samples received at appropriate temperature			
4.	Shipping container/cooler in good condition?	Yes ☑	No ☐	
5.	Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Required ☑
6.	Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
7.	Were all coolers received at a temperature of >0°C to 10.0°C	Yes ☑	No ☐	NA ☐
8.	Sample(s) in proper container(s)?	Yes ☑	No ☐	
9.	Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
10.	Are samples properly preserved?	Yes ☑	No ☐	
11.	Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
12.	Is the headspace in the VOA vials?	Yes ☐	No ☐	NA ☑
13.	Did all samples containers arrive in good condition(unbroken)?	Yes ☑	No ☐	
14.	Does paperwork match bottle labels?	Yes ☑	No ☐	
15.	Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
16.	Is it clear what analyses were requested?	Yes ☑	No ☐	
17.	Were all holding times able to be met?	Yes ☑	No ☐	

Special Handling (if applicable)

18.	Was client notified of all discrepancies with this order?	Yes ☐	No ☐	NA ☑

Person Notified:		Date:	
By Whom:		Via:	☐ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding:			
Client Instructions:			

19. Additional remarks:

Item Information

Item #	Temp ºC	Condition
Sample	8.1	Good

SUBCONTRACT SAMPLE CHAIN OF CUSTODY

1412169

Page # 1 of 1

Send Report To Michael Erdahl

Company Friedman and Bruya, Inc.

Address 3012 16th Ave W

City, State, ZIP Seattle, WA 98119

Phone # (206) 285-8282 Fax # (206) 283-5044

SUBCONTRACTER Fremont

PROJECT NAME/NO.	PO #
412214	D-336

REMARKS

Please Email Results

TURNAROUND TIME

☒ Standard (2 Weeks)

☐ RUSH

Rush charges authorized by:

SAMPLE DISPOSAL

☐ Dispose after 30 days

☐ Return samples

☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	Dioxins and Furans by 8290	EPH	VPH	Nitrate	Sulfate	Alkalinity					Notes
SB-32-14		12/10/14	1005	soil	2		X	X								
SB-33-9		↓	1050	↓	2		X	X								
SB-35-10		↓	1220	↓	2		X	X								

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Michael Erdahl	Friedman & Bruya	12/12/14	12:45 PM
Received by:	Sophia Gage	Fremont Analytical	12/12/14	1519
Relinquished by:				
Received by:				

4/22/14

SAMPLE CHAIN OF CUSTODY

ME 12/12/14 V1/V54/A05

Page # 1 of 4

Send Report To Gabriel Cisneros
Company Floyd|Snider
Address 601 Union Street, Ste. 600
City, State, ZIP Seattle WA 98101
Phone # 206-292-2078 Fax # 206-682-7867

SAMPLERS *(signature)*

PROJECT NAME/NO.: GTH-Calhoun

PO#:

REMARKS:

TURNAROUND TIME
- [x] Standard (2 Weeks)
- [ ] RUSH
- Rush charges authorized by:

SAMPLE DISPOSAL
- [ ] Dispose after 30 days
- [ ] Return samples
- [x] Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	Short List VOCs by 8260	SVOCs by 8270 SIM	HFS	VPH/EPH	8270 SIM Naph, 1-Methyl-naph, 2-Methyl Naph & PAHs	Naph, 1-Methyl-naph, 2-Methyl Naph 8270	TOC			Notes
SB-30-4.5	01 A-E	12/10/14	0835	Soil	5		X	X										
SB-31-4.5	02		0920	Soil	5		X	X										HOLD
SB-32-6	03		1000		5		X	X										HOLD
SB-32-14	04 A-F		1005		6		X		X	X		X	X	X				
SB-32-17	05 A-E		1010		5		X	X										
SB-33-9	06 A-F		1050		6		X		X	X		X	X	X				
SB-33-17	07 A-E		1100		5		X	X										
SB-34-6.5	08		1135		5		X	X										Short List 8260 includes BTEX, MTBE, n-hexane, EDB, EDC; Methylcyclohexane
SB-34-17	09		1145		5		X	X										
SB-35-10	10 A-F	↓	1220	↓	6		X		X	X		X	X	X				1-Methyl Naph & 2-Methyl Naph should be included in 8270 SIM

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

FORMS\COC\COC.DOC

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Jenny Pracht	F/S	12/12/14	7:15
Received by:	James Bruya	F&B	12/12	7:15
Relinquished by:				
Received by:				

Samples received at 2 °C

412214

SAMPLE CHAIN OF CUSTODY ME 12/12/14

A05/V1/V54

Page # 2 of 4

Send Report To Gabriel Cisneros
Company Floyd Snider
Address 601 Union St. St. 600
City, State, ZIP Seattle, WA 98101
Phone # 206-292-2078 Fax # 206-682-7867

SAMPLERS (signature)

PROJECT NAME/NO.: GTH-Calhoun

PO#:

REMARKS

TURNAROUND TIME
- [x] Standard (2 Weeks)
- [ ] RUSH
Rush charges authorized by

SAMPLE DISPOSAL
- [ ] Dispose after 30 days
- [ ] Return samples
- [x] Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	Notes
~~SB-36-8~~		~~12/10/14~~	~~1300~~	~~Soil~~	~~5~~							
SB-36-8	11 A-E	12/10/14	1300	Soil	5		X	X				We might Archive Some HOLD Samples. Will call with instruction HOLD
SB-37-7.5	12		1330		5		X	X				
SB-37-11	13		1335		5		X	X				
SB-38-8	14		1400		5		X	X				
SB-38-14	15		1405		5		X	X				
SB-39-7	16		1440		5		X	X				
SB-39-12	17		1445		5		X	X				
SB-39-14	18		1450		5		X	X				
SB-40-7	19		1510		5		X	X				
SB-41-6	20		1530		5		X	X				

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Jenny Pracht	F/S	12/12/14	7:15
Received by:	James Bruya	F&B	12/13	7:15
Relinquished by:				
Received by:			Samples received at 2 °C	

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

FORMS\COC\COC.DOC

4122 14

SAMPLE CHAIN OF CUSTODY ME 12/12/14

4/ VS4/ AOS

Page # 3 of 4

Send Report To Gabriel Cisneros
Company Floyd Snider
Address 601 Union Street Ste. 600
City, State, ZIP Seattle, WA 98101
Phone # 206-292-2078 Fax # 206-682-7867

SAMPLERS *(signature)*

PROJECT NAME/NO. GTH-Calhoun

PO#

REMARKS

TURNAROUND TIME
☒ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by

SAMPLE DISPOSAL
☐ Dispose after 30 days
☐ Return samples
☒ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	ANALYSES REQUESTED: TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS						Notes
SB-41-6D	21 E	12/10/14	1535	Soil	5		X	X									
SB-42-13	22	12/11/14	0820		5		X	X									
SB-42-15	23	12/11/14	0825		5		X	X									
SB-43-2	24		0850		5		X	X									
SB-43-3.5	25		0855		5		X	X									HOLD
SB-44-12.5	26		0930		5		X	X									
SB-44-15	27		0935		5		X	X									HOLD
SB-45-9.5	28		1010		5		X	X									
SB-46-19.5	29		1105		5		X	X									
SB-46-15	30		1100		5		X	X									

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

FORMS\COC\COC.DOC

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Jenny Pracht	F/S	12/12/14	7:15
Received by:	James Bruya	F&B	12/12	715
Relinquished by:				
Received by:				

Samples received at 3 °C

4/22/14

SAMPLE CHAIN OF CUSTODY

ME 12/12/14 V1/ VS4/ AO5

Page # 4 of 4

Send Report To Gabriel Cisneros
Company Floyd Snider
Address 601 Union Street Ste. 600
City, State, ZIP Seattle, WA 98101
Phone # 206-292-2078 Fax # 206-682-7867

SAMPLERS (signature)

PROJECT NAME/NO. GTH-Calhoun

PO#

REMARKS

TURNAROUND TIME
☒ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by

SAMPLE DISPOSAL
☐ Dispose after 30 days
☐ Return samples
☒ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by8260	SVOCs by 8270	HFS	Notes
SB-48-8.5	31 A-E	12/11/14	1240	Soil	5		X	X				
SB-47-7.5	32	12/11	1145		5		X	X				
SB-49-13.5	33		1315		5		X	X				
SB-50-13	34		1345		5		X	X				
SB-51-7.5	35		1405		5		X	X				
SB-52-7.5	36		1455		5		X	X				
SB-53-10	37		1530		5		X	X				
SB-53-10D	38		1535		5		X	X				HOLD
SB-54-5.5	39		1555		5		X	X				
Trip Blank	40 A-B	—			4							* Added at lab

12/12/14

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Jenny Pracht	F/S	12/12/14	7:15
Received by:	James Bruya	F&B	12/13	7:15
Relinquished by:				
Received by:			Samples received at	3 °C

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

FORMS\COC\COC.DOC

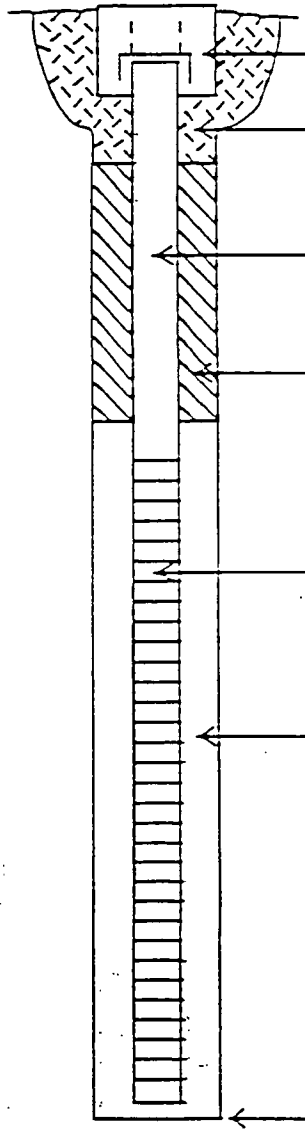
Attachment 3
Ecology Database Well Logs

HOLT DRILLING, INC.

Resource Protection Well Report

Project Name 40th & McKinley
Date 01-21-05
Well Identification # P-6
County ~~KITSAP~~ PEARCE, NE ¼ SE ¼
Drilling Method ProBE
Section 16 T. 20N R. 3E
Driller Anthony DALIAS Travis Stephens
Street Address 40th & McKinley
License # 2768 2546
Start Card S22041
213480
Consulting Firm Robinson & Noble

AS-BUILT



WELL DATA

MONUMENT TYPE:

CONCRETE SURFACE SEAL ft.

PVC BLANK "X"

BACKFILL ft.

TYPE:

PVC SCREEN "X"

SLOT SIZE

TYPE:

GRAVEL PACK ft.

MATERIAL:

WELL DEPTH

FORMATION DESCRIPTION

0 - 4 ft.

4 - 8 ft.

8 - 12 ft.

GRAVEL & TILL

- ft.

- ft.

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JAN 05 2007
DEPT. OF ECOLOGY

REMARKS Till at 12'
Refusal.

Signature
Travis Stephens

LPD8/041C9.FRX

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

Please print, sign and return to the Department of Ecology

RESOURCE PROTECTION WELL REPORT

CURRENT Notice of Intent No. S23219

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

Construction/Decommission *("x" in box)*

☒ Construction
☐ Decommission

288184

ORIGINAL INSTALLATION Notice of Intent Number:

Type of Well *("x in box)*

☒ Resource Protection
☐ Geotech Soil Boring

Property Owner Walter Hogan

Site Address 516 S 38th Street

Consulting Firm Aerotech

City Tacoma County Pierce

Unique Ecology Well IDTag No. N/A

Location SE1/4-1/4 NW1/4 Sec 16 Twn 20N R 03

EWM ☒ or WWM ☐

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

Lat/Long (s, t, r still REQUIRED) Lat Deg _____ Min _____ Sec _____

Long Deg _____ Min _____ Sec _____

☒ Driller ☐ Engineer ☐ Trainee

Name (Print Last, First Name) ~~Mefford, John~~ Don Harnden

Driller/Engineer /Trainee Signature

Driller or Trainee License No. ~~2815~~ 2914

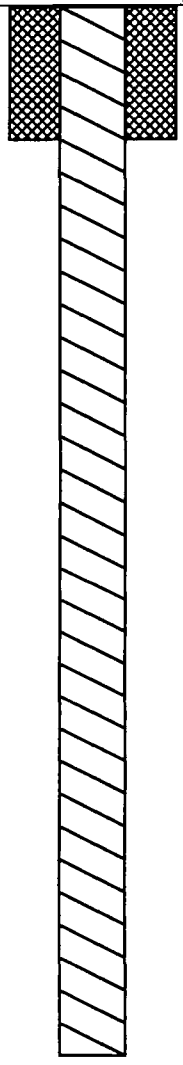
Tax Parcel No. 4895000350

Cased or Uncased Diameter 2" Static Level dry

Work/Decommission Start Date 1/9/08

Work/Decommission Completed Date 1/9/08

If trainee, licensed driller's Signature and License Number:

Construction Design	Well Data	Formation Description
	Surface Seal: ~ Drilling Method: D. P. Boring Diameter: 2" Backfill: Bentonite Chips Boring Depth: 10'	0-10 fine sand & silt w/ Tr. gravel

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JAN 22 2008

DEPARTMENT OF ECOLOGY

SCALE: 1"= N/A PAGE 6 OF 8

ECY 050-12 (Rev. 7/06)

Ecology is an Equal Opportunity

Please print, sign and return to the Department of Ecology

RESOURCE PROTECTION WELL REPORT

CURRENT Notice of Intent No. A130843

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

Construction/Decommission *("x" in box)*

☐ Construction

☒ Decommission

288192

Type of Well *("x in box)*

☒ Resource Protection

☐ Geotech Soil Boring

ORIGINAL INSTALLATION Notice of Intent Number:

S23219

Property Owner Walter Hogan

Site Address 516 S 38th Street

Consulting Firm Aerotech

City Tacoma County Pierce

Unique Ecology Well IDTag No. U/A

Location SE1/4-1/4 NW1/4 Sec 16 Twn 20N R 03

EWM ☒ or WWM ☐

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

Lat/Long (s, t, r still REQUIRED) Lat Deg _____ Min _____ Sec _____

Long Deg _____ Min _____ Sec _____

Tax Parcel No. 4895000350

☒ Driller ☐ Engineer ☐ Trainee

Name (Print Last, First Name) ~~Mefford, John~~ Doug Hansen

Driller/Engineer /Trainee Signature

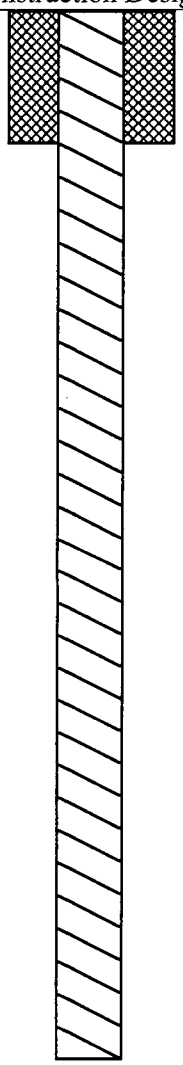
Driller or Trainee License No. ~~2815~~ 2417

Cased or Uncased Diameter 2" Static Level Dry

Work/Decommission Start Date 1/9/08

Work/Decommission Completed Date 1/9/08

If trainee, licensed driller's Signature and License Number:

Construction Design	Well Data	Formation Description
	Surface Seal: — Drilling Method: D.P. Boring Diameter: 2" Backfill: Bentonite Chips Boring Depth: 10'	0-10 Fine Sand w/ silt w/ Tr. gravel

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JAN 22 2008

DEPARTMENT OF ECOLOGY

SCALE: 1"= U/A PAGE 6 OF ~~10~~ 8

ECY 050-12 (Rev. 7/06)

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Please print, sign and return to the Department of Ecology

RESOURCE PROTECTION WELL REPORT

CURRENT Notice of Intent No. A130843

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

Construction/Decommission *("x" in box)*

☐ Construction

☒ Decommission

288193

ORIGINAL INSTALLATION Notice of Intent Number: S23219

Consulting Firm Aerotech

Unique Ecology Well IDTag No. N/A

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

☒ Driller ☐ Engineer ☐ Trainee

Name (Print Last, First Name) ~~Mefford, John~~ Dan Hanson

Driller/Engineer /Trainee Signature

Driller or Trainee License No. ~~2815~~ 2917

If trainee, licensed driller's Signature and License Number:

Type of Well *("x in box)*

☒ Resource Protection

☐ Geotech Soil Boring

Property Owner Walter Hogan

Site Address 516 S 38th Street

City Tacoma County Pierce

Location SE1/4-1/4 NW1/4 Sec 16 Twn 20N R 03

EWM ☒ or WWM ☐

Lat/Long (s, t, r still REQUIRED) Lat Deg ____ Min ____ Sec ____

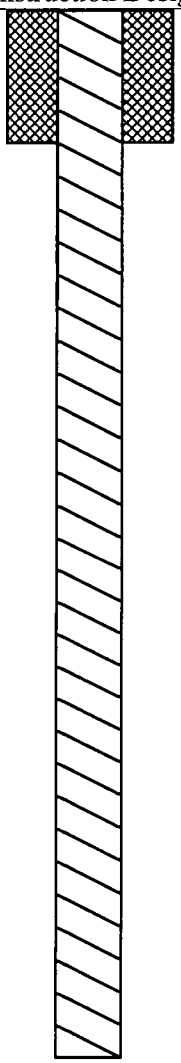
Long Deg ____ Min ____ Sec ____

Tax Parcel No. 4895000350

Cased or Uncased Diameter 2" Static Level Dry

Work/Decommission Start Date 1/9/08

Work/Decommission Completed Date 1/9/08

Construction Design	Well Data	Formation Description
	Surface Seal: –	0-2' Fine Sand & Silt w/Tr. gravel
	Drilling Method: D.P.	
	Boring Diameter: 2"	
	Backfill: Bentonite Chips	
	Boring Depth: 12'	

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JAN 22 2008

DEPARTMENT OF ECOLOGY

SCALE: 1"= N/A PAGE 2 OF 6

ECY 050-12 (Rev. 7/06)

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Please print, sign and return to the Department of Ecology

RESOURCE PROTECTION WELL REPORT

CURRENT Notice of Intent No. A130843

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

Construction/Decommission *("x" in box)*

☐ Construction

☒ Decommission 288194

ORIGINAL INSTALLATION Notice of Intent Number: S23219

Consulting Firm Aerotech

Unique Ecology Well IDTag No. N/A

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

☒ Driller ☐ Engineer ☐ Trainee

Name (Print Last, First Name) ~~Mefford, John~~ Dan Henderson

Driller/Engineer /Trainee Signature

Driller or Trainee License No. ~~2815~~ 2917

If trainee, licensed driller's Signature and License Number:

Type of Well *("x in box)*

☒ Resource Protection

☐ Geotech Soil Boring

Property Owner Walter Hogan

Site Address 516 S 38th Street

City Tacoma County Pierce

Location SE1/4-1/4 NW1/4 Sec 16 Twn 20N R 03

EWM ☒ or WWM ☐

Lat/Long (s, t, r still REQUIRED) Lat Deg ____ Min ____ Sec ____

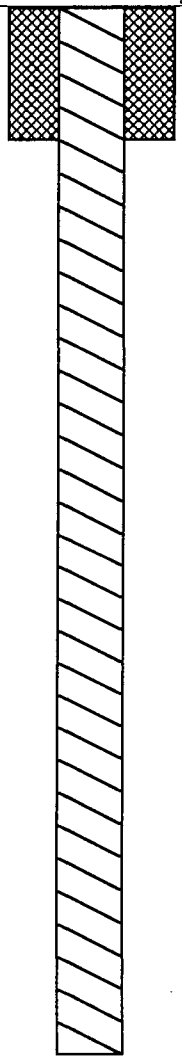
Long Deg ____ Min ____ Sec ____

Tax Parcel No. 4895000350

Cased or Uncased Diameter 2" Static Level dry

Work/Decommission Start Date 1/9/08

Work/Decommission Completed Date 1/9/08

Construction Design	Well Data	Formation Description
	Surface Seal: – Drilling Method: D.P Boring Diameter: 2" Backfill: Bentonite Chips Boring Depth: 12	0-12 Fine Sand & Silt w/ Tr. gravel

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JAN 22 2008

DEPARTMENT OF ECOLOGY

SCALE: 1"= N/A PAGE 8 OF 8

Please print, sign and return to the Department of Ecology

RESOURCE PROTECTION WELL REPORT

CURRENT Notice of Intent No. S23219

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

Construction/Decommission *("x" in box)*

☒ Construction
☐ Decommission

288182

ORIGINAL INSTALLATION Notice of Intent Number:

Consulting Firm Aerotech

Unique Ecology Well IDTag No. N/A

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

☒ Driller ☐ Engineer ☐ Trainee

Name (Print Last, First Name) ~~Mefford, John~~ Don Hamden

Driller/Engineer /Trainee Signature

Driller or Trainee License No. ~~2815~~ 2914

If trainee, licensed driller's Signature and License Number:

Type of Well *("x in box)*

☒ Resource Protection
☐ Geotech Soil Boring

Property Owner Walter Hogan

Site Address 516 S 38th Street

City Tacoma County Pierce

Location SE1/4-1/4 NW1/4 Sec 16 Twn 20N R 03

EWM ☒ or WWM ☐

Lat/Long (s, t, r still REQUIRED) Lat Deg ____ Min ____ Sec ____

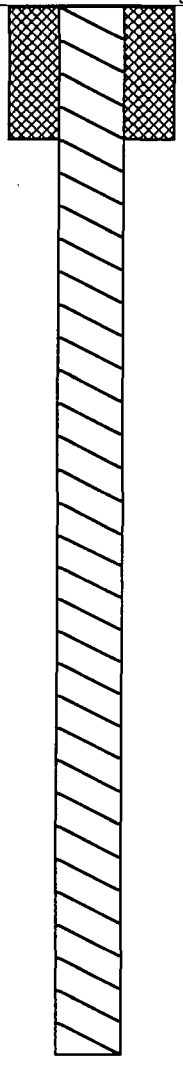
Long Deg ____ Min ____ Sec ____

Tax Parcel No. 4895000350

Cased or Uncased Diameter 2" Static Level dry

Work/Decommission Start Date 1/9/08

Work/Decommission Completed Date 1/9/08

Construction Design	Well Data	Formation Description
	Surface Seal: — Drilling Method: D.P. Boring Diameter: 2" Backfill: Bentonite Chips Boring Depth: 12'	0-16 fine sand & silt w/ Tr. gravel

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JAN 22 2008
DEPARTMENT OF ECOLOGY

SCALE: 1"= N/A PAGE 4 OF 8

Please print, sign and return to the Department of Ecology

RESOURCE PROTECTION WELL REPORT

CURRENT Notice of Intent No. A130843

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

Construction/Decommission *("x" in box)*

☐ Construction

☒ Decommission 288198

ORIGINAL INSTALLATION Notice of Intent Number: S23219

Consulting Firm Aerotech

Unique Ecology Well IDTag No. N/A

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

☒ Driller ☐ Engineer ☐ Trainee

Name (Print Last, First Name) ~~Mefford, John~~ Don Hander

Driller/Engineer /Trainee Signature

Driller or Trainee License No. ~~2815~~ 2917

If trainee, licensed driller's Signature and License Number:

Type of Well *("x in box)*

☒ Resource Protection

☐ Geotech Soil Boring

Property Owner Walter Hogan

Site Address 516 S 38th Street

City Tacoma County Pierce

Location SE1/4-1/4 NW1/4 Sec 16 Twn 20N R 03

EWM ☒ or WWM ☐

Lat/Long (s, t, r still REQUIRED) Lat Deg ____ Min ____ Sec ____

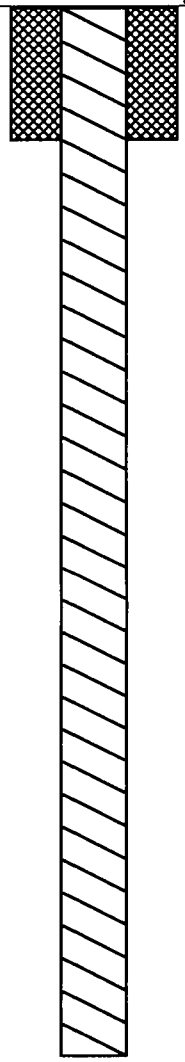
Long Deg ____ Min ____ Sec ____

Tax Parcel No. 4895000350

Cased or Uncased Diameter 2" Static Level Dry

Work/Decommission Start Date 1/9/08

Work/Decommission Completed Date 1/9/08

Construction Design	Well Data	Formation Description
	Surface Seal: — Drilling Method: D.P. Boring Diameter: 2" Backfill: Bentonite Chips Boring Depth: 16'	0-16 Fine Sand & silt w/Tr. gravel

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JAN 22 2008

DEPARTMENT OF ECOLOGY

SCALE: 1"= N/A PAGE 4 OF 8

Geologic Drill Exploration, Inc.

GEOTECH SOIL BORING REPORT

Construction & Decommission

452007

Decommission# **AE 16220**
Notice of Intent# **SE 44531**

Property Owner:	PacWest Energy LLC
Site Address:	3740 Pacific Ave, Tacoma
Location:	SE,NW,SEC 16,T20N,R3E
County	Pierce County
Work/Decom Date:	1/26/12
Date Completed	1/26/12
Consulting Firm	Geotech Consultants
Drilling Company	Geologic Drill Exploration, Inc
Driller & License #	Ritch Gibson 1816
Signature	

Construction:

Procedure	Hollow Stem Auger
Auger Size	6"
Boring Depth	See below
Water Level	No Water

Formation Description: **Borings # B-1, 2, 3, 4, 5**

B-1	0' to 15'	Sand w/gravel
B-2	0' to 15'	Sand w/gravel
B-3	0' to 15'	Sand w/gravel
B-4	0' to 20'	Sand w/gravel
B-5	0' to 35'	Sand w/gravel

Decommission

Backfilled with Bentonite

RESOURCE PROTECTION WELL REPORT

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

CURRENT
Notice of Intent No. SEO7779

Construction/Decommission

[X] Construction 389356

[ ] Decommission *ORIGINAL INSTALLATION Notice of Intent Number* _____

Consulting Firm CRA

Unique Ecology Well ID
Tag No. N/A

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards

Materials used and the information reported above are true to my best knowledge and belief

[ ] Driller [X] Trainee Name (Print) Steve Stivers

Driller/Trainee Signature _____

Driller/Trainee License No. 2965

If trainee, licesned drillers' Signature and License No. 2330

Type of Well

[X] Resource Protection

[ ] Geotechnical Soil Boring

Property Owner SHELL STATION

Site Address 3740 PACIFIC AVE

City TACOMA County PIERCE

Location 1/4 SE 1/4 NW Sec 16 Twn 20N R 3E (EWM) or WWM

Lat/Long (s,t,r still Required) Lat Deg _____ Lat Min/Sec _____ Long Deg _____ Long Min/Sec _____

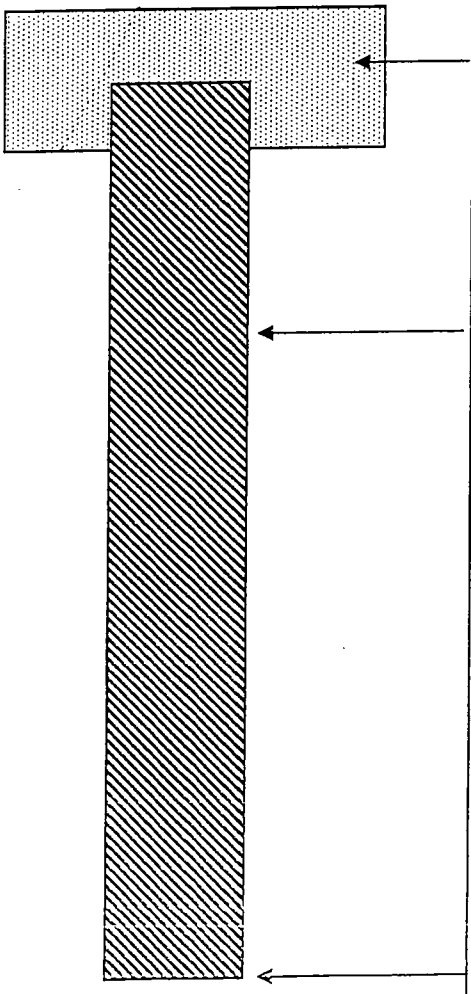
Tax Parcel No. _____

Cased or Uncased Diameter 8"/4 Static Level _____

Work/Decommision Start Date _____

Work/Decommision Completed Date _____

Construction/Design



Well Data

CONCRETE SURFACE SEAL 0-4 FT

BACKFILL 4-25' FT

Bent. Chip

DEPTH OF BORING 25' FT

Formation Description

0 - 25' FT
brown sand

- FT

RECEIVED
'10 SEP 17 A10:52
WA STATE DEPARTMENT OF ECOLOGY SW REGIONAL OFFICE

Scale 1" = _____

Page _____ of _____

ECY 050-12 (Rev 2/01)

RESOURCE PROTECTION WELL REPORT

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

CURRENT
Notice of Intent No. EE01603

Construction/Decommission

☒ Construction 3893601

☐ Decommission *ORIGINAL INSTALLATION Notice of Intent Number* _____

Type of Well

☒ Resource Protection

☐ Geotechnical Soil Boring

Property Owner Shell Station

Site Address 3740 Pacific Ave.

Consulting Firm CRA Conestoga-Rovers & Associates

City Tacoma County 27-Pierce

Unique Ecology Well ID

Tag No. N/A

Location 1/4 SE 1/4 NW Sec 16 Town 20N R3E (EWM) or WWM

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief

Lat/Long (s,t,r still Required) Lat Deg x Lat Min/Sec x Long Deg x Long Min/Sec x

Tax Parcel No. _____

☒ Driller ☒ Trainee Name (Print) ~~Curtis Askew~~ Steve Stivers

Driller/Trainee Signature _____

Driller/Trainee License No. ~~2007~~ 2965

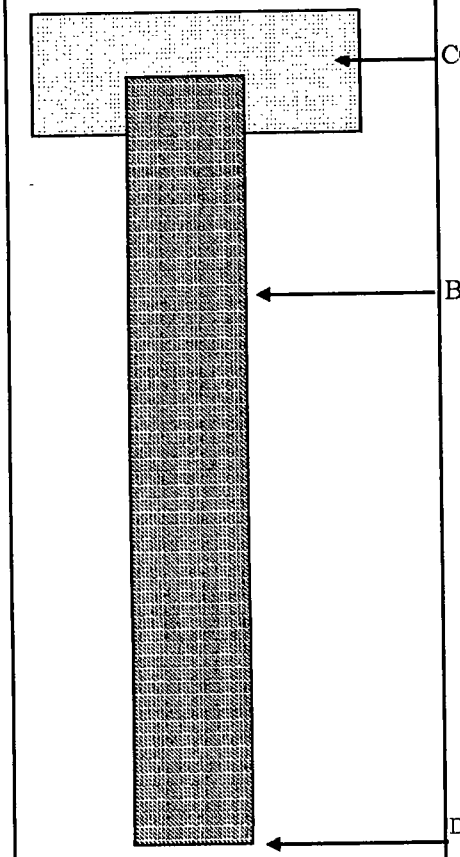
Cased or **Uncased** Diameter 8"/4 Static Level N/A

Work/Decommision Start Date 8/12/2010

If trainee, licesned drillers' Signature and License No. 2330

Work/Decommision Completed Date 8/13/2010

Construction/Design | Well Data W10-414B | Formation Description



CONCRETE SURFACE SEAL 0 - 4' FT

BACKFILL 4 - 30' FT Bent. Chips

DEPTH OF BORING 30' FT

Formation Description:

0 - 30' FT brown fine sands

0 - FT

0 - FT

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'10 SEP 17 AM 11:10
WA STATE DEPARTMENT OF ECOLOGY SW REGIONAL OFFICE

Scale 1" = _____

Page _____ of _____

ECY 050-12 (Rev 2/01)

Geologic Drill Exploration, Inc.

GEOTECH SOIL BORING REPORT
Construction & Decommission

452099

Decommission# **AE 16220**
Notice of Intent# **SE 44531**

Property Owner:	PacWest Energy LLC
Site Address:	3740 Pacific Ave, Tacoma
Location:	SE,NW,SEC 16,T20N,R3E
County	Pierce County
Work/Decom Date:	1/26/12
Date Completed	1/26/12
Consulting Firm	Geotech Consultants
Drilling Company	Geologic Drill Exploration, Inc
Driller & License #	Ritch Gibson 1816
Signature	

Construction:

Procedure	Hollow Stem Auger
Auger Size	6"
Boring Depth	See below
Water Level	No Water

Formation Description: **Borings # B-1, 2, 3, 4, 5**

B-1	0' to 15'	Sand w/gravel
B-2	0' to 15'	Sand w/gravel
B-3	0' to 15'	Sand w/gravel
B-4	0' to 20'	Sand w/gravel
B-5	0' to 35'	Sand w/gravel

Decommission
Backfilled with Bentonite

RECEIVED

FEB 11 1998

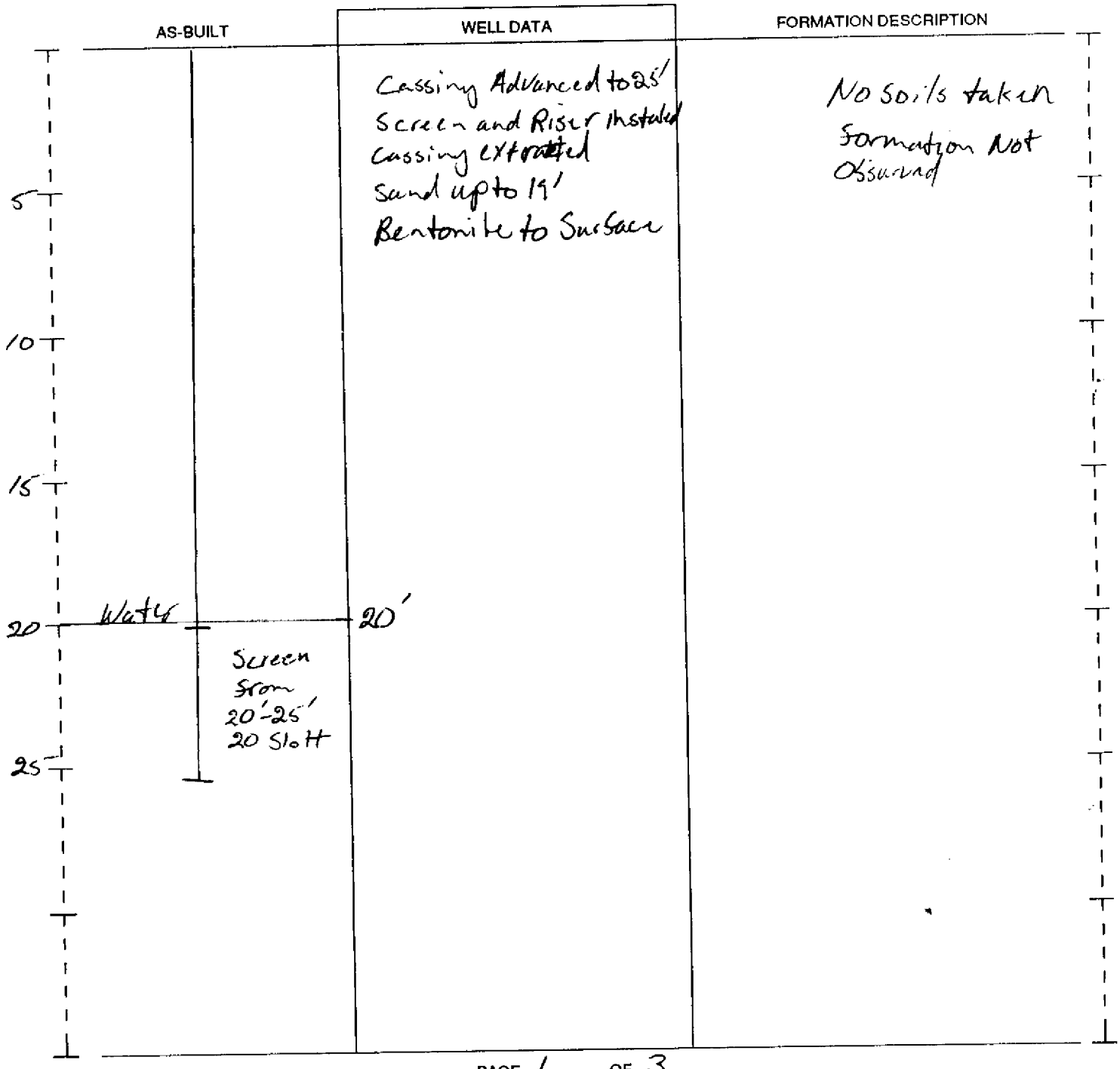
RESOURCE PROTECTION WELL REPORT

Water Resources Program
Department of Ecology

START CARD NO. 036035 ~~P036035~~

PROJECT NAME: Nu Way Cleaners
WELL IDENTIFICATION NO. NWC-1
DRILLING METHOD: Direct Push
DRILLER: Kevin Vandehey
FIRM: TEG
SIGNATURE: Kevin Vandehey
CONSULTING FIRM: Giles Engineering Inc.
REPRESENTATIVE: Andy Smith

COUNTY: Pierce County
LOCATION: SE¼ NW¼ Sec 16 Twn 20N R 3E
STREET ADDRESS OF WELL: 3800 Pacific Avenue Tacoma WA
WATER LEVEL ELEVATION: 20'
GROUND SURFACE ELEVATION:
INSTALLED: 2/5/98
DEVELOPED: 2/5/98



SCALE: 1" = _____

PAGE 1 OF 3

ECY 050-12 (Rev. 11/89)

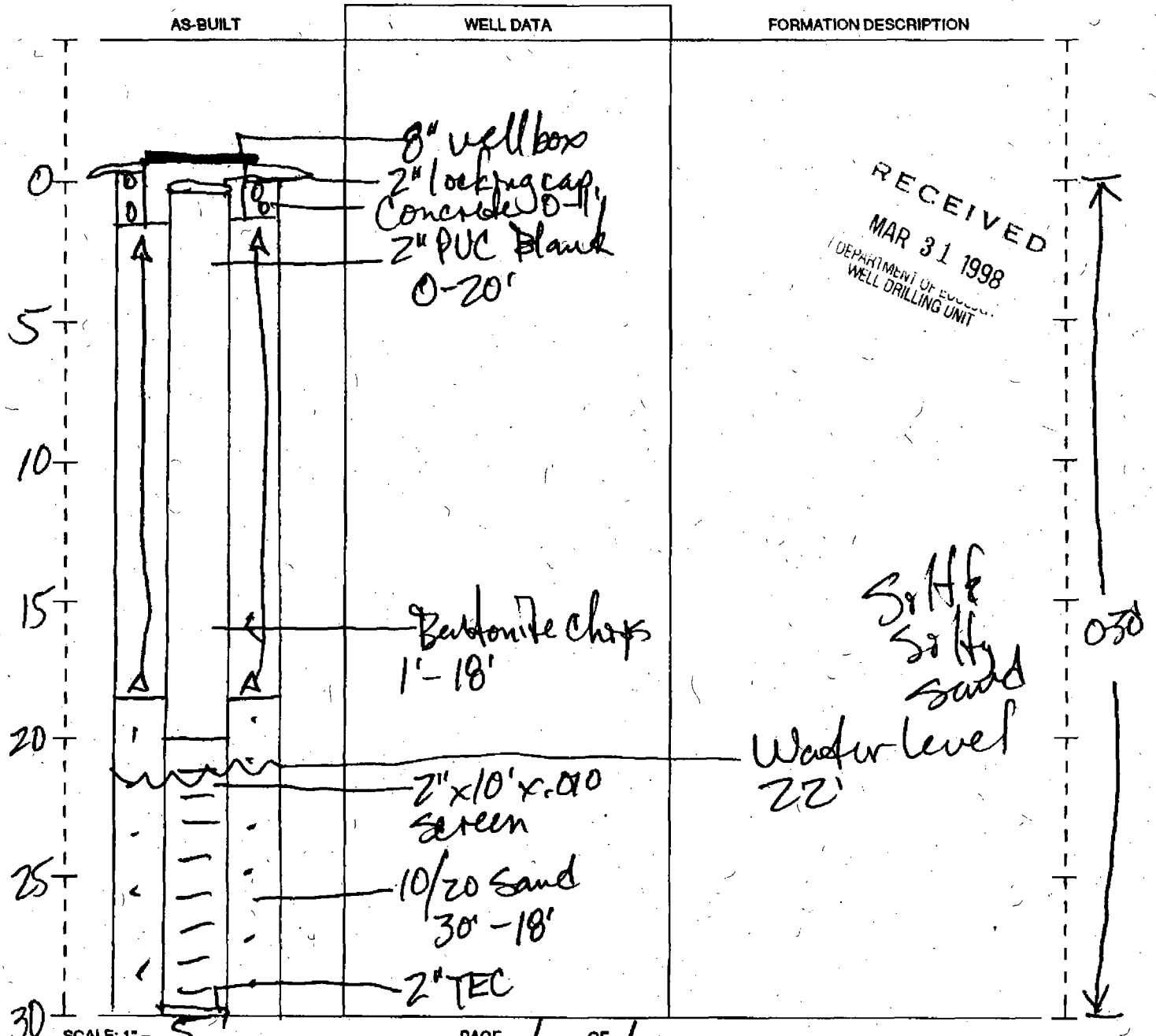
284487

RESOURCE PROTECTION WELL REPORT

START CARD NO. R039119

PROJECT NAME: Dry Cleaners Tacoma
WELL IDENTIFICATION NO: 1-3
DRILLING METHOD: HSA
DRILLER: Mickey Scott
FIRM: Geotech
SIGNATURE: Mickey Scott
CONSULTING FIRM: Aspect Env
REPRESENTATIVE: Bruce

COUNTY: Pierce
LOCATION: SE¼ NW¼ Sec 16 Twn 20N R 3E
STREET ADDRESS OF WELL: 3800 Pacific Avenue, Tacoma
WATER LEVEL ELEVATION:
GROUND SURFACE ELEVATION:
INSTALLED: 2/23/98
DEVELOPED: 2/24/98



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MAR 31 1998
DEPARTMENT OF ECOLOGY
WELL DRILLING UNIT

SCALE: 1" = 5

PAGE 1 OF 1

ECY 050-12 (Rev. 11/89)

Borings #1-6

RESOURCE PROTECTION WELL REPORT

Notice of Intent No. SE015770

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

Construction/Decommission *("x" in circle)*

- (X) Construction
- ( ) Decommission *Original Construction Notice of Intent Number* 254077

Type of Well *("x" in circle)*

- ( ) Resource Protection
- (X) Geotech Soil Boring

Property Owner CECCANTI : CECCANTI

Site Address 3302 PACIFIC AVE.

City TACOMA County: PIERCE

Unique Ecology Well ID Tag No.

Consulting Firm ROBINSON, NOBLE : SHEARBASH

Location SE 1/4-1/4 NW 1/4 Sec 16 Twn 20 R 3 EWM or WWM

Driller or Trainee Name ROB WARNER

Lat/Long (s, t, r still REQUIRED) Lat Deg Lat Min/Sec

Long Deg Long Min/Sec

Driller or Trainee Signature

Tax Parcel No.

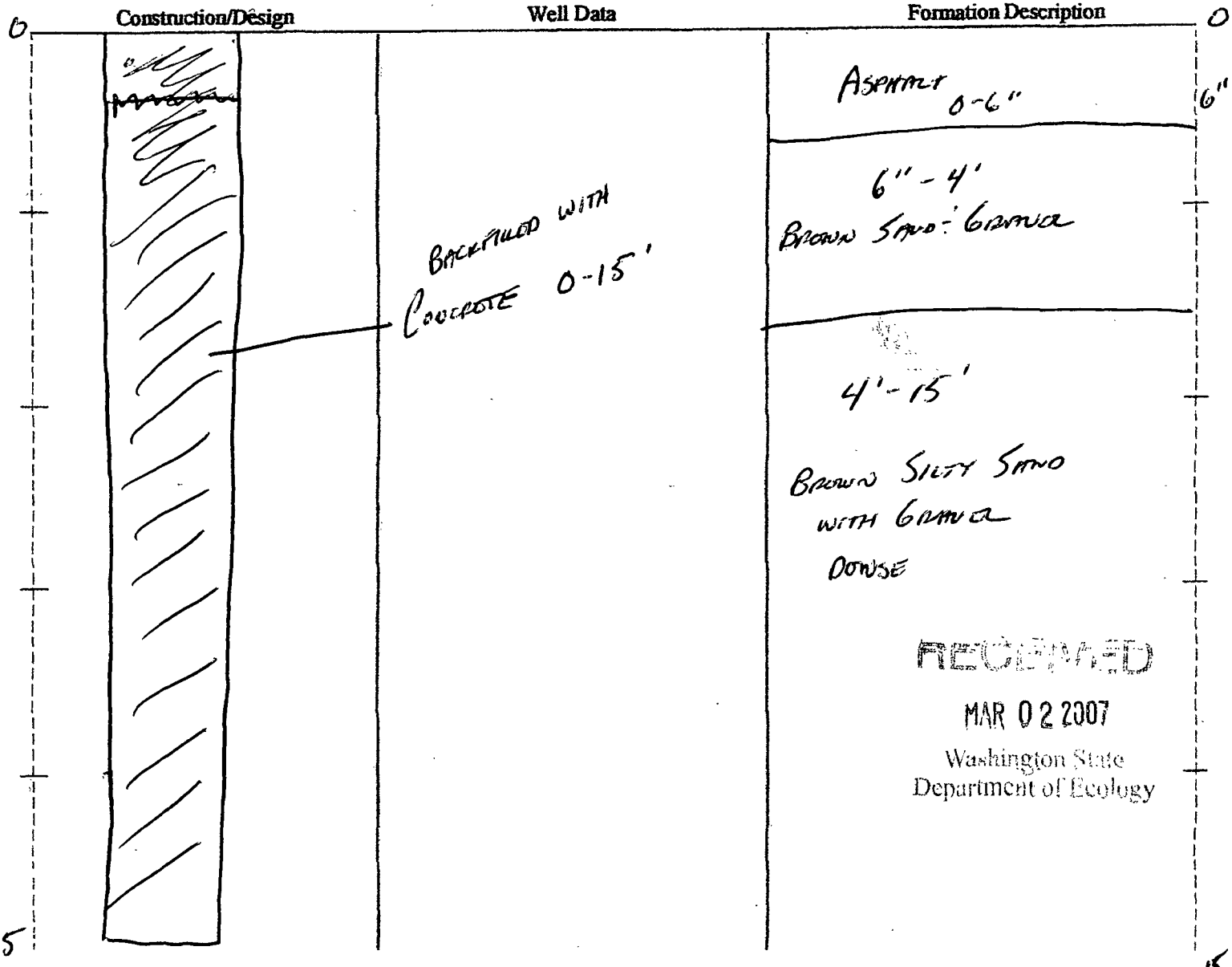
Driller or Trainee License No. 2778T

Cased or Uncased Diameter 2 3/8 Static Level N/A

If trainee, licensed driller's Signature and License no. 1873

Work/Decommission Start Date 2/3/07

Work/Decommission Completed Date 2/3/07



Borings #1-6

RESOURCE PROTECTION WELL REPORT Notice of Intent No. SE015770

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

Construction/Decommission *("x" in circle)*
- ⊗ Construction
- ○ Decommission *Original Construction Notice of Intent Number* 254076

Type of Well *("x" in circle)*
- ○ Resource Protection
- ⊗ Geotech Soil Boring

Property Owner Ceccanti : Ceccanti

Site Address 3302 Pacific Ave.

Unique Ecology Well ID Tag No. _____

City Tacoma County: Pierce

Consulting Firm Robinson Noble : Shotbush

Location SE 1/4-1/4 NW 1/4 Sec 16 Twn 20 R 3 EWM or WWM

Driller or Trainee Name Rob Wanner

Lat/Long (s, t, r still REQUIRED) Lat Deg _____ Lat Min/Sec _____

Driller or Trainee Signature _____

Long Deg _____ Long Min/Sec _____

Driller or Trainee License No. 2775

Tax Parcel No. _____

If trainee, licensed driller's Signature and License no. _____ 1075

Cased or Uncased Diameter 2 3/8 Static Level N/A

Work/Decommission Start Date 2/3/07

Work/Decommission Completed Date 2/3/07

Construction/Design	Well Data	Formation Description
0		
	Backfilled with Concrete 0-15'	Asphalt 0-6"
		6" - 4' Brown Silty Sand - Gravel
		4' - 15' Brown Silty Sand with Gravel Dense
15		

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1

Borings #1-6

RESOURCE PROTECTION WELL REPORT

Notice of Intent No. SE01570

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

Construction/Decommission *("x" in circle)*

☒ Construction

○ Decommission *Original Construction Notice*

254075 *of Intent Number*

Property Owner Ceccanti & Ceccanti

Unique Ecology Well ID Tag No.

Consulting Firm Robinson, Noble & Saltbush

Driller or Trainee Name Rog Warner

Driller or Trainee Signature [signature]

Driller or Trainee License No. 2778T

If trainee, licensed driller's Signature and License no. [signature] 1473

Type of Well *("x" in circle)*

○ Resource Protection

☒ Geotech Soil Boring

Site Address 3802 Pacific Ave.

City Tacoma County: Pierce

Location SE 1/4- 1/4 NW 1/4 Sec 16 Twn 20 R 3 EWM (circle) or WWM

Lat/Long (s, t, r still REQUIRED) Lat Deg ____ Lat Min/Sec ____ Long Deg ____ Long Min/Sec ____

Tax Parcel No.

Cased or Uncased Diameter 2 3/8 Static Level N/A

Work/Decommission Start Date 2/3/07

Work/Decommission Completed Date 2/3/07

Construction/Design	Well Data	Formation Description
0 – 15	Backfilled with Concrete 0-15'	Asphalt 0-6"
		6"-4' Brown Sand & Gravel
		4'-15' Brown Silty Sand with Gravel Dense

BORINGS #1-6

RESOURCE PROTECTION WELL REPORT

Notice of Intent No. SE01570

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

Construction/Decommission *("x" in circle)*
- (X) Construction
- O Decommission *Original Construction Notice of Intent Number*

254074

Type of Well *("x" in circle)*
- O Resource Protection
- (X) Geotech Soil Boring

Property Owner: CECCANTI : CECCANTI

Unique Ecology Well ID Tag No.

Consulting Firm: ROBINSON, NOBLE : SALTBUSH

Driller or Trainee Name: ROB WARNER

Driller or Trainee Signature: [signature]

Driller or Trainee License No. 2778T

If trainee, licensed driller's Signature and License no. [signature] 1073

Site Address: 3902 PACIFIC AVE.

City: TACOMA County: PIERCE

Location: SE 1/4-1/4 NW 1/4 Sec 16 Twn 20 R 3 EWM or WWM

Lat/Long (s, t, r still REQUIRED) Lat Deg ____ Lat Min/Sec ____ Long Deg ____ Long Min/Sec ____

Tax Parcel No.

Cased or Uncased Diameter: 2 3/8 Static Level: N/A

Work/Decommission Start Date: 2/3/07

Work/Decommission Completed Date: 2/3/07

Construction/Design	Well Data	Formation Description
0–15 (backfilled column)	BACKFILLED WITH CONCRETE 0-15'	ASPHALT 0-6"
		6" - 4' BROWN SAND : GRAVEL
		4' - 15' BROWN SILTY SAND WITH GRAVEL DENSE

Borings #1-6

RESOURCE PROTECTION WELL REPORT Notice of Intent No. SE015770

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

Construction/Decommission *("x" in circle)*
- ⊗ Construction
- ○ Decommission *Original Construction Notice of Intent Number* 254073

Type of Well *("x" in circle)*
- ○ Resource Protection
- ⊗ Geotech Soil Boring

Property Owner Ceccanti : Ceccanti

Site Address 3502 Pacific Ave.

City Tacoma County: Pierce

Unique Ecology Well ID Tag No.

Consulting Firm Robinson, Noble : Shotbush

Location SE 1/4-1/4 NW 1/4 Sec 16 Twn 20 R 3 EWM or WWM

Driller or Trainee Name Rob Watson

Lat/Long (s, t, r still REQUIRED) Lat Deg Lat Min/Sec

Driller or Trainee Signature

Long Deg Long Min/Sec

Driller or Trainee License No. 2775T

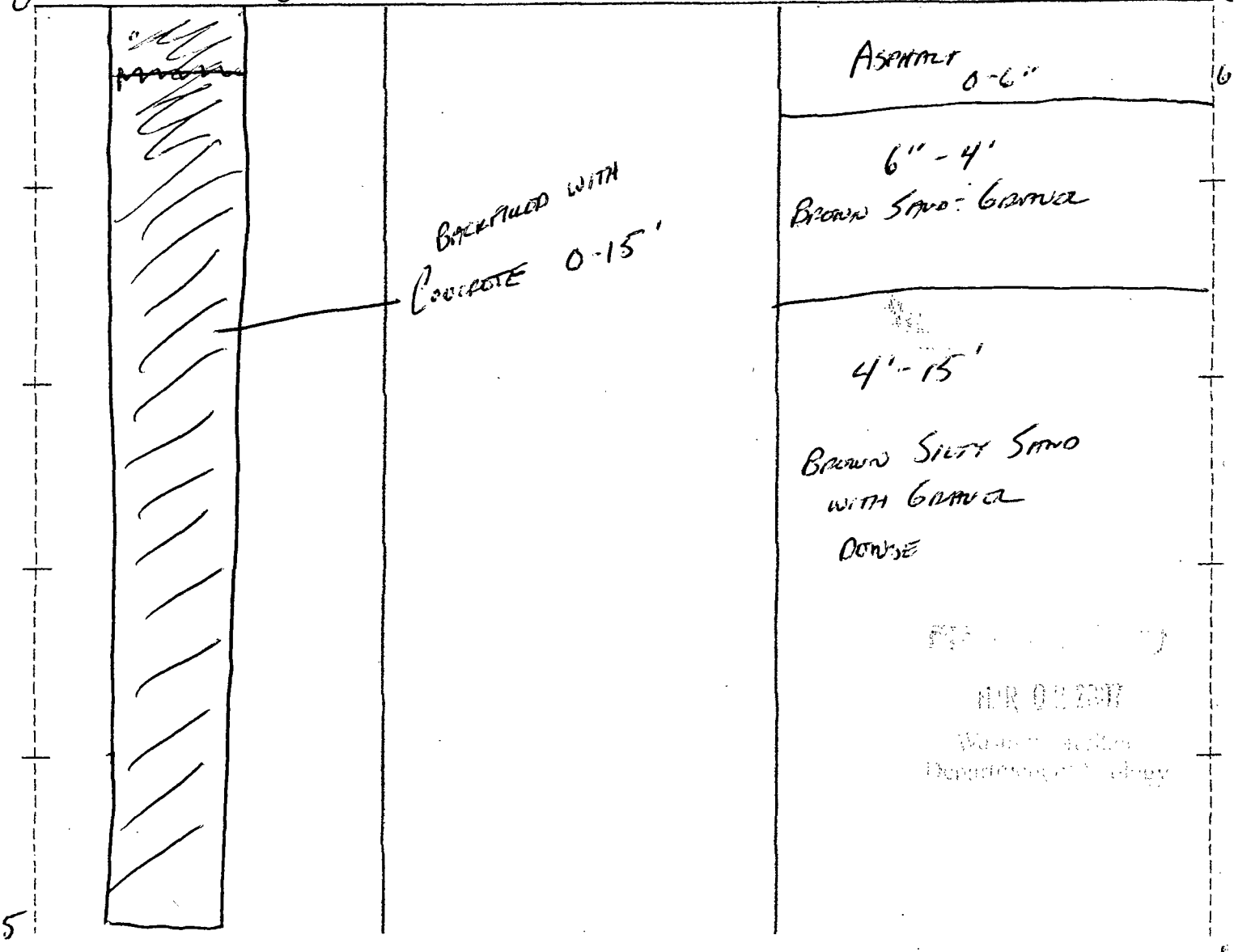
Tax Parcel No.

If trainee, licensed driller's Signature and License no. 1073

Cased or Uncased Diameter 2 3/8 Static Level N/A

Work/Decommission Start Date 2/3/07

Work/Decommission Completed Date 2/3/07



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Borings #1-6

RESOURCE PROTECTION WELL REPORT Notice of Intent No. SE015770

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

Construction/Decommission *("x" in circle)*
- ⊗ Construction
- ○ Decommission *Original Construction Notice of Intent Number* 254072

Type of Well *("x" in circle)*
- ○ Resource Protection
- ⊗ Geotech Soil Boring

Property Owner Ceccanti & Ceccanti

Site Address 3302 Pacific Ave.

City Tacoma County: Pierce

Unique Ecology Well ID Tag No.

Consulting Firm Robinson, Noble & Saltbush

Location SE 1/4-1/4 NW 1/4 Sec 16 Twn 20 R 3 EWM or WWM

Driller or Trainee Name Rob Wanner

Lat/Long (s, t, r still REQUIRED) Lat Deg Lat Min/Sec

Driller or Trainee Signature

Long Deg Long Min/Sec

Driller or Trainee License No. 2775

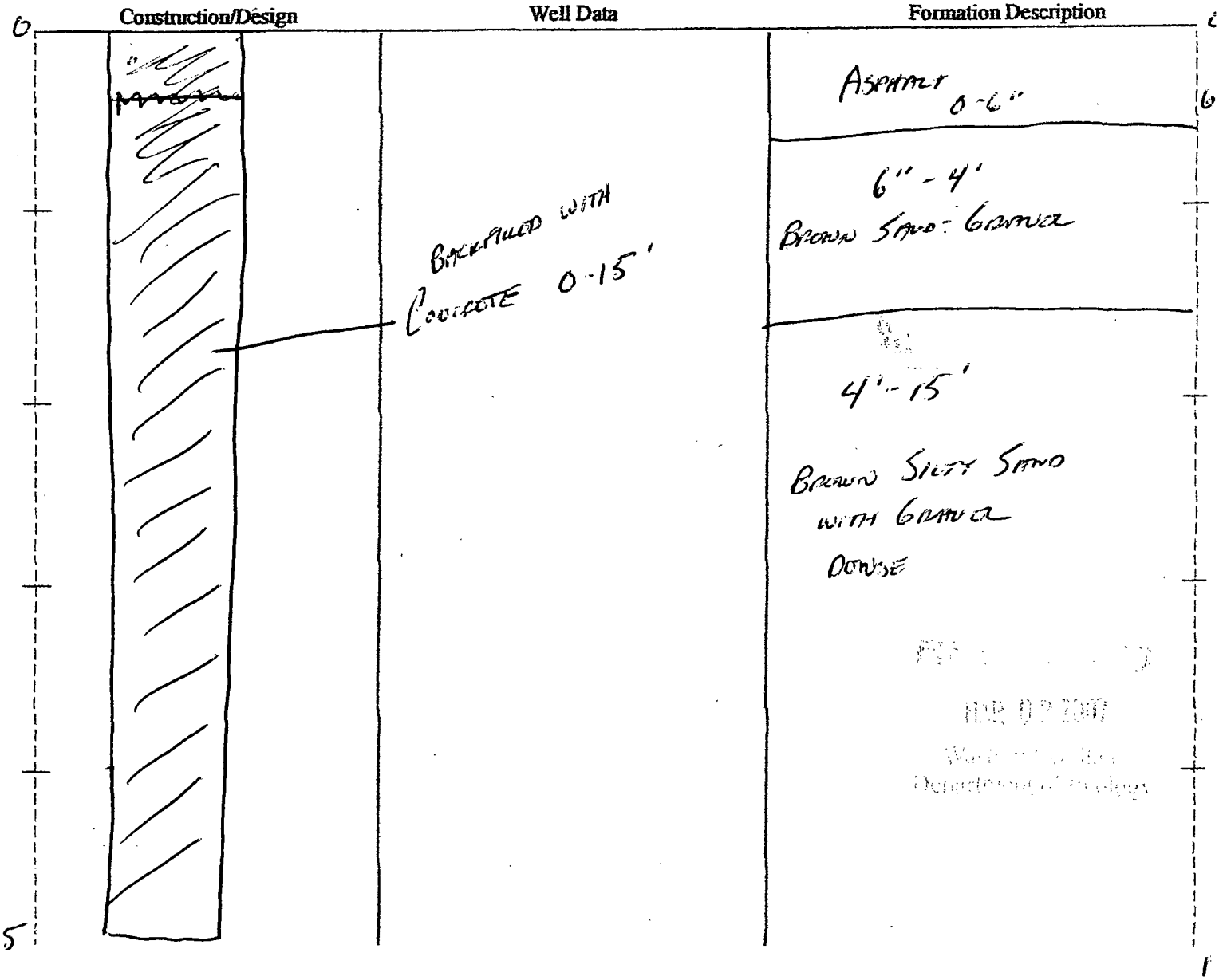
Tax Parcel No.

If trainee, licensed driller's Signature and License no. 1675

Cased or Uncased Diameter 2 3/8 Static Level N/A

Work/Decommission Start Date 2/3/07

Work/Decommission Completed Date 2/3/07



Please print, sign and return to the Department of Ecology

RESOURCE PROTECTION WELL REPORT

CURRENT Notice of Intent No. S34462

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

Construction/Decommission *("x" in box)*

☒ Construction
☐ Decommission

303542

ORIGINAL INSTALLATION Notice of Intent Number:

Type of Well *("x in box)*

☒ Resource Protection
☐ Geotech Soil Boring

Property Owner McLaughlin Estate

Site Address 3855 Pacific Ave

Consulting Firm Encon

City Tacoma County Pierce

Unique Ecology Well IDTag No. B-1

Location SE1/4-1/4 NW1/4 Sec 16 Twn 20N R 03

EWM ☒ or WWM ☐

WELL CONSTRUCTION CERTIFICATION I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards Materials used and the information reported above are true to my best knowledge and belief

Lat/Long (s, t, r still REQUIRED) Lat Deg _____ Min _____ Sec _____

Long Deg _____ Min _____ Sec _____

☒ Driller ☐ Engineer ☐ Trainee

Name (Print Last, First Name) Marty, Haun

Driller/Engineer /Trainee Signature _____

Driller or Trainee License No. 2827

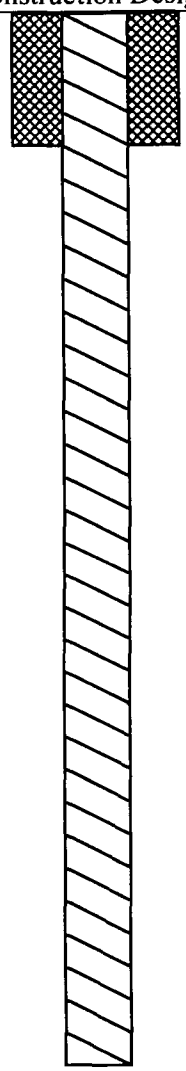
Tax Parcel No. 7470021840

Cased or Uncased Diameter 2" Static Level N/A

Work/Decommission Start Date 5/5/08

Work/Decommission Completed Date 5/5/08

If trainee, licensed driller's Signature and License Number:

Construction Design	Well Data	Formation Description
	Surface Seal: ASPHALT Drilling Method: DIRECT PUSH Boring Diameter: 2" Backfill: BENTONITE Boring Depth: 14'	0 - 8' BRN SAND W/ GRAVEL 8' - 14' BRN/GREYISH TIGHT SAND SILT

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SCALE 1"= ____ PAGE 1 OF 4

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RESOURCE PROTECTION WELL REPORT

CURRENT Notice of Intent No. S34462

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

Construction/Decommission *("x" in box)*

☒ Construction 303544

☐ Decommission

ORIGINAL INSTALLATION Notice of Intent Number:

Type of Well *("x in box)*

☒ Resource Protection

☐ Geotech Soil Boring

Property Owner McLaughlin Estate

Site Address 3855 Pacific Ave

Consulting Firm Encon

City Tacoma County Pierce

Unique Ecology Well IDTag No. B-3

Location SE1/4-1/4 NW1/4 Sec 16 Twn 20N R 03

EWM ☒ or WWM ☐

WELL CONSTRUCTION CERTIFICATION I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards Materials used and the information reported above are true to my best knowledge and belief

Lat/Long (s, t, r still REQUIRED) Lat Deg _____ Min _____ Sec _____

Long Deg _____ Min _____ Sec _____

☒ Driller ☐ Engineer ☐ Trainee

Name (Print Last, First Name) Marty, Haun

Driller/Engineer /Trainee Signature

Driller or Trainee License No. 2827

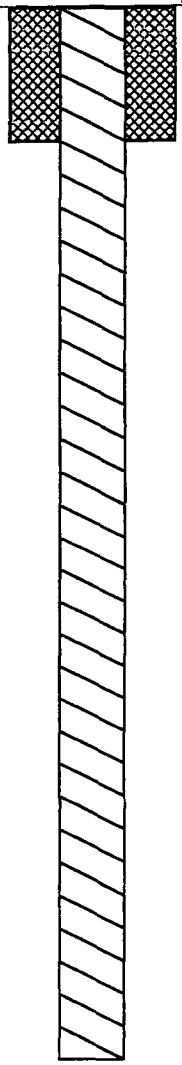
Tax Parcel No. 7470021840

Cased or Uncased Diameter 2" Static Level N/A

Work/Decommission Start Date 5/5/08

Work/Decommission Completed Date 5/5/08

If trainee, licensed driller's Signature and License Number:

Construction Design	Well Data	Formation Description
	Surface Seal: ASPHALT Drilling Method: DIRECT PUSH Boring Diameter: 2" Backfill: BENTONITE Boring Depth: 9'	0-4' BRN SAND SILT W/TRACE GRAVEL 4'-9' BRN SAND SILT

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SCALE 1"= ____ PAGE 3 OF 4

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RESOURCE PROTECTION WELL REPORT

CURRENT Notice of Intent No. S34462

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

Construction/Decommission *("x" in box)*

☒ Construction
☐ Decommission

303545

ORIGINAL INSTALLATION Notice of Intent Number:

Type of Well *("x in box)*

☒ Resource Protection
☐ Geotech Soil Boring

Property Owner McLaughlin Estate

Site Address 3855 Pacific Ave

Consulting Firm Encon

City Tacoma County Pierce

Unique Ecology Well IDTag No. B-4

Location SE1/4-1/4 NW1/4 Sec 16 Twn 20N R 03

EWM ☒ or WWM ☐

WELL CONSTRUCTION CERTIFICATION I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards Materials used and the information reported above are true to my best knowledge and belief

Lat/Long (s, t, r still REQUIRED) Lat Deg _____ Min _____ Sec _____

Long Deg _____ Min _____ Sec _____

☒ Driller ☐ Engineer ☐ Trainee

Name (Print Last, First Name) Marty, Haun

Driller/Engineer /Trainee Signature

Driller or Trainee License No. 2827

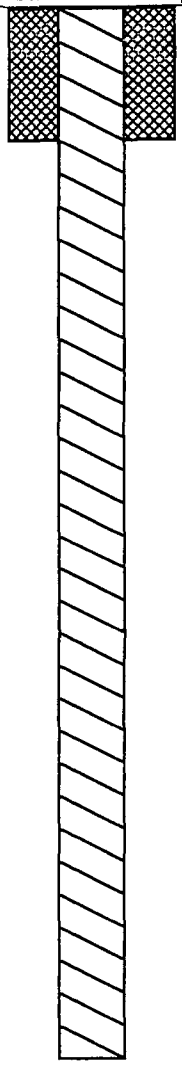
Tax Parcel No. 7470021840

Cased or Uncased Diameter 2" Static Level N/A

Work/Decommission Start Date 5/5/08

Work/Decommission Completed Date 5/5/08

If trainee, licensed driller's Signature and License Number:

Construction Design	Well Data	Formation Description
	Surface Seal: ASPHALT Drilling Method: DIRECT PUSH Boring Diameter: 2" Backfill: BENTONITE Boring Depth: 14'	0 - 8' BRN SAND W/ GRAVEL 8' - 14' BRN/GREYISH TIGHT SAND SLT

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Department of Ecology

SCALE 1"= ____ PAGE 4 OF 4

RESOURCE PROTECTION WELL REPORT

This is a report of the activities of a licensed Washington well driller and serves as the official record of work done within the borehole and casing and describes the amount of water encountered.

Construction

Type of Well: Environmental Investigation - Soil Sampling
Number of Wells in Group 3: 2 wells
Type of Work: New
Method: DirectPush
Drilling Start Date: 6/19/2015
Drilling Completion Date: 6/19/2015
Received by Ecology: 7/9/2015 3:53 PM

Dimensions:
Borehole Diameter: 2.25 in
Depth of completed well: 6 ft 0 in

Construction Details

Casings:

From Depth	To Depth	Type	Diameter	Stickup
N/A				

Perforations:

Type	Size	Total Perforations	From Depth	To Depth
N/A				

Screens:

Manufacturer	Type	Dia-meter	Slot Size	From Depth	To Depth
N/A					

Sand/Gravel Packings:

Material	From Depth	To Depth
N/A		

Individual Well Details (Group 3 of 4)

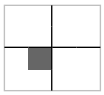
Well	Driller's Identifier	Water Level
1	B3	Dry Hole
2	B5	Dry Hole

Additional Well Construction Information
None

Well Group 3 of 4

Construction Notice of Intent Number: SE55155
Decommissioning Notice of Intent Number: AE32566
Unique Ecology Well ID Tag Number: N/A
Property Owner Name: MDLPS LLC
Property Owner Address: PO Box 902, Kent, WA 98035

Well Location:
Well Street Address: 4001 Pacific Ave
City, State, Zip: Tacoma, WA , 98418
County: Pierce
Township: 20N Range: 3E Section: 16 in the NE 1/4 of the SW 1/4



Well Head Elevation:
Elevation Datum:
Elevation Method:
Latitude (DD): Longitude (DD):
Datum:
Horizontal Coordinate Collection Method:
Tax parcel No.: 2415000420

Lithology

Layer: Describe by color, character, size of material and structure, and the kind and nature of the material in each layer penetrated, with at least one entry for each change of information.

From	To	Material
0 ft 0 in	6 ft 0 in	brown silty gravel

Well Construction Certification: I constructed and/or accept responsibility for construction of this well and its compliance with all Washington well construction standards. Material used and information reported above are true to the best of my knowledge and belief.

Driller/Engineer/Trainee Printed Name: RICHARD BATES	Drilling Company: ESN NORTHWEST
Driller or trainee License Number: 3174	Address: 1210 EASTSIDE ST SUITE 200
If trainee, Driller's License Number: 2508	City, State, Zip: OLYMPIA, WA, 98503

RESOURCE PROTECTION WELL REPORT

This is a report of the activities of a licensed Washington well driller and serves as the official record of work done within the borehole and casing and describes the amount of water encountered.

Construction

Type of Well: Environmental Investigation - Soil Sampling
Number of Wells in Group 4: 1 well
Type of Work: New
Method: DirectPush
Drilling Start Date: 6/19/2015
Drilling Completion Date: 6/19/2015
Received by Ecology: 7/9/2015 3:54 PM

Dimensions:
Borehole Diameter: 2.25 in
Depth of completed well: 7 ft 5 in

Construction Details

Casings:

From Depth	To Depth	Type	Diameter	Stickup
N/A				

Perforations:

Type	Size	Total Perforations	From Depth	To Depth
N/A				

Screens:

Manufacturer	Type	Dia-meter	Slot Size	From Depth	To Depth
N/A					

Sand/Gravel Packings:

Material	From Depth	To Depth
N/A		

Individual Well Details (Group 4 of 4)

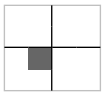
Well	Driller's Identifier	Water Level
1	B4	Dry Hole

Additional Well Construction Information
None

Well Group 4 of 4

Construction Notice of Intent Number: SE55155
Decommissioning Notice of Intent Number: AE32566
Unique Ecology Well ID Tag Number: N/A
Property Owner Name: MDLPS LLC
Property Owner Address: PO Box 902, Kent, WA 98035

Well Location:
Well Street Address: 4001 Pacific Ave
City, State, Zip: Tacoma, WA , 98418
County: Pierce
Township: 20N Range: 3E Section: 16 in the NE 1/4 of the SW 1/4



Well Head Elevation:
Elevation Datum:
Elevation Method:
Latitude (DD): Longitude (DD):
Datum:
Horizontal Coordinate Collection Method:
Tax parcel No.: 2415000420

Lithology

Layer: Describe by color, character, size of material and structure, and the kind and nature of the material in each layer penetrated, with at least one entry for each change of information.

From	To	Material
0 ft 0 in	7 ft 5 in	brown silty gravel

Well Construction Certification: I constructed and/or accept responsibility for construction of this well and its compliance with all Washington well construction standards. Material used and information reported above are true to the best of my knowledge and belief.

Driller/Engineer/Trainee Printed Name: RICHARD BATES	Drilling Company: ESN NORTHWEST
Driller or trainee License Number: 3174	Address: 1210 EASTSIDE ST SUITE 200
If trainee, Driller's License Number: 2508	City, State, Zip: OLYMPIA, WA, 98503

RESOURCE PROTECTION WELL REPORT

This is a report of the activities of a licensed Washington well driller and serves as the official record of work done within the borehole and casing and describes the amount of water encountered.

Construction

Type of Well: Environmental Investigation - Soil Sampling
Number of Wells in Group 1: 1 well
Type of Work: New
Method: DirectPush
Drilling Start Date: 6/19/2015
Drilling Completion Date: 6/19/2015
Received by Ecology: 7/9/2015 3:50 PM

Dimensions:
Borehole Diameter: 2.25 in
Depth of completed well: 11 ft 0 in

Construction Details

Casings:

From Depth	To Depth	Type	Diameter	Stickup
N/A				

Perforations:

Type	Size	Total Perforations	From Depth	To Depth
N/A				

Screens:

Manufacturer	Type	Dia-meter	Slot Size	From Depth	To Depth
N/A					

Sand/Gravel Packings:

Material	From Depth	To Depth
N/A		

Individual Well Details (Group 1 of 4)

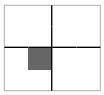
Well	Driller's Identifier	Water Level
1	B1	Dry Hole

Additional Well Construction Information
None

Well Group 1 of 4

Construction Notice of Intent Number: SE55155
Decommissioning Notice of Intent Number: AE32566
Unique Ecology Well ID Tag Number: N/A
Property Owner Name: MDLPS LLC
Property Owner Address: PO Box 902, Kent, WA 98035

Well Location:
Well Street Address: 4001 Pacific Ave
City, State, Zip: Tacoma, WA , 98418
County: Pierce
Township: 20N Range: 3E Section: 16 in the NE 1/4 of the SW 1/4



Well Head Elevation:
Elevation Datum:
Elevation Method:
Latitude (DD): Longitude (DD):
Datum:
Horizontal Coordinate Collection Method:
Tax parcel No.: 2415000420

Lithology

Layer: Describe by color, character, size of material and structure, and the kind and nature of the material in each layer penetrated, with at least one entry for each change of information.

From	To	Material
0 ft 0 in	8 ft 0 in	brown silty gravel
8 ft 0 in	11 ft 0 in	gray clay

Well Construction Certification: I constructed and/or accept responsibility for construction of this well and its compliance with all Washington well construction standards. Material used and information reported above are true to the best of my knowledge and belief.

Driller/Engineer/Trainee Printed Name: RICHARD BATES	Drilling Company: ESN NORTHWEST
Driller or trainee License Number: 3174	Address: 1210 EASTSIDE ST SUITE 200
If trainee, Driller's License Number: 2508	City, State, Zip: OLYMPIA, WA, 98503

RESOURCE PROTECTION WELL REPORT

This is a report of the activities of a licensed Washington well driller and serves as the official record of work done within the borehole and casing and describes the amount of water encountered.

Construction

Type of Well: Environmental Investigation - Soil Sampling
Number of Wells in Group 2: 1 well
Type of Work: New
Method: DirectPush
Drilling Start Date: 6/19/2015
Drilling Completion Date: 6/19/2015
Received by Ecology: 7/9/2015 3:52 PM

Dimensions:
Borehole Diameter: 2.25 in
Depth of completed well: 13 ft 5 in

Construction Details

Casings:

From Depth	To Depth	Type	Diameter	Stickup
N/A				

Perforations:

Type	Size	Total Perforations	From Depth	To Depth
N/A				

Screens:

Manufacturer	Type	Dia-meter	Slot Size	From Depth	To Depth
N/A					

Sand/Gravel Packings:

Material	From Depth	To Depth
N/A		

Individual Well Details (Group 2 of 4)

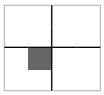
Well	Driller's Identifier	Water Level
1	B2	Dry Hole

Additional Well Construction Information
None

Well Group 2 of 4

Construction Notice of Intent Number: SE55155
Decommissioning Notice of Intent Number: AE32566
Unique Ecology Well ID Tag Number: N/A
Property Owner Name: MDLPS LLC
Property Owner Address: PO Box 902, Kent, WA 98035

Well Location:
Well Street Address: 4001 Pacific Ave
City, State, Zip: Tacoma, WA , 98418
County: Pierce
Township: 20N Range: 3E Section: 16 in the NE 1/4 of the SW 1/4



Well Head Elevation:
Elevation Datum:
Elevation Method:
Latitude (DD): Longitude (DD):
Datum:
Horizontal Coordinate Collection Method:
Tax parcel No.: 2415000420

Lithology

Layer: Describe by color, character, size of material and structure, and the kind and nature of the material in each layer penetrated, with at least one entry for each change of information.

From	To	Material
0 ft 0 in	8 ft 0 in	brown silty gravel
8 ft 0 in	13 ft 5 in	gray clay

Well Construction Certification: I constructed and/or accept responsibility for construction of this well and its compliance with all Washington well construction standards. Material used and information reported above are true to the best of my knowledge and belief.

Driller/Engineer/Trainee Printed Name: RICHARD BATES	Drilling Company: ESN NORTHWEST
Driller or trainee License Number: 3174	Address: 1210 EASTSIDE ST SUITE 200
If trainee, Driller's License Number: 2508	City, State, Zip: OLYMPIA, WA, 98503

File: Orig. & First Copy - Dept of Ecology
Second Copy - Owner; Third Copy - Driller

WATER WELL REPORT
State of Washington

Start Card No. A49313
Unique Well ID A49313
Water Right Permit No.

(1) OWNER: Name AMFAC DEVELOPMENT Address 34222 102ND AVE S. ROY WA 98580 Page 1 of

(2) LOCATION OF WELL: County PIERCE NE 1/4 NW 1/4 Sec 21 T 20 N R 3 E

(2a) STREET ADDRESS OF WELL (or nearest address) 5001 PACIFIC AVE TACOMA WA

(3) PROPOSED USE: DECOMMISSION

(4) Type of work: ABANDONED
Method: ROTARY

(5) DIMENSIONS: Diameter of well 6 inches.
Drilled 0 feet. Depth of completed well 242 ft.

(6) CONSTRUCTION DETAILS:
Casing instld: " Diam. from ft. to ft.
Welded _ " Diam. from ft. to ft.
Liner _ " Diam. from ft. to ft.
Threaded _

Perforations: Yes _ No X
Type of perforator used
Size of perforations in. by in.
perforations from ft. to in.
perforations from ft. to in.
perforations from ft. to in.

Screens: Yes _ No X
Manufacturer's Name
Type Model No
Diam Slot size from ft. to ft.
Diam Slot size from ft. to ft.

Gravel packed: Yes _ No X Size of gravel
Gravel placed from ft. to ft.

Surface seal: Yes _ No X To what depth? ft.
Material used in seal
Did any strata contain unusable water? Yes _ No X
Type of water? Depth of strata
Method of sealing strata off

(7) PUMP: Manufacturer's Name
Type H.P. 0

(8) WATER LEVELS: Surface elev above mean sea level ft.
Static level ft. below top of well Date
Artesian pressure lbs. per sq. in. Date
Artesian pressure is controlled by

(9) WELL TESTS: Pump test made? ___ By whom?
Yield 0 gal./min. with ft. drawdown after hrs
Yield 0 gal./min. with ft. drawdown after hrs
Yield 0 gal./min. with ft. drawdown after hrs
Recovery data:

Time	Wtr. Lvl.	Time	Wtr. Lvl.	Time	Wtr. Lvl.

Date of test
Bailer test 0 gal/min with ft. drawdown after hr
Airtest 0 gal/min with stem set at ft. for hrs
Artesian flow 0 gal/min Date
Temperature of water Was chemical analysis made? NO

(10) WELL LOG or DECOMMISSIONING PROCEDURE DESCRIPTION

Material	From	To
DECOMMISSIONED EXISTING 6" WELL PER WAC-173-160-381 (B) CUT 6" CASING AT 237, GROUT BENTONITE FROM 242 TO SURFACE.		

RECEIVED
SEP 29 2000
Washington State Department of Ecology

Work Started 06/28/2000 Completed 06/28/2000

WELL CONSTRUCTOR CERTIFICATION:
I constructed and/or accept responsibility for construction o this well, and its compliance with all Washington well construction standards. Materials used and the information reporte above are true to my best knowledge and belief.
Name RICHARDSON WELL DRILLING
Address P.O. Box 44427 Tacoma WA 98444

(Signed) Lic. No 2081
(Well Driller)

Contractor's Registration No. RICHAW*3210B Date 07/11/1
Based on form ECL 050-1-20 (2/93)**f-1329- by Speed Systems Cor

RESOURCE PROTECTION WELL REPORT

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

CURRENT
Notice of Intent No. S34259,

Construction/Decommission

[X] Construction 298340

[ ] Decommission *ORIGINAL INSTALLATION Notice of Intent Number* _____

Type of Well

[X] Resource Protection

[ ] Geotechnical Soil Boring

Property Owner: **Chevron # 21-1579**

Site Address: **601 S. 38th St.**

Consulting Firm: **CRA Conestoga-Rovers & Associates**

City: **Tacoma** County: **Pierce**

EWM

Unique Ecology Well ID
Tag No. _____

Location 1/4 **SW** 1/4 **NW** Sec **16** Town **20N** R **3E** or WWM

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

Lat/Long (s,t,r still Required) Lat Deg x Lat Min/Sec x Long Deg x Long Min/Sec x

[ ] Driller [X] Trainee Name (Print) **Curtis Askew**

Driller/Trainee Signature _____

Driller/Trainee License No. **2867T**

Tax Parcel No. _____

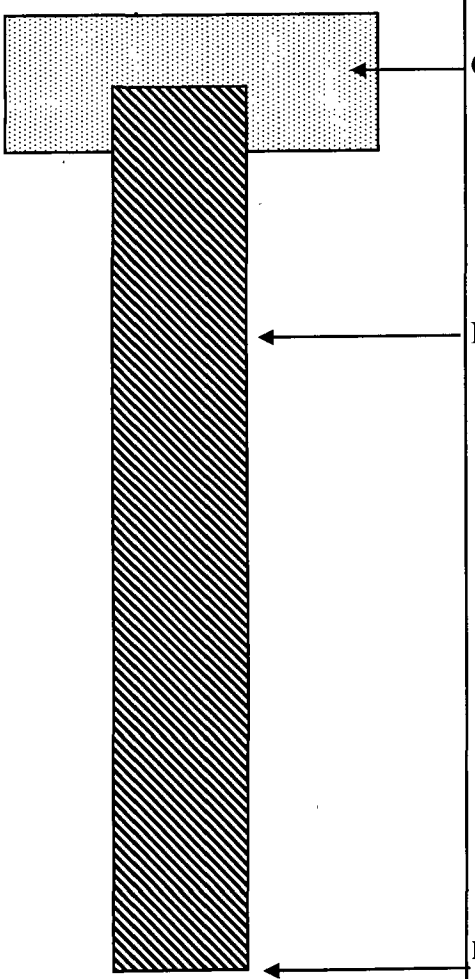
Cased or Uncased Diameter 8"/4 Static Level _____

If trainee, licesned drillers' Signature and License No. 2330

Work/Decommision Start Date **5/15/2008**

Work/Decommision Completed Date **5/15/2008**

Construction/Design — **Well Data** W08-352 — **Formation Description**



CONCRETE SURFACE SEAL — 5 FT

BACKFILL — 45 FT

Bent Chip

DEPTH OF BORING — 50' FT

0 - 50 FT: gravelly till w/ cobbles, hard drilling, brown

0 - FT

0 - FT

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JUN 02 2008
Washington State Department of Ecology

Scale 1" = _____

Page _____ of _____

ECY 050-12 (Rec=v 2/01)

RESOURCE PROTECTION WELL REPORT Notice of Intent No. SE45212

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

Construction/Decommission 450909 *("x" in circle)*

- X Construction
- ○ Decommission *Original Construction Notice of Intent Number* _____

Property Owner City of Tacoma

Unique Ecology Well ID Tag No. _____

Consulting Firm Landau Associates

Driller or Trainee Name Josh Brandt

Driller or Trainee Signature _____

Driller or Trainee License No 3073

If trainee, licensed driller's Signature and License no. _____

Type of Well *("x" in circle)*

- ○ Resource Protection
- X Geotech Soil Boring

Site Address 543rd St and SR 5 St

City Tacoma County: Pierce

Location SW 1/4- 1/4 NE 1/4 Sec 16 Twn 20 R 3 (EWM or WWM) *circle one*

Lat/Long (s, t, r still REQUIRED) Lat Deg _____ Lat Min/Sec _____ Long Deg _____ Long Min/Sec _____

Tax Parcel No. _____

Cased or Uncased Diameter 8" Static Level _____

Work/Decommission Start Date 4/30/12

Work/Decommission Completed Date 4/30/12

Construction/Design	Well Data	Formation Description
5 10 15 20	8" Bore Hole	Silty Sand

RECEIVED
MAY 09 2012
DEPT OF ECOLOGY
NWRO - WR

Scale 1"= 5'

Page _____ of _____

RESOURCE PROTECTION WELL REPORT Notice of Intent No. SE45212

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

Construction/Decommission 450909 *("x" in circle)*

- X Construction
- ○ Decommission *Original Construction Notice of Intent Number* _____

Property Owner City of Tacoma

Unique Ecology Well ID Tag No. _____

Consulting Firm Landau Associates

Driller or Trainee Name Josh Brandt

Driller or Trainee Signature _____

Driller or Trainee License No 3073

If trainee, licensed driller's Signature and License no. _____

Type of Well *("x" in circle)*

- ○ Resource Protection
- X Geotech Soil Boring

Site Address 543rd St and SR 5 St

City Tacoma County: Pierce

Location SW 1/4- 1/4 NE 1/4 Sec 16 Twn 20 R 3 (EWM or WWM) *circle one*

Lat/Long (s, t, r still REQUIRED) Lat Deg _____ Lat Min/Sec _____ Long Deg _____ Long Min/Sec _____

Tax Parcel No. _____

Cased or Uncased Diameter 8" Static Level _____

Work/Decommission Start Date 4/30/12

Work/Decommission Completed Date 4/30/12

Construction/Design	Well Data	Formation Description
5 10 15 20	8" Bore Hole	Silty Sand

RECEIVED
MAY 09 2012
DEPT OF ECOLOGY
NWRO - WR

Scale 1"= 5'

Page _____ of _____

436599

MONITORING WELL REPORT

Well ID# SOIL BORING
Start Card # AE 15322

(1) OWNER/PROJECT WELL NO.
Name El Comadre LLC
Address 4002 McKinley Ave
City Tacoma State WA Zip 98404

(2) TYPE OF WORK
☐ New construction ☐ Alteration (Repair/Recondition)
☐ Conversion ☐ Deepening ☒ Abandonment

(3) DRILLING METHOD
☐ Rotary Air ☐ Rotary Mud ☐ Cable
☒ Hollow Stem Auger ☐ Other

(4) BORE HOLE CONSTRUCTION:
Special Standards Yes ☐ No ☒ Depth of Completed Well 101.5 ft.

Vault
Special Standards
ft.
TO
ft.

Seal
ft.
TO
ft.

Filter pack:
ft.
TO
ft.

Water-tight cover
Surface flush vault
Locking cap
Casing diameter
Material
Welded ☐ Threaded ☐ Glued ☐

Well Seal:
Material Bentonite
Amount Chips
Grout weight

Borehole diameter:
in. from ft. to ft.
in. from ft. to ft.

Bentonite plug at least 3 ft. thick

Screen:
Material
From ft. to
Slot size in.

Filter pack:
Material
Size

(5) WELL TESTS:
☐ Pump ☐ Bailer ☐ Air ☐ Flowing Artesian
Permeability Yield GPM
Conductivity PH
Temperature of water OF/C Depth artesian flow found ft.
Was water analysis done? ☐ Yes ☐ No
By whom?
Depth of strata to be analyzed. From ft. to ft.
Remarks:

Name Of Supervising Geologist/Engineer Adapt Engineering, Inc

(6) LOCATION OF WELL By *legal description:*
County Pierce Latitude Longitude
Township 20N (N or S) Range 3E (E or W) Section 16
NE 1/4 of SW 1/4 of above section.
Street address of well location 4002 McKinley Ave Tacoma, WA 98404
Tax lot number of well location 7447001050

(7) STATIC WATER LEVEL:
Ft. below land surface. Date
Artesian Pressure lb/sq. in. Date

(8) WATER BEARING ZONES:
Depth at which water was first found

From	To	Est. Flow Rate	SWL

(9) WELL LOG:
Ground Elevation

Material	From	To	SWL
Back fill from bottom to top with bentonite chips	0	101.5	

RECEIVED
NOV 17 2011
WA State Department of Ecology (SWRO)

Date started 10/24/11 Completed 10/24/11

WELL CONSTRUCTION CERTIFICATION:
I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

Type or Print Name Matt Graham License No. 2671
Trainee Name License No.
Drilling Company Holocene Drilling Inc. License No. 2671
(Signed)
Address 11442 62nd Ave E. Puyallup, WA 98373
Registration No. HOLOCDI044KH Date 10/28/11

436245

ONITORING WELL REPORT

Well ID# SOIL BORING
Start Card # SE44025

(1) OWNER/PROJECT

WELL NO. _____
Name El Compadre LLC
Address 4002 Mckinley Ave
City Tacoma State WA Zip 98404

(2) TYPE OF WORK

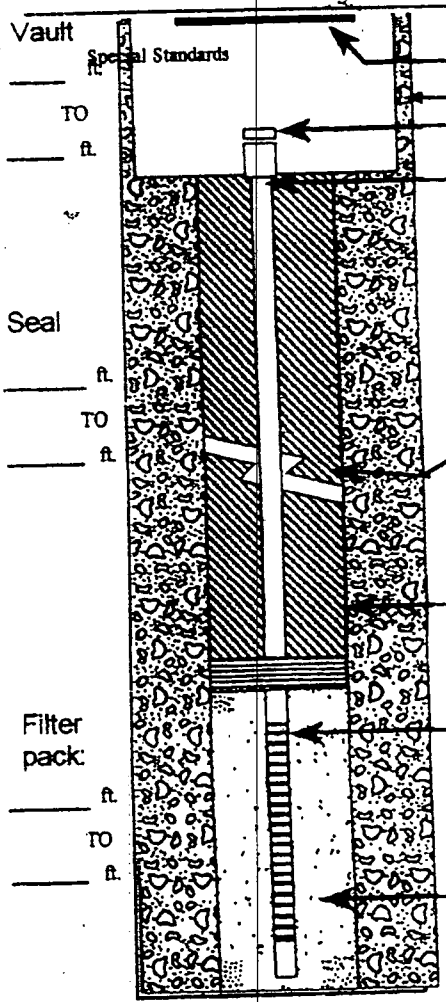
☒ New construction ☐ Alteration (Repair/Recondition)
☐ Conversion ☐ Deepening ☐ Abandonment

(3) DRILLING METHOD

☐ Rotary Air ☐ Rotary Mud ☐ Cable
☒ Hollow Stem Auger ☐ Other _____

(4) BORE HOLE CONSTRUCTION:

Special Standards Yes ☐ No ☒ Depth of Completed Well 101.5 ft.



Water-tight cover
Surface flush vault
Locking cap
Casing diameter
Material
Welded Threaded Glued

Well Seal:
Material
Amount
Grout weight

Borehole diameter:
in. from ft. to ft.
in. from ft. to ft.

Bentonite plug at least 3 ft. thick

Screen:
Material
From ft. to
Slot size in.

Filter pack:
Material
Size

(5) WELL TESTS:

☐ Pump ☐ Bailer ☐ Air ☐ Flowing Artesian
Permeability _____ Yield _____ GPM
Conductivity _____ PH _____
Temperature of water _____ °F/°C Depth artesian flow found _____ ft.
Was water analysis done? ☐ Yes ☐ No
By whom? _____
Depth of strata to be analyzed. From _____ ft. to _____ ft.
Remarks: _____
Name Of Supervising Geologist/Engineer Adept Engineering, Inc

(6) LOCATION OF WELL By *legal description:*

County Pierce Latitude _____ Longitude _____
Township 20N (N or S) Range 3E (E or W) Section 16
NE 1/4 of SW 1/4 of above section.
Street address of well location 4002 McKinley Ave
Tacoma, WA 98404
Tax lot number of well location 7470010520

(7) STATIC WATER LEVEL:

_____ Ft. below land surface. Date _____
Artesian Pressure _____ lb/sq. in. Date _____

(8) WATER BEARING ZONES:

Depth at which water was first found _____

From	To	Est. Flow Rate	SWL

(9) WELL LOG:

Ground Elevation _____

Material	From	To	SWL
Sand and gravel	0	101.5	

RECEIVED
NOV 17 2011
WA State Department of Ecology (SWRO)

Date started 10/24/11 Completed 10/24/11

WELL CONSTRUCTION CERTIFICATION:

I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

Type or Print Name Matt Graham License No. 2671
Trainee Name _____ License No. _____
Drilling Company Holocene Drilling Inc. License No. 2671
(Signed) _____
Address 11412 62nd Ave E. Puyallup, WA 98373
Registration No. HOLOCDI 044KH Date 10/28/11

File Original and First Copy with Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT
STATE OF WASHINGTON

Application No. .....
Permit No. .....

(1) OWNER: Name Gibson Nursury Address 5001 Pacific Ave. Tacoma, Wa. 98408

(2) LOCATION OF WELL: County Pierce — NE ¼ NW ¼ Sec 21 T. 20 N., R. 3E W.M.

Bearing and distance from section or subdivision corner

(3) PROPOSED USE: Domestic ☐ Industrial ☐ Municipal ☐
Irrigation ☒ Test Well ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one) 1
New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☐ Driven ☐
Reconditioned ☐ Rotary ☒ Jetted ☐

(5) DIMENSIONS: Diameter of well 6 inches.
Drilled 238 ft. Depth of completed well 235 ft.

(6) CONSTRUCTION DETAILS:
Casing installed: 6 " Diam. from 0 ft. to 235 ft.
Threaded ☐ " Diam. from ft. to ft.
Welded ☒ " Diam. from ft. to ft.

Perforations: Yes ☐ No ☒
Type of perforator used
SIZE of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

Screens: Yes ☐ No ☒
Manufacturer's Name
Type Model No
Diam. Slot size from ft. to ft.
Diam. Slot size from ft. to ft.

Gravel packed: Yes ☐ No ☒ Size of gravel:
Gravel placed from ft. to ft.

Surface seal: Yes ☒ No ☐ To what depth? 20 ft.
Material used in seal Bentonite
Did any strata contain unusable water? Yes ☐ No ☒
Type of water? Depth of strata
Method of sealing strata off

(7) PUMP: Manufacturer's Name Jacuzzi
Type: 2S4C H.P. 2

(8) WATER LEVELS: Land-surface elevation above mean sea level .... ft.
Static level 125 ft. below top of well Date 2/8/77
Artesian pressure lbs. per square inch Date
Artesian water is controlled by (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☒ If yes, by whom?
Yield: gal./min. with ft. drawdown after hrs.
" " " "
" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test
Bailer test 25 gal./min. with 40 ft. drawdown after 1 hrs.
Artesian flow g.p.m. Date
Temperature of water Was a chemical analysis made? Yes ☐ No ☒

(10) WELL LOG:

Formation: *Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.*

MATERIAL	FROM	TO
Clay, Sand & Gravel	0	44
Cemented Sand & Gravel	44	102
Sand, Gravel & Seapage	102	157
A little water, Sand & Gravel	157	177
Cemtemted Sand & Gravel	177	196
Clay & Gravel	196	218
Sand, Clay Gravel & Water	218	227
Gravel & Water	227	238

RECEIVED
JUL 14 1977
DEPARTMENT OF ECOLOGY
SOUTHWEST REGIONAL OFFICE

Work started 2/4, 19 77 Completed 2/8, 19 77

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME Richardson's Well Drilling
(Person, firm, or corporation) (Type or print)

Address P.O. Box 44408 Tacoma, Wa. 98444

[Signed] (Well Driller)

License No 223-02-6500 Date 7/7, 1977

(USE ADDITIONAL SHEETS IF NECESSARY)

ECY 060-1-20

Please print, sign and return to the Department of Ecology

RESOURCE PROTECTION WELL REPORT

CURRENT Notice of Intent No. SE03132

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

Construction/Decommission *("x" in box)*

☒ Construction 3187160

☐ Decommission

ORIGINAL INSTALLATION Notice of Intent Number:

Type of Well *("x in box)*

☒ Resource Protection

☐ Geotech Soil Boring

Property Owner Skippers

Site Address 4710 Pacific Avenue

Consulting Firm Sound Environmental Strategies

City Tacoma County Pierce

Unique Ecology Well IDTag No. JH-4-91908

Location SE1/4-1/4 SW1/4 Sec 16 Twn 20 R 03

EWM ☒ or WWM ☐

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

Lat/Long (s, t, r still REQUIRED) Lat Deg _____ Min _____ Sec _____

Long Deg _____ Min _____ Sec _____

☒ Driller ☐ Engineer ☐ Trainee

Name (Print Last, First Name) Harnden, Don

Driller/Engineer /Trainee Signature

Driller or Trainee License No. 2914

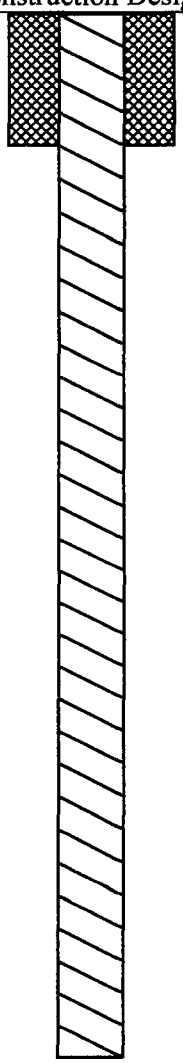
Tax Parcel No. 1200070272

Cased or Uncased Diameter 2" Static Level Dry

Work/Decommission Start Date 9/19/08

Work/Decommission Completed Date 9/19/08

If trainee, licensed driller's Signature and License Number:

Construction Design	Well Data	Formation Description
	Surface Seal: Asphalt Drilling Method: D. P. Boring Diameter: 2" Backfill: ~~Silty Sand~~ Bentonite Chips Boring Depth: 7'	0-7' Silty Sand

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OCT 0 9 2008

Washington State Department of Ecology

SCALE: 1"= N/a PAGE 4 OF 4

ECY 050-12 (Rev. 7/06)

Ecology is an Equal Opportunity

Please print, sign and return to the Department of Ecology

RESOURCE PROTECTION WELL REPORT

CURRENT Notice of Intent No. SE 03132

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

Construction/Decommission *("x" in box)*

☒ Construction
☐ Decommission 318757

ORIGINAL INSTALLATION Notice of Intent Number:

Type of Well *("x in box)*

☒ Resource Protection
☐ Geotech Soil Boring

Property Owner Skippers

Site Address 4710 Pacific Avenue

Consulting Firm Sound Environmental Strategies

City Tacoma County Pierce

Unique Ecology Well IDTag No. DH-1-91908

Location SE1/4-1/4 SW1/4 Sec 16 Twn 20 R 03

EWM ☒ or WWM ☐

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

Lat/Long (s, t, r still REQUIRED) Lat Deg _____ Min _____ Sec _____

Long Deg _____ Min _____ Sec _____

Tax Parcel No. 1200070272

☒ Driller ☐ Engineer ☐ Trainee

Name (Print Last, First Name) Harnden, Don

Driller/Engineer /Trainee Signature

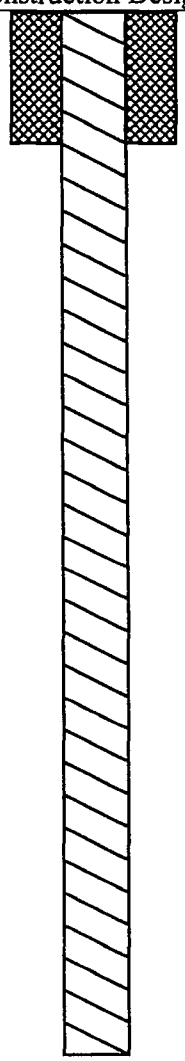
Driller or Trainee License No. 2914

Cased or Uncased Diameter 2" Static Level Dry

Work/Decommission Start Date 9/19/08

Work/Decommission Completed Date 9/19/08

If trainee, licensed driller's Signature and License Number:

Construction Design	Well Data	Formation Description
	Surface Seal: Asphalt Drilling Method: D.P. Boring Diameter: 2" Backfill: Bentonite Chips Boring Depth: 12'	0-8' med Sand (Fill) 8-12 Silty Sand

RECEIVED
OCT 0 9 2008
Washington State Department of Ecology

SCALE: 1"= n/a PAGE 1 OF 4

ECY 050-12 (Rev. 7/06)

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RESOURCE PROTECTION WELL REPORT

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

CURRENT Notice of Intent No. 524924

x2

Construction/Decommission *("x" in circle)*

(X) Construction

( ) Decommission *ORIGINAL INSTALLATION Notice of Intent Number* 177649

Consulting Firm Sound Environmental

Unique Ecology Well ID

Tag No: —

Type of Well *("x" in circle)*

(X) Resource Protection

( ) Geotech Soil Boring

Property Owner Skippers

Site Address 4710 Pacific AVE S.

City Tacoma County: Pierce

Location SE 1/4 SW 1/4 Sec 16 Twn 20N R 3E EWM or WWM *circle one*

Lat/Long (s, t, r still REQUIRED) Lat Deg ____ Lat Min/Sec ____ Long Deg ____ Long Min/Sec ____

Tax Parcel No. ~

Cased or Uncased Diameter 2" Static Level ~

Work/Decommission Start Date 8/4/05

Work/Decommission Completed Date 8/4/05

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

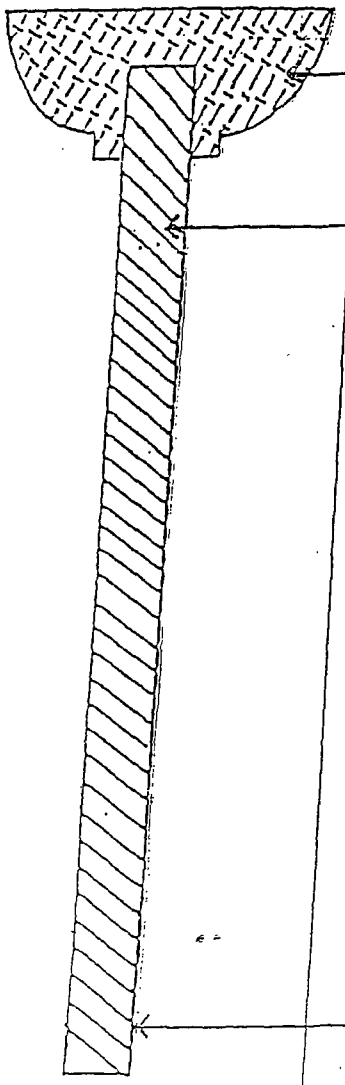
(X) Driller ( ) Engineer ( ) Trainee Name (Print) Kasey Goble

Driller/Engineer/Trainee Signature [signature]

Driller or Trainee License No. 2501

If trainee, licensed driller's Signature and License no. /

Construction/Design — Well Data WOG-444 — Formation Description



CONCRETE SURFACE SEAL

BACKFILL Bentonite chips

DEPTH OF BORING 12'0"

0 - 12 ft.

Light Brown Clay with Gravel

— ft.

— ft.

RECEIVED

AUG 19 2005

Washington State Department of Ecology

ECY 050-12 (Rev 2/01)

RESOURCE PROTECTION WELL REPORT

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

CURRENT Notice of Intent No. S24924

Construction/Decommission *("x" in circle)*

(X) Construction

( ) Decommission *ORIGINAL INSTALLATION Notice of Intent Number* 177654

Consulting Firm Sound Environmental

Unique Ecology Well ID

Tag No: —

X2

Type of Well *("x" in circle)*

(X) Resource Protection

( ) Geotech Soil Boring

Property Owner Skippers

Site Address 4710 Pacific AVE S.

City Tacoma County: Pierce

Location SE 1/4 SW 1/4 Sec 16 Twn 20N R 3E EWM or WWM *circle one*

Lat/Long (s, t, r still REQUIRED) Lat Deg — Lat Min/Sec —

Long Deg — Long Min/Sec —

Tax Parcel No. ~

Cased or Uncased Diameter 2" Static Level ~

Work/Decommission Start Date 8/4/05

Work/Decommission Completed Date 8/4/05

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

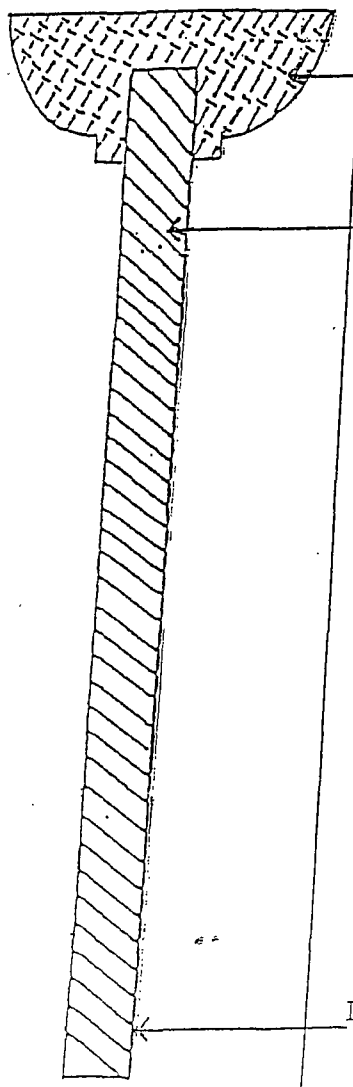
(X) Driller ( ) Engineer ( ) Trainee Name (Print) Kasey Cobble

Driller/Engineer/Trainee Signature

Driller or Trainee License No. 2501

If trainee, licensed driller's Signature and License no. /

Construction/Design — Well Data WCS-444 — Formation Description



CONCRETE SURFACE SEAL

BACKFILL Bentonite Chips

DEPTH OF BORING 14.0 ft.

0 - 14 ft. Light Brown CLAY with Gravel

— ft.

— ft.

RECEIVED

AUG 19 2005

Washington State Department of Ecology

Scale 1"=

ECY 050-12 (Rev 2/01)

Please print, sign and return to the Department of Ecology

RESOURCE PROTECTION WELL REPORT

CURRENT Notice of Intent No. AE07197

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

Construction/Decommission *("x" in box)*

☐ Construction

☒ Decommission 3187162

ORIGINAL INSTALLATION Notice of Intent Number: SE03132

Type of Well *("x in box)*

☒ Resource Protection

☐ Geotech Soil Boring

Property Owner Skippers

Site Address 4710 Pacific Avenue

Consulting Firm Sound Environmental Strategies

City Tacoma County Pierce

Unique Ecology Well IDTag No. DHZ-91908

Location SE1/4-1/4 SW1/4 Sec 16 Twn 20 R 03

EWM ☒ or WWM ☐

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

Lat/Long (s, t, r still REQUIRED) Lat Deg _____ Min _____ Sec _____

Long Deg _____ Min _____ Sec _____

Tax Parcel No. 1200070272

☒ Driller ☐ Engineer ☐ Trainee

Name (Print Last, First Name) Harnden, Don

Driller/Engineer /Trainee Signature _____

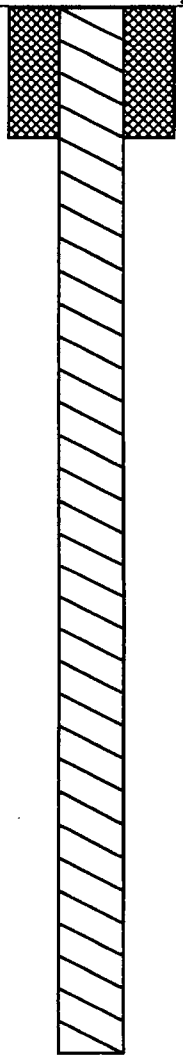
Driller or Trainee License No. 2914

Cased or Uncased Diameter 2" Static Level Dry

Work/Decommission Start Date 9/19/08

Work/Decommission Completed Date 9/19/08

If trainee, licensed driller's Signature and License Number:

Construction Design	Well Data	Formation Description
	Surface Seal: Asphalt Drilling Method: D.P. Boring Diameter: 2" Backfill: Bentonite Chips Boring Depth: 15'	0-8 not observed 8-15' silty sand

RECEIVED

OCT 09 2008

Washington State Department of Ecology

SCALE: 1"= N/A PAGE 2 OF 4

RESOURCE PROTECTION WELL REPORT

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

CURRENT Notice of Intent No. E 00 5980

Construction/Decommission *("x" in circle)*

(X) Construction
( ) Decommission *ORIGINAL INSTALLATION Notice of Intent Number* 177655

X2

Type of Well *("x" in circle)*

(X) Resource Protection
( ) Geotech Soil Boring

Consulting Firm Sound Environmental

Property Owner Skippers

Site Address 4710 Pacific AVE S.

Unique Ecology Well ID
Tag No: —

City Tacoma County: Pierce

Location SE 1/4 SW 1/4 Sec 10 Twn 20N R 3E E W WWM *circle one*

Lat/Long (s, t, r still REQUIRED) Lat Deg ____ Lat Min/Sec ____ Long Deg ____ Long Min/Sec ____

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

(X) Driller ( ) Engineer ( ) Trainee Name (Print) Kasey Goble

Driller/Engineer/Trainee Signature [signature]

Driller or Trainee License No. 2501

Tax Parcel No. —

Cased or Uncased Diameter 2" Static Level —

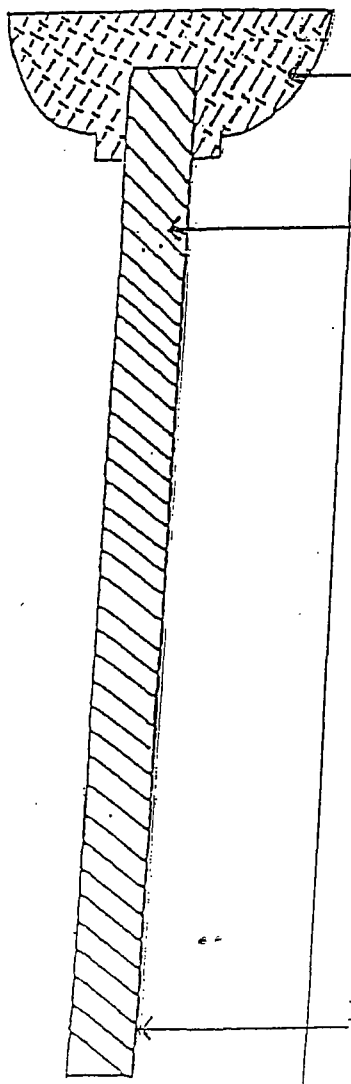
Work/Decommission Start Date 8/4/05

Work/Decommission Completed Date 8/4/05

If trainee, licensed driller's Signature and License no. —

Well Data W05-444

Construction/Design



Formation Description

0 - 17 ft.
light Brown CLAY with GRAVEL

— ft.

— ft.

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Washington State Department of Ecology

Scale 1"= ____

ECY 050-12 (Rev 2/01)

Please print, sign and return to the Department of Ecology

RESOURCE PROTECTION WELL REPORT

CURRENT Notice of Intent No. SE0332

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

Construction/Decommission *("x" in box)*

☒ Construction 318758

☐ Decommission

ORIGINAL INSTALLATION Notice of Intent Number:

Type of Well *("x in box)*

☒ Resource Protection

☐ Geotech Soil Boring

Property Owner Skippers

Site Address 4710 Pacific Avenue

Consulting Firm Sound Environmental Strategies

City Tacoma County Pierce

Unique Ecology Well IDTag No. DHZ-91908

Location SE1/4-1/4 SW1/4 Sec 16 Twn 20 R 03

EWM ☒ or WWM ☐

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

Lat/Long (s, t, r still REQUIRED) Lat Deg _____ Min _____ Sec _____

Long Deg _____ Min _____ Sec _____

☒ Driller ☐ Engineer ☐ Trainee

Name (Print Last, First Name) Harnden, Don

Driller/Engineer /Trainee Signature

Driller or Trainee License No. 2914

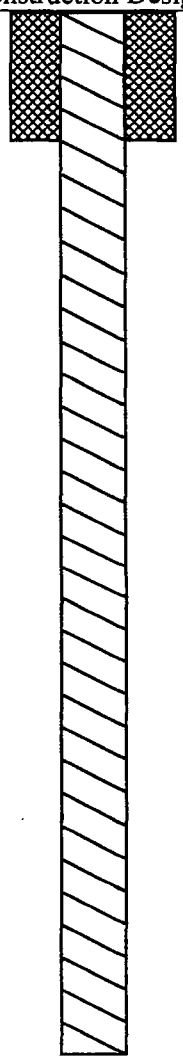
Tax Parcel No. 1200070272

Cased or Uncased Diameter 2" Static Level Dry

Work/Decommission Start Date 9/19/08

Work/Decommission Completed Date 9/19/08

If trainee, licensed driller's Signature and License Number:

Construction Design	Well Data	Formation Description
	Surface Seal: Asphalt Drilling Method: D.P. Boring Diameter: 2" Backfill: Bentonite Chips Boring Depth: 15'	0-8 not observed 8-15' Silty Sand

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Washington State Department of Ecology

SCALE: 1"= N/A PAGE 2 OF 4

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RESOURCE PROTECTION WELL REPORT

CURRENT Notice of Intent No. SE52006

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

Construction/Decommission *("x" in box)*

☒ Construction

☐ Decommission

ORIGINAL INSTALLATION Notice of Intent Number:

Consulting Firm

Unique Ecology Well IDTag No. BLS

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

Driller ☐ Engineer ☒ Trainee

Name (Print Last, First Name) Newman, Casey

Driller/Engineer /Trainee Signature Casey Newman

Driller or Trainee License No. 3152T

Trainee, licensed driller's Signature and License Number:

Jami Harndin 2508

Type of Well *("x in box)*

☒ Resource Protection

☐ Geotech Soil Boring

Property Owner Tacoma Sch Dist 10

Site Address 5010 Pacific Ave

City Tacoma County Pierce

Location NE1/4-1/4 NW1/4 Sec 21 Twn 20 R 03

EWM ☒ or WWM ☐

Lat/Long (s, t, r still REQUIRED) Lat Deg ____ Min ____ Sec ____

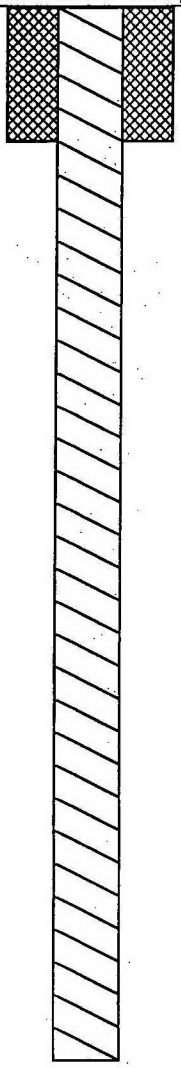
Long Deg ____ Min ____ Sec ____

Tax Parcel No. 0320212004

Cased or Uncased Diameter 2.25" Static Level 12'

Work/Decommission Start Date 07/10/2014

Work/Decommission Completed Date 07/10/2014

Construction Design	Well Data	Formation Description
	Surface Seal: ASPHALT Drilling Method: DIRECT PUSH Boring Diameter: 2.25" Backfill: BENTONITE Boring Depth: 15'	0-5' GRAVELLY BROWN SANDS 5-12' BROWN SANDS WITH PEBBLES. 12-15' GRAVELLY BROWN SILTY SANDS

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SCALE: 1"= ____ PAGE 4 OF 9

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RESOURCE PROTECTION WELL REPORT

CURRENT Notice of Intent No. SE52006

SUBMIT ONE WELL REPORT PER WELL INSTALLED)

Construction/Decommission *("x" in box)*

☒ Construction

☐ Decommission

ORIGINAL INSTALLATION Notice of Intent Number:

Consulting Firm

Unique Ecology Well IDTag No. BB

Type of Well *("x in box)*

☒ Resource Protection

☐ Geotech Soil Boring

Property Owner Tacoma Sch Dist 10

Site Address 5010 Pacific Ave

City Tacoma County Pierce

Location NE1/4-1/4 NW1/4 Sec 21 Twn 20 R 03

EWM ☒ or WWM ☐

Lat/Long (s, t, r still REQUIRED) Lat Deg ____ Min ____ Sec ____

Long Deg ____ Min ____ Sec ____

Tax Parcel No. 0320212004

Cased or Uncased Diameter 2.25" Static Level —

Work/Decommission Start Date 07/10/2014

Work/Decommission Completed Date 07/10/2014

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

☐ Driller ☐ Engineer ☒ Trainee

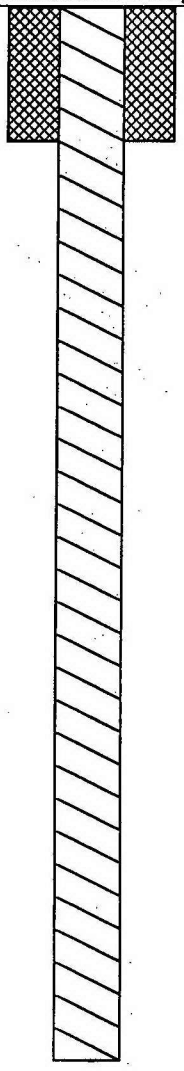
Name (Print Last, First Name) Newman, Casey

Driller/Engineer /Trainee Signature Casey Newman

Driller or Trainee License No. 3152T

Trainee, licensed driller's Signature and License Number:

Casey Newman 2508

Construction Design	Well Data	Formation Description
	Surface Seal: GROUT Drilling Method: DIRECT PUSH Boring Diameter: 2.25" Backfill: BENTONITE Boring Depth: 10'	0 TO 10' DENSE BROWN SILT

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AUG 04 2014
WA State Department of Ecology (SWRO)

SCALE: 1"= ____ PAGE 6 OF 9

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RESOURCE PROTECTION WELL REPORT

CURRENT Notice of Intent No. SE52006

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

Construction/Decommission *("x" in box)*

☒ Construction

☐ Decommission

ORIGINAL INSTALLATION Notice of Intent Number:

Type of Well *("x in box)*

☒ Resource Protection

☐ Geotech Soil Boring

Property Owner Tacoma Sch Dist 10

Site Address 5010 Pacific Ave

Consulting Firm

City Tacoma County Pierce

Unique Ecology Well IDTag No. B10A

Location NE1/4-1/4 NW1/4 Sec 21 Twn 20 R 03

EWM ☒ or WWM ☐

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

Lat/Long (s, t, r still REQUIRED) Lat Deg ____ Min ____ Sec ____

Long Deg ____ Min ____ Sec ____

Driller ☐ Engineer ☒ Trainee

Name (Print Last, First Name) Newman, Casey

Driller/Engineer /Trainee Signature Casey Newman

Driller or Trainee License No. 3152T

Tax Parcel No. 0320212004

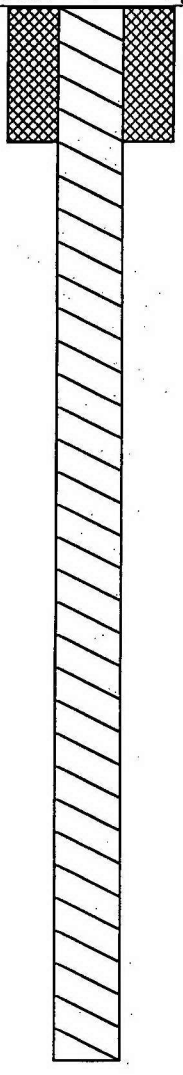
Cased or Uncased Diameter 2.25" Static Level ____

Work/Decommission Start Date 07/10/2014

Work/Decommission Completed Date 07/10/2014

Trainee, licensed driller's Signature and License Number:

Anna Harnden 2508

Construction Design	Well Data	Formation Description
	Surface Seal: Grass Drilling Method: Direct Push Boring Diameter: 2.25" Backfill: Bentonite Boring Depth: 12'	0-8' Brown Silt Sands 8'-12' Dense Gray Sandy Silt

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SCALE: 1"= ____ PAGE 8 OF 9

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RESOURCE PROTECTION WELL REPORT

CURRENT Notice of Intent No. SE52006

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

Construction/Decommission *("x" in box)*

☒ Construction

☐ Decommission

ORIGINAL INSTALLATION Notice of Intent Number:

Type of Well *("x in box)*

☒ Resource Protection

☐ Geotech Soil Boring

Consulting Firm

Unique Ecology Well IDTag No. B14

Property Owner Tacoma Sch Dist 10

Site Address 5010 Pacific Ave

City Tacoma County Pierce

Location NE1/4-1/4 NW1/4 Sec 21 Twn 20 R 03

EWM ☒ or WWM ☐

Lat/Long (s, t, r still REQUIRED) Lat Deg ____ Min ____ Sec ____

Long Deg ____ Min ____ Sec ____

Tax Parcel No. 0320212004

Cased or Uncased Diameter 2.25" Static Level —

Work/Decommission Start Date 07/10/2014

Work/Decommission Completed Date 07/10/2014

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

☐ Driller ☐ Engineer ☒ Trainee

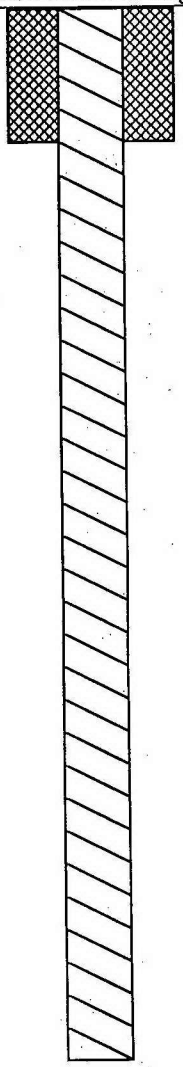
Name (Print Last, First Name) Newman, Casey

Driller/Engineer /Trainee Signature Casey Newman

Driller or Trainee License No. 3152T

Trainee, licensed driller's Signature and License Number:

Anna Harnden 2508

Construction Design	Well Data	Formation Description
	Surface Seal: ASPHALT Drilling Method: DIRECT PUSH Boring Diameter: 2.25" Backfill: BENTONITE Boring Depth: 15'	0-5' GRAVELLY BROWN SANDS 5-8' DENSE GRAVELLY BROWN SANDS 8-15' HARD GRAVELLY BROWN SANDS

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SCALE: 1"= ____ PAGE 1 OF 9

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RESOURCE PROTECTION WELL REPORT

CURRENT Notice of Intent No. SE52006

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

Construction/Decommission *("x" in box)*

☒ Construction

☐ Decommission

ORIGINAL INSTALLATION Notice of Intent Number:

Consulting Firm

Unique Ecology Well IDTag No. BTZ

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

Driller ☐ Engineer ☒ Trainee

Name (Print Last, First Name) Newman, Casey

Driller/Engineer /Trainee Signature Casey Newman

Driller or Trainee License No. 3152T

Trainee, licensed driller's Signature and License Number:
Amie Harndin 2508

Type of Well *("x in box)*

☒ Resource Protection

☐ Geotech Soil Boring

Property Owner Tacoma Sch Dist 10

Site Address 5010 Pacific Ave

City Tacoma County Pierce

Location NE1/4-1/4 NW1/4 Sec 21 Twn 20 R 03

EWM ☒ or WWM ☐

Lat/Long (s, t, r still REQUIRED) Lat Deg ____ Min ____ Sec ____

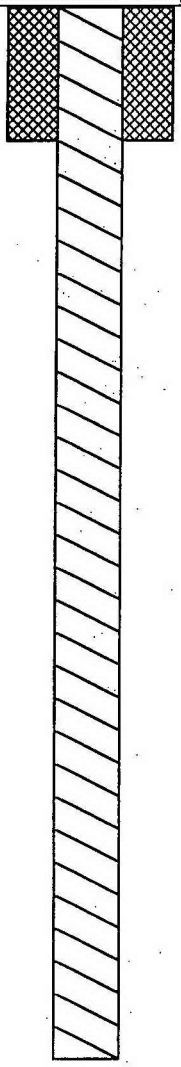
Long Deg ____ Min ____ Sec ____

Tax Parcel No. 0320212004

Cased or Uncased Diameter 2.25" Static Level ____

Work/Decommission Start Date 07/10/2014

Work/Decommission Completed Date 07/10/2014

Construction Design	Well Data	Formation Description
	Surface Seal: ASPHALT Drilling Method: DIRECT PUSH Boring Diameter: 2.25" Backfill: BENTONITE Boring Depth: 15'	0-5' GRAVELLY BROWN SANDS 5-8' DENSE GRAVELLY BROWN SANDS 8-15' HARD BROWN SANDS WITH COBBLES.

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SCALE: 1"= ____ PAGE 9 OF 9

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RESOURCE PROTECTION WELL REPORT

CURRENT Notice of Intent No. AE27656

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

Construction/Decommission *("x" in box)*

☐ Construction

☒ Decommission

ORIGINAL INSTALLATION Notice of Intent Number: AE52006

Consulting Firm _____

Unique Ecology Well IDTag No. _____ BJ2

Type of Well *("x in box)*

☒ Resource Protection

☐ Geotech Soil Boring

Property Owner Tacoma Sch Dist 10

Site Address 5010 Pacific Ave

City Tacoma County Pierce

Location NE1/4-1/4 NW1/4 Sec 21 Twn 20 R 03

EWM ☒ or WWM ☐

Lat/Long (s, t, r still REQUIRED) Lat Deg _____ Min _____ Sec _____

Long Deg _____ Min _____ Sec _____

Tax Parcel No. 0320212004

Cased or Uncased Diameter 2.25" Static Level _____

Work/Decommission Start Date 07/10/2014

Work/Decommission Completed Date 07/10/2014

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

☐ Driller ☐ Engineer ☒ Trainee

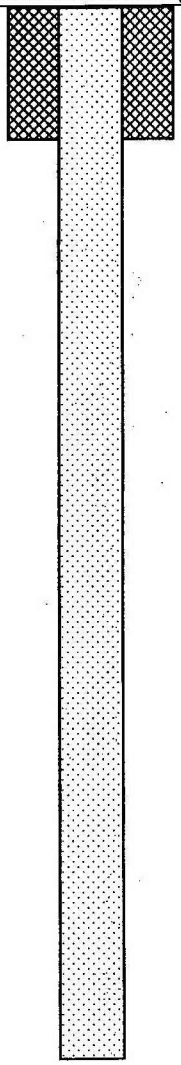
Name (Print Last, First Name) Newman, Casey

Driller/Engineer /Trainee Signature Casey Newman

Driller or Trainee License No. 3152T

Trainee, licensed driller's Signature and License Number:

Chris Hamden 2508

Construction Design	Well Data	Formation Description
	Boring Diameter: 2.25" Removed all rods from boring and backfilled with bentonite Boring Depth: 15'	RECEIVED AUG 04 2014 WA State Department of Ecology (SWRO)

SCALE: 1"= ____ PAGE 3 OF 9

ECY 050-12 (Rev. 7/06)

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ONITORING WELL REPORT

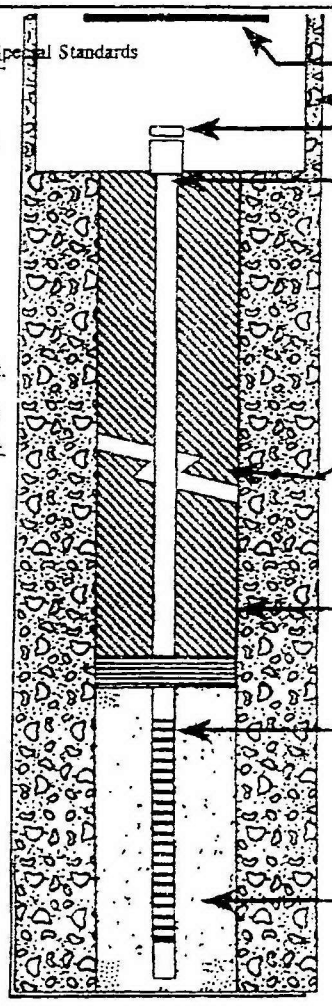
Well ID# Soil Boring
State Card # SE01534 0/AE26974

OWNER/PROJECT Tacoma Public Schools WELL NO.
Address PO Box 1357
Tacoma State WA Zip 98401

TYPE OF WORK
☒ New construction ☐ Alteration (Repair/Recondition)
☐ Conversion ☐ Deepening ☐ Abandonment

DRILLING METHOD
☐ Rotary Air ☐ Rotary Mud ☐ Cable
☒ Hollow Stem Auger ☐ Other

BORE HOLE CONSTRUCTION:
Special Standards Yes No ☐ ☒ Depth of Completed Well 21.5 ft.



(5) LOCATION OF WELL By *legal description:*
County Pierce Latitude Longitude
Township 20N (N or S) Range 3E (E or W) Section 21
NW 1/4 of NE 1/4 of above section.
Street address of well location
Tax lot number of well location

(7) STATIC WATER LEVEL:
ft. below land surface. Date
Artesian Pressure lb/sq. in. Date

(8) WATER BEARING ZONES:
Depth at which water was first found

From	To	Est. Flow Rate	SWL

(9) WELL LOG:
Ground Elevation

Material	From	To	SWL
Sand & gravel	0	21.5	
Backfilled from Bottom to top with Bentonite Chips	0	21.5	

Date started 6/23/2014 Completed 6/23/2014

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WELL CONSTRUCTION CERTIFICATION:
I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief
Type or Print Name Matt Graham License No. 2671
Trainee Name License No
Drilling Company Holocene Drilling Inc.
(Signed) License No 2671
Address 11412 62nd Ave E. Puyallup, WA 98373
Registration No HOLOCDI044KH Date 7/31/2014

TEST TESTS:
Pump ☐ Bailer ☐ Air ☐ Flowing Artesian
Pumpability Yield GPM
Productivity PH
Temperature of water OF/C Depth artesian flow found ft.
Water analysis done? ☐ Yes ☐ No
By whom?
Depth of strata to be analyzed From ft. to ft.
Remarks:
Name Of Supervising Geologist/Engineer Geo Engineers

ONITORING WELL REPORT

Well ID# Soil Boring
State Card # SE51534 0/AE26974

OWNER/PROJECT WELL NO.
Tacoma Public Schools
ss PO Box 1357
Tacoma State WA Zip 98401

TYPE OF WORK
☐ New construction ☐ Alteration (Repair/Recondition)
☐ Conversion ☐ Deepening ☒ Abandonment

DRILLING METHOD
☐ Rotary Air ☐ Rotary Mud ☐ Cable
☒ Hollow Stem Auger ☐ Other

ORE HOLE CONSTRUCTION:
Special Standards Yes No
Standards ☐ ☒ Depth of Completed Well 31.5 ft.

ult
Special Standards
TO ft.
ft.
TO ft.
ft.
TO ft.
ft.

Water-tight cover
Surface flush vault
Locking cap
Casing diameter
Material
Welded Threaded Glued ☐ ☐ ☐

Well Seal:
Material Bentonite
Amount Chips
Grout weight

Borehole diameter:
9 in. from ft. to All ft.
in. from ft. to ft.

Bentonite plug at least 3 ft. thick

Screen:
Material
From ft. to
Slot size in.

Filter pack:
Material
Size

(6) LOCATION OF WELL By *legal description:*
County Pierce Latitude Longitude
Township 20N (N or S) Range 3E (E or W) Section 21
NW 1/4 of NE 1/4 of above section.
Street address of well location
Tax lot number of well location

(7) STATIC WATER LEVEL:
ft. below land surface. Date
Artesian Pressure lb/sq. in. Date

(8) WATER BEARING ZONES:
Depth at which water was first found

From	To	Est. Flow Rate	SWL

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(9) WELL LOG:
Ground Elevation

Material	From	To	SWL
Sand & gravel	0	31.5	
Backfilled from Bottom to top with Bentonite Chips	0	31.5	

Date started 5/23/2014 Completed 5/23/2014

WELL CONSTRUCTION CERTIFICATION:
I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

Type or Print Name Matt Graham License No. 2671
Trainee Name License No.
Drilling Company Holocene Drilling Inc.
(Signed) License No. 2671
Address 11412 62nd Ave E. Puyallup, WA 98373
Registration No. HOLOCDI044KH Date 7/31/2014

ELL TESTS:
Pump ☐ Bailer ☐ Air ☐ Flowing Artesian
neability Yield GPM
ductivity PH
perature of water OF/C Depth artesian flow found ft.
water analysis done? ☐ Yes ☐ No
whom?
th of strata to be analyzed From ft. to ft.
arks:

e Of Supervising Geologist/Engineer Geo Engineers

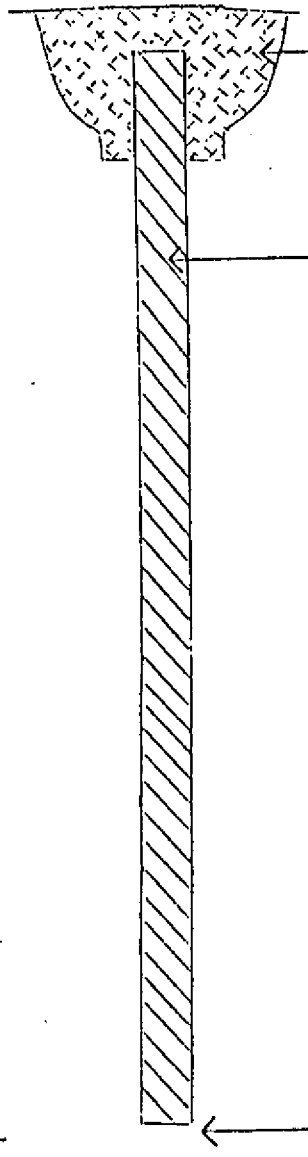
RESOURCE PROTECTION WELL REPORT

START CARD NO. A28367

PROJECT NAME: TEXACO HALLIDAY'S AUTO REPAIR
WELL IDENTIFICATION NO. N/a
DRILLING METHOD: HSA
DRILLER: BRENT C. MALOY
FIRM: Cascade Drilling, Inc.
SIGNATURE:
CONSULTING FIRM: Texaco
REPRESENTATIVE: Theresa Geiger

COUNTY: PIERCE
LOCATION: SW¼ NW¼ Sec 16 Twn 20N R 3E
STREET ADDRESS OF WELL: 601 South 38th St, Tacoma, WA
WATER LEVEL ELEVATION: N/A
GROUND SURFACE ELEVATION: N/A
INSTALLED: 3-13-97
DEVELOPED:

7110

AS-BUILT	WELL DATA	FORMATION DESCRIPTION
	CONCRETE SURFACE SEAL 2'	0 - 1 ft. SANDY / GRAVEL BASE
	BACKFILL BENT CHIPS	1 - 9 ft. DENSE SANDY GRAVEL
		9 - 20 ft. SANDY / GRAVEL / CLAY
	DEPTH OF BORING 20'	

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'97 APR 21 A9:05
WASHINGTON STATE DEPARTMENT OF ECOLOGY
S.W. REGIONAL OFFICE

SCALE: 1" = _____ PAGE _____ OF _____

ECY 050-12 (Rev. 11/99)

RESOURCE PROTECTION WELL REPORT

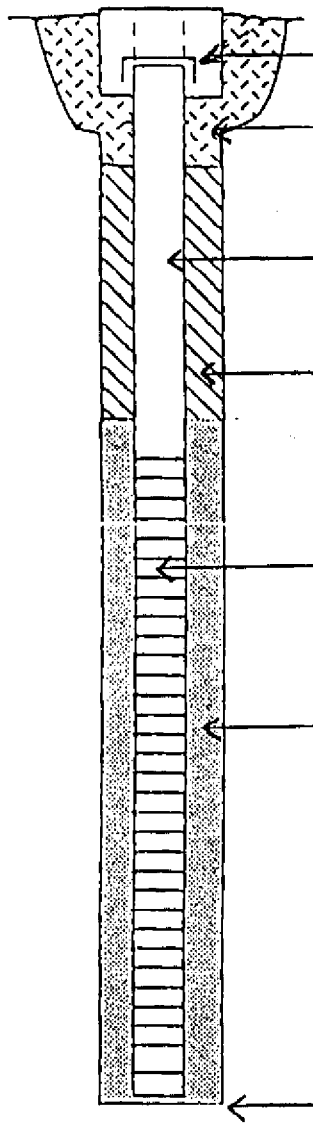
START CARD NO. R28697

PROJECT NAME: HALLADAY AUTO REPAIR (TEXACO)
WELL IDENTIFICATION NO. AEB 458
DRILLING METHOD: HSA
DRILLER: Michael Colbert
FIRM: Cascade Drilling, Inc.
SIGNATURE: Michael Colbert
CONSULTING FIRM: GeoEngineers, Inc.
REPRESENTATIVE: Carla Woodworth

COUNTY: PIERCE
LOCATION: SW¼ NW¼ Sec 16 Twn 20N R 3E
STREET ADDRESS OF WELL: 601 S. 38th St - Tacoma, WA
WATER LEVEL ELEVATION:
GROUND SURFACE ELEVATION: N/A
INSTALLED: 4/11/98
DEVELOPED: NO

8157

AS-BUILT



WELL DATA

WELL COVER
CONCRETE SURFACE SEAL
DEPTH = 1/ft
2'
PVC BLANK 4 "x 10'
BACKFILL 6 ft.
TYPE: BENT CHIPS
PVC SCREEN 4 "x 15'
SLOT SIZE: 010
GRAVEL PACK 17 ft.
MATERIAL: 2/12 SAND
WELL DEPTH 25' "

FORMATION DESCRIPTION

0 - 5 ft.
FILL MATERIAL

5 - 15 ft.
GRAVELY TILL

15 - 25 ft.
DENSE SANDY TILL WITH SOME GRAVELS

RECEIVED
'98 MAY 11 AM 10:10

SCALE: 1" = _____ PAGE _____ OF _____

ECY 050-12 (Rev. 11/89)

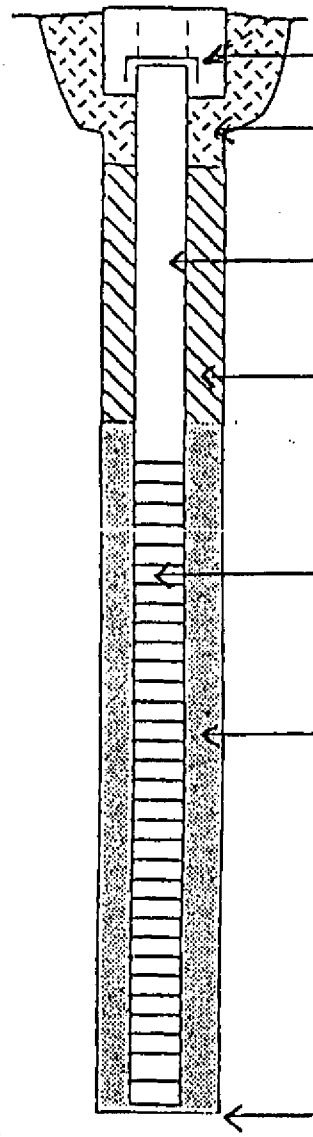
RESOURCE PROTECTION WELL REPORT

START CARD NO. R28697

PROJECT NAME: (TEXACO) HALLADAY AUTO REPAIR
WELL IDENTIFICATION NO. AEB 462
DRILLING METHOD: HSA
DRILLER: Michael Colbert
FIRM: Cascade Drilling, Inc.
SIGNATURE: Michael Colbert
CONSULTING FIRM: GeoEngineers, Inc.
REPRESENTATIVE: Carla Woodworth

COUNTY: PIERCE
LOCATION: SW¼ NW¼ Sec 16 Twn 20N R 3E
STREET ADDRESS OF WELL: 601 S. 38th St - Tacoma, WA
WATER LEVEL ELEVATION:
GROUND SURFACE ELEVATION: N/A
INSTALLED: 4/11/98
DEVELOPED: NO

8157

AS-BUILT	WELL DATA	FORMATION DESCRIPTION
	WELL COVER CONCRETE SURFACE SEAL DEPTH = 1/ft 2' PVC BLANK 4 "x 10' BACKFILL 6 ft. TYPE: BENT CHIPS PVC SCREEN 4 "x 15' SLOT SIZE: 010 GRAVEL PACK 17 ft. MATERIAL: 2/12 SAND WELL DEPTH 25' "	0 - 5 ft. FILL MATERIAL 5 - 15 ft. GRAVELY TILL 15 - 25 ft. DENSE SANDY TILL WITH SOME GRAVELS

SCALE: 1" = _____ PAGE _____ OF _____

ECY 050-12 (Rev. 11/09)

RESOURCE PROTECTION WELL REPORT

START CARD NO. R28697

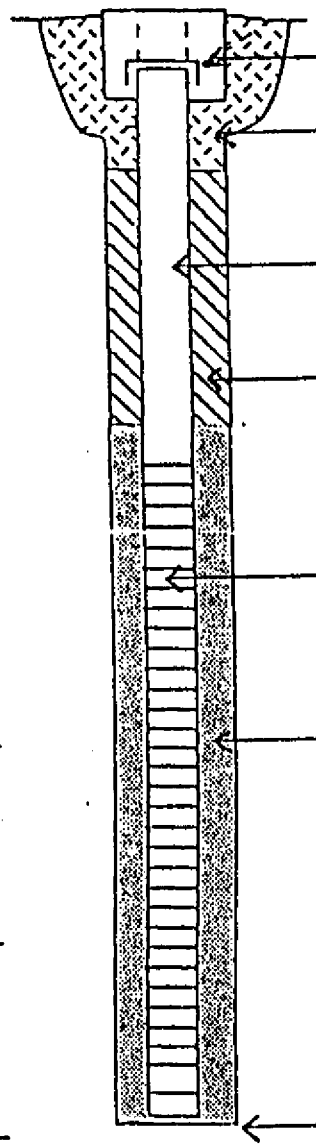
(TEXACO)

PROJECT NAME: HALLAYDAY AUTO REPAIR
WELL IDENTIFICATION NO. AEB 459
DRILLING METHOD: HSA
DRILLER: S. KRUEGER
FIRM: Cascade Drilling, Inc.
SIGNATURE:
CONSULTING FIRM: GeoEngineers, Inc
REPRESENTATIVE: Carla Woodworth

COUNTY: PIERCE
LOCATION SW¼ NW¼ Sec 16 Twn 20N R 3E
STREET ADDRESS OF WELL: 601 S. 38th ST. Tacoma, WA
WATER LEVEL ELEVATION: 17
GROUND SURFACE ELEVATION: N/A
INSTALLED: 4-11-98
DEVELOPED: yes

8157

AS-BUILT



WELL DATA

- WELL COVER
- CONCRETE SURFACE SEAL DEPTH = 1/ft
- PVC BLANK 4 "x 17'
- BACKFILL 14 ft.
  TYPE: Rent chips
- PVC SCREEN 4 "x 10'
  SLOT SIZE: .020
- GRAVEL PACK 12 ft.
  MATERIAL: 2/12
- WELL DEPTH 27' "

FORMATION DESCRIPTION

0 - 7 ft.
brown silty Sandy clay

7 - 27 ft.
brown Sandy gravels, cobbles

- ft.

SCALE: 1" = _____ PAGE _____ OF _____

ECY 050-12 (Rev. 11/89)

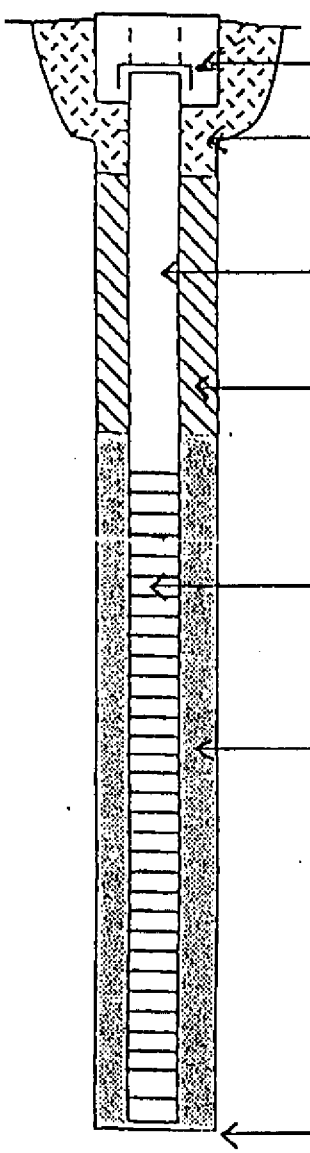
RESOURCE PROTECTION WELL REPORT

START CARD NO. AC34812

PROJECT NAME: HALLADAY AUTO REPAIR
WELL IDENTIFICATION NO. AEE-817
DRILLING METHOD: HSA
DRILLER: James Goble or Scott Krueger
FIRM: Cascade Drilling, Inc.
SIGNATURE:
CONSULTING FIRM: GeoEngineers, Inc
REPRESENTATIVE: Carla Woodworth

COUNTY: PIERCE
LOCATION: SW¼ NW¼ Sec 16 Twn 20N R 3E
STREET ADDRESS OF WELL: 601 S. 38th Street, Tacoma
WATER LEVEL ELEVATION: N/A
GROUND SURFACE ELEVATION: N/A
INSTALLED: 9-26-98
DEVELOPED: No

8457

AS-BUILT	WELL DATA	FORMATION DESCRIPTION
	WELL COVER CONCRETE SURFACE SEAL DEPTH = 1/ft PVC BLANK 4 "x 8' BACKFILL 6 ft. TYPE: Rent chip PVC SCREEN 4 "x25' SLOT SIZE: .020 GRAVEL PACK 26 ft. MATERIAL: 2/12 WELL DEPTH 33' "	0 - 12 ft. gray silty Sand 12 - 30 ft. gray silty sand, gravel, cobbles 30 -33 ft. brown med sand

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SCALE: 1" = _____ PAGE _____ OF _____

ECY 060-12 (Rev. 11/89)

RESOURCE PROTECTION WELL REPORT

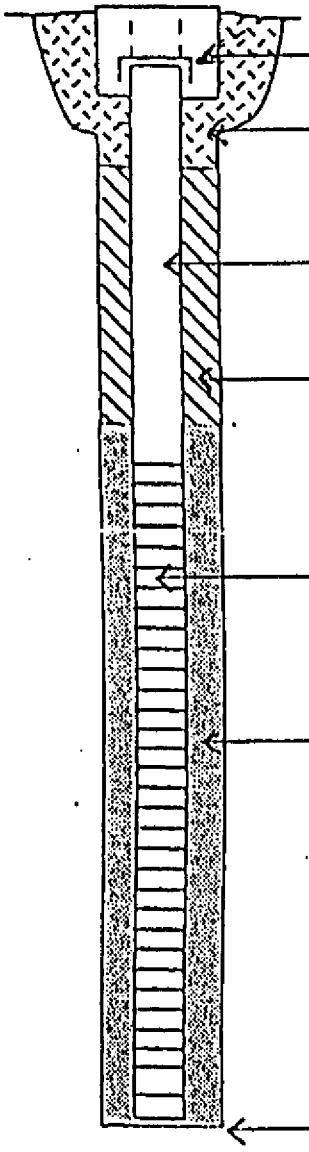
START CARD NO. R28697

(TEXACO)

PROJECT NAME: HALLADAY AUTO REPAIR
WELL IDENTIFICATION NO. AEB 461
DRILLING METHOD: HSA
DRILLER: S. KRUEGER
FIRM: Cascade Drilling, Inc.
SIGNATURE:
CONSULTING FIRM: GeoEngineers, Inc
REPRESENTATIVE: Carla Woodworth

COUNTY: PIERCE
LOCATION: SW¼ NW¼ Sec 16 Twn 20N R 3E
STREET ADDRESS OF WELL: 601 S. 38th St. - Tacoma, WA
WATER LEVEL ELEVATION: 17
GROUND SURFACE ELEVATION: N/A
INSTALLED: 4-11-98
DEVELOPED: No

8157

AS-BUILT	WELL DATA	FORMATION DESCRIPTION
	WELL COVER CONCRETE SURFACE SEAL DEPTH = 1/ft PVC BLANK 4 "x 15' BACKFILL 12 ft. TYPE: Bent chips PVC SCREEN 4 "x25' SLOT SIZE: .020 GRAVEL PACK 27 ft. MATERIAL: 2/12 WELL DEPTH 40 ' "	0 - 13 ft. brown silty Sand, clay 13 - 40 ft. brown Sandy gravel, cobbles - ft.

SCALE: 1" = _____ PAGE _____ OF _____

ECY 060-12 (Rev. 11/09)

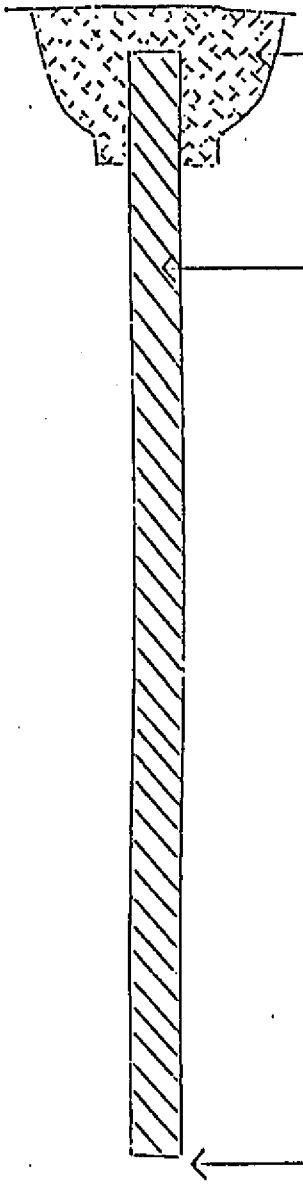
RESOURCE PROTECTION WELL REPORT

START CARD NO. A31951

PROJECT NAME: (TEXACO) HALLADAY AUTO REPAIR
WELL IDENTIFICATION NO. n/a
DRILLING METHOD: HSA
DRILLER: Scott E. Krueger
FIRM: Cascade Drilling, Inc.
SIGNATURE:
CONSULTING FIRM: GeoEngineers, Inc.
REPRESENTATIVE: Carla Woodworth

COUNTY: PIERCE
LOCATION: SW¼ NW¼ Sec 16 Twn 20N R 3E
STREET ADDRESS OF WELL: 601 S. 38th St. - Tacoma, WA
WATER LEVEL ELEVATION: N/A
GROUND SURFACE ELEVATION: N/A
INSTALLED: 4-11-98
DEVELOPED: N/A

8157

AS-BUILT	WELL DATA	FORMATION DESCRIPTION
	CONCRETE SURFACE SEAL	0 - 13 ft. brown Silty Sand
	BACKFILL Bent chips	13 - 50 ft. brown Sand, gravel Cobbles
		- ft.
	DEPTH OF BORING 50' "	

RECEIVED
'98 MAY 11 A10:10
S.W. REGIONAL OFFICE

SCALE: 1" = _____ PAGE _____ OF _____

ECY 050-12 (Rev. 11/09)

Attachment 4
Method B Calculations MTCATPH11.1

A1 Soil Cleanup Levels: Worksheet for Soil Data Entry: Refer to WAC 173-340-720, 740,745, 747, 750

1. Enter Site Information

Date: 12/30/14
Site Name: GTH-Calhoun
Sample Name: SB-32-14

2. Enter Soil Concentration Measured

Chemical of Concern or Equivalent Carbon Group	Measured Soil Conc dry basis	Composition Ratio
	mg/kg	%
Petroleum EC Fraction		
AL_EC >5-6	24.5	2.99%
AL_EC >6-8	226	27.61%
AL_EC >8-10	161	19.67%
AL_EC >10-12	104	12.70%
AL_EC >12-16	23	2.81%
AL_EC >16-21	2.845	0.35%
AL_EC >21-34	0	0.00%
AR_EC >8-10	157.1	19.19%
AR_EC >10-12	77.35	9.45%
AR_EC >12-16	12.03	1.47%
AR_EC >16-21	2.845	0.35%
AR_EC >21-34	0	0.00%
Benzene	0.717	0.09%
Toluene	1.15	0.14%
Ethylbenzene	1.83	0.22%
Total Xylenes	5.07	0.62%
Naphthalene	4.25	0.52%
1-Methyl Naphthalene	0.67	0.08%
2-Methyl Naphthalene	1.3	0.16%
n-Hexane	11	1.34%
MTBE	1.96	0.24%
Ethylene Dibromide (EDB)	0	0.00%
1,2 Dichloroethane (EDC)	0	0.00%
Benzo(a)anthracene	0	0.00%
Benzo(b)fluoranthene	0	0.00%
Benzo(k)fluoranthene	0	0.00%
Benzo(a)pyrene	0	0.00%
Chrysene	0	0.00%
Dibenz(a,h)anthracene	0	0.00%
Indeno(1,2,3-cd)pyrene	0	0.00%
Sum	818.617	100.00%

Notes for Data Entry | Set Default Hydrogeology

Clear All Soil Concentration Data Entry Cells

Restore All Soil Concentration Data cleared previously

REMARK:
Half detection limits were used for AL_EC>16-21 and AR_EC>16-21.

The following constituents have never been detected; therefore, zero was entered: AL_EC>21-34, AR_EC>21-34, EDB, EDC, benzo(a)anthracene, benzo(b)flouranthene, benzo(k)flouranthene, benzo(a)pyrene, chrysene, dibenz(a,h)anthrancene, and indeno(1,2,3-cd)pyrene.

Default values were used for total soil porosity, volumetric water content, soil bulk density, and fraction organic carbon.

Groundwater was not encountered; therefore the default value of 20 was used for the dilution factor.

3. Enter Site-Specific Hydrogeological Data

Total soil porosity:	0.43	Unitless
Volumetric water content:	0.3	Unitless
Volumetric air content:	0.13	Unitless
Soil bulk density measured:	1.5	kg/L
Fraction Organic Carbon:	0.001	Unitless
Dilution Factor:	20	Unitless

4. Target TPH Ground Water Concentation (if adjusted)

If you adjusted the target TPH ground water concentration, enter adjusted value here:	800	ug/L

A2 Soil Cleanup Levels: Calculation and Summary of Results. Refer to WAC 173-340-720, 740, 745, 747, 750

Site Information

Date: 12/30/2014
Site Name: GTH-Calhoun
Sample Name: SB-32-14
Measured Soil TPH Concentration, mg/kg: **818.617**

1. Summary of Calculation Results

Exposure Pathway	Method/Goal	Protective Soil TPH Conc, mg/kg	With Measured Soil Conc		Does Measured Soil Conc Pass or Fail?
			RISK @	HI @	
Protection of Soil Direct Contact: Human Health	Method B	3,585	3.95E-08	2.28E-01	Pass
	Method C	66,691	5.29E-09	1.23E-02	Pass
Protection of Method B Ground Water Quality (Leaching)	Potable GW: Human Health Protection	32	7.99E-05	3.67E+00	Fail
	Target TPH GW Conc. @ 800 ug/L	121	NA	NA	Fail

Warning! Check to determine if a simplified or site-specific Terrestrial Ecological Evaluation may be required (Refer to WAC 173-340-7490 through ~7494).

2. Results for Protection of Soil Direct Contact Pathway: Human Health

	Method B: Unrestricted Land Use	Method C: Industrial Land Use
Protective Soil Concentration, TPH mg/kg	**3,585.24**	**66,690.93**
Most Stringent Criterion	**HI =1**	**HI =1**

Soil Criteria	Protective Soil Concentration @Method B				Protective Soil Concentration @Method C			
	Most Stringent?	TPH Conc, mg/kg	RISK @	HI @	Most Stringent?	TPH Conc, mg/kg	RISK @	HI @
HI =1	YES	3.59E+03	1.73E-07	1.00E+00	YES	6.67E+04	4.31E-07	1.00E+00
Total Risk=1E-5	*NO*	2.07E+05	1.00E-05	5.78E+01	*NO*	1.55E+06	1.00E-05	2.32E+01
Risk of Benzene= 1E-6	*NO*	2.07E+04	1.00E-06	5.78E+00	NA			
Risk of cPAHs mixture= 1E-6	NA	NA	NA	NA				
EDB	NA	NA	NA	NA				
EDC	NA	NA	NA	NA				

3. Results for Protection of Ground Water Quality (Leaching Pathway)

3.1. Protection of Potable Ground Water Quality (Method B): Human Health Protection

Most Stringent Criterion	**Benzene MCL = 5 ug/L**
Protective Ground Water Concentration, ug/L	**356.87**
Protective Soil Concentration, mg/kg	**32.35**

Ground Water Criteria	Protective Potable Ground Water Concentration @Method B				Protective Soil Conc, mg/kg
	Most Stringent?	TPH Conc, ug/L	RISK @	HI @	
HI=1	*NO*	4.34E+02	8.03E-06	1.00E+00	4.16E+01
Total Risk = 1E-5	*NO*	5.10E+02	1.00E-05	1.17E+00	5.23E+01
Total Risk = 1E-6	YES	5.94E+01	1.00E-06	1.38E-01	5.12E+00
Risk of cPAHs mixture= 1E-5	NA	NA	NA	NA	NA
Benzene MCL = 5 ug/L	YES	3.57E+02	6.29E-06	8.25E-01	3.24E+01
MTBE = 20 ug/L	*NO*	3.84E+02	6.88E-06	8.88E-01	3.55E+01

3.2 Protection of Ground Water Quality for TPH Ground Water Concentration previously adjusted and entered

Ground Water Criteria	Protective Ground Water Concentration			Protective Soil Conc, mg/kg
	TPH Conc, ug/L	Risk @	HI @	
Target TPH GW Conc = 800 ug/L	8.00E+02	2.16E-05	1.86E+00	**1.21E+02**

A2. 1B Worksheet for Calculating Soil Cleanup Levels for Protection of Human Health: (Soil Direct Contact Pathway)

Method B: Unrestricted Land Use (WAC 173-340-740)

Date: 12/30/2014
Site Name: GTH-Calhoun
Sample Name: SB-32-14

Chemical of Concern or EC group	Current Condition				Adjusted Condition			
	Measured Soil Conc @dry basis	HQ	RISK	Pass or Fail?	Soil Conc being tested	HQ	RISK	Pass or Fail?
	mg/kg	unitless	unitless		mg/kg	unitless	unitless	
Petroleum EC Fraction								
AL_EC >5-6	24.5	1.95E-04			1.07E+02	8.54E-04		
AL_EC >6-8	226	1.80E-03			9.90E+02	7.88E-03		
AL_EC >8-10	161	7.26E-02			7.05E+02	3.18E-01		
AL_EC >10-12	104	4.69E-02			4.55E+02	2.05E-01		
AL_EC >12-16	23	1.38E-02			1.01E+02	6.04E-02		
AL_EC >16-21	2.845	2.56E-05			1.25E+01	1.12E-04		
AL_EC >21-34	0				0.00E+00			
AR_EC >8-10	157.1	2.13E-02			6.88E+02	9.31E-02		
AR_EC >10-12	77.35	5.23E-02			3.39E+02	2.29E-01		
AR_EC >12-16	12.03	4.33E-03			5.27E+01	1.90E-02		
AR_EC >16-21	2.845	1.71E-03			1.25E+01	7.48E-03		
AR_EC >21-34	0				0.00E+00			
Benzene	0.717	2.24E-03	3.95E-08		3.14E+00	9.82E-03	1.73E-07	
Toluene	1.15	1.92E-04			5.04E+00	8.39E-04		
Ethylbenzene	1.83	2.45E-04			8.01E+00	1.07E-03		
Total Xylenes	5.07	3.40E-04			2.22E+01	1.49E-03		
Naphthalene	4.25	3.51E-03			1.86E+01	1.54E-02		
1-Methyl Naphthalene	0.67	1.72E-04			2.93E+00	7.54E-04		
2-Methyl Naphthalene	1.3	4.17E-03			5.69E+00	1.83E-02		
n-Hexane	11	2.48E-03			4.82E+01	1.09E-02		
MTBE	1.96				8.58E+00			
Ethylene Dibromide (EDB)	0		0.00E+00		0.00E+00	0.00E+00	0.00E+00	
1,2 Dichloroethane (EDC)	0		0.00E+00		0.00E+00	0.00E+00	0.00E+00	
Benzo(a)anthracene	0		0.00E+00	*For*	0.00E+00		0.00E+00	*For*
Benzo(b)fluoranthene	0		0.00E+00	*all*	0.00E+00		0.00E+00	*all*
Benzo(k)fluoranthene	0		0.00E+00	*cPAHs*	0.00E+00		0.00E+00	*cPAHs*
Benzo(a)pyrene	0		0.00E+00		0.00E+00		0.00E+00	
Chrysene	0		0.00E+00		0.00E+00		0.00E+00	
Dibenz(a,h)anthracene	0		0.00E+00	Σ Risk=	0.00E+00		0.00E+00	Σ Risk=
Indeno(1,2,3-cd)pyrene	0		0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00
Sum	**818.617**	2.28E-01	3.95E-08		3.59E+03	1.00E+00	1.73E-07	

TEST CURRENT CONDITION

Measured TPH Soil Conc, mg/kg= 818.617
HI= 2.283E-01
RISK= 3.948E-08
Pass or Fail? Pass

CALCULATE PROTECTIVE CONDITION

This tool allows the user to calculate protective TPH soil concentration based on various soil quality criteria. The Workbook uses the same composition ratio as for the measured data.

Calculate Protective TPH Soil Conc

Selected Criterion: Most Stringent?

Protctive TPH Soil Conc, mg/kg =
HI =
RISK =

TEST ADJUSTED CONDITION

This tool allows the user to test whether a particular TPH soil concentration is protective of human health. The Workbook uses the same composition ratio as for the measured data.

Test Adjusted TPH Soil Conc

Tested TPH Soil Conc, mg/kg =
HI =
RISK =
Pass or Fail?

A1 Soil Cleanup Levels: Worksheet for Soil Data Entry: Refer to WAC 173-340-720, 740,745, 747, 750

1. Enter Site Information

Date: 12/30/14
Site Name: GTH-Calhoun
Sample Name: SB-33-9

2. Enter Soil Concentration Measured

Chemical of Concern or Equivalent Carbon Group	Measured Soil Conc dry basis	Composition Ratio
	mg/kg	%
Petroleum EC Fraction		
AL_EC >5-6	25	1.97%
AL_EC >6-8	182	14.33%
AL_EC >8-10	214	16.85%
AL_EC >10-12	189	14.88%
AL_EC >12-16	99.4	7.83%
AL_EC >16-21	13.6	1.07%
AL_EC >21-34	0	0.00%
AR_EC >8-10	293.31	23.09%
AR_EC >10-12	158.27	12.46%
AR_EC >12-16	46.2	3.64%
AR_EC >16-21	6.29	0.50%
AR_EC >21-34	0	0.00%
Benzene	0.477	0.04%
Toluene	1.13	0.09%
Ethylbenzene	6.6	0.52%
Total Xylenes	14.1	1.11%
Naphthalene	8.73	0.69%
1-Methyl Naphthalene	2.5	0.20%
2-Methyl Naphthalene	3.6	0.28%
n-Hexane	5.1	0.40%
MTBE	0.843	0.07%
Ethylene Dibromide (EDB)	0	0.00%
1,2 Dichloroethane (EDC)	0	0.00%
Benzo(a)anthracene	0	0.00%
Benzo(b)fluoranthene	0	0.00%
Benzo(k)fluoranthene	0	0.00%
Benzo(a)pyrene	0	0.00%
Chrysene	0	0.00%
Dibenz(a,h)anthracene	0	0.00%
Indeno(1,2,3-cd)pyrene	0	0.00%
Sum	1270.15	100.00%

Notes for Data Entry | Set Default Hydrogeology

Clear All Soil Concentration Data Entry Cells

Restore All Soil Concentration Data cleared previously

REMARK:

The following constituents have never been detected; therefore, zero was entered: AL_EC>21-34, AR_EC>21-34, EDB, EDC, benzo(a)anthracene, benzo(b)flouranthene, benzo(k)flouranthene, benzo(a)pyrene, chrysene, dibenz(a,h)anthrancene, and indeno(1,2,3-cd)pyrene.

Default values were used for total soil porosity, volumetric water content, soil bulk density, and fraction organic carbon.

Groundwater was not encountered; therefore the default value of 20 was used for the dilution factor.

3. Enter Site-Specific Hydrogeological Data

Total soil porosity:	0.43	Unitless
Volumetric water content:	0.3	Unitless
Volumetric air content:	0.13	Unitless
Soil bulk density measured:	1.5	kg/L
Fraction Organic Carbon:	0.001	Unitless
Dilution Factor:	20	Unitless

4. Target TPH Ground Water Concentation (if adjusted)

If you adjusted the target TPH ground water concentration, enter adjusted value here:	800	ug/L

A2 Soil Cleanup Levels: Calculation and Summary of Results. Refer to WAC 173-340-720, 740, 745, 747, 750

Site Information

Date: 12/30/2014
Site Name: GTH-Calhoun
Sample Name: SB-33-9
Measured Soil TPH Concentration, mg/kg: **1,270.150**

1. Summary of Calculation Results

Exposure Pathway	Method/Goal	Protective Soil TPH Conc, mg/kg	With Measured Soil Conc		Does Measured Soil Conc Pass or Fail?
			RISK @	HI @	
Protection of Soil Direct Contact: Human Health	Method B	2,925	2.63E-08	4.34E-01	Pass
	Method C	51,326	3.52E-09	2.47E-02	Pass
Protection of Method B Ground Water Quality (Leaching)	Potable GW: Human Health Protection	36	4.28E-05	3.37E+00	Fail
	Target TPH GW Conc. @ 800 ug/L	98	NA	NA	Fail

Warning! Check to determine if a simplified or site-specific Terrestrial Ecological Evaluation may be required (Refer to WAC 173-340-7490 through ~7494).

Warning! Check Residual Saturation (WAC340-747(10)).

2. Results for Protection of Soil Direct Contact Pathway: Human Health

	Method B: Unrestricted Land Use	Method C: Industrial Land Use
Protective Soil Concentration, TPH mg/kg	**2,925.35**	**51,326.24**
Most Stringent Criterion	**HI =1**	**HI =1**

Soil Criteria	Protective Soil Concentration @Method B				Protective Soil Concentration @Method C			
	Most Stringent?	TPH Conc, mg/kg	RISK @	HI @	Most Stringent?	TPH Conc, mg/kg	RISK @	HI @
HI =1	YES	2.93E+03	6.05E-08	1.00E+00	YES	5.13E+04	1.42E-07	1.00E+00
Total Risk=1E-5	*NO*	4.84E+05	1.00E-05	1.65E+02	*NO*	3.61E+06	1.00E-05	7.04E+01
Risk of Benzene= 1E-6	*NO*	4.84E+04	1.00E-06	1.65E+01	NA			
Risk of cPAHs mixture= 1E-6	NA	NA	NA	NA				
EDB	NA	NA	NA	NA				
EDC	NA	NA	NA	NA				

3. Results for Protection of Ground Water Quality (Leaching Pathway)

3.1. Protection of Potable Ground Water Quality (Method B): Human Health Protection

Most Stringent Criterion	**HI=1**
Protective Ground Water Concentration, ug/L	**425.54**
Protective Soil Concentration, mg/kg	**36.40**

Ground Water Criteria	Protective Potable Ground Water Concentration @Method B				Protective Soil Conc, mg/kg
	Most Stringent?	TPH Conc, ug/L	RISK @	HI @	
HI=1	YES	4.26E+02	3.02E-06	1.00E+00	3.64E+01
Total Risk = 1E-5	*NO*	9.08E+02	1.00E-05	2.04E+00	1.32E+02
Total Risk = 1E-6	YES	1.54E+02	1.00E-06	3.66E-01	1.19E+01
Risk of cPAHs mixture= 1E-5	NA	NA	NA	NA	NA
Benzene MCL = 5 ug/L	*NO*	7.15E+02	6.29E-06	1.64E+00	7.85E+01
MTBE = 20 ug/L	*NO*	9.01E+02	9.81E-06	2.03E+00	1.29E+02

3.2 Protection of Ground Water Quality for TPH Ground Water Concentration previously adjusted and entered

Ground Water Criteria	Protective Ground Water Concentration			Protective Soil Conc, mg/kg
	TPH Conc, ug/L	Risk @	HI @	
Target TPH GW Conc = 800 ug/L	8.00E+02	7.68E-06	1.81E+00	**9.77E+01**

A2. 1B Worksheet for Calculating Soil Cleanup Levels for Protection of Human Health: (Soil Direct Contact Pathway)

Method B: Unrestricted Land Use (WAC 173-340-740)

Date: 12/30/2014
Site Name: GTH-Calhoun
Sample Name: SB-33-9

Chemical of Concern or EC group	Current Condition				Adjusted Condition			
	Measured Soil Conc @dry basis	HQ	RISK	Pass or Fail?	Soil Conc being tested	HQ	RISK	Pass or Fail?
	mg/kg	unitless	unitless		mg/kg	unitless	unitless	
Petroleum EC Fraction								
AL_EC >5-6	25	1.99E-04			5.76E+01	4.58E-04		
AL_EC >6-8	182	1.45E-03			4.19E+02	3.34E-03		
AL_EC >8-10	214	9.65E-02			4.93E+02	2.22E-01		
AL_EC >10-12	189	8.52E-02			4.35E+02	1.96E-01		
AL_EC >12-16	99.4	5.96E-02			2.29E+02	1.37E-01		
AL_EC >16-21	13.6	1.22E-04			3.13E+01	2.82E-04		
AL_EC >21-34	0				0.00E+00			
AR_EC >8-10	293.31	3.97E-02			6.76E+02	9.14E-02		
AR_EC >10-12	158.27	1.07E-01			3.65E+02	2.47E-01		
AR_EC >12-16	46.2	1.66E-02			1.06E+02	3.83E-02		
AR_EC >16-21	6.29	3.77E-03			1.45E+01	8.69E-03		
AR_EC >21-34	0				0.00E+00			
Benzene	0.477	1.49E-03	2.63E-08		1.10E+00	3.44E-03	6.05E-08	
Toluene	1.13	1.88E-04			2.60E+00	4.33E-04		
Ethylbenzene	6.6	8.84E-04			1.52E+01	2.04E-03		
Total Xylenes	14.1	9.46E-04			3.25E+01	2.18E-03		
Naphthalene	8.73	7.21E-03			2.01E+01	1.66E-02		
1-Methyl Naphthalene	2.5	6.42E-04			5.76E+00	1.48E-03		
2-Methyl Naphthalene	3.6	1.16E-02			8.29E+00	2.66E-02		
n-Hexane	5.1	1.15E-03			1.17E+01	2.65E-03		
MTBE	0.843				1.94E+00			
Ethylene Dibromide (EDB)	0		0.00E+00		0.00E+00	0.00E+00	0.00E+00	
1,2 Dichloroethane (EDC)	0		0.00E+00		0.00E+00	0.00E+00	0.00E+00	
Benzo(a)anthracene	0		0.00E+00	*For*	0.00E+00		0.00E+00	*For*
Benzo(b)fluoranthene	0		0.00E+00	*all*	0.00E+00		0.00E+00	*all*
Benzo(k)fluoranthene	0		0.00E+00	*cPAHs*	0.00E+00		0.00E+00	*cPAHs*
Benzo(a)pyrene	0		0.00E+00		0.00E+00		0.00E+00	
Chrysene	0		0.00E+00		0.00E+00		0.00E+00	
Dibenz(a,h)anthracene	0		0.00E+00	Σ Risk=	0.00E+00		0.00E+00	Σ Risk=
Indeno(1,2,3-cd)pyrene	0		0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00
Sum	**1270.15**	4.34E-01	2.63E-08		2.93E+03	1.00E+00	6.05E-08	

TEST CURRENT CONDITION

Measured TPH Soil Conc, mg/kg= 1270.150
HI= 4.344E-01
RISK= 2.627E-08
Pass or Fail? Pass
Check Residual Saturation (WAC340-747(10))

CALCULATE PROTECTIVE CONDITION

This tool allows the user to calculate protective TPH soil concentration based on various soil quality criteria. The Workbook uses the same composition ratio as for the measured data.

Calculate Protective TPH Soil Conc

Selected Criterion:
Most Stringent?
Protctive TPH Soil Conc, mg/kg =
HI =
RISK =

TEST ADJUSTED CONDITION

This tool allows the user to test whether a particular TPH soil concentration is protective of human health. The Workbook uses the same composition ratio as for the measured data.

Test Adjusted TPH Soil Conc

Tested TPH Soil Conc, mg/kg =
HI =
RISK =
Pass or Fail?

A1 Soil Cleanup Levels: Worksheet for Soil Data Entry: Refer to WAC 173-340-720, 740,745, 747, 750

1. Enter Site Information

Date: 12/30/14
Site Name: GTH-Calhoun
Sample Name: SB-35-10

2. Enter Soil Concentration Measured

Chemical of Concern or Equivalent Carbon Group	Measured Soil Conc dry basis mg/kg	Composition Ratio %
Petroleum EC Fraction		
AL_EC >5-6	10.1	0.53%
AL_EC >6-8	397	20.95%
AL_EC >8-10	199	10.50%
AL_EC >10-12	318	16.78%
AL_EC >12-16	18	0.95%
AL_EC >16-21	2.64	0.14%
AL_EC >21-34	0	0.00%
AR_EC >8-10	530	27.97%
AR_EC >10-12	304.5	16.07%
AR_EC >12-16	44.7	2.36%
AR_EC >16-21	2.64	0.14%
AR_EC >21-34	0	0.00%
Benzene	0.418	0.02%
Toluene	1.2	0.06%
Ethylbenzene	5.65	0.30%
Total Xylenes	21.85	1.15%
Naphthalene	19.5	1.03%
1-Methyl Naphthalene	3.7	0.20%
2-Methyl Naphthalene	7.8	0.41%
n-Hexane	7.5	0.40%
MTBE	0.402	0.02%
Ethylene Dibromide (EDB)	0	0.00%
1,2 Dichloroethane (EDC)	0	0.00%
Benzo(a)anthracene	0	0.00%
Benzo(b)fluoranthene	0	0.00%
Benzo(k)fluoranthene	0	0.00%
Benzo(a)pyrene	0	0.00%
Chrysene	0	0.00%
Dibenz(a,h)anthracene	0	0.00%
Indeno(1,2,3-cd)pyrene	0	0.00%
Sum	1894.6	100.00%

Notes for Data Entry | Set Default Hydrogeology

Clear All Soil Concentration Data Entry Cells

Restore All Soil Concentration Data cleared previously

REMARKS:

Half detection limits were used for AL_EC>16-21 and AR_EC>16-21.

The following constituents have never been detected; therefore, zero was entered: AL_EC>21-34, AR_EC>21-34, EDB, EDC, benzo(a)anthracene, benzo(b)flouranthene, benzo(k)flouranthene, benzo(a)pyrene, chrysene, dibenz(a,h)anthrancene, and indeno(1,2,3-cd)pyrene.

Default values were used for total soil porosity, volumetric water content, soil bulk density, and fraction organic carbon.

Groundwater was not encountered; therefore the default value of 20 was used for the dilution factor.

3. Enter Site-Specific Hydrogeological Data

Total soil porosity:	0.43	Unitless
Volumetric water content:	0.3	Unitless
Volumetric air content:	0.13	Unitless
Soil bulk density measured:	1.5	kg/L
Fraction Organic Carbon:	0.001	Unitless
Dilution Factor:	20	Unitless

4. Target TPH Ground Water Concentation (if adjusted)

If you adjusted the target TPH ground water concentration, enter adjusted value here: 800 ug/L

A2 Soil Cleanup Levels: Calculation and Summary of Results. Refer to WAC 173-340-720, 740, 745, 747, 750

Site Information

Date: 12/30/2014
Site Name: GTH-Calhoun
Sample Name: SB-35-10
Measured Soil TPH Concentration, mg/kg: **1,894.600**

1. Summary of Calculation Results

Exposure Pathway	Method/Goal	Protective Soil TPH Conc, mg/kg	With Measured Soil Conc		Does Measured Soil Conc Pass or Fail?
			RISK @	HI @	
Protection of Soil Direct Contact: Human Health	Method B	3,210	2.30E-08	5.90E-01	Pass
	Method C	60,929	3.08E-09	3.11E-02	Pass
Protection of Method B Ground Water Quality (Leaching)	Potable GW: Human Health Protection	28	2.79E-05	3.42E+00	Fail
	Target TPH GW Conc. @ 800 ug/L	72	NA	NA	Fail

Warning! Check to determine if a simplified or site-specific Terrestrial Ecological Evaluation may be required (Refer to WAC 173-340-7490 through ~7494).

Warning! Check Residual Saturation (WAC340-747(10)).

2. Results for Protection of Soil Direct Contact Pathway: Human Health

	Method B: Unrestricted Land Use	Method C: Industrial Land Use
Protective Soil Concentration, TPH mg/kg	**3,210.21**	**60,929.30**
Most Stringent Criterion	**HI =1**	**HI =1**

Soil Criteria	Protective Soil Concentration @Method B				Protective Soil Concentration @Method C			
	Most Stringent?	TPH Conc, mg/kg	RISK @	HI @	Most Stringent?	TPH Conc, mg/kg	RISK @	HI @
HI =1	YES	3.21E+03	3.90E-08	1.00E+00	YES	6.09E+04	9.91E-08	1.00E+00
Total Risk=1E-5	*NO*	8.23E+05	1.00E-05	2.56E+02	*NO*	6.15E+06	1.00E-05	1.01E+02
Risk of Benzene= 1E-6	*NO*	8.23E+04	1.00E-06	2.56E+01	NA			
Risk of cPAHs mixture= 1E-6	NA	NA	NA	NA				
EDB	NA	NA	NA	NA				
EDC	NA	NA	NA	NA				

3. Results for Protection of Ground Water Quality (Leaching Pathway)

3.1. Protection of Potable Ground Water Quality (Method B): Human Health Protection

Most Stringent Criterion	**HI=1**
Protective Ground Water Concentration, ug/L	**405.20**
Protective Soil Concentration, mg/kg	**28.09**

Ground Water Criteria	Protective Potable Ground Water Concentration @Method B				Protective Soil Conc, mg/kg
	Most Stringent?	TPH Conc, ug/L	RISK @	HI @	
HI=1	YES	4.05E+02	1.38E-06	1.00E+00	2.81E+01
Total Risk = 1E-5	*NO*	1.21E+03	1.00E-05	2.74E+00	2.54E+02
Total Risk = 1E-6	YES	2.97E+02	1.00E-06	7.35E-01	2.03E+01
Risk of cPAHs mixture= 1E-5	NA	NA	NA	NA	NA
Benzene MCL = 5 ug/L	*NO*	1.06E+03	6.29E-06	2.43E+00	1.42E+02
MTBE = 20 ug/L	*NO*	1.30E+03	1.40E-05	2.95E+00	4.10E+02

3.2 Protection of Ground Water Quality for TPH Ground Water Concentration previously adjusted and entered

Ground Water Criteria	Protective Ground Water Concentration			Protective Soil Conc, mg/kg
	TPH Conc, ug/L	Risk @	HI @	
Target TPH GW Conc = 800 ug/L	8.00E+02	3.42E-06	1.90E+00	**7.20E+01**

A2. 1B Worksheet for Calculating Soil Cleanup Levels for Protection of Human Health: (Soil Direct Contact Pathway)

Method B: Unrestricted Land Use (WAC 173-340-740)

Date: 12/30/2014
Site Name: GTH-Calhoun
Sample Name: SB-35-10

Chemical of Concern or EC group	Current Condition				Adjusted Condition			
	Measured Soil Conc @dry basis	HQ	RISK	Pass or Fail?	Soil Conc being tested	HQ	RISK	Pass or Fail?
	mg/kg	unitless	unitless		mg/kg	unitless	unitless	
Petroleum EC Fraction								
AL_EC >5-6	10.1	8.04E-05			1.71E+01	1.36E-04		
AL_EC >6-8	397	3.16E-03			6.73E+02	5.35E-03		
AL_EC >8-10	199	8.98E-02			3.37E+02	1.52E-01		
AL_EC >10-12	318	1.43E-01			5.39E+02	2.43E-01		
AL_EC >12-16	18	1.08E-02			3.05E+01	1.83E-02		
AL_EC >16-21	2.64	2.38E-05			4.47E+00	4.03E-05		
AL_EC >21-34	0				0.00E+00			
AR_EC >8-10	530	7.17E-02			8.98E+02	1.22E-01		
AR_EC >10-12	304.5	2.06E-01			5.16E+02	3.49E-01		
AR_EC >12-16	44.7	1.61E-02			7.57E+01	2.73E-02		
AR_EC >16-21	2.64	1.58E-03			4.47E+00	2.68E-03		
AR_EC >21-34	0				0.00E+00			
Benzene	0.418	1.31E-03	2.30E-08		7.08E-01	2.22E-03	3.90E-08	
Toluene	1.2	2.00E-04			2.03E+00	3.39E-04		
Ethylbenzene	5.65	7.57E-04			9.57E+00	1.28E-03		
Total Xylenes	21.85	1.47E-03			3.70E+01	2.48E-03		
Naphthalene	19.5	1.61E-02			3.30E+01	2.73E-02		
1-Methyl Naphthalene	3.7	9.50E-04			6.27E+00	1.61E-03		
2-Methyl Naphthalene	7.8	2.50E-02			1.32E+01	4.24E-02		
n-Hexane	7.5	1.69E-03			1.27E+01	2.87E-03		
MTBE	0.402				6.81E-01			
Ethylene Dibromide (EDB)	0		0.00E+00		0.00E+00	0.00E+00	0.00E+00	
1,2 Dichloroethane (EDC)	0		0.00E+00		0.00E+00	0.00E+00	0.00E+00	
Benzo(a)anthracene	0		0.00E+00	*For*	0.00E+00		0.00E+00	*For*
Benzo(b)fluoranthene	0		0.00E+00	*all*	0.00E+00		0.00E+00	*all*
Benzo(k)fluoranthene	0		0.00E+00	*cPAHs*	0.00E+00		0.00E+00	*cPAHs*
Benzo(a)pyrene	0		0.00E+00		0.00E+00		0.00E+00	
Chrysene	0		0.00E+00		0.00E+00		0.00E+00	
Dibenz(a,h)anthracene	0		0.00E+00	Σ Risk=	0.00E+00		0.00E+00	Σ Risk=
Indeno(1,2,3-cd)pyrene	0		0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00
Sum	**1894.6**	5.90E-01	2.30E-08		3.21E+03	1.00E+00	3.90E-08	

TEST CURRENT CONDITION

Measured TPH Soil Conc, mg/kg= 1894.600
HI= 5.902E-01
RISK= 2.302E-08
Pass or Fail? Pass
Check Residual Saturation (WAC340-747(10))

CALCULATE PROTECTIVE CONDITION

This tool allows the user to calculate protective TPH soil concentration based on various soil quality criteria. The Workbook uses the same composition ratio as for the measured data.

Calculate Protective TPH Soil Conc

Selected Criterion: Most Stringent?

Protctive TPH Soil Conc, mg/kg =
HI =
RISK =

TEST ADJUSTED CONDITION

This tool allows the user to test whether a particular TPH soil concentration is protective of human health. The Workbook uses the same composition ratio as for the measured data.

Test Adjusted TPH Soil Conc

Tested TPH Soil Conc, mg/kg =
HI =
RISK =
Pass or Fail?