Additional Site Characterization Activities

Progress Rail Services
4012 State Route 509 South Frontage Road
Tacoma, Washington

April 29, 2016
Terracon Project No. 81167031

Prepared for:
Progress Rail Services Corporation
Tacoma, Washington

Prepared by:
Terracon Consultants, Inc.
Mountlake Terrace, Washington

terracon.com

Terracon

Environmental ■ Facilities ■ Geotechnical ■ Materials

April 29, 2016

Terracon

Progress Rail Services Corporation
4012 SR 509 South Frontage Road
Tacoma, Washington 98421

Attn.: Ms. Tanya Girouard - Regional Environmental Manager
P: (801) 510-3952
E: tgirouard@PROGRESSRAIL.com

Re: **Additional Site Characterization Activities**
Progress Rail Services
4012 State Route 509 South Frontage Road
Tacoma, Washington 98421
VCP Site ID SW1474
Terracon Project No. 81167031

Dear Ms. Girouard:

Terracon Consultants, Inc. (Terracon) is pleased to submit our report of Additional Site Characterization Activities completed at the site referenced above. The report presents data from recent field activities that included soil and groundwater sampling and the collection of groundwater elevations from the on-site groundwater monitoring wells. The activities were completed to address a request for additional site characterization included in a Washington State Department of Ecology (Ecology) Voluntary Cleanup Program (VCP) Opinion Letter addressed to Progress Rail Services (PRS), dated September 11, 2015. Terracon conducted this investigation in general accordance with our Ecology-approved *Work Plan for Additional Site Characterization Activities*, dated February 17, 2016.

Terracon appreciates this opportunity to provide environmental services to Progress Rail Services. In addition to sampling services, our professionals provide geotechnical, environmental, construction materials, and facilities services on a wide variety of projects locally, regionally, and nationally. For more detailed information on all of Terracon's services, please visit our website at www.terracon.com. Should you have any questions or require additional information, please do not hesitate to contact our office.

Sincerely,
Terracon Consultants, Inc.

Sabine Datum, G.I.T.
Staff Geologist

Michael D. Noll, L.G., L.Hg.
Senior Project Manager

State of Washington
Hydrogeologist
1403
Licensed Geologist
MICHAEL D. NOLL

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ADDTIONAL SITE CHARACTERIZATION ACTIVITIES

Progress Rail Services
4012 State Route 509 South Frontage Road
Tacoma, Washington

Terracon Project No. 81167031
April 29, 2016

1.0 SITE DESCRIPTION AND SUMMARY OF SITE HISTORY

The site is located at 4012 State Route 509 South Frontage Road in Tacoma, Washington (Pierce County Parcel No. 2001867000), on a larger portion of land owned by the Port of Tacoma (Pierce County Tax parcel No. 0320021002). The site is currently used for painting and repairing railroad locomotives and railcars. Site features include a locomotive shop, locomotive wash pad, truck shop/blast bay/paint bay building with offices, paint shop office, car shop/welding building, car shop office, maintenance building, material storage building/material storage area, evaporator room, small engine wash pad, and paint storage building.

A Topographic Map showing the site location is included as Figure 1 and a Site Diagram is included as Figure 2 in Appendix A. A detailed Site Diagram with Boring Locations showing sampling locations relative to site features is included as Figure 3 in Appendix A.

This report should be used in conjunction with the following previous site documents issued by Terracon:

- *Draft Limited Site Investigation, Progress Rail, 4012 SR 509 South Frontage Road, Tacoma, Pierce County, Washington, dated January 28, 2013;*
- *Summary of Limited Investigation Activity, Progress Rail Services, 4012 SR 509, Tacoma, Washington, dated July 17, 2013;*
- *Supplemental Investigation & Remedial Excavation, Progress Rail Spill Incident #12-0773, 4012 SR 509 South Frontage Road, Tacoma, Pierce County, Washington, dated March 11, 2014;*
- *Groundwater Monitoring Well Installation and Sampling, Progress Rail Spill Incident #12-0773, 4012 SR 509 South Frontage Road, Tacoma, Pierce County, Washington, dated April 15, 2014; and*
- *Annual Groundwater Monitoring Report: 2014, Progress Rail Spill Incident #12-0773, 4012 SR 509 South Frontage Road, Tacoma, Pierce County, Washington, dated January 23, 2015.*
- *Work Plan for Additional Site Characterization Activities, Progress Rail Services, 4012 State Route 509 South Frontage Road, Tacoma, Washington, dated February 17, 2016.*

Progress Rail Services (PRS) purchased the facility and assumed the property lease from Coastal Engine and Equipment Company (CEECO) in April 2009. In 2007, diesel- and oil-range total petroleum hydrocarbons (TPH) and lead were found in site groundwater at concentrations exceeding the Washington State Model Toxics Control Act (MTCA) Method A cleanup levels. Metals (arsenic, cadmium, chromium, and lead) were also found in the shallow soil at the sandblast bag house at concentrations exceeding the MTCA Method A or MTCA Method B cleanup levels. Based on these historical CEECO releases, the site was included on the Washington State Department of Ecology (Ecology) Confirmed and Suspected Contaminated Sites List (CSCSL) and on the ranked Hazardous Sites List (HSL; Cleanup Site ID 4267). CEECO conducted remedial actions from 2007 to 2009 to address these reported releases.

PRS has reported three diesel fuel spills since beginning facility operations in 2009. A release of diesel to soil by the locomotive shop from an auxiliary locomotive fuel tank was reported in March 2012 (ERTS #632477). Oil leaching from soil and sheen on ponded water in the southeast area of the site was reported in November 2012 (ERTS #637544). A damaged railcar auxiliary fuel tank valve spilled diesel to the soil at the southwest property corner in February 2014 (ERTS #646894). Terracon, on behalf of PRS, has subsequently completed soil and groundwater remedial treatment and confirmation sampling related to these documented releases.

Following the discovery of the diesel spill at the locomotive shop (ERTS #632477), PRS and Panhandle Geotechnical & Environmental, Inc. (Panhandle) conducted a limited remedial excavation of impacted soils between the locomotive shop and the locomotive wash pad in March 2012 (Figure 3). An area measuring approximately 50 feet east-west and 10 feet wide was excavated to approximately 2 feet below the ground surface (bgs). Approximately 37 cubic yards (CY) of petroleum-contaminated soil (PCS) were removed for offsite disposal. Soil samples collected from the extents of the excavation at the east end (East end sample), west end (West end sample), south sidewall (South side sample), and north sidewall (North side sample) were analyzed for diesel- and oil-range TPH. The diesel-range TPH concentration in the East end sample (5,500 milligrams per kilogram [mg/kg] exceeded the MTCA Method A cleanup level (2,000 mg/kg).

Panhandle advanced three direct-push soil borings (DP-1, DP-2, and DP-4) at the excavation area in May 2012. Grab groundwater samples collected from the borings exhibited concentrations of diesel- and/or oil-range TPH ranging from 560 micrograms per liter (µg/L) to 2,300 µg/L, exceeding the MTCA Method A cleanup levels (500 µg/L for diesel- or oil-range TPH).

Terracon advanced seven soil borings (B-1 through B-5, B-7, and B-9) at the excavation area in November 2012. Ten soil samples were collected from borings B-1 through B-3, B-7, and B-9. Soil samples were not collected from borings B-4 and B-5 due to a lack of sample recovery. Grab groundwater samples were collected from temporary monitoring wells installed in soil borings B-1 through B-5, B-7, and B-9. Grab groundwater samples collected from the temporary wells

installed in borings B-5 and B-7 exhibited diesel- and oil-range TPH ranging from 760 µg/L to 9,800 µg/L, exceeding the MTCA Method A cleanup levels.

Terracon advanced two additional soil borings (B-10 and B-11) to the east and west of the excavation area in August 2013, and completed the borings as permanent groundwater monitoring wells MW-1 and MW-2. Soil and groundwater samples collected from the borings/wells did not contain diesel- or oil-range TPH above the laboratory method reporting limits (MRLs).

In September 2013, PRS, Terracon, and NRC Environmental Services, Inc. (NRC) removed approximately 200 feet of railroad tracks between the locomotive shop and locomotive wash pad and excavated PCS for offsite disposal. Multiple buried utilities were identified in the excavation area, including natural gas, telecommunications, and electrical lines. NRC excavated impacted soil to depths ranging from approximately 2 to 4 feet bgs and removed approximately 146 tons of PCS for offsite disposal. Terracon collected four soil samples from the base of the excavation (samples EX-1 through EX-4) and three soil samples from the excavation south sidewall (SW-1 through SW-3). Soil samples collected from the limits of the excavation did not contain diesel- or oil-range TPH above laboratory MRLs. NRC excavated soil to approximately 7 feet bgs along the length of the PCS removal excavation. Approximately 1,125 pounds of Regenesis Oxygen Release Compound (ORC) were mixed with the excavated soil, and the soil was placed back into the trench. The upper portion of the PCS removal excavation was backfilled with clean imported fill, compacted, and the railroad tracks were re-installed.

Terracon advanced two additional soil borings (B-12 and B-13) in the excavation area in February 2014, and completed the borings as permanent groundwater monitoring wells MW-3 and MW-4. Soil samples collected from the borings did not contain diesel- or oil-range TPH above laboratory MRLs. Groundwater samples collected from monitoring wells MW-1 through MW-4 contained diesel- and oil-range TPH ranging from 74 µg/L to 410 µg/L, below the MTCA Method A cleanup levels. Measured depth to groundwater in the monitoring wells was approximately 2.5 feet below the top of the well casing (TOC).

Groundwater samples were collected from monitoring wells MW-1 through MW-4 in May, August, and November 2014. Groundwater samples were analyzed for diesel- and oil-range TPH; naphthalenes; carcinogenic polycyclic aromatic hydrocarbons (cPAHs); and benzene, toluene, ethylbenzene, and xylenes (BTEX). Diesel- and oil-range TPH results ranged from 120 µg/L to 400 µg/L, below the MTCA Method A cleanup levels. Results for BTEX, naphthalenes, and cPAHs were below the laboratory MRLs.

At the request of PRS, Terracon submitted a Voluntary Cleanup Program (VCP) application for the site to Ecology in May 2015, and requested a No Further Action (NFA) determination for the site. Ecology enrolled the site into the VCP in June 2015 (VCP Project No. SW1474), and issued

an Opinion Letter on September 3, 2015. In particular, Ecology provided the following comments/requests regarding the March 2012 reported release (ERTS #632477):

1. Based on the groundwater concentrations of oil-range TPH at soil borings B-4, B-5, B-7 and groundwater monitoring well MW-4, more characterization is required to determine the source of the elevated concentrations in this area of the site.

2. Please provide a work plan for additional site characterization activities at the site to ensure that Ecology can make recommendations, if necessary.

In response to the Ecology Opinion Letter, Terracon prepared a Work Plan for Additional Site Characterization Activities for performing additional site soil sampling in the area of previous soil borings B-4, B-5, B-7, and groundwater monitoring well MW-4, which was approved by PRS and submitted to Ecology on February 17, 2016. Ecology approved the work plan in a meeting with Terracon, PRS and Port of Tacoma representatives on March 2, 2016.

The scope of work performed is summarized in the following sections.

2.0 SCOPE OF SERVICES

Terracon's scope of work was conducted in accordance with our *Work Plan for Additional Site Characterization Activities* dated February 17, 2016. Our scope of services included completion of the following tasks:

- Perform pre-mobilization activities including public and private underground utility clearances and preparation of a site specific health and safety plan;
- Advance seven borings using hand tools to approximately 2 to 3 feet bgs and collect soil samples from each boring;
- Collect one groundwater sample from groundwater monitoring well MW-4;
- Collect groundwater elevation data from all on-site groundwater monitoring wells;
- Complete laboratory analyses of soil and groundwater; and
- Prepare this report.

2.1 Standard of Care

Terracon's services were performed in a manner consistent with generally accepted practices of the profession undertaken in similar studies in the same geographical area during the same time. Terracon makes no warranties, either express or implied, regarding the findings, conclusions, or recommendations. Please note that Terracon does not warrant the work of laboratories, regulatory agencies, or other third parties supplying information used in the preparation of the report. These services were performed in accordance with the scope of work agreed with you,

our client, as reflected in our proposal and work plan, and were not restricted by American Society for Testing and Materials (ASTM) practice E 1903-11, *Standard Practice for Environmental Site Assessments: Phase II Environmental Site Assessment Practice*.

2.2 Additional Scope Limitations

Findings, conclusions, and recommendations resulting from these services are based upon information derived from the on-site activities and other services performed under this scope of work; such information is subject to change over time. Certain indicators of the presence of hazardous substances, petroleum products, or other constituents may have been latent, inaccessible, unobservable, non-detectable, or not present during these services. We cannot represent that the site contains no hazardous substances, toxic materials, petroleum products, or other latent conditions beyond those identified during this investigation. Subsurface conditions may vary from those encountered at specific borings or wells or during other surveys, tests, assessments, investigations, or exploratory services. The data, interpretations, findings, and our recommendations are based solely upon data obtained at the time and within the scope of these services.

2.3 Reliance

This report has been prepared for the exclusive use of PRS, and any authorization for use or reliance by any other party (except a governmental entity having jurisdiction over the site) is prohibited without the express written authorization of PRS and Terracon. Any unauthorized distribution or reuse is at PRS's sole risk. Notwithstanding the foregoing, reliance by authorized parties will be subject to the terms, conditions, and limitations stated in the proposal, this report, and Terracon's Agreement for Services. The limitation of liability defined in the terms and conditions is the aggregate limit of Terracon's liability to PRS and all relying parties unless otherwise agreed in writing.

3.0 FIELD INVESTIGATION

Terracon has a commitment to the safety of all its employees. As such, and in accordance with our *Incident and Injury Free*® safety goals, Terracon conducted the fieldwork under a site specific health and safety plan developed for this project. Work was performed using the Occupational Health and Safety Administration (OSHA) Level D work attire consisting of hard hats, safety glasses, protective gloves, and protective boots. In an effort to locate underground utilities in the work area, Terracon contacted the Washington State Utility Notification Center to arrange for public underground utility clearance at the site. In addition, a private utility location service was subcontracted by Terracon to identify the locations and depths of the various utilities located near the proposed borings.

3.1 Soil Sampling

Terracon field representatives mobilized to the site on March 15, 2016, to advance seven borings (B101 through B107) in the area between the locomotive shop and the locomotive wash pad using hand tools. The borings were advanced in the vicinity of previous borings B-4, B-5, B-7, and groundwater monitoring well MW-4.

Specifically, two borings were advanced northwest (B101) and south (B102) of B-4, two borings were advanced west (B103) and east (B104) of B-5, and three borings were advanced south of MW-4 and B-7 (B105 through B107). Due to the presence of the railroad tracks and several buried utilities in the proposed soil sampling locations, the borings were advanced with hand tools. The soil borings were advanced to depths ranging from approximately 1 ½ to 3 feet bgs, at which depth groundwater was encountered. Boring locations relative to site features are depicted on Figure 3 of Appendix A.

Terracon field-screened soil samples for organic vapors using a photoionization detector (PID). This device provides a direct reading in parts per million (ppm) isobutylene equivalents. Prior to use, Terracon calibrated the PID in accordance with the manufacturer's recommendations. Upon removal of the hand auger from the borehole, Terracon put a portion of each sample in a sealable plastic bag. After a stabilization period, Terracon screened the headspace above the soil using the PID.

The soil was also field-screened by a sheen test. A small portion of soil was placed into a shallow stainless steel bowl containing potable water and observed to see if a sheen was emitted on the top of the water's surface from the soil. The *Summary of Field Observations* table (Table 1) in Section 4.2 includes field screening results for each soil boring.

Soil samples were collected with a clean stainless steel hand auger and/or clean stainless steel spoons and bowls. All non-disposable sampling equipment was cleaned with a non-phosphate soap wash followed by a potable water rinse prior to the beginning of the field work and after each sampling effort.

Seven soil samples (one from each boring) were collected and submitted for laboratory analysis. Soil samples were extracted by hand using disposable gloves and placed directly into laboratory-supplied glassware.

Each sample container was labeled with the project number, date, time, boring number and sample number. Sample containers were placed in a chilled cooler immediately after sampling, and subsequently transported to a Washington State-accredited laboratory under strict chain-of-custody procedures.

At the completion of soil sampling activities, the borings were backfilled with the soil removed during sampling activities.

3.2 Groundwater Sampling

Terracon collected groundwater elevation data from site monitoring wells MW-1 through MW-4. In addition, one groundwater sample was collected from monitoring well MW-4. Prior to sample collection, all monitoring wells were opened and exposed to surficial atmospheric conditions and static groundwater elevations were measured from the top of the casing (TOC). The water level probe was decontaminated using a non-phosphate soap wash and distilled water rinse before use in each well.

The groundwater sample from MW-4 was collected using a peristaltic pump and clean sample tubing. Prior to sample collection, the well was purged. Low-flow groundwater discharge rates were maintained during purging in order to minimize the drawdown of the water level in the monitoring wells. During the purging process, groundwater quality parameters, including temperature, electrical conductivity (EC), pH, dissolved oxygen (DO), and oxidation-reduction potential (ORP), were measured at regular intervals using a Horiba U-22 or equivalent water quality meter and a flow-through cell. Purging was considered complete when two consecutive readings for EC, pH, temperature, DO, and ORP were observed to be within 10% of one-another.

Approximately 0.5 gallon of water was purged from the well. The purge water was clear to slightly cloudy, with no sediment. No hydrocarbon-like odor or sheen was observed in the purge water from the well. The purge water was disposed in the locomotive wash pad oil/water separator, which discharges to an adjacent evaporator unit.

The groundwater sample was collected from well MW-4 by directing the discharge from the peristaltic pump directly into laboratory-supplied glassware. The sample containers were labeled with the project number, date, time, well number, and sample number and placed in a chilled cooler immediately after sampling. The sample containers were subsequently transported to a Washington state-certified laboratory, under strict chain-of-custody procedures.

4.0 RESULTS OF ADDITIONAL SITE CHARACTERIZATION ACTIVITIES

4.1 Geology/Hydrogeology

Terracon encountered Type 17 structural fill material consisting of tan to brown sandy gravel in the borings to approximately 2 feet bgs. Brown to gray silty sand was encountered below the fill in borings B101 and B105.

Groundwater was encountered in the borings at approximately 0.8 to 2.75 feet bgs. A sheen was observed on the shallow groundwater surface in borings B102 through B104, B106, and B107.

Measured depth to water in the wells ranged from 1.34 feet below TOC at monitoring well MW-1 to 2.02 feet below TOC at monitoring well MW-4. Based on depth to water measurements and well survey data, the relative groundwater elevations at the monitoring wells ranged from 96.90 feet at monitoring MW-1 to 97.60 feet at monitoring well MW-2 (Table 2). Based on groundwater level measurements collected during this investigation, the groundwater flow direction at the site was toward the west-southwest at a horizontal gradient of approximately 0.005 feet per foot (ft/ft), consistent with previous findings (Figure 4). Depth to groundwater and groundwater elevation measurements are summarized in Table 4 of Appendix B.

4.2 Field Screening

PID readings were not detected above 1 ppm in the soil samples. A sheen was observed on the soil sample collected at 1.5 feet bgs from boring B106. Sheen was observed on the shallow groundwater in borings B102 through B104, B106, and B107. Odors were not observed in the soil or groundwater. The field screening results are summarized in Table 1 below.

Table 1 – Summary of Field Observations

Boring ID	Boring depth (ft)	Soil Description	Sample ID	Sample Depth (ft)	PID readings (ppm)	Sheen observed on soil	Approximate depth to groundwater (ft)	Other observations
B101	3	Fill; brown silty sand below 2 feet bgs.	B101-3’	3	<1	No	2.75	NA
B102	2	Fill	B102-2’	2	<1	No	2	Slight sheen on groundwater
B103	1	Fill	B103-1’	1	<1	No	1	Sheen on groundwater
B104	1	Fill	B104-1’	1	<1	No	0.8	Sheen on groundwater
B105	2.5	Fill; brown silty sand below 2 feet bgs.	B105-2’	2	<1	No	1	NA
B106	1.5	Fill	B106-1.5’	1.5	<1	Yes	1.5	Sheen on groundwater
B107	1	Fill	B107-1’	1	<1	No	1	Sheen on groundwater

5.0 ANALYTICAL RESULTS

All soil and groundwater samples were analyzed for gasoline-, diesel-, and oil-range TPH by Northwest Method NWTPH-HCID.

NWTPH-HCID is a qualitative and semi-quantitative screen to determine the presence and type of petroleum products that may exist in water or soil. The results of this method determines what fully quantitative method/methods, if any, are needed to determine compliance with the soil or groundwater matrix criteria. If the value of the analysis for gasoline-, diesel-, or oil-range TPH exceeds the method reporting limit, a specific analytical method for that product is required to quantify the contaminant concentration.

Due to detections of diesel- and oil-range TPH by HCID, soil samples B103-1' and B104-1' were additionally analyzed for diesel- and oil-range TPH by Northwest Method NWTPH-Dx. Method NWTPH-Dx is the qualitative and quantitative method (extended) for semi-volatile ("diesel") petroleum products in soil and water. Petroleum products applicable for this include jet fuels, kerosene, diesel oils, hydraulic fluids, mineral oils, lubricating oils and fuel oils.

Reported soil and groundwater concentrations were compared with the Washington State Model Toxics Control Act (MTCA) Method A Cleanup Levels for unrestricted land use, as applicable.

In order to further evaluate the site-specific nature of the diesel- and/or oil-range product(s) detected in soil samples B103-1' and B104-1' using MTCA Method B, the samples were also analyzed for the following:

- Volatile petroleum hydrocarbons (VPH) and n-hexane by Northwest Method NWVPH,
- Volatile organic compounds (VOCs) and oxygenates by EPA Method 8260,
- Extractable petroleum hydrocarbons (EPH) by Northwest Method NWEPH, and
- PAHs by EPA Method 8270 with selected ion monitoring (SIM).

Method NWTPH evaluates gasoline-range TPH and the Method NWEPH evaluates diesel- and oil-range TPH, based on carbon range fractions. Specifically, Method NWVPH quantifies the presence of both aromatic and aliphatic volatile petroleum hydrocarbon molecules in a sample, in the 5 to 6 carbon atom range (C5-C6), C6-C8, C8-C10, C10-C12, and C12-C13. Method NWEPH quantifies the presence of both aromatic and aliphatic extractable petroleum hydrocarbon molecules in the C8-C10, C10-C12, C12-C16, C16-C21, and C21-C34 8 carbon atom ranges. Analysis for VPH and/or EPH are used to determine the chemical composition of the petroleum product(s) present, and allow for calculations to establish alternative site-specific cleanup levels for those contaminants in soil and/or groundwater at that location.

The laboratory analytical report and chain-of-custody record are attached in Appendix C. MTCA Method B calculations soil samples B103-1' and B104-1' are attached in Appendix D. The following sections describe the results of the testing.

5.1 Soil Sampling Results

A summary of soil analytical results from the March 2016 additional site characterization activities is presented in Table 2 of Appendix B. The results are tabulated, with the state cleanup levels included for comparison. The complete laboratory reports and chain-of-custody forms for analytical results from these sampling activities are included in Appendix C.

Gasoline-Range Organics

Gasoline-range TPH was not identified at concentrations above the laboratory method reporting limit (MRL) in the soil samples.

Diesel- and Oil-Range Organics

Diesel-range TPH was identified in the soil samples collected at 1 foot bgs from borings B103 and B104 at concentrations of 120 and 180 mg/kg, respectively, well below the MTCA Method A cleanup level of 2,000 mg/kg.

Oil-range TPH was identified in the soil samples collected at 1 foot bgs from borings B103 and B104 at concentrations of 410 and 840 mg/kg, respectively, below the MTCA Method A cleanup level of 2,000 mg/kg.

Diesel- and oil-range TPH were not detected in the remaining samples at concentrations above the laboratory MRLs.

Volatile Petroleum Hydrocarbons and n-Hexane

VPH carbon ranges and n-hexane were not identified at concentrations above the laboratory MRLs in soil samples B103-1' and B104-1'.

Volatile Organic Compounds and Gasoline Oxygenates

VOCs and oxygenates were not identified at concentrations above the laboratory MRLs in soil samples B103-1' and B104-1'.

Extractable Petroleum Hydrocarbons

Aliphatic hydrocarbons in the C12-C16, C16-C21, and C21-C34 carbon ranges were identified in the soil sample collected at 1 foot bgs from boring B103 at concentrations ranging from 60 to 740 mg/kg. Aromatic hydrocarbons in the C16-C21 and C21-C34 carbon ranges were also identified in the B103-1' soil sample at concentrations of 31 and 110 mg/kg, respectively.

Aliphatic hydrocarbons in the C16-C21 and C21-C34 carbon ranges were identified in the soil sample collected at 1 foot bgs from boring B104 at concentrations of 39 and 950 mg/kg, respectively. Aromatic hydrocarbons in the C16-C21 and C21-C34 carbon ranges were also identified in the B104-1' soil sample at concentrations of 8.6 and 120 mg/kg, respectively.

Polycyclic Aromatic Hydrocarbons

PAHs were not identified at concentrations above the laboratory MRLs in soil samples B103-1' and B104-1'.

5.2 Groundwater Sampling Results

Gasoline-, diesel-, and oil-range TPH were not identified at concentrations above the laboratory MRLs in the groundwater sample collected from monitoring well MW-4.

The groundwater sampling results from this and previous investigations are summarized in Table 3 of Appendix B.

5.3 Quality Assurance/Quality Control Results

The analytical results for the current investigation were checked for completeness immediately upon receipt from the laboratory to ensure that data and QA/QC information requested were present. Data quality was assessed by considering hold times, surrogate recovery, method blanks, matrix spike and matrix spike duplicate (MS/MSD) recovery, and detection limits. QA/QC review was completed using guidance described in *USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review* (Draft Final, USEPA, 2005). Our evaluation assumes that the QA/QC is correct as reported by the laboratory, and merely provides an interpretation of the QA/QC results.

Hold Times. All analyses were completed within specified hold times.

Surrogate Recoveries. All surrogate recoveries were within laboratory limits.

Method Blanks. Analytes were not detected in any of the laboratory method blanks.

MS/MSD Results. MS and MSD recoveries were all within laboratory limits, and Relative Percent Differences (RPDs) between MS and MSD recoveries were all within laboratory limits.

Laboratory Reporting Limits. Reporting limits were below relevant MTCA cleanup levels.

Data packages were checked for completeness immediately upon receipt from the laboratory to ensure that data and QA/QC information requested were present. Data quality was assessed by

considering holding times, surrogate recovery, method blanks, matrix spike and matrix spike duplicate recovery, and detection limits.

Based upon our interpretation of quality control information provided by the laboratories, it is our opinion that the overall dataset is useable as qualified for the purposes of this investigation.

6.0 INVESTIGATION DERIVED WASTES (IDW)

As stated above, Terracon backfilled the hand auger borings with the removed soil. Therefore, no soil IDW was accumulated.

Per the client's request, sampling equipment decontamination water and well purge water were placed into the on-site oil/water separator, for processing through the facility wastewater evaporator system.

7.0 FINDINGS AND CONCLUSIONS

Based on the analytical results of soil and groundwater samples, analytes were not detected above the laboratory MRLs and/or their respective MTCA Method A cleanup levels.

The soil samples collected at 1 foot bgs from borings B103 and B104, where diesel- and oil-range TPH was detected, were additionally analyzed for VPH, VOCs, EPH, and PAHs in order to calculate site-specific TPH soil cleanup levels for the detected product type that are protective of groundwater using the Ecology MTCA Method B Workbook, *MTCATPH11.1*.

The MTCA Method B Workbook stipulates that a value equal to ½ of the laboratory MRL be entered into the workbook for all contaminants that were not detected but are suspected to be present at the site. For contaminants not suspected to be present (i.e., the gasoline additive methyl tert butyl ether [MTBE]), a value of 0 may be entered into the workbook. Based on the petroleum product analyzed, the workbook calculated a TPH concentration for soil for each sample that is protective of groundwater quality via the leaching pathway, assuming that the groundwater is used as a drinking water source. In addition, the workbook calculated a TPH concentration for soil for each sample that is protective of human health via the direct contact exposure pathway.

The calculated TPH concentration for soil for protection of groundwater quality for both samples was 100% non-aqueous phase liquid (NAPL), indicating that the product does not have a risk of leaching to groundwater at soil concentrations below product saturation (100% NAPL). The calculated TPH concentration for soil for protection of human health via the direct contact pathway is 7,302 mg/kg for sample B103-1', and 7,708 mg/kg for sample B104'. Copies of the MTCA Method B TPH worksheets are included in Appendix D.

8.0 RECOMMENDATIONS

Based on the findings of the additional site characterization activities, Terracon does not recommend any additional investigations at the site at this time. Upon the client's approval, Terracon will submit this report to Ecology with a request for an Opinion Letter and an NFA determination.

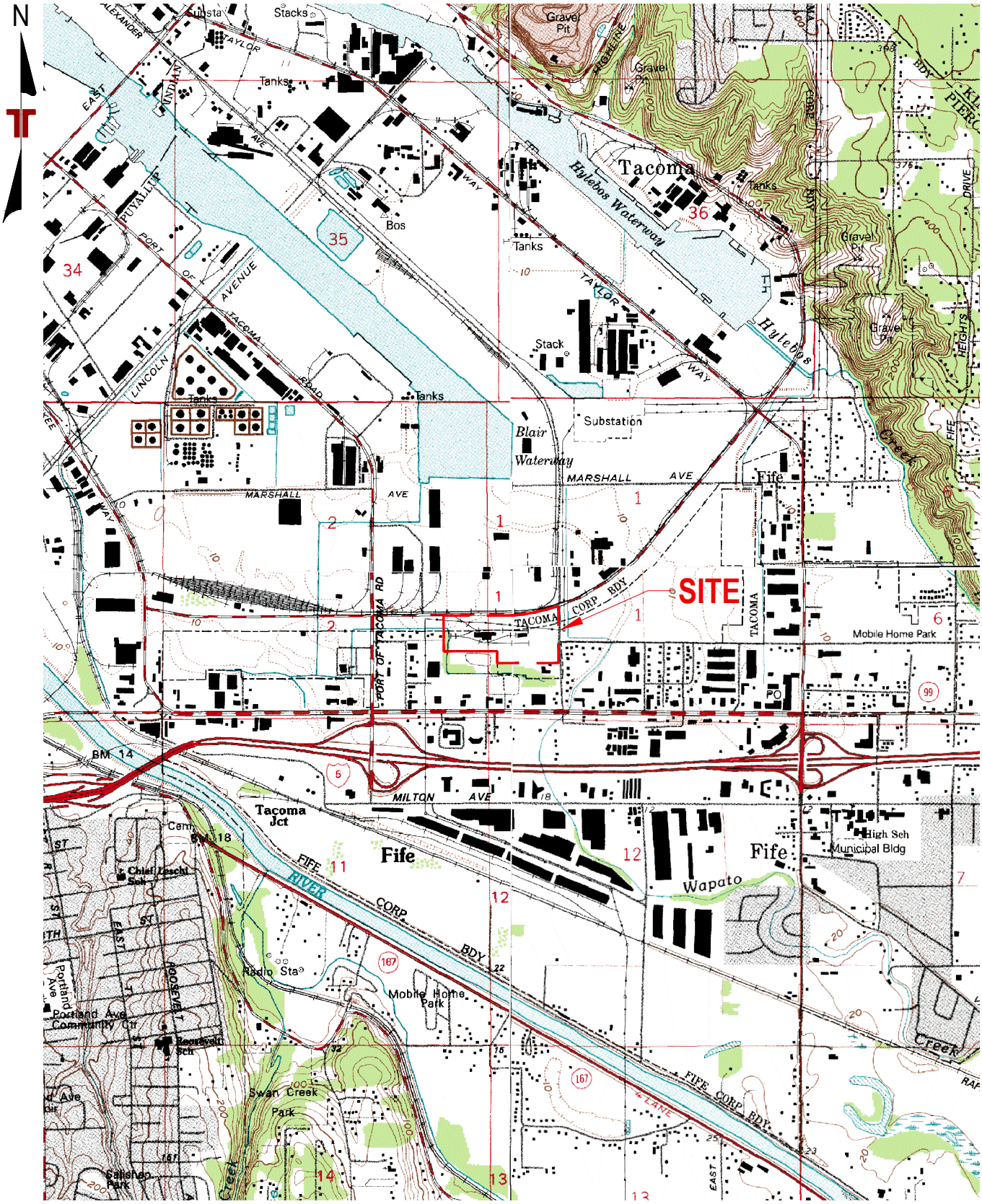
APPENDIX A – FIGURES

Figure 1 – Topographic Map

Figure 2 – Site Diagram

Figure 3 – Site Diagram with Boring Locations

Figure 4 – Groundwater Contour Map March 2016



LEGEND:

— — — Approximate site boundary

USGS Topographic Map, Tacoma North, Tacoma South, Poverty Bay, and Puyallup Quadrangles, 1994

Project Mngr:	LCS
Drawn By:	EMP
Checked By:	LCS
Approved By:	MYW
Project No.	81167031
Scale:	Not to scale
File No.	81127060 Fig 1.dwg
Date:	December 2012

Terracon
Consulting Engineers and Scientists
21905 64th Avenue W., Ste 100 Mountlake Terrace, WA 98043
PH. (425) 771-3304 FAX. (425) 771-3549

Topographic Map

Progress Rail Services
4012 SR 509 South Frontage Road
Tacoma, Pierce County, Washington

FIG. No. 1

LEGEND:

APPROXIMATE SITE BOUNDARY

150 0 50 100 150

SCALE IN FEET
(APPROXIMATE)

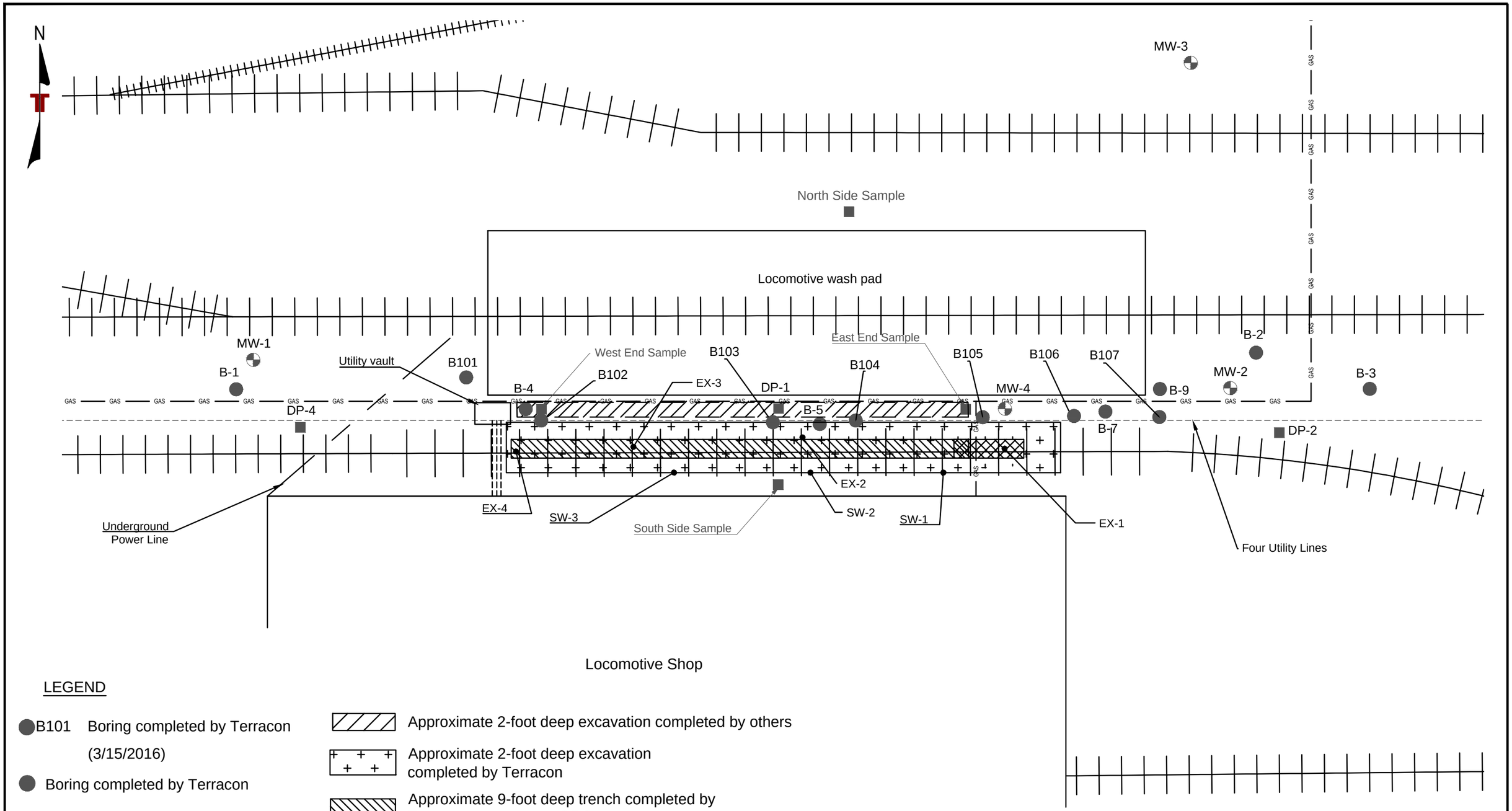
Project Mngr:	EAD
Drawn By:	RMS
Checked By:	MDN
Approved By:	MYW
Project No.	81167031
Scale:	AS SHOWN
File No.	Fig2, P2 Plan.dwg
Date:	September 2014

Terracon
Consulting Engineers and Scientists
21905 64th Avenue W, Ste 100 Mountlake Terrace, WA 98043
PH. (425) 771-3304 FAX. (425) 771-3549

SITE DIAGRAM

Progress Rail Services
4012 SR 509 South Frontage Road
Tacoma, Pierce County, Washington

FIG. No. 2



LEGEND

- B101 Boring completed by Terracon (3/15/2016)
- Boring completed by Terracon
- Monitoring well completed by Terracon
- Boring completed by others

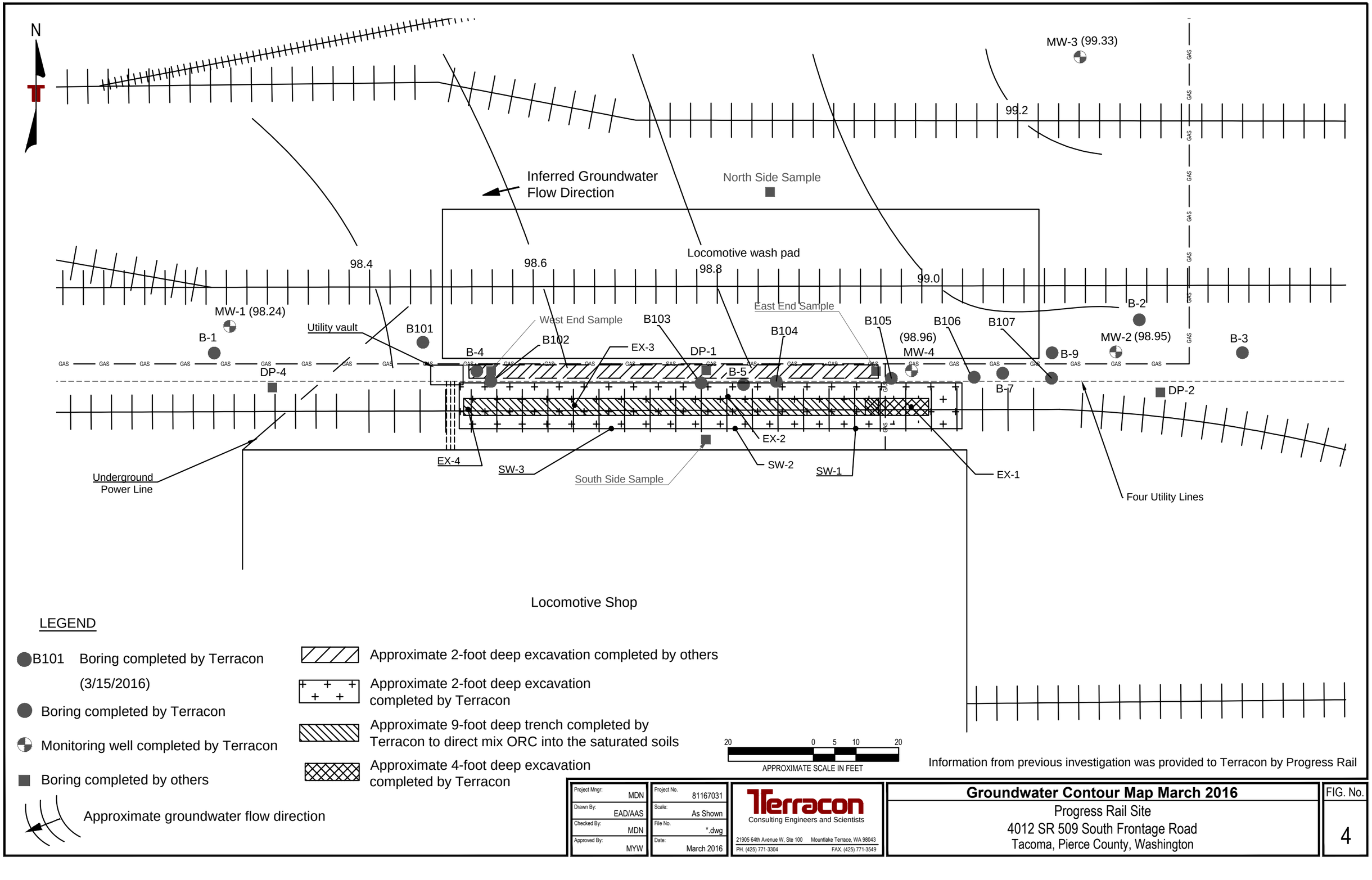
- Approximate 2-foot deep excavation completed by others
- Approximate 2-foot deep excavation completed by Terracon
- Approximate 9-foot deep trench completed by Terracon to direct mix ORC into the saturated soils
- Approximate 4-foot deep excavation completed by Terracon

20 0 5 10 20
APPROXIMATE SCALE IN FEET

Information from previous investigation was provided to Terracon by Progress Rail

Project Mngr: MDN	Project No. 81167031	Terracon Consulting Engineers and Scientists	**SITE DIAGRAM WITH BORING LOCATIONS**
Drawn By: EAD/AAS	Scale: As Shown	21905 64th Avenue W, Ste 100 Mountlake Terrace, WA 98043	Progress Rail Site
Checked By: MDN	File No. *.dwg	PH. (425) 771-3304 FAX. (425) 771-3549	4012 SR 509 South Frontage Road
Approved By: MYW	Date: March 2016		Tacoma, Pierce County, Washington

FIG. No. 3



LEGEND

- B101 Boring completed by Terracon (3/15/2016)
- Boring completed by Terracon
- Monitoring well completed by Terracon
- Boring completed by others
- Approximate groundwater flow direction
- Approximate 2-foot deep excavation completed by others
- Approximate 2-foot deep excavation completed by Terracon
- Approximate 9-foot deep trench completed by Terracon to direct mix ORC into the saturated soils
- Approximate 4-foot deep excavation completed by Terracon

20 0 5 10 20
APPROXIMATE SCALE IN FEET

Information from previous investigation was provided to Terracon by Progress Rail

Project Mngr: MDN	Project No. 81167031	Terracon Consulting Engineers and Scientists	**Groundwater Contour Map March 2016**
Drawn By: EAD/AAS	Scale: As Shown	21905 64th Avenue W, Ste 100 Mountlake Terrace, WA 98043	Progress Rail Site
Checked By: MDN	File No. *.dwg	PH. (425) 771-3304 FAX. (425) 771-3549	4012 SR 509 South Frontage Road
Approved By: MYW	Date: March 2016		Tacoma, Pierce County, Washington

FIG. No. 4

APPENDIX B – TABLES

Table 2– Summary of Soil Analytical Results

Table 3 – Summary of Groundwater Analytical Results

Table 4– Depth to Water Measurements and Groundwater Elevations

TABLE 2 - SUMMARY OF SOIL ANALYTICAL RESULTS

Progress Rail Spill Incident # 12-0773, 4012 SR 509 South Frontage Rd, Tacoma WA

all concentrations are in milligrams per kilogram (mg/kg)

Boring ID	Sample Number	Collected By:	Sample Date	Sample Depth (feet)	TPH			VOCs/SVOCs
					Gasoline-range	Diesel-Range	Oil-Range	
B101	B101-3'	Terracon	3/15/16	3	ND (<20)	ND (<50)	ND (<100)	NA
B102	B102-2'		3/15/16	2	ND (<20)	ND (<50)	ND (<100)	NA
B103	B103-1'		3/15/16	1	ND (<20)	**120**	**410**	ND
B104	B104-1'		3/15/16	1	ND (<20)	**180**	**840**	ND
B105	B105-2'		3/15/16	2	ND (<20)	ND (<50)	ND (<100)	NA
B106	B106-1.5'		3/15/16	1.5	ND (<20)	ND (<50)	ND (<100)	NA
B107	B107-1'		3/15/16	1	ND (<20)	ND (<50)	ND (<100)	NA
B-12	S-1		2/11/14	4.5-5.5	NA	ND (<50)	ND (<250)	NA
B-13	S-1		2/11/14	4.5-5.5	NA	ND (<50)	ND (<250)	NA
B-10	S-1		8/3/13	4.5-5.5	NA	ND (<50)	ND (<250)	NA
B-11	S-1		8/3/13	3.5-4.5	NA	ND (<50)	ND (<250)	NA
B-1	S-1		11/15/12	4.5	NA	ND (<50)	ND (<250)	NA
B-1	S-2		11/15/12	7.5	NA	ND (<50)	ND (<250)	NA
B-2	S-1		11/15/12	3.5	NA	ND (<50)	ND (<250)	NA
B-2	S-2		11/15/12	7.5	NA	ND (<50)	ND (<250)	NA
B-3	S-1		11/15/12	4	NA	ND (<50)	ND (<250)	NA
B-3	S-2		11/15/12	8	NA	ND (<50)	ND (<250)	NA
B-7	S-1		11/15/12	5.5	NA	ND (<50)	ND (<250)	NA
B-7	S-2		11/15/12	7.5	NA	ND (<50)	ND (<250)	NA
B-9	S-1		11/15/12	5.5	NA	ND (<50)	ND (<250)	NA
B-9	S-2		11/15/12	7.5	NA	ND (<50)	ND (<250)	NA
West end Sample		Panhandle	3/7/12	NA	NA	**44**	**210**	NA
South side sample			3/7/12	NA	NA	ND<26	ND <51	NA
East end sample			3/7/12	NA	NA	**5,500**	**900**	NA
North side sample			3/7/12	NA	NA	ND <24	ND <54	NA
MTCA Method A Cleanup Level					**100**	**2,000**	**2,000**	**varies**

Note: Concentrations reported above MDLs are in bold.
Shaded cells are values that exceed cleanup levels.

TPH - total petroleum hydrocarbons
VOCs - volatile organic compounds
SVOCs - semi-volatile organic compounds
MTCA - Model Toxics Control Act
ND - Not detected above MDL
NA - Not analyzed

TABLE 3 - SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

Progress Rail Spill Incident # 12-0773, 4012 SR 509 S Frontage Road, Tacoma WA

all concentrations are in micrograms per liter (µg/l)

Sample	Collected By	Sample Date	TPH	
			Diesel-Range	Oil-Range
MW-1	Terracon	11/13/14	**240x**	ND <250
		8/14/14	**120**	ND <250
		5/15/14	**220x**	ND <250
		2/17/14	**150x**	ND <250
		8/16/13	**62x**	ND <250
MW-2		11/13/14	**190x**	ND <250
		8/14/14	**120**	ND <250
		5/15/14	**270x**	ND <250
		2/17/14	**200x**	ND <250
		8/16/13	**94x**	ND <250
MW-3		11/13/14	ND <50	ND <250
		8/14/14	ND <50	ND <250
		5/15/14	ND <50	ND <250
		2/17/14	**74x**	ND <250
MW-4		3/15/16	ND <310	ND <250
		11/13/14	**300x**	ND <250
		8/14/14	**250**	ND <250
		5/15/14	**400x**	**260x**
		2/17/14	**390x**	**410x**
B-1		11/15/12	**220x**	ND <250
B-2		11/15/12	**140x**	ND <250
B-3		11/15/12	**380x**	ND <250
B-4		11/15/12	**330x**	**390x**
B-5		11/15/12	**5,800**	**9,800x**
B-7		11/15/12	**900x**	**760x**
B-9		11/15/12	**140x**	ND <250
DP-1	Panhandle	5/22/12	**2,300**	**1,000**
DP-2		5/22/12	**450**	**700**
DP-4		5/22/12	**560**	**1,500**
MTCA Method A Cleanup Level			**500**	**500**

Note: Concentrations reported above MDLs are in bold.
Shaded cells are values that exceed cleanup levels.

TPH - total petroleum hydrocarbons
MTCA - Model Toxics Control Act
x - the sample chromaticgraph pettern does not resemble the fuel standard for quantitation

TABLE 4

DEPTH TO WATER MEASUREMENTS AND GROUNDWATER ELEVATIONS

Progress Rail Spill Incident # 12-0773, 4012 SR 509 South Frontage Rd, Tacoma WA

Well Number	Sample Date	TOC Elevation (Feet)	Depth to Water (Feet)	Depth to Product (Feet)	Relative Groundwater Elevation (Feet)
MW-1 Screened 4-14'	8/16/2013	98.24	5.70	0.00	92.54
	2/17/2014	98.24	2.41	0.00	95.83
	5/15/2014	98.24	2.68	0.00	95.56
	8/14/2014	98.24	5.30	0.00	92.94
	11/13/2014	98.24	3.84	0.00	94.40
	3/15/2016	98.24	1.34	0.00	96.90
MW-2 screened 4-14'	8/16/2013	98.95	5.85	0.00	93.10
	2/17/2014	98.95	2.54	0.00	96.41
	5/15/2014	98.95	2.38	0.00	96.57
	8/14/2014	98.95	5.12	0.00	93.83
	11/13/2014	98.95	2.88	0.00	96.07
	3/15/2016	98.95	1.35	0.00	97.60
MW-3 screened 5-15'	2/17/2014	99.33	2.52	0.00	96.81
	5/15/2014	99.33	2.84	0.00	96.49
	8/14/2014	99.33	5.32	0.00	94.01
	11/13/2014	99.33	3.06	0.00	96.27
	3/15/2016	99.33	1.91	0.00	97.42
MW-4 screened 5-15'	2/17/2014	98.96	2.71	0.00	96.25
	5/15/2014	98.96	2.80	0.00	96.16
	8/14/2014	98.96	5.61	0.00	93.35
	11/13/2014	98.96	3.39	0.00	95.57
	3/15/2016	98.96	2.02	0.00	96.94

* all the monitoring wells are 2-inch diameter casings

APPENDIX C – ANALYTICAL REPORT AND CHAIN OF CUSTODY

March 25, 2016

Mr. Mike Noll
Terracon
21905 - 64th Ave W, Suite 100
Mountlake Terrace, WA 98043

Dear Mr. Noll,

On March 15th, 8 samples were received by our laboratory and assigned our laboratory project number EV16030111. The project was identified as your PRS Tacoma Soil - 81167031 Task 2. The sample identification and requested analyses are outlined on the attached chain of custody record.

No abnormalities or nonconformances were observed during the analyses of the project samples.

Please do not hesitate to call me if you have any questions or if I can be of further assistance.

Sincerely,

ALS Laboratory Group

Rick Bagan
Laboratory Director

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	3/25/2016
		ALS JOB#:	EV16030111
		ALS SAMPLE#:	EV16030111-01
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	03/15/2016
CLIENT PROJECT:	PRS Tacoma Soil - 81167031 Task 2	COLLECTION DATE:	3/15/2016 9:55:00 AM
CLIENT SAMPLE ID	B101-3'	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
HCID-Gas Range	NWTPH-HCID	U	20	1	MG/KG	03/16/2016	EBS
HCID-Diesel Range	NWTPH-HCID	U	50	1	MG/KG	03/16/2016	EBS
HCID-Oil Range	NWTPH-HCID	U	100	1	MG/KG	03/16/2016	EBS

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
BCB	NWTPH-HCID	**89.5**	03/16/2016	EBS
C25	NWTPH-HCID	**86.7**	03/16/2016	EBS

U - Analyte analyzed for but not detected at level above reporting limit.

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	3/25/2016
		ALS JOB#:	EV16030111
		ALS SAMPLE#:	EV16030111-02
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	03/15/2016
CLIENT PROJECT:	PRS Tacoma Soil - 81167031 Task 2	COLLECTION DATE:	3/15/2016 10:07:00 AM
CLIENT SAMPLE ID	B102-2'	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
HCID-Gas Range	NWTPH-HCID	U	20	1	MG/KG	03/16/2016	EBS
HCID-Diesel Range	NWTPH-HCID	U	50	1	MG/KG	03/16/2016	EBS
HCID-Oil Range	NWTPH-HCID	U	100	1	MG/KG	03/16/2016	EBS

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
BCB	NWTPH-HCID	**113**	03/16/2016	EBS
C25	NWTPH-HCID	**111**	03/16/2016	EBS

U - Analyte analyzed for but not detected at level above reporting limit.

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE: ALS JOB#: ALS SAMPLE#:	3/25/2016 EV16030111 EV16030111-03
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	03/15/2016
CLIENT PROJECT:	PRS Tacoma Soil - 81167031 Task 2	COLLECTION DATE:	3/15/2016 10:31:00 AM
CLIENT SAMPLE ID	B103-1'	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
HCID-Gas Range	NWTPH-HCID	U	20	1	MG/KG	03/16/2016	EBS
HCID-Diesel Range	NWTPH-HCID	**>50**	50	1	MG/KG	03/16/2016	EBS
HCID-Oil Range	NWTPH-HCID	**>100**	100	1	MG/KG	03/16/2016	EBS
C5-C6 Aliphatics	NWVPH	U	5.0	1	MG/KG	03/21/2016	PAB
>C6-C8 Aliphatics	NWVPH	U	5.0	1	MG/KG	03/21/2016	PAB
>C8-C10 Aliphatics	NWVPH	U	5.0	1	MG/KG	03/21/2016	PAB
>C10-C12 Aliphatics	NWVPH	U	5.0	1	MG/KG	03/21/2016	PAB
>C8-C10 Aromatics	NWVPH	U	5.0	1	MG/KG	03/21/2016	PAB
>C10-C12 Aromatics	NWVPH	U	5.0	1	MG/KG	03/21/2016	PAB
Hexane	NWVPH	U	0.20	1	MG/KG	03/21/2016	PAB
TPH-Diesel Range	NWTPH-DX	**120**	25	1	MG/KG	03/17/2016	EBS
TPH-Oil Range	NWTPH-DX	**410**	50	1	MG/KG	03/17/2016	EBS
>C12-C16 Aliphatics	NWEPH	**60**	5.0	1	MG/KG	03/23/2016	EBS
>C16-C21 Aliphatics	NWEPH	**120**	5.0	1	MG/KG	03/23/2016	EBS
>C21-C34 Aliphatics	NWEPH	**740**	5.0	1	MG/KG	03/23/2016	EBS
>C12-C16 Aromatics	NWEPH	U	5.0	1	MG/KG	03/23/2016	EBS
>C16-C21 Aromatics	NWEPH	**31**	5.0	1	MG/KG	03/23/2016	EBS
>C21-C34 Aromatics	NWEPH	**110**	5.0	1	MG/KG	03/23/2016	EBS
Dichlorodifluoromethane	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
Chloromethane	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
Vinyl Chloride	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
Bromomethane	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
Chloroethane	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
Carbon Tetrachloride	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
Trichlorofluoromethane	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
Ethanol	EPA-8260	U	1.0	1	MG/KG	03/18/2016	DLC
Carbon Disulfide	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
Acetone	EPA-8260	U	0.050	1	MG/KG	03/18/2016	DLC
1,1-Dichloroethene	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
Methylene Chloride	EPA-8260	U	0.020	1	MG/KG	03/18/2016	DLC
Acrylonitrile	EPA-8260	U	0.050	1	MG/KG	03/18/2016	DLC
Methyl T-Butyl Ether	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
Trans-1,2-Dichloroethene	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
Diisopropyl Ether	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
Ethyl T-Butyl Ether	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
1,1-Dichloroethane	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
2-Butanone	EPA-8260	U	0.050	1	MG/KG	03/18/2016	DLC
Cis-1,2-Dichloroethene	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
2,2-Dichloropropane	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE: ALS JOB#: ALS SAMPLE#:	3/25/2016 EV16030111 EV16030111-03
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	03/15/2016
CLIENT PROJECT:	PRS Tacoma Soil - 81167031 Task 2	COLLECTION DATE:	3/15/2016 10:31:00 AM
CLIENT SAMPLE ID	B103-1'	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
Bromochloromethane	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
Chloroform	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
1,1,1-Trichloroethane	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
1,1-Dichloropropene	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
1,2-Dichloroethane	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
Benzene	EPA-8260	U	0.0050	1	MG/KG	03/18/2016	DLC
Trichloroethene	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
tert-Amyl Methyl Ether	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
tert-Butanol	EPA-8260	U	0.020	1	MG/KG	03/18/2016	DLC
1,2-Dichloropropane	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
Dibromomethane	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
Bromodichloromethane	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
Trans-1,3-Dichloropropene	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
4-Methyl-2-Pentanone	EPA-8260	U	0.050	1	MG/KG	03/18/2016	DLC
Toluene	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
Cis-1,3-Dichloropropene	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
1,1,2-Trichloroethane	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
2-Hexanone	EPA-8260	U	0.050	1	MG/KG	03/18/2016	DLC
1,3-Dichloropropane	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
Tetrachloroethylene	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
Dibromochloromethane	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
1,2-Dibromoethane	EPA-8260	U	0.0050	1	MG/KG	03/18/2016	DLC
Chlorobenzene	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
1,1,1,2-Tetrachloroethane	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
Ethylbenzene	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
m,p-Xylene	EPA-8260	U	0.020	1	MG/KG	03/18/2016	DLC
Styrene	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
o-Xylene	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
Bromoform	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
Isopropylbenzene	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
1,1,2,2-Tetrachloroethane	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
1,2,3-Trichloropropane	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
Bromobenzene	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
N-Propyl Benzene	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
2-Chlorotoluene	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
1,3,5-Trimethylbenzene	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
4-Chlorotoluene	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
T-Butyl Benzene	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
1,2,4-Trimethylbenzene	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE: ALS JOB#: ALS SAMPLE#:	3/25/2016 EV16030111 EV16030111-03
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	03/15/2016
CLIENT PROJECT:	PRS Tacoma Soil - 81167031 Task 2	COLLECTION DATE:	3/15/2016 10:31:00 AM
CLIENT SAMPLE ID	B103-1'	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
S-Butyl Benzene	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
P-Isopropyltoluene	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
1,3-Dichlorobenzene	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
1,4-Dichlorobenzene	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
N-Butylbenzene	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
1,2-Dichlorobenzene	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
1,2-Dibromo 3-Chloropropane	EPA-8260	U	0.050	1	MG/KG	03/18/2016	DLC
1,2,4-Trichlorobenzene	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
Hexachlorobutadiene	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
Naphthalene	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
1,2,3-Trichlorobenzene	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
Naphthalene	EPA-8270 SIM	U	0.020	1	MG/KG	03/21/2016	GAP
2-Methylnaphthalene	EPA-8270 SIM	U	0.020	1	MG/KG	03/21/2016	GAP
1-Methylnaphthalene	EPA-8270 SIM	U	0.020	1	MG/KG	03/21/2016	GAP
Acenaphthylene	EPA-8270 SIM	U	0.020	1	MG/KG	03/21/2016	GAP
Acenaphthene	EPA-8270 SIM	U	0.020	1	MG/KG	03/21/2016	GAP
Fluorene	EPA-8270 SIM	U	0.020	1	MG/KG	03/21/2016	GAP
Phenanthrene	EPA-8270 SIM	U	0.020	1	MG/KG	03/21/2016	GAP
Anthracene	EPA-8270 SIM	U	0.020	1	MG/KG	03/21/2016	GAP
Fluoranthene	EPA-8270 SIM	U	0.020	1	MG/KG	03/21/2016	GAP
Pyrene	EPA-8270 SIM	U	0.020	1	MG/KG	03/21/2016	GAP
Benzo[A]Anthracene	EPA-8270 SIM	U	0.020	1	MG/KG	03/21/2016	GAP
Chrysene	EPA-8270 SIM	U	0.020	1	MG/KG	03/21/2016	GAP
Benzo[B]Fluoranthene	EPA-8270 SIM	U	0.020	1	MG/KG	03/21/2016	GAP
Benzo[K]Fluoranthene	EPA-8270 SIM	U	0.020	1	MG/KG	03/21/2016	GAP
Benzo[A]Pyrene	EPA-8270 SIM	U	0.020	1	MG/KG	03/21/2016	GAP
Indeno[1,2,3-Cd]Pyrene	EPA-8270 SIM	U	0.020	1	MG/KG	03/21/2016	GAP
Dibenz[A,H]Anthracene	EPA-8270 SIM	U	0.020	1	MG/KG	03/21/2016	GAP
Benzo[G,H,I]Perylene	EPA-8270 SIM	U	0.020	1	MG/KG	03/21/2016	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
BCB	NWTPH-HCID	**83.6**	03/16/2016	EBS
C25	NWTPH-HCID	**83.9**	03/16/2016	EBS
TFT - Aliphatic	NWVPH	**96.8**	03/21/2016	PAB
TFT - Aromatic	NWVPH	**89.0**	03/21/2016	PAB
TFT - Hexane	NWVPH	**91.2**	03/21/2016	PAB
C25	NWTPH-DX	**92.8**	03/17/2016	EBS
C25	NWEPH	**112**	03/23/2016	EBS

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE: ALS JOB#: ALS SAMPLE#:	3/25/2016 EV16030111 EV16030111-03
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	03/15/2016
CLIENT PROJECT:	PRS Tacoma Soil - 81167031 Task 2	COLLECTION DATE:	3/15/2016 10:31:00 AM
CLIENT SAMPLE ID	B103-1'	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
p-Terphenyl	NWEPH	**99.1**	03/23/2016	EBS
1,2-Dichloroethane-d4	EPA-8260	**101**	03/18/2016	DLC
Toluene-d8	EPA-8260	**103**	03/18/2016	DLC
4-Bromofluorobenzene	EPA-8260	**101**	03/18/2016	DLC
Terphenyl-d14	EPA-8270 SIM	**116**	03/21/2016	GAP

U - Analyte analyzed for but not detected at level above reporting limit.
Chromatogram indicates that it is likely that sample contains highly weathered diesel and lube oil.
Diesel range product results biased high due to oil range product overlap.

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	3/25/2016
		ALS JOB#:	EV16030111
		ALS SAMPLE#:	EV16030111-04
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	03/15/2016
CLIENT PROJECT:	PRS Tacoma Soil - 81167031 Task 2	COLLECTION DATE:	3/15/2016 10:53:00 AM
CLIENT SAMPLE ID	B104-1'	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
HCID-Gas Range	NWTPH-HCID	U	20	1	MG/KG	03/16/2016	EBS
HCID-Diesel Range	NWTPH-HCID	U	50	1	MG/KG	03/16/2016	EBS
HCID-Oil Range	NWTPH-HCID	**>100**	100	1	MG/KG	03/16/2016	EBS
C5-C6 Aliphatics	NWVPH	U	5.0	1	MG/KG	03/22/2016	PAB
>C6-C8 Aliphatics	NWVPH	U	5.0	1	MG/KG	03/22/2016	PAB
>C8-C10 Aliphatics	NWVPH	U	5.0	1	MG/KG	03/22/2016	PAB
>C10-C12 Aliphatics	NWVPH	U	5.0	1	MG/KG	03/22/2016	PAB
>C8-C10 Aromatics	NWVPH	U	5.0	1	MG/KG	03/22/2016	PAB
>C10-C12 Aromatics	NWVPH	U	5.0	1	MG/KG	03/22/2016	PAB
Hexane	NWVPH	U	0.20	1	MG/KG	03/22/2016	PAB
TPH-Diesel Range	NWTPH-DX	**180**	50	2	MG/KG	03/17/2016	EBS
TPH-Oil Range	NWTPH-DX	**840**	100	2	MG/KG	03/17/2016	EBS
>C12-C16 Aliphatics	NWEPH	U	5.0	1	MG/KG	03/23/2016	EBS
>C16-C21 Aliphatics	NWEPH	**39**	5.0	1	MG/KG	03/23/2016	EBS
>C21-C34 Aliphatics	NWEPH	**950**	5.0	1	MG/KG	03/23/2016	EBS
>C12-C16 Aromatics	NWEPH	U	5.0	1	MG/KG	03/23/2016	EBS
>C16-C21 Aromatics	NWEPH	**8.6**	5.0	1	MG/KG	03/23/2016	EBS
>C21-C34 Aromatics	NWEPH	**120**	5.0	1	MG/KG	03/23/2016	EBS
Dichlorodifluoromethane	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
Chloromethane	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
Vinyl Chloride	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
Bromomethane	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
Chloroethane	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
Carbon Tetrachloride	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
Trichlorofluoromethane	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
Ethanol	EPA-8260	U	1.0	1	MG/KG	03/18/2016	DLC
Carbon Disulfide	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
Acetone	EPA-8260	U	0.050	1	MG/KG	03/18/2016	DLC
1,1-Dichloroethene	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
Methylene Chloride	EPA-8260	U	0.020	1	MG/KG	03/18/2016	DLC
Acrylonitrile	EPA-8260	U	0.050	1	MG/KG	03/18/2016	DLC
Methyl T-Butyl Ether	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
Trans-1,2-Dichloroethene	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
Diisopropyl Ether	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
Ethyl T-Butyl Ether	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
1,1-Dichloroethane	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
2-Butanone	EPA-8260	U	0.050	1	MG/KG	03/18/2016	DLC
Cis-1,2-Dichloroethene	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
2,2-Dichloropropane	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE: ALS JOB#: ALS SAMPLE#:	3/25/2016 EV16030111 EV16030111-04
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	03/15/2016
CLIENT PROJECT:	PRS Tacoma Soil - 81167031 Task 2	COLLECTION DATE:	3/15/2016 10:53:00 AM
CLIENT SAMPLE ID	B104-1'	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
Bromochloromethane	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
Chloroform	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
1,1,1-Trichloroethane	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
1,1-Dichloropropene	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
1,2-Dichloroethane	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
Benzene	EPA-8260	U	0.0050	1	MG/KG	03/18/2016	DLC
Trichloroethene	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
tert-Amyl Methyl Ether	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
tert-Butanol	EPA-8260	U	0.020	1	MG/KG	03/18/2016	DLC
1,2-Dichloropropane	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
Dibromomethane	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
Bromodichloromethane	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
Trans-1,3-Dichloropropene	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
4-Methyl-2-Pentanone	EPA-8260	U	0.050	1	MG/KG	03/18/2016	DLC
Toluene	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
Cis-1,3-Dichloropropene	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
1,1,2-Trichloroethane	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
2-Hexanone	EPA-8260	U	0.050	1	MG/KG	03/18/2016	DLC
1,3-Dichloropropane	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
Tetrachloroethylene	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
Dibromochloromethane	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
1,2-Dibromoethane	EPA-8260	U	0.0050	1	MG/KG	03/18/2016	DLC
Chlorobenzene	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
1,1,1,2-Tetrachloroethane	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
Ethylbenzene	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
m,p-Xylene	EPA-8260	U	0.020	1	MG/KG	03/18/2016	DLC
Styrene	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
o-Xylene	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
Bromoform	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
Isopropylbenzene	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
1,1,2,2-Tetrachloroethane	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
1,2,3-Trichloropropane	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
Bromobenzene	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
N-Propyl Benzene	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
2-Chlorotoluene	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
1,3,5-Trimethylbenzene	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
4-Chlorotoluene	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
T-Butyl Benzene	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
1,2,4-Trimethylbenzene	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE: ALS JOB#: ALS SAMPLE#:	3/25/2016 EV16030111 EV16030111-04
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	03/15/2016
CLIENT PROJECT:	PRS Tacoma Soil - 81167031 Task 2	COLLECTION DATE:	3/15/2016 10:53:00 AM
CLIENT SAMPLE ID	B104-1'	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
S-Butyl Benzene	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
P-Isopropyltoluene	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
1,3-Dichlorobenzene	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
1,4-Dichlorobenzene	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
N-Butylbenzene	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
1,2-Dichlorobenzene	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
1,2-Dibromo 3-Chloropropane	EPA-8260	U	0.050	1	MG/KG	03/18/2016	DLC
1,2,4-Trichlorobenzene	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
Hexachlorobutadiene	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
Naphthalene	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
1,2,3-Trichlorobenzene	EPA-8260	U	0.010	1	MG/KG	03/18/2016	DLC
Naphthalene	EPA-8270 SIM	U	0.020	1	MG/KG	03/21/2016	GAP
2-Methylnaphthalene	EPA-8270 SIM	U	0.020	1	MG/KG	03/21/2016	GAP
1-Methylnaphthalene	EPA-8270 SIM	U	0.020	1	MG/KG	03/21/2016	GAP
Acenaphthylene	EPA-8270 SIM	U	0.020	1	MG/KG	03/21/2016	GAP
Acenaphthene	EPA-8270 SIM	U	0.020	1	MG/KG	03/21/2016	GAP
Fluorene	EPA-8270 SIM	U	0.020	1	MG/KG	03/21/2016	GAP
Phenanthrene	EPA-8270 SIM	U	0.020	1	MG/KG	03/21/2016	GAP
Anthracene	EPA-8270 SIM	U	0.020	1	MG/KG	03/21/2016	GAP
Fluoranthene	EPA-8270 SIM	U	0.020	1	MG/KG	03/21/2016	GAP
Pyrene	EPA-8270 SIM	U	0.020	1	MG/KG	03/21/2016	GAP
Benzo[A]Anthracene	EPA-8270 SIM	U	0.020	1	MG/KG	03/21/2016	GAP
Chrysene	EPA-8270 SIM	U	0.020	1	MG/KG	03/21/2016	GAP
Benzo[B]Fluoranthene	EPA-8270 SIM	U	0.020	1	MG/KG	03/21/2016	GAP
Benzo[K]Fluoranthene	EPA-8270 SIM	U	0.020	1	MG/KG	03/21/2016	GAP
Benzo[A]Pyrene	EPA-8270 SIM	U	0.020	1	MG/KG	03/21/2016	GAP
Indeno[1,2,3-Cd]Pyrene	EPA-8270 SIM	U	0.020	1	MG/KG	03/21/2016	GAP
Dibenz[A,H]Anthracene	EPA-8270 SIM	U	0.020	1	MG/KG	03/21/2016	GAP
Benzo[G,H,I]Perylene	EPA-8270 SIM	U	0.020	1	MG/KG	03/21/2016	GAP

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
BCB	NWTPH-HCID	**134**	03/16/2016	EBS
C25	NWTPH-HCID	**136**	03/16/2016	EBS
TFT - Aliphatic	NWVPH	**83.9**	03/22/2016	PAB
TFT - Aromatic	NWVPH	**86.7**	03/22/2016	PAB
TFT - Hexane	NWVPH	**85.3**	03/22/2016	PAB
C25 2X Dilution	NWTPH-DX	**97.0**	03/17/2016	EBS
C25	NWEPH	**113**	03/23/2016	EBS

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE: ALS JOB#: ALS SAMPLE#:	3/25/2016 EV16030111 EV16030111-04
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	03/15/2016
CLIENT PROJECT:	PRS Tacoma Soil - 81167031 Task 2	COLLECTION DATE:	3/15/2016 10:53:00 AM
CLIENT SAMPLE ID	B104-1'	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
p-Terphenyl	NWEPH	**95.3**	03/23/2016	EBS
1,2-Dichloroethane-d4	EPA-8260	**109**	03/18/2016	DLC
Toluene-d8	EPA-8260	**101**	03/18/2016	DLC
4-Bromofluorobenzene	EPA-8260	**111**	03/18/2016	DLC
Terphenyl-d14	EPA-8270 SIM	**77.3**	03/21/2016	GAP

U - Analyte analyzed for but not detected at level above reporting limit.
Chromatogram indicates that it is likely that sample contains light oil/lube oil.

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	3/25/2016
		ALS JOB#:	EV16030111
		ALS SAMPLE#:	EV16030111-05
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	03/15/2016
CLIENT PROJECT:	PRS Tacoma Soil - 81167031 Task 2	COLLECTION DATE:	3/15/2016 1:04:00 PM
CLIENT SAMPLE ID	B105-2'	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
HCID-Gas Range	NWTPH-HCID	U	20	1	MG/KG	03/16/2016	EBS
HCID-Diesel Range	NWTPH-HCID	U	50	1	MG/KG	03/16/2016	EBS
HCID-Oil Range	NWTPH-HCID	U	100	1	MG/KG	03/16/2016	EBS

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
BCB	NWTPH-HCID	**103**	03/16/2016	EBS
C25	NWTPH-HCID	**103**	03/16/2016	EBS

U - Analyte analyzed for but not detected at level above reporting limit.

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	3/25/2016
		ALS JOB#:	EV16030111
		ALS SAMPLE#:	EV16030111-06
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	03/15/2016
CLIENT PROJECT:	PRS Tacoma Soil - 81167031 Task 2	COLLECTION DATE:	3/15/2016 12:15:00 PM
CLIENT SAMPLE ID	B106-1.5'	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
HCID-Gas Range	NWTPH-HCID	U	20	1	MG/KG	03/16/2016	EBS
HCID-Diesel Range	NWTPH-HCID	U	50	1	MG/KG	03/16/2016	EBS
HCID-Oil Range	NWTPH-HCID	U	100	1	MG/KG	03/16/2016	EBS

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
BCB	NWTPH-HCID	**107**	03/16/2016	EBS
C25	NWTPH-HCID	**117**	03/16/2016	EBS

U - Analyte analyzed for but not detected at level above reporting limit.

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	3/25/2016
		ALS JOB#:	EV16030111
		ALS SAMPLE#:	EV16030111-07
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	03/15/2016
CLIENT PROJECT:	PRS Tacoma Soil - 81167031 Task 2	COLLECTION DATE:	3/15/2016 11:27:00 AM
CLIENT SAMPLE ID	B107-1'	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
HCID-Gas Range	NWTPH-HCID	U	20	1	MG/KG	03/16/2016	EBS
HCID-Diesel Range	NWTPH-HCID	U	50	1	MG/KG	03/16/2016	EBS
HCID-Oil Range	NWTPH-HCID	U	100	1	MG/KG	03/16/2016	EBS

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
BCB	NWTPH-HCID	**132**	03/16/2016	EBS
C25	NWTPH-HCID	**139**	03/16/2016	EBS

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	3/25/2016
		ALS JOB#:	EV16030111
		ALS SAMPLE#:	EV16030111-08
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	03/15/2016
CLIENT PROJECT:	PRS Tacoma Soil - 81167031 Task 2	COLLECTION DATE:	3/15/2016 11:20:00 AM
CLIENT SAMPLE ID	MW-4	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
HCID-Gas Range	NWTPH-HCID	U	130	1	UG/L	03/16/2016	EBS
HCID-Diesel Range	NWTPH-HCID	U	310	1	UG/L	03/16/2016	EBS
HCID-Oil Range	NWTPH-HCID	U	310	1	UG/L	03/16/2016	EBS

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
BCB	NWTPH-HCID	**81.9**	03/16/2016	EBS
C25	NWTPH-HCID	**70.2**	03/16/2016	EBS
C25 (conc)	NWTPH-HCID	**119**	03/16/2016	EBS

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CERTIFICATE OF ANALYSIS

CLIENT: Terracon
21905 - 64th Ave W, Suite 100
Mountlake Terrace, WA 98043

CLIENT CONTACT: Mike Noll
CLIENT PROJECT: PRS Tacoma Soil - 81167031 Task 2

DATE: 3/25/2016
ALS SDG#: EV16030111
WDOE ACCREDITATION: C601

LABORATORY BLANK RESULTS

MB-031616S - Batch 102324 - Soil by NWTPH-HCID

ANALYTE	METHOD	RESULTS	UNITS	REPORTING LIMITS	ANALYSIS DATE	ANALYSIS BY
HCID-Gas Range	NWTPH-HCID	U	MG/KG	20	03/16/2016	EBS
HCID-Diesel Range	NWTPH-HCID	U	MG/KG	50	03/16/2016	EBS
HCID-Oil Range	NWTPH-HCID	U	MG/KG	100	03/16/2016	EBS

U - Analyte analyzed for but not detected at level above reporting limit.

MB-031616W - Batch 102326 - Water by NWTPH-HCID

ANALYTE	METHOD	RESULTS	UNITS	REPORTING LIMITS	ANALYSIS DATE	ANALYSIS BY
HCID-Gas Range	NWTPH-HCID	U	UG/L	130	03/16/2016	EBS
HCID-Diesel Range	NWTPH-HCID	U	UG/L	310	03/16/2016	EBS
HCID-Oil Range	NWTPH-HCID	U	UG/L	310	03/16/2016	EBS

U - Analyte analyzed for but not detected at level above reporting limit.

MBLK-271360 - Batch R271360 - Soil by NWVPH

ANALYTE	METHOD	RESULTS	UNITS	REPORTING LIMITS	ANALYSIS DATE	ANALYSIS BY
C5-C6 Aliphatics	NWVPH	U	MG/KG	5.0	03/21/2016	PAB
>C6-C8 Aliphatics	NWVPH	U	MG/KG	5.0	03/21/2016	PAB
>C8-C10 Aliphatics	NWVPH	U	MG/KG	5.0	03/21/2016	PAB
>C10-C12 Aliphatics	NWVPH	U	MG/KG	5.0	03/21/2016	PAB
>C8-C10 Aromatics	NWVPH	U	MG/KG	5.0	03/21/2016	PAB
>C10-C12 Aromatics	NWVPH	U	MG/KG	5.0	03/21/2016	PAB
Hexane	NWVPH	U	MG/KG	0.20	03/21/2016	PAB

U - Analyte analyzed for but not detected at level above reporting limit.

MB-031416S - Batch 102230 - Soil by NWTPH-DX

ANALYTE	METHOD	RESULTS	UNITS	REPORTING LIMITS	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range	NWTPH-DX	U	MG/KG	25	03/14/2016	EBS
TPH-Oil Range	NWTPH-DX	U	MG/KG	50	03/14/2016	EBS

U - Analyte analyzed for but not detected at level above reporting limit.

MBLK-271406 - Batch R271406 - Soil by NWEPH

ANALYTE	METHOD	RESULTS	UNITS	REPORTING LIMITS	ANALYSIS DATE	ANALYSIS BY
>C12-C16 Aliphatics	NWEPH	U	MG/KG	5.0	03/23/2016	EBS
>C16-C21 Aliphatics	NWEPH	U	MG/KG	5.0	03/23/2016	EBS
>C21-C34 Aliphatics	NWEPH	U	MG/KG	5.0	03/23/2016	EBS

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CERTIFICATE OF ANALYSIS

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Mountlake Terrace, WA 98043

CLIENT CONTACT: Mike Noll
CLIENT PROJECT: PRS Tacoma Soil - 81167031 Task 2

DATE: 3/25/2016
ALS SDG#: EV16030111
WDOE ACCREDITATION: C601

LABORATORY BLANK RESULTS

MBLK-271406 - Batch R271406 - Soil by NWEPH

>C12-C16 Aromatics	NWEPH	U	MG/KG	5.0	03/23/2016	EBS
>C16-C21 Aromatics	NWEPH	U	MG/KG	5.0	03/23/2016	EBS
>C21-C34 Aromatics	NWEPH	U	MG/KG	5.0	03/23/2016	EBS

U - Analyte analyzed for but not detected at level above reporting limit.

MB-031616S - Batch 102314 - Soil by EPA-8260

ANALYTE	METHOD	RESULTS	UNITS	REPORTING LIMITS	ANALYSIS DATE	ANALYSIS BY
Dichlorodifluoromethane	EPA-8260	U	MG/KG	0.010	03/17/2016	DLC
Chloromethane	EPA-8260	U	MG/KG	0.010	03/17/2016	DLC
Vinyl Chloride	EPA-8260	U	MG/KG	0.010	03/17/2016	DLC
Bromomethane	EPA-8260	U	MG/KG	0.010	03/17/2016	DLC
Chloroethane	EPA-8260	U	MG/KG	0.010	03/17/2016	DLC
Carbon Tetrachloride	EPA-8260	U	MG/KG	0.010	03/17/2016	DLC
Trichlorofluoromethane	EPA-8260	U	MG/KG	0.010	03/17/2016	DLC
Ethanol	EPA-8260	U	MG/KG	1.0	03/17/2016	DLC
Carbon Disulfide	EPA-8260	U	MG/KG	0.010	03/17/2016	DLC
Acetone	EPA-8260	U	MG/KG	0.050	03/17/2016	DLC
1,1-Dichloroethene	EPA-8260	U	MG/KG	0.010	03/17/2016	DLC
Methylene Chloride	EPA-8260	U	MG/KG	0.020	03/17/2016	DLC
Acrylonitrile	EPA-8260	U	MG/KG	0.050	03/17/2016	DLC
Methyl T-Butyl Ether	EPA-8260	U	MG/KG	0.010	03/17/2016	DLC
Trans-1,2-Dichloroethene	EPA-8260	U	MG/KG	0.010	03/17/2016	DLC
Diisopropyl Ether	EPA-8260	U	MG/KG	0.010	03/17/2016	DLC
Ethyl T-Butyl Ether	EPA-8260	U	MG/KG	0.010	03/17/2016	DLC
1,1-Dichloroethane	EPA-8260	U	MG/KG	0.010	03/17/2016	DLC
2-Butanone	EPA-8260	U	MG/KG	0.050	03/17/2016	DLC
Cis-1,2-Dichloroethene	EPA-8260	U	MG/KG	0.010	03/17/2016	DLC
2,2-Dichloropropane	EPA-8260	U	MG/KG	0.010	03/17/2016	DLC
Bromochloromethane	EPA-8260	U	MG/KG	0.010	03/17/2016	DLC
Chloroform	EPA-8260	U	MG/KG	0.010	03/17/2016	DLC
1,1,1-Trichloroethane	EPA-8260	U	MG/KG	0.010	03/17/2016	DLC
1,1-Dichloropropene	EPA-8260	U	MG/KG	0.010	03/17/2016	DLC
1,2-Dichloroethane	EPA-8260	U	MG/KG	0.010	03/17/2016	DLC
Benzene	EPA-8260	U	MG/KG	0.0050	03/17/2016	DLC
Trichloroethene	EPA-8260	U	MG/KG	0.010	03/17/2016	DLC
tert-Amyl Methyl Ether	EPA-8260	U	MG/KG	0.010	03/17/2016	DLC
tert-Butanol	EPA-8260	U	MG/KG	0.020	03/17/2016	DLC
1,2-Dichloropropane	EPA-8260	U	MG/KG	0.010	03/17/2016	DLC
Dibromomethane	EPA-8260	U	MG/KG	0.010	03/17/2016	DLC
Bromodichloromethane	EPA-8260	U	MG/KG	0.010	03/17/2016	DLC

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CERTIFICATE OF ANALYSIS

CLIENT: Terracon
21905 - 64th Ave W, Suite 100
Mountlake Terrace, WA 98043

DATE: 3/25/2016
ALS SDG#: EV16030111
WDOE ACCREDITATION: C601

CLIENT CONTACT: Mike Noll
CLIENT PROJECT: PRS Tacoma Soil - 81167031 Task 2

LABORATORY BLANK RESULTS

MB-031616S - Batch 102314 - Soil by EPA-8260

Trans-1,3-Dichloropropene	EPA-8260	U	MG/KG	0.010	03/17/2016	DLC
4-Methyl-2-Pentanone	EPA-8260	U	MG/KG	0.050	03/17/2016	DLC
Toluene	EPA-8260	U	MG/KG	0.010	03/17/2016	DLC
Cis-1,3-Dichloropropene	EPA-8260	U	MG/KG	0.010	03/17/2016	DLC
1,1,2-Trichloroethane	EPA-8260	U	MG/KG	0.010	03/17/2016	DLC
2-Hexanone	EPA-8260	U	MG/KG	0.050	03/17/2016	DLC
1,3-Dichloropropane	EPA-8260	U	MG/KG	0.010	03/17/2016	DLC
Tetrachloroethylene	EPA-8260	U	MG/KG	0.010	03/17/2016	DLC
Dibromochloromethane	EPA-8260	U	MG/KG	0.010	03/17/2016	DLC
1,2-Dibromoethane	EPA-8260	U	MG/KG	0.0050	03/17/2016	DLC
Chlorobenzene	EPA-8260	U	MG/KG	0.010	03/17/2016	DLC
1,1,1,2-Tetrachloroethane	EPA-8260	U	MG/KG	0.010	03/17/2016	DLC
Ethylbenzene	EPA-8260	U	MG/KG	0.010	03/17/2016	DLC
m,p-Xylene	EPA-8260	U	MG/KG	0.020	03/17/2016	DLC
Styrene	EPA-8260	U	MG/KG	0.010	03/17/2016	DLC
o-Xylene	EPA-8260	U	MG/KG	0.010	03/17/2016	DLC
Bromoform	EPA-8260	U	MG/KG	0.010	03/17/2016	DLC
Isopropylbenzene	EPA-8260	U	MG/KG	0.010	03/17/2016	DLC
1,1,2,2-Tetrachloroethane	EPA-8260	U	MG/KG	0.010	03/17/2016	DLC
1,2,3-Trichloropropane	EPA-8260	U	MG/KG	0.010	03/17/2016	DLC
Bromobenzene	EPA-8260	U	MG/KG	0.010	03/17/2016	DLC
N-Propyl Benzene	EPA-8260	U	MG/KG	0.010	03/17/2016	DLC
2-Chlorotoluene	EPA-8260	U	MG/KG	0.010	03/17/2016	DLC
1,3,5-Trimethylbenzene	EPA-8260	U	MG/KG	0.010	03/17/2016	DLC
4-Chlorotoluene	EPA-8260	U	MG/KG	0.010	03/17/2016	DLC
T-Butyl Benzene	EPA-8260	U	MG/KG	0.010	03/17/2016	DLC
1,2,4-Trimethylbenzene	EPA-8260	U	MG/KG	0.010	03/17/2016	DLC
S-Butyl Benzene	EPA-8260	U	MG/KG	0.010	03/17/2016	DLC
P-Isopropyltoluene	EPA-8260	U	MG/KG	0.010	03/17/2016	DLC
1,3-Dichlorobenzene	EPA-8260	U	MG/KG	0.010	03/17/2016	DLC
1,4-Dichlorobenzene	EPA-8260	U	MG/KG	0.010	03/17/2016	DLC
N-Butylbenzene	EPA-8260	U	MG/KG	0.010	03/17/2016	DLC
1,2-Dichlorobenzene	EPA-8260	U	MG/KG	0.010	03/17/2016	DLC
1,2-Dibromo 3-Chloropropane	EPA-8260	U	MG/KG	0.050	03/17/2016	DLC
1,2,4-Trichlorobenzene	EPA-8260	U	MG/KG	0.010	03/17/2016	DLC
Hexachlorobutadiene	EPA-8260	U	MG/KG	0.010	03/17/2016	DLC
Naphthalene	EPA-8260	U	MG/KG	0.010	03/17/2016	DLC
1,2,3-Trichlorobenzene	EPA-8260	U	MG/KG	0.010	03/17/2016	DLC

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CERTIFICATE OF ANALYSIS

CLIENT: Terracon
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Mountlake Terrace, WA 98043

CLIENT CONTACT: Mike Noll
CLIENT PROJECT: PRS Tacoma Soil - 81167031 Task 2

DATE: 3/25/2016
ALS SDG#: EV16030111
WDOE ACCREDITATION: C601

LABORATORY BLANK RESULTS

MB-031816S - Batch 102488 - Soil by EPA-8270 SIM

ANALYTE	METHOD	RESULTS	UNITS	REPORTING LIMITS	ANALYSIS DATE	ANALYSIS BY
Naphthalene	EPA-8270 SIM	U	MG/KG	0.020	03/21/2016	GAP
2-Methylnaphthalene	EPA-8270 SIM	U	MG/KG	0.020	03/21/2016	GAP
1-Methylnaphthalene	EPA-8270 SIM	U	MG/KG	0.020	03/21/2016	GAP
Acenaphthylene	EPA-8270 SIM	U	MG/KG	0.020	03/21/2016	GAP
Acenaphthene	EPA-8270 SIM	U	MG/KG	0.020	03/21/2016	GAP
Fluorene	EPA-8270 SIM	U	MG/KG	0.020	03/21/2016	GAP
Phenanthrene	EPA-8270 SIM	U	MG/KG	0.020	03/21/2016	GAP
Anthracene	EPA-8270 SIM	U	MG/KG	0.020	03/21/2016	GAP
Fluoranthene	EPA-8270 SIM	U	MG/KG	0.020	03/21/2016	GAP
Pyrene	EPA-8270 SIM	U	MG/KG	0.020	03/21/2016	GAP
Benzo[A]Anthracene	EPA-8270 SIM	U	MG/KG	0.020	03/21/2016	GAP
Chrysene	EPA-8270 SIM	U	MG/KG	0.020	03/21/2016	GAP
Benzo[B]Fluoranthene	EPA-8270 SIM	U	MG/KG	0.020	03/21/2016	GAP
Benzo[K]Fluoranthene	EPA-8270 SIM	U	MG/KG	0.020	03/21/2016	GAP
Benzo[A]Pyrene	EPA-8270 SIM	U	MG/KG	0.020	03/21/2016	GAP
Indeno[1,2,3-Cd]Pyrene	EPA-8270 SIM	U	MG/KG	0.020	03/21/2016	GAP
Dibenz[A,H]Anthracene	EPA-8270 SIM	U	MG/KG	0.020	03/21/2016	GAP
Benzo[G,H,I]Perylene	EPA-8270 SIM	U	MG/KG	0.020	03/21/2016	GAP

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DATE: 3/25/2016
ALS SDG#: EV16030111
WDOE ACCREDITATION: C601

LABORATORY CONTROL SAMPLE RESULTS

ALS Test Batch ID: R271360 - Soil by NWVPH

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	LIMITS MIN	LIMITS MAX	ANALYSIS DATE	ANALYSIS BY
C5-C6 Aliphatics - BS	NWVPH	**98.2**			70	130	03/21/2016	PAB
C5-C6 Aliphatics - BSD	NWVPH	**98.6**	**0**		70	130	03/21/2016	PAB
>C6-C8 Aliphatics - BS	NWVPH	**98.9**			70	130	03/21/2016	PAB
>C6-C8 Aliphatics - BSD	NWVPH	**102**	**3**		70	130	03/21/2016	PAB
>C8-C10 Aliphatics - BS	NWVPH	**101**			70	130	03/21/2016	PAB
>C8-C10 Aliphatics - BSD	NWVPH	**104**	**3**		70	130	03/21/2016	PAB
>C10-C12 Aliphatics - BS	NWVPH	**109**			70	130	03/21/2016	PAB
>C10-C12 Aliphatics - BSD	NWVPH	**118**	**8**		70	130	03/21/2016	PAB
>C8-C10 Aromatics - BS	NWVPH	**98.2**			70	130	03/21/2016	PAB
>C8-C10 Aromatics - BSD	NWVPH	**99.1**	**1**		70	130	03/21/2016	PAB
>C10-C12 Aromatics - BS	NWVPH	**94.3**			70	130	03/21/2016	PAB
>C10-C12 Aromatics - BSD	NWVPH	**95.1**	**1**		70	130	03/21/2016	PAB
Hexane - BS	NWVPH	**100**			70	130	03/21/2016	PAB
Hexane - BSD	NWVPH	**99.1**	**1**		70	130	03/21/2016	PAB

ALS Test Batch ID: 102230 - Soil by NWTPH-DX

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	LIMITS MIN	LIMITS MAX	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range - BS	NWTPH-DX	**95.6**			75.5	122.1	03/14/2016	EBS
TPH-Diesel Range - BSD	NWTPH-DX	**99.6**	**4**		75.5	122.1	03/14/2016	EBS

ALS Test Batch ID: R271406 - Soil by NWEPH

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	LIMITS MIN	LIMITS MAX	ANALYSIS DATE	ANALYSIS BY
>C12-C16 Aliphatics - BS	NWEPH	**90.4**			70	130	03/23/2016	EBS
>C12-C16 Aliphatics - BSD	NWEPH	**102**	**12**		70	130	03/23/2016	EBS
>C16-C21 Aliphatics - BS	NWEPH	**92.1**			70	130	03/23/2016	EBS
>C16-C21 Aliphatics - BSD	NWEPH	**104**	**12**		70	130	03/23/2016	EBS
>C21-C34 Aliphatics - BS	NWEPH	**94.9**			70	130	03/23/2016	EBS
>C21-C34 Aliphatics - BSD	NWEPH	**106**	**11**		70	130	03/23/2016	EBS
>C12-C16 Aromatics - BS	NWEPH	**89.8**			70	130	03/23/2016	EBS
>C12-C16 Aromatics - BSD	NWEPH	**96.3**	**7**		70	130	03/23/2016	EBS
>C16-C21 Aromatics - BS	NWEPH	**90.8**			70	130	03/23/2016	EBS
>C16-C21 Aromatics - BSD	NWEPH	**96.8**	**6**		70	130	03/23/2016	EBS
>C21-C34 Aromatics - BS	NWEPH	**75.4**			70	130	03/23/2016	EBS
>C21-C34 Aromatics - BSD	NWEPH	**82.7**	**9**		70	130	03/23/2016	EBS

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CLIENT CONTACT: Mike Noll
CLIENT PROJECT: PRS Tacoma Soil - 81167031 Task 2

DATE: 3/25/2016
ALS SDG#: EV16030111
WDOE ACCREDITATION: C601

LABORATORY CONTROL SAMPLE RESULTS

ALS Test Batch ID: 102314 - Soil by EPA-8260

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	LIMITS MIN	LIMITS MAX	ANALYSIS DATE	ANALYSIS BY
1,1-Dichloroethene - BS	EPA-8260	**86.0**			73	138	03/17/2016	DLC
1,1-Dichloroethene - BSD	EPA-8260	**96.5**	**12**		73	138	03/17/2016	DLC
Benzene - BS	EPA-8260	**102**			75	138	03/17/2016	DLC
Benzene - BSD	EPA-8260	**111**	**8**		75	138	03/17/2016	DLC
Trichloroethene - BS	EPA-8260	**98.4**			75	136	03/17/2016	DLC
Trichloroethene - BSD	EPA-8260	**108**	**9**		75	136	03/17/2016	DLC
Toluene - BS	EPA-8260	**93.9**			76	134	03/17/2016	DLC
Toluene - BSD	EPA-8260	**101**	**7**		76	134	03/17/2016	DLC
Chlorobenzene - BS	EPA-8260	**94.8**			79	128	03/17/2016	DLC
Chlorobenzene - BSD	EPA-8260	**103**	**8**		79	128	03/17/2016	DLC

ALS Test Batch ID: 102488 - Soil by EPA-8270 SIM

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	LIMITS MIN	LIMITS MAX	ANALYSIS DATE	ANALYSIS BY
Naphthalene - BS	EPA-8270 SIM	**98.3**			49.2	140	03/21/2016	GAP
Naphthalene - BSD	EPA-8270 SIM	**117**	**18**		49.2	140	03/21/2016	GAP
Acenaphthene - BS	EPA-8270 SIM	**131**			55	147	03/21/2016	GAP
Acenaphthene - BSD	EPA-8270 SIM	**116**	**12**		55	147	03/21/2016	GAP
Pyrene - BS	EPA-8270 SIM	**159**			47.9	176	03/21/2016	GAP
Pyrene - BSD	EPA-8270 SIM	**148**	**7**		47.9	176	03/21/2016	GAP
Benzo[G,H,I]Perylene - BS	EPA-8270 SIM	**138**			40.4	143	03/21/2016	GAP
Benzo[G,H,I]Perylene - BSD	EPA-8270 SIM	**119**	**15**		40.4	143	03/21/2016	GAP

APPROVED BY

Laboratory Director

ADDRESS 8620 Holly Drive, Suite 100, Everett, WA 98208 | PHONE 425-356-2600 | FAX 425-356-2626
ALS Group USA, Corp dba ALS Environmental

Environmental www.alsglobal.com
RIGHT SOLUTIONS RIGHT PARTNER

ALS Environmental
8620 Holly Drive, Suite 100
Everett, WA 98208
Phone (425) 356-2600
Fax (425) 356-2626
http://www.alsglobal.com

Chain Of Custody/ Laboratory Analysis Request

ALS Job# (Laboratory Use Only)

EV1603011

Date 3/15/2016 Page 1 Of 1

PROJECT ID: PRS Tacoma Soil – 81167031 Task 2
REPORT TO COMPANY: Terracon Consultants, Inc.
PROJECT MANAGER: Mike Noll
ADDRESS: 21905 64th Avenue West, Suite 100
Mountlake Terrace, WA 98043
PHONE: (425) 409-2602 FAX: (425) 771-3549
P.O. #: 81167031 Task 2 E-MAIL: Mike.Noll@Terracon.com
INVOICE TO COMPANY: Terracon
ATTENTION: Karen Meyer
ADDRESS: Karen.Meyer@Terracon.com

ANALYSIS REQUESTED

SAMPLE I.D.	DATE	TIME	TYPE	LAB#	NWTPH-HCID	NWTPH-DX (H = Hold)	NWTPH-GX (H = Hold)	BTEX by EPA-8021	MTBE by EPA-8021 ☐ EPA-8260 ☐	Halogenated Volatiles by EPA 8260	Volatile Organic Compounds by EPA 8260 + oxygenates	EDB / EDC by EPA 8260 SIM (water)	EDB / EDC by EPA 8260 (soil)	Semivolatile Organic Compounds by EPA 8270	Polycyclic Aromatic Hydrocarbons (PAH) by EPA-8270 SIM	PCB ☐ Pesticides ☐ by EPA 8081/8082	Metals-MTCA-5 ☐ RCRA-8 ☐ Pri Pol ☐ TAL ☐	Metals Other (Specify)	TCLP-Metals ☐ VOA ☐ Semi-Vol ☐ Pest ☐ Herbs ☐	OTHER (Specify): VPH + naphthalene	OTHER (Specify): EPH	NUMBER OF CONTAINERS	RECEIVED IN GOOD CONDITION?
1. B101-3'	3/15/2016	9:55	S	1	X	(H)	(H)				(H)				(H)					(H)	(H)	4	
2. B102-2'		10:07		2	X	(H)	(H)				(H)				(H)					(H)	(H)	4	
3. B103-1'		10:31		3	X	(X)	(H)				(X)				(X)					(X)	(X)	4	
4. B104-1'		10:53		4	X	(X)	(H)				(X)				(X)					(X)	(X)	4	
5. B105-2'		13:04		5	X	(H)	(H)				(H)				(H)					(H)	(H)	4	
6. B106-1.5'		12:15		6	X	(H)	(H)				(H)				(H)					(H)	(H)	4	
7. B107-1		11:27	S	7	X	(H)	(H)				(H)				(H)					(H)	(H)	4	
8. MW-4	3/15/2016	11:20	W	8	X	(H)	(H)															4	
9.																							
10.																							

SPECIAL INSTRUCTIONS Report HCID results to Noll, analyze NWTPH-Gx or NWTPH-Dx as needed, hold all (H) for instruction
5-day TAT per existing contract.

SIGNATURES (Name, Company, Date, Time):

1. Relinquished By: [signature] / Terracon / 3-15-2016 / 1510
   Received By: Shawn Roberson AU 3/15/16 1510
2. Relinquished By: _____
   Received By: _____

TURNAROUND REQUESTED in Business Days*

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

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

OTHER:
Specify: X Added per instructions 3/15/16 per Mike

*Turnaround request less than standard may incur Rush Charges

APPENDIX D – MTCA Method B Calculations

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

1. Enter Site Information

Date: 03/15/16
Site Name: Progress Rail Services Tacoma Facility
Sample Name: B103-1'

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		0.00%
AL_EC >6-8		0.00%
AL_EC >8-10		0.00%
AL_EC >10-12		0.00%
AL_EC >12-16	60	5.64%
AL_EC >16-21	120	11.28%
AL_EC >21-34	740	69.58%
AR_EC >8-10		0.00%
AR_EC >10-12		0.00%
AR_EC >12-16	2.5	0.24%
AR_EC >16-21	31	2.91%
AR_EC >21-34	110	10.34%
Benzene		0.00%
Toluene		0.00%
Ethylbenzene		0.00%
Total Xylenes		0.00%
Naphthalene	0.01	0.00%
1-Methyl Naphthalene	0.01	0.00%
2-Methyl Naphthalene	0.01	0.00%
n-Hexane		0.00%
MTBE		0.00%
Ethylene Dibromide (EDB)		0.00%
1,2 Dichloroethane (EDC)		0.00%
Benzo(a)anthracene	0.01	0.00%
Benzo(b)fluoranthene	0.01	0.00%
Benzo(k)fluoranthene	0.01	0.00%
Benzo(a)pyrene	0.01	0.00%
Chrysene	0.01	0.00%
Dibenz(a,h)anthracene	0.01	0.00%
Indeno(1,2,3-cd)pyrene	0.01	0.00%
Sum	1063.6	100.00%

Notes for Data Entry | Set Default Hydrogeology

Clear All Soil Concentration Data Entry Cells

Restore All Soil Concentration Data cleared previously

REMARK:
HCID did not detect gasoline-range TPH. All VPH and VOCs results were ND, and were left blank in the worksheet. Method B TPH calculations are based on EPH and PAHs only.

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: 500 ug/L

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

Site Information

Date: 3/15/2016
Site Name: Progress Rail Services Tacoma Facility
Sample Name: B103-1'
Measured Soil TPH Concentration, mg/kg: **1,063.600**

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	7,302	1.46E-07	1.13E-01	Pass
	Method C	113,183	3.62E-08	9.40E-03	Pass
Protection of Method B Ground Water Quality (Leaching)	Potable GW: Human Health Protection	100% NAPL	1.60E-10	5.49E-03	Pass
	Target TPH GW Conc. @ 500 ug/L	100% NAPL	NA	NA	Pass

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	**7,302.33**	**113,183.45**
Most Stringent Criterion	**Risk of cPAHs mixture= 1E-6**	**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	*NO*	9.43E+03	1.29E-06	1.00E+00	YES	1.13E+05	3.85E-06	1.00E+00
Total Risk=1E-5	*NO*	7.30E+04	1.00E-05	7.74E+00	*NO*	2.94E+05	1.00E-05	2.60E+00
Risk of Benzene= 1E-6	NA	NA	NA	NA	NA			
Risk of cPAHs mixture= 1E-6	YES	7.30E+03	1.00E-06	7.74E-01				
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	**NA**
Protective Ground Water Concentration, ug/L	**NA**
Protective Soil Concentration, mg/kg	**Soil-to-Ground Water is not a critical pathway!**

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	2.92E+00	1.60E-10	5.77E-03	100% NAPL
Total Risk = 1E-5	YES	2.92E+00	1.60E-10	5.77E-03	100% NAPL
Total Risk = 1E-6	YES	2.92E+00	1.60E-10	5.77E-03	100% NAPL
Risk of cPAHs mixture= 1E-5	YES	2.92E+00	1.60E-10	5.77E-03	100% NAPL
Benzene MCL = 5 ug/L	NA	NA	NA	NA	NA
MTBE = 20 ug/L	NA	NA	NA	NA	NA

Note: 100% NAPL is 71000 mg/kg TPH.

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 = 500 ug/L	2.92E+00	1.60E-10	5.77E-03	**100% NAPL**

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

1. Enter Site Information

Date: 03/15/16
Site Name: Progress Rail Services Tacoma Facility
Sample Name: B104-1'

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		0.00%
AL_EC >6-8		0.00%
AL_EC >8-10		0.00%
AL_EC >10-12		0.00%
AL_EC >12-16	2.5	0.22%
AL_EC >16-21	39	3.47%
AL_EC >21-34	950	84.62%
AR_EC >8-10		0.00%
AR_EC >10-12		0.00%
AR_EC >12-16	2.5	0.22%
AR_EC >16-21	8.6	0.77%
AR_EC >21-34	120	10.69%
Benzene		0.00%
Toluene		0.00%
Ethylbenzene		0.00%
Total Xylenes		0.00%
Naphthalene	0.01	0.00%
1-Methyl Naphthalene	0.01	0.00%
2-Methyl Naphthalene	0.01	0.00%
n-Hexane		0.00%
MTBE		0.00%
Ethylene Dibromide (EDB)		0.00%
1,2 Dichloroethane (EDC)		0.00%
Benzo(a)anthracene	0.01	0.00%
Benzo(b)fluoranthene	0.01	0.00%
Benzo(k)fluoranthene	0.01	0.00%
Benzo(a)pyrene	0.01	0.00%
Chrysene	0.01	0.00%
Dibenz(a,h)anthracene	0.01	0.00%
Indeno(1,2,3-cd)pyrene	0.01	0.00%
Sum	1122.7	100.00%

Notes for Data Entry | Set Default Hydrogeology

Clear All Soil Concentration Data Entry Cells

Restore All Soil Concentration Data cleared previously

REMARK:
HCID did not detect gasoline-range TPH. All VPH and VOCs results were ND, and were left blank in the worksheet. Method B TPH calculations are based on EPH and PAHs only.

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:	500	ug/L

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

Site Information

Date: 3/15/2016
Site Name: Progress Rail Services Tacoma Facility
Sample Name: B104-1'
Measured Soil TPH Concentration, mg/kg: **1,122.700**

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	7,708	1.46E-07	7.05E-02	Pass
	Method C	191,134	3.62E-08	5.87E-03	Pass
Protection of Method B Ground Water Quality (Leaching)	Potable GW: Human Health Protection	100% NAPL	1.67E-10	3.71E-03	Pass
	Target TPH GW Conc. @ 500 ug/L	100% NAPL	NA	NA	Pass

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	**7,708.09**	**191,134.18**
Most Stringent Criterion	**Risk of cPAHs mixture= 1E-6**	**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	*NO*	1.59E+04	2.07E-06	1.00E+00	YES	1.91E+05	6.16E-06	1.00E+00
Total Risk=1E-5	*NO*	7.71E+04	1.00E-05	4.84E+00	*NO*	3.10E+05	1.00E-05	1.62E+00
Risk of Benzene= 1E-6	NA	NA	NA	NA	NA			
Risk of cPAHs mixture= 1E-6	YES	7.71E+03	1.00E-06	4.84E-01				
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	**NA**
Protective Ground Water Concentration, ug/L	**NA**
Protective Soil Concentration, mg/kg	**Soil-to-Ground Water is not a critical pathway!**

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	2.08E+00	1.68E-10	4.00E-03	100% NAPL
Total Risk = 1E-5	YES	2.08E+00	1.68E-10	4.00E-03	100% NAPL
Total Risk = 1E-6	YES	2.08E+00	1.68E-10	4.00E-03	100% NAPL
Risk of cPAHs mixture= 1E-5	YES	2.08E+00	1.68E-10	4.00E-03	100% NAPL
Benzene MCL = 5 ug/L	NA	NA	NA	NA	NA
MTBE = 20 ug/L	NA	NA	NA	NA	NA

Note: 100% NAPL is 71000 mg/kg TPH.

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 = 500 ug/L	2.08E+00	1.68E-10	4.00E-03	**100% NAPL**