Remedial Investigation Report

Former DeBock's Texaco

100 West Wine Country Road

Grandview, Washington

Washington Department of Ecology Cleanup Site ID 6910

Voluntary Cleanup Program File Number CE0488

Prepared For

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EES Project #2093-01

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1 INTRODUCTION

EES Environmental Consulting, Inc. (EES) has prepared this Remedial Investigation (RI) Report on behalf of Christensen, Inc. (Christensen) for the former DeBock's Texaco retail gasoline station located at 100 W. Wine Country Road in Grandview, Washington (Property, Figure 1).

In accordance with Washington Administrative Code (WAC) 173-340, the purpose of this RI is to characterize the Site for the purpose of developing and evaluating cleanup-action alternatives. Specifically, the RI:

- Characterizes the nature, extent, and magnitude of contamination for affected media (i.e., soil, soil vapor, and groundwater) using data from field investigations;
- Presents a detailed conceptual Site model; and
- Identifies the applicable cleanup regulations and standards for affected media.

1.1 GENERAL SITE INFORMATION

The subject Property covers approximately 0.2 acres and is located at the southwest corner of West Wine Country Road and Division Street in Grandview, Washington (Figure 1). The coordinates for the Site are 46° 15' 20.878" longitude and -119° 54' 08.510" latitude. The Yakima County Tax Parcel Number is 230923-12463, located in the southeast quarter of Section 23, Township 09, Range 23. The Property is currently occupied Clyde's Auto Repair, an automotive service and maintenance facility.

As owner of the subject Property, Christensen (formerly known as RE Powell) enrolled in the Washington Department of Ecology's (Ecology) Voluntary Cleanup Program (VCP) during 2017 in an effort to facilitate efforts necessary to complete Site cleanup and to achieve a No Further Action Opinion from Ecology.

The Ecology VCP Project Manager for this project is Kyle Parker (509-454-7833). The following Ecology identification numbers have been assigned to the Site:

- Voluntary Cleanup Program (VCP) Site Identification Number CE0488;
- UST Facility Site ID Number 956;
- Cleanup Site Identification Number 6910; and
- Facility Site Identification Number 94369212

This report was prepared on behalf of Christensen, Inc. (Richland, Washington). The Property owner's representative is Brandon Christensen (509-295-8676). Christensen's consultant is Paul Ecker of EES Environmental Consulting in Portland, Oregon (503-847-2740).

1.2 SITE HISTORY

Available historical documentation indicates that the subject Property was developed by 1920, when the northeastern portion of the Property was in use as an automotive fueling and service station. These facility operations continued until 1995, when the fueling system was decommissioned and fueling

activities ceased. Since 1995, the Property has been used for automotive service and maintenance activities.

While in operation, the most recent site-fueling infrastructure consisted of three single-walled steel underground gasoline storage tanks (USTs) with capacities of 8,000, 5,000, and 1,000 gallons. Fuel-distribution piping connected the USTs to a dispensing island located north of the station building, along West Main Street (now named West Wine Country Road). All three steel tanks reportedly stored gasoline, and the 5,000-gallon tank is known to have contained leaded gasoline. Diesel fuel is not known to have been stored or dispensed at this Property, although diesel heating fuel and oil-range lubricants are expected to have been used. The three known USTs were removed, along with dispenser pumps, in 1995. Underground piping was emptied, capped, and left in place at the time of decommissioning. The historic fueling system used during the 1920s-30s also included a 550-gallon UST located near the northeast corner of the Property (see Figure 2A). It is unclear when this tank was removed from service.

A gasoline release (source) area located on the Property was identified during 1995 decommissioning. Other prior gasoline releases are likely to have occurred on the Property during its extensive period of retail service-station operations dating to the 1920s. Various follow-up investigation and cleanup tasks conducted between 1996 and 2003 identified soil impacts originating at the dispenser island area and gasoline-contaminated groundwater extending across the Property and at upgradient locations both north and east of the Property in the City of Grandview's (City) right-of-way. In 2017, Ecology required an updated Site assessment. In October 2017, EES observed floating free-phase hydrocarbons (LNAPL) at one of three existing monitoring wells on the Property (MW-2), located near the downgradient western Property boundary. LNAPL on the water table was not previously reported at the Property.

Subsurface gasoline contamination associated with the Property's former fueling operations has migrated in groundwater beyond Property boundaries to the west and south beneath other properties not owned by Christensen. Soil and groundwater contamination is also present north (upgradient) of the Property beneath the West Wine Country Road/Main Street public right-of-way, but the source of that contamination appears related to fueling activities conducted elsewhere by other parties. Collectively, the area affected by mixed gasoline contamination originating at the multiple locations and facilities is called the Site. Site features are illustrated in Figure set 2.

1.3 SITE USE AND ZONING

The Property includes a single commercial building occupied by an automotive service and maintenance facility (Figure 2A). The Property and adjoining properties are zoned for commercial use as C-2 General Business District (City of Grandview 2015). The Property is bounded to the north and east by public roadways, adjoined to the south/southeast by a restaurant (El Campestre Mexican), bounded to the south by an alley and beyond the alley by a tavern (Herbs), and bounded to the west by a restaurant (Javi's Chicken and Churros). A zoning map for the Property and vicinity is provided in Appendix A.

The intent of this commercial use zoning, as described in Chapter 17.44 of the Grandview Municipal

Code, is to establish and promote centralization of business within a compact commercial area. This zoning designation allows for residential use above the ground floor of buildings under a special permit. There are no known future land use changes for the subject Property (City of Grandview 2016). A copy of the City of Grandview's 2016 future zoning map is provided in Appendix A.

1.4 REGULATORY STATUS

Site cleanup, including the preparation of this RI report, is being completed by Christensen in compliance with the Washington State Model Toxics Control Act (MTCA) and within the framework of Ecology's Voluntary Cleanup Program. Ongoing cleanup activities are coordinated and communicated with Ecology.

2 FIELD INVESTIGATIONS AND SITE CONDITIONS

2.1 PREVIOUS INVESTIGATIONS AND INTERIM ACTIONS

A summary of characterization activities and remedial actions conducted at the Site is provided below, with data compiled on Tables 1 through 7 and illustrated on Figures 6 through 12. Supporting details are provided under separate cover.

2.1.1 SITE INVESTIGATION SUMMARY

A release from the DeBock's gasoline UST system was confirmed during 1995 decommissioning. Various follow-up investigation tasks conducted between 1995 and 2003 identified soil impacts originating at the dispenser island area and groundwater contamination extending across the Site. Additional releases may also originate at one or more of the former UST and/or fuel piping locations, although no shallow soil contamination has been identified to our knowledge except at the dispenser island area. Remedial excavation was conducted in 2003 to mitigate known gasoline impacts among dispenser area soils. RI and supplemental data indicate residual gasoline mass is sorbed to smear-zone and shallow aquifer matrix and appears to be a continuing source of contamination within the plume core.

Gasoline-contaminated groundwater was identified at the subject Property in likely source areas and also at inferred upgradient locations both north and east of the Property in the City's right-of-way. Free-phase gasoline hydrocarbons persist at well MW-2, with maximum LNAPL thicknesses of nearly one foot observed in 2017-2018. LNAPL appears to be localized at MW-2 and has not been identified elsewhere at the Site. Dissolved-phase gasoline concentrations approaching approximately 10,000 µg/L are observed within the localized plume-core, and exceeding MTCA groundwater cleanup levels beyond subject Property boundaries to the north, west, and south. Gasoline-related vapor concentrations were not observed above MTCA soil-gas screening levels throughout the Site.

2.1.2 TANK DECOMMISSIONING AND LIMITED SITE CHARACTERIZATION (1995)

In March 1995, White Shield Inc. (WSI) decommissioned and removed three gasoline USTs and associated fuel dispensers, and drained and capped the fuel distribution piping in place (WSI 1995). These excavation and initial sampling locations are illustrated on Figure 6 and noted on Table 1.

The 5,000 and 8,000 gallon USTs were removed from a common cavity ("excavation #1") located south of the DeBock's garage building, and the 1,000 gallon UST was removed from "excavation #2," located in the alley west of the dispenser area and adjacent to the M & J Tavern. WSI reported no observed contamination within the UST cavities except for shallow soil impacts above the 1,000-gallon UST. Confirmatory testing identified no gasoline or related benzene, toluene, ethylbenzene, and xylenes (BTEX) constituent concentrations measured among any of the final excavation floor or sidewall samples. Excavation #1 stockpile samples were determined not to contain detected gasoline or BTEX concentrations, and these soils were returned to the same cavity as backfill material. The excavation #2 soil stockpile contained gasoline (1,600 milligrams per kilogram [mg/kg]) and was transported offsite for treatment and disposal. Groundwater was reportedly not encountered during excavation work, which extended to maximum depths between nine feet (excavation #2) and 12.5 feet (excavation #1).

During decommissioning work, obvious petroleum impacts were observed in soil immediately beneath the fuel dispenser island at depths of 2.5 feet, but no confirmatory analytical testing or soil removal efforts were initially conducted at that area. WSI returned to the site the following week and excavated an exploratory test pit in the dispenser area to a maximum depth of 14.5 feet to evaluate deeper soils. WSI field notes indicate obvious petroleum contamination extending to the base of the excavation at 14.5 feet depth, but no sampling/testing was conducted.

Fuel piping located outside the UST excavation areas appears to have been left in place, and no confirmatory soil samples are known to have been collected from the piping locations.

In October 1995, Sage Earth Sciences, Inc. (Sage) collected soil and groundwater samples from five hand auger borings (SB3 through SB7) at the subject Property (Sage 1996; see Figure 6 and Tables 1 and 5). Gasoline-related concentrations were identified at each boring location, with concentrations exceeding MTCA Method A soil cleanup levels everywhere except at boring SB6 (located near the former 1,000-gallon gasoline UST "excavation #2" area). Soils shallower than 10 feet were not analyzed. With the exception of lead, gasoline and constituent concentrations among the 1995 grab groundwater samples did not exceed MTCA Method A cleanup levels.

2.1.3 PRELIMINARY SITE INVESTIGATION (1998)

Additional Site investigation work was conducted by Olympus Environmental, Inc. (Olympus) in February and March 1998 (Olympus 1998). This investigation included temporary borings located in upgradient sidewalk areas along Division Street to the east (GP-1, GP-2) and Main Street to the north (GP-3, GP-4), one temporary boring (GP-5) located south of the DeBock's building within the former gasoline UST "excavation #1" area, and installation of three water table monitoring wells (MW-1 through MW-3) on the Property (Figure 6).

Olympus reported that the water table flowed generally towards the southwest across the three Property monitoring wells. Groundwater samples collected at all eight boring locations identified gasoline at concentrations exceeding MTCA Method A cleanup levels. These data indicate gasoline impacts to the water table originate both on the Property (GP-5 and wells MW-1, MW-2, MW-3; gasoline measured up to 5,970 micrograms per liter [ug/L]) and from other contributing off-Property sources (GP-1 through GP-4; gasoline measured up to 8,400 ug/L).

Soils shallower than 15 feet were not analyzed at any of the eight borings. With the exception of upgradient location GP-2, soil samples analyzed from each boring at depths of 15 feet (generally in contact with the local water table) typically exceeded MTCA Method A soil cleanup levels.

2.1.4 Site Assessment (2000)

In September 2000, Olympus Technical Services, Inc. (OTS) advanced five soil borings (SP-1 through SP-5) to terminal depths of approximately 18 feet at the former fuel dispenser island area (OTS 2001; see Figure 6). Gasoline impacts were identified in soil at each location, with the greatest concentrations (ranging up to 32,500 mg/kg) centered on the former dispenser island source area in boring SP-2 at depths between 7 and 13 feet, above the water table. Soils shallower than seven feet appear not to have been analyzed.

Although free-phase petroleum (LNAPL) was not directly reported, groundwater testing data indicated gasoline and benzene contamination at SP-2 near the former dispenser island approaching aqueous saturation limits and suggesting possible LNAPL in this area (281,000 and 8,390 micrograms per liter [ug/L], respectively). Groundwater analytical data collected from near Property margins at monitoring wells MW-1 through MW-3 identified gasoline and benzene concentrations in each well, with the greatest concentrations (11,700 ug/L gasoline and 649 ug/L benzene) detected at well MW-2, located west (downgradient) from the DeBock's garage building and former piping and fueling dispenser island areas.

2.1.5 Soil Excavation (2003)

In 2003, 3Kings Environmental prepared a proposal in conjunction with Blue Mountain Environmental to excavate petroleum contaminated soil from the former fuel dispenser island area of the Property. Although a written confirmatory report has not been identified by EES, the remedial excavation work appears to have been conducted in December 2003 based on related waste profiling/testing/disposal documentation provided by Christensen. Records indicate petroleum contaminated soil (PCS) was profiled for disposal at Coffin Butte Landfill (Corvallis, Oregon) by 3Kings. A landfill disposal ticket indicates a total of approximately 50 tons PCS was disposed of on December 16-17, 2003, presumably at the Coffin Butte landfill, although the disposal facility name is not noted on this document.

Seven soil samples were submitted by Blue Mountain Environmental for laboratory analysis of gasoline contaminants, although sampling locations were not indicated (OnSite 2004). No gasoline or related constituents were detected in any of the seven samples except for sample 1216-01, where gasoline (possibly mixed with diesel fuel, according to laboratory notes) was detected at a concentration of 680

mg/kg, exceeding the MTCA Method A soil cleanup level of 30 mg/kg. Based on these analytical results, remedial excavation in the dispenser island area appears to have mitigated source-area soil impacts and residual gasoline mass, but contaminant delineation was not fully documented, and soil/groundwater impacts may have remained in this area.

2.1.6 Recent Soil and Groundwater Characterization (2017-2020)

Since October 2017, EES has conducted additional soil and groundwater characterization activities to delineate the magnitude and extent of Site contamination, mitigate free-product LNAPL at well MW-2, and confirm upgradient sources contributing to the Site plume. This report documents completion of the RI in accordance with MTCA criteria. Details are provided throughout this RI report and site characterization elements are illustrated in Figures 4 through 11.

Recent and ongoing interim actions being conducted at the Site are summarized in Section 2.5.4 of this report and detailed under separate cover.

2.2 NATURAL CONDITIONS

General subsurface conditions including Site stratigraphy and regional hydrogeology are described below. Copies of Site boring logs are included for reference in Appendix B.

2.2.1 Regional and Site Geology

The subject Site is located between Rattlesnake Hills to the north and Horse Heaven Hills to the south and surface geology is mapped as Pleistocene flood deposits (unit Qfs3; outburst flood deposits, silt and sand (Pleistocene); WA DNR 1994). Based on a review of drilling logs from the Site vicinity and a USGS scientific investigation report (USGS 2009), the shallow overburden unit is approximately 50 feet thick and is underlain by the Ellensburg Formation (consisting of fluvial and lacustrine sedimentary deposits and intercalated basalts) in the vicinity of the Site. The Columbia River Basalt Group (CRBG) underlies the Ellensburg Formation and is expected at depths greater than 200 feet below ground surface and possibly much deeper.

The majority of the Property and adjoining city sidewalks, roadways, and alleys are covered with concrete or asphalt. The remainder of the Site, including the parking area to the south of the Property building and areas west of the Property building and surrounding the Javi's Chicken and Churros restaurant, are unpaved and consist primarily of gravel or native soil. Subsurface conditions beneath the surface cover consist of native silts and sands extending to the maximum depths explored of approximately 25 feet bgs. In previously excavated areas, pea gravel and non-native fill extend below the surface cover to depths of approximately 13-14 feet bgs.

2.2.2 Regional and Site Hydrogeology

The Property is located within the Extended Toppenish Basin of the Yakima River basin aquifer system (USGS 2009). Regionally, groundwater is expected to flow southwest towards the Yakima River. Regional groundwater is present near the ground surface among a shallow unconfined aquifer (within the overburden unit and Ellensburg Formation), and at depths below approximately 200 feet among a

confined regional basalt formation (CRBG). Municipal water wells located near the subject Site beneficially use water from the Ellensburg Formation (deeper than 100 bgs) or the deeper confined water-bearing unit (CRBG, see Section 2.3).

This RI evaluates the shallow unconfined water table within the overburden unit, which at the Site is present at depths between approximately 18 and 22 feet bgs, averaging approximately 20 feet bgs. The water table flows to the southwest (Figure set 10). Recent RI data regarding water table flow direction between 2017 and 2020 is consistent with historical data developed during the early 2000s (Brown and Caldwell 2001), although the water table elevation has decreased significantly and consistently. Historic water-table elevations during the 2000s were approximately 5 feet higher than current levels, averaging approximately 15 feet bgs during that time (see Chart 1). During the 2017-2020 RI monitoring period, the water table fluctuated regularly, with higher water table conditions generally corresponding to the regional irrigation season (April through October) and seasonal low water conditions observed between early winter and spring. Current and historical water table fluctuations are illustrated on Chart 1 and summarized on Table 3.

2.2.3 SITE SURFACE WATER

Surface water features are not present at the subject Property, and stormwater does not pond or accumulate on the Site. The nearest identified surface water body is the Sunnyside Canal, located approximately 0.5 miles northeast of the Site (Figure 5). Stormwater control is discussed further in Section 2.4.1 of this report.

2.3 LOCAL BENEFICIAL WATER USE

EES conducted a local beneficial-water-use determination to evaluate groundwater conditions in the Site vicinity and to identify wells that may serve beneficial uses in order to complete the Conceptual Site Model and exposure-pathway evaluation, as required by Ecology guidance (Section 3). The evaluation was conducted using Ecology's Well Log Viewer online database, Ecology's Water Resources Explorer, and the Washington Department of Health's Source Water Assessment Program (SWAP) Mapping Application to search for wells located within an approximate 0.25-mile radius of the Property. In addition, property records were reviewed using the Yakima County Assessor online parcel search tool to confirm the location of water wells identified from the Ecology online database.

The water-well search was intended to identify and locate wells based on information provided in the available well reports. Categories of wells searched include water wells and resource-protection wells (which in many cases are exploratory borings where water was not encountered). Among the 219 wells reviewed as part of our water-well search, a total of three water wells and 13 monitoring wells were identified within approximately 0.25-mile of the Site (with all 13 monitoring wells attributed to this Site). The remaining wells were either exploratory borings, decommissioned wells, or were located greater than 0.25 mile of the Site. The Ecology Well Log database included well logs uploaded through April 8, 2020; other wells may be located within the search area that have not yet been accessed through the online database.

The well search was limited to the northwest and northeast quarters of Section 23; and the southern halves of the southwest and southeast quarters of Section 14 of Township 9 North, Range 23 East of the Willamette Meridian. Identified wells are summarized on Table 8 and illustrated on Figure 4.

The data in Table 8 provide useful information supporting our assessment that shallow groundwater near the Site is not used for drinking purposes.

- **Water Wells:** Three registered water wells are located up- or cross-gradient and within 0.25-mile of the Site: Well Log IDs 343325, 113474, 343326, and 143787 (Well Log ID 113474 refers to the reconditioning of Well Log ID 343326). Each of the water wells obtain water at depths below 100 feet bgs.
  - Well Log ID 343325 corresponds with the City of Grandview "Balcom Well," which is approximately 1,200 feet due south (cross-gradient) of the Site, has a total depth of 1,150 feet, and a stable water level of 333 feet bgs.
  - Well Log IDs 113474 and 343326 correspond with the City of Grandview "W. Main Well," which is approximately 700 feet west-northwest (up- or cross-gradient) of the Site. The original well (Well Log ID 343326) appears to have been reconditioned in 1977 (Well Log ID 113474) to include two distinct screened intervals at 105-185 feet depth and 222-247 feet depth. The stable water level was listed at 42 feet depth.
  - Well 143787, which is approximately 300 feet due north (upgradient) of the Site, has a total depth of 174 feet with a reported static water level of 50 feet depth.
- **Other Wells**: A total of 13 monitoring wells are registered and located at the Site. These include Well Log IDs 1712997, 1712998, 1712999, 1713001, 1713002, 1713002, 1713003, 1713006, 1713007, 1713008. Three of the wells (Well Log IDs 122826, 122827, and 122828) are located on the Site but are registered to the incorrect section on the Ecology online database (registered to Section 13 but should be Section 23). These well logs indicate shallow groundwater was observed at approximately 15-22 feet bgs.

Based on the results of the database review and the following lines of evidence, no beneficial groundwater use appears likely within 0.25-miles of the Site.

- The well search did not identify any water wells down-gradient and within 0.25-mile of the Site. This search radius represents a protective buffer extending beyond known Site contaminants.
- A total of 13 monitoring wells are located within the search area on the Site. These well logs indicate shallow groundwater was observed at approximately 15-22 feet bgs.
- The City of Grandview provides municipal water in the Site vicinity, and local shallow groundwater use is not known or anticipated.
  - Municipal water is sourced from water wells in the greater Grandview area, all of which are up- or cross-gradient relative to the Site, or are more than 0.25-miles away.
  - Among the three water wells within 0.25-mile of the Site, each obtains water at depths below 100 feet, which is more than 75 feet deeper than the deepest known Site groundwater contamination (approximately 25 feet bgs).

2.4 SITE UTILITIES

The location and construction of underground utilities and drainage structures at the Site are important data needs since these features could be affected by or may modify contaminant distribution and future cleanup efforts. EES reviewed water, sewer, and stormwater utility maps and construction plans provided by the City of Grandview Public Works Department as well as contracted private locators to identify and map subsurface features using magnetometers and ground penetration radar (GPR). Identified infrastructure at the Property and adjacent Site locations is illustrated on Figures 2B and Figure set 9.

Underground utilities identified at the Site include municipal water supply, sanitary sewer, storm sewer and infiltration infrastructure, irrigation, electrical power, abandoned fuel distribution piping, fiber optic/communication cables, and natural gas lines. Based on available data, utility corridors are present at depths ranging between approximately one and eight feet. Since subsurface impacts have generally not been identified above 10 feet, underground utility features do not appear to be in direct contact with identified soil and groundwater contamination. Details regarding subsurface infrastructure identified at the Site are summarized below.

2.4.1 STORM SEWER

With annual precipitation of approximately eight inches per year in the Site vicinity (NOAA 2020), stormwater on the unpaved southern and eastern portions of the Property is expected to infiltrate to the subsurface and/or run off under some conditions. Stormwater runoff from the paved northeastern portion of the Property is expected to sheet flow to the north and east, where drainage is controlled by municipal stormwater catch basins located in West Wine Country Road and Division Street. The catch basins are maintained by the City of Grandview and discharge to infiltration trench features.

One of the city's stormwater infiltration trenches was identified during this RI beneath the north side of Wine Country Road, approximately 50 feet north of the DeBock's Property (see Figure 2B). In addition, two drywells were identified approximately 100 feet northeast of the Property. The drywells (Figure 2B) appear to have been installed by the City and are likely to be old stormwater control features supplemented or replaced by the newer infiltration trenches, but their current use has not been verified by EES. These various trench and drywell features are significant, because they contribute increased stormwater infiltration immediately north and up-gradient of the Debock's Property and may alter water-table conditions near local contaminant sources.

2.4.2 SANITARY SEWER

The Property's sanitary sewer flows south beneath the center of the existing Property building and connects to a west-flowing main line located in the central portion of the adjacent alley to the south. This sewer connects to a south-flowing main located beneath the central portion of another alley situated in a north-south configuration located approximately 50 feet to the west-southwest of the Property. The west-flowing sewer in the alley slopes from depths of approximately six to eight feet.

2.4.3 OTHER UTILITIES

The City of Grandview provides municipal water service to properties in the Site vicinity. Water service enters the Property from a water main situated at a depth of approximately three feet beneath West Wine Country Road. A water meter servicing the Property was identified near the northern Property boundary and is piped to the Property building at a depth of approximately two feet. An additional water main is located beneath Division Street at a depth of three feet and services other properties in the Site vicinity. Irrigation piping is located beneath the adjacent West Wine Country Road and Division Street sidewalks and services right-of-way landscaping features maintained by the City of Grandview. Based on information provided by the Grandview Public Works Department, these lines are likely located between one and two feet bgs.

Electrical power to the existing Site building is provided by overhead service. However, underground electrical utility lines for street lighting were identified beneath the adjacent West Wine Country Road and Division Street sidewalks. Based on information provided by the Grandview Public Works Department, these lines are likely located between one and two feet bgs.

Natural gas service is reportedly not present at the Property. However, natural gas service is provided to the adjoining commercial building to the southeast. Natural gas service is provided to the adjoining structure from a gas main that runs along the southern portion of the adjacent southern alley at an approximate depth of three feet. The natural gas supply line runs north from the gas main to the southwestern corner of the adjoining building at an approximate depth of two feet.

Telephone and cable service in the Property vicinity is provided by overhead service. One underground fiber optic line is located approximately 50 feet to the west-southwest of the Property and continues south.

2.4.4 UNDERGROUND HEATING OIL TANK

One or two underground heating oil tanks may be present south of the Property building near the former UST nest. These features were tentatively identified using GPR during 2018 site investigation activities, however the presence could not be confirmed due to numerous anomalies in the area and close proximity to the Property building and neighboring restaurant (El Campestre). Based on the age of the buildings (built in 1950 and 1920, respectively), it is likely that heating oil was used to heat both structures in the past. No heating oil tanks are registered to either the subject Property or neighboring property (El Campestre) in Ecology's online database of Regulated USTs, Active & Inactive Facilities.

2.5 SITE CHARACTERIZATION AND ANALYTICAL RESULTS

This report section describes Site characterization and laboratory analytical testing results of soil, groundwater, and soil-gas samples collected between February 2018 and February 2020. Sample data collected before 2018 is included on the data tables noted below. This RI focuses on Site contaminants of interest (COIs) related to gasoline and common constituents including benzene, toluene, ethylbenzene, xylenes, naphthalene, and lead. Other gasoline additives methyl tertiary butyl ether

(MTBE), 1,2-dibromoethane (EDB), and 1,2-dichloroethane (EDC) are not regarded as COIs as discussed in Section 2.5.2.6.

Analytical testing results are summarized in Tables 1, 2, and 5 through 7. Site soil data are compared to generic MTCA Method B direct contact cleanup levels, except for TPH which is compared to a calculated site-specific MTCA Method B direct contact cleanup level (2,451 mg/kg; discussed in Section 4.1). Groundwater data are compared to MTCA Method A cleanup levels. Since soil-gas-cleanup levels have not been established, soil-gas data are compared to MTCA Method B screening levels, which are intended to be protective of indoor and outdoor air conditions. All pertinent laboratory analytical testing results were previously submitted to Ecology (Section 2.1) and have been electronically uploaded to the Department's Environmental Information Management (EIM) system. Supporting laboratory documentation is available upon request.

Figures 7 through 9, 11 and 12 illustrate the magnitude and extent of gasoline impacts identified at the Site.

2.5.1 SOIL

Laboratory analytical testing data are evaluated with respect to contaminant occurrence and likely movement at the Site. COI concentrations detected in soil are summarized on Tables 1 and 2. Figure sets 5 and 6 illustrate the lateral and vertical extent of gasoline impacts in soil at the Site.

2.5.1.1 GASOLINE

Gasoline is present in deeper subsurface soil near the water table at locations across the majority of the DeBock's Property and extends laterally beyond Property boundaries approximately 50 feet to the west. Sitewide, concentrations of gasoline-range hydrocarbons measured in soil ranged up to 22,300 mg/kg. Gasoline concentrations exceed the calculated MTCA Method B direct contact cleanup level of 2,451 mg/kg in 10 of 70 samples (14%), of which only six samples are located shallower than 15 feet depth.

The greatest gasoline concentrations were observed at the former fuel dispenser source-area, where concentrations of gasoline exceeded 10,000 mg/kg in the depth interval between 15 and 20 feet (shallower soils in this area were previously removed). Gasoline concentrations generally diminished laterally with distance from the dispenser-island source area.

Elsewhere, gasoline concentrations near or above 5,000 mg/kg were observed at two general locations including (1) west of the dispenser area near the former 1,000-gallon UST location, and (2) south/southwest of the shop building near the former 5,000/8,000-gallon UST nest and piping locations. These locations appear to represent distinct gasoline source areas related to historic facility fueling operations.

Identified gasoline impacts in soil are limited to the interval between 12 and 22 feet bgs at the DeBock's Site. The impacted soils within this interval reflect the groundwater plume distribution and are attributed generally to a smear zone caused by the fluctuating contaminated water table. Because the present-day water table is nearly five feet lower compared to 1990 levels, upper portions of this smear zone (soil impacts between about 12 and 17 feet bgs) are isolated above the current water table as illustrated schematically on Chart 1 and cross sections shown in Figure set 9. Residual soil contamination near the base of the vadose-zone extends into the upper saturated-zone and is generally co-located with the groundwater plume. Soil contamination attenuates with depth, with the vertical extent of soil contamination limited to depths between approximately 12 and 22 feet bgs based on available data.

In addition to the identified gasoline contamination originating from the DeBock's Property, one or more sources of gasoline contamination originates north of Wine Country Road near Division Street and upgradient from the DeBock's facility. Impacts were confirmed in smear-zone soils on both the northwest and northeast corners of the Wine Country Road and Division Street intersection, with the greatest gasoline concentrations (approaching 5,000 mg/kg) identified in soil directly upgradient of the DeBock's Property at the intersection's northwest corner. These locations correspond with historical automotive repair and fueling operations as shown on Figures 2C and 5.

2.5.1.2 Gasoline-Related VOCs

Common gasoline-range constituents (BTEX and/or naphthalene) are generally absent in soil but in some cases remain at low concentrations corresponding with gasoline impacts. The detected constituent concentrations were mainly identified at depths between approximately 15 and 20 feet bgs. Fuel constituents typically are depleted relative to total hydrocarbons, indicating likely older and degraded releases. BTEX and naphthalene concentrations were uniformly below corresponding MTCA Method B direct contact soil cleanup levels.

- Benzene was detected in 6 of 70 soil samples (9%), with an observed maximum concentration of 0.078 mg/kg (below the Method B cleanup level for direct contact of 18 mg/kg).
- Naphthalene concentrations ranged up to 126 mg/kg, with detections in 28 of the 70 samples (40%), none of which exceed the Method B soil cleanup level for direct contact of 1,600 mg/kg.

Gasoline-related constituents were also identified at the off-Property upgradient source-areas at relatively low concentrations. Detected constituents corresponded with where gasoline was identified in soil in smear-zone soils.

2.5.1.3 Other Gasoline Additives

Lead has not been detected in Site soils above the MTCA Method A Soil Cleanup Level of 250 mg/kg. Ecology has not established a MTCA Method B Soil Cleanup Level for direct contact to lead. Laboratory analyses for gasoline additives such as EDB, EDC, and MTBE were not performed on Site soil samples since the chemicals were not detected in Site groundwater (see Section 2.5.2.6).

2.5.1.4 Diesel, Oil, and PAHs

Diesel- and oil-range hydrocarbon analysis was performed on five soil samples collected from representative Site locations and where elevated gasoline concentrations were identified. The most highly-contaminated soil sample was also analyzed for polynuclear aromatic hydrocarbons (PAHs).

- Diesel was detected in two samples at concentrations up to 342 mg/kg. Where identified, the presence of diesel appears to be due to overlap from gasoline-range hydrocarbons (Table 1), and therefore no discernable release of diesel fuel is confirmed for this Site.
- Oil-range hydrocarbons were not identified in any of the samples analyzed.
- In addition to naphthalene (discussed in Section 2.5.1.2), trace levels of other PAH compounds were also identified, including 1- and 2-methyl naphthalene, phenanthrene and pyrene. Except for naphthalene, all identified PAHs were measured at concentrations below MTCA Method B soil-cleanup levels. Naphthalene, 1-methyl naphthalene, and 2-methyl naphthalene are also associated with gasoline and therefore not characteristic of a diesel release.

Based on these findings, Site soils do not appear to be impacted by diesel and oil, and therefore these hydrocarbon contaminants are not retained as Site COIs (see also Section 2.5.2.7).

2.5.2 Groundwater

EES characterized Site groundwater conditions as follows:

- Measured Site water table depths on a quarterly basis beginning in October 2017;
- Conducted quarterly groundwater monitoring between February 2018 and January 2019;
- Collected supplemental groundwater samples in August 2019 and February 2020.

Findings from these RI activities document representative seasonal plume conditions including water table depth and flow direction, water quality and redox conditions, and chemical/contaminant concentrations and distribution. Monitoring data are summarized on Tables 3 through 6 and illustrated on Figures 9 through 11.

2.5.2.1 Water Table Conditions

The Site water table flowed consistently to the southwest as measured during the 2017-2020 monitoring period. This southwesterly flow direction is similar to historical Site data (Olympus 1998, OTS 2001) and data from the nearby Grandview Market/Food Mart/Time Oil site (Brown and Caldwell 2001, ES Engineering 2018). During the 2017-2020 monitoring period, the water table elevation fluctuated seasonally between approximately 18 and 22 feet bgs, with higher elevations generally corresponding to irrigation season (April through October) and seasonal lows observed between early winter and spring, as illustrated on Chart 1. Figure set 10 illustrates seasonal water table surface contours for the four most recent monitoring events ending in February 2020. These measurements indicate a potentiometric surface sloping to the southwest at a gradient of approximately 0.01 ft/ft as measured between monitoring wells MW-3 and MW-7. Groundwater elevation and product thickness data are presented on Table 3.

Historical water table elevations at the Site were about five feet higher when comparing the monitoring period reported between 1998 and 2007, versus the 2017-2020 elevation data. Seasonal water table fluctuations as shallow as 12 feet bgs were repeated and consistent throughout the 1998-2007 timeframe at a time when groundwater contamination is known to have been present at the Site, which explains the presence of vadose-zone soil impacts at depths within this range, now stranded above the current high-water table (see Chart 1 and Figure set 9 and 11).

2.5.2.2 Field-Measured Water Quality Parameters

Parameters including temperature, conductivity, dissolved oxygen, pH, and oxygen reduction potential were measured in the field during quarterly monitoring well monitoring activities to evaluate water quality conditions at the Site. Upgradient and perimeter monitoring wells indicate moderately aerobic background water table conditions, as summarized in Table 4. Wells located within the contaminated plume show more reductive (anaerobic) groundwater conditions as expected, including relative decreases in dissolved oxygen, negative oxygen reduction potential, and increases in ferrous iron concentrations. The redox conditions observed within the fuel-contaminated zones are generally consistent with expectations for a gasoline contaminated plume where residual impacts are present, and biodegradation is partially or incompletely occurring.

2.5.2.3 Gasoline

Beyond the localized LNAPL zone that persists at well MW-2 (Section 2.5.4), dissolved-phase gasoline concentrations have ranged up to 8,560 ug/L (MW-13 in February 2020) since February 2018. The greatest dissolved gasoline concentrations in groundwater were observed upgradient and northeast of MW-2, near the Property's former fueling island. Dissolved concentrations exceeding MTCA groundwater cleanup levels (800 ug/L gasoline based on Method A criteria) extend beyond the subject Property boundaries to the west and south as illustrated on Figure 11.

In addition, groundwater sampling results indicate water table impacts are present north (upgradient) of the DeBock's facility. One or more sources of gasoline contamination have been confirmed to originate upgradient from the Debock's facility and north of Wine Country Road near Division Street. These locations correspond with historical automotive and fueling operations as shown on Figures 3 and 11. Dissolved gasoline concentrations recently identified at several upgradient locations exceeded MTCA cleanup criteria and ranged up to 4,160 ug/L (B19 in August 2019). The 2019 investigative findings are generally consistent with groundwater data developed in 1998 for upgradient boring locations GP-3 and GP-4 (Figure 6 and Table 5). Identified upgradient gasoline contamination in groundwater appears likely to migrate towards the DeBock's facility.

2.5.2.4 Gasoline-Related Constituents

Common gasoline constituents (BTEX+N) were detected in groundwater samples at locations generally overlapping locations where gasoline was identified.

- Detected benzene concentrations in groundwater at the DeBock's Property ranged up to 31 ug/L (B1 in March 2018). Benzene concentrations exceeding the MTCA Method A cleanup level of 5 ug/L extend beyond Property boundaries to the west (Figure 11).
- Upgradient from DeBock's, benzene concentrations measured in 2019 were much lower compared to the 1998 groundwater data at GP-3 and GP-4, which indicated concentrations between 17 and 72 ug/L.
- Dissolved naphthalene concentrations exceeded the MTCA Method A groundwater cleanup level of 160 ug/L in only two samples (boring B1 at 162 ug/L and well MW-2 at 193 ug/L).

All observed gasoline constituent impacts are extensively degraded and consistent with the long history of fueling and maintenance activities on and near the subject Property, including upgradient facilities.

2.5.2.5 Other Gasoline Additives

Analytical testing for gasoline additives (lead, EDB, EDC, and MTBE) was conducted for groundwater samples in accordance with MTCA requirements (Table 830-1, WAC 173-340-900).

- Total and dissolved lead concentrations among developed monitoring wells appear generally similar and are uniformly below the MTCA Method A cleanup level of 15 ug/L. Among temporary borings where turbid water conditions are common, total lead concentrations were generally higher (28 ug/L maximum observed in March 2018), but more representative dissolved concentrations were observed at trace levels and far below the cleanup criteria. Where detected, the presence of these low lead concentrations in groundwater may be related to naturally occurring conditions, and possibly highly-degraded leaded fuel associated with historical Site releases.
- The gasoline additives EDB, EDC, and MTBE were not detected in any of the analyzed groundwater samples. Based on these data, EDB, EDC, and MTBE are not regarded as a COIs at the Site.

2.5.2.6 Diesel, Oil, and PAHs

Diesel- and oil-range hydrocarbon analysis was performed on groundwater samples collected from representative Site locations and where elevated gasoline concentrations were identified. Four of the most highly-contaminated groundwater samples collected in 2018 were selected for supplemental PAH analysis to verify the absence of diesel contribution.

- Diesel was identified in 10 samples at concentrations ranging up to 1,070 ug/L. All of the identified diesel concentrations were attributed by the laboratory to be due to gasoline overlap and not representative of a diesel source.
- Oil-range hydrocarbons were not identified in any of the groundwater samples analyzed in 2018-2019.
- Other than naphthalene, 1-methyl naphthalene, and 2-methyl naphthalene, and a trace concentration of phenanthrene, PAHs were not detected among any of the four groundwater samples. Detected PAH concentrations were all below applicable MTCA Method A or MTCA Method B cleanup levels (see Table 6), except for 1-methyl naphthalene in one sample collected from the dispenser island source-area. Naphthalene, 1-methyl naphthalene, and 2-

methyl naphthalene are also associated with gasoline and therefore not indicative of a diesel release.

Although diesel-range hydrocarbons have been identified in Site groundwater samples, laboratory results indicate these detections are likely due to overlap from degraded gasoline and not indicative of separate diesel sources. These findings are consistent with soil data (Section 2.5.3) and confirm that diesel and oil are not regarded as COIs for this Site.

2.5.3 SUBSURFACE VAPORS/SOIL GAS

EES collected and analyzed a total of nine subsurface soil-gas samples at the Site in March 2018 to characterize contaminant distribution and satisfy Ecology requirements for a "Tier 1" Vapor Intrusion Assessment (VIA). Soil gas data were collected at five-foot sampling depths and are summarized on Table 7 and illustrated on Figure 12.

2.5.3.1 GASOLINE

Gasoline was detected at two of the nine soil gas sample locations at the Site. The greatest gasoline vapor concentration (280 micrograms per cubic meter [ug/m^3]) was identified at the former fuel dispenser area. Relatively lower gasoline vapor (90 ug/m^3) was observed along the western Property boundary within 10 feet of where LNAPL is present at monitoring well MW-2. Subsurface gasoline vapors were not detected elsewhere at the Site, including multiple other sample locations directly above the groundwater plume. None of the detected gasoline vapor concentrations exceed MTCA Method B shallow soil gas screening criteria of 4,700 ug/m^3.

2.5.3.2 GASOLINE-RELATED CONSTITUENTS

Common gasoline constituents (BTEX+N) were detected at relatively low levels among the nine soil gas sampling locations across the Site. None of the detected concentrations exceed MTCA Method B screening criteria.

- Benzene was measured in all but one of the nine soil gas samples at concentrations ranging up to 4.8 ug/m^3. All identified benzene concentrations were well below the corresponding 11 ug/m^3 MTCA Method B screening level for shallow soil gas.
- Naphthalene was not detected at seven of the nine soil gas locations. Where detected, naphthalene at dispenser island source-area was equivalent to the MTCA Method B soil gas screening level of 2.5 ug/m^3. The other naphthalene detection (0.59 ug/m^3), was far below the screening level and observed near the groundwater plume's downgradient margin.

2.5.3.3 OTHER GASOLINE ADDITIVES

The gasoline additives EDB, EDC, and MTBE were not detected in any of the nine soil gas samples analyzed at this Site.

2.5.4 LNAPL AND PRODUCT REMOVAL

Floating free-phase hydrocarbon product (LNAPL) has been observed at well MW-2 since monitoring

resumed at the Site in October 2017. LNAPL has not been observed at any other Site wells since monitoring began in 2017, and previous Site work (1995 – 2003) did not report the presence of LNAPL. A bulk product sample collected from MW-2 in 2018 characterized the LNAPL product as gasoline. Diesel- and oil-range hydrocarbons were not identified in the bulk product sample. Product thickness measurements are summarized in Table 3.

As required under MTCA and as directed in 2017 by Ecology, product removal and rebound observation activities have been routinely conducted, including active total fluids pumping and recovery ("TFR," February 2018-January 2019) and passive product recovery using in-well absorbents (February 2019-present). Product thicknesses at MW-2 have decreased since initiation of the product removal in early 2018 (see Chart 2) but LNAPL persists.

During eight active fluid recovery events, a total of approximately six gallons of emulsified fuel and water was removed from MW-2. Due to relatively low yield and slow recharge rates, product removal by bulk extraction was discontinued after the January 2019 fluid recovery event. EES initiated passive product recovery by deploying hydrocarbon-absorbent sock media in MW-2 beginning on February 19, 2019. The absorbent sock is inspected on a quarterly basis and replaced as needed. Between February 2019 and July 2020, approximately 1.6 gallons of floating free product was removed. Free product generally does not exceed the passive recovery capacity and the absorbent socks rarely become fully saturated between monitoring events. When observed, floating free product exceeding absorbent capacity was manually removed before installing new absorbents (indicated by the vertical steps shown on Chart 3). The 2017-2020 LNAPL recovery data confirm residual hydrocarbons remain in soils surrounding MW-2, but transmissivity and recovery rates are very low.

Observations and testing of subsurface media at numerous locations surrounding MW-2 confirm that LNAPL distribution is limited in extent and free-phase hydrocarbons do not appear to be migrating to other locations beyond the immediate vicinity of MW-2.

2.5.5 Site Characterization Summary

Gasoline impacts at the Site originate from historic fueling operations originating both at the DeBock's Property and from one or more nearby upgradient sources. Contaminants identified in soil and groundwater at the Site are mixed or overlapping, making discrete source origins in some cases difficult to discern. Fuel constituents typically appear to be depleted relative to total hydrocarbons, indicating generally old and degraded releases. At least three source areas have been identified, including (1) the former fuel dispenser island, (2) the former gasoline UST areas and associated piping, and (3) the upgradient plume identified along the north side of Wine Country Road.

The commingled dissolved-phase groundwater plume covers much of the DeBock's Property and is currently observed beyond Property boundaries to the north, west, and south. Free-phase gasoline hydrocarbons persist at the MW-2 area with maximum LNAPL thicknesses of approximately one foot observed during the 2017-2018 monitoring period. LNAPL distribution appears limited and no free-phase hydrocarbons have been observed at any other location during this RI.

Among soils, the vertical distribution of identified contamination was predominantly observed within the groundwater smear zone and shallow saturated zone between approximately 12- and 22-feet depth. This residual gasoline mass in the smear zone appears generally co-located with the groundwater plume and, where present at relatively high concentrations, represents a continuing source of contamination and contaminant migration from soil into groundwater. Soil impacts deeper than 22 feet were not identified, indicating the vertical extent of contamination is defined throughout the Site.

Gasoline-related subsurface vapors are present in shallow soils at low concentrations that do not exceed applicable MTCA screening levels and therefore petroleum vapor intrusion is not anticipated at this Site based on available RI data.

3 CONCEPTUAL SITE MODEL

A conceptual site model is used to guide the site-characterization process by identifying contaminant sources and source locations, routes of migration or dispersal, receptors, and other information needed to understand the Site impacts and design a remedy to address those impacts. Only complete pathways can result in exposure to contaminants. Complete exposure pathways must include each of the following components:

- A source and mechanism of contaminant release
- An exposure route by which contact can occur
- A receptor

A summary diagram of the CSM is provided as Figure 13 and discussed below.

3.1 CONTAMINANT SOURCES

At this former retail gasoline station, the primary sources of Site contamination involve past releases of gasoline products from the former USTs and fuel-delivery system. The fueling system was decommissioned and removed in 1995. However, fuel transmission piping was abandoned in-place west of the Site building and north of the building between the 1,000-gallon UST and dispenser island. Remaining fuel, if present, in the abandoned piping may be a continuing, primary source of contamination.

Secondary sources include residual impacts in soil and groundwater that persist at the Site. Fuel-related vapors originating from these secondary sources represent mobile contaminants and are considered tertiary sources.

Under MTCA, COIs include all chemicals suspected or known to be present at a site, based on the published *Required Testing for Petroleum Releases* (Table 830-1, WAC 173-340-900). Site characterization efforts confirm that gasoline and related constituents, primarily BTEX+N, are the primary COIs at the Site. Impacted media at the Site include soil and groundwater. COIs are present in soil vapor but vapor concentrations do not exceed regulatory screening levels based on available data.

A summary of current and historical analytical data obtained from Site soil, groundwater, and soil-vapor samples is provided in Section 2 and presented on Tables 1, 2, and 5 through 7.

3.2 TRANSPORT MECHANISMS AND PATHWAYS

Potential contaminant transport mechanisms present at the Site include:

- Direct discharge of COIs from past fueling operations to surface and subsurface soil
- Migration (leaching) of COIs from soil into groundwater
- Groundwater transport of COIs
- Volatilization of COIs from soil and groundwater to indoor and outdoor air

3.3 RECEPTORS

Potential human and ecological receptors for the Site are summarized below. The potential receptors are derived based on the Site setting and use, ecology, and beneficial-use determinations.

3.3.1 HUMAN RECEPTORS

Potential human receptors were identified based on current and reasonably likely future land use. It is anticipated that the Site will retain its commercial character and that future land uses will be consistent with the current commercial uses. As indicated in Section 1.3, current zoning allows residential use at the subject Property and nearby properties above ground-floor commercial operations with a special permit. Where COIs extend beyond Property margins beneath the adjacent sidewalks, roadways, and buildings, current and future receptors include (infrequent) construction, excavation, and maintenance use.

Under MTCA, typical commercial and/or residential land use requires that the most protective cleanup levels (termed unrestricted land use) normally be applied based on assumptions for a "reasonable maximum exposure scenario." An alternative set of default cleanup levels utilizing industrial-exposure assumptions exist under MTCA, but those values likely cannot be applied for the Site because zoning codes allow for non-industrial usage.

Planned target cleanup levels for this Site are based on the published unrestricted-land-use scenario. Current and potential future human receptors include:

- Residential – potential residents at properties located within the Site (living above ground-floor commercial businesses)
- Retail Customers – periodic patrons of businesses located throughout the Site
- Occupational Workers – Site employees/workers/tenants
- Construction Workers – personnel temporarily working at the Site during maintenance or construction activities
- Excavation/Trench Workers – personnel temporarily working at the Site and conducting activities that involve excavation, such as utility trenching for maintenance
- Roadway Maintenance Workers – personnel working during roadway-maintenance activities (re-paving, short-term shallow excavations, etc.)

3.3.2 ECOLOGICAL RECEPTORS

No ecological receptors are known or suspected at the urban Site based on the results of a terrestrial ecological evaluation (TEE), as described in Section 4.6.

3.4 EXPOSURE ROUTES AND MEDIA

Human-exposure media and exposure pathways are summarized below. No significant ecological pathways are anticipated within the urbanized Site (Section 4.6).

3.4.1 HUMAN EXPOSURE MEDIA

Human receptors could be exposed to Site contaminants through contact with the following media:

- Soil
- Groundwater
- Air

3.4.2 HUMAN EXPOSURE ROUTES

The most reasonably likely routes of exposure to contaminants originating at the Site for human receptors are summarized below. These are derived based on the Site setting and beneficial-use determinations.

Soil Direct Contact:

- Potential exposure of current and future construction, trench and/or excavation workers to COIs via direct contact from subsurface soil extending to 15 feet bgs.
- Roadway maintenance workers are excluded from this exposure scenario since COIs are not known or suspected to be present among shallow soils where typical road-maintenance work would be expected.

Groundwater Ingestion and Direct Contact:

- Potential exposure of current and/or future residents, commercial/occupational workers and retail customers to COIs via ingestion and inhalation of groundwater used for drinking and/or irrigation purposes. Groundwater beneficial use is not known or suspected at or near this Site, but this ingestion/inhalation/direct contact exposure pathway is retained for preliminary consideration as a conservative measure, in accordance with MTCA criteria.
- Direct contact exposures to groundwater are not anticipated since the seasonal high-water table is deeper than 15 feet bgs.

Vapor Intrusion and Air Inhalation:

- Potential exposure of excavation/trench workers to COIs via inhalation of volatile compounds in outdoor air originating from subsurface soil and groundwater. This route of exposure is applicable near and within zones of contamination but not anticipated beyond plume margins.
- Potential exposure of retail customers, commercial/occupational workers, residents, current and/or future construction workers, and/or roadway maintenance workers to COIs via inhalation of volatile compounds in indoor and outdoor air originating from subsurface soil and

groundwater is a feasible exposure scenario based on the presence of a volatile (gasoline) source. However, empirical data confirm no exceedances of MTCA sub-slab soil vapor screening levels were observed during this RI.

These exposure pathways will be considered in development of cleanup levels.

4 PROPOSED CLEANUP STANDARDS

In accordance with MTCA regulations (WAC 173-340) and published Ecology Guidance (Ecology 2016a, 2016c, 2017, 2018a, 2019), EES evaluated Site cleanup standards for soil and groundwater and screening levels for soil gas as summarized below.

4.1 SOIL CLEANUP LEVELS

Table 4.1 below summarizes cleanup levels (CULs) for indicator compounds detected in soil at the Site based on MTCA's *Required Testing for Petroleum Releases* (Table 830-1, WAC 173-340-900). The source of these numeric CULs is the Ecology CLARC database (Ecology 2020). Method B CULs for unrestricted use, including soil direct contact and soil leaching to groundwater, are proposed for this Site. Site-specific analytical testing results were used to calculate a representative "modified" Method B CUL that is protective of direct contact exposure to total hydrocarbons (TPH) in soil, using published MTCA methodology. Supporting documentation is presented in Appendix C.

For purposes of this RI, the most restrictive applicable Method B soil cleanup levels are for the leaching pathway, regarded as a very conservative numeric benchmark for the unrestricted-use protection of groundwater. The soil leaching cleanup levels are therefore acknowledged and adopted in the RI for purposes of administrative compliance.

However, we emphasize that final determination of groundwater protection will be based on post-cleanup compliance with the proposed Method A groundwater cleanup levels. By definition, once the Method A groundwater cleanup levels are reliably attained, the soil leaching pathway will be adequately addressed, and no further soil cleanup will be necessary for this pathway (direct contact cleanup levels still must be achieved). MTCA allows for this type of empirical demonstration as specified in 173-340-747 WAC. To allow for flexibility in the implementation of future soil remedial actions, we expect to use this empirical approach to demonstrate compliance with groundwater CULs.

Table 4.1: Proposed MTCA Soil Cleanup Levels (mg/kg)

Contaminant	MTCA Method B Cleanup Levels			Maximum Concentration Observed in Soil (2018-2019)
	Soil Direct Contact (0-15 ft)[note1]	Vadose Zone Soil Leaching to Groundwater (0-18 ft)[note2]	Saturated Zone Soil Leaching to Groundwater (18-22 ft)[note2]	
Total Petroleum Hydrocarbons				
Gasoline Range Organics	**2,451***	NA	NA	**22,300 J**
Individual Substances				
Benzene	18	**0.027**	**0.0017**	**0.078**
Toluene	6,400	**4.5**	**0.27**	**98**
Ethylbenzene	8,000	**5.9**	**0.34**	**276 J**
Xylenes	16,000	**14**	**0.83**	**1,870 J**
Naphthalene	1,600	**4.5**	**0.24**	**126 J**
Lead	250**	3,000	150	12

Notes:
[1] For carcinogenic chemicals, the MTCA Method B Cancer value is shown.
[2] Alternatively, cleanup compliance may be achieved by an empirical demonstration after remedy implementation.
* = MTCA modified Method B cleanup value for total petroleum hydrocarbons calculated using Ecology's Workbook Tool for Calculating Soil and Groundwater Cleanup Levels (Ecology 2007). The median soil concentration shown is based on site-specific analytical data combined with generic default assumptions to be protective of the direct contact with soil pathway per Model Remedies for Sites with Petroleum Contaminated Soils (Ecology 2017)
** = Since a MTCA Method B cleanup level is not established, MTCA Method A criteria is proposed.
J = Results are estimated. See attached data tables for details.
Bold values exceed cleanup criteria. **The only COI exceeding a direct contact CUL is gasoline.**

4.2 GROUNDWATER CLEANUP LEVELS

MTCA Method A criteria are proposed for groundwater cleanup. Table 4.2 below identifies the selected groundwater-cleanup levels for COIs at the Site. The source of the listed cleanup levels is Table 720-1 in WAC 173-340-900 and Ecology's CLARC Database (Ecology 2020).

Table 4.2: Proposed MTCA Groundwater Cleanup Levels (ug/L)

Contaminant	MTCA Method A Groundwater Cleanup Level	Maximum Dissolved Concentration Observed in Groundwater (2018-2020*)
Total Petroleum Hydrocarbons		
Gasoline Range Organics	**800**	**14,500**
Individual Substances		
Benzene	**5**	**31**
Toluene	1,000	66
Ethylbenzene	700	441
Xylenes	1,000	936
MTBE	20	ND (<10)
Naphthalene	**160**	**193**
EDB	***0.01***	***ND (<5.0)***
EDC	5	ND (<5.0)
Dissolved Lead	15	1.3
1-Methyl naphthalene	**1.5**[note1]	**6.2**
2-Methyl naphthalene	32[note1]	5.5

Notes:
* LNAPL persists at well MW-2
[1] MTCA Method B cleanup level shown. A MTCA Method A cleanup level has not been established for this chemical
ND – not detected above laboratory analytical method reporting limit (highest shown)
Bold values exceed MTCA screening criteria. EDB is ***italicized*** because (although not detected) analytical method reporting limits exceed the CUL

4.3 VAPOR (INDOOR AIR AND SOIL GAS)

Published Ecology guidance describes the rationale and process for evaluating subsurface-vapor conditions with respect to potential indoor air-vapor intrusion (Ecology 2016a, 2018a, 2018b). MTCA standard Method B cleanup levels for air are published in the CLARC Data Tables along with sub-slab soil-gas-screening levels establishing protective attenuation factors. The sub-slab soil gas screening levels are not strictly intended to govern contaminant cleanup but are evaluated as a first step to determine whether subsequent indoor-air sampling and mitigation are necessary. In cases where the sub-slab/soil gas data are below MTCA Method B screening criteria (as observed at the subject Property), the vapor-intrusion pathway can generally be ruled out. Table 4.3 below summarizes MTCA soil-gas screening levels for indicator compounds detected at the Site.

Table 4.3: MTCA Soil Gas Screening Levels (ug/m^3)

Contaminant	MTCA Method B Shallow Soil Gas Screening Level	Maximum Concentration Observed In Soil Gas (2018)
Total Petroleum Hydrocarbons		
Gasoline Range Organics	4,700	280
Individual Substances		
Benzene	11	4.8
Toluene	76,000	11
Ethylbenzene	15,000	1.1
Xylenes	1,500	7.2
MTBE	320	ND (<0.69)
Naphthalene	2.5	2.5
EDB	0.14	ND (<0.29)
EDC	3.2	ND (<0.15)

Note:
ND – not detected above laboratory method reporting limit (highest shown)

4.4 RISK CHARACTERIZATION SUMMARY

The Conceptual Site Model is presented in Section 3 and illustrated on Figure 13. CSM conclusions indicate the following human-health-receptor scenarios are applicable for this Site.

- **Soil Direct Contact:** Gasoline concentrations at portions of the Site exceed MTCA Method B soil direct-contact-cleanup levels within deeper smear-zone soils. Possible direct contact human-health impacts are limited to future construction/excavation work occurring at depths between approximately 12 and 15 feet. Shallower soils do not exceed the CULs.
- **Soil Leaching to Groundwater:** Soil impacts between approximately 12- and 22-feet depth represent an ongoing source of groundwater contamination. Residual gasoline and constituent COIs must be mitigated to satisfy MTCA's requirement for protection of groundwater.
- **Groundwater Protection:** Gasoline, benzene, and naphthalene concentrations in groundwater exceed MTCA Method A cleanup levels. Under current and anticipated conditions, groundwater within or near the Site is not beneficially used, and no contaminant exposures or adverse risks are therefore anticipated. In accordance with MTCA requirements, however, groundwater must be restored to protective levels to comply with unrestricted-use criteria.
- **Vapor Intrusion:** Vapor intrusion represents a potential indirect contaminant exposure pathway in source areas located above residual soil and groundwater contamination. Identified

concentrations of COIs in soil gas do not exceed MTCA Method B screening criteria, and therefore no unacceptable vapor intrusion conditions are anticipated.

4.5 POINTS OF COMPLIANCE

Points of compliance are the locations and media where Site cleanup levels identified in Section 4 must be attained to achieve unrestricted use criteria. Points of compliance have been determined in accordance with the regulatory requirements contained within WAC 173-340-740(6).

4.5.1 SOIL

The soil point of compliance is established where cleanup levels identified in Section 4.1 shall be attained, consistent with WAC 173-340-740(6). The soil point of compliance achieves the following protective conditions:

- **Direct Contact:** Soil-cleanup levels based on human exposure via direct contact to soil will be attained throughout the Site, extending from the ground surface to a depth of 15 feet as defined under MTCA.
- **Leaching to Groundwater:** Soil-cleanup levels based on leaching to groundwater will be attained throughout the Site, extending through the soil profile and into the water table. This compliance point will be achieved when soil conditions do not cause groundwater quality to exceed the established cleanup levels.

4.5.2 GROUNDWATER

The groundwater point of compliance is established where the groundwater-cleanup levels identified in Section 4.2 are attained, consistent with WAC 173-340-720(8). Two types of groundwater compliance points are considered.

- **Standard point of compliance:** The standard point of compliance will be established throughout the Site from the uppermost level of the saturated zone extending vertically to the lowest depth that could potentially be affected.
- **Conditional point of compliance:** Where it can be demonstrated under WAC 173-340-350 through 173-340-390 that it is not practicable to meet the cleanup level throughout the Site within a reasonable restoration time frame, Ecology may approve a conditional point of compliance established as close as practicable to the source of hazardous substances and generally not extending beyond the Property boundary. Where a conditional point of compliance is proposed, it is necessary to demonstrate that all practicable methods of treatment are or will be used in the site cleanup.

This RI concludes that the standard point of compliance will be utilized for groundwater and cleanup will seek to achieve unrestricted use of the Site. During future remedial-action planning and implementation measures for the Site, the viability of attaining groundwater cleanup values within a reasonable restoration timeframe will be evaluated.

4.5.3 AIR

Ambient air is regarded under MTCA as a standard point of compliance (WAC 173-340-750). Soil gas

data is a useful indicator of likely air compliance. No discernable gasoline-related vapor-intrusion conditions were observed at the Site.

4.6 TERRESTRIAL ECOLOGICAL EVALUATION

In accordance with Ecology guidance and criteria in WAC 173-340-7492, EES conducted a TEE to determine whether Site conditions represent a threat of significant adverse effects to terrestrial-ecological receptors. Based upon the evaluation, the Site meets the undeveloped land exclusion because less than 1.5 acres of contiguous undeveloped land are located within 500 feet of the Site. Therefore, terrestrial-ecological-receptor exposure is unlikely, and no adjustment to cleanup values to protect terrestrial-ecological receptors is necessary. A copy of this evaluation is included in Appendix D.

5 AREAS POTENTIALLY REQUIRING CLEANUP

Utilizing MTCA unrestricted-land-use-cleanup levels, the areas of soil, groundwater, and soil gas potentially requiring cleanup can be delineated and are described in subsections 5.1 through 5.3 below. Cleanup considerations have been evaluated on the basis of contaminant screening for all anticipated chemicals of interest as detailed in Sections 3 and 4 of this report. Based on that evaluation, potential cleanup actions are driven primarily by the distribution of gasoline and benzene, as discussed below. These cleanup areas are illustrated schematically on Figure set 14.

5.1 SOIL

Gasoline impacts to soils at depths between the ground surface and 12 feet bgs have been generally remediated based on sampling results collected in 2018-2019. Residual soil impacts exceeding MTCA Method B cleanup levels remain in smear-zone and shallow saturated zone soils at depths primarily between approximately 12 and 22 feet bgs (Figure 14A). Table 4.1 compares maximum COI concentrations to CULs and illustrates that the greatest exceedances are associated with total hydrocarbon (ie, gasoline), with individual gasoline constituents being generally depleted in soils. Therefore, TPH is the primary contaminant that will drive soil cleanup requirements. The area requiring soil cleanup will be based on the following:

- **Direct Contact:** Gasoline concentrations in soil at depths between approximately 12 and 15 feet bgs exceed the modified MTCA Method B direct-contact cleanup level of 2,451 mg/kg throughout the majority of the subject Property.
- **Soil Leaching to Groundwater**: Residual-fuel impacts among Site soils are a continuing source of contamination to the water table and must be addressed to satisfy the leaching to groundwater pathway. Future cleanup efforts will be developed to mitigate the effects of this leaching pathway. MTCA Method B soil leaching criteria are adopted under this RI, although we anticipate protection of groundwater will be achieved using an empirical demonstration, once the Method A groundwater point of compliance is achieved.

5.2 GROUNDWATER

The area requiring groundwater cleanup based on Site gasoline data covers an area approximately 150 feet in diameter as illustrated on Figure 14B.

- Gasoline concentrations detected in groundwater during 2018-2020 exceeded the MTCA Method A cleanup level of 800 ug/L at nine of the 13 Site groundwater monitoring wells. Plume concentrations exceeding cleanup levels extend beyond Property boundaries to the west below two commercial properties, and to the south below a commercial property. LNAPL is localized at monitoring MW-2 and does not appear at other locations or extend beyond Property boundaries.
- Gasoline was identified in groundwater located approximately 80 to 100 feet upgradient (northeast) from the DeBock's Property at concentrations exceeding MTCA Method A cleanup criteria. These upgradient groundwater impacts appear to migrate towards and commingle with the DeBock's plume. Future upgradient plume characterization and cleanup will be the responsibility of other parties and those elements are not included in cleanup planning for the DeBock's Property.

5.3 AIR

No vapor intrusion conditions are known or suspected at the Site based on available VIA data.

5.4 FINAL CLEANUP PLANNING & FEASIBILITY STUDY

Interim remedial actions were resumed in 2017 to mitigate LNAPL at the Site, and will continue as necessary until a final remedy is implemented. EES is working with the facility owners to develop a long-term cleanup action plan. At this time, a formal feasibility study is not anticipated, subject to Ecology concurrence.

6 LIMITATIONS

EES has prepared this report for use by Christensen Inc. and its agents. This report may be made available to other parties and to regulatory agencies at the discretion of Christensen Inc. This report is not intended for use by others, and the information contained herein is not applicable to other sites.

Our interpretation of subsurface conditions and risk criteria is based on field observations and chemical analytical data within the areas explored. Areas with contamination may exist in portions of the Site that were not explored or analyzed.

Within the limitations of scope, schedule, and budget, our services have been executed in accordance with generally accepted practices and laws, rules, and regulations at the time that the report was prepared. No other conditions, expressed or implied, should be understood.

EES | Environmental Consulting, Inc.

Chris Rhea, LG
Senior Project Manager

Paul Ecker, LHG
Principal

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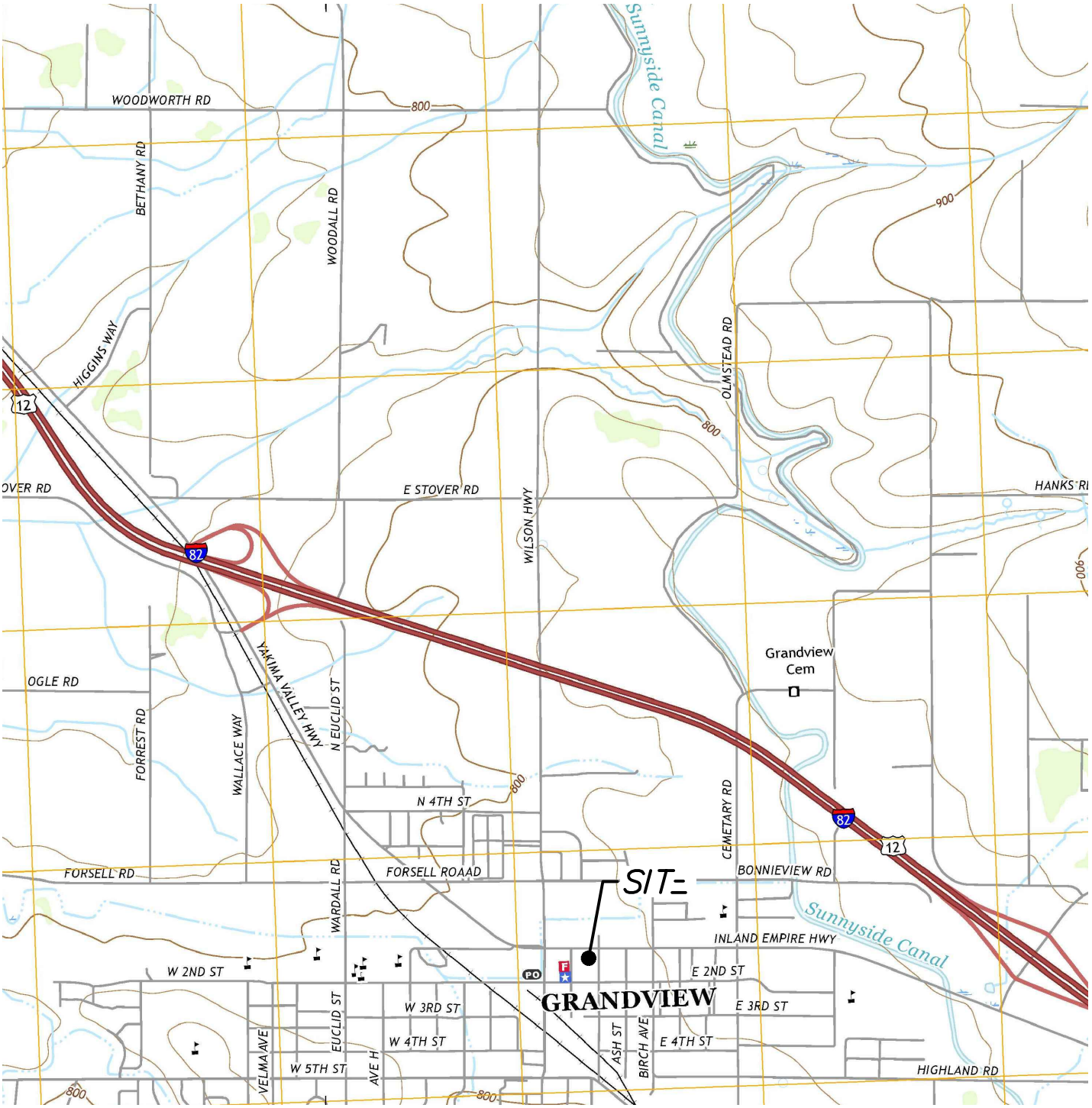
Figures



SOURCE:
USGS, GRANDVIEW QUAD
WASHINGTON-YAKIMA COUNTY
7.5 MINUTE SERIES (TOPOGRAPHIC)

NORTH

APPROXIMATE SCALE IN FEET

0 1000 2000 4000

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SITE VICINITY MAP

D.BOCK'S TEXACO
100 WEST MAIN ST.
GRANDVIEW, WA.

DATE:	11-24-20	PROJECT NO.	
FILE:	2093-01		2093-01
DRAWN:	JJT	FIGURE NO.	
APPROVED:	CR		1

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DEBOCK'S TEXACO
100 WEST MAIN ST.
GRANDVIEW, WA.

SITE FEATURES

DATE:	8-28-20	PROJECT NO.	
FILE:	2093-01		2093-01
DRAWN:	JJT	FIGURE NO.	
APPROVED:	CR		2A

L=G=ND

- PROP=RTY LIN=
- MW–1 — MONITORING W=LL
- TOMW–6 – TIM= OIL MONITORING W=LL (D=COMMISSION=D BY OTH=RS, 2019)
- W — W-T=R M=T=R
- G — G =T=R
- ST — STORM S=W=R M- HOL=
- S — S- IT- \Y S=W=R M- HOL=
- C-TCH B- IN
- DR-IN
- UST -ILL PORT
- POL=
- LIGHT POL=
- \Y W=LL
- ST — STORM S=W=R
- S — S- IT- \Y S=W=R
- W — W-T=R
- G — G
- FO — -IB=R OPTIC
- P — POW=R
- ? — UNKNOWN UTILITY
- IR — IRRIG-TION
- SIT= =-TUR=S - \= - \OXIM-T=.

-PPROXIMAT= SC = IN =T

0 25 50

N

GRANDVIEW MUSEUM

COMMERCIAL BUSINESS

RETAIL/COMMERCIAL BUSINESSES

CITY STORMWATER INFILTRATION TRENCH

4.7'

32"

SIDEWALK

WEST MAIN STREET/WINE COUNTRY ROAD

-3.0'-

FORMER GASOLINE UST LOCATION (1,000 GAL.)

FORMER GASOLINE UST LOCATION (550 GAL.)

MW–10

MW–11

MW–3

FORMER FUEL DISPENSER ISLAND

ABANDONED FUEL TRANSMISSION PIPING

MW–13

MW–12

MW–5

RETAIL FUELING

4.2'

3.0'

RESTAURANT (JAVI'S CHICKEN & CHURROS)

DEBOCK'S TEXACO

MORA PROPERTY

MW–4

MW–2

MW–9

POSSIBL= H=ATING OIL TANK(S)

DIVISION STREET

SIDEWALK

EXXON/TIME OIL

RESTAURANT (EL CAMPESTRE)

FORMER GASOLINE UST LOCATIONS (5,000 & 8,000 GAL.)

2.1'

2.5'

MW–8

MW–1

MW–7

0.5'

3.2'

2.6'

2.8'

3.5'

MW–6

TOMW–6

ALLEY

-7.0'-

- \OXIM-T= \OUNDW-T= \
- IR= TION

PROJECT NO.	2093-01	FIGURE NO.	2B
DATE:	8-28-20	DRAWN:	JJT
FILE:	2093-01	APPROVED:	CR

UTILITY LAYOUT

D=BOCK'S T=XACO
100 W=ST MAIN ST.
GRANDV=W, WA.

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RAILROAD, AS =ARLY
AS 1915–PR=S=NT

- \OXIM-T=
\OUNDW-T= \
- IR= TION

1931–63? OIL
STORAG= UST

1942–52 TIN SHOP

1963–2000
=RTILIZ=R &
INS=CTICID=

1915–31 R=PAIR SHOP

1942–52? AND=RSON
TRACTOR S=RVIC=S

1929–31 TIN SHOP
1939–52? GAS & OILS

1952 DRY CL=ANING

1915–31 GARAG=

1931–63? R=PAIR
GAS & OIL

1963–74? -IXIT LAWN
MOW=R R=PAIR

1942–52? GAS & OILS
1969–74? DAN'S =NCO S=RVIC= STATION
1974–79? PAYN='S =XXON STATION
1994–2000? JOHN'S TIR= S=RVIC=

1915–25 GAS UST

1920–50 GAS & OIL
1950–2005 VARIOUS =LING
--CILITI=S
2005–PR=S=NT AUTO R=PAIR

D=BOCK'S SIT=

1942–52 GAS & OIL

1942–52 GAS & OIL
1952 AUTO S=RVIC=
1969–74? CASRO'S TIM= GAS
1974–94? JACK POT GAS

1942–52 GAS & OIL
1963–74 WAYN=S T=XACO
1974–2000 HIWAY ARCO

1952 AUTO SAL=S & S=RVIC=
1974–2014 SAM'S MOTORCYCL= S=RVIC=

1920 AUTO R=PAIR

1979 PHOTO

1931 PRINTING

1969–89 M=TAL SHOP

1925–84 PRINTING

1969–74 LAUNDRY
1925 J=W=L=R

1915 PHOTO

1920–52 AUTO
GARAG= & S=RVIC=

1920–42 AUTO R=PAIR

1915 PAINTS

N

-PPROXIMAT= SC = IN ==T

0 80 160

L=G=ND

- HISTORIC AUTOMOTIV= --CILITI=S
- HISTORIC UST OR =LING --CILITI=S
- OTH=R HISTORIC CH=MICAL US=
- PROP=RTY LIN=

SIT= =ATUR=S AR= APPROXIMAT=.

PROJ=CT NO.	2093-01
DAT=: 8-28-20	-IGUR= NO. 3
-IL=: 2093-01	DRAWN: JJT
APPROV=D: CR	

POT=NTIAL HISTORIC
CONTAMINANT SOURC=S

D=BOCK'S T=XACO
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GRANDVI=W, WA.

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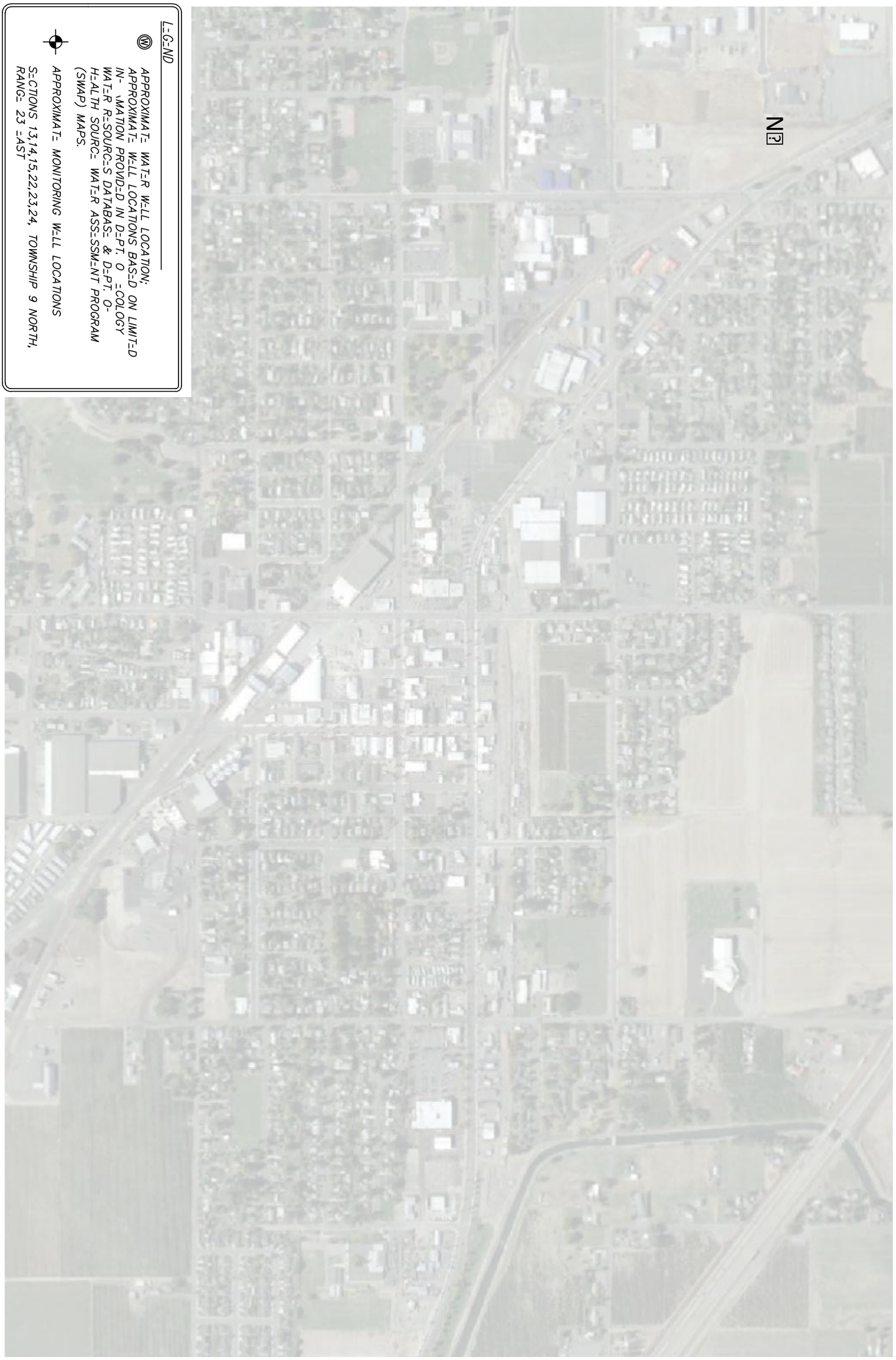

L=G=ND

APPROXIMAT= WAT=R W=LL LOCATION; APPROXIMAT= W=LL LOCATIONS BAS=D ON LIMIT=D IN- \MATION PROVID=D IN D=PT. O =COLOGY WAT=R R=SOURC=S DATABAS= & D=PT. O- H=ALTH SOURC= WAT=R ASS=SSM=NT PROGRAM (SWAP) MAPS.

APPROXIMAT= MONITORING W=LL LOCATIONS

S=CTIONS 13,14,15,22,23,24, TOWNSHIP 9 NORTH, RANG= 23 =AST

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D=BOCK'S T=XACO
100 W=ST MAIN ST.
GRANDVI=W, WA.

VICINITY W=LL LOCATIONS

DAT=:	11-24-20	PROJ=CT NO.	
-IL=:	2093-01		2093-01
DRAWN:	JJT	-IGUR= NO.	
APPROV=D:	CR		4

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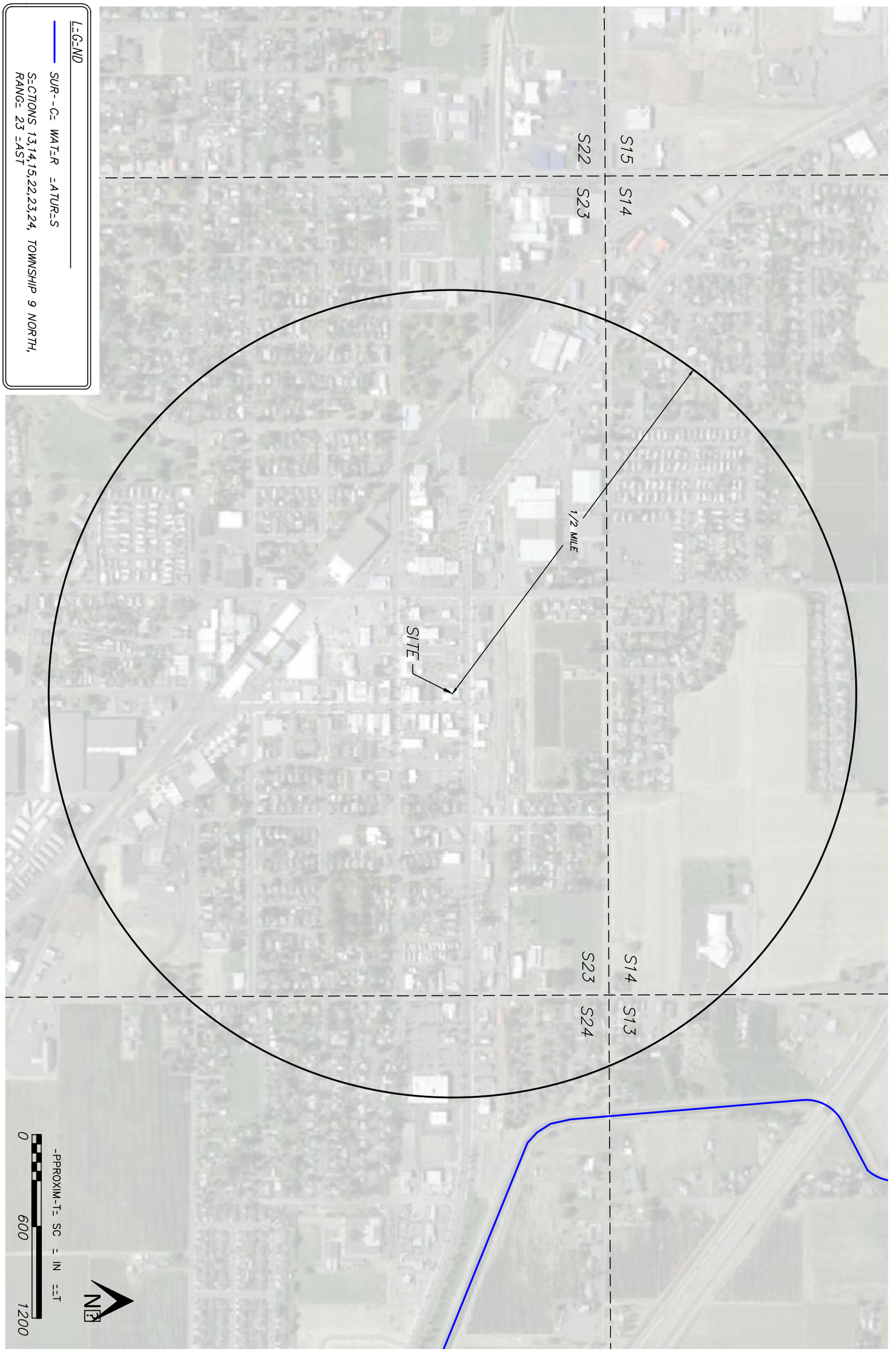

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D=BOCK'S T=XACO
100 W=ST MAIN ST.
GRANDVI=W, WA.

VICINITY SUR--C=
WAT=R =ATUR=S

DAT=:	11-24-20	PROJ=CT NO.	
-IL=:	2093-01		2093-01
DRAWN:	JJT	-IGUR= NO.	
APPROV=D:	CR		5

LEGEND

PROPERTY LINE

MW–1 MONITORING WELL (OLYMPUS, 1998)

SP–1 SOIL BORING LOCATION (BY OTHERS, 1995–2000)

101 EXCAVATION SOIL SAMPLE LOCATION (WSI, 1995)

MTCA METHOD A CLEANUP LEVEL EXCEEDANCE IN SOIL SHALLOWER THAN 10' DEPTH

MTCA METHOD A CLEANUP LEVEL EXCEEDANCE IN SOIL AT 10' OR GREATER DEPTH

GROUNDWATER MTCA METHOD A CLEANUP LEVEL EXCEEDANCE. * INDICATES LEAD EXCEEDANCES ONLY

SITE FEATURES ARE APPROXIMATE.

APPROXIMATE SCALE IN FEET

0 25 50

N

GRANDVIEW MUSEUM

COMMERCIAL BUSINESS

RETAIL/COMMERCIAL BUSINESSES

SIDEWALK

GP–3

GP–4

WEST MAIN STREET/WINE COUNTRY ROAD

APPROXIMATE GROUNDWATER FLOW DIRECTION

FORMER GASOLINE UST LOCATION (1,000 GAL.)

EXCAVATION AREA

FORMER GASOLINE UST LOCATION (550 GAL.)

SB–4*

SB–3*

SP–4

MW–3

SP–3

SP–1

FORMER FUEL DISPENSER ISLAND

203

302

205

303

202

ABANDONED FUEL TRANSMISSION PIPING

SP–2

301

SB–6*

204

SP–5

201

SB–5*

RESTAURANT (JAVI'S CHICKEN & CHURROS)

DEBOCK'S TEXACO

MW–2

MORA PROPERTY

SB–7*

FORMER GASOLINE UST LOCATIONS (5,000 & 8,000 GAL.)

RESTAURANT (EL CAMPESTRE)

104

105

107

MW–1

103

101

106

GP–5

EXCAVATION AREA

102

SIDEWALK

DIVISION STREET

SIDEWALK

EXXON/TIME OIL

GP–2

GP–1

RETAIL FUELING

PROJECT NO.	2093-01
FIGURE NO.	6
DATE:	8-28-20
FILE:	2093-01
DRAWN:	JJT
APPROVED:	CR

MONITORING WELL AND HISTORIC SAMPLE DATA

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LEGEND

- PROPERTY LINE
- MW–1 — MONITORING WELL
- TOMW–6 — TIME OIL MONITORING WELL DECOMMISSIONED BY OTHERS, 2019)
- B1 — SOIL BORING (EES, 2018)
- B19 — SOIL BORING (EES, 2019)
- SG1 — SOIL GAS SAMPLE LOCATION–5' DEPTH (EES, 2018)
- CATCH BASIN
- DRAIN
- UST FILL PORT
- DRY WELL

SITE FEATURES ARE APPROXIMATE.

APPROXIMATE SCALE IN FEET

0 25 50

N

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COMMERCIAL BUSINESS

RETAIL/COMMERCIAL BUSINESSES

CITY STORMWATER INFILTRATION TRENCH

SIDEWALK

B22 B20 B19 B21 B23

APPROXIMATE GROUNDWATER FLOW DIRECTION

WEST MAIN STREET/WINE COUNTRY ROAD

FORMER GASOLINE UST LOCATION (1,000 GAL.)

FORMER GASOLINE UST LOCATION (550 GAL.)

MW–10 (B15)

MW–11 (B16)

MW–3

FORMER FUEL DISPENSER ISLAND

B1

B4

SG3

ABANDONED FUEL TRANSMISSION PIPING

SG7

B3

MW–5 (B5)

MW–13 (B18)

MW–12 (B17)

RETAIL FUELING

RESTAURANT (JAVI'S CHICKEN & CHURROS)

DEBOCK'S TEXACO

SG6

SG2

SG8

B6

MW–9 (B14)

MORA PROPERTY

MW–4 (B2)

MW–2

DIVISION STREET

SIDEWALK

EXXON/TIME OIL

SG1

B7

FORMER GASOLINE UST LOCATIONS (5,000 & 8,000 GAL.)

RESTAURANT (EL CAMPESTRE)

MW–8 (B11)

SG4

MW–1

B9

B8

TOMW–6

MW–7 (B13)

SG9

B10

SG5

MW–6 (B12)

ALLEY

PROJECT NO.	2093–01
DATE: 8–28–20	FIGURE NO. 7
FILE: 2093–01	DRAWN: JJT
APPROVED: CR	

SAMPLE LOCATIONS (2018–2020)

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APPROXIMATE SCALE IN FEET

0 25 50

N

APPROXIMATE GROUNDWATER FLOW DIRECTION

GRANDVIEW MUSEUM

COMMERCIAL BUSINESS

RETAIL/COMMERCIAL BUSINESSES

CITY STORMWATER INFILTRATION TRENCH

SIDEWALK

WEST MAIN STREET/WINE COUNTRY ROAD

FORMER GASOLINE UST LOCATION (1,000 GAL.)

FORMER GASOLINE UST LOCATION (550 GAL.)

FORMER FUEL DISPENSER ISLAND

ABANDONED FUEL TRANSMISSION PIPING

RESTAURANT (JAVI'S CHICKEN & CHURROS)

DEBOCK'S TEXACO

RESTAURANT (EL CAMPESTRE)

FORMER GASOLINE UST LOCATIONS (5,000 & 8,000 GAL.)

MORA

DIVISION STREET

EXXON

B22	G	B	N
15	5.6U	0.011U	0.11U

B20	G	B	N
15	5.5U	0.011U	0.11U

B19	G	B	N
15	4,740	0.45U	36

B21	G	B	N
14	119	0.016U	1.4

B23	G	B	N
15	6.1U	0.012U	0.12U

B1	G	B	N	D
3	6.5U	0.013U	0.13U	--
10	7.1U	0.014U	0.14U	--
15	9,970	0.23U	40	25U
20	44	0.026	0.34	--
25	6.4U	0.013U	0.13U	--

B15	G	B	N
3	7.6U	0.013U	0.15U
15	7,840	0.24U	24
20	318	0.025U	0.25U

B16	G	B	N
3	7.0U	0.014U	0.14U
14	441	0.025U	1.8
20	34	0.016U	0.16U

B4	G	B	N	D
15	5,600	0.26U	29	--
17	22,300	0.52U	126	342*
20	10,500	0.50U	39	--
25	5.8U	0.012U	0.12U	--

B5	G	B	N
5	6.2U	0.012U	0.12U
10	5.6U	0.011U	0.11U
15	82	0.011U	0.19
20	2,300	0.012U	9.1
25	6.8U	0.014U	0.14U

B18	G	B	N
10	7.0U	0.014U	0.14U
15	1,600	0.013U	7.3
20	1,210	0.031	3.8
25	6.2U	0.012U	0.12U

B3	G	B	N
3	6.3U	0.013U	0.13U
10	6.4U	0.013U	0.13U
15	10,000	0.47U	37
20	13	0.011U	0.11U
25	6.9U	0.014U	0.14U

B17	G	B	N
3	7.6U	0.015U	0.15U
16.5	670	0.065	2.0
20	7.9U	0.016U	0.16U

B6	G	B	N	D
3	6.5U	0.013U	0.13U	--
15	631	0.015U	2.7	--
17	206	0.026	0.86	25U
20	1,110	0.054	2.7	--
25	6.1U	0.012U	0.12U	--

B14	G	B	N
3	6.4U	0.013U	0.13U
16	108	0.014U	0.14U

B7	G	B	N
3	6.8U	0.014U	0.14U
15	4,190	0.045U	7.6
20	9.5	0.011U	0.11U

B11	G	B	N	D
3	6.0U	0.012U	0.12U	--
16	53	0.014U	0.34	26U
20	15	0.012U	0.13	--

B2	G	B	N
10	6.3U	0.013U	0.13U
15	648	0.025U	1.9
19	1,530	0.078	1.8
25	5.1U	0.010U	0.10U

B8	G	B	N
3	6.9U	0.014U	0.14U
15	141	0.013U	0.23
20	367	0.013U	0.60
25	5.8U	0.012U	0.12U

B9	G	B	N	D
16.5	6,360	0.14U	11	51*
20	5.4U	0.011U	0.11U	--

B13	G	B	N
15	6.4U	0.013U	0.13U
20	4,530	0.24U	2.5
25	6.3U	0.013U	0.13U

B12	G	B	N
3	6.2U	0.012U	0.12U
10	6.5U	0.013U	0.13U
16	915	0.026U	1.8
20	5.9U	0.012U	0.12U

B10	G	B	N
3	7.1U	0.014U	0.14U
15	6.4U	0.013U	0.13U
20	6.4U	0.013U	0.13U

LEGEND

- PROPERTY LINE
- MW-1 MONITORING WELL
- TOMW-6 TIME OIL MONITORING WELL (DECOMMISSIONED BY OTHERS, 2019)
- B1 SOIL BORING (EES, 2018)
- B19 SOIL BORING (EES, 2019)
- SG1 SOIL GAS SAMPLE LOCATION-5' DEPTH (EES, 2018)
- CATCH BASIN
- DRAIN
- UST FILL PORT
- DRY WELL
- G= GASOLINE
- B= BENZENE
- N= NAPHTHALENE
- D= DIESEL
- U= NOT DETECTED AT METHOD REPORTING LIMIT
- -- NOT ANALYZED FOR THIS PARAMETER
- HISTORIC AUTOMOTIVE FACILITIES
- HISTORIC UST OR FUELING FACILITIES
- OTHER HISTORIC CHEMICAL USE
- * DIESEL DETECTION DUE TO OVERLAP FROM GASOLINE RANGE PRODUCT
- 800 ESTIMATED AREA WHERE GASOLINE CONCENTRATIONS IN GROUNDWATER EXCEED THE MTCA METHOD A CLEANUP LEVEL OF 800 ug/L (MAXIMUM OBSERVED IN 2018-2020)
- AREA POTENTIALLY REQUIRING SOIL CLEANUP AT 12'-15' BASED ON MTCA METHOD B DIRECT CONTACT EXCEEDANCES (2,451 mg/kg)
- AREA POTENTIALLY REQUIRING SOIL CLEANUP AT DEPTHS OF 15'-22' BASED ON MTCA METHOD A CLEANUP LEVELS IN GROUNDWATER

RESULTS SHOWN IN MILLIGRAMS PER KILOGRAM (mg/kg)

SITE FEATURES ARE APPROXIMATE.

PROJECT NO. 2093-01 | FIGURE NO. 8

DATE: 11-24-20 | FILE: 2093-01 | DRAWN: JJT | APPROVED: CR

SOIL ANALYTICAL RESULTS (2018-2020)

DEBOCK'S TEXACO
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LEGEND

- PROPERTY LINE
- MW–1 — MONITORING WELL
- TOMW–6 — TIME OIL MONITORING WELL DECOMMISSIONED BY OTHERS, 2019)
- B1 — SOIL BORING (EES, 2018)
- B19 — SOIL BORING (EES, 2019)
- SG1 — SOIL GAS SAMPLE LOCATION–5' DEPTH (EES, 2018)
- CATCH BASIN
- DRAIN
- UST FILL PORT
- DRY WELL

SITE FEATURES ARE APPROXIMATE.

APPROXIMATE SCALE IN FEET

0 25 50

N

GRANDVIEW MUSEUM

COMMERCIAL BUSINESS

RETAIL/COMMERCIAL BUSINESSES

CITY STORMWATER INFILTRATION TRENCH

SIDEWALK

WEST MAIN STREET/WINE COUNTRY ROAD

FORMER GASOLINE UST LOCATION (1,000 GAL.)

FORMER GASOLINE UST LOCATION (550 GAL.)

FORMER FUEL DISPENSER ISLAND

ABANDONED FUEL TRANSMISSION PIPING

RETAIL FUELING

RESTAURANT (JAVI'S CHICKEN & CHURROS)

DEBOCK'S TEXACO

MORA PROPERTY

FORMER GASOLINE UST LOCATIONS (5,000 & 8,000 GAL.)

RESTAURANT (EL CAMPESTRE)

DIVISION STREET

SIDEWALK

EXXON/TIME OIL

ALLEY

TOMW–6

TOMW–7

B22 B20 B19 B21 B23

MW–10 (B15) MW–11 (B16) MW–3

B1 B4 B3

SG3 SG7

MW–5 (B5) MW–13 (B18) MW–12 (B17)

SG6 SG2 B6 SG8

MW–4 (B2) MW–2 MW–9 (B14)

SG1 B7

MW–8 (B11) SG4

MW–1 B9

B8 B10 SG9

MW–7 (B13)

SG5 MW–6 (B12)

A A' B B' C C'

APPROXIMATE GROUNDWATER FLOW DIRECTION

PROJECT NO.	2093–01
DATE: 8–28–20	FIGURE NO. 9A
FILE: 2093–01	
DRAWN: JJT	
APPROVED: CR	

CROSS SECTION LOCATIONS

DEBOCK'S TEXACO
100 WEST MAIN ST.
GRANDVIEW, WA.

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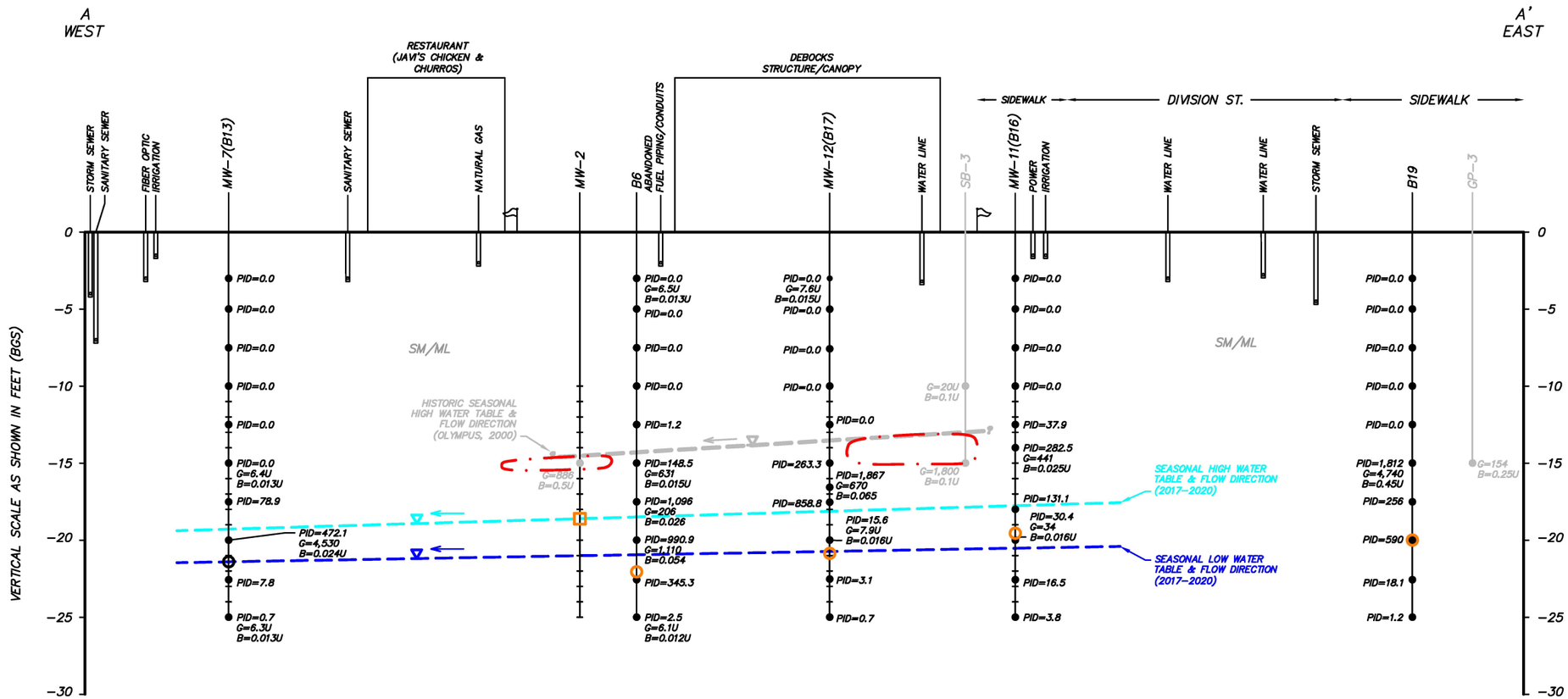

APPROXIMATE SCALE IN FEET

0 25 50

LEGEND

- ● SOIL SAMPLE (EES, 2018–2019)
- ● HISTORIC SOIL SAMPLE (BY OTHERS, 1995–2000)
- PROPERTY LINE
- SOIL RESULTS SHOWN IN MILLIGRAMS PER KILOGRAM (mg/kg)
- APPROXIMATE EXTENT OF GASOLINE CONTAMINATION IN SOIL GREATER THAN THE MTCA METHOD B CLEANUP LEVEL FOR DIRECT CONTACT (2,451 mg/kg BETWEEN GROUND SURFACE & 15' DEPTH)

- G = GASOLINE
- B = BENZENE
- U = CONCENTRATION NOT DETECTED ABOVE METHOD REPORTING LIMIT
- PID = VOLATILE ORGANIC COMPOUNDS MEASURED WITH PHOTOIONIZATION DETECTOR. RESULTS SHOWN IN PARTS PER MILLION BY VOLUME (ppmv)

- ○ GROUNDWATER SAMPLE BELOW MTCA METHOD A (<800 ug/L GASOLINE) IN 2018–2020
- ○ GROUNDWATER SAMPLE EXCEEDING MTCA METHOD A (<800 ug/L GASOLINE) IN 2018–2020
- □ GASOLINE FLOATING FREE PRODUCT OBSERVED IN 2017–2020

GROUNDWATER SAMPLES SHOWN AT WATER TABLE DEPTH DURING MAXIMUM OBSERVED GASOLINE CONCENTRATION IN 2018–2020

DATE:	8-28-20
FILE:	2093-01
DRAWN:	JJT
APPROVED:	CR
PROJECT NO.	2093-01
FIGURE NO.	9B

CROSS SECTION A–A'

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B
WEST

B'
EAST

RESTAURANT (JAVI'S CHICKEN & CHURROS)

PEREZ PROPERTY

DEBOCKS STRUCTURE/CANOPY

ABANDONED FUEL PIPING/CONDUITS

APPROXIMATE EXCAVATION (WSI 1995 & BLUE MTN. ENV. 2003)

FORMER 550 GAL. GASOLINE UST

SIDEWALK — DIVISION ST. — SIDEWALK

MW-4(B2) MW-2 B6 MW-12(B17) WATER LINE SP-3 SP-2 B4 MW-11(B16) SP-1 B3 SB-4 MW-3 POWER IRRIGATION WATER LINE WATER LINE B21 STORM SEWER STORM SEWER B23 IRRIGATION POWER

VERTICAL SCALE AS SHOWN IN FEET (BGS)

0 −5 −10 −15 −20 −25 −30

SM/ML

GP

HISTORIC SEASONAL HIGH WATER TABLE & FLOW DIRECTION (OLYMPUS, 2000)

SEASONAL HIGH WATER TABLE & FLOW DIRECTION (2017–2020)

SEASONAL LOW WATER TABLE & FLOW DIRECTION (2017–2020)

LEGEND

- SOIL SAMPLE (EES, 2018–2019)
- HISTORIC SOIL SAMPLE (BY OTHERS, 1995–2000)
- PROPERTY LINE
- SOIL RESULTS SHOWN IN MILLIGRAMS PER KILOGRAM (mg/kg)
- APPROXIMATE EXTENT OF GASOLINE CONTAMINATION IN SOIL GREATER THAN THE MTCA METHOD B CLEANUP LEVEL FOR DIRECT CONTACT (2,451 mg/kg BETWEEN GROUND SURFACE & 15' DEPTH)

G = GASOLINE

B = BENZENE

U = CONCENTRATION NOT DETECTED ABOVE METHOD REPORTING LIMIT

PID = VOLATILE ORGANIC COMPOUNDS MEASURED WITH PHOTOIONIZATION DETECTOR. RESULTS SHOWN IN PARTS PER MILLION BY VOLUME (ppmv)

- GROUNDWATER SAMPLE BELOW MTCA METHOD A (<800 ug/L GASOLINE) IN 2018–2020
- GROUNDWATER SAMPLE EXCEEDING MTCA METHOD A (<800 ug/L GASOLINE) IN 2018–2020
- GASOLINE FLOATING FREE PRODUCT OBSERVED IN 2017–2020

GROUNDWATER SAMPLES SHOWN AT WATER TABLE DEPTH DURING MAXIMUM OBSERVED GASOLINE CONCENTRATION IN 2018–2020

APPROXIMATE SCALE IN FEET

0 25 50

DATE:	8-28-20
FILE:	2093-01
DRAWN:	JJT
APPROVED:	CR
PROJECT NO.	2093-01
FIGURE NO.	9C

CROSS SECTION B-B'

DEBOCK'S TEXACO
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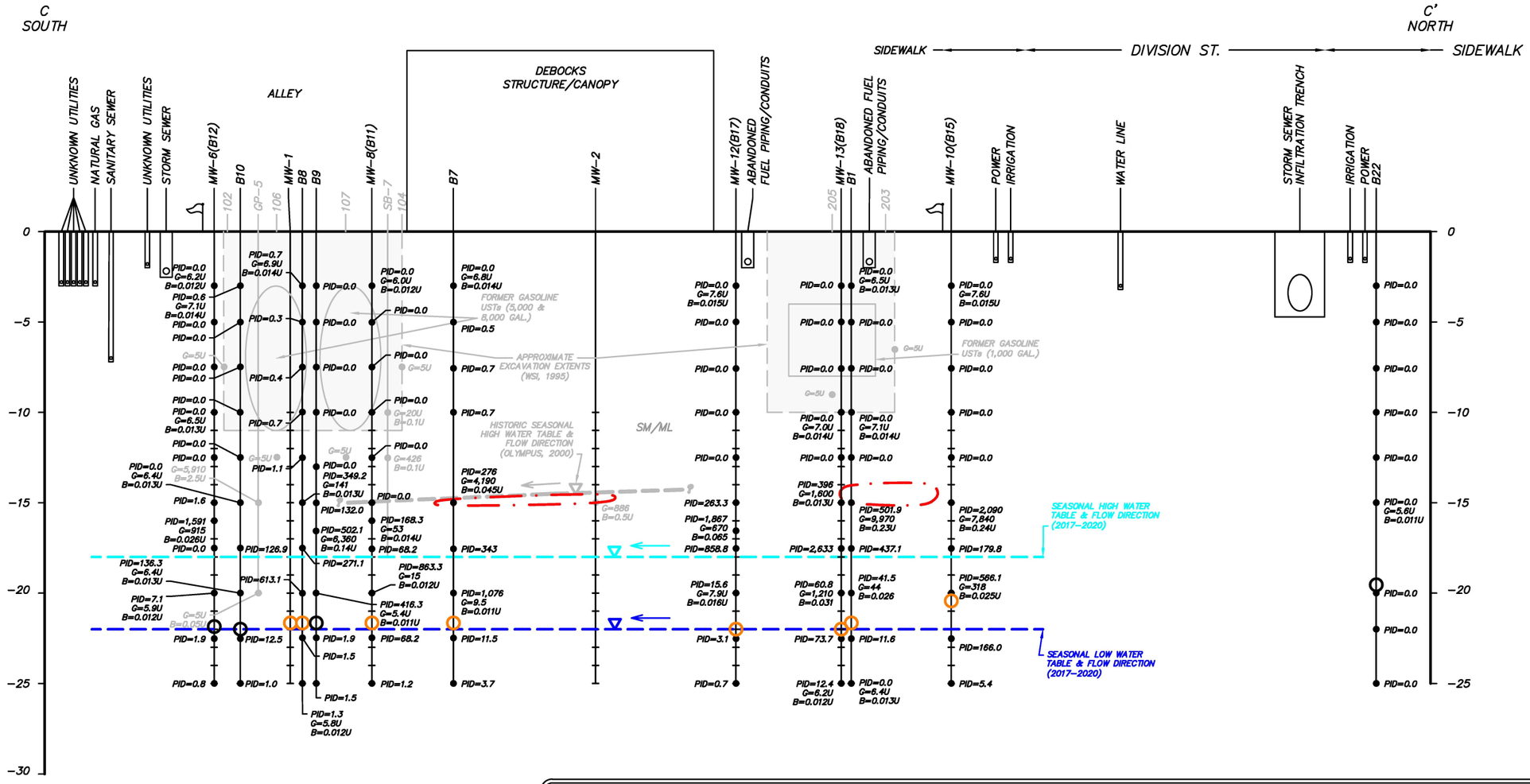

APPROXIMATE SCALE IN FEET

0 20 40

LEGEND

- SOIL SAMPLE (EES, 2018–2019)
- HISTORIC SOIL SAMPLE (BY OTHERS, 1995–2000)
- PROPERTY LINE
- SOIL RESULTS SHOWN IN MILLIGRAMS PER KILOGRAM (mg/kg)
- APPROXIMATE EXTENT OF GASOLINE CONTAMINATION IN SOIL GREATER THAN THE MTCA METHOD B CLEANUP LEVEL FOR DIRECT CONTACT (2,451 mg/kg BETWEEN GROUND SURFACE & 15' DEPTH)

G = GASOLINE
B = BENZENE
U = CONCENTRATION NOT DETECTED ABOVE METHOD REPORTING LIMIT
PID = VOLATILE ORGANIC COMPOUNDS MEASURED WITH PHOTOIONIZATION DETECTOR. RESULTS SHOWN IN PARTS PER MILLION BY VOLUME (ppmv)

- GROUNDWATER SAMPLE BELOW MTCA METHOD A (<800 ug/L GASOLINE) IN 2018–2020
- GROUNDWATER SAMPLE EXCEEDING MTCA METHOD A (<800 ug/L GASOLINE) IN 2018–2020
- GASOLINE FLOATING FREE PRODUCT OBSERVED IN 2017–2020

GROUNDWATER SAMPLES SHOWN AT WATER TABLE DEPTH DURING MAXIMUM OBSERVED GASOLINE CONCENTRATION IN 2018–2020

PROJECT NO.	2093-01
DATE: 8-28-20	FIGURE NO. 9D
FILE: 2093-01	
DRAWN: JJT	
APPROVED: CR	

CROSS SECTION C–C'

DEBOCK'S TEXACO
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L=G=ND

PROP=RTY LIN=

MW–1 MONITORING W=LL

TOMW–6 TIM= OIL MONITORING W=LL (D=COMMISSION=D BY OTH=RS, 2019)

C–TCH B– IN

793.08 GROUNDW–T=R =L=V–TION (==T)

792.0 – \OXIM–T= GROUNDW–T=R =L=V–TION ISOCONTOUR

– \OXIM–T= GROUNDW–T=R – IR=CTION

NM = NOT M=– \=D

SIT= =–TUR=S –\= – \OXIM–T=.

–PPROXIM–T= SC = IN ==T

0 25 50

N

GRANDVIEW MUSEUM

COMMERCIAL BUSINESS

RETAIL/COMMERCIAL BUSINESSES

SIDEWALK

SIDEWALK

– \OXIM–T= \OUNDW–T= \ – IR= TION

WEST MAIN STREET/WINE COUNTRY ROAD

FORMER GASOLINE UST LOCATION (1,000 GAL.)

FORMER GASOLINE UST LOCATION (550 GAL.)

SIDEWALK

SIDEWALK

MW–10 793.67

MW–11 794.08

MW–3 794.34

FORMER FUEL DISPENSER ISLAND

RETAIL FUELING

ABANDONED FUEL TRANSMISSION PIPING

MW–5 793.08

MW–12 793.88

RESTAURANT (JAVI'S CHICKEN & CHURROS)

DEBOCK'S TEXACO

MORA PROPERTY

MW–4 792.67

MW–2 793.25*

MW–9 794.20

794.0

DIVISION STREET

SIDEWALK

EXXON/TIME OIL

FORMER GASOLINE UST LOCATIONS (5,000 & 8,000 GAL.)

RESTAURANT (EL CAMPESTRE)

MW–8 793.44

MW–1 793.30

794.5

SIDEWALK

TOMW–6

MW–7 792.27

793.0

MW–6 792.97

ALLEY

PROJECT NO.	2093–01
DATE: 8–28–20	FIGURE NO. 10A
FILE: 2093–01	DRAWN: JJT
	APPROVED: CR

GROUNDWATER ELEVATION CONTOURS (OCTOBER 22, 2018)

D=BOCK'S T=XACO
100 W=ST MAIN ST.
GRANDVI=W, WA.

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L=G=ND

PROP=RTY LIN=

MW–1 MONITORING W=LL

TOMW–6 TIM= OIL MONITORING W=LL (D=COMMISSION=D BY OTH=RS, 2019)

C–TCH B– IN

791.24 GROUNDW–T=R =L=V–TION (==T)

792.0 – \OXIM–T= GROUNDW–T=R =L=V–TION ISOCONTOUR

– \OXIM–T= GROUNDW–T=R – IR=CTION

NM = NOT M=– \=D

SIT= =–TUR=S –\= – \OXIM–T=.

–PPROXIM–T= SC = IN ==T

0 25 50

N

GRANDVIEW MUSEUM

COMMERCIAL BUSINESS

RETAIL/COMMERCIAL BUSINESSES

SIDEWALK

SIDEWALK

WEST MAIN STREET/WINE COUNTRY ROAD

– \OXIM–T= \OUNDW–T= \ – IR= TION

FORMER GASOLINE UST LOCATION (1,000 GAL.)

FORMER GASOLINE UST LOCATION (550 GAL.)

SIDEWALK

SIDEWALK

MW–10 791.95

MW–11 792.45

MW–3 792.69

FORMER FUEL DISPENSER ISLAND

RETAIL FUELING

ABANDONED FUEL TRANSMISSION PIPING

MW–5 791.24

MW–12 792.19

RESTAURANT (JAVI'S CHICKEN & CHURROS)

DEBOCK'S TEXACO

MORA PROPERTY

MW–4 791.04

MW–2 791.63*

MW–9 792.61

DIVISION STREET

SIDEWALK

EXXON/TIME OIL

FORMER GASOLINE UST LOCATIONS (5,000 & 8,000 GAL.)

RESTAURANT (EL CAMPESTRE)

MW–8 791.87

MW–1 791.73

SIDEWALK

792.5

TOMW–6

MW–7 790.72

792.0

791.0

MW–6 791.39

791.5

ALLEY

PROJECT NO.	2093–01
FIGURE NO.	10B
DATE:	8–28–20
FILE:	2093–01
DRAWN:	JJT
APPROVED:	CR

GROUNDWATER ELEVATION CONTOURS (JANUARY 22, 2019)

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GRANDVIEW, WA.

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L=G=ND

PROP=RTY LIN=

MW–1 MONITORING W=LL

TOMW–6 TIM= OIL MONITORING W=LL (D=COMMISSION=D BY OTH=RS, 2019)

C–TCH B– I

792.82 GROUNDW–T=R =L=V–TION (==T)

792.0 – \OXIM–T= GROUNDW–T=R =L=V–TION ISOCONTOUR

– \OXIM–T= GROUNDW–T=R – IR=CTION

NM = NOT M=– \=D DU= TO – \B=NT SOCK IN W=LL

SIT= =–TUR=S –\= – \OXIM–T=.

-PPROXIM–T= SC = IN ==T

0 25 50

N

GRANDVIEW MUSEUM

COMMERCIAL BUSINESS

RETAIL/COMMERCIAL BUSINESSES

SIDEWALK

SIDEWALK

– \OXIM–T=
\OUNDW–T= \
– IR= TION

WEST MAIN STREET/WINE COUNTRY ROAD

FORMER GASOLINE UST LOCATION (1,000 GAL.)

FORMER GASOLINE UST LOCATION (550 GAL.)

SIDEWALK

SIDEWALK

MW–10 793.35

MW–11 793.73

MW–3 794.02

FORMER FUEL DISPENSER ISLAND

RETAIL FUELING

MW–5 792.82

MW–13 793.32

ABANDONED FUEL TRANSMISSION PIPING

MW–12 793.50

RESTAURANT (JAVI'S CHICKEN & CHURROS)

DEBOCK'S TEXACO

MORA PROPERTY

MW–4 792.35

MW–2 NM

MW–9 793.95

794.0

DIVISION STREET

SIDEWALK

EXXON/TIME OIL

FORMER GASOLINE UST LOCATIONS (5,000 & 8,000 GAL.)

RESTAURANT (EL CAMPESTRE)

MW–8 793.13

MW–1 793.01

SIDEWALK

TOMW–6

MW–7 791.99

792.0

MW–6 792.68

793.0

ALLEY

PROJECT NO. 2093-01

DATE: 8-28-20 | 2093-01

DRAWN: JJT

APPROVED: CR

FIGURE NO. 10C

GROUNDWATER ELEVATION CONTOURS (AUGUST 8, 2019)

D-BOCK'S T-XACO
100 W=ST MAIN ST.
GRANDVI=W, WA.

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L=G=ND

PROP=RTY LIN=

MW–1 MONITORING W=LL

TOMW–6 TIM= OIL MONITORING W=LL (D=COMMISSION=D BY OTH=RS, 2019)

C–TCH B– I

792.34 GROUNDW–T=R =L=V–TION (==T)

792.0 – \OXIM–T= GROUNDW–T=R =L=V–TION ISOCONTOUR

– \OXIM–T= GROUNDW–T=R – IR=CTION

NM = NOT M=– \=D DO TO – \B=NT SOCK IN W=LL

SIT= =–TUR=S –\= – \OXIM–T=.

-PPROXIM–T= SC = IN ==T

0 25 50

N

GRANDVIEW MUSEUM

COMMERCIAL BUSINESS

RETAIL/COMMERCIAL BUSINESSES

SIDEWALK

SIDEWALK

– \OXIM–T=
\OUNDW–T= \
– IR= TION

WEST MAIN STREET/WINE COUNTRY ROAD

FORMER GASOLINE UST LOCATION (1,000 GAL.)

FORMER GASOLINE UST LOCATION (550 GAL.)

SIDEWALK

SIDEWALK

MW–10 791.84

MW–11 792.32

MW–3 792.54

FORMER FUEL DISPENSER ISLAND

RETAIL FUELING

ABANDONED FUEL TRANSMISSION PIPING

MW–5 791.15

MW–13 791.87

MW–12 792.30

RESTAURANT (JAVI'S CHICKEN & CHURROS)

DEBOCK'S TEXACO

MORA PROPERTY

MW–4 790.98

MW–2 NM

MW–9 792.52

792.5

DIVISION STREET

SIDEWALK

EXXON/TIME OIL

FORMER GASOLINE UST LOCATIONS (5,000 & 8,000 GAL.)

RESTAURANT (EL CAMPESTRE)

MW–8 791.79

MW–1 791.64

MW–7 790.65

792.0

TOMW–6

MW–6 791.36

791.0

791.5

ALLEY

PROJECT NO. 2093-01
DATE: 8-28-20
FIGURE NO. 10D
FILE: 2093-01
DRAWN: JJT
APPROVED: CR

GROUNDWATER ELEVATION CONTOURS
(FEBRUARY 19, 2020)

D-BOCK'S T-XACO
100 W=ST MAIN ST.
GRANDVI=W, WA.

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APPROXIMATE SCALE IN FEET

0 25 50

N

APPROXIMATE GROUNDWATER FLOW DIRECTION

B22			
DATE	G	B	N
8/7/19	100U	0.20U	2.0U

B20			
DATE	G	B	N
8/7/19	1,840	0.22	2.0U

B19			
DATE	G	B	N
8/7/19	4,160	0.20U	15

B21			
DATE	G	B	N
8/7/19	1,130	0.20U	3.4

B23			
DATE	G	B	N
8/8/19	100U	0.20U	2.0U

MW-12			
DATE	G	B	N
4/24/18	3,780	5.8	6.0
7/19/18	2,070	2.3	20U
10/24/18	2,060	5.1	6.9
1/23/19	1,160	1.9	2.4
8/8/19	272	0.43	2.0U
2/19/20	1,270	1.82	2.0U

MW-10			
DATE	G	B	N
***4/24/18	1,210	2.5	2.0U
7/18/18	466	1.2	2.0
10/23/18	1,910	3.5	2.0U
1/23/19	1,450	3.0	2.0U
8/8/19	115	0.47	2.0U
2/19/20	1,930	2.88	2.0U

MW-11			
DATE	G	B	N
4/24/18	2,060	0.73	2.0U
7/18/18	834	0.31	2.0U
10/24/18	2,180	0.72	9.4
1/23/19	1,880	0.66	2.0U
8/8/19	600	0.29	2.0U
2/19/20	1,720	0.58	2.0U

B4-W				
DATE	G	B	N	D
3/16/18	5,250	1.3	21	411Y

B1-W				
DATE	G	B	N	D
3/15/18	7,240	31	162	1,070Y

MW-13				
DATE	G	B	N	D
8/8/19	2,580	8.1	30	1,000Z
2/19/20	8,560	15.5	104	--

MW-3				
DATE	G	B	N	D
2/2/18	121	0.20U	2.0U	269X
4/24/18	821	0.20U	2.0U	--
7/18/18	715	0.20U	2.0U	--
10/23/18	564	0.20U	2.0U	--
1/22/19	847	0.20U	2.0U	--

MW-5			
DATE	G	B	N
4/25/18	390	0.24	2.0U
7/19/18	100U	0.20U	2.0U
10/23/18	767	0.33	2.0U
1/22/19	981	0.32	2.0U
8/8/19	100U	0.20U	2.0U
2/19/20	771	0.30	2.0U

B3-W				
DATE	G	B	N	D
3/16/18	1,440	0.20U	2.0U	348Y

MW-2				
DATE	G	B	N	D
2/1/18	FREE PRODUCT			
4/24/18	FREE PRODUCT			
7/18/18	14,500	12	193	948Y
10/23/18	FREE PRODUCT			
1/22/19	FREE PRODUCT			
8/8/19	FREE PRODUCT			

B6-W				
DATE	G	B	N	D
4/3/18	1,280	6.1	4.3	194U

MW-9			
DATE	G	B	N
4/24/18	100U	0.20U	2.0U
7/18/18	100U	0.20U	2.0U
10/23/18	100U	0.20U	2.0U
1/22/19	100U	0.20U	2.0U

MW-4			
DATE	G	B	N
4/25/18	521	0.53	2.0U
7/19/18	121	0.21	2.0U
10/23/18	653	1.2	2.0U
1/22/19	628	0.37	2.0U

B7-W				
DATE	G	B	N	D
4/3/18	1,270	0.20U	6.2	190U

MW-8			
DATE	G	B	N
4/25/18	5,860	0.20U	58
***7/18/18	1,590	0.20U	22
***10/24/18	2,390	0.20U	35
***1/23/19	2,980	0.24	62

B8-W				
DATE	G	B	N	D
4/3/18	1,290	0.26	5.2	317Y

MW-1				
DATE	G	B	N	D
2/2/18	928	0.20U	2.0U	866X
4/24/18	725	0.20U	2.0U	--
7/18/18	364	0.20U	2.0U	--
10/23/18	250	0.20U	2.0U	--
1/23/19	412	0.20U	2.0U	--

MW-7			
DATE	G	B	N
4/25/18	100U	0.20U	2.0U
7/19/18	100U	0.20U	2.0U
10/24/18	100U	0.20U	2.0U
1/22/19	100U	0.20U	2.0U

MW-6			
DATE	G	B	N
4/25/18	100U	0.20U	2.0U
7/18/18	100U	0.20U	2.0U
10/23/18	100U	0.20U	2.0U
1/22/19	100U	0.20U	2.0U

B9-W				
DATE	G	B	N	D
4/3/18	725	0.20U	2.0U	238Y

B10-W				
DATE	G	B	N	D
4/4/18	449	0.20U	2.0U	389Y

CITY STORMWATER INFILTRATION TRENCH
SIDEWALK
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COMMERCIAL BUSINESS
RETAIL/COMMERCIAL BUSINESSES
WEST MAIN STREET/WINE COUNTRY
FORMER GASOLINE UST LOCATION (1,000 GAL.)
FORMER GASOLINE UST LOCATION (550 GAL.)
FORMER FUEL DISPENSER ISLAND
ABANDONED FUEL TRANSMISSION PIPING
RESTAURANT (JAVI'S CHICKEN & CHURROS)
DEBOCK'S TEXACO
RESTAURANT (EL CAMPESTRE)
FORMER GASOLINE UST LOCATIONS (5,000 & 8,000 GAL.)
SIDEWALK
TOMW-6
EX.
LNAPL
800
5,000

LEGEND

- PROPERTY LINE
- MW-10 — MONITORING WELL
- TOMW-6 — TIME OIL MONITORING WELL (DECOMMISSIONED BY OTHERS, 2019)
- B1 — SOIL BORING (EES, 2018)
- B19 — SOIL BORING (EES, 2019)
- SG1 — SOIL GAS SAMPLE LOCATION– 5' DEPTH (EES, 2018)
- CATCH BASIN
- UST FILL PORT
- DRY WELL
- HISTORIC AUTOMOTIVE FACILITIES
- HISTORIC UST OR FUELING FACILITIES
- OTHER HISTORIC CHEMICAL USE

G= GASOLINE

B= BENZENE

N= NAPHTHALENE

D= DIESEL

U= NOT DETECTED AT METHOD REPORTING LIMIT

X= THE CHROMATOGRAPHIC PATTERN DOES NOT RESEMBLE THE FUEL STANDARD USED FOR QUANTITATION

Y= THE RESULT FOR DIESEL IS DUE TO OVERLAP FROM GASOLINE, OR A GASOLINE RANGE PRODUCT.

Z= THE RESULT FOR DIESEL IS ESTIMATED DUE TO OVERLAP FROM GASOLINE RANGE ORGANICS OR OTHER VOLATILE ORGANIC COMPOUNDS.

--= NOT ANALYZED

800 — ESTIMATED AREA WHERE GASOLINE CONCENTRATIONS IN GROUNDWATER EXCEED THE MTCA METHOD A CLEANUP LEVEL OF 800 ug/L (MAXIMUM OBSERVED IN 2018–2020)

***= DUPLICATE COLLECTED AT THIS SAMPLE LOCATION. HIGHER VALUE IS SHOWN.

RESULTS SHOWN IN MICROGRAMS PER LITER (ug/L)

SITE FEATURES ARE APPROXIMATE.

PROJECT NO. 2093-01 | FIGURE NO. 11
DATE: 8-28-20 | FILE: 2093-01 | DRAWN: JJT | APPROVED: CR

GROUNDWATER ANALYTICAL RESULTS (FEBRUARY 2018 – FEBRUARY 2020)

DEBOCK'S TEXACO
100 WEST MAIN ST.
GRANDVIEW, WA.

EES Environmental Consulting, Inc.
240 N. Broadway, Suite 203 • Portland, Oregon 97227
(503) 847-2740 • ees environmental.com

LEGEND

- PROPERTY LINE
- MW–1 — MONITORING WELL
- TOMW–6 — TIME OIL MONITORING WELL
- B1 — SOIL BORING (EES, 2018)
- SG1 ▲ — SOIL GAS SAMPLE LOCATION–5' DEPTH (EES, 2018)
- CATCH BASIN
- DRAIN
- UST FILL PORT
- G= GASOLINE
- B= BENZENE
- N= NAPHTHALENE
- U= NOT DETECTED AT METHOD REPORTING LIMIT
- SOIL GAS ANALYTICAL RESULTS IN MICROGRAMS PER CUBIC METER (ug/m³)
- ESTIMATED AREAS WHERE GASOLINE CONCENTRATIONS IN GROUNDWATER EXCEED THE MTCA METHOD A CLEANUP LEVEL OF 800 ug/L (MAXIMUM OBSERVED IN 2018–2020)
- SITE FEATURES ARE APPROXIMATE.

APPROXIMATE SCALE IN FEET

0 20 40

N

WEST MAIN STREET/WINE COUNTRY ROAD

APPROXIMATE GROUNDWATER FLOW DIRECTION

FORMER GASOLINE UST LOCATION (1,000 GAL.)

SIDEWALK

CANOPY

MW–10 (B15)

MW–11 (B16)

MW–3

B1

B4

ABANDONED FUEL TRANSMISSION PIPING

B3

FORMER GASOLINE UST LOCATION (550 GAL.)

FORMER FUEL DISPENSER ISLAND

MW–5 (B5)

MW–12 (B17)

SG3	
G	75U
B	0.76
N	0.48U

SG3 ▲

SG7	
G	280
B	1.2
N	2.5

SG7 ▲

SG6	
G	72U
B	0.53
N	0.59

SG6 ▲

RESTAURANT (JAVI'S CHICKEN & CHURROS)

SG2	
G	90
B	2.0
N	0.50U

SG2 ▲ B6

DEBOCK'S TEXACO

SG8	
G	72U
B	4.8
N	0.46U

SG8 ▲

MW–4 (B2)

MW–2

MW–9 (B14)

B7

800 ug/L GASOLINE

DIVISION STREET

SG1	
G	75U
B	0.66
N	0.48U

SG1 ▲

MORA PROPERTY

RESTAURANT (EL CAMPESTRE)

MW–8 (B11)

SG4 ▲

SG4	
G	72U
B	0.38
N	0.46U

FORMER GASOLINE UST LOCATIONS (5,000 & 8,000 GAL.)

MW–1

B9

SIDEWALK

MW–7 (B13)

B8

B10

SG9 ▲ TOMW–6

SG9	
G	72U
B	0.28U
N	0.46U

SG5	
G	70U
B	1.1
N	0.45U

SG5 ▲ MW–6 (B12)

ALLEY

TOMW–7

PROJECT NO.	2093–01
DATE: 8–28–20	FIGURE NO. 12
FILE: 2093–01	
DRAWN: JJT	
APPROVED: CR	

SOIL GAS ANALYTICAL RESULTS (MARCH 2018)

DEBOCK'S TEXACO
100 WEST MAIN ST.
GRANDVIEW, WA.

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(503) 847–2740 • ees environmental.com

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CONCEPTUAL SITE MODEL OF COMPLETE EXPOSURE PATHWAYS

PRIMARY SOURCE	PRIMARY RELEASE MECHANISM	SECONDARY SOURCE	SECONDARY RELEASE MECHANISMS	TERTIARY SOURCE	TERTIARY RELEASE MECHANISMS	QUATERNARY SOURCE	EXPOSURE ROUTE	RESIDENTIAL (0–3 FEET)	RETAIL CUSTOMER (0–3 FEET)	OCCUPATIONAL WORKERS (0–3 FEET)	CONSTRUCTION WORKERS (0–3 FEET)	EXCAVATION/ TRENCH WORKERS (0–15 FEET)	HIGHWAY MAINTENANCE WORKERS (0–3 FEET)
FORMER USTs & ASSOCIATED SYSTEMS	PREVIOUS ACCIDENTAL SPILLS & RELEASES	SOIL	DIRECT CONTACT WITH SURFACE SOIL (0–3 FEET)				DERMAL ABSORPTION	○	◍	◍	◍	◍	◍
							INGESTION	○	◍	◍	◍	◍	◍
							INHALATION OF FUGITIVE DUST PARTICLES	○	◍	◍	◍	◍	◍
			VOLATILIZATION/ VAPOR INTRUSION	VOLATILIZATION EMISSIONS			INHALATION OF INDOOR AIR	○	◍	◍	◍	○	○
							INHALATION OF OUTDOOR AIR	○	◍	◍	◍	●	◍
				SUBSURFACE SOIL	DIRECT CONTACT WITH SUBSURFACE SOIL (3–15 FEET)		DERMAL ABSORPTION	○	○	○	○	●	○
							INGESTION	○	○	○	○	●	○
							INHALATION OF FUGITIVE DUST PARTICLES	○	○	○	○	●	○
			LEACHING/ INFILTRATION/ PERCOLATION	GROUNDWATER	DIRECT CONTACT WITH GROUNDWATER		DERMAL ABSORPTION	○	○	○	○	○	○
							INGESTION	○	○	○	○	○	○
					GROUNDWATER MIGRATION	VOLATILIZATION	INHALATION OF INDOOR AIR	○	◍	◍	◍	○	○
						VOLATILIZED EMISSIONS	INHALATION OF OUTDOOR AIR	○	◍	◍	◍	●	◍
			STORMWATER RUNOFF	SURFACE WATER	DIRECT CONTACT WITH SURFACE WATER		DERMAL ABSORPTION	○	○	○	○	○	○
							INGESTION	○	○	○	○	○	○
					SEDIMENTATION ADSORPTION	SEDIMENT	DERMAL ABSORPTION	○	○	○	○	○	○
							INGESTION	○	○	○	○	○	○

LEGEND

○ INCOMPLETE OR INSIGNIFICANT EXPOSURE PATHWAY (NOT QUANTIFIED)

◍ EXPOSURE PATHWAY POTENTIALLY COMPLETE BUT INSIGNIFICANT

● EXPOSURE PATHWAY COMPLETE

PROJECT NO. 2093-01
FIGURE NO. 13
DATE: 8-28-20
FILE: 2093-01
DRAWN: JJT
APPROVED: CR

CONCEPTUAL SITE MODEL

DEBOCK'S TEXACO
100 WEST MAIN ST.
GRANDVIEW, WA.

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LEGEND

- PROPERTY LINE
- MW–1 — MONITORING WELL
- TOMW–6 — TIME OIL MONITORING WELL DECOMMISSIONED BY OTHERS, 2019)
- B1 — SOIL BORING (EES, 2018)
- B19 — SOIL BORING (EES, 2019)
- SG1 — SOIL GAS SAMPLE LOCATION–5' DEPTH (EES, 2018)
- CATCH BASIN
- DRAIN
- UST FILL PORT
- DRY WELL
- AREA POTENTIALLY REQUIRING SOIL CLEANUP AT 12'–15' BASED ON MTCA METHOD B DIRECT CONTACT EXCEEDANCES (2,451 mg/kg)
- AREA POTENTIALLY REQUIRING SOIL CLEANUP AT DEPTHS OF 15'–22' BASED ON MTCA METHOD A CLEANUP LEVELS EXCEEDANCES IN GROUNDWATER
- *= NOTE THAT GASOLINE CONCENTRATIONS IN SOIL EXCEED MTCA CLEANUP LEVELS AT THESE BORING LOCATIONS. CONTAMINATION AT THESE LOCATIONS ORIGINATES FROM SOURCES OFF THE DEBOCK'S PROPERTY AND ARE THEREFORE NOT CONSIDERED FOR CLEANUP AS PART OF THE DEBOCK'S SITE.

SITE FEATURES ARE APPROXIMATE.

APPROXIMATE SCALE IN FEET

0 25 50

N

GRANDVIEW MUSEUM
COMMERCIAL BUSINESS
RETAIL/COMMERCIAL BUSINESSES
CITY STORMWATER INFILTRATION TRENCH
SIDEWALK
B22
B20
B19*
B21*
B23
WEST MAIN STREET/WINE COUNTRY ROAD
APPROXIMATE GROUNDWATER FLOW DIRECTION
FORMER GASOLINE UST LOCATION (1,000 GAL.)
FORMER GASOLINE UST LOCATION (550 GAL.)
MW–10 (B15)
MW–11 (B16)
MW–3
B1
B4
B3
SG3
SG7
ABANDONED FUEL TRANSMISSION PIPING
FORMER FUEL DISPENSER ISLAND
RETAIL FUELING
MW–5 (B5)
MW–13 (B18)
MW–12 (B17)
RESTAURANT (JAVI'S CHICKEN & CHURROS)
DEBOCK'S TEXACO
SG6
SG2
B6
SG8
MW–9 (B14)
MORA PROPERTY
MW–4 (B2)
MW–2
SG1
B7
DIVISION STREET
SIDEWALK
EXXON/TIME OIL
FORMER GASOLINE UST LOCATIONS (5,000 & 8,000 GAL.)
RESTAURANT (EL CAMPESTRE)
MW–8 (B11)
SG4
MW–1
B9
B8
TOMW–6
SG9
MW–7 (B13)
B10
SG5
MW–6 (B12)
ALLEY

PROJECT NO.	2093–01
DATE: 11–24–20	FIGURE NO. 14A
FILE: 2093–01	
DRAWN: JJT	
APPROVED: CR	

AREA POTENTIALLY REQUIRING SOIL CLEANUP

DEBOCK'S TEXACO
100 WEST MAIN ST.
GRANDVIEW, WA.

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240 N. Broadway, Suite 203 • Portland, Oregon 97227
(503) 847–2740 • ees-environmental.com

LEGEND

- PROPERTY LINE
- MW–1 — MONITORING WELL
- TOMW–6 — TIME OIL MONITORING WELL DECOMMISSIONED BY OTHERS, 2019)
- B1 — SOIL BORING (EES, 2018)
- B19 — SOIL BORING (EES, 2019)
- SG1 — SOIL GAS SAMPLE LOCATION–5' DEPTH (EES, 2018)
- CATCH BASIN
- DRAIN
- UST FILL PORT
- DRY WELL
- AREA POTENTIALLY REQUIRING GROUNDWATER CLEANUP AT BASED ON MTCA METHOD A EXCEEDANCES FOR GASOLINE (800 ug/L)
- *= NOTE THAT GASOLINE CONCENTRATIONS IN GROUNDWATER EXCEED MTCA CLEANUP LEVELS AT THESE BORING LOCATIONS. CONTAMINATION AT THESE LOCATIONS ORIGINATES FROM SOURCES OFF THE DEBOCK'S PROPERTY AND ARE THEREFORE NOT CONSIDERED FOR CLEANUP AS PART OF THE DEBOCK'S SITE.

SITE FEATURES ARE APPROXIMATE.

APPROXIMATE SCALE IN FEET

0 25 50

N

GRANDVIEW MUSEUM

COMMERCIAL BUSINESS

RETAIL/COMMERCIAL BUSINESSES

CITY STORMWATER INFILTRATION TRENCH

B22

SIDEWALK

B20*

B19*

B21*

B23

SIDEWALK

WEST MAIN STREET/WINE COUNTRY ROAD

APPROXIMATE GROUNDWATER FLOW DIRECTION

FORMER GASOLINE UST LOCATION (1,000 GAL.)

FORMER GASOLINE UST LOCATION (550 GAL.)

SIDEWALK

SIDEWALK

MW–10 (B15)

MW–11 (B16)

MW–3

B1

B4

FORMER FUEL DISPENSER ISLAND

SG3

ABANDONED FUEL TRANSMISSION PIPING

SG7

B3

RETAIL FUELING

MW–5 (B5)

MW–13 (B18)

MW–12 (B17)

RESTAURANT (JAVI'S CHICKEN & CHURROS)

DEBOCK'S TEXACO

SG6

SG2

B6

SG8

MW–9 (B14)

MORA PROPERTY

MW–4 (B2)

MW–2

DIVISION STREET

SIDEWALK

EXXON/TIME OIL

SG1

B7

FORMER GASOLINE UST LOCATIONS (5,000 & 8,000 GAL.)

RESTAURANT (EL CAMPESTRE)

MW–8 (B11)

SG4

SIDEWALK

MW–1

B9

TOMW–6

MW–7 (B13)

B8

SG9

B10

SG5

MW–6 (B12)

ALLEY

PROJECT NO.	2093–01
DATE: 8–28–20	FIGURE NO. 14B
FILE: 2093–01	
DRAWN: JJT	
APPROVED: CR	

AREA POTENTIALLY REQUIRING GROUNDWATER CLEANUP

DEBOCK'S TEXACO
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Tables

TABLE 1
Soil Analytical Results - Fuels and Related Constituents (mg/kg)
DeBock's Texaco
Grandview, Washington

Location	Date	Depth (feet bgs)	Gasoline	Diesel	Oil	Benzene	Toluene	Ethylbenzene	Total Xylenes	Naphthalene	Lead[d]
MTCA Soil Screening Levels[a]											
Method B - Direct Contact[b]		0-15		Combined Total 2,451[c]		18	6,400	8,000	16,000	1,600	250
Method B - Vadose Zone Soil Leaching to Groundwater		0-22	NA	NA	NA	0.027	4.5	5.9	14	4.5	3,000
Method B - Saturated Soil Leaching to Groundwater		22-25	NA	NA	NA	0.0017	0.27	0.34	0.83	0.24	150
White Shield - Tank Decommissioning (1995)											
REP-1295-101	03/14/1995	7.5	5 U	-	-	-	-	-	-	-	-
REP-1295-102	03/14/1995	7.5	5 U	-	-	-	-	-	-	-	-
REP-1295-103	03/14/1995	7.5	5 U	-	-	-	-	-	-	-	-
REP-1295-104	03/14/1995	7.5	5 U	-	-	-	-	-	-	-	-
REP-1295-105	03/14/1995	7.5	5 U	-	-	-	-	-	-	-	-
REP-1295-106	03/14/1995	12.5	5 U	-	-	-	-	-	-	-	-
REP-1295-107	03/14/1995	12.5	5 U	-	-	-	-	-	-	-	-
REP-1295-108sp/109sp[e]	03/15/1995	2	15	-	-	-	-	-	-	-	-
REP-1295-110sp	03/15/1995	2	5 U	-	-	-	-	-	-	-	-
REP-1295-202	03/14/1995	6.5	5 U	-	-	-	-	-	-	-	-
REP-1295-203	03/14/1995	6.5	5 U	-	-	-	-	-	-	-	-
REP-1295-204	03/14/1995	6.5	5 U	-	-	-	-	-	-	-	-
REP-1295-205	03/14/1995	9	5 U	-	-	-	-	-	-	-	-
REP-1295-206sp/207sp[e]	03/15/1995	2	1,600	-	-	-	-	-	-	-	-
REP-1295-208sp[e]	03/15/1995	2	5 U	-	-	-	-	-	-	-	-
Sage Earth Sciences - Limited Site Characterization (1995)											
SB3-10	10/20/1995	10	20 U	0.1 U	0.1 U	0.1 U	0.1 U	0.3 U	0.1 U	-	-
SB3-15	10/20/1995	15	1,800	0.1 U	0.1 U	0.1 U	0.1 U	1.7	4.1	-	25 U
SB4-10	10/20/1995	10	255 AG	0.1 U	0.1 U	0.1 U	0.1 U	0.3 U	0.1 U	-	25 U
SB5-10	10/20/1995	10	117 AG	0.1 U	0.1 U	0.1 U	0.1 U	0.3 U	0.1 U	-	-
SB6-10	10/23/1995	10	20 U	0.1 U	0.1 U	0.1 U	0.1 U	0.3 U	0.1 U	-	-
SB7-10	10/23/1995	10	20 U	0.1 U	0.1 U	0.1 U	0.1 U	0.3 U	0.1 U	-	-
SB7-12	10/23/1995	12	426 AG	0.1 U	0.1 U	0.1 U	0.1 U	0.3 U	0.1 U	-	25 U
Olympus Environmental - Site Investigation (1998)											
GP-1-15	02/20/1998	15	1,280	1.3	1.3	1.3	1.0	8.7	40	-	-
GP-2-15	02/20/1998	15	5 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.1 U	-	-
GP-3-15	02/20/1998	15	154	0.25 U	0.25 U	0.25 U	0.25 U	0.58	0.80	-	-
GP-4-15	02/20/1998	15	299	0.5 U	0.5 U	0.5 U	0.5 U	0.97	1.1	-	-
GP-5-15	02/20/1998	15	**5,910**	2.5 U	2.5 U	2.5 U	2.5 U	14	54	-	-
GP-5-20	02/20/1998	20	5 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.1 U	-	-
Olympus Environmental - Monitoring Well Installation (1998)											
SS2-15	03/26/1998	15	886	0.5 U	0.5 U	0.5 U	0.5 U	10 U	20 U	-	-
SS3-15	03/26/1998	15	306	0.19	0.19	0.19	0.29	1.0	3.5	-	-
Olympus Technical Services - Site Assessment (2000)											
SP-1-79	09/26/2000	7-9	641	0.25 U	0.25 U	0.25 U	0.35	0.59	12	-	-
SP-2-79	09/26/2000	7-9	**15,900**	2.7	2.7	2.7	7.8	20	1,090	-	-
SP-2-1113	09/26/2000	11-13	**32,500**	10	10	10	346	280	1,900	-	-
SP-3-79	09/26/2000	7-9	30	0.05 U	0.05 U	0.05 U	0.054	0.05 U	1.3	-	-
SP-4-79	09/26/2000	7-9	15	0.05 U	0.05 U	0.05 U	0.050	0.05 U	0.28	-	-
SP-5-79	09/26/2000	7-9	26	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.31	-	-

TABLE 1
Soil Analytical Results - Fuels and Related Constituents (mg/kg)
DeBock's Texaco
Grandview, Washington

Location	Date	Depth (feet bgs)	Gasoline	Diesel	Oil	Benzene	Toluene	Ethylbenzene	Total Xylenes	Naphthalene	Lead[d]
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Method B - Saturated Soil Leaching to Groundwater		22-25	NA	NA	NA	0.0017	0.27	0.34	0.83	0.24	150
Blue Mountain Environmental - Soil Excavation (2003)											
1216-01	12/16/2003	-	680 Z	0.023 U	0.023 U	0.023 U	0.11 U	0.17	0.88	-	11
1216-02	12/16/2003	-	5.4 U	0.054 U	0.054 U	0.054 U	0.011 U	0.054 U	0.11 U	-	5.6
1216-03	12/16/2003	-	5.5 U	0.011 U	0.011 U	0.011 U	0.055 U	0.055 U	0.11 U	-	6.3
1217-04	12/17/2003	-	5.4 U	0.011 U	0.011 U	0.011 U	0.054 U	0.054 U	0.11 U	-	5.4
1217-05	12/17/2003	-	5.4 U	0.011 U	0.011 U	0.011 U	0.054 U	0.054 U	0.11 U	-	5.7
1217-06	12/17/2003	-	5.4 U	0.011 U	0.011 U	0.011 U	0.054 U	0.054 U	0.11 U	-	6.6
1217-07	12/17/2003	-	5.4 U	0.011 U	0.011 U	0.011 U	0.054 U	0.054 U	0.11 U	-	6.9
EES - Remedial Investigation (2018-2019)											
B1-3	03/15/2018	3	6.5 UJ	-	-	0.013 U	0.065 U	0.032 UJ	0.097 UJ	0.13 UJ	-
B1-10	03/15/2018	10	7.1 UJ	-	-	0.014 U	0.071 U	0.035 UJ	0.11 UJ	0.14 UJ	-
B1-15	03/15/2018	15	**9,970** J	25 U	50 U	0.23 U	1.2 U	36 J	85 J	40 J	12
B1-20	03/15/2018	20	44	-	-	0.026	0.054 U	0.027 U	0.080 U	0.34	-
B1-25	03/15/2018	25	6.4 UJ	-	-	0.013 U	0.064 U	0.032 UJ	0.096 UJ	0.13 UJ	-
B2-10	03/15/2018	10	6.3 UJ	-	-	0.013 U	0.063 U	0.032 UJ	0.095 UJ	0.13 UJ	-
B2-15	03/15/2018	15	648	-	-	0.025 U	0.12 U	0.80	1.3	1.9	-
B2-19	03/15/2018	19	1,530	-	-	0.078	0.34 U	1.8	1.9	1.8	-
B2-25	03/15/2018	25	5.1 UJ	-	-	0.010 U	0.051 U	0.026 UJ	0.077 UJ	0.10 UJ	-
B3-3	03/16/2018	3	6.3 UJ	-	-	0.013 U	0.063 U	0.032 UJ	0.095 UJ	0.13 UJ	-
B3-10	03/16/2018	10	6.4 UJ	-	-	0.013 U	0.064 U	0.032 UJ	0.096 UJ	0.13 UJ	-
B3-15	03/16/2018	15	**10,000** J	-	-	0.47 U	2.3 U	73 J	374 J	37 J	-
B3-20	03/16/2018	20	13	-	-	0.011 U	0.054 U	0.027 U	0.082 U	0.11 U	-
B3-25	03/16/2018	25	6.9 UJ[2]	-	-	0.014 U	0.069 U	0.035 UJ	0.10 UJ	0.14 UJ	-
B4-15	03/16/2018	15	**5,600** J	-	-	0.26 U	7.8	40 J	342 J	29 J	-
B4-17	03/16/2018	17	22,300 J	342 J[1]	52 U	0.52 U	98	276 J	1,870 J	126 J	10
B4-20	03/16/2018	20	10,500 J	-	-	0.50 U	15	71 J	343 J	39 J	-
B4-25	03/16/2018	25	5.8 UJ[2]	-	-	0.012 U	0.058 U	0.029 UJ	0.086 UJ	0.12 UJ	-
B5-5	03/16/2018	5	6.2 UJ[2]	-	-	0.012 U	0.062 U	0.031 UJ	0.093 UJ	0.12 UJ	-
B5-10	03/16/2018	10	5.6 UJ[2]	-	-	0.011 U	0.056 U	0.028 UJ	0.084 UJ	0.11 UJ	-
B5-15	03/16/2018	15	82 J	-	-	0.011 U	0.057 U	0.029 UJ	0.086 UJ	0.19 J	-
B5-20	03/16/2018	20	2,300	-	-	0.012 U	0.088	8.1	19	9.1	-
B5-25	03/16/2018	20	6.8 UJ[2]	-	-	0.014 UJ[2]	0.068 UJ[2]	0.034 UJ[2]	0.10 UJ[2]	0.14 UJ[2]	-
B6-3	04/02/2018	3	6.5 U	-	-	0.013 U	0.065 U	0.032 U	0.097 U	0.13 U	-
B6-15	04/02/2018	15	631	-	-	0.015 U	0.073 U	1.1	6.6	2.7	-
B6-17	04/02/2018	17	206	25 U	50 U	0.026	0.077	1.5	6.0	0.86	-
B6-20	04/02/2018	20	1,110	-	-	0.054	0.23 U	5.4	12	2.7	-
B6-25	04/02/2018	25	6.1 U[2]	-	-	0.012 U[2]	0.061 U[2]	0.031 U[2]	0.092 U[2]	0.12 U[2]	-
B7-3	04/02/2018	3	6.8 U	-	-	0.014 U	0.068 U	0.034 U	0.10 U	0.14 U	-
B7-15	04/02/2018	15	**4,190**	-	-	0.045 U	0.23 U	2.5	5.2	7.6	8.5
B7-20	04/02/2018	20	9.5	-	-	0.011 U	0.056 U	0.028 U	0.084 U	0.11 U	-

TABLE 1
Soil Analytical Results - Fuels and Related Constituents (mg/kg)
DeBock's Texaco
Grandview, Washington

Location	Date	Depth (feet bgs)	Gasoline	Diesel	Oil	Benzene	Toluene	Ethylbenzene	Total Xylenes	Naphthalene	Lead[d]
MTCA Soil Screening Levels[a]											
Method B - Direct Contact[b]		0-15		Combined Total 2,451[c]		18	6,400	8,000	16,000	1,600	250
Method B - Vadose Zone Soil Leaching to Groundwater		0-22	NA	NA	NA	0.027	4.5	5.9	14	4.5	3,000
Method B - Saturated Soil Leaching to Groundwater		22-25	NA	NA	NA	0.0017	0.27	0.34	0.83	0.24	150
B8-3	04/02/2018	3	6.9 U	-	-	0.014 U	0.069 U	0.035 U	0.10 U	0.14 U	-
B8-15	04/02/2018	15	141	-	-	0.013 U	0.067 U	0.033 U	0.10 U	0.23	-
B8-20	04/02/2018	20	367	-	-	0.013 U	0.065 U	1.2	2.9	0.60	-
B8-25	04/02/2018	25	5.8 U[2]	-	-	0.012 U[2]	0.058 U[2]	0.029 U[2]	0.087 U[2]	0.12 U[2]	-
B9-16.5	04/03/2018	16.5	6,360	51 [1]	50 U	0.14 U	0.70 U	15	61	11	-
B9-20	04/03/2018	20	5.4 U	-	-	0.011 U	0.054 U	0.041	0.082 U	0.11 U	-
B10-3	04/03/2018	3	7.1 U	-	-	0.014 U	0.071 U	0.035 U	0.11 U	0.14 U	-
B10-15	04/03/2018	15	6.4 U	-	-	0.013 U	0.064 U	0.032 U	0.096 U	0.13 U	-
B10-20	04/03/2018	20	6.4 U	-	-	0.013 U	0.064 U	0.032 U	0.096 U	0.13 U	-
B11-3	04/03/2018	3	6.0 U	-	-	0.012 U	0.060 U	0.030 U	0.091 U	0.12 U	-
B11-16	04/03/2018	16	53	26 U	52 U	0.014 U	0.070 U	0.11	0.61	0.34	-
B11-20	04/03/2018	20	15	-	-	0.012 U	0.061 U	0.36	1.5	0.13	-
B12-3	04/03/2018	3	6.2 U	-	-	0.012 U	0.062 U	0.031 U	0.093 U	0.12 U	-
B12-10	04/03/2018	10	6.5 U	-	-	0.013 U	0.065 U	0.033 U	0.098 U	0.13 U	-
B12-16	04/03/2018	16	915	-	-	0.026 U	0.13 U	0.39	0.19 U	1.8	7.6
B12-20	04/03/2018	20	5.9 U	-	-	0.012 U	0.059 U	0.030 U	0.089 U	0.12 U	-
B13-15	04/03/2018	15	6.4 U	-	-	0.013 U	0.064 U	0.032 U	0.095 U	0.13 U	-
B13-20	04/03/2018	20	4,530	-	-	0.24 U	1.2 U	3.8	6.1	2.5	-
B13-25	04/03/2018	25	6.3 U	-	-	0.013 U	0.063 U	0.032 U	0.095 U	0.13 U	-
B14-3	04/04/2018	3	6.4 U	-	-	0.013 U	0.064 U	0.032 U	0.096 U	0.13 U	-
B14-16	04/04/2018	16	108	-	-	0.014 U	0.071 U	0.035 U	0.11 U	0.14 U	-
B15-3	04/04/2018	3	7.6 U	-	-	0.015 U	0.076 U	0.038 U	0.11 U	0.15 U	-
B15-15	04/04/2018	15	**7,840**	-	-	0.24 U	1.2 U	16	39	24	-
B15-20	04/04/2018	20	318	-	-	0.025 U	0.12 U	0.061 U	0.18 U	0.25 U	-
B16-3	04/05/2018	3	7.0 U	-	-	0.014 U	0.070 U	0.035 U	0.10 U	0.14 U	-
B16-14	04/05/2018	14	441	-	-	0.025 U	0.13 U	1.1	3.4	1.8	-
B16-20	04/05/2018	20	34	-	-	0.016 U	0.079 U	0.040 U	0.12 U	0.16 U	-
B17-3	04/05/2018	3	7.6 U	-	-	0.015 U	0.076 U	0.038 U	0.11 U	0.15 U	-
B17-16.5	04/05/2018	16.5	670	-	-	0.065	1.2	5.5	26	2.0	-
B17-20	04/05/2018	20	7.9 U	-	-	0.016 U	0.079 U	0.040 U	0.12 U	0.16 U	-
B18-10 (MW13-10)	08/06/2019	10	7.0 U	-	-	0.014 U	0.070 U	0.035 U	0.11 U	0.14 U	-
B18-15 (MW13-15)	08/06/2019	15	1,600	-	-	0.013 U	0.072 [3]	4.0	8.8	7.3	-
B18-20 (MW13-20)	08/06/2019	20	1,210	-	-	0.031	0.078 [3]	0.078 [3]	0.22 [4]	3.8	-
B18-25 (MW13-25)	08/06/2019	25	6.2 U	-	-	0.012 U	0.062 U	0.031 U	0.093 U	0.12 U	-

TABLE 1
Soil Analytical Results - Fuels and Related Constituents (mg/kg)
DeBock's Texaco
Grandview, Washington

Location	Date	Depth (feet bgs)	Gasoline	Diesel	Oil	Benzene	Toluene	Ethylbenzene	Total Xylenes	Naphthalene	Lead[d]
MTCA Soil Screening Levels[a]											
Method B - Direct Contact[b]		0-15		Combined Total 2,451[c]		18	6,400	8,000	16,000	1,600	250
Method B - Vadose Zone Soil Leaching to Groundwater		0-22	NA	NA	NA	0.027	4.5	5.9	14	4.5	3,000
Method B - Saturated Soil Leaching to Groundwater		22-25	NA	NA	NA	0.0017	0.27	0.34	0.83	0.24	150
B19-15	08/07/2019	15	**4,740**	-	-	0.45 U	2.3 U	3.1	4.2	36	-
B20-15	08/07/2019	15	5.5 U	-	-	0.011 U	0.055 U	0.028 U	0.083 U	0.11 U	-
B21-14	08/07/2019	14	119	-	-	0.016 U	0.081 U	0.040 U	0.12 U	1.4	-
B22-15	08/07/2019	15	5.6 U	-	-	0.011 U	0.056 U	0.028 U	0.083 U	0.11 U	-
B23-15	08/08/2019	15	6.1 U	-	-	0.012 U	0.061 U	0.030 U	0.091 U	0.12 U	-

Notes:

Historical data through 2003 obtained from historical reports.

[a] Washington Department of Ecology (WDOE), Model Toxics Control Act (MTCA) Cleanup Amendments, Soil Cleanup Levels (CLARC Tables, August 2020)

[b] For carcinogenic chemicals, the MTCA Method B Cancer value is shown. If MTCA Method B Cleanup Levels are not available for a chemical, then the MTCA Method A value is shown.

[c] MTCA modified Method B cleanup value calculated using Ecology's Workbook Tool for Calculating Soil and Groundwater Cleanup Levels (Ecology 2007). The median soil concentration shown is based on site-specific analytical data combined with generic default assumptions to

[d] Lead background concentration = 17 mg/kg (WDOE, Natural Background Soil Metals Concentrations in Washington State, Table 1, October 1994)

[e] Samples taken from soil stockpiles, not "in-place".

Gasoline analyzed by NWTPH-Gx

Diesel and Oil analyzed by NWTPH-Dx

Volatile Organic Compounds (VOCs) by EPA Method 8260C

Lead by EPA Method 200.8 (ICPMS)

[1] Diesel result is estimated due to overlap from gasoline range organics or a gasoline range product.

[2] Sample was analyzed past the recommended holding time.

[3] Due to matrix interference, this analyte cannot be accurately quantified. The reported result may contain a high bias.

[4] Due to matrix interference, this analyte cannot be accurately quantified. The reported result is estimated.

bgs = below ground surface

mg/kg = milligrams per kilogram

AG = Aged Gasoline

J = Data Validation Qualifier. The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

U = undetected at method reporting limit shown

NA = Not Available

Z = Laboratory Qualifier. Gasoline result is being impacted by the presence of diesel fuel.

- = not analyzed for this parameter

BOLD values exceed the MTCA Method B Direct Contact value between the ground surface and 15 feet depth.

Italicized values have reporting limits above the MTCA Method B Direct Contact value between the ground surface and 15 feet depth.

TABLE 2
Soil Analytical Results - Polynuclear Aromatic Hydrocarbons (mg/kg)
DeBock's Texaco
Grandview, Washington

Location	Date	Sample Depth (feet bgs)	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a) anthracene [cPAH]	Benzo(a) pyrene [cPAH]	Benzo(b) fluoranthene [cPAH]	Benzo(k) fluoranthene [cPAH]	Benzo(g,h,i) perylene	Chrysene [cPAH]	Dibenzo(a,h) anthracene [cPAH]	Dibenzofuran	Fluoranthene	Fluorene	Indeno (1,2,3-c,d) pyrene [cPAH]	1-Methyl naphthalene	2-Methyl naphthalene	Naphthalene	Phenanthrene	Pyrene	Total cPAHs[b]
MTCA Soil Screening Levels[a]																						
Method B Direct Contact[b]			4,800	NA	24,000	NA	0.19	NA	NA	NA	NA	NA	80	3,200	3,200	NA	34	320	1,600	NA	2,400	0.19
Method B Vadose Zone Soil Leaching to Groundwater			98	NA	2,300	NA	3.9	NA	NA	NA	NA	NA	NA	630	100	NA	NA	NA	4.5	NA	650	3.9
Method B Saturated Soil Leaching to Groundwater			5	NA	110	NA	0.19	NA	NA	NA	NA	NA	NA	32	5.1	NA	NA	NA	0.24	NA	33	0.19
Toxicity Equivalency Factor[c]			NA	NA	NA	0.1	1	0.1	0.1	NA	0.01	0.1	NA	NA	NA	0.1	NA	NA	NA	NA	NA	NA
B4-17	03/16/2018	17	0.036 U	0.016 U	0.012 U	0.0086 U	0.0086 U	0.0086 U	0.0086 U	0.0086 U	0.0086 U	0.0086 U	0.024 U	0.010	0.060	0.0086 U	5.3	10	9.8	0.098	0.014 J	0.013 U

Notes:

Polynuclear Aromatic Hydrocarbons (PAHs) EPA Method 8270D SIM

[a] Washington Department of Ecology (WDOE), Model Toxics Control Act (MTCA) Cleanup Amendments, Soil Cleanup Levels (CLARC Tables, August 2020)

[b] For carcinogenic chemicals, the MTCA Method B Cancer value is shown.

[c] Total cPAHs calculated using toxicity equivalency factors (TEFs) as specified in WDOE Implementation Memo #10 (April 2015).

cPAH indicates "Carcinogenic PAH" (WDOE Implementation Memo #10, April 2015)

bgs = below ground surface

mg/kg = Milligrams per kilogram

NA = Not Available

J = Data Validation Qualifier. The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

U = Undetected at method reporting limit shown

TABLE 3

Groundwater Elevation and Product Thickness Data

DeBock's Texaco

Grandview, Washington

Well Identification	TOC Elevation (feet)	Date Measured	Depth to Water (feet below TOC)	Depth to Product (feet below TOC)	Product Thickness (feet)	Groundwater Elevation[a] (feet)
MW-1	99.08	04/01/1998	17.34	-	0	81.74
		09/27/2000	14.26	-	0	84.82
		10/25/2017	18.59	-	0	80.49
		11/07/2017	18.88	-	0	80.20
		02/02/2018	20.18	-	0	78.90
	812.37	03/06/2018	20.59	-	0	791.78
		03/16/2018	20.71	-	0	791.66
		04/02/2018	20.93	-	0	791.44
		04/05/2018	20.96	-	0	791.41
		04/24/2018	21.14	-	0	791.23
		07/17/2018	20.40	-	0	791.97
		10/22/2018	19.07	-	0	793.30
		01/22/2019	20.64	-	0	791.73
		08/08/2019	19.36	-	0	793.01
		10/29/2019	18.66	-	0	793.71
		01/16/2020	20.22	-	0	792.15
		02/19/2020	20.73	-	0	791.64
		04/24/2020	21.59	-	0	790.78
		07/21/2020	20.48	-	0	791.89
MW-2	99.55	04/01/1998	17.93	-	0	81.62
		09/27/2000	14.66	-	0	84.89
		10/25/2017	19.91	19.05	0.86	80.26
		11/07/2017	20.13	19.22	0.91	80.08
		02/01/2018	21.81	20.67	1.14	78.56
		02/02/2018	21.31	21.18	0.13	78.33
		02/03/2018	21.14	20.89	0.25	78.59
	812.91	03/06/2018	21.61	21.22	0.39	791.58
		03/16/2018	21.73	21.32	0.41	791.48
		04/02/2018	22.03	21.53	0.50	791.24
		04/05/2018	22.03	21.56	0.47	791.22
		04/24/2018	22.32	21.73	0.59	791.01
		05/04/2018	22.42	21.83	0.59	790.91
		06/05/2018	21.80	21.67	0.13	791.20
		07/17/2018	21.00	-	0	791.91
		08/17/2018	20.53	20.40	0.13	792.47
		09/10/2018	19.86	19.78	0.08	793.11
		10/22/2018	19.73	19.63	0.10	793.25
		11/13/2018	20.13	20.06	0.07	792.83
		12/11/2018	20.65	20.57	0.08	792.32
		01/22/2019	21.32	21.26	0.06	791.63
		02/19/2019	21.62	21.56	0.06	791.33
		04/23/2019	22.08	21.60	0.48	791.18
		07/23/2019	20.21	20.20	0.01	792.71
		10/29/2019	19.38	-	0	793.53
		01/16/2020	20.97	-	0	791.94
		04/24/2020	22.59	22.40	0.19	790.46
		07/21/2020	21.23	-	0	791.68
MW-3	99.23	04/01/1998	16.29	-	0	82.94
		09/27/2000	13.01	-	0	86.22

TABLE 3

Groundwater Elevation and Product Thickness Data

DeBock's Texaco

Grandview, Washington

Well Identification	TOC Elevation (feet)	Date Measured	Depth to Water (feet below TOC)	Depth to Product (feet below TOC)	Product Thickness (feet)	Groundwater Elevation[a] (feet)
MW-3 (cont'd)		10/25/2017	17.92	-	0	81.31
		11/07/2017	18.18	-	0	81.05
		02/02/2018	19.58	-	0	79.65
	812.74	03/06/2018	19.99	-	0	792.75
		03/16/2018	21.02	-	0	791.72
		04/05/2018	20.38	-	0	792.36
		04/24/2018	20.62	-	0	792.12
		07/17/2018	19.83	-	0	792.91
		10/22/2018	18.40	-	0	794.34
		01/22/2019	20.05	-	0	792.69
		08/08/2019	18.72	-	0	794.02
		10/29/2019	17.92	-	0	794.82
		01/16/2020	19.56	-	0	793.18
		02/19/2020	20.20	-	0	792.54
		04/24/2020	19.99	-	0	792.75
		07/21/2020	19.80	-	0	792.94
MW-4		03/16/2018	21.04	-	0	-
		04/02/2018	21.27	-	0	-
		04/05/2018	21.30	-	0	-
	811.94	04/24/2018	21.48	-	0	790.46
		07/17/2018	20.66	-	0	791.28
		10/22/2018	19.27	-	0	792.67
		01/22/2019	20.90	-	0	791.04
		08/08/2019	19.59	-	0	792.35
		10/29/2019	18.90	-	0	793.04
		01/16/2020	20.27	-	0	791.67
		02/19/2020	20.96	-	0	790.98
		04/24/2020	21.89	-	0	790.05
MW-5		04/05/2018	20.83	-	0	-
	811.64	04/24/2018	20.99	-	0	790.65
		07/17/2018	19.91	-	0	791.73
		10/22/2018	18.56	-	0	793.08
		01/22/2019	20.40	-	0	791.24
		08/08/2019	18.82	-	0	792.82
		10/29/2019	18.35	-	0	793.29
		01/16/2020	19.98	-	0	791.66
		02/19/2020	20.49	-	0	791.15
		04/24/2020	21.40	-	0	790.24
MW-6		04/05/2018	20.96	-	0	-
	811.99	04/24/2018	21.10	-	0	790.89
		07/17/2018	20.34	-	0	791.65
		10/22/2018	19.02	-	0	792.97
		01/22/2019	20.60	-	0	791.39
		08/08/2019	19.31	-	0	792.68
		10/29/2019	18.62	-	0	793.37
		01/16/2020	20.15	-	0	791.84
		02/19/2020	20.63	-	0	791.36
		04/24/2020	21.51	-	0	790.48
		07/21/2020	20.42	-	0	791.57

TABLE 3

Groundwater Elevation and Product Thickness Data

DeBock's Texaco

Grandview, Washington

Well Identification	TOC Elevation (feet)	Date Measured	Depth to Water (feet below TOC)	Depth to Product (feet below TOC)	Product Thickness (feet)	Groundwater Elevation[a] (feet)
MW-7		04/05/2018	22.82	-	0	-
	811.92	04/24/2018	21.75	-	0	790.17
		07/17/2018	20.99	-	0	790.93
		10/22/2018	19.65	-	0	792.27
		01/22/2019	21.20	-	0	790.72
		08/08/2019	19.93	-	0	791.99
		10/29/2019	19.24	-	0	792.68
		01/16/2020	20.78	-	0	791.14
		02/19/2020	21.27	-	0	790.65
		04/24/2020	22.14	-	0	789.78
MW-8		04/05/2018	20.77	-	0	-
	812.28	04/24/2018	20.94	-	0	791.34
		07/17/2018	20.20	-	0	792.08
		10/22/2018	18.84	-	0	793.44
		1/22/20019	20.41	-	0	791.87
		08/08/2019	19.15	-	0	793.13
		10/29/2019	18.42	-	0	793.86
		01/16/2020	20.01	-	0	792.27
		02/19/2020	20.49	-	0	791.79
		04/24/2020	21.38	-	0	790.90
		07/21/2020	20.26	-	0	792.02
MW-9		04/05/2018	21.02	-	0	-
	812.76	04/24/2018	20.69	-	0	792.07
		07/17/2018	19.92	-	0	792.84
		10/22/2018	18.56	-	0	794.20
		01/22/2019	20.15	-	0	792.61
		08/08/2019	18.81	-	0	793.95
		10/29/2019	18.15	-	0	794.61
		01/16/2020	19.73	-	0	793.03
		02/19/2020	20.24	-	0	792.52
		04/24/2020	21.13	-	0	791.63
		07/21/2020	20.00	-	0	792.76
MW-10		04/05/2018	20.91	-	0	-
	812.05	04/24/2018	20.70	-	0	791.35
		07/17/2018	19.79	-	0	792.26
		10/22/2018	18.38	-	0	793.67
		01/22/2019	20.10	-	0	791.95
		08/08/2019	18.70	-	0	793.35
		10/29/2019	18.02	-	0	794.03
		01/16/2020	19.71	-	0	792.34
		02/19/2020	20.21	-	0	791.84
		04/24/2020	21.13	-	0	790.92
		07/21/2020	19.85	-	0	792.20
MW-11		04/05/2018	-	-	0	-
	812.13	04/24/2018	20.29	-	0	791.84
		07/17/2018	19.47	-	0	792.66
		10/22/2018	18.05	-	0	794.08
		01/22/2019	19.68	-	0	792.45
		08/08/2019	18.40	-	0	793.73

TABLE 3

Groundwater Elevation and Product Thickness Data

DeBock's Texaco

Grandview, Washington

Well Identification	TOC Elevation (feet)	Date Measured	Depth to Water (feet below TOC)	Depth to Product (feet below TOC)	Product Thickness (feet)	Groundwater Elevation[a] (feet)
MW-11 (cont'd)		10/29/2019	17.63	-	0	794.50
		01/16/2020	19.29	-	0	792.84
		02/19/2020	19.81	-	0	792.32
		04/24/2020	20.72	-	0	791.41
		07/21/2020	19.49	-	0	792.64
MW-12		04/05/2018	-	-	0	-
	812.81	04/24/2018	21.18	-	0	791.63
		07/17/2018	20.38	-	0	792.43
		10/22/2018	18.93	-	0	793.88
		01/22/2019	20.62	-	0	792.19
		08/08/2019	19.31	-	0	793.50
		01/16/2020	20.18	-	0	792.63
		02/19/2020	20.51	-	0	792.30
		04/24/2020	21.58	-	0	791.23
		07/21/2020	20.43	-	0	792.38
MW-13	812.72	08/08/2019	19.40	-	0	793.32
		02/19/2020	20.85	-	0	791.87
		04/24/2020	22.17	-	0	790.55
		07/21/2020	20.55	-	0	792.17

Notes:

[a] Groundwater elevation is adjusted to account for floating gasoline product, where present.

Data prior to 2017 was obtained from historical reports.

Wells surveyed on 3/6/2018, 4/24/2018, and 8/7/2019 by PLSA of Yakima, Washington.

TOC = Top of Casing

- = Not measured

TABLE 4
Groundwater Field Parameters
DeBock's Texaco
Grandview, Washington

Well Name	Date	Dissolved Oxygen (mg/L) DRI [a]	Oxidation Reduction Potential (mV) DRI [a]	Ferrous Iron (Fe 2+) (mg/L) HACH [b]	pH (unitless) DRI [a]	Turbidity (NTUs)	Specific Conductance (ms/cm) DRI [a]
MW-1	02/02/2018	3.6	74	0.0	7.1	8.2	1.676
	04/24/2018	1.1	25	0.0	6.9	4.8	1.586
	07/18/2018	1.8	4.4	0.5	7.0	5.3	1.747
	10/23/2018	0.29	85	0.0	7.0	3.0	1.208
	01/22/2019	0.93	48	0.0	7.1	3.9	1.694
MW-2	07/18/2018	1.2	-181	5.5[c]	7.6	0.4	1.895
MW-3	02/02/2018	0.79	25	0.0	7.2	33	1.334
	04/24/2018	0.80	-41	1.0[c]	6.9	2.7	1.321
	07/18/2018	1.2	-57	3.0[c]	7.1	1.0	1.632
	10/23/2018	0.35	-23	2.5[c]	6.9	12	1.132
	01/22/2019	0.74	21	1.0[c]	6.9	6.4	1.677
MW-4	04/25/2018	0.84	142	0.0	6.9	0.0	1.626
	07/19/2018	1.4	138	0.0	7.3	3.9	2.068
	10/23/2018	0.34	-29	2.5[c]	6.9	4.8	1.488
	01/22/2019	1.0	35	0.5[c]	6.9	4.0	2.047
MW-5	04/25/2018	2.0	122	0.0	7.2	0.0	0.878
	07/19/2018	2.0	205	0.0	7.6	2.1	1.083
	10/23/2018	0.53	-47	1.0[c]	7.1	5.2	0.857
	01/22/2019	0.97	26	0.5[c]	7.2	2.1	1.152
	08/08/2019	2.0	-112	0.5	7.3	2.3	1.070
	02/19/2020	3.1	-5.0	0.5	7.1	2.6	0.729
MW-6	04/25/2018	1.1	155	0.0	7.1	0.9	1.309
	07/18/2018	1.4	90	1.0[c]	7.2	14	1.673
	10/23/2018	0.44	88	0.0	6.9	4.4	1.242
	01/22/2019	1.1	172	0.0	7.0	3.0	1.878
MW-7	04/25/2018	1.0	112	-	7.1	0.0	1.104
	07/19/2018	1.7	142	0.5	7.6	2.4	1.311
	10/24/2018	1.4	124	0.0	6.8	2.4	1.017
	01/22/2019	1.4	126	0.0	7.1	2.7	1.530
MW-8	04/25/2018	0.89	-38	0.5[c]	7.0	50	1.612
	07/17/2018	1.5	-61	3.0[c]	7.1	4.4	2.115
	10/24/2018	0.54	-64	6.5[c]	6.9	3.9	1.443
	01/22/2019	1.6	-30	1.5[c]	7.1	15	2.221
MW-9	04/24/2018	2.4	124	0.0	7.2	2.8	1.419
	07/18/2018	3.0	216	0.0	7.1	16	1.738
	10/23/2018	0.52	116	0.0	7.0	2.8	1.514
	01/22/2019	1.1	182	0.0	7.0	2.5	2.205
MW-10	04/24/2018	1.1	46	0.0	7.0	16	1.550
	07/18/2018	1.5	0.7	0.5[c]	7.1	27	1.879
	10/23/2018	0.31	-9.9	0.5[c]	6.9	3.9	1.345
	01/22/2019	0.83	35	1.0[c]	7.1	2.4	2.042
	08/08/2019	1.8	-108	0.5	7.2	40	1.796
	02/19/2020	3.5	-19	0.5	6.9	5.0	1.257
MW-11	04/24/2018	1.3	45	0.0	7.0	8.5	1.098
	07/18/2018	1.4	14	0.5[c]	6.9	8.7	1.318
	10/24/2018	0.46	28	1.0[c]	6.8	2.7	1.028
	01/22/2019	0.71	25	0.5[c]	6.9	2.3	1.428
	08/08/2019	1.8	-121	1.0[c]	7.0	16	1.317
	02/19/2020	3.2	-16	1.5[c]	6.8	10	0.955

TABLE 4

Groundwater Field Parameters

DeBock's Texaco

Grandview, Washington

Well Name	Date	Dissolved Oxygen (mg/L) DRI [a]	Oxidation Reduction Potential (mV) DRI [a]	Ferrous Iron (Fe 2+) (mg/L) HACH [b]	pH (unitless) DRI [a]	Turbidity (NTUs)	Specific Conductance (ms/cm) DRI [a]
MW-12	04/24/2018	0.97	-30	0.0	7.0	22	1.644
	07/19/2018	1.5	-59	3.0[c]	6.9	3.9	1.856
	10/24/2018	0.82	-40	3.5[c]	6.9	3.0	1.396
	01/22/2019	0.62	-21	2.0[c]	7.0	2.5	2.056
	08/08/2019	1.9	-24	0.5	7.0	23	1.927
	02/19/2020	3.1	-23	1.5[c]	6.9	3.5	1.351
MW-13	08/08/2019	3.3	-130	0.0	7.1	18	1.894
	02/19/2020	2.8	-53	3.0[c]	6.8	5	1.379

Notes:

[a] DRI = Direct-Read Instrument

[b] HACH = Colorimetric "Hach" Field Kit

[c] Field filtered sample

[1] Free product observed - not measured

mg/L = milligrams per liter

mV = millivolts

ms/cm = millisiemens per centimeter

NTU = nephelometric turbidity units

- = not measured

TABLE 5

Groundwater Analytical Results - Fuels, Volatile Organic Compounds and Lead (ug/L)

DeBock's Texaco

Grandview, Washington

Location	Date	Gasoline	Diesel	Oil	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE	Naphthalene	EDB	EDC	Total Lead	Dissolved Lead
MTCA Groundwater Screening Levels[a] Method A		800	500	500	5	1,000	700	1,000	20	160	0.01	5	15	15
Sage Earth Sciences - Limited Site Characterization														
SB3-16	10/20/1995	67	4.2	1.2 U	1.6	3.4	-	-	-	-	-	-	**64**	-
SB4-16	10/20/1995	53	0.16	0.83	1.3	5.8	-	-	-	-	-	-	**47**	-
SB5-16	10/20/1995	56	0.05 U	0.34	1.4	4.9	-	-	-	-	-	-	**150**	-
SB6-16	10/23/1995	185	3.5	1.9	2.4	5.7	-	-	-	-	-	-	**96**	-
SB7-16.5	10/23/1995	111	0.14	2.1	1.5	6.9	-	-	-	-	-	-	**37**	-
Olympus Environmental - Site Investigation														
GP-1-15W	02/20/1998	**8,400**	**1,910**	13 U	**527**	**1,660**	-	-	-	-	-	-	-	-
GP-2-15W	02/20/1998	78	5.3	2.5	1.8	6.6	-	-	-	-	-	-	-	-
GP-3-15W	02/20/1998	594	22	1.6	**17**	22	-	-	-	-	-	-	-	-
GP-4-15W	02/20/1998	**1,220**	92	3.9	**72**	14	-	-	-	-	-	-	-	-
GP-5-15W	02/20/1998	**2,930**	7.9	4.9	**81**	113	-	-	-	-	-	-	-	-
Olympus Technical Services - Site Assessment														
SP-1-1418	09/26/2000	**12,600**	153	100	**430**	**1,030**	-	-	-	-	-	-	-	-
SP-2-1418	09/26/2000	**281,000**	**2,690**	**31,900**	**8,390**	**55,100**	-	-	-	-	-	-	-	-
SP-3-1418	09/26/2000	**26,400**	365	**2,090**	**718**	**4,040**	-	-	-	-	-	-	-	-
SP-4-1418	09/26/2000	**6,570**	37	64	**73**	154	-	-	-	-	-	-	-	-
SP-5-1418	09/26/2000	**34,200**	**630**	**2,400**	**1,120**	**6,060**	-	-	-	-	-	-	-	-
MW-1	04/01/1998	**1,370**	2.2	2.9	**24**	62	-	-	-	-	-	-	-	-
	09/27/2000	120	0.78	0.53	1.3	3.5	-	-	-	-	-	-	-	-
	02/02/2018	**928**	**866** J[7]	385 U	0.20 U	1.0 U	0.50 U	1.5 U	1.0 U	2.0 U	0.033 U[2,4]	0.50 U	0.27	0.20 U
	04/24/2018	725	-	-	0.20 U	1.0 U	0.50 U	1.5 U	1.0 U	2.0 U	0.020 U[2,3,4]	0.50 U	0.20 U	0.20
	07/18/2018	364	-	-	0.20 U	1.0 U	0.50 U	1.5 U	-	2.0 U	-	-	0.20 U	-
	10/23/2018	250	-	-	0.20 U	1.0 U	0.50 U	1.5 U	1.0 U	2.0 U	*0.50 U*	0.50 U	0.20 U	-
	01/23/2019	412	-	-	0.20 U	1.0 U	0.50 U	1.5 U	-	2.0 U	-	-	-	-
MW-2	04/01/1998	**5,970**	94	30	**217**	396	-	-	-	-	-	-	-	-
	09/27/2000	**11,700**	**1,040**	74	**649**	710	-	-	-	-	-	-	-	-
MW-2 (free product)	02/01/2018[b]	DET [1]	*45,000,000 U*[1]	*90,100,000 U*[1]	*6,760 U*	**50,700**	**1,700,000**	**3,892,000**	*33,800 U*	**1,220,000**	*33,800 U*	*16,900 U*	-	-
	04/24/2018[c]	-	-	-	-	-	-	-	-	-	-	-	-	-
	07/18/2018	**14,500**	**948** J[5]	404 U	**12**	34	441	936	10 U	**193**	*5.0 U*	5.0 U	2.6	-
	10/23/2018[c]	-	-	-	-	-	-	-	-	-	-	-	-	-
	01/22/2019[c]	-	-	-	-	-	-	-	-	-	-	-	-	-
	02/19/2020[c]	-	-	-	-	-	-	-	-	-	-	-	-	-
MW-3	04/01/1998	**2,590**	19	3.5	**61**	205	-	-	-	-	-	-	-	-
	09/27/2000	**2,270**	15	2.0	**74**	48	-	-	-	-	-	-	-	-
(duplicate)	09/27/2000	**1,440**	7.1	1.1	**26**	26	-	-	-	-	-	-	-	-
	02/02/2018	121	269 J[7]	377 U	0.20 U	1.0 U	0.50 U	1.5 U	1.0 U	2.0 U	0.010 U[2,3]	0.50 U	0.27	0.20 U
	04/24/2018	**821**	-	-	0.20 U	1.0 U	5.0	13	1.0 U	2.0 U	0.020 U[2,3,4]	0.50 U	0.20 U	0.44
	07/18/2018	715	-	-	0.20 U	1.0 U	12	20	-	2.0 U	-	-	0.20 U	-

TABLE 5

Groundwater Analytical Results - Fuels, Volatile Organic Compounds and Lead (ug/L)

DeBock's Texaco

Grandview, Washington

Location	Date	Gasoline	Diesel	Oil	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE	Naphthalene	EDB	EDC	Total Lead	Dissolved Lead
MTCA Groundwater Screening Levels[a] Method A		800	500	500	5	1,000	700	1,000	20	160	0.01	5	15	15
MW-3 (cont'd)	10/23/2018	564	-	-	0.20 U	1.0 U	0.50 U	1.5 U	1.0 U	2.0 U	*0.50 U*	0.50 U	0.20 U	-
	01/22/2019	**847**	-	-	0.20 U	1.0 U	4.7	13	-	2.0 U	-	-	-	-
MW-4	04/25/2018	521	-	-	0.53	1.0 U	0.50 U	1.5 U	1.0 U	2.0 U	0.010 U[2,3]	0.50 U	0.93	0.64
	07/19/2018	121	-	-	0.21	1.0 U	0.50 U	1.5 U	-	2.0 U	-	-	-	-
	10/23/2018	653	-	-	1.2	1.0 U	0.50 U	1.5 U	1.0 U	2.0 U	*0.50 U*	0.50 U	2.7	-
	01/22/2019	628	-	-	0.37	1.0 U	0.50 U	1.5 U	-	2.0 U	-	-	-	-
MW-5	04/25/2018	390	-	-	0.24	1.0 U	0.50 U	1.5 U	1.0 U	2.0 U	0.010 U[2,3]	0.50 U	0.94	0.71
	07/19/2018	100 U	-	-	0.20 U	1.0 U	0.50 U	1.5 U	-	2.0 U	-	-	-	-
	10/23/2018	767	-	-	0.33	1.0 U	1.3 J	2.2 J	1.0 U	2.0 U	*0.50 U*	0.50 U	1.1	-
	01/22/2019	**981**	-	-	0.32	1.0 U	0.50 U	1.5 U	-	2.0 U	-	-	-	-
	08/08/2019	100 U	-	-	0.20 U	1.0 U	0.50 U	1.5 U	-	2.0 U	-	-	-	-
	02/19/2020	771	-	-	0.30	1.0 U	0.50 U	1.5 U	-	2.0 U	-	-	-	-
MW-6	04/25/2018	100 U	-	-	0.20 U	1.0 U	0.50 U	1.5 U	1.0 U	2.0 U	0.010 U[2,3]	0.50 U	0.82	0.23
	07/18/2018	100 U	-	-	0.20 U	1.0 U	0.50 U	1.5 U	-	2.0 U	-	-	-	-
	10/23/2018	100 U	-	-	0.20 U	1.0 U	0.50 U	1.5 U	1.0 U	2.0 U	*0.50 U*	0.50 U	0.71	-
	01/22/2019	100 U	-	-	0.20 U	1.0 U	0.50 U	1.5 U	-	2.0 U	-	-	-	-
MW-7	04/25/2018	100 U	-	-	0.20 U	1.0 U	0.74	1.5 U	1.0 U	2.0 U	0.010 U[2,3]	0.50 U	1.5	0.71
	07/19/2018	100 U	-	-	0.20 U	1.0 U	0.50 U	1.5 U	-	2.0 U	-	-	-	-
	10/24/2018	100 U	-	-	0.20 U	1.0 U	0.50 U	1.5 U	1.0 U	2.0 U	*0.50 U*	0.50 U	0.63	-
	01/22/2019	100 U	-	-	0.20 U	1.0 U	0.50 U	1.5 U	-	2.0 U	-	-	-	-
MW-8	04/25/2018	**5,860**	-	-	0.20 U	3.9	75	299	1.0 U	58	0.020 U[2,3,4]	0.50 U	3.8	0.66
	07/18/2018	**1,590**	-	-	0.20 U	1.0 U	8.9	18	-	22	-	-	1.3	-
MW-50 (DUP)	07/18/2018	**1,410**	-	-	0.20 U	1.0 U	8.9	16	-	17	-	-	-	-
	10/24/2018	**2,390**	-	-	0.20 U	5.2	121 J	206 J	1.0 U	35 J	*0.50 U*	0.50 U	0.90	-
MW-50 (DUP)	10/24/2018	**2,170**	-	-	0.20 U	4.9	112 J	190 J	1.0 U	32 J	*0.50 U*	0.50 U	0.92	-
	01/23/2019	**2,980**	-	-	0.22	1.0 U	64	10	-	59	-	-	-	-
MW-50 (DUP)	01/23/2019	**2,920**	-	-	0.24	1.0 U	72	11	-	62	-	-	-	-
MW-9	04/24/2018	100 U	-	-	0.20 U	1.0 U	0.50 U	1.5 U	1.0 U	2.0 U	0.010 U[2,3]	0.50 U	2.5	0.20 U
	07/18/2018	100 U	-	-	0.20 U	1.0 U	0.50 U	1.5 U	-	2.0 U	-	-	-	-
	10/23/2018	100 U	-	-	0.20 U	1.0 U	0.50 U	1.5 U	1.0 U	2.0 U	*0.50 U*	0.50 U	0.28	-
	01/22/2019	100 U	-	-	0.20 U	1.0 U	0.50 U	1.5 U	-	2.0 U	-	-	-	-
MW-10	04/24/2018	**1,210**	-	-	2.5	1.0 U	9.2	13	1.0 U	2.0 U	0.020 U[2,3,4]	0.50 U	1.1	1.1
MW-50 (DUP)	04/24/2018	779	-	-	2.1	1.0 U	3.8	5.1	1.0 U	2.0 U	0.020 U[2,3,4,6]	0.50 U	0.95	0.85
	07/18/2018	466	-	-	1.2	1.0 U	0.50 U	1.5 U	-	2.0 U	-	-	1.4	-
	10/23/2018	**1,910**	-	-	3.5	1.0 U	2.3 J	3.0 J	1.0 U	2.0 U	*0.50 U*	0.50 U	1.8	-
	01/23/2019	**1,450**	-	-	3.0	1.0 U	0.51	1.5 U	-	2.0 U	-	-	-	-
	08/08/2019	115	-	-	0.47	1.0 U	0.50 U	1.5 U	-	2.0 U	-	-	-	-
	02/19/2020	**1,930**	-	-	2.9	1.0 U	2.1	1.5 U	-	2.0 U	-	-	-	-
MW-11	04/24/2018	**2,060**	-	-	0.73	1.5	1.6	16	1.0 U	2.0 U	0.020 U[2,3,4]	0.50 U	0.72	0.61
	07/18/2018	**834**	-	-	0.31	1.0 U	0.50 U	1.5 U	-	2.0 U	-	-	0.59	-

TABLE 5
Groundwater Analytical Results - Fuels, Volatile Organic Compounds and Lead (ug/L)
DeBock's Texaco
Grandview, Washington

Location	Date	Gasoline	Diesel	Oil	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE	Naphthalene	EDB	EDC	Total Lead	Dissolved Lead
MTCA Groundwater Screening Levels[a] Method A		800	500	500	5	1,000	700	1,000	20	160	0.01	5	15	15
MW-11 (cont'd)	10/24/2018	**2,180**	-	-	0.72	1.0 U	4.8 J	3.2 J	1.0 U	9.4 J	*0.50 U*	0.50 U	0.77	-
	01/23/2019	**1,880**	-	-	0.66	1.0 U	0.73	1.7	-	2.0 U	-	-	-	-
	08/08/2019	600	-	-	0.29	1.0 U	0.50 U	1.5 U	-	2.0 U	-	-	-	-
	02/19/2020	**1,720**	-	-	0.58	1.0 U	0.67	1.5 U	-	2.0 U	-	-	-	-
MW-12	04/24/2018	**3,780**	-	-	**5.8**	50	92	596	1.0 U	6.0	0.020 U[2,3,4]	0.50 U	0.91	1.1
	07/19/2018	**2,070**	-	-	2.3	10 U	15	281	-	20 U	-	-	0.51	-
	10/24/2018	**2,060**	-	-	**5.1**	2.5	17	59	1.0 U	6.9	*0.50 U*	0.50 U	0.60	-
	01/23/2019	**1,160**	-	-	1.9	1.0 U	0.95	4.1	-	2.4	-	-	-	-
	08/08/2019	272	-	-	0.43	1.0 U	0.50 U	1.8	-	2.0 U	-	-	-	-
	02/19/2020	**1,090**	-	-	1.8	1.0 U	1.1	3.6	-	2.0 U	-	-	-	-
MW-50 (DUP)	02/19/2020	**1,270**	-	-	1.8	1.0 U	1.2	4.1	-	2.0 U	-	-	-	-
MW-13	08/08/2019	**2,580**	**1,000** [8,9]	374 U	**8.1**	1.5	13	25	-	30	-	-	-	-
	02/19/2020	**8,560**	-	-	**16**	4.4	114	86	-	104	-	-	-	-
B1-W	03/15/2018	**7,240**	**1,070** J[5]	*1,960 U*	**31**	6.9	98	195	5.0 U	**162**	*2.5 U*	2.5 U	7.6	1.3
B3-W	03/16/2018	**1,440**	348 J[5]	388 U	0.20 U	1.0 U	9.9	35	1.0 U	2.0 U	*0.50 U*	0.50 U	**18**	2.0 U
B4-W	03/16/2018	**5,250**	411 J[5]	388 U	1.3	66	92	588	5.0 U	21	*2.5 U*	2.5 U	13	1.0 U
B6-W	04/03/2018	**1,280**	194 U	388 U	**6.1**	5.2	36	125	1.0 U	4.3	*0.50 U*	0.50 U	**28**	1.1
B7-W	04/03/2018	**1,270**	190 U	381 U	0.20 U	1.4	28	40	1.0 U	6.2	*0.50 U*	0.50 U	**27**	0.26
B8-W	04/03/2018	**1,290**	317 [5]	381 U	0.26	13	39	68	1.0 U	5.2	*0.50 U*	0.50 U	**26**	0.20 U
B9-W	04/03/2018	725	238 [5]	392 U	0.20 U	2.3	18	39	1.0 U	2.0 U	*0.50 U*	0.50 U	11	0.20 U
B10-W	04/04/2018	449	389 [5]	374 U	0.20 U	3.9	0.50 U	1.5 U	1.0 U	2.0 U	*0.50 U*	0.50 U	4.3	0.20 U
B19-W	08/07/2019	**4,160**	-	-	0.20 U	1.0 U	4.9	6.7	-	15	-	-	-	-
B20-W	08/07/2019	**1,840**	-	-	0.22	1.0 U	0.50 U	1.5 U	-	2.0 U	-	-	-	-
B21-W	08/07/2019	**1,130**	-	-	0.20 U	1.0 U	0.50 U	1.5 U	-	3.4	-	-	-	-
B22-W	08/07/2019	100 U	-	-	0.20 U	1.0 U	0.50 U	1.5 U	-	2.0 U	-	-	-	-
B23-W	08/08/2019	100 U	-	-	0.20 U	1.0 U	0.50 U	1.5 U	-	2.0 U	-	-	-	-

TABLE 5

Groundwater Analytical Results - Fuels, Volatile Organic Compounds and Lead (ug/L)

DeBock's Texaco

Grandview, Washington

Notes:

Historical data through 2000 obtained from historical reports.

[a] Washington Department of Ecology (WDOE), Model Toxics Control Act (MTCA) Cleanup Amendments, Groundwater Cleanup Levels (CLARC Tables, August 2020)

[b] Concentrations are shown in units of micrograms per kilogram (ug/kg) wet

[c] Free product observed - not sampled

Gasoline analyzed by Method NWTPH-Gx

Diesel and Oil analyzed by Method NWTPH-Dx

Volatile Organic Compounds (VOCs) by EPA Method 8260C

Lead by EPA Method 200.8 (ICPMS)

[1] Gasoline, Diesel and Oil analyzed by Method NWTPH-HCID

[2] EDB was analyzed by EPA Method 8260C-SIM

[3] Analyte was reported down to the method detection limit (MDL)

[4] The reporting limit for this analyte has been raised to account for interference from coeluting compounds and/or matrix interference.

[5] The result for diesel (diesel range organics, C12-C24) is due to overlap from gasoline or a gasoline range product.

[6] The sample aliquot was taken from a vial with headspace (air bubble greater than 6mm diameter).

[7] The chromatographic pattern does not resemble the fuel standard used for quantitation.

[8] Analyte detected in an associated blank at a level between one-half the MRL and the MRL.

[9] The result for diesel is estimated due to overlap from gasoline range organics or other VOCs.

MCL = Maximum Contaminant Level (Washington State)

MTBE = Methyl tert-butyl ether

EDB = 1,2-Dibromoethane

EDC = 1,2-Dichloroethane

J = Data Validation Qualifier. The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

U = Undetected at method reporting limit shown

ug/L = micrograms per liter

NA = Not Available

- = Not analyzed for this parameter

BOLD values exceed the MTCA Method A screening level.

Italicized values indicate the reporting limit was higher than the MTCA Method A screening level.

TABLE 6
Groundwater Analytical Results - Polynuclear Aromatic Hydrocarbons (ug/L)
DeBock's Texaco
Grandview, Washington

Location	Date	Acenaphthene	Acenaphthylene	Anthracene	Benz(a) anthracene [cPAH]	Benzo(a) pyrene [cPAH]	Benzo(b) fluoranthene [cPAH]	Benzo(g,h,i) perylene	Benzo(k) fluoranthene [cPAH]	Chrysene [cPAH]	Dibenz(a,h) anthracene [cPAH]	Dibenzofuran	Fluoranthene	Fluorene	Indeno (1,2,3-cd) pyrene [cPAH]	1-Methyl naphthalene	2-Methyl naphthalene	Naphthalene	Phenanthrene	Pyrene	Total cPAHs[b]
Groundwater Screening Levels[a] Method A		960[c]	NA	4,800[c]	NA	0.1	NA	NA	NA	NA	NA	16[c]	640[c]	640[c]	NA	1.5[c]	32[c]	160	NA	480[c]	0.1
Toxicity Equivalency Factor[b]		NA	NA	NA	0.1	1	0.1	NA	0.1	0.01	0.1	NA	NA	NA	0.1	NA	NA	NA	NA	NA	NA
MW-1	02/02/2018	0.042 U	0.083 U[1]	0.042 U	0.042 U	0.042 U	0.042 U	0.042 U	0.042 U	0.042 U	0.042 U	0.042 U	0.042 U	0.042 U	0.042 U	0.10 U[1]	0.083 U	0.20 U[1]	0.042 U	0.042 U	0.063 U
MW-3	02/02/2018	0.042 U	0.042 U	0.042 U	0.042 U	0.042 U	0.042 U	0.042 U	0.042 U	0.042 U	0.042 U	0.042 U	0.042 U	0.042 U	0.042 U	0.083 U	0.083 U	0.083 U	0.042 U	0.042 U	0.063 U
B1-W	03/15/2018	0.19 U	0.19 U	0.19 U	0.19 U	*0.19 U*	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	1.3	0.56	37	0.19 U	0.19 U	*0.29 U*
B4-W	03/16/2018	0.090 U	0.050 U	0.040 U	0.040 U	0.040 U	0.040 U	0.040 U	0.040 U	0.040 U	0.040 U	0.040 U	0.040 U	0.040 U	0.040 U	**6.2**	5.5	15	0.066	0.040 U	0.060 U

Notes:

[a] Washington Department of Ecology (WDOE), Model Toxics Control Act (MTCA) Cleanup Amendments, Groundwater Cleanup Levels (CLARC Tables, August 2020)

[b] Toxicity equivalency factors (TEFs) used to calculate total cPAHs as specified in WDOE Implementation Memo #10 (April 2015). The total cPAH concentration is compared to the cleanup level for benzo(a)pyrene.

[c] MTCA B Cleanup Level; a MTCA A Cleanup Level has not been established for this chemical.

Polyaromatic Hydrocarbons (PAHs) analyzed by EPA Method 8270D SIM

[1] The reporting limit for this analyte has been raised to account for interference from coeluting compounds.

cPAH indicates "Carcinogenic PAH" (WDOE Implementation Memo #10, April 2015)

MCL = Maximum Contaminant Level (Washington State)

J = Data Validation Qualifier. The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

NA = Not Available

U = Undetected at method reporting limit shown

ug/L = micrograms per liter

BOLD values exceed the MTCA Method A Cleanup Level.

Italicized values indicate the reporting limit was higher than the MTCA Method A Cleanup Level.

TABLE 7

Soil Vapor Analytical Results - Gasoline and Volatile Organic Compounds (ug/m^3)

DeBock's Texaco

Grandview, Washington

Location	Date	Depth (feet)	Field-Measured Biodegradation Parameters			Laboratory Analytical Testing Results													
			Oxygen ($O_{2)}$	Carbon Dioxide (CO_2)	Methane (CH_4)	Gasoline	Benzene	Toluene	Ethylbenzene	o-Xylene	m,p-Xylene	MTBE	Naphthalene	EDB	EDC	1,2,4-TMB	1,3,5-TMB	Hexane	Ethanol
MTCA Soil Gas Screening Levels[a]																			
	Method B Sub-Slab[b]		NA	NA	NA	4,700	11	76,000	15,000	1,500[c]	1,500[c]	320	2.5	0.14	3.2	910	NA	11,000[d]	NA
SG1	03/14/2018	5	19.0%	1.6%	0%	75 U	0.66	0.77	0.16	0.19	0.33	0.66 U	0.48 U	*0.28 U*	0.15 U	0.90 U	0.90 U	0.64 U	5.1
SG2	03/14/2018	5	19.1%	1.9%	0%	90	2.0	3.0	0.70	1.1	2.3	0.69 U	0.50 U	*0.29 U*	0.15 U	0.94 U	0.94 U	2.1	2.9
SG3	03/14/2018	5	19.5%	1.3%	0%	75 U	0.76	2.4	0.58	0.80	2.1	0.66 U	0.48 U	*0.28 U*	0.15 U	1.0	0.90 U	0.64 U	12
SG4	03/14/2018	5	20.3%	0.2%	0%	72 U	0.38	1.6	0.19	0.31	0.66	0.63 U	0.46 U	*0.27 U*	0.14 U	1.2	0.86 U	0.62 U	1.6 U
SG5	03/14/2018	5	17.3%	2.7%	0%	70 U	1.1	1.5	0.36	0.36	0.89	0.62 U	0.45 U	*0.26 U*	0.14 U	0.84 U	0.84 U	0.60 U	4.2
SG6	03/14/2018	5	20.1%	0.7%	0%	72 U	0.53	11	0.44	0.94	1.8	0.63 U	0.59	*0.27 U*	0.14 U	1.8	0.86 U	1.2	3.2
SG7	03/14/2018	5	18.5%	2.4%	0%	280	1.2	2.3	1.1	2.2	5.0	0.62 U	2.5	*0.26 U*	0.14 U	18	5.8	0.60 U	4.6
SG8	03/14/2018	5	16.8%	3.5%	0%	72 U	4.8	1.7	0.38	0.63	1.4	0.63 U	0.46 U	*0.27 U*	0.14 U	1.6	0.86 U	0.62 U	4.0
SG9	03/14/2018	5	20.6%	0.2%	0%	72 U	0.28 U	1.0	0.21	0.33	0.76	0.63 U	0.46 U	*0.27 U*	0.14 U	0.86 U	0.86 U	0.62 U	2.5

Notes:

Gasoline and Volatile Organic Compounds analyzed by EPA Method TO-15 modified.

[a] Washington Department of Ecology (WDOE) Soil Vapor Intrusion DRAFT Guidance, Method B Soil Gas Screening Levels (WDOE, October 2009). Updated based on CLARC database values (August 2020).

[b] For carcinogenic chemicals, the MTCA Method B Cancer value is shown.

[c] Screening level shown is for total xylenes

[d] Screening level shown is for n-hexane

MTBE = Methyl tert butyl ether

EDB = 1,2-Dibromoethane

EDC = 1,2-Dichloroethane

TMB = Trimethylbenzene

U = Undetected at reporting limit shown

NA = Not available

TABLE 8
Water Well Search
DeBock's Texaco
Grandview, Washington

Well Log ID	Well Tag ID	Notice of Intent ID	Well Depth (Feet)	Well Diameter (Inches)	Water Encountered?	Screened Interval (Feet)	Stable Water Depth (Feet)	Well Owner Name	Township	Range	Range Direction	Section	Quarter Section	Quarter-Quarter Section	Well Completion Date	County	Well Type
WATER WELLS																	
113474	AEP517		247	10/8*	Yes	165-185/222-247*	42	CITY OF GRANDVIEW	9	23	E	23	NW	NE	4/26/1977	Yakima	W
343325			1150	10	Yes	No Perforations	200	CITY OF GRANDVIEW	9	23	E	23	NE	SE	2/6/1974	Yakima	W
343326			120	10		No Perforations		CITY OF GRANDVIEW	9	23	E	23	NW	NE		Yakima	W
143787			174	10	Yes		50	OREGON WASH R R & NAV CO	9	23	E	23	NE	NW	1/1/1925	Yakima	W
RESOURCE PROTECTION WELLS																	
122826	AEG422	R028674	25	2	Yes	10-25	15	DeBock's Texaco	9	23	E	13	SE	SE	3/26/1998	Yakima	R
122827	AEG423	R028674	25	2	Yes	10-25	15	DeBock's Texaco	9	23	E	13	SE	SE	3/26/1998	Yakima	R
122828	AEB424	R028674	25	2	Yes	10-25	15	DeBock's Texaco	9	23	E	13	SE	SE	3/26/1998	Yakima	R
1712997	BKR331	RE15821	25	2	Yes	10-25	21.2	Brandon Christensen-RE Powell	9	23	E	23	NE	NW	4/4/2018	Yakima	R
1712998	BKR329	RE15821	25	2	Yes	10-25	21	Brandon Christensen-RE Powell	9	23	E	23	NE	NW	3/16/2018	Yakima	R
1712999	BKR332	RE15821	25	2	Yes	10-25	22	Brandon Christensen-RE Powell	9	23	E	23	NE	NW	4/4/2018	Yakima	R
1713001	BKR333	RE15821	25	2	Yes	10-25	21.1	Brandon Christensen-RE Powell	9	23	E	23	NE	NW	4/4/2018	Yakima	R
1713002	BKR334	RE15821	25	2	Yes	10-25	21.6	Brandon Christensen-RE Powell	9	23	E	23	NE	NW	4/4/2018	Yakima	R
1713003	BKR328	RE15821	25	2	Yes	10-25	21	Brandon Christensen-RE Powell	9	23	E	23	NE	NW	3/16/2018	Yakima	R
1713006	BKR336	RE15821	25	2	Yes	10-25	21.8	Brandon Christensen-RE Powell	9	23	E	23	NE	NW	4/5/2018	Yakima	R
1713007	BKR335	RE15821	25	2	Yes	10-25	22.1	Brandon Christensen-RE Powell	9	23	E	23	NE	NW	4/4/2018	Yakima	R
1713008	BKR337	RE15821	25	2	Yes	10-25	21.6	Brandon Christensen-RE Powell	9	23	E	23	NE	NW	4/5/2018	Yakima	R

* = Borehole completed with two distinct wells with unique diameters and screened intervals, as reported.

Charts

CHART 1

Historic and Current Depth to Water

DeBock's Texaco

Grandview, Washington

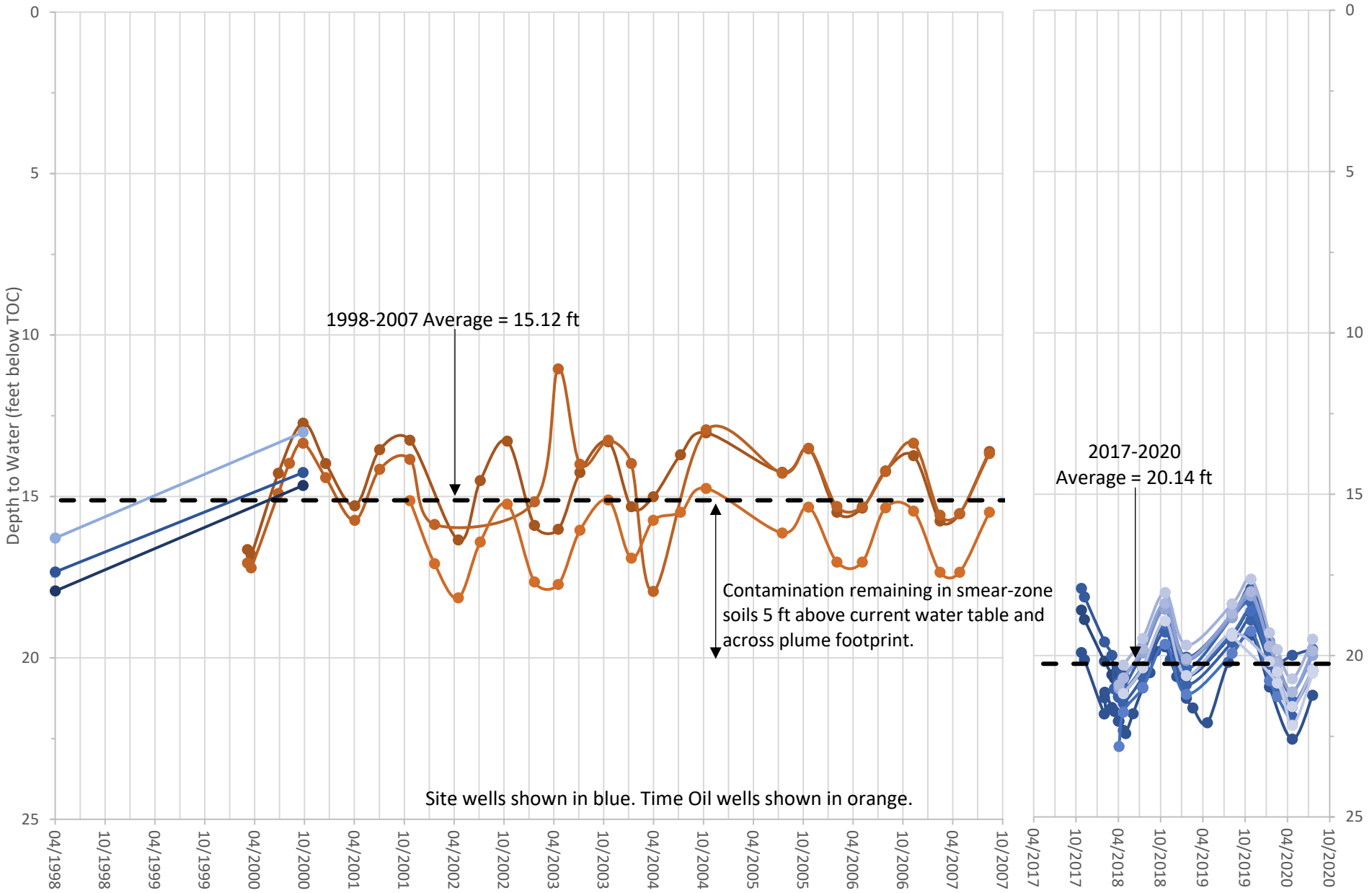


CHART 2
LNAPL Thickness at Well MW-2
DeBock's Texaco
Grandview, Washington

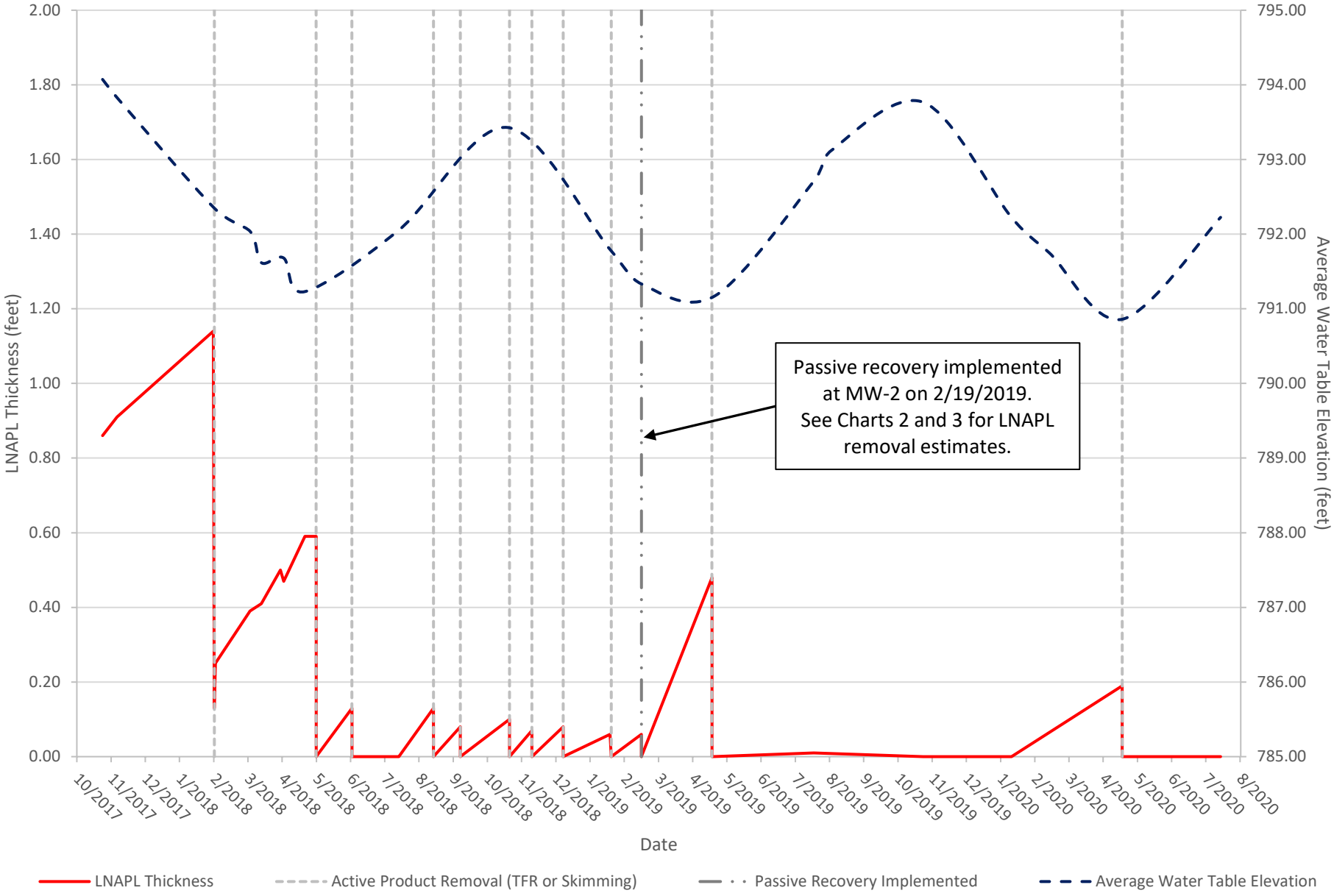
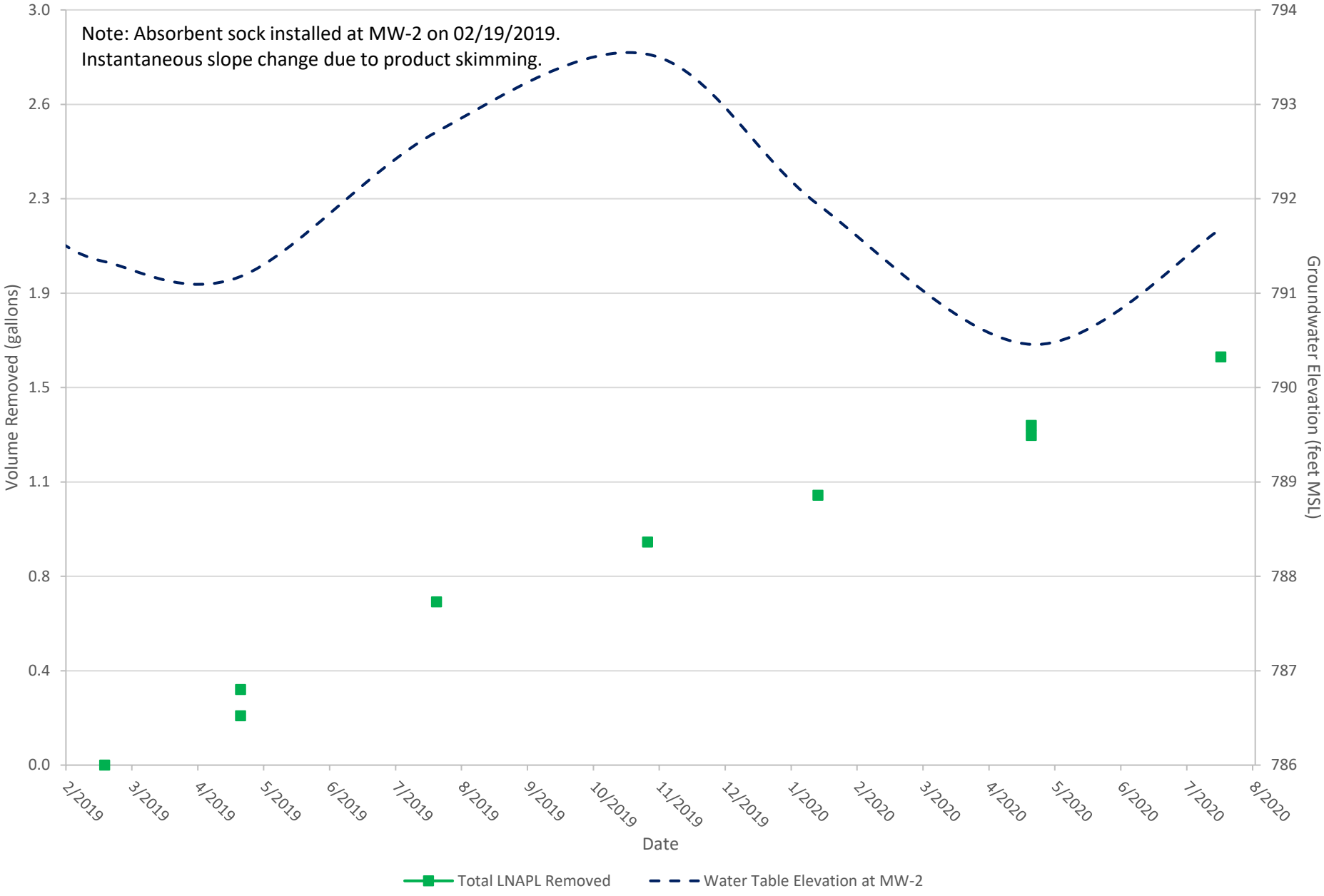


CHART 3

LNAPL Removal at Well MW-2 since 02/19/2019

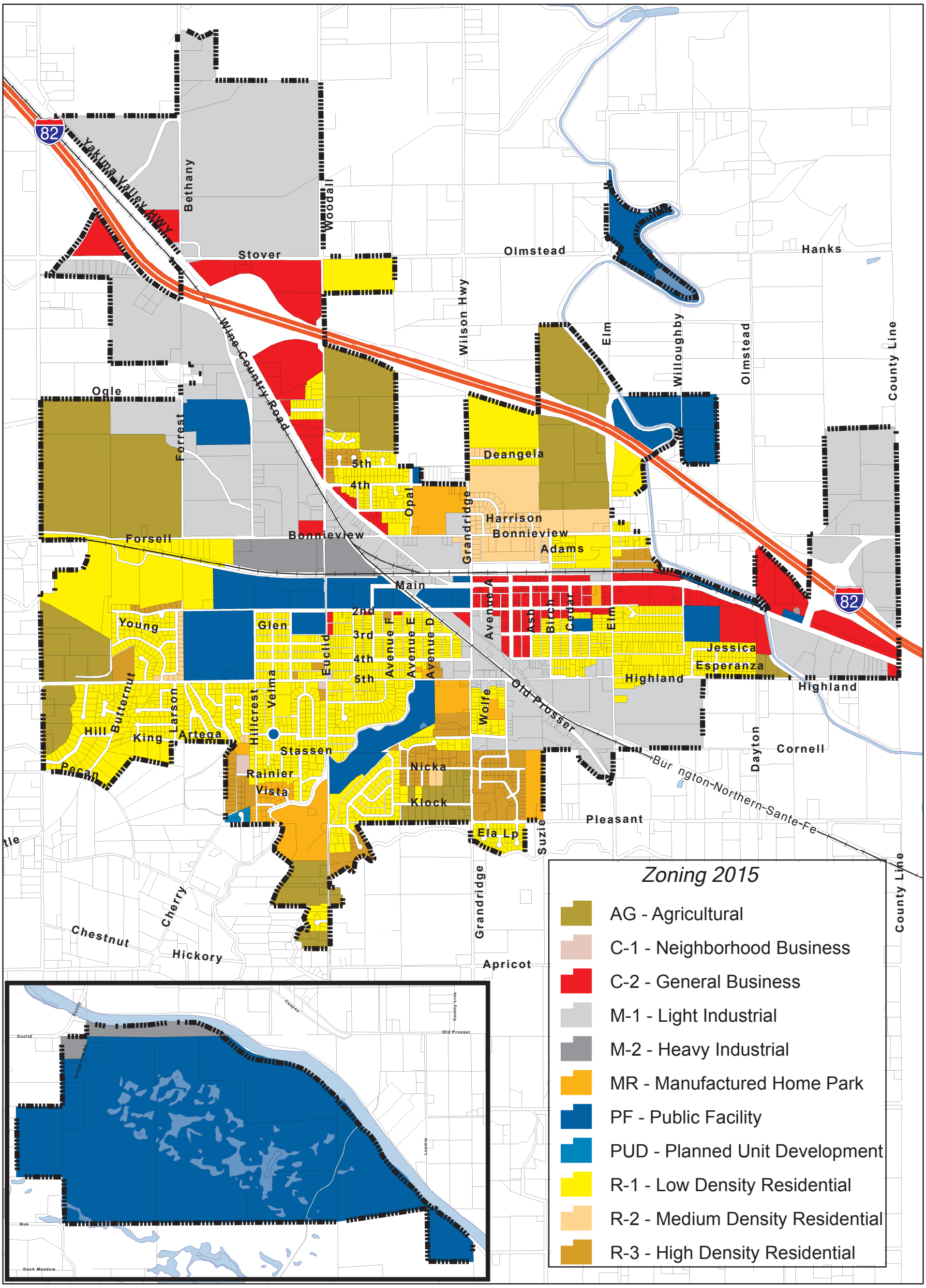
DeBock's Texaco

Grandview, Washington



Appendix A

City of Grandview, WA
Zoning 2015



Zoning 2015

- AG - Agricultural
- C-1 - Neighborhood Business
- C-2 - General Business
- M-1 - Light Industrial
- M-2 - Heavy Industrial
- MR - Manufactured Home Park
- PF - Public Facility
- PUD - Planned Unit Development
- R-1 - Low Density Residential
- R-2 - Medium Density Residential
- R-3 - High Density Residential

Yakima Valley Conference of Governments
311 North 4th Street, Suite 204
Yakima, Washington 98901
Phone: (509) 574-1550

June 2015

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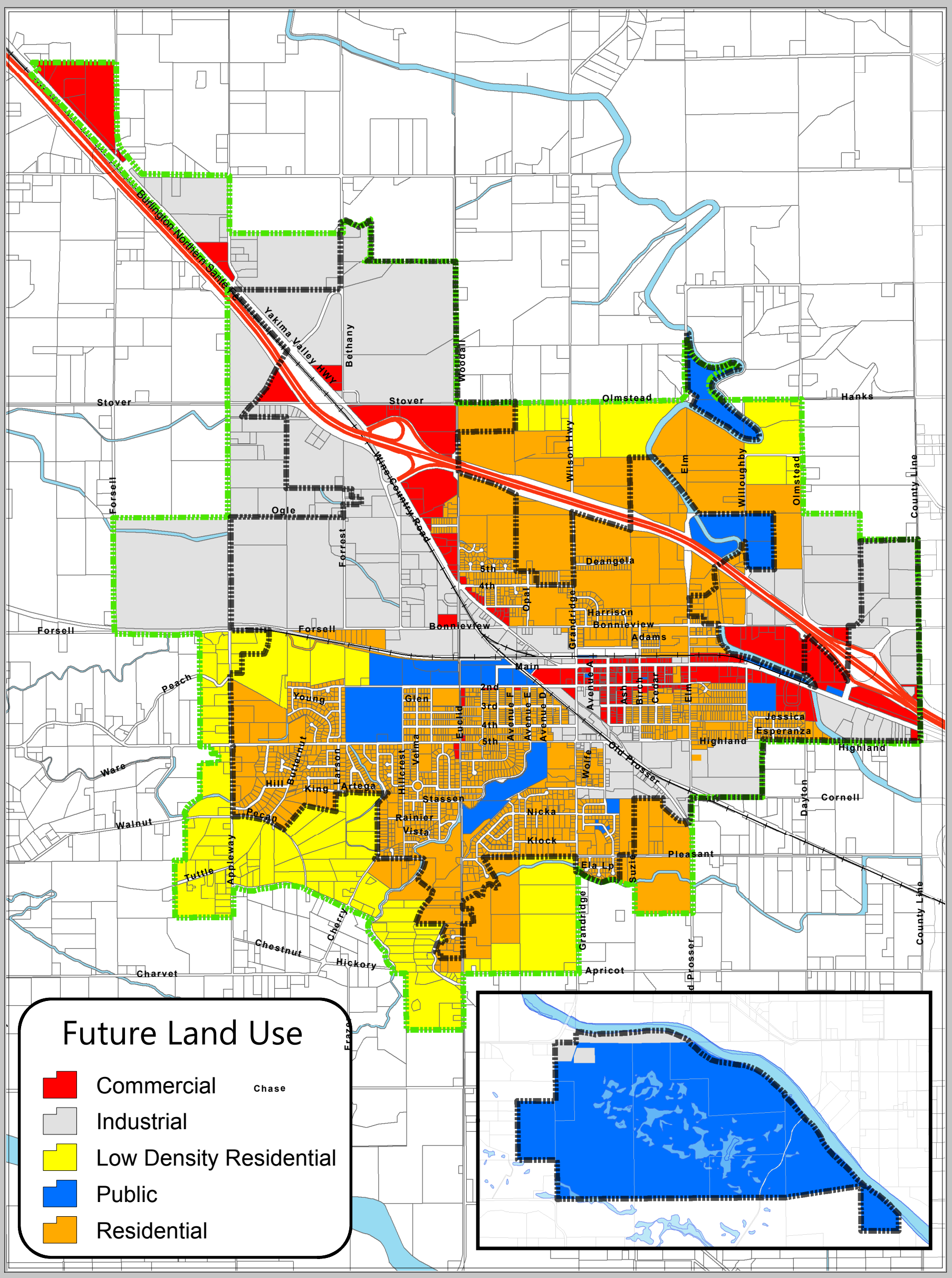
City of Grandview, WA
Future Land Use 2016



Yakima Valley Conference of Governments
311 North 4th Street, Suite 204
Yakima, WA 98901
October 2016

Appendix B

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BORING NO. **B1** PAGE **1** OF **1**

PROJECT **DeBock's Texaco**

LOCATION **Grandview, Washington**

START CARD **SE65434** WELL ID

COORDINATES

PROJECT NO. **2093-01**

SURFACE ELEVATION DATUM

LOGGED BY **DBP**

SAMPLE INFORMATION						STRATA	DESCRIPTION	CONSTRUCTION DETAIL/ COMMENTS	ELEVATION FEET
DEPTH FEET	LAB SAMPLE ID	pH	PID (ppmV)	SHEEN	RECOVERY %				
					100		Vegetation.		
							Brown SILT (ML), trace sand, trace gravel; medium stiff, dry, sand is fine, gravel is coarse.		
	B1-3		0.0	NO			Becomes moist.		
							Becomes without gravel.		
5			0.0	NO	100				
							Gray-brown silty SAND (SM); medium loose, moist, fine.		
			0.0	NO					
							Medium sand lens.		
10	B1-10		0.0	NO	100				
							Brown SILT; stiff, moist, stratified 1-inch-thick medium sand layers every 1 foot from 11 to 14.5 feet.		
			0.0	NO					
							Becomes gray (stained).		
15	B1-15		501.9	SLIGHT	100		Gray to black (stained) SAND (SP), minor silt; loose, moist, fine.		
							Gray-brown (stained) SILT (ML), minor sand; soft, wet, sand is fine.		
			437.1	SLIGHT					
							Gray-brown silty SAND (SM); medium dense, moist, fine.		
20	B1-20		41.5	NO	100				
							Brown SILT (ML), trace sand; soft, saturated, sand is fine.	▼	
			11.6	NO					
25	B1-25		0.0	NO					
							Boring complete at 25 feet, backfilled with bentonite chips and finished at surface with existing soil.		

Installed temporary 3/4-inch Sch 40 PVC well screened from 19 to 24 feet with 0.010-inch slots. Conductor casing left in place from 0 to 19 feet during groundwater sampling. Collected groundwater sample B1W.

DRILLING CONTRACTOR **Cascade Drilling**

DRILLING METHOD **Hand Auger/Direct Push**

DRILLING EQUIPMENT **Geoprobe 7720DT**

DRILLING STARTED **3/15/18** ENDED **3/15/18**

REMARKS **Boring advanced from 0 to 5 feet bgs using hand auger, then advanced to terminal depth using direct-push tooling.**

See key sheet for symbols and abbreviations used above.

EES EES Environmental Consulting, Inc.

BORING NO. **B2** PAGE **1** OF **1**

PROJECT **DeBock's Texaco**

LOCATION **Grandview, Washington**

START CARD **RE15821** WELL ID **MW-4**

COORDINATES PROJECT NO. **2093-01**

SURFACE ELEVATION DATUM LOGGED BY **DBP**

DEPTH FEET	LAB SAMPLE ID	pH	PID (ppmV)	SHEEN	RECOVERY %	STRATA	DESCRIPTION	CONSTRUCTION DETAIL/ COMMENTS	ELEVATION FEET
					100		Vegetation.		
							Brown silty SAND (SM); loose, moist, fine.	Well is sealed at the surface using concrete, a flush-mounted traffic-rated steel monument and locking cap.	
			0.0	NO					
5			0.0	NO	100				
			0.0	VERY SLIGHT					
10	B2-10		0.0	NO	100				
			0.0	NO			Brown SILT (ML), minor sand; stiff, moist, sand is fine. 2-inch-thick coarse sand lens.		
							Grades to gray (stained) SAND (SW); loose, moist, medium grain.		
15	B2-15		381.2	SLIGHT	100		Gray (stained) SILT (ML); stiff, moist. Hard drilling from 15 feet to 20 feet.	Well constructed using two-inch diameter threaded schedule-40 PVC casing and screened with machine-cut 0.020-inch slots. Filter media consists of #8/10 sand. Ecology Well Tag ID: BKR 328	
			33.1	SLIGHT					
	B2-19		955.1	MOD.			Becomes with mottled black staining and saturated.		
20			27.2	NO	100		Grades from gray to tan silty SAND (SM); dense, saturated, fine. Strong petroleum odor at 19 feet. Becomes loose.		
			30.1	NO			Becomes very dense; hard drilling from 22.5 feet to 25 feet.		
25	B2-25		0.0	NO			Boring complete at 25 feet. Installed groundwater monitoring well.		

DRILLING CONTRACTOR **Cascade Drilling**

DRILLING METHOD **Hand Auger/Direct Push**

DRILLING EQUIPMENT **Geoprobe 7720DT**

DRILLING STARTED **3/15/18** ENDED **3/15/18**

REMARKS **Boring advanced from 0 to 5 feet bgs using hand auger, then advanced to terminal depth using direct-push tooling.**

See key sheet for symbols and abbreviations used above.

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BORING NO. **B3** PAGE **1** OF **1**

PROJECT **DeBock's Texaco**

LOCATION **Grandview, Washington**

START CARD **SE65434** WELL ID

COORDINATES PROJECT NO. **2093-01**

SURFACE ELEVATION DATUM LOGGED BY **DBP**

DEPTH FEET	LAB SAMPLE ID	pH	PID (ppmV)	SHEEN	RECOVERY %	STRATA	DESCRIPTION	CONSTRUCTION DETAIL/ COMMENTS	ELEVATION FEET
					100		Concrete.		
							Brown sandy SILT (SM); soft, damp, sand is fine.	Installed temporary 3/4-inch Sch 40 PVC well screened from 15 to 25 feet with 0.010-inch slots. Conductor casing left in place from 0 to 15 feet during groundwater sampling. Collected groundwater sample B3W.	
	B3-3		0.0	VERY SLIGHT					
5			0.0	NO	100		Becomes stiff.		
			0.0	NO					
							1-inch-thick sand lenses at 9 and 9.5 feet; sand is fine to medium.		
10	B3-10		0.0	NO	100		Brown SAND (SP), minor silt; loose, moist, medium grain.		
							Brown silty SAND (SM); medium dense, moist, fine.		
			107.1	NO			Gray (stained) SILT (ML), trace sand; stiff, moist, sand is fine. Fine sand lens from 14 to 14.5 feet.		
15			215.3	SLIGHT	100				
	B3-15		1,863	MOD.			Gray with mottled black (stained) silty SAND (SM); dense, wet, sand is fine. Black (stained) lens from 15 to 15.2 feet; strong petroleum odor.		
			343.1	SLIGHT					
20	B3-20		9.0	NO	100		Grades to light-brown and becomes saturated. Becomes loose.	▼	
			4.1	NO			Becomes very dense.		
25	B3-25		1.5	NO					
							Boring complete at 25 feet, backfilled with bentonite chips and finished at surface with concrete.		

DRILLING CONTRACTOR **Cascade Drilling**

DRILLING METHOD **Hand Auger/Direct Push**

DRILLING EQUIPMENT **Geoprobe 7720DT**

DRILLING STARTED **3/16/18** ENDED **3/16/18**

REMARKS **Boring advanced from 0 to 5 feet bgs using hand auger, then advanced to terminal depth using direct-push tooling.**

See key sheet for symbols and abbreviations used above.

EES LOG WITH WELL & SHEEN - LOG A EWNN03.GDT - 8/22/19 09:40 - C:\USERS\DANIELE\DROPBOX (EES ENVIRONMENTAL)\PROJECTS_GINT\PROJECTS\2093-01 DEBOCKS 082119.GPJ

EES EES Environmental Consulting, Inc.

BORING NO. **B4** PAGE **1** OF **1**

PROJECT **DeBock's Texaco**

LOCATION **Grandview, Washington**

START CARD **SE65434** WELL ID

COORDINATES PROJECT NO. **2093-01**

SURFACE ELEVATION DATUM LOGGED BY **DBP**

SAMPLE INFORMATION						STRATA	DESCRIPTION	CONSTRUCTION DETAIL/ COMMENTS	ELEVATION FEET
DEPTH FEET	LAB SAMPLE ID	pH	PID (ppmV)	SHEEN	RECOVERY %				
					20		Concrete.		
							Gray GRAVEL (GP); medium dense, dry, fine (pea gravel; fill).		
							No recovery from 2 to 14 feet (pea gravel being pushed to side by shoe).	Installed temporary 3/4-inch Sch 40 PVC well screened from 15 to 25 feet with 0.010-inch slots. Conductor casing left in place from 0 to 15 feet during groundwater sampling. Collected groundwater sample B4W.	
5					0				
10					20				
15	B4-15		719.1 2,121	VERY SLIGHT HEAVY	100		Brown silty SAND (SM); medium dense, moist, fine. Becomes stained gray at 14.5 feet. Strong petroleum odor from 15.5 to 20 feet.		
	B4-17		2,195	HEAVY			Gray (stained) SILT (ML), minor sand; medium stiff, saturated, sand is fine. Becomes medium soft; sheen on core from 16.5 to 18.5 feet. Becomes medium stiff.		
20	B4-20		2,774	HEAVY	100		Gray (stained) silty SAND (SM); very dense, wet, fine, stratified 0.5-inch-thick fine sand layers every 1 foot. Very hard drilling from 20 to 25 feet. ▼		
25	B4-25			NO			Boring complete at 25 feet, backfilled with bentonite chips, and finished at surface with concrete.		

DRILLING CONTRACTOR **Cascade Drilling**

DRILLING METHOD **Hand Auger/Direct Push**

DRILLING EQUIPMENT **Geoprobe 7720DT**

DRILLING STARTED **3/16/18** ENDED **3/16/18**

REMARKS **Boring advanced to terminal depth using direct-push tooling.**

See key sheet for symbols and abbreviations used above.

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BORING NO. **B5** PAGE **1** OF **1**

PROJECT **DeBock's Texaco**

LOCATION **Grandview, Washington**

START CARD **RE15821** WELL ID **MW-5**

COORDINATES PROJECT NO. **2093-01**

SURFACE ELEVATION DATUM LOGGED BY **NG**

SAMPLE INFORMATION						STRATA	DESCRIPTION	CONSTRUCTION DETAIL/ COMMENTS	ELEVATION FEET
DEPTH FEET	LAB SAMPLE ID	pH	PID (ppmV)	SHEEN	RECOVERY %				
					100		Vegetation.		
							Brown silty SAND (SM); very loose, dry, fine.	Well is sealed at the surface using concrete, a flush-mounted traffic-rated steel monument and locking cap.	
			1.0	VERY SLIGHT					
5	B5-5		2.6	VERY SLIGHT	100				
			0.5	NO					
10	B5-10		0.2	VERY SLIGHT	100		Becomes dense.		
			1.5	SLIGHT					
15	B5-15		1,597	SLIGHT	100		Stong petroleum odor from 14.5 to 20 feet. Gray to black (stained) SAND (SP) with silt; dense, dry, fine.	Well constructed using two-inch diameter threaded schedule-40 PVC casing and screened with machine-cut 0.020-inch slots. Filter media consists of #8/10 sand. Ecology Well Tag ID: BKR 329	
			8.1	SLIGHT			Gray (stained) silty SAND (SM); dense, wet, fine.		
20	B5-20		36.2	SLIGHT					
			44.0	SLIGHT	100		Brown SAND (SP) with silt; dense, moist, fine.		
			2.6	NO					
							Brown sandy SILT (ML); dense, wet, sand is fine.		
25	B5-25		0.5	NO					
							Boring complete at 25 feet. Installed groundwater monitoring well.		

DRILLING CONTRACTOR **Cascade Drilling**

DRILLING METHOD **Hand Auger/Direct Push**

DRILLING EQUIPMENT **Geoprobe 7720DT**

DRILLING STARTED **3/16/18** ENDED **3/16/18**

REMARKS **Boring advanced from 0 to 5 feet bgs using hand auger, then advanced to terminal depth using direct-push tooling.**

See key sheet for symbols and abbreviations used above.

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BORING NO. **B6** PAGE **1** OF **1**

PROJECT **DeBock's Texaco**

LOCATION **Grandview, Washington**

START CARD **SE65434** WELL ID

COORDINATES

PROJECT NO. **2093-01**

SURFACE ELEVATION DATUM

LOGGED BY **DBP**

SAMPLE INFORMATION						STRATA	DESCRIPTION	CONSTRUCTION DETAIL/ COMMENTS	ELEVATION FEET
DEPTH FEET	LAB SAMPLE ID	pH	PID (ppmV)	SHEEN	RECOVERY %				
					100		Vegetation and topsoil.		
							1-inch-thick asphalt layer.		
	B6-3		0.0	VERY SLIGHT			Gray-brown silty SAND (SM), minor gravel; loose, moist, fine, gravel is coarse. Gravel becomes trace.	Installed temporary 3/4-inch Sch 40 PVC well screened from 20 to 25 feet with 0.010-inch slots. Conductor casing left in place from 0 to 20 feet during groundwater sampling. Collected groundwater sample B6W.	
5			0.0	VERY SLIGHT	100				
			0.0	NO			Becomes very dense.		
10			0.0	NO	100		Becomes brown.		
			1.2	NO					
							Becomes gray (stained).		
15	B6-15		148.5	NO	100		Gray (stained) SAND (SP), trace silt; moist, fine to medium.		
	B6-17		1,096	SLIGHT			Gray (stained) silty SAND (SM); dense, moist, fine, stratified 1- to 2-inch-thick fine to medium sand layers every 1 to 2 feet from 14.5 to 20 feet. Strong petroleum odor from 17 to 23 feet.		
20	B6-20		990.9	SLIGHT	100				
			345.3	SLIGHT			Light-brown SILT (ML) with sand; soft, saturated, sand is fine. Strong petroleum odor.	▼	
							Light-brown silty SAND (SM); very dense, saturated, sand is fine.		
25	B6-25		2.5	NO					
							Boring complete at 25 feet, backfilled with bentonite chips, and finished at surface with existing soil.		

DRILLING CONTRACTOR **Cascade Drilling**

DRILLING METHOD **Hand Auger/Direct Push**

DRILLING EQUIPMENT **Geoprobe 7720DT**

DRILLING STARTED **4/2/18** ENDED **4/4/18**

REMARKS **Boring advanced from 0 to 5 feet bgs using hand auger, then advanced to terminal depth using direct-push tooling.**

See key sheet for symbols and abbreviations used above.

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BORING NO. **B7** PAGE **1** OF **1**

PROJECT **DeBock's Texaco**

LOCATION **Grandview, Washington**

START CARD **SE65434** WELL ID

COORDINATES PROJECT NO. **2093-01**

SURFACE ELEVATION DATUM LOGGED BY **DBP**

SAMPLE INFORMATION						STRATA	DESCRIPTION	CONSTRUCTION DETAIL/ COMMENTS	ELEVATION FEET
DEPTH FEET	LAB SAMPLE ID	pH	PID (ppmV)	SHEEN	RECOVERY %				
					100		Vegetation and topsoil.		
							1-inch-thick asphalt layer.		
	B7-3		0.0	NO			Gray-brown silty SAND (SM), trace gravel; loose, moist, fine, gravel is coarse.		
							Becomes medium dense and without gravel.		
5			0.5	NO	100				
			0.7	NO					
							Mottled rust-red color from 9 to 9.5 feet.		
10			0.7	NO	100				
				HEAVY			Black staining at 14 feet. Strong petroleum odor from 14 to 20 feet.		
15	B7-15		276.0		100		Becomes gray (stained). 1-inch-thick fine to medium sand lens at 14.5 feet.		
							Becomes medium loose.		
			343.1	SLIGHT					
20	B7-20		1,076	SLIGHT	100				
							Gray SILT (ML), with fine sand; loose, saturated, sand is fine. Grades to light-brown.	▼	
			11.5	NO					
							Light-brown silty SAND (SM); medium dense, saturated, fine.		
25			3.7	NO					
							Boring complete at 25 feet, backfilled with bentonite chips, and finished at surface with existing soil.		

CONSTRUCTION DETAIL/ COMMENTS: Installed temporary 3/4-inch Sch 40 PVC well screened from 20 to 25 feet with 0.010-inch slots. Conductor casing left in place from 0 to 20 feet during groundwater sampling. Collected groundwater sample B7W.

DRILLING CONTRACTOR **Cascade Drilling**

DRILLING METHOD **Hand Auger/Direct Push**

DRILLING EQUIPMENT **Geoprobe 7720DT**

DRILLING STARTED **4/2/18** ENDED **4/3/18**

REMARKS **Boring advanced from 0 to 5 feet bgs using hand auger, then advanced to terminal depth using direct-push tooling.**

See key sheet for symbols and abbreviations used above.

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BORING NO. **B8** PAGE **1** OF **1**

PROJECT **DeBock's Texaco**

LOCATION **Grandview, Washington**

START CARD **SE65434** WELL ID

COORDINATES PROJECT NO. **2093-01**

SURFACE ELEVATION DATUM LOGGED BY **DBP**

SAMPLE INFORMATION						STRATA	DESCRIPTION	CONSTRUCTION DETAIL/ COMMENTS	ELEVATION FEET
DEPTH FEET	LAB SAMPLE ID	pH	PID (ppmV)	SHEEN	RECOVERY %				
					100		Gray GRAVEL (GP); dry, coarse (fill).		
							Gray-brown silty SAND (SM); medium loose, moist, fine.	Installed temporary 3/4-inch Sch 40 PVC well screened from 20 to 25 feet with 0.010-inch slots. Conductor casing left in place from 0 to 20 feet during groundwater sampling. Collected groundwater sample B8W.	
	B8-3		0.7	NO					
5			0.3	NO	100				
			0.4	NO					
							Becomes brown and sand becomes fine to medium.		
10			0.7	NO	100				
			1.1	NO			Becomes very dense.		
							Becomes stained gray. Strong petroleum odor from 14 to 20 feet. 2-inch-thick fine to medium sand lens.		
15	B8-15		349.2	SLIGHT	100				
							Becomes medium dense.		
			271.1	SLIGHT					
20	B8-20		613.1	SLIGHT	100		Grades to light-brown.		
							Becomes loose and saturated. ▼		
			1.5	NO			Light-brown sandy SILT (ML); soft, saturated, sand is fine.		
							Light-brown, silty SAND (SM); very dense, saturated, fine.		
25	B8-25		1.3	NO			Boring complete at 25 feet, backfilled with bentonite chips, and finished at surface with existing gravel.		

DRILLING CONTRACTOR **Cascade Drilling**

DRILLING METHOD **Hand Auger/Direct Push**

DRILLING EQUIPMENT **Geoprobe 7720DT**

DRILLING STARTED **4/2/18** ENDED **4/3/18**

REMARKS **Boring advanced from 0 to 10 feet bgs using hand auger, then advanced to terminal depth using direct-push tooling.**

See key sheet for symbols and abbreviations used above.

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PROJECT **DeBock's Texaco**

LOCATION **Grandview, Washington**

START CARD **SE65434** WELL ID

COORDINATES PROJECT NO. **2093-01**

SURFACE ELEVATION DATUM LOGGED BY **DBP**

DEPTH FEET	LAB SAMPLE ID	pH	PID (ppmV)	SHEEN	RECOVERY %	STRATA	DESCRIPTION	CONSTRUCTION DETAIL/ COMMENTS	ELEVATION FEET
					100		Gray GRAVEL (GP); dry, coarse (fill).		
							Brown silty SAND (SM), minor gravel; medium loose, moist, fine to medium, gravel is coarse (fill).	Installed temporary 3/4-inch Sch 40 PVC well screened from 20 to 25 feet with 0.010-inch slots. Conductor casing left in place from 0 to 20 feet during groundwater sampling. Collected groundwater sample B9W.	
			0.0	SLIGHT			Pieces of brick from 3 to 8 feet.		
5			0.0	SLIGHT	100				
			0.0	VERY SLIGHT			Cobble at 6.5 feet.		
10			0.0	SLIGHT	100				
			0.0	NO			Gray-brown SILT (ML), minor sand; dense, moist, sand is fine (native).		
15			132.0	SLIGHT	100		1-inch-thick black (stained) fine sand lens at 14 feet. Gray (stained) silty SAND (SM); dense, moist, fine.		
	B9-16.5		502.1	HEAVY			Gray (stained) SILT (ML), minor sand; medium stiff, wet, sand is fine, mottled black staining. Strong petroleum odor at 16.5 feet.		
20	B9-20		416.3	SLIGHT	100		Gray (stained) silty SAND (SM); medium dense, moist, fine. Grades to light-brown; becomes loose and saturated. ▼		
			1.9	NO			Becomes medium dense.		
25			1.5	NO			Becomes dense.		
							Boring complete at 25 feet, backfilled with bentonite chips, and finished at surface with existing gravel.		

DRILLING CONTRACTOR **Cascade Drilling**

DRILLING METHOD **Hand Auger/Direct Push**

DRILLING EQUIPMENT **Geoprobe 7720DT**

DRILLING STARTED **4/3/18** ENDED **4/3/18**

REMARKS **Boring advanced from 0 to 6.5 feet bgs using hand auger, then advanced to terminal depth using direct-push tooling.**

See key sheet for symbols and abbreviations used above.

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BORING NO. **B10** PAGE **1** OF **1**

PROJECT **DeBock's Texaco**

LOCATION **Grandview, Washington**

START CARD **SE65434** WELL ID

COORDINATES

PROJECT NO. **2093-01**

SURFACE ELEVATION DATUM

LOGGED BY **DBP**

SAMPLE INFORMATION						STRATA	DESCRIPTION	CONSTRUCTION DETAIL/ COMMENTS	ELEVATION FEET
DEPTH FEET	LAB SAMPLE ID	pH	PID (ppmV)	SHEEN	RECOVERY %				
					100		Gray GRAVEL (GP); dry, coarse (fill).		
							Gray-brown silty SAND (SM); medium loose, moist, fine.	Installed temporary 3/4-inch Sch 40 PVC well screened from 20 to 25 feet with 0.010-inch slots. Conductor casing left in place from 0 to 20 feet during groundwater sampling. Collected groundwater sample B10W.	
	B10-3		0.6	SLIGHT					
5			0.0	SLIGHT	100				
			0.0	VERY SLIGHT					
							Sand becomes fine to medium.		
10			0.0	VERY SLIGHT	100				
			0.0	VERY SLIGHT					
							Gray-brown SILT (ML), with sand; stiff, moist, sand is fine.		
15	B10-15		0.0	NO	100				
			126.9	MOD.			1-inch-thick black (stained) fine sand lens; strong petroleum odor. Becomes gray (stained).		
							Gray (stained) silty SAND (SM); dense, moist, fine. Grades to light-brown.		
20	B10-20		136.3	NO	100			▼	
							Becomes loose and saturated.		
			12.5	NO					
							Becomes very dense.		
25			1.0	NO			Boring complete at 25 feet, backfilled with bentonite chips, and finished at surface with existing gravel.		

DRILLING CONTRACTOR **Cascade Drilling**

DRILLING METHOD **Hand Auger/Direct Push**

DRILLING EQUIPMENT **Geoprobe 7720DT**

DRILLING STARTED **4/3/18** ENDED **4/4/18**

REMARKS **Boring advanced from 0 to 10 feet bgs using hand auger, then advanced to terminal depth using direct-push tooling.**

See key sheet for symbols and abbreviations used above.

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BORING NO. **B11** PAGE **1** OF **1**

PROJECT **DeBock's Texaco**

LOCATION **Grandview, Washington**

START CARD **RE15821** WELL ID **MW-8**

COORDINATES PROJECT NO. **2093-01**

SURFACE ELEVATION DATUM LOGGED BY **DBP**

DEPTH FEET	LAB SAMPLE ID	pH	PID (ppmV)	SHEEN	RECOVERY %	STRATA	DESCRIPTION	CONSTRUCTION DETAIL/ COMMENTS	ELEVATION FEET
					100		Gray GRAVEL (GP); dry, coarse (fill).		
							Brown silty SAND (SM), minor gravel; medium loose, moist, fine to medium, gravel is coarse (fill).	Well is sealed at the surface using concrete, a flush-mounted traffic-rated steel monument and locking cap.	
	B11-3		0.0	SLIGHT					
			0.0	NO			Gray-brown silty SAND (SM); medium dense, moist, fine (native).		
5					100				
			0.0	NO					
			0.0	NO					
10					100				
			0.0	NO					
			0.0	NO					
15					100		Gray-brown SILT (ML), trace sand; medium soft, moist, sand is fine.	Well constructed using two-inch diameter threaded schedule-40 PVC casing and screened with machine-cut 0.020-inch slots. Filter media consists of #8/10 sand. Ecology Well Tag ID: BKR 333	
	B11-16		168.3	SLIGHT			Becomes stained gray. Strong petroleum odor from 16.5 to 20 feet. Becomes medium stiff.		
							Gray (stained) silty SAND (SM); dense, moist to wet, fine. Grades to gray-brown from 18.5 to 19.5 feet.		
20	B11-20		863.3	MOD.	100		Becomes medium loose and saturated.	0.5-inch-thick layer of LNAPL observed floating on water column.	
			68.2	NO			Grades to light-brown.		
25			1.2	NO			Boring complete at 25 feet. Installed groundwater monitoring well.		

DRILLING CONTRACTOR **Cascade Drilling**

DRILLING METHOD **Hand Auger/Direct Push**

DRILLING EQUIPMENT **Geoprobe 7720DT**

DRILLING STARTED **4/3/18** ENDED **4/4/18**

REMARKS **Boring advanced from 0 to 10 feet bgs using hand auger, then advanced to terminal depth using direct-push tooling.**

See key sheet for symbols and abbreviations used above.

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BORING NO. **B12** PAGE **1** OF **1**
PROJECT **DeBock's Texaco**
LOCATION **Grandview, Washington**
PROJECT NO. **2093-01**
LOGGED BY **DBP**

START CARD **RE15821** WELL ID **MW-6**
COORDINATES
SURFACE ELEVATION DATUM

DEPTH FEET	LAB SAMPLE ID	pH	PID (ppmV)	SHEEN	RECOVERY %	STRATA	DESCRIPTION	CONSTRUCTION DETAIL/ COMMENTS	ELEVATION FEET
0					100		Gray GRAVEL (GP); dry, coarse (fill).		
							Gray-brown silty SAND (SM); medium dense, moist, fine.	Well is sealed at the surface using concrete, a flush-mounted traffic-rated steel monument and locking cap.	
	B12-3		0.0	NO					
5			0.0	NO	100				
			0.0	NO					
10	B12-10		0.0	NO	100				
			0.0	NO					
15			1.6	NO	100				
	B12-16		1,591	MOD.			Gray (stained) sandy SILT (ML); medium soft, wet, sand is fine. Strong petroleum odor at 15.5 feet. 1-inch-thick black stained lens at 16 feet.	Well constructed using two-inch diameter threaded schedule-40 PVC casing and screened with machine-cut 0.020-inch slots. Filter media consists of #8/10 sand. Ecology Well Tag ID: BKR 331	
							Gray (stained) silty SAND (SM); dense, moist, fine.		
20	B12-20		7.1	MOD.	100				
							Grades to light-brown; becomes loose and saturated.		
			1.9	NO					
							Becomes very dense.		
25			0.8	NO					
							Boring complete at 25 feet. Installed groundwater monitoring well.		

DRILLING CONTRACTOR **Cascade Drilling**
DRILLING METHOD **Hand Auger/Direct Push**
DRILLING EQUIPMENT **Geoprobe 7720DT**
DRILLING STARTED **4/3/18** ENDED **4/3/18**

REMARKS **Boring advanced from 0 to 10 feet bgs using hand auger, then advanced to terminal depth using direct-push tooling.**

See key sheet for symbols and abbreviations used above.

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BORING NO. **B13** PAGE **1** OF **1**
PROJECT **DeBock's Texaco**
LOCATION **Grandview, Washington**
PROJECT NO. **2093-01**
LOGGED BY **DBP**

START CARD **RE15821** WELL ID **MW-7**
COORDINATES
SURFACE ELEVATION DATUM

DEPTH FEET	LAB SAMPLE ID	pH	PID (ppmV)	SHEEN	RECOVERY %	STRATA	DESCRIPTION	CONSTRUCTION DETAIL/ COMMENTS	ELEVATION FEET
					100		Vegetation.		
							Gray-brown silty SAND (SM); medium loose, dry, fine.	Well is sealed at the surface using concrete, a flush-mounted traffic-rated steel monument and locking cap.	
			0.0	VERY SLIGHT					
5			0.0	VERY SLIGHT	100		Becomes moist.		
			0.0	NO					
10			0.0	NO	100				
			0.0	NO			3-inch-thick medium sand lens.		
15	B13-15		0.0	NO	100		Gray-brown SILT (ML), minor sand; medium stiff, moist, sand is fine.	Well constructed using two-inch diameter threaded schedule-40 PVC casing and screened with machine-cut 0.020-inch slots. Filter media consists of #8/10 sand. Ecology Well Tag ID: BKR 332	
			78.9	MOD.			1-inch-thick black (stained) sand lens. Becomes gray (stained).		
							1-inch-thick medium sand lens.		
20	B13-20		472.1	MOD.	100		Gray (stained) silty SAND (SM); medium dense, wet, fine. Mottled black staining; strong petroleum odor. Grades to light-brown. Becomes loose and saturated.		
			7.8	VERY SLIGHT			Becomes medium dense.		
25	B13-25		0.7	NO			Becomes dense.		
							Boring complete at 25 feet. Installed groundwater monitoring well.		

DRILLING CONTRACTOR **Cascade Drilling**
DRILLING METHOD **Hand Auger/Direct Push**
DRILLING EQUIPMENT **Geoprobe 7720DT**
DRILLING STARTED **4/3/18** ENDED **4/3/18**

REMARKS **Boring advanced from 0 to 5 feet bgs using hand auger, then advanced to terminal depth using direct-push tooling.**

See key sheet for symbols and abbreviations used above.

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BORING NO. **B14** PAGE **1** OF **1**

PROJECT **DeBock's Texaco**

LOCATION **Grandview, Washington**

START CARD **RE15821** WELL ID **MW-9**

COORDINATES PROJECT NO. **2093-01**

SURFACE ELEVATION DATUM LOGGED BY **DBP**

DEPTH FEET	LAB SAMPLE ID	pH	PID (ppmV)	SHEEN	RECOVERY %	STRATA	DESCRIPTION	CONSTRUCTION DETAIL/ COMMENTS	ELEVATION FEET
					100		Concrete.		
							Gray GRAVEL (GP); dry, coarse (fill).		
							Gray-brown silty SAND (SM); medium loose, moist, fine.	Well is sealed at the surface using concrete, a flush-mounted traffic-rated steel monument and locking cap.	
	B14-3		0.0	VERY SLIGHT					
5			0.0	NO	100				
			0.0	NO			Stratified 1- to 1.5-inch-thick medium sand layers every 1 to 1.5 feet from 7 to 14 feet.		
10			0.0	NO	100				
			0.0	NO			Becomes moist and dense.		
15			0.0	NO	100			Well constructed using two-inch diameter threaded schedule-40 PVC casing and screened with machine-cut 0.020-inch slots. Filter media consists of #8/10 sand. Ecology Well Tag ID: BKR 334	
	B14-16		169.0	MOD.			Becomes gray (stained).		
							Becomes loose and saturated. Grades to light-brown.		
20			0.8	NO	100		Becomes medium dense.		
							Becomes loose.		
			0.0	NO					
25			0.0	NO			Becomes very dense.		
							Boring complete at 25 feet. Installed groundwater monitoring well.		

DRILLING CONTRACTOR **Cascade Drilling**

DRILLING METHOD **Hand Auger/Direct Push**

DRILLING EQUIPMENT **Geoprobe 7720DT**

DRILLING STARTED **4/4/18** ENDED **4/4/18**

REMARKS **Boring advanced from 0 to 5 feet bgs using hand auger, then advanced to terminal depth using direct-push tooling.**

See key sheet for symbols and abbreviations used above.

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BORING NO. **B15** PAGE **1** OF **1**

PROJECT **DeBock's Texaco**

LOCATION **Grandview, Washington**

START CARD **RE15821** WELL ID **MW-10**

COORDINATES PROJECT NO. **2093-01**

SURFACE ELEVATION DATUM LOGGED BY **DBP**

DEPTH FEET	LAB SAMPLE ID	pH	PID (ppmV)	SHEEN	RECOVERY %	STRATA	DESCRIPTION	CONSTRUCTION DETAIL/ COMMENTS	ELEVATION FEET
					100		Concrete.		
							Gray GRAVEL (GP); dry, coarse (fill).		
							Gray-brown silty SAND (SM); medium loose, moist, fine.	Well is sealed at the surface using concrete, a flush-mounted traffic-rated steel monument and locking cap.	
	B15-3		0.0	VERY SLIGHT					
5			0.0	NO	100				
			0.0	NO			Stratified 1- to 2-inch-thick medium sand layers every 1 to 1.5 feet from 6 to 13.5 feet.		
10			0.0	NO	100				
			0.0	NO			Becomes medium dense.		
							Becomes gray (stained).		
15	B15-15		2,090	MOD.	100		Strong petroleum odor at 15 feet.	Well constructed using two-inch diameter threaded schedule-40 PVC casing and screened with machine-cut 0.020-inch slots. Filter media consists of #8/10 sand. Ecology Well Tag ID: BKR 335	
			179.8	NO					
							Becomes loose and saturated. Grades to gray-brown (stained). Becomes medium dense.		
20	B15-20		566.1	NO	100		Grades to light-brown.		
			166.0	NO					
							Becomes dense.		
25			5.4	NO			Boring complete at 25 feet. Installed groundwater monitoring well.		

DRILLING CONTRACTOR **Cascade Drilling**

DRILLING METHOD **Hand Auger/Direct Push**

DRILLING EQUIPMENT **Geoprobe 7720DT**

DRILLING STARTED **4/4/18** ENDED **4/4/18**

REMARKS **Boring advanced from 0 to 5 feet bgs using hand auger, then advanced to terminal depth using direct-push tooling.**

See key sheet for symbols and abbreviations used above.

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EES EES Environmental Consulting, Inc.

BORING NO. **B16** PAGE **1** OF **1**

PROJECT **DeBock's Texaco**

LOCATION **Grandview, Washington**

START CARD **RE15821** WELL ID **MW-11**

COORDINATES PROJECT NO. **2093-01**

SURFACE ELEVATION DATUM LOGGED BY **DBP**

DEPTH FEET	LAB SAMPLE ID	pH	PID (ppmV)	SHEEN	RECOVERY %	STRATA	DESCRIPTION	CONSTRUCTION DETAIL/ COMMENTS	ELEVATION FEET
					100		Concrete.		
							Gray GRAVEL (GP); dry, coarse (fill).		
							Gray-brown silty SAND (SM); medium loose, moist, fine.	Well is sealed at the surface using concrete, a flush-mounted traffic-rated steel monument and locking cap.	
	B16-3		0.0	NO					
5			0.0	NO	100				
			0.0	NO			Stratified 1- to 2-inch-thick medium sand layers every 1 to 1.5 feet from 8 to 15 feet.		
10			0.0	NO	100				
			37.9	SLIGHT			Black (stained) silt lens. Becomes gray (stained). Strong petroleum odor from 12 to 14 feet.		
	B16-14		282.5	SLIGHT					
15					100			Well constructed using two-inch diameter threaded schedule-40 PVC casing and screened with machine-cut 0.020-inch slots. Filter media consists of #8/10 sand. Ecology Well Tag ID: BKR 336	
			131.1	NO			Becomes loose and saturated.		
20	B16-20		30.4	NO	100		Becomes medium dense.		
							Becomes medium loose.		
			16.5	NO					
							Becomes medium dense.		
25			3.8	NO					
							Boring complete at 25 feet. Installed groundwater monitoring well.		

DRILLING CONTRACTOR **Cascade Drilling**

DRILLING METHOD **Hand Auger/Direct Push**

DRILLING EQUIPMENT **Geoprobe 7720DT**

DRILLING STARTED **4/5/18** ENDED **4/5/18**

REMARKS **Boring advanced from 0 to 5 feet bgs using hand auger, then advanced to terminal depth using direct-push tooling.**

See key sheet for symbols and abbreviations used above.

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BORING NO. **B17** PAGE **1** OF **1**

PROJECT **DeBock's Texaco**

LOCATION **Grandview, Washington**

START CARD **RE15821** WELL ID **MW-12**

COORDINATES PROJECT NO. **2093-01**

SURFACE ELEVATION DATUM LOGGED BY **DBP**

DEPTH FEET	LAB SAMPLE ID	pH	PID (ppmV)	SHEEN	RECOVERY %	STRATA	DESCRIPTION	CONSTRUCTION DETAIL/ COMMENTS	ELEVATION FEET
					100		Concrete.		
							Gray GRAVEL (GP); dry, coarse (fill), brick at 1 foot.	Well is sealed at the surface using concrete, a flush-mounted traffic-rated steel monument and locking cap.	
	B17-3		0.0	VERY SLIGHT			Gray-brown silty SAND (SM); medium loose, moist, fine.		
5			0.0	NO	100				
			0.0	NO					
10			0.0	NO	100				
			0.0	NO					
			263.3		100		Becomes gray (stained). Strong petroleum odor from 14 to 18.5 feet.		
15	B17-16.5		1,867	VERY SLIGHT			Stratified 1- to 2-inch-thick medium sand layers every 1 to 1.5 feet from 15.5 to 20 feet.	Well constructed using two-inch diameter threaded schedule-40 PVC casing and screened with machine-cut 0.020-inch slots. Filter media consists of #8/10 sand. Ecology Well Tag ID: BKR 337	
			858.8	VERY SLIGHT			Becomes loose and saturated.		
20	B17-20		15.6	NO	100		Grades to light-gray (stained).		
			3.1	NO			Grades to light-brown.		
			0.7	NO			Becomes very dense.		
25							Boring complete at 25 feet. Installed groundwater monitoring well.		

DRILLING CONTRACTOR **Cascade Drilling**

DRILLING METHOD **Hand Auger/Direct Push**

DRILLING EQUIPMENT **Geoprobe 7720DT**

DRILLING STARTED **4/5/18** ENDED **4/5/18**

REMARKS **Boring advanced from 0 to 5 feet bgs using hand auger, then advanced to terminal depth using direct-push tooling.**

See key sheet for symbols and abbreviations used above.

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BORING NO. **B18** PAGE **1** OF **1**
PROJECT **DeBock's Texaco**
LOCATION **Grandview, Washington**
PROJECT NO. **2093-01**
LOGGED BY **PCT**

START CARD **RE18004** WELL ID **MW-13**
COORDINATES
SURFACE ELEVATION **812.98'** DATUM

DEPTH FEET	LAB SAMPLE ID	pH	PID (ppmV)	SHEEN	RECOVERY %	STRATA	DESCRIPTION	CONSTRUCTION DETAIL/ COMMENTS	ELEVATION FEET
					100		Topsoil and grass.		
							Brown SILT (ML), trace sand and gravel; medium stiff, dry, sand is fine, gravel is coarse.	Well is sealed at the surface using concrete, a flush-mounted traffic-rated steel monument and locking cap.	
			0.0	SLIGHT			Becomes moist.		
							Becomes without gravel, otherwise same as above.		
5			0.0	VERY SLIGHT	100		0.5-inch-thick ash lens.		
							Gray-brown silty SAND (SM); loose, moist, fine.		
			0.0	NO			Stratified brown medium sand, from 8' to 8.5'.		
10	MW13-10		0.0	NO	100				
							Brown SILT (ML), trace gravel; stiff, moist.		
			0.0	NO			Stratified 1- to 2-inch-thick medium sand lenses every 1.5' to 2' from 13' to 18'.		
15	MW13-15		396	MOD.	100		Becomes gray (stained).	Well constructed using two-inch diameter threaded schedule-40 PVC casing and screened with machine-cut 0.020-inch slots. Filter media consists of #8/12 sand. Ecology Well Tag ID: BLW 391	
			2,633	MOD.			Becomes saturated. Strong petroleum odor.		
							Brown SAND (SP), trace silt; dense, saturated, fine.		
20	MW13-20		60.8	NO	100				
							Brown SILT (ML), trace sand; soft, saturated, sand is fine.		
			73.7	NO					
							Becomes stiff and moist.		
25	MW13-25		12.4	NO					
							Boring complete at 25 feet. Installed groundwater monitoring well.		

DRILLING CONTRACTOR **Cascade Drilling**
DRILLING METHOD **Hand Auger/Direct Push**
DRILLING EQUIPMENT **Geoprobe 7720DT**
DRILLING STARTED **8/6/19** ENDED **8/6/19**

REMARKS **Boring advanced from 0 to 5 feet bgs using hand auger, then advanced to terminal depth using direct-push tooling.**

See key sheet for symbols and abbreviations used above.

EES EES Environmental Consulting, Inc.

BORING NO. **B19** PAGE **1** OF **1**

PROJECT **DeBock's Texaco**

LOCATION **Grandview, Washington**

START CARD **SE65434** WELL ID

COORDINATES

PROJECT NO. **2093-01**

SURFACE ELEVATION DATUM

LOGGED BY **DBP**

SAMPLE INFORMATION						STRATA	DESCRIPTION	CONSTRUCTION DETAIL/ COMMENTS	ELEVATION FEET
DEPTH FEET	LAB SAMPLE ID	pH	PID (ppmV)	SHEEN	RECOVERY %				
					100		Concrete Gray silty GRAVEL (GM); dry, coarse (fill).	Installed temporary 3/4-inch Sch 40 PVC well screened from 15 to 25 feet with 0.010-inch slots. Conductor casing left in place from 0 to 15 feet during groundwater sampling. Collected groundwater sample B19W.	
			0.0	NO			Brown sandy SILT (ML), minor gravel; medium stiff, moist, gravel is coarse, sand is fine.		
5			0.0	NO	100		Becomes without gravel, otherwise same as above.		
			0.0	NO					
10			0.0	NO	100		Brown silty SAND (SM); medium dense, moist, fine to medium.		
			0.0	NO			Brown sandy SILT (ML); medium stiff, moist, sand is fine to medium. Becomes gray (stained).		
15	B19-15		1,812	SLIGHT	100		Gray silty SAND (SM); medium dense, moist, fine to medium, sand and silt stratified in 4-inch-thick layers. Strong petroleum order.		
			256	SLIGHT			Gray-brown (stained) SILT (ML), minor sand; medium stiff, saturated, sand is fine. Grades to tan from 17'-22'. Becomes wet.		
20			590	SLIGHT	100		Tan silty SAND (SM); dense, moist, fine. Becomes saturated.	▼	
			18.1	NO			Becomes tan. Becomes loose.		
25			1.2	NO			Becomes dense.		
							Boring complete at 25 feet, backfilled with bentonite chips, and finished at surface with concrete.		

DRILLING CONTRACTOR **Cascade Drilling**

DRILLING METHOD **Hand Auger/Direct Push**

DRILLING EQUIPMENT **Geoprobe 7720DT**

DRILLING STARTED **8/7/19** ENDED **8/7/19**

REMARKS **Boring advanced from 0 to 5 feet bgs using hand auger, then advanced to terminal depth using direct-push tooling.**

See key sheet for symbols and abbreviations used above.

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BORING NO. **B20** PAGE **1** OF **1**

PROJECT **DeBock's Texaco**

LOCATION **Grandview, Washington**

START CARD **SE70846** WELL ID

COORDINATES

PROJECT NO. **2093-01**

SURFACE ELEVATION DATUM

LOGGED BY **DBP**

SAMPLE INFORMATION						STRATA	DESCRIPTION	CONSTRUCTION DETAIL/ COMMENTS	ELEVATION FEET
DEPTH FEET	LAB SAMPLE ID	pH	PID (ppmV)	SHEEN	RECOVERY %				
					100		Concrete Gray silty GRAVEL (GM); dry, coarse (fill).	Installed temporary 3/4-inch Sch 40 PVC well screened from 15 to 25 feet with 0.010-inch slots. Conductor casing left in place from 0 to 15 feet during groundwater sampling. Collected groundwater sample B20W.	
			0.0	NO			Brown sandy SILT (ML); medium stiff, moist, sand is fine.		
5			0.0	NO	100		0.5-inch-thick ash lens.		
			0.0	NO					
10			0.0	NO	100		Brown silty SAND (SM); medium dense, moist, fine to medium, sand and silt stratified in 4- to 6-inch-thick layers.		
			0.0	NO					
15	B20-15		0.0	NO	100		Brown SILT (ML), minor sand; medium stiff, saturated, sand is fine.		
			0.0	NO					
20			0.0	NO	100		Brown silty SAND (SM); medium dense, saturated, sand is fine. Becomes tan. Becomes loose.	▼	
			1.5	NO					
25			2.9	NO			Becomes dense. Boring complete at 25 feet, backfilled with bentonite chips, and finished at the surface with concrete.		

DRILLING CONTRACTOR **Cascade Drilling**

DRILLING METHOD **Hand Auger/Direct Push**

DRILLING EQUIPMENT **Geoprobe 7720DT**

DRILLING STARTED **8/7/19** ENDED **8/7/19**

REMARKS **Boring advanced from 0 to 5 feet bgs using hand auger, then advanced to terminal depth using direct-push tooling.**

See key sheet for symbols and abbreviations used above.

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BORING NO. **B21** PAGE **1** OF **1**
PROJECT **DeBock's Texaco**
LOCATION **Grandview, Washington**
PROJECT NO. **2093-01**
LOGGED BY **DBP**

START CARD **SE70846** WELL ID
COORDINATES
SURFACE ELEVATION DATUM

DEPTH FEET	LAB SAMPLE ID	pH	PID (ppmV)	SHEEN	RECOVERY %	STRATA	DESCRIPTION	CONSTRUCTION DETAIL/ COMMENTS	ELEVATION FEET
					100		Concrete Gray silty GRAVEL (GM); dry, coarse (fill).	Installed temporary 3/4-inch Sch 40 PVC well screened from 15 to 25 feet with 0.010-inch slots. Conductor casing left in place from 0 to 15 feet during groundwater sampling. Collected groundwater sample B21W.	
			0.0	SLIGHT			Brown sandy SILT (ML); medium stiff, moist, sand is fine.		
			0.0	SLIGHT			1-inch-thick ash lens.		
5					100				
			0.0	SLIGHT			4-inch-thick silty fine sand lens.		
			0.0	SLIGHT			Brown silty SAND (SM); medium dense, moist.		
10					100				
			4.8	VERY SLIGHT			5-inch-thick stiff silt lens.		
	B21-14		839	VERY SLIGHT			Becomes gray (stained). Strong petroleum odor from 13.5' to 17.5'. 6-inch-thick medium stiff silt lens. Becomes wet. 2-inch-thick fine sand lens.		
15					100		3-inch-thick fine to medium sand lens.		
			195	NO			Gray-brown SILT (ML), trace sand; soft, saturated, sand is fine. Becomes tan and stiff.	▼	
			12.3	NO					
20					100		Tan silty SAND (SM); loose, saturated, fine.		
			3.5	NO			Becomes medium dense.		
			0.0	NO					
25							Boring complete at 25 feet, backfilled with bentonite chips, and finished at surface with concrete.		

DRILLING CONTRACTOR **Cascade Drilling**
DRILLING METHOD **Hand Auger/Direct Push**
DRILLING EQUIPMENT **Geoprobe 7720DT**
DRILLING STARTED **8/7/19** ENDED **8/7/19**

REMARKS **Boring advanced from 0 to 5 feet bgs using hand auger, then advanced to terminal depth using direct-push tooling.**

See key sheet for symbols and abbreviations used above.

EES EES Environmental Consulting, Inc.

BORING NO. **B22** PAGE **1** OF **1**

PROJECT **DeBock's Texaco**

LOCATION **Grandview, Washington**

START CARD **SE70846** WELL ID

COORDINATES PROJECT NO. **2093-01**

SURFACE ELEVATION DATUM LOGGED BY **DBP**

SAMPLE INFORMATION						STRATA	DESCRIPTION	CONSTRUCTION DETAIL/ COMMENTS	ELEVATION FEET
DEPTH FEET	LAB SAMPLE ID	pH	PID (ppmV)	SHEEN	RECOVERY %				
					100		Concrete Gray silty GRAVEL (GM); dry, coarse (fill).	Installed temporary 3/4-inch Sch 40 PVC well screened from 15 to 25 feet with 0.010-inch slots. Conductor casing left in place from 0 to 15 feet during groundwater sampling. Collected groundwater sample B22W.	
			0.0	VERY SLIGHT			Brown sandy SILT (ML); medium stiff, moist, sand is fine.		
5			0.0	NO	100		1-inch-thick ash lens.		
			0.0	SLIGHT*			3-inch-thick silty fine sand lens. * Not indicative of petroleum. 5-inch-thick fine sand lens.		
10			0.0	NO	100		2-inch-thick medium sand lens.		
			0.0	NO			1-inch-thick medium to coarse sand lens. Brown SILT (ML), minor sand; medium stiff, wet, sand is fine.		
15	B22-15		0.0	NO	20		No recovery from 15' to 19'.		
20			0.0	NO	100		Tan silty SAND (SM); medium dense, saturated, fine. Becomes loose.	▼	
			0.0	NO			Becomes medium dense.		
25			0.0	NO			Becomes dense.		
							Boring complete at 25 feet, backfilled with bentonite chips, and finished at surface with concrete.		

DRILLING CONTRACTOR **Cascade Drilling**

DRILLING METHOD **Hand Auger/Direct Push**

DRILLING EQUIPMENT **Geoprobe 7720DT**

DRILLING STARTED **8/7/19** ENDED **8/7/19**

REMARKS **Boring advanced from 0 to 5 feet bgs using hand auger, then advanced to terminal depth using direct-push tooling.**

See key sheet for symbols and abbreviations used above.

EES EES Environmental Consulting, Inc.

BORING NO. **B23** PAGE **1** OF **1**

PROJECT **DeBock's Texaco**

LOCATION **Grandview, Washington**

START CARD **SE70846** WELL ID

COORDINATES PROJECT NO. **2093-01**

SURFACE ELEVATION DATUM LOGGED BY **DBP**

SAMPLE INFORMATION						STRATA	DESCRIPTION	CONSTRUCTION DETAIL/ COMMENTS	ELEVATION FEET
DEPTH FEET	LAB SAMPLE ID	pH	PID (ppmV)	SHEEN	RECOVERY %				
					100		Asphalt Gray silty GRAVEL (GM); dry, coarse (fill).		
			0.0	VERY SLIGHT*			Gray-brown sandy SILT (ML); medium stiff, moist, sand is fine. * Not indicative of petroleum.	Installed temporary 3/4-inch Sch 40 PVC well screened from 15 to 25 feet with 0.010-inch slots. Conductor casing left in place from 0 to 15 feet during groundwater sampling. Collected groundwater sample B23W.	
5			0.0	NO	100		1-inch-thick ash lens.		
			0.0	NO					
							1-inch-thick medium sand lens.		
							0.5-inch-thick medium sand lens.		
10			0.0	NO	100				
			0.0	NO			5-inch-thick medium sand lens.		
							Sand becomes trace.		
							Becomes sandy, sand is fine. Becomes stiff.		
15	B23-15		0.0	NO	100				
							Becomes saturated and soft.		
			0.0	NO			Becomes medium stiff.	▼	
20			0.0	NO	100		Becomes soft.		
			0.0	NO					
							Gray-brown silty SAND (SM); dense, saturated, fine.		
25			0.0	NO			Boring complete at 25 feet, backfilled with bentonite chips, and finished at surface with asphalt.		

DRILLING CONTRACTOR **Cascade Drilling**

DRILLING METHOD **Hand Auger/Direct Push**

DRILLING EQUIPMENT **Geoprobe 7720DT**

DRILLING STARTED **8/8/19** ENDED **8/8/19**

REMARKS **Boring advanced from 0 to 5 feet bgs using hand auger, then advanced to terminal depth using direct-push tooling.**

See key sheet for symbols and abbreviations used above.

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Appendix C

Technical Assessment Services, Inc.

MEMORANDUM

To: Chris Rhea
EES Environmental Consulting, Inc.

From: Regina Skarzinskas

Date: 22 February 2020

Re: DeBock's Texaco, Grandview, Washington

MTCATPH11.1 was used to calculate product specific TPH CULs for the Direct Contact with Soil Pathway for DeBock's Texaco in Grandview, Washington. The attached pdf file contains the model output and the Excel workbook summarizes the model results,

MTCATPH11.1 OUTPUT

Table A2 indicates that the measured soil concentrations in all but B4-17 are protective of human health upon direct contact under MTCA Standard B. The adjusted soil concentrations of all samples are protective for this pathway under MTCA Standard B.

A summary of the calculated Clean-up Levels for TPH are presented in the table below:

Sample	TPH CUL (direct contact) (mg/Kg)	Most Stringent	HI
B2-19	2343	YES	1
B4-17	2451	YES	1
B6-17	2441	YES	1
B9-16.5	2859	YES	1
B11-20	2578	YES	1

TPH SUMMARY TABLES –EXCEL WORKBOOK

The most stringent soil concentration was calculated at each sampling location for direct soil contact. The median of the TPH CUL values was calculated to determine the site-wide soil concentration protective of human health by way of the direct contact pathway. This was calculated to be 2451 mg/Kg.

Please let me know if you have any questions or need more information.

7870 SW Bristol Court
Beaverton, OR 97007
Voice (503) 970-9538

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

1. Enter Site Information

Date: 02/22/20
Site Name: DeBocks - Grandview, Washington
Sample Name: B2-19

2. Enter Soil Concentration Measured

Chemical of Concern or Equivalent Carbon Group	Measured Soil Conc dry basis mg/kg	Composition Ratio %
Petroleum EC Fraction		
AL_EC >5-6		0.00%
AL_EC >6-8		0.00%
AL_EC >8-10	105	35.28%
AL_EC >10-12	94	31.59%
AL_EC >12-16	6.5	2.18%
AL_EC >16-21	6.5	2.18%
AL_EC >21-34	6.5	2.18%
AR_EC >8-10	25.4	8.53%
AR_EC >10-12	23.7	7.96%
AR_EC >12-16	6.5	2.18%
AR_EC >16-21	6.5	2.18%
AR_EC >21-34	6.5	2.18%
Benzene	0.28	0.09%
Toluene	1.1	0.37%
Ethylbenzene	2.2	0.74%
Total Xylenes	2.99	1.00%
Naphthalene	3.7	1.24%
1-Methyl Naphthalene		0.00%
2-Methyl Naphthalene		0.00%
n-Hexane		0.00%
MTBE	0.23	0.08%
Ethylene Dibromide (EDB)		0.00%
1,2 Dichloroethane (EDC)		0.00%
Benzo(a)anthracene		0.00%
Benzo(b)fluoranthene		0.00%
Benzo(k)fluoranthene		0.00%
Benzo(a)pyrene		0.00%
Chrysene		0.00%
Dibenz(a,h)anthracene		0.00%
Indeno(1,2,3-cd)pyrene		0.00%
Sum	297.6	100.00%

Notes for Data Entry | Set Default Hydrogeology
Clear All Soil Concentration Data Entry Cells
Restore All Soil Concentration Data cleared

REMARK:
Enter site-specific information here.....

3. Enter Site-Specific Hydrogeological Data

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

4. Target TPH Ground Water Concentation (if adjusted)

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

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

Site Information

Date: 2/22/2018
Site Name: DeBocks - Grandview, Washington
Sample Name: B2-19
Measured Soil TPH Concentration, mg/kg: **297.600**

1. Summary of Calculation Results

Exposure Pathway	Method/Goal	Protective Soil TPH Conc, mg/kg	With Measured Soil Conc		Does Measured Soil Conc Pass or Fail?
			RISK @	HI @	
Protection of Soil Direct Contact: Human Health	Method B	2,343	1.54E-08	1.27E-01	Pass
	Method C	42,854	2.06E-09	6.94E-03	Pass
Protection of Method B Ground Water Quality (Leaching)	Potable GW: Human Health Protection	30	4.84E-05	2.55E+00	Fail
	NA	NA	NA	NA	NA

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

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

	Method B: Unrestricted Land Use	Method C: Industrial Land Use
Protective Soil Concentration, TPH mg/kg	**2,342.92**	**42,853.95**
Most Stringent Criterion	**HI =1**	**HI =1**

Soil Criteria	Protective Soil Concentration @Method B				Protective Soil Concentration @Method C			
	Most Stringent?	TPH Conc, mg/kg	RISK @	HI @	Most Stringent?	TPH Conc, mg/kg	RISK @	HI @
HI =1	YES	2.34E+03	1.21E-07	1.00E+00	YES	4.29E+04	2.97E-07	1.00E+00
Total Risk=1E-5	*NO*	1.93E+05	1.00E-05	8.24E+01	*NO*	1.44E+06	1.00E-05	3.36E+01
Risk of Benzene= 1E-6	*NO*	1.93E+04	1.00E-06	8.24E+00	NA			
Risk of cPAHs mixture= 1E-6	NA	NA	NA	NA				
EDB	NA	NA	NA	NA				
EDC	NA	NA	NA	NA				

3. Results for Protection of Ground Water Quality (Leaching Pathway)

3.1. Protection of Potable Ground Water Quality (Method B): Human Health Protection

Most Stringent Criterion	**Benzene MCL = 5 ug/L**
Protective Ground Water Concentration, ug/L	**205.53**
Protective Soil Concentration, mg/kg	**30.38**

Ground Water Criteria	Protective Potable Ground Water Concentration @Method B				Protective Soil Conc, mg/kg
	Most Stringent?	TPH Conc, ug/L	RISK @	HI @	
HI=1	*NO*	3.05E+02	1.40E-05	1.00E+00	7.33E+01
Total Risk = 1E-5	*NO*	2.91E+02	1.00E-05	9.29E-01	4.92E+01
Total Risk = 1E-6	YES	3.74E+01	1.00E-06	1.20E-01	4.77E+00
Risk of cPAHs mixture= 1E-5	NA	NA	NA	NA	NA
Benzene MCL = 5 ug/L	YES	2.06E+02	6.29E-06	6.55E-01	3.04E+01
MTBE = 20 ug/L	*NO*	4.71E+02	2.12E-05	1.54E+00	1.10E+02

3.2 Protection of Ground Water Quality for TPH Ground Water Concentration previously adjusted and entered

Ground Water Criteria	Protective Ground Water Concentration			Protective Soil Conc, mg/kg
	TPH Conc, ug/L	Risk @	HI @	
NA	NA	NA	NA	NA

A2. 1B Worksheet for Calculating Soil Cleanup Levels for Protection of Human Health: (Soil Direct Contact Pathway)

Method B: Unrestricted Land Use (WAC 173-340-740)

Date: 2/22/2020
Site Name: DeBock's Texaco Grandview, Washington
Sample Name: B2-19

Chemical of Concern or EC group	Current Condition				Adjusted Condition			
	Measured Soil Conc @dry basis	HQ	RISK	Pass or Fail?	Soil Conc being tested	HQ	RISK	Pass or Fail?
	mg/kg	unitless	unitless		mg/kg	unitless	unitless	
Petroleum EC Fraction								
AL_EC >5-6	0				0.00E+00			
AL_EC >6-8	0				0.00E+00			
AL_EC >8-10	105	4.74E-02			8.26E+02	3.72E-01		
AL_EC >10-12	94	4.24E-02			7.39E+02	3.33E-01		
AL_EC >12-16	6.5	3.90E-03			5.11E+01	3.07E-02		
AL_EC >16-21	6.5	5.85E-05			5.11E+01	4.60E-04		
AL_EC >21-34	6.5	5.85E-05			5.11E+01	4.60E-04		
AR_EC >8-10	25.4	3.44E-03			2.00E+02	2.70E-02		
AR_EC >10-12	23.7	1.60E-02			1.86E+02	1.26E-01		
AR_EC >12-16	6.5	2.34E-03			5.11E+01	1.84E-02		
AR_EC >16-21	6.5	3.90E-03			5.11E+01	3.07E-02		
AR_EC >21-34	6.5	2.93E-03			5.11E+01	2.30E-02		
Benzene	0.28	8.76E-04	1.54E-08		2.20E+00	6.89E-03	1.21E-07	
Toluene	1.1	1.83E-04			8.65E+00	1.44E-03		
Ethylbenzene	2.2	2.95E-04			1.73E+01	2.32E-03		
Total Xylenes	2.99	2.01E-04			2.35E+01	1.58E-03		
Naphthalene	3.7	3.06E-03			2.91E+01	2.40E-02		
1-Methyl Naphthalene	0				0.00E+00	0.00E+00		
2-Methyl Naphthalene	0				0.00E+00	0.00E+00		
n-Hexane	0				0.00E+00	0.00E+00		
MTBE	0.23				1.81E+00			
Ethylene Dibromide (EDB)	0		0.00E+00		0.00E+00	0.00E+00	0.00E+00	
1,2 Dichloroethane (EDC)	0		0.00E+00		0.00E+00	0.00E+00	0.00E+00	
Benzo(a)anthracene	0		0.00E+00	*For*	0.00E+00		0.00E+00	*For*
Benzo(b)fluoranthene	0		0.00E+00	*all*	0.00E+00		0.00E+00	*all*
Benzo(k)fluoranthene	0		0.00E+00	*cPAHs*	0.00E+00		0.00E+00	*cPAHs*
Benzo(a)pyrene	0		0.00E+00		0.00E+00		0.00E+00	
Chrysene	0		0.00E+00		0.00E+00		0.00E+00	
Dibenz(a,h)anthracene	0		0.00E+00	Σ Risk=	0.00E+00		0.00E+00	Σ Risk=
Indeno(1,2,3-cd)pyrene	0		0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00
Sum	**297.6**	1.27E-01	1.54E-08		2.34E+03	9.99E-01	1.21E-07	

TEST CURRENT CONDITION

Measured TPH Soil Conc, mg/kg= 297.600
HI= 1.270E-01
RISK= 1.542E-08
Pass or Fail? Pass

CALCULATE PROTECTIVE CONDITION

This tool allows the user to calculate protective TPH soil concentration based on various soil quality criteria. The Workbook uses the same composition ratio as for the measured data.

Calculate Protective TPH Soil Conc

Selected Criterion: @HI=1
Most Stringent? YES
Protctive TPH Soil Conc, mg/kg = 2342.92
HI = 1.00E+00
RISK = 1.21E-07

TEST ADJUSTED CONDITION

This tool allows the user to test whether a particular TPH soil concentration is protective of human health. The Workbook uses the same composition ratio as for the measured data.

Test Adjusted TPH Soil

Tested TPH Soil Conc, mg/kg = 2340
HI = 9.99E-01
RISK = 1.21E-07
Pass or Fail? Pass
Check Residual Saturation (WAC340-747(10))

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

1. Enter Site Information

Date: 02/22/20
Site Name: DeBocks - Grandview, Washington
Sample Name: B4-17

2. Enter Soil Concentration Measured

Chemical of Concern or Equivalent Carbon Group	Measured Soil Conc dry basis mg/kg	Composition Ratio %
Petroleum EC Fraction		
AL_EC >5-6		0.00%
AL_EC >6-8		0.00%
AL_EC >8-10	1140	40.54%
AL_EC >10-12	495	17.60%
AL_EC >12-16	164	5.83%
AL_EC >16-21	104	3.70%
AL_EC >21-34	5.5	0.20%
AR_EC >8-10	197.6	7.03%
AR_EC >10-12	276.1	9.82%
AR_EC >12-16	112.7	4.01%
AR_EC >16-21	25	0.89%
AR_EC >21-34	5.5	0.20%
Benzene	0.28	0.01%
Toluene	22	0.78%
Ethylbenzene	42	1.49%
Total Xylenes	204	7.25%
Naphthalene	18	0.64%
1-Methyl Naphthalene		0.00%
2-Methyl Naphthalene		0.00%
n-Hexane		0.00%
MTBE	0.23	0.01%
Ethylene Dibromide (EDB)		0.00%
1,2 Dichloroethane (EDC)		0.00%
Benzo(a)anthracene		0.00%
Benzo(b)fluoranthene		0.00%
Benzo(k)fluoranthene		0.00%
Benzo(a)pyrene		0.00%
Chrysene		0.00%
Dibenz(a,h)anthracene		0.00%
Indeno(1,2,3-cd)pyrene		0.00%
Sum		100.00%

Notes for Data Entry | Set Default Hydrogeology
Clear All Soil Concentration Data Entry Cells
Restore All Soil Concentration Data cleared

REMARK:
Enter site-specific information here.....

3. Enter Site-Specific Hydrogeological Data

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

4. Target TPH Ground Water Concentation (if adjusted)

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

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

Site Information

Date: 2/22/2020
Site Name: DeBocks - Grandview, Washington
Sample Name: B4-17
Measured Soil TPH Concentration, mg/kg:

1. Summary of Calculation Results

Exposure Pathway	Method/Goal	Protective Soil TPH Conc, mg/kg	With Measured Soil Conc		Does Measured Soil Conc Pass or Fail?
			RISK @	HI @	
Protection of Soil Direct Contact: Human Health	Method B		1.54E-08	1.15E+00	Fail
	Method C		2.06E-09	6.37E-02	Pass
Protection of Method B Ground Water Quality (Leaching)	Potable GW: Human Health Protection		0.00E+00	0.00E+00	Pass
	NA		NA	NA	NA

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

	Method B: Unrestricted Land Use	Method C: Industrial Land Use
Protective Soil Concentration, TPH mg/kg	2,451.24	44,131.04
Most Stringent Criterion	HI =1	HI =1

Soil Criteria	Protective Soil Concentration @Method B				Protective Soil Concentration @Method C			
	Most Stringent?	TPH Conc, mg/kg	RISK @	HI @	Most Stringent?	TPH Conc, mg/kg	RISK @	HI @
HI =1	YES	2.45E+03	1.34E-08	1.00E+00	YES	4.41E+04	3.24E-08	1.00E+00
Total Risk=1E-5	*NO*	1.82E+06	1.00E-05	7.44E+02	*NO*	1.36E+07	1.00E-05	3.09E+02
Risk of Benzene= 1E-6	*NO*	1.82E+05	1.00E-06	7.44E+01	NA			
Risk of cPAHs mixture= 1E-6	NA	NA	NA	NA				
EDB	NA	NA	NA	NA				
EDC	NA	NA	NA	NA				

3. Results for Protection of Ground Water Quality (Leaching Pathway)

3.1. Protection of Potable Ground Water Quality (Method B): Human Health Protection

Most Stringent Criterion	
Protective Ground Water Concentration, ug/L	
Protective Soil Concentration, mg/kg	

Ground Water Criteria	Protective Potable Ground Water Concentration @Method B				Protective Soil Conc, mg/kg
	Most Stringent?	TPH Conc, ug/L	RISK @	HI @	
HI=1					
Total Risk = 1E-5					
Total Risk = 1E-6					
Risk of cPAHs mixture= 1E-5					
Benzene MCL = 5 ug/L					
MTBE = 20 ug/L					

3.2 Protection of Ground Water Quality for TPH Ground Water Concentration previously adjusted and entered

Ground Water Criteria	Protective Ground Water Concentration			Protective Soil Conc, mg/kg
	TPH Conc, ug/L	Risk @	HI @	
NA				

A2. 1B Worksheet for Calculating Soil Cleanup Levels for Protection of Human Health: (Soil Direct Contact Pathway)

Method B: Unrestricted Land Use (WAC 173-340-740)

Date: 2/22/2020
Site Name: DeBock's Texaco Grandview, Washington
Sample Name: B4-17

Chemical of Concern or EC group	Current Condition				Adjusted Condition			
	Measured Soil Conc @dry basis	HQ	RISK	Pass or Fail?	Soil Conc being tested	HQ	RISK	Pass or Fail?
	mg/kg	unitless	unitless		mg/kg	unitless	unitless	
Petroleum EC Fraction								
AL_EC >5-6	0				0.00E+00			
AL_EC >6-8	0				0.00E+00			
AL_EC >8-10	1140	5.14E-01			9.93E+02	4.48E-01		
AL_EC >10-12	495	2.23E-01			4.31E+02	1.95E-01		
AL_EC >12-16	164	9.84E-02			1.43E+02	8.57E-02		
AL_EC >16-21	104	9.36E-04			9.06E+01	8.16E-04		
AL_EC >21-34	5.5	4.95E-05			4.79E+00	4.31E-05		
AR_EC >8-10	197.6	2.67E-02			1.72E+02	2.33E-02		
AR_EC >10-12	276.1	1.87E-01			2.41E+02	1.63E-01		
AR_EC >12-16	112.7	4.06E-02			9.82E+01	3.54E-02		
AR_EC >16-21	25	1.50E-02			2.18E+01	1.31E-02		
AR_EC >21-34	5.5	2.48E-03			4.79E+00	2.16E-03		
Benzene	0.28	8.76E-04	1.54E-08		2.44E-01	7.63E-04	1.34E-08	
Toluene	22	3.66E-03			1.92E+01	3.19E-03		
Ethylbenzene	42	5.63E-03			3.66E+01	4.90E-03		
Total Xylenes	204	1.37E-02			1.78E+02	1.19E-02		
Naphthalene	18	1.49E-02			1.57E+01	1.30E-02		
1-Methyl Naphthalene	0				0.00E+00	0.00E+00		
2-Methyl Naphthalene	0				0.00E+00	0.00E+00		
n-Hexane	0				0.00E+00	0.00E+00		
MTBE	0.23				2.00E-01			
Ethylene Dibromide (EDB)	0		0.00E+00		0.00E+00	0.00E+00	0.00E+00	
1,2 Dichloroethane (EDC)	0		0.00E+00		0.00E+00	0.00E+00	0.00E+00	
Benzo(a)anthracene	0		0.00E+00	*For*	0.00E+00		0.00E+00	*For*
Benzo(b)fluoranthene	0		0.00E+00	*all*	0.00E+00		0.00E+00	*all*
Benzo(k)fluoranthene	0		0.00E+00	*cPAHs*	0.00E+00		0.00E+00	*cPAHs*
Benzo(a)pyrene	0		0.00E+00		0.00E+00		0.00E+00	
Chrysene	0		0.00E+00		0.00E+00		0.00E+00	
Dibenz(a,h)anthracene	0		0.00E+00	Σ Risk=	0.00E+00		0.00E+00	Σ Risk=
Indeno(1,2,3-cd)pyrene	0		0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00
Sum	**2811.91**	1.15E+00	1.54E-08	Fail	2.45E+03	9.99E-01	1.34E-08	

TEST CURRENT CONDITION

Measured TPH Soil Conc, mg/kg= 2811.910
HI= 1.147E+00
RISK= 1.542E-08
Pass or Fail? *Fail*

CALCULATE PROTECTIVE CONDITION

This tool allows the user to calculate protective TPH soil concentration based on various soil quality criteria. The Workbook uses the same composition ratio as for the measured data.

Calculate Protective TPH Soil Conc

Selected Criterion: @HI=1
Most Stringent? YES
Protctive TPH Soil Conc, mg/kg = 2451.24
HI = 1.00E+00
RISK = 1.34E-08

TEST ADJUSTED CONDITION

This tool allows the user to test whether a particular TPH soil concentration is protective of human health. The Workbook uses the same composition ratio as for the measured data.

Test Adjusted TPH Soil

Tested TPH Soil Conc, mg/kg = 2450
HI = 9.99E-01
RISK = 1.34E-08
Pass or Fail? Pass
Check Residual Saturation (WAC340-747(10))

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

1. Enter Site Information

Date: 02/22/20
Site Name: DeBocks - Grandview, Washington
Sample Name: B6-17

2. Enter Soil Concentration Measured

Chemical of Concern or Equivalent Carbon Group	Measured Soil Conc dry basis mg/kg	Composition Ratio %
Petroleum EC Fraction		
AL_EC >5-6		0.00%
AL_EC >6-8		0.00%
AL_EC >8-10	42	29.97%
AL_EC >10-12	29	20.70%
AL_EC >12-16	5.5	3.92%
AL_EC >16-21	5.5	3.92%
AL_EC >21-34	5.5	3.92%
AR_EC >8-10	8.4	5.99%
AR_EC >10-12	13.1	9.35%
AR_EC >12-16	5.5	3.92%
AR_EC >16-21	5.5	3.92%
AR_EC >21-34	5.5	3.92%
Benzene	0.29	0.21%
Toluene	0.34	0.24%
Ethylbenzene	2.2	1.57%
Total Xylenes	8.7	6.21%
Naphthalene	2.9	2.07%
1-Methyl Naphthalene		0.00%
2-Methyl Naphthalene		0.00%
n-Hexane		0.00%
MTBE	0.2	0.14%
Ethylene Dibromide (EDB)		0.00%
1,2 Dichloroethane (EDC)		0.00%
Benzo(a)anthracene		0.00%
Benzo(b)fluoranthene		0.00%
Benzo(k)fluoranthene		0.00%
Benzo(a)pyrene		0.00%
Chrysene		0.00%
Dibenz(a,h)anthracene		0.00%
Indeno(1,2,3-cd)pyrene		0.00%
Sum		100.00%

Notes for Data Entry | Set Default Hydrogeology
Clear All Soil Concentration Data Entry Cells
Restore All Soil Concentration Data cleared

REMARK:
Enter site-specific information here.....

3. Enter Site-Specific Hydrogeological Data

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

4. Target TPH Ground Water Concentation (if adjusted)

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

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

Site Information

Date: 2/22/2020
Site Name: DeBocks - Grandview, Washington
Sample Name: B6-17
Measured Soil TPH Concentration, mg/kg:

1. Summary of Calculation Results

Exposure Pathway	Method/Goal	Protective Soil TPH Conc, mg/kg	With Measured Soil Conc		Does Measured Soil Conc Pass or Fail?
			RISK @	HI @	
Protection of Soil Direct Contact: Human Health	Method B		1.60E-08	5.74E-02	Pass
	Method C		2.14E-09	3.33E-03	Pass
Protection of Method B Ground Water Quality (Leaching)	Potable GW: Human Health Protection		0.00E+00	0.00E+00	Pass
	NA		NA	NA	NA

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

	Method B: Unrestricted Land Use	Method C: Industrial Land Use
Protective Soil Concentration, TPH mg/kg	2,440.66	42,133.78
Most Stringent Criterion	HI =1	HI =1

Soil Criteria	Protective Soil Concentration @Method B				Protective Soil Concentration @Method C			
	Most Stringent?	TPH Conc, mg/kg	RISK @	HI @	Most Stringent?	TPH Conc, mg/kg	RISK @	HI @
HI =1	YES	2.44E+03	2.78E-07	1.00E+00	YES	4.21E+04	6.43E-07	1.00E+00
Total Risk=1E-5	*NO*	8.78E+04	1.00E-05	3.60E+01	*NO*	6.55E+05	1.00E-05	1.56E+01
Risk of Benzene= 1E-6	*NO*	8.78E+03	1.00E-06	3.60E+00	NA			
Risk of cPAHs mixture= 1E-6	NA	NA	NA	NA				
EDB	NA	NA	NA	NA				
EDC	NA	NA	NA	NA				

3. Results for Protection of Ground Water Quality (Leaching Pathway)

3.1. Protection of Potable Ground Water Quality (Method B): Human Health Protection

Most Stringent Criterion	
Protective Ground Water Concentration, ug/L	
Protective Soil Concentration, mg/kg	

Ground Water Criteria	Protective Potable Ground Water Concentration @Method B				Protective Soil Conc, mg/kg
	Most Stringent?	TPH Conc, ug/L	RISK @	HI @	
HI=1					
Total Risk = 1E-5					
Total Risk = 1E-6					
Risk of cPAHs mixture= 1E-5					
Benzene MCL = 5 ug/L					
MTBE = 20 ug/L					

3.2 Protection of Ground Water Quality for TPH Ground Water Concentration previously adjusted and entered

Ground Water Criteria	Protective Ground Water Concentration			Protective Soil Conc, mg/kg
	TPH Conc, ug/L	Risk @	HI @	
NA				

A2. 1B Worksheet for Calculating Soil Cleanup Levels for Protection of Human Health: (Soil Direct Contact Pathway)

Method B: Unrestricted Land Use (WAC 173-340-740)

Date: 2/22/2020
Site Name: DeBock's Texaco Grandview, Washington
Sample Name: B6-17

Chemical of Concern or EC group	Current Condition				Adjusted Condition			
	Measured Soil Conc @dry basis	HQ	RISK	Pass or Fail?	Soil Conc being tested	HQ	RISK	Pass or Fail?
	mg/kg	unitless	unitless		mg/kg	unitless	unitless	
Petroleum EC Fraction								
AL_EC >5-6	0				0.00E+00			
AL_EC >6-8	0				0.00E+00			
AL_EC >8-10	42	1.89E-02			7.31E+02	3.30E-01		
AL_EC >10-12	29	1.31E-02			5.05E+02	2.28E-01		
AL_EC >12-16	5.5	3.30E-03			9.58E+01	5.75E-02		
AL_EC >16-21	5.5	4.95E-05			9.58E+01	8.62E-04		
AL_EC >21-34	5.5	4.95E-05			9.58E+01	8.62E-04		
AR_EC >8-10	8.4	1.14E-03			1.46E+02	1.98E-02		
AR_EC >10-12	13.1	8.86E-03			2.28E+02	1.54E-01		
AR_EC >12-16	5.5	1.98E-03			9.58E+01	3.45E-02		
AR_EC >16-21	5.5	3.30E-03			9.58E+01	5.75E-02		
AR_EC >21-34	5.5	2.48E-03			9.58E+01	4.31E-02		
Benzene	0.29	9.07E-04	1.60E-08		5.05E+00	1.58E-02	2.78E-07	
Toluene	0.34	5.66E-05			5.92E+00	9.86E-04		
Ethylbenzene	2.2	2.95E-04			3.83E+01	5.13E-03		
Total Xylenes	8.7	5.84E-04			1.51E+02	1.02E-02		
Naphthalene	2.9	2.39E-03			5.05E+01	4.17E-02		
1-Methyl Naphthalene	0				0.00E+00	0.00E+00		
2-Methyl Naphthalene	0				0.00E+00	0.00E+00		
n-Hexane	0				0.00E+00	0.00E+00		
MTBE	0.2				3.48E+00			
Ethylene Dibromide (EDB)	0		0.00E+00		0.00E+00	0.00E+00	0.00E+00	
1,2 Dichloroethane (EDC)	0		0.00E+00		0.00E+00	0.00E+00	0.00E+00	
Benzo(a)anthracene	0		0.00E+00	*For*	0.00E+00		0.00E+00	*For*
Benzo(b)fluoranthene	0		0.00E+00	*all*	0.00E+00		0.00E+00	*all*
Benzo(k)fluoranthene	0		0.00E+00	*cPAHs*	0.00E+00		0.00E+00	*cPAHs*
Benzo(a)pyrene	0		0.00E+00		0.00E+00		0.00E+00	
Chrysene	0		0.00E+00		0.00E+00		0.00E+00	
Dibenz(a,h)anthracene	0		0.00E+00	Σ Risk=	0.00E+00		0.00E+00	Σ Risk=
Indeno(1,2,3-cd)pyrene	0		0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00
Sum	**140.13**	5.74E-02	1.60E-08		2.44E+03	1.00E+00	2.78E-07	

TEST CURRENT CONDITION

Measured TPH Soil Conc, mg/kg= 140.130
HI= 5.741E-02
RISK= 1.597E-08
Pass or Fail? Pass

CALCULATE PROTECTIVE CONDITION

This tool allows the user to calculate protective TPH soil concentration based on various soil quality criteria. The Workbook uses the same composition ratio as for the measured data.

Calculate Protective TPH Soil Conc

Selected Criterion: @HI=1
Most Stringent? YES
Protctive TPH Soil Conc, mg/kg = 2440.66
HI = 1.00E+00
RISK = 2.78E-07

TEST ADJUSTED CONDITION

This tool allows the user to test whether a particular TPH soil concentration is protective of human health. The Workbook uses the same composition ratio as for the measured data.

Test Adjusted TPH Soil

Tested TPH Soil Conc, mg/kg = 2440
HI = 1.00E+00
RISK = 2.78E-07
Pass or Fail? Pass
Check Residual Saturation (WAC340-747(10))

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

1. Enter Site Information

Date: 02/22/20
Site Name: DeBocks - Grandview, Washington
Sample Name: B9-16.5

2. Enter Soil Concent b9-16.5

Chemical of Concern or Equivalent Carbon Group	Measured Soil Conc dry basis mg/kg	Composition Ratio %
Petroleum EC Fraction		
AL_EC >5-6		0.00%
AL_EC >6-8		0.00%
AL_EC >8-10	35	17.49%
AL_EC >10-12	24	11.99%
AL_EC >12-16	6	3.00%
AL_EC >16-21	6	3.00%
AL_EC >21-34	6	3.00%
AR_EC >8-10	6	3.00%
AR_EC >10-12	6	3.00%
AR_EC >12-16	6	3.00%
AR_EC >16-21	6	3.00%
AR_EC >21-34	6	3.00%
Benzene	0.3	0.15%
Toluene	7.6	3.80%
Ethylbenzene	15	7.49%
Total Xylenes	47	23.48%
Naphthalene	23	11.49%
1-Methyl Naphthalene		0.00%
2-Methyl Naphthalene		0.00%
n-Hexane		0.00%
MTBE	0.25	0.12%
Ethylene Dibromide (EDB)		0.00%
1,2 Dichloroethane (EDC)		0.00%
Benzo(a)anthracene		0.00%
Benzo(b)fluoranthene		0.00%
Benzo(k)fluoranthene		0.00%
Benzo(a)pyrene		0.00%
Chrysene		0.00%
Dibenz(a,h)anthracene		0.00%
Indeno(1,2,3-cd)pyrene		0.00%
Sum		100.00%

Notes for Data Entry | Set Default Hydrogeology
Clear All Soil Concentration Data Entry Cells
Restore All Soil Concentration Data cleared

REMARK:
Enter site-specific information here.....

3. Enter Site-Specific Hydrogeological Data

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

4. Target TPH Ground Water Concentation (if adjusted)

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

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

Site Information

Date: 2/22/2020
Site Name: DeBocks - Grandview, Washington
Sample Name: B9-16.5
Measured Soil TPH Concentration, mg/kg:

1. Summary of Calculation Results

Exposure Pathway	Method/Goal	Protective Soil TPH Conc, mg/kg	With Measured Soil Conc		Does Measured Soil Conc Pass or Fail?
			RISK @	HI @	
Protection of Soil Direct Contact: Human Health	Method B		1.65E-08	7.00E-02	Pass
	Method C		2.21E-09	4.38E-03	Pass
Protection of Method B Ground Water Quality (Leaching)	Potable GW: Human Health Protection		0.00E+00	0.00E+00	Pass
	NA		NA	NA	NA

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

	Method B: Unrestricted Land Use	Method C: Industrial Land Use
Protective Soil Concentration, TPH mg/kg	2,858.80	45,654.22
Most Stringent Criterion	HI =1	HI =1

Soil Criteria	Protective Soil Concentration @Method B				Protective Soil Concentration @Method C			
	Most Stringent?	TPH Conc, mg/kg	RISK @	HI @	Most Stringent?	TPH Conc, mg/kg	RISK @	HI @
HI =1	YES	2.86E+03	2.36E-07	1.00E+00	YES	4.57E+04	5.04E-07	1.00E+00
Total Risk=1E-5	*NO*	1.21E+05	1.00E-05	4.24E+01	*NO*	9.05E+05	1.00E-05	1.98E+01
Risk of Benzene= 1E-6	*NO*	1.21E+04	1.00E-06	4.24E+00	NA			
Risk of cPAHs mixture= 1E-6	NA	NA	NA	NA				
EDB	NA	NA	NA	NA				
EDC	NA	NA	NA	NA				

3. Results for Protection of Ground Water Quality (Leaching Pathway)

3.1. Protection of Potable Ground Water Quality (Method B): Human Health Protection

Most Stringent Criterion	
Protective Ground Water Concentration, ug/L	
Protective Soil Concentration, mg/kg	

Ground Water Criteria	Protective Potable Ground Water Concentration @Method B				Protective Soil Conc, mg/kg
	Most Stringent?	TPH Conc, ug/L	RISK @	HI @	
HI=1					
Total Risk = 1E-5					
Total Risk = 1E-6					
Risk of cPAHs mixture= 1E-5					
Benzene MCL = 5 ug/L					
MTBE = 20 ug/L					

3.2 Protection of Ground Water Quality for TPH Ground Water Concentration previously adjusted and entered

Ground Water Criteria	Protective Ground Water Concentration			Protective Soil Conc, mg/kg
	TPH Conc, ug/L	Risk @	HI @	
NA				

A2. 1B Worksheet for Calculating Soil Cleanup Levels for Protection of Human Health: (Soil Direct Contact Pathway)

Method B: Unrestricted Land Use (WAC 173-340-740)

Date: 2/22/2020
Site Name: DeBock's Texaco Grandview, Washington
Sample Name: B9-16.5

Chemical of Concern or EC group	Current Condition				Adjusted Condition			
	Measured Soil Conc @dry basis	HQ	RISK	Pass or Fail?	Soil Conc being tested	HQ	RISK	Pass or Fail?
	mg/kg	unitless	unitless		mg/kg	unitless	unitless	
Petroleum EC Fraction								
AL_EC >5-6	0				0.00E+00			
AL_EC >6-8	0				0.00E+00			
AL_EC >8-10	35	1.58E-02			5.00E+02	2.26E-01		
AL_EC >10-12	24	1.08E-02			3.43E+02	1.55E-01		
AL_EC >12-16	6	3.60E-03			8.57E+01	5.14E-02		
AL_EC >16-21	6	5.40E-05			8.57E+01	7.72E-04		
AL_EC >21-34	6	5.40E-05			8.57E+01	7.72E-04		
AR_EC >8-10	6	8.12E-04			8.57E+01	1.16E-02		
AR_EC >10-12	6	4.06E-03			8.57E+01	5.80E-02		
AR_EC >12-16	6	2.16E-03			8.57E+01	3.09E-02		
AR_EC >16-21	6	3.60E-03			8.57E+01	5.14E-02		
AR_EC >21-34	6	2.70E-03			8.57E+01	3.86E-02		
Benzene	0.3	9.39E-04	1.65E-08		4.29E+00	1.34E-02	2.36E-07	
Toluene	7.6	1.27E-03			1.09E+02	1.81E-02		
Ethylbenzene	15	2.01E-03			2.14E+02	2.87E-02		
Total Xylenes	47	3.15E-03			6.72E+02	4.51E-02		
Naphthalene	23	1.90E-02			3.29E+02	2.71E-01		
1-Methyl Naphthalene	0				0.00E+00	0.00E+00		
2-Methyl Naphthalene	0				0.00E+00	0.00E+00		
n-Hexane	0				0.00E+00	0.00E+00		
MTBE	0.25				3.57E+00			
Ethylene Dibromide (EDB)	0		0.00E+00		0.00E+00	0.00E+00	0.00E+00	
1,2 Dichloroethane (EDC)	0		0.00E+00		0.00E+00	0.00E+00	0.00E+00	
Benzo(a)anthracene	0		0.00E+00	*For*	0.00E+00		0.00E+00	*For*
Benzo(b)fluoranthene	0		0.00E+00	*all*	0.00E+00		0.00E+00	*all*
Benzo(k)fluoranthene	0		0.00E+00	*cPAHs*	0.00E+00		0.00E+00	*cPAHs*
Benzo(a)pyrene	0		0.00E+00		0.00E+00		0.00E+00	
Chrysene	0		0.00E+00		0.00E+00		0.00E+00	
Dibenz(a,h)anthracene	0		0.00E+00	Σ Risk=	0.00E+00		0.00E+00	Σ Risk=
Indeno(1,2,3-cd)pyrene	0		0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00
Sum	**200.15**	7.00E-02	1.65E-08		2.86E+03	1.00E+00	2.36E-07	

TEST CURRENT CONDITION

Measured TPH Soil Conc, mg/kg= 200.150
HI= 7.001E-02
RISK= 1.652E-08
Pass or Fail? Pass

CALCULATE PROTECTIVE CONDITION

This tool allows the user to calculate protective TPH soil concentration based on various soil quality criteria. The Workbook uses the same composition ratio as for the measured data.

Calculate Protective TPH Soil Conc

Selected Criterion: @HI=1
Most Stringent? YES
Protctive TPH Soil Conc, mg/kg = 2858.80
HI = 1.00E+00
RISK = 2.36E-07

TEST ADJUSTED CONDITION

This tool allows the user to test whether a particular TPH soil concentration is protective of human health. The Workbook uses the same composition ratio as for the measured data.

Test Adjusted TPH Soil

Tested TPH Soil Conc, mg/kg = 2860
HI = 1.00E+00
RISK = 2.36E-07
Pass or Fail? Pass
Check Residual Saturation (WAC340-747(10))

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

1. Enter Site Information

Date: 02/22/20
Site Name: DeBocks - Grandview, Washington
Sample Name: B11-20

2. Enter Soil Concent b9-16.5

Chemical of Concern or Equivalent Carbon Group	Measured Soil Conc dry basis mg/kg	Composition Ratio %
Petroleum EC Fraction		
AL_EC >5-6		0.00%
AL_EC >6-8		0.00%
AL_EC >8-10	12	17.53%
AL_EC >10-12	6	8.77%
AL_EC >12-16	6	8.77%
AL_EC >16-21	6	8.77%
AL_EC >21-34	6	8.77%
AR_EC >8-10	6	8.77%
AR_EC >10-12	6	8.77%
AR_EC >12-16	6	8.77%
AR_EC >16-21	6	8.77%
AR_EC >21-34	6	8.77%
Benzene	0.26	0.38%
Toluene	0.31	0.45%
Ethylbenzene	0.31	0.45%
Total Xylenes	0.83	1.21%
Naphthalene	0.52	0.76%
1-Methyl Naphthalene		0.00%
2-Methyl Naphthalene		0.00%
n-Hexane		0.00%
MTBE	0.22	0.32%
Ethylene Dibromide (EDB)		0.00%
1,2 Dichloroethane (EDC)		0.00%
Benzo(a)anthracene		0.00%
Benzo(b)fluoranthene		0.00%
Benzo(k)fluoranthene		0.00%
Benzo(a)pyrene		0.00%
Chrysene		0.00%
Dibenz(a,h)anthracene		0.00%
Indeno(1,2,3-cd)pyrene		0.00%
Sum		100.00%

Notes for Data Entry | Set Default Hydrogeology
Clear All Soil Concentration Data Entry Cells
Restore All Soil Concentration Data cleared

REMARK:
Enter site-specific information here.....

3. Enter Site-Specific Hydrogeological Data

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

4. Target TPH Ground Water Concentation (if adjusted)

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

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

Site Information

Date: 2/22/2020
Site Name: DeBocks - Grandview, Washington
Sample Name: B11-20
Measured Soil TPH Concentration, mg/kg:

1. Summary of Calculation Results

Exposure Pathway	Method/Goal	Protective Soil TPH Conc, mg/kg	With Measured Soil Conc		Does Measured Soil Conc Pass or Fail?
			RISK @	HI @	
Protection of Soil Direct Contact: Human Health	Method B		1.43E-08	2.65E-02	Pass
	Method C		1.92E-09	1.75E-03	Pass
Protection of Method B Ground Water Quality (Leaching)	Potable GW: Human Health Protection		0.00E+00	0.00E+00	Pass
	NA		NA	NA	NA

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

	Method B: Unrestricted Land Use	Method C: Industrial Land Use
Protective Soil Concentration, TPH mg/kg	2,578.18	39,203.88
Most Stringent Criterion	HI =1	HI =1

Soil Criteria	Protective Soil Concentration @Method B				Protective Soil Concentration @Method C			
	Most Stringent?	TPH Conc, mg/kg	RISK @	HI @	Most Stringent?	TPH Conc, mg/kg	RISK @	HI @
HI =1	YES	2.58E+03	5.39E-07	1.00E+00	YES	3.92E+04	1.10E-06	1.00E+00
Total Risk=1E-5	*NO*	4.78E+04	1.00E-05	1.85E+01	*NO*	3.57E+05	1.00E-05	9.11E+00
Risk of Benzene= 1E-6	*NO*	4.78E+03	1.00E-06	1.85E+00	NA			
Risk of cPAHs mixture= 1E-6	NA	NA	NA	NA				
EDB	NA	NA	NA	NA				
EDC	NA	NA	NA	NA				

3. Results for Protection of Ground Water Quality (Leaching Pathway)

3.1. Protection of Potable Ground Water Quality (Method B): Human Health Protection

Most Stringent Criterion	
Protective Ground Water Concentration, ug/L	
Protective Soil Concentration, mg/kg	

Ground Water Criteria	Protective Potable Ground Water Concentration @Method B				Protective Soil Conc, mg/kg
	Most Stringent?	TPH Conc, ug/L	RISK @	HI @	
HI=1					
Total Risk = 1E-5					
Total Risk = 1E-6					
Risk of cPAHs mixture= 1E-5					
Benzene MCL = 5 ug/L					
MTBE = 20 ug/L					

3.2 Protection of Ground Water Quality for TPH Ground Water Concentration previously adjusted and entered

Ground Water Criteria	Protective Ground Water Concentration			Protective Soil Conc, mg/kg
	TPH Conc, ug/L	Risk @	HI @	
NA				

A2. 1B Worksheet for Calculating Soil Cleanup Levels for Protection of Human Health: (Soil Direct Contact Pathway)

Method B: Unrestricted Land Use (WAC 173-340-740)

Date: 2/22/2020
Site Name: DeBock's Texaco Grandview, Washington
Sample Name: B11-20

Chemical of Concern or EC group	Current Condition				Adjusted Condition			
	Measured Soil Conc @dry basis	HQ	RISK	Pass or Fail?	Soil Conc being tested	HQ	RISK	Pass or Fail?
	mg/kg	unitless	unitless		mg/kg	unitless	unitless	
Petroleum EC Fraction								
AL_EC >5-6	0				0.00E+00			
AL_EC >6-8	0				0.00E+00			
AL_EC >8-10	12	5.41E-03			4.52E+02	2.04E-01		
AL_EC >10-12	6	2.71E-03			2.26E+02	1.02E-01		
AL_EC >12-16	6	3.60E-03			2.26E+02	1.36E-01		
AL_EC >16-21	6	5.40E-05			2.26E+02	2.04E-03		
AL_EC >21-34	6	5.40E-05			2.26E+02	2.04E-03		
AR_EC >8-10	6	8.12E-04			2.26E+02	3.06E-02		
AR_EC >10-12	6	4.06E-03			2.26E+02	1.53E-01		
AR_EC >12-16	6	2.16E-03			2.26E+02	8.14E-02		
AR_EC >16-21	6	3.60E-03			2.26E+02	1.36E-01		
AR_EC >21-34	6	2.70E-03			2.26E+02	1.02E-01		
Benzene	0.26	8.13E-04	1.43E-08		9.80E+00	3.07E-02	5.40E-07	
Toluene	0.31	5.16E-05			1.17E+01	1.95E-03		
Ethylbenzene	0.31	4.15E-05			1.17E+01	1.57E-03		
Total Xylenes	0.83	5.57E-05			3.13E+01	2.10E-03		
Naphthalene	0.52	4.29E-04			1.96E+01	1.62E-02		
1-Methyl Naphthalene	0				0.00E+00	0.00E+00		
2-Methyl Naphthalene	0				0.00E+00	0.00E+00		
n-Hexane	0				0.00E+00	0.00E+00		
MTBE	0.22				8.29E+00			
Ethylene Dibromide (EDB)	0		0.00E+00		0.00E+00	0.00E+00	0.00E+00	
1,2 Dichloroethane (EDC)	0		0.00E+00		0.00E+00	0.00E+00	0.00E+00	
Benzo(a)anthracene	0		0.00E+00	*For*	0.00E+00		0.00E+00	*For*
Benzo(b)fluoranthene	0		0.00E+00	*all*	0.00E+00		0.00E+00	*all*
Benzo(k)fluoranthene	0		0.00E+00	*cPAHs*	0.00E+00		0.00E+00	*cPAHs*
Benzo(a)pyrene	0		0.00E+00		0.00E+00		0.00E+00	
Chrysene	0		0.00E+00		0.00E+00		0.00E+00	
Dibenz(a,h)anthracene	0		0.00E+00	Σ Risk=	0.00E+00		0.00E+00	Σ Risk=
Indeno(1,2,3-cd)pyrene	0		0.00E+00	0.00E+00	0.00E+00		0.00E+00	0.00E+00
Sum	**68.45**	2.65E-02	1.43E-08		2.58E+03	1.00E+00	5.40E-07	

TEST CURRENT CONDITION

Measured TPH Soil Conc, mg/kg= 68.450
HI= 2.655E-02
RISK= 1.432E-08
Pass or Fail? Pass

CALCULATE PROTECTIVE CONDITION

This tool allows the user to calculate protective TPH soil concentration based on various soil quality criteria. The Workbook uses the same composition ratio as for the measured data.

Calculate Protective TPH Soil Conc

Selected Criterion: @HI=1
Most Stringent? YES
Protctive TPH Soil Conc, mg/kg = 2578.18
HI = 1.00E+00
RISK = 5.39E-07

TEST ADJUSTED CONDITION

This tool allows the user to test whether a particular TPH soil concentration is protective of human health. The Workbook uses the same composition ratio as for the measured data.

Test Adjusted TPH Soil

Tested TPH Soil Conc, mg/kg = 2580
HI = 1.00E+00
RISK = 5.40E-07
Pass or Fail? Pass
Check Residual Saturation (WAC340-747(10))

Appendix D

SWCA
ENVIRONMENTAL CONSULTANTS
Sound Science. Creative Solutions.®

1220 SW Morrison St, Suite 700
Portland, Oregon 97205
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www.swca.com

TECHNICAL MEMORANDUM

To: Paul Ecker
EES Environmental Consultants, Inc.
240 N Broadway, Suite 203
Portland, OR 97227

From: Tom Dee, PWS, CERP

Date: June 10, 2019

Re: **Debock's Texaco Terrestrial Ecological Evaluation / SWCA Project No. 56326.01**

INTRODUCTION

SWCA Environmental Consultants (SWCA) conducted a simplified terrestrial ecological evaluation (TEE) on May 31, 2019, at the former Debock's Texaco site, located at 100 W Main Street, Grandview, WA 98930. The TEE included desktop analysis and direct observations of the contiguous undeveloped land within 500 feet of the site.

This site meets the exclusion criteria from the TEE process because: 1) there is less than 1.5 acres of contiguous undeveloped land on the site and within 500 feet and the hazardous substances on the site are not listed in Washington Administrative Code (WAC) 173-340-7491(1)(c)(ii), including chlorinated dioxins or furans, PCB mixtures, DDT, DDE, DDD, aldrin, chlordane, dieldrin, endosulfan, endrin, heptachlor or heptachlor epoxide, benzene hexachloride, toxaphene, hexachlorobenzene, pentachlorophenol, or pentachlorobenzene; and 2) because it has less than 0.25 acre of contiguous undeveloped land on or within 500 feet of any area of the site affected by hazardous substances listed above (none are present). A simplified TEE was conducted even though it is likely not required.

TERESTRIAL ECOLOGICAL EVALUATION

Desktop Analysis

The desktop analysis consisted of reviewing aerial photographs in Google Earth to determine the extent of contiguous undeveloped land within 500 feet of the site. Contiguous undeveloped land is defined under WAC 173-340-7491 as:

> Land that is not divided into smaller areas by highways, extensive paving or similar structures that are likely to reduce the potential use of the overall area by wildlife. Roads, sidewalks and other structures that are unlikely to reduce potential use of the area by wildlife shall not be considered to divide a contiguous area into smaller areas.

Undeveloped land is defined under the same code as:

> land that is not covered by buildings, roads, paved areas or other barriers that would prevent wildlife from feeding on plants, earthworms, insects or other food in or on the soil.

The desktop analysis found no contiguous undeveloped land within 500 feet of the site (Figure 1). The site is isolated from any natural cover by at least 200 feet of roads and buildings. The only vegetation adjacent to the site is street trees.

Habitat Evaluation

A habitat evaluation was conducted on May 31, 2019, by botanist and wetland ecologist Tom Dee (Professional Wetland Scientist and Certified Ecological Restoration Practitioner). Mr. Dee recorded observations on plant composition and wildlife sightings from public rights-of-way surrounding the site. Vegetation observations included ornamental maple (*Acer* sp.) street trees and Cotoneaster (*Cotoneaster* sp.) shrubs. No wildlife was observed. Photographs are provided in Appendix A. The Habitat Rating System presented in Table 749-1 of the TEE form was used to determine the quality of the habitat of the contiguous undeveloped land. Table 749-1 of the TEE has been completed by SWCA and is provided in Appendix B.

The habitat evaluation resulted in a "low" habitat rating. The "low" rating is defined as:

> Early successional vegetative stands; vegetation predominantly noxious, nonnative, exotic plant species or weeds. Areas severely disturbed by human activity, including intensively cultivated croplands. Areas isolated from other habitat used by wildlife.

There was no plant community adjacent to the site. A grape farm is located about 480 feet to the north, and is separated from the site by streets, buildings, and a gravel lot. No native plants were observed during the habitat evaluation.

Question 3 in Table 749-1 asks "Is the undeveloped land likely to attract wildlife?" The qualifiers for this question listed below the table include the statement:

> Indicate "yes" if the area attracts wildlife or is likely to do so. Examples: Birds frequently visit the area to feed; evidence of high use by mammals (tracks, scat, etc.); habitat "island" in an industrial area; unusual features of an area that make it important for feeding animals; heavy use during seasonal migrations.

There is no contiguous undeveloped land and wildlife do not use the areas adjacent to the site.

Based on this finding, and the table in Appendix B, the simplified evaluation may be ended.

PREPARED BY:

Tom Dee, PWS, CERP
Botanist/Wetland Ecologist

REVIEWED BY:

C. Mirth Walker, PWS
Senior Wetland Scientist

Figure 1. Former Debock's Texaco

No contiguous undeveloped land

APPENDIX A

Site Photographs

Photo 1. Looking southeast from site.

Photo 2. Looking east from site.

Photo 3. Looking west toward and beyond site.

Photo 4. Looking north at grape farm 485 feet north of site.

APPENDIX B

Completed Table 749-1

Table 749-1

Simplified Terrestrial Ecological Evaluation-Exposure Analysis Procedure

Estimate the area of contiguous (connected) undeveloped land on the site or within 500 feet of any area of the site to the nearest 1/2 acre (1/4 acre if the area is less than 0.5 acre).	
1) From the table below, find the number of points corresponding to the area and enter this number in the field to the right.	
Area (acres) / Points 0.25 or less / 4 0.5 / 5 1.0 / 6 1.5 / 7 2.0 / 8 2.5 / 9 3.0 / 10 3.5 / 11 4.0 or more / 12	4
2) Is this an industrial or commercial property? If yes, enter a score of 3. If no, enter a score of 1	3
3)[a] Enter a score in the box to the right for the habitat quality of the site, using the following rating system[b]. High=1, Intermediate=2, Low=3	3
4) Is the undeveloped land likely to attract wildlife? If yes, enter a score of 1 in the box to the right. If no, enter a score of 2.[c]	2
5) Are there any of the following soil contaminants present: Chlorinated dioxins/furans, PCB mixtures, DDT, DDE, DDD, aldrin, chlordane, dieldrin, endosulfan, endrin, heptachlor, benzene hexachloride, toxaphene, hexachlorobenzene, pentachlorophenol, pentachlorobenzene? If yes, enter a score of 1 in the box to the right. If no, enter a score of 4.	4
6) Add the numbers in the boxes on lines 2-5 and enter this number in the box to the right. If this number is larger than the number in the box on line 1, the simplified evaluation may be ended.	12

Notes for Table 749-1

[a] It is expected that this habitat evaluation will be undertaken by an experienced field biologist. If this is not the case, enter a conservative score of (1) for questions 3 and 4.

[b] **Habitat rating system.** Rate the quality of the habitat as high, intermediate or low based on your professional judgment as a field biologist. The following are suggested factors to consider in making this evaluation:

> **Low:** Early successional vegetative stands; vegetation predominantly noxious, nonnative, exotic plant species or weeds. Areas severely disturbed by human activity, including intensively cultivated croplands. Areas isolated from other habitat used by wildlife.

High: Area is ecologically significant for one or more of the following reasons: Late-successional native plant communities present; relatively high species diversity; used by an uncommon or rare species; priority habitat (as defined by the Washington Department of fish and Wildlife); part of a larger area of habitat where size or fragmentation may be important for the retention of some species.

Intermediate: Area does not rate as either high or low.

[c] Indicate "yes" if the area attracts wildlife or is likely to do so. Examples: Birds frequently visit the area to feed; evidence of high use b mammals (tracks, scat, etc.); habitat "island" in an industrial area; unusual features of an area that make it important for feeding animals; heavy use during seasonal migrations.

[Area Calculation Aid] [Aerial Photo with Area Designations] [TEE Table 749-1] [Index of Tables]

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