FINAL
REMEDIAL INVESTIGATION WORK PLAN
NEWMAN'S CHEVRON
2021 6th Street
Bremerton, Washington

July 3, 2018

Prepared for:
Washington State Department of Ecology
3190 160th Ave SE
Bellevue, Washington 98008

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On Behalf of:
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and

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1 INTRODUCTION AND OBJECTIVES

Leidos, Inc. (Leidos), prepared this work plan, on behalf of Chevron Environmental Management Company (CEMC), Nordic Properties, Inc. (Nordic), and Victory Business Park L.L.C. (Victory) [collectively (the Parties)] to complete a Remedial Investigation (RI) at the Newman's Chevron site (the Site), located at 2021 6th Street in Bremerton, Washington. Preparation and implementation of an RI work plan is required per Section VII of Agreed Order No. DE 14246 (the Agreed Order), which was executed by the State of Washington, Department of Ecology (Ecology) and the Parties and has an effective date of February 6, 2018.

2 SITE BACKGROUND INFORMATION

2.1 SITE DESCRIPTION AND SETTING

The Site is located at 2021 6th Street, at the southeast corner of the intersection of Naval Avenue and 6th Street in Bremerton, Washington, as shown on Figure 1. The Site currently consists of Kitsap County Tax Parcel 3717-002-015-0106 (the Property), which is approximately 0.39 acres in size. Title records for the Property indicate that the current parcel (3717-002-015-0106) was formerly three separate parcels (Parcels I, II, and III). Legal descriptions of the Property still retain references to these former parcel numbers. A map showing the current and former parcel boundaries is included as Figure 2.

The Site is currently occupied by a closed gasoline service station and convenience store. The retail building has an area of approximately 2,500 square feet and the canopy has an area of approximately 1,200 square feet. Three underground storage tanks (USTs) are reported to remain at the Site. An aerial photo of the Site is included as Figure 3.

2.1.1 Land Use

The Site is located in the incorporated Bremerton city limits within Kitsap County, Washington. The area is zoned General Commercial (GC) which allows for high intensity commercial uses. Low Density Residential (R-10) zone is adjacent to the GC zone in the vicinity of the Site.

2.1.2 Topography

The Site is generally level. It is a paved, rectangular lot located in the West Bremerton neighborhood. The elevation of the property is approximately 100 feet above mean sea level with a moderate gradient to the southwest. An approximately 3-4 foot high concrete retaining wall is located on the east and south sides of the property. The adjacent properties to the south and east are lower in elevation than the Site (GeoScience Management [GSM], 2001).

2.1.3 Adjacent Properties

The Site is bounded by 6th Street to the north and commercial businesses across the street (a bank and store with parking lot), a private residence to the east, a paved alley and a tire shop and private residences to the south, and Naval Avenue to the west. An ARCO Service Station is located to the west across Naval Avenue at 2101 6th Street. The ARCO station is Ecology Facility No. 53813326 and received a No Further Action determination in September 2013.

2.1.4 Surface Water

The property is located approximately 4,900 feet south of Anderson Cove. Oyster Bay is approximately 5,600 feet to the northwest and Sinclair Inlet is approximately 3,700 feet to the south and 5,600 to the east of the property.

2.1.5 Climate

The Bremerton climate is characterized by mild temperatures and an extended rainy season, with an average annual rainfall of 56 inches. Average temperatures vary between 34 and 45 degrees Fahrenheit in the winter and 53 to 75 degrees Fahrenheit in the summer. The driest month of the year is typically July, with the rainy season extending from October to March.

2.2 SITE OPERATING HISTORY

As previously discussed in Section 2.1, the current tax parcel associated with the Site formerly consisted of three separate parcels (Parcels I, II and III). CEMC's affiliate, Texaco, Inc. (Texaco) began leasing Parcel III (the western most parcel) in 1928, at which time it may have been developed as a service station. Texaco purchased Parcel III in 1943.

In 1961, Texaco began leasing Parcels I and II and the service station was reconfigured to occupy all three parcels. Kitsap County Assessor's records indicate that the existing service station building and canopy were constructed at that time. In 1981, Texaco sold Parcel III and assigned its interest in the leases of Parcels I and II to Wilkins Distributing Company (Wilkins), known now as Nordic. Wilkins subsequently sublet Parcels I and II to Robert and Karin Newman in 1981. Wilkens then purchased Parcels I and II in 1985.

The Newmans operated the service station beginning in 1981. The Newmans purchased Parcels I, II, and III from Wilkins in 1990 and continued to operate the service station as Newman's Chevron until 2004, when the Property was sold to SJ-N-SJ Corporation (SJ-N-SJ). The deed from this, and all subsequent property transfers, reference the current tax parcel number (3717-002-015-0106). SJ-N-SJ owned the Property and operated the service station from 2004 to 2006. In 2006, Chang S. Choe purchased the Property and continued to operate the service station until it was closed in 2008. The current owner, Victory, acquired the Property in December 2012.

2.3 SITE ENVIRONMENTAL HISTORY

Petroleum-hydrocarbon impacts were first encountered at the Site between August 7 and 13, 1990, during UST removal operations being performed by Pacific Environmental Services Company (PESCO) for Wilkins. Applied Geotechnolgy Inc. (AGI) observed and documented the UST removals and collected soil samples for laboratory analysis.

Five gasoline USTs (four 4,000-gallon steel tanks and one 6,000-gallon steel tank) and one 550-gallon steel used oil UST were reported removed from the Site. The gasoline USTs were removed from one excavation located east of the dispenser islands and northeast of the store building and the used oil UST was removed from a separate excavation located northeast of the store building. The excavations were completed to a depth of approximately 10 and 14 feet below ground surface (bgs). Groundwater was not encountered during the excavation activities. Several holes were observed in the used oil UST. In addition, an apparent piping leak was observed in the southeast corner of the gasoline USTs excavation.

Nine soil samples were collected from the gasoline USTs excavation and analyzed for gasoline-range organics (GRO), diesel-range organics (DRO), and benzene, toluene, ethylbenzene, and total xylenes (BTEX). GRO was detected in six of the samples, with a maximum concentration of 10,230 milligrams per kilogram (mg/kg) at a depth of 10.5 feet bgs at the east end of the excavation. Two soil samples were collected from the used oil UST excavation and analyzed for heavy-oil range hydrocarbons (heavy oils), pesticides, polychlorinated biphenyls (PCBs), halogenated volatile organic compounds (HVOCs), and metals. Metals (chromium, copper, and lead), a PCB compound, and pesticide compounds were detected. Prior to the gasoline UST excavation being backfilled, a series of vapor extraction pipes were installed at depths between 10 and 12 feet bgs to be used for a potential future vapor extraction system. However, a system was reportedly never installed (AGI, 1990a, 1990c).

On August 29, 1990, AGI excavated two test pits to the south (Test Pit 1) and to the east (Test Pit 2) of the eastern end of the former 6,000 gallon gasoline UST. The work was reportedly performed to further assess the extent of hydrocarbon impacts in the area where GRO had been detected over 10,000 mg/kg. Concentrations of GRO were 634 mg/kg in Test Pit 1 and 4 mg/kg in Test Pit 2, at approximately 13.8 and 13 feet bgs, respectively (AGI, 1990b, 1990c).

In September 2000, GeoScience Management, Inc. (GSM) performed additional subsurface assessment at the Site, on behalf of Nordic. Seven direct push borings (B-1 through B-7) were advanced to depths of approximately 15 feet bgs outside the limits of the 1990 excavation. Nine soil samples were collected at depth between 10.5 and 14 feet bgs and analyzed for GRO, BTEX, methyl tertiary butyl ether (MTBE), naphthalene, and lead. Concentrations of GRO, BTEX, and naphthalene were reported above their respective Model Toxics Control Act (MTCA) Method A cleanup levels in samples collected from boring B-5 at depths between approximately 10.5 and 12.5 feet bgs. This boring was completed east of the gasoline USTs excavation. In addition, GRO was reported above the MTCA Method A cleanup level in sample from boring B-7 (completed south of the gasoline USTs excavation) at a depth of approximately 14 feet bgs (GSM, 2001).

In December 2000, GSM removed approximately 20 cubic yards of impacted soil from the southeast corner of the 1990 gasoline UST excavation, in the vicinity of boring B-5. Two soil samples were collected from the walls (at depths of approximately 11.5 feet bgs) and one soil sample was collected from the bottom (at a depth of approximately 14.5 feet bgs) of the excavation. The samples were analyzed for GRO and BTEX. Concentrations of GRO, benzene, and xylenes exceeded their respective MTCA Method A cleanup levels in the samples collected from the bottom of the excavation (GSM, 2001).

In April 2009, Pinnacle Environmental, Inc. (PEI) completed a Phase I Environmental Site Assessment for the Site, on behalf of First Citizens Bank & Trust (Phase I assessments for the Site were also reportedly completed in 2000 by ADaPT Engineering, Inc. and in 2006 by Associated Environmental Group). Based on the results of their Phase I assessment, PEI recommended the following additional investigation efforts at the Site:

- A subsurface investigation of the USTs and dispensers to evaluate the property for possible unknown or unreported leakage;
- A subsurface investigation in the western portion of the property to evaluate possible impact from the historic gas stations operations;

- Investigation of the 1,000-gallon capacity fuel oil UST noted on a 1961 plan of the Site; and
- A subsurface investigation of the former auto repair areas, including former sumps[1], hydraulic lifts, and a 3-stage clarifier.

In July 2009, PEI returned to the Site to perform a Limited Phase II Environmental Site Assessment. The scope of work for the Limited Phase II included a geophysical survey to evaluate possible historic USTs and advancement of thirteen direct-push soil borings. Results of the geophysical survey indicate that three large radar anomalies were detected in the westernmost portion of the Site, adjacent to Naval Avenue. PEI reported that the geophysical survey contractor (Underground Detection Services, Inc.) believed these anomalies to be buried USTs. However, a magnetic locator used in conjunction with the radar did not respond with a strong signal. The geophysical survey did not find direct evidence of the 1,000 gallon fuel oil UST, which was reportedly shown on a 1961 diagram as immediately west of the service station building. (PEI 2009)

PEI advanced 13 direct-push soil borings (BM-1 through BM-9, BM-9A, and BM-10 through BM-13) at the Site to depths between approximately 20 to 28 feet bgs. Soil samples were analyzed for GRO, DRO, heavy oils, BTEX, VOCs, PCBs, polynuclear aromatic hydrocarbons (PAHs), and/or lead. GRO, BTEX, and/or naphthalene were detected at concentrations exceeding their respective MTCA Method A cleanup levels in borings located east of former used oil UST (BM-8), in the vicinity of fuel dispensers (BM-4 though BM-7), and east of the gasoline USTs excavation (BM-12) at depths between approximately 7 and 20 feet bgs. (PEI, 2009)

Due to an inability to access the interior of the service station building, PEI was unable to complete their proposed investigation of the historic hydraulic lifts and sump that were believed to have been present in this area. (PEI, 2009)

In February 2010, Ecology completed a site hazard assessment (SHA), which assigns a rank to sites based on their estimated potential threat to human health and the environment relative to all other cleanup sites in Washington State. The Site was ranked a 5, where 1 represents the highest relative risk and 5 the lowest (WARM; Ecology 2010).

[1] Following further review of the available reports for the Site, Leidos has concluded that references to the former interior hydraulic lifts and indoor sump contained in PEI's 2009 Limited Phase II ESA report are vague and potentially unsubstantiated. It is unclear whether PEI had evidence that these features previously existed at the Site, or whether they instead speculated on the possible existence of these features based on the Site use and layout, and therefore recommended further investigation of these potential Site features. Based on the limited information currently available, Leidos cannot confirm that these features were previously, or are still, present at the Site; therefore, these features are not shown on the accompanying figures to this work plan. However, the RI field activities will include a visual inspection and geophysical survey of the former service station building area in order to determine if evidence of these potential features can be located.

2.4 GEOLOGY AND HYDROGEOLOGY

Site geology consists largely of fine silt and fine to coarse sand. Subsurface soils were found to vary little with depth and consist of pebbly brown silty sand to sandy silt, and rarely, clayey sandy silt (PEI, 2009).

Groundwater was not encountered to depths of approximately 28 feet bgs, the maximum depth explored at the Site to date (PEI, 2009). Estimated groundwater depth is 70-75 feet bgs with a southerly or southwesterly direction (AGI, 1990a).

Leidos reviewed Ecology well log records to identify soil borings and groundwater wells in the vicinity of the Site. The following borings were found:

- 17 soil boring were advanced and 4 monitoring wells were installed to approximately 10 feet bgs at a property located approximately 0.25 miles west of the Site (2513 6th Street). Groundwater was not encountered in any of the borings.
- An ARCO service station is located immediately to the west of the Site, across Naval Avenue (2102 W 6th Street). Four monitoring wells were installed at this property to depths of approximately 35 feet bgs. Groundwater was not encountered in any of the wells. In addition, one well was installed to approximately 80 feet bgs. At the time of installation static water level was at 69 feet, and at the time of decommissioning the static water level was at 71 feet in this well. Six soil borings were advance at this property to depths of approximately 50 feet bgs. Groundwater was not encountered in any of the borings.
- The Bremerton Naval Base site is located approximately 0.4 miles to the southwest of the Site (120 Dewey Street). Two monitoring wells were installed at this site to depths of approximately 29 and 65 feet bgs. Groundwater was not encountered in the shallower well and the static water level was 51 feet in the deeper well.
- Several soil borings were advanced at a property located approximately 0.1 miles to the southwest of the Site (301 Naval Avenue). The borings were advanced to depths of approximately 21 feet bgs and groundwater was not encountered in any of the borings.
- Several soil borings were advanced at a property located approximately 0.15 miles to the southwest of the Site (2101 Burwell Place). The borings were advanced to depths of approximately 15-20 feet bgs and groundwater was not encountered in any of the borings.

3 PRELIMINARY CONCEPTUAL SITE MODEL

A conceptual site model (CSM) is a written and/or illustrative representation of the collective information that is known or suspected regarding the presence of contamination at a site, and the physical, chemical, or biological processes that may impact contaminant migration, transport to other media, or exposure of human and/or ecological receptors. Development and refinement of a CSM is an iterative process, in which the CSM is updated when new investigation data or other information is available for a site. Preparation and updates of a CSM is beneficial within the remedial investigation process to identify data gaps and to provide a comprehensive understanding of the potential risks associated with a site.

To initiate the remedial investigation process for the Site, Leidos has developed this preliminary CSM to summarize our current understanding of known and potential environmental impacts to the Site, and the potential risks to human health or the environment that may be associated with those impacts. The sources of data used in developing the preliminary CSM include previous

site investigations, site plans, aerial photographs, and utility location information provided by the City of Bremerton. As the remedial investigation process progresses for the Site, this preliminary CSM will be updated to incorporate the results of the RI field activities described herein.

3.1 CONTAMINANT RELEASE

A review of available historical data indicates that no releases have been documented by Ecology for the Site. In addition, no off-site sources were identified in the immediate vicinity of the Site. Therefore, Leidos is currently not aware of any details regarding specific contaminant release events at the Site.

Based on data from previous environmental investigations and information that is known or suspected regarding service station operations at the Site between approximately 1928 and 2008, Leidos has identified the following potential sources for the petroleum hydrocarbon impacts at the Site:

- Releases to the subsurface associated with leaking USTs in the current or former UST basin areas;
- Releases to shallow soils associated with leaking product lines associated with the current or former service station configurations;
- Releases to the ground surface or near surface soils from UST overfills in the current or former UST basin areas;
- Releases to the ground surface associated with vehicle refueling operations at the current or former dispenser island locations; and
- Releases to shallow and subsurface soils associated with former hoists and vehicle maintenance activities at the current or former service station building locations.

3.2 CONTAMINANTS OF CONCERN

MTCA defines a contaminant as "any hazardous substance that does not occur naturally or occurs at greater than natural background levels." Contaminants of concern (COCs) are those hazardous substances that are known to be present at a site and those which may be present based on information regarding the nature of a known release or past operations at a site. Based on the results of previous environmental sampling performed, as well as information known regarding the past history of service station operations, the following hazardous substances are currently considered as COCs for the Site:

- Gasoline-range organics (GRO)[1]
- Diesel-range organics (DRO)[3]
- Heavy oils[3]
- Benzene[1]
- Toluene[1]
- Ethylbenzene[1]
- Xylenes[1]
- N-Hexane[2]
- 1,2 – Dibromoethane (EDB)[2,3,4]
- 1,2 – Dichloroethane (EDC)[2,3,4]
- Methyl Tertiary-Butyl Ether (MTBE)[2,3,4]

- Lead[2,3]
- Carcinogenic PAHs[3]
- Naphthalenes[1]
- Polychlorinated Biphenyls (PCBs)[3]
- Halogenated Volatile Organic Compounds (HVOCs)[3]

Notes:

1. Confirmed COC based on results of previous environmental sampling results.
2. Potential COC; testing required at sites with known or potential releases of gasoline-range petroleum products.
3. Potential COC; testing required at site with known or potential releases of diesel-range petroleum products, waste oil, or other oils.
4. Testing for this substance in soil is required only if it has first been detected in groundwater.

3.3 MEDIA OF POTENTIAL CONCERN

The following environmental media are considered of potential concern and will be evaluated for the presence of petroleum hydrocarbon constituents as part of the RI:

- **Soil** – One or more COCs have been detected in soil above their respective MTCA Method A cleanup levels.
- **Groundwater** – Known petroleum impacts to soil at the Site have the potential to contaminate groundwater. Groundwater has not been encountered during previous investigations at the Site, which have been performed to a maximum depth of approximately 28 feet bgs. However, because the depth to groundwater at the Site is currently unknown, groundwater is currently considered a media of potential concern for the Site.
- **Soil Vapor** – Known petroleum impacts to soil at the Site have the potential to contaminate soil vapor. Leidos has conducted a preliminary vapor intrusion assessment for the Site. Based on the presence of petroleum-range constituents (specifically benzene and naphthalene) in vadose zone soils within close proximity to the existing service station building, Leidos has determined that additional evaluation, in the form of a Tier I vapor intrusion assessment, is warranted. Therefore, soil vapor is currently considered a media of potential concern.
- **Surface Water** – Utility location maps provided by the City of Bremerton (see Appendix D) indicate that storm water sewer inlets are present adjacent to the northern and western property boundaries of the Site. Because the service station has not operated since approximately 2008, ground surface storm water drainage from the Site is not an exposure pathway of concern for surface water. However, if groundwater at the Site is impacted by petroleum hydrocarbons and is migrating from the former service station property, impacted groundwater has the potential to infiltrate into subsurface storm water conveyance piping, which drains to surface water. Therefore, surface water is currently considered a media of potential concern.

3.4 POTENTIAL RECEPTORS AND EXPOSURE PATHWAYS

Receptors are individuals or populations that are at risk of being exposed to hazardous substances at or originating from a contaminated site. Based on the location and setting of the Site, the following are currently considered potential receptors:

- Humans;
- Terrestrial ecological receptors (e.g., vascular plants, ground-feeding birds, ground-feeding small mammal predators, herbivorous small mammals); and
- Aquatic ecological receptors (e.g., fish, aquatic mammals, bivalves, aquatic invertebrates).

An exposure pathway is the path a hazardous substance takes from a source to a receptor. For the potential receptors currently identified for the Site, the following are considered potential exposure pathways for the media of potential concern.

For humans:

- Soil – humans may be exposed by direct contact, ingestion, or inhalation of contaminated soil particles at or originating from the Site.
- Groundwater – if groundwater is determined to be impacted by petroleum constituents leaching from soil at the Site, humans may be exposed by direct contact or ingestion of contaminated groundwater.
- Soil vapor – if soil vapor is determined to be impacted by petroleum constituents volatilizing from soil or groundwater originating from the Site, humans may be exposed by inhalation of contaminated soil vapor.
- Surface water – if surface water is determined to be impacted by contaminated groundwater originating from the Site, humans may be exposed by direct contact or ingestion of surface water or surface water sediments, or consumption of aquatic species.

For terrestrial ecological receptors:

- Soil – terrestrial ecological receptors may be exposed by direct contact or ingestion of contaminated soil originating from the Site. Based on the current Site conditions, which include asphalt or concrete cover over most ground surfaces, it is considered unlikely that this exposure pathway will be determined to be complete. However, it is currently being retained for further evaluation under Ecology's Terrestrial Ecological Evaluation (TEE) Procedure.

For aquatic ecological receptors:

- Surface water – aquatic ecological receptors may be exposed by direct contact or ingestion of surface water that is impacted by contaminants originating from the Site. Based on our current understanding of groundwater conditions in the vicinity of the Site, it is considered unlikely that there is a complete exposure pathway from impacted soil at the Site to surface water. However, this potential exposure pathway will be further evaluated if groundwater at the Site is determined to be impacted and there is potential for contaminated groundwater to impact surface water.

In order to complete the RI, each of the media of potential concern will be evaluated to determine whether one or more of the COCs are detected within a representative and comprehensive set of environmental sample data. If detected, further evaluation will be

performed to determine whether the concentrations of COCs detected are sufficiently high to result in a risk to human, terrestrial, or aquatic receptors, and whether conditions at the Site can result in a complete exposure pathway between impacts originating from the Site and those potential receptors.

3.5 NATURE AND EXTENT OF PETROLEUM IMPACTS

This section summarizes what is currently known about the nature and extent of petroleum impacts present at the Site.

To date, GRO, benzene, toluene, ethylbenzene, xylenes, and naphthalene have been detected in soil at concentrations exceeding their respective MTCA Method A cleanup levels. These COCs were detected in four of four soil borings (BM-4, BM-5, BM-6, and BM-7) advanced by PEI in 2009 between the northern and southern dispenser islands at the Site. Soil sampling results from these borings indicate that petroleum-range constituents are present from at least approximately 11 to 20 feet bgs.

Petroleum-range impacts to soil have also been confirmed to the south and east of the current UST basin at the Site. Soil samples collected by PEI in 2009 from boring BM-8 contained GRO and BTEX, and BTEX were also reported in boring BM-12, from a sample collected at 11-12 feet bgs. Results for deeper samples collected from both of these borings suggest that petroleum impacts in this vicinity may be limited to relatively shallow soils, less than 20 feet deep. To date, petroleum-related impacts to soil have not been detected to the north of the UST basin; however, additional assessment is warranted in this area of the Site to confirm the lateral extent of impacts to the north.

Based on data collected to date, petroleum impacted soil remain in the vicinity of fuel dispensers and former gasoline USTs. Petroleum impacted soil was observed at depths of approximately 11 and 20 feet bgs in the dispensers area and between approximately 7 and 14 feet bgs in the former UST basin..

3.6 DATA GAPS

The following data gaps have been identified in the Preliminary CSM as information necessary to fully characterize the nature and extent of petroleum impacts at the Site:

- It is unknown whether groundwater at the Site has been, or has the potential to be, impacted by known petroleum impacts to soil.
- The lateral and vertical extents of soil impacts confirmed in the vicinity of the dispenser islands by sampling results from borings BM-4, BM-5, BM-6, and BM-7 has not been fully delineated. Additional sampling to the north, south and west is warranted in this area.
- The lateral and vertical extents of soil impacts confirmed in the vicinity of the current UST basin by sampling results from borings BM-8 and BM-12 has not been fully delineated. Additional sampling to the north, south and east is warranted in this area.
- The potential that petroleum-range impacts are present at the Site resulting from the former hydraulic hoist and vehicle maintenance operations has not been evaluated. Additional investigation in the former service bay area of the Site is warranted.
- The potential that soil vapor at the Site has been impacted by volatilization of petroleum-range constituents present in soil or groundwater has not been evaluated. Performance of a soil vapor intrusion assessment is warranted.

- The potential presence of undocumented USTs in the western portion of the property is unknown. Additional investigation is warranted in this area to determine whether USTs are present, and if so, their status and condition.

4 REMEDIAL INVESTIGATION SCOPE OF WORK

This section of the RI Work Plan provides the approach and scope of work for the proposed remedial investigation field activities, which have been developed to address the data gaps identified above in the preliminary CSM. Additional details regarding the proposed RI field data collection activities and quality assurance/quality control (QA/AC) procedures are provided in the Sampling and Analysis Plan (SAP) and Quality Assurance Project Plan (QAPP) which are included as Appendix A and Appendix B of this work plan.

The objective of the scope of work presented herein is to fully characterize the nature and extent of petroleum-range constituents within the boundaries of the former service station property, and will include the following investigation components:

1. Evaluation of potential impacts to groundwater;
2. Delineation of lateral and vertical extents of impacts to soil;
3. Tier I vapor intrusion assessment; and
4. Evaluation of former UST basin GPR anomalies, and identification and mapping of all underground utilities on and immediately adjacent to the Site.

Section 4.5 of this work plan discusses additional contingency RI field activities that may be necessary in the future if investigation results from this scope of work suggest that contaminants originating from the Site have migrated beyond the boundaries of the former service station property. However, those activities are beyond the intended scope of this work plan. If the results of the first phase of RI field activities indicate that additional investigation is warranted, Leidos will prepare an addendum to this work plan and revise the SAP and QAPP as necessary, to conduct a supplemental phase of investigation activities.

4.1 EVALUATION OF POTENTIAL IMPACTS TO GROUNDWATER

4.1.1 Soil Boring to Assess Depth to Groundwater

As previously discussed, groundwater has not been encountered during previous environmental assessment efforts at the Site, which have advanced to a maximum depth of approximately 28 feet bgs. Well logs for other sites in the vicinity suggest that groundwater is present at depths of approximately 70 or more feet bgs, including at the ARCO service station located to the west of the Site, across Naval Avenue. However, the depth to groundwater at the Site is currently unknown and the potential that petroleum impacts at the Site is impacting groundwater must be evaluated.

Based on discussions with Ecology during the RI planning and scoping meeting on February 28, 2018, Leidos understands that groundwater can be eliminated as a media of concern for the Site if groundwater is not encountered in at least one boring advanced to a depth of at least 50 feet bgs. Based on this understanding, Leidos proposes to advance one soil boring (SB-1) to a depth of approximately 50 feet bgs in the central portion of the Site, approximately southwest of the current dispenser islands location (see Figure 4). This boring will serve to determine if groundwater is present at the Site, as well as to provide data regarding the extent of soil impacts to the west of the current dispenser islands and UST basin.

Soil boring clearance, sampling, and abandonment procedures, as well as soil sample laboratory analyses are presented in Section 3 of the SAP, which is included as Appendix A.

Based on the information known regarding the geological characteristics of the Site, Leidos anticipates that drilling below 8 feet bgs (i.e. following completion of borehole clearance) will be performed using a hollow-stem auger drill rig, with sample collection using a split-spoon sampler. Between 8 and 25 feet bgs, soil samples will be collected on a continuous basis in order to fully delineate the vertical extent of soil impacts at this location, if present. If, upon reaching 25 feet bgs, field screening results indicate no evidence of petroleum-hydrocarbon impacts are present, the soil sampling frequency will be reduced to every 5 feet. However, if field screening results indicate evidence of impacts, sampling will continue on a continuous basis until field screening results indicate that the bottom-most extent of impacted soil has been defined.

As SB-1 is advanced, the Leidos field geologist will closely monitor and record soil moisture conditions in samples, and/or soil cuttings from the auger, in order to assess whether intervals of perched groundwater are encountered in the boring. If a zone that appears to be wet is encountered, the boring will be sounded with a water-level meter to determine whether groundwater is standing in the boring. Upon reaching the maximum boring depth, the drill casing will be left in place within the boring for a period of 2 hours in order to allow monitoring of the boring for groundwater accumulation. During the monitoring period, the drill casing will be sounded approximately once every hour using a water-level meter to determine if water is present, and if so, its approximate depth.

If water is not encountered in boring SB-1, the boring will be abandoned according to Section 3.5 of the SAP. However, if groundwater is encountered, boring SB-1 will be evaluated for completion as a monitoring well, per the following section.

4.1.2 Monitoring Well Installation

If groundwater is encountered in boring SB-1, Leidos will install at least four groundwater monitoring wells in order to evaluate groundwater flow patterns at the Site and evaluate the potential for petroleum impacts to groundwater. Proposed monitoring well locations are shown on Figure 4. As shown, monitoring wells are proposed to the west, north, east, and south of the area of known soil impacts located near the current UST basin and dispenser islands. The proposed monitoring well network would utilize two of the planned soil boring locations, SB-1 (to the west of the dispenser islands) and SB-4 (to the east of the former and existing UST basins). Two additional soil borings (SB-8 and SB-9) would also be added to evaluate potential groundwater impacts in the northern and southern portions of the Site; however, these boring locations are considered contingency borings that will only be completed if the presence of groundwater is confirmed in boring SB-1.

Actual well locations, depths, and screen intervals will be determined based on conditions encountered in the field.

Monitoring well construction and development procedures are presented in Section 4 of the SAP, which is included as Appendix A. Groundwater monitoring and sampling procedures, as well as groundwater sample laboratory analyses, are presented in Section 5 of the SAP.

4.2 DELINEATION OF LATERAL AND VERTICAL EXTENTS OF IMPACTS TO SOIL

In order to further delineate the lateral and vertical extents of petroleum impacts to soil, Leidos proposes to advance nine soil borings (SB-1 through SB-7, and SVP-1 - SVP-2) as shown on Figure 4. Justification for each proposed boring is provided below:

- **SB-1** – As previously described in Section 4.1, soil boring SB-1 is proposed to evaluate whether groundwater is present at the Site at a depth of less than 50 feet bgs. However, soil sampling data from this boring will also be used to evaluate the extent of potential contamination to the east of the dispenser islands, where GRO, BTEX, and naphthalene were previously reported above MTCA Method A cleanup levels at depths between 11 and 20 feet bgs.
- **SB-2** – Soil sampling data from this boring will be used to evaluate the extent of potential contamination to the north of the dispenser islands, where GRO, BTEX, and naphthalene were previously reported above MTCA Method A cleanup levels at depths between 11 and 20 feet bgs.
- **SB-3** – Soil sampling data from this boring will be used to evaluate the extent of potential contamination to the north of the eastern boundary of the current UST basin, where GRO was previously reported above the MTCA Method A cleanup level at depths between 10 and 11 feet bgs.
- **SB-4** – Soil sampling data from this boring will be used to evaluate the extent of potential contamination to the east of the eastern boundary of the current UST basin, where GRO was previously reported above the MTCA Method A cleanup level at depths between 10 and 11 feet bgs.
- **SB-5** – Soil sampling data from this boring will be used to evaluate the extent of potential contamination to the south of the eastern boundary of the current UST basin, where GRO was previously reported above the MTCA Method A cleanup level at depths between 10 and 11 feet bgs.
- **SB-6** – Soil sampling data from this boring will be used to evaluate the extent of potential contamination to the south of the dispenser islands, where GRO, BTEX, and naphthalene were previously reported above MTCA Method A cleanup levels at depths between 11 and 20 feet bgs.
- **SB-7**– Soil sampling data from this boring will be used to evaluate the extent of potential contamination to the southwest of the dispenser islands, where GRO, BTEX, and naphthalene were previously reported above MTCA Method A cleanup levels at depths between 11 and 20 feet bgs.
- **SVP-1** – SVP-1 is the proposed location for a soil vapor sampling probe to collect soil samples for the Tier I vapor intrusion assessment. However, soil data from this boring will also be used to evaluate shallow soils beneath the existing station building, to the south of impacts previously reported in soil boring BM-8.
- **SVP-2** – SVP-2 is the proposed location for a soil vapor sampling probe to collect soil samples for the Tier I vapor intrusion assessment. However, soil data from this boring will also be used to evaluate shallow soils in the former service bay area for potential petroleum impacts.

The soil boring locations shown on Figure 4 are proposed; therefore, actual locations may differ based on utilities or other conditions encountered in the field.

Soil boring installation, abandonment and soil sampling procedures as well as soil sample analysis summary are presented in Section 3 of SAP included in Appendix A.

4.3 EVALUATION OF POTENTIAL VAPOR INTRUSION EXPOSURE PATHWAY

Leidos has completed a Preliminary Vapor Intrusion (VI) Assessment for the Site per Ecology's *Guidance for Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action* (Ecology, 2016). Based on the presence of petroleum-range constituents (specifically benzene and naphthalene) in vadose zone soils within close proximity to the existing service station building, Leidos has determined that additional evaluation, in the form of a Tier I vapor intrusion assessment, is warranted.

The scope of the proposed Tier I assessment will include installation and sampling of three soil vapor sampling probes as depicted in Figure 4. Soil borings SVP-2 and SVP-3 will be advanced to a depth of 5.5 feet bgs and soil boring SVP-1 will be advanced to a depth of 10 feet bgs using a hand auger. Each soil vapor sampling probe will consist of a shallow probe that will be installed at a depth of approximately 5.25 feet bgs. The proposed locations are as follows:

- Proposed soil vapor probes SVP-1 and SVP-2 are located in the service station building and will be used shallow soil vapor conditions in this area. Soil vapor probe SVP-2 is located in the area of the building that is believed to have been formerly used as service bays and will be used to collect samples for additional testing per Table 830-1 in MTCA.
- Proposed soil vapor probe SVP-3 is located east of the gasoline UST basin and will be used to assess shallow soil vapor conditions adjacent to the residential property to the east.

The soil vapor sampling probe locations shown on Figure 4 are proposed; therefore, actual locations may differ based on utilities or other conditions encountered in the field.

Soil vapor probe installation procedures are presented in Section 6 and soil vapor sampling procedures as well as soil vapor sample analysis summary are presented in Section 7 of the SAP, which is included as Appendix A.

4.4 EVALUATION OF FORMER UST BASIN GPR ANOMALIES

In order to address the data gap regarding the potential presence of undocumented USTs in the western portion of the property, Leidos will perform additional investigation activities in this area in order to confirm whether or not undocumented UST are still present at the Site, and if so, their current status and condition.

To begin this phase of the RI field activities, Leidos will conduct a geophysical survey in the area that is believed to be a former UST basin, in order to redefine the locations and approximate extents of the GPR anomalies previously identified in 2009 for PEI. The geophysical survey will include use of both electromagnetic and GPR survey equipment.

Following relocation of the previously identified GPR anomalies, a section of asphalt cover above the approximate middle of each suspected tank location will be removed to provide access to the soil below. Soil from each location will then be removed, using an air-knife or other "soft-dig" excavation method, to the approximate depth of the GPR anomaly identified at that location. Based on the results of the previous GPR survey, it is expected that tanks would be encountered within 3 to 4 feet of the ground surface.

If the presence of undocumented USTs at the Site is confirmed, additional air-knife excavation will be conducted to sufficiently unearth the tanks to confirm their size and to attempt to determine whether or not they have been abandoned in place. In addition, at least one boring will be advanced using a hand-auger along each side of any UST found, to the approximate bottom depth of the tank. Soil samples will be field screened, sampled, and analyzed according to the procedures presented in Section 3 of the SAP. If additional assessment is warranted, Leidos will subcontract a specialty UST testing contractor to open and assess the contents of any undocumented USTs encountered. Removal of any undocumented UST is beyond the scope of this work plan.

If the presence of undocumented USTs is not confirmed by the air-knife excavation borings, one soil boring will be advanced to a minimum depth of 20 feet bgs within the area that is suspected to be a former UST basin. Soil samples will be collected, field screened, sampled, and analyzed according to the procedures presented in Section 3 of the SAP.

As part of the geophysical survey that will be conducted in association with this evaluation, Leidos will also identify and map all underground utilities on and immediately adjacent to the Site, and investigate the former service station building for evidence of former hoists, sumps, or other service station infrastructure that may be remaining, or may have been present, in that area.

4.5 ADDITIONAL CONTINGENCY RI FIELD WORK

This work plan presents the scope of work for the first phase of RI field activities at the Site, which are focused within the boundaries of the former service station property. However, if the lateral extent of petroleum related constituents at the Site is not delineated by the investigation activities described in this work plan, additional investigation may be required in off-property areas to north, east, south, or west. If necessary, potential future investigation activities may include, but would not be limited to:

- Soil boring and/or monitoring well installation in City of Bremerton rights-of-way to the north, west, or south of the Site;
- Storm water sampling and/or storm water sediment sampling within City of Bremerton storm water sewers to the north and west of the Site;
- Soil and/or groundwater sample collection in areas of utility line backfill in City of Bremerton rights-of-way to the north, west, or south of the Site;
- Soil sampling, monitoring well installation and sampling, and/or soil vapor sampling on privately owned properties to the south or east of the Site; and
- Tier II vapor intrusion assessment sampling in the former service station building and/or on privately owned properties to the south or east of the Site.

Because the need for these potential supplemental investigation tasks is currently not known, they are considered beyond the scope and intent of this work plan. If the results of the first phase of RI field activities indicate that additional investigation is warranted that is beyond the scope of this work plan, Leidos will prepare an addendum to this work plan and revise the SAP and QAPP, as necessary, for the next phase of work.

5 ANTICIPATED SCHEDULE FOR RI FIELD INVESTIGATIONS

Leidos will begin planning and coordination to implement this proposed scope of work upon receipt of Ecology approval of this work plan and approval of the Parties. Project planning and

coordination for this scope of work is expected to require approximately four to eight weeks to complete, prior to initiation of RI field activities. However, initiation of field work may also be contingent on approval by the Parties, permits, subcontractor availability, staff resources, or weather concerns.

Per the Schedule of Deliverables (Exhibit C) of the Agreed Order, the due date for the completion of RI field investigations is 180 days after Ecology's approval of the Final RI Work Plan. However, as previously discussed, if the results of the investigation activities performed per this work plan indicate that additional investigation is required beyond the boundaries of the service station property, it is likely that permitting and/or property access coordination to conduct off-property investigation activities will delay the completion of that work beyond the current due date. In the event of such circumstances, Leidos will advise the Parties that an extension of schedule request should be submitted per the terms of the Agreed Order.

6 REMEDIAL INVESTIGATION DATA MANAGEMENT

As required per the Scope of Work (Exhibit B) of the Agreed Order, environmental data collected in association with the RI field activities will be validated by a third-party review performed at Quality Assurance Level 2 (EAP2). Leidos currently anticipates that third-party data validation will be performed by EcoChem Data Quality of Seattle, Washington.

Upon receipt of validated data from third-party review, Leidos will submit all new sampling data generated under the RI Work Plan into Ecology's Environmental Information Management System (EIM) within 30 days, in accordance with WAC 173-340-840(5) and Ecology's Toxics Cleanup Program Policy 840: Data Submittal Requirements.

7 REFERENCES

AGI, 1990a. Hydrocarbon Contamination Remediation. Newman Texaco. 2021 Sixth Street, Bremerton, Washington. September 12, 1990.

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Ecology, 2016. Guidance for Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action" – Review Draft. Washington State Department of Ecology Publication No. 09-09-047. Revised February 2016.

PEI, 2009. Limited Phase II Environmental Site Assessment of the Chevron Gas Station Property. 2021 6th Street, Bremerton, Washington 98337. August 20, 2009.

LIMITATIONS

This technical document was prepared on behalf of the Parties and is intended for their sole use and for use by the local, state, or federal regulatory agency that the technical document was sent to by Leidos. Any other person or entity obtaining, using, or relying on this technical document hereby acknowledges that they do so at their own risk, and Leidos shall have no responsibility or liability for the consequences thereof.

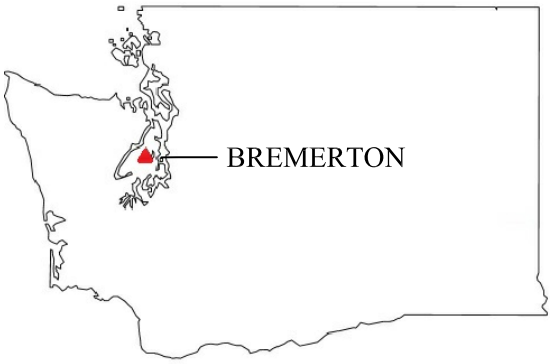
Site history and background information provided in this technical document are based on sources that may include interviews with environmental regulatory agencies and property management personnel and a review of acquired environmental regulatory agency documents and property information obtained from the Parties and others. Leidos has not made, nor has it been asked to make, any independent investigation concerning the accuracy, reliability, or completeness of such information beyond that described in this technical document.

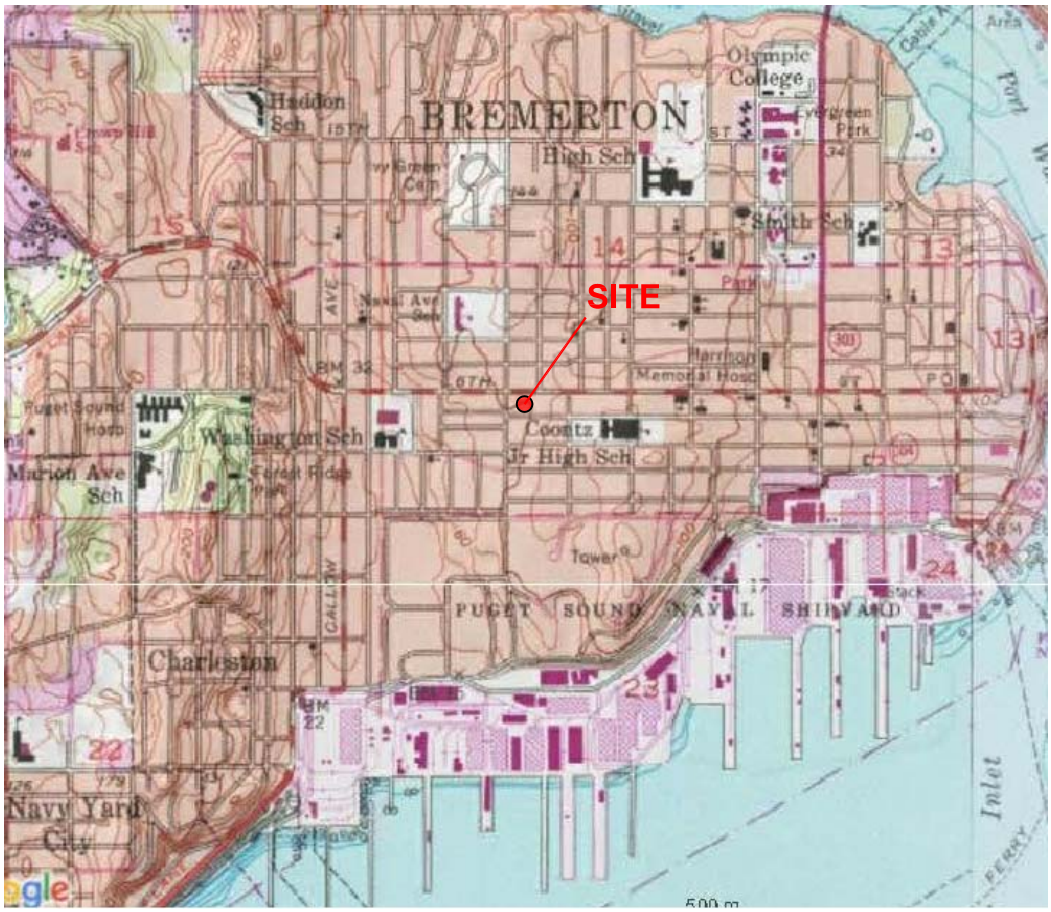
Recognizing reasonable limits of time and cost, this technical document cannot wholly eliminate uncertainty regarding the vertical and lateral extent of impacted environmental media.

Opinions and recommendations presented in this technical document apply only to site conditions and features as they existed at the time of Leidos site visits or site work and cannot be applied to conditions and features of which Leidos is unaware and has not had the opportunity to evaluate.

All sources of information on which Leidos has relied in making its conclusions (including direct field observations) are identified by reference in this technical document or in appendices attached to this technical document. Any information not listed by reference or in appendices has not been evaluated or relied on by Leidos in the context of this technical document. The conclusions, therefore, represent our professional opinion based on the identified sources of information.

Figures





Former Chevron Facility No. 204177
2021 6th Street
Bremerton, Washington

FIGURE 1
Vicinity Map

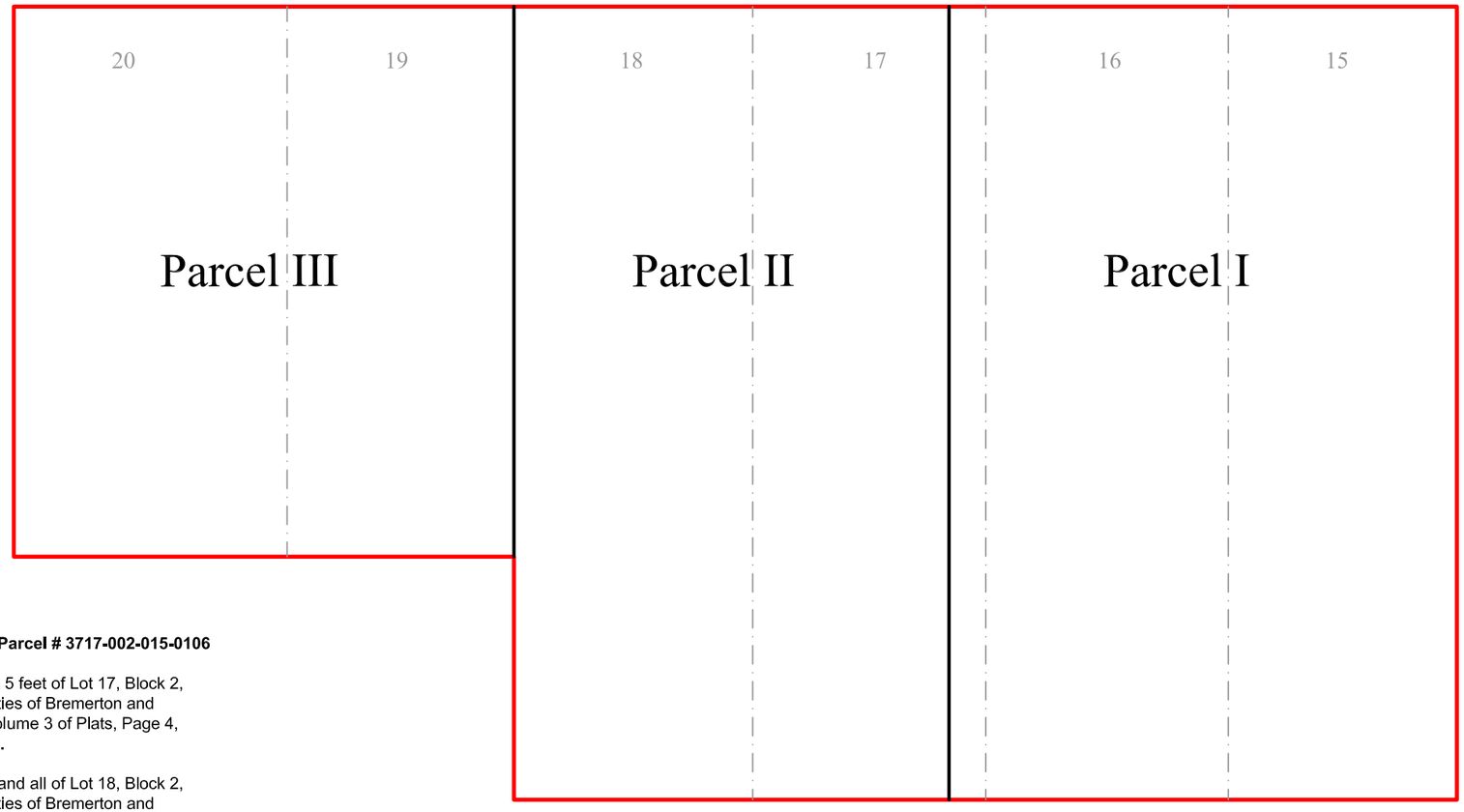
DATE: 2/28/2018

DRAWING: 204177_Bremerton_Vicinity_Map.dwg

N

6th Street

Naval Avenue



LEGEND:

- Approximate Current Parcel Boundary
- Approximate Former Parcel Boundaries
- Approximate Lot Boundaries
- 15 Kitsap County Assessor's Tax Lot Identification Number

Tax Description for Kitsap County Parcel # 3717-002-015-0106

Parcel **I:** Lots 15 and 16, and the East 5 feet of Lot 17, Block 2, Wm. Bremer's First Addition of the Cities of Bremerton and Charleston, as per plat recorded in Volume 3 of Plats, Page 4, records of Kitsap County, Washington.

Parcel **II:** The West 25 feet of Lot 17, and all of Lot 18, Block 2, Wm. Bremer's First Addition of the Cities of Bremerton and Charleston, as per plat recorded in Volume 3 of Plats, Page 4, records of Kitsap County, Washington.

Parcel **III:** The North 75 feet of Lots 19 and 20, Block 2, Wm. Bremer's First Addition of the Cities of Bremerton and Charleston, as per plat recorded in Volume 3 of Plats, Page 4, records of Kitsap County, Washington.

SCALE

0 20 40 60ft

Parcel boundaries shown are considered approximate and are based on the assessor's parcel map provided in Figure 2 of PEI's "Limited Phase II Environmental Site Assessment" report, dated August 20, 2009.

leidos

Newman's Chevron
2021 6th Street
Bremerton, Washington

FIGURE 2
Current and Former Property Boundaries

DATE: 6/5/2018 | DRAWING: 204177 Site Map.dwg

N

SOURCE: GOOGLE EARTH IMAGE DATED 2017.

SCALE

0 20 40 60ft

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LEGEND:

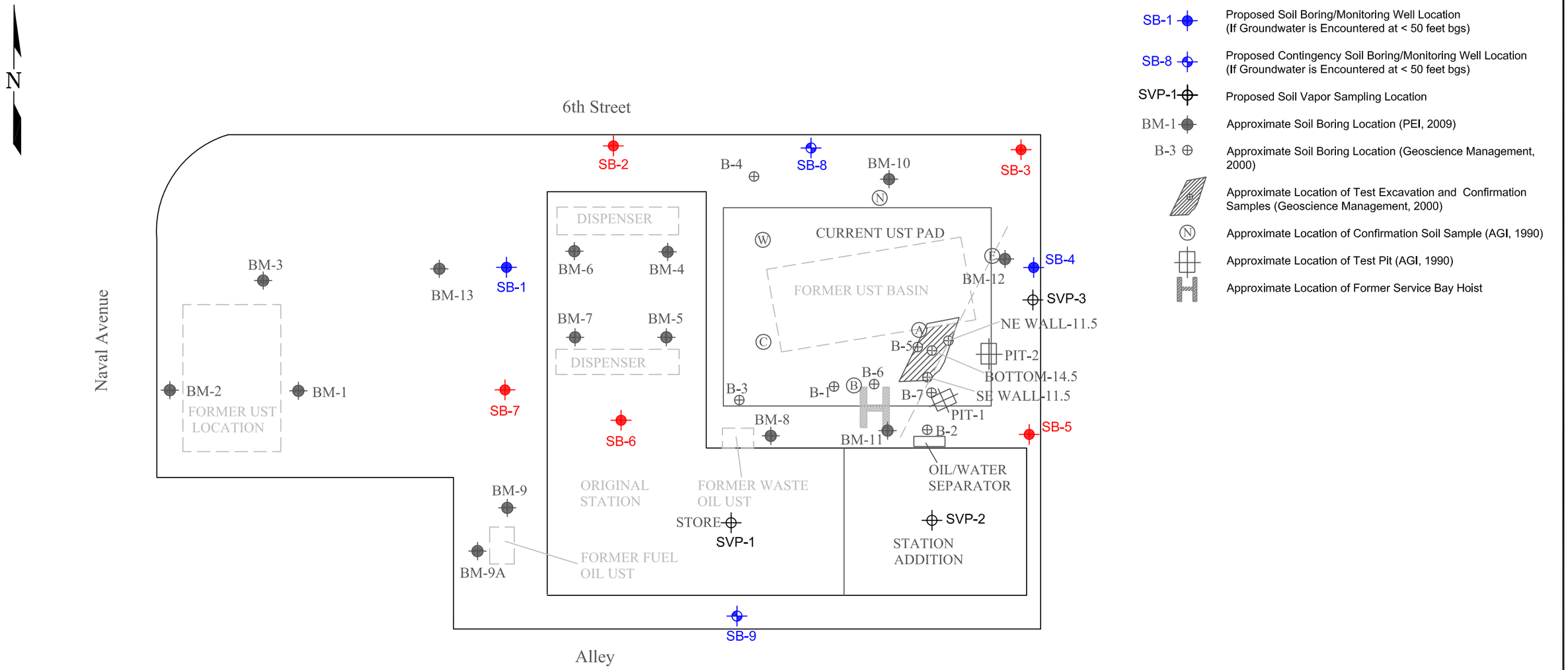
Approximate Property Boundary

Newman's Chevron
2021 6th Street
Bremerton, Washington

FIGURE 3
Aerial Photo of Site and Adjacent Properties

DATE: 6/5/2018

DRAWING: 204177 Site Map.dwg



SCALE

0 20 40 60ft

leidos

Newman's Chevron
2021 6th Street
Bremerton, Washington

FIGURE 4
Site Map with Historical and Proposed Investigation Locations

DATE: 6/5/2018 | DRAWING: 204177 Site Map.dwg

Appendix A:
Sampling and Analysis Plan

APPENDIX A
AGENCY REVIEW DRAFT REMEDIAL INVESTIGATION SAMPLING AND ANALYSIS PLAN

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Figure A-1: Typical Soil Vapor Sampling Probe Construction and Equipment Layout

APPENDIX A
AGENCY REVIEW DRAFT REMEDIAL INVESTIGATION SAMPLING AND ANALYSIS PLAN

1 INTRODUCTION AND OBJECTIVES

This Sampling and Analysis Plan (SAP) has been prepared by Leidos for anticipated Remedial Investigation (RI) field activities to be conducted at the Newman's Chevron site (the Site), located at 2021 6th Street in Bremerton, Washington. This SAP is not intended to be a stand-alone document. Instead, the SAP has been prepared as an appendix to the RI Work Plan for the Site, and is designed to be used in conjunction with both the RI Work Plan and the Quality Assurance Project Plan (QAPP) for the project.

The objective of the SAP is to establish the procedures necessary to complete the scope of work presented in the RI Work Plan. Based on the currently anticipated scope of work for the RI field activities, the following procedures are included in this version of the SAP:

1) General Sampling Procedures;
2) Soil Boring and Soil Sampling Procedures;
3) Groundwater Monitoring Well Installation Procedures;
4) Groundwater Monitoring and Sampling Procedures;
5) Soil Vapor Sampling Probe Installation Procedures;
6) Soil Vapor Sampling Procedures;
7) Field Equipment Decontamination Procedures; and
8) Investigation-Derived Waste Management Procedures.

If, based on the results of the initial RI field activities, additional investigation tasks are added or modified beyond the scope of this SAP, the SAP will be amended to include procedures for those additional or revised tasks.

2 GENERAL SAMPLING PROCEDURES

Sampling personnel will be equipped with a bound field notebook during performance of RI field activities. All data regarding sample collection will be recorded in this field notebook.

The chain of custody (COC) program will be adequate to allow for the tracing, possession and handling of individual samples from the time of field collection through laboratory analysis. The COC form will be used by personnel responsible for ensuring the integrity of the samples and will be maintained in the project files as documentation of sample handling procedures.

2.1 SAMPLE CONTAINER PREPARATION

All containers used in the sampling of soils, groundwater, and/or soil vapor will be laboratory cleaned as specified in the Quality Assurance Project Plan (QAPP) provided in Appendix B. The container type and preservative requirements will follow the specifications of the QAPP.

2.2 PROCEDURES TO PREVENT CROSS-CONTAMINATION

Personnel collecting soil, groundwater, and/or soil vapor samples will take the following precautions to minimize sample contamination or cross-contamination between samples:

- New nitrile gloves will be used while taking all samples and disposed of after equipment has been decontaminated.
- Sampling personnel will not touch the inside of the sampling container.
- Only equipment that has been properly decontaminated according to the procedures specified by the SAP will be used for environmental sample collection.

Immediately following the collection of the sample, the container will be sealed and the sample will be labeled and entered in the field notebook. At this time, the COC form will be completed to note the acquisition of the sample.

The sample will then be placed in a pre-cooled ice chest container and preserved (if required) according to the directions of the QAPP.

2.3 SAMPLE IDENTIFICATION AND LABELING

The sample designation protocols will be adhered to during the sample collection procedures to maintain sample data integrity. Each sample will be identified in the logbook and on the sample container label. The label will be filled out as follows:

- Sampler's initials;
- Sample location number;
- Site identifier;
- Date – date of sample collection;
- Time – time of sample collection; and
- Source – sample number and matrix (i.e., soil, water).

2.3.1 Soil Sample Designation

Subsurface soil boring samples will be designated with the number corresponding to the boring and the depth at which the sample was collected. Sample names will be created using the following format:

- SB-1-10.0-S-MMDDYY

QA/QC samples such as method blanks, trip blanks, field blanks, and duplicate samples collected during the RI will be labeled with unique sample identifiers and the date at which the sample was collected. A record of the QA/QC samples collected will be kept in the field notebook along with the COC. The following format will be used for QA/QC samples:

Equipment Rinsate Blanks

- ER-1-MMDDYY

Trip Blanks

- TB-1-MMDDYY

Duplicate Samples

- DUP-1-MMDDYY

2.3.2 Groundwater Sample Designation

Groundwater samples collected from proposed monitoring wells (if monitoring wells are installed at the Site) will be labeled according to the monitoring well ID and the date of collection. The date and time of collection will be recorded in the field logbook and on the COC.

- MW-14-W-MMDDYY.

QA/QC samples collected during groundwater sampling will be labeled in the same manner as QA/QC samples for soil.

2.3.3 Soil Vapor Sample Designation

Soil vapor samples will be labeled according to the soil vapor probe ID and the date of collection. The date and time of collection will be recorded in the field logbook and on the COC.

- SVP-1-MMDDYY.

QA/QC samples such as equipment blanks, and duplicate samples collected during the RI will be labeled with unique sample identifiers and the date at which the sample was collected. A record of the QA/QC samples collected will be kept in the field notebook along with the COC. The following format will be used for QA/QC samples:

Equipment Blanks

- EB-1-MMDDYY

Duplicate Samples

- DUP-1-MMDDYY

2.4 FIELD DOCUMENTATION

Field personnel will maintain detailed records of drilling and installation activities as well as development activities. These records will consist of soil boring and well installation and development logs, information recorded in field notebooks, and driller's daily field reports.

A bound field notebook will be maintained by the sampler to provide a daily record of events. At the beginning of each entry, the following will be recorded:

- Date;
- Time;
- Meteorological conditions;
- Field personnel present;
- List of on-site visitors and equipment; and
- Initials of the person making the entry.

Field notebook entries will be in as much detail as necessary so that essential information is properly documented. All documentation in field notebooks will be in ink. If an error is made, corrections will be made by crossing a line through the error and entering the correct information. Corrections will be dated and initialed. No entries will be obliterated or rendered unreadable.

If sample locations cannot be indicated on field maps, a sample drawing of the location (not to scale) will be included in the notebook to provide an illustration of all sampling points.

The cover of each notebook used will contain:

- Project ID and book number;
- Start date;
- End date; and
- A list of personnel that are authorized to record entries into the notebook.

Entries in the notebook will include the following information for each sample date:

- Site identification;
- Location of sampling points;
- Description of sampling points;
- References to photographs (if applicable) and brief sketch of sampling points;
- Sample identification number;
- Number of samples collected;
- Time of sample collection;
- Reference to sample location map;
- Number of QA/QC samples collected and their labeled identifier;
- Sampler's name;
- Field observations;
- Sample distribution (i.e., split samples, analytical lab); and
- All field measurements made (e.g., PID readings, etc.).

Daily activities will be summarized in the field notebook.

3 SOIL BORING AND SAMPLING PROCEDURES

Soil boring advancement and soil sampling proposed in the RI Work Plan will be conducted according to the following procedures.

3.1 BORE HOLE CLEARANCE

Prior to beginning of ground disturbance activities, Leidos will contact the Utilities Underground Location Center to request location of all public utilities in the vicinity of the proposed locations. In addition, Leidos will subcontract a private utility locating contractor to locate on-site infrastructure or other buried objects that would not typically be identified through the public utility locating process. The private utility survey will use a combination of ground-penetrating radar (GPR) and electromagnetic (EM) locating techniques.

Soil borings will not be advanced within 3 feet of known underground utilities and 10 feet from any overhead utilities without first evaluating alternative boring locations, and without written approval to proceed by CEMC, Nordic, and Victory.

If present, asphalt/concrete will be removed from each of the boring locations using appropriate equipment (e.g. jackhammer, concrete cutter).

In order to comply with current CEMC requirements for subsurface asset avoidance, each boring will initially be cleared to a depth of at least 8 feet below ground surface (bgs) using an air-vacuum excavation system or similar "soft-dig" method to avoid damage to buried utilities or other subsurface infrastructure. Within this interval, the diameter of the boring is required to be at least 3 inches larger than the largest diameter of tooling to be advanced into the boring.

When soil sample collection is required between the ground surface and 8 feet bgs, air-vacuum excavation will be stopped at least 6 inches above the top of the desired sampling interval and a hand-auger will be used to clear the boring to the desired sampling depth and collect the soil sample.

3.2 SOIL SAMPLE COLLECTION METHODS

The soil sampling scope of work proposed in the RI Work Plan includes soil sampling by one or more of the following methods:

- Hand auger;
- Direct-push; or
- Split-spoon sampling conducted during hollow-stem-auger drilling operations.

Appropriate soil sampling procedures will be followed at all times to ensure that representative soil samples are provided for analysis and that the act of sampling does not contribute to further contamination by cross-contamination. Care will be taken to quickly collect and preserve soil samples in order to minimize the potential loss of volatile organic compounds (VOCs). All techniques will be thoroughly documented to ensure future re-creation. The location of each sample will be mapped using a measuring tape or wheel and referenced to a local permanent feature where possible.

For soil samples collected between the ground surface and 8 feet bgs (i.e. the boring clearance interval), soil samples will be collected using a stainless steel hand-auger. Samples within this interval will generally be collected at approximate 2-foot intervals, unless otherwise specified in the RI Work Plan.

For soil sampling at depths below 8 feet bgs, samples will be collected using direct-push tooling or a split-spoon sampler advanced using a hollow-stem auger rig. Within this interval, soil sample collection at each location will be as specified in Section 4 of the RI Work Plan.

3.3 LOGGING AND FIELD SCREENING OF SOIL SAMPLES

Soil samples will be logged in the field in accordance with the Unified Soil Classification System (USCS). In addition, each sample will be field screened for the presence of

petroleum hydrocarbons by headspace vapor measurements using a photo-ionization detector (PID) and sheen testing.

The samples will be examined and the following items will be noted in the field logbook or boring log:

- Color;
- Moisture content (dry, damp, moist, or wet);
- Lithology (using USCS);
- Geological interpretation, if possible (e.g., fill, topsoil, alluvium, till, etc.);
- Presence of sheen or light non-aqueous phase liquid (LNAPL);
- Other indications of contamination (e.g., discoloration); and
- Field screening results (see below).

Each sample will be field screened to obtain a relative estimate of its VOC concentration. This field screening will be performed by measuring the concentration of VOCs in the headspace above the sample in a closed container using a PID. Headspace vapor measurements will be performed by placing the soil into a sealed plastic bag (e.g. Ziploc), disaggregating the soil by hand, allowing the sample to equilibrate for at least five minutes, and then opening the bag slightly, inserting the instrument probe, and measuring the VOC concentration in the headspace.

Sheen testing will be conducted by placing soil in a pan of water and observing the water surface for signs of sheen. Sheens are classified as follows:

- ***Slight Sheen***: Light, colorless, dull sheen. The spread is irregular and dissipates rapidly.
- ***Moderate Sheen***: Light to heavy sheen, may show color/iridescence. The spread is irregular to flowing. Few remaining areas of no sheen are evident on the water surface.
- ***Heavy Sheen***: Heavy sheen with color/iridescence. The spread is rapid and the entire water surface may be covered with sheen.

3.4 SOIL SAMPLES ANALYSIS

At a minimum, two soil samples from each boring will be submitted for laboratory analysis. It is expected that one sample will be submitted from the bottom-most sample interval attained in the boring. The bottom-most sample will be used to demonstrate that the sampling effort has advanced to a sufficient depth to define the vertical extent of petroleum-hydrocarbon impacts. Additional soil samples may also be submitted based on field-screening observations. For example, the sample producing the highest PID readings, strongest sheen, or otherwise having the greatest visual or olfactory indication of hydrocarbon impacts may also be submitted for laboratory analysis.

Selected soil samples will be submitted to Eurofins Lancaster Laboratories Environmental, of Lancaster, Pennsylvania for the following analyses:

- Gasoline-range hydrocarbons (GRO) by Ecology method 97-602 NWTPH-Gx;

- Diesel-range hydrocarbons (DRO) and oil-range organics (ORO) by Ecology method 97-602 NWTPH-Dx,;
- Benzene, toluene, ethylbenzene, and total xylenes (BTEX) by United States Environmental Protection Agency (USEPA) method 8260B;
- Naphthalenes by USEPA method 8270; and
- Total lead by USEPA method 6010B.

Select soil samples (those displaying strong indications of petroleum hydrocarbon impact based on field screening results) will be submitted for the following additional analyses:

- Methyl tertiary butyl ether (MTBE), ethylene dibromide (EDB), ethylene dichloride (EDC), and n-hexane by USEPA method 8260B;
- Extractable petroleum hydrocarbons (EPH) by Ecology method 97-602 WA EPH;
- Volatile petroleum hydrocarbons (VPH) by Ecology method 97-602 WA VPH; and
- Carcinogenic polycyclic aromatic hydrocarbons (cPAHs) by USEPA method 8270 SIM.

Soil samples collected from boring SVP-2, which will be advanced inside an area of the building that is believed to have been formerly used as service bays, will also be analyzed for the following analyses:

- Polychlorinated biphenyls (PCBs) by USEPA method 8082;
- Halogenated volatile organic compounds (HVOCs) by USEPA 8260B;
- Extractable petroleum hydrocarbons (EPH) by Ecology method 97-602 WA EPH; and
- Volatile petroleum hydrocarbons (VPH) by Ecology method 97-602 WA VPH.

Duplicate soil samples will be collected at a rate of one per each 20 soil samples and submitted for the above-referenced analyses to ensure QA/QC. Additional QA/QC samples will include one trip blank to accompany each sample cooler, and equipment rinse samples to verify equipment decontamination procedures. Equipment rinse sampling will be performed by collecting laboratory-supplied distilled water that has been used as the final rinse following equipment decontamination procedures. Equipment rinse samples will be collected at a rate of one per sample collection method. Trip blank and equipment rinse QA/QC samples will be submitted for the following analysis:

- GRO by Ecology method 97-602 NWTPH-Gx; and
- BTEX by USEPA method 8260B.

3.5 SOIL BORING ABANDONMENT

Following soil sample collection, soil boring will be decommissioned with hydrated bentonite by a Washington State Licensed Driller, in accordance with requirements of WAC 173-160. The ground surface will be restored with an asphalt, concrete, or natural cover to resemble the surrounding area.

4 GROUNDWATER MONITORING WELL INSTALLATION PROCEDURES

Groundwater monitoring well installation and development proposed in the RI Work Plan will be conducted according to the following procedures.

4.1 MONITORING WELL CONSTRUCTION

Monitoring wells will be completed in accordance with the WAC Minimum Standards for Construction and Maintenance of Wells (Chapter 173-160 WAC). The drilling subcontractor will be responsible for obtaining and submitting all well drilling permits, logs, and well identification (ID) tags as required by the State of Washington.

Wells will be constructed using a 2-inch-diameter PVC casing with 0.010-inch, factory-slotted screen. The screen-interval depths for the wells will depend on the water table at each location. Each well screen will be positioned to straddle the water table during anticipated seasonal fluctuations. The screen interval filter pack will consist of 2/12 Monterey or 10/20 Colorado sand to a depth of two feet above the top-of-screen elevation. Above the filter pack, the remaining borehole annulus will be filled with bentonite chips to approximately 1.5 feet bgs. The remaining annular space will be filled with cement and completed with a flush-mount, traffic-rated well box.

The purpose of the development activities is to set the sand pack and to remove fine-grained material from the sand pack and casing. This is done to enable the collection of groundwater samples with a low turbidity**.** Wells will not be developed until at least 24 hours after being installed in order to allow the surface seal to adequately cure. If light non-aqueous phase liquid (LNAPL) is observed in any new wells, the LNAPL will be removed prior to development. The well will be allowed to stabilize after development for at least 24 hours before being sampled.

Monitoring well development procedures are as follow:

- Date and time of arrival, general site conditions and other applicable field observations related to the Site will be recorded.
- Locations and conditions of the wells will be verified. The least contaminated wells (if known) and background wells will be developed first to minimize the potential for cross contamination.
- Monitoring instruments will be checked by performing one calibration check. Results will be recorded in the field logbook.
- Wells will be inspected to determine the condition of the surface casings, surface seal and well identification.
- A water level indicator (electronic) will be used to measure depth to water in the well. The total depth of each well will be measured. The measurement will be used to calculate the thickness of the water column (height of standing water in the well). Well depths will be compared to completion data and any significant differences that may indicate silt buildup in the well will be reported.
- Well development will consist of surging for 10 minutes and pumping at least 10 well-casing volumes of groundwater from the well using an electric submersible pump until water produced from the well is clear and free of sediment. However, if LNAPL is present, development will be performed by manual bailing, instead of using an electric submersible pump.

4.3 MONITORING WELL LOCATION AND ELEVATION SURVEY

Following installation of the new wells, Leidos will subcontract a Washington State licensed land-surveying firm to perform a location and elevation survey of the new monitoring wells. Monitoring well elevation measurements will be made to the nearest 0.01 foot at the ground surface (i.e., top of well-box lid) and at the top of the well casing, relative to the North American Vertical Datum (NAVD) of 1988. Monitoring well location measurements will be made relative to the NAD 1983 High Accuracy Reference Network [NAD83 (HARN)].

5 GROUNDWATER MONITORING AND SAMPLING PROCEDURES

Groundwater monitoring and sampling proposed in the RI Work Plan will be conducted according to the following procedures.

5.1 GROUNDWATER ELEVATION AND LNAPL THICKNESS MEASUREMENTS

The depth-to-groundwater and depth to the bottom of the monitoring well will be measured to the nearest 0.01 foot using an electronic water level meter. The water level indicator will be decontaminated between wells

The presence of LNAPL will be evaluated in all wells using an electronic oil/water interface probe. If present, the LNAPL thickness will be measured to the nearest 0.01 foot. The oil/water interface probe will be decontaminated between wells.

5.2 GROUNDWATER SAMPLE COLLECTION

Proper sampling protocol will be followed to ensure that representative samples of groundwater are provided for analysis and that the act of sampling does not contribute to further impact at the site or cross-contamination of samples. Techniques employed will be thoroughly documented.

The pump (or intake hose) will be placed near the middle or slightly above the middle of the screened interval. The well will be purged at a rate of 100 to 500 ml/min; the goal is to minimize drawdown in the well (ideally less than 10 cm drawdown).

Purge-water temperature, pH, specific conductance, dissolved oxygen, oxidation-reduction (redox) potential, and turbidity will be monitored using an in-line flow cell. Readings will be taken every 3 to 5 minutes.

Purging will cease when the following parameters have stabilized as defined below for three successive readings or when at least one well casing volume has been purged:

- Temperature: $\pm$ 1 ºC;
- pH: $\pm$ 0.1 units;
- Specific conductance: $\pm$ 10 percent; and
- Dissolved oxygen or turbidity: $\pm$ 10 percent.

To minimize delays in field parameter stabilization and potential bias in analytical testing results, any vents or other potential sources of air bubbles in the pump discharge tubing or

in-line flow cell will be identified and sealed off (or otherwise isolated) prior to purging or as soon as possible after purging begins.

If well yield is so low that continuous flow is lost during well purging event at the minimum sustainable purge rate, the pump will be turned off to allow the well to recover as much as possible (but not longer than 24 hours). After the water level in the well has recovered, the required samples will be collected with the pump placed near the middle of the screened interval.

5.3 GROUNDWATER SAMPLE ANALYSIS

One groundwater sample will be collected from each of the monitoring wells and will be submitted to Lancaster for the following analyses:

- GRO by Ecology method 97-602 NWTPH-Gx;
- DRO and ORO by Ecology method 97-602 NWTPH-Dx, without silica gel cleanup;
- DRO and ORO by Ecology method 97-602 NWTPH-Dx, with silica gel cleanup;
- BTEX, MTBE, and EDC by USEPA method 8260B;
- EDB by USEPA method 8011;
- Naphthalene by USEPA method 8270;
- cPAHs by USEPA method 8270 SIM; and
- Total lead by USEPA method 6010B.

6 SHALLOW SOIL VAPOR SAMPLING PROBE INSTALLATION PROCEDURES

Shallow soil vapor sampling probe installation proposed in the RI Work Plan will be conducted according to the following procedures.

6.1 BORINGS FOR SHALLOW SOIL VAPOR PROBE INSTALLATION

Based on the planned construction of the shallow soil vapor sampling probes, which is described in further detail in Section 6.2, soil borings for installation of shallow soil vapor sampling probes will generally be advanced to a depth of approximately 6 feet bgs. Where borings are advanced to greater depths for additional soil sampling, or other purposes, the borings will be backfilled with pre-hydrated granular bentonite to 6 feet bgs.

Borings for installation of shallow soil vapor sampling probes will be advanced with a stainless-steel hand auger only. Air-vacuum or pressure excavation equipment will not be used for shallow soil vapor probe installation due to the potential to significantly disturb equilibrium soil vapor conditions near the sampling probe. Soil sampling during the shallow soil vapor probe installation process will be performed as stated in the RI Work Plan.

6.2 SHALLOW SOIL VAPOR SAMPLING PROBE CONSTRUCTION

Construction of shallow soil vapor sampling probes will be performed under the supervision of a Washington State licensed driller. Upon completion of the sampling probe boring to 6 feet bgs, the borehole will be prepared by placing a 6-inch lift of 2/12 Monterey or 10/20 Colorado sand into the bottom of borehole. The vapor sampling probe hardware, which will consist of a 6-inch long, 0.75-inch diameter stainless steel screen (0.0057-inch screen pore size) connected to a length of ¼-inch outside diameter (O.D.) Teflon® tubing via a Swagelok® fitting with a rubber compression ferule, will then be placed in the approximate center of the boring, and additional sand will be added until the sand pack extends to a depth approximately 6 inches above the top of the probe screen. Approximately 12 inches of dry, granular bentonite will then be placed above the sand pack. The boring will then be sealed with approximately 24 inches of pre-hydrated granular bentonite and the upper portion of the boring will be completed with an 18-inch thick cement cap. An 8-inch flush-mounted well box will be installed to protect the tubing line that is set in the cement cap. The above-grade end of the soil vapor sampling probe tubing will be fitted with a Swagelok® stainless steel on/off control valve. An illustration showing the typical construction of a soil vapor sampling probe is included as Figure A-1.

7 SHALLOW SOIL VAPOR SAMPLING PROCEDURES

Shallow soil vapor sampling proposed in the RI Work Plan will be conducted according to the following procedures.

7.1 SHALLOW SOIL VAPOR SAMPLING EVENT SCHEDULING

Sampling of shallow soil vapor sampling probes will not be performed within the first 48 hours after installation of the probes, in order to ensure that the surface seal of the probes is sufficiently cured. In addition, soil vapor sampling will not be performed during or within 48 hours after a significant rain event (greater than 1 inch of precipitation), due to the potential reduction of the effective diffusion coefficient and decrease in relative vapor saturation in the unsaturated zone. Soil vapor sampling will also not be performed during periods of high winds, or during other major storm events with the potential to cause significant and rapid changes in barometric pressure trends.

7.2 SHALLOW SOIL VAPOR SAMPLING EQUIPMENT

Soil vapor samples will be collected in stainless steel Summa air-sampling canisters (Summa canisters), which will be provided by the subcontracted laboratory for the vapor sampling portion of the project. Each Summa canister used for sample collection will be individually certified (100-percent certified) to contain less than the reporting limit for each of the target analytes listed in Section 7.8. Soil vapor sampling manifolds, duplicate sampling tees, purge canisters, and tubing will also be supplied by the subcontracted laboratory.

7.3 PRE-SAMPLING EQUIPMENT SETUP AND LEAK TESTING

7.3.1 Initial Canister Vacuum Check

To begin setup for the vapor sample collection process, the sampling canister (or canisters if a duplicate sample is being collected) will be checked to determine their initial vacuum level, in order to verify that the canisters have not been inadvertently opened or have otherwise leaked prior to the sampling event. The initial vacuum, which should be approximately 29 inches of mercury vacuum, will be recorded on the canister's identification tag and in the field log book and/or field data form. Sampling canisters with initial vacuum readings of less than 27 inches of mercury vacuum will not be used for soil vapor sample collection.

7.3.2 Sampling Canister and Manifold Assembly and Shut-In Test

Following the initial canister vacuum check, the sampling canister (or canisters if a duplicate sample is being collected) will be fitting with a sampling manifold. The sampling manifold will be equipped with an on/off valve and a flow controller that will be calibrated to provide a sample collection flow rate of less than 200 milliliters per minute (mL/min). Vacuum gauges will be provided on both in the inlet and outlet side of the flow controller. The manifold will also allow the sampling canister to be connected to another Summa canister that will be used to purge the soil vapor sampling probe and sampling equipment train. Where duplicate samples are to be collected, the sampling manifold will also allow connection of another Summa canister for simultaneous collection of a duplicate sample.

After connecting the sampling manifold to the sampling canister(s) and purge canister, a "shut-in" test will be performed as a preliminary check of the manifold connections. With the inlet to the manifold tightly capped, the purge canister will be opened momentarily and then shut, thereby applying a vacuum to the sampling manifold. Initial vacuum readings will then be recorded in the field log book and/or field data form from both of the two vacuum gauges on the sampling manifold. After a period of at least 5 minutes, the vacuum readings of each gauge will be checked again to verify that the initial vacuum levels have been maintained. If the vacuum readings between the initial and final readings are the same, the results of the shut-in test will be recorded and the sampling canister and manifold assembly will be used for vapor sample collection. However, if the vacuum readings between the initial and final readings are different, it is an indication that one or more of the manifold connections is leaking. In that event, an attempt will be made to tighten the manifold connections, or otherwise remedy the manifold leak(s), and the shut-in test will be repeated. If after three attempts, shut-in test results still indicate that the sampling canister and manifold assembly is not leak-free, the sampling manifold will be removed from service and not used for vapor sample collection.

7.4 CONNECTION TO SAMPLING PROBE AND PRE-SAMPLE COLLECTION PURGING

After satisfactory completion of the shut-in test, the sampling canister and manifold assembly will be connected to the soil vapor sampling probe. Teflon® tubing (¼–inch outside diameter) will be used to connect the soil vapor sampling probe control valve to the

inlet of the sampling manifold. Swagelok® fittings with rubber compression ferrules will be used to make connections from the Teflon® tubing to the control valve and sampling manifold inlet. During this process, the soil vapor sampling probe control valve will be maintained in the closed position.

Prior to collecting a soil vapor sample, each soil vapor sampling probe will be purged to remove the air volume present in the sample collection train, which would not be representative of subsurface soil vapor conditions. Purge volume will be based on the volume of air contained within the inner diameter of the soil-vapor sampling probe and all tubing connected to the inlet of the sampling canister. The sand pack volume of the soil-vapor sampling probe will not be included in the purge volume calculation, as it is assumed that the soil-vapor concentration in the sand pack will be in equilibrium with the surrounding soil. Three purge volumes will be removed from each soil-vapor sampling probe prior to sample collection. The purge cycle will be completed by applying vacuum to the manifold, using the purge container, for the duration of the calculated purge time. Upon completion of the purge cycle, the purge canister valve will be closed to reseal the sampling manifold.

Assuming use of ¼-inch O.D. tubing and an approximate combined sampling probe and tubing length of 10 feet, it is estimated that the total purge volume would be equal to approximately 300 milliliters, which would equate to a purge time of approximately 1.5 minutes at a purge rate of approximately 200 mL/min.

7.5 SECONDARY LEAK TESTING AND SAMPLE COLLECTION

In order to verify the integrity of the vapor sample collection system during the sampling process, helium gas will be used as a tracer to check for leaks or short-circuiting of ambient air into the sampling system. To accomplish this, the entire soil-vapor sampling train (soil-vapor sampling probe, sampling manifold, sampling canister, and purge canister) will be contained in a shroud in which a helium-rich environment will be maintained throughout the duration of the sample collection. Laboratory-grade helium will be used as the tracer gas. During the duration of the sampling, the concentration of helium inside the shroud will be monitored using a Mark 9822, or equivalent, helium detector. During sample collection, the sampling technicians will attempt to maintain a concentration of helium of approximately 10 percent by volume in the sampling shroud. An illustration showing the typical equipment setup for soil vapor sample collection is included as Figure A-1.

After reaching a helium concentration in the sampling shroud of at least 10 percent by volume, the valve on the sampling canister(s) will be opened to begin sample collection. The start time and initial canister vacuum(s) will be recorded in the project log book. During collection of each sample, the sampling technician will periodically check the canister vacuum(s) readings to verify that the canister is filling at the expected rate. The sampling technician will also monitor and maintain the concentration of helium leak-detection gas within the sampling shroud. Sample collection will be stopped when the vacuum gauge on the sampling canister indicates that between approximately1 to 3 inches of mercury vacuum is remaining in the sampling canister. Once sample collection is done, the final canister vacuum will be recorded on the canister ID tag and also in the project log book.

7.6 QA/QC SAMPLE COLLECTION

In order to verify sample collection, and laboratory QA/QC, one equipment blank and one duplicate soil vapor sample will be collected. The QA/QC equipment blank will be collected by passing laboratory-certified nitrogen through a representative length of Teflon® tubing, and the sampling manifold, into a Summa canister. The QA/QC duplicate sample will be collected using a duplicate-sampling manifold, which will allow two sample collection canisters to be filled simultaneously in a parallel configuration.

7.7 WEATHER MONITORING AND OBSERVATIONS

During the soil vapor sampling event, the following weather data and observations will be recorded at the start of the work day, at the approximate time of each sample collected, and at the end of the work day:

- General weather conditions;
- Barometric pressure; and
- Wind speed and direction.

General weather conditions will be recorded based on observations in the field by Leidos personnel. Weather data will recorded from National Weather Service or equivalent web-based resources available for the Bremerton area.

7.8 SOIL VAPOR SAMPLE ANALYSIS

Soil vapor samples will be submitted to ALS Environmental in Simi Valley, California for the following analyses:

- BTEX, MTBE; and naphthalene by USEPA method TO-15 modified; and
- Oxygen, carbon dioxide, methane, nitrogen, and helium by American Society for Testing and Materials (ASTM) D1946.

8 FIELD EQUIPMENT DECONTAMINATION PROCEDURES

Field equipment used during drilling soil borings and sampling will be decontaminated prior to use and between sample collection events to reduce the potential for the introduction of contamination and cross-contamination in accordance with the guidelines and procedures set forth in this document. These procedures are necessary to ensure quality control in decontamination of field equipment and to serve as a means to identify and correct potential errors in sample collection and sample handling procedures.

The decontamination fluids generated during decontamination procedures will be treated as though they are contaminated and will be contained in 55-gallon drums, marked and secured until a proper disposal method is developed and implemented based on analytical test results.

Decontamination of all non-disposable field sampling equipment, field instruments and sample containers will be conducted in a thorough and step-wise manner as described below. New, disposable nitrile gloves will be worn when handling clean sampling equipment and monitoring well construction materials to ensure that the equipment is not

cross-contaminated. Decontamination procedures will be documented in the field notebook.

8.1 EXPLORATION AND CONTRUCTION EQUIPMENT

Prior to use, between locations, and before leaving the Site; augers, direct-push rods, well screens, casings and other non-sampling equipment shall be certified clean or decontaminated in accordance with the following procedures:

- Move equipment to designated decontamination area;
- Clean thoroughly (inside and outside) with a high-pressure steam cleaning unit (water at 1,500 psi);
- Allow to air dry; and
- Store in a clean area on plastic sheeting.

8.2 SAMPLING EQUIPMENT

All non-disposable sampling equipment used for soil and water sampling will be decontaminated between each sample. The decontamination procedure is provided as follows:

- Scrub with Liquinox and water to remove any visible dirt;
- Rinse thoroughly with potable water;
- Rinse with distilled water; and
- Store in a clean area on plastic sheeting.

8.3 SAMPLE CONTAINERS

Reusable sample containers (such as Summa canisters for vapor sample collection) will be cleaned and certified prior to use, by the analytical laboratory performing the analyses.

9 INVESTIGATION DERIVED WASTE MANAGEMENT PROCEDURES

9.1 IDW STORAGE

Residual soil from this investigation will be contained in 55-gallon Department of Transportation (DOT) approved drums, which will remain on-site for temporary storage while awaiting laboratory results. All decontamination and purge water will be stored in 55-gallon DOT approved waste drums.

Each drum will be labeled immediately before waste is placed into the container using a non-hazardous waste or pending analysis label. The following information, at a minimum, will be written in indelible, waterproof ink on each label: container number, date of generation, facility address, contact information for the CEMC Waste Management Center, and a brief description of the contents of the container. Each drum will be secured after every addition of waste and prior to departing the site on each work day.

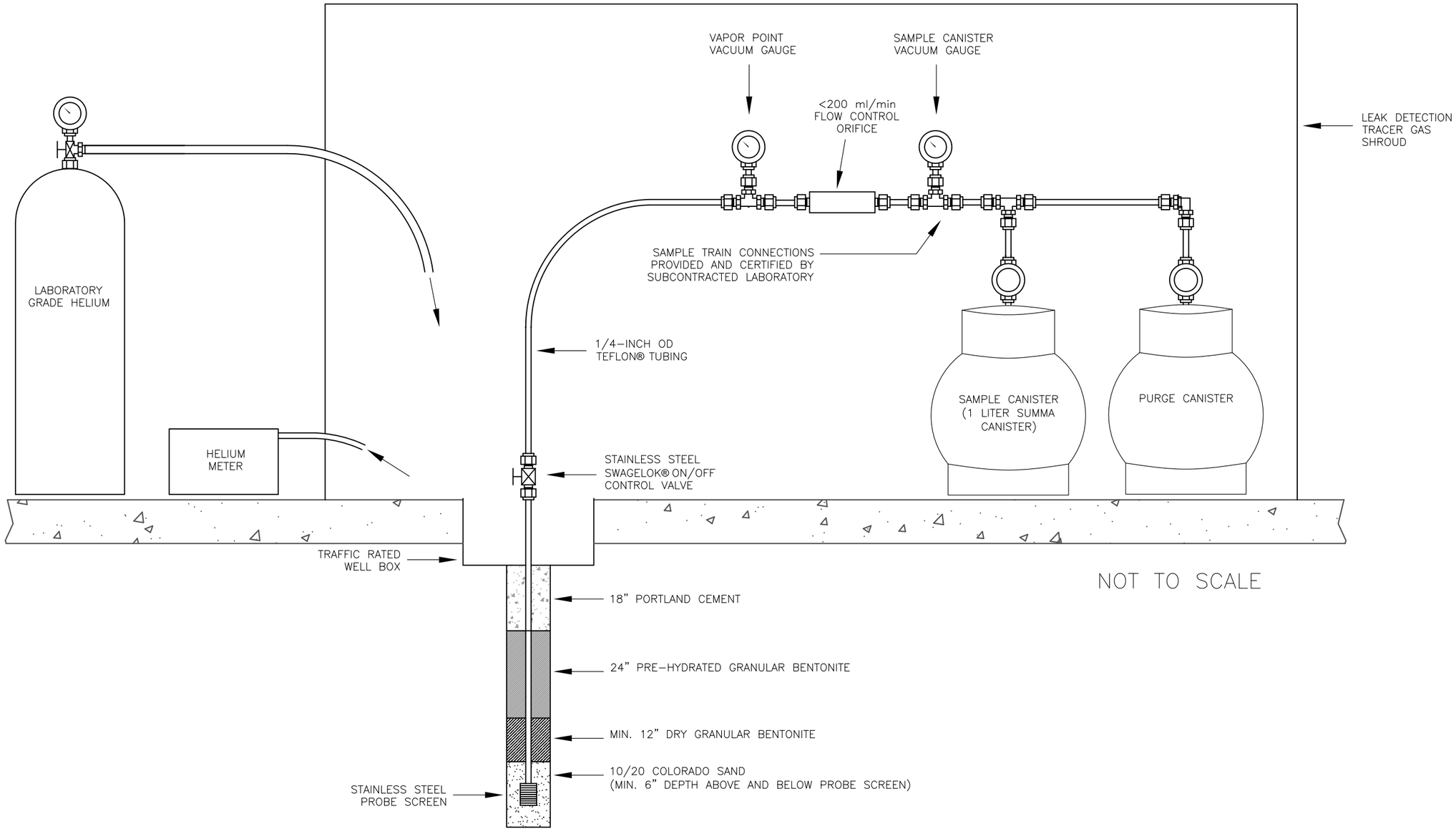
9.2 IDW SAMPLING

For waste profiling purposes, waste samples will be collected and submitted under a separate COC. For soil waste, a 4-point composite sample will be collected and

composited by the laboratory. For liquid waste, one sample will be collected from the container where the liquid is stored. The waste samples will be submitted to Lancaster for analysis specified by CEMC in the site-specific waste sampling plan.

9.3 IDW DISPOSAL

Following receipt of laboratory analytical data, the waste soil and water will be transported for disposal at a permitted facility by an approved disposal subcontractor.



leidos

Newman's Chevron
2021 6th Street
Bremerton, Washington

FIGURE A-1

TYPICAL SOIL VAPOR SAMPLING PROBE CONSTRUCTION AND EQUIPMENT LAYOUT

FILE NAME: 204117_SVSP.dwg

DATE: 05/07/2018

Appendix B:
Quality Assurance Project Plan

APPENDIX B
AGENCY REVIEW DRAFT REMEDIAL INVESTIGATION QUALITY ASSURANCE PROJECT PLAN

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APPENDIX B
AGENCY REVIEW DRAFT REMEDIAL INVESTIGATION QUALITY ASSURANCE PROJECT PLAN

1 INTRODUCTION AND OBJECTIVES

This Quality Assurance Project Plan (QAPP) has been prepared by Leidos for anticipated Remedial Investigation (RI) field activities to be conducted at the Newman's Chevron site (the Site), located at 2021 6th Street in Bremerton, Washington. This QAPP is not intended to be a stand-alone document. Instead, the QAPP has been prepared as an appendix to the RI Work Plan for the Site, and is designed to be used in conjunction with both the RI Work Plan and the Sampling and Analysis Plan (SAP) for the project.

The objective of the QAPP is to establish the practices and procedures necessary to ensure that data collected as part of the RI field investigation activities are of the type and quality needed. The quality of data collected for the RI must be documented in order to ensure that the data is scientifically and legally defensible.

2 PROJECT ORGANIZATION AND RESPONSIBILITY

Leidos is the lead project consultant, involved with data generation. Key roles on this project are as follows:

Project Manager – Leidos. The project manager is responsible for the successful completion of all aspects of this project, including day-to-day management, production of reports, liaison with party and regulatory agencies, and coordination with the project team members. The project manager is also responsible for resolution of non-conformance issues, is the lead author on project plans and reports, and will provide regular, up-to-date progress reports and other requested information to project team and Ecology.

Field Manager – Leidos. The field manager is responsible for overseeing the field sampling program outlined in the RI Work Plan, including collecting representative samples and ensuring that they are handled properly prior to transfer of custody to the project laboratory. The field manager will manage procurement of necessary field supplies, assure that monitoring equipment is operational and calibrated in accordance with the specifications provided herein.

Data Quality Manager – Leidos. The data quality manager is responsible for developing data quality objectives, selecting analytical methods, coordinating with the analytical laboratory, overseeing laboratory performance, and approving QA/QC procedures.

Data Validation Manager – EcoChem Data Quality of Seattle, WA. The data validation manager is responsible for overseeing QA validation of the analytical data reports received from the project laboratory. The validator works independently, with no interference from those who collect and use the Site data.

Laboratory Project Manager – Eurofins Lancaster Laboratories Environmental. The laboratory project manager is responsible for ensuring that all laboratory analytical work for soil and water media complies with project requirements, and acting as a liaison with the project manager, field manager, data quality manager, and data validation manager to

fulfill project needs on the analytical laboratory work. This responsibility also applies to analyses the laboratory project manager subcontracts to another laboratory.

Laboratory Project Manager –ALS (Simi Valley). The laboratory will be utilized for soil vapor analyses. The laboratory project manager is responsible for ensuring that all laboratory analytical work for soil vapor media complies with project requirements, and acting as a liaison with the project manager, field manager, and data quality manager to fulfill project needs on the analytical laboratory work. This responsibility also applies to analysis the laboratory project manager subcontracts to another laboratory.

3 QUALITY ASSURANCE/QUALITY CONTROL FIELD PROCEDURES

The following quality assurance (QA)/quality control (QC) procedures will be utilized during this RI to ensure that accurate, reproducible, and defensible data is collected.

3.1 FIELD MONITORING EQUIPMENT CALIBRATION

All instruments and equipment (field meters including pH, conductivity, dissolved oxygen, temperature probe, and PID) used during sampling and analysis will be operated, calibrated, and maintained according to the manufacturer's guidelines. Operation, calibration, and maintenance will be performed by personnel properly trained in these procedures. Documentation of all routine and special maintenance and calibration conducted during the duration of the RI field activities will be recorded in the project logbook.

The PID will be calibrated daily in the field in accordance with the manufacturer's recommended procedure using a laboratory-certified isobutylene gas standard. A calibration test will be performed as necessary in the field using the calibration gas to check if the instrument remains properly calibrated throughout the day.

3.2 SAMPLE COLLECTION

The specific methods for sample container size and type, sample preservation requirements and holding times are determined by the contact laboratory chosen for the project. The laboratory will provide the sample containers. Leidos will verify that the laboratory has supplied the proper containers and that they are pre-cleaned and shipped in sealed boxes.

All samples (with the exception of trip blanks) will be prepared and sealed in the field. Sample collection procedures, locations and protocols will be documented in a bound field notebook.

3.3 SAMPLE IDENTIFIERS AND LABELS

Sample identifiers and labels will be assigned by the sampling team as described in the SAP. The unique sample identifier will be clearly written on the sample label affixed to each sample container. Sample labels will be affixed to each sample container in such a way so as to not obscure any QA/QC lot numbers on the containers. Sample information will be printed clearly on each label. Field identification will be sufficient to enable cross-reference with the project field book.

3.4 QA/QC SAMPLING

QC data are necessary to determine precision and accuracy and to demonstrate the absence of interference and/or contamination of sampling equipment glassware and reagents, etc. All field QC samples will be submitted as blind samples to the laboratory. Specific QC requirements for laboratory analyses will be the responsibility of the project laboratory. Field QC will include the following:

- **Trip Blanks** are blank samples prepared to assess ambient transport conditions. The contract laboratory will prepare them. The blanks will be handled like a sample and shipped to the laboratory for analyses. One trip blank will accompany each sample cooler containing water samples.
- **Equipment Rinsate Blanks** are blank samples designed to demonstrate that sampling equipment has been properly prepared and cleaned before field use and that cleaning procedures between samples are sufficient to minimize cross contamination. Rinsate blanks will be collected at a rate of one blank per sample collection method.
- **Field Duplicate** samples consist of a set of two samples collected independently of one another at the same sampling location during the same sampling event. Field duplicates are designed to assess actual field variability as compared to analytical duplicate or MSD analyses which measure laboratory variability. Duplicate samples will be collected at a rate of one for each 20 samples.
- **MS/MSDs** are environmental samples that are spiked, in the laboratory, with a known concentration of a target analyte. The MS/MSDs are used to check sample matrix interferences and evaluate error due to laboratory bias and precision. Additional sample volume will be submitted for water samples. The project laboratory will perform MS/MSD analyses at a rate of one for each 20 samples of a particular matrix

3.5 SAMPLE STORAGE

All soil and groundwater samples will be stored in an ice chest while at the Site and during transportation to the laboratory. Samples will be sub-packed by sample location in new Ziploc plastic bags and stored in the dark at approximately 4°C.

Summa canisters used for soil vapor sample collection are not subject to special preservation requirements. However, used Summa canisters (i.e. those containing soil vapor samples) will be clearly marked and segregated from unused canisters in order to prevent possible compromise of the samples by inadvertently reopening a used sample canister. Used canisters will be returned to their original shipping box, or a similar protective enclosure, and stored away from heating sources or direct sunlight.

3.6 CHAIN OF CUSTODY RECORDS AND PROCEDURES

The primary objective of chain of custody (COC) protocol is to provide an accurate written record that can trace the possession and handling of a sample from collection to the completion of all required analyses. A sample is in custody if it is in someone's possession, in someone's view, locked up, or kept in a secured area that is restricted to authorized personnel only.

The COC will be fully completed in the field and signed by the sample collector. The samples will be entered onto the COC as they are collected.

3.7 CUSTODY SEALS

Custody seals will be used on all coolers and sample shipping containers. The number of seals per container is dependent upon the nature of each container. Seals will be signed and dated prior to use. Clear strapping tape will be placed over each seal to ensure that seals are not accidentally broken during shipment.

3.8 FIELD CUSTODY PROCEDURES

The following guidance will be used to ensure proper control of samples while in the field:

- As few persons as possible will handle samples.
- The sample collector is personally responsible for the care and custody of samples collected until they are transferred to another person or dispatched properly under COC rules.
- The sample collector will record sample data in the field logbook.

When transferring custody (i.e., releasing samples to a shipping agent), the following will apply:

- The coolers in which the samples are packed will be sealed and accompanied by COC records. Separate COC records will accompany each shipment.
- When transferring custody of samples between individuals, the individuals relinquishing and receiving them must sign, date and note the time on the COC record. This record documents sample custody transfer.
- When transferring custody of samples to a commercial carrier (e.g. FedEx or UPS) the individual relinquishing them must sign, date and note the time on the COC record and record the method of shipment, name of courier and shipment tracking information on the COC record. Shipping containers will be sealed with custody seals for shipment to the laboratory.
- All shipments will be accompanied by COC records identifying their contents. The original record will accompany the shipment. The other copies will be provided to the Project Manager and copies will be retain in the project files.

4 LABORATORY ANALYTICAL METHODS

Tables B-1 through B-3 provide the laboratory analytical methods to be used for completing the laboratory analytical tasks defined in the RI Work Plan and the SAP. Table B-4 summarizes sample containers, preservation, and holding times.

5 DATA VALIDATION

As required per the Scope of Work (Exhibit B) of the Agreed Order, environmental data collected in association with the RI field activities will be validated by a third-party review performed at Quality Assurance Level 2 (EAP2). Leidos currently anticipates that third-party data validation will be performed by EcoChem Data Quality of Seattle, Washington.

TABLE B-1
Analytical Methods and Detection Limits for Soil Samples

Analyte	Method A Clean-Up Level	Soil					
		Analytical Method	MDL	LOD	LOQ	LCS	RPD
			(mg/kg)			(%)	
Petroleum Hydrocarbons							
GRO	30/100	NWTPH-Gx	1	2	5	80-120	≤ 30
DRO	2,000	NWTPH-Dx[1]	3	6	25	61-115	≤ 20
EPH	--	NWVPH	3	6	5	61-115	≤ 20
VPH	--	NWEPH	3	6	5	61-115	≤ 20
Volatile Organic Compounds							
Benzene	0.03	USEPA 8260B	0.0005	0.002	0.005	80-120	≤ 30
Ethylbenzene	6	USEPA 8260B	0.001	0.002	0.005	80-120	≤ 30
Toluene	7	USEPA 8260B	0.001	0.002	0.005	80-120	≤ 30
Total Xylenes	9	USEPA 8260B	0.001	0.002	0.005	80-120	≤ 30
n-Hexane	--	USEPA 8260B	0.001	0.002	0.005	8-120	≤ 30
Fuel Additives							
EDC	--	USEPA 8260B	0.001	0.002	0.005	70-133	≤ 30
EDB	0.005	USEPA 8260B	0.001	0.002	0.005	80-120	≤ 30
MTBE	0.1	USEPA 8260B	0.000231	0.001	0.005	59-120	≤40
Other Petroleum Components							
Carcinogenic PAHs							
benzo[a]pyrene	0.1[2]	USEPA 8270 SIM	0.000065	0.010	0.05	51-118	≤20
benzo[a]anthracene		USEPA 8270 SIM	0.000088	0.010	0.05	51-115	≤20
benzo[b]fluoranthene		USEPA 8270 SIM	0.000182	0.010	0.05	56-123	≤20
benzo[k]fluoranthene		USEPA 8270 SIM	0.000194	0.010	0.05	54-131	≤20
chrysene		USEPA 8270 SIM	0.000165	0.010	0.05	55-129	≤20
dibenz[a,h]anthracene		USEPA 8270 SIM	0.00025	0.010	0.05	50-141	≤20
indeno[1,2,3-cd]pyrene		USEPA 8270 SIM	0.000183	0.010	0.05	49-148	≤20
Naphthalenes	5	USEPA 8270	0.000429	0.005	0.5	71 – 122	≤ 30
Other Non-Petroleum Contaminants							
Halogenated VOCs	--[3]	USEPA 8260B	0.001	0.002	0.005	80-120	≤ 30
PCB Arachlors	1	USEPA 8082	0.001	0.002	0.04	80-120	≤ 30
Metals							
Lead	250	USEPA 6010B	0.55	1.5	1.5	80-120	≤ 20

Notes:
DRO = Diesel-range hydrocarbons
EDB = Ethylene dibromide
EDC = Ethylene dichloride
EPH = Extractable petroleum hydrocarbons
GRO = Gasoline-range hydrocarbons
LCS = Laboratory control sample (supplied by Eurofins)
LOD = Limit of detection (supplied by Eurofins)
LOQ = Limit of quantitation (supplied by Eurofins; equivalent to PQLs or RLs)
MDL = Method detection limit (supplied by Eurofins)
mg/kg = milligrams per kilogram
MTBE = Methyl tert-butyl ether
PAHs = Polycyclic aromatic hydrocarbons
PCB = Polychlorinated biphenyl
RPD = Relative percent difference (supplied by Eurofins)
SIM = Selective ion monitoring
USEPA = United States Environmental Protection Agency
VOCs = Volatile organic compounds
VPH = Volatile petroleum hydrocarbons

[1] = Benzene present/benzene absent

[2] = Sum of concentrations normalized to benzo(a)pyrene using toxicity equivalence factors (TEFs) per WAC 173-340-708(8)

[3] = Refer to the Clark database for individual concentrations

-- Not applicable or not available

TABLE B-2
Analytical Methods and Detection Limits for Groundwater Samples

Analyte	Method A Clean-Up Level	Groundwater					
		Analytical Method	MDL	LOD	LOQ	LCS	RPD
			(µg/L)			(%)	
Petroleum Hydrocarbons							
GRO	800/1,000[1]	NWTPH-Gx	50	100	250	75-135	≤ 30
DRO	500	NWTPH-Dx	45	90	100	32-115	≤ 20
Volatile Organic Compounds							
Benzene	5	USEPA 8260B	0.5	1	1	78-120	≤ 30
Ethylbenzene	700	USEPA 8260B	0.5	1	1	78-120	≤ 30
Toluene	1,000	USEPA 8260B	0.5	1	1	80-120	≤ 30
Total Xylenes	1,000	USEPA 8260B	0.5	1	1	80-120	≤ 30
Fuel Additives							
Methyl tert-butyl ether	20	USEPA 8260B	0.5	1	1	75-120	≤ 30
EDC	5	USEPA 8260B	0.5	1	1	66-128	≤ 30
EDB	0.01	USEPA 8011	0.0	0.02	0.03	60-140	≤ 20
Other Petroleum Components							
Carcinogenic PAHs							
benzo[a]pyrene	0.1[2]	USEPA 8270 SIM	0.000065	0.010	0.02	51-118	≤20
benzo[a]anthracene		USEPA 8270 SIM	0.000088	0.010	0.02	51-115	≤20
benzo[b]fluoranthene		USEPA 8270 SIM	0.000182	0.010	0.02	56-123	≤20
benzo[k]fluoranthene		USEPA 8270 SIM	0.000194	0.010	0.02	54-131	≤20
chrysene		USEPA 8270 SIM	0.000165	0.010	0.02	55-129	≤20
dibenz[a,h]anthracene		USEPA 8270 SIM	0.00025	0.010	0.02	50-141	≤20
indeno[1,2,3-cd]pyrene		USEPA 8270 SIM	0.000183	0.010	0.02	49-148	≤20
Naphthalenes	160	USEPA 8270	0.118	0.5	1	80 – 128	≤ 30
Metals							
Total Lead	15	USEPA 6010B	6.2	15	15	80-120	≤ 20

Notes:
DRO = Diesel-range hydrocarbons
EDB = Ethylene dibromide
EDC = Ethylene dichloride
GRO = Gasoline-range hydrocarbons
LCS = Laboratory control sample (supplied by Eurofins)
LOD = Limit of detection (supplied by Eurofins)
LOQ = Limit of quantitation (supplied by Eurofins; equivalent to PQLs or RLs)
MDL = Method detection limit (supplied by Eurofins Lancaster)
PAHs = Polycyclic aromatic hydrocarbons
RPD = Relative percent difference (supplied by Eurofins)
SIM = Selective ion monitoring
USEPA = United States Environmental Protection Agency
µg/L = Micrograms per liter

[1] = Benzene present/ benzene absent

[2] = Sum of concentrations normalized to benzo(a)pyrene using toxicity equivalence factors (TEFs) per WAC 173-340-708(8)

TABLE B-3
Analytical Method and Detection Limits for Soil Vapor Samples

Analyte	Ecology Method B Sub-Slab Soil Gas Screening Level ($\mu g/m^3$)	Soil Vapor			
		Analytical Method	MDL	MRL	MRL
			($\mu g/m^3$)		(% by volume)
Volatile Organic Compounds					
Benzene	10.7	USEPA TO-15 Modified	0.16	1.30	---
Ethylbenzene	15,200		0.16	1.30	---
Methyl tert-butyl ether	321		0.16	1.4	---
Toluene	76,200		0.16	1.3	---
m,p-Xylene	1,520		0.35	2.8	---
o-Xylene	1,520		0.19	1.3	---
Naphthalene	2.45		0.33	1.3	---
Atmospheric Gases					
Carbon dioxide	---	ASTM D1946	--	--	0.15
Helium	---		--	--	0.15
Methane	---		--	--	0.15
Nitrogen	---		--	--	0.15
Oxygen	---		--	--	0.15

Notes:
ASTM = American Society for Testing and Materials
MDL = Method detection limit (supplied by ALS)
MRL - Method reporting limit (supplied by ALS)
USEPA = United States Environmental Protection Agency
$\mu g/m^3$ = micrograms per cubic meter
-- Not applicable or not available

TABLE B-4
Sampling Containers, Preservatives, and Holding Times

Sample Matrix	Analytical Parameter	Analytical Method	Sample Container	No. of Containers	Preservation Requirements	Holding Time
Soil	GRO	NWTPH-Gx	Method 5035A, 40-mL VOA vials	4	4°C ±2°C, Freeze within 48 hours to <-7°C	14 days
	DRO	NWTPH-Dx	4-ounce jar	1	4°C ±2°C	14 days for extraction; 40 days for analysis
	EPH/ VPH	NWEPH/NWVPH	4-ounce jar/ 40-mL VOA vials	5	4°C ±2°C, Freeze within 48 hours to <-7°C	14 days
	BTEX, MTBE, EDC, EDB, n-hexane, Halogenated VOCs	USEPA 8260B	Method 5035A, 40-mL VOA vials	4	4°C ±2°C, Freeze within 48 hours to <-7°C	14 days
	PCB Arachlors	USEPA 8082	4-ounce jar	1	4°C ±2°C	6 months
	cPAHs	USEPA 8270 SIM	4-ounce jar	1	4°C ±2°C	6 months
	Naphthalene	USEPA 8270	4-ounce jar	1	4°C ±2°C	6 months
	Lead	USEPA 6010B	4-ounce jar	1	4°C ±2°C	6 months
Water	GRO	NWTPH-Gx	40-mL VOA vials	3	4°C ±2°C, HCl pH < 2	14 days
	DRO	NWTPH-Dx	500-mL amber glass bottle	1	4°C ±2°C	7 days for extraction,40 days for analysis
	BTEX, MTBE, EDC	USEPA 8260B	40-mL VOA vials	3	4°C ±2°C	14 days for analysis
	EDB	USEPA 8011	1 L amber glass bottle	1	4°C ±2°C	14 days for analysis
	cPAHs	USEPA 8270 SIM	1 L amber glass bottle	1	4°C ±2°C	7 days for extraction,40 days for analysis
	Naphthalene	USEPA 8270	1 L amber glass bottle	1	4°C ±2°C	7 days for extraction,40 days for analysis
	Lead	USEPA 6010B	500-mL HDPE bottle	1	4°C ±2°C, $HN0_3$	180 days

Notes:
HCL = Hydrochloric acid
VOA = Volatile organic analysis
DRO = Diesel-range hydrocarbons
EDB = Ethylene dibromide
EDC = Ethylene dichloride
EPH = Extractable petroleum hydrocarbons
GRO = Gasoline-range hydrocarbons
MTBE = Methyl tert-butyl ether
cPAHs = Carcinogenic polycyclic aromatic hydrocarbons
PCB = Polychlorinated biphenyl
USEPA = United States Environmental Protection Agency
VPH = Volatile petroleum hydrocarbons
VOCs = Volatile organic compounds

Appendix C:
Health and Safety Plan

HEALTH AND SAFETY PLAN (HASP)
FOR FIELD OPERATIONS

CHEVRON FACILITY 204117
2021 6th Street, Bremerton, Washington

Prepared by

Prepared for

Chevron Environmental Management Company (CEMC)

May 1, 2018

Remedial Investigation

Approval Signatures

Leidos Project Manager	7/3/2018 Date
Leidos Field Manager/Site Health and Safety Officer	Date
Leidos Health and Safety Approval	5/3/2018 Date

CEMC Acceptance

The Chevron Project Manager's (PM) signature on an EMC Project Manager HASP Review Checklist will serve as documentation that the PM has reviewed and accepted the HASP. A copy of the signed checklist will be maintained with the field copy of this HASP.

Key Contact Information

Fire/Police/EMS	911
WorkCare Early Injury Intervention	(888) 449-7787
Harrison Medical Center	(360) 744-3911

Purpose and Program-Specific Policies, Procedures, and Protocols

This plan was developed to satisfy requirements identified in 29 CFR 1910.120, 29 CFR 1926.65, the regulations of the State of Washington, and Section 7.0 of Leidos Engineering, LLC's (Leidos) Environmental, Health and Safety Program (EH&SP) Manual, *Hazardous Waste Operations*. This plan represents a good-faith effort to identify, evaluate, and prescribe controls for the hazards that will be posed by this work and provide guidance for emergency response. ***Revisions to this plan must be documented, and the Project Manager (PM) and responsible Health and Safety (H&S) manager must approve any revisions that result in changes to the level of protection specified in this plan***. Employees and subcontractors of Leidos will be informed of the requirements of this plan and provided with unrestricted access to the document; however, the use of this plan by other entities will be at those parties' own risk.

Company- and Program-specific requirements associated with operations at CEMC field sites are identified in applicable sections of this plan and in Leidos' ***Health and Safety Policy Manual for the Chevron Program***.

Site History and Description

The Site is a rectangular lot located at 2021 6th Street at the southeast corner of the intersection of Naval Avenue and 6th Street in Bremerton, Washington and is currently occupied by a closed gasoline service station and convenience store. The retail building has an area of approximately 2,500 square feet and the canopy has an area of approximately 1,200 square feet. Three underground storage tanks (USTs) are reported to remain at the Site. The remainder of the lot is paved, with an approximately 3-4 foot high concrete retaining wall located on the east and south sides of the property.

Land use in the vicinity is generally mixed commercial and residential, with commercial businesses across the street (a bank and store with parking lot), a private residence to the east, a paved alley and a tire shop and private residences to the south, and Naval Avenue to the west. An ARCO Service Station is located to the west across the Naval Avenue at 2101 6th Street.

Proposed work zones will be located in the western portion of the site, around the pump island and the building, and inside the building.

Scope of Work to be Performed by Leidos and Subcontractors

A general scope of work for this project is listed in the following section; a more detailed description of proposed activities and an overview of field logistics are presented in a work plan or similar document(s):

- A private utility locator will mark the approximate positions of subsurface utilities and/or assets prior to beginning any intrusive work.
- A ground-penetrating radar (GPR) survey will be conducting to determine the potential presence of an undocumented UST in the western portion of the property.
- One (1) soil boring will be drilled to a depth of approximately 50 feet below ground surface (ft bgs) using hollow-stem auger methods to determine depth of groundwater.
- Eight (7) soil boring will be advanced to a depth of approximately 20 ft bgs using hollow-stem auger methods.
- Each soil boring will be advanced to a depth of approximately 8 ft bgs using an air-excavation rig prior to beginning powered drilling to provide physical clearance of subsurface utilities and assets.
- Soil samples will be collected using a hand auger and/or split-spoon sampler.
- If groundwater is encountered at the site, four (4) monitoring wells, constructed of 2-inch diameter PVC, will be installed within selected soil borings. Monitoring wells will be developed using a bailer and/or electric submersible pump.
- Groundwater sample will be collected using a peristaltic pump after each well has been developed.
- Three (3) soil vapor points will be installed at depths of approximately 5.5 ft bgs.
- All reusable tools and equipment will be decontaminated before initial use, between sampling locations, and before demobilization from the site.
- Waste characterization samples will be gathered using hand tools and/or a bailer.

Private utility location services and GPR will be provided by Geophysical Survey, LLC. Air-excavation, drilling, and well installation activities will be conducted by Cascade Drilling. Leidos employees will provide technical/H&S oversight for all field operations and collect soil, groundwater and waste characterization samples.

Chemicals/Constituents of Concern

The maximum concentrations of chemical constituents that have been recently reported in soil at this site follow: Total petroleum hydrocarbons (TPH) as gasoline (TPHg): 4,400 milligrams per kilogram (mg/kg); benzene: 100 mg/kg; toluene: 200 mg/kg; ethylbenzene: 105 mg/kg; xylenes: 790 mg/kg; and naphthalene: 22 mg/kg.

Potential Hazards Associated with Field Operations

The following, general hazards may be associated with the work described in this HASP:

- Third parties being in close proximity to work zones.
- Traffic accidents associated with travel to and from the site.
- Exposure to chemicals/constituents of concern (see Chemicals/Constituents of Concern section).
- Noise (drill rigs).
- Lifting or moving materials and/or equipment.
- Contact with overhead or buried utilities.
- Contact with powered, rotating, pressured, and/or hydraulic equipment.
- Cuts, contusions, sprains, strains, etc. from the use of hand tools and equipment.
- Contact with flying debris.
- Exposure to temperature extremes.
- Physical hazards (slips/trips/falls, burns, cuts/contusions, etc.).
- Biological hazards (biting/stinging insects, venomous snakes, stray dogs).
- Being struck by mobile equipment (drill rigs).
- Fire.

Emergency Medical Facility and Emergency Telephone Numbers

The emergency medical facility is Harrison Medical Center. A map showing the location and directions to the facility and a list of emergency telephone numbers are presented in ***Appendix A***.

In the event of a non-life threatening emergency the employee shall contact WorkCare (888) 449-7787 and the licensed health care professional will direct the employee to the appropriate urgent medical facility when necessary.

Emergency Reporting and Communication

The Site Health and Safety Officer (SHSO), or an alternate team member, will immediately contact emergency response organizations (if necessary) and the Leidos PM to report any incident or near-incident. The Leidos PM will continue to report the event through Leidos' internal, incident notification process. If the Leidos PM is not available to accept the initial notification, then the SHSO will contact the H&S Manager, Program Manager, or another Leidos PM to report the event. While it may be appropriate to leave voicemails and/or emails when reporting an incident, the notification process must continue until the event has been reported to a responsible manager, either in person or by voice contact. Notifications to CEMC will be initiated by Leidos' Program Leadership Team, as required by the most recent version of CEMC's Incident Investigation and Reporting Process.
The Emergency Chain-of-Reporting is presented in ***Appendix A***; Leidos' procedures that are applicable to emergency reporting include sections 4.0, *Incident Reporting, Investigation & Management,* and 21.0, *Regulatory Agency Inspections & Regulatory Incident Reporting* of Leidos' EH&SP Manual.

Emergency Evacuation Protocols

When within practical visual distance of other staff members, verbal communication will serve as the notification to evacuate the work zone. If staff is not within practical visual distance, one long blast from a vehicle or portable air horn will serve as the site emergency alarm. In the event of an emergency, the SHSO, or an alternate team member, will call 911, utility companies (if necessary), safety personnel at adjacent facilities (if applicable), and initiate notifications to the project team, as described in the preceding section of this plan.

Workers will immediately relocate from the work area to a designated assembly point. If the assembly point is inaccessible or is in an unsafe area, then workers will relocate to an alternate assembly point. If both assembly points are inaccessible, then the SHSO or FM will direct the field team to assemble at a different location. The SHSO or FM will use the current Safe Work Permit to conduct an accountability of all employees onsite. If any employee is missing, then that person's name will be presented to emergency responders. An emergency evacuation practice drill will be conducted during the first week of work at the site and at regular intervals for extended-duration projects. A map showing the locations of the designated assembly points is presented in ***Appendix A***.

Additional information concerning procedures and protocols that will be followed in the event of an emergency is presented in Leidos' ***Health and Safety Policy Manual for the Chevron Program***.

Emergency Decontamination Procedures

Field operations at this site could potentially cause the skin, eyes and lungs to become exposed to compounds that are associated with petroleum hydrocarbons.

Chemical contact with the skin: Remove affected clothing, and wash the affected skin with soap and water until the contamination is removed. Seek medical attention if irritation of the skin is observed (redness, swelling, rash).

Chemical contact with the eye: Immediately flush the eye(s) using an eye wash bottle or station, as appropriate. When using an eye wash bottle, the eyelid should be lifted several times while the eye is being flushed. Seek medical attention immediately.

Inhalation of organic vapor: Move affected workers to an area that is upwind of the source of the vapors. If workers experience dizziness or nausea, they should rest until their symptoms subside.

Refer to NIOSH Pocket Cards, which are located in the ***Health and Safety Policy Manual for the Chevron Program***, for additional guidance concerning decontamination procedures and protocols.

Decontamination of reusable tools and equipment will be accomplished using processes that have been identified in operating procedures, job safety analyses (JSAs), or applicable work control documents.

Emergency Equipment and Supplies

The SHSO or FM will verify that supplies are available to control and remove potential spills of chemicals or contaminants. Spill-control equipment typically includes sorbent pads, granules, and/or booms; drums; buckets; shovels; etc. Safety supplies (fire extinguisher, first aid kit, eyewash bottles, etc.) will be inspected monthly and documented in the field logbook or on an inspection tag. The following supplies are required during all field activities:

- Air horn or similar emergency warning device(s).
- Cellular telephone (or immediate access to a land line or satellite phone).
- First aid kit that meets minimum requirements in applicable federal and/or state regulations.
- Fire extinguisher(s) with minimum ratings of 5 pounds and 2A 5BC and documented evidence of having passed an annual maintenance check and monthly inspections.
- Eyewash bottle.
- Spill kit.

Permit to Work

Leidos will issue work permits for field activities that will be conducted for this project/for its employees and subcontractors. Refer to CEMC MSW 2017, *Permit to Work*, and the ***Health and Safety Policy Manual for the Chevron Program*** for specific information concerning Leidos' implementation of CEMC's Permit to Work Process. A High Hazard Work Permit (HHWP) will be in place during 'excavation activities' (refer to HHWP for additional information).

Delineation of Work Zones and Traffic Control

The following measures will be used to delineate work zones and provide traffic control at this site**.** Traffic cones may be used as secondary delineators or to mark locations within a work zone where specific hazards may be present (ruts, disturbed ground, along runs of hoses, etc.).

All work zones will be delineated to contain physical and chemical hazards that may be present in the work area and to discourage encroachment of the work zone by third parties or untrained employees. The level of traffic control that will be used to establish a work zone will be identified in the HASP for the project. No food, drink, or tobacco products will be allowed inside of an exclusion zone. Upon exiting an exclusion zone, field team members will wash their hands prior to eating, drinking, etc.

Level 2:

- 48-inch (minimum) tall, high-visibility, traffic barricades ('sawhorses,' traffic candles, etc.) with two strands of caution tape connecting the barricades will be used as primary work zone delineators.
- Field vehicles will be used, when possible, to protect the field team from vehicle traffic that may intrude upon the work zone.

Journey Management Plan

A site-specific Journey Management Plan (JMP) will be created for this project and kept with this HASP during site activities.

Air Monitoring

The concentration of each chemical/substance that is listed, below, will be monitored by a qualified person using a properly-calibrated, portable meter during drilling activities. If the action level for a constituent should be exceeded, then the field team will suspend work and relocate to a designated assembly point.

Chemical/Substance	Area Monitored	Action Level	Duration
Organic vapors (undifferentiated)	Breathing zone	≥5 parts per million (ppm)	1 minute

Each chemical/substance above will be monitored and concentrations recorded every 15 minutes or as changes in site conditions or tasks warrant. The frequency of air monitoring may be adjusted by the SHSO; however, the reason for adjustments will be documented in the field log book or field notes. If the above action levels are reached, work will be stopped, EH&S management will be contacted, and a hazard analysis will be performed and documented to identify changes to these requirements before work can continue.

Training

General training requirements for field operations are described in Leidos' ***Health and Safety Policy Manual for the Chevron Program***. Task-specific training is listed in applicable JSA or standard operating procedures and documented in Leidos' intranet database. A summary of training expectations for Leidos subcontractors is presented in the Subcontractors section of the ***Health and Safety Policy Manual for the Chevron Program***.

Investigation-Derived Waste

A project-specific waste plan is presented in ***Appendix B***. Leidos' procedures that are applicable to investigation-derived waste include Section 46.0 of Leidos' ES&HP Manual, *Management of Waste Generated at Project Sites*.

Job Safety Analyses and Personal Protective Equipment

A JSA will be prepared for each significant task that will be performed by the field team. The JSA for each task shall be reviewed, manually updated (when necessary), and validated with the field team prior to beginning the task. ***Significant changes to a JSA (levels of personal protective equipment [PPE] or other protective systems) must be approved by an H&S manager. All JSAs that were used during field operations must be assessed for completeness and applicability during a post-task meeting that will be conducted at the end of each day.***

General requirements that are associated with PPE are described in the ***Health and Safety Policy Manual for the Chevron Program***; task-specific requirements are presented within each JSA. JSAs that will be used by Leidos employees are presented in ***Appendix C***. Subcontractors to Leidos are required to provide applicable task-specific JSAs for activities they will be performing. These JSAs must meet current CEMC JSA standards.

Safety Data Sheets

A list of hazardous chemical tools that will be used onsite and their corresponding Safety Data Sheets (SDSs) are presented in ***Appendix D***.

Field Data Forms

Field data forms are presented in ***Appendix E***.

APPENDIX A—Emergency Contact Information and Hospital Map

Emergency Telephone Numbers

Fire/Police/EMS	911
WorkCare Early Injury Intervention	(888) 449-7787
Harrison Medical Center	(360) 744-3911

Utilities

Electricity—Puget Sound Energy	(888) 225-5773
Gas—Cascade Natural Gas	(888) 522-1130
Gas—Ferrellgas	(360) 373-2515
Water/Sewer—City of Bremerton	(360) 473-5316
Telecommunications—Comcast	(800) 934-6489

A contact list including all applicable utility members will be generated by a local 'one-call' dig center and kept with this HASP during applicable field activities.

Project Team Organization List

Title	Name	Office Phone	Cellular Phone
CEMC Team Leader	Drew Noel	(714)-671-3315	(714) 328-9446
CEMC Project Manager	Mark Horne	(925) 842-0973	(925) 324-5415
Leidos Project Manager	Russell Shropshire	(425) 482-3323	(206) 321-2387
Leidos Field Manager/SHSO	Aaron Wisher	(425) 398-2106	(206) 999-8293
Subcontractors			
Cascade Drilling	Jeff Townsend	(208) 345-0878	(971) 645-1061
Geophysical Survey, LLC	Mark Villa	(509) 222-0933	

Emergency Chain-of-Reporting

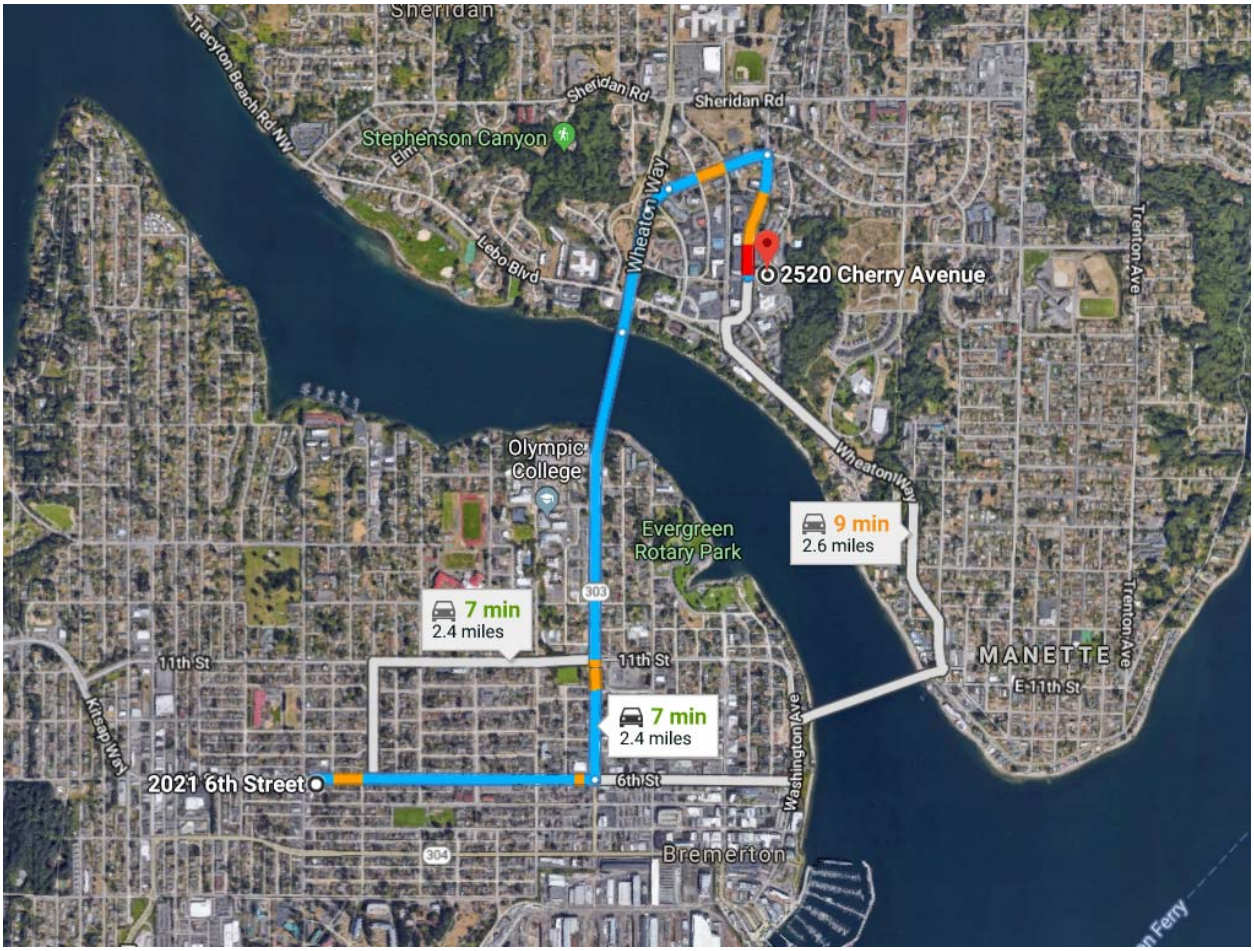
When reporting any incident or near-incident, contact the Leidos management team members listed below. Begin at the bottom of the list and continue upward until voice contact has been established with a member of the management team.

Title	Name	Office Phone	Cellular Phone
Leidos H&S Manager	Steve Lowery	(405) 701-3158	(405) 919-4176
OE Program Manager	Nicholas Kidd	(717) 409-2857	(717) 409-2857
Division/Program H&S Manager	Chris Fontana	(610) 952-1752	(610) 952-1752
Project Manager	Russell Shropshire	(425) 482-3323	(206) 321-2387

MAP AND DRIVING DIRECTIONS TO EMERGENCY CARE FACILITY

Harrison Medical Center
2520 Cherry Ave, Bremerton, Washington
(360) 744-3911

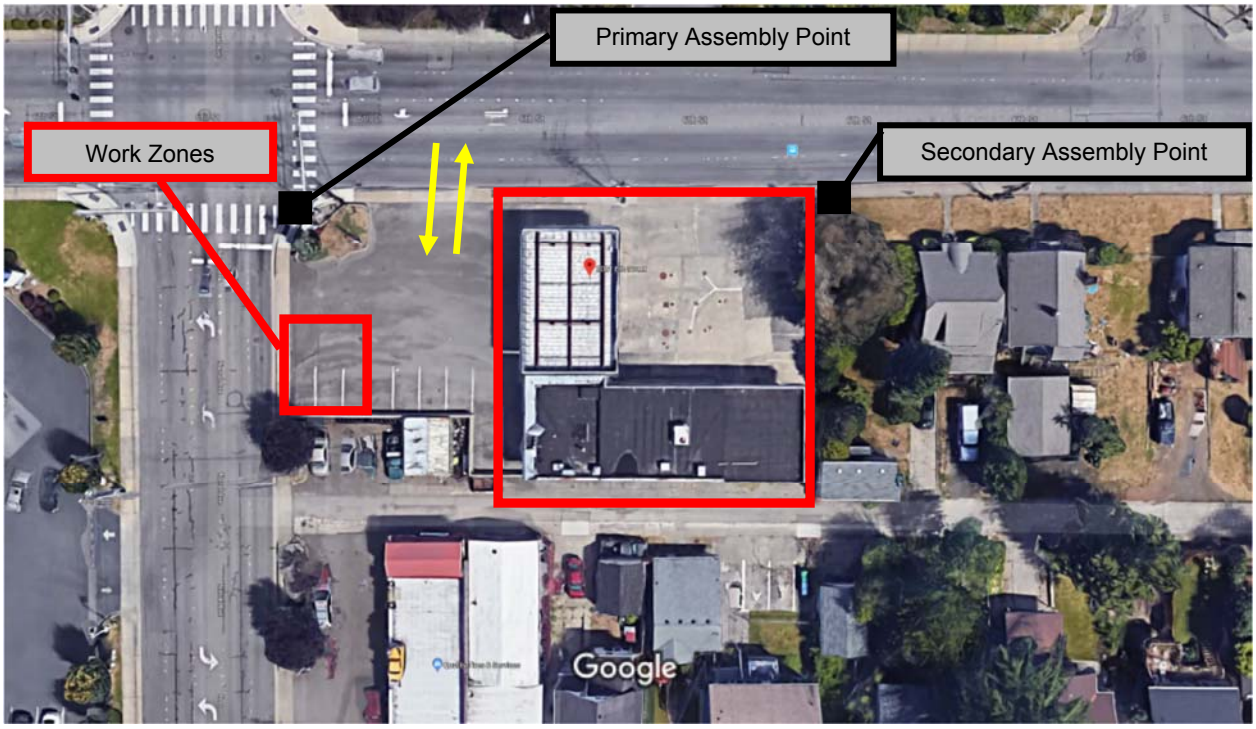
Starting From:	2021 6th Street
Arriving At:	2520 Cherry Avenue
Distance:	2.4 miles
Approximate Travel Time:	7 minutes



Directions:

1.	Head EAST on 6th St towards Roosevelt Ave	0.6 miles
2.	Turn LEFT onto Warren Ave	1.3 miles
3.	Take Callahan Drive exit- Continue onto Callahan Drive	0.3 miles
4.	Turn RIGHT onto Cherry Ave (Destination)	0.2 miles

SITE MAP (INGRESS/EGRESS ROUTES AND EMERGENCY ASSEMBLY POINTS)



Primary Assembly Point: Intersection of 6th Street and Naval Ave, northwest corner of the property

Secondary Assembly Point: Northeast corner of the property

(Refer to associated Journey Management Plan for site-specific hazards and restrictions).

APPENDIX B—Waste Management Plan May 1, 2018

Chevron Facility 204117, 2021 6th Street, Bremerton, Washington

Purpose

This plan has been developed to clearly outline Leidos' responsibilities that are associated with project wastes, so that those responsibilities are executed according to applicable environmental regulations, DOT regulations, CEMC requirements, and Leidos procedures. This plan is intended to be used by employees of Leidos and its subcontractors; use by other entities will be at those parties' own risk.

Scope of Work

The scope of work for this project includes the drilling of nine soil borings, installation of up to five monitoring wells, and three soil vapor points using a hollow-stem auger rig, and collection of soil samples. During drilling activities, all practical measures will be taken to eliminate or minimize soil and aqueous waste contact with the ground.

Anticipated Waste Streams

Waste that may be generated during field operations could include the following materials:

Soil

Soil waste is expected to be generated during drilling activities. The volume of soil is anticipated to fill six, 55-gallon drums.

Water

Aqueous waste is expected to be generated during well development, groundwater sampling, and equipment decontamination activities. The volume of water is anticipated to fill four, 55-gallon drums.

Expendable Solid Waste

Expendable solid waste associated with general field operations, such as lightly-soiled gloves, disposable sample tubing, bailers, cardboard, paper, plastic, etc. will be disposed as sanitary waste by the drilling subcontractor or Leidos personnel. The volume of waste is anticipated to fill five, 30-gallon trash bags.

Containment and Labeling Requirements

Soil and aqueous waste will be segregated and stored in DOT-approved, 55-gallon capacity, steel drums (new or reconditioned, open-head drums for soil and new, closed-head drums for liquids). When feasible, the integrity and condition of all waste containers will be inspected and documented prior to use. Each drum will be labeled immediately before waste is placed into the container using a non-hazardous waste, or pending analysis label. The following information will be written in indelible, waterproof ink on each label, at a minimum: container number, date of generation, facility address, CEMC Project Manager's name/telephone number, CEMC Business Unit, and a brief description of the contents of the container. Each drum will be secured after every addition of waste and prior to departing the site on each work day.

Each drum that will be used to contain liquids will be filled to a level that is no greater than 85% of the rated capacity of the container and will be outfitted with a secondary containment structure. Each empty waste container left onsite will be labeled accordingly.

Management of Waste Streams

The following measures will be taken to manage soil and aqueous waste at this site:

- Waste will be staged in an area that is acceptable to affected property owners and preferably in an area that is protected from traffic and isolated from pedestrians.
- An inspection will be conducted at the end of each day and prior to demobilization to ensure that all waste containers have been secured and are properly labeled.
- The FM will take photographs of the waste staging area prior to demobilizing from the site and will document the number and types of containers that are present onsite, the location of the containers, and any restrictions associated with the staging area. The FM will communicate this information to the Leidos PM after the field team has demobilized from the site.
- Leidos will provide CEMC with documentation of the status of waste at the site (approximate quantities, location, etc.). Leidos may coordinate and document the pickup of the waste by vendor(s) that will be contracted directly to CEMC.
- Leidos will not be responsible for the management or security of waste containers, except when Leidos is present onsite.

Leidos may collect characterization samples during field operations; however, Leidos will not be responsible to determine the regulatory status of waste (sign profiles) or to execute any shipping papers associated with waste (sign manifests, bills of lading, land disposal restrictions, or similar documents). CEMC or one of its 'direct-billed' vendors will sign all documents associated with the disposal of soil and water from this site.

Soil and water will be transported from the site and disposed by CEMC-approved and 'direct-billed' vendors. Leidos will not subcontract for the transportation or disposal of such waste.

Reporting

The management and disposition of waste will be documented in field notes and a field activities report.

Site # 204117, 2021 6th Street, Bremerton, Washington

APPENDIX C—Job Safety Analyses

The following JSAs are included in this HASP to identify and address the hazards that are anticipated to be associated with activities that will be conducted by Leidos employees:

- CHV-J001: General work activities
- CHV-J002: Collection of groundwater or soil vapor samples from monitoring points
- CHV-J003: Collection of soil samples and technical oversight of drilling activities
- CHV-J009: Driving

Each JSA has been developed as an initial guide to identify hazards and corresponding critical actions that should be followed to mitigate those hazards during a particular task. Each JSA will be reviewed and manually modified, ***on a daily basis or as changes in site tasks warrant***, to verify that the hazards and mitigation steps are updated to address site-specific hazards and changing conditions that may evolve during field activities.

Identify the Hazards and Take Action

- The first safeguard is you. To reduce the odds for human error, you must address any factors that may interfere with your readiness to perform well and to react effectively to unexpected events or changes.
- Review and follow the procedure for the task.
- Question what you would do in an emergency and include that information in the JSA document.
- Discuss the JSA with your co-workers to ensure it addresses the hazards associated with the work, that you understand what you will be doing and that you know how to do it safely.
- If the job changes: Stop, evaluate and revise the JSA as needed. Don't make snap decisions.

Energy Source Hierarchy of Controls

Follow a *hierarchy of controls* approach to reduce the risk of a serious or fatal injury. Where possible, it is always best to first eliminate the hazard and then apply lower-level controls as needed. Based on the energy source, the hierarchy of controls is:

1. Remove the energy source.
2. Prevent the release of energy.
3. Protect from the release.
4. Use Stop-Work Authority.

Job Safety Analysis—Leidos—Developed/Revised on May 1, 2018 Site # - 204117 Emergency contact information is located in the General HASP	
CHV-J001: General work activities	**Date of Use:**

Development Team Member(s)	Position
BONNIE GOVONI	**ENVIRONMENTAL GEOLOGIST**
AARON WISHER	**SENIOR GEOLOGIST**

Verification and Review of Hazard Mitigation Measures	Signature/Printed Name	Date
Requirements of this JSA have been verified and discussed with affected site workers		

Personal Protective Equipment (PPE)					
Hard Hat (ANSI Z89.1)	X	Hearing Protection	X	Gloves (High-Visibility When Possible)	X
Safety Glasses With Side Shields (ANSI Z87.1)	X	High-Visibility Clothing (Min. ANSI/ISEA 107 Class 2)	X	Safety-Toed Boots (ASTM-F2413 or ANSI Z41)	X
Kneeling Pad					

Job Step	Potential Hazard	Critical Actions	Responsible Party (Print Name)	Verification/ Validation (Print Name)
General activities	Verification	For each job step, a responsible person will verify that all potential hazards have been identified, mitigated, or eliminated, and that the work can proceed safely as described in the job steps, or as marked-up during the review between the on-site field staff and the responsible person. If only one Leidos employee (the Field Manager) is on-site, that FM will obtain verification with the Leidos PM or Task Manager through a telephone discussion of job steps, hazard mitigation, and safe work practices, with field mark-up of the JSA as appropriate, until the Leidos PM (or designee) is satisfied that the work can proceed safely and provides verbal authorization to proceed. This verbal authorization should be noted on the JSA in pen and ink.		

1) Always operate within design or environmental limits. 2) Always operate in a safe and controlled condition. 3) Always ensure safety devices are in place and functioning. 4) Always follow safe work practices and procedures. 5) Always meet or exceed customers' requirements. 6) Always maintain integrity of dedicated systems. 7) Always comply with all applicable rules and regulations. 8) Always address abnormal conditions. 9) Always follow written procedures for high-risk or unusual situations. 10) Always involve the right people in decisions that affect procedures and equipment.

CHV-J001: General work activities

Job Step	Potential Hazard	Critical Actions	Responsible Party (Print Name)	Verification/ Validation (Print Name)
	Various hazards	Conduct or verify a site 'walk-down' with all applicable site personnel to identify, document, eliminate, or mitigate hazards that may be present (review critical actions in the 'Establish and maintain walking paths/work surfaces' job step of this JSA) prior to beginning field operations. , walking/working areas should be identified to eliminate these types of hazards. Verify that subcontractor JSAs have been reviewed, 'marked up' and signed by affected staff prior to beginning applicable tasks. Verify all applicable ES&H documents, permits, and training requirements are in place, current and approved prior to beginning applicable tasks. Verify all applicable personal protective equipment (PPE) is in 'fit-for-use' condition. Review applicable sections of CEMC's Preventing Serious Injury and Fatalities Field Guide.		
	Field personnel readiness ('fit-for-duty')	Discuss/identify any potential limitations site personnel may have prior to beginning operations and discuss applicable job steps to ensure all personnel can safely and effectively perform their respective tasks.		
	Civil Unrest/Weather	Check the local / national news, reviewing key social media sites for potential civil unrest and potential severe weather events. If there is a potential for civil unrest or severe weather, use SWA, move field staff to a safe location, as agreed upon during the kick-off tailgate, documented on the JSA, and communicate to project team.		
	Dropped objects	Identify potential objects that could be dropped by staff or fall from equipment and communicate to all project staff onsite. Ensure equipment can be secured when working in an area of potential dropped objects. Do not place body parts under suspended loads.		
	Temperature stress resulting from working in high- or low- temperature environments	Administrative controls will be implemented to mitigate heat/cold stress (providing cooled or warmed drinks, encouraging workers to take routine breaks in heated or shaded areas, providing measures for emergency heating or cooling, etc.) when the ambient temperature is above 80°F or below 40°F.		
	Biological hazards	Inspect the work area for hazardous plants, medical waste (syringes and similar items), and indications of hazardous organisms, and avoid such areas if possible. Wear clothing that covers potentially affected body parts and seal openings, as appropriate, to prevent access by organisms or contact with plants. Review the hospital route if an employee is allergic to insect/spider stings/bites.		

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CHV-J001: General work activities

Job Step	Potential Hazard	Critical Actions	Responsible Party (Print Name)	Verification/ Validation (Print Name)
	Severe weather	Verify the location and accessibility of the nearest severe weather shelter before beginning field work. Suspend activities and seek shelter if you hear thunder, see lightning, if excessive wind is present, or if a tornado warning has been issued. Do not work in areas that are subject to flash flooding if heavy rain has been forecasted in the region.		
Construct and maintain a work zone	Being struck by vehicles	Face the line of danger to observe oncoming vehicles. Delineate work zones, as described in the 'Delineation of Work Zones and Traffic Control' section of the HASP. Place vehicle(s) between workers and oncoming traffic, when possible, to serve as an additional level of protection against intrusion of the work zone by vehicle traffic. Wear Class 2 or higher, high-visibility clothing at all times.		
	Encroachment of the work zone by third parties	Construct the work zone to be large enough to contain all hazards that are anticipated to be present in the work area. Create a designated and safe ingress/egress point to the work zone based on site conditions and limitations. If public areas, structures, or property access issues limit the amount of available space, then configure the work zone and position equipment to minimize hazards to the public and prevent entry of third parties into the work zone.		
Establish and maintain walking paths/work surfaces	Slips, trips, and falls from walking or working on uneven or cluttered surfaces	Clear the work area of all unnecessary materials/debris and equipment prior to beginning operations. Do not walk backwards. Maintain good 'housekeeping' practices at all times. Exercise caution while working near curbs or similar areas. Walking/working areas should be identified to eliminate these types of hazards. Do not walk or work on uneven surfaces. If uneven surfaces are observed in walking/working areas, then work will be stopped so that such areas can be leveled (using plates, 'clean' fill, etc.) or barricaded to prevent employees from walking in those areas.		
Use of tools and equipment to perform general tasks	Pinch and crush points from handling/moving tools and equipment	Identify and mark, when possible, pinch/crush points on tools and equipment prior to beginning operations. Inspect tools and equipment prior to use; damaged or defective materials will be discarded or tagged out pending repair. Use tools and equipment according to the manufacturer's recommendations.		
	Cuts and contusions from handling/using tools and equipment or from slips, trips, and falls	Wear basic, abrasion- and puncture-resistant gloves at all times (leather, Kevlar, etc.), unless a more protective type of glove has been specified for a particular task. Do not use fixed-open bladed knives (FOBKs). Wear Kevlar gloves when handling glassware.		

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CHV-J001: General work activities

Job Step	Potential Hazard	Critical Actions	Responsible Party (Print Name)	Verification/ Validation (Print Name)
	Musculoskeletal injuries (strain, sprain, broken bones, etc.) from lifting/moving tools and equipment	Comply with EH&SP Section 51.0, Manual Lifting, and CEMC's Manual Handling Standard. Stretch prior to commencing work and take breaks as needed. Assess the weight of tools, equipment, and materials prior to beginning activities that require lifting such items. Use proper bending/lifting techniques by lifting with your arms and legs and not with your back. Request additional help or use mechanical assistance (such as a lift truck or cart) if equipment or materials to be moved are unwieldy, weigh more than 50 lbs., or must be moved using awkward body positions.		
Load and transport equipment on vehicles	Equipment damage from improper loading and stacking of equipment	Organize and stage materials in an orderly manner in areas that are away from foot paths or vehicle traffic. Do not over-stack equipment or materials in a vehicle bed or cab. Secure items in truck beds or inside of a vehicle to prevent shifting or losing loads.		
List equipment used for the task:		First Aid Kit, Fire Extinguisher, Spill Kit, Marking Paint/ Chalk, Delineators, Barricades, Caution Tape, Stop Work Authority Cards, Preventing Serious Injury and Fatalities Handbook, HASP, Field Log Book, Field Forms		

Job Safety Analysis—Leidos—Developed/Revised on May 1, 2018 Site # - 204117 Emergency contact information is located in the General HASP	
CHV-J002: Collection of groundwater or soil vapor samples from monitoring points	**Date of Use:**

Development Team Member(s)	Position
BONNIE GOVONI	ENVIRONMENTAL GEOLOGIST
AARON WISHER	SENIOR GEOLOGIST

Verification and Review of Hazard Mitigation Measures	Signature/Printed Name	Date
Requirements of this JSA have been verified and discussed with affected site workers		

Personal Protective Equipment (PPE)					
Hard Hat (ANSI Z89.1)	X	Hearing Protection		Gloves (High-Visibility When Possible)	X
Safety Glasses With Side Shields (ANSI Z87.1)	X	High-Visibility Clothing (Min. ANSI/ISEA 107 Class 2)	X	Safety-Toed Boots (ASTM-F2413 or ANSI Z41)	X
Knee Pads/Kneeling Pad	X				

Job Step	Potential Hazard	Critical Actions	Responsible Party (Print Name)	Verification/ Validation (Print Name)
General activities/ Verification process	Various hazards	Follow requirements in the JSA for General work activities. All Job Steps completion requires verification. If only one Leidos staff is onsite the Field Manager must obtain verification by calling the Leidos PM or Task Manager.		
Enter a HAZWOPER Exclusion Zone	Various incidents resulting from untrained workers	Each employee must have received current HAZWOPER training, possess a valid HAZWOPER medical clearance, and have completed applicable training for this task. The Field Manager and Health and Safety Officer must have received 8-hr HAZWOPER supervisory training. Site-specific training must address the hazards, storage, and proper handling associated with all chemicals that will be used onsite.		
Pre-job inventory of sample bottles	Chemical burns from acids or caustic that has leaked from sample bottles	Wear nitrile, or equivalent, gloves and safety glasses during inventory to protect against exposure to chemicals that have leaked from pre-preserved sample bottles.		

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CHV-J002: Collection of groundwater or soil vapor samples from monitoring points

Job Step	Potential Hazard	Critical Actions	Responsible Party (Print Name)	Verification/ Validation (Print Name)
	Cuts from broken glass containers	Wear Kevlar gloves when handling glassware.		
Pre-job inventory of canisters	Pinch/crush points, cuts and contusions	Wear cut-resistant gloves when handling sample canisters.		
Load and transport compressed gas tanks on vehicles	Equipment damage from improper loading and stacking of equipment	Secure tanks upright and in vehicles to prevent shifting or movement of tanks.		
	Musculoskeletal injuries associated with lifting compressed gas tanks	Comply with EH&SP Section 51.0, Manual Lifting, and CEMC's Manual Handling Standard. Assess the weight of the tank prior to lifting it into/from the vehicle. Request assistance or use tools or equipment to hoist the tank if it weighs >50 lbs.		
Remove and/or replace a well box cover	Pinch/crush points, cuts and contusions, and musculoskeletal injuries associated with the removal and replacement of a well box cover or lid	Comply with EH&SP Section 51.0, Manual Lifting, and CEMC's Manual Handling Standard. Assess the weight of the cover prior to lifting or moving it. Wear cut-resistant gloves when handling well covers. Covers will be moved by one person. Verify that the working surface is free of debris of slippery materials when handling the cover. Use a 'Handy Hook,' pry bar, or similar tool that is designed to lift or remove a well cover when the cover weighs less than 25 pounds or is less than 12 inches in diameter. Never place your hands or fingers between the well box cover and the sealing surface.		
Collect groundwater or soil vapor samples	General hazards	Follow requirements in the JSA for General work activities.		
	Exposure to chemicals	Use a portable meter to monitor the concentration(s) of organic vapors as described in the HASP. Do not take food, drinks, tobacco products, etc. into the work zone; wash your hands when leaving the work area. Wear nitrile, or equivalent, gloves when handling potentially-contaminated materials or chemical tools. Verify that chemical containers are properly labeled and that SDSs are present for chemicals that are used onsite.		

CHV-J002: Collection of groundwater or soil vapor samples from monitoring points

Job Step	Potential Hazard	Critical Actions	Responsible Party (Print Name)	Verification/ Validation (Print Name)
List equipment used for the task:		Multi Rae 4 Gas Meter, Photo Ionization Detector, Helium Detector, Tool Box (Wrenches, Socket, Pry Bar), Nitrile Gloves, Work Tables, Canopy Plastic Sheeting, Garbage Bags, Duct Tape, Summa Canisters, Fittings, Tubing, UHP80 Helium Cylinder: attach to dolly using rachet straps for transport, Field Log Book, Field Forms, HASP		

Job Safety Analysis—Leidos—Developed/Revised on May 1, 2018 Site # - 204117 Emergency contact information is located in the General HASP	
CHV-J003: Collection of soil samples and technical oversight of drilling activities	**Date of Use:**

Development Team Member(s)	Position
BONNIE GOVONI	**ENVIRONMENTAL GEOLOGIST**
AARON WISHER	**SENIOR GEOLOGIST**

Verification and Review of Hazard Mitigation Measures	Signature/Printed Name	Date
Requirements of this JSA have been verified and discussed with affected site workers		

Personal Protective Equipment (PPE)					
Hard Hat (ANSI Z89.1)	X	Hearing Protection	X	Gloves (High-Visibility When Possible)	X
Safety Glasses With Side Shields (ANSI Z87.1)	X	High-Visibility Clothing (Min. ANSI/ISEA 107 Class 2)	X	Safety-Toed Boots (ASTM-F2413 or ANSI Z41)	X
Knee Pads/Kneeling Pad	X				

Job Step	Potential Hazard	Critical Actions	Responsible Party (Print Name)	Verification/ Validation (Print Name)
General activities/ Verification process	Various hazards	Follow requirements in the JSA for General work activities. All Job Steps completion requires verification. If only one Leidos staff is onsite the Field Manager must obtain verification by calling the Leidos PM or Task Manager.		
Enter a HAZWOPER Exclusion Zone	Various incidents resulting from untrained workers	Each employee must have received current HAZWOPER training, possess a valid HAZWOPER medical clearance, and have completed applicable training for this task. The Field Manager and Health and Safety Officer must have received 8-hr HAZWOPER supervisory training. Site-specific training must address the hazards, storage, and proper handling associated with all chemicals that will be used onsite.		
Establish a work zone	Contact with overhead structures or utilities.	Verify that no overhead obstructions are present prior to beginning operations and do not allow equipment to come within 15 ft of overhead power lines.		

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CHV-J003: Collection of soil samples and technical oversight of drilling activities

Job Step	Potential Hazard	Critical Actions	Responsible Party (Print Name)	Verification/ Validation (Print Name)
Collect soil samples and provide oversight of drilling activities	Incorrectly functioning drill rig/air-excavation rig/fluid release from equipment	Verify that 'kill' switches have been tested before the initial use of a drill rig and/or air-excavation rig and on a daily basis thereafter. Verify that hoses and cables have been inspected daily. Verify that a visual inspection of all equipment has been performed prior to its initial use. Discuss the need for plastic sheeting or other methods to contain drips (hydraulic oil, motor oil, etc.) to determine if measures are needed to prevent releases to the ground. Verify that all hydraulic lines and fittings on equipment have been inspected prior to use.		
	Being struck by Drilling equipment in Primary Work Zone	Only the subcontractor drilling team is authorized to be in the Primary work zone when the drilling rig is in operation. The Primary Work Zone drilling zone must be established and secondary work zone identified for the geologist/staff scientist to work from. Geologist/staff scientist are not allowed in primary work zone when the drilling rig is in operation. To enter the primary work zone visual and verbal communication must be established with the drilling rig operator prior to entry and any drilling operations must be at a stop.		
	Being struck by moving or mobile equipment	Use a spotter when heavy equipment is being moved onsite. The movement of the equipment will be stopped if visual contact is lost with the spotter. The spotter will only back a vehicle from a stationary position and shall not walk backwards to move to another stationary position. Be mindful of your position and keep out of the intended pathway(s) of moving vehicles. Do not stand in the blind spot of large, mobile equipment.		
	Pinch points associated with handling tools and equipment	Identify, mark (when possible), and communicate the locations of pinch points on equipment. Keep body parts at least 12 in. away from rotating equipment. Do not wear baggy or loose-fitting clothing near rotating equipment.		
	Falling equipment	Do not place body parts under suspended loads.		

CHV-J003: Collection of soil samples and technical oversight of drilling activities

Job Step	Potential Hazard	Critical Actions	Responsible Party (Print Name)	Verification/ Validation (Print Name)
	Damage to subsurface utilities or assets	Comply with EH&SP Section 21.0, Subsurface Clearance. Clear boreholes to a depth of 8 ft below surface and to a diameter that is at least 3 in. greater than the outside diameter of the largest drilling tool. Verify applicable and complete subsurface checklists are in place prior to commencing subsurface activities. Verify underground service alert tickets are in place, active, and all companies have marked out their respective utilities prior to commencing subsurface activities. Verify all utility markings are still present and visible, and that their locations are illustrated on an applicable site map/figure prior to commencing subsurface activities. If utility mark-outs are missing, or faded, re-mark with appropriate materials (spray paint, flagging, or stakes) as needed. Use as-built photos to assist in the re-marking. The Field Manager must verify that the markings are intact, or have been replaced, and that verification step must be noted in the daily JSA mark-up.		
	Whipping caused by release of high-pressure fittings	Verify that 'whip checks,' or similar securing devices, are installed on 'quick-connections,' where the failure of such connections could lead to the whipping of hoses.		
	Exposure to chemicals	Use a portable meter to monitor the concentration(s) of organic vapors, as described in the HASP. Do not take food, drinks, tobacco products, etc. into the work zone; wash your hands when leaving the work area. Wear nitrile, or equivalent, gloves when handling potentially-contaminated materials or chemical tools. Verify that chemical containers are properly labeled and that SDSs are present for chemicals that are used onsite.		
	Cuts and contusions that may occur during sampling activities	Use tools and equipment as noted in the JSA for General work activities. Use a dedicated tube cutter or hooked safety blades when opening polymer sample tubes. Wear heavy-duty, cut-resistant gloves when handling split-spoons, polymer tubes, hand auger buckets, etc. Keep fingers out from between split-spoon halves. Wear Kevlar gloves when handling glassware.		
	Flying debris	Stay clear of activities and areas that may generate flying debris. Verify subcontractors performing applicable activities have the proper PPE (face shield) in place prior to commencing activities that may generate flying debris hazards.		
List equipment used for the task:		Multi Rae 4 Gas Meter, Photo Ionization Detector, Tool Box (Wrenches, Socket, Pry Bar), Nitrile Gloves, Work Tables, Canopy, Plastic Sheeting, Garbage Bags, Duct Tape, Zip Lock Bags, Sheen Pan, Field Log Book, Field Forms, HASP		

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Job Safety Analysis—Leidos—Developed/Revised on May 1, 2018 Site # - 204117 Emergency contact information is located in the General HASP	
CHV-J009: Driving	**Date of Use:**

Development Team Member(s)	Position
BONNIE GOVONI	ENVIRONMENTAL GEOLOGIST
AARON WISHER	SENIOR GEOLOGIST

Verification and Review of Hazard Mitigation Measures	Signature/Printed Name	Date
Requirements of this JSA have been verified and discussed with affected site workers		

Job Step	Potential Hazard	Critical Actions	Responsible Party (Print Name)	Verification/ Validation (Print Name)
Plan the trip	Untrained or fatigued driver; vehicle crash when driving in inclement weather	Comply with EH&SP Section 19.0, Vehicle Operations, and Procedure CHV-003, Motor Vehicle Safety. Verify that the driver possesses defensive driving training. Review the Journey Management Plan for the project prior to beginning travel. Do not operate a vehicle if you are fatigued. Sleep prior to traveling or stop at a safe location to sleep during the trip. Pull over and take a break every 2 hours in a safe location during the trip. Check anticipated weather conditions immediately prior to departing for a trip; consider cancelling or postponing a trip if weather conditions are too poor to travel safely.		
Perform 360 degree perimeter walk around of vehicle	Vehicle malfunction or crash from improper maintenance or damage	Conduct a visual inspection of the vehicle to verify that there are no broken or damaged parts on the exterior of the vehicle. Use Get Out And Look (GOAL) stickers as required. Check the tires to ensure that they are adequately inflated.		
Verify that equipment and cargo are secure	Injury to occupants from shifting loads inside of a vehicle cab; injury to third parties or damage to assets from ejection of loose cargo	Place equipment/cargo in a secured compartment (trunk, cargo box, etc.), the bed of a truck, or the rear compartment of a van/sport utility vehicle (SUV), if possible. If equipment must be stored in the cab of a vehicle, then secure it using seat belts, an interior cargo net, or a similar device. Secure equipment in the bed or rear compartment of a truck, van, or SUV with cargo nets or similar devices.		

1) Always operate within design or environmental limits. 2) Always operate in a safe and controlled condition. 3) Always ensure safety devices are in place and functioning. 4) Always follow safe work practices and procedures. 5) Always meet or exceed customers' requirements. 6) Always maintain integrity of dedicated systems. 7) Always comply with all applicable rules and regulations. 8) Always address abnormal conditions. 9) Always follow written procedures for high-risk or unusual situations. 10) Always involve the right people in decisions that affect procedures and equipment.

CHV-J009: Driving

Job Step	Potential Hazard	Critical Actions	Responsible Party (Print Name)	Verification/ Validation (Print Name)
Check and adjust seat and mirrors; check lights, turn signals, and gauges	Vehicle crash from improperly functioning warning devices	Adjust the steering wheel, seat, and mirrors so that your back is fully supported, your upper arms are close to your body, and the pedals are within easy reach. Test the operation of the turn signals, windshield wiper, washer, and head- and tail-lights prior to beginning a trip. Ensure that adequate fuel is present in the tank prior to beginning a trip.		
Fasten seat belts	Increased risk of serious injury or death in a collision	Verify that seat belts are in good condition, work correctly, and are fastened for all passengers.		
Lock doors	Ejection from vehicle; unwanted intrusion	Lock all doors to the vehicle.		
Pull out of the parking space	Collision; injury to vehicle occupants or third parties	Check all mirrors and over your shoulder in all directions prior to pulling out of a parking space.		
Driving the vehicle	Collision; injury to vehicle occupants or third parties	Obey all posted rules and regulations; do not exceed posted speed limits; travel at slower speed as conditions warrant. Maintain a 15-second 'eye lead time' and scan your mirrors every 5 to 8 seconds. Maintain at least a 4-second following distance between your vehicle and vehicles that are in front of you. Increase your following distance as conditions warrant. Avoid motorists who are driving erratically, aggressively, or who appear to be distracted. Scan intersections as you approach them to avoid drivers who fail to stop or yield, at intersections. Check mirrors when changing lanes to verify that you have enough clearance before shifting lanes. Avoid traveling in 'blind spots' of other drivers or within 'packs' of vehicles. At stops, maintain a one-half to one-car length distance between your vehicle and crosswalks, intersections, vehicles, etc. that may be present in front of you. Place your hands on the steering well at the '9 and 3' positions to prevent your hands from hitting your face in the event that the airbag were to deploy. When vehicle access is narrow/limited, Stop Work Authority will be evoked and exact measurements of the access area and vehicle will be taken to verify a safe and acceptable amount of clearance is present prior to moving the vehicle.		

1) Always operate within design or environmental limits. 2) Always operate in a safe and controlled condition. 3) Always ensure safety devices are in place and functioning. 4) Always follow safe work practices and procedures. 5) Always meet or exceed customers' requirements. 6) Always maintain integrity of dedicated systems. 7) Always comply with all applicable rules and regulations. 8) Always address abnormal conditions. 9) Always follow written procedures for high-risk or unusual situations. 10) Always involve the right people in decisions that affect procedures and equipment.

CHV-J009: Driving

Job Step	Potential Hazard	Critical Actions	Responsible Party (Print Name)	Verification/ Validation (Print Name)
Backing the vehicle	Collision; injury to vehicle occupants or third parties	Use a spotter, when possible. Discuss the hand and/or voice signals that will be used by the spotter prior to beginning the backing maneuver. The spotter will only back a vehicle from a stationary position and shall not walk backwards to move to another stationary position. Visually inspect the intended backing area prior to moving the vehicle to verify that no obstructions or impediments are present in the area. Back the vehicle slowly and pay attention to all sides of the vehicle to ensure that it does not come into contact with a person or object while backing. Avoid backing any further than necessary. When vehicle access is narrow/limited, Stop Work Authority will be evoked and exact measurements of the access area and vehicle will be taken to verify a safe and acceptable amount of clearance is present prior to moving the vehicle.		
Park the vehicle	Collision; injury to vehicle occupants or third parties	Park away from other cars, if possible, and use parking spaces that will allow you to move forward when you return to the vehicle. Set the parking brake after the vehicle has been parked.		
Report maintenance issues	Vehicle malfunction or crash from improper maintenance or damage	Report vehicle problems immediately to a company representative or rental car agency.		

1) Always operate within design or environmental limits. 2) Always operate in a safe and controlled condition. 3) Always ensure safety devices are in place and functioning. 4) Always follow safe work practices and procedures. 5) Always meet or exceed customers' requirements. 6) Always maintain integrity of dedicated systems. 7) Always comply with all applicable rules and regulations. 8) Always address abnormal conditions. 9) Always follow written procedures for high-risk or unusual situations. 10) Always involve the right people in decisions that affect procedures and equipment.

APPENDIX D—Safety Data Sheets

SDSs will be maintained onsite for each of the following chemicals:

- Asphalt patch
- Bentonite
- Concrete
- Helium
- Horiba calibration fluid
- Hydrochloric acid
- Isobutylene calibration gas
- Liquinox
- Methanol
- Nitric acid
- Non-flammable calibration gas mixture
- Portland cement
- Silica sand
- Sodium bisulfate

APPENDIX E—Forms

Project Information

CEMC Facility ID/Name	204117
Project Location	2021 6th Street, Bremerton, WA
Name of Field Manager/SHSO	Aaron Wisher

List of Forms

Air Monitoring Log
Hazard Hunt Form
JSA Cover Page/Commitment to Comply
CEMC HHWP Specific Forms
Stop Work Authority/HASP Revision Log
Drill Rig Operational Checklist
Post-Task Debriefing Record
Pre-Departure Checklist

LEIDOS Air Monitoring Log

Gas Testing Requirements (all gas testing to be performed by a Qualified Gas Tester).

Facility ID: **Location:** **Date:**

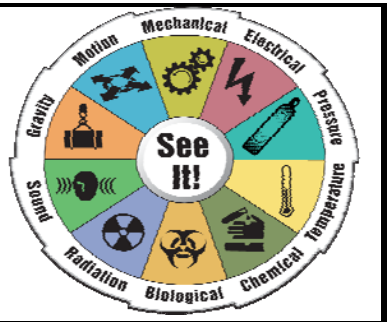
☐ Initial ☐ Hourly ☐ Every ______Hours ☐ Continuous: record gas test result every ☐ 1hr ☐ 2hr ☐ other:

Initial Gas Test Readings

Time	% O2	% LEL	H_2S ppm	CO ppm	Temp. ºF/ºC	VOC ppm	Other	Qualified Gas Tester Name

Leidos-Hazard Hunt Form

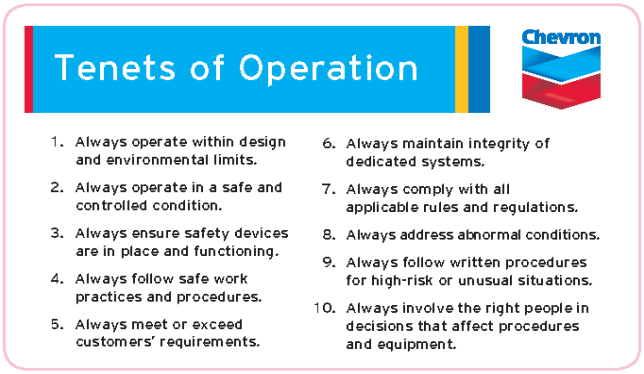
Facility ID	204117	Date	
Location	2021 6th Street, Bremerton, WA		
Field Manager/SHSO Printed Name/Signature	Aaron Wisher		
Specific Work Activity			

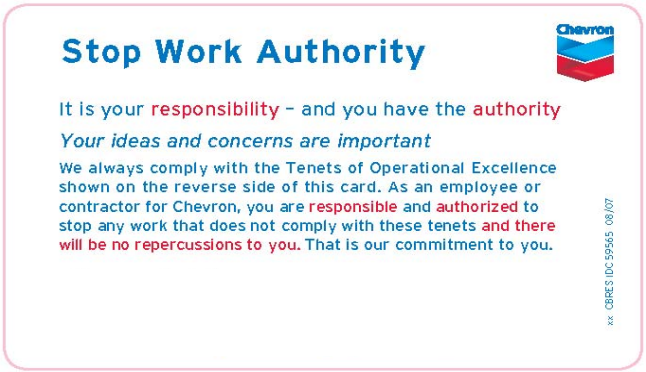


Hazard Category	Hazard(s) Identified	Elimination/Mitigation Actions	Verified/ Validated By (Print Name)
Mechanical			
Electrical			
Pressure			
Temperature			
Chemical			
Biological			
Radiation			
Sound			
Gravity			
Motion			

Leidos-JSA Cover Page/HASP Commitment to Comply

Facility ID	204117	Date	
Location	2021 6th Street, Bremerton, WA		





The following JSAs will be used during field operations:

- [X] CHV-J001: General work activities
- [ ] CHV-J002: Collection of groundwater or soil vapor samples from monitoring points
- [ ] CHV-J003: Collection of soil samples and technical oversight of drilling activities
- [X] CHV-J009: Driving

The Field Manager and Site Health and Safety Officer (SHSO) are responsible to enforce the requirements outlined in the HASP and JSAs.

Field Manager/SHSO Printed Name/Signature	Aaron Wisher	Date	

A signature on this form indicates that the individual has reviewed the Heath and Safety Plan (HASP), applicable job safety analyses (JSAs), received site-specific training ('tailgate briefing'), and agreed to comply with the HASP, JSAs, Chevron's Guiding Principles ('Every Task, the Right Way, Every Time'), and Chevron's Preventing Serious Injury and Fatalities Field Guide.

Printed Name	Signature	Date

Leidos-Stop Work Authority/HASP Revision Log			
Facility ID	204117		
Location	2021 6th Street, Bremerton, WA		
Date	Description	Actions Taken	Notifications

Leidos-Drill Rig Operational Checklist

Facility ID	204117	Date	
Location	2021 6th Street, Bremerton, WA		
Drilling Company			
Rig Manufacturer		Rig Model	
Rig Identification		Drilling Method	
Inspector Printed Name/Signature			
Field Manager/SHSO Printed Name/Signature	Aaron Wisher		

		Yes	No	NA
1.	Are emergency interrupt ('kill') switches in working order?			
	Location of kill switch #1:			
	Location of kill switch #2:			
	Location of other kill switches:			
2.	Is the proper type/capacity of fire extinguisher present, charged, and inspected?			
3.	Is the backup alarm on the rig functional?			
4.	Is a spill kit present?			
5.	Have operational modifications been made to the rig?			
5a.	If 'Yes,' are the modifications within the manufacturer's specifications?			
6.	Are moving parts (except for a cat head) properly guarded and identified?			
7.	Are exhaust pipes and manifolds properly guarded and identified?			
8.	Are there any noticeable leaks from fuel or hydraulic tanks, lines, or fittings?			
9.	Is there a log for manufacturer's recommended maintenance activities?			
9a.	If 'Yes,' has maintenance been performed according to the recommendations?			
10.	Are walking or standing surfaces free of slip, trip, and fall hazards?			
11.	Was the drill rig properly decontaminated prior to arrival onsite?			
12.	Is the operating manual for the drill rig present?			
13.	Is all downhole equipment properly stored on the rig or support vehicle?			
14.	Are all control mechanisms and gauges functional and free of unsafe materials?			
15.	Is the level of fluid acceptable in hydraulic reservoirs or tanks?			
16.	Are hydraulic and pneumatic systems in good condition and functional?			
17.	Are hydraulic/pneumatic hoses and fittings undamaged and in good condition?			
18.	Are wires, ropes, cables, and lines undamaged and in good condition?			
19.	Are pulleys undamaged and functional?			
20.	Are clips, clamps, hooks, and clevises undamaged and attached properly?			
21	Are thimbles used to form eyes in wires, ropes, cables, or lines?			
22	Do all hooks have functional gates or safety latches?			
23.	Verify that the water swivel (when present) is functioning as intended (no leaks, free movement, etc.).			
24.	Other/Comments:			
25.	Other/Comments:			

Leidos-Post-Task Debriefing Record

Facility ID	204117	Date	
Location	2021 6th Street, Bremerton, WA		

Discussion Topics

☐ Job safety analyses (List opportunities for improvement, below, and reference JSAs to be modified)

☐ Significant exercises of Stop Work Authority, near-incidents, or incidents (Reference SWA Log)

☐ Unanticipated situations or conditions encountered during field activities

☐ General comments/recommendations

Field Manager/SHSO Printed Name/Signature	Aaron Wisher	Date	

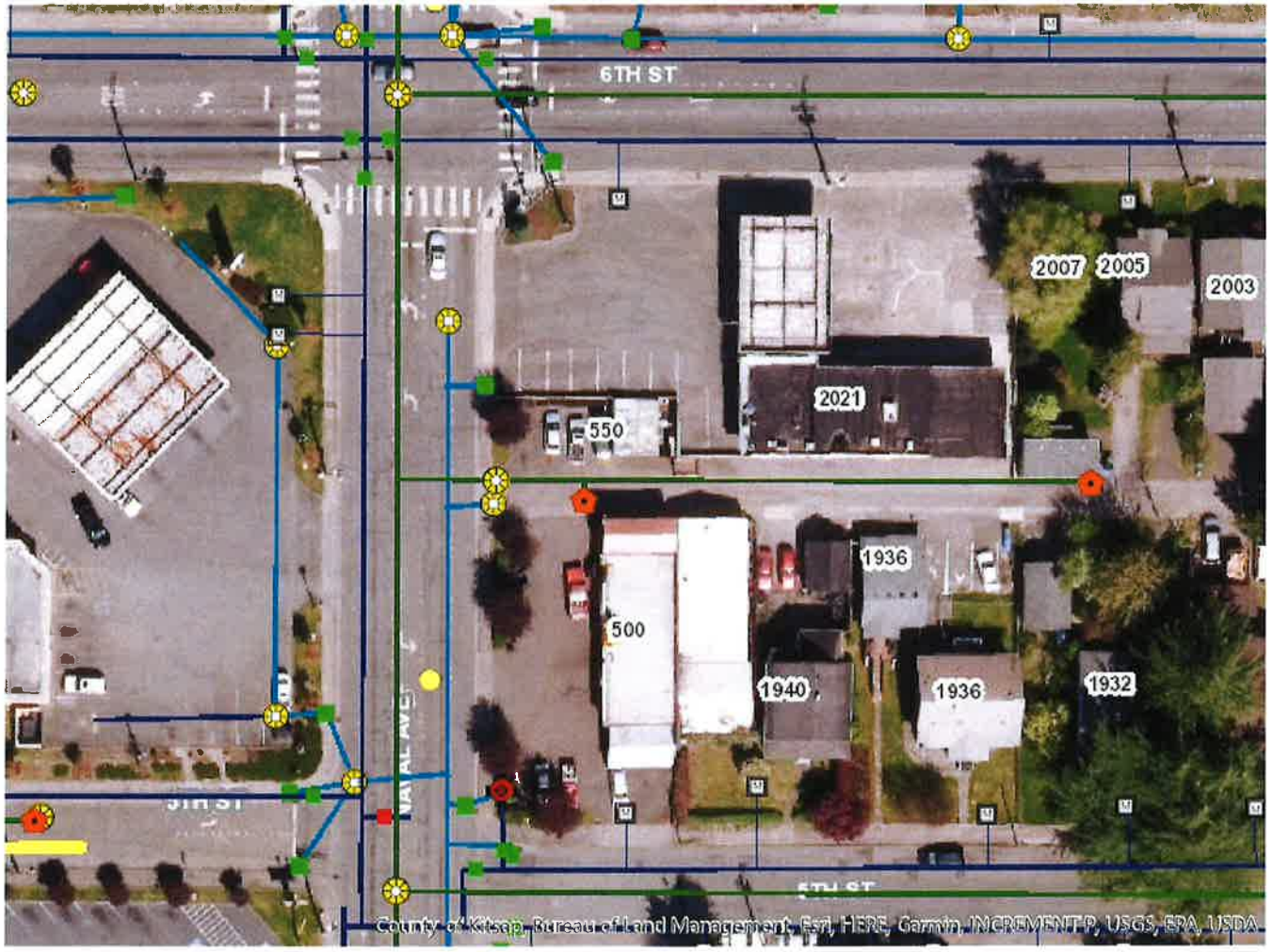
Printed Name	Signature	Date

Leidos-Pre-Departure Checklist

Facility ID	204117	Date	
Location	2021 6th Street, Bremerton, WA		
Field Manager/SHSO Printed Name/Signature	Aaron Wisher		

		Yes	No	NA
1.	Are any wells damaged as noted below? If 'Y,' note Well IDs below.			
	Sunken/cracked concrete pad:			
	Missing bolts:			
	Missing or damaged cover:			
	Missing locking/slip cap:			
	Other:			
2.	Have lids and locking devices been reinstalled on any wells that were opened?			
3.	Has a photograph been taken of each well on at least a quarterly basis?			
	Actions taken to correct noted deficiencies:			
	Recommended actions to correct deficiencies:			
4.	Are there any stockpiles/containers of investigation-derived waste (IDW) onsite?			
	If 'Y,' list the number and type(s) of container(s):			
5.	Are waste containers properly labeled, and is the contact information correct?			
6.	Is waste remaining from a previous investigation? If 'Y,' list types below.			
7.	Are containers of IDW properly staged on a level surface and away from traffic?			
8.	Is IDW staged in an area that will be accessible when the waste is picked up?			
9.	Is the IDW staging area shown on a site map? If 'Y,' attach a copy of the map.			
10.	Are stockpiles of IDW or materials properly covered and bermed?			
11.	Has municipal trash been collected and properly disposed?			
12.	Have paved areas been swept and/or washed down?			
13.	Have materials and equipment been properly stored and secured?			
14.	Have barricades been left onsite? If 'Y,' list the number and type(s) below.			
15.	Have vehicles and/or equipment been property stored, secured, and locked?			
16.	Is the remediation system door/panel secured and locked?			
17.	Is the remediation system enclosure/fence secured and locked?			
18.	Is emergency contact information posted on the remediation system?			
19.	Are all excavations fenced, covered and/or barricaded?			
20.	Are there any signs of vandalism?			
21.	Are there any depressions or areas of subsidence that must be repaired?			
22.	Other/Comments:			
23.	Other/Comments:			

Appendix D:
City of Bremerton Utility Information


6TH ST
2007
2005
2003
2021
550
1936
500
1940
1936
1932
County of Kitsap, Bureau of Land Management, Esri, HERE, Garmin, INCREMENT P, USGS, EPA, USDA

9-22-92	AEL	ADD ROOF DRAINS, OLYMPIC AVE.		C.B. FIELD MEAS.
8-7-92	AEL	ADD SAN./STORM TIES / DRAINS	WB	C.B. FIELD MEAS./NOTES
2-1-89	AEL	COMB. STORM/SAN. SWRS.		KRAMER, CHIN & MAYO MAPS 10/84
DATE	BY	REVISION	APPD.	REFERENCES

ENGINEERING DEPARTMENT

CITY of BREMERTON

1618 | 1718

SANITARY SEWER SYSTEM

COMBINED STORM & SANITARY SEWER

1" = 100'

DATE

FILE NO.

111
116 + 106
109

110

PLAN	
SURVEYED	
PLOTTED	
NOTE BOOK	LAYOUT CHECKED
NO. C.S.C.	RT. OF WAY CHECKED

PROFILE	
SURVEYED G. McB.&I.C.	
PLOTTED C.B.M.	
NOTE BOOK	DRAWN CHECKED E.J.M.
NO. C.S.C.	STRUCTURE NOTATNS CH'KD

STREET

6TH.

7TH.

8TH.

STREET

STREET

SCALE: 1"=20'

8" SAN.

EXIST. 15" STORM LINE

6" SAN (CLAY)

CONSTRUCT- PRE CAST M.H.

4'X12'Y

M.H. #1
INLET INV. ELEV. 216.72

CONST STATE STD. C.B

PLUG EXISTING DISCHARGE

CONST. STATE STD. C.B

USE EXIST. CATCH BASIN

4'X10'Y

M.H. #2
INLET INV. ELEV - 220.71
DISCHARGE INV. ELEV. - 220.07

CONST. STATE STD. C.B.

RELOCATE INLETS

PLACE 270' OF 12" C.S.P.

PLACE 262' OF 10" C.S.P.

PLACE 238.45 OF 8" C.

USE EXIST. C.B. PLUG EXIST. DISCHAR

M.H. #3
INLET INV. ELEV.- 227.29
DISCHARGE INV. ELEV.- 22

RELOCATE INLETS

6" EXIST.

8" SAN.

LEGEND

- EXISTING POWER POLE
- EXISTING TELEPHONE POLE
- PROPOSED STORM SEWER
- EXISTING CURB
- EXISTING MANHOLE
- EXISTING CATCH BASIN
- EXISTING GUTTER INLET
- PROPOSED GUTTER INLET
- EXISTING FIRE HYDRANT
- EXISTING SIDEWALK
- EXISTING WATER VALVE
- EXISTING LUMINAIRE
- EXISTING SAN. SEWER
- W — W — EXISTING WATER LINE
- G — G — EXISTING GAS LINE
- EXISTING ASPHALT
- T.O.P.E. — TOP OF PIPE ELEVATION
- B.O.P.E — BOTTOM OF PIPE ELEVATION

232
230
228
226
224
222
220
218
216

M.H. #1
0+00
INV. ELEV. 216.72
INV. EL. 215.42
0+50
1+00
B.O.P.E. 218.06
T.O.P.E.- 217.68
6" SAN. (CLAY)
B.O.P.E. 217.02
S=.01241 12" C.S.P.
M.H. #2
2+70
0+00
T.O.P.E. - 222.10
6" C.I. WATER
B.P.E 220.54
T.O.P.E. 221.11
INV. EL. - 220.71
INV. EL. - 220.07
INV. EL. 218.40
T.O.P.E. - 216.84
8" SAN. (CONC.)
B.O.P.E. - 216.09
2+00
1+00
S=.0135 10" C.S.P.
M.H. #3
2+62
0+00
S=.0325 8" C.S.P.
T.O.P.E. 227.84
6" C.I. WATER
INV. ELEV. 227.29
B.O.P.E. - 227.26
INV. EL. 225.82
INV. EL. - 224.96
T.O.P.E. - 222.52
12" SAN. CONC.
B.O.P.E. - 221.41
3+00
2+00

Preliminary Drawing/Plan

3454

SCALE	
HOR. 1"= 20'	
VERT. 1"= 2'	
DRAWN BY	C.B.M.
DATE	
CHECKED BY	C.S.C.
DATE	
REVISED BY	
DATE	

OFFICE OF THE CITY ENGINEER
Bremerton, Wash.

CONSTRUCTION OF STORM SEWER
NAVAL AVE.
FROM 6TH. ST. TO 11TH. S

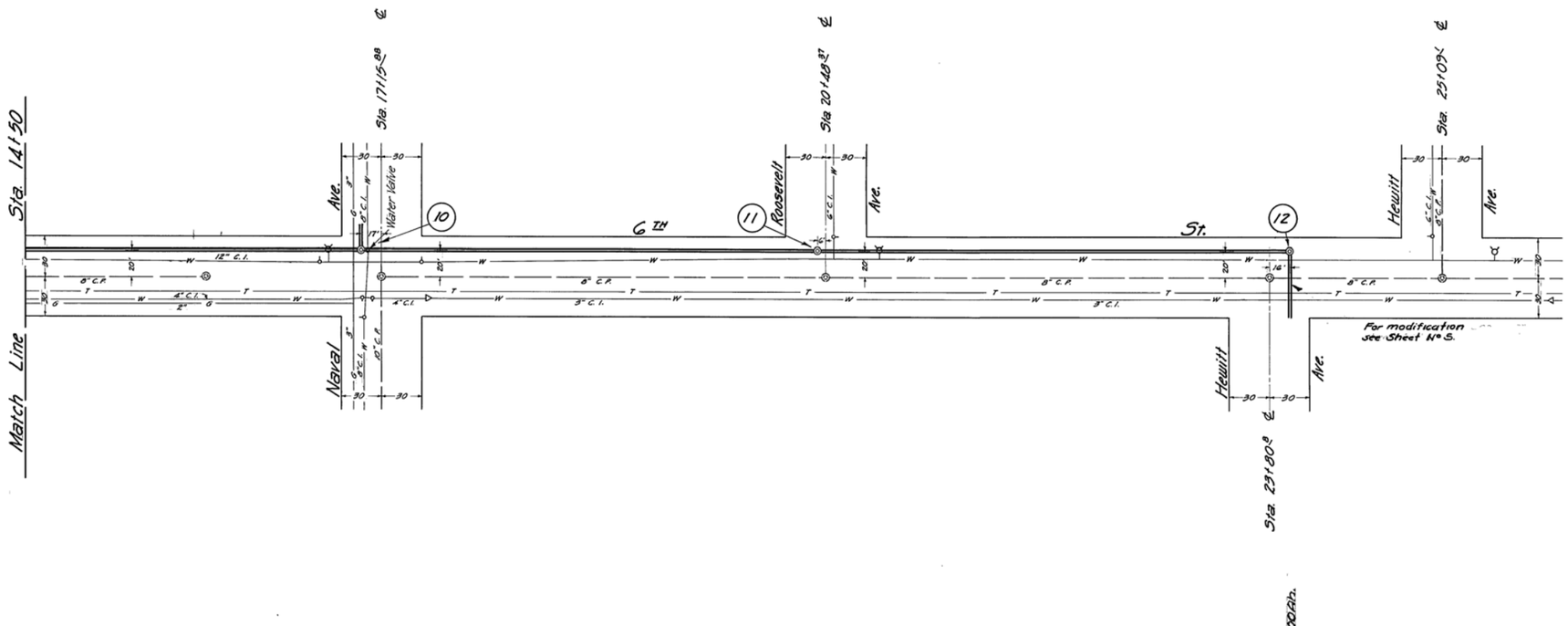
FRED J. MEBUS
CITY ENGINEER

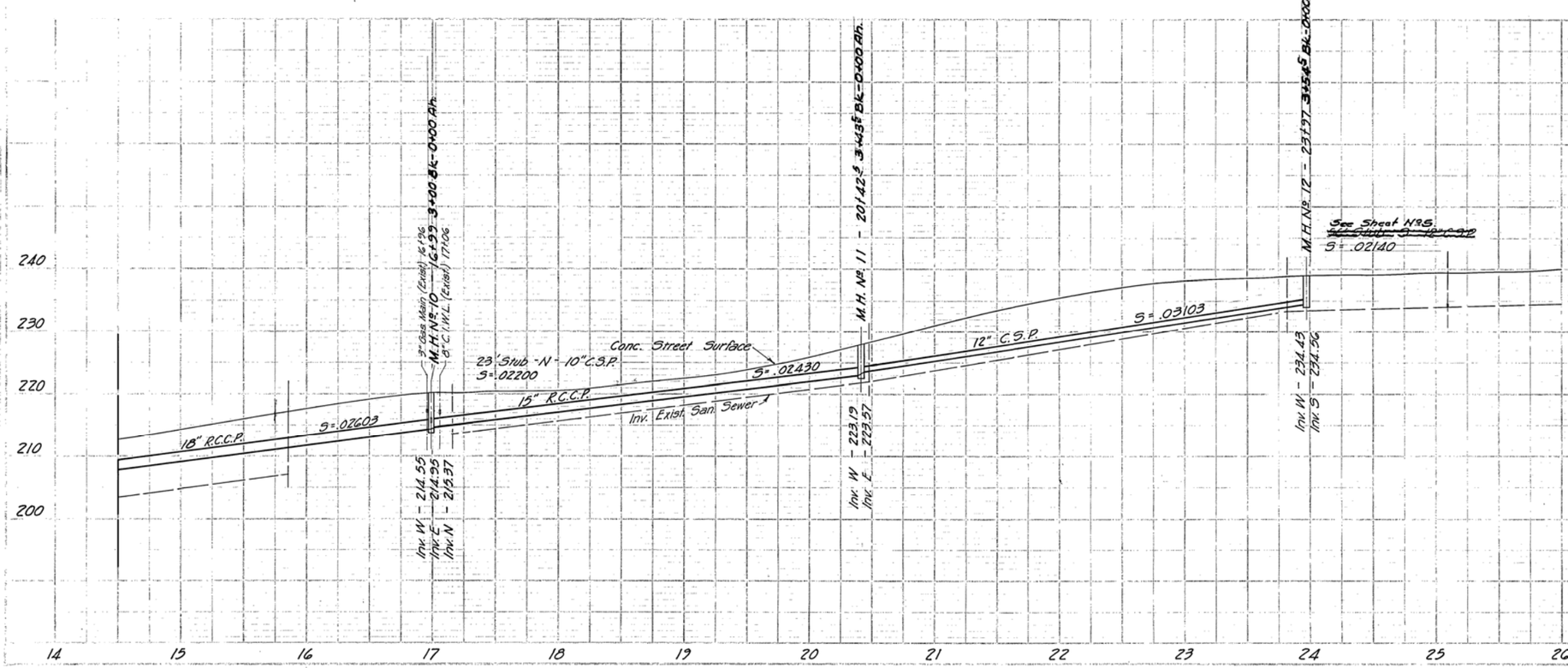
SHEET NUMBER 1 OF 2

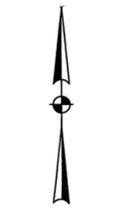
JOB NUMBER SA-1-67-

PLATE 1 PLAN: PROFILE B P R STANDARD
EUGENE DIETZGEN CO., CHICAGO - NEW YORK

MICRO 1289 A







3353

SCALE	1" = 30'
DATE	May 39
DESIGNED	R.M.S.
DRAWN	R.M.S.
CHECKED	ADD
REVISED	

CITY OF BREMERTON, WASH.

PLAN & PROFILE

6TH ST. STORM SEWER

STA. 14+50 TO 23+76

W L Fortman — CITY ENGINEER

SHEET NR. 2 of 6

DRAWING NUMBER C-SEWERS 44

WILLIAM L. FORTMAN — STATE OF WASHINGTON — REGISTERED PROFESSIONAL ENGINEER — 6054

As-Built/Record Drawing

Micro 1294

6TH STREET

17+50

18+00

18+34.7

EXISTING CATCH BASIN

#4 REBAR 2' O.C. – TYPICAL

EXISTING EDGE P.C.C. PAVEMENT

EXISTING CURB

NEW CURB

6 DUCTS IN CONC.

A

A

DRIVE WAY

NEW BACK OF WALK AND R/W

NAVAL

PLAN VIEW

1" = 10'

℄ TEL. M.H.

3.8'

1.45'

1.45'

0.15'

NEW P.C.C. CURB AND PAVEMENT

EXISTING CURB

#4 REBAR – 2' O.C.

EXISTING 6" P.C.C. PAVEMENT

1.13'±

12"

6"

3" CRUSHED ROCK

1¼" MINUS WELL COMPACTED

6" TEL. DUCTS IN P.C.C. ENVELOPE

6" CRUSHED ROCK

1¼" MINUS

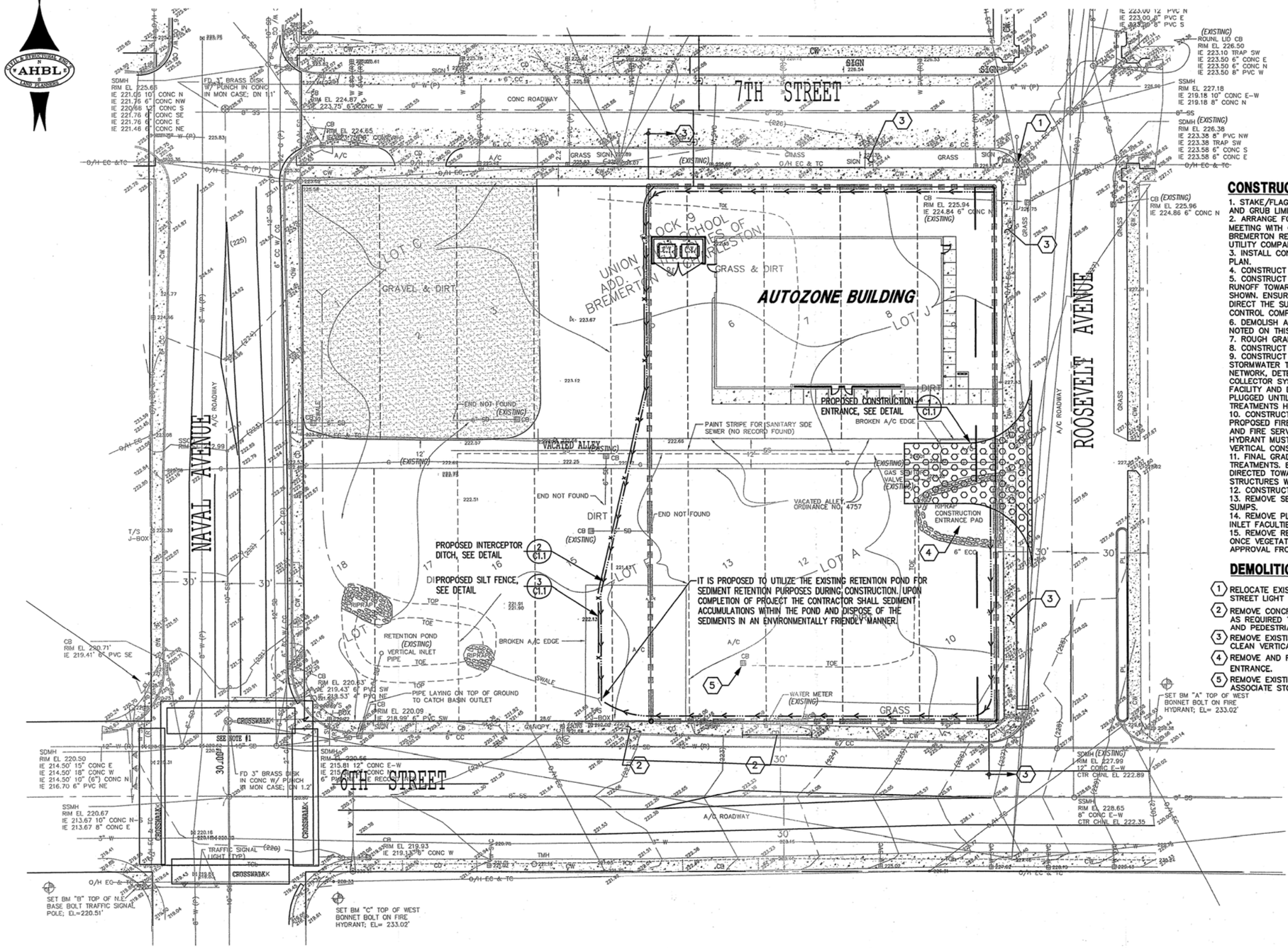
WELL COMPACTED

SECTION A-A

1" = 1'

AutoZone
Sec. 14, T24N, R1E, W.M.
City of Bremerton, Washington

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = 20 ft.



CONSTRUCTION SEQUENCE

1. STAKE/FLAG LIMITS OF CONSTRUCTION AND CLEAR AND GRUB LIMITS.
2. ARRANGE FOR AND ATTEND PRE-CONSTRUCTION MEETING WITH OWNER(S), ENGINEER(S), CITY OF BREMERTON REPRESENTATIVES, AND ALL APPLICABLE UTILITY COMPANIES.
3. INSTALL CONSTRUCTION ENTRANCE AS SHOWN ON PLAN.
4. CONSTRUCT PERIMETER EROSION CONTROL FENCING.
5. CONSTRUCT INTERCEPTOR DITCHES AND DIRECT RUNOFF TOWARDS EXISTING RETENTION PONDS AS SHOWN. ENSURE THAT INTERCEPTOR DITCHES POSITIVELY DIRECT THE SURFACE RUNOFF TOWARDS THE SEDIMENT CONTROL COMPONENTS.
6. DEMOLISH ALL "MAN MADE" STRUCTURES ON SITE AS NOTED ON THIS PLAN.
7. ROUGH GRADE SITE PER PLANS.
8. CONSTRUCT SANITARY SEWER CONNECTION.
9. CONSTRUCT STORM DRAIN SERVICES INCLUDING STORMWATER TREATMENT FACILITY, CATCH BASIN NETWORK, DETENTION PIPE GALLERY, AND ROOF DRAIN COLLECTOR SYSTEM. ENSURE THAT INLET TO TREATMENT FACILITY AND DETENTION PIPE GALLERY REMAIN PLUGGED UNTIL SUCH TIME AS THE FINAL SURFACING TREATMENTS HAVE BEEN COMPLETED.
10. CONSTRUCT WATER SERVICE RECONFIGURATION, PROPOSED FIRE HYDRANT STRUCTURE, AND DOMESTIC, AND FIRE SERVICES AS SHOWN ON PLANS. FIRE HYDRANT MUST BE PLACED AND OPERATING PRIOR TO VERTICAL CONSTRUCTION.
11. FINAL GRADE SITE, CONSTRUCT FINAL SURFACING TREATMENTS. ENSURE SURFACE WATER IS POSITIVELY DIRECTED TOWARDS PROPOSED STORM DRAINAGE STRUCTURES WITHOUT PONDING.
12. CONSTRUCT LANDSCAPE FEATURES.
13. REMOVE SEDIMENT ACCUMULATIONS IN CATCH BASIN SUMPS.
14. REMOVE PLUGS FROM DETENTION AND TREATMENT INLET FACULTIES.
15. REMOVE REMAINING EROSION CONTROL FEATURES ONCE VEGETATION HAS BEEN STABILIZED AND UPON APPROVAL FROM PIERCE COUNTY REPRESENTATIVE.

DEMOLITION KEYNOTES

1. RELOCATE EXISTING POWER POLE TO PROPOSED STREET LIGHT LOCATION BEHIND SIDEWALK.
2. REMOVE CONCRETE SIDEWALK AND DRIVEWAY APRONS AS REQUIRED TO CONSTRUCT PROPOSED DRIVEWAY AND PEDESTRIAN SIDEWALK.
3. REMOVE EXISTING CONCRETE SIDEWALK, SAWCUT A CLEAN VERTICAL INTERFACE.
4. REMOVE AND RELOCATE EXISTING CONSTRUCTION ENTRANCE.
5. REMOVE EXISTING CATCH BASIN STRUCTURE AND ASSOCIATE STORM DRAIN PIPE.

CALL 48 HOURS BEFORE YOU DIG 1-800-424-5555

"THESE DRAWINGS ARE ISSUED FOR AGENCY PERMIT REVIEW PURPOSES ONLY AND ARE NOT TO BE USED FOR CONSTRUCTION".

Civil Engineers
Structural Engineers
Landscape Architects
Community Planners
Land Surveyors
Neighbors

AHBL
TACOMA · SEATTLE
2215 North 30th Street, Suite 300, Tacoma, WA 98403
253.383.2422 TEL
316 Occidental Avenue South, Suite 320, Seattle, WA 98104
206.267.2425 TEL

Project Title:

AutoZone
6th St. and Roosevelt Ave.

Client:

Hawkins Companies

8645 West Franklin Road
Boise, Idaho 83709

Brian Huffaker
Phone: (253) 351-3444

Job No.

203113.10

Issue Set & Date:

ISSUED FOR PERMIT APPROVAL

9/19/03

PAUL B. McCORMICK — STATE OF WASHINGTON — REGISTERED PROFESSIONAL ENGINEER

EXPIRES 6/4/04

Revisions:

4. _____
3. _____
2. _____
1. _____

Sheet Title:

Temporary Erosion Control Plan

Designed by:	Drawn by:	Checked by:
S. Beier	H. Rodriguez	P. McCormick

Sheet No. 10551

C1.0

2 of 10 Sheets