# PORT OF ILLAHEE PROPERTY – PNW296

## Environmental Data Submittal and Budget Increase Request

Prepared for:

Pollution Liability Insurance Agency

Client Ref: Contract No. 17-005SLR, SOW No. WP-002401

March 2023

DRAFT

# Port of Illahee Property – PNW296
# Environmental Data Submittal and Budget Increase Request

Prepared for:
Pollution Liability Insurance Agency
PO Box 40930
Olympia, Washington 98504-0930

This document has been prepared by SLR International Corporation (SLR). The material and data in this report were prepared under the supervision and direction of the undersigned.

DRAFT

Spencer Lo
Project Geologist

John McCorkle, CEP
Principal
(206) 510-2736

Chris Lee, L.G.
Associate Geologist

# CONTENTS



## FIGURES



## TABLES



DRAFT

## APPENDICES



DRAFT

# ACRONYMS

| | |
|---|---|
| µg/L | micrograms per liter |
| µS/cm | microSiemens per centimeter |
| Apex | Apex Laboratories, Inc. |
| Bgs | below ground surface |
| BTEX | benzene, toluene, ethylbenzene, and xylenes |
| DO | dissolved oxygen |
| DRO | diesel-range organics |
| EC | electrical conductivity |
| Ecology | Washington State Department of Ecology |
| EPA | United States Environmental Protection Agency |
| Fe2+ | ferrous iron |
| Fe3+ | ferric iron |
| ft/ft | foot per foot |
| GRO | gasoline-range organics |
| mg/L | milligrams per liter |
| MRL | method reporting limit |
| msl | mean sea level |
| MTCA | Model Toxics Control Act |
| mV | millivolts |
| ORO | oil-range organics |
| ORP | oxidation-reduction potential |
| PID | photoionization detector |
| PLIA | Pollution Liability Insurance Agency |
| PPA | Pre-Planning Assessment |
| ppm | parts per million |
| ROW | right-of-way |
| SLR | SLR International Corporation |
| UST | underground storage tank |
| WAC | Washington Administrative Code |

DRAFT

DRAFT

# 1. INTRODUCTION

SLR International Corporation (SLR) has prepared this report to present the results of environmental assessment activities that have been conducted to date in late 2022 at the Port of Illahee property located at 5507 Illahee Road, Bremerton Washington (the Subject Property/Site), and to present an approach to complete assessment activities at the Subject Property. The location of the Subject Property is shown in Figure 1. The objectives of these activities were to assess the extents of soil and groundwater contamination at the site, which had not been laterally defined during prior activities. SLR's proposed approach was detailed in the *Remedial Investigation Work Plan Port of Illahee Property* (SLR, 2022).

## 1.1 DESCRIPTION OF SUBJECT PROPERTY

The Subject Property is located at 5507 Illahee Road in Bremerton, Washington (Kitsap County Parcel 4429-015-001-0309), and is approximately 0.15 acres in size. The surface topography of the Subject Property is generally flat and the property is situated at an approximate elevation of 54 feet above mean sea level (msl). The topography to the east of the Subject Property slopes steeply toward the Port Orchard channel of Puget Sound, located approximately 250 feet to the east. One approximately 1,600 square feet (sf) slab-on-grade building is located on the western portion of the property. Subject Property/Site features are shown on Figure 2.


*Photo 1 - View of the Tank Basin*

The Subject Property was previously used as a gasoline station, and there are three abandoned underground storage tanks (USTs) located at the Subject Property, including one 4,000-gallon UST which contained leaded gasoline; and one 4,000-gallon UST and one 6,000-gallon UST which both contained unleaded gasoline. The USTs are constructed of single-wall steel with leak detection and impressed-current corrosion protection. The USTs were reportedly upgraded in 1998 and have been out of service since approximately 2002. Jim Aho, the Port Commissioner, reported that the USTs were previously emptied of remaining product (G-Logics, 2017).

Subsurface soils at the Site generally consist of dense to very dense sand, gravel, and gravelly sand with varying amounts of silt and occasional silt lenses, to depths of approximately 17 feet below ground surface (bgs). Groundwater was encountered at depths between 9 and 12 feet bgs during previous drilling

DRAFT

activities at the Site. Based on groundwater data collected by G-Logics, Inc. (G-Logics) on July 14, 2017, the depth to groundwater in each of the monitoring wells ranged from 5.19 to 12.88 feet bgs (G-Logics, 2017). The groundwater flow direction beneath the Site is generally to the east, toward the Port Orchard channel.

## 1.2 PREVIOUS INVESTIGATIONS AND IDENTIFIED DATA GAPS

In 2016 and 2017, Langseth Environmental Services, Inc. (Langseth) and G-Logics conducted environmental assessment activities at the Site. These activities identified contaminated soil and groundwater in the vicinity of the USTs and pump islands at the Site.

The results of these activities were summarized in SLR's *Remedial Investigation Work Plan, Port of Illahee Property* (SLR, 2022). SLR identified select data gaps :

- The lateral extents of petroleum hydrocarbon-impacted groundwater had not been delineated:
    - To the east, downgradient of the UST basin, and beneath the Illahee Road NE ROW, towards the Port Orchard channel.
    - To the west, upgradient of the UST basin toward the current building.
    - To the north beyond the former dispenser island.
    - Potentially to the south beyond GLMW-4. Only a single groundwater sampling event had occurred at the Site in 2017, and additional sampling was necessary to confirm that seasonal groundwater fluctuations would not result in exceedances at GLMW-4.
- The lateral extents of the petroleum-impacted soil had not been delineated:
    - Laterally to the north beyond the former dispenser island; to the east beneath the Illahee Road NE right-of-way (ROW); and to the west beneath the current building.
- The soil vapor pathway had not been assessed.

DRAFT

# 2. ASSESSMENT ACTIVITIES

As the previous groundwater sampling event occurred five years prior to the current assessment, SLR visited the Site on October 24, 2022, to conduct a groundwater sampling event. The data from this event would be used to plan subsequent drilling activities. During the sampling event, SLR collected groundwater samples from the four monitoring wells present on the Subject Property (GLMW-1 through GLMW-4). Prior to sampling, SLR measured the depths to groundwater in the wells by using an electronic water level indicator. SLR used a peristaltic pump with new tubing to purge and sample each well by using low flow (0.33 liter per minute) pumping methods, with the bottom of the tubing set at approximately 2 feet below the water level. During the purging of each well, pH, conductivity, temperature, oxidation-reduction (redox) potential, and dissolved oxygen concentration of the extracted water were measured, and a groundwater sample was collected after stabilization of the field parameter measurements. The final field parameter measurements (at the time of groundwater sample collection) from the October 2022 sampling event are presented in Table 1. The groundwater sampling field data sheets from the October 2022 sampling event are included in Appendix A.

The groundwater samples were submitted to Apex Laboratories (Apex) in Tigard, Oregon, for analysis of gasoline-range organics (GRO) by Washington State Department of Ecology (Ecology) Method NWTPH-Gx; diesel-range organics (DRO) and oil-range organics (ORO) by Ecology Method NWTPH-Dx; benzene, toluene, ethylbenzene, and total xylenes (BTEX) by U.S. Environmental Protection Agency (EPA) Method 8260D; and total and dissolved lead by EPA Method 6020. The samples collected for dissolved lead were filtered in the field using disposable 0.45-micron field filters.

The purge water generated during the sampling of the wells was placed in a properly-labeled drum pending offsite disposal at a licensed facility.

## 2.1 GROUNDWATER MONITORING RESULTS

The depths to groundwater on October 24, 2022 ranged from 7.57 to 16.12 feet below the tops of the well casings. Based on the surveyed top-of-well-casing elevations, the groundwater elevations ranged from 81.93 to 93.33 feet above mean sea level (msl). Based on these groundwater table elevations, it appears that groundwater flow direction beneath the Subject Property is generally to the east, with an average hydraulic gradient of 0.3 foot per foot (ft/ft). The elevations measured in monitoring wells GLMW-1 and GLMW-2 were significantly lower than the elevations measured by G-Logics in 2017, and the elevations measured in wells GLMW-3 and GLMW-4 were similar to that previous event.

The depth to groundwater measurements and groundwater elevations in the monitoring wells during the October 2022 groundwater sampling event, as well as during the 2017 sampling event, are presented in Table 2. A groundwater elevation contour map based on the data collected on October 24, 2022 is presented on Figure 3.

DRAFT

## 2.2 GROUNDWATER SAMPLE ANALYTICAL RESULTS

The groundwater sample analytical results showed that the sample from monitoring well GLMW-3 contained a GRO concentration [351 micrograms per liter (µg/L) that was below the Model Toxics Control Act (MTCA) Method A groundwater cleanup level (800 µg/L). No other analytes were detected in any of the wells above the laboratory's method reporting limits (MRLs). The GRO and BTEX concentrations in the October 2022 groundwater samples are presented on Figure 4. The groundwater sample analytical results from the October 2022 sampling event, as well as from the 2017 sampling event, are presented in Table 3. A copy of the laboratory report from the October 2022 sampling event is presented in Appendix C.

## 2.3 SAMPLE SUB-SLAB SOIL VAPOR PROBES

On October 28, 2022, SLR installed two sub-slab vapor probes within the eastern and western portions of the building (designated SS-1 and SS-2, respectively). SLR installed the probes by drilling a small-diameter hole in the concrete floor with a rotary hammer to install Vapor Pins®. Probe installation and vapor sampling were conducted in accordance with the guidance provided in Ecology's *Guidance for Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action* (Ecology, 2016), and with the manufacturer's standard operation procedure for Vapor Pin® installation.

Prior to sampling, the soil vapors in each probe were purged for a minimum of five minutes. A peristaltic pump with new tubing was connected to the purging port on a decontaminated, disposable three-way manifold and was used to extract soil vapors from the probe. While purging, the soil vapor probes were tested for leaks by using a tracer gas box over the probe. A calibrated helium detector with a range of 0 parts million to 100 percent was used to monitor the helium concentration within the box and in the purged air. Helium was introduced into the tracer gas box and maintained at a concentration of at least 70 percent while helium concentrations in the purged soil vapors were monitored. Each soil vapor probe passed the leak testing procedure.

After purging, a one-liter Summa canister (certified as decontaminated by the lab) with a dedicated flow regulator was attached to the sample valve on each manifold. The purging value on the manifold was closed, the peristaltic pump turned off, and then the sample valve and dedicated flow regulator were opened to allow the Summa canister to extract a sample from the soil vapor probe over a period of approximately five minutes. The valve on the canister was closed be the vacuum reached zero. The filled Summa canisters were submitted to Friedman & Bruya, Inc. (Friedman & Bruya) in Seattle, Washington, for analysis of total petroleum hydrocarbon (TPH) equivalent carbon (EC) fractions 5-8 (aliphatics), EC9-12 (aliphatics), EC9-10 (aromatics), BTEX, and naphthalene by EPA Method TO-15.

## 2.4 SUB-SLAB SOIL VAPOR ANALYTICAL RESULTS

The sub-slab soil vapor sample analytical results showed that both of the samples contained concentrations of air-phase hydrocarbons (APH) that were below the MTCA Method B screening level for APH. No other analytes were detected in any of the wells above the laboratory's MRLs. The total APH and BTEX concentrations in the October 2022 sub-slab soil vapor samples are presented on Figure 5. The sub-

DRAFT

slab soil vapor analytical results from the October 2022 sampling event are presented in Table 4. A copy of the laboratory report from the October 2022 sampling event is presented in Appendix C.

## 2.5 DRILL AND SAMPLE SOIL BORINGS AND INSTALL GROUNDWATER MONITORING WELLS

To delineate the eastern and western extents of the petroleum hydrocarbon-impacted groundwater and soil, a total of four soil borings (designated SB-1, MW-5, MW-7, and MW-8) were drilled and sampled on December 12, 13, and 14, 2022. Borings SB-1, MW-7, and MW-8 were located to the east of the UST basin, beneath the Illahee Road NW ROW; and boring MW-5 was located to the west of the UST basin, adjacent to the eastern wall of the Subject Property building (see Figure 2). Holt Services, Inc. (Holt) of Edgewood, Washington, drilled and sampled the borings using a limited-access combination hydraulic push-probe and hollow-stem auger drill rig, under the direction of an SLR geologist. Borings MW-5, MW-7, and MW-8 were completed as groundwater monitoring wells.

Prior to conducting the drilling activities, SLR arranged for public and private utility locates to identify and mark the locations of underground utilities and structures near the planned drilling locations. The drilling locations were adjusted in the field based on the presence of utilities or structures. To ensure that shallow underground utilities were not damaged during drilling, Holt used a vacuum truck to air knife the upper five feet of soil from each boring.

At depths below five feet bgs, soil samples were collected on a continuous basis by using a disposable acetate liner within the drill rods. SLR personnel screened each soil sample for the presence of petroleum hydrocarbons by using visual appearance, odor, and photoionization detector (PID) readings. Soil samples were collected from each of the soil borings for laboratory analysis. Based on the field screening results, the soil sample from each boring that exhibited the greatest evidence of contamination, as well as the sample from the bottom of the boring, were submitted to Apex for analysis. If there was no evidence of petroleum hydrocarbon in the samples from a boring, then the soil sample collected directly above the water table or at the bottom of the boring was submitted to Apex for analysis. Soil boring logs that describe the geologic conditions, field screening results, and moisture content are presented in Appendix B.

Boring MW-5 was advanced to a depth of approximately 15 feet bgs, which was approximately 7 feet below the groundwater table. There were no indications of petroleum-impacted soil, so SLR collected samples from directly above the groundwater table (at a depth of approximately 7 to 8 feet bgs) and from the bottom of the boring (at a depth of approximately 14 to 15 feet bgs) for laboratory analysis. Boring MW-7 was advanced to a depth of approximately 26 feet bgs, which was approximately 16 feet below the groundwater table. Strong petroleum-like odors and PID readings [up to 1,292 parts per million (ppm)] were observed in soil at a depth of approximately 12.5 feet bgs, and the field evidence of contamination decreased with depth. SLR collected a sample of the soil exhibiting the greatest field evidence of contamination (at a depth of approximately 12 to 13 feet bgs) as well as from the bottom of the boring (at a depth of approximately 24 to 26 feet bgs) for laboratory analysis.

DRAFT


*Photo 2 - Installation of MW-8*

Boring MW-8 was advanced to a depth of approximately 30 feet bgs, which was approximately 17.5 feet below the groundwater table. Strong petroleum-like odors and PID readings (up to 1,673 ppm) were present in a soil sample collected at approximately 12 to 13 feet bgs and the field evidence of contamination decreased with depth. SLR did not collect a sample of the soil exhibiting the greatest field evidence of contamination due to the proximity of a sample collected at the same depth and interval in MW-7. SLR did collect a sample from the bottom of the boring (at a depth of approximately 29 to 30 feet bgs) for laboratory analysis. Boring SB-1 was advanced to a depth of approximately 20 feet bgs, and groundwater was not encountered above this depth. Strong petroleum-like odors and PID readings (up to 861 ppm) were observed in soil at a depth of approximately 10.5 feet bgs, and the field evidence of contamination decreased with depth. SLR collected a sample of the soil exhibiting the greatest field evidence of contamination (at a depth of approximately 10 to 11 feet bgs as well as from the bottom of the boring (at a depth of approximately 19 to 20 feet bgs) for laboratory analysis

The soil samples were analyzed for DRO and ORO by Northwest Method NWTPH-Dx, GRO by Northwest Method NWTPH-Gx, BTEX by EPA Method 8260D, and lead by EPA Method 6020.

## 2.6 SOIL SAMPLE ANALYTICAL RESULTS

The soil sample analytical results showed that the shallow soil samples collected from borings SB-1 and MW-8 contained GRO concentrations (160 mg/kg and 477 mg/kg, respectively) that exceeded the MTCA Method A soil clean up level (100 mg/kg). The shallow soil sample collected from boring MW-7 contained a GRO concentration (19.5 mg/kg) that did not exceed the cleanup level. The shallow soil samples collected from borings SB-1, MW-7, and MW-8 contained DRO concentrations (34.7, 19.5, and 58.7 mg/kg, respectively) that did not exceed the cleanup level (2,000 mg/kg). The shallow soil samples collected from MW-5 and the deep samples from all of the borings did not contain any analytes above either the MTCA

DRAFT

Method A cleanup levels or the laboratory's MRLs. The soil sample analytical results from this investigation, as well as from the 2017 investigation, are presented in Table 4. The GRO and benzene concentrations in the soil samples are also presented on Figure 6. Copies of the laboratory reports from this assessment are included in Appendix C.

DRAFT

# 3. DEVIATIONS FROM WORK PLAN/REMAINING DATA GAPS

## 3.1 DEVIATIONS FROM WORK PLAN

The installment of monitoring wells MW-5, MW-7, and MW-8 and soil boring SB-1 took longer than anticipated. The proposed soil boring MW-6 was not installed during this event due to the time constraints. Additionally, during drilling of MW-7 and MW-8, located within the Illahee Road NE ROW, petroleum hydrocarbon-impacted soil was encountered. Based on these observations, it was determined that additional work would be required to complete delineation. To save costs in remobilizing to the Site, SLR proposes to conduct the MW-6 well installation and additional groundwater sampling concurrent with the proposed follow up work. As such, the schedule presented in the Work Plan has been modified. Finally, because the groundwater sample analytical results indicated that GLMW-4 did not contain concentrations of petroleum hydrocarbons above the MTCA Method A cleanup levels, contingent boring MW-9 was determined to not be necessary.

## 3.2 REMAINING DATA GAPS

Based on the results of this assessment, there appear to be two remaining data gaps:

- As contaminated soil was observed in newly installed wells MW-7 and MW-8, the downgradient/eastern extents of petroleum contamination has not been characterized.
- Because proposed groundwater monitoring well MW-6 was not installed, the extent of petroleum-impacted soil and groundwater to the north of GLMW-2 has not been delineated.

Due to the remaining data gaps, SLR proposes to install and sample the planned monitoring well MW-6; one additional monitoring wells (designated MW-9); and one additional soil boring (designated SB-2) to attempt to delineate the extents of petroleum-impacted soil and groundwater to the north of the tank basin and GLMW-2; the east of MW-7 and MW-8; and to the south of soil boring SB-1, respectively. SLR proposes to conduct a follow-up groundwater sampling event to include all the monitoring wells, GLMW-1 through GLMW-4, MW-6, MW-7, and MW-8, in addition to the groundwater samples collected from MW-6 and MW-9. SLR will coordinate with a licensed surveyor to establish the top-of-casing elevations for existing and proposed monitoring wells GLMW-1 through GLMW-4 and MW-5 through MW-9 relative to the NAVD88 datum to calculate groundwater elevations at each well and to evaluate the groundwater flow direction and gradient.

DRAFT

# 4. CONCLUSIONS

In October 2022, SLR conducted additional soil, groundwater, and soil-vapor assessment activities in accordance with the Work Plan (SLR, 2022). Based on the results of this assessment, it appears that some of the data gaps described in Section 1.2 above have been resolved as follows:

- The lateral extents of petroleum-impacted groundwater have been delineated to the south (with a second sampling event indicating that GLMW-4 is below MTCA Method A Cleanup Levels), which rendered contingent boring MW-9 unnecessary.
    - The northern, eastern, and western extents of impacted groundwater have not been delineated.
- The lateral extents of petroleum-impacted soil have been delineated to the west, because MW-5 did not contain any petroleum hydrocarbon concentrations above the MTCA Method A cleanup levels.
    - The northern and eastern extents of impacted soil have not been delineated
- The soil vapor pathway has been determined to be an incomplete exposure pathway at the Site.

DRAFT

# 5. PROPOSED ADDITIONAL WORK SCOPE

As noted above, select data gaps summarized above remain for the Site following the assessment activities conducted in late 2022. SLR proposes to conduct a second phase of assessment which will include the soil boring which was not completed during the initial phase (MW-6), plus two additional borings (SB-2 and MW-9). Two of the borings (MW-6 and MW-9) will be completed as groundwater monitoring wells in accordance with the approach and procedures presented in the previous Work Plan (SLR, 2022), and as shown on Figure 7.

**Table 1 Supplemental Soil Boring Purpose and Details**

| Boring Locations | Data Gap Target | Approximate Sample Intervals (feet bgs) | Total Depth (feet bgs) |
|---|---|---|---|
| SB-2 | Soil – Assess if impacted soil extends into the ROW, and potentially delineate lateral extent of impacted soil to the east | 8, 15 | 15 |
| MW-6 | Soil – Delineate lateral extent of impacted soil to the north<br><br>Groundwater – Delineate the lateral extent of impacted groundwater to the north | 8, 15 | 15 |
| MW-9 | Soil – Delineate lateral extent of impacted soil to the east<br><br>Groundwater – Delineate the lateral extent of impacted groundwater to the east | 8, 15 | 15 |

DRAFT

The described proposed work is based on SLR's review of available documents provided to us by PLIA, Ecology, and Site owners, as well as our experience with similar projects. All work described in this work plan must be approved by, and is subject to modifications by, PLIA and the Site owners, pursuant to representations made by PLIA during the intake meeting.

The work scope and estimated costs are based on the assumptions included in the Work Plan (SLR, 2022).

SLR has provided estimated costs on Table 6. Costs shown include costs for SLR and subcontractors to perform the tasks as described in this document, and are supplemental to the already-approved costs included in the Work Plan. These costs do not include costs for PLIA, Ecology, or any attorney's fees.

SLR appreciates the opportunity to provide this work plan to PLIA. Please feel free to contact us with any questions, comments, or concerns.

# 6. REFERENCES

G-Logics, 2017. PLIA Preliminary Planning Assessment, Illahee Foods, 5507 Illahee Rd NE, Bremerton, WA 98310. October 10.

Langseth Environmental Services, Inc., 2016. Site Investigation Report, 5507 Illahee Rd NW, Parcel # 4429-015-001-0309, ERTS # 669620, Soil Boring and Sampling Project. December 28.

SLR International Corporation (SLR). 2022. Remedial Investigation Work Plan Port of Illahee Property. October.

DRAFT

# LIMITATIONS

The services described in this work product were performed in accordance with generally accepted professional consulting principles and practices. No other representations or warranties, expressed or implied, are made. These services were performed consistent with our agreement with our client. This work product is intended solely for the use and information of our client unless otherwise noted. Any reliance on this work product by a third party is at such party's sole risk.

Opinions and recommendations contained in this work product are based on conditions that existed at the time the services were performed and are intended only for the client, purposes, locations, time frames, and project parameters indicated. The data reported and the findings, observations, and conclusions expressed are limited by the scope of work. We are not responsible for the impacts of any changes in environmental standards, practices, or regulations subsequent to performance of services. We do not warrant the accuracy of information supplied by others, or the use of segregated portions of this work product.

The purpose of an environmental assessment is to reasonably evaluate the potential for, or actual impact of, past practices on a given site area. In performing an environmental assessment, it is understood that a balance must be struck between a reasonable inquiry into the environmental issues and an appropriate level of analysis for each conceivable issue of potential concern. The following paragraphs discuss the assumptions and parameters under which such an opinion is rendered.

No investigation can be thorough enough to exclude the presence of hazardous materials at a given site. If hazardous conditions have not been identified during the assessment, such a finding should not therefore be construed as a guarantee of the absence of such materials on the site, but rather as the result of the services performed within the scope, practical limitations, and cost of the work performed.

Environmental conditions that are not apparent may exist at the site. Our professional opinions are based in part on interpretation of data from a limited number of discrete sampling locations and therefore may not be representative of the actual overall site environmental conditions.

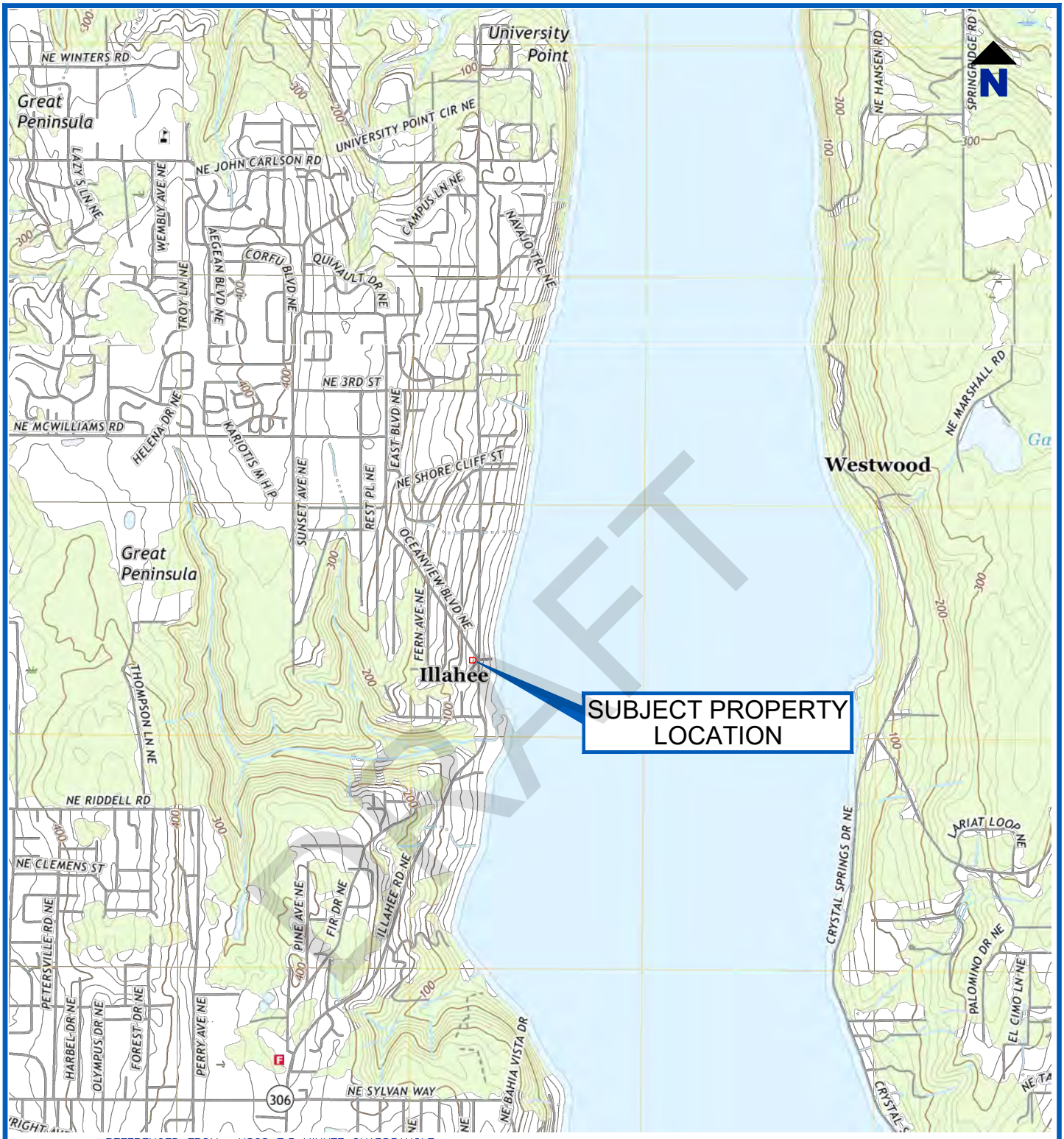
The passage of time, manifestation of latent conditions, or occurrence of future events may require further study at the site, analysis of the data, and/or reevaluation of the findings, observations, and conclusions in the work product.

This work product presents professional opinions and findings of a scientific and technical nature. The work product shall not be construed to offer legal opinion or representations as to the requirements of, nor the compliance with, environmental laws rules, regulations, or policies of federal, state, or local governmental agencies.

DRAFT

# FIGURES

DRAFT




REFERENCED FROM : USGS 7.5 MINUTE QUARDRANGLE
BREMERTON EAST, WA 2020
SUQUAMISH, WA 2020

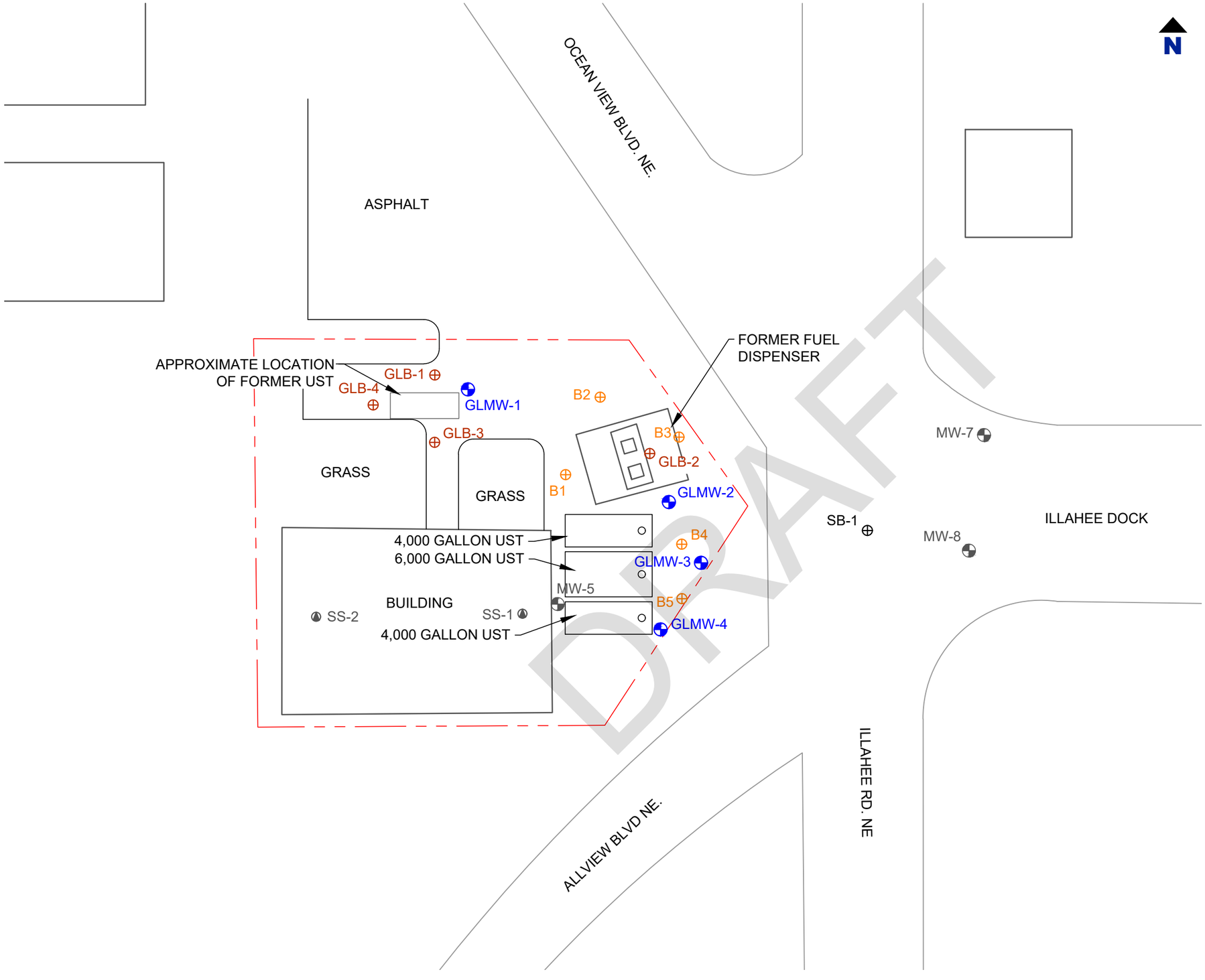
0 2,000 4,000 6,000'

PORT OF ILLAHEE
5507 ILLAHEE ROAD NE.
BREMERTON, WA 98311

Drawing
SUBJECT PROPERTY LOCATION MAP

| | | | | |
|---|---|---|---|---|
| Date | February 1, 2023 | Scale | AS SHOWN | Fig. No. 1 |
| File Name | 02-01 | Project No. | 128.01826.00022 | |

Last Saved: February 01, 2023 10:22:27 AM by mstrain Drawing path: N:\Bothell\1 PROJECTS\Pollution Liability Insurance Agency - 1826\Port of Illahee\Work Plan\Figures\dwg\02-01.dwg




DRAFT

NOTES

1) BUILDING AND STREET LOCATIONS ARE BASED ON GOOGLE EARTH PRO AERIAL IMAGERY, JUNE 2021.

LEGEND

| | |
|---|---|
| | SUBJECT PROPERTY BOUNDARY |
| MW-1 | MONITORING WELL LOCATION LOCATION AND DESIGNATION |
| SS-1 | SUB-SLAB SOIL VAPOR POINT LOCATION AND DESIGNATION |
| SB-1 | SOIL BORING LOCATION AND DESIGNATION |
| B-1 | 2016 LANGSETH SOIL BORING LOCATION AND DESIGNATION |
| GLB-1 | 2017 G-LOGICS SOIL BORING LOCATION AND DESIGNATION |
| GLMW-1 | 2017 G-LOGICS MONITORING WELL LOCATION AND DESIGNATION |

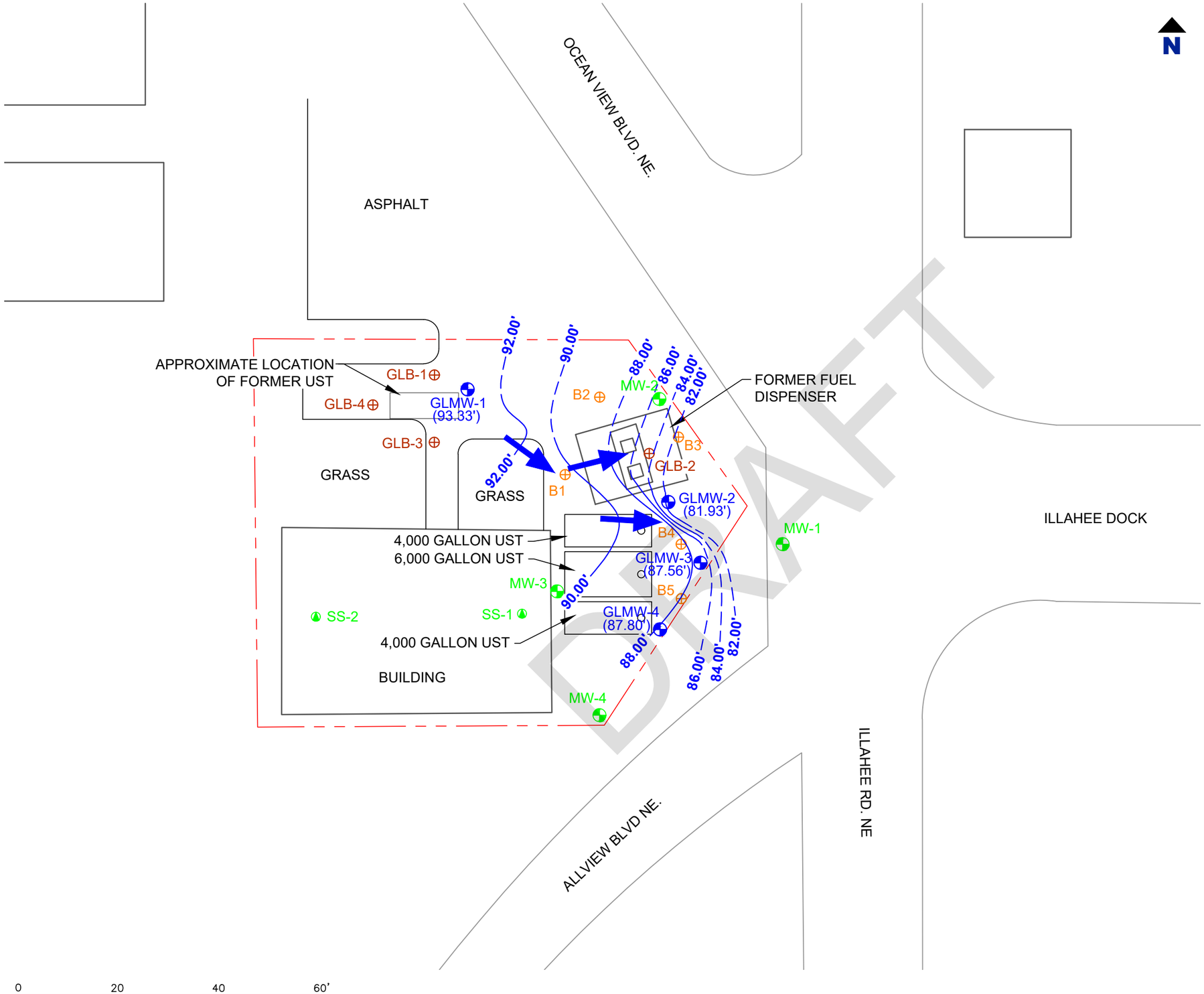
PORT OF ILLAHEE
5507 ILLAHEE ROAD NE.
BREMERTON, WA 98311

Drawing
SITE MAP

| | | | | |
|---|---|---|---|---|
| Date | February 1, 2023 | Scale | AS SHOWN | Drawing No. 2 |
| File Name | 02-01 | Project No. | 128.01826.00022 | |

SLR

Drawing path: N:\Bothell\1 PROJECTS\Pollution Liability Insurance Agency - 1826\Port of Illahee\Work Plan\Figures\dwg\02-01.dwg




NOTES

1) BUILDING AND STREET LOCATIONS ARE BASED ON GOOGLE EARTH PRO AERIAL IMAGERY, JUNE 2021.

LEGEND

| | |
|---|---|
| | SUBJECT PROPERTY BOUNDARY |
| MW-1 | PROPOSED MONITORING WELL LOCATION |
| SS-1 | PROPOSED SUB-SLAB SOIL VAPOR POINT LOCATION |
| B-1 | 2016 LANGSETH SOIL BORING LOCATION AND DESIGNATION |
| GLB-1 | 2017 G-LOGICS SOIL BORING LOCATION AND DESIGNATION |
| GLMW-1 | 2017 G-LOGICS MONITORING WELL LOCATION AND DESIGNATION |
| (95.71') | GROUNDWATER SURFACE ELEVATION (RELATIVE TO ARBITRARY SURVEY POINT ASSIGNED ELEVATION OF 100.00 FT) ON JUNE 14. 2017 |
| 94.00' | GROUNDWATER SURFACE ELEVATION CONTOUR LINE |
| | GENERAL GROUNDWATER FLOW DIRECTION |

PORT OF ILLAHEE
5507 ILLAHEE ROAD NE.
BREMERTON, WA 98311

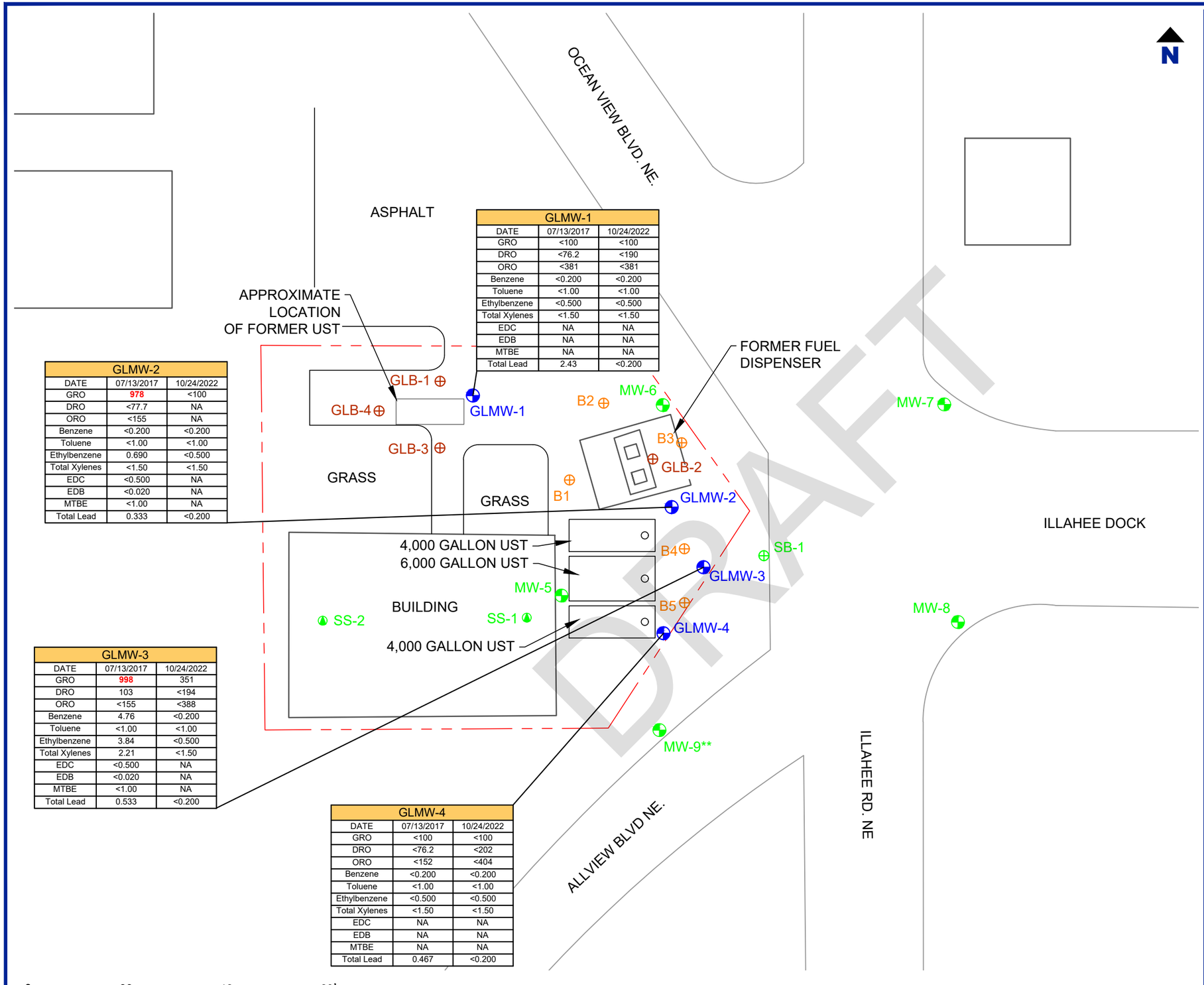
Drawing
GROUNDWATER ELEVATION CONTOUR MAP - OCTOBER 24, 2022

| | | | | |
|---|---|---|---|---|
| Date | February 1, 2023 | Scale | AS SHOWN | Drawing No. 3 |
| File Name | 01-05_Oct22 | Project No. | 128.01826.00022 | |

SLR

DRAFT

Drawing path: N:\Bothell\1 PROJECTS\Pollution Liability Insurance Agency - 1826\Port of Illahee\Work Plan\Figures\dwg\01-01\01-05_Oct22.dwg




| GLMW-1 | | |
|---|---|---|
| DATE | 07/13/2017 | 10/24/2022 |
| GRO | <100 | <100 |
| DRO | <76.2 | <190 |
| ORO | <381 | <381 |
| Benzene | <0.200 | <0.200 |
| Toluene | <1.00 | <1.00 |
| Ethylbenzene | <0.500 | <0.500 |
| Total Xylenes | <1.50 | <1.50 |
| EDC | NA | NA |
| EDB | NA | NA |
| MTBE | NA | NA |
| Total Lead | 2.43 | <0.200 |

| GLMW-2 | | |
|---|---|---|
| DATE | 07/13/2017 | 10/24/2022 |
| GRO | **978** | <100 |
| DRO | <77.7 | NA |
| ORO | <155 | NA |
| Benzene | <0.200 | <0.200 |
| Toluene | <1.00 | <1.00 |
| Ethylbenzene | 0.690 | <0.500 |
| Total Xylenes | <1.50 | <1.50 |
| EDC | <0.500 | NA |
| EDB | <0.020 | NA |
| MTBE | <1.00 | NA |
| Total Lead | 0.333 | <0.200 |

| GLMW-3 | | |
|---|---|---|
| DATE | 07/13/2017 | 10/24/2022 |
| GRO | **998** | 351 |
| DRO | 103 | <194 |
| ORO | <155 | <388 |
| Benzene | 4.76 | <0.200 |
| Toluene | <1.00 | <1.00 |
| Ethylbenzene | 3.84 | <0.500 |
| Total Xylenes | 2.21 | <1.50 |
| EDC | <0.500 | NA |
| EDB | <0.020 | NA |
| MTBE | <1.00 | NA |
| Total Lead | 0.533 | <0.200 |

| GLMW-4 | | |
|---|---|---|
| DATE | 07/13/2017 | 10/24/2022 |
| GRO | <100 | <100 |
| DRO | <76.2 | <202 |
| ORO | <152 | <404 |
| Benzene | <0.200 | <0.200 |
| Toluene | <1.00 | <1.00 |
| Ethylbenzene | <0.500 | <0.500 |
| Total Xylenes | <1.50 | <1.50 |
| EDC | NA | NA |
| EDB | NA | NA |
| MTBE | NA | NA |
| Total Lead | 0.467 | <0.200 |

DRAFT

N

NOTES

1) BUILDING AND STREET LOCATIONS ARE BASED ON GOOGLE EARTH PRO AERIAL IMAGERY, JUNE 2021.
2) SAMPLE VALUES BOLDED IN **RED** INDICATE CONCENTRATIONS EXCEEDING MTCA CLEANUP LEVEL.
3) GRO = GASOLINE RANGE ORGANICS.
4) B = BENZENE.
5) MTCA = AVAILABLE METHOD A CLEANUP LEVELS (2013).
6) µg/L = MICROGRAMS PER LITER.

LEGEND

- SUBJECT PROPERTY BOUNDARY
- MW-1 — PROPOSED MONITORING WELL LOCATION
- SS-1 — PROPOSED SUB-SLAB SOIL VAPOR POINT LOCATION
- SB-1 — PROPOSED SOIL BORING LOCATION AND DESIGNATION
- B-1 — 2016 LANGSETH SOIL BORING LOCATION AND DESIGNATION
- GLB-1 — 2017 G-LOGICS SOIL BORING LOCATION AND DESIGNATION
- GLMW-1 — 2017 G-LOGICS MONITORING WELL LOCATION AND DESIGNATION

| GLMW-3 | |
|---|---|
| DATE | 07/13/2017 |
| GRO | **998** |
| B | 4.76 |

SAMPLE DESIGNATION
ANALYTE (µg/L)
SAMPLE DATE

PORT OF ILLAHEE
5507 ILLAHEE ROAD NE.
BREMERTON, WA 98311

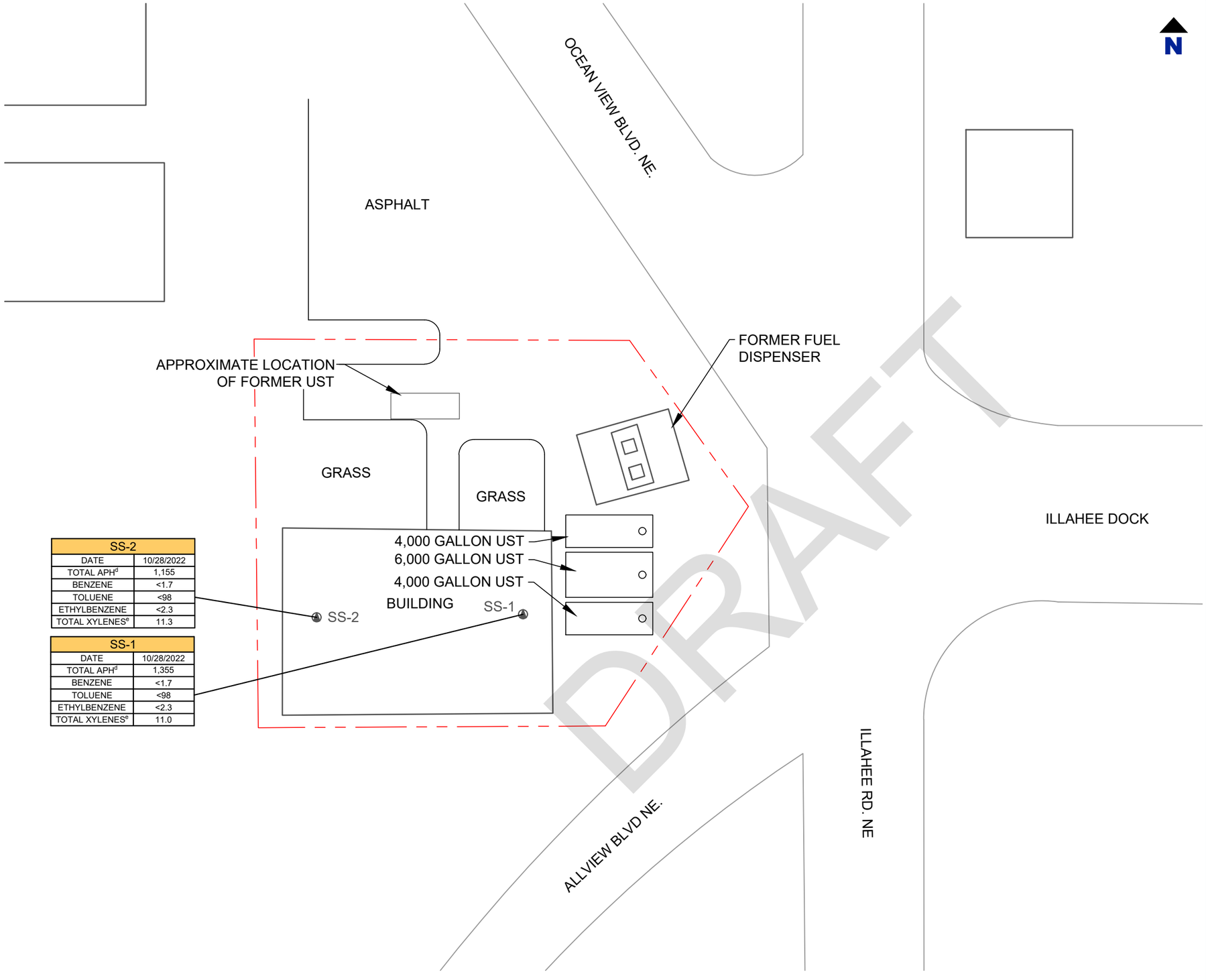
Drawing
GRO AND BENZENE CONCENTRATIONS IN GROUNDWATER SAMPLES

| | | | |
|---|---|---|---|
| Date | February 1, 2023 | Scale | AS SHOWN |
| File Name | 01-01_Oct22 | Project No. | 128.01826.00022 |

Drawing No. 4

SLR

Drawing path: N:\Bothell\1 PROJECTS\Pollution Liability Insurance Agency - 18261Port of IllaheeWork Plan\Figures\dwg\01-01\01-01_Oct22.dwg




| SS-2 | |
|---|---|
| DATE | 10/28/2022 |
| TOTAL APH[d] | 1,155 |
| BENZENE | <1.7 |
| TOLUENE | <98 |
| ETHYLBENZENE | <2.3 |
| TOTAL XYLENES[e] | 11.3 |

| SS-1 | |
|---|---|
| DATE | 10/28/2022 |
| TOTAL APH[d] | 1,355 |
| BENZENE | <1.7 |
| TOLUENE | <98 |
| ETHYLBENZENE | <2.3 |
| TOTAL XYLENES[e] | 11.0 |

DRAFT

N

NOTES

1) BUILDING AND STREET LOCATIONS ARE BASED ON GOOGLE EARTH PRO AERIAL IMAGERY, JUNE 2021.
2) SAMPLE VALUES BOLDED IN **RED** INDICATE CONCENTRATIONS EXCEEDING MTCA CLEANUP LEVEL.
3) APH = AIR PHASE HYDROCARBONS.
4) d = TPH ANALYZED AS APH BY MASSACHUSSETTS METHOD MA-APH.
5) e = TOTAL XYLENES IS EQUAL TO THE SUM OF INDIVIDUAL XYLENE COMPOUNDS.
6) $\mu g/m^3$ = MICROGRAMS PER CUBIC METER

LEGEND

SUBJECT PROPERTY BOUNDARY

SS-1 SUB-SLAB SOIL VAPOR POINT LOCATION AND DESIGNATION

| SS-2 | |
|---|---|
| DATE | 10/28/2022 |
| TOTAL APH[d] | 1,155 |
| BENZENE | <1.7 |
| TOLUENE | <98 |
| ETHYLBENZENE | <2.3 |
| TOTAL XYLENES[e] | 11.3 |

SAMPLE DESIGNATION

SAMPLE DATE

ANALYTE ($\mu g/m^3$)

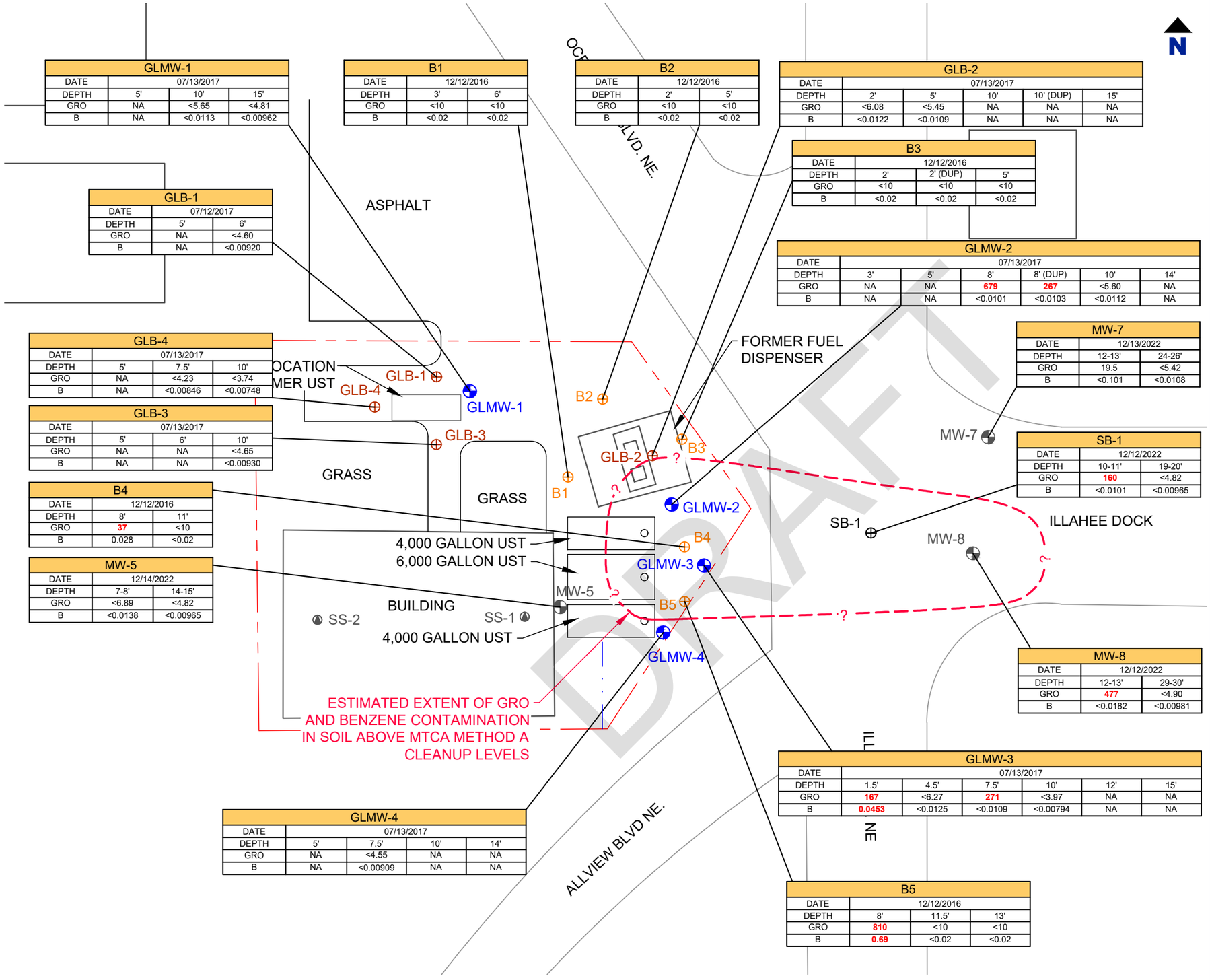
PORT OF ILLAHEE
5507 ILLAHEE ROAD NE.
BREMERTON, WA 98311

Drawing
SVP CONCENTRATION MAP

| | | | | | |
|---|---|---|---|---|---|
| Date | February 1, 2023 | Scale | AS SHOWN | Drawing No. | 5 |
| File Name | 02-01 | Project No. | 128.01826.00022 | | |

SLR

Drawing path: N:\Bothell\1 PROJECTS\Pollution Liability Insurance Agency - 1826\Port of Illahee\Work Plan\Figures\dwg\02-01.dwg




NOTES

1) BUILDING AND STREET LOCATIONS ARE BASED ON GOOGLE EARTH PRO AERIAL IMAGERY, JUNE 2021.
2) SAMPLE VALUES BOLDED IN **RED** INDICATE CONCENTRATIONS EXCEEDING MTCA CLEANUP LEVEL.
3) GRO = GASOLINE RANGE ORGANICS.
4) B = BENZENE.
5) DUP = DUPLICATE SAMPLE FOR QA/QC.
6) NA = NOT ANALYZED.
7) MTCA = AVAILABLE METHOD A CLEANUP LEVELS (2013).
8) mg/kg = MILLIGRAMS PER KILOGRAMS

LEGEND

- SUBJECT PROPERTY BOUNDARY
- MW-1 — MONITORING WELL LOCATION LOCATION AND DESIGNATION
- SS-1 — SUB-SLAB SOIL VAPOR POINT LOCATION AND DESIGNATION
- SB-1 — SOIL BORING LOCATION AND DESIGNATION
- B-1 — 2016 LANGSETH SOIL BORING LOCATION AND DESIGNATION
- GLB-1 — 2017 G-LOGICS SOIL BORING LOCATION AND DESIGNATION
- GLMW-1 — 2017 G-LOGICS MONITORING WELL LOCATION AND DESIGNATION

B4

| DATE | 12/12/2016 | |
|---|---|---|
| DEPTH | 8' | 11' |
| GRO | 37 | <10 |
| B | 0.028 | <0.02 |

SAMPLE DESIGNATION
SAMPLE DEPTH (FEET)
ANALYTE (mg/kg)
SAMPLE DATE

PORT OF ILLAHEE
5507 ILLAHEE ROAD NE.
BREMERTON, WA 98311

Drawing
ESTIMATED EXTENTS OF GRO AND BENZENE IMPACTED SOIL

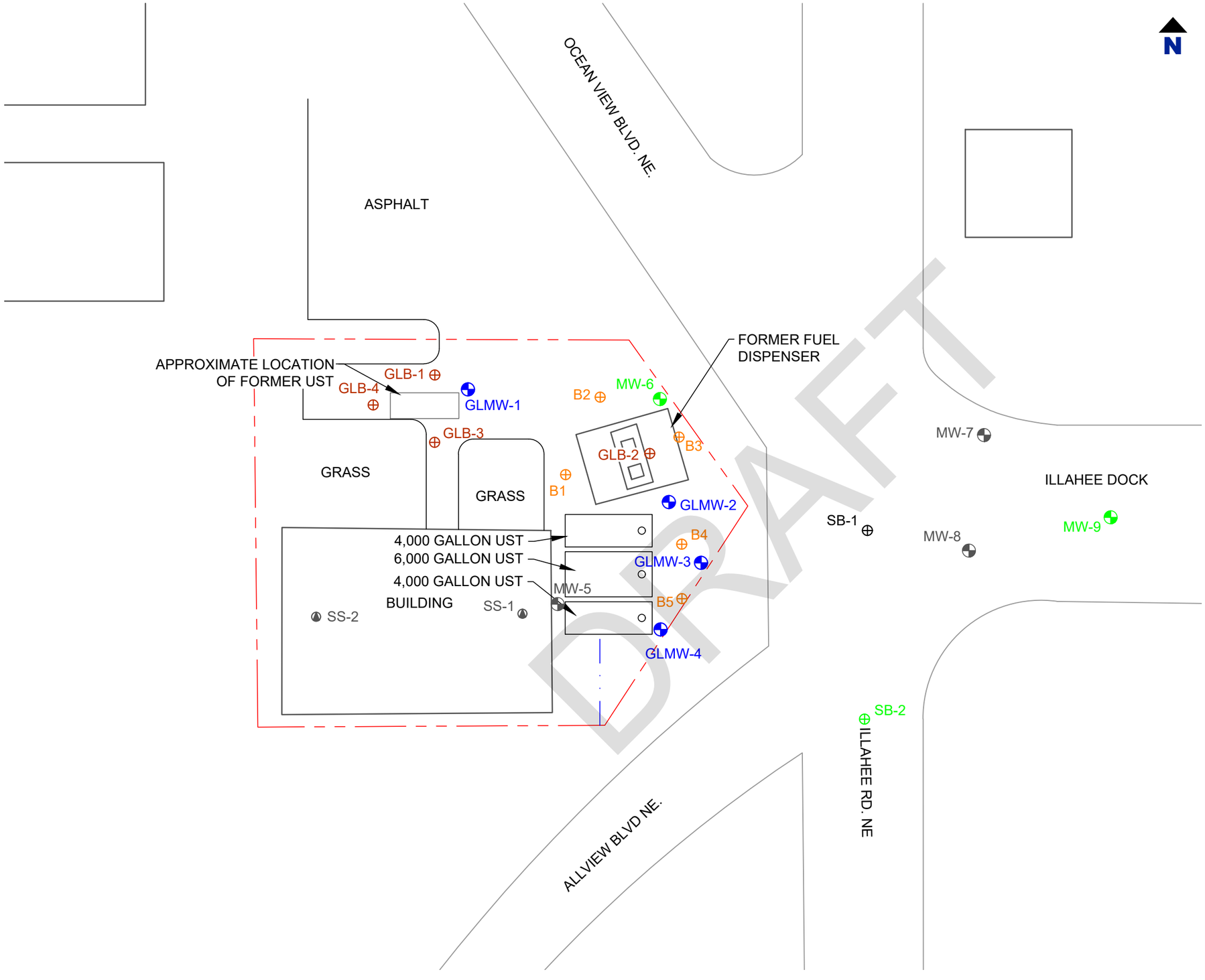
| | | | |
|---|---|---|---|
| Date | February 1, 2023 | Scale | AS SHOWN |
| File Name | 02-01 | Project No. | 128.01826.00022 |

Drawing No. 5

SLR

Drawing path: N:\Bothell\1 PROJECTS\Pollution Liability Insurance Agency - 1826\Port of Illahee\Work Plan\Figures\dwg\02-01.dwg

DRAFT




NOTES

1) BUILDING AND STREET LOCATIONS ARE BASED ON GOOGLE EARTH PRO AERIAL IMAGERY, JUNE 2021.

LEGEND

| | |
|---|---|
| | SUBJECT PROPERTY BOUNDARY |
| MW-1 | PROPOSED MONITORING WELL LOCATION |
| SB-1 | PROPOSED SOIL BORING LOCATION |
| MW-1 | MONITORING WELL LOCATION LOCATION AND DESIGNATION |
| SS-1 | SUB-SLAB SOIL VAPOR POINT LOCATION AND DESIGNATION |
| SB-1 | SOIL BORING LOCATION AND DESIGNATION |
| B-1 | 2016 LANGSETH SOIL BORING LOCATION AND DESIGNATION |
| GLB-1 | 2017 G-LOGICS SOIL BORING LOCATION AND DESIGNATION |
| GLMW-1 | 2017 G-LOGICS MONITORING WELL LOCATION AND DESIGNATION |

PORT OF ILLAHEE
5507 ILLAHEE ROAD NE.
BREMERTON, WA 98311

Drawing
PROPOSED SOIL BORING LOCATION MAP

| | | | | | |
|---|---|---|---|---|---|
| Date | February 23, 2023 | Scale | AS SHOWN | Drawing No. | 7 |
| File Name | 02-01 | Project No. | 128.01826.00022 | | |

SLR

DRAFT

Drawing path: N:\Bothell\1 PROJECTS\Pollution Liability Insurance Agency - 1826\Port of Illahee\Work Plan\Figures\dwg\02-01.dwg

# TABLES

DRAFT

**Table 1**
**Groundwater Sampling Field Parameter Measurements**
**Port of Illahee**
**Bremerton, Washington**

| Well Number | Date Measured | Approximate Total Purge Volume (gallons) | Temperature (°C) | Conductivity (mS/cm) | Dissolved Oxygen (mg/L) | pH | Redox Potential (mV) |
|---|---|---|---|---|---|---|---|
| GLMW-1 | 10/24/2022 | 1.75 | 16.0 | 0.703 | 3.19 | 6.44 | 12.9 |
| GLMW-2 | 10/24/2022 | 0.25 | 17.4 | 0.159 | 0.92 | 6.61 | 20.5 |
| GLMW-3 | 10/24/2022 | 2.25 | 18.1 | 0.175 | 0.07 | 6.60 | 20.5 |
| GLMW-4 | 10/24/2022 | 1.25 | 16.5 | 0.143 | 2.37 | 6.48 | 28.3 |

**Notes:**
Field parameter measurements in this table were the final measurements prior to collecting each groundwater sample.
°C = Degrees Celsius.
mS/cm = Millisiemens per centimeter.
mg/L = Milligrams per liter.

DRAFT

**Table 2**
**Groundwater Monitoring Data**
**Port of Illahee**
**Bremerton, Washington**

| Well Number | Top of Casing Elevation[a] (feet) | Date Measured | Depth to Groundwater (feet) | Groundwater Elevation (feet) |
|---|---|---|---|---|
| GLMW-1 | 100.90 | 07/14/17 | 5.19 | 95.71 |
| | | 10/24/22 | 7.57 | 93.33 |
| GLMW-2 | 98.05 | 07/14/17 | 12.88 | 85.17 |
| | | 10/24/22 | 16.12 | 81.93 |
| GLMW-3 | 96.95 | 07/14/17 | 9.27 | 87.68 |
| | | 10/24/22 | 9.39 | 87.56 |
| GLMW-4 | 97.07 | 07/14/17 | 9.10 | 87.97 |
| | | 10/24/22 | 9.27 | 87.80 |

**Notes:**
[a] Elevation readings taken at top of casing and rim on north side unless otherwise noted.

DRAFT

# Table 3
# Groundwater Sample Analytical Results
# Port of Illahee
# Bremerton, Washington

| Monitoring Well Number | Sample ID | Date Collected | Petroleum Hydrocarbons | | | Volatile Organic Compounds[c] | | | | | | | Total Lead[d] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Gasoline -Range Organics[a] | Diesel-Range Organics[b] | Oil-Range Organics[b] | Benzene | Toluene | Ethylbenzene | Total Xylenes | Ethylene Dichloride (EDC)[c] | Ethylene Dibromide (EDB)[c] | Methyl tert-Butyl Ether (MTBE)[c] | |
| **MTCA Method A Cleanup Levels[e]** | | | **800** | **500** | **500** | **5** | **1,000** | **700** | **1,000** | **5** | **0.01** | **20** | **15** |
| GLMW-1 | GLMW-1-0717 | 7/13/17 | <100 | <76.2 | <152 | <0.200 | <1.00 | <0.500 | <1.50 | NA | NA | NA | 2.43 |
| | GLMW-1-1022 | 10/24/22 | <100 | <190 | <381 | <0.200 | <1.00 | <0.500 | <1.50 | NA | NA | NA | <0.200 |
| GLMW-2 | GLMW-2-0717 | 7/13/17 | **978** | <77.7 | <155 | <0.200 | <1.00 | 0.690 | <1.50 | <0.500 | <0.020 | <1.00 | 0.333 |
| | GLMW-2-1022 | 10/24/22 | <100 | NA | NA | <0.200 | <1.00 | <0.500 | <1.50 | NA | NA | NA | <0.200 |
| GLMW-3 | GLMW-3-0717 | 7/13/17 | **998** | 103 | <155 | 4.76 | <1.00 | 3.84 | 2.21 | <0.500 | <0.020 | <1.00 | 0.533 |
| | GLMW-3-1022 | 10/24/22 | 351 | <194 | <388 | <0.200 | <1.00 | <0.500 | <1.50 | NA | NA | NA | <0.200 |
| GLMW-4 | GLMW-4-0717 | 7/13/17 | <100 | <76.2 | <152 | <0.200 | <1.00 | <0.500 | <1.50 | NA | NA | NA | 0.467 |
| | GLMW-4-1022 | 10/24/22 | <100 | <202 | <404 | <0.200 | <1.00 | <0.500 | <1.50 | NA | NA | NA | <0.200 |
| Trip Blank | Trip Blank 1546 | 7/13/17 | <100 | NA | NA | <0.200 | <1.00 | <0.500 | <1.50 | NA | NA | NA | NA |

**Notes:**

All values in micrograms per liter (µg/L).

Values in **red** represent concentrations above the MTCA Method A groundwater cleanup levels.

NA = Not analyzed.

[a] Gasoline-range organics (GRO) analysed by Ecology Method NWTPH-Gx.

[b] Diesel-range organics (DRO) and oil-range organics (ORO) analysed by Ecology Method NWTPH-Dx (without silica gel cleanup).

[c] VOCs analyzed by EPA Method 8260C.

[d] Total and dissolved lead by EPA Method 200.8.

[e] Chapter 173-340 WAC, Model Toxics Control Act Statute and Regulation, Table 720-1, Method A Cleanup Levels for Groundwater.

DRAFT

# Table 4
# Soil Vapor Sample Analytical Results
# Port of Illahee
# Bremerton, Washington

| Sample ID | Date | TPH[a] | | | | VOCs[b] | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | APH EC5-8 Aliphatics | APH EC9-12 Aliphatics | APH EC9-10 Aromatics | Total APH[d] | Benzene | Toluene | Ethylbenzene | m,p-Xylene | o-Xylene | Total Xylenes[e] | Naphthalene |
| **MTCA Method B Screening Levels[c]** | | **NE** | **NE** | **NE** | **4,700** | **11.0** | **76,000** | **15,000** | **1,500** | **1,500** | **1,500** | **46** |
| **2022 Investigation** | | | | | | | | | | | | |
| SS-1-1022 | 10/28/2022 | 730 | 560 | <130 | 1,355 | <1.7 | <98 | <2.3 | 8 | 3 | 11 | <1.4 |
| SS-2-1022 | 10/28/2022 | 550 | 540 | <130 | 1,155 | <1.7 | <98 | <2.3 | 8.2 | 3.1 | 11.3 | <1.4 |

**Notes:**

All values in micrograms per cubic meter (µg/m$^3$).

Values in **red** represent concentrations above MTCA Method B cleanup levels.

[a] TPH analyzed as APH by Massachussetts Method MA-APH.

[b] BTEX and naphthalene analyzed by EPA Method TO-15.

[c] Ecology's MTCA Cleanup Regulation (Chapter 173-340 WAC), Method B Soil Vapor Screening Levels for Residential Land Uses, as published on Ecology's Cleanup Level and Risk Calculation (CLARC) table (updated July 2022).

[d] Total APH = sum of individual EC boiling ranges. For compounds that were non-detect, a value of half the laboratory's RL was used.

[e] Total xylenes = sum of individual xylene compounds.

[ve] The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

NA = not analyzed

NE = none established

< = analyte was not detected at a concentration above the laboratory's listed RL.

APH = Air Phase Hydrocarbons

Ecology = Washington State Department of Ecology

EPA = United States Environmental Protection Agency

MTCA = Model Toxics Control Act

TPH = Total Petroleum Hydrocarbons

BTEX = benzene, toluene, ethylbenzene, and total xylenes

VOCs = volatile organic compounds

DRAFT

# Table 5
## Soil Sample Analytical Results
## Port of Illahee Bremerton,
## Washington

| Soil Boring Number | Sample ID | Sample Depth (feet) | Date Collected | Gasoline Range Organics[a] | Diesel Range Organics[b] | Heavy Oil Range Organics[b] | Benzene[d] | Toluene[d] | Ethylbenzene[d] | Xylenes[cd] | Total Lead[e] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **MTCA Method A Cleanup Levels** | | | | **100/30** | **2,000** | **2,000** | **0.03** | **7** | **6** | **9** | **250** |
| **2022 SLR Investigation** | | | | | | | | | | | |
| SB-1 | SB-1-10'-11' | 10-11 | 12/12/22 | **160** | 34.7 | <41.4 | <0.0101 | <0.0503 | 0.072 | 0.132 | 2.12 |
| | SB-1-19'-20' | 19-20 | 12/12/22 | <4.82 | <21.1 | <42.3 | <0.00965 | <0.0482 | <0.0241 | <0.0723 | 1.79 |
| MW-5 | MW-5-7'-8' | 7-8 | 12/14/22 | <6.89 | <23.3 | <46.6 | <0.0138 | <0.0689 | <0.0344 | <0.103 | 1.57 |
| | MW-5-14'-15' | 14-15 | 12/14/22 | <4.82 | <21.1 | <42.2 | <0.00965 | <0.0482 | <0.0241 | <0.0724 | 1.09 |
| MW-7 | MW-7-12'-13' | 12-13 | 12/13/22 | 19.5 | 36.8 | <44.6 | <0.0101 | <0.0505 | 0.0389 | 0.138 | 1.99 |
| | MW-7-24'-26' | 24-26 | 12/13/22 | <5.42 | <24.0 | <48.0 | <0.0108 | <0.0542 | <0.0271 | <0.0813 | 1.83 |
| MW-8 | MW-8-12'-13' | 12-13 | 12/12/22 | **477** | 58.7 | <40.5 | <0.0182 | <0.0908 | 0.351 | 0.622 | 1.27 |
| | MW-8-29'-30' | 29-30 | 12/12/22 | <4.90 | <21.1 | <42.1 | <0.00981 | <0.0490 | 0.0279 | <0.0736 | 1.11 |
| **2017 G-Logics Investigation** | | | | | | | | | | | |
| GLB-1 | GLB-1-6 | 6 | 07/12/17 | <4.60 | <25.0 | <50.0 | <0.00920 | <0.0460 | <0.0230 | <0.0690 | 1.58 |
| GLB-2 | GLB-2-2 | 2 | 07/13/17 | <6.08 | <25.0 | <50.0 | <0.0122 | <0.0608 | <0.0304 | <0.0912 | 31.3 |
| | GLB-2-5 | 5 | 07/13/17 | <5.45 | <25.0 | <50.0 | <0.0109 | <0.0545 | <0.0272 | <0.0817 | 3.58 |
| GLB-3 | GLB-3-10 | 10 | 07/13/17 | <4.65 | <25.0 | <50.0 | <0.00930 | <0.0465 | <0.0233 | <0.0698 | 1.39 |
| GLB-4 | GLB-4-7.5 | 7.5 | 07/13/17 | <4.23 | <25.0 | <50.0 | <0.00846 | <0.0423 | <0.0212 | <0.0635 | 1.25 |
| | GLB-4-10 | 10 | 07/13/17 | <3.74 | <25.0 | <50.0 | <0.00748 | <0.0374 | <0.0187 | <0.0561 | 1.72 |
| GLMW-1 | GLMW-1-10 | 10 | 07/13/17 | <5.65 | <25.0 | <50.0 | <0.0113 | <0.0565 | <0.0282 | <0.0847 | 1.18 |
| | GLMW-1-15 | 15 | 07/13/17 | <4.81 | <25.0 | <50.0 | <0.00962 | <0.0481 | <0.0241 | <0.0722 | 1.46 |
| GLMW-2 | GLMW-2-8 | 8 | 07/13/17 | **679** | 42.7 | <50.0 | <0.0101 | <0.0504 | 0.0493 | <0.0755 | 1.48 |
| | GLMW-2-8 DUP | 8 | 07/13/17 | **267** | <25.0 | <50.0 | <0.0103 | <0.514 | <0.0257 | <0.0771 | 1.9 |
| | GLMW-2-10 | 10 | 07/13/17 | <5.60 | <25.0 | <50.0 | <0.0112 | <0.0560 | <0.0280 | <0.0839 | 1.32 |
| GLMW-3 | GLMW-3-1.5 | 1.5 | 07/13/17 | **167** | <25.0 | <50.0 | **0.0453** | 0.109 | 2.14 | 8.05 | NA |
| | GLMW-3-4.5 | 4.5 | 07/13/17 | <6.27 | <25.0 | <50.0 | <0.0125 | <0.0627 | <0.0314 | <0.0941 | NA |
| | GLMW-3-7.5 | 7.5 | 07/13/17 | **271** | 142 | <50.0 | <0.0109 | <0.0544 | 0.0544 | <0.0815 | 2.20 |
| | GLMW-3-10 | 10 | 07/13/17 | <3.97 | <25.0 | <50.0 | <0.00794 | <0.0397 | <0.0199 | <0.0596 | NA |
| GLMW-4 | GLMW-4-7.5 | 7.5 | 07/13/17 | <4.55 | <25.0 | <50.0 | <0.00909 | <0.0455 | <0.0227 | <0.0682 | 1.80 |

DRAFT

# Table 5
# Soil Analysis
# Port of Illahee
# Bremerton, Washington

| Soil Boring Number | Sample ID | Sample Depth (feet) | Date Collected | Gasoline Range Organics[a] | Diesel Range Organics[b] | Heavy Oil Range Organics[b] | Benzene[d] | Toluene[d] | Ethylbenzene[d] | Xylenes[cd] | Total Lead[e] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **MTCA Method A Cleanup Levels** | | | | **100/30** | **2,000** | **2,000** | **0.03** | **7** | **6** | **9** | **250** |
| **2016 Langseth Environmental Investigation** | | | | | | | | | | | |
| B-1 | B-1-3' | 3 | 12/12/16 | <10 | NA | NA | <0.02 | <0.1 | <0.05 | <0.15 | 12.4 |
| | B-1-6' | 6 | 12/12/16 | <10 | NA | NA | <0.02 | <0.1 | <0.05 | <0.15 | <5 |
| B-2 | B-2-2' | 2 | 12/12/16 | <10 | NA | NA | <0.02 | <0.1 | <0.05 | <0.15 | <5 |
| | B-2-5' | 5 | 12/12/16 | <10 | NA | NA | <0.02 | <0.1 | <0.05 | <0.15 | <5 |
| B-3 | B-3-2' | 2 | 12/12/16 | <10 | NA | NA | <0.02 | <0.1 | <0.05 | <0.15 | 8.3 |
| | B-3-2' DUP | 2 | 12/12/16 | <10 | NA | NA | <0.02 | <0.1 | <0.05 | <0.15 | NA |
| | B-3-5' | 5 | 12/12/16 | <10 | NA | NA | <0.02 | <0.1 | <0.05 | <0.15 | <5 |
| B-4 | B-4-8' | 8 | 12/12/16 | **37** | NA | NA | 0.028 | <0.1 | 0.28 | <0.15 | <5 |
| | B-4-11' | 11 | 12/12/16 | <10 | NA | NA | <0.02 | <0.1 | <0.05 | <0.15 | <5 |
| B-5 | B-5-8' | 8 | 12/12/16 | **810** | NA | NA | **0.69** | 1.57 | **8.87** | 4.84 | <5 |
| | B-5-11.5' | 11.5 | 12/12/16 | <10 | NA | NA | <0.02 | <0.1 | <0.05 | <0.15 | <5 |
| | B-5-13' | 13 | 12/12/16 | <10 | NA | NA | <0.02 | <0.1 | <0.05 | <0.15 | <5 |

**Notes:**

This table only includes the analytes that were detected in at least one soil sample and have MTCA Method A soil cleanup levels.

All values in milligrams per kilogram (mg/kg).

Values in **red** represent concentrations above MTCA Method A cleanup levels.

NA = Not Analyzed

[a] Gasoline-range organics by Ecology Method NWTPH-Gx.

[b] Diesel-range organics (DRO) and Oil-range organics (ORO) by Ecology Method NWTPH-Dx.

[c] Total xylenes is the total concentration of m,p-Xylene and o-Xylene. For a non-detect value, 1/2 of the method reporting limit (MRL) was used to caclulate the total xylene concentration.

[d] BTEX analyzed by EPA Method 8021B, EPA 8260B, or EPA 8260C (see individual reports)

[e] Total Lead by EPA Method 7010 Series

DRAFT

# Table 6 - Second Phase - Remedial Investigation Supplemental Budget Estimate
# Port of Illahee Property
# 5507 Illahee Road
# Bremerton, Washington

| | PROFESSIONAL SERVICES | | | | | | | LABOR | EXPENSES | | | | EXPENSE TOTALS | SUBCONTRACTED COSTS | | | | | TASK TOTALS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | EQUIPMENT | | OTHER DIRECT COSTS | | | | | | | | |
| | Principal $245 | Senior Staff $220 | Associate Staff $180 | Project Staff $160 | Technical Staff $135 | Drafter/CADD Operator $120 | Non-Tech Support $110 | | | | | | | | | | | | |
| **Task 2: Prepare Work Plan for RI** | | | | | | | | | Travel | | | | | | | | | | |
| Develop Scope of Work to Address Data Gaps | 4 | | 4 | 2 | | 2 | | $ 2,260 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 2,260 |
| Revise Work Plan | 4 | | 4 | 2 | | 2 | | $ 2,260 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 2,260 |
| *Subtotal* | 8 | 0 | 8 | 4 | 0 | 4 | 0 | $ 4,520 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 4,520 |
| **Task 3: Conduct RI** | | | | | | | | | Travel | Equip Pkg | Permit Fee | Per Diem | | Cascade | Lab | Other (TC, waste, survey) | 10% Markup | Subtotal | |
| Coordinate Work, Permitting | 8 | | 4 | 6 | | | | $ 3,640 | $ - | $ - | $ 1,000 | $ - | $ 1,000 | $ - | $ - | $ - | $ 100 | $ 100 | $ 4,740 |
| Locate Underground Utilities | | | 4 | | 8 | | | $ 1,800 | $ 100 | $ - | $ - | $ - | $ 100 | $ - | $ - | $ 800 | $ 80 | $ 880 | $ 2,780 |
| Drill & Sample Soil Borings/Install Wells/IDW Disposal | 2 | | 6 | 28 | 0 | | | $ 6,050 | $ 175 | $ 420 | $ - | $ 600 | $ 1,195 | $ 17,019 | $ 1,230 | $ 4,884 | $ 2,313 | $ 25,446 | $ 32,691 |
| Sample New Groundwater Monitoring Wells/Well Survey | | | 1 | 3 | 0 | | | $ 660 | $ - | $ - | $ - | $ - | $ - | $ - | $ 780 | $ 750 | $ 153 | $ 1,683 | $ 2,343 |
| *Subtotal* | 10 | 0 | 15 | 37 | 8 | 0 | 0 | $ 12,150 | $ 275 | $ 420 | $ - | $ - | $ 2,295 | $ 17,019 | $ 2,010 | $ 6,434 | $ 2,646 | $ 28,109 | $ 42,554 |
| **Task 4: Draft Environmental Report** | | | | | | | | | | | | | | | | | | | |
| Prepare Environmental Report | 2 | | 2 | 2 | 2 | 2 | 0 | $ 1,680 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 1,680 |
| *Subtotal* | 2 | 0 | 2 | 2 | 2 | 2 | 0 | $ 1,680 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 1,680 |
| **Task Totals** | | | | | | | | | | | | | | | | | | | |
| Task 2 | 8 | 0 | 8 | 4 | 0 | 4 | 0 | $ 4,520 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 4,520 |
| Task 3 | 10 | 0 | 15 | 37 | 8 | 0 | 0 | $ 12,150 | $ 275 | $ 420 | $ - | $ - | $ 2,295 | $ 17,019 | $ 2,010 | $ 6,434 | $ 2,646 | $ 28,109 | $ 42,554 |
| Task 4 | 2 | 0 | 2 | 2 | 2 | 2 | 0 | $ 1,680 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 1,680 |
| **Total Project Estimate** | 20 | 0 | 25 | 43 | 10 | 6 | 0 | $ 18,350 | $ 275 | $ 420 | $ - | $ - | $ 2,295 | $ 17,019 | $ 2,010 | $ 6,434 | $ 2,646 | $ 28,109 | $ 48,754 |

**Notes and assumptions:**

Subject to Limitations presented in the accompanying Work Plan dated August 2022

DRAFT

# APPENDIX A

# GROUNDWATER SAMPLING FIELD DATA SHEETS

DRAFT

**PORT OF ILLAHEE PROPERTY – PNW296**
**Environmental Data Submittal and Budget Increase Request**

**Error! Reference source not found.**Pollution Liability Insurance Agency
PO Box 40930
Olympia, Washington 98504-0930

March 2023

# LOW-FLOW GROUNDWATER SAMPLING FIELD DATA SHEET

Project No. 128.01826.00022 | Purged By: EH | Well I.D.: GLMW- 1

Project Name: Port of Illahee | Sampled By: EH | Sample I.D.: GLMW- 1 -1022

Location: Bremerton, WA | QA Samples:

Date Purged: 10- 24 -2022 | Start (2400hr): 1437 | End (2400hr): 1458

Date Sampled: 10- 24 -2022 | Sample Time (2400hr): 1458

| Casing Diameter: | 2" X | 3"___ | 4"___ | 5"___ | 6"___ | 8"___ | Other___ |
|---|---|---|---|---|---|---|---|
| Casing Volume: (gallons per foot) | ( 0.17) | (0.38) | (0.67) | (1.02) | (1.50) | (2.60) | (  ) |

Total depth (feet) = 13.89 | Casing Volume (gal) =

Depth to water (feet) = 7.57 | Minimum Purge (gal) =

Water column height (feet) = | Actual Purge (gal) =

## FIELD MEASUREMENTS

| Volume (Gal) | Time (2400hr) | Temp. (degrees C) | Conductivity (mS/cm) | TDS (g/L) | DO (mg/L) | pH (units) | ORP (mV) | Turbidity (Visual) | Color (Visual) |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1437 | 16.3 | .703 | — | 3.35 | 8.43 | -75.5 | clear | clear |
| 0.25 | 1440 | 16.2 | .2511 | — | 3.17 | 7.33 | -19.4 | ↓ | ↓ |
| 0.50 | 1443 | 16.2 | .1979 | — | 3.14 | 7.04 | -3.3 | | |
| 0.75 | 1446 | 16.1 | .1920 | — | 3.17 | 6.89 | 5.1 | | |
| 1 | 1449 | 16.1 | .1870 | — | 3.20 | 6.82 | 7.9 | | |
| 1.25 | 1452 | 16.0 | .1856 | — | 3.19 | 6.78 | 10.3 | | |
| 1.50 | 1455 | 16.0 | .1838 | — | 3.19 | 6.76 | 11.7 | | |
| 1.75 | 1458 | 16.0 | .1842 | — | 3.19 | 6.44 | 12.9 | | |

DRAFT

## PURGING & SAMPLING EQUIPMENT

___ Well Wizard Bladder Pump
___ Active Extraction Well Pump
___ Submersible Pump
X Peristaltic Pump
Other: ___
Pump Intake Depth: 29.6 (feet)

___ Bailer (disposable)
___ Bailer (PVC)
___ Bailer (Stainless Steel)
___ Dedicated ___

## SAMPLE VESSELS

___ 40mL VOA
3 40mL VOA w/ HCL
___ ___mL amber glass
2 1000 mL amber glass w/ HCl
1 250 mL HDPE
1 250 mL HDPE w/ HNO3

___ ___mL HDPE w/ H2SO4

Well Integrity: good | Odor: none

Remarks: new tubing

Signature:

# LOW-FLOW GROUNDWATER SAMPLING FIELD DATA SHEET

Project No. 128.01826.00022 | Purged By: EH | Well I.D.: GLMW- 2

Project Name: Port of Illahee | Sampled By: EH | Sample I.D.: GLMW- 2 -1022

Location: Bremerton, WA | QA Samples:

Date Purged: 10- 24 -2022 | Start (2400hr): 1525 | End (2400hr): 1526

Date Sampled: 10- 24 -2022 | Sample Time (2400hr): 1630

| Casing Diameter: | 2" X | 3"___ | 4"___ | 5"___ | 6"___ | 8"___ | Other ___ |
|---|---|---|---|---|---|---|---|
| Casing Volume: (gallons per foot) | ( 0.17) | (0.38) | (0.67) | (1.02) | (1.50) | (2.60) | ( ) |

Total depth (feet) = 16.59 | Casing Volume (gal) = ___

Depth to water (feet) = 16.12 | Minimum Purge (gal) = ___

Water column height (feet) = | Actual Purge (gal) =

## FIELD MEASUREMENTS

| Volume (Gal) | Time (2400hr) | Temp. (degrees C) | Conductivity (mS/cm) | TDS (g/L) | DO (mg/L) | pH (units) | ORP (mV) | Turbidity (Visual) | Color (Visual) |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1525 | 17.4 | .1585 | — | 0.92 | 6.61 | 20.5 | clear | clear |
| well went dry, will let recharge and sample immediately despite low-flow parameters | | | | | | | | | |

## PURGING & SAMPLING EQUIPMENT

___ Well Wizard Bladder Pump
___ Active Extraction Well Pump
___ Submersible Pump
X Peristaltic Pump
Other: ___
Pump Intake Depth: ~16.2 (feet)

___ Bailer (disposable)
___ Bailer (PVC)
___ Bailer (Stainless Steel)
___ Dedicated ___

## SAMPLE VESSELS

___ 40mL VOA
3 40mL VOA w/ HCL
___ ___mL amber glass
2 1000mL amber glass w/ HCl
1 250mL HDPE
1 250mL HDPE w/ HNO3
___ ___mL HDPE w/ H2SO4

Well Integrity: good | Odor: none

Remarks: new tubing

Signature:

Page 1 of _1_

DRAFT

# LOW-FLOW GROUNDWATER SAMPLING FIELD DATA SHEET

SLR

Project No. 128.01826.00022 | Purged By: EH | Well I.D.: GLMW-3

Project Name: Port of Illahee | Sampled By: EH | Sample I.D.: GLMW-3-1022

Location: Bremerton, WA | QA Samples:

Date Purged: 10-24-2022 | Start (2400hr): 1537 | End (2400hr): 1604

Date Sampled: 10-24-2022 | Sample Time (2400hr): 1604

| Casing Diameter: | 2" | 3" | 4" | 5" | 6" | 8" | Other |
|---|---|---|---|---|---|---|---|
| Casing Volume: (gallons per foot) | X (0.17) | (0.38) | (0.67) | (1.02) | (1.50) | (2.60) | ( ) |

Total depth (feet) = 13.83 | Casing Volume (gal) =

Depth to water (feet) = 9.39 | Minimum Purge (gal) =

Water column height (feet) = | Actual Purge (gal) =

## FIELD MEASUREMENTS

| Volume (Gal) | Time (2400hr) | Temp. (degrees C) | Conductivity (mS/cm) | TDS (g/L) | DO (mg/L) | pH (units) | ORP (mV) | Turbidity (Visual) | Color (Visual) |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1537 | 17.9 | .1811 | — | 0.26 | 6.52 | 24.8 | clear | clear |
| 0.25 | 1540 | 18.3 | .1875 | — | 0.20 | 6.53 | 24.0 | | |
| 0.50 | 1543 | 18.2 | .1833 | — | 0.24 | 6.57 | 21.7 | | |
| 0.75 | 1546 | 18.2 | .1796 | — | 0.08 | 6.61 | 19.6 | | |
| 1 | 1549 | 18.2 | .1785 | — | 0.10 | 6.63 | 19.2 | | |
| 1.25 | 1552 | 18.2 | .1773 | — | 0.15 | 6.63 | 18.6 | | |
| 1.50 | 1555 | 18.2 | .1773 | — | 0.12 | 6.62 | 18.3 | | |
| 1.75 | 1558 | 18.1 | .1770 | — | 0.06 | 6.62 | 19.6 | | |
| 2 | 1601 | 18.1 | .1768 | — | 0.07 | 6.60 | 20.7 | | |
| 2.25 | 1604 | 18.1 | .1753 | — | 0.07 | 6.60 | 20.5 | | |

DRAFT

## PURGING & SAMPLING EQUIPMENT

___ Well Wizard Bladder Pump
___ Active Extraction Well Pump
___ Submersible Pump
X Peristaltic Pump
Other: _____
Pump Intake Depth: 11.4 (feet)

___ Bailer (disposable)
___ Bailer (PVC)
___ Bailer (Stainless Steel)
___ Dedicated _____

## SAMPLE VESSELS

___ 40mL VOA
3 40mL VOA w/ HCL
___ ___mL amber glass
2 1000mL amber glass w/ HCl
1 250mL HDPE
1 250mL HDPE w/ HNO3
___ ___mL HDPE w/ H2SO4

Well Integrity: good | Odor: none

Remarks: new tubing

Signature:

Page 1 of _1_

# LOW-FLOW GROUNDWATER SAMPLING FIELD DATA SHEET

Project No. 128.01826.00022 | Purged By: EH | Well I.D.: GLMW-4

Project Name: Port of Illahee | Sampled By: EH | Sample I.D.: GLMW-4-1022

Location: Bremerton, WA | QA Samples:

Date Purged: 10-24-2022 | Start (2400hr): 1633 | End (2400hr): 1651

Date Sampled: 10-24-2022 | Sample Time (2400hr): 1702

| Casing Diameter: | 2" X | 3"___ | 4"___ | 5"___ | 6"___ | 8"___ | Other___ |
|---|---|---|---|---|---|---|---|
| Casing Volume: (gallons per foot) | ( 0.17) | (0.38) | (0.67) | (1.02) | (1.50) | (2.60) | (  ) |

Total depth (feet) = 15.49 | Casing Volume (gal) =

Depth to water (feet) = 9.27 | Minimum Purge (gal) =

Water column height (feet) = | Actual Purge (gal) =

## FIELD MEASUREMENTS

| Volume (Gal) | Time (2400hr) | Temp. (degrees C) | Conductivity (mS/cm) | TDS (g/L) | DO (mg/L) | pH (units) | ORP (mV) | Turbidity (Visual) | Color (Visual) |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1633 | 16.4 | .1451 | — | 2.44 | 6.60 | 20.9 | clear | clear |
| 0.25 | 1636 | 16.6 | .1489 | — | 1.80 | 6.50 | 26.0 | ↓ | ↓ |
| 0.50 | 1639 | 16.5 | .1458 | — | 1.96 | 6.50 | 26.0 | | |
| 0.75 | 1642 | 16.5 | .1432 | — | 2.20 | 6.50 | 26.1 | | |
| 1 | 1645 | 16.5 | .1430 | — | 2.28 | 6.49 | 26.1 | | |
| 1.25 | 1648 | 16.5 | .1433 | — | 2.37 | 6.48 | 28.3 | ↓ | ↓ |
| 1.50 | 1651 | well went dry upon stabilization; will let recharge 10 mins and collect sample | | | | | | | |

DRAFT

## PURGING & SAMPLING EQUIPMENT

___ Well Wizard Bladder Pump
___ Active Extraction Well Pump
___ Submersible Pump
X Peristaltic Pump
Other: _____
Pump Intake Depth: 11.3 (feet)

___ Bailer (disposable)
___ Bailer (PVC)
___ Bailer (Stainless Steel)
___ Dedicated _____

## SAMPLE VESSELS

___ 40mL VOA
3 40mL VOA w/ HCL
___ ___mL amber glass
2 1000mL amber glass w/ HCl
1 250mL HDPE
1 250mL HDPE w/ HNO3
___ ___mL HDPE w/ H2SO4

Well Integrity: good | Odor: none

Remarks: new tubing

Signature:

Page 1 of _1_

# APPENDIX B

# BORING LOGS

DRAFT

**PORT OF ILLAHEE PROPERTY – PNW296**
**Environmental Data Submittal and Budget Increase Request**

**Error! Reference source not found.**Pollution Liability Insurance Agency
PO Box 40930
Olympia, Washington 98504-0930

March 2023

SLR
22118 20th Ave. SE, Suite G-202
Bothell, Washington 98021
Telephone: 425.402.8800
Fax: 425.402.8488

# BORING NUMBER MW-5



**CLIENT** Pollution Liability Insurance Agency
**PROJECT NAME** Port of Illahee
**PROJECT NUMBER** 128.01826.00022
**PROJECT LOCATION** 5507 Illahee Road NE, Bremerton WA 98311
**DATE STARTED** 12/14/22 **COMPLETED** 12/14/22
**GROUND ELEVATION** _____ **HOLE SIZE** 6" - diameter
**DRILLING CONTRACTOR** Holt Drilling
**GROUND WATER LEVELS:**
**DRILLING METHOD** Direct Push/Hollow-Stem Auger
▼ **AT TIME OF DRILLING** 10 ft
**LOGGED BY** C. Blackburn **CHECKED BY** G. Lish
**AFTER DRILLING** N/A
**NOTES**

| DEPTH (ft) | INTERVAL | TYPE | NAME | RECOVERY % | U.S.C.S. | GRAPHIC LOG | MATERIAL DESCRIPTION | PID (ppm) | WELL DIAGRAM |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | | | | 0.1 **ASPHALT** | | Concrete |
| | | | | | GP | | **SANDY GRAVELS**, brown, fine to medium grained sands, moist, loose, no odor | | |
| | | | | | | | 1.5 **GRAVELY SILTY SAND**, brown, fine to coarse grained, few gravels, moist, loose, no odor | | 2-inch sch 40 PVC riser |
| | | | | 100 | GP-GM | | | | Hydrated bentonite chips |
| 5 | | | | | | | | | #10/20 silica sand |
| | | | | | | | | 0.0 | |
| | | | | | | | 6.0 | 0.0 | |
| | | | | | SW-SM | | **SANDY SILT**, brownish gray, fine grained sands with trace coarse sand, moist, loose | | |
| | | Direct Push | MW-5-7'-8'* | 100 | | | 7.5 | 0.0 | |
| | | | | | GP-GM | | **GRAVELLY SILTY SAND**, grayish brown, fine to medium grained sands | 0.0 | |
| 10 | | | | | | | 10.0 ▼ @ 10.0 feet: Becomes wet | 0.0 | 2-inch sch 40 PVC 0.01" slot screen |
| | | | | | SW-SM | | **SANDY SILT**, brownish gray, few fine grained sand, wet, dense, no odor | 0.0 | |
| | | Direct Push | | 100 | | | 13.0 | | |
| | | | | | SM | | **SILTY SAND**, grayish brown, fine to medium grained sands, trace fine gravel, wet, dense, no odor | 0.0 | |
| | | | | | | | 14.0 | | |
| | | | MW-5-14'-15'* | | GP-GM | | **GRAVELLY SILTY SAND**, grayish brown, fine to medium grained sands, fine to coarse gravel, wet, dense, no odor | 0.0 | |
| 15 | | | | | | | 15.0 | | End cap |

DRAFT

## REMARKS

PID = Photoionization detector readings in parts per million (ppm).
Air Knife = Removed soil with a vacuum truck.
Direct Push = Soil sampes collected as a continuous core within a 5-foot-long acetate liner.
* = Soil sample submitted for laboratory analysis.

▼ = Water level at time of drilling.

*(Continued Next Page)*

SLR
22118 20th Ave. SE, Suite G-202
Bothell, Washington 98021
Telephone: 425.402.8800
Fax: 425.402.8488

# BORING NUMBER MW-5



**CLIENT** Pollution Liability Insurance Agency
**PROJECT NAME** Port of Illahee
**PROJECT NUMBER** 128.01826.00022
**PROJECT LOCATION** 5507 Illahee Road NE, Bremerton WA 98311
**DATE STARTED** 12/14/22 **COMPLETED** 12/14/22
**GROUND ELEVATION** _____ **HOLE SIZE** 6" - diameter
**DRILLING CONTRACTOR** Holt Drilling
**GROUND WATER LEVELS:**
**DRILLING METHOD** Direct Push/Hollow-Stem Auger
▼ **AT TIME OF DRILLING** 10 ft
**LOGGED BY** C. Blackburn **CHECKED BY** G. Lish
**AFTER DRILLING** N/A
**NOTES**

| DEPTH (ft) | INTERVAL | TYPE | NAME | RECOVERY % | U.S.C.S. | GRAPHIC LOG | MATERIAL DESCRIPTION | PID (ppm) | WELL DIAGRAM |
|---|---|---|---|---|---|---|---|---|---|

## WELL COMPLETION DETAILS:

Boring completed at 15.0 feet bgs.

0.0 to 2.0 feet: Concrete
2.0 to 3.5 feet: Hydrated bentonite chips
3.0 to 15.0 feet: 10x20 silica sand pack

0.0 to 5.0 feet: 2"-diameter, flush-threaded Sch. 40 PVC riser.
5.0 to 14.8 feet: 2"-diameter, flush-threaded Sch. 40 PVC 0.020-slotted well screen.
14.8 to 15.0 feet: 2"-diameter, flush-threaded Sch. 40 PVC cap.

DRAFT

## REMARKS

PID = Photoionization detector readings in parts per million (ppm).
Air Knife = Removed soil with a vacuum truck.
Direct Push = Soil sampes collected as a continuous core within a 5-foot-long acetate liner.
* = Soil sample submitted for laboratory analysis.

▼ = Water level at time of drilling.

SLR
22118 20th Ave. SE, Suite G-202
Bothell, Washington 98021
Telephone: 425.402.8800
Fax: 425.402.8488

# BORING NUMBER MW-7



**CLIENT** Pollution Liability Insurance Agency
**PROJECT NAME** Port of Illahee
**PROJECT NUMBER** 128.01826.00022
**PROJECT LOCATION** 5507 Illahee Road NE, Bremerton WA 98311
**DATE STARTED** 12/13/22 **COMPLETED** 12/13/22
**GROUND ELEVATION** _____ **HOLE SIZE** 6" - diameter
**DRILLING CONTRACTOR** Holt Drilling
**GROUND WATER LEVELS:**
**DRILLING METHOD** Direct Push/Hollow-Stem Auger
▼ **AT TIME OF DRILLING** 10 ft
**LOGGED BY** A. Pales **CHECKED BY** G. Lish
**AFTER DRILLING** N/A
**NOTES**

| DEPTH (ft) | INTERVAL | TYPE | NAME | RECOVERY % | U.S.C.S. | GRAPHIC LOG | MATERIAL DESCRIPTION | PID (ppm) | WELL DIAGRAM |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | | | | **ASPHALT** 0.8 | | Concrete |
| | | Air Knife | | | SM | | **SILTY SAND**, brown, some gravels and cobbles, moist, dense | | 2-inch sch 40 PVC riser; Hydrated bentonite chips; #10/20 silica sand |
| 5 | | | | | | | 5.0 | | |
| | | Direct Push | | 100 | GP-GM | | **SILTY SAND**, brown, some gravels and cobbles, moist, loose | 2.5 | |
| 10 | | | | | | | 10.0 ▼ @ 10.0 feet: Becomes wet | | |
| | | | | | GP-GM | | 10.5 **GRAVELLY SILTY SAND**, brown, fine to medium grained, some gravels, moist | 286.1 | |
| | | | | | SP-SM | | **SILTY SAND**, gray, some gravels and cobbles, moist, petroleum-like odor, dense | | |
| | | Direct Push | MW-7-12'-13'* | 75 | | | 12.5 | 1,292 | 2-inch sch 40 PVC 0.01" slot screen |
| | | | | | SP-SM | | 13.0 **SAND**, gray, fine to medium grained, some silt and gravels, wet, petroleum-like odor, dense | 33.1 | |
| | | | | | SM | | **SILTY SAND**, gray, fine to medium grained, some gravels and cobbles, wet, petroleum-like odor, dense | | |
| 15 | | | | | | | 14.0 @13.5 feet: Orange mottling<br>@14 feet: No recovery between 14 feet and 15 feet | | |

DRAFT

## REMARKS

PID = Photoionization detector readings in parts per million (ppm).
Air Knife = Removed soil with a vacuum truck.
Direct Push = Soil sampes collected as a continuous core within a 5-foot-long acetate liner.
* = Soil sample submitted for laboratory analysis.

▼ = Water level at time of drilling.



*(Continued Next Page)*

SLR
22118 20th Ave. SE, Suite G-202
Bothell, Washington 98021
Telephone: 425.402.8800
Fax: 425.402.8488

# BORING NUMBER MW-7



**CLIENT** Pollution Liability Insurance Agency
**PROJECT NAME** Port of Illahee
**PROJECT NUMBER** 128.01826.00022
**PROJECT LOCATION** 5507 Illahee Road NE, Bremerton WA 98311
**DATE STARTED** 12/13/22 **COMPLETED** 12/13/22
**GROUND ELEVATION** _____ **HOLE SIZE** 6" - diameter
**DRILLING CONTRACTOR** Holt Drilling
**GROUND WATER LEVELS:**
**DRILLING METHOD** Direct Push/Hollow-Stem Auger
▼ **AT TIME OF DRILLING** 10 ft
**LOGGED BY** A. Pales **CHECKED BY** G. Lish
**AFTER DRILLING** N/A
**NOTES**

| DEPTH (ft) | INTERVAL | TYPE | NAME | RECOVERY % | U.S.C.S. | GRAPHIC LOG | MATERIAL DESCRIPTION | PID (ppm) | WELL DIAGRAM |
|---|---|---|---|---|---|---|---|---|---|
| 15 | | | | | GP-GM | | **GRAVELLY SILTY SAND**, brownish gray, fine to medium grained, no odor, dense, wet | 46.7 | |
| | | | | | | | 16.0 | | |
| | | | | | GP-GM | | **GRAVELLY SILTY SAND**, gray, fine to medium grained, dense, dry, 1" sandy silt lens, wet | | |
| | | Direct Push | | 100 | | | | 8.8 | |
| | | | | | | | 19.0 | | |
| 20 | | | | | | | **GRAVELLY SILTY SAND**, gray, medium grained sand, wet, dense | | |
| | | | | | GP-GM | | | 20.6 | |
| | | | | | | | | 14.9 | |
| | | Direct Push | | 100 | | | | | |
| | | | | | | | 22.5 | | |
| | | | | | SP-SM | | **SANDY SILT**, grey, fine grained sands, wet | 34.7 | |
| | | | | | | | 24.0 | | |
| 25 | | | MW-7-24'-26'* | | SP-SM | | **SANDY SILT**, grey, fine grained sands, wet, no odor | 27.0 | End cap |
| | | Direct Push | | 100 | | | 26.0 | | Backfill |

DRAFT

## WELL COMPLETION DETAILS:

Boring completed at 26.0 feet bgs.

0.0 to 2.0 feet: Concrete
2.0 to 3.5 feet: Hydrated bentonite chips
3.5 to 25.0 feet: 10x20 silica sand pack
25.0 to 26.0 feet: Backfill

0.0 to 5.0 feet: 2"-diameter, flush-threaded Sch. 40 PVC riser.
5.0 to 24.8 feet: 2"-diameter, flush-threaded Sch. 40 PVC 0.020-slotted well screen.
24.8 to 25.0 feet: 2"-diameter, flush-threaded Sch. 40 PVC cap.

## REMARKS

PID = Photoionization detector readings in parts per million (ppm).
Air Knife = Removed soil with a vacuum truck.
Direct Push = Soil sampes collected as a continuous core within a 5-foot-long acetate liner.
* = Soil sample submitted for laboratory analysis.

▼ = Water level at time of drilling.

SLR
22118 20th Ave. SE, Suite G-202
Bothell, Washington 98021
Telephone: 425.402.8800
Fax: 425.402.8488

# BORING NUMBER MW-8



**CLIENT** Pollution Liability Insurance Agency
**PROJECT NAME** Port of Illahee
**PROJECT NUMBER** 128.01826.00022
**PROJECT LOCATION** 5507 Illahee Road NE, Bremerton WA 98311
**DATE STARTED** 12/12/22 **COMPLETED** 12/12/22
**GROUND ELEVATION** _____ **HOLE SIZE** 6" - diameter
**DRILLING CONTRACTOR** Holt Drilling
**GROUND WATER LEVELS:**
**DRILLING METHOD** Direct Push/Hollow-Stem Auger
▼ **AT TIME OF DRILLING** 12.5 ft
**LOGGED BY** A. Pales **CHECKED BY** G. Lish
**AFTER DRILLING** N/A
**NOTES**

| DEPTH (ft) | INTERVAL | TYPE | NAME | U.S.C.S. | GRAPHIC LOG | MATERIAL DESCRIPTION | PID (ppm) | WELL DIAGRAM |
|---|---|---|---|---|---|---|---|---|
| 0 | | | | | | **ASPHALT** 0.8 | | Concrete |
| | | | | GW | | **GRAVEL BACKFILL** 1.3 | | |
| | | Air Knife | | GW-GM | | **GRAVELLY SILT**, medium brown, some cobbles, dry, organic roots observed | | 2-inch sch 40 PVC riser; Hydrated bentonite chips; #10/20 silica sand |
| 5 | | | | | | 6.0 | | |
| | | Direct Push | | SP | | **GRAVELLY SAND**, brownish gray, some silt and cobbles, dry, medium density, no odor | 3.1 | |
| | | | | | | | 4.3 | |
| 10 | | | | | | 10.0 | | |
| | | | | GP-GM | | **GRAVELLY SILTY SAND**, brown, dense, moist 12.0 | 69.2 | |
| | | Direct Push | MW-8-12'-13'* | GP-GM | | ▼ **GRAVELLY SAND AND SILT**, gray, some silt and cobbles, moist, dense, petroleum-like odor @ 12.5 feet: Becomes wet 13.8 | 1,673 | 2-inch sch 40 PVC 0.01" slot screen |
| | | | | SM | | **SILTY SAND**, gray, fine to medium grained, some silt and cobbles, wet, dense, petroleum odor @ 14.5 feet: Few gravel 15.0 | 636.7 | |
| 15 | | | | | | | | |

DRAFT

## REMARKS

PID = Photoionization detector readings in parts per million (ppm).
Air Knife = Removed soil with a vacuum truck.
Direct Push = Soil sampes collected as a continuous core within a 5-foot-long acetate liner.
* = Soil sample submitted for laboratory analysis.

▼ = Water level at time of drilling.



*(Continued Next Page)*

SLR
22118 20th Ave. SE, Suite G-202
Bothell, Washington 98021
Telephone: 425.402.8800
Fax: 425.402.8488

# BORING NUMBER MW-8



**CLIENT** Pollution Liability Insurance Agency
**PROJECT NAME** Port of Illahee
**PROJECT NUMBER** 128.01826.00022
**PROJECT LOCATION** 5507 Illahee Road NE, Bremerton WA 98311
**DATE STARTED** 12/12/22 **COMPLETED** 12/12/22
**GROUND ELEVATION** _____ **HOLE SIZE** 6" - diameter
**DRILLING CONTRACTOR** Holt Drilling
**GROUND WATER LEVELS:**
**DRILLING METHOD** Direct Push/Hollow-Stem Auger
▼ **AT TIME OF DRILLING** 12.5 ft
**LOGGED BY** A. Pales **CHECKED BY** G. Lish
**AFTER DRILLING** N/A
**NOTES**

| DEPTH (ft) | INTERVAL | TYPE | NAME | U.S.C.S. | GRAPHIC LOG | MATERIAL DESCRIPTION | PID (ppm) | WELL DIAGRAM |
|---|---|---|---|---|---|---|---|---|
| 15 | | | | | | | | |
| | | Direct Push | | SW-SM | | **SANDY SILT**, gray, fine to medium grained, some gravel, wet, dense, petroleum odor | 92.1 | |
| | | | | | | | 32.1 | |
| | | | | GP-GM | | 17.0<br>**GRAVELLY SAND AND SILT**, gray, some silt and cobbles, moist, dense, petroleum-like odor | 1,446 | |
| | | | | | | | 1,557 | |
| | | | | ML | | 19.0<br>**SILT**, gray, few fine grained sand, wet, dense, petroleum-like odor | 98.8 | |
| 20 | | | | | | 20.0 | | |
| | | Direct Push | | SM | | **SILTY SAND**, gray, fine to medium grained, some gravel, wet, loose, petroleum-like odor | 176.0 | |
| | | | | | | 22.0 | | |
| | | | | GP-GM | | **GRAVELLY SILTY SAND**, gray, fine to medium grained, wet, loose, petroleum-like odor | 24.0 | |
| | | | | | | | 92.4 | |
| 25 | | | | SW-SM | | 24.5<br>**SANDY SILT**, gray, fine grained, few clay, wet, dense, petroleum-like odor | | End cap |
| | | | | | | 25.0 | 93.7 | |
| | | | | GP-GM | | **GRAVELLY SILTY SAND**, gray, fine to medium grained, wet, dense, petroleum-like odor | | |
| | | | | | | 27.0 | | |
| | | Direct Push | | SW-SM | | **SANDY SILT**, gray, fine grained, wet, dense, weak petroleum-like odor | 52.2 | Backfill |
| | | | | | | 28.5 | | |
| | | | | GP-GM | | **GRAVELLY SILTY SAND**, gray, fine to medium grained, wet, dense, weak petroleum-like odor | | |
| 30 | | | MW-8-29'-30'* | | | 30.0 | 83.3 | |

DRAFT

## REMARKS

PID = Photoionization detector readings in parts per million (ppm).
Air Knife = Removed soil with a vacuum truck.
Direct Push = Soil sampes collected as a continuous core within a 5-foot-long acetate liner.
* = Soil sample submitted for laboratory analysis.

▼ = Water level at time of drilling.

*(Continued Next Page)*

22118 20th Ave. SE, Suite G-202
Bothell, Washington 98021
Telephone: 425.402.8800
Fax: 425.402.8488

# BORING NUMBER MW-8



**CLIENT** Pollution Liability Insurance Agency
**PROJECT NAME** Port of Illahee
**PROJECT NUMBER** 128.01826.00022
**PROJECT LOCATION** 5507 Illahee Road NE, Bremerton WA 98311
**DATE STARTED** 12/12/22 **COMPLETED** 12/12/22
**GROUND ELEVATION** _____ **HOLE SIZE** 6" - diameter
**DRILLING CONTRACTOR** Holt Drilling
**GROUND WATER LEVELS:**
**DRILLING METHOD** Direct Push/Hollow-Stem Auger
▼ **AT TIME OF DRILLING** 12.5 ft
**LOGGED BY** A. Pales **CHECKED BY** G. Lish
**AFTER DRILLING** N/A
**NOTES**

| DEPTH (ft) | INTERVAL | TYPE | NAME | U.S.C.S. | GRAPHIC LOG | MATERIAL DESCRIPTION | PID (ppm) | WELL DIAGRAM |
|---|---|---|---|---|---|---|---|---|

## WELL COMPLETION DETAILS:

Boring completed at 30.0 feet bgs.

0.0 to 2.0 feet: Concrete
2.0 to 3.5 feet: Hydrated bentonite chips
3.5 to 25.0 feet: 10x20 silica sand pack
25.0 to 30.0 feet: Backfill

0.0 to 5.0 feet: 2"-diameter, flush-threaded Sch. 40 PVC riser.
5.0 to 24.8 feet: 2"-diameter, flush-threaded Sch. 40 PVC 0.020-slotted well screen.
24.8 to 25.0 feet: 2"-diameter, flush-threaded Sch. 40 PVC cap.

DRAFT

## REMARKS

PID = Photoionization detector readings in parts per million (ppm).
Air Knife = Removed soil with a vacuum truck.
Direct Push = Soil sampes collected as a continuous core within a 5-foot-long acetate liner.
* = Soil sample submitted for laboratory analysis.

▼ = Water level at time of drilling.

SLR
22118 20th Ave. SE, Suite G-202
Bothell, Washington 98021
Telephone: 425.402.8800
Fax: 425.402.8488

# BORING NUMBER SB-1



**CLIENT** Pollution Liability Insurance Agency
**PROJECT NAME** Port of Illahee
**PROJECT NUMBER** 128.01826.00022
**PROJECT LOCATION** 5507 Illahee Road NE, Bremerton WA 98311
**DATE STARTED** 12/12/22 **COMPLETED** 12/12/22
**GROUND ELEVATION** _____ **HOLE SIZE** 2.25"- diameter
**DRILLING CONTRACTOR** Holt Drilling
**GROUND WATER LEVELS:**
**DRILLING METHOD** Direct Push/Hollow-Stem Auger
**AT TIME OF DRILLING** _____
**LOGGED BY** A. Pales **CHECKED BY** G. Lish
**AFTER DRILLING** N/A
**NOTES** _____

| DEPTH (ft) | INTERVAL | TYPE | NAME | RECOVERY % | U.S.C.S. | GRAPHIC LOG | MATERIAL DESCRIPTION | PID (ppm) |
|---|---|---|---|---|---|---|---|---|
| 0 | | | | | | | | |
| | | | | | | | 0.5 **ASPHALT** | |
| | | | | | | | 1.0 **GRAVEL BACKFILL** | |
| | | Air Knife | | 100 | ML | | **SILT**, medium brown, some gravel and cobbles, moist | |
| 5 | | | | | | | 5.0 | |
| | | Direct Push | | 100 | SM | | **SILTY SAND**, brown, fine to medium grained, some grey gravel and cobbles, moist, dense | 1.5 |
| 10 | | | | | | | 10.0 | 2.5 |
| | | Direct Push | SB-1-10'-11'* | 75 | GW | | **GRAVEL**, dark gray, moist, petroleum-like odor | 861.6 |
| | | | | | SM | | **SILTY SAND**, brown, fine to medium grained, some grey gravel and cobbles, dry, dense | 120.0 |
| | | | | | | | 14.0 | |
| | | | | | SM | | **SILTY SAND**, grey, fine to medium grained, some crushed rock, dry, dense, petroleum-like odor | |
| 15 | | | | | | | 15.0 | |

DRAFT

## REMARKS

PID = Photoionization detector readings in parts per million (ppm).
Air Knife = Removed soil with a vacuum truck.
Direct Push = Soil sampes collected as a continuous core within a 5-foot-long acetate liner.
* = Soil sample submitted for laboratory analysis.

▼ = Water level at time of drilling.

*(Continued Next Page)*

SLR
22118 20th Ave. SE, Suite G-202
Bothell, Washington 98021
Telephone: 425.402.8800
Fax: 425.402.8488

# BORING NUMBER SB-1



**CLIENT** Pollution Liability Insurance Agency
**PROJECT NAME** Port of Illahee
**PROJECT NUMBER** 128.01826.00022
**PROJECT LOCATION** 5507 Illahee Road NE, Bremerton WA 98311
**DATE STARTED** 12/12/22 **COMPLETED** 12/12/22
**GROUND ELEVATION** _____ **HOLE SIZE** 2.25"- diameter
**DRILLING CONTRACTOR** Holt Drilling
**GROUND WATER LEVELS:**
**DRILLING METHOD** Direct Push/Hollow-Stem Auger
**AT TIME OF DRILLING** _____
**LOGGED BY** A. Pales **CHECKED BY** G. Lish
**AFTER DRILLING** N/A
**NOTES** _____

| DEPTH (ft) | INTERVAL | TYPE | NAME | RECOVERY % | U.S.C.S. | GRAPHIC LOG | MATERIAL DESCRIPTION | PID (ppm) |
|---|---|---|---|---|---|---|---|---|
| 15 | | | | | | | | |
| | | Direct Push | | 100 | GP-GM | | **GRAVELLY SILTY SAND**, grey, fine to medium grained, moist, dense, weak petroleum-like odor | 99.8 |
| | | | | | | | | 25.0 |
| | | | | | SW-SM | | **SANDY SILT**, grey, fine grained, moist, dense | 10.8 |
| | | | | | | | | |
| 20 | | | SB-1-19'-20'* | | GP-GM | | **GRAVELLY SILTY SAND**, grey, fine to medium grained, moist, dense | 11.7 |

18.0
19.0
20.0

## BORING COMPLETION DETAILS:

Boring completed at 20.0 feet bgs.

Boring backfilled with bentonite chips and then concrete at ground surface.

DRAFT

## REMARKS

PID = Photoionization detector readings in parts per million (ppm).
Air Knife = Removed soil with a vacuum truck.
Direct Push = Soil sampes collected as a continuous core within a 5-foot-long acetate liner.
* = Soil sample submitted for laboratory analysis.

▼ = Water level at time of drilling.

# APPENDIX C

# LABORATORY REPORTS

DRAFT

## PORT OF ILLAHEE PROPERTY – PNW296
## Environmental Data Submittal and Budget Increase Request

**Error! Reference source not found.**Pollution Liability Insurance Agency
PO Box 40930
Olympia, Washington 98504-0930

March 2023