



Engineering +
Environmental

Site Characterization Report

Yakima Bulk Plant
1 East I Street
Yakima, Washington

Prepared for:
Wondrack Distributing
529 E Kennewick Avenue
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June 2015
Project No. 64116.000

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1.0 EXECUTIVE SUMMARY

PBS Engineering and Environmental Inc. (PBS) has prepared this report to present the site characterization findings at the bulk plant located at 1 East I Street in Yakima, Washington (site). The site characterization of the bulk plant focused on assessing the potential presence of petroleum contamination at the site. A combination of hand sampling and the use of a truck-mounted drill rig was used to collect soil samples. PBS attempted to collect a groundwater sample using the drill rig, but was unsuccessful.

The site is currently in use as a bulk plant supplying gasoline, motor oil, diesel, hydraulic oil, and automatic transmission fluid. The storage of these products takes place in aboveground storage tanks (ASTs) in the tank farm and oil shed.

Petroleum-contaminated soil consisting of diesel and motor oil compounds above the State of Washington Model Toxics Control Act (MTCA) Method A cleanup levels (cleanup level) was found in multiple areas of the site: inside the tank farm, the out-of-use tank and drum storage area within the tank farm, and the loading rack. Soil near a waste oil tank inside the tank farm was found to exceed the cleanup levels for the metals cadmium and lead. This soil also exceeded the cleanup level for polyaromatic hydrocarbons (PAHs), which are a group of semi-volatile compounds with many classified as known or probable human carcinogens. Gasoline-range soil contamination was detected during the site characterization, but did not exceed state cleanup levels.

Based on the findings of this investigation, PBS provides the following recommendations:

- Under the MTCA cleanup regulations, the soil contamination that has been detected at the site would likely be considered a release. A release is deemed reportable if it may be a threat to human health or the environment, and it must be reported to Ecology within 90 days of discovery by the owner or operator of a facility. The cleanup regulation lists some examples of situations that should be reported, one of which is at sites where hazardous substances have been leaked or dumped to the ground. It appears that the leakage of petroleum products, primarily oil and diesel, has occurred at this site. However, the interpretation of “threat to human health or the environment” can vary, and the lack of groundwater data is considered a data gap for determining a possible threat.
- Focused soil investigation should be undertaken to delineate the horizontal and vertical extent of contamination. Deeper sampling in the tank farm would allow a more accurate determination of any soil contamination in the vicinity of the ASTs and suspect UST. This would also provide information toward a determination whether monitoring wells are needed. This could include collection of additional data to aid in design of remediation options, if warranted.
- Enrollment into the Voluntary Cleanup Program (VCP) is recommended. An important feature of the program is that it allows owners, through a technical consultation process with Ecology, to apply for and receive a No Further Action (NFA) letter once Ecology has reviewed the assessment and any cleanup documentation and is satisfied that no unacceptable risk remains.
- PBS recommends decommissioning the suspect waste oil tank at the site. Based on the dimensions as estimated during the utility locate, the tank has an approximate capacity of 128 gallons. This exceeds the UST exemption capacity of 110 gallons and indicates the UST is a regulated tank.

- PBS recommends soil sampling under the concrete floor of the oil shed, due to the large amount of petroleum staining observed on the floor.
- PBS recommends that the metal grate noted south of the tank farm be cleaned out to determine if this is a drywell.
- PBS recommends that any suspect asbestos-containing material be tested for asbestos prior to maintenance activities.

2.0 BACKGROUND AND CURRENT USE

The site is located in a commercial area of Yakima, Washington, and has a long history of use as a petroleum bulk plant. The following sections provide a brief description of past and current site usage.

2.1 Site Background

From a review of historical maps, PBS understands that the site was in use as a bulk plant by Standard Oil of California in 1920. The 1920 map showed eight aboveground storage tanks (ASTs) on concrete piers along the north property boundary. This map showed an oil storage area in the southeast corner of the property and several buildings including an office and warehouse. The tanks are shown in the location of the current tank farm. A railroad siding is shown on the west side of the site.

A historical map dated 1952 shows the tanks on concrete piers have been removed and replaced by vertically standing ASTs. These tanks correspond to the present tanks in the tank farm.

2.2 Current Use

PBS understands that in 1976 Wondrack Distributing purchased the site, which continued to be operated as a bulk plant. There are currently 14 ASTs present at the property.

3.0 SITE CHARACTERISTICS

3.1 Site Location and Topography

The site is located at 1 East I Street, Yakima, Washington, in the northeast quarter of Section 13, Township 13 North, Range 18 East of the Willamette Meridian (Figure 1) and is approximately one acre in size.

The site elevation is about 1,088 feet above mean sea level in the northwest corner, decreasing to about 1,086 feet near the loading rack in the south portion of the site.

Adjoining properties include a railroad line to the west. To the south is a commercial structure in use by RS Mechanical. To the north is a large facility occupied by Tri-Valley Construction. To the east is a fast food restaurant.

The Naches River is approximately one mile to the north and the Yakima River is just over one mile to the east. These rivers represent the most substantial surface water in the project vicinity. The Yakima River lies at approximately 1,060 feet above mean sea level and the regional topography generally slopes gently downward to the southeast.

3.2 Site Features

There are 14 ASTs located in the tank farm, which is on the north side of the site and surrounded by a 2-foot-high concrete wall that serves as a secondary containment structure. Inside the tank farm, the ground is covered by crushed gravel fill, an area of concrete and some asphalt. One AST is in use as gasoline storage, and four are in use for diesel storage. Motor oil and hydraulic oil are also stored in the ASTs, and several ASTs were out-of-use at the time of the site characterization. A waste oil tank with a capacity of about 1,000 gallons is located in the southwest corner of the tank farm.

Most of the tanks are numbered on the outside and PBS has referred to several of these tank numbers in Section 6.0. Valves and piping inside the tank farm consisted of uninsulated metal piping; however PBS observed a short section of pipe insulation material that may have contained asbestos near the base of AST #5. This tank was out-of-use at the time of the site characterization.

The northeast side of the gravel yard inside the tank farm is in use for the storage of out-of-use tanks and drums. Metal and poly drums were observed in this area, and some were stored upside down. A former vehicle hoist is located in this storage area; the hoist held empty drums on the exposed metal rack at the time of the site characterization. PBS was informed the hoist was previously in use when vehicle maintenance was performed in the nearby oil shed. The hoist has reportedly been used to help move empty drums and tanks over the secondary containment berm and into the storage area.

PBS observed a suspect underground storage tank (UST) fill pipe in the south-central area of the tank farm. PBS opened the cap and noted the pipe was plugged at a depth of 3 feet. Wondrack staff was unfamiliar with this pipe, and no further information was provided to PBS during the characterization.

At the south-central side of the tank farm is the loading header, an area containing valves and piping that are used to supply fuel into the tanks. These valves are located just outside of the tank farm secondary containment structure.

To the south of the tank farm is the loading rack, where fuel is dispensed to the delivery trucks. Subsurface lines lead to the loading rack from the tank farm. The loading rack is covered by a canopy. The center of the loading rack, where the fuel lines exit the subsurface, has red landscaping rock for surfacing; the east and west sides have concrete surfacing. The loading rack and concrete loading area are surrounded by paving.

On the east side of the site is a metal building called the oil shed. This building contains nine ASTs that hold hydraulic fluid and automatic transmission fluid as well as one AST that contains heating oil. These tanks are located on the concrete floor and oily staining was observed on the floor in numerous areas of the building.

Near the southwest end of the oil shed is a 3-foot by 3-foot concrete sump with a metal grate that collects stormwater from the site. A pipe leads from the sump to two oil-water separators at the south end of the oil shed. The oil-water separators have round concrete lids that are about 3.5 feet and 5 feet in diameter. The lids have metal rings for lifting to provide access to the oil-water separators.

PBS observed a metal grate, measuring about 1 square foot, south of the tank farm in the paved area that was filled with soil. This may be a drywell or other stormwater disposal system. PBS did not collect any additional information on this structure during the site characterization.

Directly to the west of the loading rack is a one-story building in use as a warehouse and office. Much of this building consists of a storage warehouse with a raised concrete dock that is used to load vehicles with petroleum products. Full totes and drums are located within this storage building. An out-of-use railroad spur runs along the west side of the site and ends alongside the warehouse/office. This spur line was likely used to supply petroleum products to the site during

past activities. PBS understands the railroad has never been used by Wondrack Distributing since acquiring the site in 1976.

3.3 Site Geology

The surface geology is mapped by the online Geologic map of Washington (<https://fortress.wa.gov/dnr/geology/?Site=wigm>) as alluvium deposits of the Quaternary Period. These deposits consist of sand, silt, and gravel and formed as streambed terraces.

The soil sampling conducted during this investigation found that below the fill or paved areas was brown silt up to 5 feet in thickness. This material was homogeneous, contained occasional gravel, and was generally in a moist state. Below the silt was a gray to brown gravel layer that was present across the site and extended to an unknown depth. This deposit consisted of fine to coarse gravel and contained some silt and sand.

3.4 Site Hydrogeology

There are no wells shown on the online Washington State Department of Ecology well log viewer (<http://apps.ecy.wa.gov/wellog/textsearch.asp>) for the property. There are monitoring wells located at the ARCO station about 200 feet to the southeast of the site and the static water table is noted in the logs at 18 to 20 feet below ground surface (BGS).

Based on overall areal topography, groundwater flow is anticipated to be to the southeast toward the Yakima River.

4.0 PBS SCOPE OF SERVICES

The following is a brief discussion of the scope of services provided by PBS:

1. Queried the Washington State Department of Ecology (Ecology) for any available environmental reports for the site. Ecology reported no reports in their files for the site.
2. Used hand sampling tools to collect shallow soil samples in areas of discolored soil observed at the site and in areas where field indications suggested that contamination might be present.
3. Contracted with a direct-push drilling subcontractor to conduct deeper soil and groundwater sampling.
4. Sent collected samples to an accredited laboratory for analysis.
5. Prepared a site characterization report for this scope of work.

5.0 BULK PLANT SOIL INVESTIGATION METHODS

PBS conducted the soil investigation by collecting samples using a combination of hand sampling and the use of a drill rig. Hand tools were used in areas that were not accessible to a drill rig. The drill rig was used to drill soil borings in accessible areas of the site and at depths below those practical for hand tool sampling. The drill rig was also intended to obtain a groundwater sample, but drilling conditions prevented a sample from being collected.

5.1 Hand Tool Soil Sampling/Field Screening

PBS conducted the hand tool sampling in areas where gravel and soil were exposed at the time of the fieldwork. These included the area inside of the secondary containment of the tank farm and the out-of-use drum storage area, and the former railroad area. All hand tool soil samples were collected within 3 feet or less in depth.

Individual grab samples from the surface were collected by hand using a stainless steel trowel. Sampling personnel wore a new pair of disposable latex-gloves for each sample. The hand tools were decontaminated after each sample was collected. The samples were placed into laboratory-provided glass sample jars and sealed with Teflon-lined lids. All samples were labeled and stored on ice for preservation and shipped to the Friedman and Bruya laboratory in Seattle, Washington, accompanied by chain-of-custody documentation.

Field screening consisted of visual and olfactory observations and soil screening for volatile organic compounds (VOCs) using a portable Mini-RAE 2000 photoionization detector (PID). After sampling, any remaining soil was placed back in the hole and tamped down.

5.2 Drill Rig Sampling

Each soil boring was completed by a truck-mounted direct-push sampling rig operated by ESN Northwest of Olympia, Washington. The rig uses a vibratory hammer to continuously drive a 5-foot PVC liner inside the sample barrel. Soil is recovered in 5-foot-long intervals for field screening and sampling. All recovered soils were field screened visually and for evidence of a fuel odor, and for volatile petroleum compounds using a portable PID. After screening, grab soil samples were collected and placed into laboratory-provided sample jars with Teflon lid liners, sealed, and labeled.

All samples were stored on ice for the duration of the fieldwork. All sampling equipment was decontaminated between borings and after each sample was collected.

After sampling, each boring was backfilled with granular bentonite and hydrated with tap water. The soil borings were in asphalt or concrete; therefore, borings were either topped off with an asphalt or a concrete patch.

5.3 Laboratory Analysis

All soil samples were analyzed for the following:

- All the soil samples were initially analyzed by the Northwest Total Petroleum Hydrocarbons-hydrocarbon identification (NWTPH-HCID) method. NWTPH-HCID laboratory results are reported as “detected” or “not detected.”
- When a hydrocarbon detection occurred above the laboratory reporting limits (RLs) in the diesel- or heavy oil-range, selected samples were quantified by Method Northwest Total Petroleum Hydrocarbons Diesel Extended (NWTPH-Dx). Selected samples were chosen to provide the most useful information of the extent and depth of contamination, and in the most cost effective manner.
- When a hydrocarbon detection occurred above the laboratory reporting limits (RLs) in the gasoline range, the sample was quantified by Method Northwest Total Petroleum Hydrocarbons Gasoline Extended (NWTPH-Gx). The sample was also quantified by analysis for common gasoline constituent’s benzene, toluene, ethylbenzene, and xylenes (BTEX) by Method 8021B.

Given the volume of samples, not every HCID detection was analyzed by Method NWTPH-Dx. The laboratory provided estimates for samples that were not quantified by the Dx method. Samples estimated under the HCID method are designated with an “E” in the diesel and motor oil columns. These estimated concentrations provide useful information in assessing the horizontal and vertical extent of soil contamination.

One sample was selected for additional analysis to assess if other contaminants of concern (listed below) were present:

- Five metals (arsenic, cadmium, chromium, lead, mercury) by EPA Method 200.8
- Polychlorinated biphenyls (PCBs) by EPA Method 8082A
- Semi-volatile organic compounds (SVOCs) by EPA Method 8270D SIM
- VOCs by EPA Method 8260C

The results of the soil analyses were compared to the MTCA Method A soil cleanup levels for unrestricted land use. The MTCA Method A cleanup levels are presented in Washington Administrative Code (WAC) 173-340, which includes common contaminants of concern presented in a table of cleanup levels. The soil sample data and relevant MTCA Method A cleanup levels for the potential contaminants of concern are presented in the following tables.

6.0 BULK PLANT SOIL INVESTIGATION RESULTS

The following sections detail the sample locations and analytical results of the site characterization. The data are presented by current and/or former operational area. PBS generally was able to use hand tools to sample within 3 feet of the surface, and in areas not accessible to the drill rig. All laboratory data is included in Appendix A. Drill rig boring logs are presented in Appendix B. Figures 2 and 3 illustrate the sample locations provided in the tables below.

6.1 Tank Farm

Due to the secondary containment structure, getting inside the tank farm was not possible for the drill rig. PBS used hand tools to collect samples within this area. Sample locations, depths, and results are presented in Tables 1, 3, and 4.

Borings B2 and B7 were drilled directly south of the tank farm, and within 6 to 12 feet of the loading header system of valves and piping used for product loading. The boring locations along with the samples and results are presented in Table 2.

**Table 1: Tank Farm and Drum Storage Area Surface Samples
Total Petroleum Hydrocarbon Soil Sample Results**

Sample ID	Location / Approximate Sample Depth (' = feet bgs)	PID	Hydrocarbon Identification			Diesel	Motor Oil
			Gasoline	Diesel	Heavy Oil		
S1	NE corner of oil shed, under three 3-inch aboveground pipes / 0'-0.5'	0	<20	<50	D	NA	2,600 E
S2	NE corner of oil shed, under three 3-inch aboveground pipes / 0.5'-0.75'	0	<20	<50	D	NA	590 E
S3	At base of overturned drums in blackish stained soil / 0'-0.4'	12	<20	<50	D	2,100x	11,000

Sample ID	Location / Approximate Sample Depth (' = feet bgs)	PID	Hydrocarbon Identification			Diesel	Motor Oil
			Gasoline	Diesel	Heavy Oil		
S4	At base of overturned drums in blackish stained soil / 0.4'-0.8'	22	<20	<50	D	270x	1,100
S5	In open area north of empty drums / 0'-0.5'	0	<20	<50	D	NA	600 E
S6	In open area north of empty drums / 0.5'-1.0'	0	<20	<50	<250	NA	NA
S7	Under green valve at AST #10 / 0'-0.5'	0	<20	D	D	390x E	470 E
S8	Under green valve at AST #10 / 0.5'-1.0'	0	<20	D	D	550x	1,100
S9	Directly under 3 flanged-off pipes in SW corner of tank farm / 0'-0.25'	0	<20	<50	D	NA	6,700 E
S29	1' N of waste oil tank concrete containment in black stained soil / 0.5'-1.0'	1	ND	D	D	7,300 E	7,400 E
S30	1' N of waste oil tank concrete containment in black stained soil / 1.5'-2.0'	1.5	<20	D	D	3,200	5,000
S31	In broken asphalt just south of AST #5 valve / 1.0'-1.5'	0	<20	D	D	3,300 E	2,100 E
S32	Under red valve AST #7 / 0.25'-0.5'	0	<20	D	D	2,400 E	1,200 E
S33	Under green and white valve AST #2 / 0'-0.5'	0	<20	D	D	2,100 E	510 E
S34	Under red valve AST #3 / 0'-0.5'	0	<20	D	ND	320 E	NA
S35	Under faded red valve AST #4 / 0'-0.5'	0	<20	D	ND	90 E	NA

Sample ID	Location / Approximate Sample Depth (' = feet bgs)	PID	Hydrocarbon Identification			Diesel	Motor Oil
			Gasoline	Diesel	Heavy Oil		
S36	In NW corner of tank farm near out-of-use pipes and black stained soil / 0'-0.5'	1	<20	D	D	52,000	5,300
S37	In NW corner of tank farm near out-of-use pipes and black stained soil / 2.5'-2.75'	1	<20	D	<250	530	<250
MTCA Method A Cleanup Levels						2,000	2,000

Notes: All results, lab reporting limits and MTCA Cleanup Levels are in milligrams per kilogram (mg/kg)

bgs = below ground surface

D: Indicates a qualitative detection of a petroleum hydrocarbon

PID = Photoionization detector measurement in parts per million

Bold results exceed MTCA Method A Cleanup Levels

< = Below laboratory method reporting limits

NA = Not Analyzed due to no HCID detection

E = Estimated Concentration

x = laboratory data qualifier, the sample chromatograph pattern does not resemble the fuel standard used for quantitation

**Table 2: Tank Farm Drilled Soil Borings
Total Petroleum Hydrocarbon Soil Sample Results**

Sample ID	Location / Approximate Sample Depth (' = feet bgs)	PID	Hydrocarbon Identification			Diesel	Motor Oil
			Gasoline	Diesel	Heavy Oil		
S14	B2, 12' S of tank farm and loading header / 4.5'-5'	2*	<20	<50	<250	NA	NA
S18	B7, 6.5' S of tank farm and loading header / 4'-4.5'	0	<20	<50	<250	NA	NA
MTCA Method A Cleanup Levels						2,000	2,000

Notes: All results, lab reporting limits and MTCA Cleanup Levels are in milligrams per kilogram (mg/kg)

bgs = below ground surface

PID = Photoionization detector measurement in parts per million

< = Below laboratory method reporting limits

* = Reading likely due to fuel being transferred by nearby tanker truck during drilling

NA = Not Analyzed due to no HCID detection

S11

Table 3: Stained Soil at Waste Oil Tank - MTCA 5 Metals Results

Sample ID	Location / Approximate Sample Depth (' = feet bgs)	Arsenic	Cadmium	Chromium	Lead	Mercury
S29	1' N of waste oil tank concrete containment in black stained soil / 0.5'-1.0'	8.00	2.35	5.91	332	<1
MTCA Method A Cleanup Levels		20	2	19/2,000*	250	2

Notes: All results, laboratory reporting limits and MTCA Cleanup Levels are in milligrams per kilogram (mg/kg)

bgs = below ground surface

< = below laboratory method reporting limit

* Chromium VI = 19 mg/kg Chromium III = 2,000 mg/kg

Bold results exceed MTCA Method A Cleanup Levels

Table 4: Stained Soil at Waste Oil Tank - Selected PAH Results

Sample ID	Location / Approximate Sample Depth (' = feet bgs)	Benzo(a)pyrene			Benzo(b)fluoranthene			Naphthalene
		Soil Conc.	TEF	TEF Soil Conc.	Soil Conc.	TEF	TEF Soil Conc.	
S30	1' N of waste oil tank concrete containment in black stained soil / 1.5'-2.0'	0.10	1	0.10	0.11	0.1	0.01	0.12
Total PAH Concentration (Sum of TEF Soil Concentrations)		0.11						NA
MTCA Method A Cleanup Levels		0.1*						5**

Notes: All results and laboratory reporting limits are in milligrams per kilogram (mg/kg)

bgs = below ground surface

< = below laboratory method reporting limit

TEF = Toxicity Equivalency Factor (unitless)

NA = Not Applicable

* This cleanup level includes benzo(a)pyrene and the six carcinogenic PAHs listed in WAC 173-340-900

** Includes naphthalene and 1, and 2-methylnaphthalene

Bold results exceed MTCA Method A Cleanup Levels

Findings

Figure 2 shows the sample locations and the soil contamination detected by the sampling and borings done in this area. Multiple areas of dark discolored soil were observed in the tank farm. The deepest hand sampling that took place in the tank farm was 2.75 feet bgs, where increasing gravel made deeper sampling difficult.

Inside the tank farm, samples S1 and S2 were collected under three aboveground pipes near the northwest corner of the oil shed. Sample S1 had an estimated motor oil concentration that exceeded the cleanup level. Sample S2 was collected below S1 and had an estimated motor oil

concentration that did not exceed the cleanup level, indicating a decrease in soil contamination with depth.

Samples S3 through S6 were collected on the east end of the tank farm and near the out-of-use tanks and drums. Sample S3 and S4 were collected from dark-stained soil and S3 exceeded the cleanup level. Sample S4 was collected directly under S3 and did not exceed the cleanup level, indicating a decrease in soil contamination at depth.

PBS collected soil samples under five AST valves, designated S7 and S8 and S32–S35. All five samples had petroleum hydrocarbons above the HCID RLs, and samples S32 and S33 were found to exceed the cleanup levels.

Sample S9 was collected directly under three flanged-off valves in the southwest corner of the tank farm. These lines were out-of-use and may have been associated with fuel handling during past railroad activities. This sample had a motor oil concentration that exceeded the cleanup level.

Samples S36 and S37 were collected near out-of-use piping and in visibly black-stained soil in the northwest corner of the tank farm. Sample S36 exceeded the cleanup level, whereas the deeper sample S37 did not.

PBS collected two samples, S29 and S30, from a single location in dark-stained soil on the north side of the waste oil tank. Both samples contained diesel and motor oil compounds above the cleanup level. Soil contamination in the deeper sample, S30, was at a depth of 2 feet.

Sample S29 was also analyzed for the five metals regulated by the Method A cleanup levels: arsenic, cadmium, chromium, lead, and mercury. Sample results are presented in Table 3. This sample exceeded the cleanup level for cadmium and lead.

Sample S30 was analyzed for PCBs. PCBs can be present in waste oils and are reported as Aroclor compounds, with each specific compound containing a different percentage of chlorine by mass in the overall compound. One Aroclor was reported to have a concentration of 0.37 mg/kg. The other eight Aroclors were reported as below the RLs for this sample. The MTCA Method A cleanup level for all reported Aroclors is 1.0 mg/kg; therefore this sample does not exceed the cleanup level. Please see the laboratory report for the data.

Sample S30 was analyzed for polyaromatic hydrocarbons (PAHs), which are a group of semi-volatile compounds with many classified as known or probable human carcinogens. This sample was selected for PAH analysis due to the high diesel- and motor oil-range hydrocarbons detected. The only regulated PAH in the MTCA Method A Soil Cleanup level is benzo(a)pyrene; this and six other PAHs are identified as carcinogenic.

When establishing cleanup levels for PAHs under MTCA, the laboratory-reported total of the seven carcinogenic PAHs is calculated and compared to the Method A cleanup level for benzo(a)pyrene. A toxicity equivalency factor (TEF) is first applied to the PAHs; the TEF is an estimate of the relative toxicity of each of the six PAHs as compared to benzo(a)pyrene. After the TEF is calculated for each PAH, the concentrations are summed and compared to the MTCA Method A cleanup level of 0.1 mg/kg for benzo(a)pyrene.

As shown in Table 4, benzo(a)pyrene was detected at a concentration of 0.1 mg/kg, which equals the cleanup level. Benzo(a)fluoranthene is a carcinogenic PAH and was detected at a concentration of 0.11 mg/kg, and has a TEF of 0.1. When the concentration is multiplied by the TEF, this results in a concentration of 0.01 mg/kg. When added to the benzo(a)pyrene result of 0.1 mg/kg, this results in a total carcinogenic PAH concentration of 0.11 mg/kg, which does exceed the cleanup level.

6.2 Loading Rack and Subsurface Fuel Lines

The loading rack is located south of the tank farm and within a paved area. The loading area below the canopy is concrete. Borings B8–B11 were drilled around the loading rack and through the concrete. Three hand samples were collected in the subsurface soil in the area where the subsurface lines exit the ground.

Borings B3 and B4 were drilled north of the loading rack, and in the vicinity of the subsurface fuel lines from the tank farm. Both the soil boring samples and the samples collected with hand tools are presented in Table 5.

Table 5: Loading Rack and Subsurface Fuel Lines - Drilled Soil Borings and Surface Samples Total Petroleum Hydrocarbon Soil Sample Results

Sample ID	Location / Approximate Sample Depth (' = feet bgs)	PID	Hydrocarbon Identification			Diesel	Motor Oil
			Gasoline	Diesel	Heavy Oil		
S13	B3 North of loading rack / 1.5'–2'	0	<20	<50	<250	NA	NA
S14	B4 North of loading rack / 2'–2.5'	0	<20	<50	<250	NA	NA
S19	B8 SE side of loading rack / 1'–1.5'	0	<20	<50	<250	NA	NA
S20	B9 NE side of loading rack / 4'–4.5'	0	<20	<50	<250	NA	NA
S21	B9 NE side of loading rack / 9'–9.5'	0	<20	<50	<250	NA	NA
S22	B10 NW side of loading rack / 4'–4.5'	0	<20	<50	<250	NA	NA
S23	B11 SW side of loading rack / 1'–2'	0	<20	<50	<250	NA	NA

Sample ID	Location / Approximate Sample Depth (' = feet bgs)	PID	Hydrocarbon Identification			Diesel	Motor Oil
			Gasoline	Diesel	Heavy Oil		
S26	NW side of loading rack / 0.5'-1.0'	1	<20	D	D	15,000	980
S27	NW side of loading rack / 1.5'-2'	0.1	<20	D	ND	160 <i>E</i>	NA
S28	Approximate center of loading rack / 0.3'-0.6'	1	<20	D	D	10,000 <i>E</i>	1,500 <i>E</i>
MTCA Method A Cleanup Levels						2,000	2,000

Notes: All results and laboratory reporting limits are in milligrams per kilogram (mg/kg)

bgs = below ground surface

D: Indicates a qualitative detection of a petroleum hydrocarbon

PID = Photoionization detector measurement in parts per million

Bold results exceed MTCA Method A Cleanup Levels

< = Below laboratory method reporting limits

NA = Not Analyzed due to no HCID detection

E = Estimated Concentration

Findings

Two borings designated as B11 and B8 were drilled on the southwest and southeast sides of the loading rack, respectively, and borings B9 and B10 were drilled on the northeast and northwest sides of the loading rack, respectively. The deepest sample collected in this area was sample S21 from boring B9, which was collected at a depth of 9–9.5 feet. None of the samples from the borings exceeded the laboratory HCID RLs.

As part of the loading rack investigation, PBS collected a sample below the red landscaping rock in the center of the rack, in an area of stained soil where the subsurface pipes exit the ground. Sample S28 was collected with hand tools at a depth of 0.3–0.6 feet. This sample exceeded the cleanup level.

Samples S26 and S27 were collected from the northwest side of the loading rack, below the red landscape rock and in an area of stained soil. Sample S26 exceeded the cleanup level, whereas the deeper sample S27 did not. This indicates a decrease in soil contamination at depth.

6.3 Oil Shed

The east side of the oil shed is paved and no hand samples were collected in this area. Two soil borings were drilled along the east side of the oil shed. The boring information along with the samples and results are presented in Table 6.

**Table 6: Oil Shed Drilled Soil Borings
Total Petroleum Hydrocarbon Soil Sample Results**

Sample ID	Location / Approximate Sample Depth (' = feet bgs)	PID	Hydrocarbon Identification			Diesel	Motor Oil
			Gasoline	Diesel	Heavy Oil		
S10	B1 3.5' west of three valves along west side and near center of oil shed / 4'-4.5'	0	<20	<50	<250	NA	NA
S15	B5 Near NW corner of oil shed / 3'-3.5'	0	<20	<50	<250	NA	NA
S16	B5 Near NW corner of oil shed / 6'-6.5'	0	<20	<50	<250	NA	NA
MTCA Method A Cleanup Levels						2,000	2,000

Notes: All results and laboratory reporting limits are in milligrams per kilogram (mg/kg)

bgs = below ground surface

PID = Photoionization detector measurement in parts per million

< = Below laboratory method reporting limits

NA = Not Analyzed due to no HCID detection

Findings

None of the soil samples exceeded the respective laboratory HCID RLs.

6.4 Former Railroad Area

Out-of-use valves and piping are visible along the west side of the warehouse, and appear to have been used for fuel unloading during past use of the railroad. PBS collected hand samples at two locations of out-of-use valves in this area; no soil borings were drilled. Sample locations, depths, and results are presented in the following tables.

**Table 7: Former Railroad Area Surface Samples
Total Petroleum Hydrocarbon Soil Sample Results**

Sample ID	Location / Approximate Sample Depth (' = feet bgs)	PID	Hydrocarbon Identification			Gasoline	Diesel	Motor Oil
			Gasoline	Diesel	Heavy Oil			
S40	West side of warehouse near out-of-use valves / 0'-0.5'	0	D	<50	<250	<2	NA	NA
S41 (DUP)	West side of warehouse near out-of-use valves / 0'-0.5'	0	D	<50	<250	NA	NA	NA

Sample ID	Location / Approximate Sample Depth (' = feet bgs)	PID	Hydrocarbon Identification			Gasoline	Diesel	Motor Oil
			Gasoline	Diesel	Heavy Oil			
S42	West side of warehouse near out-of-use valves / 0'-0.5'	0	<20	D	<250	NA	290 E	310
S43	West side of warehouse near out-of-use valves / 0.5'-1.0'	0	<20	D	<250	NA	99 E	NA
MTCA Method A Cleanup Levels						30/100*	2,000	2,000

Notes: All results and laboratory reporting limits are in milligrams per kilogram (mg/kg)

bgs = below ground surface

D: Indicates a qualitative detection of a petroleum hydrocarbon

PID = Photoionization detector measurement in parts per million

< = Below laboratory method reporting limits

NA = Not Analyzed due to no HCID detection

* = 100 milligrams per kilogram without benzene

E = Estimated Concentration

**Table 8: Former Railroad Area Surface Samples
BTEX Soil Sample Results**

Sample ID	Location / Approximate Sample Depth (' = feet bgs)	PID	Benzene	Toluene	Ethylbenzene	Xylenes
S40	West side of warehouse near out-of-use valves / 0'-0.5'	0	<0.02	<0.02	<0.02	<0.06
MTCA Method A Cleanup Levels			0.03	7	6	9

Notes: All results and laboratory reporting limits are in milligrams per kilogram (mg/kg)

bgs = below ground surface

PID = Photoionization detector measurement in parts per million

< = Below laboratory method reporting limits

Findings

Sample S40 had a detection of gasoline-range compounds; this was the only sample at the site that had a gasoline detection. This sample was then analyzed by NWTPH-Gx and BTEX, and the concentrations did not exceed the gasoline-range or BTEX laboratory RLs.

Samples S42 and S43 had diesel-range compound detections. Follow-up analysis found that neither sample exceeded the cleanup level.

6.5 Suspect Out-Of-Use Waste Oil Tank

During the private utility locate, a suspect underground storage tank was located in the paved area west of the oil shed. The private locate noted a metal object at a depth of 2.8 feet, with a

length of 3.5 feet and diameter of 2.5 feet. A suspect metal fill pipe cover was observed in a concrete casing within the overall paving and is located at the surface above this suspect tank; however, no fill pipe was observed.

PBS was informed that vehicle maintenance had formerly taken place in the north portion of the building. The location of the suspect UST was west of the oil shed about 60 feet. This tank may have served as a waste oil tank during past operations.

PBS drilled one soil boring near this suspected tank, with sample information and results presented in Table 9.

**Table 9: Suspect Waste Oil Tank Drilled Soil Boring
Total Petroleum Hydrocarbon Soil Sample Results**

Sample ID	Location / Approximate Sample Depth (' = feet bgs)	PID	Hydrocarbon Identification			Diesel	Motor Oil
			Gasoline	Diesel	Heavy Oil		
S25	B13 In asphalt 3' S of suspect underground tank / 5'-10'	0	<20	<50	<250	NA	NA
MTCA Method A Cleanup Levels						2,000	2,000

Notes: All results and laboratory reporting limits are in milligrams per kilogram (mg/kg)

bgs = below ground surface

D: Indicates a qualitative detection of a petroleum hydrocarbon

PID = Photoionization detector measurement in parts per million

< = Below laboratory method reporting limits

NA = Not Analyzed due to no HCID detection

Findings

This sample did not exceed the respective laboratory HCID RLs.

6.6 East Side of Warehouse Investigation

PBS collected a shallow surface sample at the base of the raised loading area between the concrete dock and asphalt on the east side of the warehouse. PBS then used the direct-push rig to drill at the base of the concrete dock to advance one soil boring about 25 feet south of the surface sample location as part of the overall site investigation.

PBS had sample S17 from the soil boring analyzed for lead and arsenic due to the widespread occurrence of these metals throughout Yakima County. The presence of these metals is generally due to former orchard operations that preceded most development in this area. This sample was also analyzed for VOCs as a screening sample if methanol or other solvents had spilled into the soil from the dock area.

**Table 10: East Side of Warehouse Drilled and Surface Samples
Total Petroleum Hydrocarbon Soil Sample Results**

Sample ID	Location / Approximate Sample Depth (' = feet bgs)	PID	Hydrocarbon Identification			Diesel	Motor Oil
			Gasoline	Diesel	Heavy Oil		
S38	S side of loading dock / 0'-0.5'	0	<20	<50	D	NA	310 E
S17	B6 At base of warehouse loading area / 2'-2.5'	0	<20	<50	<250	NA	NA
MTCA Method A Cleanup Levels						2,000	2,000

Notes: All results and laboratory reporting limits are in milligrams per kilogram (mg/kg)

bgs = below ground surface

PID = Photoionization detector measurement in parts per million

< = Below laboratory method reporting limits

D: Indicates a qualitative detection of a petroleum hydrocarbon

E =Estimated Concentration

Table 11: Arsenic and Lead Metals Results

Sample ID	Location / Approximate Sample Depth (' = feet bgs)	Arsenic	Lead
S17	B6 At base of warehouse loading area / 2'-2.5'	2.62	4.56
MTCA Method A Cleanup Levels		20	250

Notes: All results, laboratory reporting limits and MTCA Cleanup Levels are in milligrams per kilogram (mg/kg)

bgs = below ground surface

Findings

Sample S38 had a detection of heavy oil that did not exceed the cleanup level. Sample S17 did not exceed the HCID RLs and the concentrations of arsenic and lead did not exceed the respective cleanup levels. No VOCs were detected in this sample.

6.7 Former Oil Storage Area

The historical 1920 map showed an oil storage area in the southeast corner of the site. This area is currently an open area south of the oil shed where two oil-water separators are located, as discussed in the next section. This area is topographically low and PBS drilled one soil boring in this area. PBS also attempted to collect a groundwater sample from this boring, but was unsuccessful.

**Table 12: Former Oil Storage Area Drilled Samples
Total Petroleum Hydrocarbon Soil Sample Results**

Sample ID	Location / Approximate Sample Depth (' = feet bgs)	PID	Hydrocarbon Identification			Diesel	Motor Oil
			Gasoline	Diesel	Heavy Oil		
S24	B12 In asphalt 9.5' S of oil shed / 5'-5.5'	0	<20	<50	<250	NA	NA
MTCA Method A Cleanup Levels						2,000	2,000

Notes: All results and laboratory reporting limits are in milligrams per kilogram (mg/kg)

bgs = below ground surface

PID = Photoionization detector measurement in parts per million

< = Below laboratory method reporting limits

NA = Not Analyzed due to no HCID detection

Findings

This sample did not exceed the respective laboratory HCID RLs.

6.8 Stormwater Drain System and Oil-Water Separators

The presence of a stormwater collection drain in the southeast portion of the site was mentioned in Section 3.0. Stormwater from the east side of the site enters the sump and is then gravity piped to two oil-water separators. PBS understands the concrete lids were lifted by a forklift four to five years ago and the oil-water separators cleaned out. Wondrack staff did not know if the oil-water separators tie into the City of Yakima sewage system.

PBS collected a sludge sample from the stormwater sump and submitted it for analysis.

**Table 12: Stormwater Sump Sludge Sample
Total Petroleum Hydrocarbon Soil Sample Results**

Sample ID	Location / Approximate Sample Depth (' = feet bgs)	Hydrocarbon Identification			Diesel	Motor Oil	
		Gasoline	Diesel	Heavy Oil			
S39	Collected from sludge inside sump / 1'-3'	<20	D	D	15,000	31,000	
MTCA Method A Cleanup Levels						2,000	2,000

Notes: All results and laboratory reporting limits are in milligrams per kilogram (mg/kg)

bgs = below ground surface

PID = Photoionization detector measurement in parts per million

< = Below laboratory method reporting limits

D: Indicates a qualitative detection of a petroleum hydrocarbon

Bold results exceed MTCA Method A Cleanup Levels

Findings

Sludge inside the stormwater sump was noted to exceed the cleanup levels; however, this material is contained within the concrete sump. The sump is concrete and had a solid bottom, and the presence of standing water indicates the bottom is intact. Discharge from the oil-water separators was not determined as part of this characterization.

7.0 CONCLUSIONS/RECOMMENDATIONS

The purpose of the site characterization was to investigate the contamination status of soil and groundwater at the site. Based on drill rig refusal, no groundwater sampling was conducted. PBS collected soil samples in areas of visibly stained soil or in areas of suspected petroleum contamination. The site characterization findings confirm that areas of petroleum contamination in soil exist that exceed cleanup levels. This assessment was intended as an initial characterization of the site and should not be considered as a comprehensive delineation of on-site contamination.

As noted previously, a groundwater sample could not be collected due to difficult drilling conditions. With regard to the site characterization of the site, PBS presents the following conclusions for unsaturated soil:

- Diesel- and/or motor oil-range compounds are present in soil at the tank farm, the out-of-use tank and drum storage area, and the loading rack at concentrations that exceed the MTCA Method A cleanup levels.
- Much but not all of the soil contamination is associated with dark-stained soil at the surface. However sampling by hand tools was limited to about the upper 3 feet from the surface, and deeper sampling within the tank farm was not possible due to drill rig access limitations.
- PBS has confirmed the presence of the metals cadmium and lead in soil near the waste oil tank that exceed the MTCA Method A cleanup level. PAHs were also found the exceed the cleanup level.

RECOMMENDATIONS

Based on the findings of this investigation, PBS provides the following recommendations:

- Under the MTCA cleanup regulations, the soil contamination that has been detected at the site would likely be considered a release. A release is deemed reportable if it may be a threat to human health or the environment, and it must be reported to Ecology within 90 days of discovery by the owner or operator of a facility. The cleanup regulation lists some examples of situations that should be reported, one of which is at sites where hazardous substances have been leaked or dumped to the ground. It appears that the leakage of petroleum products, primarily oil and diesel, has occurred at this site. However, the interpretation of “threat to human health or the environment” can vary, and the lack of groundwater data is considered a data gap for determining a possible threat.
- Focused soil investigation should be undertaken to delineate the horizontal and vertical extent of contamination. Deeper sampling in the tank farm would allow a more accurate determination of any soil contamination in the vicinity of the ASTs and suspect UST. This would also provide information in aiding a determination if monitoring wells are needed. This could include collection of additional data to aid in design of remediation wells, if warranted.

- Enrollment into the Voluntary Cleanup Program (VCP) is recommended. An important feature of the program is that it allows owners, through a technical consultation process with Ecology, to apply for and receive a No Further Action (NFA) letter once Ecology has reviewed the assessment and any cleanup documentation and is satisfied that no unacceptable risk remains.
- PBS recommends decommissioning the suspect waste oil tank at the site. Based on the dimensions as estimated during the utility locate, the tank has an approximate capacity of 128 gallons. This exceeds the UST exemption capacity of 110 gallons and indicates the UST is a regulated tank.
- PBS recommends soil sampling under the concrete floor of the oil shed, due to the large amount of petroleum staining observed on the floor.
- PBS recommends that the metal grate noted south of the tank farm be cleaned out to determine if this is a drywell.
- PBS recommends that any suspect asbestos-containing material be tested for asbestos prior to maintenance activities

PBS recommends that Wondrack Distributing keep this report as a permanent record of the site characterization that took place at the site. It should be submitted to Ecology if the site is enrolled in the VCP.

8.0 LIMITATIONS

PBS has prepared this report for use by Wondrack Distributing and is not intended for use by others without the written consent of PBS. The site as a whole may have other contamination that was not characterized by this study. The findings and conclusions of this report are not scientific certainties, but rather probabilities based on professional judgment concerning the significance of the data gathered during the course of this investigation. PBS is not able to represent that the site or adjoining land contain no hazardous waste, oil or other latent conditions beyond that detected or observed by PBS.

9.0 SIGNATURES

PBS Engineering and Environmental Inc.



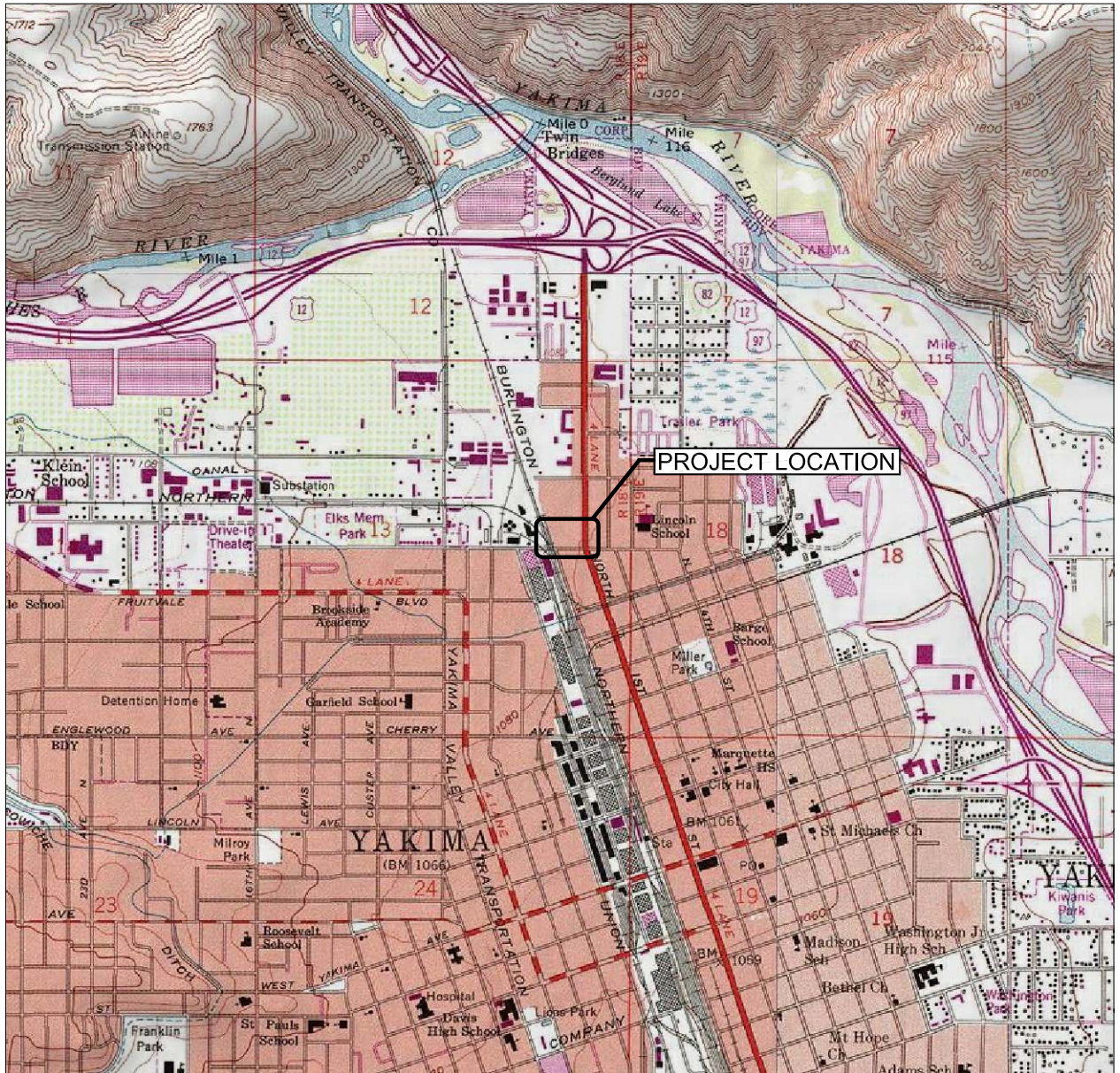
Dana Ertel, LG
Project Manager

Reviewed by:

A handwritten signature in black ink that reads "Heidi Yantz".

Heidi Yantz, LHG
Principal Hydrogeologist

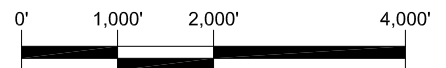
TAB 1 – FIGURES



SOURCE: USGS YAKIMA EAST QUADRANGLE, WA 1981



WASHINGTON



APPROX. SCALE: 1" = 2,000'

PREPARED FOR: WONDRACK DISTRIBUTING



PROJECT #:
64116.000

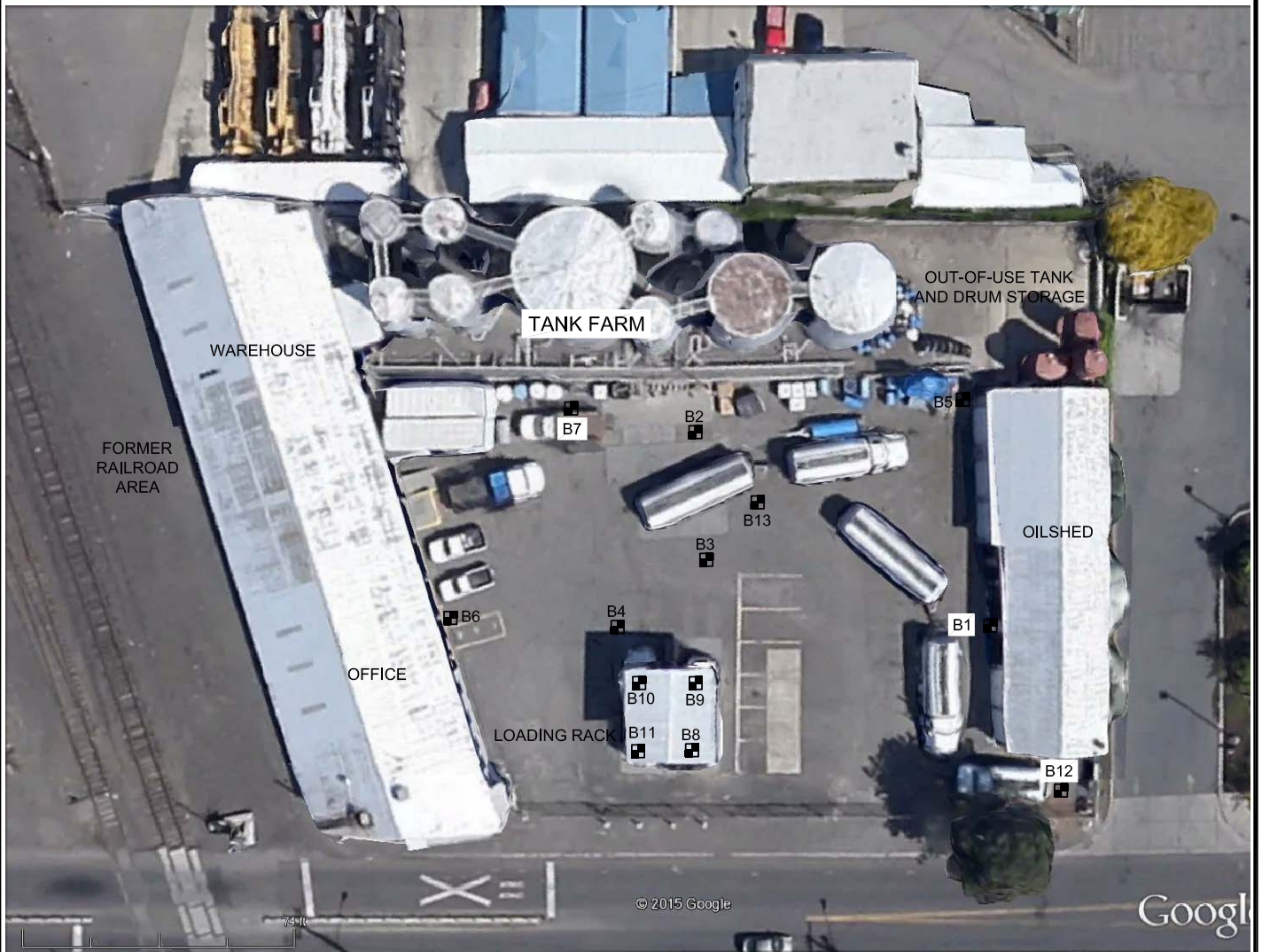
DATE:
JUNE 2015

SITE VICINITY MAP

1 E. I STREET
YAKIMA, WASHINGTON

FIGURE:

1



LEGEND

B1 ■ SOIL BORING NUMBER AND APPROXIMATE LOCATION



NOT TO SCALE

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PROJECT #
64116.000

DATE
JUNE 2015

APPROXIMATE SOIL BORING LOCATIONS

1 E. I STREET
YAKIMA, WASHINGTON

FIGURE

2



LEGEND

- S1 ● SOIL SAMPLE NUMBER AND APPROXIMATE LOCATION
- ▣ SUSPECT STORMWATER STRUCTURE APPROXIMATE LOCATION



NOT TO SCALE

PREPARED FOR: WONDRACK DISTRIBUTING



PROJECT #
64116.000

DATE
JUNE 2015

APPROXIMATE SOIL SAMPLE LOCATIONS

1 E. I STREET
YAKIMA, WASHINGTON

FIGURE

3

APPENDIX A

Laboratory Data and Chain of Custody

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.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

May 19, 2015

Dana Ertel, Project Manager
PBS Engineering and Environmental, Inc.
400 Bradley Blvd, Suite 300
Richland, WA 99352

Dear Mr. Ertel:

Included is the amended report from the testing of material submitted on April 8, 2015 from the 64116, F&BI 504134 project. Per your request, the estimated concentrations of the HCID analysis were included in the report for the samples that were not quantified by NWTPH-Dx analysis.

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
PBR0416R.DOC

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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April 16, 2015

Dana Ertel, Project Manager
PBS Engineering and Environmental, Inc.
400 Bradley Blvd, Suite 300
Richland, WA 99352

Dear Mr. Ertel:

Included are the results from the testing of material submitted on April 8, 2015 from the 64116, F&BI 504134 project. There are 5 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
PBR0416R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on April 8, 2015 by Friedman & Bruya, Inc. from the PBS Engineering and Environmental 64116, F&BI 504134 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>PBS Engineering and Environmental</u>
504134 -01	S1
504134 -02	S2
504134 -03	S3
504134 -04	S4
504134 -05	S5
504134 -06	S6
504134 -07	S7
504134 -08	S8

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/16/15
 Date Received: 04/08/15
 Project: 64116, F&BI 504134
 Date Extracted: 04/08/15
 Date Analyzed: 04/08/15

**RESULTS FROM THE ANALYSIS OF SOIL SAMPLES
 FOR GASOLINE, DIESEL AND HEAVY OIL BY NWTPH-HCID
 Results Reported as Not Detected (ND) or Detected (D)**

**THE DATA PROVIDED BELOW WAS PERFORMED PER THE GUIDELINES ESTABLISHED BY THE
 WASHINGTON DEPARTMENT OF ECOLOGY AND WERE NOT DESIGNED TO PROVIDE INFORMATION
 WITH REGARDS TO THE ACTUAL IDENTIFICATION OF ANY MATERIAL PRESENT**

<u>Sample ID</u> Laboratory ID	<u>Gasoline</u>	<u>Diesel</u>	<u>Heavy Oil</u>	<u>Surrogate</u> <u>(% Recovery)</u> (Limit 53-144)
S1 504134-01	ND	ND	2,600 e	72
S2 504134-02	ND	ND	590 e	99
S3 504134-03	ND	ND	D	62
S4 504134-04	ND	ND	D	74
S5 504134-05	ND	ND	600 e	99
S6 504134-06	ND	ND	ND	88
S7 504134-07	ND	390 x e	470 e	99
S8 504134-08	ND	D x	D	82
Method Blank 05-727 MB	ND	ND	ND	102

ND - Material not detected at or above 20 mg/kg gas, 50 mg/kg diesel and 250 mg/kg heavy oil.

e - The concentration reported is an estimate.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/16/15
Date Received: 04/08/15
Project: 64116, F&BI 504134
Date Extracted: 04/13/15
Date Analyzed: 04/13/15

**RESULTS FROM THE ANALYSIS OF SOIL SAMPLES
FOR TOTAL PETROLEUM HYDROCARBONS AS
DIESEL AND MOTOR OIL
USING METHOD NWTPH-Dx**

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

<u>Sample ID</u> Laboratory ID	<u>Diesel Range</u> (C ₁₀ -C ₂₅)	<u>Motor Oil Range</u> (C ₂₅ -C ₃₆)	<u>Surrogate</u> (% Recovery) (Limit 53-144)
S3 504134-03	2,100 x	11,000	91
S4 504134-04	270 x	1,100	89
S8 504134-08	550 x	1,100	97
Method Blank 05-744 MB	<50	<250	124

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/16/15

Date Received: 04/08/15

Project: 64116, F&BI 504134

**QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF SOIL SAMPLES
FOR TOTAL PETROLEUM HYDROCARBONS AS
DIESEL EXTENDED USING METHOD NWTPH-Dx**

Laboratory Code: 504208-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet Wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	mg/kg (ppm)	5,000	<50	105	115	64-133	9

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Diesel Extended	mg/kg (ppm)	5,000	118	58-147

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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.

SO4134

SAMPLE CHAIN OF CUSTODY

NE 04/08/15 03/15/15

Send Report To Dana Ertel

Company PRS Environmental

Address 400 Bradley Blvd Suite 300

City, State, ZIP Richland, WA 99352

Phone # (509) 727-0873 Fax #

SAMPLERS (signature) Dana H. Ertel

PROJECT NAME/NO. 64116

PO#

REMARKS

All return cores of bags/packaging.

Page # 1 of 1/15/15

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						Notes	
						TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260	SVOCs by 8270	HFS		HClO
S1	01	4/15/15		Soil	3								Q - per DE 04/14/15 E
S2	02												
S3	03												
S4	04												
S5	05												
S6	06												
S7	07												
S8	08												

Samples received at 5 °C

SIGNATURE

Relinquished by: Dana H. Ertel

PRINT NAME

Dana Ertel

COMPANY

PRS

DATE

4/15/15

TIME

1030

Friedman & Bryva, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029

Ph. (206) 285-8282

Fax (206) 283-5044

FORMS\COC\COC.DOC

SIGNATURE

Received by: [Signature]

PRINT NAME

Nolan Pharr

COMPANY

F&B I

DATE

4/8/15

TIME

1030

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
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Eric Young, B.S.

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fbi@isomedia.com
www.friedmanandbruya.com

May 19, 2015

Dana Ertel, Project Manager
PBS Engineering and Environmental, Inc.
400 Bradley Blvd, Suite 300
Richland, WA 99352

Dear Mr. Ertel:

Included is the amended report from the testing of material submitted on April 13, 2015 from the Yakima 64116, F&BI 504216 project. Per your request, the estimated HCID concentrations were included in the report.

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

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl
Project Manager

Enclosures
PBR0417R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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

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www.friedmanandbruya.com

April 17, 2015

Dana Ertel, Project Manager
PBS Engineering and Environmental, Inc.
400 Bradley Blvd, Suite 300
Richland, WA 99352

Dear Mr. Ertel:

Included are the results from the testing of material submitted on April 13, 2015 from the Yakima 64116, F&BI 504216 project. There are 11 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
PBR0417R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on April 13, 2015 by Friedman & Bruya, Inc. from the PBS Engineering and Environmental Yakima 64116, F&BI 504216 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>PBS Engineering and Environmental</u>
504216 -01	S9
504216 -02	S10
504216 -03	S11
504216 -04	S13
504216 -05	S14
504216 -06	S15
504216 -07	S16
504216 -08	S17
504216 -09	S18
504216 -10	S19
504216 -11	S20
504216 -12	S21
504216 -13	S22
504216 -14	S23
504216 -15	S24
504216 -16	S25

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/17/15
 Date Received: 04/13/15
 Project: Yakima 64116, F&BI 504216
 Date Extracted: 04/14/15
 Date Analyzed: 04/14/15

**RESULTS FROM THE ANALYSIS OF SOIL SAMPLES
 FOR GASOLINE, DIESEL AND HEAVY OIL BY NWTPH-HCID
 Results Reported as Not Detected (ND) or Detected (D)**

**THE DATA PROVIDED BELOW WAS PERFORMED PER THE GUIDELINES ESTABLISHED BY THE
 WASHINGTON DEPARTMENT OF ECOLOGY AND WERE NOT DESIGNED TO PROVIDE INFORMATION
 WITH REGARDS TO THE ACTUAL IDENTIFICATION OF ANY MATERIAL PRESENT**

<u>Sample ID</u> Laboratory ID	<u>Gasoline</u>	<u>Diesel</u>	<u>Heavy Oil</u>	<u>Surrogate</u> <u>(% Recovery)</u> (Limit 56-165)
S9 504216-01 1/10	ND	ND	6,700 e	98
S10 504216-02	ND	ND	ND	101
S11 504216-03	ND	ND	ND	96
S13 504216-04	ND	ND	ND	96
S14 504216-05	ND	ND	ND	97
S15 504216-06	ND	ND	ND	96
S16 504216-07	ND	ND	ND	98
S17 504216-08	ND	ND	ND	99
S18 504216-09	ND	ND	ND	96
S19 504216-10	ND	ND	ND	94
S20 504216-11	ND	ND	ND	96

ND - Material not detected at or above 20 mg/kg gas, 50 mg/kg diesel and 250 mg/kg heavy oil.

e - The concentration reported is an estimate.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/17/15
Date Received: 04/13/15
Project: Yakima 64116, F&BI 504216
Date Extracted: 04/14/15
Date Analyzed: 04/14/15

**RESULTS FROM THE ANALYSIS OF SOIL SAMPLES
FOR GASOLINE, DIESEL AND HEAVY OIL BY NWTPH-HCID
Results Reported as Not Detected (ND) or Detected (D)**

**THE DATA PROVIDED BELOW WAS PERFORMED PER THE GUIDELINES ESTABLISHED BY THE
WASHINGTON DEPARTMENT OF ECOLOGY AND WERE NOT DESIGNED TO PROVIDE INFORMATION
WITH REGARDS TO THE ACTUAL IDENTIFICATION OF ANY MATERIAL PRESENT**

<u>Sample ID</u> Laboratory ID	<u>Gasoline</u>	<u>Diesel</u>	<u>Heavy Oil</u>	<u>Surrogate</u> <u>(% Recovery)</u> (Limit 56-165)
S21 504216-12	ND	ND	ND	91
S22 504216-13	ND	ND	ND	95
S23 504216-14	ND	ND	ND	95
S24 504216-15	ND	ND	ND	92
S25 504216-16	ND	ND	ND	95
Method Blank 05-765 MB	ND	ND	ND	105

ND - Material not detected at or above 20 mg/kg gas, 50 mg/kg diesel and 250 mg/kg heavy oil.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	S17	Client:	PBS Engineering and Environmental
Date Received:	04/13/15	Project:	Yakima 64116, F&BI 504216
Date Extracted:	04/14/15	Lab ID:	504216-08
Date Analyzed:	04/15/15	Data File:	504216-08.028
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	80	60	125
Holmium	94	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	2.62
Lead	4.56

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	PBS Engineering and Environmental
Date Received:	NA	Project:	Yakima 64116, F&BI 504216
Date Extracted:	04/14/15	Lab ID:	I5-222 mb
Date Analyzed:	04/15/15	Data File:	I5-222 mb.010
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	94	60	125
Holmium	102	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	<1
Lead	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	S17	Client:	PBS Engineering and Environmental
Date Received:	04/13/15	Project:	Yakima 64116, F&BI 504216
Date Extracted:	04/13/15	Lab ID:	504216-08
Date Analyzed:	04/13/15	Data File:	041320.D
Matrix:	Soil	Instrument:	GCMS9
Units:	mg/kg (ppm) Dry Weight	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	89	113
Toluene-d8	101	64	137
4-Bromofluorobenzene	101	81	119

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	<0.025
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	<0.5	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Methylene chloride	<0.5	o-Xylene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Styrene	<0.05
trans-1,2-Dichloroethene	<0.05	Isopropylbenzene	<0.05
1,1-Dichloroethane	<0.05	Bromoform	<0.05
2,2-Dichloropropane	<0.05	n-Propylbenzene	<0.05
cis-1,2-Dichloroethene	<0.05	Bromobenzene	<0.05
Chloroform	<0.05	1,3,5-Trimethylbenzene	<0.05
2-Butanone (MEK)	<0.5	1,1,2,2-Tetrachloroethane	<0.05
1,2-Dichloroethane (EDC)	<0.05	1,2,3-Trichloropropane	<0.05
1,1,1-Trichloroethane	<0.05	2-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	4-Chlorotoluene	<0.05
Carbon tetrachloride	<0.05	tert-Butylbenzene	<0.05
Benzene	<0.03	1,2,4-Trimethylbenzene	<0.05
Trichloroethene	<0.02	sec-Butylbenzene	<0.05
1,2-Dichloropropane	<0.05	p-Isopropyltoluene	<0.05
Bromodichloromethane	<0.05	1,3-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,4-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dichlorobenzene	<0.05
cis-1,3-Dichloropropene	<0.05	1,2-Dibromo-3-chloropropane	<0.5
Toluene	<0.05	1,2,4-Trichlorobenzene	<0.25
trans-1,3-Dichloropropene	<0.05	Hexachlorobutadiene	<0.25
1,1,2-Trichloroethane	<0.05	Naphthalene	<0.05
2-Hexanone	<0.5	1,2,3-Trichlorobenzene	<0.25

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	PBS Engineering and Environmental
Date Received:	Not Applicable	Project:	Yakima 64116, F&BI 504216
Date Extracted:	04/13/15	Lab ID:	05-0718 mb
Date Analyzed:	04/13/15	Data File:	041308.D
Matrix:	Soil	Instrument:	GCMS9
Units:	mg/kg (ppm) Dry Weight	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	89	113
Toluene-d8	100	64	137
4-Bromofluorobenzene	100	81	119

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	<0.025
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	<0.5	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Methylene chloride	<0.5	o-Xylene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Styrene	<0.05
trans-1,2-Dichloroethene	<0.05	Isopropylbenzene	<0.05
1,1-Dichloroethane	<0.05	Bromoform	<0.05
2,2-Dichloropropane	<0.05	n-Propylbenzene	<0.05
cis-1,2-Dichloroethene	<0.05	Bromobenzene	<0.05
Chloroform	<0.05	1,3,5-Trimethylbenzene	<0.05
2-Butanone (MEK)	<0.5	1,1,2,2-Tetrachloroethane	<0.05
1,2-Dichloroethane (EDC)	<0.05	1,2,3-Trichloropropane	<0.05
1,1,1-Trichloroethane	<0.05	2-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	4-Chlorotoluene	<0.05
Carbon tetrachloride	<0.05	tert-Butylbenzene	<0.05
Benzene	<0.03	1,2,4-Trimethylbenzene	<0.05
Trichloroethene	<0.02	sec-Butylbenzene	<0.05
1,2-Dichloropropane	<0.05	p-Isopropyltoluene	<0.05
Bromodichloromethane	<0.05	1,3-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,4-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dichlorobenzene	<0.05
cis-1,3-Dichloropropene	<0.05	1,2-Dibromo-3-chloropropane	<0.5
Toluene	<0.05	1,2,4-Trichlorobenzene	<0.25
trans-1,3-Dichloropropene	<0.05	Hexachlorobutadiene	<0.25
1,1,2-Trichloroethane	<0.05	Naphthalene	<0.05
2-Hexanone	<0.5	1,2,3-Trichlorobenzene	<0.25

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/17/15

Date Received: 04/13/15

Project: Yakima 64116, F&BI 504216

**QUALITY ASSURANCE RESULTS
FOR THE ANALYSIS OF SOIL SAMPLES
FOR TOTAL METALS USING EPA METHOD 200.8**

Laboratory Code: 504171-02 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	mg/kg (ppm)	10	1.92	75	80	67-121	6
Lead	mg/kg (ppm)	50	7.41	81	87	59-148	7

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	mg/kg (ppm)	10	97	83-113
Lead	mg/kg (ppm)	50	102	80-120

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/17/15

Date Received: 04/13/15

Project: Yakima 64116, F&BI 504216

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

Laboratory Code: 504208-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Dichlorodifluoromethane	mg/kg (ppm)	2.5	<0.5	38	37	10-56	3
Chloromethane	mg/kg (ppm)	2.5	<0.5	60	60	10-90	0
Vinyl chloride	mg/kg (ppm)	2.5	<0.05	64	63	10-91	2
Bromomethane	mg/kg (ppm)	2.5	<0.5	65	65	10-110	0
Chloroethane	mg/kg (ppm)	2.5	<0.5	74	72	10-101	3
Trichlorofluoromethane	mg/kg (ppm)	2.5	<0.5	71	72	10-95	1
Acetone	mg/kg (ppm)	12.5	<0.5	92	91	11-141	1
1,1-Dichloroethene	mg/kg (ppm)	2.5	<0.05	78	79	11-103	1
Methylene chloride	mg/kg (ppm)	2.5	<0.5	92	92	14-128	0
Methyl t-butyl ether (MTBE)	mg/kg (ppm)	2.5	<0.05	92	92	17-134	0
trans-1,2-Dichloroethene	mg/kg (ppm)	2.5	<0.05	85	85	13-112	0
1,1-Dichloroethane	mg/kg (ppm)	2.5	<0.05	87	87	23-115	0
2,2-Dichloropropane	mg/kg (ppm)	2.5	<0.05	88	86	18-117	2
cis-1,2-Dichloroethene	mg/kg (ppm)	2.5	<0.05	91	91	25-120	0
Chloroform	mg/kg (ppm)	2.5	<0.05	88	89	29-117	1
2-Butanone (MEK)	mg/kg (ppm)	12.5	<0.5	99	101	20-133	2
1,2-Dichloroethane (EDC)	mg/kg (ppm)	2.5	<0.05	84	86	22-124	2
1,1,1-Trichloroethane	mg/kg (ppm)	2.5	<0.05	90	90	27-112	0
1,1-Dichloropropene	mg/kg (ppm)	2.5	<0.05	89	90	26-107	1
Carbon tetrachloride	mg/kg (ppm)	2.5	<0.05	89	88	22-115	1
Benzene	mg/kg (ppm)	2.5	<0.03	86	85	26-114	1
Trichloroethene	mg/kg (ppm)	2.5	<0.02	90	88	30-112	2
1,2-Dichloropropane	mg/kg (ppm)	2.5	<0.05	91	92	31-119	1
Bromodichloromethane	mg/kg (ppm)	2.5	<0.05	93	92	31-131	1
Dibromomethane	mg/kg (ppm)	2.5	<0.05	91	91	27-124	0
4-Methyl-2-pentanone	mg/kg (ppm)	12.5	<0.5	102	101	16-147	1
cis-1,3-Dichloropropene	mg/kg (ppm)	2.5	<0.05	98	97	28-137	1
Toluene	mg/kg (ppm)	2.5	<0.05	88	90	34-112	2
trans-1,3-Dichloropropene	mg/kg (ppm)	2.5	<0.05	92	93	30-136	1
1,1,2-Trichloroethane	mg/kg (ppm)	2.5	<0.05	88	89	32-126	1
2-Hexanone	mg/kg (ppm)	12.5	<0.5	89	90	17-147	1
1,3-Dichloropropane	mg/kg (ppm)	2.5	<0.05	93	94	29-125	1
Tetrachloroethene	mg/kg (ppm)	2.5	<0.025	88	89	25-114	1
Dibromochloromethane	mg/kg (ppm)	2.5	<0.05	88	89	32-143	1
1,2-Dibromoethane (EDB)	mg/kg (ppm)	2.5	<0.05	91	92	32-126	1
Chlorobenzene	mg/kg (ppm)	2.5	<0.05	89	90	37-113	1
Ethylbenzene	mg/kg (ppm)	2.5	<0.05	91	92	34-115	1
1,1,1,2-Tetrachloroethane	mg/kg (ppm)	2.5	<0.05	91	93	35-126	2
m,p-Xylene	mg/kg (ppm)	5	<0.1	93	93	25-125	0
o-Xylene	mg/kg (ppm)	2.5	<0.05	94	96	27-126	2
Styrene	mg/kg (ppm)	2.5	<0.05	95	96	39-121	1
Isopropylbenzene	mg/kg (ppm)	2.5	<0.05	97	98	34-123	1
Bromoform	mg/kg (ppm)	2.5	<0.05	85	87	18-155	2
n-Propylbenzene	mg/kg (ppm)	2.5	<0.05	94	96	31-120	2
Bromobenzene	mg/kg (ppm)	2.5	<0.05	89	89	40-115	0
1,3,5-Trimethylbenzene	mg/kg (ppm)	2.5	<0.05	96	96	24-130	0
1,1,2,2-Tetrachloroethane	mg/kg (ppm)	2.5	<0.05	95	94	27-148	1
1,2,3-Trichloropropane	mg/kg (ppm)	2.5	<0.05	87	89	33-123	2
2-Chlorotoluene	mg/kg (ppm)	2.5	<0.05	93	93	39-110	0
4-Chlorotoluene	mg/kg (ppm)	2.5	<0.05	93	92	39-111	1
tert-Butylbenzene	mg/kg (ppm)	2.5	<0.05	102	103	36-116	1
1,2,4-Trimethylbenzene	mg/kg (ppm)	2.5	<0.05	96	97	35-116	1
sec-Butylbenzene	mg/kg (ppm)	2.5	<0.05	96	98	33-118	2
p-Isopropyltoluene	mg/kg (ppm)	2.5	<0.05	96	97	32-119	1
1,3-Dichlorobenzene	mg/kg (ppm)	2.5	<0.05	87	90	38-111	3
1,4-Dichlorobenzene	mg/kg (ppm)	2.5	<0.05	86	87	39-109	1
1,2-Dichlorobenzene	mg/kg (ppm)	2.5	<0.05	89	89	40-111	0
1,2-Dibromo-3-chloropropane	mg/kg (ppm)	2.5	<0.5	92	96	37-122	4
1,2,4-Trichlorobenzene	mg/kg (ppm)	2.5	<0.25	93	95	31-121	2
Hexachlorobutadiene	mg/kg (ppm)	2.5	<0.25	90	91	24-128	1
Naphthalene	mg/kg (ppm)	2.5	<0.05	96	98	24-139	2
1,2,3-Trichlorobenzene	mg/kg (ppm)	2.5	<0.25	91	93	35-117	2

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 04/17/15

Date Received: 04/13/15

Project: Yakima 64116, F&BI 504216

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

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Dichlorodifluoromethane	mg/kg (ppm)	2.5	52	10-76
Chloromethane	mg/kg (ppm)	2.5	67	34-98
Vinyl chloride	mg/kg (ppm)	2.5	72	42-107
Bromomethane	mg/kg (ppm)	2.5	70	46-113
Chloroethane	mg/kg (ppm)	2.5	78	47-115
Trichlorofluoromethane	mg/kg (ppm)	2.5	80	53-112
Acetone	mg/kg (ppm)	12.5	94	39-147
1,1-Dichloroethene	mg/kg (ppm)	2.5	84	65-110
Methylene chloride	mg/kg (ppm)	2.5	92	50-127
Methyl t-butyl ether (MTBE)	mg/kg (ppm)	2.5	92	72-122
trans-1,2-Dichloroethene	mg/kg (ppm)	2.5	88	71-113
1,1-Dichloroethane	mg/kg (ppm)	2.5	89	74-109
2,2-Dichloropropane	mg/kg (ppm)	2.5	88	64-151
cis-1,2-Dichloroethene	mg/kg (ppm)	2.5	91	73-110
Chloroform	mg/kg (ppm)	2.5	90	76-110
2-Butanone (MEK)	mg/kg (ppm)	12.5	110	60-121
1,2-Dichloroethane (EDC)	mg/kg (ppm)	2.5	91	73-111
1,1,1-Trichloroethane	mg/kg (ppm)	2.5	93	72-116
1,1-Dichloropropene	mg/kg (ppm)	2.5	93	72-112
Carbon tetrachloride	mg/kg (ppm)	2.5	92	67-123
Benzene	mg/kg (ppm)	2.5	90	72-106
Trichloroethene	mg/kg (ppm)	2.5	93	72-107
1,2-Dichloropropane	mg/kg (ppm)	2.5	97	74-115
Bromodichloromethane	mg/kg (ppm)	2.5	96	75-126
Dibromomethane	mg/kg (ppm)	2.5	95	76-116
4-Methyl-2-pentanone	mg/kg (ppm)	12.5	112	80-128
cis-1,3-Dichloropropene	mg/kg (ppm)	2.5	107	71-138
Toluene	mg/kg (ppm)	2.5	93	74-111
trans-1,3-Dichloropropene	mg/kg (ppm)	2.5	101	77-135
1,1,2-Trichloroethane	mg/kg (ppm)	2.5	93	77-116
2-Hexanone	mg/kg (ppm)	12.5	107	70-129
1,3-Dichloropropane	mg/kg (ppm)	2.5	101	75-115
Tetrachloroethene	mg/kg (ppm)	2.5	89	73-111
Dibromochloromethane	mg/kg (ppm)	2.5	94	64-152
1,2-Dibromoethane (EDB)	mg/kg (ppm)	2.5	99	77-117
Chlorobenzene	mg/kg (ppm)	2.5	93	76-109
Ethylbenzene	mg/kg (ppm)	2.5	95	75-112
1,1,1,2-Tetrachloroethane	mg/kg (ppm)	2.5	88	76-125
m,p-Xylene	mg/kg (ppm)	5	97	77-115
o-Xylene	mg/kg (ppm)	2.5	94	76-115
Styrene	mg/kg (ppm)	2.5	101	76-119
Isopropylbenzene	mg/kg (ppm)	2.5	97	76-120
Bromoform	mg/kg (ppm)	2.5	92	50-174
n-Propylbenzene	mg/kg (ppm)	2.5	99	77-115
Bromobenzene	mg/kg (ppm)	2.5	96	76-112
1,3,5-Trimethylbenzene	mg/kg (ppm)	2.5	97	77-121
1,1,2,2-Tetrachloroethane	mg/kg (ppm)	2.5	99	74-121
1,2,3-Trichloropropane	mg/kg (ppm)	2.5	97	74-116
2-Chlorotoluene	mg/kg (ppm)	2.5	95	75-113
4-Chlorotoluene	mg/kg (ppm)	2.5	96	77-115
tert-Butylbenzene	mg/kg (ppm)	2.5	103	77-123
1,2,4-Trimethylbenzene	mg/kg (ppm)	2.5	99	77-119
sec-Butylbenzene	mg/kg (ppm)	2.5	97	78-120
p-Isopropyltoluene	mg/kg (ppm)	2.5	98	77-120
1,3-Dichlorobenzene	mg/kg (ppm)	2.5	91	76-112
1,4-Dichlorobenzene	mg/kg (ppm)	2.5	89	74-109
1,2-Dichlorobenzene	mg/kg (ppm)	2.5	89	75-114
1,2-Dibromo-3-chloropropane	mg/kg (ppm)	2.5	92	68-122
1,2,4-Trichlorobenzene	mg/kg (ppm)	2.5	89	75-122
Hexachlorobutadiene	mg/kg (ppm)	2.5	84	74-130
Naphthalene	mg/kg (ppm)	2.5	92	73-122
1,2,3-Trichlorobenzene	mg/kg (ppm)	2.5	86	75-117

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.

504216

SAMPLE CHAIN OF CUSTODY

ME 04-13-15

03 / 132

Send Report To Dana Eitel

Company PRS Environmental

Address 400 Bradley Blvd Suite 300

City, State, ZIP Richland, WA 99352

Phone # (509) 727-0873 Fax # _____

SAMPLERS (signature) Dana Eitel

PROJECT NAME/NO. Yakima 64116

REMARKS

Page # _____ of 2

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						Notes				
						TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260	SVOCs by 8270	HFS		HCID	Pb	Arsenic	
S09	0144	4/8/15		Soil	3											
S10	027	↓		↓	3											
S11	037	↓		↓	3											
No Sample 12					—											
S13	044	4/8/15		↓	3											No Sample Attached
S14	057	↓		↓	3											
S15	067	↓		↓	3											
S16	077	↓		↓	3											
S17	087	↓		↓	3				✓							
S18	097	↓		↓	3											

Friedman & Brya, 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
Reinquished by: <u>Dana Eitel</u>		<u>Dana Eitel</u>		<u>PRS</u>		<u>4/10/15</u>	
Received by: <u>Melissa Davis</u>		<u>Melissa Davis</u>		<u>F&B</u>		<u>4/13/15</u>	<u>1125</u>
Reinquished by:							
Received by:							

Samples received at 6 °C

504216

SAMPLE CHAIN OF CUSTODY NE 04-13-15

03/152

Send Report To Dana Ertel
 Company PRS Environmental
 Address 400 Bradley Blvd Suite 300
 City, State, ZIP Riskland, WA 99352
 Phone # (509) 727-0873 Fax # _____

SAMPLERS (signature)	
PROJECT NAME/NO. <u>64116</u>	PO#
REMARKS	

Page # 2 of 2

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						Notes		
						TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260	SVOCs by 8270	HFS		HCID	
S19	10A-D	4/8/15		Soil	4									
S20	11A-C				3									
S21	12T				3									
S22	13				3									
S23	14				3									
S24	15				3									
S25	16				3									

Friedman & Bryva, 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:							
Received by:	<u>[Signature]</u>	<u>Nhan Phan</u>		<u>FCBT</u>		<u>4/23/15</u>	<u>1125</u>
Relinquished by:							
Received by:							

Samples received at 6 °C

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.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

May 19, 2015

Dana Ertel, Project Manager
PBS Engineering and Environmental, Inc.
400 Bradley Blvd, Suite 300
Richland, WA 99352

Dear Mr. Ertel:

Included is the amended report from the testing of material submitted on April 17, 2015 from the 64116 Yakima, F&BI 504328 project. Per your request, the estimated concentrations of the HCID analysis were included in the report for the samples that were not quantified by NWTPH-Dx analysis.

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
PBR0507R.DOC

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.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

May 7, 2015

Dana Ertel, Project Manager
PBS Engineering and Environmental, Inc.
400 Bradley Blvd, Suite 300
Richland, WA 99352

Dear Mr. Ertel:

Included are the results from the testing of material submitted on April 17, 2015 from the 64116 Yakima, F&BI 504328 project. There are 17 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
PBR0507R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on April 17, 2015 by Friedman & Bruya, Inc. from the PBS Engineering and Environmental 64116 Yakima, F&BI 504328 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>PBS Engineering and Environmental</u>
504328 -01	S26
504328 -02	S27
504328 -03	S28
504328 -04	S29
504328 -05	S30
504328 -06	S31
504328 -07	S32
504328 -08	S33
504328 -09	S34
504328 -10	S35
504328 -11	S36
504328 -12	S37
504328 -13	S38
504328 -14	S39
504328 -15	S40
504328 -16	S41
504328 -17	S42
504328 -18	S43
504328 -19	S44

The 8082A aroclor 1016 matrix spike failed below the acceptance criteria. The laboratory control sample passed the acceptance criteria, therefore the results are likely due to matrix effect.

All other quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 05/07/15
 Date Received: 04/17/15
 Project: 64116 Yakima, F&BI 504328
 Date Extracted: 04/20/15
 Date Analyzed: 04/20/15

**RESULTS FROM THE ANALYSIS OF SOIL SAMPLES
 FOR GASOLINE, DIESEL AND HEAVY OIL BY NWTPH-HCID
 Results Reported as Not Detected (ND) or Detected (D)**

**THE DATA PROVIDED BELOW WAS PERFORMED PER THE GUIDELINES ESTABLISHED BY THE
 WASHINGTON DEPARTMENT OF ECOLOGY AND WERE NOT DESIGNED TO PROVIDE INFORMATION
 WITH REGARDS TO THE ACTUAL IDENTIFICATION OF ANY MATERIAL PRESENT**

<u>Sample ID</u> Laboratory ID	<u>Gasoline</u>	<u>Diesel</u>	<u>Heavy Oil</u>	<u>Surrogate</u> <u>(% Recovery)</u> (Limit 53-144)
S26 504328-01	ND	D	D	ip
S27 504328-02	ND	160 e	ND	89
S28 504328-03	ND	10,000 e	1,500 e	ip
S29 504328-04	ND	7,300 e	7,400 e	78
S30 504328-05	ND	D	D	82
S31 504328-06	ND	3,300 e	2,100 e	87
S32 504328-07	ND	2,400 e	1,200 e	95
S33 504328-08	ND	2,100 e	510 e	87
S34 504328-09	ND	320 e	ND	99
S35 504328-10	ND	90 e	ND	88

ND - Material not detected at or above 20 mg/kg gas, 50 mg/kg diesel and 250 mg/kg heavy oil.

e - The reported concentration is an estimate.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 05/07/15
 Date Received: 04/17/15
 Project: 64116 Yakima, F&BI 504328
 Date Extracted: 04/20/15
 Date Analyzed: 04/20/15

**RESULTS FROM THE ANALYSIS OF SOIL SAMPLES
 FOR GASOLINE, DIESEL AND HEAVY OIL BY NWTPH-HCID
 Results Reported as Not Detected (ND) or Detected (D)**

**THE DATA PROVIDED BELOW WAS PERFORMED PER THE GUIDELINES ESTABLISHED BY THE
 WASHINGTON DEPARTMENT OF ECOLOGY AND WERE NOT DESIGNED TO PROVIDE INFORMATION
 WITH REGARDS TO THE ACTUAL IDENTIFICATION OF ANY MATERIAL PRESENT**

<u>Sample ID</u> Laboratory ID	<u>Gasoline</u>	<u>Diesel</u>	<u>Heavy Oil</u>	<u>Surrogate</u> <u>(% Recovery)</u> (Limit 53-144)
S36 504328-11	ND	D	D	ip
S37 504328-12	ND	D	ND	103
S38 504328-13	ND	ND	310 e	89
S40 504328-15	D	ND	ND	94
S41 504328-16	D	ND	ND	97
S42 504328-17	ND	290 e	ND	90
S43 504328-18	ND	99 e	ND	91
S44 504328-19	ND	1,300 e	330 e	91
Method Blank 05-808 MB	ND	ND	ND	89

ND - Material not detected at or above 20 mg/kg gas, 50 mg/kg diesel and 250 mg/kg heavy oil.

e - The reported concentration is an estimate.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 05/07/15
Date Received: 04/17/15
Project: 64116 Yakima, F&BI 504328
Date Extracted: 04/27/15
Date Analyzed: 04/27/15

**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)

<u>Sample ID</u> Laboratory ID	<u>Benzene</u>	<u>Toluene</u>	<u>Ethyl Benzene</u>	<u>Total Xylenes</u>	<u>Gasoline Range</u>	<u>Surrogate (% Recovery)</u> (Limit 50-150)
S40 504328-15	<0.02	<0.02	<0.02	<0.06	<2	89
Method Blank 05-0821 MB	<0.02	<0.02	<0.02	<0.06	<2	79

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 05/07/15
 Date Received: 04/17/15
 Project: 64116 Yakima, F&BI 504328
 Date Extracted: 04/27/15
 Date Analyzed: 04/27/15

**RESULTS FROM THE ANALYSIS OF SOIL SAMPLES
 FOR TOTAL PETROLEUM HYDROCARBONS AS
 DIESEL AND MOTOR OIL
 USING METHOD NWTPH-Dx**

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

<u>Sample ID</u> Laboratory ID	<u>Diesel Range</u> (C ₁₀ -C ₂₅)	<u>Motor Oil Range</u> (C ₂₅ -C ₃₆)	<u>Surrogate</u> <u>(% Recovery)</u> (Limit 56-165)
S26 504328-01	15,000	980	69
S30 504328-05 1/10	3,200	5,000	100
S36 504328-11 1/10	52,000	5,300	ip
S37 504328-12	530	<250	96
S39 504328-14 1/10	15,000	31,000	79
S42 504328-17	660	310	91
Method Blank 05-851 MB	<50	<250	106

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	S29	Client:	PBS Engineering and Environmental
Date Received:	04/17/15	Project:	64116 Yakima, F&BI 504328
Date Extracted:	04/27/15	Lab ID:	504328-04
Date Analyzed:	04/27/15	Data File:	504328-04.065
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	95	60	125
Indium	84	60	125
Holmium	96	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	8.00
Cadmium	2.35
Chromium	5.91
Lead	332
Mercury	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	PBS Engineering and Environmental
Date Received:	NA	Project:	64116 Yakima, F&BI 504328
Date Extracted:	04/27/15	Lab ID:	I5-252 mb
Date Analyzed:	04/27/15	Data File:	I5-252 mb.045
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	72	60	125
Indium	78	60	125
Holmium	92	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	<1
Cadmium	<1
Chromium	<1
Lead	<1
Mercury	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	S30	Client:	PBS Engineering and Environmental
Date Received:	04/17/15	Project:	64116 Yakima, F&BI 504328
Date Extracted:	04/27/15	Lab ID:	504328-05 1/50
Date Analyzed:	05/01/15	Data File:	050110.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	88 d	31	163
Benzo(a)anthracene-d12	103 d	24	168

Compounds:	Concentration mg/kg (ppm)
Naphthalene	0.12
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	0.14
Anthracene	0.16
Fluoranthene	0.11
Pyrene	0.23
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	0.10
Benzo(b)fluoranthene	0.11
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	0.34

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	Method Blank	Client:	PBS Engineering and Environmental
Date Received:	Not Applicable	Project:	64116 Yakima, F&BI 504328
Date Extracted:	04/27/15	Lab ID:	05-853 mb 1/5
Date Analyzed:	04/28/15	Data File:	042805.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	83	31	163
Benzo(a)anthracene-d12	82	24	168

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

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	S30	Client:	PBS Engineering and Environmental
Date Received:	04/17/15	Project:	64116 Yakima, F&BI 504328
Date Extracted:	05/04/15	Lab ID:	504328-05 1/50
Date Analyzed:	05/04/15	Data File:	09.D\ECD1A.CH
Matrix:	Soil	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	40 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<0.2
Aroclor 1232	<0.2
Aroclor 1016	<0.2
Aroclor 1242	<0.2
Aroclor 1248	<0.2
Aroclor 1254	<0.2
Aroclor 1260	<0.2
Aroclor 1262	0.37
Aroclor 1268	<0.2

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	Method Blank	Client:	PBS Engineering and Environmental
Date Received:	Not Applicable	Project:	64116 Yakima, F&BI 504328
Date Extracted:	05/04/15	Lab ID:	05-895 mb 1/5
Date Analyzed:	05/04/15	Data File:	07.D\ECD1A.CH
Matrix:	Soil	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	80	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<0.02
Aroclor 1232	<0.02
Aroclor 1016	<0.02
Aroclor 1242	<0.02
Aroclor 1248	<0.02
Aroclor 1254	<0.02
Aroclor 1260	<0.02

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 05/07/15

Date Received: 04/17/15

Project: 64116 Yakima, F&BI 504328

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

Laboratory Code: 504462-01 (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	81	69-120
Toluene	mg/kg (ppm)	0.5	92	70-117
Ethylbenzene	mg/kg (ppm)	0.5	92	65-123
Xylenes	mg/kg (ppm)	1.5	91	66-120
Gasoline	mg/kg (ppm)	20	100	71-131

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 05/07/15

Date Received: 04/17/15

Project: 64116 Yakima, F&BI 504328

**QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF SOIL SAMPLES
FOR TOTAL PETROLEUM HYDROCARBONS AS
DIESEL EXTENDED USING METHOD NWTPH-Dx**

Laboratory Code: 504328-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet Wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	mg/kg (ppm)	5,000	14,000	123 b	138 b	63-146	11 b

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Diesel Extended	mg/kg (ppm)	5,000	110	79-144

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 05/07/15

Date Received: 04/17/15

Project: 64116 Yakima, F&BI 504328

**QUALITY ASSURANCE RESULTS
FOR THE ANALYSIS OF SOIL SAMPLES
FOR TOTAL METALS USING EPA METHOD 200.8**

Laboratory Code: 504442-41 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	mg/kg (ppm)	10	10.3	83 b	102 b	67-121	21 b
Cadmium	mg/kg (ppm)	10	<1	97	102	88-121	5
Chromium	mg/kg (ppm)	50	5.43	79	83	57-128	5
Lead	mg/kg (ppm)	50	68.8	114	122	59-148	7
Mercury	mg/kg (ppm)	10	<1	88	95	50-150	8

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	mg/kg (ppm)	10	84	83-113
Cadmium	mg/kg (ppm)	10	100	85-114
Chromium	mg/kg (ppm)	50	88	78-121
Lead	mg/kg (ppm)	50	105	80-120
Mercury	mg/kg (ppm)	10	96	70-130

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 05/07/15

Date Received: 04/17/15

Project: 64116 Yakima, F&BI 504328

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

Laboratory Code: 504416-03 1/5 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Acceptance Criteria
Naphthalene	mg/kg (ppm)	0.17	<0.01	88	44-129
Acenaphthylene	mg/kg (ppm)	0.17	<0.01	86	52-121
Acenaphthene	mg/kg (ppm)	0.17	<0.01	88	51-123
Fluorene	mg/kg (ppm)	0.17	<0.01	90	37-137
Phenanthrene	mg/kg (ppm)	0.17	<0.01	84	34-141
Anthracene	mg/kg (ppm)	0.17	<0.01	85	32-124
Fluoranthene	mg/kg (ppm)	0.17	<0.01	86	16-160
Pyrene	mg/kg (ppm)	0.17	<0.01	79	10-180
Benz(a)anthracene	mg/kg (ppm)	0.17	<0.01	87	23-144
Chrysene	mg/kg (ppm)	0.17	<0.01	89	32-149
Benzo(b)fluoranthene	mg/kg (ppm)	0.17	<0.01	94	23-176
Benzo(k)fluoranthene	mg/kg (ppm)	0.17	<0.01	96	42-139
Benzo(a)pyrene	mg/kg (ppm)	0.17	<0.01	89	21-163
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.17	<0.01	99	23-170
Dibenz(a,h)anthracene	mg/kg (ppm)	0.17	<0.01	100	31-146
Benzo(g,h,i)perylene	mg/kg (ppm)	0.17	<0.01	98	37-133

Laboratory Code: Laboratory Control Sample 1/5

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	mg/kg (ppm)	0.17	89	90	58-121	1
Acenaphthylene	mg/kg (ppm)	0.17	85	86	54-121	1
Acenaphthene	mg/kg (ppm)	0.17	87	87	54-123	0
Fluorene	mg/kg (ppm)	0.17	91	91	56-127	0
Phenanthrene	mg/kg (ppm)	0.17	89	91	55-122	2
Anthracene	mg/kg (ppm)	0.17	83	85	50-120	2
Fluoranthene	mg/kg (ppm)	0.17	87	88	54-129	1
Pyrene	mg/kg (ppm)	0.17	77	83	53-127	7
Benz(a)anthracene	mg/kg (ppm)	0.17	82	84	51-115	2
Chrysene	mg/kg (ppm)	0.17	88	92	55-129	4
Benzo(b)fluoranthene	mg/kg (ppm)	0.17	97	98	56-123	1
Benzo(k)fluoranthene	mg/kg (ppm)	0.17	101	105	54-131	4
Benzo(a)pyrene	mg/kg (ppm)	0.17	90	90	51-118	0
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.17	98	93	49-148	5
Dibenz(a,h)anthracene	mg/kg (ppm)	0.17	101	95	50-141	6
Benzo(g,h,i)perylene	mg/kg (ppm)	0.17	98	95	52-131	3

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 05/07/15

Date Received: 04/17/15

Project: 64116 Yakima, F&BI 504328

**QUALITY ASSURANCE RESULTS
FOR THE ANALYSIS OF SOIL SAMPLES FOR
POLYCHLORINATED BIPHENYLS AS
AROCLOR 1016/1260 BY EPA METHOD 8082A**

Laboratory Code: 504328-05 1/50 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet Wt)	Percent Recovery MS	Control Limits
Aroclor 1016	mg/kg (ppm)	0.8	<0.2	29 vo	50-150
Aroclor 1260	mg/kg (ppm)	0.8	<0.2	74	50-150

Laboratory Code: Laboratory Control Sample 1/5

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Aroclor 1016	mg/kg (ppm)	0.8	82	81	55-130	1
Aroclor 1260	mg/kg (ppm)	0.8	99	89	58-133	11

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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.

504328

SAMPLE CHAIN OF CUSTODY ME 04/17/15

153/2

Send Report To Dave Erle
 Company PBS Environmental
 Address 400 Bradley Blvd Suite 300
 City, State, ZIP Richland, WA 99352
 Phone # (509) 727-0873 Fax # _____

SAMPLERS (signature) <u>Dave Erle</u>	PROJECT NAME/NO. <u>64116</u>	PO#
REMARKS	<u>Yakima</u>	

Page # 1 of 2
 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										Notes
						TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260	SVOCs by 8270	HFS	HClD	MTCA 5	PCBs	PAHs	
S26	01A	4/14/15		Soil	3	X										X-PO D2
S27	02				3											4/24/15
S28	03				3											Mt.
S29	04				3							X				
S30	05	AD			4	X										
S31	06	A-K			3							X	X			
S32	07				3											
S33	08				3											
S34	09				3											
S35	10				3											

Friedman & Bryna, 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: <u>Dave Erle</u>		Dave Erle		PBS		4/15/15	
Received by: <u>M. Phan</u>		M. Phan		FBT		4/16/15	1415
Relinquished by:							
Received by:							

samples received at 6 °C

504325

SAMPLE CHAIN OF CUSTODY

ME 09/13/15

US3/2015

Send Report To Dana Ertel

Company PRS Environmental

Address 400 Bradley Blvd Suite 300

City, State, ZIP Richland, WA 99352

Phone # (509) 727-0873 Fax # _____

SAMPLERS (signature)

PROJECT NAME/NO.

64116 Yalima

PO#

REMARKS

Page # 2 of 2

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						Notes		
						TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260	SVOCs by 8270	HFS		HClD	
S36	DA 24/11/15			Soil	3	X								
S37	12			↓		X								Analyte per DC 11/15
S38	13			↓		X								Porter Analytical
S39	14			Soil/Knowledge	4	X								Insight Environmental
S40	15			Soil			X	X						
S41	16			↓										
S42	17			↓		X								
S43	18			↓										
S44	19			↓										

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Seattle, WA 98119-2029

Ph. (206) 285-8282

Fax (206) 283-5044

FORMSIC00C00C.DOC

SIGNATURE

Relinquished by:

Received by: [Signature]

Relinquished by: [Signature]

PRINT NAME

COMPANY

DATE

TIME

Alman Phran

FEB 15

1418

Received by:

Samples received at 6 °C

APPENDIX B
Soil Boring Logs



400 Bradley Boulevard
Suite 300
Richland, WA 99352
Phone: 509.942.1600
Fax: 866.727.0140

WONDRACK DISTRIBUTING
1 E. I STREET
YAKIMA, WASHINGTON

BORING B-1

PBS PROJECT NUMBER:
64116.000

BORING B-1 LOCATION:
3.5' W of three valves along west side and
near center of oil shed

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/WELL INSTALLATION
0.0		ASPHALT						
0.0 - 2.0		Loose black silty GRAVEL (GP-GM); fine to coarse, subrounded gravel		0				
2.0 - 5.0		FILL Brown SILT (ML); homogeneous; damp		0	S10		90	No blackish staining or odors
5.0 - 6.0		becoming moist						
6.0 - 20.0		Boring complete at 5 feet bgs Groundwater not encountered at time of exploration						

BORING LOG-ENV CORE 64116_B1-B14_081115_RG.GPJ_DATATMPL_GDT_PRINT DATE: 6/15/15:RPG

BORING METHOD: Direct Push
DRILLED BY: ESN Northwest
BORING BIT DIAMETER: 2 1/4-inch OD

LOGGED BY: D. Ertel
COMPLETED: 4/08/15



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Fax: 866.727.0140

WONDRACK DISTRIBUTING
1 E. I STREET
YAKIMA, WASHINGTON

BORING B-2

PBS PROJECT NUMBER:
64116.000

BORING B-2 LOCATION:
12' S of concrete containment berm around
tank farm, 2.5' W of concrete corner

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/WELL INSTALLATION
0.0		ASPHALT						
0.0 - 2.0		Loose black to brown silty GRAVEL (GP-GM); fine to coarse gravel; damp FILL Brown SILT (ML); homogeneous; damp		2				Fuel odor due to truck unloading near shed
2.0 - 5.5		becomes moist; trace fine gravel					60	
5.5 - 6.0		Loose gray to brown GRAVEL (GP) with silt and sand; fine sand; fine to coarse gravel, subrounded gravel		0.5	S11			No black staining; fuel odor due to truck unloading
10.0		Boring complete at 10 feet bgs Groundwater not encountered at time of exploration						

BORING LOG-ENV CORE 64116_B1-B14_081115_RG.GPJ_DATA\IMPL_GDT_PRINT DATE: 6/15/15:RPG

BORING METHOD: Direct Push
DRILLED BY: ESN Northwest
BORING BIT DIAMETER: 2 1/4-inch OD

LOGGED BY: D. Ertel
COMPLETED: 4/08/15



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WONDRACK DISTRIBUTING
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BORING B-3

PBS PROJECT NUMBER:
64116.000

BORING B-3 LOCATION:
48.5' S of concrete containment berm around
tank farm, 11.5' W of concrete corner

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/WELL INSTALLATION
0.0		ASPHALT						
0.0 - 1.8		Black silty sandy GRAVEL (GM)		0				No fuel staining or odor
1.8 - 5.0		FILL Brown SILT (ML); homogeneous; damp		0	S13		85	
5.0 - 20.0		Boring complete at 5 feet bgs Groundwater not encountered at time of exploration						

BORING LOG-ENV CORE_64116_B1-B14_081115_RG.GPJ_DATATMPL_GDT_PRINT DATE: 6/15/15:RPG

BORING METHOD: Direct Push
DRILLED BY: ESN Northwest
BORING BIT DIAMETER: 2 1/4-inch OD

LOGGED BY: D. Ertel
COMPLETED: 4/08/15



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WONDRACK DISTRIBUTING
1 E. I STREET
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BORING B-4

PBS PROJECT NUMBER:
64116.000

BORING B-4 LOCATION:
3' N of N edge of asphalt containment berm at
loading rack

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0		ASPHALT						
0.0 - 2.0		Loose black to dark brown sandy GRAVEL (GP)		0				
2.0 - 5.0		FILL Brown SILT (ML) with gravel		0	S14			
5.0 - 6.0		becomes wet Gray to brown sandy GRAVEL (GP); fine sand; subrounded gravel						
6.0 - 20.0		Boring complete at 5 feet bgs Groundwater not encountered at time of exploration						

BORING LOG-ENV CORE_64116_B1-B14_081115_RG.GPJ_DATATMPL.GDT_PRINT DATE: 6/15/15:RPG

BORING METHOD: Direct Push
DRILLED BY: ESN Northwest
BORING BIT DIAMETER: 2 1/4-inch OD

LOGGED BY: D. Ertel
COMPLETED: 4/08/15



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WONDRACK DISTRIBUTING
1 E. I STREET
YAKIMA, WASHINGTON

BORING B-5

PBS PROJECT NUMBER:
64116.000

BORING B-5 LOCATION:
4' SW of raised inlet valves at NW end of oil shed

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/WELL INSTALLATION
0.0		ASPHALT						
0.0 - 1.5		Loose brown to black silty GRAVEL (GM)		0				
1.5 - 5.0		FILL Brown SILT (ML); homogeneous; moist		0	S15		50	
5.0 - 6.0		becomes wet		0				
6.0 - 10.0		Loose GRAVEL (GP) with sand; fine to coarse sand; moist			S16		60	
10.0 - 20.0		Boring complete at 10 feet bgs Groundwater not encountered at time of exploration						

BORING LOG-ENV CORE_64116_B1-B14_081115_RG.GPJ_DATATMPL_GDT_PRINT DATE: 6/15/15:RPG

BORING METHOD: Direct Push
DRILLED BY: ESN Northwest
BORING BIT DIAMETER: 2 1/4-inch OD

LOGGED BY: D. Ertel
COMPLETED: 4/08/15



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WONDRACK DISTRIBUTING
 1 E. I STREET
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BORING B-6

PBS PROJECT NUMBER:
 64116.000

BORING B-6 LOCATION:
 3.5' E of loading dock, 7.5' N of steps to office

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0		ASPHALT						
0.0 - 2.0		Loose dark brown silty sandy GRAVEL (GM); fine to coarse gravel; damp		0				
2.0 - 4.5		FILL Brown SILT (ML); homogeneous; damp		0	S17		60	
4.5 - 5.0		Loose SAND (SP) with gravel; fine sand; damp		0				
5.0 - 20.0		Boring complete at 5 feet bgs Groundwater not encountered at time of exploration						

BORING LOG-ENV CORE 64116_B1-B14_081115_RG.GPJ DATATMPL.GDT PRINT DATE: 6/15/15:RPG

BORING METHOD: Direct Push
 DRILLED BY: ESN Northwest
 BORING BIT DIAMETER: 2 1/4-inch OD

LOGGED BY: D. Ertel
 COMPLETED: 4/08/15



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WONDRACK DISTRIBUTING
 1 E. I STREET
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BORING B-7

PBS PROJECT NUMBER:
 64116.000

BORING B-7 LOCATION:
 6.5' S of concrete containment berm around
 tank farm

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/WELL INSTALLATION
0.0		ASPHALT						
0.0 - 1.5		Loose dark brown silty sandy GRAVEL (GM); dry		0				
1.5 - 4.5		FILL Brown SILT (ML); homogeneous		0			70	
4.5 - 10.0		becomes wet Loose gray to brown GRAVEL (GP)		0	S18		20	
10.0 - 20.0		Boring complete at 10 feet bgs Groundwater not encountered at time of exploration						

BORING LOG-ENV CORE_64116_B1-B14_081115_RG.GPJ_DATATMPL.GDT_PRINT DATE: 6/15/15:RPG

BORING METHOD: Direct Push
 DRILLED BY: ESN Northwest
 BORING BIT DIAMETER: 2 1/4-inch OD

LOGGED BY: D. Ertel
 COMPLETED: 4/08/15



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WONDRACK DISTRIBUTING
1 E. I STREET
YAKIMA, WASHINGTON

BORING B-8

PBS PROJECT NUMBER:
64116.000

BORING B-8 LOCATION:
In concrete slab 5' N of asphalt on E side of
loading rack

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/WELL INSTALLATION
0.0		CONCRETE						
0.0 - 5.5		Brown SILT (ML); homogeneous; damp		0	S19		60	No odors or blackish staining
5.5 - 10.0		Light gray to gray sandy GRAVEL (GP); basalt; fine sand		0			60	
10.0 - 20.0		Boring complete at 10 feet bgs Groundwater not encountered at time of exploration						

BORING LOG-ENV CORE_64116_B1-B14_081115_RG.GPJ_DATATMPL_GDT_PRINT DATE: 6/15/15:RPG

BORING METHOD: Direct Push
DRILLED BY: ESN Northwest
BORING BIT DIAMETER: 2¼-inch OD

LOGGED BY: D. Ertel
COMPLETED: 4/08/15



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WONDRACK DISTRIBUTING
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BORING B-9

PBS PROJECT NUMBER:
64116.000

BORING B-9 LOCATION:
6.5' S, 1.5' E of concrete curb on E side of
loading rack

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/WELL INSTALLATION
0.0		CONCRETE						
0.0 - 1.5		Brown silty GRAVEL (GM)		0				
1.5 - 5.0		FILL Brown sandy SILT (ML) with gravel; homogeneous						
5.0 - 5.5		becomes wet			S20			
5.5 - 8.5		Light gray to brown gravelly SAND (SP); dry		0				
8.5 - 9.5				0				
9.5 - 10.0		Loose brown SAND (SP) with gravel; medium sand; fine gravel; moist			S21			
10.0 - 20.0		Boring complete at 10 feet bgs Groundwater not encountered at time of exploration						

BORING LOG-ENV CORE_64116_B1-B14_081115_RG.GPJ_DATA\IPL_GDT_PRINT DATE: 6/15/15:RPG

BORING METHOD: Direct Push
DRILLED BY: ESN Northwest
BORING BIT DIAMETER: 2 1/4-inch OD

LOGGED BY: D. Ertel
COMPLETED: 4/08/15



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WONDRACK DISTRIBUTING
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YAKIMA, WASHINGTON

BORING B-10

PBS PROJECT NUMBER:
64116.000

BORING B-10 LOCATION:
5' S, 1.5' W of concrete curb on W side of
loading rack

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/WELL INSTALLATION
0.0		CONCRETE						
0.0 - 1.5		Brown SILT (ML) with gravel; blocky; damp		0				
1.5 - 5.0		FILL Brown SILT (ML); homogeneous		0			60	
5.0 - 5.5		becomes slight plasticity; wet			S22			
5.5 - 6.0		increase in gravel Loose gray to brown sandy GRAVEL (GP); moist		0				
6.0 - 8.0							25	
10.0		Boring complete at 10 feet bgs Groundwater not encountered at time of exploration						

BORING LOG-ENV CORE 64116_B1-B14_081115_RG.GPJ_DATATMPL_GDT_PRINT DATE: 6/15/15:RPG

BORING METHOD: Direct Push
DRILLED BY: ESN Northwest
BORING BIT DIAMETER: 2 1/4-inch OD

LOGGED BY: D. Ertel
COMPLETED: 4/08/15



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Fax: 866.727.0140

WONDRACK DISTRIBUTING
1 E. I STREET
YAKIMA, WASHINGTON

BORING B-11

PBS PROJECT NUMBER:
64116.000

BORING B-11 LOCATION:
5' N, 1' W of concrete curb on W side of
loading rack

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/WELL INSTALLATION
0.0		CONCRETE						
0.0 - 1.5		Loose black silty sandy GRAVEL (GM)						
1.5 - 5.5		FILL Brown SILT (ML); homogeneous; slight plasticity		0	S23		40	
5.5 - 6.0		becomes wet						
6.0 - 10.0		Brown to gray sandy GRAVEL (GP); fine sand; fine to coarse gravel, subrounded gravel		0			40	
10.0 - 20.0		Boring complete at 10 feet bgs Groundwater not encountered at time of exploration						

BORING LOG-ENV CORE 64116_B1-B14_081115_RG.GPJ_DATATMPL_GDT_PRINT DATE: 6/15/15:RPG

BORING METHOD: Direct Push
DRILLED BY: ESN Northwest
BORING BIT DIAMETER: 2 1/4-inch OD

LOGGED BY: D. Ertel
COMPLETED: 4/08/15



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Phone: 509.942.1600
Fax: 866.727.0140

WONDRACK DISTRIBUTING
1 E. I STREET
YAKIMA, WASHINGTON

BORING B-12

PBS PROJECT NUMBER:
64116.000

BORING B-12 LOCATION:
9.5' S, of oil shed, 22' W of east fence

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/WELL INSTALLATION
0.0		ASPHALT						
0.0 - 2.0		Loose black sandy silty GRAVEL (GP-GM)		0				
2.0 - 5.5		FILL Brown SILT (ML); homogeneous		0			60	
5.5 - 19.0		Loose brown to gray sandy GRAVEL (GP); fine sand; damp		0	S24		50	
19.0 - 20.0		Boring complete at 19 feet bgs Groundwater not encountered at time of exploration		0			48	Drilled to 19 feet bgs using direct push in an attempt to sample groundwater. Encountered refusal at 19 feet bgs; groundwater was not encountered and no sample was collected.

BORING LOG-ENVY CORE_64116_B1-B14_081115_RG.GPJ_DATA\IMPL_GDT_PRINT DATE: 6/15/15:RPG

BORING METHOD: Direct Push
DRILLED BY: ESN Northwest
BORING BIT DIAMETER: 2 1/4-inch OD

LOGGED BY: D. Ertel
COMPLETED: 4/08/15



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WONDRACK DISTRIBUTING
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YAKIMA, WASHINGTON

BORING B-13

PBS PROJECT NUMBER:
64116.000

BORING B-13 LOCATION:
3' S of suspected underground storage tank

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	GROUND-WATER	PID (PPM)	SAMPLE NUMBER	SAMPLE/ TEMPORARY WELL(S)	RECOVERY (%)	COMMENTS/ WELL INSTALLATION
0.0		ASPHALT						
0.0 - 2.0		Loose dark brown to black silty sandy GRAVEL (GP-GM); dry		0				
2.0 - 5.5		FILL Brown SILT (ML); homogeneous; damp		0			76	
5.5 - 10.0		Loose brown sandy GRAVEL (GP); fine to coarse gravel; dry		0	S25		25	
10.0 - 20.0		Boring complete at 10 feet bgs Groundwater not encountered at time of exploration						

BORING LOG-ENV CORE_64116_B1-B14_081115_RG.GPJ_DATATMPL_GDT_PRINT DATE: 6/15/15:RPG

BORING METHOD: Direct Push
DRILLED BY: ESN Northwest
BORING BIT DIAMETER: 2 1/4-inch OD

LOGGED BY: D. Ertel
COMPLETED: 4/08/15