Exhibit D

Public Review Draft Cleanup Action Plan

Truck City Site
Mount Vernon, WA

Facility/Site ID: 2673
Cleanup Site ID: 5176

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Issued by:
Washington State Department of Ecology
Toxics Cleanup Program
Northwest Regional Office
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1.0 INTRODUCTION

This Public Review Draft Cleanup Action Plan (CAP) presents the Washington State Department of Ecology's (Ecology) proposed cleanup action for the Truck City site ("Site") (Facility Site ID: 2673, Cleanup Site ID: 5176). The Site is located at 3216 Old Highway 99 South, Mount Vernon in Skagit County, Washington (Figure 1). The Site, in combination with other adjacent parcels, is proposed for construction of the Skagit County jail. The proposed jail property (Property) comprises the following five parcels: Skagit County parcels P29546 (Truck City parcel) and four adjoining undeveloped parcels to the south, P119262, P119263, P119265, and P119267 (Figure 2). The parcels are owned by various parties, and Skagit County (the "County") has executed purchase and sale agreement(s) for the parcels. The Truck City parcel comprises the entire Site based on data available at this time. As part of that effort, the County is pursuing a Prospective Purchaser Consent Decree with the Washington State Department of Ecology (Ecology).

This document has been prepared in accordance with the requirements of the Washington State Model Toxics Control Act (MTCA; Washington Administrative Code [WAC] 173-340-350). The cleanup action decision is based on the Remedial Investigation and Feasibility Study (RI/FS) (MFA, 2014) and other relevant documents in the administrative record (see Section 1.3).

This Public Review Draft CAP outlines the following:

- The history of operations, ownership, and activities at the Site;
- The nature and extent of contamination;
- Cleanup levels (CULs) for the Site that are protective of human health and the environment;
- The selected remedial action for the Site; and
- Compliance monitoring and institutional controls.

1.1 DECLARATION

Ecology has selected this remedy because it complies with the provisions of WAC 173-340-360. The selected cleanup action will be protective of human health and the environment, comply with cleanup standards and applicable state and federal laws, and provide for compliance monitoring. The selected cleanup action is also considered to use permanent solutions to the maximum extent practicable, provide for a reasonable restoration timeframe of less than five years, and will consider public concerns. Furthermore, the selected remedy is consistent with the preference of the State of Washington as stated in Revised Code of Washington (RCW) 70.105D.030(1)(b) for permanent solutions.

1.2 APPLICABILITY

CULs specified in this Public Review Draft CAP are applicable only to the Site. They were developed as a part of an overall remediation process under Ecology oversight, using the authority of MTCA, and should not be considered as setting precedents for other sites.

1.3 ADMINISTRATIVE RECORD

The documents used to make the decisions discussed in this Public Review Draft CAP are on file in the administrative record for the Site. Major documents are listed in the reference section. The entire administrative record for the Site is available for public review by appointment at Ecology's Northwest Regional Office (NWRO), located at 3190 160th Avenue SE, Bellevue, WA 98008. Appointments can be made by calling the NWRO resource contact at 425.649.7235 or sending an email to nwro_public_request@ecy.wa.gov. Results from applicable studies and reports are summarized to provide background information pertinent to this Public Review Draft CAP. The following is a list of relevant studies and reports for the Site:

Reports associated with the Site:

- Applied Geotechnology, Inc. conducted a hydrocarbon contamination assessment in 1989.
- Ecology completed an interim soil remedial cleanup action in 1993.
- Associated Environmental Group, LLC conducted a site characterization in 2005.
- Materials Testing & Consulting, Inc. conducted an initial Phase II environmental site assessment (ESA) in February 2014 and a supplemental ESA in March 2014.
- Maul Foster & Alongi, Inc. prepared a Public Review Remedial Investigation and Feasibility in November 2014.

1.4 CLEANUP PROCESS

Cleanup conducted under the MTCA process requires the preparation of specific documents either by a Potentially Liable Party (PLP), Ecology, or in this instance by Skagit County as a Prospective Purchaser. These procedural tasks and resulting documents, along with the MTCA section that requires their completion, are listed below with a brief description of each task.

- Remedial Investigation and Feasibility Study (RI/FS) —WAC 173-340-350
  The RI/FS documents the investigations and evaluations conducted at the Site from the discovery phase to the RI/FS document. The RI collects and presents information on the nature and extent of contamination, as well as the risks posed by the contamination. The FS presents and evaluates site cleanup alternatives and proposes a preferred cleanup alternative. The document is prepared by the Prospective Purchaser, is approved by Ecology, and undergoes public comment.

- Cleanup Action Plan (CAP)—WAC 173-340-380
  The CAP sets CULs and standards for the Site and the selected cleanup actions intended to achieve the CULs. The document is prepared by Ecology and undergoes public comment.

- Engineering Design Report (EDR), Construction Plans and Specifications—WAC 173-340-400. These reports outline details of the selected cleanup action, including any engineered systems and design components from the CAP, and all procedurally exempt and required permits. These may include construction plans and specifications with technical drawings. The document is prepared by the Prospective Purchaser and approved by Ecology.

- Operation and Maintenance Plans (O&M)—WAC 173-340-400
  The O&M plans summarizes the requirements for inspection and maintenance of cleanup actions. It includes any actions required to operate and maintain equipment, structures, or other remedial systems. The document is prepared by the Prospective Purchaser and approved by Ecology.

- Cleanup Action Report—WAC 173-340-400
  The Cleanup Action Report is completed following implementation of the cleanup action, and provides details about the cleanup activities along with documentation of adherence to or variance from the CAP. The document is prepared by the Prospective Purchaser and approved by Ecology.

- Compliance Monitoring Plan—WAC 173-340-410
  Compliance Monitoring Plans provide details about monitoring activities required to ensure that the cleanup action is performing as intended. It is prepared by the Prospective Purchaser and approved by Ecology.

2.0 SITE BACKGROUND

2.1 SITE HISTORY AND OPERATIONS

Archival records indicate that the vicinity once was generally rural farmland with local residences. The Site was developed by 1953 and operated as a truck stop and restaurant until the truck stop burned in 1976. The parcel was redeveloped to its current configuration in 1978, and operations have not changed since then.

Figure 3 presents the Site's features and previous environmental investigation features.

The Site currently contains six buildings associated with the commercial operations of the gas station, truck stop and truck wash, restaurant, and retail store. The remainder of the Property is undeveloped rural grassland. The gas station pump islands, fueling facilities, and truck scale (weigh station) are located in the western area of the Truck City parcel. The diesel pump islands and the Truck City parcel's current operational underground storage tanks (USTs) are located in the central area of the parcel, adjacent south of the truck wash building. Long-term truck parking is designated in the east area of the parcel. Figure 4 presents the Site's current site features and recent investigation locations.

2.2 SITE INVESTIGATIONS AND INTERIM ACTIONS

Subsurface investigations have been conducted on the Site since 1989 to assess potential petroleum hydrocarbon impacts related to the operation of the retail gasoline station. Applied Geotechnology, Inc. (AGI) conducted a hydrocarbon assessment of the Site in 1989. AGI advanced eight borings, to approximately 15 to 20 feet below ground surface (bgs), adjacent to the northern, southern, and eastern UST nests; gasoline and diesel pump islands; and truck wash area. Six of the borings were completed as 2-inch-diameter monitoring wells. AGI concluded that soil and ground water gasoline and diesel petroleum hydrocarbon contamination was present around the northern and southern UST nests, and the potential exists for their off-site migration of these indicator hazardous substances (IHS). Detected concentrations of gasoline- and diesel-range total petroleum hydrocarbons (TPH) and associated petroleum fuel VOCs, specifically benzene, toluene, and total xylenes, are above Ecology's current MTCA Method A cleanup levels (CULs). Ground water flow direction at the Site was assessed to be west to southwesterly (AGI, 1989).

Ecology conducted an interim action cleanup in 1993. Seven USTs, 5,000 gallons in capacity each and located in the northern and southern UST nests, were decommissioned and removed along with associated product lines. Two additional 500-gallon-capacity USTs, as well as a septic tank full of waste oil, were encountered during the contaminated-soil-excavation activities and were also removed. Ecology reported that, because the septic system had been used for waste oil disposal and was connected to the parcel's storm drain system, the septic tank may be one of the contaminant sources at this parcel (Ecology, 1993). The interim action removed 6,244 cubic yards of contaminated soil and 89,991 gallons of contaminated water. The impacted soil was placed on an on-site treatment pad in the northeastern area of the Site for aeration and biodegradation. Final confirmation samples from the stockpiled soil showed detections of gasoline-range TPH below CULs, with residual diesel-range TPH concentrations above CULs. The USTs were reported to be in good condition, with no holes. However, impacted soil was apparent in the excavation pit (sidewalls and base of the excavation). A petroleum sheen was also observed in ground water that had seeped into the pit. Ecology also reported the presence of free product in the form of fuel seeps from the excavation sidewalls (Ecology, 1993). The monitoring wells installed in the excavation area by AGI were destroyed during excavation activities. Ecology concluded that ground water contamination at the Site likely would be an ongoing issue.

Associated Environmental Group, LLC (AEG) conducted a site characterization of the Site in 2005. Eleven borings were advanced via a direct-push-probe drilling rig to depths ranging from approximately 5 to 8 feet bgs. The borings were placed in the perimeters north, east, and south of the pump islands and UST nests. Shallow soil and ground water samples were collected at all borings. Analytical results for all samples indicated no detectable presence of petroleum hydrocarbons (AEG, 2005).

In 2005, an unknown volume of diesel was spilled at the Site when a truck driver filling a rig allowed an unattended fueling nozzle to fall out of the tank during fueling activities. The spill spread to a ditch (known as Maddox Creek) which is located adjacent to and west of the Site and flows south parallel to Old Highway 99 South to Hickox Road (approximately 0.68 mile south of the Site). This spill went unreported until Ecology Spills Team traced the source back to the Truck City parcel (Ecology, Environmental Report Tracking System #546209, 2005). Sheen was observed in Maddox Creek. Ecology retained NRC Environmental Services to clean up the spill. Absorbent booms and pads were placed in Maddox Creek. Subsequently, MTC conducted sediment sampling within Maddox Creek, in the vicinity of the Site, to assess whether residual contamination remains in Maddox Creek. The fuel spill in 2005 was remediated, and sediment sampling in Maddox Creek at locales downgradient of the Site indicated cleanup activities were completed in accordance with MTCA. Based on current data the sediments in Maddox Creek no longer appears to be impacted by releases at the Site.

Materials Testing & Consulting, Inc. (MTC) conducted an initial Phase II environmental site assessment (ESA) in February 2014 and a supplemental ESA in March 2014. Eleven borings were advanced, via a direct-push-probe drilling rig, to a maximum depth of 15 feet bgs. The borings were located in and outside of the former excavation remediation area. Soil samples were collected from all borings for laboratory analyses. One ground water sample was collected from a boring placed south of the former UST nests in the western area of the Truck City parcel. MTC assessed the condition of several remaining monitoring wells at the Site and concluded that most wells were inaccessible or unusable (MTC, 2014a). A secondary ground water sample was collected from an existing well located north of the truck scale. Three surficial soil samples were also collected at adjoining parcels to the south. MTC concluded that the remediated area contained localized, residual soil contaminated with petroleum at concentrations below MTCA Method A CULs. However, impacted soil, at concentrations above MTCA CULs for gasoline- and diesel-range TPH, was documented adjacent to the truck scale (MTC, 2014b). Laboratory analytical results for the two ground water samples indicated no detectable TPH in the gasoline and diesel ranges or associated VOCs, specifically benzene, toluene, ethylbenzene, and total xylenes (BTEX).

The following is a list of reports that have been completed in association with the evaluation of petroleum hydrocarbon impacts on the Site. Environmental concerns identified by MFA are discussed in the next section (Section 2.4).

- Hydrocarbon contamination assessment (AGI, 1989).
- Interim action cleanup report (Ecology, 1993).
- Site characterization (AEG, 2005).
- Phase II ESA—supplemental investigation (MTC, 2014b).
- Phase II ESA (MTC, 2014a).

2.3 Physical Site Characteristics

2.3.1 Site Location

The Truck City parcel is located at 3216 Old Highway 99 South, Mount Vernon in Skagit County, Washington in section 32, township 34 north, range 4 east, of the Willamette Meridian (figure 1). The Truck City parcel comprises the entire Site based on data available at this time. The Property, where the jail construction is proposed to take place, comprises five rectangular parcels: the Truck City parcel, an 8.01-acre tax parcel (parcel number P29546); two 1.0-acre tax parcels (parcel numbers P119262 and P119263); a 1.75-acre tax parcel (parcel number P119265); and a 1.88-acre tax parcel (parcel number P119267) (refer to Figure 2). The Site's surface topography is generally flat. Access to the Site is from Old Highway 99 South, adjacent to the west of the Site.

The Property is currently zoned "Public." Properties immediately adjacent to the Site are largely composed of similar, large-lot commercial, light industrial, and undeveloped cleared land uses.

- To the north: Residences, commercial storage, and Skagit Gardens (garden supply wholesalers).

- To the west: Old Highway 99, agricultural land, and railroad corridor. Maddox Creek is culverted along the western boundary of the property and day-lights at the south-west corner of the property.

- To the south: Undeveloped cleared land, Suzanne Lane, and Northwest Propane (propane distribution company).

- To the east: Northstar Stone & Landscaping (landscaping supply), paved parking lot, and the Interstate 5 corridor.

2.3.2 Topography and Climate

The Site, located within the Skagit River floodplain, is at approximately 15 feet mean sea level elevation and is nearly flat topographically. The Site is located within the 100- year floodplain. The climate in the Puget Sound region is typified by cool and comparatively dry summers, and winters are mild, wet, and cloudy. The mean annual temperature is 50 degrees Fahrenheit and the mean annual precipitation is 30 inches (CH2MHILL, 2004).

2.3.3 Geology and Hydrogeology

The Site and vicinity have been mapped as recent alluvium and artificial fill. Alluvium deposits encountered at the Site, at locations of investigation, consist of floodplain sequences ranging from fluvial silty sand and well sorted sand, to silt with intervening clay. Fill, comprising sandy gravel to gravelly silty sand, was generally present to approximately 3 to 5 feet bgs at the Truck City parcel, except in the former UST nests, where soil remedial cleanup action by Ecology in 1993 over excavated this area to depths of approximately 9.5 feet bgs. A cross section transect of the Site and corresponding geologic cross section are presented in Figures 5 and 6, respectively.

The matrix of the unconfined shallow aquifer appears to be silty sand. Depth to ground water, encountered during subsurface exploration activities, was variable throughout the Site, ranging approximately from 3.5 to 9.5 feet bgs. The static water level at completed monitoring wells TC-1 through TC-6, at the Truck City parcel, ranged approximately from 5.80 to 6.45 feet bgs during the ground water monitoring and sampling event conducted on July 18, 2014. The direction of ground water migration at the Site during the July 2014 ground water event, based on professionally surveyed elevations at monitoring wells TC-1 through TC-6, is generally to the south-southeast, with tangent to the west (refer to Figure 7).

AGI reported a west-to-southwesterly ground water flow direction at the Site during their investigation in October 1989, based on water levels measured from installed monitoring wells. Seasonal ground water flow direction fluctuations are expected at the Site and vicinity because of the shallow depth to ground water in the floodplain area. The local and regional discharge points in the area appear to be to the west-southwest, toward Britt Slough and the Skagit River. At its closest points, Britt Slough and the Skagit River are located approximately 0.5 mile and 1.5 mile, respectively, west of the Site. Maddox Creek is culverted along the western boundary of the property and day-lights at the south-west corner of the property then flows south parallel to Old Highway 99 South; intersects at Hickox Road; and flows west from this intersection.

3.0 REMEDIAL INVESTIGATION

Field Site assessment activities were conducted in July 2014 to characterize the current nature and extent of contamination in soil and ground water and to complete the RI. A summary of findings is presented below. A detailed discussion is presented in the RI/FS (MFA, 2014).

3.1 SOIL

Gasoline-range TPH is the common indicator hazardous substances (IHS) identified in soil media at the Truck City parcel. Ethylbenzene was also identified in soil. The impacted soil exhibited at TCBH-3 (8.5 feet bgs) is in the area of the soil remedial action conducted by Ecology in 1993. It appears that localized soil contamination remains adjacent south of the former northern UST nest. Additionally, soil contaminated with residual gasoline- and diesel-range TPH remains on the east side of the truck scale at approximately 4.5 to 10.5 feet bgs (Ecology, 1993; MTC, 2014b).

3.2 GROUND WATER

Gasoline-range TPH is the common IHS identified in ground water media at the Truck City parcel. Other IHSs identified include diesel-range TPH and benzene in ground water. Ground water contamination at the Truck City parcel appears to be localized—limited to areas adjacent to the former USTs and septic waste-oil tank. The gasoline- and diesel-range TPH and benzene concentrations exhibited are indicative of residual contamination in an area where an interim soil remedial action has been completed. Ground water analytical results from borings and monitoring wells located inferred downgradient of this area did not exhibit detections of the identified IHSs. Laboratory results also indicate no detectable concentrations of IHS at the remaining southern parcels of the Property. Figure 10 presents an overview of ground water investigation at the Truck City parcel.

Environmental concerns have been raised regarding the potential for off-Site migration of IHSs to areas west-southwest of the Truck City parcel because of fluctuations in local ground water flow direction from west-southwest to south-southeasterly. However, ground water analytical results from all borings and monitoring wells advanced along the western and southwestern property boundary of the Truck City parcel and at borings advanced on the ROW of Old Highway 99 South indicate no detectable concentrations of IHSs.

3.3 SURFACE WATER

The fuel spill in 2005 was remediated, and sediment sampling in Maddox Creek at locales downgradient of the Site indicated cleanup activities were completed in accordance with MTCA. Based on current data the sediments in Maddox Creek no longer appears to be impacted by releases at the Site.

3.4 RISKS TO HUMAN HEALTH AND THE ENVIRONMENT

The Truck City parcel/Site contains two buildings. The northern building is currently used as the convenience store for the gasoline station. The southern building is a café. The remaining parcels of the Property are undeveloped. The footprint of the proposed county jail encompasses the central area of the Truck City parcel and adjoining southern parcels of the Property. The northwestern portion of the proposed jail will overlie a localized area of soil remediation for removal of historical residual contamination. Figure 11 presents an overlay of the proposed jail with respect to current residual impacted areas at the Site.

Therefore, it is possible that persons will occupy this area of the Site at some time in the foreseeable future. Any future development will need to be protective of persons at the Site.

There are currently no building structures at the localized impacted area at the Truck City parcel. Therefore, there are no current commercial workers potentially exposed to IHSs in soil. However, construction activities likely will be performed as part of site redevelopment. Construction workers could contact IHSs in soil at 0 to 15 feet bgs through incidental ingestion, dermal contact, and inhalation of impacted soil particulates.

In the future, persons may also be exposed to volatile contaminants via inhalation of chemicals migrating from vadose-zone soil or ground water in the vapor phase and into future buildings. Soil gas has the potential to migrate, and workers in nearby buildings may be exposed to IHSs that migrate into proposed buildings at the Site. Figure 12 presents a conceptual site model of potential exposure pathways. However, all contaminated soil will be excavated to a depth of 15 feet bgs, removed, and disposed of offsite at a regulated landfill. Moreover, impacts have not been detected in soil below approximately 8.5 feet bgs. Section 5 presents soil remedial action to ensure that the soil point of compliance, at 15 feet bgs, will be attained for the Site.

Ecology is unaware of any current drinking water use at or near the site. The impacted ground water is shallow and localized. Section 5 presents ground water remedial action to prevent future construction workers from potentially being exposed to the impacted shallow ground water through ingestion, dermal contact, and inhalation of chemicals volatilizing from ground water. Potable water to the Site may be provided by the Skagit County Public Utility District No. 1 ("PUD"), including for any future development.

4.0 CLEANUP STANDARDS

MTCA requires the establishment of cleanup standards for individual sites. The two primary components of cleanup standards are CULs and points of compliance (POCs). CULs determine the concentration at which a substance does not threaten human health or the environment. All environmental media that exceed a CUL are addressed through a remedy that prevents exposure. POCs represent the locations on the Site where CULs must be met.

4.1 OVERVIEW

The process for establishing CULs involves the following::

- Determining which MTCA Method to use;
- Developing CULs for individual contaminants in each medium;
- Determining which contaminants contribute most to the overall risk in each medium IHS; and

- Adjusting the CULs based on total site risk.

The MTCA Cleanup Regulation provides three options for establishing CULs: Methods A, B, and C.

- Method A may be used to establish CULs at routine sites or at sites with relatively few hazardous substances.

- Method B is the standard method for establishing CULs and may be used to establish CULs at any site.

- Method C is a conditional method used when a CUL under Method A or B is technically impossible to achieve or may cause significantly greater environmental harm. Method C also may be applied to qualifying industrial properties.

The MTCA administrative rules define the factors used to determine whether a substance should be retained as an indicator for the Site. When defining CULs at a site contaminated with several hazardous substances, Ecology may eliminate from consideration those contaminants that contribute a small percentage of the overall threat to human health and the environment. WAC 173-340-703(2) provides that a substance may be eliminated from further consideration based on:

- The toxicological characteristics of the substance which govern its ability to adversely affect human health or the environment relative to the concentration of the substance;

- The chemical and physical characteristics of the substance which govern its tendency to persist in the environment;

- The chemical and physical characteristics of the substance which govern its tendency to move into and through the environment;

- The natural background concentration of the substance;

- The thoroughness of testing for the substance;

- The frequency of detection; and

- The degradation by-products of the substance.

MTCA also considers the limits of analytical chemistry. If the practical quantitation limit (PQL) of a substance is greater than the risk-based CUL, then the CUL can be set equal to the PQL.

MTCA requires that the total risk from all contaminated media not exceed certain levels. The total site cancer risk shall not exceed $1x10^{-5}$, and the hazard index (calculated for chemicals with similar non-carcinogenic toxicity endpoints) shall not exceed 1. After the CUL for each medium is developed, the risks from each chemical and medium are summed. If the total site cancer risk and/or hazard index exceeds the levels listed above, then the CULs are adjusted downward until cancer risk is less than $1x10^{-5}$ and the hazard index is less than or equal to 1 for each endpoint. MTCA does not specify how the risks can be adjusted, as long as the individual CUL standard for each chemical is not violated.

4.2 Terrestrial Ecological Evaluation

WAC 173-340-7490 requires that sites perform a terrestrial ecological evaluation (TEE) to determine the potential effects of soil contamination on ecological receptors. Sites may be removed from further ecological consideration either by documenting an exclusion, using the criteria set forth in WAC 173-340-7491, or by conducting a simplified TEE procedure as set forth in WAC 173-340-7492. The simplified TEE provides an evaluation process that may be used to identify sites that do not have the potential to pose a substantial threat of significant adverse effects to terrestrial ecological receptors, and thus may be removed from further ecological consideration during the RI and cleanup process.

A terrestrial ecological evaluation (TEE) was performed for the Site, following the evaluation procedures outlined in WAC 173-340-7490 and 173-340-7493. The site-specific TEE includes problem formulation and an ecological screening evaluation.

The purpose of problem formulation is to determine if important terrestrial ecological receptors (e.g., native plants and wildlife) could potentially have significant exposure to site-related hazardous substances in upland soil. As described above, the Site has two buildings, and about one-fourth of the Site is paved (in the Truck City parcel). The rest of the Site is vegetated with grass, weeds, and shrubs. The density and diversity of plants on the site are low. The Property is expected to be developed as a county jail.

All contamination to a depth of 15 feet below ground surface (bgs), which is the point of compliance for soil, will be excavated and removed from the Site. Therefore the simplified TEE determined that the Site will not pose a substantial threat to potential ecological receptors (see Appendix A). Therefore, soil analytical results will not be compared to ecological screening values.

4.3 Site Cleanup Levels

Previous investigations documented the presence of contamination in soil and ground water at the Site. CULs were developed for both of these media.

The Site historically has been used for commercial purposes, and it is anticipated that it will be used for public purposes (as a county jail) in the future. Soil on the Site, at the Truck City parcel, is impacted mainly with TPH and ethylbenzene (Table 1). The impacts appear to be localized in extent.

The primary exposure mechanism for soil at the Site is direct contact. The soil-to-ground water pathway has been mitigated by the implementation of interim actions at the Truck City parcel, including petroleum-contaminated-soil removal and capping with asphalt pavement in the former UST and gasoline pump islands, which limits infiltration of stormwater and leaching of residual soil contamination. CULs were developed for soil based on a direct-contact exposure pathway. Terrestrial ecological CULs were not considered, based on the TEE exclusion. Method A CULs are deemed applicable at the Site.

These CULs are calculated to derive concentrations that are estimated to result in no acute or chronic toxic effects on human health from non-carcinogens, and concentrations for which the upper bound on the estimated excess cancer risk is less than or equal to one in one million (1×10^{-6}) for carcinogens.

Shallow ground water, only at the Truck City parcel, is impacted with TPH and benzene (Table 2). The impacts appear to be localized. Method A CULs are deemed applicable at the Site. Arsenic-impacted ground water was exhibited only at monitoring well TC-2. This elevated detection was due to the high sediments in the ground water sample collected, as indicated by laboratory analytical results for dissolved arsenic (Table 2).

4.4 POINT OF COMPLIANCE

The MTCA Cleanup Regulation defines the POC as the point or points where CULs shall be attained. Once CULs are met at the POC, the Site is no longer considered a threat to human health or the environment.

WAC 173-340-740(6) gives the POC requirements for soil. WAC 173-340-740(6) states that "for soil CULs based on the protection of ground water, the POC shall be established in the soils throughout the site," and/or for soil CULs based on direct contact, "the point of compliance shall be established in the soils throughout the Site from the ground surface to fifteen feet below the ground surface." Hence, all contaminated soil will be excavated to a depth of 15 feet bgs, removed, and disposed of offsite at a regulated landfill. This standard POC is applied to soil on the Site. Impacts have not been detected in soil below approximately 8.5 feet bgs.

For ground water, the POC is the point or points where the ground water CULs must be attained for a site to be in compliance with the cleanup standards. Ground water CULs shall be attained in all ground waters from the POC to the outer boundary of the hazardous substance plume. A conditional POC may be established if it is not practicable to meet the CULs throughout the site within a reasonable restoration timeframe (WAC 173-340-720(8)(c)). A conditional POC for ground water is not proposed for the Site at this time.

For surface water, the POC is where Maddox Creek daylights at the south west corner of the Site property boundary.

5.0 CLEANUP ACTION SELECTION

5.1 REMEDIAL ACTION OBJECTIVES

The remedial action objectives describe the actions necessary to protect human health and the environment through eliminating, reducing, or otherwise controlling risks posed through each exposure pathway and migration route. These objectives are developed by evaluating the characteristics of the contaminated media, the characteristics of the hazardous substances present, migration and exposure pathways, and potential receptor points.

As a result of past activities on the Truck City parcel, soil on this Site has been contaminated with TPH and ethylbenzene. Ground water has been contaminated by gasoline- and diesel-range TPH, and benzene. The potentially complete exposure pathway for COIs in soil is direct contact with contaminated soils by on-site workers. Future persons may also be exposed to volatile contaminants migrating from the subsurface. Soil gas has the potential to migrate, and persons in nearby buildings may be exposed to IHSs that migrated into proposed buildings at the Site. Ecology is unaware of any drinking water use at or near the site. However, the impacted ground water is shallow. Future construction workers may be exposed to the impacted shallow ground water through ingestion, dermal contact, and inhalation of chemicals volatilizing from ground water.

The following remedial action objectives are intended to address the potential exposure pathways:

- Prevent and minimize direct contact or ingestion of contaminated soil by humans and ecological receptors;
- Prevent and minimize ingestion of contaminated ground water by humans and ecological receptors.

5.2 Cleanup Action Alternatives

Cleanup alternatives are evaluated as part of the RI/FS. The feasibility study included the evaluation of two options for soil and ground water cleanup. Cleanup alternatives were scored and ranked using relevant criteria as described in WAC 173-340-360. Each of the considered alternatives includes a combination of one or more of the following remedial actions:

- Soil excavation
- In situ bioremediation and ground water treatment
- Ground water monitoring
- Monitored natural attenuation

These remedial action options were combined to develop two alternatives, each intended to address all contaminated media at the Site.

5.2.1 Alternative 1: SOIL EXCAVATION AND IN SITU TREATMENT

This alternative presents one of two options for soil and ground water remediation, but both Alternatives 1 and 2 include the same proposed remedy for petroleum-hydrocarbon-contaminated soil and ground water. Alternative 1 includes the following actions:

- Petroleum-Hydrocarbon-Contaminated Soil and Ground water Remedial Action

  Excavation Tasks

  - Excavate impacted soil at the four residual localized impacted areas (including in the vicinity of borings TCBH-1 and TCBH-3 and monitoring well TC-5, and the east side of the truck scale) to approximately 14 feet bgs. Remove the truck scale and associated concrete pad prior to excavation activities. Characterize each area of excavation by collecting soil samples throughout the excavation to assess the lateral and vertical extent of impact. Collect confirmation soil samples from each area of excavation. Collect representative stockpile soil samples and dispose of impacted soil at a permitted disposal facility. The initial area of excavation will be determined based on field screening results. The final excavation area will be determined by confirmation sampling of the excavation sidewalls and base of the excavation pit. Over excavation of petroleum-contaminated soil below the ground water table, in the smear zone, is necessary to remove the impacted zone. It is anticipated that removal of up to three monitoring wells will be necessary during soil excavation activities, as these wells are currently located in the vicinity of the proposed soil remedial action. Reinstallation of new monitoring wells in these excavated areas, after completion of this task, will be necessary.

Because the ground water is shallow, each excavation pit will be dewatered. Impacted water will be contained in an appropriately sized tank and will be remediated by cycling of water through granular reactivated carbon filters and sediment filters. Water samples will be collected from the storage tank and submitted for analysis of TPH and BTEX as well as measurement of the treated water's turbidity to ensure water quality prior to discharging water into the Site's stormwater system. A permit for discharge to the City of Mount Vernon's stormwater system will be obtained prior to discharge.

For cost estimating purposes, the total estimated volume of excavated soil, based on collective subsurface investigation results, is assumed to be 500 cubic yards and is assumed suitable for disposal at a RCRA Subtitle D landfill.

– Backfill the excavation area with clean, imported fill to existing ground surface elevation and compact consistent with construction specifications associated with the jail.

In Situ Bioremediation—Enhanced Aerobic Biodegradation Tasks

– The second phase of this remedial action involves using enhanced aerobic biodegradation to expedite the biodegradation of TPH and VOCs in soil and ground water by adding oxygen (as an electron acceptor). The addition of a controlled-release supplemental source of oxygen enables the indigenous microorganisms (bacteria) to expedite the biodegradation process. An industry standard oxygen release compound will be added as a soil amendment (dry powder) to the backfill material and applied to each excavation area. Installation of the backfill-mixed oxygen release material will account for the anticipated ground water smear zone. Installation of a bioremediation product that releases oxygen in the dissolved phase when it is hydrated will provides terminal electron acceptors to support the oxidative biodegradation of petroleum hydrocarbons and VOCs. It is anticipated that generous application of a bioremediation product throughout the smear zone at each localized residual impacted area will remediate both residual saturated soil and ground water contamination.

- Conduct a baseline ground water sampling event at the Site's monitoring wells before initiating the in situ bioremediation task. Conduct up to two years of consecutive quarterly ground water monitoring events, as necessary, to meet the following objectives: (1) confirm effectiveness of the bioremediation treatment; (2) collect the necessary data for compliance with consent decree, based on compliance with CULs; and (3) confirm that petroleum-hydrocarbon-impacted ground water is not migrating past the POC or downgradient of the Site boundary. Throughout this monitoring period, selected ground water samples will be analyzed for geochemical parameters (including nitrate, manganese, ferrous iron, sulfate, and methane) to continue assessment of the presence of electron acceptors during the biodegradation process and to evaluate the biodegradation of TPH and selected VOCs.

- The estimated cost for this alternative of $537,800 is presented in Table 3.

5.2.2 Alternative 2: Soil Excavation and Monitored Natural Attenuation

Alternative 2 includes the same approach for remediation of petroleum-hydrocarbon-contaminated soil and ground water by over excavation of impacted soil through the smear zone, but excludes the in situ ground water treatment component. The task of subsequent ground water monitoring and sampling events is also consistent with Alternative 1. The estimated cost for this alternative of $506,000 is presented in Table 4.

5.3 Regulatory Requirements

The MTCA Cleanup Regulation sets forth the minimum requirements and procedures for selecting a cleanup action. A cleanup action must meet each of the minimum requirements specified in WAC 173-340-360(2), including certain threshold and other requirements. This section outlines these cleanup action requirements and procedures as set forth in the regulation. Section 5.4 provides an evaluation of the cleanup alternatives with respect to these criteria.

5.3.1 Threshold Requirements

WAC 173-340-360(2)(a) requires that the cleanup action:

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

5.3.2 Other Requirements

In addition, WAC 173-340-360(2)(b) states that the cleanup action shall:

- Use permanent solutions to the maximum extent practicable;

- Provide for a reasonable restoration time frame; and
- Consider public concerns.

WAC 173-340-360(3) describes the specific requirements and procedures for determining whether a cleanup action uses permanent solutions to the maximum extent practicable. A permanent solution is defined as one where CULs can be met without further action being required at the Site other than the disposal of residue from the treatment of hazardous substances. To determine whether a cleanup action provides permanent solutions to the maximum extent practicable, a disproportionate cost analysis is conducted. This analysis compares the costs and benefits of the cleanup action alternatives and involves the consideration of several factors, including:

- Protectiveness;
- Permanent reduction of toxicity, mobility, and volume;
- Cost;
- Long-term effectiveness;
- Short-term risk;
- Implementability; and
- Consideration of public concerns.

The comparison of benefits and costs may be quantitative, but will often be qualitative and require the use of best professional judgment.

WAC 173-340-360(4) describes the specific requirements and procedures for determining whether a cleanup action provides for a reasonable restoration time frame.

5.3.3 Ground water Cleanup Action Requirements

For sites with contaminated ground water, WAC 173-340-360(2)(c) requires that the cleanup action meet certain additional requirements. Permanent cleanup actions shall be taken when possible, and if a nonpermanent action must be conducted, the regulation requires that the following two requirements be met:

1) Treatment or removal of the source of the release shall be conducted for liquid wastes, areas of high contamination, areas of highly mobile contaminants, or substances that cannot be reliably contained; and

2) Ground water containment (such as barriers) or control (such as pumping) shall be implemented to the maximum extent practicable.

5.3.4 CLEANUP ACTION EXPECTATIONS

WAC 173-340-370 sets forth the following expectations for the development of cleanup action alternatives and the selection of cleanup actions. These expectations represent the types of cleanup actions Ecology considers likely results of the remedy selection process; however, Ecology recognizes that there may be some sites where cleanup actions conforming to these expectations are not appropriate.

- Treatment technologies will be emphasized at sites with liquid wastes and areas with high concentrations of hazardous substances or with highly mobile and/or highly treatable contaminants;

- To minimize the need for long-term management of contaminated materials, hazardous substances will be destroyed, detoxified, and/or removed to concentrations below CULs throughout sites with small volumes of hazardous substances;

- Engineering controls, such as containment, may be required at sites with large volumes of materials with relatively low levels of hazardous substances where treatment is impracticable;

- To minimize the potential for migration of hazardous substances, active measures will be taken to prevent precipitation and runoff from coming into contact with contaminated soil or waste materials;

- When hazardous substances remain on site at concentrations that exceed CULs, they will be consolidated to the maximum extent practicable where it is necessary to minimize the potential for direct contact and migration of hazardous substances;

- For sites adjacent to surface water, active measures will be taken to prevent/minimize releases to that water; dilution will not be the sole method for demonstrating compliance;

- Natural attenuation of hazardous substances may be appropriate at sites where (1) source control is conducted to the maximum extent practicable, (2) leaving contaminants on site does not pose an unacceptable risk, (3) there is evidence that natural degradation is occurring and will continue to occur, and (4) appropriate monitoring is taking place; and

- Cleanup actions will not result in a significantly greater overall threat to human health and the environment than other alternatives.

5.3.5 APPLICABLE, RELEVANT, AND APPROPRIATE, AND LOCAL REQUIREMENTS

WAC 173-340-710(1) requires that all cleanup actions comply with all applicable state and federal law. It further states that the term "applicable state and federal laws" shall include legally applicable requirements and those requirements that the department determines "…are relevant and appropriate requirements." This section discusses applicable state and federal law, relevant and appropriate requirements, and local permitting requirements that were of primary importance in selecting cleanup requirements. If other requirements are identified at a later date, they will be applied to the cleanup actions at that time.

At a minimum applicable permits or substantive requirements for the remediation of the Site may include:

- Washington State Department of Ecology, Construction Stormwater General Permit;
- City of Mount Vernon, Grading Permit;
- City of Mount Vernon, Building Permit;
- City of Mount Vernon, Floodplain Development Permit;
- City of Mount Vernon, Utility and Right-of-Way Permit; and
- City of Mount Vernon, Storm water discharge permit.

MTCA provides an exemption from the procedural requirements of several state laws and from any laws authorizing local government permits or approvals for remedial actions conducted under a consent decree, EO, or AO (RCW 70.105D.090). However, the substantive requirements of a required permit must be met. The procedural requirements of the following state laws are exempted:

- Ch. 70.94 RCW, Washington Clean Air Act and Puget Sound Clean Air Agency Regulations;
- Ch. 70.95 RCW, Solid Waste Management, Reduction, and Recycling;
- Ch. 70.105 RCW, Hazardous Waste Management;
- Ch. 75.20 RCW, Construction Projects in State Waters;
- Ch. 90.48 RCW, Water Pollution Control; and
- Ch. 90.58 RCW, Shoreline Management Act of 1971.

WAC 173-340-710(4) sets forth the criteria that Ecology evaluates when determining whether certain requirements are relevant and appropriate for a cleanup action. Table 6 lists the state and federal laws that contain ARARs that apply to the cleanup action at the Site. Local laws, which may be more stringent than specified state and federal laws, will govern where applicable.

5.4 Evaluation of Cleanup Action Alternatives

The requirements and criteria outlined in Section 5.3 are used to conduct a comparative evaluation of Alternatives 1 and 2 and to select a cleanup action from those alternatives. Table 5 provides a summary of the ranking of the alternatives against the various criteria.

5.4.1 Threshold Requirements

5.4.1.1 Protection of Human Health and the Environment and Compliance with Cleanup Standards

Protectiveness is a factor by which human health and the environment are protected by the cleanup action, including the degree to which existing risks are reduced; time required to reduce risk at the Site and attain cleanup standards; on-site and off-site risks resulting from implementing the cleanup action alternative; and improvement of the overall environmental quality. Alternatives 1 and 2 reduce or eliminate risk from contaminated soil and ground water through soil removal, in-situ treatment, and monitored natural attenuation. These remedial actions eliminate exposure pathways, protect human health and the environment, and comply with cleanup standards.

5.4.1.2 Compliance with State and Federal Laws

The selected CULs are consistent with MTCA. Additionally, local, state, and federal laws related to environmental protection, health and safety, transportation, and disposal apply to each proposed alternative. During remedial design, the selected alternative will be designed to comply with applicable, relevant, and appropriate requirements.

5.4.1.3 Provision for Compliance Monitoring

There are three types of compliance monitoring: protection, performance, and confirmational. Protection monitoring is designed to protect human health and the environment during the construction and operation and maintenance phases of the cleanup action. Performance monitoring confirms that the cleanup action has met cleanup and/or performance standards. Confirmational monitoring confirms the long-term effectiveness of the cleanup action once cleanup standards have been met or other performance standards have been attained. Both alternatives require all three types of compliance monitoring and therefore will meet this provision.

5.4.2 Other Requirements

5.4.2.1 Use of Permanent Solutions to the Maximum Extent Practicable

As discussed previously, to determine whether a cleanup action uses permanent solutions to the maximum extent practicable, the disproportionate cost analysis specified in the regulation is used. The analysis compares the costs and benefits of the cleanup action alternatives and involves the consideration of several factors. The comparison of costs and benefits may be quantitative, but will often be qualitative and require the use of best professional judgment.

Costs are disproportionate to the benefits if the incremental costs of an alternative are disproportionate to the incremental benefits of that alternative. As noted above, Alternative 1 includes the completed interim actions which satisfy the threshold requirements of WAC 173-340-360(2)(a), in that they are protective to human health and the environment, comply with CULs and applicable state and federal laws, and provide for compliance monitoring.

Alternative 1, which has a slightly higher cost, but lower risk, is the preferred remedy for the Site. Table 5 presents the ranking of both alternatives with respect to the following risk factors consideration.

- Protectiveness

  Protectiveness measures the degree to which existing risks are reduced, the time required to reduce risk and attain cleanup standards, on- and off-site risks resulting from implementing the alternative, and improvement of overall environmental quality. Alternatives 1 and 2 would both be protective. All alternatives comply with applicable federal and state cleanup standards through permanent removal and natural attenuation.

  The alternatives prevent human and ecological exposure to soil exceeding cleanup levels through removal from the Site. Alternative 1 takes a more active approach to remediating impacts from ground water and therefore, receives the highest ranking for overall protectiveness. Alternative 2 relies on monitored natural attenuation and compliance monitoring to address ground water impacts and therefore, receives a lower ranking for overall protectiveness.

- Permanent Reduction of Toxicity, Mobility and Volume

  Permanence is a factor by which the cleanup action alternative permanently reduces the toxicity, mobility, and/or volume of hazardous substances. It takes into account the adequacy of the alternative in destroying the hazardous substances, the reduction or elimination of hazardous-substance releases and sources of releases, the degree of irreversibility of the waste-treatment process, and the characteristics and quantity of treatment residuals generated. Removal of soils is a permanent remedial action because it permanently eliminates the source of releases at the Site.

  Alternative 1 received a higher permanence ranking for ground water since ground water impacts are removed by in situ bioremediation treatment followed by natural attenuation. Alternative 2 relies on monitored natural attenuation. Both alternatives also receive equivalent permanence rankings for soil since these alternatives include the permanent removal of impacted soil by excavation from focused areas. In summary, the permanence ranking for ground water and soil is slightly higher for Alternative 1 than Alternative 2.

- Cleanup Costs

  Costs are approximated based on specific design assumptions for each alternative. Although the costs provided by consultants are estimates based on design assumptions that might change, the relative costs can be used for this evaluation.

  The estimated cost for Alternative 1 ($537,800) includes anticipated costs for soil removal, in-situ treatment, and compliance ground water monitoring/sampling. Alternative 2 ($506,000) includes costs for only soil removal and compliance ground water monitoring/sampling.

- Long-Term Effectiveness

  Long-term effectiveness includes the degree of certainty that the alternative will be successful; the reliability of the alternative for the expected duration of hazardous substances remaining on site at concentrations that exceed CULs; the magnitude of residual risk with the alternative in place; and the effectiveness of controls required to manage treatment residues or remaining wastes.

  Alternatives that include removal of greater volumes of contaminated soils would have greater long-term effectiveness because they would immediately be successful in achieving CULs, would represent lower residual risk. Soil actions that remove less contaminated soil would have reduced long-term effectiveness. Ground water actions will have a lower long-term effectiveness if they leave contaminants in ground water for a longer time (requiring management) or leave behind residual risk after implementation. Alternative 1 receives a high ranking for long-term effectiveness while Alternative 2 receives a slightly lower ranking for long-term effectiveness.

- Short-Term Risk

  Short-term risks to remediation workers, the public, and the environment are assessed under this criterion. Generally, short-term risks are expected to be linearly related to the amount of material handled, treated, and/or transported and disposed of (e.g., worker injury per cubic yard excavated [equipment failure], public exposure per cubic yard-mile transported [highway accident]).

  This factor addresses the risk to human health and the environment associated with the alternative during construction and implementation, and the effectiveness of measures that will be taken to manage such risks. Potential exposure via transport, handling, and excavation required each of the alternatives could lead to short-term risks. Alternatives 1 and 2 require the same amount of construction and implementation work; however, Alternative 1 involves application of in situ bioremediation and therefore receives a lower ranking for management of short-term risk management.

- Implementability

  Implementability considers whether the alternative is technically possible; the availability of necessary off-site facilities, services, and materials; administrative and regulatory requirements; scheduling; size; complexity; monitoring requirements; access for operations and monitoring; and integration with existing facility operations. Both alternatives include actions that are well proven and that have been employed at many sites throughout the United States. Alternative 1 and 2 receive an equal ranking for implementability.

- Consider Public Concerns

  This factor includes considering concerns from individuals; community groups; and local governments, tribes, federal and state agencies, and any other organization that may have an interest in or knowledge of the Site and that may have a preferred alternative. Each alternative provides opportunity for members of the public to review and comment on plans.

5.4.2.2 Provide a Reasonable Restoration Time Frame

WAC 173-340-360(4) describes the specific requirements and procedures for determining whether a cleanup action provides for a reasonable restoration time frame, as required under subsection (2)(b)(ii). The factors that are used to determine whether a cleanup action provides a reasonable restoration time frame are set forth in WAC 173-340-360(4)(b) and include:

- Potential risks posed by the site to human health and the environment;
- Practicability of achieving a shorter restoration time frame;
- Current site use and nearby resources that are or may be affected by the site;
- Potential future use of the site and of nearby resources that are or may be affected by the site;
- Availability of alternative water supplies;
- Likely effectiveness and reliability of institutional controls;
- Ability to control and monitor migration of hazardous substances;
- Toxicity of hazardous substances; and
- Natural processes that reduce contaminant concentrations and that are documented to occur.

The alternatives rely on removal of soil containing contaminants exceeding CULs, providing flexibility for current and future site use and reduction in risk, and eliminate the need for institutional controls. Alternatives that only cap impacted soil on site rely on institutional controls, have residual risk, and increase the restoration time frame by leaving in place a potential ongoing source of contamination.

Both alternatives rely on soil removal, ground water recovery, and natural degradation of ground water impacts to achieve CULs. Alternative 1 allows remediation to occur while allowing business operations to continue on site with minimal disturbance, and would allow a restoration time frame of less than five years. Alternative 2 relies on natural attenuation of contaminants in ground water (after soil removal) and would likely require greater restoration time frame. In summary, Alternative 1 is ranked highest for restoration time frame.

5.4.3 GROUND WATER CLEANUP ACTION REQUIREMENTS

Cleanup actions that address ground water must meet the specific requirements described in Section 5.3.3 in addition to those listed above. Each alternative meets the threshold requirements under WAC 173-340-360(2)(a). Both alternatives meet the requirement through bioremediation (Alternative 1) or natural attenuation (Alternative 2), which is a form of treatment, and monitoring will provide evidence that degradation of contaminants is continuing to occur under natural processes.

5.4.4 CLEANUP ACTION EXPECTATIONS

Specific cleanup action expectations are outlined in WAC 173-340-370 and are described in Section 5.3.4. Alternatives 1 and 2 address these expectations in the following manner:

- Alternatives 1 and 2 include soil removal of contaminated soils and bioremediation and natural attenuation (Alternative 1) or only natural attenuation (Alternative 2). Natural attenuation is an effective ground water treatment because leaving contaminants on site will not pose an unacceptable risk, degradation has been demonstrated to occur at the Site, and regular monitoring will be conducted. The soil removal actions will eliminate the overall threat to human health and the environment. Previous ground water monitoring indicate that IHS concentrations in ground water, in the western area of the Site, had attenuated to non-detectable levels. Current sentinel wells, along the western and southern perimeters of the Site will provide early warning of changes in IHS concentrations downgradient of the localized remediation area. These actions meet the following cleanup expectations:

  – Treatment technologies will be emphasized at sites with liquid wastes and areas with high concentrations of hazardous substances or with highly mobile and/or highly treatable contaminants.

  – To minimize the potential for migration of hazardous substances, active measures will be taken to prevent precipitation and runoff from coming into contact with contaminated soil or waste materials.

  – Natural attenuation of hazardous substances may be appropriate at sites where (1) source control is conducted to the maximum extent practicable, (2) leaving contaminants on site does not pose an unacceptable risk, (3) there is evidence that natural degradation is occurring and will continue to occur, and (4) appropriate monitoring is taking place.

  – Cleanup actions will not result in a significantly greater overall threat to human health and the environment than other alternatives.

  – To minimize the need for long-term management of contaminated materials, hazardous substances will be destroyed, detoxified, and/or removed to concentrations below CULs throughout sites with small volumes of hazardous substances.

The following cleanup expectations are not applicable to the Site:

- When hazardous substances remain on site at concentrations that exceed CULs, they will be consolidated to the maximum extent practicable where it is necessary to minimize the potential for direct contact and migration of hazardous substances.

- Engineering controls, such as containment, will be used at sites with large volumes of materials with relatively low levels of hazardous substances where treatment is impracticable.

5.5 DECISION

Based on the analysis described above, Alternative 1 was the selected remedial action for the Site. Alternative 1 meets each of the minimum requirements for remedial actions and has the shortest restoration time frame. As noted above, Alternative 1 includes the soil removal and in situ bioremediation, which satisfies the threshold requirements of WAC 173-340-360(2)(a) in that they are protective of human health and the environment, comply with CULs and applicable state and federal laws, and provide for compliance monitoring. Alternative 2 also satisfies the threshold requirements but have a longer restoration time frame. Table 5 provides a summary of the relative ranking of these alternatives in the decision process.

6.0 SELECTED REMEDIAL ACTION

In order to meet CULs for TPH and ethylbenzene in soil, the proposed cleanup action for the contaminated soil on the Site, Alternative 1, incorporates the interim actions performed to date.

This remedy addresses ground water contamination by over excavation of petroleum-contaminated soil below the ground water table, in the smear zone, to remove the impacted zone. Ground water from each area of excavation will be dewatered, contained, and treated prior to discharge into the Site's stormwater system. A ground water compliance monitoring program relies on sentinel wells, remediation levels (RELs) for use at residual impacted area and sentinel wells, and contingency measures to be implemented should IHS concentrations are present in sentinel wells and increase to exceed applicable CULs (Appendix B). Existing Site wells and two of the three proposed replacement new wells will be used as sentinel wells for the compliance monitoring. RELs are based on MTCA Method A ground water cleanup levels (Appendix B). Compliance with RELs will ensure that CULs are not exceeded and monitoring of sentinel wells will provide early warning of contaminant migration toward the perimeters of the Site. Additionally, selected ground water samples will be analyzed for geochemical parameters (including nitrate, manganese, ferrous iron, sulfate, and methane) to continue assessment of the presence of electron acceptors during the biodegradation process and to evaluate the biodegradation of TPH and selected VOCs.

6.1 GROUND WATER MONITORING

Ground water monitoring is required to determine the effectiveness of remedial action and will include the quarterly ground water monitoring/sampling of all wells at the Site for the assessment of ground water IHSs in accordance with the ground water compliance monitoring plan (Appendix B). The goals of the ground water monitoring, as presented in Appendix B, are to:

- Measure the effectiveness of the cleanup after petroleum contaminated soil removal and in situ bioremediation treatment.
- Provide criteria for the decommissioning of monitoring wells and evaluating compliance.
- Identify contingencies for additional actions and provide criteria for the conditions that would trigger a contingent action.
- Demonstrate the eventual achievement of CULs and the criteria for cessation of monitoring.

6.2 CONTINGENCY PLAN TO ADDRESS UNKNOWN CONTAMINATION

All data available at this time indicates that the Site is contained within the Truck City parcel boundary. Once the excavation process begins, there is the potential for finding previously undiscovered preferential pathways for hazardous substance migration beyond the Site boundary as currently defined. In the event this occurs, additional remedial action may be required by the County. Additional remedial action could include, but is not limited to excavation and removal of any contaminated soil.

6.3 INSTITUTIONAL CONTROLS

Institutional controls are measures taken to limit or prohibit activities that may interfere with the integrity of a cleanup action or result in exposure to hazardous substances at a site. Such measures are required to assure both the continued protection of human health and the environment and the integrity of the cleanup action whenever hazardous substances remain at a site at concentrations exceeding applicable CULs. Institutional controls can include both physical measures and legal and administrative mechanisms. WAC 173-340-440 provides information on institutional controls and the conditions under which they may be removed.

Currently, there are no institutional controls for the Site or City of Mount Vernon codes which restricts Site use. The Property is zoned for public use.

6.4 FINANCIAL ASSURANCES

WAC 173-340-440 requires financial assurance mechanisms at sites where the selected cleanup action includes engineered and/or institutional controls. Financial assurances are not required at the site because engineered controls are not included in the remedy.

6.5 PERIODIC REVIEW

After ground water and soil CULs have been achieved, periodic reviews will not be required because institutional controls are not a part of the remedy.

7.0 REFERENCES CITED

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AEG. 2005. Phase II—Site characterization report, Truck City Truck Stop, 3228 Old Highway 99, Mount Vernon, Washington, WA 98273. Associated Environmental Group, LLC. November 30.

CH2MHILL. 2004. City of Mount Vernon Comprehensive Stormwater Management Plan Update. November.

Ecology. 1993. Interim action cleanup report, Truck City Truck Stop, 1731 Old Highway 99 South, Mount Vernon, Washington. Washington State Department of Ecology. January 8.

Ecology. 2005. Environmental Report Tracking System #546209. February 9.

Ecology. 2009. Guidance for evaluating soil vapor intrusion in Washington State: investigation and remediation action. Review draft. No. 09-09-047. Washington State Department of Ecology, Toxics Cleanup Program. October.

Ecology, 2014. Correspondence with Site Manager.

MTC. 2014a. Phase II environmental site assessment, Truck City site, 3228 Old Highway 99 South, Mount Vernon, WA 98273. Materials Testing & Consulting, Inc. February 17.

MTC. 2014b. Phase II environmental site assessment, Truck City site, 3228 Old Highway 99 South, Mount Vernon, WA 98273. Materials Testing & Consulting, Inc. March 17.

MFA. 2014. Focused site assessment work plan, Truck City site property. Maul Foster & Alongi, Inc. July 8.

APPENDIX A

TERRESTRIAL ECOLOGICAL EVALUATION

Voluntary Cleanup Program

Washington State Department of Ecology
Toxics Cleanup Program

TERRESTRIAL ECOLOGICAL EVALUATION FORM

Under the Model Toxics Control Act (MTCA), a terrestrial ecological evaluation is necessary if hazardous substances are released into the soils at a Site. In the event of such a release, you must take one of the following three actions as part of your investigation and cleanup of the Site:

1. Document an exclusion from further evaluation using the criteria in WAC 173-340-7491.
2. Conduct a simplified evaluation as set forth in WAC 173-340-7492.
3. Conduct a site-specific evaluation as set forth in WAC 173-340-7493.

When requesting a written opinion under the Voluntary Cleanup Program (VCP), you must complete this form and submit it to the Department of Ecology (Ecology). The form documents the type and results of your evaluation. You still need to submit your evaluation as part of your cleanup plan or report.

If you have questions about how to conduct a terrestrial ecological evaluation, please contact the Ecology site manager assigned to your Site. For additional guidance, please refer to www.ecy.wa.gov/programs/tcp/policies/terrestrial/TEEHome.htm.

Step 1: IDENTIFY HAZARDOUS WASTE SITE

Please identify below the hazardous waste site for which you are documenting an evaluation.

Facility/Site Name: Truck City Stop Site	
Facility/Site Address: 3216 Old Highway 99 South, Mount Vernon, WA 98273	
Facility/Site No: 2673; Cleanup Site ID: 5176	VCP Project No.:

Step 2: IDENTIFY EVALUATOR

Please identify below the person who conducted the evaluation and their contact information.

Name: Yen-Vy Van		Title: Senior Hydrogeologist
Organization: Maul Foster Alongi, Inc.		
Mailing address: 411 First Avenue, Suite 610		
City: Seattle	State: WA	Zip code: 98104
Phone: 206-858-7618	Fax:	E-mail: yvan@maulfoster.com

Step 3: DOCUMENT EVALUATION TYPE AND RESULTS

A. Exclusion from further evaluation.

1. Does the Site qualify for an exclusion from further evaluation?

☒ Yes — *If you answered **"YES,"** then answer **Question 2**.*

☐ No or Unknown — *If you answered **"NO" or "UKNOWN,"** then skip to **Step 3B** of this form.*

2. What is the basis for the exclusion? *Check all that apply. Then skip to **Step 4** of this form.*

Point of Compliance: WAC 173-340-7491(1)(a)

☒ All soil contamination is, or will be,* at least 15 feet below the surface.

☐ All soil contamination is, or will be,* at least 6 feet below the surface (or alternative depth if approved by Ecology), and institutional controls are used to manage remaining contamination.

Barriers to Exposure: WAC 173-340-7491(1)(b)

☐ All contaminated soil, is or will be,* covered by physical barriers (such as buildings or paved roads) that prevent exposure to plants and wildlife, and institutional controls are used to manage remaining contamination.

Undeveloped Land: WAC 173-340-7491(1)(c)

☐ There is less than 0.25 acres of contiguous[#] undeveloped[±] land on or within 500 feet of any area of the Site and any of the following chemicals is present: chlorinated dioxins or furans, PCB mixtures, DDT, DDE, DDD, aldrin, chlordane, dieldrin, endosulfan, endrin, heptachlor, heptachlor epoxide, benzene hexachloride, toxaphene, hexachlorobenzene, pentachlorophenol, or pentachlorobenzene.

☐ For sites not containing any of the chemicals mentioned above, there is less than 1.5 acres of contiguous[#] undeveloped[±] land on or within 500 feet of any area of the Site.

Background Concentrations: WAC 173-340-7491(1)(d)

☐ Concentrations of hazardous substances in soil do not exceed natural background levels as described in WAC 173-340-200 and 173-340-709.

* An exclusion based on future land use must have a completion date for future development that is acceptable to Ecology.

[±] "Undeveloped land" is land that is not covered by building, roads, paved areas, or other barriers that would prevent wildlife from feeding on plants, earthworms, insects, or other food in or on the soil.

[#] "Contiguous" undeveloped land is an area of undeveloped land that is not divided into smaller areas of highways, extensive paving, or similar structures that are likely to reduce the potential use of the overall area by wildlife.

B. Simplified evaluation.		
1. Does the Site qualify for a simplified evaluation?		
[X]	Yes	*If you answered **"YES,"** then answer **Question 2** below.*
[ ]	No or Unknown	*If you answered **"NO"** or **"UNKNOWN,"** then skip to **Step 3C** of this form.*
2. Did you conduct a simplified evaluation?		
[X]	Yes	*If you answered **"YES,"** then answer **Question 3** below.*
[ ]	No	*If you answered **"NO,"** then skip to **Step 3C** of this form.*
3. Was further evaluation necessary?		
[ ]	Yes	*If you answered **"YES,"** then answer **Question 4** below.*
[X]	No	*If you answered **"NO,"** then answer **Question 5** below.*
4. If further evaluation was necessary, what did you do?		
[ ]	Used the concentrations listed in Table 749-2 as cleanup levels. *If so, then skip to **Step 4** of this form.*	
[ ]	Conducted a site-specific evaluation. *If so, then skip to **Step 3C** of this form.*	
5. If no further evaluation was necessary, what was the reason? *Check all that apply. Then skip to **Step 4** of this form.*		
Exposure Analysis: WAC 173-340-7492(2)(a)		
[ ]	Area of soil contamination at the Site is not more than 350 square feet.	
[ ]	Current or planned land use makes wildlife exposure unlikely. Used Table 749-1.	
Pathway Analysis: WAC 173-340-7492(2)(b)		
[ ]	No potential exposure pathways from soil contamination to ecological receptors.	
Contaminant Analysis: WAC 173-340-7492(2)(c)		
[X]	No contaminant listed in Table 749-2 is, or will be, present in the upper 15 feet at concentrations that exceed the values listed in Table 749-2.	
[X]	No contaminant listed in Table 749-2 is, or will be, present in the upper 6 feet (or alternative depth if approved by Ecology) at concentrations that exceed the values listed in Table 749-2, and institutional controls are used to manage remaining contamination.	
[X]	No contaminant listed in Table 749-2 is, or will be, present in the upper 15 feet at concentrations likely to be toxic or have the potential to bioaccumulate as determined using Ecology-approved bioassays.	
[X]	No contaminant listed in Table 749-2 is, or will be, present in the upper 6 feet (or alternative depth if approved by Ecology) at concentrations likely to be toxic or have the potential to bioaccumulate as determined using Ecology-approved bioassays, and institutional controls are used to manage remaining contamination.	

C. Site-specific evaluation. A site-specific evaluation process consists of two parts: (1) formulating the problem, and (2) selecting the methods for addressing the identified problem. Both steps require consultation with and approval by Ecology. *See* WAC 173-340-7493(1)(c).

1. Was there a problem? *See* WAC 173-340-7493(2).

☐ Yes *If you answered **"YES,"** then answer **Question 2** below.*

☒ No *If you answered **"NO,"** then identify the reason here and then skip to **Question 5** below:*

☐ No issues were identified during the problem formulation step.

☐ While issues were identified, those issues were addressed by the cleanup actions for protecting human health.

2. What did you do to resolve the problem? *See* WAC 173-340-7493(3).

☐ Used the concentrations listed in Table 749-3 as cleanup levels. *If so, then skip to **Question 5** below.*

☐ Used one or more of the methods listed in WAC 173-340-7493(3) to evaluate and address the identified problem. *If so, then answer **Questions 3 and 4** below.*

3. If you conducted further site-specific evaluations, what methods did you use?
Check all that apply. See WAC 173-340-7493(3).

☐ Literature surveys.

☐ Soil bioassays.

☐ Wildlife exposure model.

☐ Biomarkers.

☐ Site-specific field studies.

☐ Weight of evidence.

☐ Other methods approved by Ecology. If so, please specify:

4. What was the result of those evaluations?

☐ Confirmed there was no problem.

☐ Confirmed there was a problem and established site-specific cleanup levels.

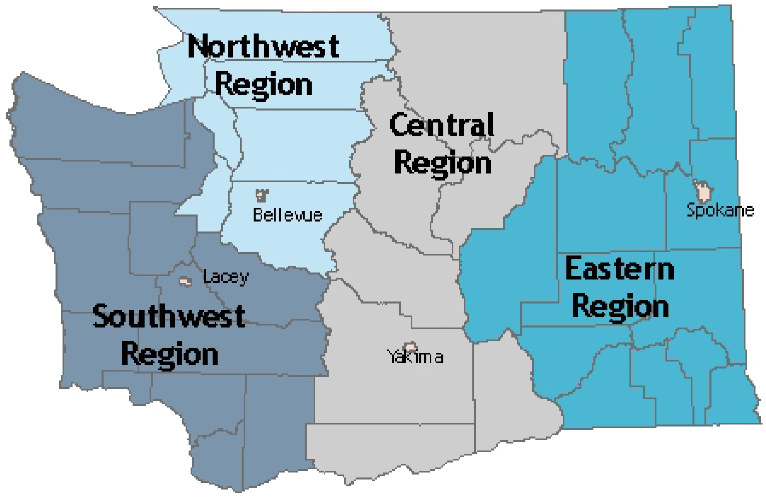
5. Have you already obtained Ecology's approval of both your problem formulation and problem resolution steps?

☐ Yes If so, please identify the Ecology staff who approved those steps:

☐ No

Step 4: SUBMITTAL

Please mail your completed form to the Ecology site manager assigned to your Site. If a site manager has not yet been assigned, please mail your completed form to the Ecology regional office for the County in which your Site is located.



Northwest Region:	Central Region:
Attn: Sara Nied 3190 160th Ave. SE Bellevue, WA 98008-5452	Attn: Mark Dunbar 15 W. Yakima Ave., Suite 200 Yakima, WA 98902
Southwest Region: Attn: Scott Rose P.O. Box 47775 Olympia, WA 98504-7775	**Eastern Region:** Attn: Patti Carter N. 4601 Monroe Spokane WA 99205-1295

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APPENDIX B

GROUND WATER COMPLIANCE MONITORING PLAN

GROUNDWATER COMPLIANCE MONITORING PLAN

TRUCK CITY SITE
MOUNT VERNON, WASHINGTON

Prepared for
SKAGIT COUNTY
MOUNT VERNON, WASHINGTON
November 11, 2014
Project No. 0714.02.02

Prepared by
Maul Foster & Alongi, Inc.
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MAUL FOSTER ALONGI

GROUNDWATER COMPLIANCE MONITORING PLAN

TRUCK CITY SITE PROPERTY

The material and data in this plan were prepared under the supervision and direction of the undersigned.

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Jim Darling
Vice President, Principal Planner

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ACRONYMS AND ABBREVIATIONS

AEG	Associated Environmental Group, LLC
AGI	Applied Geotechnology, Inc.
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, and total xylenes
COI	chemical of interest
the County	Skagit County, Washington
CUL	cleanup level
Ecology	Washington State Department of Ecology
ESA	environmental site assessment
IHS	indicator hazardous substance
MFA	Maul Foster & Alongi, Inc.
MTC	Materials Testing & Consulting, Inc.
MTCA	Model Toxics Control Act
NWTPH	Northwest Total Petroleum Hydrocarbons
POC	point of compliance
the Property	The proposed jail property
REL	remediation level
RI/FS	remedial investigation and feasibility study
TPH	total petroleum hydrocarbons
the Site	Truck City Site, Skagit County parcel P29546
USEPA	U.S. Environmental Protection Agency
UST	underground storage tank
VOC	volatile organic compound
WAC	Washington Administrative Code

1 INTRODUCTION

This Compliance Monitoring Plan (CMP) presents the Washington State Department of Ecology's (Ecology) proposed ground water CMP for the Truck City site ("Site") (Facility Site ID: 2673, Cleanup Site ID: 5176). The Site is located at 3216 Old Highway 99 South, Mount Vernon in Skagit County, Washington (Figure 1). The Site, in combination with other adjacent parcels, is proposed for construction of the Skagit County jail. The proposed jail property (Property) comprises the following five parcels: Skagit County parcels P29546 (Truck City parcel) and four adjoining undeveloped parcels to the south, P119262, P119263, P119265, and P119267 (Figure 2). The parcels are owned by various parties, and Skagit County (the "County") has executed purchase and sale agreement(s) for the parcels. The Truck City parcel comprises the entire Site based on data available at this time. As part of that effort, the County is pursuing a Prospective Purchaser Consent Decree with the Washington State Department of Ecology (Ecology).

This plan has been prepared to meet the groundwater monitoring requirements specified in the cleanup action plan for the Site and was developed in accordance with the compliance monitoring requirements put forth in the Washington State Model Toxics Control Act (MTCA) (Washington Administrative Code [WAC] 173-340-410). The approach put forth in this plan is consistent with the Washington State Department of Ecology (Ecology)-approved Public Review Remedial Investigation and Feasibility Study (RI/FS) (MFA, 2014).

1.1 Purpose of Groundwater Compliance Monitoring Plan

The final remedy for the site, as described in the cleanup action plan (Ecology, 2014a), includes removal of contaminated soils, bioremediation, and natural attenuation.

The goals of this compliance monitoring plan are to:

- Identify existing and proposed replacement monitoring wells (to be installed after completion of petroleum-contaminated-soil excavation) for inclusion in the compliance monitoring network and provide criteria for siting and installing future monitoring wells.
- Describe cleanup levels (CULs) for use in existing and future monitoring wells.
- Provide guidelines and criteria for assessing compliance with CULs during the protection, performance, and confirmational stages of groundwater monitoring, including monitoring frequency.
- Identify contingent actions to be implemented in response to noncompliance with CULs and the criteria for triggering these actions.
- Provide criteria for decommissioning monitoring wells.

- Provide criteria for modifying the monitoring frequency, as a contingent action, in response to a change in the stage of monitoring, or in response to achievement of cleanup criteria.

Ecology has determined that the highest beneficial use of groundwater is protection of surface water. Groundwater CULs based on protection of surface water and the point of compliance (POC) at the site boundary were established in the Ecology-approved public review RI/FS (MFA, 2014).

Groundwater data collected at the site from 1989 to 2014 showed that selected indicator hazardous substance (IHS) concentrations, including gasoline- and diesel-range total petroleum hydrocarbons (TPH) and benzene, exceed MTCA Method A CULs within the site boundary (MFA, 2014). These findings support the use of sentinel wells at the site boundary for monitoring CUL compliance at the POC.

2 BACKGROUND

2.1 Site Description

The Site is located in section 32, township 34 north, range 4 east, of the Willamette Meridian. The Property comprises five rectangular parcels: the Truck City parcel, an 8.01-acre tax parcel; two 1.0-acre tax parcels (parcel numbers P119262 and P119263); a 1.75-acre tax parcel (parcel number P119265); and a 1.88-acre tax parcel (parcel number P119267) (refer to Figure 2). The Property's surface topography is generally flat. Access to the Site/Property is from Old Highway 99 South, adjacent to the west property boundary.

Fifteen former underground storage tank (UST) locations were identified at the Truck City Site. Historical UST nests include the northern UST and southern UST nests, which had housed four USTs and three USTs, respectively (Figure 2). These USTs were decommissioned and removed in 1993, during an interim remedial action conducted by Ecology (Ecology, 1993). The USTs had a capacity of 5,000 gallons each. The current and only operational UST nest at the Site is the eastern UST nest, which houses three 5,000-gallon gasoline USTs and one 15,000-gallon diesel UST. This UST system was upgraded in 1998. Two 500-gallon USTs, located between the diesel pump islands and the gasoline pump islands, and a former septic tank, used as a waste oil tank, were also decommissioned and removed during the interim removal action. Additionally, a UST, of unknown size (and presumably a former heating oil tank), may be located beneath the retail store footprint. This UST reportedly was decommissioned in place. Figure 3 presents the Site's features and previous environmental investigation features.

The Property is currently zoned "Public." The City of Mt. Vernon has designated the proposed county jail as an Essential Public Facility. The Truck City parcel contains six buildings associated with the commercial operations of the gas station, truck stop and truck wash, restaurant, and retail store. Five of the buildings—the contractor's staging shop, office space, truck wash building, retail store, and restaurant/café—were constructed in 1978. The building currently used for storage was constructed in 1957.

The gas station pump islands, fueling facilities, and truck scale (weigh station) are located in the western area of the Truck City parcel. The diesel pump islands and the Truck City parcel's current operational USTs are located in the central area of the parcel, adjacent south of the truck wash building. Long-term truck parking is designated in the east area of the parcel. Figure 4 presents the Site's current site features and recent investigation locations.

2.2 Site History

Archival records indicate that the vicinity once was, generally, rural farmland with local residences. The Site was developed by 1953 and operated as a truck stop and restaurant until the truck stop burned in 1976. The parcel was redeveloped to its current configuration in 1978, and operations have not significantly changed since then. Several subsurface investigations were conducted at the Site between 1989 and 2014. Ecology completed an interim soil remedial cleanup action in 1993.

2.3 Previous Investigations

Subsurface investigations have been conducted on the Site since 1989 to assess potential petroleum-hydrocarbon impacts related to the operation of the retail gasoline station. Applied Geotechnology, Inc. (AGI) conducted a hydrocarbon assessment of the Site in 1989. AGI advanced eight borings, to approximately 15 to 20 feet below ground surface (bgs), adjacent to the northern, southern, and eastern UST nests; gasoline and diesel pump islands; and truck wash area. Six of the borings were completed as 2-inch-diameter monitoring wells. AGI concluded that soil and groundwater gasoline and diesel petroleum hydrocarbon contamination was present around the northern and southern UST nests, and the potential exists for off-site migration of these chemicals of interest (COIs). Detected concentrations of gasoline- and diesel-range TPH and associated petroleum fuel volatile organic compounds (VOCs), specifically benzene, toluene, and total xylenes, are above Ecology's current MTCA Method A CULs. Groundwater flow direction at the Site was assessed to be west to southwesterly (AGI, 1989).

Ecology conducted an interim action cleanup in 1993. Seven USTs, 5,000 gallons in capacity each and located in the northern and southern UST nests, were decommissioned and removed, along with associated product lines. Two additional 500-gallon-capacity USTs, as well as a septic tank full of waste oil, were encountered during the contaminated-soil-excavation activities and were also removed. Ecology reported that, because the septic system had been used for waste oil disposal and was connected to the parcel's storm drain system, the septic tank may be one of the contaminant sources at this parcel (Ecology, 1993). The interim action removed 6,244 cubic yards of contaminated soil and 89,991 gallons of contaminated water. The impacted soil was placed on an on-site treatment pad in the northeastern area of the Site for aeration and biodegradation. Final confirmation samples from the stockpiled soil showed detections of gasoline-range TPH below CULs, with residual diesel-range TPH concentrations above CULs. The USTs were reported to be in good condition, with no holes. However, impacted soil was apparent in the excavation pit (sidewalls and base of the excavation). A petroleum sheen was also observed in groundwater that had seeped into the pit. Ecology also reported the presence of free product in the form of fuel seeps from the excavation sidewalls (Ecology, 1993). The monitoring wells installed in the excavation area by AGI were destroyed during excavation activities. Ecology concluded that groundwater contamination at the Site may be an ongoing issue.

Associated Environmental Group, LLC (AEG) conducted a site characterization of the Site in 2005. Eleven borings were advanced via a direct-push-probe drilling rig to depths ranging from approximately 5 to 8 feet bgs. The borings were placed in the perimeters north, east, and south of the pump islands and UST nests. Shallow soil and groundwater samples were collected at all borings. Analytical results for all samples indicated no detectable presence of petroleum hydrocarbons (AEG, 2005).

In 2005, an unknown volume of diesel was spilled at the Site when a truck driver filling a rig allowed an unattended fueling nozzle to fall out of the tank during fueling activities. The spill spread to a ditch (known as Maddox Creek), which is located adjacent to and east of the Site/Property and flows south parallel to Old Highway 99 South to Hickox Road (approximately 0.68 mile south of the Property). This spill went unreported until the Ecology Spills Team traced the source back to the Truck City parcel (Ecology, Environmental Report Tracking System No. 546209, 2005). Sheen was observed in Maddox Creek. Ecology retained NRC Environmental Services to clean up the spill. Absorbent booms and pads were placed in Maddox Creek. Subsequently, Materials Testing & Consulting, Inc. (MTC) conducted sediment sampling in Maddox Creek, in the vicinity of the Site/Property, to assess whether residual contamination remains in the creek. Based on current data the sediments in Maddox Creek no longer appear to be impacted by releases at the Site.

MTC conducted an initial Phase II environmental site assessment (ESA) in February 2014 and a supplemental ESA in March 2014. Eleven borings were advanced, via a direct-push-probe drilling rig, to a maximum depth of 15 feet bgs. The borings were located in and outside of the former excavation remediation area. Soil samples were collected from all borings for laboratory analyses. One groundwater sample was collected from a boring placed south of the former UST nests in the western area of the Truck City parcel. MTC assessed the condition of several remaining monitoring wells at the Site and concluded that most wells were inaccessible or unusable (MTC, 2014a). A secondary groundwater sample was collected from an existing well located north of the truck scale. Three surficial soil samples were also collected at adjoining parcels to the south. MTC concluded that the remediated area contained localized, residual soil contaminated with petroleum at concentrations below MTCA Method A CULs. However, impacted soil, at concentrations above MTCA CULs for gasoline- and diesel-range TPH, was documented adjacent to the truck scale (MTC, 2014b). Laboratory analytical results for the two groundwater samples indicated no detectable TPH in the gasoline and diesel ranges or associated VOCs, specifically benzene, toluene, ethylbenzene, and total xylenes (BTEX).

2.4 Point of Compliance

For groundwater, the POC is the point or points where the groundwater CULs must be attained for a site to be in compliance with the cleanup standards. Groundwater CULs shall be attained in all groundwaters from the POC to the outer boundary of the hazardous-substance plume. A conditional POC for groundwater is not proposed for the Property at this time.

POCs at the site will include all existing monitoring wells. Sentinel wells will include wells TC-1, TC-2, TC-4, and TC-6. The remaining wells, TC-3 and TC-5, are located at the former source areas. Site CULs, based on protection of surface water, apply at the POC. Compliance monitoring will be conducted at all monitoring wells, TC-1 through TC-6, to evaluate compliance with CULs at the former source areas and downgradient of these areas, near the southern and western perimeter of the Truck City parcel.

Sentinel wells will be used to evaluate whether groundwater at the downgradient POC is in compliance with CULs. IHS concentrations in groundwater at or below action levels will not exceed CULs at the POC. RELs are discussed in Section 4 of this plan. Sentinel wells are designated to allow monitoring between the former source areas and the property boundary of the Truck City parcel.

The fuel spill in 2005 was remediated, and sediment sampling in Maddox Creek at locales downgradient of the Site indicated cleanup activities were completed in accordance with MTCA. Based on current data the sediments in Maddox Creek no longer appear to be impacted by releases at the Site.

3 CONCEPTUAL SITE MODEL

The following is a summary of the investigation findings and the resultant conceptual site model as presented in the public review RI/FS (MFA, 2014).

3.1 Geology and Hydrogeology

The Property and vicinity have been mapped as recent alluvium and artificial fill. Alluvium deposits encountered at the Property, at locations of investigation, consist of floodplain sequences ranging from fluvial silty sand and well sorted sand, to silt with intervening clay. Fill, comprising sandy gravel to gravelly silty sand, was generally present to approximately 3 to 5 feet bgs at the Truck City parcel, except in the former UST nests, where soil remedial cleanup action by Ecology in 1993 overexcavated this area to approximately 9.5 feet bgs. A cross section transect of the Site and a corresponding geologic cross section are presented in Figures 5 and 6, respectively.

The matrix of the unconfined shallow aquifer appears to be silty sand. Depth to groundwater, encountered during subsurface exploration activities, was variable throughout the Site/Property, ranging approximately from 3.5 to 9.5 feet bgs. The static water level at completed monitoring wells TC-1 through TC-6, at the Truck City parcel, ranged approximately from 5.80 to 6.45 feet bgs during the groundwater monitoring and sampling event conducted on July 18, 2014. The direction of groundwater migration at the Site during the July 2014 groundwater event, based on professionally surveyed elevations at monitoring wells TC-1 through TC-6, is generally to the south-southeast, with tangent to the west (refer to Figure 7).

AGI reported a west-to-southwesterly groundwater flow direction at the Site during their investigation in October 1989, based on water levels measured from installed monitoring wells. Seasonal groundwater flow direction fluctuations are expected at the Site/Property and vicinity because of the shallow depth to groundwater in the floodplain area. The local and regional discharge points in the area appear to be to the west-southwest, toward Britt Slough and the Skagit River. At their closest points, Britt Slough and the Skagit River are located approximately 0.5 mile and 1.5 mile, respectively, west of the Property. Maddox Creek, located adjacent east of the Property, flows south, parallel to Old Highway 99 South; intersects at Hickox Road; and flows west from this intersection.

3.2 Source and Nature and Extent of Residual Contamination

Based on historical and MFA's recent subsurface investigations, the source of soil and groundwater contamination is the historical operation of a gasoline station at the Truck City parcel.

IHSs identified for site soil include gasoline-range TPH and ethylbenzene (Table 1). IHSs identified for site groundwater are:

- Gasoline-range TPH
- Diesel-range TPH
- Benzene

The selected remedy for the site addresses these IHSs. There is residual soil contamination on the Truck City parcel adjacent south of the former northern UST nest, in the vicinity of boring TCBH-3 and adjacent east of the truck scale (Figure 8). Site data indicate IHS concentrations exceeding CULs in groundwater adjacent to the former southern and northern UST nests (borings TCBH-1 and TCBH-3, respectively) and the former septic waste oil tank (well TC-5) (MFA, 2014).

Figure 9 and Table 2 show IHSs that were detected in groundwater at concentrations above their respective CULs, based on MFA's remedial investigation conducted in July 2014.

3.2.1.1 Groundwater Contamination

CUL exceedances were detected only in well TC-5 and at borings TCBH-1 and TCBH-3. These locales of investigation represent former source areas at the Truck City parcel. Total arsenic was detected above its CUL only at TC-2; however, in our professional opinion, this detection was due to the high level of turbidity in this groundwater sample, as concentrations of dissolved arsenic from TC-2 were below the CUL (Table 2).

In general, IHS concentrations in shallow groundwater at the Site show decreasing trends of TPH and benzene, based on a comparison and evaluation of historical analytical results from investigations conducted from 1989 through 2014. IHS impacts appear to be localized to the former source areas in the western area of the Truck City parcel.

3.3 Risk Evaluation

The Property is currently zoned "Public." Properties immediately adjacent to the site are largely composed of similar, large-lot commercial and light-industrial uses. The Truck City parcel currently contains two buildings. The northern building is used as the convenience store for the gasoline station. The southern building is a café. The remaining parcels of the Property are undeveloped. The footprint of the proposed county jail encompasses the central area of the Truck City parcel and adjoining southern parcels of the Property. The northwestern portion of the proposed jail will overlie a localized area of soil remediation for removal of historical residual contamination. Figure 10 presents an overlay of the proposed jail with respect to current residual-impacted areas at the Site.

Therefore, it is possible that persons will occupy this area of the Property at some time in the foreseeable future. Any future development will need to be protective of persons at the Property.

The following are potentially complete human health exposure pathways.

Commercial/construction/workers—there are currently no building structures at the localized impacted area at the Site. Therefore, there are no current commercial workers potentially exposed to COIs in soil. However, construction activities likely will be performed as part of site redevelopment. Construction workers could contact IHSs in soil at 0 to 15 feet bgs through incidental ingestion, dermal contact, and inhalation of impacted soil particulates. There is currently no potable water use at or near the Property and there are no known plans to develop this resource. In the future, potable water to the Property may be provided by the Skagit County Public Utility District No. 1, including water for any future development.

The impacted groundwater is shallow and localized. Future construction workers may be exposed to the impacted shallow groundwater through ingestion, dermal contact, and inhalation of chemicals volatilizing from groundwater, and appropriate protection of construction workers will be required.

Remedial action will be required to protect persons from potential exposure to volatile chemicals from the subsurface. Soil gas has the potential to migrate, and, without remedial action, persons in nearby future buildings could potentially be exposed to IHSs.

Note: this is an assessment of current potential exposure scenarios if the Site is not remediated before buildings are constructed. The intent of future cleanup actions and the subsequent recommended cleanup alternative is to remediate the soil and groundwater so that these scenarios are addressed and concerns are negated once buildings are constructed.

Following cleanup, the site will be used as an essential public facility and is anticipated to operate as the county jail.

There is no exposure by ecological receptors at the site. The site is covered by buildings, pavement, or other physical barriers that prevent plants or wildlife from being exposed.

3.4 Post-Remedial Action Conditions

The focus of the compliance groundwater monitoring discussed in this plan is to confirm that the site remedy is protective of groundwater. The primary objectives of the monitoring program are to provide early warning, via sentinel wells, of a potential change in groundwater conditions that could indicate that contaminants could potentially migrate off site (see Section 5 for further details). The surface water exposure pathway has been eliminated by the completed remedial actions associated with Maddox Creek. Monitoring will continue in accordance with this plan to ensure that groundwater protection continues.

4 CLEANUP LEVELS

The compliance monitoring program put forth in this plan relies on sentinel wells (TC-1, TC-2, TC-4, and TC-6) to provide early warning of a possible exceedance of groundwater CULs at the POC. CULs are based on MTCA Method A groundwater CULs (Table 3).

5 MONITORING PROGRAM

This section provides the monitoring program objectives and details, including selection of the monitoring network, stages of monitoring, and the sampling and analysis program.

5.1 Monitoring Objectives

The primary objectives of the groundwater-related remedial actions at the Truck City parcel are to reduce source area concentrations in groundwater, protect groundwater from further contamination, and prevent contaminant migration off site. The groundwater monitoring program will:

- Provide confirmation of the ongoing effectiveness of the site remedy.
- Ensure that CULs are met at the POC.
- Provide early warning, via sentinel wells, of a potential increase in source area groundwater concentrations.
- Prevent exceedances of CULs at the POC through implementation of contingency measures, if needed.

5.2 Monitoring Well Network

The compliance monitoring program relies on the use of sentinel wells (i.e., wells located near the groundwater source area, upgradient of the POC). The compliance monitoring network includes existing wells TC-1 through TC-6 (Figure 11). Sentinel well locations are based on the following criteria:

- They are downgradient of the source area.
- They are situated to allow monitoring for compliance with CULs at the POC and to provide ongoing evaluation of the efficacy of the completed remedial action.

Well logs for TC-1 through TC-6 are provided in the appendix.

The following table summarizes the intended use for each well included in the compliance monitoring network.

Table 4 Compliance Monitoring Network

Monitoring Well	Well Type	Purpose
TC-1	Sentinel well	Assess compliance with CULs
TC-2	Sentinel well	Assess compliance with CULs
TC-3	Source area well	Evaluate remedy effectiveness and contaminant trends
TC-4	Sentinel well	Assess compliance with CULs
TC-5	Source area well	Evaluate remedy effectiveness and contaminant trends
TC-6	Sentinel well	Assess compliance with CULs

Sentinel wells will be monitored for compliance with CULs (see Section 4). The source area wells will be monitored to evaluate concentration trends in the source area and will also be monitored for compliance purposes (i.e., achievement of CULs or action levels).

5.2.1 Monitoring Well Installation

It is assumed that monitoring wells TC-4 and TC-5 will be removed as part of the soil excavation cleanup activities, i.e., excavation and removal of localized residual contamination. Replacement wells will be installed in either the same locations or in their vicinity to continue assessment of these locations on the Truck City parcel. The replacement monitoring wells will be installed in accordance with Washington State well construction standards (WAC 173-160). Soil descriptions and dispositions will be logged during well installations. Site characterization is complete and soil samples will not be collected for chemical analysis. Ecology will be notified within 30 days of the installation of replacement compliance network wells.

5.2.2 Monitoring Well Decommissioning

Inactive monitoring wells, which may include wells that are not included in the compliance monitoring network or compliance network wells that are deemed no longer needed for compliance monitoring (as discussed in the next section), may be decommissioned after consultation and with Ecology's approval. Ecology will be notified at least 30 days prior to well-decommissioning activities. All active wells, and inactive wells that have not yet been decommissioned, will be maintained in order to meet the functional well standards put forth in the Washington State Minimum Standards for Construction and Maintenance of Wells (WAC 173-160). Monitoring well decommissioning will be completed by a licensed well driller in accordance with WAC 173-160.

5.3 Stages of Monitoring

Compliance monitoring at the site will be conducted in three stages in accordance with WAC 173-340-410. This section includes detailed information on each stage of monitoring, including:

- Monitoring frequency
- Data evaluation and compliance requirements and procedures
- Criteria for terminating the compliance monitoring program

The protection and performance monitoring stages will include all compliance network wells, which consist of source area wells and sentinel wells (see Section 5.2 and Figure 5); the confirmational monitoring stage will include only sentinel wells.

If an action level is exceeded in a sentinel well at any time during the monitoring program, then the contingency measures outlined in Section 6 of this plan will go into effect and will be conducted concurrently with other monitoring activities.

Source area wells will be monitored to assess IHS concentration trends in the source area for purposes of better understanding concentration and hydraulic gradients, but will not be used for determining compliance with cleanup requirements.

5.3.1 Protection Monitoring

Protection monitoring is conducted to confirm that human health and the environment are adequately protected during the construction, operation, and maintenance period of a remedial action.

Protection monitoring will be conducted on a quarterly basis for the first four to six quarters of the monitoring program and will involve the entire network of wells (TC-1 through TC-6).

Quarterly monitoring may begin, at the discretion of the property owner and operator, six to nine months after completion of remedial action. Monitoring of the other compliance network wells will continue on the approved schedule.

5.3.2 Performance Monitoring

Performance monitoring is conducted to confirm that the interim action or cleanup action has attained CULs established for the Truck City parcel. Protection monitoring and performance monitoring may be combined and will proceed to the confirmational monitoring stage.

Performance monitoring requirements include attaining four consecutive quarters of either detections below RELs or non-detects at the source area wells.

5.3.3 Confirmational Monitoring

Confirmational monitoring is conducted to confirm the long-term effectiveness of an interim action or cleanup action once CULs have been attained. The confirmational monitoring phase will begin after the performance monitoring requirements have been met (as discussed in the previous section). The monitoring program will be terminated once the confirmational monitoring requirements discussed below have been met.

During the confirmational monitoring stage, only sentinel wells will be monitored. The source area wells will no longer be monitored and may be decommissioned, as discussed in the previous section.

The sentinel wells will be monitored on a quarterly basis until the following requirements have been met:

- IHS concentrations in the sentinel wells have been below action levels for four consecutive quarters, beginning with the first confirmational monitoring event.
- Following four consecutive quarters of concentrations below action levels in sentinel wells during the confirmational monitoring stage, the owner or operator, after consultation with Ecology, may discontinue compliance monitoring and abandon the sentinel wells. Ecology will be provided with a notice of intent to abandon the sentinel wells 30 days prior to abandonment.

The objective of the monitoring program, as stated in Section 5.1, is to prevent groundwater contaminant migration off site by ensuring that the CULs are met at the POC. Meeting the requirements listed for each of the three stages of the monitoring program will provide confirmation that this primary objective has been met, as follows:

- CULs have been achieved in the source area.
- Action levels have not been exceeded in the sentinel wells, and confirmational monitoring indicates that they are not likely to exceed action levels in the future, indicating that the threat of off-site migration has been eliminated.

Therefore, once the confirmational monitoring requirements listed above have been met, the monitoring program may be terminated and the sentinel wells may be decommissioned.

5.4 Sampling and Analysis

Groundwater monitoring will include measuring water levels and water quality parameters (e.g., dissolved oxygen, pH, temperature, and specific conductance) and the collection and analysis of groundwater samples.

Groundwater samples collected in association with routine compliance monitoring activities (i.e., not as part of the contingency measures discussed in Section 6 of this plan) will be analyzed for IHSs, using the following analytical methods or other, comparable, analytical methods deemed to be suitable alternatives and approved for use by Ecology:

- Gasoline-range TPH by Northwest Total Petroleum Hydrocarbon (NWTPH)-Gx with U.S. Environmental Protection Agency (USEPA) 5035 sample preparation
- Diesel-range TPH by NWTPH-Dx Method
- VOCs associated with petroleum fuel, specifically BTEX, by USEPA 8021B with USEPA 5035 sample preparation

The analytical methods used will be verified to ensure that the method reporting limits do not exceed CULs. Additionally, selected groundwater samples will be analyzed for geochemical parameters (including nitrate, manganese, ferrous iron, sulfate, and methane) to continue assessment of the presence of electron acceptors during the biodegradation process and to evaluate the biodegradation of TPH and selected VOCs. Analytical methods for these geochemical parameters include:

- Nitrate by USEPA 353.2
- Manganese by USEPA 6020A
- Ferrous iron by USEPA ApplEnvMic7-87-1536
- Sulfate by ASTM D516-02
- Methane by RSK 175

6 CONTINGENCY MEASURES

Sentinel wells will be monitored during all three stages of the compliance monitoring program (as discussed in the previous section). If an IHS concentration in a sentinel well exceeds the associated CUL nine months after completion of remedial action at the Truck City parcel, then contingency measures will be implemented. Contingency measures are specific followup actions that will be implemented in response to defined triggers, as discussed in the sections below.

Contingencies are organized into four tiers.

6.1 Tier 1

Tier 1 is triggered when, after completion of the remedial action, a CUL is exceeded during two consecutive monitoring events in one (or more) sentinel well(s).

Quarterly monitoring will continue at all sentinel wells until IHS concentrations remain below CULs for four consecutive quarters. Allowing for up to eight quarters of quarterly monitoring will provide sufficient data to evaluate concentration trends and seasonal variations for two consecutive seasons. If IHS concentrations are below CULs for four consecutive quarters before two years of monitoring are complete, monitoring activities may cease after consultation with and Ecology's approval. The Tier 1 contingency action will be considered complete, and Tier 2 contingency measures will not be triggered. However, if IHS concentrations are not below CULs for two consecutive quarters, Tier 2 contingency measures may be triggered.

A longer period of quarterly monitoring may be conducted before proceeding to Tier 2 if:

- IHS concentrations are showing stable or declining trends; and
- No detected IHS concentration is greater than two times an action level.

Ecology will be notified if quarterly monitoring is extended beyond two years. If IHS concentrations are not below action levels for four consecutive quarters at any time during the two-year period, and a Tier 2 contingency has already been implemented for that well(s) and IHS(s), then Tier 3 contingency measures will be triggered.

6.2 Tier 2

Tier 2 contingency measures follow a Tier 1 response and are triggered when IHS concentrations in a sentinel well are not below action CULs for two consecutive quarters at any time during a two-year quarterly monitoring period (or longer if the conditions listed in the previous section are met and Ecology has been notified).

If a Tier 2 contingency is triggered, then supplemental in situ bioremediation will be implemented. Injection of additional bioremediation products by direct-push drilling into the subsurface in the vicinity of monitoring wells with detections above CULs will provide a supplemental source of oxygen to enable the indigenous microorganisms (bacteria) to continue to break down COIs.

If higher action levels are not supported by the Tier 2 modeling work, then Tier 3 contingency measures will be triggered.

6.3 Tier 3

Tier 3 follows a Tier 2 response and is triggered when:

a) Higher action levels are not supported by the Tier 2 work, or

b) IHS concentrations in a sentinel well are not below CULs for four consecutive quarters at any time during a two-year quarterly monitoring period.

Tier 3 involves installation of up to two additional sentinel well(s) in the immediate vicinity, either downgradient or crossgradient, of the existing sentinel well (or wells) with the CUL exceedances. Monitoring in the affected sentinel well(s) will continue on a quarterly basis while the Tier 3 sentinel well locations are selected and the new well(s) are installed and developed. New sentinel wells will be installed in accordance with Ecology regulations.

The purpose of installing a new sentinel well(s) in the vicinity of the original, affected sentinel well is to determine whether the CUL exceedances observed in the original well are localized or representative of widespread groundwater contamination and/or IHS migration at concentrations that exceed CULs.

Following installation and development, the new sentinel wells will be monitored on a quarterly basis and concentrations compared to CULs. If CULs are exceeded in the new wells during any of the next four quarters, Tier 4 contingency measures, as discussed below, will be triggered. If no CULs are exceeded, the original sentinel well will be decommissioned, the new sentinel wells will be incorporated into the compliance monitoring network, and monitoring will proceed according to the current stage of monitoring.

6.4 Tier 4

Tier 4 follows a Tier 3 response and is triggered when CULs are exceeded in new sentinel well(s) installed as a Tier 3 response. Tier 4 involves additional subsurface investigation and/or source characterization, which may indicate a need for additional remedial action(s) in order to ensure that CULs are met at the POC.

Tier 4 contingency measures, if needed, will be determined on a case-by-case basis in consultation with Ecology. However, Tier 4 activities will focus characterization efforts on the upgradient source areas, as identified in the RI/FS (MFA, 2014). Tier 4 will include producing a work plan with proposed additional subsurface characterization and/or source characterization activities and a schedule for completion for review and approval by Ecology.

7 NOTIFICATION AND REPORTING

Ecology will be notified of the following activities:

- Revisions to the compliance monitoring network, including decommissioning or replacement of compliance network wells.
- Reverting to a previous stage of the monitoring program (e.g., from performance monitoring to protection monitoring).
- Proceeding to the confirmational monitoring stage and termination of the monitoring program.
- Tier 1 contingency measures have been triggered or contingency measures have been elevated to the next tier.
- Extending the Tier 1 contingency monitoring beyond two years without initiating Tier 2 contingency measures.

- Implementation of certain contingency measures, including installation of additional sentinel wells, and developing and conducting additional subsurface investigation and/or source area characterization activities.

Groundwater monitoring reports will be prepared on a quarterly basis, at a minimum, unless Ecology has preapproved a longer reporting timeframe. The reports will provide a description of sampling activities, analytical data, field measurements of groundwater quality parameters and groundwater levels, a discussion of analytical data trends, and data validation reports. The data validation reports will provide a review of all raw data to verify that the laboratory has supplied the required quality assurance and quality control deliverables. The data will be validated against USEPA, Washington State, and laboratory-specific criteria for completeness and usability.

8 SCHEDULE

The proposed compliance monitoring activities, as outlined in this plan, will begin within six months following execution of the Prospective Purchaser Consent Decree and Ecology approval of this plan.

LIMITATIONS

The services undertaken in completing this plan were performed consistent with generally accepted professional consulting principles and practices. No other warranty, express or implied, is made. These services were performed consistent with our agreement with our client. This plan is solely for the use and information of our client unless otherwise noted. Any reliance on this plan by a third party is at such party's sole risk.

Opinions and recommendations contained in this plan apply to conditions existing when services were performed and are intended only for the client, purposes, locations, time frames, and project parameters indicated. We are not responsible for the impacts of any changes in environmental standards, practices, or regulations subsequent to performance of services. We do not warrant the accuracy of information supplied by others, or the use of segregated portions of this plan.

REFERENCES

AEG. 2005. Phase II—Site characterization report, Truck City Truck Stop, 3228 Old Highway 99, Mount Ecology. 1993.

AGI. 1989. Hydrocarbon contamination assessment, Truck City Truck Stop, 1731 Old Highway 99 South, Mount Vernon, Washington. Applied Geotechnology, Inc. November 13.

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MTC. 2014a. Phase II environmental site assessment, Truck City site, 3228 Old Highway 99 South, Mount Vernon, WA 98273. Materials Testing & Consulting, Inc. February 17.

MTC. 2014b. Phase II environmental site assessment, Truck City site, 3228 Old Highway 99 South, Mount Vernon, WA 98273. Materials Testing & Consulting, Inc. March 17.

TABLES

Table 1
Summary of Soil Analytical Results
Truck City Site Property
Mount Vernon, Washington

		Location:	TC-1	TC-2	TC-2	TC-2	TC-3	TC-3	TC-4	TC-4	TC-5	TC-5
		Sample Name:	TC1-S2-8.5	TC2-S-6.5	TCDUP-S	TC2-S-15.0	TC3-S-9.7	TC3-S-15.0	TC4-S-7.0	TC4-S-15.0	TC5-S-9.5	TC5-S-15.0
		Collection Date:	7/15/2014	7/17/2014	7/17/2014	7/17/2014	7/17/2014	7/17/2014	7/16/2014	7/16/2014	7/17/2014	7/17/2014
		Collection Depth (ft bgs):	8.5	6.5	6.5	15	9.7	15	7	15	9.5	15
	MTCA Method A URLU	MTCA Method A Industrial										
TPH (mg/kg)												
Gasoline Range Hydrocarbons	30	30	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	--	--
Diesel Range Hydrocarbons	2000	2000	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
Motor Oil Range Hydrocarbons	2000	2000	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U	350	250 U
TPH Identification												
Gasoline Range Hydrocarbons	NV	NV	--	--	--	--	--	--	--	--	--	--
Diesel Range Hydrocarbons	NV	NV	--	--	--	--	--	--	--	--	--	--
Motor Oil Range Hydrocarbons	NV	NV	--	--	--	--	--	--	--	--	--	--
VOCs (mg/kg)												
1,1,1,2-Tetrachloroethane	NV	NV	0.05 U	--	--	--	0.05 U	0.05 U	--	--	--	--
1,1,1-Trichloroethane	2	2	0.05 U	--	--	--	0.05 U	0.05 U	--	--	--	--
1,1,2,2-Tetrachloroethane	NV	NV	0.05 U	--	--	--	0.05 U	0.05 U	--	--	--	--
1,1,2-Trichloroethane	NV	NV	0.05 U	--	--	--	0.05 U	0.05 U	--	--	--	--
1,1-Dichloroethane	NV	NV	0.05 U	--	--	--	0.05 U	0.05 U	--	--	--	--
1,1-Dichloroethene	NV	NV	0.05 U	--	--	--	0.05 U	0.05 U	--	--	--	--
1,1-Dichloropropene	NV	NV	0.05 U	--	--	--	0.05 U	0.05 U	--	--	--	--
1,2,3-Trichlorobenzene	NV	NV	0.25 U	--	--	--	0.25 U	0.25 U	--	--	--	--
1,2,3-Trichloropropane	NV	NV	0.05 U	--	--	--	0.05 U	0.05 U	--	--	--	--
1,2,4-Trichlorobenzene	NV	NV	0.25 U	--	--	--	0.25 U	0.25 U	--	--	--	--
1,2,4-Trimethylbenzene	NV	NV	0.05 U	--	--	--	0.05 U	0.05 U	--	--	--	--
1,2-Dibromo-3-chloropropane	NV	NV	0.5 U	--	--	--	0.5 U	0.5 U	--	--	--	--
1,2-Dibromoethane	0.005	0.005	0.005 U	--	--	--	0.005 UJ	0.005 U	--	--	--	--
1,2-Dichlorobenzene	NV	NV	0.05 U	--	--	--	0.05 U	0.05 U	--	--	--	--
1,2-Dichloroethane	NV	NV	0.05 U	--	--	--	0.05 U	0.05 U	--	--	--	--
1,2-Dichloropropane	NV	NV	0.05 U	--	--	--	0.05 U	0.05 U	--	--	--	--
1,3,5-Trimethylbenzene	NV	NV	0.05 U	--	--	--	0.05 U	0.05 U	--	--	--	--
1,3-Dichlorobenzene	NV	NV	0.05 U	--	--	--	0.05 U	0.05 U	--	--	--	--
1,3-Dichloropropane	NV	NV	0.05 U	--	--	--	0.05 U	0.05 U	--	--	--	--
1,4-Dichlorobenzene	NV	NV	0.05 U	--	--	--	0.05 U	0.05 U	--	--	--	--
2,2-Dichloropropane	NV	NV	0.05 U	--	--	--	0.05 U	0.05 U	--	--	--	--
2-Butanone	NV	NV	0.5 U	--	--	--	0.5 U	0.5 U	--	--	--	--
2-Chlorotoluene	NV	NV	0.05 U	--	--	--	0.05 U	0.05 U	--	--	--	--
2-Hexanone	NV	NV	0.5 U	--	--	--	0.5 U	0.5 U	--	--	--	--

	Location:		TC-1	TC-2	TC-2	TC-2	TC-3	TC-3	TC-4	TC-4	TC-5	TC-5
	Sample Name:		TC1-S2-8.5	TC2-S-6.5	TCDUP-S	TC2-S-15.0	TC3-S-9.7	TC3-S-15.0	TC4-S-7.0	TC4-S-15.0	TC5-S-9.5	TC5-S-15.0
	Collection Date:		7/15/2014	7/17/2014	7/17/2014	7/17/2014	7/17/2014	7/17/2014	7/16/2014	7/16/2014	7/17/2014	7/17/2014
	Collection Depth (ft bgs):		8.5	6.5	6.5	15	9.7	15	7	15	9.5	15
	MTCA Method A URLU	MTCA Method A Industrial										
4-Chlorotoluene	NV	NV	0.05 U	--	--	--	0.05 U	0.05 U	--	--	--	--
4-Isopropyltoluene	NV	NV	0.05 U	--	--	--	0.05 U	0.05 U	--	--	--	--
4-Methyl-2-pentanone	NV	NV	0.5 U	--	--	--	0.5 U	0.5 U	--	--	--	--
Acetone	NV	NV	0.5 U	--	--	--	0.5 U	0.5 U	--	--	--	--
Benzene	0.03	0.03	0.03 U	0.02 U	0.02 U	0.02 U	0.03 U	0.03 U	0.02 U	0.02 U	0.02 U	0.02 U
Bromobenzene	NV	NV	0.05 U	--	--	--	0.05 U	0.05 U	--	--	--	--
Bromodichloromethane	NV	NV	0.05 U	--	--	--	0.05 U	0.05 U	--	--	--	--
Bromoform	NV	NV	0.05 U	--	--	--	0.05 U	0.05 U	--	--	--	--
Bromomethane	NV	NV	0.5 U	--	--	--	0.5 U	0.5 U	--	--	--	--
Carbon tetrachloride	NV	NV	0.05 U	--	--	--	0.05 U	0.05 U	--	--	--	--
Chlorobenzene	NV	NV	0.05 U	--	--	--	0.05 U	0.05 U	--	--	--	--
Chloroethane	NV	NV	0.5 U	--	--	--	0.5 U	0.5 U	--	--	--	--
Chloroform	NV	NV	0.05 U	--	--	--	0.05 U	0.05 U	--	--	--	--
Chloromethane	NV	NV	0.5 UJ	--	--	--	0.5 UJ	0.5 UJ	--	--	--	--
cis-1,2-Dichloroethene	NV	NV	0.05 U	--	--	--	0.05 U	0.05 U	--	--	--	--
cis-1,3-Dichloropropene	NV	NV	0.05 U	--	--	--	0.05 U	0.05 U	--	--	--	--
Dibromochloromethane	NV	NV	0.05 U	--	--	--	0.05 U	0.05 U	--	--	--	--
Dibromomethane	NV	NV	0.05 U	--	--	--	0.05 U	0.05 U	--	--	--	--
Dichlorodifluoromethane	NV	NV	0.5 UR	--	--	--	0.5 UR	0.5 UR	--	--	--	--
Ethylbenzene	6	6	0.05 U	0.02 U	0.02 U	0.02 U	0.05 U	0.05 U	0.02 U	0.02 U	0.02 U	0.04
Hexachlorobutadiene	NV	NV	0.25 U	--	--	--	0.25 U	0.25 U	--	--	--	--
Isopropylbenzene	NV	NV	0.05 U	--	--	--	0.05 U	0.05 U	--	--	--	--
m,p-Xylene	NV	NV	0.1 U	--	--	--	0.1 U	0.1 U	--	--	--	--
Methyl tert-butyl ether	0.1	0.1	0.05 U	--	--	--	0.05 U	0.05 U	--	--	--	--
Methylene chloride	0.02	0.02	0.5 U	--	--	--	0.5 U	0.5 U	--	--	--	--
Naphthalene	5	5	0.05 U	--	--	--	0.05 U	0.05 U	--	--	--	--
n-Hexane	NV	NV	0.25 U	--	--	--	0.25 U	0.25 U	--	--	--	--
n-Propylbenzene	NV	NV	0.05 U	--	--	--	0.05 U	0.05 U	--	--	--	--
o-Xylene	NV	NV	0.05 U	--	--	--	0.05 U	0.05 U	--	--	--	--
sec-Butylbenzene	NV	NV	0.05 U	--	--	--	0.05 U	0.05 U	--	--	--	--
Styrene	NV	NV	0.05 U	--	--	--	0.05 U	0.05 U	--	--	--	--
tert-Butylbenzene	NV	NV	0.05 U	--	--	--	0.05 U	0.05 U	--	--	--	--
Tetrachloroethene	0.05	0.05	0.025 U	--	--	--	0.025 U	0.025 U	--	--	--	--

Table 1
Summary of Soil Analytical Results
Truck City Site Property
Mount Vernon, Washington

		Location:	TC-1	TC-2	TC-2	TC-2	TC-3	TC-3	TC-4	TC-4	TC-5	TC-5
		Sample Name:	TC1-S2-8.5	TC2-S-6.5	TCDUP-S	TC2-S-15.0	TC3-S-9.7	TC3-S-15.0	TC4-S-7.0	TC4-S-15.0	TC5-S-9.5	TC5-S-15.0
		Collection Date:	7/15/2014	7/17/2014	7/17/2014	7/17/2014	7/17/2014	7/17/2014	7/16/2014	7/16/2014	7/17/2014	7/17/2014
		Collection Depth (ft bgs):	8.5	6.5	6.5	15	9.7	15	7	15	9.5	15
	MTCA Method A URLU	MTCA Method A Industrial										
Toluene	7	7	0.05 U	0.02 U	0.02 U	0.02 U	0.05 U	0.05 U	0.02 U	0.02 U	0.02 U	0.02 U
trans-1,2-dichloroethene	NV	NV	0.05 U	--	--	--	0.05 U	0.05 U	--	--	--	--
trans-1,3-Dichloropropene	NV	NV	0.05 U	--	--	--	0.05 U	0.05 U	--	--	--	--
Trichloroethene	0.03	0.03	0.02 U	--	--	--	0.02 U	0.02 U	--	--	--	--
Trichlorofluoromethane	NV	NV	0.5 U	--	--	--	0.5 U	0.5 U	--	--	--	--
Vinyl chloride	NV	NV	0.05 U	--	--	--	0.05 U	0.05 U	--	--	--	--
Xylenes, Total	9	9	--	0.06 U	0.06 U	0.06 U	--	--	0.06 U	0.06 U	0.06 U	0.19
PAHs (mg/kg)												
1-Methylnaphthalene	NV	NV	0.01 U	--	--	--	--	--	0.01 U	0.01 U	--	0.01 U
2-Methylnaphthalene	NV	NV	0.011	--	--	--	--	--	0.01 U	0.01 U	--	0.01 U
Acenaphthene	NV	NV	0.01 U	--	--	--	--	--	0.01 U	0.01 U	--	0.01 U
Acenaphthylene	NV	NV	0.01 U	--	--	--	--	--	0.01 U	0.01 U	--	0.01 U
Anthracene	NV	NV	0.01 U	--	--	--	--	--	0.01 U	0.01 U	--	0.01 U
Benzo(a)anthracene	NV	NV	0.01 U	--	--	--	--	--	0.01 U	0.01 U	--	0.01 U
Benzo(a)pyrene	0.1	2	0.1 U	--	--	--	--	--	0.01 U	0.01 U	--	0.01 U
Benzo(b)fluoranthene	NV	NV	0.1 U	--	--	--	--	--	0.01 U	0.01 U	--	0.01 U
Benzo(ghi)perylene	NV	NV	0.1 U	--	--	--	--	--	0.01 U	0.01 U	--	0.01 U
Benzo(k)fluoranthene	NV	NV	0.1 U	--	--	--	--	--	0.01 U	0.01 U	--	0.01 U
Chrysene	NV	NV	0.026	--	--	--	--	--	0.01 U	0.01 U	--	0.01 U
Dibenzo(a,h)anthracene	NV	NV	0.1 U	--	--	--	--	--	0.01 U	0.01 U	--	0.01 U
Fluoranthene	NV	NV	0.01 U	--	--	--	--	--	0.01 U	0.01 U	--	0.01 U
Fluorene	NV	NV	0.01 U	--	--	--	--	--	0.01 U	0.01 U	--	0.01 U
Indeno(1,2,3-cd)pyrene	NV	NV	0.1 U	--	--	--	--	--	0.01 U	0.01 U	--	0.01 U
Naphthalene	5	5	0.01 U	--	--	--	--	--	0.01 U	0.01 U	--	0.01 U
Phenanthrene	NV	NV	0.013	--	--	--	--	--	0.01 U	0.01 U	--	0.01 U
Pyrene	NV	NV	0.01 U	--	--	--	--	--	0.01 U	0.01 U	--	0.01 U
Metals (mg/kg)												
Arsenic	20	20	--	6.34	--	6.94	2.9	1 U	--	--	--	--
Barium	NV	NV	--	26.1	--	51.5	30.4	6.69	--	--	--	--
Cadmium	2	2	--	1 U	--	1 U	1 U	1 U	--	--	--	--
Chromium	19[a]	19[a]	--	8.87	--	15.4	8.03	3.35	--	--	--	--
Lead	250	1000	--	3.12	--	4.85	2.49	1 U	--	--	--	--
Mercury	2	2	--	0.1 U	--	0.1 U	0.1 U	0.1 U	--	--	--	--

Table 1
Summary of Soil Analytical Results
Truck City Site Property
Mount Vernon, Washington

Location:			TC-1	TC-2	TC-2	TC-2	TC-3	TC-3	TC-4	TC-4	TC-5	TC-5
Sample Name:			TC1-S2-8.5	TC2-S-6.5	TCDUP-S	TC2-S-15.0	TC3-S-9.7	TC3-S-15.0	TC4-S-7.0	TC4-S-15.0	TC5-S-9.5	TC5-S-15.0
Collection Date:			7/15/2014	7/17/2014	7/17/2014	7/17/2014	7/17/2014	7/17/2014	7/16/2014	7/16/2014	7/17/2014	7/17/2014
Collection Depth (ft bgs):			8.5	6.5	6.5	15	9.7	15	7	15	9.5	15
	MTCA Method A URLU	MTCA Method A Industrial										
Selenium	NV	NV	--	1 U	--	1 U	1 U	1 U	--	--	--	--
Silver	NV	NV	--	1 U	--	1 U	1 U	1 U	--	--	--	--
EPH (mg/kg)			--	--	--	--	--	--	--	--	--	
C8-C10 Aliphatic Hydrocarbons	NV	NV	--	--	--	--	--	--	--	--	--	5.74 U
C10-C12 Aliphatic Hydrocarbons	NV	NV	--	--	--	--	--	--	--	--	--	5.74 U
C12-C16 Aliphatic Hydrocarbons	NV	NV	--	--	--	--	--	--	--	--	--	5.74 U
C16-C21 Aliphatic Hydrocarbons	NV	NV	--	--	--	--	--	--	--	--	--	5.74 U
C21-C34 Aliphatic Hydrocarbons	NV	NV	--	--	--	--	--	--	--	--	--	408
C8-C10 Aromatic Hydrocarbons	NV	NV	--	--	--	--	--	--	--	--	--	5.74 U
C10-C12 Aromatic Hydrocarbons	NV	NV	--	--	--	--	--	--	--	--	--	5.74 U
C12-C16 Aromatic Hydrocarbons	NV	NV	--	--	--	--	--	--	--	--	--	5.74 U
C16-C21 Aromatic Hydrocarbons	NV	NV	--	--	--	--	--	--	--	--	--	5.74 U
C21-C34 Aromatic Hydrocarbons	NV	NV	--	--	--	--	--	--	--	--	--	510

Table 1
Summary of Soil Analytical Results
Truck City Site Property
Mount Vernon, Washington

		Location:	TC-6	TC-6	TCBH-1	TCBH-2	**TCBH-3**	TCBH-3	TCBH-4	TCBH-4	TCBH-5	TCBH-5
		Sample Name:	TC6-S-7.0	TC6-S-15.0	TCBH1-S-8.5	TCBH2-S-15.0	**TCBH3-S-8.5**	TCBH3-S-14.5	TCBH4-S-6.0	TCBH4-S-15.0	TCBH5-S-4.5	TCBH5-S-15.0
		Collection Date:	7/17/2014	7/17/2014	7/15/2014	7/15/2014	7/15/2014	7/15/2014	7/15/2014	7/15/2014	7/18/2014	7/18/2014
		Collection Depth (ft bgs):	7	15	8.5	15	8.5	14.5	6	15	4.5	15
	MTCA Method A URLU	MTCA Method A Industrial										
TPH (mg/kg)												
Gasoline Range Hydrocarbons	30	30	2 U	2 U	2 U	2 U	**2800**	2 U	2 U	2 U	2 U	2 U
Diesel Range Hydrocarbons	2000	2000	50 U	50 U	50 U	50 U	950	50 U	50 U	50 U	50 U	50 U
Motor Oil Range Hydrocarbons	2000	2000	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U
TPH Identification												
Gasoline Range Hydrocarbons	NV	NV	--	--	--	--	--	--	--	--	--	--
Diesel Range Hydrocarbons	NV	NV	--	--	--	--	--	--	--	--	--	--
Motor Oil Range Hydrocarbons	NV	NV	--	--	--	--	--	--	--	--	--	--
VOCs (mg/kg)												
1,1,1,2-Tetrachloroethane	NV	NV	--	--	--	--	0.05 U	--	--	--	--	--
1,1,1-Trichloroethane	2	2	--	--	--	--	0.05 U	--	--	--	--	--
1,1,2,2-Tetrachloroethane	NV	NV	--	--	--	--	0.05 U	--	--	--	--	--
1,1,2-Trichloroethane	NV	NV	--	--	--	--	0.05 U	--	--	--	--	--
1,1-Dichloroethane	NV	NV	--	--	--	--	0.05 U	--	--	--	--	--
1,1-Dichloroethene	NV	NV	--	--	--	--	0.05 U	--	--	--	--	--
1,1-Dichloropropene	NV	NV	--	--	--	--	0.05 U	--	--	--	--	--
1,2,3-Trichlorobenzene	NV	NV	--	--	--	--	0.25 U	--	--	--	--	--
1,2,3-Trichloropropane	NV	NV	--	--	--	--	0.05 U	--	--	--	--	--
1,2,4-Trichlorobenzene	NV	NV	--	--	--	--	0.25 U	--	--	--	--	--
1,2,4-Trimethylbenzene	NV	NV	--	--	--	--	0.34	--	--	--	--	--
1,2-Dibromo-3-chloropropane	NV	NV	--	--	--	--	0.5 U	--	--	--	--	--
1,2-Dibromoethane	0.005	0.005	--	--	--	--	0.005 UJ	--	--	--	--	--
1,2-Dichlorobenzene	NV	NV	--	--	--	--	0.05 U	--	--	--	--	--
1,2-Dichloroethane	NV	NV	--	--	--	--	0.05 U	--	--	--	--	--
1,2-Dichloropropane	NV	NV	--	--	--	--	0.05 U	--	--	--	--	--
1,3,5-Trimethylbenzene	NV	NV	--	--	--	--	0.77	--	--	--	--	--
1,3-Dichlorobenzene	NV	NV	--	--	--	--	0.05 U	--	--	--	--	--
1,3-Dichloropropane	NV	NV	--	--	--	--	0.05 U	--	--	--	--	--
1,4-Dichlorobenzene	NV	NV	--	--	--	--	0.05 U	--	--	--	--	--
2,2-Dichloropropane	NV	NV	--	--	--	--	0.05 U	--	--	--	--	--
2-Butanone	NV	NV	--	--	--	--	0.5 U	--	--	--	--	--
2-Chlorotoluene	NV	NV	--	--	--	--	0.05 U	--	--	--	--	--
2-Hexanone	NV	NV	--	--	--	--	0.5 U	--	--	--	--	--

Table 1
Summary of Soil Analytical Results
Truck City Site Property
Mount Vernon, Washington

	Location:		TC-6	TC-6	TCBH-1	TCBH-2	**TCBH-3**	TCBH-3	TCBH-4	TCBH-4	TCBH-5	TCBH-5
	Sample Name:		TC6-S-7.0	TC6-S-15.0	TCBH1-S-8.5	TCBH2-S-15.0	**TCBH3-S-8.5**	TCBH3-S-14.5	TCBH4-S-6.0	TCBH4-S-15.0	TCBH5-S-4.5	TCBH5-S-15.0
	Collection Date:		7/17/2014	7/17/2014	7/15/2014	7/15/2014	7/15/2014	7/15/2014	7/15/2014	7/15/2014	7/18/2014	7/18/2014
	Collection Depth (ft bgs):		7	15	8.5	15	8.5	14.5	6	15	4.5	15
	MTCA Method A URLU	MTCA Method A Industrial										
4-Chlorotoluene	NV	NV	--	--	--	--	0.05 U	--	--	--	--	--
4-Isopropyltoluene	NV	NV	--	--	--	--	0.47	--	--	--	--	--
4-Methyl-2-pentanone	NV	NV	--	--	--	--	0.5 U	--	--	--	--	--
Acetone	NV	NV	--	--	--	--	0.5 U	--	--	--	--	--
Benzene	0.03	0.03	0.02 U	0.02 U	0.02 U	0.02 U	0.03 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Bromobenzene	NV	NV	--	--	--	--	0.05 U	--	--	--	--	--
Bromodichloromethane	NV	NV	--	--	--	--	0.05 U	--	--	--	--	--
Bromoform	NV	NV	--	--	--	--	0.05 U	--	--	--	--	--
Bromomethane	NV	NV	--	--	--	--	0.5 U	--	--	--	--	--
Carbon tetrachloride	NV	NV	--	--	--	--	0.05 U	--	--	--	--	--
Chlorobenzene	NV	NV	--	--	--	--	0.05 U	--	--	--	--	--
Chloroethane	NV	NV	--	--	--	--	0.5 U	--	--	--	--	--
Chloroform	NV	NV	--	--	--	--	0.05 U	--	--	--	--	--
Chloromethane	NV	NV	--	--	--	--	0.5 UJ	--	--	--	--	--
cis-1,2-Dichloroethene	NV	NV	--	--	--	--	0.05 U	--	--	--	--	--
cis-1,3-Dichloropropene	NV	NV	--	--	--	--	0.05 U	--	--	--	--	--
Dibromochloromethane	NV	NV	--	--	--	--	0.05 U	--	--	--	--	--
Dibromomethane	NV	NV	--	--	--	--	0.05 U	--	--	--	--	--
Dichlorodifluoromethane	NV	NV	--	--	--	--	0.5 UR	--	--	--	--	--
Ethylbenzene	6	6	0.02 U	0.02 U	0.02 U	0.02 U	**7.8**	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Hexachlorobutadiene	NV	NV	--	--	--	--	0.25 U	--	--	--	--	--
Isopropylbenzene	NV	NV	--	--	--	--	1.7	--	--	--	--	--
m,p-Xylene	NV	NV	--	--	--	--	0.31	--	--	--	--	--
Methyl tert-butyl ether	0.1	0.1	--	--	--	--	0.05 U	--	--	--	--	--
Methylene chloride	0.02	0.02	--	--	--	--	0.5 U	--	--	--	--	--
Naphthalene	5	5	--	--	--	--	3.1	--	--	--	--	--
n-Hexane	NV	NV	--	--	--	--	4.9	--	--	--	--	--
n-Propylbenzene	NV	NV	--	--	--	--	7.4	--	--	--	--	--
o-Xylene	NV	NV	--	--	--	--	0.23	--	--	--	--	--
sec-Butylbenzene	NV	NV	--	--	--	--	1	--	--	--	--	--
Styrene	NV	NV	--	--	--	--	0.05 U	--	--	--	--	--
tert-Butylbenzene	NV	NV	--	--	--	--	0.05 U	--	--	--	--	--
Tetrachloroethene	0.05	0.05	--	--	--	--	0.025 U	--	--	--	--	--

	MTCA Method A URLU	MTCA Method A Industrial	TC-6	TC-6	TCBH-1	TCBH-2	**TCBH-3**	TCBH-3	TCBH-4	TCBH-4	TCBH-5	TCBH-5
Location:			TC-6	TC-6	TCBH-1	TCBH-2	**TCBH-3**	TCBH-3	TCBH-4	TCBH-4	TCBH-5	TCBH-5
Sample Name:			TC6-S-7.0	TC6-S-15.0	TCBH1-S-8.5	TCBH2-S-15.0	**TCBH3-S-8.5**	TCBH3-S-14.5	TCBH4-S-6.0	TCBH4-S-15.0	TCBH5-S-4.5	TCBH5-S-15.0
Collection Date:			7/17/2014	7/17/2014	7/15/2014	7/15/2014	7/15/2014	7/15/2014	7/15/2014	7/15/2014	7/18/2014	7/18/2014
Collection Depth (ft bgs):			7	15	8.5	15	8.5	14.5	6	15	4.5	15
Toluene	7	7	0.02 U	0.02 U	0.02 U	0.02 U	0.05 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
trans-1,2-dichloroethene	NV	NV	--	--	--	--	0.05 U	--	--	--	--	--
trans-1,3-Dichloropropene	NV	NV	--	--	--	--	0.05 U	--	--	--	--	--
Trichloroethene	0.03	0.03	--	--	--	--	0.02 U	--	--	--	--	--
Trichlorofluoromethane	NV	NV	--	--	--	--	0.5 U	--	--	--	--	--
Vinyl chloride	NV	NV	--	--	--	--	0.05 U	--	--	--	--	--
Xylenes, Total	9	9	0.06 U	0.06 U	0.06 U	0.06 U	--	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U
PAHs (mg/kg)												
1-Methylnaphthalene	NV	NV	--	--	--	--	--	--	--	--	--	--
2-Methylnaphthalene	NV	NV	--	--	--	--	--	--	--	--	--	--
Acenaphthene	NV	NV	--	--	--	--	--	--	--	--	--	--
Acenaphthylene	NV	NV	--	--	--	--	--	--	--	--	--	--
Anthracene	NV	NV	--	--	--	--	--	--	--	--	--	--
Benzo(a)anthracene	NV	NV	--	--	--	--	--	--	--	--	--	--
Benzo(a)pyrene	0.1	2	--	--	--	--	--	--	--	--	--	--
Benzo(b)fluoranthene	NV	NV	--	--	--	--	--	--	--	--	--	--
Benzo(ghi)perylene	NV	NV	--	--	--	--	--	--	--	--	--	--
Benzo(k)fluoranthene	NV	NV	--	--	--	--	--	--	--	--	--	--
Chrysene	NV	NV	--	--	--	--	--	--	--	--	--	--
Dibenzo(a,h)anthracene	NV	NV	--	--	--	--	--	--	--	--	--	--
Fluoranthene	NV	NV	--	--	--	--	--	--	--	--	--	--
Fluorene	NV	NV	--	--	--	--	--	--	--	--	--	--
Indeno(1,2,3-cd)pyrene	NV	NV	--	--	--	--	--	--	--	--	--	--
Naphthalene	5	5	--	--	--	--	--	--	--	--	--	--
Phenanthrene	NV	NV	--	--	--	--	--	--	--	--	--	--
Pyrene	NV	NV	--	--	--	--	--	--	--	--	--	--
Metals (mg/kg)												
Arsenic	20	20	--	--	--	--	--	--	--	--	--	--
Barium	NV	NV	--	--	--	--	--	--	--	--	--	--
Cadmium	2	2	--	--	--	--	--	--	--	--	--	--
Chromium	19[a]	19[a]	--	--	--	--	--	--	--	--	--	--
Lead	250	1000	--	--	--	--	--	--	--	--	--	--
Mercury	2	2	--	--	--	--	--	--	--	--	--	--

Table 1
Summary of Soil Analytical Results
Truck City Site Property
Mount Vernon, Washington

Location:			TC-6	TC-6	TCBH-1	TCBH-2	**TCBH-3**	TCBH-3	TCBH-4	TCBH-4	TCBH-5	TCBH-5
Sample Name:			TC6-S-7.0	TC6-S-15.0	TCBH1-S-8.5	TCBH2-S-15.0	**TCBH3-S-8.5**	TCBH3-S-14.5	TCBH4-S-6.0	TCBH4-S-15.0	TCBH5-S-4.5	TCBH5-S-15.0
Collection Date:			7/17/2014	7/17/2014	7/15/2014	7/15/2014	7/15/2014	7/15/2014	7/15/2014	7/15/2014	7/18/2014	7/18/2014
Collection Depth (ft bgs):			7	15	8.5	15	8.5	14.5	6	15	4.5	15
	MTCA Method A URLU	MTCA Method A Industrial										
Selenium	NV	NV	--	--	--	--	--	--	--	--	--	--
Silver	NV	NV	--	--	--	--	--	--	--	--	--	--
EPH (mg/kg)			--	--	--	--	--	--	--	--	--	--
C8-C10 Aliphatic Hydrocarbons	NV	NV	--	--	--	--	--	--	--	--	--	--
C10-C12 Aliphatic Hydrocarbons	NV	NV	--	--	--	--	--	--	--	--	--	--
C12-C16 Aliphatic Hydrocarbons	NV	NV	--	--	--	--	--	--	--	--	--	--
C16-C21 Aliphatic Hydrocarbons	NV	NV	--	--	--	--	--	--	--	--	--	--
C21-C34 Aliphatic Hydrocarbons	NV	NV	--	--	--	--	--	--	--	--	--	--
C8-C10 Aromatic Hydrocarbons	NV	NV	--	--	--	--	--	--	--	--	--	--
C10-C12 Aromatic Hydrocarbons	NV	NV	--	--	--	--	--	--	--	--	--	--
C12-C16 Aromatic Hydrocarbons	NV	NV	--	--	--	--	--	--	--	--	--	--
C16-C21 Aromatic Hydrocarbons	NV	NV	--	--	--	--	--	--	--	--	--	--
C21-C34 Aromatic Hydrocarbons	NV	NV	--	--	--	--	--	--	--	--	--	--

Table 1
Summary of Soil Analytical Results
Truck City Site Property
Mount Vernon, Washington

		Location:	TCBH-6	TCBH-7	TCBH-8	TCBH-8	TCBH-9	TCBH-9	TCBH-10	TCBH-11	TCBH-12	TCBH-13	TCBH-14
		Sample Name:	TCBH6-S-4.8	TCBH7-S-15.0	TCBH8-S-9.5	TCBH8-S-15.0	TCBH9-S-9.5	TCBH9-S-15.0	TCBH10-S-4.0	TCBH11-S-4.7	TCBH12-S-3.5	TCBH13-S-4.5	TCBH14-S-8.5
		Collection Date:	7/16/2014	7/16/2014	7/16/2014	7/16/2014	7/16/2014	7/16/2014	7/18/2014	7/18/2014	7/18/2014	7/18/2014	7/18/2014
		Collection Depth (ft bgs):	4.8	15	9.5	15	9.5	15	4	4.7	3.5	4.5	8.5
	MTCA Method A URLU	MTCA Method A Industrial											
TPH (mg/kg)													
Gasoline Range Hydrocarbons	30	30	--	2 U	2 U	2 U	2 U	2 U	--	--	--	--	--
Diesel Range Hydrocarbons	2000	2000	--	50 U	50 U	50 U	50 U	50 U	--	--	--	--	--
Motor Oil Range Hydrocarbons	2000	2000	--	250 U	250 U	250 U	250 U	250 U	--	--	--	--	--
TPH Identification													
Gasoline Range Hydrocarbons	NV	NV	ND	--	--	--	--	--	ND	ND	ND	ND	ND
Diesel Range Hydrocarbons	NV	NV	ND	--	--	--	--	--	ND	ND	ND	ND	ND
Motor Oil Range Hydrocarbons	NV	NV	ND	--	--	--	--	--	ND	ND	ND	ND	ND
VOCs (mg/kg)													
1,1,1,2-Tetrachloroethane	NV	NV	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	2	2	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	NV	NV	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	NV	NV	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	NV	NV	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethene	NV	NV	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloropropene	NV	NV	--	--	--	--	--	--	--	--	--	--	--
1,2,3-Trichlorobenzene	NV	NV	--	--	--	--	--	--	--	--	--	--	--
1,2,3-Trichloropropane	NV	NV	--	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	NV	NV	--	--	--	--	--	--	--	--	--	--	--
1,2,4-Trimethylbenzene	NV	NV	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromo-3-chloropropane	NV	NV	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	0.005	0.005	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	NV	NV	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	NV	NV	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	NV	NV	--	--	--	--	--	--	--	--	--	--	--
1,3,5-Trimethylbenzene	NV	NV	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	NV	NV	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichloropropane	NV	NV	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	NV	NV	--	--	--	--	--	--	--	--	--	--	--
2,2-Dichloropropane	NV	NV	--	--	--	--	--	--	--	--	--	--	--
2-Butanone	NV	NV	--	--	--	--	--	--	--	--	--	--	--
2-Chlorotoluene	NV	NV	--	--	--	--	--	--	--	--	--	--	--
2-Hexanone	NV	NV	--	--	--	--	--	--	--	--	--	--	--

Table 1
Summary of Soil Analytical Results
Truck City Site Property
Mount Vernon, Washington

		Location:	TCBH-6	TCBH-7	TCBH-8	TCBH-8	TCBH-9	TCBH-9	TCBH-10	TCBH-11	TCBH-12	TCBH-13	TCBH-14
		Sample Name:	TCBH6-S-4.8	TCBH7-S-15.0	TCBH8-S-9.5	TCBH8-S-15.0	TCBH9-S-9.5	TCBH9-S-15.0	TCBH10-S-4.0	TCBH11-S-4.7	TCBH12-S-3.5	TCBH13-S-4.5	TCBH14-S-8.5
		Collection Date:	7/16/2014	7/16/2014	7/16/2014	7/16/2014	7/16/2014	7/16/2014	7/18/2014	7/18/2014	7/18/2014	7/18/2014	7/18/2014
		Collection Depth (ft bgs):	4.8	15	9.5	15	9.5	15	4	4.7	3.5	4.5	8.5
	MTCA Method A URLU	MTCA Method A Industrial											
4-Chlorotoluene	NV	NV	--	--	--	--	--	--	--	--	--	--	--
4-Isopropyltoluene	NV	NV	--	--	--	--	--	--	--	--	--	--	--
4-Methyl-2-pentanone	NV	NV	--	--	--	--	--	--	--	--	--	--	--
Acetone	NV	NV	--	--	--	--	--	--	--	--	--	--	--
Benzene	0.03	0.03	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Bromobenzene	NV	NV	--	--	--	--	--	--	--	--	--	--	--
Bromodichloromethane	NV	NV	--	--	--	--	--	--	--	--	--	--	--
Bromoform	NV	NV	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	NV	NV	--	--	--	--	--	--	--	--	--	--	--
Carbon tetrachloride	NV	NV	--	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	NV	NV	--	--	--	--	--	--	--	--	--	--	--
Chloroethane	NV	NV	--	--	--	--	--	--	--	--	--	--	--
Chloroform	NV	NV	--	--	--	--	--	--	--	--	--	--	--
Chloromethane	NV	NV	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	NV	NV	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	NV	NV	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	NV	NV	--	--	--	--	--	--	--	--	--	--	--
Dibromomethane	NV	NV	--	--	--	--	--	--	--	--	--	--	--
Dichlorodifluoromethane	NV	NV	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	6	6	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Hexachlorobutadiene	NV	NV	--	--	--	--	--	--	--	--	--	--	--
Isopropylbenzene	NV	NV	--	--	--	--	--	--	--	--	--	--	--
m,p-Xylene	NV	NV	--	--	--	--	--	--	--	--	--	--	--
Methyl tert-butyl ether	0.1	0.1	--	--	--	--	--	--	--	--	--	--	--
Methylene chloride	0.02	0.02	--	--	--	--	--	--	--	--	--	--	--
Naphthalene	5	5	--	--	--	--	--	--	--	--	--	--	--
n-Hexane	NV	NV	--	--	--	--	--	--	--	--	--	--	--
n-Propylbenzene	NV	NV	--	--	--	--	--	--	--	--	--	--	--
o-Xylene	NV	NV	--	--	--	--	--	--	--	--	--	--	--
sec-Butylbenzene	NV	NV	--	--	--	--	--	--	--	--	--	--	--
Styrene	NV	NV	--	--	--	--	--	--	--	--	--	--	--
tert-Butylbenzene	NV	NV	--	--	--	--	--	--	--	--	--	--	--
Tetrachloroethene	0.05	0.05	--	--	--	--	--	--	--	--	--	--	--

Table 1
Summary of Soil Analytical Results
Truck City Site Property
Mount Vernon, Washington

		Location:	TCBH-6	TCBH-7	TCBH-8	TCBH-8	TCBH-9	TCBH-9	TCBH-10	TCBH-11	TCBH-12	TCBH-13	TCBH-14
		Sample Name:	TCBH6-S-4.8	TCBH7-S-15.0	TCBH8-S-9.5	TCBH8-S-15.0	TCBH9-S-9.5	TCBH9-S-15.0	TCBH10-S-4.0	TCBH11-S-4.7	TCBH12-S-3.5	TCBH13-S-4.5	TCBH14-S-8.5
		Collection Date:	7/16/2014	7/16/2014	7/16/2014	7/16/2014	7/16/2014	7/16/2014	7/18/2014	7/18/2014	7/18/2014	7/18/2014	7/18/2014
		Collection Depth (ft bgs):	4.8	15	9.5	15	9.5	15	4	4.7	3.5	4.5	8.5
	MTCA Method A URLU	MTCA Method A Industrial											
Toluene	7	7	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
trans-1,2-dichloroethene	NV	NV	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	NV	NV	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	0.03	0.03	--	--	--	--	--	--	--	--	--	--	--
Trichlorofluoromethane	NV	NV	--	--	--	--	--	--	--	--	--	--	--
Vinyl chloride	NV	NV	--	--	--	--	--	--	--	--	--	--	--
Xylenes, Total	9	9	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U
PAHs (mg/kg)													
1-Methylnaphthalene	NV	NV	--	--	--	--	--	--	--	--	--	--	--
2-Methylnaphthalene	NV	NV	--	--	--	--	--	--	--	--	--	--	--
Acenaphthene	NV	NV	--	--	--	--	--	--	--	--	--	--	--
Acenaphthylene	NV	NV	--	--	--	--	--	--	--	--	--	--	--
Anthracene	NV	NV	--	--	--	--	--	--	--	--	--	--	--
Benzo(a)anthracene	NV	NV	--	--	--	--	--	--	--	--	--	--	--
Benzo(a)pyrene	0.1	2	--	--	--	--	--	--	--	--	--	--	--
Benzo(b)fluoranthene	NV	NV	--	--	--	--	--	--	--	--	--	--	--
Benzo(ghi)perylene	NV	NV	--	--	--	--	--	--	--	--	--	--	--
Benzo(k)fluoranthene	NV	NV	--	--	--	--	--	--	--	--	--	--	--
Chrysene	NV	NV	--	--	--	--	--	--	--	--	--	--	--
Dibenzo(a,h)anthracene	NV	NV	--	--	--	--	--	--	--	--	--	--	--
Fluoranthene	NV	NV	--	--	--	--	--	--	--	--	--	--	--
Fluorene	NV	NV	--	--	--	--	--	--	--	--	--	--	--
Indeno(1,2,3-cd)pyrene	NV	NV	--	--	--	--	--	--	--	--	--	--	--
Naphthalene	5	5	--	--	--	--	--	--	--	--	--	--	--
Phenanthrene	NV	NV	--	--	--	--	--	--	--	--	--	--	--
Pyrene	NV	NV	--	--	--	--	--	--	--	--	--	--	--
Metals (mg/kg)													
Arsenic	20	20	--	--	--	--	--	--	--	--	--	--	--
Barium	NV	NV	--	--	--	--	--	--	--	--	--	--	--
Cadmium	2	2	--	--	--	--	--	--	--	--	--	--	--
Chromium	19[a]	19[a]	--	--	--	--	--	--	--	--	--	--	--
Lead	250	1000	--	--	--	--	--	--	--	--	--	--	--
Mercury	2	2	--	--	--	--	--	--	--	--	--	--	--

Table 1
Summary of Soil Analytical Results
Truck City Site Property
Mount Vernon, Washington

	Location:		TCBH-6	TCBH-7	TCBH-8	TCBH-8	TCBH-9	TCBH-9	TCBH-10	TCBH-11	TCBH-12	TCBH-13	TCBH-14
	Sample Name:		TCBH6-S-4.8	TCBH7-S-15.0	TCBH8-S-9.5	TCBH8-S-15.0	TCBH9-S-9.5	TCBH9-S-15.0	TCBH10-S-4.0	TCBH11-S-4.7	TCBH12-S-3.5	TCBH13-S-4.5	TCBH14-S-8.5
	Collection Date:		7/16/2014	7/16/2014	7/16/2014	7/16/2014	7/16/2014	7/16/2014	7/18/2014	7/18/2014	7/18/2014	7/18/2014	7/18/2014
	Collection Depth (ft bgs):		4.8	15	9.5	15	9.5	15	4	4.7	3.5	4.5	8.5
	MTCA Method A URLU	MTCA Method A Industrial											
Selenium	NV	NV	--	--	--	--	--	--	--	--	--	--	--
Silver	NV	NV	--	--	--	--	--	--	--	--	--	--	--
EPH (mg/kg)			--	--	--	--	--	--	--	--	--	--	--
C8-C10 Aliphatic Hydrocarbons	NV	NV	--	--	--	--	--	--	--	--	--	--	--
C10-C12 Aliphatic Hydrocarbons	NV	NV	--	--	--	--	--	--	--	--	--	--	--
C12-C16 Aliphatic Hydrocarbons	NV	NV	--	--	--	--	--	--	--	--	--	--	--
C16-C21 Aliphatic Hydrocarbons	NV	NV	--	--	--	--	--	--	--	--	--	--	--
C21-C34 Aliphatic Hydrocarbons	NV	NV	--	--	--	--	--	--	--	--	--	--	--
C8-C10 Aromatic Hydrocarbons	NV	NV	--	--	--	--	--	--	--	--	--	--	--
C10-C12 Aromatic Hydrocarbons	NV	NV	--	--	--	--	--	--	--	--	--	--	--
C12-C16 Aromatic Hydrocarbons	NV	NV	--	--	--	--	--	--	--	--	--	--	--
C16-C21 Aromatic Hydrocarbons	NV	NV	--	--	--	--	--	--	--	--	--	--	--
C21-C34 Aromatic Hydrocarbons	NV	NV	--	--	--	--	--	--	--	--	--	--	--

NOTES:

Result values in **bold** font indicate exceedance of MTCA Method A cleanup level. Non-detect results are not evaluated against MTCA cleanup levels.

Analytes and sample names with exceedances are also in **bold** font.

-- = not analyzed.

EPH = extractable petroleum hydrocarbons.

ft bgs = feet below ground surface.

J = the result is an estimated value.

mg/kg = milligrams per kilogram.

MTCA Method A = Model Toxics Control Act Method A.

ND = not detected

NV = no value.

PAHs = polycyclic aromatic hydrocarbons.

R = roentgen

TPH = total petroleum hydrocarbons.

U = the result is non-detect.

URLU = unrestricted land use.

VOCs = volatile organic compounds.

[a]MTCA Method A CUL for Hexavalent Chromium.

Table 2
Summary of Groundwater Analytical Results
Truck City Site Property
Mount Vernon, Washington

	Location:	TC-1	TC-1	**TC-2**	TC-3	TC-4	**TC-5**	TC-6	**TCBH-1**	TCBH-2
	Sample Name:	TC1-W-10.0	TCDup-W-10.0	**TC2-W-10.0**	TC3-W-10.0	TC4-W-10.0	**TC5-W-10.0**	TC6-W-10.0	**TCBH1-W-8.5**	TCBH2-W-8.5
	Collection Date:	7/17/2014	7/17/2014	7/18/2014	7/17/2014	7/18/2014	7/17/2014	7/18/2014	7/15/2014	7/15/2014
	Collection Depth (ft bgs):	10	10	10	10	10	10	10	8.5	8.5
	MTCA Method A									
TPH (ug/L)										
Gasoline Range Hydrocarbons	800	100 U	100 U	100 U	380	100 U	**800**	100 U	100 U	100 U
Diesel Range Hydrocarbons	500	120 J	--	50 U	--	50 U	360 J	89 J	**790** J	50 U
Motor Oil Range Hydrocarbons	500	250 U	--	250 U	--	250 U	250 U	250 U	250 U	250 U
TPH Identification										
Gasoline Range Hydrocarbons	NV	--	--	--	--	--	--	--	--	--
Diesel Range Hydrocarbons	NV	--	--	--	--	--	--	--	--	--
Motor Oil Range Hydrocarbons	NV	--	--	--	--	--	--	--	--	--
VOCs (ug/L)										
1,1,1,2-Tetrachloroethane	NV	1 U	--	--	1 U	--	--	--	--	--
1,1,1-Trichloroethane	200	1 U	--	--	1 U	--	--	--	--	--
1,1,2,2-Tetrachloroethane	NV	1 U	--	--	1 U	--	--	--	--	--
1,1,2-Trichloroethane	NV	1 U	--	--	1 U	--	--	--	--	--
1,1-Dichloroethane	NV	1 U	--	--	1 U	--	--	--	--	--
1,1-Dichloroethene	NV	1 U	--	--	1 U	--	--	--	--	--
1,1-Dichloropropene	NV	1 U	--	--	1 U	--	--	--	--	--
1,2,3-Trichlorobenzene	NV	1 U	--	--	1 U	--	--	--	--	--
1,2,3-Trichloropropane	NV	1 U	--	--	1 U	--	--	--	--	--
1,2,4-Trichlorobenzene	NV	1 U	--	--	1 U	--	--	--	--	--
1,2,4-Trimethylbenzene	NV	1 U	--	--	23	--	--	--	--	--
1,2-Dibromo-3-chloropropane	NV	10 U	--	--	10 U	--	--	--	--	--
1,2-Dibromoethane	0.01	0.01 U	--	--	0.01 U	--	--	--	--	--
1,2-Dichlorobenzene	NV	1 U	--	--	1 U	--	--	--	--	--
1,2-Dichloroethane	NV	1 U	--	--	1 U	--	--	--	--	--
1,2-Dichloropropane	NV	1 U	--	--	1 U	--	--	--	--	--
1,3,5-Trimethylbenzene	NV	1 U	--	--	6.2	--	--	--	--	--
1,3-Dichlorobenzene	NV	1 U	--	--	1 U	--	--	--	--	--
1,3-Dichloropropane	NV	1 U	--	--	1 U	--	--	--	--	--
1,4-Dichlorobenzene	NV	1 U	--	--	1 U	--	--	--	--	--
2,2-Dichloropropane	NV	1 U	--	--	1 U	--	--	--	--	--

Table 2
Summary of Groundwater Analytical Results
Truck City Site Property
Mount Vernon, Washington

	Location:	TC-1	TC-1	**TC-2**	TC-3	TC-4	**TC-5**	TC-6	**TCBH-1**	TCBH-2
	Sample Name:	TC1-W-10.0	TCDup-W-10.0	**TC2-W-10.0**	TC3-W-10.0	TC4-W-10.0	**TC5-W-10.0**	TC6-W-10.0	**TCBH1-W-8.5**	TCBH2-W-8.5
	Collection Date:	7/17/2014	7/17/2014	7/18/2014	7/17/2014	7/18/2014	7/17/2014	7/18/2014	7/15/2014	7/15/2014
	Collection Depth (ft bgs):	10	10	10	10	10	10	10	8.5	8.5
	MTCA Method A									
2-Butanone	NV	10 U	--	--	10 U	--	--	--	--	--
2-Chlorotoluene	NV	1 U	--	--	1 U	--	--	--	--	--
2-Hexanone	NV	10 U	--	--	10 U	--	--	--	--	--
4-Chlorotoluene	NV	1 U	--	--	1 U	--	--	--	--	--
4-Isopropyltoluene	NV	1 U	--	--	1 U	--	--	--	--	--
4-Methyl-2-pentanone	NV	10 U	--	--	10 U	--	--	--	--	--
Acetone	NV	10 U			10 U					
Benzene	5	0.35 U	1 U	1 U	1.2	1 U	**22**	1 U	1 U	1 U
Bromobenzene	NV	1 U	--	--	1 U	--	--	--	--	--
Bromodichloromethane	NV	1 U	--	--	1 U	--	--	--	--	--
Bromoform	NV	1 U	--	--	1 U	--	--	--	--	--
Bromomethane	NV	1 U	--	--	1 U	--	--	--	--	--
Carbon tetrachloride	NV	1 U	--	--	1 U	--	--	--	--	--
Chlorobenzene	NV	1 U	--	--	1 U	--	--	--	--	--
Chloroethane	NV	1 U	--	--	1 U	--	--	--	--	--
Chloroform	NV	1 U	--	--	1 U	--	--	--	--	--
Chloromethane	NV	10 U	--	--	10 U	--	--	--	--	--
cis-1,2-Dichloroethene	NV	1 U	--	--	1 U	--	--	--	--	--
cis-1,3-Dichloropropene	NV	1 U	--	--	1 U	--	--	--	--	--
Dibromochloromethane	NV	1 U	--	--	1 U	--	--	--	--	--
Dibromomethane	NV	1 U	--	--	1 U	--	--	--	--	--
Dichlorodifluoromethane	NV	1 UJ	--	--	1 UJ	--	--	--	--	--
Ethylbenzene	700	1 U	1 U	1 U	8.1	1 U	25	1 U	1 U	1 U
Hexachlorobutadiene	NV	1 U	--	--	1 U	--	--	--	--	--
Isopropylbenzene	NV	1 U	--	--	1 U	--	--	--	--	--
m,p-Xylene	NV	2 U	--	--	27	--	--	--	--	--
Methyl tert-butyl ether	20	1 U	--	--	1 U	--	--	--	--	--
Methylene chloride	5	5 U	--	--	5 U	--	--	--	--	--

Table 2
Summary of Groundwater Analytical Results
Truck City Site Property
Mount Vernon, Washington

	Location:	TC-1	TC-1	**TC-2**	TC-3	TC-4	**TC-5**	TC-6	**TCBH-1**	TCBH-2
	Sample Name:	TC1-W-10.0	TCDup-W-10.0	**TC2-W-10.0**	TC3-W-10.0	TC4-W-10.0	**TC5-W-10.0**	TC6-W-10.0	**TCBH1-W-8.5**	TCBH2-W-8.5
	Collection Date:	7/17/2014	7/17/2014	7/18/2014	7/17/2014	7/18/2014	7/17/2014	7/18/2014	7/15/2014	7/15/2014
	Collection Depth (ft bgs):	10	10	10	10	10	10	10	8.5	8.5
	MTCA Method A									
Naphthalene	160	1 U	--	--	5.2	--	--	--	--	--
n-Hexane	NV	1 U	--	--	12	--	--	--	--	--
n-Propylbenzene	NV	1 U	--	--	2.8	--	--	--	--	--
o-Xylene	NV	1 U	--	--	5.6	--	--	--	--	--
sec-Butylbenzene	NV	1 U	--	--	1 U	--	--	--	--	--
Styrene	NV	1 U	--	--	1 U	--	--	--	--	--
tert-Butylbenzene	NV	1 U	--	--	1 U	--	--	--	--	--
Tetrachloroethene	5	1 U	--	--	1 U	--	--	--	--	--
Toluene	1000	1 U	1 U	1 U	1 U	1 U	1.7	1 U	1 U	1 U
trans-1,2-dichloroethene	NV	1 U	--	--	1 U	--	--	--	--	--
trans-1,3-Dichloropropene	NV	1 U	--	--	1 U	--	--	--	--	--
Trichloroethene	5	1 U	--	--	1 U	--	--	--	--	--
Trichlorofluoromethane	NV	1 U	--	--	1 U	--	--	--	--	--
Vinyl chloride	0.2	0.2 U	--	--	0.2 U	--	--	--	--	--
Xylenes, Total	1000	--	3 U	3 U	--	3 U	130	3 U	3 U	3 U
PAHs (ug/L)										
1-Methylnaphthalene	NV	0.1 U	--	--	0.28	--	0.77	--	--	--
2-Methylnaphthalene	NV	0.1 U	--	--	0.34	--	0.48	--	--	--
Acenaphthene	NV	0.1 U	--	--	0.1 U	0.1 U	0.1 U	--	--	--
Acenaphthylene	NV	0.1 U	--	--	0.1 U	0.1 U	0.1 U	--	--	--
Anthracene	NV	0.1 U	--	--	0.1 U	0.1 U	0.1 U	--	--	--
Benzo(a)anthracene	NV	0.1 U	--	--	0.1 U	0.1 U	0.1 U	--	--	--
Benzo(a)pyrene	0.1	0.1 U	--	--	0.1 U	0.1 U	0.1 U	--	--	--
Benzo(b)fluoranthene	NV	0.1 U	--	--	0.1 U	0.1 U	0.1 U	--	--	--
Benzo(ghi)perylene	NV	0.1 U	--	--	0.1 U	0.1 U	0.1 U	--	--	--
Benzo(k)fluoranthene	NV	0.1 U	--	--	0.1 U	0.1 U	0.1 U	--	--	--
Chrysene	NV	0.1 U	--	--	0.1 U	0.1 U	0.1 U	--	--	--

Table 2
Summary of Groundwater Analytical Results
Truck City Site Property
Mount Vernon, Washington

	Location:	TC-1	TC-1	**TC-2**	TC-3	TC-4	**TC-5**	TC-6	**TCBH-1**	TCBH-2
	Sample Name:	TC1-W-10.0	TCDup-W-10.0	**TC2-W-10.0**	TC3-W-10.0	TC4-W-10.0	**TC5-W-10.0**	TC6-W-10.0	**TCBH1-W-8.5**	TCBH2-W-8.5
	Collection Date:	7/17/2014	7/17/2014	7/18/2014	7/17/2014	7/18/2014	7/17/2014	7/18/2014	7/15/2014	7/15/2014
	Collection Depth (ft bgs):	10	10	10	10	10	10	10	8.5	8.5
	MTCA Method A									
Dibenzo(a,h)anthracene	NV	0.1 U	--	--	0.1 U	0.1 U	0.1 U	--	--	--
Fluoranthene	NV	0.1 U	--	--	0.1 U	0.1 U	0.1 U	--	--	--
Fluorene	NV	0.1 U	--	--	0.1 U	0.1 U	0.1 U	--	--	--
Indeno(1,2,3-cd)pyrene	NV	0.1 U	--	--	0.1 U	0.1 U	0.1 U	--	--	--
Naphthalene	160	0.1 U	--	--	0.83	0.1 U	8.6	--	--	--
Phenanthrene	NV	0.1 U	--	--	0.1 U	0.1 U	0.1 U	--	--	--
Pyrene	NV	0.1 U	--	--	0.1 U	0.1 U	0.1 U	--	--	--
Total Metals (ug/L)										
Arsenic	5	--	--	**7.1** J	1.29	--	--	--	--	--
Barium	NV	--	--	125 J	85.3	--	--	--	--	--
Cadmium	NV	--	--	1 UJ	1 U	--	--	--	--	--
Chromium	NV	--	--	1.02 J	2.29	--	--	--	--	--
Lead	15	--	--	1 UJ	1 U	--	--	--	--	--
Manganese	NV	--	1300 J	--	708	--	--	--	--	--
Mercury	2	--	--	0.25 U	0.1 U	--	--	--	--	--
Selenium	NV	--	--	1 UJ	1 U	--	--	--	--	--
Silver	NV	--	--	1 UJ	1 U	--	--	--	--	--
Dissolved Metals (ug/L)										
Arsenic	5	--	--	1.37	--	--	--	--	--	--
Barium	NV	--	--	79.8	--	--	--	--	--	--
Cadmium	NV	--	--	1 U	--	--	--	--	--	--
Chromium	NV	--	--	1 U	--	--	--	--	--	--
Lead	15	--	--	1 U	--	--	--	--	--	--
Manganese	NV	1200	--	--	--	--	--	--	--	--
Mercury	2	--	--	0.1 U	--	--	--	--	--	--
Selenium	NV	--	--	1 U	--	--	--	--	--	--
Silver	NV	--	--	1 U	--	--	--	--	--	--
Dissolved Gases (ug/L)										

Table 2
Summary of Groundwater Analytical Results
Truck City Site Property
Mount Vernon, Washington

	Location:	TC-1	TC-1	**TC-2**	TC-3	TC-4	**TC-5**	TC-6	**TCBH-1**	TCBH-2
	Sample Name:	TC1-W-10.0	TCDup-W-10.0	**TC2-W-10.0**	TC3-W-10.0	TC4-W-10.0	**TC5-W-10.0**	TC6-W-10.0	**TCBH1-W-8.5**	TCBH2-W-8.5
	Collection Date:	7/17/2014	7/17/2014	7/18/2014	7/17/2014	7/18/2014	7/17/2014	7/18/2014	7/15/2014	7/15/2014
	Collection Depth (ft bgs):	10	10	10	10	10	10	10	8.5	8.5
	MTCA Method A									
Methane	NV	7.1	--	--	48	--	--	--	--	--
Anions (mg/L)										
Nitrate	NV	0.329 J	--	--	1.47	--	--	--	--	--
Sulfate	NV	198	--	--	126	--	--	--	--	--
Ferrous Iron (mg/L)										
Ferrous Iron	NV	16.4	--	--	5.4	--	--	--	--	--
EPH (ug/L)										
C8-C10 Aliphatic Hydrocarbons	NV	80 U	--	--	--	--	213 U	--	--	--
C10-C12 Aliphatic Hydrocarbons	NV	80 U	--	--	--	--	213 U	--	--	--
C12-C16 Aliphatic Hydrocarbons	NV	80 U	--	--	--	--	213 U	--	--	--
C16-C21 Aliphatic Hydrocarbons	NV	80 U	--	--	--	--	213 U	--	--	--
C21-C34 Aliphatic Hydrocarbons	NV	162	--	--	--	--	271	--	--	--
C8-C10 Aromatic Hydrocarbons	NV	89.9 J	--	--	--	--	213 UJ	--	--	--
C10-C12 Aromatic Hydrocarbons	NV	80 UJ	--	--	--	--	213 UJ	--	--	--
C12-C16 Aromatic Hydrocarbons	NV	80 U	--	--	--	--	213 U	--	--	--
C16-C21 Aromatic Hydrocarbons	NV	86	--	--	--	--	676	--	--	--
C21-C34 Aromatic Hydrocarbons	NV	14500	--	--	--	--	49000	--	--	--
VPH (ug/L)										
C5-C6 Aliphatic Hydrocarbons	NV	10 U	--	--	214	--	--	--	--	--
C6-C8 Aliphatic Hydrocarbons	NV	10 U	--	--	80.7	--	--	--	--	--
C8-C10 Aliphatic Hydrocarbons	NV	10 U	--	--	44.3	--	--	--	--	--
C10-C12 Aliphatic Hydrocarbons	NV	10 U	--	--	99.2	--	--	--	--	--
C8-C10 Aromatic Hydrocarbons	NV	10 U	--	--	82.6	--	--	--	--	--
C10-C12 Aromatic Hydrocarbons	NV	10 U	--	--	117	--	--	--	--	--
C12-C13 Aromatic Hydrocarbons	NV	10 U	--	--	10 U	--	--	--	--	--
Benzene	5	5 U	--	--	5 U	--	--	--	--	--
Ethylbenzene	700	5 U	--	--	6.93	--	--	--	--	--
m,p-Xylene	NV	5 U	--	--	22.9	--	--	--	--	--
o-Xylene	NV	5 U	--	--	5 U	--	--	--	--	--
Methyl tert-butyl ether	20	5 U	--	--	5 U	--	--	--	--	--
Naphthalene	160	5 U	--	--	5 U	--	--	--	--	--
Toluene	1000	5 U	--	--	5 U	--	--	--	--	--

Table 2
Summary of Groundwater Analytical Results
Truck City Site Property
Mount Vernon, Washington

	Location:	**TCBH-3**	TCBH-4	TCBH-5	TCBH-5	TCBH-6	TCBH-7	TCBH-8	TCBH-9	TCBH-10	TCBH-13
	Sample Name:	**TCBH3-W-8.5**	TCBH4-W-6.0	TCBH5-W-4.5 (1)	TCBH5-W-4.5 (2)	TCBH6-W-4.8	TCBH7-W-6.5	TCBH8-W-9.5	TCBH9-W-6.5	TCBH10-W-4.0	TCBH13-W-4.5
	Collection Date:	7/15/2014	7/15/2014	7/18/2014	7/18/2014	7/16/2014	7/16/2014	7/16/2014	7/16/2014	7/18/2014	7/18/2014
	Collection Depth (ft bgs):	8.5	6	4.5	4.5	4.8	6.5	9.5	6.5	4	4.5
	MTCA Method A										
TPH (ug/L)											
Gasoline Range Hydrocarbons	800	**1900**	100 U	100 U	100 U	--	100 U	100 U	100 U	--	--
Diesel Range Hydrocarbons	500	**1100** J	120 J	210 J	210 J	--	56 J	50 U	50 U	--	--
Motor Oil Range Hydrocarbons	500	250 U	250 U	250 U	250 U	--	250 U	250 U	250 U	--	--
TPH Identification											
Gasoline Range Hydrocarbons	NV	--	--	--	--	ND	--	--	--	ND	ND
Diesel Range Hydrocarbons	NV	--	--	--	--	ND	--	--	--	ND	ND
Motor Oil Range Hydrocarbons	NV	--	--	--	--	ND	--	--	--	ND	ND
VOCs (ug/L)											
1,1,1,2-Tetrachloroethane	NV	1 U	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	200	1 U	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	NV	1 U	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	NV	1 U	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	NV	1 U	--	--	--	--	--	--	--	--	--
1,1-Dichloroethene	NV	1 U	--	--	--	--	--	--	--	--	--
1,1-Dichloropropene	NV	1 U	--	--	--	--	--	--	--	--	--
1,2,3-Trichlorobenzene	NV	1 U	--	--	--	--	--	--	--	--	--
1,2,3-Trichloropropane	NV	1 U	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	NV	1 U	--	--	--	--	--	--	--	--	--
1,2,4-Trimethylbenzene	NV	160	--	--	--	--	--	--	--	--	--
1,2-Dibromo-3-chloropropane	NV	10 U	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	0.01	0.01 U	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	NV	1 U	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	NV	1 U	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	NV	1 U	--	--	--	--	--	--	--	--	--
1,3,5-Trimethylbenzene	NV	54	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	NV	1 U	--	--	--	--	--	--	--	--	--
1,3-Dichloropropane	NV	1 U	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	NV	1 U	--	--	--	--	--	--	--	--	--
2,2-Dichloropropane	NV	1 U	--	--	--	--	--	--	--	--	--

Table 2
Summary of Groundwater Analytical Results
Truck City Site Property
Mount Vernon, Washington

	Location:	**TCBH-3**	TCBH-4	TCBH-5	TCBH-5	TCBH-6	TCBH-7	TCBH-8	TCBH-9	TCBH-10	TCBH-13
	Sample Name:	**TCBH3-W-8.5**	TCBH4-W-6.0	TCBH5-W-4.5 (1)	TCBH5-W-4.5 (2)	TCBH6-W-4.8	TCBH7-W-6.5	TCBH8-W-9.5	TCBH9-W-6.5	TCBH10-W-4.0	TCBH13-W-4.5
	Collection Date:	7/15/2014	7/15/2014	7/18/2014	7/18/2014	7/16/2014	7/16/2014	7/16/2014	7/16/2014	7/18/2014	7/18/2014
	Collection Depth (ft bgs):	8.5	6	4.5	4.5	4.8	6.5	9.5	6.5	4	4.5
	MTCA Method A										
2-Butanone	NV	10 U	--	--	--	--	--	--	--	--	--
2-Chlorotoluene	NV	1 U	--	--	--	--	--	--	--	--	--
2-Hexanone	NV	10 U	--	--	--	--	--	--	--	--	--
4-Chlorotoluene	NV	1 U	--	--	--	--	--	--	--	--	--
4-Isopropyltoluene	NV	2.1	--	--	--	--	--	--	--	--	--
4-Methyl-2-pentanone	NV	10 U	--	--	--	--	--	--	--	--	--
Acetone	NV	10 U	--	--	--	--	--	--	--	--	--
Benzene	5	4.2	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromobenzene	NV	1 U	--	--	--	--	--	--	--	--	--
Bromodichloromethane	NV	1 U	--	--	--	--	--	--	--	--	--
Bromoform	NV	1 U	--	--	--	--	--	--	--	--	--
Bromomethane	NV	1 U	--	--	--	--	--	--	--	--	--
Carbon tetrachloride	NV	1 U	--	--	--	--	--	--	--	--	--
Chlorobenzene	NV	1 U	--	--	--	--	--	--	--	--	--
Chloroethane	NV	1 U	--	--	--	--	--	--	--	--	--
Chloroform	NV	1 U	--	--	--	--	--	--	--	--	--
Chloromethane	NV	10 U	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	NV	1 U	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	NV	1 U	--	--	--	--	--	--	--	--	--
Dibromochloromethane	NV	1 U	--	--	--	--	--	--	--	--	--
Dibromomethane	NV	1 U	--	--	--	--	--	--	--	--	--
Dichlorodifluoromethane	NV	1 UJ	--	--	--	--	--	--	--	--	--
Ethylbenzene	700	160	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Hexachlorobutadiene	NV	1 U	--	--	--	--	--	--	--	--	--
Isopropylbenzene	NV	21	--	--	--	--	--	--	--	--	--
m,p-Xylene	NV	50	--	--	--	--	--	--	--	--	--
Methyl tert-butyl ether	20	1 U	--	--	--	--	--	--	--	--	--
Methylene chloride	5	5 U	--	--	--	--	--	--	--	--	--

Table 2
Summary of Groundwater Analytical Results
Truck City Site Property
Mount Vernon, Washington

	Location:	**TCBH-3**	TCBH-4	TCBH-5	TCBH-5	TCBH-6	TCBH-7	TCBH-8	TCBH-9	TCBH-10	TCBH-13
	Sample Name:	**TCBH3-W-8.5**	TCBH4-W-6.0	TCBH5-W-4.5 (1)	TCBH5-W-4.5 (2)	TCBH6-W-4.8	TCBH7-W-6.5	TCBH8-W-9.5	TCBH9-W-6.5	TCBH10-W-4.0	TCBH13-W-4.5
	Collection Date:	7/15/2014	7/15/2014	7/18/2014	7/18/2014	7/16/2014	7/16/2014	7/16/2014	7/16/2014	7/18/2014	7/18/2014
	Collection Depth (ft bgs):	8.5	6	4.5	4.5	4.8	6.5	9.5	6.5	4	4.5
	MTCA Method A										
Naphthalene	160	95	--	--	--	--	--	--	--	--	--
n-Hexane	NV	41	--	--	--	--	--	--	--	--	--
n-Propylbenzene	NV	70	--	--	--	--	--	--	--	--	--
o-Xylene	NV	3.8	--	--	--	--	--	--	--	--	--
sec-Butylbenzene	NV	4.4	--	--	--	--	--	--	--	--	--
Styrene	NV	1 U	--	--	--	--	--	--	--	--	--
tert-Butylbenzene	NV	1 U	--	--	--	--	--	--	--	--	--
Tetrachloroethene	5	1 U	--	--	--	--	--	--	--	--	--
Toluene	1000	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
trans-1,2-dichloroethene	NV	1 U	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	NV	1 U	--	--	--	--	--	--	--	--	--
Trichloroethene	5	1 U	--	--	--	--	--	--	--	--	--
Trichlorofluoromethane	NV	1 U	--	--	--	--	--	--	--	--	--
Vinyl chloride	0.2	0.2 U	--	--	--	--	--	--	--	--	--
Xylenes, Total	1000	--	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U
PAHs (ug/L)											
1-Methylnaphthalene	NV	--	--	--	--	--	--	--	--	--	--
2-Methylnaphthalene	NV	--	--	--	--	--	--	--	--	--	--
Acenaphthene	NV	--	--	--	0.1 U	--	--	--	--	--	--
Acenaphthylene	NV	--	--	--	0.1 U	--	--	--	--	--	--
Anthracene	NV	--	--	--	0.1 U	--	--	--	--	--	--
Benzo(a)anthracene	NV	--	--	--	0.1 U	--	--	--	--	--	--
Benzo(a)pyrene	0.1	--	--	--	0.1 U	--	--	--	--	--	--
Benzo(b)fluoranthene	NV	--	--	--	0.1 U	--	--	--	--	--	--
Benzo(ghi)perylene	NV	--	--	--	0.1 U	--	--	--	--	--	--
Benzo(k)fluoranthene	NV	--	--	--	0.1 U	--	--	--	--	--	--
Chrysene	NV	--	--	--	0.1 U	--	--	--	--	--	--

	Location:	**TCBH-3**	TCBH-4	TCBH-5	TCBH-5	TCBH-6	TCBH-7	TCBH-8	TCBH-9	TCBH-10	TCBH-13
	Sample Name:	**TCBH3-W-8.5**	TCBH4-W-6.0	TCBH5-W-4.5 (1)	TCBH5-W-4.5 (2)	TCBH6-W-4.8	TCBH7-W-6.5	TCBH8-W-9.5	TCBH9-W-6.5	TCBH10-W-4.0	TCBH13-W-4.5
	Collection Date:	7/15/2014	7/15/2014	7/18/2014	7/18/2014	7/16/2014	7/16/2014	7/16/2014	7/16/2014	7/18/2014	7/18/2014
	Collection Depth (ft bgs):	8.5	6	4.5	4.5	4.8	6.5	9.5	6.5	4	4.5
	MTCA Method A										
Dibenzo(a,h)anthracene	NV	--	--	--	0.1 U	--	--	--	--	--	--
Fluoranthene	NV	--	--	--	0.1 U	--	--	--	--	--	--
Fluorene	NV	--	--	--	0.1 U	--	--	--	--	--	--
Indeno(1,2,3-cd)pyrene	NV	--	--	--	0.1 U	--	--	--	--	--	--
Naphthalene	160	--	--	--	0.1 U	--	--	--	--	--	--
Phenanthrene	NV	--	--	--	0.1 U	--	--	--	--	--	--
Pyrene	NV	--	--	--	0.1 U	--	--	--	--	--	--
Total Metals (ug/L)											
Arsenic	5	--	--	--	--	--	--	--	--	--	--
Barium	NV	--	--	--	--	--	--	--	--	--	--
Cadmium	NV	--	--	--	--	--	--	--	--	--	--
Chromium	NV	--	--	--	--	--	--	--	--	--	--
Lead	15	--	--	--	--	--	--	--	--	--	--
Manganese	NV	--	--	--	--	--	--	--	--	--	--
Mercury	2	--	--	--	--	--	--	--	--	--	--
Selenium	NV	--	--	--	--	--	--	--	--	--	--
Silver	NV	--	--	--	--	--	--	--	--	--	--
Dissolved Metals (ug/L)											
Arsenic	5	--	--	--	--	--	--	--	--	--	--
Barium	NV	--	--	--	--	--	--	--	--	--	--
Cadmium	NV	--	--	--	--	--	--	--	--	--	--
Chromium	NV	--	--	--	--	--	--	--	--	--	--
Lead	15	--	--	--	--	--	--	--	--	--	--
Manganese	NV	--	--	--	--	--	--	--	--	--	--
Mercury	2	--	--	--	--	--	--	--	--	--	--
Selenium	NV	--	--	--	--	--	--	--	--	--	--
Silver	NV	--	--	--	--	--	--	--	--	--	--
Dissolved Gases (ug/L)											

Table 2
Summary of Groundwater Analytical Results
Truck City Site Property
Mount Vernon, Washington

	Location:	**TCBH-3**	TCBH-4	TCBH-5	TCBH-5	TCBH-6	TCBH-7	TCBH-8	TCBH-9	TCBH-10	TCBH-13
	Sample Name:	**TCBH3-W-8.5**	TCBH4-W-6.0	TCBH5-W-4.5 (1)	TCBH5-W-4.5 (2)	TCBH6-W-4.8	TCBH7-W-6.5	TCBH8-W-9.5	TCBH9-W-6.5	TCBH10-W-4.0	TCBH13-W-4.5
	Collection Date:	7/15/2014	7/15/2014	7/18/2014	7/18/2014	7/16/2014	7/16/2014	7/16/2014	7/16/2014	7/18/2014	7/18/2014
	Collection Depth (ft bgs):	8.5	6	4.5	4.5	4.8	6.5	9.5	6.5	4	4.5
	MTCA Method A										
Methane	NV	--	--	--	--	--	--	--	--	--	--
Anions (mg/L)											
Nitrate	NV	--	--	--	--	--	--	--	--	--	--
Sulfate	NV	--	--	--	--	--	--	--	--	--	--
Ferrous Iron (mg/L)											
Ferrous Iron	NV	--	--	--	--	--	--	--	--	--	--
EPH (ug/L)											
C8-C10 Aliphatic Hydrocarbons	NV	--	--	--	--	--	--	--	--	--	--
C10-C12 Aliphatic Hydrocarbons	NV	--	--	--	--	--	--	--	--	--	--
C12-C16 Aliphatic Hydrocarbons	NV	--	--	--	--	--	--	--	--	--	--
C16-C21 Aliphatic Hydrocarbons	NV	--	--	--	--	--	--	--	--	--	--
C21-C34 Aliphatic Hydrocarbons	NV	--	--	--	--	--	--	--	--	--	--
C8-C10 Aromatic Hydrocarbons	NV	--	--	--	--	--	--	--	--	--	--
C10-C12 Aromatic Hydrocarbons	NV	--	--	--	--	--	--	--	--	--	--
C12-C16 Aromatic Hydrocarbons	NV	--	--	--	--	--	--	--	--	--	--
C16-C21 Aromatic Hydrocarbons	NV	--	--	--	--	--	--	--	--	--	--
C21-C34 Aromatic Hydrocarbons	NV	--	--	--	--	--	--	--	--	--	--
VPH (ug/L)											
C5-C6 Aliphatic Hydrocarbons	NV	--	--	--	--	--	--	--	--	--	--
C6-C8 Aliphatic Hydrocarbons	NV	--	--	--	--	--	--	--	--	--	--
C8-C10 Aliphatic Hydrocarbons	NV	--	--	--	--	--	--	--	--	--	--
C10-C12 Aliphatic Hydrocarbons	NV	--	--	--	--	--	--	--	--	--	--
C8-C10 Aromatic Hydrocarbons	NV	--	--	--	--	--	--	--	--	--	--
C10-C12 Aromatic Hydrocarbons	NV	--	--	--	--	--	--	--	--	--	--
C12-C13 Aromatic Hydrocarbons	NV	--	--	--	--	--	--	--	--	--	--
Benzene	5	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	700	--	--	--	--	--	--	--	--	--	--
m,p-Xylene	NV	--	--	--	--	--	--	--	--	--	--
o-Xylene	NV	--	--	--	--	--	--	--	--	--	--
Methyl tert-butyl ether	20	--	--	--	--	--	--	--	--	--	--
Naphthalene	160	--	--	--	--	--	--	--	--	--	--
Toluene	1000	--	--	--	--	--	--	--	--	--	--

NOTES:
Result values in **bold** font indicate exceedance of MTCA Method A cleanup level. Non-detect results are not evaluated against MTCA cleanup levels.
Analytes and sample names with exceedances are also in **bold** font.
-- = not analyzed.
EPH = extractable petroleum hydrocarbons.
ft bgs = feet below ground surface.
J = the result is an estimated value.
mg/L = milligrams per liter.
MTCA Method A = Model Toxics Control Act Method A.
ND = not detected
NV = no value.
PAHs = polycyclic aromatic hydrocarbons.
TPH = total petroleum hydrocarbons.
U = the result is non-detect.
ug/L = micrograms per liter.
VOCs = volatile organic compounds.
VPH = volatile petroleum hydrocarbons.
[a]MTCA Method A CUL for Hexavalent Chromium.

Table 3
Remediation Levels at All Monitoring Wells
Truck City Site Property
Mount Vernon, Washington

Indicator Hazardous Substance:	Gasoline-range TPH	Diesel-range TPH	Benzene	Arsenic
Cleanup Level (ug/L):	800	500	5	5
Remediation Levels at All Monitoring Wells (ug/L)				
Sentinel wells				
TC-1 (southern perimeter of Site)	100U	120J	1U	--
TC-2 (western perimeter of Site)	100U	50U	1U	7.1J
TC-4 (northwestern perimeter of Site)	100U	50U	1U	--
TC-6 (southwestern perimeter of Site)	100U	89J	1U	--
Wells in interior of Site				
TC-3 (source area well)	380	--	1.2	1.29
TC-5 (source area well)	800	360J	22	--

NOTES:

-- = not analyzed

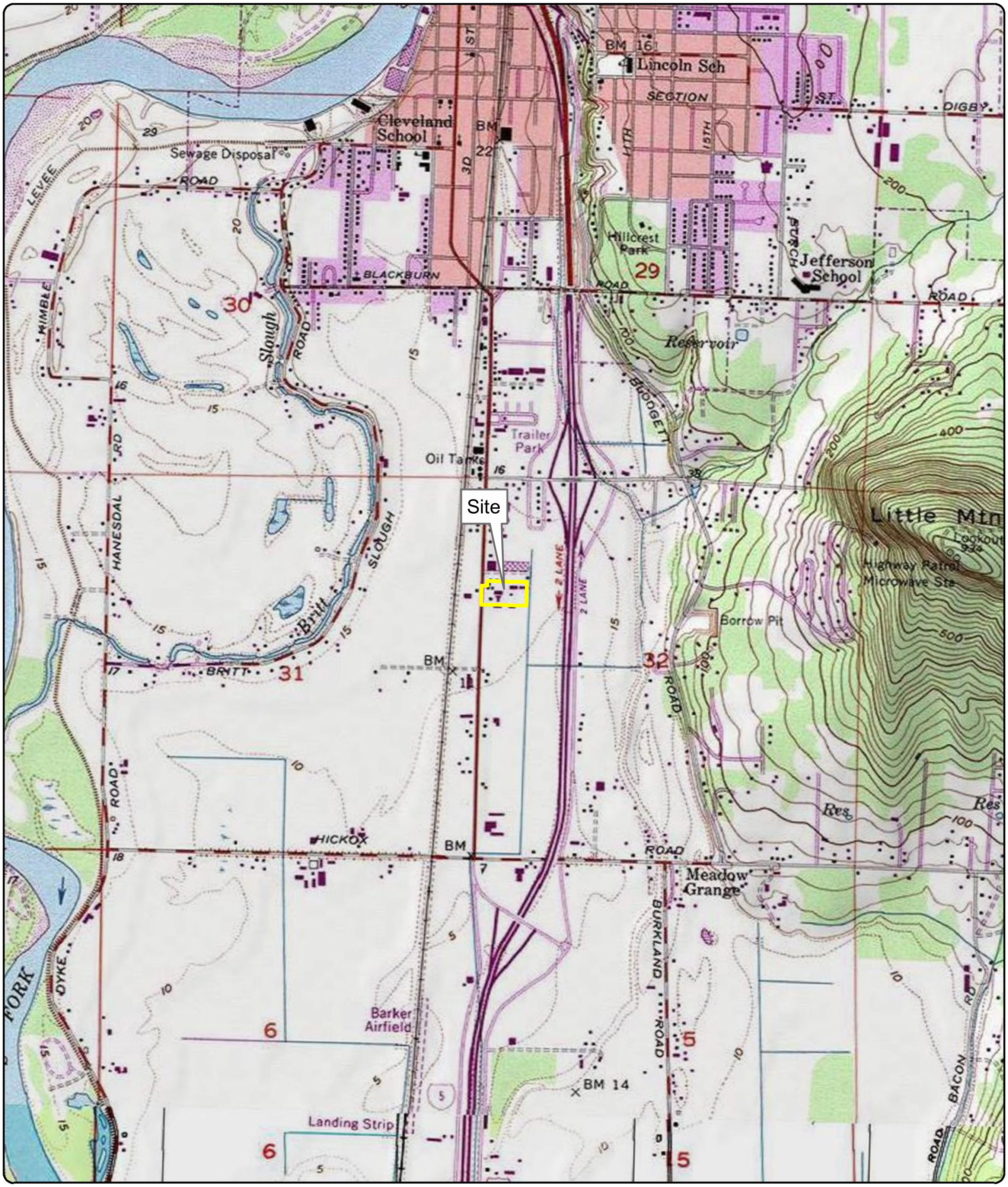
J = Result is an estimated value.

TPH = total petroleum hydrocarbons.

U = Result is non-detect.

ug/L = micrograms per liter.

FIGURES



Source: US Geological Survey (1990) 7.5-minute
topographic quadrangle: Mount Vernon
Section 32, Township 34 North, Range 4 East

Figure 1
Site Location

Truck City Site
Mount Vernon, Washington

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0 1,000 2,000
Feet

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Print Date: 10/30/2014
Approved By:
Produced By: gherbert
Project: 0714.02

Path: X:\0714.02 Skagit County Truck City\Projects\Fig_2 Site Parcels Map.mxd

Print Date: 10/30/2014

Approved By:

Produced By: gherbert

Project:

Source: Aerial photograph obtained from Esri ArcGIS Online; parcels obtained from Skagit County.

Aerial Imagery Date: 1999

Legend

- Site
- Parcels

Figure 2
Site Parcels Map
Truck City Site
Mount Vernon, Washington

0 100 200
Feet

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Figure 3
Site Features & Previous Environmental Investigations

Truck City Site
Mount Vernon, Washington

Legend

Previous Investigation

- Hand Auger - Surface Sediment Sample
- Soil Borings
- Active Monitoring Well
- Decommissioned - No Steel Monument
- Decommissioned - Steel Monument
- Former Soil Excavation Area
- USTs
- Septic System
- Parcel Boundary
- Catch Basin

Aerial Imagery Date: 2010

Notes:
1. Site features were digitized from figures prepared by Materials Testing & Consulting, Inc., Associated Environmental Group, LLC, and Applied Geotechnology, Inc.
2. The locations of all features are approximate.

0 25 50
Feet

Source: Aerial photograph obtained from Esri ArcGIS Online; parcels obtained from Skagit County

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Produced By: gherbert
Project: 0714.02

Figure 4
Site Features and Locations of Investigations

Truck City Site
Mount Vernon, Washington

Legend

MFA Investigation

- Boring
- Monitoring Well

Previous Investigation

- Existing Monitoring Well
- Former Soil Excavation Area
- Catch Basin

Underground Utilities

- Communications
- Electric
- Gas
- Water
- USTs
- Septic System
- Site Boundary
- Parcel Boundary

Aerial Imagery Date: 2010

Notes:
1. Site features were digitized from figures prepared by Materials Testing & Consulting, Inc., Associated Environmental Group, LLC, and Applied Geotechnology, Inc. Utilities and well positions imported from survey by Pacific Geomatic Services in July 2014.
2. The locations of digitized features are approximate.

0 25 50
Feet

Source: Aerial photograph obtained from Esri ArcGIS Online; parcels obtained from Skagit County; well and utility positions from Pacific Geomatic Services, July 2014

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Produced By: gherbert
Project: 0714.02

Figure 5
Cross Section Transect

Truck City Site
Mount Vernon, Washington

Legend

MFA Investigation

- Boring
- Monitoring Well

Previous Investigation

- Existing Monitoring Well
- Former Soil Excavation Area

- CrossSectionTransect
- USTs
- Site Boundary
- Parcel Boundary
- Catch Basin

Aerial Imagery Date: 2010

Notes:
1. Site features were digitized from figures prepared by Materials Testing & Consulting, Inc., Associated Environmental Group, LLC, and Applied Geotechnology, Inc. Utilities and well positions imported from survey by Pacific Geomatic Services in July 2014.
2. The locations of digitized features are approximate.

0 25 50
Feet

Source: Aerial photograph obtained from Esri ArcGIS Online; parcels obtained from Skagit County; well and utility positions from Pacific Geomatic Services, July 2014

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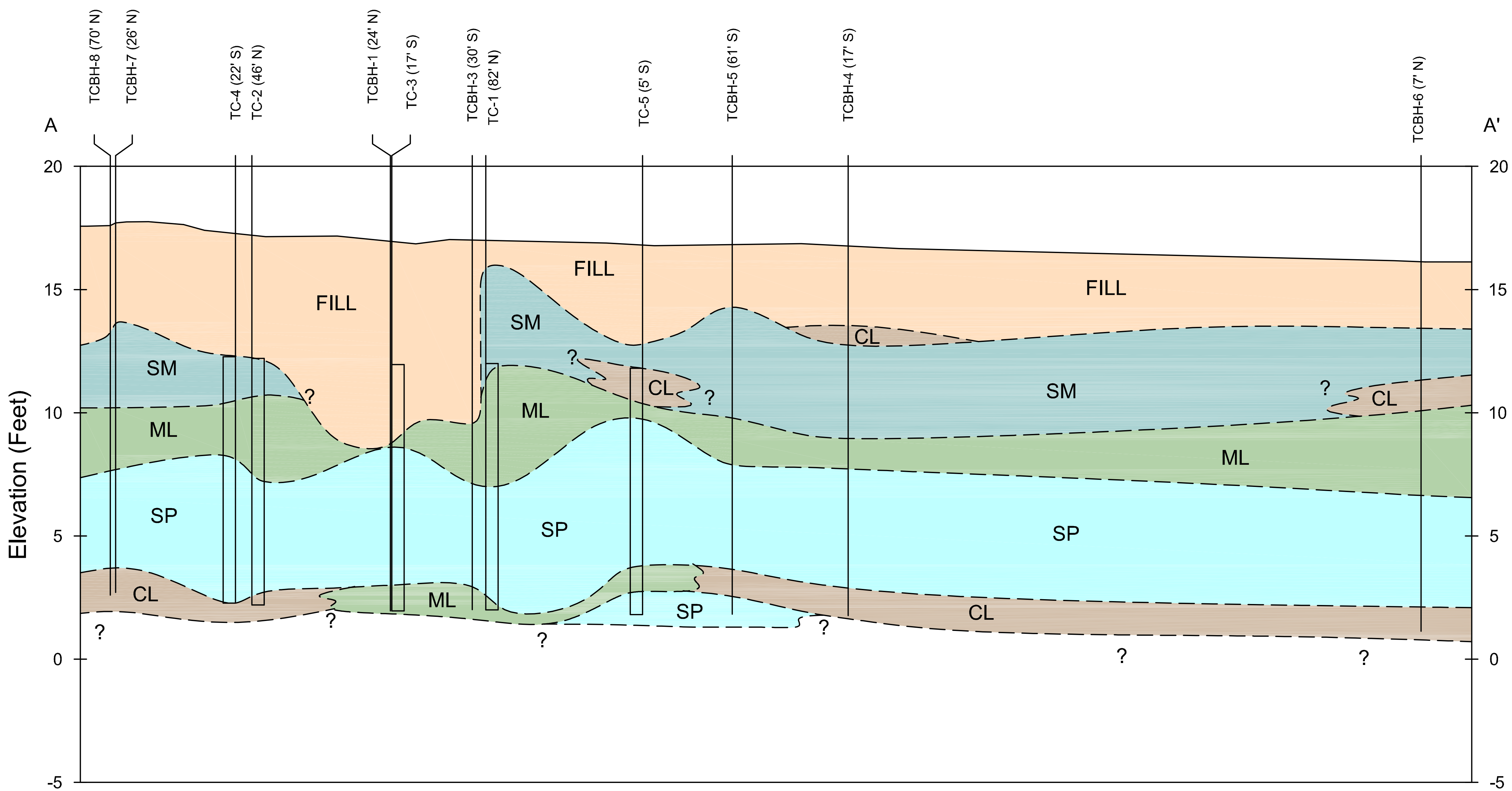
Produced By: gherbert
Project: 0714.02

Figure 6

Generalized Geologic Cross Section A-A'

Truck City
Mount Vernon, Washington



PROFILE VIEW OF SECTION
HORIZONTAL SCALE: 1" = 50' VERTICAL SCALE: 1" = 5'
VERTICAL EXAGGERATION: 10

LEGEND:

FILL

RECENT ALLUVIUM
(FLOOD PLAIN DEPOSITS)

SILT (ML)

SILTY SAND (SM)

SAND (SP)

CLAY (CL)

MONITORING WELL
(DISTANCE AND DIRECTION
PROJECTED)

SCREENED SECTION

SOL BORINGS
(DISTANCE AND DIRECTION
PROJECTED)

INFERRED LITHOLOGIC
CONTACT

0 50 100
Scale in Feet

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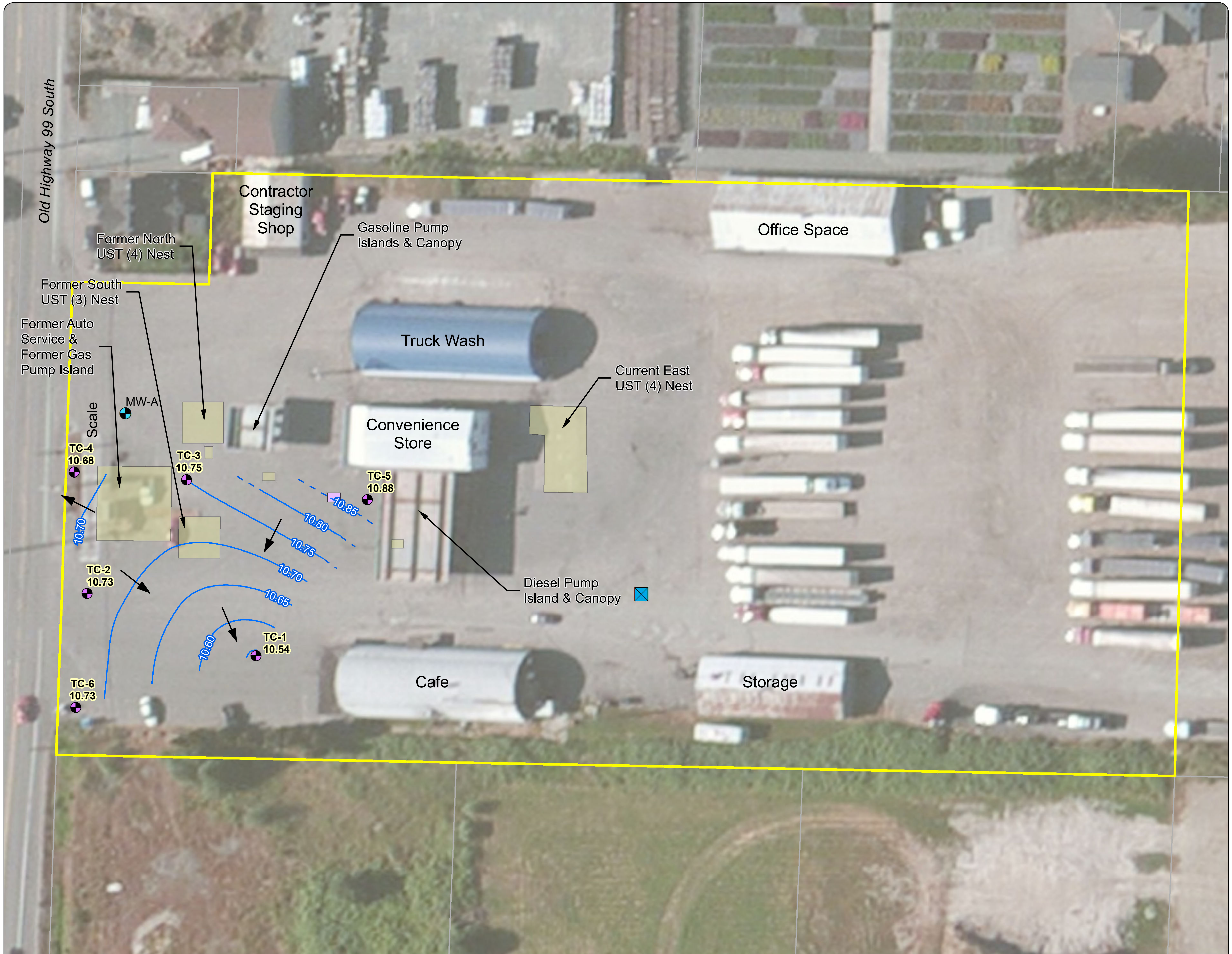

Figure 7
Groundwater Potentiometric Map - July 2014

Truck City Site
Mount Vernon, Washington

Legend

- Monitoring Well and elevation in feet (MSL)
- Groundwater Elevations
- Extrapolated GW Elevations
- Groundwater Flow Direction

Previous Investigation

- Existing Monitoring Well
- Catch Basin
- USTs
- Septic System
- Site Boundary
- Parcel Boundary

Aerial Imagery Date: 2010

Notes:
1. MSL = mean sea level.
2. Site features were digitized from figures prepared by Materials Testing & Consulting, Inc., Associated Environmental Group, LLC, and Applied Geotechnology, Inc. Utilities and well positions imported from survey by Pacific Geomatic Services in July 2014.
3. Groundwater elevations were measured July 2014.

0 25 50
Feet

Source: Aerial photograph obtained from Esri ArcGIS Online; parcels obtained from Skagit County; well and utility positions from Pacific Geomatic Services, July 2014

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Print Date: 10/30/2014
Approved By:
Produced By: gherbert
Project: 0714.02

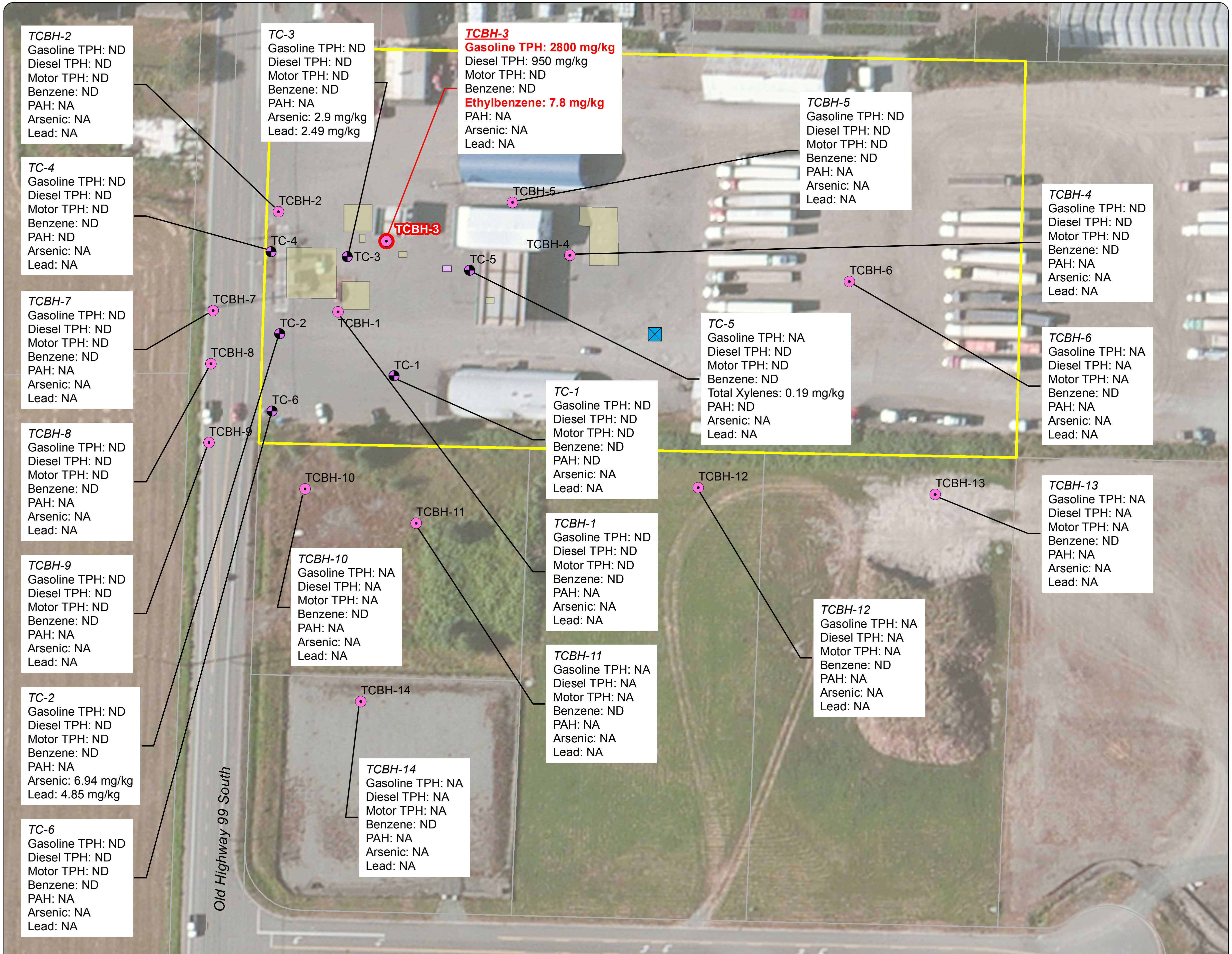

Figure 8
Soil Analytical Results

Truck City Site
Mount Vernon, Washington

Legend

MFA Investigation

- Boring
- Monitoring Well
- Catch Basin
- USTs
- Septic System
- Site Boundary
- Parcel Boundary

Notes:

Analysis Results:
NA = Not Analyzed.
ND = Not Detected.
mg/kg = Milligrams per Kilogram.
PAH = Polycyclic Aromatic Hydrocarbons.
TPH = Total Petroleum Hydrocarbons.

Results above Model Toxics Control Act (MCTA) Method A cleanup level are shown in **bold red**.

Refer to Table 1, Summary of Soil Analytical Results, for a complete summary of laboratory results.

Site features were digitized from figures prepared by Materials Testing & Consulting, Inc., Associated Environmental Group, LLC, and Applied Geotechnology, Inc. Utilities and well positions imported from survey by Pacific Geomatic Services in July 2014.
The locations of digitized features are approximate.

Aerial Imagery Date: 2010

0 25 50
Feet

Source: Aerial photograph obtained from Esri ArcGIS Online; parcels obtained from Skagit County; well and utility positions from Pacific Geomatic Services, July 2014

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Print Date: 10/30/2014
Approved By:
Produced By: gherbert
Project: 0714.02

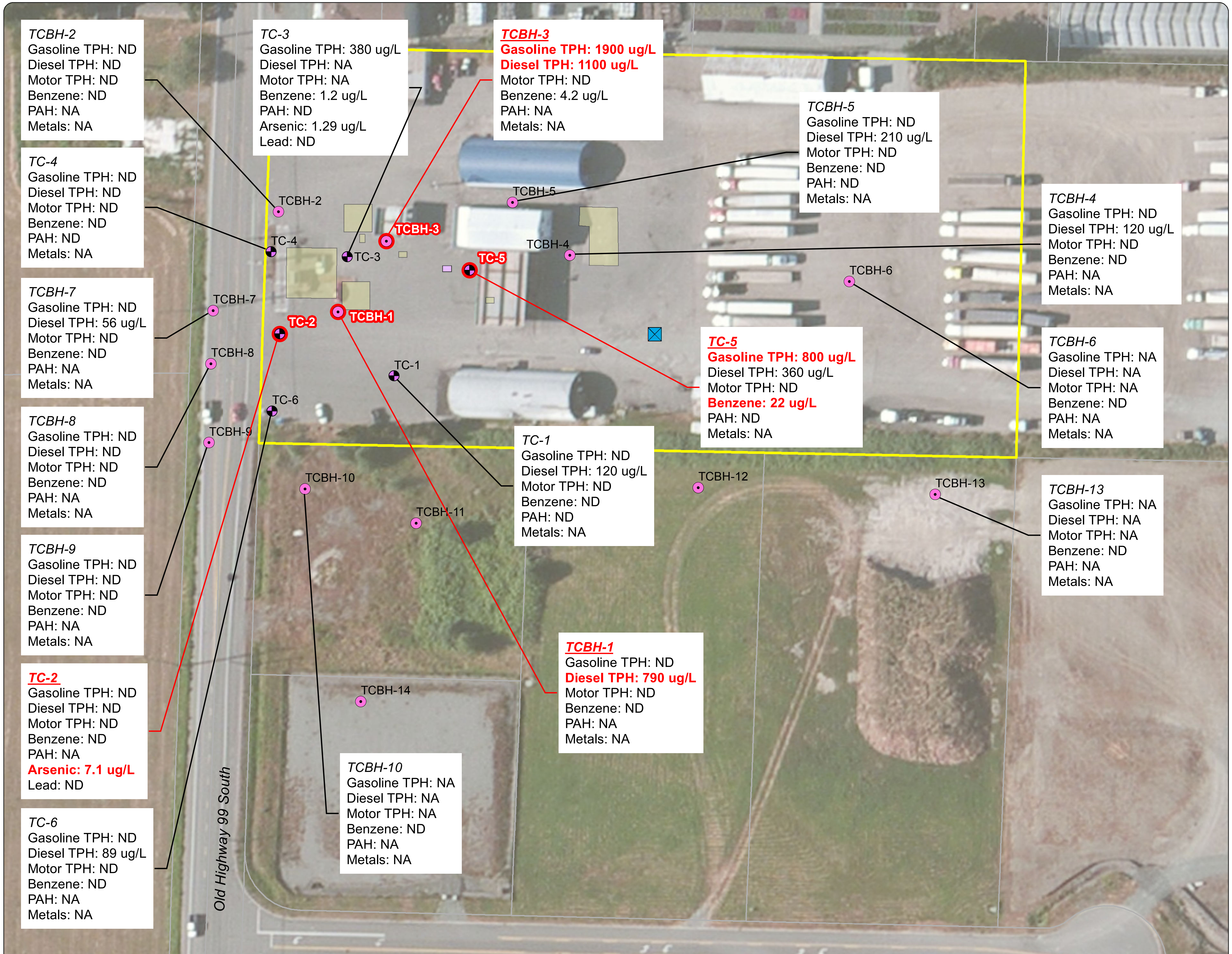

Figure 9
Groundwater Analytical Results

Truck City Site
Mount Vernon, Washington

Legend

MFA Investigation

- Boring
- Monitoring Well
- Catch Basin
- USTs
- Septic System
- Site Boundary
- Parcel Boundary

Notes:

Analysis Results:
NA = Not Analyzed.
ND = Not Detected.
PAH = Polycyclic Aromatic Hydrocarbons.
TPH = Total Petroleum Hydrocarbons.
ug/L = Micrograms per Liter.

Results above Model Toxics Control Act (MCTA) Method A cleanup level are shown in **bold red**.

Refer to Table 2, Summary of Groundwater Analytical Results, for a complete summary of laboratory results.

Site features were digitized from figures prepared by Materials Testing & Consulting, Inc., Associated Environmental Group, LLC, and Applied Geotechnology, Inc. Utilities and well positions imported from survey by Pacific Geomatic Services in July 2014.
The locations of digitized features are approximate.

Aerial Imagery Date: 2010

0 25 50
Feet

Source: Aerial photograph obtained from Esri ArcGIS Online; parcels obtained from Skagit County; well and utility positions from Pacific Geomatic Services, July 2014

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Produced By: gherbert
Project: 0714.02

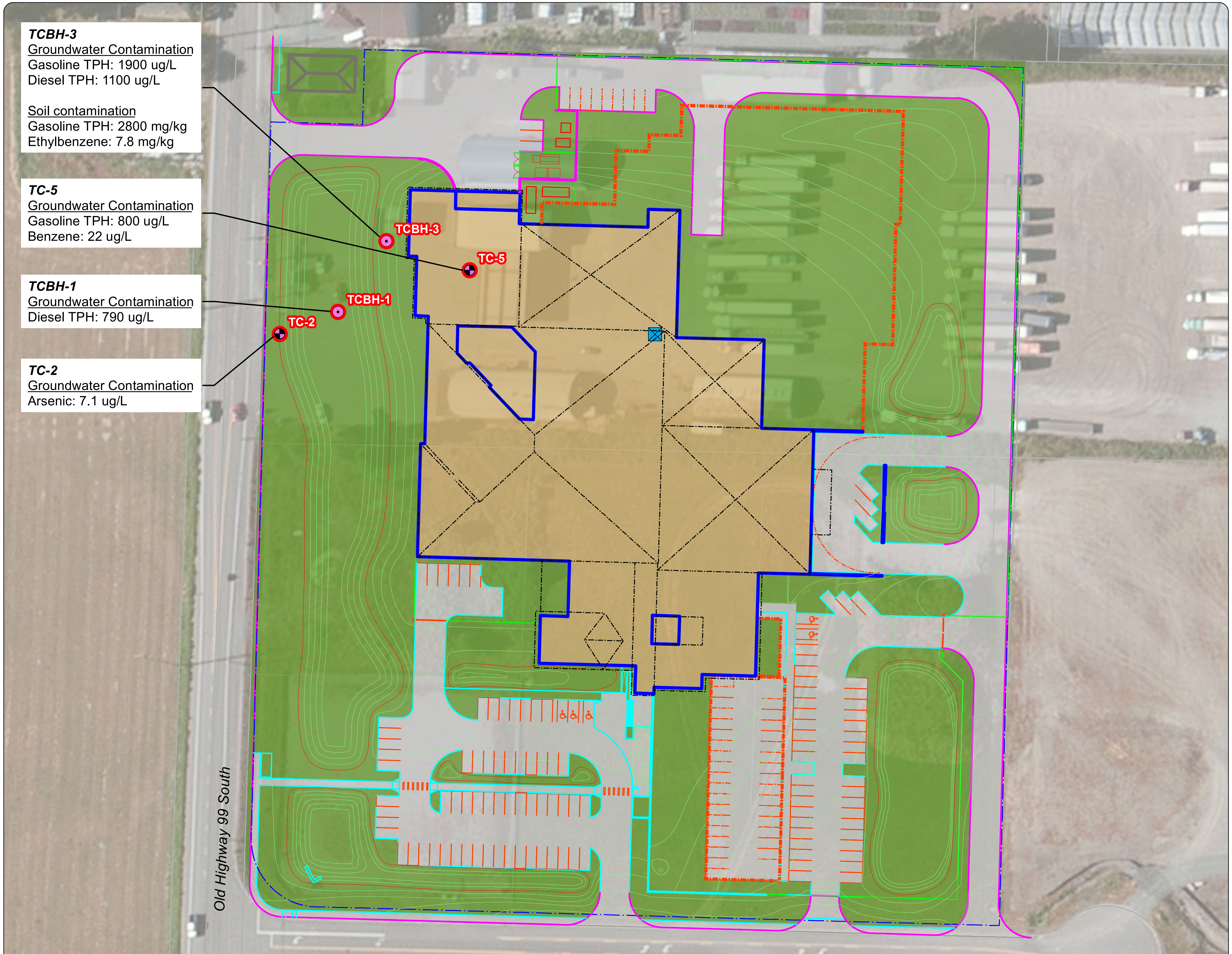

Figure 10
Proposed Skagit County Jail Site Conditions

Truck City Site
Mount Vernon, Washington

Legend

MFA Investigation

- Boring
- Monitoring Well
- Catch Basin
- Building
- Hard Surface
- Other
- Parcel Boundary

Notes:

Analysis Results:
mg/kg = Milligrams/Kilogram.
TPH = Total Petroleum Hydrocarbons.
ug/L = Micrograms per Liter.

Only results above Model Toxics Control Act (MTCA) Method A cleanup level are shown.

Refer to Table 1, Summary of Soil Analytical Results and Table 2, Summary of Groundwater Analytical Results, for a complete summary of laboratory results.

Site features were digitized from figures prepared by Materials Testing & Consulting, Inc., Associated Environmental Group, LLC, and Applied Geotechnology, Inc. Utilities and well positions imported from survey by Pacific Geomatic Services in July 2014.
The locations of digitized features are approximate.

Aerial Imagery Date: 2010

0 25 50
Feet

Source: Aerial photograph obtained from Esri ArcGIS Online; parcels obtained from Skagit County; well and utility positions from Pacific Geomatic Services, July 2014

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Print Date: 11/11/2014
Approved By:
Produced By: gherbert
Project: 0714.02

Figure 11
Compliance Monitoring Well Network

Truck City Site
Mount Vernon, Washington

Legend

- Monitoring Well and elevation in feet (MSL)

Previous Investigation

- Existing Monitoring Well
- Catch Basin
- USTs
- Septic System
- Site Boundary
- Parcel Boundary

Aerial Imagery Date: 2010

Notes:
1. MSL = mean sea level.
2. Site features were digitized from figures prepared by Materials Testing & Consulting, Inc., Associated Environmental Group, LLC, and Applied Geotechnology, Inc. Utilities and well positions imported from survey by Pacific Geomatic Services in July 2014.
3. Groundwater elevations were measured July 2014.

0 25 50
Feet

Source: Aerial photograph obtained from Esri ArcGIS Online; parcels obtained from Skagit County; well and utility positions from Pacific Geomatic Services, July 2014

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Print Date: 11/11/2014
Approved By:
Produced By: gherbert
Project: 0714.02

APPENDIX

WELL LOGS

Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
0714.02.02	**TC-1**	**1 of 1**

Project Name	**Truck City Site**	TOC Elevation (feet)	
Project Location	**Mount Vernon, WA**	Surface Elevation (feet)	
Start/End Date	**7/15/2014 to 7/17/2014**	Northing	
Driller/Equipment	**Holt Services, Inc./Geoprobe 7822DT**	Easting	
Geologist/Engineer	**Yen-Vy Van**	Hole Depth	**15.0-feet**
Sample Method	**Geoprobe**	Outer Hole Diam	**3.5-inch**

Depth (feet, BGS)	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Soil Description
0	**40**	**GP**				0.0 to 0.4 feet: ASPHALT.
0.4						0.4 to 1.0 feet: BASE GRAVEL (GP); gray; 100% gravel. (FILL)
1						1.0 to 5.0 feet: SILTY SAND with GRAVEL (SM); medium brown; 20% fines; 65% sand; 15% gravel; medium dense; moist.
5	**10**	**GP**		**TC1-S1-5.0 PID = 0.0 ppm**		5.0 to 10.0 feet: SANDY SILT (ML); gray; 55% fines; 45% sand, fine grained; soft to medium stiff; moist to wet @ 8.5 feet.
8.5				**TC1-S2-8.5 PID = 0.0 ppm**		
10	**100**	**GP**				10.0 to 15.0 feet: POORLY GRADED SAND (SP); gray; 5% fines; 95% sand, well sorted, fine grained from 10.0 to 13.5 feet, medium grained from 13.5 to 15.0 feet; loose to medium dense; saturated.
15				**TC1-S3-15.0**		

NOTES: Ecology Well ID #BIP 878. Boring completed as pre-packed 2" well.
PID = photoionization detector.
ppm = parts per million.

▽ **Water level observed at time of drilling.**

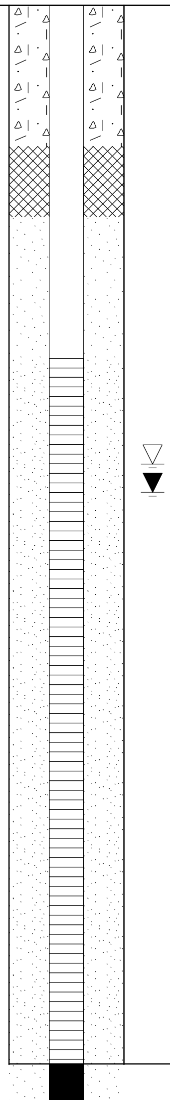
▼ **Water level observed after well development.**

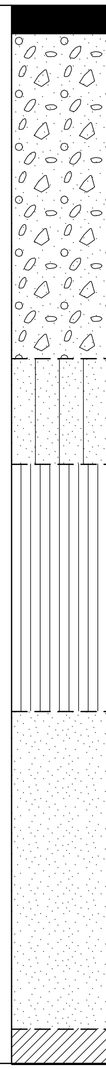
Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
0714.02.02	**TC-2**	**1 of 1**

Project Name	**Truck City Site**	TOC Elevation (feet)	
Project Location	**Mount Vernon, WA**	Surface Elevation (feet)	
Start/End Date	**7/17/2014 to 7/17/2014**	Northing	
Driller/Equipment	**Holt Services, Inc./Geoprobe 7822DT**	Easting	
Geologist/Engineer	**Yen-Vy Van**	Hole Depth	**15.0-feet**
Sample Method	**Geoprobe**	Outer Hole Diam	**3.5-inch**





Depth (feet, BGS)	Percent Recovery	Collection Method	Name (Type)	Soil Description
0	20	GP		0.0 to 0.4 feet: ASPHALT.
0.4				0.4 to 5.0 feet: SANDY GRAVEL (GW); tan brown; 5% fines; 35% sand, fine to coarse; 60% gravel, fine to medium, subangular; medium dense; dry. (FILL)
5	100	GP		5.0 to 6.5 feet: SILTY SAND (SM); grayish brown; 35% fines; 65% sand; medium dense; moist to wet @ 6.5 feet.
6.5			TC2-S-6.5 PID = 2.0 ppm	6.5 to 10.0 feet: SILT (ML); medium to dark gray; 100% fines; soft; intermittent pockets of silty clay; saturated from 7.0 to 8.0 feet, moist to wet @ 9.0 feet.
9			TC2-S-9.0	
10	100	GP		10.0 to 14.5 feet: POORLY GRADED SAND (SP); gray; 5% fines; 95% sand, medium, well sorted; medium dense; saturated @ 11.0-14.5 feet.
12			TC2-S-12.0	
14.5				14.5 to 15.0 feet: CLAY (CL); gray; 100% fines, high plasticity; soft; local wood chips; moist to wet.
15			TC2-S-15.0 PID = 0.0 ppm	

NOTES: Ecology Well ID #BIP 879. Boring completed as pre-packed 2" well.
PID = photoionization detector.
ppm = parts per million.

▽ **Water level observed at time of drilling.**

▼ **Water level observed after well development.**

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
0714.02.02	**TC-3**	**1 of 1**

Project Name	**Truck City Site**	TOC Elevation (feet)	
Project Location	**Mount Vernon, WA**	Surface Elevation (feet)	
Start/End Date	**7/17/2014 to 7/17/2014**	Northing	
Driller/Equipment	**Holt Services, Inc./Geoprobe 7822DT**	Easting	
Geologist/Engineer	**Yen-Vy Van**	Hole Depth	**15.0-feet**
Sample Method	**Geoprobe**	Outer Hole Diam	**3.5-inch**

Sample Data (Interval / Percent Recovery / Collection Method / Number / Name (Type) / Blows/6")

Depth (feet, BGS)	Percent Recovery	Collection Method	Name (Type)
0	100	GP	
5	100	GP	
8.5			TC3-S-8.5 PID = 712 ppm
10	100	GP	
9.7			TC3-S-9.7 PID = 712 ppm
15.0			TC3-S-15.0 PID = 0.3 ppm

Soil Description

	Soil Description
0.0 to 0.4 feet	ASPHALT.
0.4 to 8.5 feet	SANDY GRAVEL (GW); tan brown; 5% fines; 35% sand, fine to coarse; 60% gravel, fine to medium, subangular; medium dense; dry. (FILL)
8.5 to 9.0 feet	SILTY SAND (SM); gray; 35% fines; 65% sand; medium dense; strong fuel odor; moist.
9.0 to 14.0 feet	POORLY GRADED SAND (SP); dark gray; 5% fines; 90% sand, medium, well sorted; 5% gravel; local fine subangular gravel; strong fuel odor; moist to wet, saturated @ 10.0 to 11.5 feet.
14.0 to 15.0 feet	SILTY SAND (SM); gray; 35% fines; 65% sand; medium dense; moist to wet.

NOTES: Ecology Well ID #BIP 877. Boring completed as pre-packed 2" well. Impacted from approximately 8.5 to 15.0 feet.
PID = photoionization detector.
ppm = parts per million.

▽ **Water level observed at time of drilling.** ▼ **Water level observed after well development.**

Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
0714.02.02	TC-4	1 of 1

Project Name	Truck City Site	TOC Elevation (feet)	
Project Location	Mount Vernon, WA	Surface Elevation (feet)	
Start/End Date	7/16/2014 to 7/16/2014	Northing	
Driller/Equipment	Holt Services, Inc./Geoprobe 7822DT	Easting	
Geologist/Engineer	Yen-Vy Van	Hole Depth	15.0-feet
Sample Method	Geoprobe	Outer Hole Diam	3.5-inch

Depth (feet, BGS)	Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Soil Description
0		100	GP				0.0 to 0.4 feet: ASPHALT.
0.4							0.4 to 5.0 feet: BASE GRAVEL / SILTY SAND (GW); dark brown and gray; 10% fines; 30% sand; 60% gravel; medium dense to dense; dry. (FILL)
2					TC4-S-2.0		
2.5							2.5 to 7.0 feet: SILTY SAND (SM); light to medium brown; 35% fines; 65% sand; local fine subangular gravel; local iron oxidation staining; dry.
5		100	GP		TC4-S-5.0 PID = 0.0 ppm		
7					TC4-S-7.0 PID = 0.0 ppm		7.0 to 9.0 feet: SILT (ML); gray; 100% fines; medium stiff; layered silt; moist to wet @ 7.0 feet, saturated @ 7.5 to 9.0 feet.
9							9.0 to 15.0 feet: POORLY GRADED SAND (SP); gray; 5% fines; 95% sand, well sorted, medium grained; saturated @ 9.0 to 14.0 feet, moist to wet @ 15.0 feet.
10		100	GP				
15					TC4-S-15.0 PID = 1.3 ppm		

NOTES: Ecology Well ID #BIP 875. Boring completed as pre-packed 2" well.
PID = photoionization detector.
ppm = parts per million.

▽ **Water level observed at time of drilling.**

▼ **Water level observed after well development.**

Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
0714.02.02	**TC-5**	**1 of 1**

Project Name	**Truck City Site**	TOC Elevation (feet)	
Project Location	**Mount Vernon, WA**	Surface Elevation (feet)	
Start/End Date	**7/17/2014 to 7/17/2014**	Northing	
Driller/Equipment	**Holt Services, Inc./Geoprobe 7822DT**	Easting	
Geologist/Engineer	**Yen-Vy Van**	Hole Depth	**15.0-feet**
Sample Method	**Geoprobe**	Outer Hole Diam	**3.5-inch**

Depth (feet, BGS)	Percent Recovery	Collection Method	Name (Type)	Soil Description
0	**20**	**GP**		0.0 to 0.4 feet: ASPHALT.
0.4				0.4 to 4.0 feet: SANDY GRAVEL (GW); tan brown; 10% fines; 25% sand; 65% gravel, fine to coarse, subangular; medium dense; dry. (FILL)
4				4.0 to 5.0 feet: GRAVELLY SAND (SW); grayish brown; 15% fines; 60% sand, fine to coarse; 25% gravel; medium dense; moist.
5	**20**	**GP**		5.0 to 6.5 feet: SILTY CLAY (CL); medium brown; 100% fines, low plasticity; soft; moist.
6.5				6.5 to 13.0 feet: SILTY SAND (SM); grayish brown; 35% fines; 65% sand; loose; moist to saturated @ 10.0 feet.
9 (▽)				
9.5–10	**100**	**GP**	**TC5-S-9.5 PID = 0.0 ppm**	
13			**TC5-S-13.0**	13.0 to 14.0 feet: SANDY SILT (ML); gray; 75% fines; 25% sand; slight sheen; saturated.
14				14.0 to 15.0 feet: POORLY GRADED SAND (SP); dark gray; 5% fines; 95% sand, well sorted, medium; medium dense; strong diesel-like fuel odor; moist to wet.
15			**TC5-S-15.0 PID = 1.8 ppm**	

NOTES: Ecology Well ID #BIP 876. Boring completed as pre-packed 2" well. Fuel impacted from approximately 10.0 to 15.0 feet.
PID = photoionization detector.
ppm = parts per million.

▽ **Water level observed at time of drilling.**

Maul Foster & Alongi, Inc.	Geologic Borehole Log/Well Construction		
	Project Number: **0714.02.02**	Well Number: **TC-6**	Sheet: **1 of 1**

Project Name	**Truck City Site**	TOC Elevation (feet)	
Project Location	**Mount Vernon, WA**	Surface Elevation (feet)	
Start/End Date	**7/17/2014 to 7/17/2014**	Northing	
Driller/Equipment	**Holt Services, Inc./Geoprobe 7822DT**	Easting	
Geologist/Engineer	**Yen-Vy Van**	Hole Depth	**15.0-feet**
Sample Method	**Geoprobe**	Outer Hole Diam	**3.5-inch**

Depth (feet, BGS)	Well Details	Sample Data: Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
0.0			100	GP					0.0 to 0.4 feet: ASPHALT.
0.4									0.4 to 3.0 feet: SAND with GRAVEL (SW); black brown; 10% fines; 75% sand; 15% gravel; loose; moist.
3.0						TC6-S-3.0 PID = 0.0 ppm			3.0 to 7.0 feet: SILTY SANDY CLAY (CL); light brown; 75% fines, moderate plasticity; 25% sand; medium stiff; abundant iron oxidation staining; moist to wet @ 7.0 feet.
5.0			100	GP					
7.0						TC6-S-7.0 PID = 1.3 ppm			7.0 to 9.0 feet: SILTY CLAY (CL); gray; 100% fines, low plasticity; soft; saturated.
9.0									9.0 to 12.5 feet: SILTY SAND (SM); gray; 35% fines; 65% sand; medium dense; saturated.
10.0			100	GP					
12.5						TC6-S-12.5			12.5 to 13.5 feet: POORLY GRADED SAND (SP); 10% fines; 90% sand, well sorted, medium; medium dense; saturated.
13.5						TC6-S-13.5			13.5 to 15.0 feet: SILTY SAND (SM); gray; 35% fines; 65% sand; medium dense; moist to wet.
15.0						TC6-S-15.0 PID = 28.5 ppm			

NOTES: Ecology Well ID #BIP 880. Boring completed as pre-packed 2" well.
PID = photoionization detector.
ppm = parts per million.

▽ **Water level observed at time of drilling.**

▼ **Water level observed after well development.**

APPENDIX C

SAMPLING ANALYSIS PLAN

SAMPLING AND ANALYSIS PLAN

TRUCK CITY SITE PROPERTY

Prepared for

SKAGIT COUNTY

MOUNT VERNON, WASHINGTON

July 8, 2014

Project No. 0714.02.02

Prepared by

Maul Foster & Alongi, Inc.

1329 N State Street, Suite 301, Bellingham WA 98225

MAUL
FOSTER
ALONGI

SAMPLING AND ANALYSIS PLAN

TRUCK CITY SITE PROPERTY

The material and data in this plan were prepared under the supervision and direction of the undersigned.

MAUL FOSTER & ALONGI, INC.

Yen-Vy Van, LHG
Senior Hydrogeologist

Justin L. Clary, PE
Principal Engineer

Jim Darling
Principal Planner

CONTENTS

CONTENTS (CONTINUED)

TABLES AND ILLUSTRATIONS

FOLLOWING PLAN:

TABLES

FIGURES

ACRONYMS AND ABBREVIATIONS

bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, and total xylenes
COC	chain of custody
COI	chemical of interest
the County	Skagit County, Washington
DRO	diesel-range organic
Ecology	Washington State Department of Ecology
FSDS	field sampling data sheet
GRO	gasoline-range organic
IDW	investigation-derived waste
LCS	laboratory control sample
LDS	laboratory duplicate sample
MFA	Maul Foster & Alongi, Inc.
MS/MSD	matrix spike and matrix spike duplicate
MTCA	Model Toxics Control Act
PAH	polycyclic aromatic hydrocarbon
pH	potential hydrogen
PID	photoionization detector
the Property	Truck City parcel and four adjoining undeveloped parcels to the south in Mt. Vernon, Washington
PRT	post run tubing
QA	quality assurance
QC	quality control
SAP	sampling and analysis plan
TPH	total petroleum hydrocarbons
TPH-HCID	total petroleum hydrocarbon identification
Truck City parcel	Skagit County parcel P29546
USEPA	U.S. Environmental Protection Agency
VOC	volatile organic compound
WAC	Washington Administrative Code

1 INTRODUCTION

Maul Foster & Alongi, Inc. (MFA) has prepared this sampling and analysis plan (SAP) consistent with the requirements of the Washington Administrative Code (WAC) 173-340-820 for Skagit County, Washington (the County) to guide the collection of samples during the focused site assessment investigation at parcels associated with the County's proposed county jail property in Mount Vernon, Washington (Figure 1 of MFA, 2014). The proposed county jail property comprises the following five parcels (collectively referred to in this plan as the Property): Skagit County parcel P29546 (Truck City parcel) and four adjoining undeveloped parcels to the south: P119262, P119263, P119265, and P119267 (see Figure 1 of MFA, 2014). The parcels are owned by various parties, and the County is in negotiation to acquire them. The Property is the focus of the site assessment. The Truck City parcel is commercially occupied by a gas station, truck stop and truck wash, restaurant, and small retail store. The remaining parcels on the Property are undeveloped rural grassland.

The procedures described in this SAP will be used for various phases and tasks of the project. The goal of the sampling is to obtain reliable data about physical, environmental, and chemical conditions at the Property in order to support the goals and objectives of the focused site assessment.

This SAP has been prepared consistent with the requirements of the Washington State Department of Ecology's (Ecology) Guidance on Sampling and Data Analysis Methods (Ecology, 1995), Guidance for Preparing Quality Assurance Project Plans for Environmental Studies (Ecology, 2004), Guidance for Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action (Ecology, 2009), and the 1993 Model Toxics Control Act (MTCA) (WAC Chapter 173-340).

1.1 Investigation Objectives

The primary objective of the SAP is to establish procedures for the collection of data of sufficient quality to evaluate the nature and extent of impacted soil and groundwater at the Property. The site assessment work plan references the relevant procedures and protocols from this SAP; identifies specific media to be sampled; and identifies the locations, frequency, and types of field or laboratory analyses that will be conducted. The SAP is meant to ensure that reliable data are obtained in support of the development of remedial actions at the Property if such actions are necessary for the protection of human health and the environment. It provides a consistent set of procedures that will be used throughout the various work phases identified in the work plan (MFA, 2014).

Once the nature and extent of soil and groundwater impacts have been determined, further investigation, which may involve the collection of other media (e.g., soil gas, indoor or ambient air, subslab vapor), may be proposed. The procedures for collection of samples of other media are summarized in this SAP, in case these are necessary in future scopes of work.

If a phase of work or an otherwise unforeseen change in methodology requires modification to this SAP, an addendum may be prepared that describes the specific revision(s), or the alternative procedures used will be documented in the site assessment report. Procedures are provided that will be used to direct the investigation process so that the following conditions are met:

- Data collected are of high quality, representative, and verifiable.
- Use of resources is cost effective.
- Data can be used by the County and Ecology to support selection and implementation of remedial actions, if necessary.

This SAP describes methods that will be used for sampling environmental media, decontaminating equipment, and managing investigation-derived waste (IDW). It also includes procedures for collecting, analyzing, evaluating, and reporting useful data. This SAP includes quality assurance (QA) procedures for field activities, quality control (QC) procedures, and data validation.

2 ACCESS AND SITE PREPARATION

2.1 Access

The County has obtained signed agreements from all the current businesses at the Property, granting access for MFA to conduct environmental investigation activities. MFA will coordinate activities directly with the County, Ecology, and retail tenants at the Property and will notify the County and the Ecology project manager before beginning work at the Property.

2.2 Site Preparation and Coordination

Before subsurface field sampling programs begin at the Property, public and private utility-locating services will be used to check for underground utilities and pipelines near the proposed sample locations. MFA will coordinate fieldwork with the County to define the locations of possible on-site utilities and piping or other subsurface obstructions. Ecology will be notified a minimum of 48 hours before field activities begin.

3 SOIL AND GROUNDWATER ASSESSMENT

The proposed locations of soil and reconnaissance groundwater borings are shown on Figures 3 and 4 of the focused site assessment work plan (MFA, 2014). Subsurface soil and reconnaissance groundwater samples at the Property will be collected using a combination drilling rig capable of direct-push (i.e., Geoprobe™) and hollow-stem auger drilling techniques. Selected borings (TC-1 through TC-6), which will be completed as established 2-inch-diameter monitoring wells, will be advanced using the direct-push drill method to enable continuous collection of soil cores to approximately 15 feet below ground surface (bgs) for vertical assessment at areas of known soil and/or groundwater impacts and at locales hydraulically downgradient of potential sources of environmental concern. These borings will subsequently be overdrilled via hollow-stem augers and completed as monitoring wells. Remaining proposed borings at the Property and at off-site locales (which will not be completed as monitoring wells) will be advanced via direct-push drilling technique.

Field screening will include measuring soil headspace vapor using a photoionization detector (PID) or an organic vapor monitor and documenting visual and olfactory observations.

Soil and groundwater samples will be analyzed following the program outlined in the work plan table (MFA, 2014). If there is evidence of impacts in the field, the sample depths may be altered in order to collect samples in and/or beneath the impacted areas. Additional analyses may be recommended based on field observations.

3.1 Borings

The borings will be advanced using a direct-push drill rig and a hollow-stem auger drill rig. Soil and groundwater samples will be collected using industry-standard sampling techniques. In the event that refusal is met before the desired boring depth is reached (i.e., significant debris, cobbles, glacial till, or bedrock are encountered), a different type of drilling technology may be considered.

Reconnaissance groundwater samples will be collected using a stainless steel (e.g., Geoprobe) water sampler at probe boring locations. The water sampler will be advanced to the desired depth. The casing around the water sampler will be pulled back, exposing the screen. If water does not flow into the screen within 15 minutes, the sampler will be removed and a temporary well will be installed. This will consist of placing 0.010-inch machine slot screen with polyvinyl chloride riser into the boring and allowing the boring to stay open overnight. This procedure will enable potential shallow groundwater to collect in the boring. If no water is observed in the boring, then the boring will be abandoned. Permanent screen and risers will be installed at borings over-drilled by hollow-stem auger drilling technique to be completed as monitoring wells.

If practicable at borings not completed as monitoring wells, at least one casing volume of water will be purged before sample collection. Groundwater will be purged using new polyethylene tubing or a stainless steel bailer, following procedures summarized in Section 5.1. If there is enough water, some will be used to measure water quality field parameters, including items such as potential hydrogen (pH), specific conductance, and temperature.

New, disposable tubing will be used at each location to collect water samples. Nondisposable equipment used for water sample collection will be decontaminated both before its use at the facility and after each sample is collected.

Samples will be labeled, preserved, and shipped to the analytical laboratory under standard chain-of-custody (COC) procedures.

3.2 Documentation

A log of soil samples will be prepared by a geologist or hydrogeologist licensed by the State of Washington or a person working under the direct supervision of a geologist or hydrogeologist licensed by the State of Washington. Boring logs will include information such as the project name and location, the name of the drilling contractor, the drilling method, the sampling method, sample depths, blow counts (if applicable), a description of soil encountered, and screened intervals. Soils will be described using American Society for Testing and Materials designation D2488-00, Standard Practice for Description and Identification of Soils (Visual-Manual Procedures). The information will be recorded on the MFA boring log form shown in Attachment A or in field notes.

3.3 Boring Decommissioning

After a boring is no longer needed, it will be decommissioned with bentonite chips or with bentonite grout in accordance with the WAC for Minimum Standards for Construction and Maintenance of Wells (WAC 173-160, 1998).

3.4 Monitoring Wells

Six permanent monitoring wells are currently proposed in this plan. Monitoring wells will be constructed according to the Washington well construction standards (Chapter 173-160 WAC) and as described below:

- Monitoring wells will be constructed with 2-inch-diameter polyvinyl chloride or stainless steel riser pipe and screened sections. The well screens will consist of 0.010-inch machine slots. The monitoring wells may be constructed with prepacked well screen with 10 x 20 washed silica sand or by placing materials downhole, following the WAC regulation listed above.
- Additional filter pack may be placed around the prepacked screen (if used). The additional filter pack will consist of graded 10 x 20 washed silica sand and will extend a maximum of 1 foot below the bottom of the screen and 3 feet above the top of the screen. A weighted line will be used to monitor the level of the filter pack during installation. The filter pack may be surged during installation.
- Bentonite grout or hydrated chips (e.g., 0.75-inch minus) will be used to seal the annulus above the filter pack. Potable water will be used. A weighted line will be used to measure the top of the bentonite chips as they are poured into place.
- At least 24 hours after installation of a well, the well will be developed by surging, bailing, or pumping to remove sediment that may have accumulated during installation and to improve the hydraulic connection with the water-bearing zone.
- Water quality field parameters such as specific conductance, pH, temperature, and turbidity will be measured during well development as deemed appropriate. The wells will be developed until the turbidity measurements are 10 nephelometric turbidity units or less, or until there is no noticeable decrease in turbidity. To the extent practical, water

quality field parameters will be considered stable when the specific conductance is within 10 percent of the previous reading, pH is within 0.1 standard unit of the previous reading, and temperature is within 0.1 degree Celsius of the previous reading.

3.5 Groundwater Elevations

Water level measurements to the nearest 0.01 foot will be taken, using an electronic water level indicator. If it is not known, the depth of the boring or the monitoring well will also be measured. The depth to water will be measured from the top of the casing (typically the polyvinyl chloride riser pipe) at the surveyed elevation point. This reference point will be marked so that future readings are taken from the same reference point. In addition, the well condition (if applicable), including the condition of the lock, monument integrity, and legibility of well labels, will be recorded for each location. Gauging equipment will be decontaminated between wells in accordance with the procedures outlined in Section 3.7.

3.6 Surveying

The location of the borings, surface samples, and other features of interest will be surveyed using a global positioning unit (e.g., Trimble™) capable of submeter accuracy. The installed monitoring wells will be surveyed by a licensed surveyor.

3.7 Equipment Cleaning and Decontamination

3.7.1 Drilling Equipment

The working area of the drill rig and downhole drilling equipment will be steam-cleaned or pressure-washed after arrival on the Property and after use in each boring or monitoring well. Decontamination fluids will be transferred to drums approved by the Washington State Department of Transportation, and will be managed according to the procedures outlined in Section 3.8.

3.7.2 Sampling Equipment

Nondisposable sampling equipment and reusable materials that contact the soil or water will be decontaminated before and after each sample and sampling location. Decontamination will consist of the following:

- Tap-water rinse (may consist of an equivalent high-pressure or hot-water rinse). Visible soil to be removed by scrubbing.
- Nonphosphate detergent wash, consisting of a dilute mixture of Liqui-Nox® (or equivalent) and tap water.
- Distilled-water rinse.
- Methanol solution rinse (1:1 solution of methanol with distilled water).
- Distilled-water rinse.

Decontamination fluids will be transferred to drums for management.

3.8 Management of Investigation-Derived Waste

IDW may include items such as soil cuttings, purged groundwater, decontamination fluids, sampling debris, and personal protective equipment. The IDW will be segregated into solids, liquids, and sampling debris (e.g., personal protective equipment, tubing, bailers). IDW will be stored in a designated area on the Property in drums approved by the Washington State Department of Transportation.

Drums will be labeled with their contents, the approximate volume of material, the date of collection, and the origin of the material. The drums will be sealed, secured, and transferred to a designated area on the Property, pending characterization.

Analytical data from the soil-sampling and groundwater-sampling activities at borings advanced for investigation of potential impacts from total petroleum hydrocarbons (TPH) and associated volatile organic compounds (VOCs), previously described, will be used to characterize the soil cuttings, drilling fluids, purge water, and decontamination fluids generated during the drilling and sampling at these selected borings.

IDW associated with petroleum fuel contamination, at concentrations above Ecology MTCA Method A cleanup levels, will follow procedures and analytical tests set forth in WAC 173-303-090 and WAC 17-303-100 in accordance with Ecology MTCA cleanup regulations. The IDW will be disposed of at a regulated landfill.

4 SOIL SAMPLING

Soil samples will be collected for lithologic description, field screening, and chemical analyses, as described below. The sampling intervals, depths, and initial sample analysis schedule are specified in the work plan (MFA, 2014).

4.1 Procedure

Samples will be prepared, handled, and documented as follows:

- Soil sampling equipment will be decontaminated before it is used at each sampling location (see Section 3.7).
- Samples will be obtained using new, uncontaminated gloves or decontaminated, stainless steel spoon, trowel, or knife.
- Soil will be field-screened by measuring soil vapor headspace and documenting visual and olfactory observations. If headspace measurements are collected, a representative

amount of soil will be placed in a new, food-grade, zip-lock plastic bag. Samples will then be warmed and agitated before headspace analysis is conducted by carefully piercing the bag with the PID. Field-screen results will be documented in the field book or boring log.

- Soil that will be analyzed for VOCs will be transferred directly from freshly exposed soil into laboratory-supplied containers, using the appropriate U.S. Environmental Protection Agency (USEPA) 5035A sampling procedures. The samples will be placed in 40-milliliter vials. Depending on the soil type, 5 milligrams of soil will be added to the prepared vials preserved with sodium bisulfate monohydrate or methanol. A soil sample will also be collected in an unpreserved glass jar to be analyzed for total petroleum hydrocarbon identification (TPH-HCID). The work plan table presents potential source areas and chemicals of interest (COIs) (MFA, 2014).
- Large particles (i.e., larger than 0.25 inch) may be removed before the sample is placed in a laboratory-supplied container.
- Soil samples will be transferred directly from the sampling device into laboratory-supplied glass jars, using a new, uncontaminated-gloved hand or decontaminated, stainless steel spoon, trowel, or knife.
- Sample containers will be labeled, packed in iced shipping containers with COC documentation (see Section 9), and hand-delivered or shipped to the laboratory.
- Sampling information will be recorded in a field notebook, on a field sampling data sheet (FSDS), and on the COC form.
- Generally, duplicate soil samples should be collected at the frequency of one duplicate sample for every 20 samples collected.

4.2 Nomenclature

Soil samples will be labeled with a prefix to describe the location identification number, an "S" to indicate a soil sample matrix, and the sample depth in feet. The depth interval should be specified as the middle of the sampling interval. For example, a soil sample collected from a boring at location 1 and at 15 feet bgs will have the sample nomenclature of B1-S-15.0.

Duplicate soil samples will replace the location number with "DUP," and the sample will have the same sample time as the primary sample. A duplicate sample of the abovementioned sample would appear as BDUP-S-15.0. To avoid confusion, duplicate samples should not be collected from multiple locations at the same depth on the same day and time.

Relevant sample information will be documented on the exploratory boring log (see Attachment A) or an FSDS (see Attachment B).

4.3 Composite Soil Sampling

Should soil stockpiles be created on site in the future, characterization of each stockpile will be completed through collection of representative composite soil samples. A clean shovel or hand auger will be used to dig up to 1.5 feet into the pile from at least three subsample locations. Each of the subsamples will be collected at least 0.5 foot bgs by hand with clean, disposable gloves. Subsample locations will be selected to obtain representative material, based on visual inspection and best professional judgment. To the extent possible, subsamples should consist of fine-particle-sized material, with larger rocks and debris removed. Subsamples will be combined and homogenized. The discrete samples will be placed into laboratory-supplied containers and submitted to the laboratory and held. The composite sample of the material source will be transferred to a laboratory-supplied glass container(s).

5 GROUNDWATER SAMPLING

During drilling, reconnaissance groundwater samples may be collected for chemical analyses, as described below. If monitoring wells are installed, groundwater samples may be collected following the procedure outlined below.

5.1 Reconnaissance Groundwater Sampling

Reconnaissance groundwater samples will be collected using conventional methods associated with the drilling method (e.g., inertia or peristaltic pump). Before groundwater sampling, the boring will be purged to minimize solids and to ensure that a representative sample is collected.

Groundwater will be transferred directly into laboratory-supplied containers specific to the analysis required, as outlined in Section 9. If there is enough water, water quality field parameters (e.g., temperature, specific conductance, pH, turbidity) will be measured.

5.2 Monitoring Well Groundwater Sampling

A peristaltic pump will collect groundwater samples, using standard low-flow sampling techniques, at installed monitoring wells. If possible, groundwater samples should be collected from the middle of the screened interval or, if the water level is below the top of the screen, from the middle of the water column. New, disposable tubing will be used at each monitoring location.

Before collection of groundwater samples, the water level will be measured and the well will be purged. If a peristaltic pump is used, the well should be purged at a USEPA-approved, low flow rate (e.g., 0.1 to 0.5 liter per minute). A minimum of one well volume will be purged before sample collection or until selected water quality field parameters (e.g., temperature, specific conductance, pH, turbidity) have stabilized. If the well goes dry during purging, a sample can be collected once the well recharges enough water. During purging, the flow rates, water levels, and water quality parameters will be recorded on an appropriate field form or in the field notes. Groundwater will be transferred directly into laboratory-supplied containers specific to the analysis required.

5.3 Nomenclature

Groundwater samples will be labeled with a prefix to describe the sampling location identification number, a "W" to indicate a water sample matrix, and the midpoint of the screened or open area sample depth in feet. For example, a reconnaissance groundwater sample collected from a boring at location 4 and with a screen from 30 feet to 35 feet bgs will have the sample nomenclature of B4-W-32.5.

Duplicate reconnaissance groundwater samples will replace the location number with "DUP," and the sample will have the same sample time as the primary sample. To avoid confusion, avoid collecting more than one a duplicate sample from the same depth at the same date and time. A duplicate sample of the abovementioned sample would appear as BDUP-W-32.5.

Relevant sample information will be documented on the exploratory boring log (see Attachment A) or an FSDS (see Attachment B); documentation may include items such as the screened interval or open space, equipment used, water quality field parameters, and the amount of water purged before sampling. The screened interval or open boring will be recorded on the boring log.

6 SOIL VAPOR SAMPLING

If soil vapor sampling is performed, it should be conducted as described below.

6.1 Procedure

Soil borings for soil vapor sample collection will be advanced using direct-push technology (e.g., Geoprobe). A "post run tubing" (PRT) system will be used to reduce problems that may occur with sampling directly through the steel rods. The PRT system uses an adapter and tubing to isolate the soil gas sample from the drill rods, thereby reducing possible leaks of ambient air from the rod joints into the sample. A PRT point holder and expendable point are attached to the leading end of a sampling screen. The drill rods will be advanced to the desired sample depth. The PRT adapter attached to the sample tubing is threaded into the reverse thread fitting in the top of the point holder. The rods are then retracted to release the expendable point, exposing the screen and creating an opening where soil gas can enter the PRT system.

The upper end of the tubing will be connected to the purging/sampling system (Figure 1). A flow controller may be attached to the sample setup to regulate the flow of soil vapor into the sample container. The line will be purged for one minute or a period of time sufficient to achieve a purge volume that equals at least three volumes of the PRT system and sampling train, and then the sample will be collected using a laboratory-supplied stainless steel canister (e.g., Summa canister), or other appropriate container.

If a leak check is deemed necessary, helium will be contained around the sampling apparatus and sampling location, using a small, tent-like structure or shroud, to serve as a leak-check compound to verify the integrity of the sampling system before the sample is collected. See the attached Figure 1 for sample system configuration.

6.2 Nomenclature

Soil vapor samples will be labeled with a prefix to describe the sampling location identification number, "SV" to indicate the soil vapor sample matrix, and the midpoint of the screened or open area sample depth. For example, a soil vapor sample collected from a boring at location 4 and with an open screen from 5 feet to 7 feet bgs will have the sample number B4-SV-6.0.

Duplicate soil vapor samples will replace the location number with "DUP," and the sample will have the same sample time as the primary sample. A duplicate sample of the abovementioned sample would appear as BDUP-SV-6.0.

Relevant sample information will be documented on the exploratory boring log (see Attachment A) or an FSDS (see Attachment B); documentation should include the screened interval or open space, equipment used, and helium meter readings.

7 SUBSLAB SOIL VAPOR SAMPLING

If subslab soil vapor sampling is performed, it should be conducted as described below.

7.1 Procedure

Subslab soil vapor sampling may be performed to evaluate vapors that collect under a building's foundation. The following procedures may be followed to install subslab soil vapor sampling points.

Subslab utilities, such as water, sewer, and electrical, should be located and marked on the slab before drilling or cutting. If it is determined that a building has a moisture barrier and/or a tension slab, special care should be taken when drilling or cutting through the concrete slab. Subslab samples will not be collected if the slab is in contact with, or potentially could come into contact with, groundwater.

After removal of the floor covering, a 1.0- to 1.25-inch-diameter hole will be drilled through the concrete slab (see Figure 2). A hammer drill can be used to drill the holes. A vacuum should be used to remove drill cuttings from the borehole.

Vapor probes will be constructed of 1/8-inch- or 1/4-inch-diameter, stainless steel tubing (e.g., Swagelok®) with a permeable probe tip. A Teflon™ sealing disk should be placed, as needed, between the probe tip and the blank riser pipe to prevent the downward migration of materials into the sand pack. Dry, granular bentonite should be used to fill the borehole annular space to above the base of the concrete foundation. Hydrated bentonite should then be placed above the dry granular bentonite. The bentonite for this portion of probe construction should be hydrated to ensure proper sealing. Care should be used in placement of the bentonite to prevent post-emplacement expansion, which might compromise both the probe and the cement seal. The remainder of the hole should be filled with bentonite grout if the probe installation is temporary, or with cement if the installation is permanent. Before the introduction of the bentonite grout or cement, the existing concrete surfaces in the borehole should be cleaned with a damp towel to increase the likelihood of a good seal. The vapor probe tip should be surrounded by a sand filter pack to ensure proper airflow to the probe tip.

Water used in the construction of the probe should be deionized, the bentonite grout should be contaminant-free and quick drying, and the metal probe components should be stainless steel and should be cleaned to remove manufacturer-applied cutting oils.

Before sampling, at least two hours should elapse following installation of a probe to allow the construction materials to cure and the subsurface to equilibrate (USEPA, 2006).

The upper end of the tubing will be connected to the purging/sampling system (Figure 3). A flow controller will be attached to the sample setup to regulate the flow of soil vapor into the sample container. Before sampling, the line will be purged for one minute or a period of time sufficient to achieve a purge volume that equals at least three volumes. Relevant sampling information, such as the sampling start and stop times, the initial and final canister vacuum readings, and weather conditions, should be recorded. If a stainless steel canister is used, the sample should be rejected or the data qualified if the initial canister pressure is not at least 28 inches of mercury or if the final canister pressure is greater than 5 inches of mercury.

Upon completion of the sampling events, the foundation probes will be decommissioned by overdrilling the probe tip, probe tubing, bentonite, and grout. The borehole will be filled with grout and concrete patch material.

7.2 Nomenclature

Subslab soil vapor samples will be labeled with a prefix to describe the sampling location identification number, "BV" to indicate the subslab soil vapor sample matrix, and the midpoint of the screened or open area sample depth. For example, a subslab soil vapor sample collected from location 4 and with an open screen from 5 feet to 7 feet bgs will have the sample number L04-BV-6.0.

Duplicate soil vapor samples will replace the location number with "DUP," and the sample will have the same sample time as the primary sample. A duplicate sample of the abovementioned sample would appear as LDUP-SV.

Samples will be documented in field notes and will include the equipment used and the screened interval or open space.

8 INDOOR/BACKGROUND AIR SAMPLING

If indoor or outdoor air sampling is performed, it should be conducted as described below.

8.1 Procedure

Indoor air samples should be collected from each level, if applicable, of each building included in the assessment. Indoor air samples will be collected approximately 3 to 5 feet above the floor. If outdoor ambient air samples are collected, they should be taken from locations upwind of the building at approximately the same time as the indoor air sample collection.

A flow controller should be attached to the sample setup to regulate the flow of air into the sample container. If a 6-liter, stainless steel canister is used, the valve will be opened to collect the sample over a 24-hour period. Field data will be recorded, including items such as a description of the sample location, sampling start and stop times, the initial and final canister vacuum readings, and weather conditions. The sample should be rejected or the data qualified if the initial canister pressure is not at least -28 inch of mercury or if the final canister pressure is greater than -5 inch of mercury.

8.2 Nomenclature

Indoor air samples will be labeled with a prefix to describe the sampling location identification number prefixed by L, "IA" to indicate the indoor air sample matrix, and a height above ground, in feet. Background air samples will be labeled with a prefix to describe the sampling location identification number prefixed by L, "BA" to indicate the background air sample matrix, and a height above ground, in feet. For example, an indoor air sample collected at location 4, 3 feet off the ground, will have the sample number L04-IA-4.0.

Duplicate air samples will replace the location number with "DUP," and the sample will have the same sample time as the primary sample. A duplicate sample of the abovementioned sample would appear as LDUP-IA-4.0.

Relevant sample information may be documented on an FSDS (see Attachment B) and should include items such as a description of the sample location, the screened interval or open space, and equipment used. Record field data before and after the sampling, including items such as the sampling start and stop times, the initial and final canister vacuum readings, temperature, relative humidity, and observations of conditions that may influence sampling results (e.g., presence or use of products that may contain COIs; open windows/doors; ventilation systems).

9 ANALYTICAL METHODS

9.1 Chemicals of Interest

Gasoline-range and diesel-range TPH and petroleum-fuel-associated VOCs, including benzene, toluene, ethylbenzene, and total xylenes (BTEX), were detected in subsurface soil and groundwater at the Truck City parcel, at concentrations above Ecology MTCA Method A cleanup levels. The following chemicals may be associated with known or suspected former site activities and have been identified as COIs: TPH and associated petroleum hydrocarbons, VOCs, metals, and polycyclic aromatic hydrocarbons (PAHs). COIs will be analyzed as outlined in the work plan table (MFA, 2014).

9.2 Laboratory Test Methods and Reporting Limits

9.2.1 Soil and Groundwater

In accordance with the QA/QC requirements set forth in this SAP, an accredited laboratory may perform the following analyses. Laboratory methods are summarized in the work plan table (MFA, 2014).

- Diesel-range TPH and residual-range TPH by Northwest Method NWTPH-Dx Extended
- Gasoline-range TPH by Northwest Method NWTPH-Gx
- VOCs associated with petroleum fuel, specifically BTEX, by USEPA 8021B
- VOCs associated with former automobile services by USEPA 8260C
- TPH-HCID by Ecology Method NWTPH-HCID

Selected groundwater samples from areas with confirmed historical petroleum fuel releases, including areas in the vicinity of borings TC-1, TC-3, and TC-5, will be analyzed for COIs outlined in Ecology MTCA Cleanup Table 830-1, Required Testing for Petroleum Releases:

- Table 830-1, Required Testing for Petroleum Releases, Gasoline Range Organics (GRO) suite, which includes gasoline-range TPH, BTEX, hexane, dibromoethane, 1-2 ethylene dibromide, dichloroethane, 1-2 ethylene dichloride, methyl tertiary-butyl ether, total lead, naphthalenes, and volatile petroleum hydrocarbons
- Table 830-1, Required Testing for Petroleum Releases, Diesel Range Organics (DRO) suite, which includes diesel- and residual-oil-range TPH, BTEX, carcinogenic PAHs, naphthalenes, and extractable petroleum hydrocarbons

- RCRA (Resource Conservation and Recovery Act) metals (including arsenic, selenium, barium, cadmium, chromium, silver, mercury, and lead) by USEPA 6020 series

To evaluate the potential biodegradation process, selected groundwater samples from TC-1 and TC-3 will also be analyzed for the following geochemical parameters to prescreen for the presence of electron acceptors:

- Nitrate by USEPA 353.2
- Manganese by USEPA 6020A
- Ferrous iron by USEPA ApplEnvMic7-87-1536
- Sulfate by ASTM D516-02
- Methane by RSK 175

9.2.2 Soil Vapor/Subslab Vapor Sampling

In the event that soil vapor/subslab vapor sampling is recommended at the Property, chemical analyses will be determined based on chemical impacts observed in soil and/or groundwater. For example, samples may be analyzed for selected compounds by Modified USEPA Method TO-15 selective ion monitoring or USEPA Method TO-17. An accredited laboratory will provide a 1-liter, stainless steel canister (e.g., Summa canister) or sorbent tube for each sample to be analyzed for VOCs.

9.2.3 Indoor/Background Air Sampling

In the event that indoor air/background air sampling is recommended at the Property, chemical analyses will be determined based on chemical impacts observed in soil, groundwater, and/or vapor sampling. For example, samples may be analyzed for selected VOC compounds by Modified USEPA Method TO-15 selective ion monitoring to achieve low reporting limits. An accredited laboratory may provide a 6-liter, stainless steel canister (e.g., Summa canister) or sorbent tube for each sample.

9.3 QA/QC Samples Generated in Field

To ensure that field samples and quantitative field measurements are representative of the media collected and conditions being measured, sample collection and measurement methods will follow procedures documented in Section 4.1. QC samples collected in the field include field equipment rinsate blanks, trip blanks, and field duplicates. Field QC samples will be identified on the FSDSs. Field and trip blank results may indicate possible contamination introduced by field or laboratory procedures; field duplicates indicate precision in both field and laboratory procedures.

9.4 Laboratory Operations

In the laboratory, QC samples may include matrix spike and matrix spike duplicate (MS/MSD) samples, laboratory control samples (LCSs), surrogate spike samples, and method blanks, as well as other QC samples and procedures as required by the individual methods.

9.5 Sample Containers, Preservation, and Handling

9.5.1 Preservation

Water samples will be collected in laboratory-supplied containers, as generally specified; see the summary in Table 2.

Soil samples for halogenated VOC and VOC analyses will be collected in 40-milliliter glass vials, using the USEPA 5035A method. Other soil samples will be collected in glass jars. The soil and groundwater samples will be stored in iced coolers at approximately 4 degrees Celsius. Sample containers will be supplied by the laboratory.

9.5.2 Sample Packaging and Shipping

Soil and groundwater samples will be stored in iced shipping containers or a refrigerator designated for samples, and then transported to the analytical laboratory in containers. Air samples will be transported to the analytical laboratory in shipping containers or boxes.

9.6 Sample Custody

Sample custody will be tracked from point of origin through analysis and disposal, using a COC form, which will be filled out with the appropriate sample and analytical information after samples are collected.

The following items will be recorded on the COC form:

- Project name
- Project number
- MFA project manager
- Sampler name(s)
- Sample number, date and time collected, media, number of bottles submitted
- Requested analyses for each sample
- Type of data package required
- Turnaround requirements

- Signature, printed name, and organization name of persons having custody of samples; date and time of transfer
- Additional instructions or considerations that would affect analysis (nonaqueous layers, archiving, etc.)

Persons in possession of the samples will be required to sign and date the COC form whenever samples are transferred between individuals or organizations. The COC will be included in the shipping containers. The laboratory will implement its in-house custody procedures, which begin when sample custody is transferred to laboratory personnel.

If samples are shipped via air or ground transportation (by a third party), the following custody procedures will be followed. The COC will be signed and custody will be relinquished to the carrier. The signed COC(s) will be packed in shipping containers with the samples, and a custody seal will be placed on the container. The shipping documentation will be used by the carrier to document custody of the package while it is in transit to the laboratory.

At the analytical laboratory, a designated sample custodian will accept custody of the samples and will verify that the COC form matches the samples received. The shipping container or set of containers is given a laboratory identification number, and each sample is assigned a unique sequential identification number.

9.7 Instrumentation

9.7.1 Field Instrumentation

Field instruments will be used during the investigations. The following field equipment may require calibration before use and periodically during sampling activities:

- pH meter
- Conductivity meter
- Dissolved-oxygen meter
- Oxygen/reduction potential meter
- Turbidity meter
- Thermometer
- PID
- Electronic water-level probe

Field-instrument calibration and preventive maintenance will follow the manufacturers' guidelines, and deviations from the established guidelines will be documented.

9.7.1.1 Field Calibration

Generally, field instruments should be calibrated daily before work begins. Field personnel may decide to calibrate more than once a day if inconsistent or unusual readings occur, or if conditions warrant more frequent calibration. Calibration activities should be recorded in logbooks or field notebooks. To ensure that field instruments are properly calibrated and remain operable, the following procedures will be used, at a minimum:

- Operation, maintenance, and calibration will be performed in accordance with the instrument manufacturers' specifications.
- Standards used to calibrate field instruments will meet the minimum requirements for source and purity recommended in the equipment operation manual. Standards will be checked for expiration dates that may be printed on the bottle. Standards that have expired should not be used.
- Acceptable criteria for calibration will be based on the limits set in the operations manual.
- Users of the equipment should be trained in the proper calibration and operation of the instrument.
- Operation and maintenance manuals for each field instrument should be available to persons using the equipment.
- Field instruments will be inspected before they are taken to the site.
- Field instruments will be calibrated at the start of each workday. Meters will be recalibrated, as necessary, during the work period.
- Calibration procedures (including items such as time, standards used, and calibration results) should be recorded in a field notebook. The information should be available if problems are encountered.

9.7.1.2 Preventive Maintenance

Preventive maintenance of field instruments and equipment will follow the operations manuals. A schedule of preventive-maintenance activities should be followed to minimize downtime and ensure the accuracy of measurement systems. Maintenance will be documented in the field notebook.

9.7.2 Laboratory Instrumentation

Specific laboratory instrument calibration procedures, frequency of calibration, and preparation of calibration standards will be according to the method requirements as developed by the USEPA, following procedures presented in SW-846 (USEPA, 1986).

9.7.2.1 Laboratory Calibration and Preventive Maintenance

The laboratory calibration ranges specified in SW-846 (USEPA, 1986) will be followed.

Preventive maintenance of laboratory equipment will be the responsibility of the laboratory personnel and analysts. This maintenance includes routine care and cleaning of instruments and inspection and monitoring of carrier gases, solvents, and glassware used in analyses. The preventive-maintenance approach for specific equipment should follow the manufacturers' specifications, good laboratory practices, and industry standard techniques.

Precision and accuracy data will be examined for trends and excursions beyond control limits to determine evidence of instrument malfunction. Maintenance should be performed when an instrument begins to change, as indicated by the degradation of peak resolution, shift in calibration curves, decrease in sensitivity, or failure to meet any of the QC criteria.

9.8 Laboratory QA/QC Samples

The laboratory QC samples will be used to assess the accuracy and precision of the laboratory analysis. Each category of laboratory QA/QC will be performed by the laboratory as required by method-specific guidelines. The acceptance criteria presented in the guidelines will be adhered to, and samples that do not meet the criteria will be reanalyzed or qualified, as appropriate.

9.8.1 Calibration Verification

Instruments will initially be calibrated at the start of the project or sample run, as required, and when any ongoing calibration does not meet control criteria. The number of points used in the initial calibration is defined in the analytical method. Calibration will be continued as specified in the analytical method to track instrument performance. If a continuing calibration does not meet control limits, analysis of project samples will be suspended until the source of the control failure is either eliminated or reduced to within control specifications.

9.8.2 Matrix Spike/Matrix Spike Duplicate

MS samples are analyzed to assess the matrix effects on the accuracy of analytical measurements. MS/MSD samples will be prepared by spiking investigative samples with known amounts of analytes before extraction and preparation and analysis. The recoveries for the MS/MSD samples will be used to assess the accuracy and precision in the analytical method by measuring how well the analytical method recovers the target compounds in the investigative matrices. For each matrix type, at least one set of MS/MSD samples will be analyzed for each batch of samples of 20 (or fewer) samples received.

9.8.3 Method Blanks

Method blanks are prepared using analyte-free (reagent) water and are processed with the same methodology (e.g., extraction, digestion) as the associated investigative samples. Method blanks are used to document contamination resulting in the laboratory from the analytical process. A method blank shall be prepared and analyzed in every analytical batch. The method blank results are used to verify that reagents and preparation do not impart unacceptable bias to the investigative sample results. The presence of analytes in the method blank sample will be evaluated against method-specific thresholds. If analytes are present in the method blank above the method-specific threshold, corrective action will be taken to eliminate the source of contamination before proceeding with analysis. Investigative samples of an analytical batch associated with method blank results outside acceptance limits will be appropriately qualified by the data validation contractor.

9.8.4 Laboratory Control Samples

LCSs are prepared by spiking laboratory-certified, reagent-grade water with the analytes of interest or a certified reference material that has been prepared and analyzed. The result for percent recovery of the LCS is a data quality indicator of the accuracy of the analytical method and laboratory performance.

9.8.5 Laboratory Duplicate Samples

Laboratory duplicate samples (LDSs) are prepared by the laboratory by splitting an investigative sample into two separate aliquots and performing separate sample preparation and analysis on each aliquot. The results for relative percent difference of the primary investigative sample and the respective LDSs are used to measure precision in the analytical method and laboratory performance. For nonaqueous matrices, sample heterogeneity may affect the measured precision for the LDSs.

9.9 Field QC

The following samples will be prepared by the sampling personnel in the field and submitted to the laboratory:

- **Equipment Rinsate Blanks—**To ensure that decontamination procedures are sufficient, an equipment rinsate blank will be collected when nondedicated, nondisposable equipment is used. At least one equipment rinsate blank will be collected for every 20 samples collected. If more than 20 samples are collected with the same equipment, or if high concentrations of contaminants are encountered, additional equipment rinsate blanks may be collected. Equipment rinsate blanks will be collected by passing laboratory deionized/distilled water through or over nondisposable sampling equipment.
- **Trip Blanks—**A trip blank monitors the potential for sample contamination during sample collection and transport. A trip blank consists of reagent-grade water in a new sample container, which is prepared at the same time as the sample containers. The trip blank will accompany the samples throughout collection, shipment, and storage. At least one trip blank should be included with each cooler in which samples for VOC analyses are stored.
- **Field Duplicates—**Field duplicates are collected to measure sampling and laboratory precision. At least one duplicate sample will be collected for every 20 samples.

9.10 Data Reduction, Validation, and Reporting

The analytical laboratory will submit analytical data packages that include laboratory QA/QC results to permit independent and conclusive determination of data quality. MFA will determine data quality, using the data evaluation procedures described in this section. The results of the MFA evaluation will be used to determine if the project data quality objectives are met.

9.10.1 Field Data Reduction

Daily internal QC checks will be performed for field activities. Checks will consist of reviewing field notes and field activity memoranda to confirm that the specified measurements, calibrations, and procedures are being followed. The need for corrective action will be assessed on an ongoing basis, in consultation with the project manager.

9.10.2 Laboratory Evaluation

Initial data reduction, evaluation, and reporting at the analytical laboratory will be carried out as described in USEPA SW-846 manuals for analyses (USEPA, 1986), as appropriate. Additional laboratory data qualifiers may be defined and reported to further explain the laboratory's QC concerns about a particular sample result. Additional data qualifiers will be defined in the laboratory's case narrative reports.

9.10.3 Data Deliverables

Laboratory data deliverables are listed below. Electronic deliverables will contain the same data that are presented in the hard-copy report.

- Transmittal cover letter
- Case narrative
- Analytical results
- COC
- Surrogate recoveries
- Method blank results
- MS/MSD results
- Laboratory duplicate results

9.10.4 MFA Evaluation

9.10.4.1 Data QA/QC Review

MFA will evaluate the laboratory data for precision, completeness, accuracy, and compliance with the analytical method. MFA will review data according to applicable sections of USEPA organics and inorganics procedures (USEPA, 2008, 2010), as well as appropriate laboratory method-specific guidelines (USEPA, 1986).

Data qualifiers, as defined by the USEPA, are used to classify sample data according to their conformance to QC requirements. Common qualifiers are listed below:

- J—Estimate, qualitatively correct but quantitatively suspect.
- R—Reject, data not suitable for any purpose.
- U—Not detected at a specified reporting limit.

Poor surrogate recovery, blank contamination, or calibration problems, among other things, can require qualification of the sample data. When sample data are qualified, the reasons for the qualification should be stated in the data evaluation report.

QC criteria not defined in the guidelines for evaluating analytical data are adopted, where appropriate, from the analytical method.

The following information will be reviewed during data evaluation, as applicable:

- Sampling locations and blind sample numbers
- Sampling dates
- Requested analysis
- COC documentation
- Sample preservation
- Holding times
- Method blanks
- Surrogate recoveries
- MS/MSD results
- Laboratory duplicates (if analyzed)
- Field duplicates
- Field blanks
- LCSs
- Method reporting limits above requested levels
- Additional comments or difficulties reported by the laboratory
- Overall assessment

The results of the data evaluation review will be summarized for each data package. Data qualifiers will be assigned to sample results on the basis of USEPA guidelines, as applicable.

9.10.4.2 Data Management and Reduction

MFA uses a database (i.e.., EQuIS™) to manage laboratory data. The laboratory will provide the analytical results in electronic, EQuIS-compatible format. Following data evaluation, data qualifiers will be entered into the database.

Data may be reduced to summarize particular data sets and to aid interpretation of the results. Statistical analyses may also be applied to results. Data-reduction QC checks will be performed on hand-entered data, calculations, and data graphically displayed. Data may be further reduced and managed using one or more of the following computer software applications:

- Microsoft Excel (spreadsheet)
- EQuIS (database)
- Microsoft Access (database)
- AutoCad and/or Arc GIS (graphics)
- USEPA ProUCL (statistical software)

10 REPORTING

After the data are received, MFA will generate a data report, which will summarize and screen the data against the applicable criteria.

LIMITATIONS

The services undertaken in completing this plan were performed consistent with generally accepted professional consulting principles and practices. No other warranty, express or implied, is made. These services were performed consistent with our agreement with our client. This plan is solely for the use and information of our client unless otherwise noted. Any reliance on this plan by a third party is at such party's sole risk.

Opinions and recommendations contained in this plan apply to conditions existing when services were performed and are intended only for the client, purposes, locations, time frames, and project parameters indicated. We are not responsible for the impacts of any changes in environmental standards, practices, or regulations subsequent to performance of services. We do not warrant the accuracy of information supplied by others, or the use of segregated portions of this plan.

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TABLES

Table 1
Soil Sample Handling Summary
Truck City Site Property
Mount Vernon, Washington

Analyte	Method	Suggested Volume	Container	Number of Containers	Preservative	Storage Temperature	Holding Time from Collection
Total Petroleum Hydrocarbons-Hydrocarbon Identification	NWTPH-HCID	4 ounces	Glass Jar	1	none	4 degrees C	14 days
Total Petroleum Hydrocarbons—Diesel and Residual Oil	NWTPH-Dx	4 ounces	Glass Jar	1	none	4 degrees C	14 days
Total Petroleum Hydrocarbons—Gasoline	NWTPH-Gx	5035 Sample Kit	VOA/Glass Jar	1 5035 Sample Kit	5035 Sample Kit	4 degrees C	14 days
Total Metals	USEPA 6010	4 ounces	Glass Jar	1	none	4 degrees C	six months
Mercury	USEPA SW7471	4 ounces	Glass Jar	1	none	4 degrees C	28 days
PAHs	USEPA 8270 SIM	4 ounces	Glass Jar	1	none	4 degrees C	14 days
PCBs	USEPA 8082	4 ounces	Glass Jar	1	none	4 degrees C	365 days
VOCs	USEPA 8260B	5035 Sample Kit	VOA/Glass Jar	1 5035 Sample Kit	5035 Sample Kit	4 degrees C	14 days
1,2-dibromoethane	USEPA 8260B SIM	5035 Sample Kit	VOA/Glass Jar	1 5035 Sample Kit	5035 Sample Kit	4 degrees C	14 days
SVOCs	USEPA 8270	4 ounces	Glass Jar	1	none	4 degrees C	14 days
VPH	NWTPH-VPH	5035 Sample Kit	VOA/Glass Jar	1 5035 Sample Kit	5035 Sample Kit	4 degrees C	14 days
EPH	NWTPH-EPH	4 ounces	Glass Jar	1	none	4 degrees C	14 days

NOTES:

5035 Sample Kit consists of two prepared 40-milliliter VOAs with 5 milliliters of sodium bisulfate, two prepared 40-milliliter VOAs with 5 milliliters of methanol; OR two prepared, capped soil plungers; and one 2-ounce jar for moisture content determination.

Total metals are arsenic, chromium (total), silver, mercury, barium, selenium, lead, and cadmium.

C = Celsius.

EPH = extractable petroleum hydrocarbons.

NWTPH = Northwest Total Petroleum Hydrocarbons.

PAH = polycyclic aromatic hydrocarbon.

PCB = polychlorinated biphenyl.

SIM = selective ion monitoring.

SVOC = semivolatile organic compound.

SW = solid waste.

USEPA = U.S. Environmental Protection Agency.

VOA = volatile organic analysis vial.

VOC = volatile organic compound.

VPH = volatile petroleum hydrocarbons.

Table 2
Groundwater Sample Handling Summary
Truck City Site Property
Mount Vernon, Washington

Analyte	Method	Suggested Volume	Container	Number of Containers	Preservative	Storage Temperature	Holding Time from Collection
Total Petroleum Hydrocarbons-Hydrocarbon Identification	NWTPH-HCID	4 ounces	Glass Jar	1	none	4 degrees C	14 days
Gasoline-range organics	NWTPH-Gx	40 milliliter	VOA	3	HCL pH < 2	4 degrees C	14 days
Diesel- and residual-range organics	NWTPH-Dx	125 milliliter	Amber Glass	1	HCL pH < 2	4 degrees C	14 days
Total and dissolved metals	USEPA 6020	500 milliliter	Polyethylene	1	HNO_3 pH < 2	4 degrees C	six months
VOCs	USEPA 8260C	40 milliliter	VOA	3	HCL pH < 2	4 degrees C	14 days
PCBs	USEPA 8082	1 liter	Amber Glass	2	none	4 degrees C	365 days
PAHs	USEPA 8270	1 liter	Amber Glass	2	none	4 degrees C	7 days
SVOCs	USEPA 8270	250 milliliter	Amber Glass	1	none	4 degrees C	7 days
EDB	USEPA 8011	40 milliliter	VOA	3	none	4 degrees C	7 days

NOTES:

Total metals are aluminum, arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver, and titanium.

C = Celsius.

EDB = 1,2-dibromoethane.

HCL = hydrochloric acid.

HNO_3 = nitric acid.

NWTPH = Northwest Total Petroleum Hydrocarbons.

PAH = polycyclic aromatic hydrocarbon.

PCB = polychlorinated biphenyl.

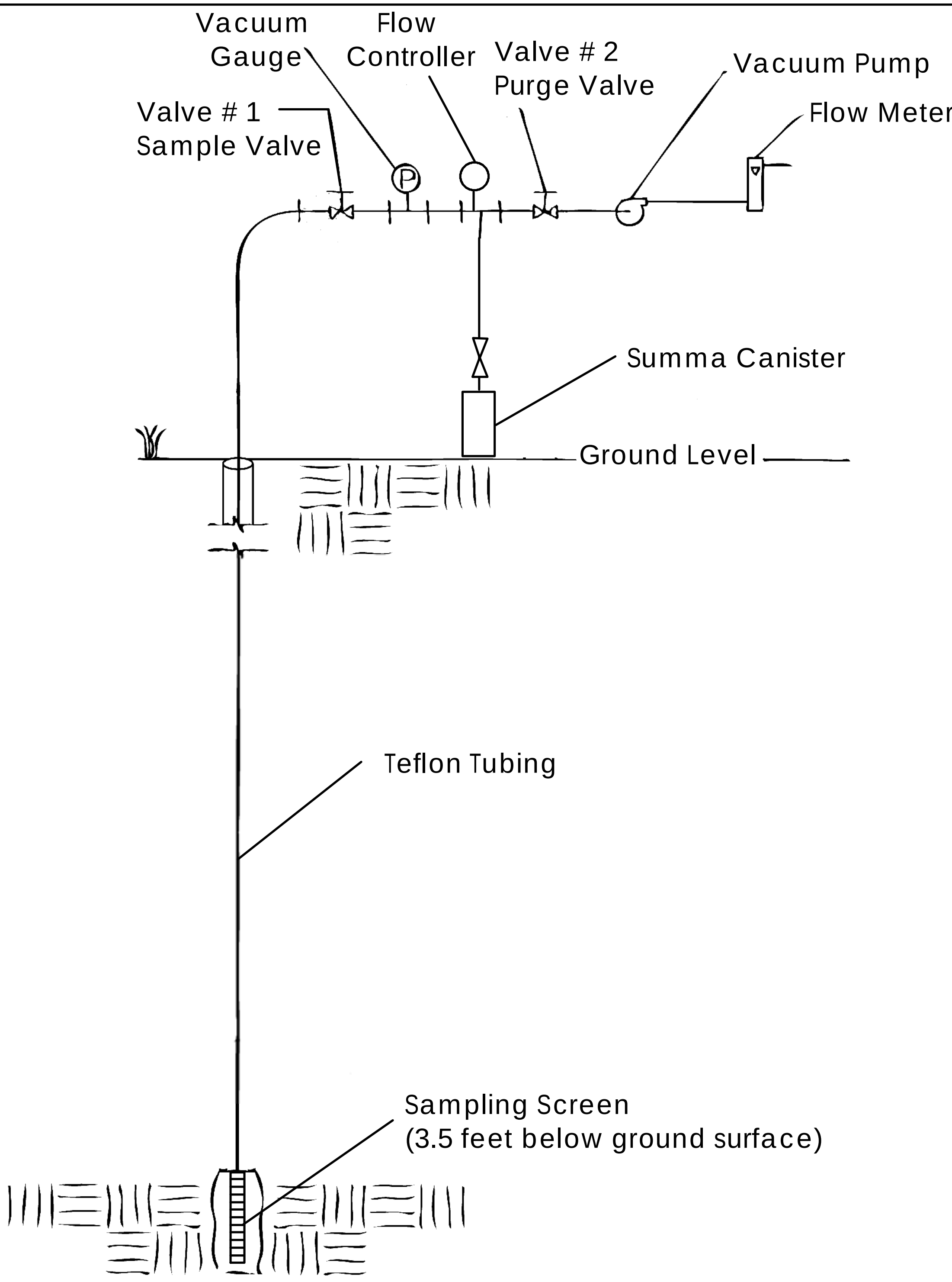
SVOC = semivolatile organic compound.

USEPA = U.S. Environmental Protection Agency.

VOA = volatile organic analysis vial.

VOC = volatile organic compound.

FIGURES



Source: CH2MHill, Corvallis Applied Sciences Laboratory

Figure 1
Soil Gas/Evacuated Sampler System
Truck City Site
Mount Vernon, Washington

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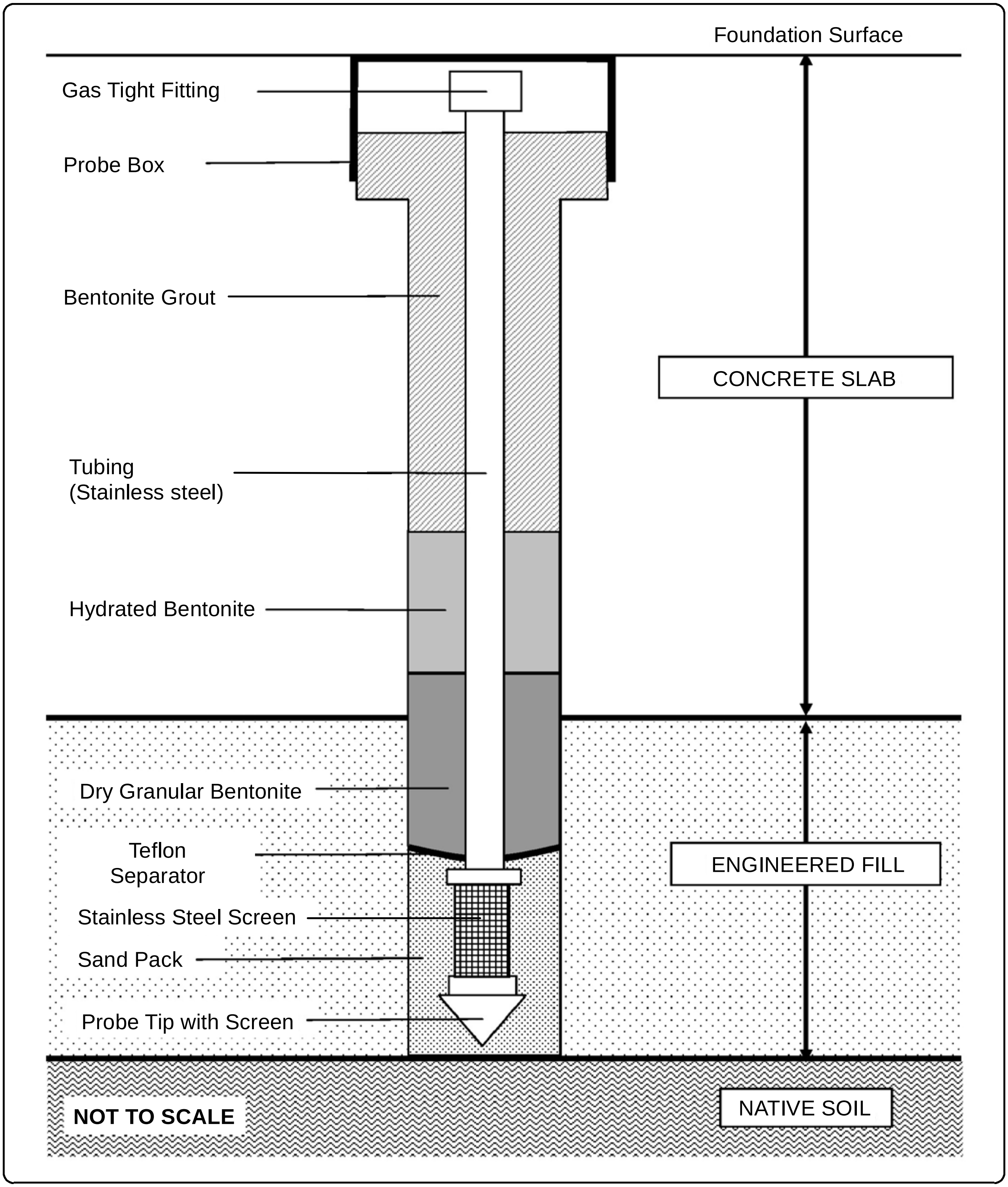
File: X:\8128.01\20\Projects\Fig4_Soil Gas_Evacuated Sampler System.mxd
Print Date: 4/29/2014
Approved By: yvan
Produced By: rmaronn
Project: 0714.02.02



Source: State of California Vapor Intrusion Document
October 2011 (DTSC - Cal/EPA).

Figure 2
Schematic Diagram of a Subslab Sampling Probe

Truck City Site
Mount Vernon,Washington

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Print Date: 4/29/2014
Approved By: yvan
Produced By: rmaronn
Project: 0714.02.02

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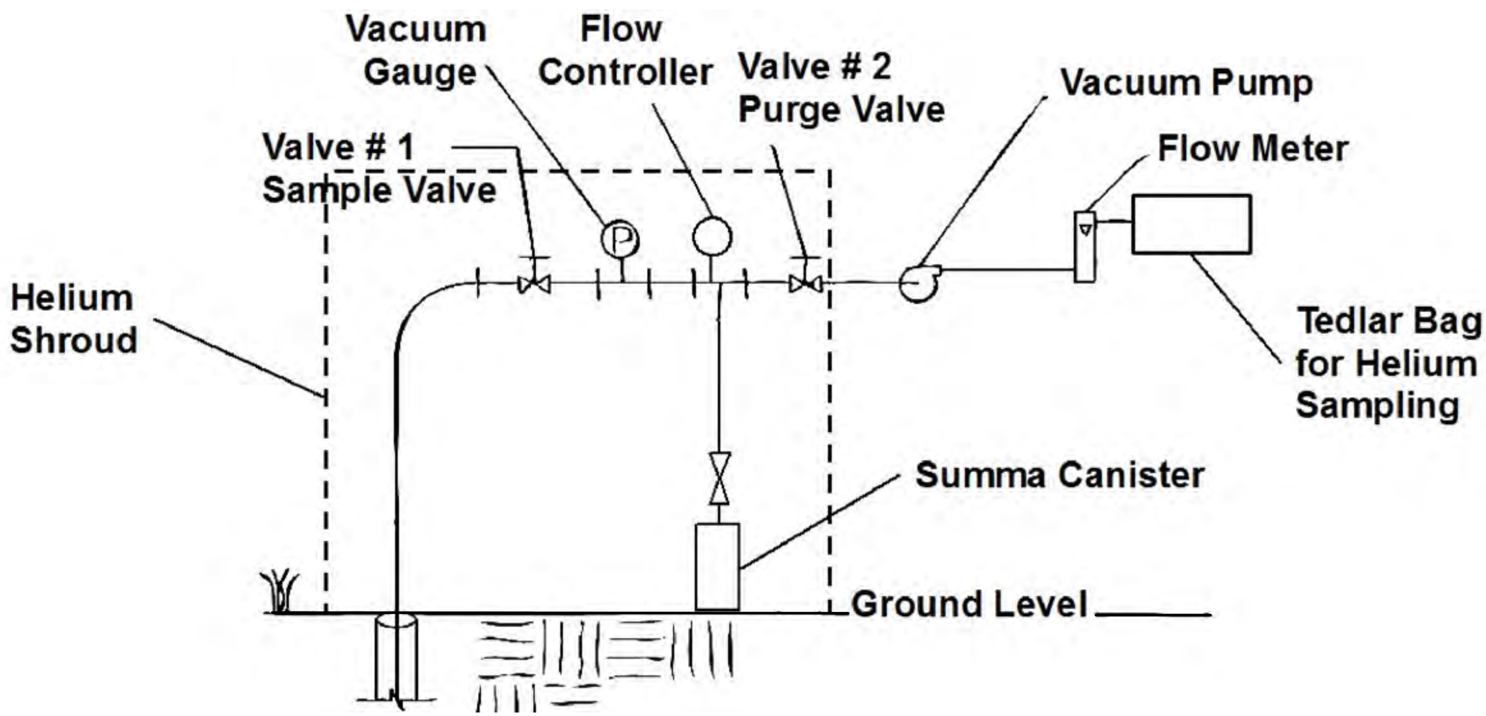

Figure 3
Subslab Soil Gas Evacuated Sampler System Ground Level

Truck City Site
Mount Vernon, Washington

Source: CH2MHill, Corvallis Applied Sciences Laboratory

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ATTACHMENT A

BORING LOG FORM

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Boring Log Form

Boring/Well No.:	
Site:	
Location:	
Project #:	

Drill Rig		MFA Staff:		Hole Dia:		Total Depth:	
Drilling Co.:				Water Level:		WLE Note:	
Start Date:		End Date:		Water Level:		WLE Note:	

Completion	Sample				Lithology							
	Top:		Time:	Depth:	Soil Type:				Color:			
	Length:				Top:		Fines:				Moisture:	
	Type:		Sample ID		Bottom:		Sand:				PID:	
	% Recov:				Soil Class:		Gravel:				Line Type:	
					Trace:				Impacts:			
					Notes:							
	Top:		Time:	Depth:	Soil Type:				Color:			
	Length:				Top:		Fines:				Moisture:	
	Type:		Sample ID		Bottom:		Sand:				PID:	
	% Recov:				Soil Class:		Gravel:				Line Type:	
					Trace:				Impacts:			
					Notes:							
	Top:		Time:	Depth:	Soil Type:				Color:			
	Length:				Top:		Fines:				Moisture:	
	Type:		Sample ID		Bottom:		Sand:				PID:	
	% Recov:				Soil Class:		Gravel:				Line Type:	
					Trace:				Impacts:			
					Notes:							
	Top:		Time:	Depth:	Soil Type:				Color:			
	Length:				Top:		Fines:				Moisture:	
	Type:		Sample ID		Bottom:		Sand:				PID:	
	% Recov:				Soil Class:		Gravel:				Line Type:	
					Trace:				Impacts:			
					Notes:							
	Top:		Time:	Depth:	Soil Type:				Color:			
	Length:				Top:		Fines:				Moisture:	
	Type:		Sample ID		Bottom:		Sand:				PID:	
	% Recov:				Soil Class:		Gravel:				Line Type:	
					Trace:				Impacts:			
					Notes:							
	Top:		Time:	Depth:	Soil Type:				Color:			
	Length:				Top:		Fines:				Moisture:	
	Type:		Sample ID		Bottom:		Sand:				PID:	
	% Recov:				Soil Class:		Gravel:				Line Type:	
					Trace:				Impacts:			
					Notes:							
	Top:		Time:	Depth:	Soil Type:				Color:			
	Length:				Top:		Fines:				Moisture:	
	Type:		Sample ID		Bottom:		Sand:				PID:	
	% Recov:				Soil Class:		Gravel:				Line Type:	
					Trace:				Impacts:			
					Notes:							
Borehole Notes:												

ATTACHMENT B

FIELD SAMPLING DATA SHEET FORMS

Maul Foster & Alongi, Inc.

7223 NE Hazel Dell Avenue, Suite B, Vancouver, WA 98665 (360) 694-2691 Fax. (360) 906-1958

Soil Field Sampling Data Sheet

Client Name		**Sample Location**	
Project Number		**Sampler**	
Project Name		**Sampling Date**	
Sampling Event		**Sample Name**	
Sub Area		**Sample Depth**	
FSDS QA:		**Easting**	

Easting		**Northing**		**TOC**	

Sample Information

Sampling Method	Sample Type	Sample Category	PID/FID	Sampling Time	Container Code	#
(1) Backhoe	Liquid	Composite			2 oz. soil	
					4 oz. soil	
					8 oz. soil	
					Other	
					Total Containers	0

Sample Description:

General Sampling Comments

Sampling Method Code:

(1) Backhoe, (2) Hand Auger, (3) Drill Bit Cutting Head, (4) Geoprobe, (5) Split Spoon, (6) Shelbey Tube, (7) Grab, (8) Other (Specify)

Signature ______________________________

Maul Foster & Alongi, Inc.

7223 NE Hazel Dell Avenue, Suite B, Vancouver, WA 98665 (360) 694-2691 Fax. (360) 906-1958

Water Field Sampling Data Sheet

Client Name		Sample Location	
Project #		Sampler	
Project Name		Sampling Date	
Sampling Event		Sample Name	
Sub Area		Sample Depth	
FSDS QA:		Easting	Northing	TOC

Hydrology/Level Measurements

Date	Time	DT-Bottom	DT-Product	DT-Water	(Product Thickness) DTP-DTW	(Water Column) DTB-DTW	(Gallons/ft x Water Column) Pore Volume

(0.75" = 0.023 gal/ft) (1" = 0.041 gal/ft) (1.5" = 0.092 gal/ft) (2" = 0.163 gal/ft) (3" = 0.367 gal/ft) (4" = 0.653 gal/ft) (6" = 1.469 gal/ft) (8" = 2.611 gal/ft)

Water Quality Data

Purge Method	Time	Purge Vol (gal)	Flowrate l/min	pH	Temp (C)	E Cond (uS/cm)	DO (mg/L)	EH	Turbidity
Final Field Parameters									

Methods: (1) Submersible Pump (2) Peristaltic Pump (3) Disposable Bailer (4) Vacuum Pump (5) Dedicated Bailer (6) Inertia Pump (7) Other (specify)

Water Quality Observations:

Sample Information

Sampling Method	Sample Type	Sampling Time	Container Code/Preservative	#	Filtered
	Groundwater		VOA-Glass		
			Amber Glass		
			White Poly		
			Yellow Poly		
			Green Poly		
			Red Total Poly		
			Red Dissolved Poly		
			Total Bottles	0	

General Sampling Comments

Signature ______________________________

APPENDIX D

QUALITY ASSURANCE PROJECT PLAN

QUALITY ASSURANCE PROJECT PLAN

TRUCK CITY SITE
MOUNT VERNON, WASHINGTON

Prepared for

SKAGIT COUNTY

MOUNT VERNON, WASHINGTON
November 11, 2014
Project No. 0714.02.02

Prepared by
Maul Foster & Alongi, Inc.
1329 N State Street, Suite 301, Bellingham WA 98225

MAUL
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ALONGI

CONTENTS

CONTENTS (CONTINUED)

TABLES AND ILLUSTRATIONS

FOLLOWING PLAN:

TABLES

ACRONYMS AND ABBREVIATIONS

ARAR	applicable or relevant and appropriate requirement
BTEX	benzene, toluene, ethylbenzene, and total xylenes
CAP	Cleanup Action Plan
COC	chain of custody
the County	Skagit County, Washington
FSDS	field sampling data sheet
LCS/LCSD	laboratory control sample and laboratory control sample duplicate
MFA	Maul Foster & Alongi, Inc.
MRL	method reporting limit
MS/MSD	matrix spike and matrix spike duplicate
PARCC	precision, accuracy, representativeness, completeness, and comparability
PID	photoionization detector
QA	quality assurance
QAPP	Quality Assurance Plan
QC	quality control
RPD	relative percent difference
SAP	Sampling and Analysis Plan
The Site	Truck City Site, Skagit County parcel P29546
The Property	The proposed jail property
TPH	total petroleum hydrocarbons
USEPA	U.S. Environmental Protection Agency
VOC	volatile organic compounds

1 INTRODUCTION

On behalf of Skagit County, Washington (the County), Maul Foster & Alongi, Inc. (MFA) has prepared this Quality Assurance Project Plan (QAPP) to guide the collection of soil and groundwater samples during remedial action for the Truck City site ("Site") (Facility Site ID: 2673, Cleanup Site ID: 5176). The Site is located at 3216 Old Highway 99 South, Mount Vernon in Skagit County, Washington (Figure 1). The Site, in combination with other adjacent parcels, is proposed for construction of the Skagit County jail. The proposed jail property (Property) comprises the following five parcels: Skagit County parcels P29546 (Truck City parcel) and four adjoining undeveloped parcels to the south, P119262, P119263, P119265, and P119267 (Figure 2). The parcels are owned by various parties, and Skagit County (the "County") has executed purchase and sale agreement(s) for the parcels. The Truck City parcel comprises the entire Site based on data available at this time. As part of that effort, the County is pursuing a Prospective Purchaser Consent Decree with the Washington State Department of Ecology (Ecology). This QAPP is to be used only in conjunction with the Cleanup Action Plan (CAP) and its Sampling and Analysis Plan (SAP). Figure 1 of the CAP presents a layout of the Site.

This QAPP was written to fulfill the requirements in Washington Administrative Code 173-340-410(3)(a).

The purpose of this QAPP is to describe the procedures that will be used to direct the remedial action process so that the following conditions are met:

- Data collected are high-quality, representative, and verifiable.
- Use of resources is cost-effective.
- Data can be used by the County and Ecology to support objectives stated in the CAP.

This document includes quality assurance (QA) procedures for field activities, as well as QA and quality control (QC) procedures for sampling. The QAPP provides a consistent set of QA/QC procedures that will be used throughout the various work phases identified in the CAP. This QAPP supports other documents (e.g., the SAP by forming the basis for data acquisition and analysis) and therefore is not expected to change significantly between phases of work. Through work plans or other documents, the scopes of work for the various activities outlined in this CAP will reference relevant parts of the QAPP for specifics. Because of this, the QAPP lists all currently foreseen analytical methods that may be used for analyzing soil and groundwater, even though a phase of monitoring may target only a specific suite of indicator compounds.

2 PROJECT ORGANIZATION AND RESPONSIBILITIES

The County, through its environmental consultant, MFA, will be responsible for seeing that the procedures and guidelines described in the QAPP are followed. MFA personnel responsibilities for quality assurance activities are summarized below.

Senior Project Director—Jim Darling

Coordinate with project task leaders and communicate with County and agency personnel, as needed. Allocate MFA's resources to the project and ensure that the objectives of the remedial action and the CAP are met. Assist task leaders with technical issues.

Senior Project Engineer—Justin Clary

Review data, reports, and other project-related documents prepared by MFA before their submittal to the County or to Ecology. Assist project staff with technical issues.

Project Manager—Yen-Vy Van

Oversee project performance to ensure compliance. Implement necessary action and adjustments to accomplish program objectives. Monitor field investigations. Coordinate field and laboratory sample tracking. Review all data and prepare reports and other project-related documents. Provide technical QA assistance. Monitor field investigations. Coordinate field and laboratory sample tracking. Arrange for other external procurement packages for QA needs. Coordinate corrective actions. Review analytical data and data validation reports. Act as liaison between the County or Ecology and contract personnel.

Analytical QA Officer—Brian Fauth

Ensure that the contract laboratory instruments are calibrated and maintained as specified, internal QC measures are performed and analytical methods are applied, the project QA coordinator is notified when problems occur and corrective action is taken, laboratory evaluation is complete and reported in the required deliverables.

Project QC Officer—Mary Benzinger

Ensure that sample collection, preservation, storage, transport, and chain-of-custody (COC) procedures are followed. Track field and laboratory samples. Perform corrective actions. Validate analytical data. Inform project QA coordinator when problems occur, and communicate and document corrective actions taken.

3 QUALITY ASSURANCE OBJECTIVES FOR DATA MEASUREMENT

The overall QA objective is to collect acceptable data of known and usable quality. The general data quality objective is to provide data on soil and groundwater of sufficient accuracy and precision to identify impacts on the Site. This objective will be achieved and documented using the procedures and criteria set forth in the QAPP. For each measurement made to obtain quantitative data, a set of quality objectives will be used to aid in collecting usable data.

3.1 Chemicals of Potential Concern

The following chemicals of interest have been detected in soil/or and groundwater at the Site:

- Gasoline-range total petroleum hydrocarbons (TPH)
- Diesel-range TPH
- Petroleum-fuel-associated volatile organic compounds (VOCs), including benzene, toluene, ethylbenzene, and total xylenes (BTEX)

3.2 Laboratory Test Methods and Detection Limits

In accordance with the QA/QC requirements set forth in this QAPP, the analyses of soil and groundwater listed in Tables 1 and 2 of the SAP will be performed by the laboratory, using the following laboratory methods:

- Gasoline-range TPH by Northwest Method NWTPH-Gx
- Diesel-range TPH and residual-range TPH by Northwest Method NWTPH-Dx Extended
- VOCs associated with petroleum fuel, specifically BTEX, by U.S. Environmental Protection Agency (USEPA) 8021B

To permit the evaluation of risk to human health and the environment, routine detection limits for samples collected as part of this investigation should be below applicable or relevant and appropriate requirements (ARARs).

State and federal laws that contain ARARs that apply to the cleanup action at the Site are presented in Table 6 of the CAP. Local laws, which may be more stringent than specified state and federal laws, will govern where applicable.

3.3 PARCC Definitions and Objectives

Typically, quality objectives are categorized under precision, accuracy, representativeness, completeness, and comparability (PARCC) parameters. Routine analytical procedures to be used for measuring precision and accuracy include use of duplicate analyses, standard reference materials, surrogate spikes, matrix spikes (MSs), method blanks, and laboratory control samples (LCSs). Surrogate spikes, MSs, method blanks, and LCSs (blank spikes) will be analyzed by at the minimum frequencies specified below. Additional spikes and duplicate analyses may be performed. For the purposes of laboratory analysis, a sample "batch" is considered to be 20 or fewer samples of a single matrix that are extracted or prepared together or are received in the same shipment.

- Surrogate spikes: every sample analyzed for organic compounds will be spiked with selected nontarget analytes and analyzed to evaluate laboratory performance on individual samples.
- MSs and MS duplicates (MSDs): MS samples are analyzed to assess the matrix effects on the accuracy of analytical measurements. MS/MSD samples will be prepared by spiking investigative samples with known amounts of analytes before extraction and preparation and analysis. The recoveries for the MS/MSD samples will be used to assess the accuracy and precision in the analytical method by measuring how well the analytical method recovers the target compounds in the investigative matrices. For each matrix type, at least one set of MS/MSD samples will be analyzed for each batch of samples of 20 (or fewer) samples received.
- Method blank: Method blanks are prepared using analyte-free (reagent) water and are processed with the same methodology (e.g., extraction, digestion) as the associated investigative samples. Method blanks are used to document contamination resulting in the laboratory from the analytical process. A method blank shall be prepared and analyzed in every analytical batch. The method blank results are used to verify that reagents and preparation do not impart unacceptable bias to the investigative sample results. The presence of analytes in the method blank sample will be evaluated against method-specific thresholds. If analytes are present in the method blank above the method-specific threshold, corrective action will be taken to eliminate the source of contamination before proceeding with analysis. Investigative samples of an analytical batch associated with method blank results outside acceptance limits will be appropriately qualified by the data validation contractor.

- LCSs and LCS duplicates (LCSDs): LCSs are prepared by spiking laboratory-certified, reagent-grade water with the analytes of interest or a certified reference material that has been prepared and analyzed. The result for percent recovery of the LCS is a data quality indicator of the accuracy of the analytical method and laboratory performance. LDSs are prepared by the laboratory by splitting an investigative sample into two separate aliquots and performing separate sample preparation and analysis on each aliquot. The results for relative percent difference (RPD) of the primary investigative sample and the respective LDSs are used to measure precision in the analytical method and laboratory performance. For nonaqueous matrices, sample heterogeneity may affect the measured precision for the LDSs.

The precision, accuracy, and completeness criteria to be used for analytical data are summarized in Table 1. Method reporting limit (MRL) goals are listed in Table 2.

PARCC parameters used for field measurements are not generally well defined in the guidelines and literature. These parameters have been defined using the best available guidelines to establish field measurement QA objectives, and will be followed as closely as possible.

3.3.1 Precision

Precision is the degree of agreement between replicate measurements of the same source or sample. Duplicate measurements can be made on the same sample or on two samples from the same source. Precision is generally assessed by duplicate measurements of a subset of samples (laboratory or field duplicate samples). The chemical analysis methods define the portion of the samples being analyzed for which precision must be assessed. The precision of physical measurements, such as groundwater level measurements, and of field measurements, such as pH and specific conductance, will be based on the general body of data for the instruments and methods, but will not be calculated specifically.

When detected concentrations in either a sample or a duplicate are less than five times the MRL or the method detection limit, data quality objectives for precision suggest that sample and duplicate results should be within plus or minus the MRL of each other. When detected concentrations in the sample and duplicate are both greater than five times the MRL, data quality objectives for precision suggest that the RPD between the results should be less than or equal to 20 percent.

The RPD can be calculated as follows:

$$RPD = \frac{(c_1 - c_2) \times 100}{c}$$

where

RPD = relative percent difference

c_1 = concentration of an analyte in a sample

c_2 = concentration of an analyte in a duplicate sample

$$c = (c_1 + c_2)/2$$

Acceptable precision limits are based on historical databases, as defined by the USEPA. Laboratory duplicate measurements will be obtained for each set of samples submitted, and will be tested for inorganic analytes only (USEPA, 1994). Field duplicates will be evaluated similarly.

3.3.2 Accuracy

Accuracy measures the level of bias exhibited by an analytical method or measurement. To measure accuracy, a substance with a known value is analyzed or measured, and the result is compared with the known value.

The accuracy of laboratory analysis is assessed by measuring standard reference materials (instrument calibration) and spiked samples (surrogate recoveries, MSs, and LCSs). Standard reference materials are used to calibrate laboratory instruments. The analytical method specifies the frequency and accuracy required for a spiked sample analysis.

Spike recovery is determined by splitting a sample into two portions, spiking one portion with a known quantity of a constituent of interest, and analyzing both portions. Spike recovery is expressed as percent recovery:

$$\text{Percent Recovery} = \frac{(MC - KC)}{KC} \times 100$$

where

MC = known concentration of an analyte

KC = measured concentration of an analyte

Acceptable MS recovery limits are based on historical data sets, as defined by the USEPA methods. Acceptable surrogate recoveries for organic analyses are based on limits calculated by the laboratory, as described in the analytical method.

The accuracy of field measurements is inherent in the instrument and procedure used.

3.3.3 Representativeness

Representativeness is the degree to which data accurately and precisely represent a characteristic of the population, the natural variation at a sampling point, or an environmental condition. There is no standard method or formula for evaluating representativeness. Specific SAPs are designed to allow collection of representative samples. Representativeness is achieved by selecting sampling locations that are appropriate for the objective of the specific sampling task, and by collecting an adequate number of samples. The representativeness of the data will be evaluated and used to identify data gaps that can be addressed during or following completion of the specific investigation.

3.3.4 Completeness

Completeness is commonly expressed as a percentage of measurements that are valid and usable relative to the total number of related measurements. Completeness criteria between 80 and 85 percent are identified in the guidance (USEPA, 1987); these will be used to determine the adequacy of the results. The percent completeness is defined by the following equation.

$$\text{Percent completeness} = \frac{N \times 100}{N_t}$$

where

N = Number of samples that meet data quality goals

N_t = Total number of samples analyzed

3.3.5 Comparability

Comparability is a qualitative parameter expressing the confidence with which one data set can be compared with another. The use of standard techniques for both sample collection and laboratory analysis should make the data collected comparable to both internal and other data generated.

3.4 Quality Assurance Samples

QA samples will be collected in the field, as specified in the specific SAPs. Samples include field equipment rinsate blanks, trip blanks, and field duplicates. QA samples will be blind-labeled and preserved as if they were typical samples. QA samples will be clearly identified on the field sampling data sheets (FSDSs). Analytical results from the blanks and duplicates will facilitate data QC checks. Field and trip blank results may indicate possible contamination introduced by field or laboratory procedures, and field duplicates indicate overall precision in both field and laboratory procedures. Results will be evaluated by applying the PARCC criteria, and the evaluation will be discussed in the data validation report.

3.4.1 Trip Blanks

A trip blank monitors the potential for sample contamination during sample collection and transport. A trip blank consists of reagent-grade water in a new sample container, which is prepared at the same time as the primary sample containers. The trip blank will accompany the samples throughout collection, shipment, and storage. At least one trip blank should be included with each cooler in which samples for VOC analyses are stored.

3.4.2 Equipment Rinsate Blanks

To ensure that decontamination procedures are sufficient, an equipment rinsate blank will be collected when nondedicated, nondisposable equipment is used. At least one equipment rinsate blank will be collected for every 20 samples collected. If more than 20 samples are collected with the same equipment, or if high concentrations of contaminants are encountered, additional equipment rinsate blanks may be collected. Equipment rinsate blanks will be collected by passing laboratory deionized/distilled water through or over nondisposable sampling equipment.

3.4.3 Field Duplicates

Field duplicates are collected to measure sampling and laboratory precision. At least one duplicate sample will be collected for every 20 samples.

4 FIELD SAMPLING QUALITY ASSURANCE PROCEDURES

This section describes how samples will be documented, handled, preserved, and shipped, and also discusses equipment decontamination. The SAP outlines the data needs identified for this work and the specific procedures used to obtain representative samples to fulfill these data needs. Specific procedures addressed in the SAP include:

- Techniques used to select sampling sites
- Sampling procedures to be used
- Decontamination procedures for the preparation of sampling equipment and containers
- Time considerations for shipping samples promptly to the laboratory

If deviations are necessary, they will be discussed ahead of time in an addendum to this QAPP. In the case of a field modification, changes will be documented in field notes. Reference to this QAPP will provide field personnel and data reviewers with quantitation goals and other relevant parameters needed for data evaluation.

The information provided in this QAPP outlines the data documentation procedures that will be followed to generate technically defensible data. Any alterations to the field sampling documentation procedures described below will be described on the soil and groundwater FSDSs and in a memorandum written to Ecology.

4.1 Work Documentation

The following data forms will be used for documenting specific field observations and conditions:

- Soil FSDS
- Groundwater FSDS
- Log of exploratory boring

The following information will be recorded on the FSDS for each soil or sediment sample collected:

- Facility name
- Sample number
- Sampler's name
- Sample location (well, boring, or sample number)
- Sampling depth
- Sampling date and time
- Sampling method
- Composite or discrete sample
- Sample container size and material
- Sample preservative
- Climatic or other noteworthy conditions (e.g., nearby activities)
- Problems encountered with equipment or methods
- Decontamination methods
- Number of sample bottles filled
- Laboratory used

The sampler will record the following information on the FSDS for each groundwater sample collected:

- Facility name
- Sampler's name
- Sample number
- Well/boring/surface site number and location
- Well/boring condition, well depth, depth to groundwater, and date and time of measurement
- Well/boring purging method, volume, depth, date, and time
- Sampling method, depth, date, and time
- Type of sample container and preservative

- Climatic or other noteworthy conditions (e.g., nearby activities)
- Problems encountered with equipment or methods
- Decontamination methods
- Field measurements (pH, specific conductance, temperature, etc.)
- Number of sample bottles filled
- Laboratory to use

General field observations will be recorded in a field notebook.

4.2 Sample Containers, Preservation, and Handling

4.2.1 Preservation

Soil and groundwater sample containers and methods of preservation for each analysis are listed in the laboratory quality assurance manual. A summary is provided in Tables 1 and 2 of the SAP. Sample containers will be supplied by the laboratory for each sampling event and will include the appropriate preservatives.

4.2.2 Sample Packaging and Shipping

To ensure that the laboratory has ample time to complete all analyses within holding time requirements, and to reduce the potential for field degradation of samples, the samples will be shipped from the field to the laboratory at a minimum of every two days. Holding times for specific analytical methods are included in Tables 1 and 2 of the SAP. Samples will be stored at 4^{o} Celsius (as measured with a thermometer) in iced shipping containers or a refrigerator designated for samples, and then transported by courier to the laboratory in iced shipping containers with a custody seal affixed.

5 SAMPLE CUSTODY PROCEDURES

This section provides information about sample labeling and custody procedures.

5.1 Sample Labeling

Sample container labels will clearly indicate:

- Sample locations
- Sample number
- Depth at which sample was collected
- Date and time of sample collection

- Sampler's initials
- Any pertinent comments such as specifics of filtration or preservation

Labels will be filled out at the time of sampling. Sample labeling information will also be recorded on the FSDS and in a field notebook.

Samples that will be collected on a regular basis (e.g., groundwater samples collected from monitoring wells) will be assigned blind sample numbers to prevent laboratory bias and tampering. Each sample label may contain the following information:

- Sample number
- Sampler identification (person's initials)
- Date and time of sampling
- Place of collection

Blind sample numbers and actual sample locations will be recorded on the FSDSs. The FSDSs will not be sent to the laboratory.

5.2 Sample Custody

Sample custody will be tracked from point of origin through final analysis and disposal, using a COC form, which will be filled out with the appropriate sample/analytical information as soon as possible after samples are collected. For purposes of this work, custody will be defined as follows:

- In plain view of an MFA field representative
- Inside a cooler that is in plain view of an MFA field representative
- Inside any locked space such as a cooler, locker, car, or truck to which the MFA field representative has the only available key(s)

The following items will be recorded on the COC form:

- Project name
- Project number
- MFA project manager
- Sampler's name
- Sample number, date and time collected, medium, number of bottles submitted
- Requested analyses for each sample
- Shipment method
- Type of data package required (Tier II½ in most cases)

- Turnaround requirements
- Signature, printed name, and organization name for all persons having custody of samples; date and time of transfer
- Additional instructions or considerations that would affect analysis (nonaqueous layers, archiving, etc.)

Persons in possession of the samples will be required to sign and date the COC form whenever samples are transferred between individuals or organizations. The COC will be included in the shipping containers with the samples, and the containers will be sealed with a laboratory custody seal. The laboratory will implement its in-house custody procedures, which begin when sample custody is transferred to laboratory personnel.

If samples are shipped via air or ground transportation (by a third party), the following custody procedures will be followed. Samples will be packed in shipping containers, and a custody seal will be placed on the container to reduce the potential for tampering. Proper shipping insurance will be requested, and the top two copies of the COC form will accompany the samples. The person shipping the samples will retain a third copy of the COC and shipping forms to allow sample tracking. The COC form will accompany the samples from point of origin in the field to the laboratory.

At the laboratory, a designated sample custodian will accept custody of the received samples, and will verify that the COC form matches the samples received. The shipping container or set of containers is given a laboratory identification number, and each sample is assigned a unique, sequential identification number that includes the original shipping container identification number.

6 EQUIPMENT CALIBRATION AND MAINTENANCE PROCEDURES

6.1 Field Instrumentation

The investigations will include the use of field instruments. The following field equipment will require calibration before use and periodically during sampling activities:

- pH meter
- Conductivity meter
- Dissolved-oxygen meter
- Photoionization detector (PID)

Field instrument calibration and preventive maintenance will follow the manufacturers' guidelines, and any deviation from the established guidelines will be documented. Generally, field instruments will be calibrated daily before work begins. Field personnel may decide to calibrate more than once a day if inconsistent or unusual readings occur, or if conditions warrant more frequent calibration. Calibration activities will be recorded in field logbooks.

6.1.1 Field Calibration

Calibration procedures, calibration frequency, and standards for measurement will be conducted according to manufacturer's guidelines. To ensure that field instruments are properly calibrated and remain operable, the following procedures will be used, at a minimum:

- Operation, maintenance, and calibration will be performed in accordance with the instrument manufacturers' specifications.
- All standards used to calibrate field instruments will meet the minimum requirements for source and purity recommended in the equipment operation manual. Standards will be used before any expiration dates that may be printed on the bottle.
- Acceptable criteria for calibration will be based on the limits set in the operations manual.
- All users of the equipment will be trained in the proper calibration and operation of the instrument.
- Operation and maintenance manuals for each field instrument will be brought to the Site.
- Field instruments will be inspected before they are taken to the Site.
- If used, PID and flame-ionization detector field instruments will be calibrated at the start and end of each work period. Meters will be recalibrated, as necessary, during the work period.
- Conductivity and pH meters will be calibrated at the start of each workday and, if deemed necessary, recalibrated during the workday.
- Calibration procedures (including time, standards used, and calibration results) will be recorded in a field logbook. Although not reviewed during routine QA/QC checks, the data will be available if problems are encountered.

6.1.2 Preventive Maintenance

Preventive maintenance of field instruments and equipment will follow the operations manuals. A schedule of preventive maintenance activities will be followed to minimize downtime and ensure the accuracy of measurement systems. Maintenance will be documented in the field logbook.

6.2 Laboratory Instrumentation

Specific laboratory instrument calibration procedures, frequency of calibration, and preparation of calibration standards will be according to the method requirements as developed by the USEPA, following procedures presented in SW-846 (USEPA, 1986).

6.2.1 Laboratory Calibration and Preventive Maintenance

The laboratory calibration ranges specified in SW-846 (USEPA, 1986) will be followed.

Preventive maintenance of laboratory equipment will be the responsibility of the laboratory personnel and analysts. This maintenance includes routine care and cleaning of instruments and inspection and monitoring of carrier gases, solvents, and glassware used in analyses. The preventive maintenance approach for specific equipment will follow the manufacturers' specifications and good laboratory practices. Maintenance will be documented in the instrument logbooks.

Precision and accuracy data will be examined for trends and excursions beyond control limits to determine evidence of instrument malfunction. Maintenance will be performed when an instrument begins to change as indicated by the degradation of peak resolution, shift in calibration curves, decrease in sensitivity, or failure to meet one or more of the QC criteria.

7 LABORATORY QUALITY CONTROL PROCEDURES

Samples will be analyzed by a laboratory that is qualified to perform the analyses using standard, documented laboratory procedures. The laboratory will have QA/QC plans and standard operation procedures that provide data quality procedures according to the protocols for the analytical method and cleanup steps. The data quality procedures will be at a level sufficient to meet the sampling program's data quality objectives. The laboratory will perform, document, and report laboratory procedures.

The analytical methods and references for analyses that may be used during project implementation are summarized in Tables 1 and 2 of the SAP. Procedural details not specified in this QAPP will follow the protocols described in SW-846 (USEPA, 1986).

7.1 Internal Quality Assurance/Quality Control Checks

The laboratory will demonstrate its ability to produce acceptable results, using the recommended methods or their equivalent. The following criteria will be used internally by the laboratory to evaluate the data (as appropriate for inorganic or organic chemical analyses):

- Performance on test methods
  - MS
  - Gas chromatograph (tailing factors)
  - Blanks
  - Precision of calibration and samples
- Percentage recovery of surrogates (organics)

- Adequacy of detection limits
- Precision of replicate sample analyses
- Comparison of percentage of missing or undetected substances between replicate samples

Laboratory records of standard calibration curves and all other pertinent data will be held for possible inspection at the laboratory, and will be made available on request.

7.2 Quality Control Procedures

The laboratory QC procedures will consist of the following:

- Instrument calibration and standards as defined in the SW-846 manual for organic and inorganic analyses (USEPA, 1986)
- Laboratory blank measurements at a minimum of 5 percent or one per 20 frequency
- Data reports including appropriate QA/QC documentation

8 DATA REDUCTION, VALIDATION, AND REPORTING

The laboratory performing sample analyses will be required to submit analytical data supported by sufficient QA information to permit independent and conclusive determination of data quality. Data quality will be determined by MFA, using the data validation procedures described in this section. The results of the MFA evaluation will be used to determine if the project data quality objectives have been met.

MFA uses a database (EQuIS™) to manage laboratory data. The laboratory will provide the analytical results in electronic, EQuIS-compatible format. Following data evaluation, data qualifiers will be entered into the database.

8.1 Laboratory Evaluation

Initial data reduction, evaluation, and reporting at the analytical laboratory will be carried out as described in USEPA SW-846 manuals for analyses (USEPA, 1986), as appropriate. Additional laboratory data qualifiers may be defined and reported to further explain the laboratory's QC concerns about a particular sample result. Additional data qualifiers will be defined in the laboratory's case narrative reports.

8.2 MFA Evaluation

8.2.1 Validation

After MFA receives the analytical data, the data will be validated under the supervision of the project analytical QA manager. MFA will examine the data for precision, completeness, accuracy, and adherence to standard operating procedures. The laboratory will perform internal QC checks and MFA will validate laboratory analytical data, as described in the following sections. QC checks will be performed on laboratory information, using the sample log-in reports electronically transferred to MFA after samples are entered into the laboratory information management system. The reports will be assessed early in the process, which will allow QC checks to begin before sample holding times have expired or before errors are incorporated in the laboratory reports.

Validation procedures: MFA will evaluate the laboratory data for precision, completeness, accuracy, and compliance with the analytical method. MFA will review data according to applicable sections of USEPA organics and inorganics procedures (USEPA, 2008, 2010), as well as appropriate laboratory method-specific guidelines (USEPA, 1986).

Data qualifiers, as defined by the USEPA, are used to classify sample data according to their conformance to QC requirements. Common qualifiers are listed below:

- J—Estimate, qualitatively correct but quantitatively suspect.
- R—Reject, data not suitable for any purpose.
- U—Not detected at a specified reporting limit.

Poor surrogate recovery, blank contamination, or calibration problems, among other things, can require qualification of the sample data. The reasons for qualification of sample data should be stated in the data evaluation report.

QC criteria not defined in the guidelines for evaluating analytical data are adopted, where appropriate, from the analytical method.

The following information will be reviewed during data evaluation, as applicable:

- Sampling locations and blind sample numbers
- Sampling dates
- Requested analysis
- COC documentation
- Sample preservation
- Holding times
- Method blanks
- Surrogate recoveries
- MS/MSD results
- Laboratory duplicates (if analyzed)

- Field duplicates
- Field blanks
- LCSs
- MRLs above requested levels
- Additional comments or difficulties reported by the laboratory
- Overall assessment

The results of the data evaluation review will be summarized for each data package. Data qualifiers will be assigned to sample results on the basis of USEPA guidelines, as applicable.

8.2.2 Reduction

MFA uses a database EQuIS) to manage laboratory data. The laboratory will provide the analytical results in electronic, EQuIS-compatible format. Following data evaluation, data qualifiers will be entered into the database.

Data may be reduced to summarize particular data sets and to aid interpretation of the results. Statistical analyses may also be applied to results. Data-reduction QC checks will be performed on hand-entered data, calculations, and data graphically displayed. Data may be further reduced and managed using one or more of the following computer software applications:

- Microsoft Excel (spreadsheet)
- EQuIS (database)
- Microsoft Access (database)
- AutoCad and/or Arc GIS (graphics)
- USEPA ProUCL (statistical software)

8.2.3 Reporting

After completion of data collection, validation, and reduction, the data will be used in reports. Copies of the reports will be kept in the main project file, submitted to the County for review, and then submitted to Ecology. The original copy of any document that MFA produces will remain in the main project file.

Ecology has requested that the County provide electronic copies of data for input into Ecology's Environmental Information Management system. MFA and the County will work with Ecology's Toxic Cleanup Program to make this possible.

9 INTERNAL QUALITY CONTROL

9.1 Field Checks

Daily internal QC checks will be performed for field activities. Checks will consist of reviewing field notes and field activity memoranda to determine whether the specified measurements, calibrations, and procedures are being followed. The need for and content of corrective action will be assessed on an ongoing basis, in consultation with the project manager.

9.2 Laboratory Checks

The laboratory will document the completion and evaluation of internal QC checks and any corrective actions or reanalyses that result.

9.3 Data Reduction Checks

Data reduction QC checks will be performed on all entered, calculated, and graphic data produced by MFA. Data entry will be compared with data generated during field activities and recorded in notebooks or on field data forms. Analytical data entry will be reviewed against laboratory reports and data validation reports.

10 PERFORMANCE AND SYSTEM AUDITS

MFA's project manager will monitor the performance of the field and laboratory QA program. Proper communication between field staff, project management, and the laboratory will be maintained so that consistent and appropriate methods and techniques are used throughout the project.

10.1 Field Performance

Field performance will be monitored through daily review of sample collection documentation, sample handling records (COC forms), field notebooks, field measurements, and periodic field inspections. All field and sampling procedures will be checked for compliance with relevant work plans.

10.2 Laboratory Performance and System Audits

The laboratory will audit in-house performance and systems under their in-house QA/QC guidelines. Two types of audits will be used at the facility: system audits to qualitatively evaluate the operational details of the QA program, and performance audits analyzing performance evaluation samples to quantitatively evaluate the outputs of the various measurement systems. Such audits will be made available for review on request. While samples for this investigation are analyzed, the project QA coordinator will be in contact with the analytical laboratory to assess progress toward obtaining the data quality objectives, and to take corrective measures as problems arise.

11 PREVENTIVE MAINTENANCE

Field equipment will be checked daily to detect any malfunctions. Steps will be taken to repair or replace any equipment that appears unreliable. Repairs will be made according to the manufacturers' guidelines, or by qualified repair technicians. Equipment will also be periodically serviced, according to the manufacturers' recommendations. Preventive maintenance procedures for field equipment as well as for analytical equipment are outlined in Section 6.

12 DATA MEASUREMENT ASSESSMENT PROCEDURES

Procedures to assess data precision, accuracy, and completeness will be completed routinely, through data validation reports. Precision and accuracy will be based on laboratory documentation. Completeness will be based on the usability of the data collected, relative to the data needs of an investigative task or the amount of data scheduled for collection. Completeness will be quantified when appropriate, but will be qualitatively evaluated with respect to the representativeness of the data when detection, or lack thereof, is the objective. The criteria that will be used for analytical data are summarized in Table 2. The laboratory is responsible for ensuring that the precision and accuracy limits for each laboratory analytical method and parameter are consistently met or exceeded.

13 CORRECTIVE ACTION

The need for corrective action will be evaluated on an ongoing basis, depending on the results of internal and laboratory QC checks.

Corrective action measures will generally result from either instrument failure or nonconformance or noncompliance with QA requirements by the laboratory or field personnel. The MFA project manager will be notified as soon as practical if a field or laboratory QA problem arises that could jeopardize the use of collected data. All project personnel are responsible for reporting lapses in QA procedures.

During field operation and sampling procedures, field personnel will be responsible for reporting any changes to specified sampling procedures. A description of any such change will be entered in the daily field logbook and on FSDSs.

If QC audits result in detection of unacceptable conditions or data, the project manager, in conjunction with the project quality assurance coordinator, will be responsible for implementing corrective action. Specific corrective actions are outlined in each SW-846 method and include, but are not limited to:

- Identifying the source of the violation
- Reanalyzing samples if holding time criteria permit
- Evaluating and amending sampling and analytical procedures
- Accepting data and flagging to indicate the level of uncertainty

Ecology and the County shall be notified of each field, laboratory, or project corrective action.

14 QUALITY ASSURANCE REPORTS TO MANAGEMENT

Reporting on the quality of data gathering will include regularly transmitting field and laboratory documentation to the project manager and summarizing the information. These reports will consist of field activity memoranda and reports and data validation reports, and will provide a means for management to evaluate accomplishment of the established QA/QC objectives.

After a complete data package is received from the laboratory and MFA has completed the data quality evaluation in accordance with this QAPP, a summary report will be prepared and presented concurrent with laboratory results. The data quality evaluation will summarize the overall quality of the chemical results in terms of the specific data quality goals identified in this QAPP, and will identify chemical results qualified by MFA.

Results of sample analyses will be transmitted to Ecology with a full data validation report that indicates the usability of each reported value. Reports will be maintained in the project files and will include results of performance and system audits; periodic assessment of measurement data accuracy, precision, and completeness; significant QA/QC problems and recommended solutions; and resolutions of previously identified problems.

LIMITATIONS

The services undertaken in completing this plan were performed consistent with generally accepted professional consulting principles and practices. No other warranty, express or implied, is made. These services were performed consistent with our agreement with our client. This plan is solely for the use and information of our client unless otherwise noted. Any reliance on this plan by a third party is at such party's sole risk.

Opinions and recommendations contained in this plan apply to conditions existing when services were performed and are intended only for the client, purposes, locations, time frames, and project parameters indicated. We are not responsible for the impacts of any changes in environmental standards, practices, or regulations subsequent to performance of services. We do not warrant the accuracy of information supplied by others, or the use of segregated portions of this plan.

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TABLES

Table 1
Objectives for Measurement
Truck City Site

Analysis	Matrix	Accuracy (%)	Precision (%)	Completeness (%)	Method	Reference	Maximum Holding Time
Total Petroleum Hydrocarbons							
Method 8015B	Soils	63–133	40	85	GC	Ecology	14 days
	Water	51–143	30	85	GC	Ecology	14 days
Volatile Organic Compounds							
Method 8260B	Soils	69–134	40	85	Purge+Trap GC/MS	SW-846	14 days
	Water	64–145	30	85	Purge+Trap GC/MS	SW-846	14 days

NOTES:

Ecology = Washington State Department of Ecology.

GC = gas chromatography.

MS = mass spectrometry.

Table 2
Comparison of MRL Goals with State Cleanup Standards
Recommended MRLs
Truck City Site

Analysis (method)	Soil (mg/kg)		Water (ug/L)	
	Quantitation Limit	MTCA Method A Cleanup Level	Quantitation Limit	MTCA Method A Cleanup Level
Gasoline-range TPH*	50	100	100	800
Diesel-range TPH	15	2,000	80	500
Benzene	0.025	0.03	0.3	5
Toluene	0.1	7	0.5	1,000
Ethylbenzene	0.1	6	0.5	700
Total Xylenes	0.3	9	1.5	1,000

NOTES:
mg/kg = milligrams per kilogram.
MRL = method reporting limit.
MTCA = Model Toxics Control Act.
TPH = total petroleum hydrocarbons.
ug/L = micrograms per liter.
*with presence of benzene.