

March 19, 2021

To: Matthew Randish, Sun Pacific Energy**From:**

3/19/2021

Robert Reginald Hanford

Robert R. Hanford
Senior Geologist
bhanford@aspectconsulting.com**Eric Marhofer**
Associate Environmental Engineer
emarhofer@aspectconsulting.com**Re: Mercer Island Shell Interim Cleanup Action Plan**

Aspect Consulting, LLC (Aspect) has prepared this Interim Cleanup Action Plan (ICAP) for the Mercer Island Shell (Former BP) site (the Site) located at 7833 SE 28th Street on Mercer Island, Washington (the property). Information used to prepare this plan is based on the Remedial Investigation and Feasibility Study Report (RI/FS) completed by Puget Environmental (Puget) dated January 22, 2020 (Appendix A). The RI/FS was prepared to summarize previous investigation results and conclusions and provide recommendation for final cleanup and site closure under the Washington State Model Toxics Control Act (MTCA) Cleanup Regulations adopted by the Washington State Department of Ecology (Ecology) in Chapter 173-340 of the Washington Administrative Code (WAC).

1 Purpose

The purpose of this ICAP is to define the objectives of the cleanup activities that will be performed in conjunction with replacement of the gas station infrastructure on the property, identify additional engineering needs to meet MTCA objectives, and make recommendations for the current planning efforts where appropriate to meet those objectives. This ICAP will be used as a roadmap for setting expectations among stakeholders and facilitating insurance coverage for planning, design, and permitting activities considered reasonable and necessary for the cleanup.

2 Chemicals and Media of Concern

The chemicals of concern (COCs) for the Site are based on the occurrence of chemicals positively identified and confirmed at concentrations above MTCA Method A cleanup levels during Puget's remedial investigation (RI). The COCs for the Site include oil-, diesel-, and gasoline-range organics (ORO, DRO, and GRO), benzene, toluene, ethylbenzene, and xylenes (BTEX). Also, while not specifically mentioned in Puget's RI, naphthalene is considered an appropriate COC for this Site. 1,2-dibromoethane (EDB), 1,2-dichloroethane (EDC), methyl tertiary-butyl ether (MTBE), and lead have not been detected at the Site, where sampled for by Puget.

The affected media at the Site includes soil and groundwater. Soil gas and air were not evaluated as part of the RI and remain as potential media of concern. The vapor exposure pathway remains to be evaluated following interim cleanup actions.

3 Applicable Cleanup Standards

This section presents the applicable cleanup standards by which evaluation of interim cleanup action will be measured.

3.1 Cleanup Levels

Applicable cleanup levels for the affected or potentially affected media at the Site are as follows:

- **Soil:** MTCA Method A cleanup levels for unrestricted land use.
- **Groundwater:** MTCA Method A cleanup levels for protection of drinking water as a beneficial use.
- **Air:** MTCA Method B cleanup levels for air. The cleanup levels for air may be adjusted for a commercial use scenario in accordance with 173-340-750 of the WAC as appropriate.

3.2 Points of Compliance

The standard points of compliance for the Site are as follows:

- **Soil for protection from direct contact:** from ground surface to a depth of 15 feet.
- **Soil for protection of groundwater:** throughout the Site.
- **Groundwater for protection of drinking water:** extending vertically from the uppermost level of the saturated zone to the lowest-most depth potentially affected.
- **Ambient and Indoor Air for protection from inhalation:** throughout the Site.

When it is not practicable to achieve cleanup levels in soil at the standard points of compliance, the cleanup action may involve containment of hazardous substances. Remedies involving containment may still be determined to comply with cleanup standards, provided:

1. The selected remedy is permanent to the maximum extent practicable.
2. The cleanup action is protective of human health and the environment.
3. Appropriate institutional controls, including compliance monitoring and periodic reviews, are implemented (173-340-740(6)(f) WAC).

Following the interim cleanup action, an additional feasibility study (FS) may be required to evaluate the potential for containment and/or setting conditional points of compliance.

4 Areas Requiring Remediation

The areas requiring remediation at this Site are defined by exceedances of the applicable cleanup standards discussed above for soil and groundwater.

4.1 Soil

Given the nature and extent of contamination presented in Puget's RI/FS, soil impacts exceeding Method A cleanup levels is present approximately 3 to 16 feet below ground surface (bgs) near and between the USTs and dispenser islands. These areas are shown in plan and cross-section views on Figures 5 through 8 of the RI/FS.

4.1.1 On-Property

The lateral extent of soil impacts exceeding Method A cleanup levels is shown on Figure 5 in the RI/FS. Given the uncertainty with respect to the lateral extent of soil impacts potentially extending under the existing convenience store building on the property, it may not be practicable in the context of MTCA to fully remove all soil impacts that are above cleanup levels on the property. A shoring system that maximizes flexibility with respect to chasing soil impacts up to and under the building, such as pin piles or micro piles, is recommended to increase the likelihood of successfully achieving cleanup levels on the property.

Pending the results of confirmation soil sampling below the building following excavation to the maximum extent practicable, engineering and institutional controls (i.e., capping and an environmental covenant) may be a necessary element for the final remedy at the Site to address inaccessible soil contamination below the building. Additionally, engineering controls in the form of a vapor mitigation system may be required if soil impacts exceed screening levels for a vapor intrusion risk.

4.1.2 Off-Property

The lateral extent of soil impacts exceeding Method A cleanup levels is shown on Figure 5 in the RI/FS. The potential for exceedances of gasoline and benzene extending off the property and into the right-of-way (ROW) to the north and east are acknowledged. However, excavation of SE 28th Street and 80th Avenue SE is not included in the scope of the interim cleanup action at this time because the cost is considered clearly disproportionate to the benefit in the context of MTCA. In other words, the cost of excavation and restoration of the ROW, given the number of sensitive utilities and potential disruption to traffic in the downtown core, is considered cost prohibitive and would not provide significant benefit to human health or the environment based on the current data and information provided in the RI/FS.

Pending the results of confirmation soil sampling at the property boundary following excavation, engineering and institutional controls (i.e., capping and an environmental covenant) may be a necessary element for the final remedy at the Site to address soil contamination in the ROW. An environmental covenant would need to be granted by the City of Mercer Island (the City). If the City will not accept the conditions for an environmental covenant, then an FS will be required to demonstrate the disproportionate cost analysis (DCA) in accordance with MTCA. If soil exceeding

Method A cleanup levels persists in the ROW, and it is not possible to negotiate an environmental covenant with the City, a no further action (NFA) will not be possible for the Site. However, a property-specific NFA may be an option pending the DCA.

4.2 Groundwater

Given the nature and extent of contamination presented in Puget's RI/FS, depth to groundwater at the Site ranges between 3 and 12 feet bgs and monitoring wells area screened as deep as 25 feet bgs. The inferred lateral extents of groundwater impacts exceeding Method A cleanup levels is shown in plan view on Figures 9 and 10 of the RI/FS.

Given the depth to groundwater, the excavation for the interim cleanup action will require dewatering to reach the vertical depth of soil contamination. This will result in the removal and disposal of some petroleum-impacted groundwater; however, it is anticipated that a period of natural attenuation will still be necessary following removal of soil impacts on the property before groundwater will attain cleanup levels both on and off the property.

Additionally, if soil impacts remain in place on and/or off the property as discussed in Section 4.1, a lengthy period of attenuation can be expected for groundwater. In that event, engineering and institutional controls (i.e., capping and an environmental covenant) may be a necessary element for the final remedy at the Site to address groundwater. Additionally, engineering controls in the form of a vapor mitigation system may be required if groundwater impacts exceed screening levels for a vapor intrusion risk.

Similar to soil, an environmental covenant for off-property groundwater impacts would need to be granted by the City. If the City will not accept the conditions of an environmental covenant, then an FS will be required to demonstrate the DCA in accordance with MTCA. If groundwater exceeding Method A cleanup levels persists in the ROW, and it is not possible to negotiate an environmental covenant with the City, an NFA will not be possible for the Site. However, a property-specific NFA may be an option pending the DCA.

4.3 Vapor

Soil gas and air were not evaluated as part of Puget's RI and remain as potential media of concern. The vapor exposure pathway remains to be evaluated following interim cleanup actions.

Pending the success of the interim cleanup action, a vapor assessment will be required if soil and groundwater impacts persist at the Site above Method A cleanup levels. Additionally, engineering controls in the form of a vapor mitigation system may be required as a necessary element of the final remedy at the Site if soil gas or indoor air impacts exceed screening levels for a vapor intrusion risk.

5 Interim Cleanup Action Plan

Given the current plans for redevelopment of the property, there is an opportunity to conduct an interim cleanup action to remove accessible soil and groundwater impacts from the property in conjunction with replacement of the underground storage tanks (USTs), pump islands, and canopy. This section presents the general approach and recommendations for the interim cleanup action to

meet the objectives of MTCA and comply with the regulation to the maximum extent practicable. The interim cleanup action will include for following elements:

- Decommissioning and removal of USTs, dispensers, piping, and ancillary equipment associated with the fueling system infrastructure, including demolition of the pump island canopy.
- Excavation and off-site disposal of petroleum impacted soil on the property to the maximum extent practicable.
- Groundwater management, dewatering, and disposal.
- Backfilling and site restoration.

These elements are described further below.

5.1 Decommissioning and Removal of USTs and Ancillary Equipment

The USTs and associated belowground piping and dispensers will be decommissioned and removed during the source removal action in accordance with Ecology's current UST regulations (WAC 173-360) and other applicable state or local regulations. The Contractor will be a Certified UST Decommissioner and responsible for completing Ecology's 30-Day Notice and Permanent Closure Notice for USTs. A Certified Site Assessor will collect the required soil samples and complete Ecology's Site Check/Site Assessment Checklist at the time of decommissioning.

5.2 Excavation and Off-Site Disposal of Petroleum Impacted Soil

The objective of the soil removal action is to remove the source of contamination in and around the UST basin, pump islands, and building to the maximum extent practicable.

5.2.1 Soil Cleanup Levels for Interim Cleanup Action

The MTCA Method A cleanup levels described in Section 3 are applicable for this interim cleanup action. Every effort should be made to remove impacted soil on the property exceeding unrestricted cleanup levels. The COCs for the Site are identified in Section 2.

It is recognized that exceedances of the Method A cleanup level for COCs may remain in the ROW to the north and east of the property, pending performance and confirmation soil sampling results. MTCA implications for potential off-property soil impacts exceeding cleanup levels are discussed in Section 4.1 in the context of the final remedy for the Site.

5.2.2 Excavation Extents and Shoring

Vertical shoring will be required along the north and east property boundaries to facilitate removal of the USTs and impacted soil up to the property line. Soil impacts to the south and west of the UST basin are delineated as shown on RI/FS Figure 5.

It is recognized that affected soil may extend under the east end of the building on the property and may require shoring to remove additional soil to the maximum extent practicable. If performance sampling indicates soil contamination extends a limited distance under the building, pin piles or micro piles are recommended to support the building and allow access for excavation.

The current shoring plan for construction is provided in Appendix B. To better meet the stated MTCA objectives of the interim cleanup action, it is recommended that the interior shoring alignment be eliminated and the shoring walls along the property lines be extended to the south and west to facilitate sloping of the excavation as necessary up to the south and west property boundary, pending performance soil sampling results.

It is also recommended that the vertical shoring along the north and east property boundaries be designed to facilitate excavation to a minimum depth of 16 feet for purposes of impacted soil removal around the UST basin. A vertical contingency of up to 2 feet is recommended to allow for additional soil removal at depth pending performance soil sampling results. The shoring design should also account for the depth of the planned UST replacement if deeper.

Detailed construction requirements for modifications to the shoring design to meet the interim cleanup action objectives, including permitting and shoring design, should be identified and performed by a structural engineer. The shoring design should also factor in considerations for dewatering of the excavation to achieve design excavation depths as discussed in Section 5.3.

The actual extent of the excavation, within the limitations of the shoring design, will be determined by collecting performance soil samples from the sidewalls and bottom of the excavation. Performance monitoring is described below in Section 5.2.3.

5.2.3 Performance Monitoring

Performance monitoring of the soil removal action will include field screening and collection of soil samples for laboratory analysis during the excavation. Soil samples will be collected for the following reasons:

- To document COC concentrations in soils that are excavated.
- To characterize soil for disposal or reuse.
- To determine whether contaminant concentrations in soils that are left in place comply with applicable cleanup standards.

Soil sampling and analysis will be conducted in accordance with a project-specific Sampling and Analysis Plan (SAP). In general, soil samples will be collected using U.S. Environmental Protection Agency (EPA) Method 5035 sampling kits for gasoline and volatile compounds. Discrete grab samples will be submitted for analysis so that contaminant variability can be evaluated. Field screening techniques will generally be used to help ensure that a “worst-case” sample is collected for analysis. If a backhoe is used to collect the sample (e.g., when it is unsafe for the sampler to enter the excavation), care will be taken to ensure the backhoe bucket is clean of other soil before sampling. “Fresh” soils will be exposed just prior to sampling (to limit contaminant loss to volatilization), and the soil sample will be collected from the middle of the bucket, from soils that have not contacted the sides of the bucket. If sampling personnel can safely access the sampling location, a hand auger or shovel will be used to expose fresh soils just prior to sampling. Laboratory analyses of soil samples will include the following:

- DRO and ORO by Northwest Method NWTPH-Dx.
- GRO by Northwest Method NWTPH-Gx.

- BTEX and naphthalene by EPA Method 8260.

The overall scope of soil sampling and analysis activities will depend on field screening results, soil volumes, and treatment/disposal facility profiling requirements. In general, performance monitoring will include field screening and laboratory analysis of both excavation sidewall and bottom samples. The distance between sidewall samples will not exceed 20 feet, and closer sample spacing may be necessary. A minimum of one sample for approximately every 100 square feet of bottom area will be collected. njurg

Where soil sampling results indicate cleanup level exceedances, soil may be over excavated and resampled, if feasible, until sampling results are at or below the proposed cleanup levels. However, the excavation extent will be constrained as described in Section 5.2.2.

5.2.4 Soil Management and Disposal

Based on the available soil characterization data, the excavated soils will be handled as:

- **Clean** (Category 1). Petroleum hydrocarbon contaminant concentrations are not detected and there is no odor, staining, or visible sheen. Generally, soils less than 3 feet bgs are expected to be clean.
- **Impacted** (Category 2). Petroleum hydrocarbon contaminants are detected below MTCA Method A cleanup levels.
- **Contaminated** (Categories 3 and 4). GRO and/or BTEX are detected above MTCA Method A cleanup levels. The soils between depths of 3 and 16 feet bgs are where the most contamination is expected to be located (i.e., around/below the USTs).

When evidence of petroleum hydrocarbon-contaminated soil is encountered (and no analytical data is available), visual and photoionization detector (PID) field screening techniques will be used to assess the extent of contamination and inform the segregation of impacted and contaminated soils. The segregation of soils will follow Ecology guidance (Ecology, 2016).

Given the limited space available on the Property, excavated soils that are known to be contaminated based on analytical data (or field-determined) will be direct loaded and hauled to a predetermined off-site treatment/disposal facility. It may be necessary to temporarily stockpile a limited amount of soil for final categorization and subsequent handling based on laboratory analytical results. Overburden soil screened as clean or impacted will be segregated and stockpiled for analytical testing and potential reuse. Stockpiling will include the following requirements:

- No material will be stockpiled in such a manner as to create surface water accumulation, impair access to adjacent sites of facilities, or be detrimental to the excavation in any way.
- Stockpiles will be constructed to isolate soils from the environment and encourage drainage of water from the soils. Stockpiles will be protected against erosion by wind and rain.
- Stockpiles will be underlain by plastic sheeting with a 10-millimeter minimum thickness, with adjacent sheeting sections overlapping a minimum of 3 feet.
- Berms will be constructed around each stockpile to a minimum height of 12 inches to prevent run-on of precipitation. Base liners of stockpiles will be bathtub construction to

collect excess water draining from the soil. Liquid accumulating in stockpiles will be collected and disposed of in accordance with applicable regulations at an approved treatment facility.

- Stockpiles will be covered with plastic sheeting of a 6-millimeter minimum thickness to prevent precipitation from entering the stockpile, and when not in use. The cover will be anchored to prevent it from being disturbed by wind.

5.3 Groundwater Management, Dewatering, and Disposal

As noted in Section 4.2, depth to groundwater at the Site ranges between 3 and 12 feet bgs. Given the targeted depths of the excavation, the proposed interim cleanup action will require dewatering to reach the vertical depth of soil contamination.

Detailed construction requirements for dewatering to meet the interim cleanup action objectives, including permitting and design, should be identified and performed by a state-licensed hydrogeologist or professional engineer in coordination with the shoring design and construction contractor's planned means and methods for the excavation approach. Recommended performance criteria for excavation dewatering include:

- Dewater excavations as needed to maintain unsaturated conditions to facilitate soil excavation/handling/loading for transport, confirmation soil sampling in the excavation, and excavation backfilling.
- Collect and treat all water generated during dewatering to meet water quantity and quality requirements for discharge to sanitary sewer under an Individual Discharge Authorization from the City of Mercer Island and/or other appropriate agencies.
- Alternatively, pumped water may be conveyed to a water storage system. Water storage will be sized appropriately to contain the necessary volume of water with consideration for disposal frequency. Collected water will be disposed of in accordance with applicable regulations at an approved treatment facility.

5.4 Backfilling and Site Restoration

Backfilling and site restoration activities are expected to be specified in the design for the UST system replacement. We recommend securing the appropriate permits and preparing a completed set of plans and specifications, stamped by a licensed professional engineer in the State of Washington, for replacement of the UST system. The UST system should be designed to meet or exceed current UST regulations (WAC 173-360). The existing dispensers, and automated tank monitoring system and associated sensors, may be reused unless prohibited by WAC 173-360.

As discussed in Section 5.2.2, it is recommended that the shoring system be designed to meet the objectives of the interim cleanup action as well as the UST system replacement. Detailed construction requirements to accommodate UST replacement, including any additional permitting and shoring design beyond the scope of the interim cleanup action, should be identified and performed in conjunction with a structural engineer.

6 Conclusions and Recommendations

The purpose of this ICAP is to define the objectives of the cleanup activities that will be performed in conjunction with replacement of the gas station infrastructure on the property, identify additional

engineering needs to meet MTCA objectives, and make recommendations for the current planning efforts where appropriate to meet those objectives.

Based on the applicable cleanup levels and areas requiring remediation at the Site, the following engineering needs and planning efforts are recommended to provide a higher level of assurance that the interim cleanup action will meet MTCA requirements and result in closure:

- Recognizing there are multiple potential paths for achieving closure at this Site or property, and they are dependent on the outcome of the interim cleanup action. Future requirements may include vapor assessment and/or mitigation, capping areas of contamination, environmental covenants for potential residual impacts both on- and/or off-property, and an additional feasibility study to support selection of a final remedy.
- Engaging the City to review the potential outcomes of the interim cleanup action as discussed in Section 4 with respect to the potential need for engineering and institutional controls to address the potential for off-property contamination and closing the Site.
- Modifying the shoring approach as recommended in Section 5.2.2 to provide greater flexibility for achieving applicable cleanup standards during excavation.
- Preparing a SAP and soil management plan for performance sampling and management of soil during the excavation as recommended in Section 5.2.3 and 5.2.4.
- Preparing a dewatering plan as recommended in Section 5.3 to maximize the depth of excavation, within the limitations of the shoring design, and remove soil impacts to the maximum extent practicable.
- Preparing plans for replacement of the fueling system infrastructure and site restoration activities as recommended in Section 5.4.

To the extent these recommendations trigger additional permitting and/or design requirements with the City, the efforts related to meeting those requirements should be considered reasonable and necessary for the cleanup of the Site. It is recommended that the insurance policy holder engage the insurance company for review and a determination of coverage for those activities as necessary.

Limitations

Work for this project was performed for Sun Pacific Energy (Client), and this memorandum was prepared in accordance with generally accepted professional practices for the nature and conditions of work completed in the same or similar localities, at the time the work was performed. This memorandum does not represent a legal opinion. No other warranty, expressed or implied, is made.

All reports prepared by Aspect Consulting for the Client apply only to the services described in the Agreement(s) with the Client. Any use or reuse by any party other than the Client is at the sole risk of that party, and without liability to Aspect Consulting. Aspect Consulting's original files/reports shall govern in the event of any dispute regarding the content of electronic documents furnished to others.

Please refer to Appendix C titled "Report Limitations and Guidelines for Use" for additional information governing the use of this report.

Sun Pacific Energy
March 19, 2021

MEMORANDUM
Project No. 200433

Attachments: Appendix A – Puget Environmental RI/FS
Appendix B – Allstructure Engineering Shoring Plan
Appendix C – Report Limitations and Guidelines for Use

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APPENDIX A

Puget Environmental RI/FS

January 22, 2020

Mr. George Stokes
Mercer Island Shell Service Station
7833 Southeast 28th Street
Mercer Island, Washington

**Subject: Remedial Investigation and Feasibility Study Report
Mercer Island Shell Service Station (Former BP)
7833 Southeast 28th Street
Mercer Island, Washington**

Dear Mr. Stokes:

In accordance with your request, Puget Environmental, PLLC (Puget) has prepared this remedial investigation and feasibility study report for the Mercer Island Shell Service Station located at 7833 Southeast 28th Street, in Mercer Island, Washington. The report has been prepared to summarize previous investigation results and conclusions and provide recommendations for final cleanup and site closure under the Washington State Model Toxics Control Act (MTCA) Cleanup Regulation, Chapter 173-340 WAC.

SITE DESCRIPTION

The site consists of an approximately 0.30 acre parcel located approximately 84 feet above mean seal level near the northern shore of Mercer Island. Lake Washington is present approximately 1,870 feet to the northwest. Luther Burbank Park is present approximately 1,470 feet to the north and west. The area around the site is relatively level. The site location is shown of Figure 1.

The site is bounded by Southeast 28th Street to the north and 80th Avenue Southeast to the east. A professional building is present on adjacent property to the south. A grocery store is present on the adjacent property to the west. Properties in remaining directions are occupied by a mix of commercial and professional facilities. Residences are present approximately 165 feet to the north and west. The site and areas of nearby property use are shown on Figure 2.

Records indicate the site has been operated as an automobile service station since the 1950s. The site is currently occupied by an active gasoline service station with four dispensers and three underground storage tanks (USTs) containing unleaded gasoline. A used oil UST was reportedly present on site at one time and removed prior to 1995. Washington State Department of Ecology (Ecology) records indicate the current USTs were installed in 1985 and 1986. A convenience store and auto repair shop are also present at the site. A total of 24 groundwater monitoring wells and 2 vapor extraction wells are present on and off site. Monitoring well locations and select site features are shown on Figure 3.

REMEDIAL INVESTIGATION

Following is a summary of historic and recent investigations and results based on review of previous consultants' reports as provided by the property owner as well as Puget's investigation results. A list of the references reviewed is attached.

Initial Investigation and Remediation System Operation

Petroleum hydrocarbon-impacted soil and groundwater at concentrations exceeding applicable cleanup levels were first identified beneath the site during a Phase II environmental site assessment conducted by AGRA Earth & Environmental, Inc. in December 1995.

Following discovery of the impacts, a combined soil-vapor extraction (SVE) and groundwater extraction (GWE) remediation system was reportedly installed to treat the impacts. The remediation system consisted of 3 extraction tranches that treated and discharged groundwater into the sanitary sewer system.

In December 2000, Camp Dresser & McKee (CDM) modified the remediation system and installed a 200-gallon aeration tank and modified the conveyance piping to eliminate discharge to storm sewer and into a new infiltration trench. SVE activities were discontinued at this time.

In January 2006, Delta Environmental Consultants Inc. (Delta) further modified the existing remediation system to utilize high vacuum dual phase extraction (HVDPE). Liquids and vapors were extracted from two of four on-site wells.

In June 2010, the remediation system operation was discontinued. The vapor and groundwater extraction equipment was subsequently dismantled and removed.

Additional Investigation

Following remediation system operation, additional investigations were subsequently conducted to further evaluate groundwater conditions and the extent of remaining impacted soil. Groundwater monitoring and sampling activities were reportedly conducted by Antea Group in 2012. Environmental Partners Inc. (EPI) subsequently advanced 12 soil borings (DP-1 through DP-12) and drilled and installed 7 additional monitoring wells (MW-5, MW-6, MW-7, MW-10, MW-11, MW-12S and MW-12D) and 2 soil vapor extraction wells (SVE-1 and SVE-2) in 2012 and 2013. Soil and groundwater analytical results are presented in EPI reports from February 2013 through January 2015.

Between 2015 and 2017, Puget conducted additional investigation to further evaluate the migration and extent of impacted soil and groundwater. A total of 8 additional monitoring wells (MW-13 through MW-20) were installed on and off site.

Following review by the Washington State Pollution Liability Insurance Agency (PLIA) 4 additional monitoring wells (MW-21 through MW-24) were installed to further evaluate shallow subsurface conditions. Results of the most recent monitoring and sampling events are presented in reports prepared by Puget dated February 8, 2019 and September 17, 2019.

GEOLOGIC AND HYDROGEOLOGIC SETTING

Geologic records indicate the site is underlain by Quaternary Vashon till deposits consisting of a compact diamict of silt, sand and subrounded to well-rounded gravel, glacially transported and deposited under ice.

Results of drilling and soil sampling conducted by CDM, Delta, EPI and Puget indicate the site is generally underlain by damp to wet, silty clay to clayey silt to approximately 15 to 20 feet below ground surface (bgs) where it is underlain by saturated fine-grained sand to the maximum depth explored of approximately 25 feet bgs. Groundwater in the underlying sandy zone appears to be partially confined by the overlying clay and silt.

Review of Ecology well log records indicates groundwater approximately 115 and 116.5 feet bgs in two water supply wells located approximately 1,300 feet southeast of the site.

Review of historic groundwater monitoring and sampling results indicate groundwater approximately 3 to 11 feet bgs beneath the site with a variable gradient generally directed toward the northwest at a magnitude of approximately 0.01. A groundwater contour map with results of the most recent sampling event conducted in August 2019 is shown on Figure 4 along with a rose diagram depicting historic groundwater gradient directions.

CONTAMINANTS OF CONCERN

The history of operations at the property and analytical results indicate the following contaminants of concern (COCs) for both soil and groundwater beneath the site:

- Total petroleum hydrocarbons as gasoline (TPH-G) and as diesel (TPH-D)
- Benzene, toluene, ethylbenzene and total xylenes (BTEX)

POINTS OF COMPLIANCE

- The point of compliance for soil based on protection of groundwater is all soil throughout the site.
- The point of compliance for groundwater is all groundwater from the uppermost level of the saturated zone extending vertically to the lowest depth that is affected by any of the COCs at the site.
- The point of compliance for air is all air throughout the site.

NATURE AND EXTENT OF CONTAMINATION

Soil

Results of previous and recent investigations indicates petroleum hydrocarbon-impacted soil at concentrations exceeding the MTCA Method A cleanup levels is present approximately 3 to 16 feet bgs near and between the USTs and dispenser islands. The estimated extent of impacted soil is shown on Figure 5. Cross-sections through the impacted areas are shown in Figures 6 through 8. Based on results of all known investigations to date, it appears up to approximately 1,500 cubic yards of soil may have been impacted.

Groundwater

Results of historical groundwater sampling activities conducted between 1995 and 2019 indicate groundwater samples collected from MW-1, MW-2, MW-4, MW-5, MW-7, MW-10, MW-11, MW-12S, MW-12D, MW-19, MW-21, SVE-1 and SVE-2 have historically contained TPH-G, TPH-D and/or BTEX concentrations exceeding the MTCA Method A cleanup levels. Sampling results do not reveal indications of off-site groundwater impacts and there are no indications that subsurface utilities have provided preferential pathways for contaminant migration. Based on results of the most recent groundwater monitoring and sampling events conducted by Puget in February and August 2019, it appears impacted groundwater is limited to the area immediately adjacent to the USTs. The estimated extent of gasoline- and benzene-impacted groundwater from the February 2019 sampling event is shown on Figures 9 and 10.

Historical groundwater results are shown on Tables 1 and 2.

CONCEPTUAL SITE MODEL

Based on investigation results, a Conceptual Site Model has been prepared in accordance with WAC 173-340-708(3)(e) to evaluate potential exposure pathways. Results of the Conceptual Site Model Evaluation indicate the following potential complete exposure pathways:

For Soil –

- Direct contact and ingestion by construction workers and terrestrial biota

For Groundwater –

- Direct contact and ingestion by construction workers and terrestrial biota

For Vapor –

- Inhalation by commercial and construction workers

TERRESTRIAL ECOLOGICAL EVALUATION

In accordance with WAC 173-340-7490, a Terrestrial Ecological Evaluation (TEE) has been conducted to determine cleanup levels that are applicable to the site for the protection of potential terrestrial receptors. Based on results, Puget proposes using the concentrations listed in Table 749-3 as cleanup levels, pending agency review and approval.

CONCLUSIONS

Soil

Review of drilling and sampling data indicate the site is generally underlain by damp to wet silty clay to clayey silt from the surface to approximately 15 to 20 feet bgs where it is underlain by saturated fine-grained sand to the maximum depth explored of approximately 25 feet bgs. Based on review of historic and recent investigation results, it appears up to approximately 1,500 cubic yards of petroleum hydrocarbon-impacted soil remains present approximately 3 to 16 feet bgs near and between the USTs and dispenser islands (Figures 5 through 7).

Groundwater

Review of historic groundwater monitoring and sampling results indicates groundwater approximately 3 to 11 feet bgs beneath the site with a variable gradient generally directed toward the northwest at a magnitude of approximately 0.01 (Table 1 and Figure 4). Groundwater in the underlying sandy zone appears to be partially confined by the overlying clay and silt.

Historic and recent laboratory results indicate groundwater immediately adjacent to the USTs is impacted with TPH-G and benzene at concentrations exceeding the MTCA Method A cleanup level (Figures 9 and 10).

FEASIBILITY STUDY

Soil and Groundwater Conditions

Results of previous investigations indicate approximately 1,500 cubic yards of impacted soil is present near and between the dispensers and USTs. Impacted soil consists primarily of silty clay and clayey silt with relatively low hydraulic conductivity in the range of approximately 10^{-8} to 10^{-9} centimeters per second.

Based on a review of historic remediation system operations and the low hydraulic conductivity properties of impacted soil, it appears prior in situ remediation techniques have removed contaminants from subsurface to the maximum extent practicable based on soil and groundwater conditions. Therefore, in order to complete cleanup within a reasonable timeframe, it appears more aggressive remediation will be needed.

Proposed Cleanup

Soil

Based on conditions, Puget has conducted a limited feasibility study to evaluate potential remedial options based on the soil conditions and the depth and location of contaminants. Based on technical considerations and results of disproportionate cost analysis conducted under WAC 173-340-360 (3)(e) Puget recommends excavation and removal of impacted soil near and between the USTs and dispensers as the preferred remedial option.

Based on over 30 years of operation and the documented presence of subsurface impacts, Puget recommends removal and replacement of the existing USTs and piping as part of the proposed cleanup of the site.

Once the existing USTs and piping have been removed, we recommend excavation and removal of remaining impacted soil near and between the dispenser islands and USTs.

Groundwater

Based on the depth to groundwater and the soil type and depth to impact, dewatering and removal of impacted groundwater will likely be needed during excavation and removal of impacted soil to be conducted in conjunction with UST replacement. Based on the relatively limited extent of impact, soil excavation along with dewatering and removal of impacted groundwater during will likely remove the majority of remaining contaminants. A brief period of natural attenuation monitoring may be needed to document and confirm soil and groundwater cleanup once excavation and tank replacement is completed.

Estimated costs for the proposed cleanup are shown on Table 3.

LIMITATIONS

The scope of work for this investigation was conducted in a manner that is consistent with the level of care and skill ordinarily exercised by other members of the profession practicing in the same locality and under similar conditions as of the date the services were provided. Results of our evaluation including conclusions, opinions and recommendations are based on a limited number of observations and data. Data from other areas may be different. Puget makes no representation, guarantee, or warranty, express or implied, regarding the services, communication, report, opinion, or instrument of service provided.

Puget provides various levels of service to meet the needs of varying clients. Evaluation of geologic and environmental conditions requires judgment leading to conclusions and recommendations that are generally based on incomplete knowledge of subsurface conditions due to the limitations of data from field studies. Although risk cannot be eliminated, more detailed and extensive studies yield more information which may help understand and manage the level of risk.

The work was conducted based on the scope and budget requirements, and site information provided by our client.

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We appreciate the opportunity to provide service. Please do not hesitate to contact either of the undersigned if you have any questions.

Sincerely,

Puget Environmental, PLLC



John P. Meyer
Project Manager



John K. Meyer, L.HG.
Principal Hydrogeologist

Attachments

References Reviewed

Figures

Tables

Boring Logs and Well Construction Diagrams

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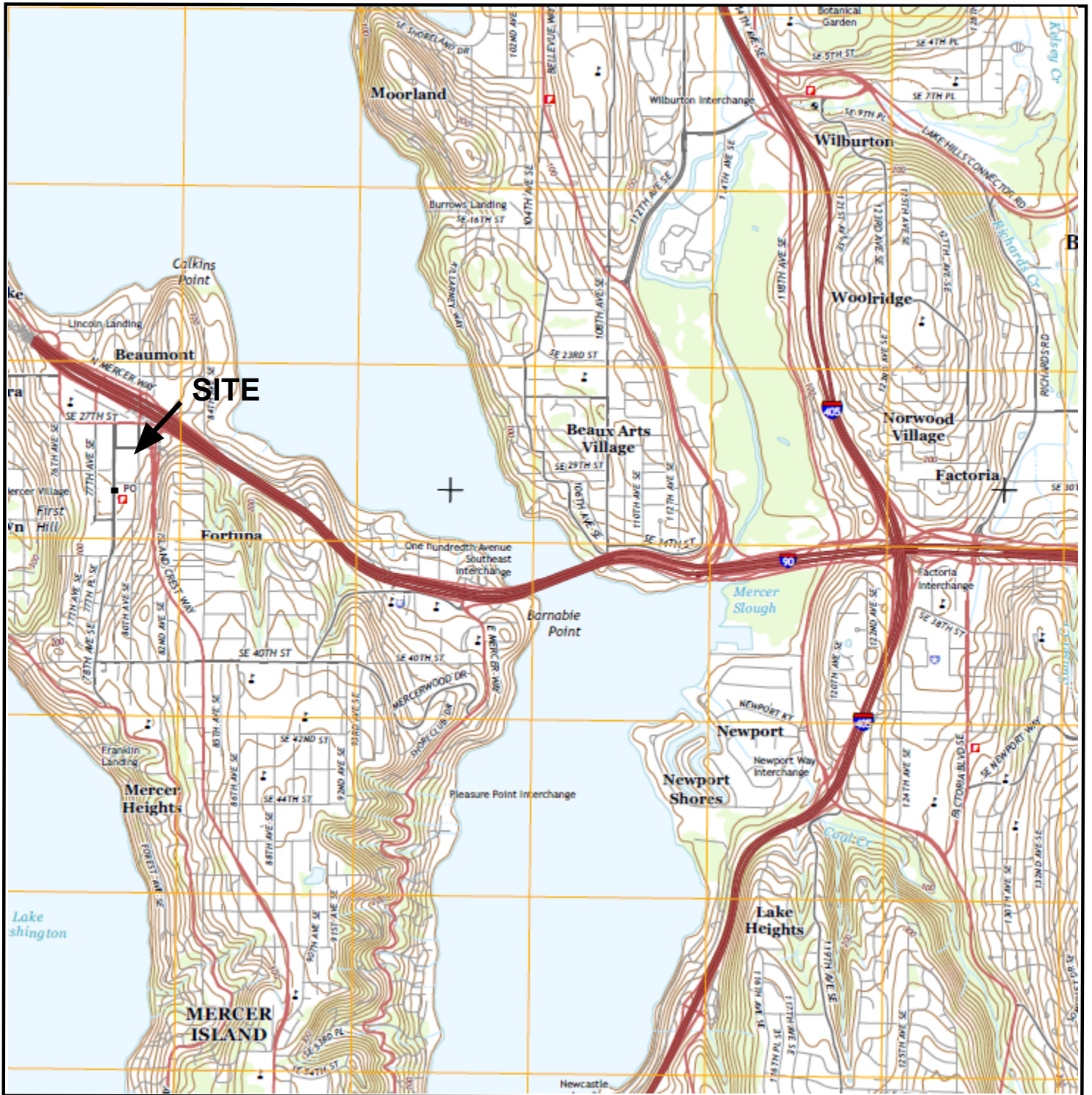
Puget Environmental P.L.L.C., *Monitoring Well Installation and Sampling, Mercer Island Shell (Formerly BP)*, April 17, 2017

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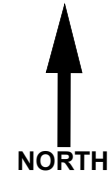
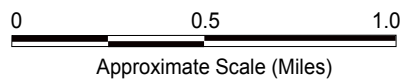
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From the United States Geological Survey - Mercer Island Quadrangle, Washington-King Co., 7.5 Minute, Quadrangle, 2011



Dimensions and locations are approximate.

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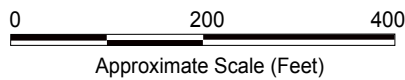
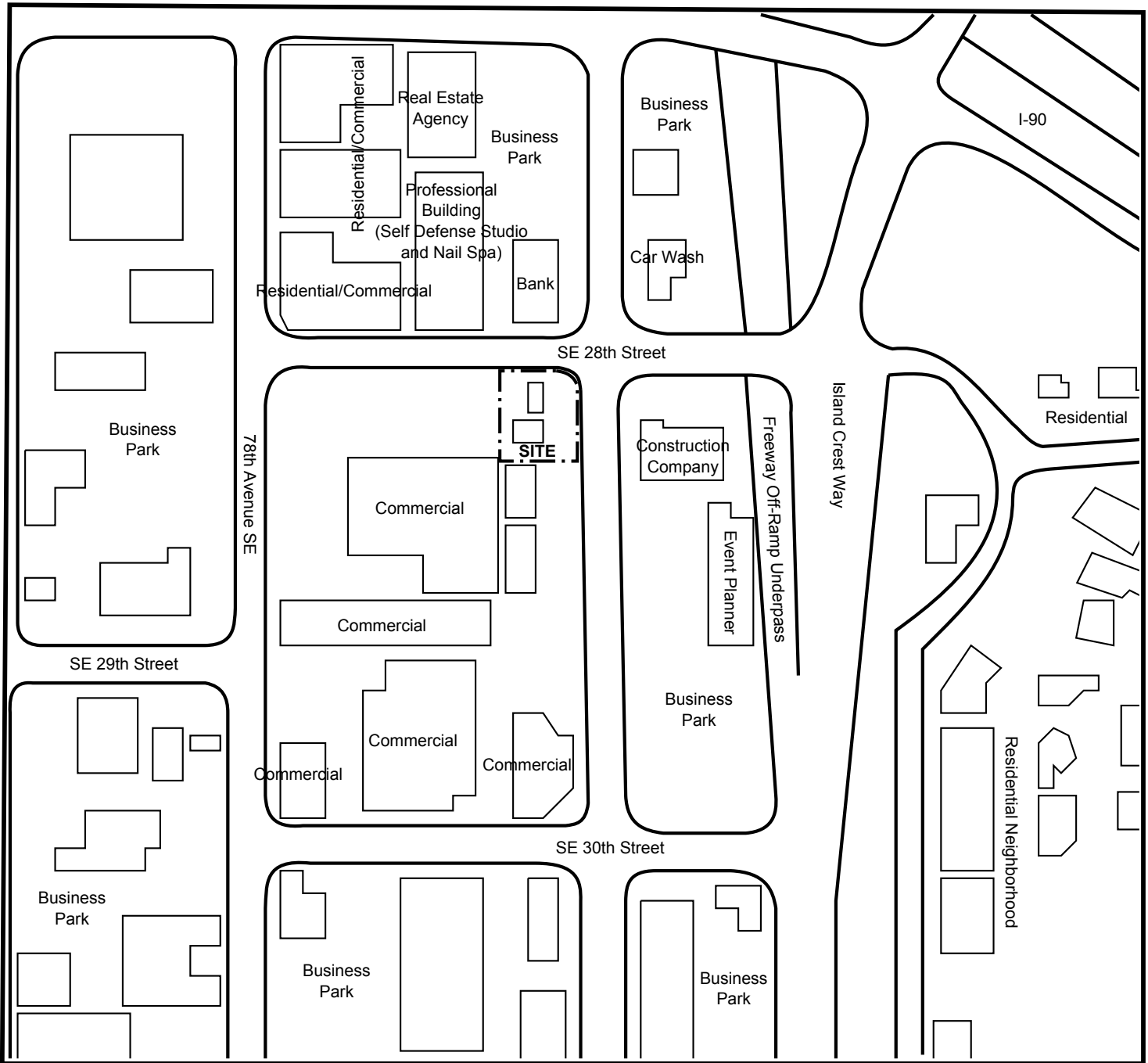
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Project Number 15038: 2/1/16 JM

Mercer Island Shell
(Former BP)
7833 SE 28th Street
Mercer Island, Washington

FIGURE 1
SITE LOCATION



NORTH

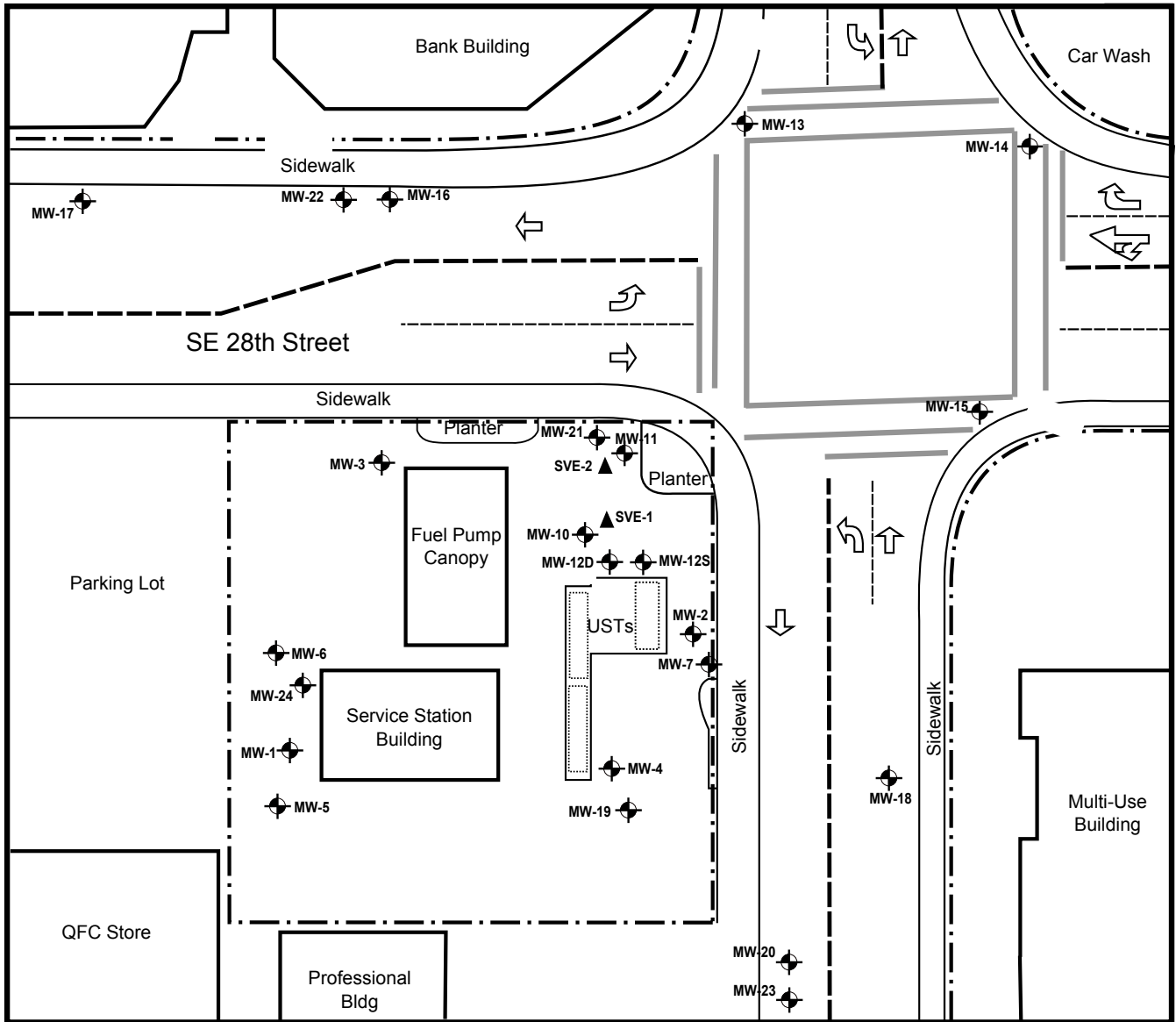
Dimensions and locations are approximate.

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Project Number 15083: 10/30/15 JPM


Mercer Island Shell
7833 SE 28th Street
Mercer Island, Washington


FIGURE 2
AREA MAP

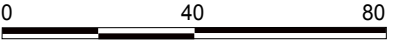


LEGEND

 Groundwater Monitoring Well
MW-1

 Soil Vapor Extraction Well Location
SVE-1


NORTH

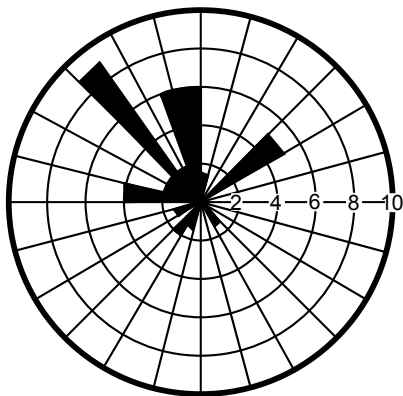
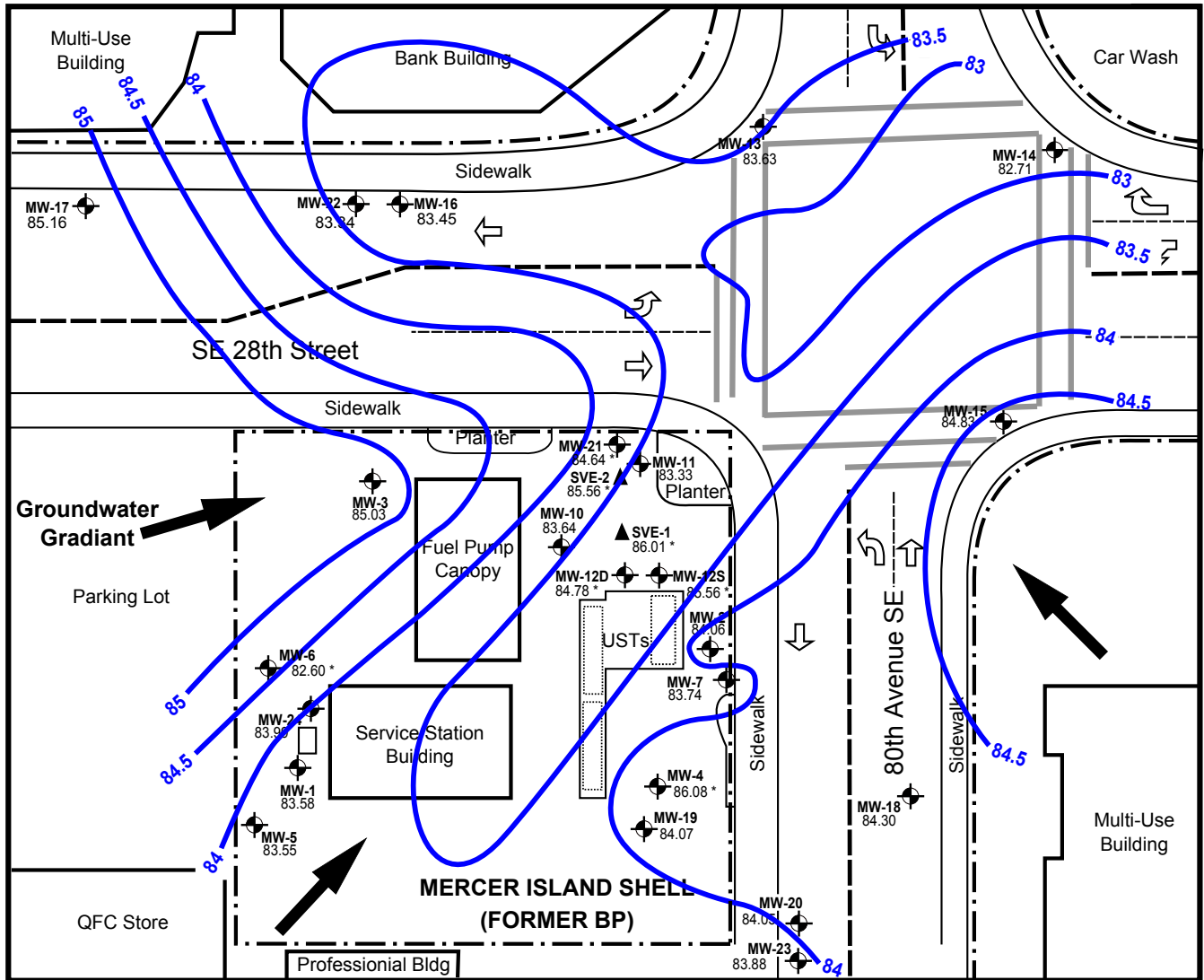

 0 40 80
 Approximate Scale (Feet)

Dimensions and locations are approximate.

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FIGURE 3
 SITE PLAN

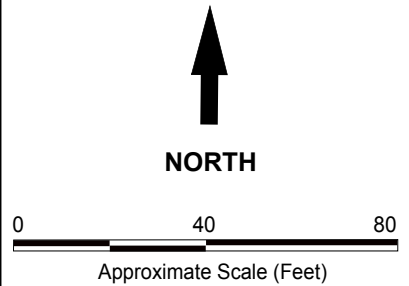


HISTORIC GROUNDWATER GRADIENT DIRECTION

LEGEND

Concentric circles represent two monitoring events with determinable flow directions. First quarter 2001 through third quarter 2019. 27 monitoring events shown. Events prior to 2016 recorded from previous consultant reports.

-  Groundwater Flow Direction
-  Groundwater Monitoring Well
-  Soil Vapor Extraction Well Location
- 82.60 Groundwater Elevation
- 84.5 Groundwater Elevation Contour
- * Data Not Used in Contouring



Dimensions and locations are approximate.

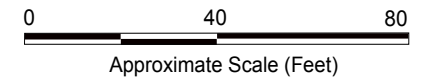
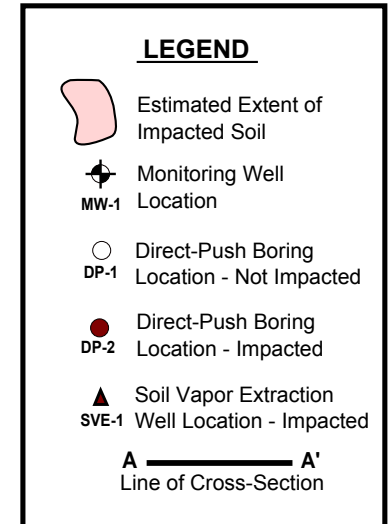
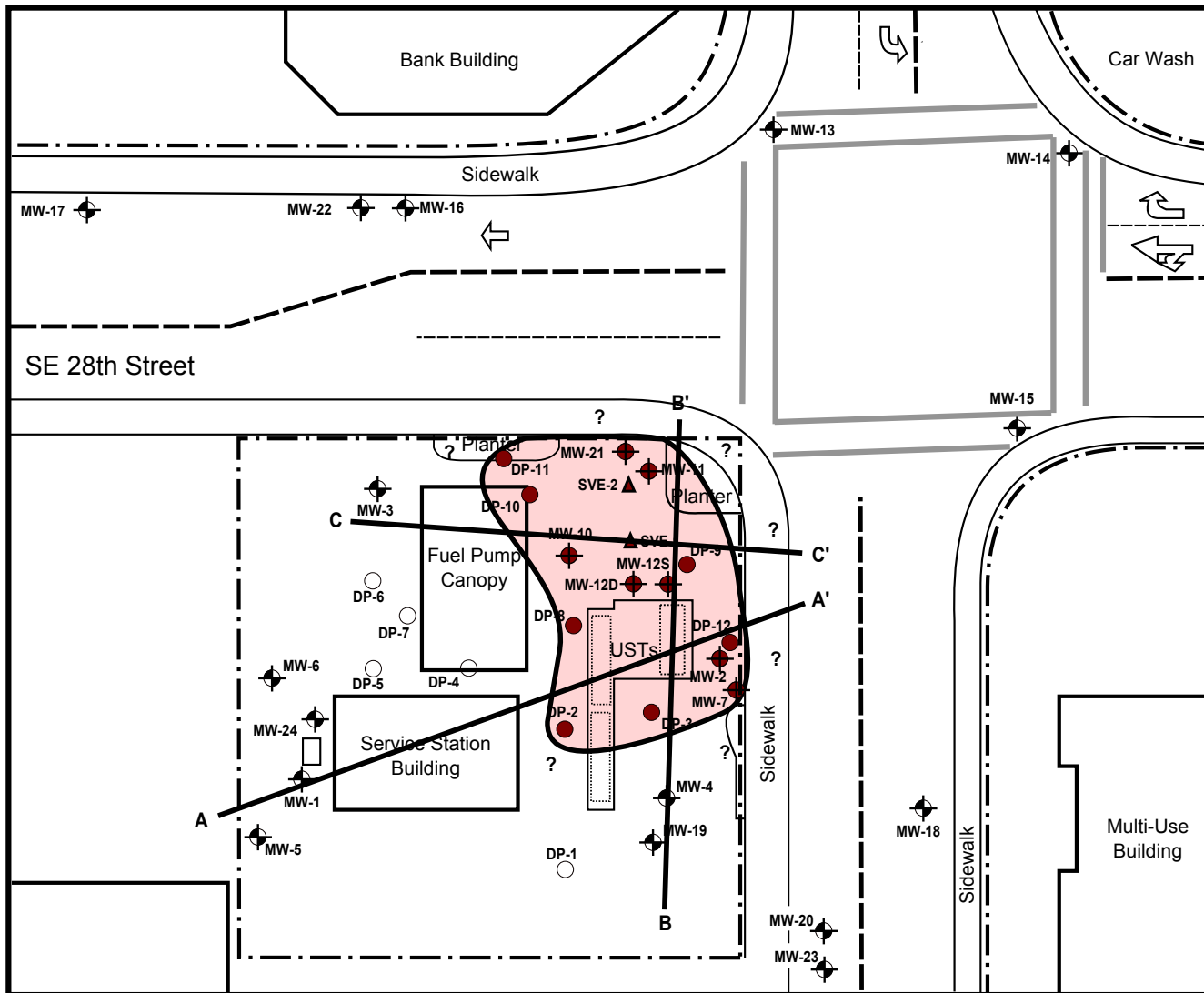
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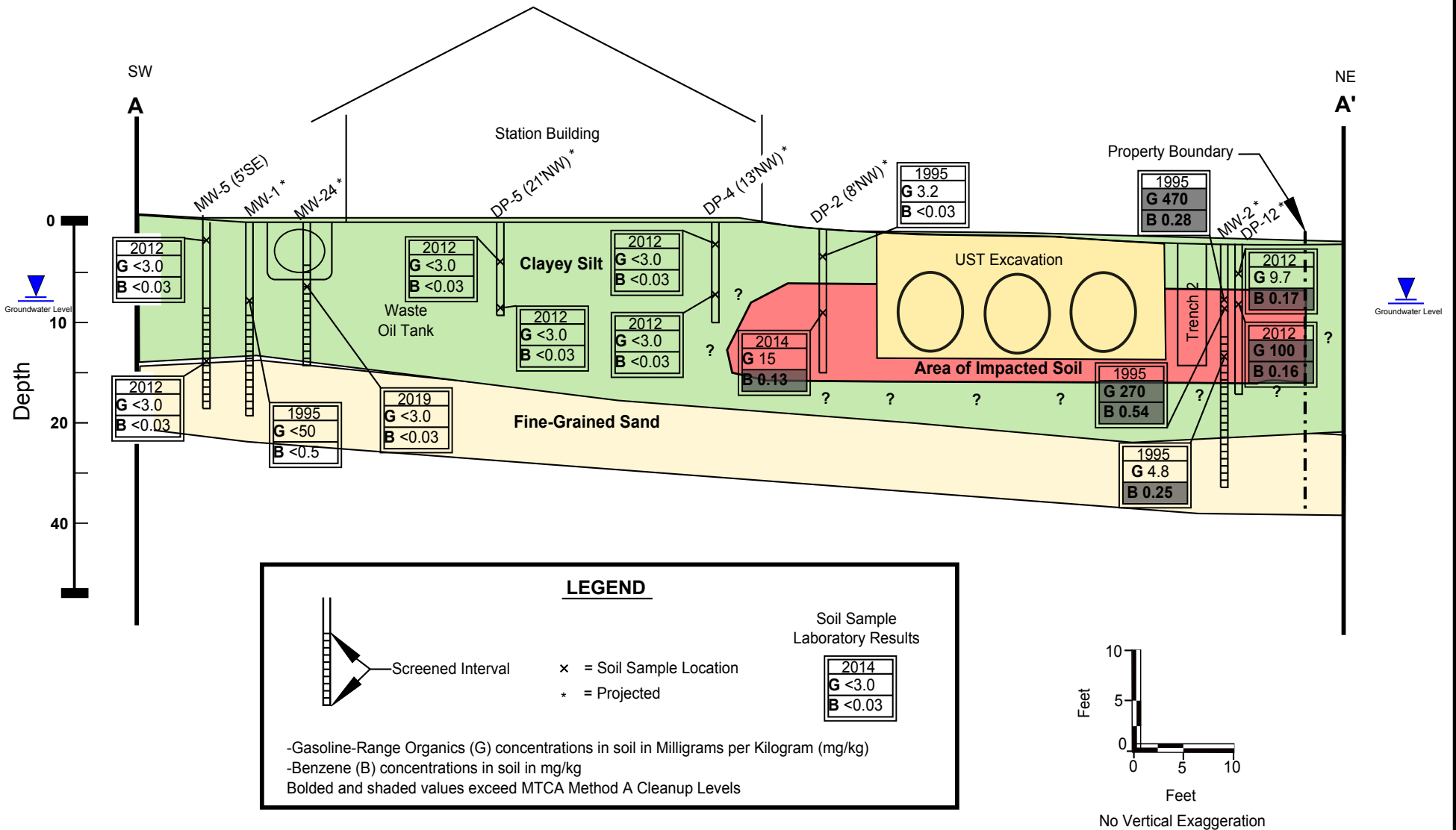
FIGURE 4
GROUNDWATER ELEVATION
ROSE DIAGRAM
AUGUST 26, 2019



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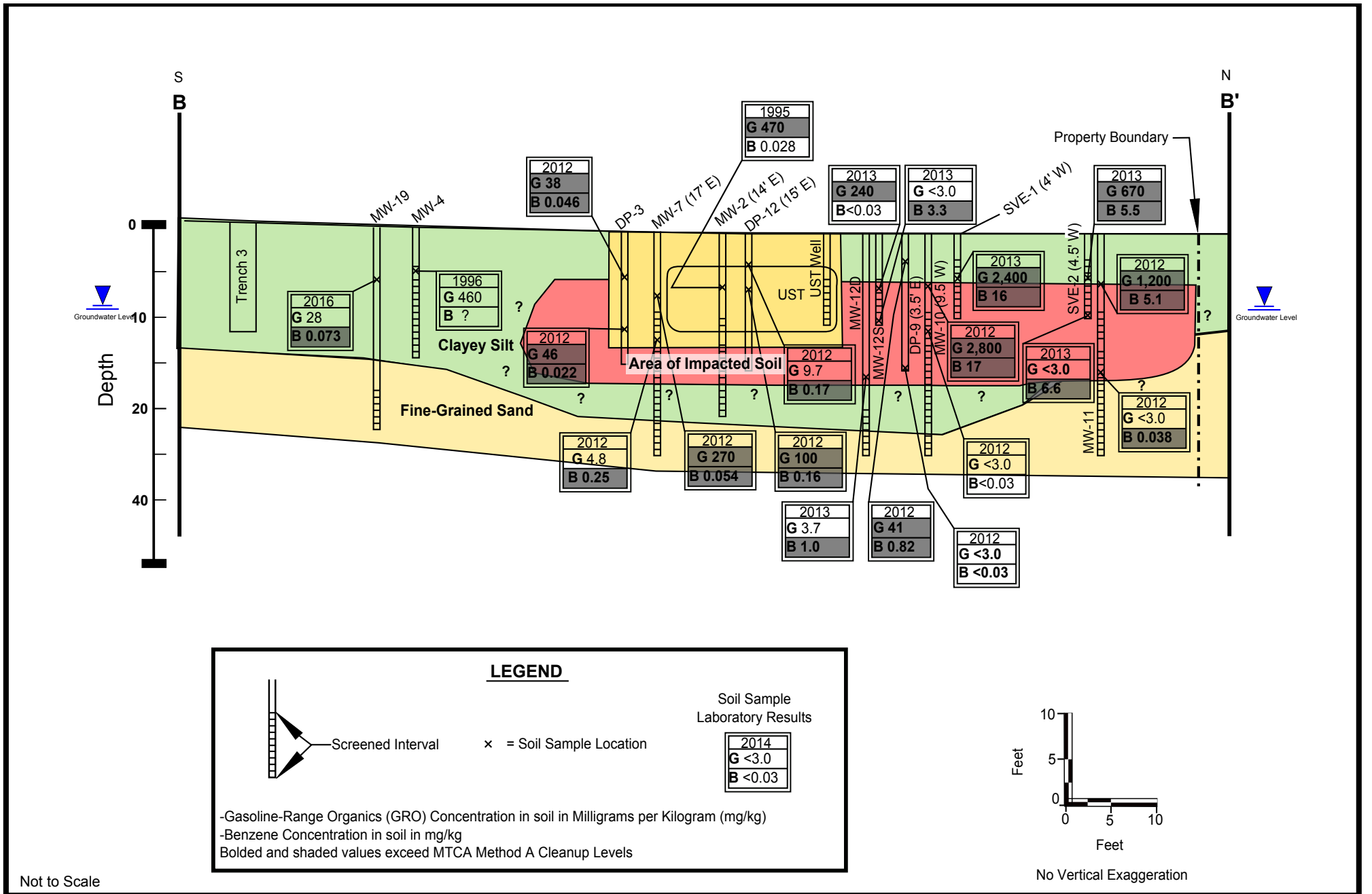
FIGURE 5
 AREAS OF IMPACTED SOIL AND
 LINES OF CROSS-SECTION



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 7833 SE 28th Street
 Mercer Island, Washington

FIGURE 6
 GENERALIZED SCHEMATIC
 CROSS-SECTION
 A - A'



Not to Scale

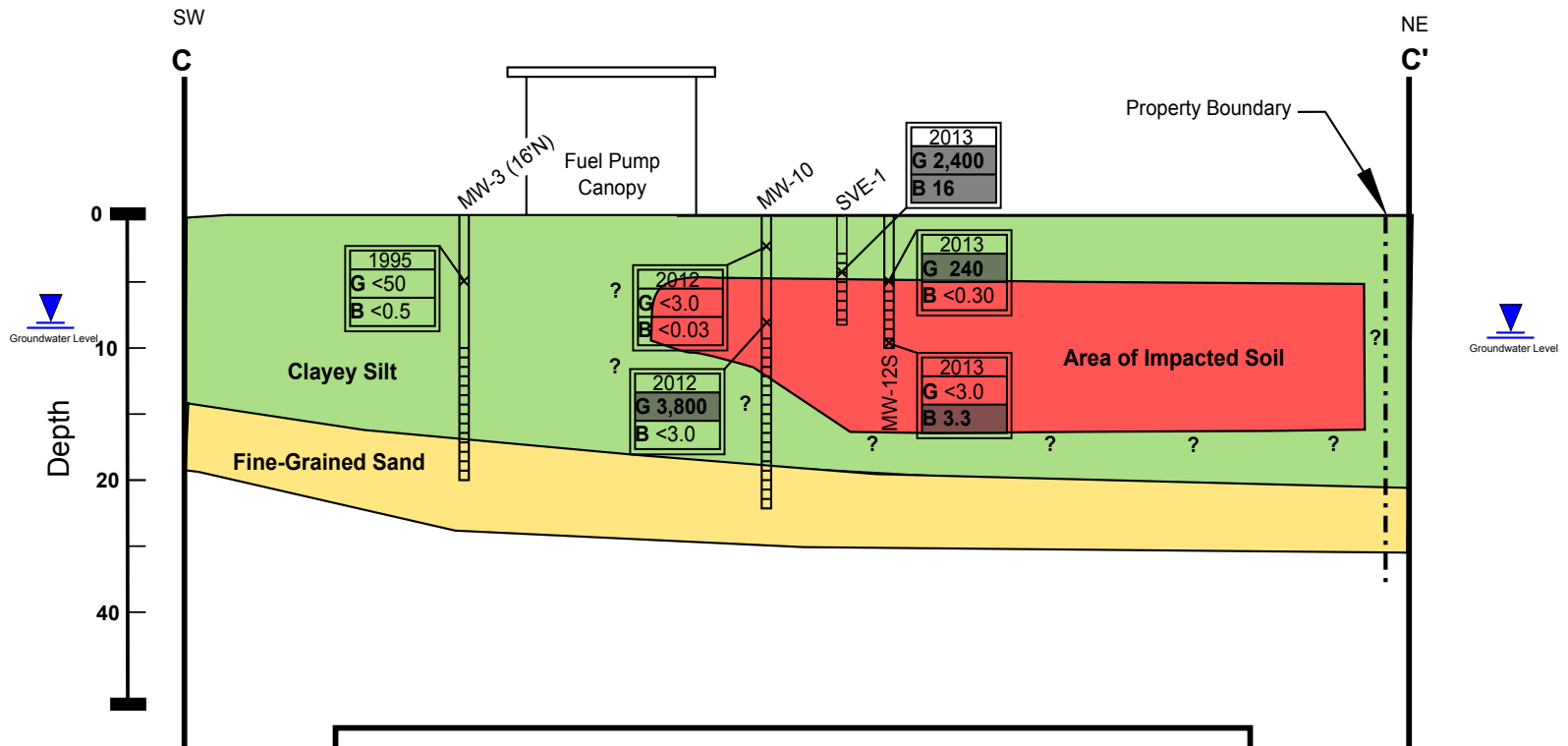
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Mercer Island Shell
 (Former BP)
 7833 SE 28th Street
 Mercer Island, Washington

FIGURE 7
 GENERALIZED SCHEMATIC
 CROSS-SECTION
 B - B'



LEGEND



Screened Interval

x = Soil Sample Location

Soil Sample Laboratory Results

2014
G <3.0
B <0.03

-Gasoline-Range Organics (GRO) Concentration in soil in Milligrams per Kilogram (mg/kg)
 -Benzene Concentration in soil in mg/kg
 Bolded and shaded values exceed MTCA Method A Cleanup Levels

Not to Scale

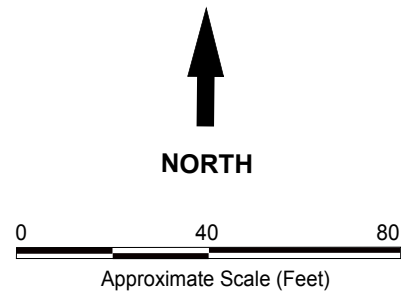
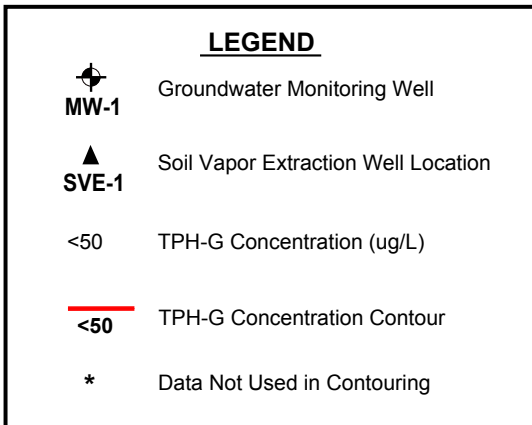
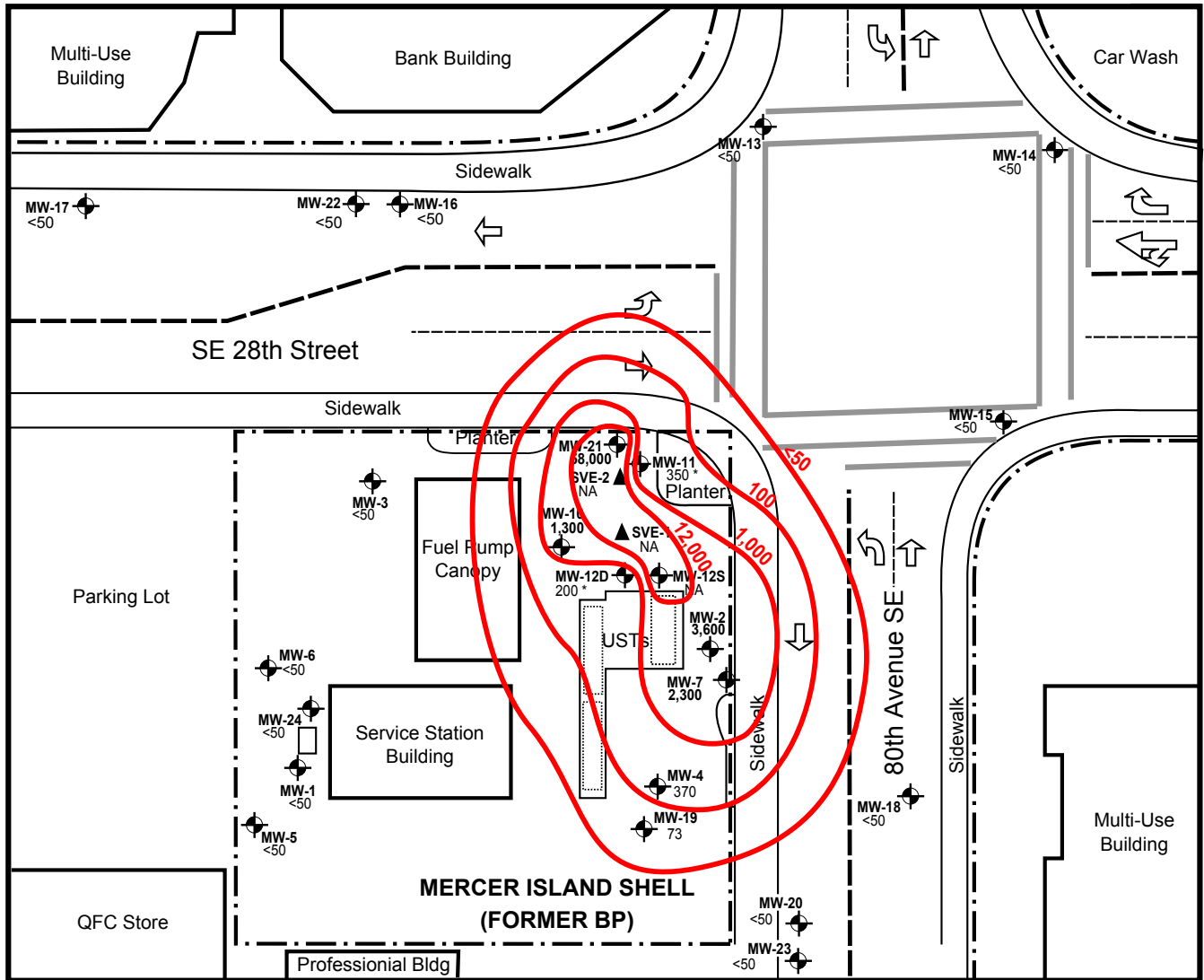
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Mercer Island Shell
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 7833 SE 28th Street
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FIGURE 8
 GENERALIZED SCHEMATIC
 CROSS-SECTION
 C - C'



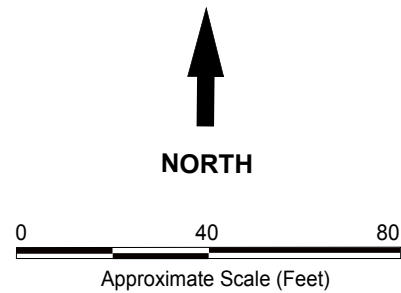
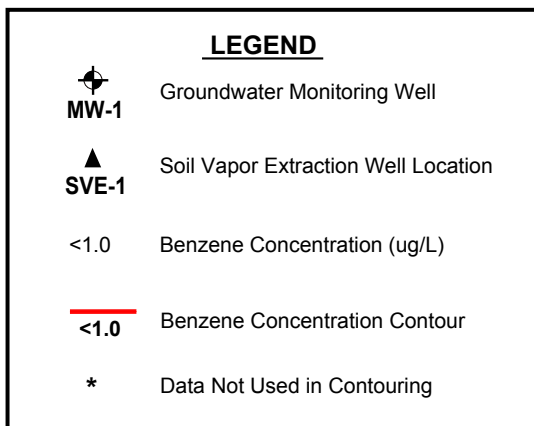
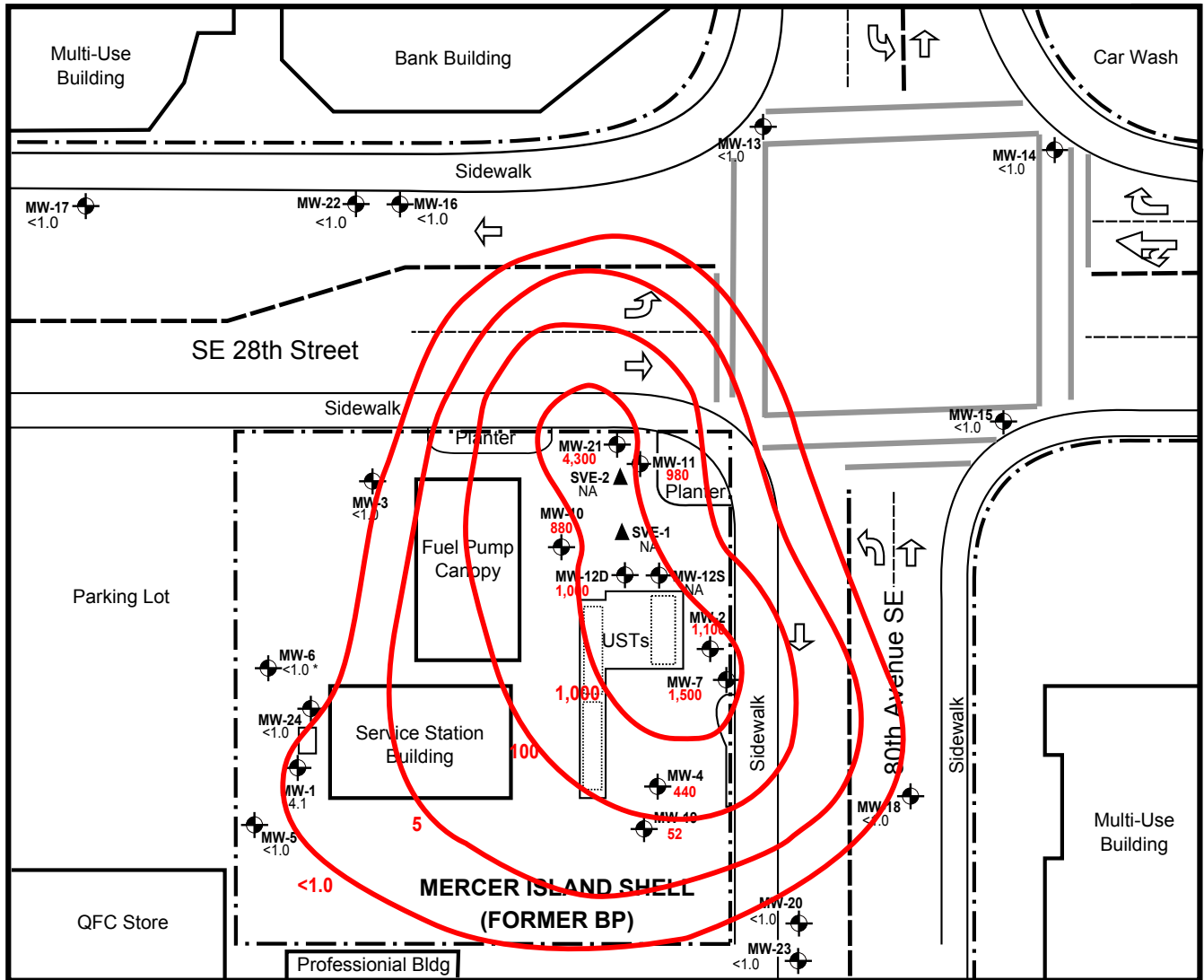
Dimensions and locations are approximate.

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Mercer Island Shell
 (Former BP)
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 Mercer Island, Washington

FIGURE 9
 TPH-G CONCENTRATION
 CONTOUR MAP
 FEBRUARY 2019



Dimensions and locations are approximate.

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Mercer Island Shell
 (Former BP)
 7833 SE 28th Street
 Mercer Island, Washington

FIGURE 10
 BENZENE CONCENTRATION
 CONTOUR MAP
 FEBRUARY 2019

Table 1
Historical Groundwater Monitoring Data
Mercer Island Shell
(Former BP)
7833 SE 28th Street
Mercer Island, Washington

Well ID	Sample Date	Depth to Water	Groundwater Elevation	TPH-G	TPH-D	TPH-O	Benzene	Toluene	Ethylbenzene	Total Xylenes	Total Lead	Dissolved Lead
MW-1	12/29/95	--	--	ND	--	--	ND	ND	ND	ND	ND	--
94.07	04/19/96	--	--	ND	--	--	ND	ND	ND	ND	--	--
	05/16/97	7.39	86.68	ND	--	--	ND	ND	ND	ND	--	--
	04/06/00	7.76	86.31	ND	--	--	ND	ND	ND	ND	--	--
	07/20/00	8.91	85.16	ND	--	--	ND	ND	ND	ND	--	--
	11/17/00	9.09	84.98	ND	--	--	ND	ND	ND	ND	--	--
	02/27/01	8.05	86.02	ND	--	--	ND	ND	ND	ND	--	--
	06/04/01	8.14	85.93	ND	--	--	ND	ND	ND	ND	--	--
	09/27/01	8.19	85.88	ND	--	--	ND	ND	ND	ND	--	--
	12/28/01	8.30	85.77	ND	--	--	ND	ND	ND	ND	--	--
	03/13/02	7.29	86.78	ND	--	--	ND	ND	ND	ND	--	--
	06/14/02	7.81	86.26	ND	--	--	ND	ND	ND	ND	--	--
	09/26/02	9.19	84.88	ND	--	--	ND	ND	ND	ND	--	--
	12/05/02	9.10	84.97	ND	--	--	ND	ND	ND	ND	--	--
	03/06/03	8.15	85.92	200	--	--	8	ND	2	8	--	--
	06/04/03	8.21	85.86	ND	--	--	ND	ND	ND	ND	--	--
	09/10/03	8.61	85.46	ND	--	--	ND	ND	ND	ND	--	--
	11/25/03	7.59	86.48	ND	--	--	ND	ND	ND	ND	--	--
	02/26/04	7.70	86.37	NS	--	--	NS	NS	NS	NS	--	--
	03/11/04	7.39	86.68	ND	--	--	ND	ND	ND	ND	--	--
	06/16/05	9.15	84.92	ND	--	--	ND	ND	ND	ND	--	--
	09/15/05	9.15	84.92	ND	--	--	ND	ND	ND	ND	--	--
	12/15/05	9.42	84.65	ND	--	--	ND	ND	ND	ND	--	--
	03/16/06	8.88	85.19	ND	--	--	ND	ND	ND	ND	--	--
	06/12/06	9.37	84.70	ND	--	--	ND	ND	ND	ND	--	--
	09/20/06	9.85	84.22	ND	--	--	ND	ND	ND	ND	--	--
	12/14/06	8.47	85.60	ND	--	--	ND	ND	ND	ND	--	--
	03/16/07	12.10	81.97	ND	--	--	ND	ND	ND	ND	--	--
	06/21/07	9.95	84.12	ND	--	--	ND	ND	ND	ND	--	--
	09/25/07	10.28	83.79	ND	--	--	ND	ND	ND	ND	--	--
	12/21/07	9.16	84.91	ND	--	--	ND	ND	ND	ND	--	--
	03/17/08	9.39	84.68	ND	--	--	ND	ND	ND	ND	--	--
	06/16/08	9.84	84.23	ND	--	--	ND	ND	ND	ND	--	--
	10/02/08	10.11	83.96	ND	--	--	ND	ND	ND	ND	--	--
	12/04/08	9.77	84.30	ND	--	--	ND	ND	ND	ND	--	--
	03/02/09	9.21	84.86	ND	--	--	ND	ND	ND	ND	--	--
	06/11/09	9.85	84.22	<50	--	--	<1	<1	<1	<3	--	--

Table 1
Historical Groundwater Monitoring Data
Mercer Island Shell
(Former BP)
7833 SE 28th Street
Mercer Island, Washington

Well ID	Sample Date	Depth to Water	Groundwater Elevation	TPH-G	TPH-D	TPH-O	Benzene	Toluene	Ethylbenzene	Total Xylenes	Total Lead	Dissolved Lead
MW-1	12/07/09	9.36	84.71	<50	--	--	<1.0	<1.0	<1.0	<3.0	--	--
(Continued)	03/02/10	9.54	84.53	<50	--	--	<1.0	<1.0	<1.0	<3.0	--	--
	09/26/11	10.37	83.70	54	--	--	9	<1.0	1.0	<3.0	<0.030	--
	12/14/11	10.17	83.90	120	--	--	47	1.7	6.2	7.0	--	--
	03/15/12	9.69	84.38	150	--	--	71	1.2	5.6	<3.0	--	--
	09/24/12	10.83	83.24	<50	--	--	3	<1.0	1.2	<3.0	<1.0	--
	12/06/02	8.65	85.42	92	--	--	31	2.9	4.7	5	<1.0	--
	03/07/13	8.76	85.31	86	--	--	61	1.2	4.1	<3.0	<1.0	--
	10/01/13	9.50	84.57	<50	--	--	<1.0	<1.0	<1.0	<3.0	--	--
	07/06/15	10.14	83.93	<50	--	--	4	<1.0	<1.0	<3.0	--	--
	01/13/16	9.11	84.96	--	--	--	--	--	--	--	--	--
	06/15/16	9.81	84.26	<50	<130	<250	5	<1.0	<1.0	<3.0	<1.0	<1.0
	09/21/16	9.11	84.96	--	--	--	--	--	--	--	--	--
	02/15/17	8.25	85.82	66	<130	<250	16	<1.0	2.3	<3.0	<1.0	<1.0
	10/24/17	10.09	83.98	<50	<130	<250	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0
	01/17/18	8.99	85.08	<50	<130	<250	10	<1.0	2.7	<3.0	--	--
	04/04/18	8.75	85.32	<50	<130	<250	5	<1.0	<1.0	<3.0	--	--
	07/24/18	10.34	83.75	--	--	--	--	--	--	--	--	--
	02/18/19	8.96	85.11	<50	160	<250	4.1	<1.0	<1.0	<3.0	<1.0	<1.0
	08/28/19	10.49	83.58	<50	130	<250	<1.0	<1.0	<1.0	<3.0	--	--
MW-2	12/29/95	--	--	15,000	--	--	6,300	140	340	34	ND	--
90.97	04/19/96	--	--	10,000	--	--	1,500	400	1,700	1,500	--	--
	05/16/97	5.47	85.50	8,700	--	--	11,400	116	1,410	1,240	--	--
	04/06/00	5.49	85.48	4,700	--	--	4,400	ND	990	110	--	--
	07/20/00	7.37	83.60	3,800	--	--	3,100	ND	760	100	--	--
	11/17/00	7.23	83.74	2,500	--	--	4,000	10	290	90	--	--
	02/27/01	6.47	84.50	2,800	--	--	2,300	20	89	190	--	--
	06/04/01	5.24	85.73	3,400	--	--	2,400	240	140	310	--	--
	09/27/01	7.08	83.89	2,400	--	--	2,900	10	94	79	--	--
	12/28/01	7.43	83.54	3,800	--	--	2,000	38	100	250	--	--
	03/13/02	7.93	83.04	3,800	--	--	2,700	36	780	460	--	--
	06/14/02	5.70	85.27	1,500	--	--	2,600	11	30	87	--	--
	09/26/02	6.18	84.79	2,200	--	--	2,700	7	55	50	--	--
	12/05/02	5.64	85.33	3,000	--	--	1,500	14	130	190	--	--
	03/06/03	7.53	83.44	2,300	--	--	2,000	6	36	120	--	--
	06/04/03	5.45	85.52	3,200	--	--	1,200	40	140	230	--	--
	06/18/03	NM	--	4,650	--	--	2,010	16	12	75	--	--
	07/01/03	NM	--	6,400	--	--	490	110	150	820	--	--
	07/02/03	NM	--	1,200	--	--	1,600	13	5	49	--	--
	09/10/03	6.64	84.32	1,400	--	--	2,000	6	7	19	--	--

Table 1
Historical Groundwater Monitoring Data
Mercer Island Shell
(Former BP)
7833 SE 28th Street
Mercer Island, Washington

Well ID	Sample Date	Depth to Water	Groundwater Elevation	TPH-G	TPH-D	TPH-O	Benzene	Toluene	Ethylbenzene	Total Xylenes	Total Lead	Dissolved Lead
MW-2	11/25/03	4.98	85.99	35,000	--	--	8,900	9,400	670	2,700	--	--
(Continued)	02/26/04	4.52	86.45	24,000	--	--	1,700	2,700	410	2,600	--	--
	03/11/04	4.60	86.39	37,000	--	--	2,100	3,600	1,100	5,200	--	--
	06/16/05	5.32	85.65	2,700	--	--	1,700	24	50	120	--	--
	09/15/05	6.38	84.59	5,200	--	--	640	110	120	420	--	--
	12/15/05	6.03	84.94	2,800	--	--	1,200	22	81	130	--	--
	03/16/06	3.58	87.39	50,000	--	--	3,500	400	1,400	5,800	--	--
	06/12/06	5.49	85.48	7,600	--	--	1,200	500	200	950	--	--
	09/20/06	6.43	84.54	3,500	--	--	1,900	13	34	330	--	--
	12/14/06	4.71	86.26	3,100	--	--	880	ND	31	300	--	--
	03/16/07	8.05	82.92	3,500	--	--	270	ND	42	270	--	--
	06/21/07	9.60	81.37	920	--	--	1,600	ND	24	89	--	--
	09/25/07	7.31	83.66	3,200	--	--	460	110	12	280	--	--
	12/21/07	4.78	86.19	1,900	--	--	380	ND	10	53	--	--
	03/17/08	5.61	85.36	1,700	--	--	1,100	5	18	22	--	--
	06/16/08	7.20	83.77	390	--	--	1,300	2	5	20	--	--
	10/02/08	7.40	83.57	1,300	--	--	490	3	8	40	--	--
	12/04/08	6.28	84.69	1,200	--	--	890	3	11	16	--	--
	03/02/09	5.85	85.12	1,800	--	--	530	4	26	60	--	--
	06/11/09	6.74	84.23	840	--	--	580	2	14	12	--	--
	09/21/09	7.69	83.28	910	--	--	120	2.1	26	110	--	--
	12/07/09	6.14	84.83	1,100	--	--	140	3.1	17	97	--	--
	03/02/10	5.85	85.12	840	--	--	200	1.5	22	31	--	--
	09/26/11	1.39	83.58	1,500	--	--	740	20	35	40	7.6	--
	12/14/11	6.60	84.37	1,800	--	--	620	9.9	41	41	--	--
	03/15/12	8.30	82.67	2,600	--	--	760	14	44	39	--	--
	09/25/12	7.35	83.62	2,000	--	--	900	17	14	23	<1.0	--
	12/06/12	6.05	84.92	1,600	--	--	570	7.3	17	20	<1.0	--
	03/08/13	5.10	85.87	2,500	--	--	840	16	50	52	<1.0	--
	10/02/13	6.04	84.93	2,100	--	--	540	6.9	20	30	--	--
	07/06/15	6.65	84.32	1,700	--	--	540	20	14	<30	--	--
	01/13/16	5.10	85.87	--	--	--	--	--	--	--	--	--
	06/16/16	5.97	85.00	2,000	900	<250	940	72	63	46	<1.0	<1.0
	09/21/16	5.10	85.87	--	--	--	--	--	--	--	--	--
	02/15/17	4.62	86.35	4,300	880	<250	690	28	55	120	<1.0	<1.0
	10/24/17	6.52	84.45	3,300	860	340	720	19	18	43	<1.0	<1.0
	01/17/18	4.91	86.06	--	--	--	--	--	--	--	--	--
	04/06/18	5.11	85.86	3,700	1,300	330	1,000	140	90	73	--	--
	07/24/18	6.75	84.22	--	--	--	--	--	--	--	--	--
	02/18/19	4.93	86.04	3,600	1,600	400	1,100	93	79	110	<1.0	<1.0
	08/27/19	6.91	84.06	NS	NS	NS	NS	NS	NS	NS	NS	NS

Table 1
Historical Groundwater Monitoring Data
Mercer Island Shell
(Former BP)
7833 SE 28th Street
Mercer Island, Washington

Well ID	Sample Date	Depth to Water	Groundwater Elevation	TPH-G	TPH-D	TPH-O	Benzene	Toluene	Ethylbenzene	Total Xylenes	Total Lead	Dissolved Lead
MW-3	04/19/96	--	--	ND	--	--	ND	ND	ND	ND	--	--
92.74	05/16/97	4.56	88.18	ND	--	--	ND	ND	ND	ND	--	--
	04/06/00	4.88	87.86	ND	--	--	ND	ND	ND	ND	--	--
	07/20/00	10.90	81.84	ND	--	--	ND	ND	ND	ND	--	--
	11/17/00	11.13	81.61	ND	--	--	ND	ND	ND	ND	--	--
	02/27/01	11.17	81.57	ND	--	--	ND	ND	ND	ND	--	--
	06/04/01	11.05	81.69	ND	--	--	ND	ND	ND	ND	--	--
	09/27/01	12.29	80.45	ND	--	--	ND	ND	ND	ND	--	--
	12/28/01	11.12	81.62	ND	--	--	ND	ND	ND	ND	--	--
	03/13/02	11.05	81.69	ND	--	--	ND	ND	ND	ND	--	--
	06/14/02	11.17	81.57	ND	--	--	ND	ND	ND	ND	--	--
	09/26/02	10.74	82.00	ND	--	--	ND	ND	ND	ND	--	--
	03/06/03	11.02	81.72	ND	--	--	ND	ND	ND	ND	--	--
	06/04/03	7.27	85.47	ND	--	--	ND	ND	ND	ND	--	--
	09/10/03	5.72	87.02	ND	--	--	ND	ND	ND	ND	--	--
	11/25/03	4.66	88.08	ND	--	--	ND	ND	ND	ND	--	--
	02/26/04	4.55	88.19	ND	--	--	ND	ND	ND	ND	--	--
	03/11/04	4.48	88.26	ND	--	--	ND	ND	ND	ND	--	--
	06/16/05	5.45	87.29	ND	--	--	ND	ND	ND	ND	--	--
	09/15/05	6.51	86.23	ND	--	--	ND	ND	ND	ND	--	--
	12/15/05	6.01	86.73	ND	--	--	ND	ND	ND	ND	--	--
	03/16/06	4.98	87.76	ND	--	--	ND	ND	ND	ND	--	--
	06/12/06	7.50	85.24	ND	--	--	ND	ND	ND	ND	--	--
	09/20/06	9.66	83.08	ND	--	--	ND	ND	ND	ND	--	--
	12/14/06	10.49	82.24	ND	--	--	ND	ND	ND	ND	--	--
	03/16/07	8.70	84.04	ND	--	--	ND	ND	ND	ND	--	--
	06/21/07	6.59	86.15	ND	--	--	ND	ND	ND	ND	--	--
	09/25/07	7.85	84.89	ND	--	--	ND	ND	ND	ND	--	--
	12/21/07	5.76	86.98	ND	--	--	ND	ND	ND	ND	--	--
	03/17/08	5.72	87.02	ND	--	--	ND	ND	ND	ND	--	--
	06/16/08	6.20	86.54	ND	--	--	ND	ND	ND	ND	--	--
	10/02/08	7.92	84.82	ND	--	--	ND	ND	ND	ND	--	--
	12/04/08	7.09	85.65	ND	--	--	ND	ND	ND	ND	--	--
	03/02/09	6.68	86.06	ND	--	--	ND	ND	ND	ND	--	--
	06/11/09	6.29	86.45	<50	--	--	<1	<1	<1	<3	--	--
	09/21/09	7.44	85.30	<50	--	--	<1.0	<1.0	<1.0	<3.0	--	--
	12/07/09	7.68	85.06	<50	--	--	<1.0	<1.0	<1.0	<3.0	--	--
	03/02/10	7.90	84.84	<50	--	--	<1.0	<1.0	<1.0	<3.0	--	--
	09/26/11	9.21	83.53	<50	--	--	<1.0	<1.0	<1.0	<3.0	0.30	--
	12/14/11	8.45	84.29	<50	--	--	<1.0	<1.0	<1.0	<3.0	--	--

Table 1
Historical Groundwater Monitoring Data
Mercer Island Shell
(Former BP)
7833 SE 28th Street
Mercer Island, Washington

Well ID	Sample Date	Depth to Water	Groundwater Elevation	TPH-G	TPH-D	TPH-O	Benzene	Toluene	Ethylbenzene	Total Xylenes	Total Lead	Dissolved Lead
MW-3	03/15/12	4.76	87.98	<50	--	--	<1.0	<1.0	<1.0	<3.0	--	--
(Continued)	09/24/12	8.07	84.67	<50	--	--	<1.0	<1.0	<1.0	<3.0	<1.0	--
	12/06/12	5.96	86.78	<50	--	--	<1.0	<1.0	<1.0	<3.0	<1.0	--
	03/07/13	6.31	86.43	<50	--	--	<1.0	<1.0	<1.0	<3.0	<1.0	--
	10/01/13	7.04	85.70	<50	--	--	<1.0	<1.0	<1.0	<3.0	--	--
	07/06/15	7.39	85.35	<50	--	--	<1.0	<1.0	<1.0	<3.0	--	--
	01/13/16	5.26	87.48	--	--	--	--	--	--	--	--	--
	06/15/16	5.70	87.04	<50	<130	<250	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0
	09/21/16	5.26	87.48	--	--	--	--	--	--	--	--	--
	02/16/17	4.98	87.76	<50	<130	<250	3.5	<1.0	<1.0	<3.0	<1.0	<1.0
	10/24/17	7.46	85.28	<50	<130	<250	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0
	01/17/18	NM	--	--	--	--	--	--	--	--	--	--
	04/04/18	6.30	86.44	<50	<130	<250	<1.0	<1.0	<1.0	<3.0	--	--
	07/24/18	6.54	86.20	<50	<130	<250	<1.0	<1.0	<1.0	<3.0	--	--
	02/18/19	5.96	86.78	<50	<130	<250	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0
	08/28/19	7.71	85.03	<50	<130	<250	<1.0	<1.0	<1.0	<3.0	--	--
MW-4	04/19/96	--	--	34,000	--	--	7,000	1,800	1,800	5,100	--	--
92.27	05/16/97	4.12	88.15	11,300	--	--	3,800	26	432	1,490	--	--
	04/06/00	4.17	88.10	7,500	--	--	2,000	25	130	110	--	--
	07/20/00	4.48	87.79	1,600	--	--	2,500	82	670	1,900	--	--
	11/17/00	4.63	87.64	8,700	--	--	2,200	20	210	130	--	--
	02/27/00	4.52	87.75	13,000	--	--	850	ND	290	1,200	--	--
	06/04/01	3.37	88.90	2,800	--	--	490	60	490	3,100	--	--
	09/27/01	5.82	86.45	33,000	--	--	250	20	550	1,800	--	--
	12/28/01	3.75	88.52	22,000	--	--	490	56	300	790	--	--
	03/13/02	4.55	87.72	24,000	--	--	460	57	440	1,400	--	--
	06/14/02	7.88	87.39	23,000	--	--	270	13	310	800	--	--
	09/26/02	5.37	86.90	20,000	--	--	150	9	100	300	--	--
	12/05/02	4.91	87.36	16,000	--	--	590	27	220	440	--	--
	03/06/03	3.92	88.35	7,700	--	--	650	15	130	180	--	--
	06/04/03	4.71	87.56	10,000	--	--	840	26	290	270	--	--
	06/18/03	NM	--	76,900	--	--	2,310	8,290	3,900	19,800	--	--
	07/01/03	NM	--	70,000	--	--	1,000	2,900	1,700	9,000	--	--
	07/02/03	NM	--	97,000	--	--	1,700	4,800	2,900	14,000	--	--
	09/10/03	7.47	84.88	NS	--	--	NS	NS	NS	NS	--	--
	11/25/03	4.05	88.23	NS	--	--	NS	NS	NS	NS	--	--
	02/26/04	4.40	87.87	NS	--	--	NS	NS	NS	NS	--	--
	03/11/04	3.74	88.54	NS	--	--	NS	NS	NS	NS	--	--
	06/16/05	4.00	88.27	52,000	--	--	3,400	300	6,200	6,200	--	--

Table 1
Historical Groundwater Monitoring Data
Mercer Island Shell
(Former BP)
7833 SE 28th Street
Mercer Island, Washington

Well ID	Sample Date	Depth to Water	Groundwater Elevation	TPH-G	TPH-D	TPH-O	Benzene	Toluene	Ethylbenzene	Total Xylenes	Total Lead	Dissolved Lead
MW-4	09/15/05	5.41	86.86	27,000	--	--	3,900	120	1,300	1,300	--	--
(Continued)	12/15/05	4.26	88.01	38,000	--	--	4,200	100	1,500	2,200	--	--
	03/16/06	6.62	85.65	5,800	--	--	450	36	160	610	--	--
	06/12/06	5.21	87.06	18,000	--	--	3,600	130	1,400	900	--	--
	09/26/06	5.61	86.66	22,000	--	--	2,600	54	770	610	--	--
	12/14/06	2.99	89.28	41,000	--	--	1,100	190	910	2,800	--	--
	03/16/07	6.79	85.48	37,000	--	--	2,500	550	1,200	2,900	--	--
	06/21/07	5.10	87.17	41,000	--	--	2,300	400	1,500	3,000	--	--
	09/25/07	7.03	85.24	8,600	--	--	870	42	410	270	--	--
	12/21/07	4.05	88.22	160	--	--	ND	ND	ND	ND	--	--
	03/17/08	4.08	88.19	4,700	--	--	53	8	47	35	--	--
	06/16/08	7.30	84.97	7,700	--	--	670	30	400	190	--	--
	10/02/08	7.13	85.14	Not sampled due to sediment								--
	12/04/08	7.41	84.86	6,000	--	--	950	25	220	68	--	--
	03/02/09	5.97	86.30	5,200	--	--	1,200	16	110	41	--	--
	06/11/09	6.40	85.87	4,500	--	--	1,300	200	170	66	--	--
	09/21/09	6.49	85.78	3,100	--	--	890	10	91	<15	--	--
	12/07/09	6.06	86.21	2,900	--	--	920	7.4	98	17	--	--
	03/02/09	4.64	87.63	610	--	--	38	<1.0	10	<3.0	--	--
	09/26/11	1.83	90.44	<50	--	--	<1.0	<1.0	<1.0	<3.0	<0.30	--
	12/14/11	5.13	87.14	250	--	--	130	<1.0	<1.0	<3.0	--	--
	03/15/12	5.12	87.15	370	--	--	29	1.5	1	<3.0	--	--
	09/25/12	6.72	85.55	1,100	--	--	340	25	7	15	<1.0	--
	12/06/12	4.44	87.83	780	--	--	190	13	14	49	2.4	--
	03/08/13	4.21	88.06	510	--	--	120	12	13	25	1.7	--
	10/02/13	5.46	86.81	2,300	--	--	630	65	17	67	--	--
	07/06/15	5.36	86.91	1,300	--	--	530	180	17	78	--	--
	01/13/16	4.56	87.71	--	--	--	--	--	--	--	--	--
	06/15/16	4.89	97.38	1,300	390	<250	580	56	19	130	<1.0	<1.0
	09/21/16	4.56	87.71	--	--	--	--	--	--	--	--	--
	02/16/17	4.01	88.26	530	250	270	230	23	11	46	<1.0	<1.0
	10/24/17	5.35	86.92	1,500	560	280	710	71	26	120	1.2	<1.0
	01/17/18	4.06	88.21	--	--	--	--	--	--	--	--	--
	04/05/18	4.16	88.11	1,800	460	290	1,000	270	29	130	--	--
	07/24/18	5.96	86.31	--	--	--	--	--	--	--	--	--
	02/18/19	3.01	89.26	370	540	530	440	37	8.4	35	<1.0	<1.0
	08/27/19	6.19	86.08	NS	NS	NS	NS	NS	NS	NS	NS	NS
MW-5	09/24/12	11.05	83.21	<50	--	--	<1.0	<1.0	<1.0	<3.0	<1.0	--
94.26	12/06/12	9.08	85.18	140	--	--	42	<1.0	<1.0	12	<1.0	--
	03/07/13	8.93	85.33	55	--	--	21	<1.0	<1.0	<3.0	<1.0	--

Table 1
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Mercer Island Shell
(Former BP)
7833 SE 28th Street
Mercer Island, Washington

Well ID	Sample Date	Depth to Water	Groundwater Elevation	TPH-G	TPH-D	TPH-O	Benzene	Toluene	Ethylbenzene	Total Xylenes	Total Lead	Dissolved Lead
MW-5	10/01/13	9.76	84.50	53	--	--	9	<1.0	<1.0	<3.0	--	--
(Continued)	07/06/15	10.38	83.88	<50	--	--	2	<1.0	<1.0	<3.0	--	--
	01/13/16	9.02	85.24	--	--	--	--	--	--	--	--	--
	06/15/16	9.95	84.31	<50	<130	<250	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0
	09/21/16	9.02	85.24	--	--	--	--	--	--	--	--	--
	02/15/17	8.65	85.61	<50	<130	<250	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0
	10/24/17	10.29	83.97	<50	<130	<250	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0
	01/17/18	8.85	85.41	<50	150	<250	<1.0	<1.0	<1.0	<3.0	--	--
	04/03/18	9.05	85.21	<50	<150	<250	<1.0	<1.0	<1.0	<3.0	--	--
	07/24/18	10.59	83.67	<50	<150	<250	<1.0	<1.0	<1.0	<3.0	--	--
	02/18/19	8.83	85.43	<50	<130	<250	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0
	08/28/19	10.71	83.55	<50	<130	<250	<1.0	<1.0	<1.0	<3.0	--	--
MW-6	09/24/12	11.09	82.46	<50	--	--	<1.0	<1.0	<1.0	<3.0	<1.0	--
93.55	12/06/12	9.38	84.17	<50	--	--	<1.0	<1.0	<1.0	<3.0	<1.0	--
	03/07/13	9.51	84.04	<50	--	--	<1.0	<1.0	<1.0	<3.0	1.3	--
	10/01/13	10.13	83.42	<50	--	--	<1.0	<1.0	<1.0	<3.0	--	--
	07/06/15	10.49	83.06	<50	--	--	<1.0	<1.0	<1.0	<3.0	--	--
	01/13/16	9.45	84.10	--	--	--	--	--	--	--	--	--
	06/15/16	10.09	83.46	<50	<130	<250	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0
	09/21/16	9.45	84.10	--	--	--	--	--	--	--	--	--
	02/14/17	9.11	84.44	<50	<130	<250	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0
	10/24/17	10.69	82.86	<50	<130	<250	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0
	01/17/18	9.30	84.25	<50	<130	<250	<1.0	<1.0	<1.0	<3.0	--	--
	04/04/18	9.52	84.03	<50	<130	<250	<1.0	<1.0	<1.0	<3.0	--	--
	07/24/18	10.79	82.76	<50	<130	<250	<1.0	<1.0	<1.0	<3.0	--	--
	02/18/19	9.28	84.27	<50	<130	<250	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0
	08/28/19	10.95	82.60	<50	<130	<250	<1.0	<1.0	<1.0	<3.0	--	--
MW-7	09/25/12	8.24	83.30	410	--	--	2,100	4.9	4.3	13	<1.0	--
91.54	12/06/12	6.09	85.45	800	--	--	1,700	6	12	18	<1.0	--
	03/08/13	6.21	85.33	1,200	--	--	1,700	7.3	17	21	<1.0	--
	10/02/13	6.88	84.66	1,200	--	--	1,500	6.7	13	16	--	--
	07/06/15	7.53	84.01	1,200	--	--	1,400	15	12	24	--	--
	01/13/16	6.09	85.45	--	--	--	--	--	--	--	--	--
	06/15/16	6.95	84.59	2,000	660	<250	1,400	30	24	39	<1.0	<1.0
	09/21/16	6.09	85.45	--	--	--	--	--	--	--	--	--
	02/16/17	5.94	85.60	2,600	680	<250	1,600	19	20	42	<1.0	<1.0
	10/24/17	7.43	84.11	3,900	640	<250	1,000	23	20	56	<1.0	<1.0
	01/17/18	5.98	85.56	--	--	--	--	--	--	--	--	--
	04/06/18	6.20	85.34	2,700	1,100	<250	1,200	48	26	<3.0	--	--
	07/24/18	7.71	83.83	--	--	--	--	--	--	--	--	--

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(Former BP)
7833 SE 28th Street
Mercer Island, Washington

Well ID	Sample Date	Depth to Water	Groundwater Elevation	TPH-G	TPH-D	TPH-O	Benzene	Toluene	Ethylbenzene	Total Xylenes	Total Lead	Dissolved Lead
MW-7	02/18/19	5.92	85.62	2,300	1,100	270	1,500	37	25	47	<1.0	<1.0
(Continued)	08/27/19	7.80	83.74	NS	NS	NS	NS	NS	NS	NS	NS	NS
MW-10	09/25/12	8.87	83.26	1,000	--	--	300	68	39	120	<1.0	--
92.13	12/06/12	6.75	85.38	370	--	--	320	7.9	42	16	<1.0	--
	03/08/13	6.90	85.23	830	--	--	530	9.0	110	30	<1.0	--
	10/01/13	7.58	84.55	840	--	--	540	5.0	80	35	--	--
	07/06/15	8.19	83.94	2,200	--	--	950	80	160	290	--	--
	01/13/16	6.93	85.20	--	--	--	--	--	--	--	--	--
	06/16/16	7.16	84.97	2,100	<130	<250	820	24	120	190	<1.0	<1.0
	09/21/16	6.93	85.20	--	--	--	--	--	--	--	--	--
	02/16/17	6.39	85.74	2,100	210	<250	930	14	110	87	<1.0	<1.0
	10/24/17	8.26	83.87	1,800	210	<250	920	9.7	92	27	<1.0	<1.0
	01/17/18	6.90	85.23	--	--	--	--	--	--	--	--	--
	04/06/18	6.84	85.29	1,600	410	<250	880	9.2	89	38	--	--
	07/24/18	8.38	83.75	--	--	--	--	--	--	--	--	--
	02/18/19	6.43	85.70	1,300	450	<250	880	4.4	56	21	<1.0	<1.0
	08/27/19	8.49	83.64	NS	NS	NS	NS	NS	NS	NS	NS	NS
MW-11	09/25/12	8.70	82.93	270	--	--	530	11	6.3	27	<1.0	--
91.63	12/06/12	6.18	85.45	190	--	--	1,500	1.8	26	5.6	<1.0	--
	03/08/13	6.90	84.73	930	--	--	1,900	5.8	110	110	<1.0	--
	10/01/13	7.53	84.10	410	--	--	1,600	2.8	42	21	--	--
	07/06/15	8.14	83.49	460	--	--	1,600	3.4	38	60	--	--
	01/13/16	6.90	84.73	--	--	--	--	--	--	--	--	--
	06/16/16	7.68	83.95	620	<130	<250	1,600	3.0	18	59	<1.0	<1.0
	09/21/16	6.90	84.73	--	--	--	--	--	--	--	--	--
	02/16/17	6.45	85.18	300	<130	<250	1,300	1.0	1.9	5.2	<1.0	<1.0
	10/24/17	8.19	83.44	190	<130	<250	980	<5.0	<5.0	<15	<1.0	<1.0
	01/17/18	6.92	84.71	--	--	--	--	--	--	--	--	--
	04/05/18	6.73	84.90	380	330	<250	1,100	1.7	3.3	11	--	--
	07/24/18	8.24	83.39	--	--	--	--	--	--	--	--	--
	02/18/19	6.63	85.00	350	480	<250	980	7.8	4.1	11	<1.0	<1.0
	08/27/19	8.30	83.33	NS	NS	NS	NS	NS	NS	NS	NS	NS
MW-12S	09/03/13	6.49	85.17	1,300	--	--	650	3	18	110	--	--
91.66	10/01/13	6.06	85.60	4,600	--	--	630	<10	170	410	--	--
	07/06/15	5.60	86.06	7,600	--	--	540	41	580	310	--	--
	01/13/16	4.56	87.10	--	--	--	--	--	--	--	--	--
	06/16/16	4.93	86.73	10,000	1,400	270	750	100	540	270	1.2	1.9
	09/21/16	4.56	87.10	--	--	--	--	--	--	--	--	--
	02/16/17	4.33	87.33	Not sampled due to heavy hydrocarbon sheen								
	10/24/17	6.31	85.35	12,000	1,100	<250	960	61	470	200	<1.0	<1.0

Table 1
Historical Groundwater Monitoring Data
Mercer Island Shell
(Former BP)
7833 SE 28th Street
Mercer Island, Washington

Well ID	Sample Date	Depth to Water	Groundwater Elevation	TPH-G	TPH-D	TPH-O	Benzene	Toluene	Ethylbenzene	Total Xylenes	Total Lead	Dissolved Lead
MW-12S (Continued)	01/17/18	4.33	87.33	--	--	--	--	--	--	--	--	--
	04/03/18	4.21	87.45	--	--	--	--	--	--	--	--	--
	07/24/18	5.82	85.84	--	--	--	--	--	--	--	--	--
	02/18/19	3.62	88.04	Not sampled due to heavy hydrocarbon sheen								
	08/27/19	6.10	85.56	NS	NS	NS	NS	NS	NS	NS	NS	NS
MW-12D	09/03/13	7.96	83.67	90	--	--	1,500	2.3	1.2	<3.0	--	--
91.63	10/01/13	7.10	84.53	65	--	--	1,400	2.0	<1.0	<3.0	--	--
	07/06/15	7.72	83.91	120	--	--	1,200	2.5	<1.0	3.3	--	--
	01/13/16	6.44	85.19	--	--	--	--	--	--	--	--	--
	06/16/16	7.19	84.44	110	140	<250	980	2.0	1.3	<3.0	<1.0	<1.0
	09/21/16	6.44	85.19	--	--	--	--	--	--	--	--	--
	02/16/17	6.00	85.63	220	180	<250	1,200	1.5	<1.0	4.4	<1.0	<1.0
	10/24/17	7.62	84.01	72	160	<250	550	<5.0	<5.0	<15	<1.0	<1.0
	01/17/18	6.18	85.45	--	--	--	--	--	--	--	--	--
	04/06/18	6.40	85.23	290	870	<250	980	1.8	<1.0	5.5	--	--
	07/24/18	7.90	83.73	--	--	--	--	--	--	--	--	--
	02/18/19	6.17	85.46	200	850	<250	1,000	2.0	<1.0	5.0	<1.0	<1.0
08/27/19	6.85	84.78	NS	NS	NS	NS	NS	NS	NS	NS	NS	
MW-13	01/13/16	5.56	84.75	<50	<130	<250	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0
90.31	06/14/16	6.01	84.30	<50	<130	<250	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0
	09/21/16	5.56	84.75	--	--	--	--	--	--	--	--	--
	02/15/17	5.12	85.19	<50	<130	<250	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0
	10/24/17	6.40	83.91	<50	<130	<250	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0
	01/17/18	5.40	84.91	<50	<130	<250	<1.0	<1.0	<1.0	<3.0	--	--
	04/04/18	5.67	84.64	<50	<130	<250	<1.0	<1.0	<1.0	<3.0	--	--
	07/24/18	6.48	83.83	<50	<130	<250	<1.0	<1.0	<1.0	<3.0	--	--
	02/18/19	5.25	85.06	<50	<130	<250	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0
	08/29/19	6.68	83.63	<50	<130	<250	<1.0	<1.0	<1.0	<3.0	--	--
MW-14	01/13/16	7.55	83.87	<50	<130	<250	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0
91.42	06/14/16	6.15	85.27	<50	<130	<250	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0
	09/21/16	7.55	83.87	--	--	--	--	--	--	--	--	--
	02/15/17	7.03	84.39	<50	<130	<250	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0
	10/24/17	8.10	83.32	<50	<130	<250	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0
	04/05/18	7.53	83.89	<50	<130	<250	<1.0	<1.0	<1.0	<3.0	--	--
	07/24/18	8.79	82.63	<50	<130	<250	<1.0	<1.0	<1.0	<3.0	--	--
	02/18/19	6.91	84.51	<50	<130	<250	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0
	08/29/19	8.71	82.71	<50	<130	<250	<1.0	<1.0	<1.0	<3.0	--	--
MW-15	01/17/18	7.08	84.34	<50	<130	<250	<1.0	<1.0	<1.0	<3.0	--	--
90.62	01/13/16	4.96	85.66	<50	<130	<250	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0
	06/14/16	6.19	84.43	<50	160	<250	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0

Table 1
Historical Groundwater Monitoring Data
Mercer Island Shell
(Former BP)
7833 SE 28th Street
Mercer Island, Washington

Well ID	Sample Date	Depth to Water	Groundwater Elevation	TPH-G	TPH-D	TPH-O	Benzene	Toluene	Ethylbenzene	Total Xylenes	Total Lead	Dissolved Lead
MW-15	09/21/16	4.96	85.66	--	--	--	--	--	--	--	--	--
(Continued)	02/15/17	4.91	85.71	<50	150	<250	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0
	10/24/17	6.28	84.34	<50	<130	<250	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0
	01/17/18	4.72	85.90	<50	<130	<250	<1.0	<1.0	<1.0	<3.0	--	--
	04/05/18	5.04	85.58	<50	<130	<250	<1.0	<1.0	<1.0	<3.0	--	--
	07/24/18	7.02	83.60	<50	<130	<250	<1.0	<1.0	<1.0	<3.0	--	--
	02/18/19	4.58	86.04	<50	<130	<250	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0
	08/29/19	5.79	84.83	<50	<130	<250	<1.0	<1.0	<1.0	<3.0	--	--
MW-16	09/21/16	9.74	82.65	<50	<130	<250	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0
92.39	02/15/17	7.43	84.96	<50	<130	<250	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0
	10/24/17	9.73	82.66	<50	<130	<250	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0
	01/17/18	7.76	84.63	<50	<130	<250	<1.0	<1.0	<1.0	<3.0	--	--
	04/04/18	7.82	84.57	<50	220	300	<1.0	<1.0	<1.0	<3.0	--	--
	07/24/18	8.83	83.56	<50	<130	<250	<1.0	<1.0	<1.0	<3.0	--	--
	02/18/19	8.30	84.09	<50	240	330	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0
	08/29/19	8.94	83.45	<50	150	<250	<1.0	<1.0	<1.0	<3.0	--	--
MW-17	09/21/16	8.89	84.95	<50	<130	<250	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0
93.84	02/14/17	7.61	86.23	<50	<130	<250	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0
	10/24/17	7.88	85.96	<50	<130	<250	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0
	01/17/18	7.62	86.22	<50	<130	<250	<1.0	<1.0	<1.0	<3.0	--	--
	04/04/18	8.22	85.62	<50	<130	<250	<1.0	<1.0	<1.0	<3.0	--	--
	07/24/18	8.85	84.99	<50	<130	<250	<1.0	<1.0	<1.0	<3.0	--	--
	12/18/19	7.42	86.42	<50	<130	<250	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0
	08/29/19	8.68	85.16	<50	<130	<250	<1.0	<1.0	<1.0	<3.0	--	--
MW-18	09/21/16	8.62	82.75	<50	<130	<250	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0
91.37	02/15/17	5.13	86.24	<50	140	<250	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0
	10/24/17	6.97	84.40	<50	<130	<250	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0
	01/17/18	5.19	86.18	<50	<130	<250	<1.0	<1.0	<1.0	<3.0	--	--
	04/05/18	5.48	85.89	<50	<130	<250	<1.0	<1.0	<1.0	<3.0	--	--
	07/24/18	7.32	84.05	<50	<130	<250	<1.0	<1.0	<1.0	<3.0	--	--
	02/18/19	5.19	86.18	<50	<130	<250	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0
	08/30/19	7.07	84.30	<50	<130	<250	<1.0	<1.0	<1.0	<3.0	--	--
MW-19	09/21/16	5.50	86.71	120	<130	<250	200	<1.0	<1.0	3.8	<1.0	<1.0
92.21	02/16/17	7.05	85.16	90	180	<250	110	<1.0	<1.0	<3.0	<1.0	<1.0
	10/24/17	9.03	83.18	74	140	<250	88	<1.0	<1.0	3.3	<1.0	<1.0
	01/17/18	6.39	85.82	--	--	--	--	--	--	--	--	--
	04/05/18	5.94	86.27	70	600	280	63	<1.0	<1.0	<3.0	--	--
	07/24/18	7.88	84.33	--	--	--	--	--	--	--	--	--
	02/18/19	6.30	85.91	73	730	<250	52	<1.0	<1.0	<3.0	<1.0	<1.0
	08/27/19	8.14	84.07	NS	NS	NS	NS	NS	NS	NS	NS	NS

Table 1
Historical Groundwater Monitoring Data
Mercer Island Shell
(Former BP)
7833 SE 28th Street
Mercer Island, Washington

Well ID	Sample Date	Depth to Water	Groundwater Elevation	TPH-G	TPH-D	TPH-O	Benzene	Toluene	Ethylbenzene	Total Xylenes	Total Lead	Dissolved Lead
MW-20	02/15/17	5.70	86.17	<50	<130	<250	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0
91.87	10/24/17	7.23	84.64	<50	<130	<250	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0
	01/17/18	5.81	86.06	<50	<130	<250	<1.0	<1.0	<1.0	<3.0	--	--
	04/05/18	6.06	85.81	<50	<130	<250	<1.0	<1.0	<1.0	<3.0	--	--
	07/24/18	7.74	84.13	<50	<130	390	<1.0	<1.0	<1.0	<3.0	--	--
	02/18/19	5.56	86.31	<50	140	<250	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0
	08/30/19	7.82	84.05	<50	<130	<250	<1.0	<1.0	<1.0	<3.0	--	--
MW-21	02/18/19	5.16	86.67	58,000	3,900	320	4,300	6,700	1,400	6,800	1.1	<1.0
91.83	08/28/19	7.19	84.64	200,000	3,100	450	14,000	23,000	4,300	24,000	--	--
MW-22	02/18/19	11.12	81.44	<50	350 *	280 *	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0
92.56	08/29/19	9.22	83.34	<50	<130	<250	<1.0	<1.0	<1.0	<3.0	--	--
MW-23	02/18/19	4.86	87.16	<50	190 *	<250 *	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0
92.02	08/30/19	8.14	83.88	<50	<130	<250	<1.0	<1.0	<1.0	<3.0	--	--
MW-24	02/18/19	9.75	83.48	<50	180	<250	<1.0	<1.0	<1.0	<3.0	<1.0	<1.0
93.23	08/28/19	9.24	83.99	<50	140	<250	<1.0	<1.0	<1.0	<3.0	--	--
SVE-1	10/01/13	5.63	85.68	100,000	--	--	7,100	9,300	2,600	13,000	--	--
91.31	07/06/15	4.69	86.62	Not sampled due to heavy hydrocarbon sheen								
	01/13/16	3.52	87.79	--	--	--	--	--	--	--	--	--
	06/16/16	4.03	87.28	100,000	1,600	290	9,600	3,000	3,400	15,000	2.1	3.4
	09/21/16	3.52	87.79	--	--	--	--	--	--	--	--	--
	02/17/17	2.98	88.33	Not sampled due to heavy hydrocarbon sheen								
	10/24/17	6.14	85.17	65,000	1,500	320	7,800	160	2,800	6,900	1.1	<1.0
	01/17/18	3.39	87.92	--	--	--	--	--	--	--	--	--
	04/03/18	3.49	87.82	--	--	--	--	--	--	--	--	--
	07/24/18	4.97	86.34	--	--	--	--	--	--	--	--	--
	02/18/19	2.91	88.40	Not sampled due to heavy hydrocarbon sheen								
	08/27/19	5.30	86.01	NS	NS	NS	NS	NS	NS	NS	NS	NS
SVE-2	10/01/13	6.01	85.53	140,000	--	--	11,000	13,000	3,100	19,000	--	--
91.54	07/06/15	5.54	86.00	Not sampled due to heavy hydrocarbon sheen								
	01/13/16	4.35	87.19	--	--	--	--	--	--	--	--	--
	06/16/16	4.75	86.79	120,000	1,900	<250	11,000	5,900	3,200	16,000	<1.0	<1.0
	09/21/16	4.35	87.19	--	--	--	--	--	--	--	--	--
	02/17/17	3.99	87.55	Not sampled due to heavy hydrocarbon sheen								
	10/24/17	7.08	84.46	80,000	2,500	1,000	8,700	1,600	2,200	9,400	<1.0	<1.0
	01/17/18	4.35	87.19	--	--	--	--	--	--	--	--	--
	04/03/18	9.32	82.22	--	--	--	--	--	--	--	--	--
	07/28/18	5.69	85.85	--	--	--	--	--	--	--	--	--
	02/18/19	3.81	87.73	Not sampled due to heavy hydrocarbon sheen								
	08/27/19	5.98	85.56	NS	NS	NS	NS	NS	NS	NS	NS	NS

UST WELL	06/25/13	4.10	87.52	16,000	--	--	40	7.2	23	1,100		
91.62	10/01/13	4.93	86.69	30,000	--	--	76	13.0	56	2,000	--	--
	07/06/15	4.81	86.81	7,300	--	--	88	11.0	32	38	--	--
VAULT-1	10/02/13	5.63	85.79	210	--	--	130	1.5	5.4	<3.0	--	--
91.42	07/06/15	4.79	86.63	520	--	--	630	23	9.9	53	--	--
VAULT-2	10/02/13	4.74	85.35	3,900	--	--	580	51	110	220	--	--
90.09	07/06/15	4.33	85.76	440	--	--	78	12	18	30	--	--
VAULT-3	10/02/13	2.90	88.37	<50	--	--	<1.0	<1.0	<1.0	<3.0	--	--
91.27	07/06/15	5.31	85.96	<50	--	--	<1.0	<1.0	<1.0	<3.0	--	--
MTCA Method A Cleanup Levels:				1,000/800¹	500	500	5	1,000	700	1,000	15	15

- TPH-G Total petroleum hydrocarbons as gasoline analysis using Ecology Method NWTPH-G
 TPH-D Total petroleum hydrocarbons as diesel analysis using Ecology Method NWTPH-Dx
 TPH-O Total petroleum hydrocarbons as oil analysis using Ecology Method NWTPH-Dx
 Benzene, toluene, ethylbenzene and total xylenes analysis using EPA Method 8021
 Total and dissolved lead analysis using EPA Method 200.8
 ND<50 Not detected at or above the indicated method reporting limit
 ND Not detected. Method reporting limit not indicated in prior consultants' reports.
 NM Not measured
 -- Not applicable or no data
 1 Benzene detected/benzene not detected and the sum of toluene, ethylbenzene and total xylenes concentrations is less than 1% of the gasoline mixture
 Top of casing elevation indicated below Well ID
 Depths are in feet below top of casing
 Groundwater elevations are relative to an established datum at an assigned elevation of 100 feet above mean sea level.
 Results in micrograms per liter (ug/L)
 Bolded and shaded values exceed MTCA Method A cleanup levels
 Data prior to 1/13/16 are taken from prior consultants' reports
 NS Not sampled
 * Resampled on 2/23/19 due to laboratory breakage

Table 2
Groundwater Sample Analytical Results
Drilling and Well Installation
Mercer Island Shell (Former BP)
7833 SE 28th Street
Mercer Island, Washington

Sample Name	Sample Date	EDB	EDC	MTBE	PAHs	VOCs	PCBs	Pesticides
MW-1	01/30/19	NS	NS	NS	NS	NS	NS	NS
	08/24/19	<2.0	<2.0	ND	NS	NS	NS	NS
MW-5	01/30/19	NS	NS	NS	NS	NS	NS	NS
	08/24/19	<2.0	<2.0	ND	NS	NS	NS	NS
MW-6	01/30/19	NS	NS	NS	NS	NS	NS	NS
	08/24/19	<2.0	<2.0	ND	NS	NS	NS	NS
MW-24	01/30/19	<2.0	<2.0	2.6	ND	ND	ND	ND
	08/24/19	<2.0	<2.0	2.2	NS	NS	NS	NS
Model Toxics Control Act (MTCA) Method A Cleanup Level		0.01	5	20	Various	Various	Various	Various

EDB Dibromomethane (EPA-8260)
EDC Dichloroethane (EPA-8260)
MTBE Methyl Tertiary-butyl Ether (EPA-8260)
PAHs Polycyclic aromatic hydrocarbons (EPA-8270 SIM)
VOCs Volatile organic compounds (EPA-8260)
PCBs Polychlorinated biphenyls (EPA-8082)
DEHP Bis (2-ethylhexyl) phthalate (EPA-8270)
<2.0 Not detected at or above the indicated method reporting limit
ND Not detected
NS Not sampled
Results are in micrograms per liter (ug/kg)
Depths are in feet below ground surface
Bolded and shaded values exceed MTCA Method A cleanup levels

**Table 3
Cost Estimate
Site Remediation
Mercer Island Shell
7833 SE 28th Street
Mercer Island, Washington**

	Unit Type	Units	Unit Cost	Total
Scope of Work: Excavate and remove up to 1,500 cubic yards (2,000 tons) of impacted soil near and between the dispensers and USTs following removal of the existing tanks and piping; remove and replace existing groundwater monitoring wells in the excavated area; conduct 2 years of quarterly monitoring and sampling to document groundwater cleanup; compile data and submit to the Washington State Pollution Liability Insurance Agency for issuance of a No Further Action determination.				
<u>Site Preparation</u>				
Permitting, Fencing, Traffic Control, Concrete and Asphalt Removal	Estimate	1	\$ 45,000.00	\$ 45,000.00
Tank Decommissioning and Removal, Dispenser and Piping Removal*	Estimate	1	\$ 60,000.00	\$ 60,000.00
* Not including installation of new tanks and lines			Site Preparation Subtotal	\$ 105,000.00
<u>Soil Excavation and Cleanup</u>				
Project Manager	Hrs	80	\$ 110.00	\$ 8,800.00
Field Supervisor	Hrs	80	\$ 95.00	\$ 7,600.00
Senior Technician	Hrs	80	\$ 80.00	\$ 6,400.00
Excavator	Day	10	\$ 900.00	\$ 9,000.00
Dumptucks (3 trucks with trailer each day)	Day	10	\$ 2,400.00	\$ 24,000.00
Shoring Materials and Foundation Supports (if needed)	Estimate	1	\$ 80,000.00	\$ 80,000.00
Disposal Fees	Ton	2,000	\$ 55.00	\$ 110,000.00
Backfill Material and Placement	Ton	1,600	\$ 45.00	\$ 72,000.00
Excavation Water	Gallon	10,000	\$ 1.00	\$ 10,000.00
Remove and Replace Monitoring Wells	Estimate	1	\$ 60,000.00	\$ 60,000.00
Quarterly Groundwater Monitoring	Estimate	1	\$ 80,000.00	\$ 80,000.00
Final Cleanup Oversight and Reporting, Well Decommissioning	Estimate	1	\$ 60,000.00	\$ 60,000.00
			Soil Excavation and Cleanup Subtotal	\$ 527,800.00
			Subtotal	\$ 632,800.00
			Contingency (10%)	\$ 63,280.00
			Subtotal Before Taxes	\$ 696,080.00
			Sales Tax (10.1%)	\$ 70,304.08
			Total Estimated Cost	\$ 766,384.08

BP Branded

PROJECT: Service Station

W.O. 11-10706-00 WELL NO. MW-1

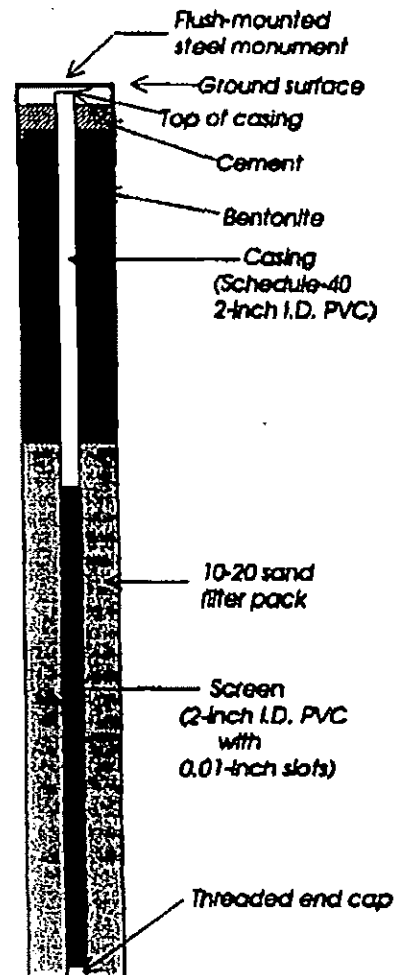
Elevation reference: 100.00 foot temporary benchmark
Ground surface elevation: 99.01 feet

Well completed: 27 December 1995
Casing elevation: 98.84 feet

AS-BUILT DESIGN

Page 1 of 1

DEPTH (feet)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	BLOW COUNTS	QVM READING	GROUND WATER
0	2.5' Asphalt Paving over soft, wet, brown, sandy SILT with some gravel and brick fragments (F#)					
	Very stiff, moist, tan-gray mottled, fine sandy SILT (no odor)		S-1	30	0	
5	Becomes hard, with trace fine gravel (no odor)		S-2	38	0	12/29/95 ATD
	Very stiff, moist, gray, fine sandy SILT grading to medium dense, wet, gray, silty, fine to medium SAND (no odor)		S-3	18	0	
15	Very dense, saturated, gray, fine SAND (no odor)		S-4	45	0	
20	Bottom of boring at 20 feet.					
25						
30						



TESTING

WTPH-G
WTPH-D Bst
Total Lead

AGRA Earth and Environmental, Inc.

LEGEND

- 2-inch O.D. split- spoon sample
- Grab sample
- Observed groundwater level
- Observed groundwater level
ATD = at time of drilling
- Analytical testing
- WTPH-G
WTPH-D Bst
Total Lead
- Observed groundwater level
0/00/00 = date observed

AGRA
Earth & Environmental
11335 NE 122nd Way, Suite 100
Kirkland, Washington 98034-6918

Drilling started: 27 December 1995

Drilling completed: 27 December 1995

BP Branded
PROJECT: Service Station

W.O. 11-10706-00 WELL NO. MW-2

Elevation reference: 100.00 foot temporary benchmark
 Ground surface elevation: 96.65 feet

Well completed: 27 December 1995
 Casing elevation: 96.20 feet

AS-BUILT DESIGN

Page 1 of 1

DEPTH (feet)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	BLOW COUNTS	OVM READING	GROUND WATER	TESTING
0	13" Asphalt Paving						
	Soft, wet, blue-gray, sandy, clayey SILT with fine gravel and wood fragments (slight gasoline-like odor)	Grab	3.0'		65		
5	Soft to medium stiff, wet, green-gray, clayey SILT with some fine sand and rootlets (slight gasoline-like odor)	Split Spoon	S-1	5	42		
	Very stiff, moist, gray SILT with trace sand and fine gravel (no odor)	Split Spoon	S-2	30	0		
15	Becomes hard, moist, sandy SILT (no odor)	Split Spoon	S-3	32	0		
20	Becomes very hard, moist, fine, gravelly SILT with sand (no odor)	Split Spoon	S-4	50/5'	0		
	Bottom of boring at 20.9 feet.						
25							
30							

WTPH-G
 WTPH-D Gr.
 Total Lead

LEGEND

I 2-inch O.D. split spoon sample

Grab sample

Observed groundwater level
 ATD = at time of drilling

Observed groundwater level
 0,000/00 = date observed

WTPH-G
 WTPH-D Gr.
 Total Lead

Analytical testing

AGRA
Earth & Environmental
 11335 NE 122nd Way, Suite 100
 Kirkland, Washington 98034-6918

AGRA Earth and Environmental, Inc.

BP Branded

PROJECT: Service Station

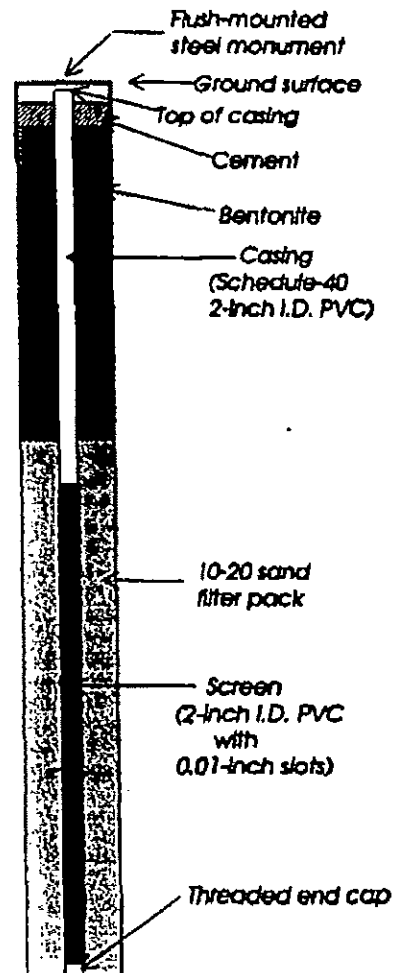
W.O. 11-10706-00 WELL NO. MW-3

Elevation reference: 100.00 foot temporary benchmark
 Ground surface elevation: 97.83 feet
 Well completed: 28 December 1995
 Casing elevation: 97.51 feet

AS-BUILT DESIGN

Page 1 of 1

DEPTH (feet)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	BLOW COUNTS	OVM READING	GROUND WATER	TESTING
0	7' Asphalt Paving						
	Hard, moist, tan mottled SILT with trace gravel and sand (no odor)		S-1	42	0		
5	Becomes dark gray (no odor)		S-2	37	0		
10			S-3	39	0		
15	Becomes very stiff (no odor)		S-4	29	0		
20	Bottom of boring at 20 feet.						
25							
30							



LEGEND

- 2-inch O.D. split- spoon sample
- Grab sample
- Observed groundwater level ATD = at time of drilling
- Observed groundwater level WTH-O (WTH-O Dd. Total Lead)
- Analytical testing
- Observed groundwater level 01/00/00 = date observed

AGRA
 Earth & Environmental
 11335 NE 122nd Way, Suite 100
 Kirkland, Washington 98034-6918

Drilling started: 28 December 1995

Drilling completed: 28 December 1995

AGRA Earth and Environmental, Inc.

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

ENTERED

(MW-4)

RESOURCE PROTECTION WELL REPORT

24/4/12A
START CARD NO. R27147

PROJECT NAME: B.P. - Mercer Island
 WELL IDENTIFICATION NO. AC6 2101
 DRILLING METHOD: HSA
 DRILLER: Brent C. Maloy
 FIRM: Cascade Drilling, Inc.
 SIGNATURE: [Signature]
 CONSULTING FIRM: [Signature]
 REPRESENTATIVE: Cliff Schmitt

COUNTY: King
 LOCATION: NE 1/4 NE 1/4 Sec 12 Twn 24N R 4E
 STREET ADDRESS OF WELL: 7833 SE 28th St. Mercer Island
 WATER LEVEL ELEVATION: _____
 GROUND SURFACE ELEVATION: N/A
 INSTALLED: 4-18-96
 DEVELOPED: YES

6169

AS-BUILT	WELL DATA	FORMATION DESCRIPTION
	<p>WELL COVER</p> <p>CONCRETE SURFACE SEAL DEPTH = <u>2</u>/ft</p> <p>PVC BLANK <u>2" x 5'</u></p> <p>BACKFILL <u>2</u> ft. TYPE: <u>BENT CHIPS</u></p> <p>PVC SCREEN <u>2" x 10'</u> SLOT SIZE: <u>.010</u></p> <p>GRAVEL PACK <u>4</u> ft. MATERIAL: <u>2/12 LONESTAR</u></p> <p>WELL DEPTH <u>15'</u> "</p>	<p><u>0 - 1</u> ft. ASPHALT / COBBLE FILL</p> <p><u>1 - 15</u> ft. SILTY / CLAY (LIGHT GREENISH) SOME GRAVEL - ft.</p>

RECEIVED
 MAY 18 1996
 DEPT. OF ECOLOGY

Client: Colony Specialty

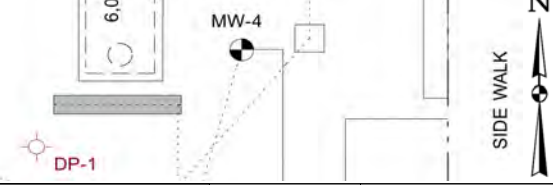
Location: 7833 SE 28th St Mercer Island, Wa

Date of Drilling: 9/6/12

Logged by: K. Addis

Total depth: 15' bgs

Site Map



SUBSURFACE PROFILE				SAMPLE			Sheen	Comments
Depth (ft)	Lithology	USCS Name	Description	Interval	Recovery	Sample		
0			Ground Surface					
0 - 1.5			Crushed Rock					
1.5 - 3.5		SM	Silty Sand Gray-brown; moist; mostly sand with some silt			DP-1:2.5	21.6	
3.5 - 4.5		GP	Pea Gravel Gray; dry; mostly fine gravel				14.7	
4.5 - 6.5		SM	Sandy Silt Gray-brown; moist; mostly silt with some fine sand				7.6	
6.5 - 7.5		GP	Fill Black; rust-stained; mostly gravel with some charcoal and debris				18.6	
7.5 - 10.0		SM	Silty Sand Tan; dry; silty sand with few gravel; becomes moist and gray					
10.0 - 11.5		SM	Becomes gray-brown					
11.5 - 13.5		SM	Silty Sand Gray; moist; mostly silt with little sand and trace clay				20.2	
13.5 - 14.5		SM	Silty Sand Brown; moist; mostly fine to medium sand with some silt				50.0	
14.5 - 15.0		MH	Elastic Silt Gray; damp; mostly silt			DP-1:15	71.2	
15.0 - 16.0		SP	Poorly-Graded Sand Gray; saturated; mostly fine to medium sand with trace silt					Saturated at 14.8'
16.0 - 20.0			End of Boring					

Client: Colony Specialty

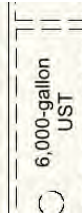
Location: 7833 SE 28th St Mercer Island, Wa

Date of Drilling: 9/6/12

Logged by: K. Addis

Total depth: 15'

Site Map



MW-4



SUBSURFACE PROFILE				SAMPLE			Sheen	Comments
Depth (ft)	Lithology	USCS Name	Description	Interval	Recovery	Sample		
0			Ground Surface					
0			Asphalt					
0		SM	Silty Sand Gray-brown; moist; mostly fine to medium sand with some silt and little gravel				1.7	
2		GP	Pea Gravel Odor			DP-2:3		DUP-1
4							31.6	
6			Strong odor					
8		SP-SM	Strong odor				34.5 40.2	
8			Poorly-Graded Sand with Silt Gray-brown; saturated; mostly coarse sand with some silt; strong odor			DP-2:9		
10		MH	Elastic Silt Gray; damp; hard; high plasticity; mostly silt/clay; no odor				0.9	
12								
14								
15							1.1	Refusal at 15'
16			End of Boring					
18								
20								

Client: Colony Specialty

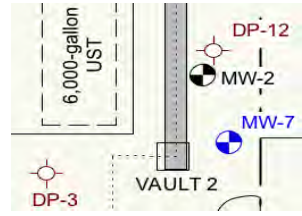
Location: 7833 SE 28th St Mercer Island, Wa

Date of Drilling: 9/6/12

Logged by: K. Addis

Total depth: 15' bgs

Site Map



SUBSURFACE PROFILE				SAMPLE			Sheen	Comments
Depth (ft)	Lithology	USCS Name	Description	Interval	Recovery	Sample		
0			Ground Surface					
0			Asphalt					
0		SM	Silty Sand with Gravel Gray-brown; moist; mostly fine to medium sand with some silt and few gravel				1.1	
2		SW	Well-Graded Sand Gray; wet; mostly fine to coarse sand; odor from 2 to 12 feet			DP-3:5	56.3	
4								
6								
8								
10							45.0	
12		ML	Silt Gray; moist; hard; moderate plasticity; mostly silt			DP-3:11	47.8	
14			Slight odor					
14			End of Boring				23.2	
16								
18								
20								

Client: Colony Specialty

Location: 7833 SE 28th St Mercer Island, Wa

Date of Drilling: 9/6/12

Logged by: K. Addis

Total depth: 10' bgs

Site Map



SUBSURFACE PROFILE				SAMPLE			Sheen	Comments
Depth (ft)	Lithology	USCS Name	Description	Interval	Recovery	Sample		
0			Ground Surface					
0			Concrete					
0 - 5.5	ML	ML	Silt with Sand Mottled gray; moist; mostly silt with few sand and trace gravel					
4.0 - 4.5			Slight odor			DP-4:2.5	15.4	
5.5 - 6.0	ML	ML	Silt with Sand Brown-gray; moist; mostly silt with few sand and few gravel					
6.0 - 7.5			No odor			DP-4:7.5	16.8	
10.0			End of Boring				0.4	Refusal at 10'

Client: Colony Specialty
Location: 7833 SE 28th St Mercer Island
Date of Drilling: 9/6/12
Logged by: K. Addis
Total depth: 10' bgs

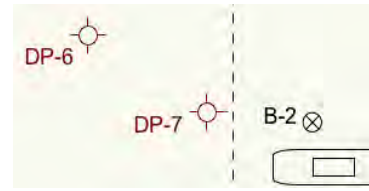
Site Map



SUBSURFACE PROFILE				SAMPLE			Sheen	Comments
Depth (ft)	Lithology	USCS Name	Description	Interval	Recovery	Sample		
0			Ground Surface					
0		ML	Asphalt					
0		ML	Sandy Silt Brown-gray; moist; mostly silt with some fine sand					
2								
4		MH	Elastic Silt Brown-gray; moist; mostly silt and/or clay			DP-5:4	0.0	
6		ML	Silt with Sand Brown-gray; moist; mostly few silt with few sand					
8		MH	Elastic Silt Brown-gray; moist; mostly silt and/or clay					
10			End of Boring			DP-5:9	0.0	
12								
14								
16								
18								
20								

Client: Colony Specialty
Location: 7833 SE 28th St Mercer Island
Date of Drilling: 9/6/12
Logged by: K. Addis
Total depth: 10'

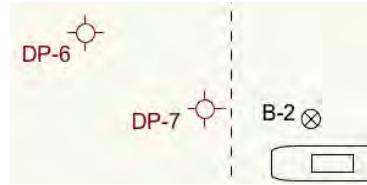
Site Map



SUBSURFACE PROFILE				SAMPLE			Sheen	Comments
Depth (ft)	Lithology	USCS Name	Description	Interval	Recovery	Sample		
0			Ground Surface					
0 - 1	SM		Asphalt					
1 - 2			Silty Sand Silty sand with gravel					
2 - 10	MH		Elastic Silt Brown-gray; moist; mostly silt and/or clay moderate to high plasticity				0.0	
4 - 5						DP-6:4		
6 - 9							0.0	
10			Becomes gray			DP-6:10		
10 - 20			End of Boring					

Client: Colony Specialty
Location: 7833 SE 28th St Mercer Island
Date of Drilling: 9/6/12
Logged by: K. Addis
Total depth: 10' bgs

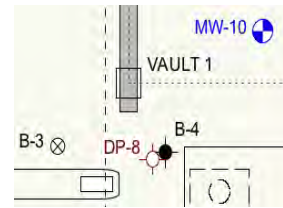
Site Map



SUBSURFACE PROFILE				SAMPLE			Sheen	Comments
Depth (ft)	Lithology	USCS Name	Description	Interval	Recovery	Sample		
0			Ground Surface					
0			Asphalt					
0	ML		Silt with Sand Brown-gray; moist; mottled; mostly silt with few fine sand					
2	CH		Fat Clay Brown-gray; moist; hard; mostly clay; moderate plasticity; mottled					
4						DP-7:5	0.0	
6								
8								
10	CH		Fat Clay Gray; moist; hard; mostly clay			DP-7:10	0.0	
10			End of Boring					
12								
14								
16								
18								
20								

Client: Colony Specialty
Location: 7833 SE 28th St Mercer Island
Date of Drilling: 9/6/12
Logged by: K. Addis
Total depth: 10' bgs

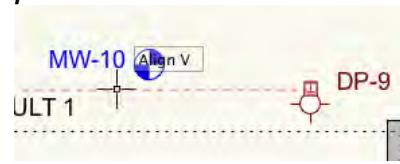
Site Map



SUBSURFACE PROFILE				SAMPLE			Sheen	Comments
Depth (ft)	Lithology	USCS Name	Description	Interval	Recovery	Sample		
0			Ground Surface					
0 - 1	Concrete		Concrete					
1 - 2.5	GW		Sandy Gravel Brown; moist; mostly fine to coarse gravel with some sand				3.7	
2.5 - 4.5	MH		Elastic Silt Gray; moist; mostly silt; odor; reworked silt; fill			DP-8:4	399	
4.5 - 7.5	MH		Elastic Silt Gray; saturated; mostly silt and clay; strong odor; fill				1729	DUP-2
7.5 - 10	MH		Elastic Silt Brown-gray; moist; mostly silt and clay; no odor			DP-8:7		
10			End of Boring				0.2	

Client: Colony Specialty
Location: 7833 SE 28th St Mercer Island
Date of Drilling: 9/6/12
Logged by: K. Addis
Total depth: 15' bgs

Site Map



SUBSURFACE PROFILE				SAMPLE			Sheen	Comments
Depth (ft)	Lithology	USCS Name	Description	Interval	Recovery	Sample		
0			Ground Surface					
0			Asphalt					
0		CL	Lean Clay Gray-green; moist; mostly lean clay					
2		OH	Silt Black; moist; mostly organic silt; charcoal; odor			DP-9:3	2260 6800	
4		ML	Silt Elastic silt; moist; brown-green with few sand, gravel and roots; odor				5200	
6			Becomes gray-green; odor					
6		SM	Silty Sand Gray; moist; very dense; mostly fine sand with some silt and few gravel			DP-9:7.5	2180	
10		MH	Elastic Silt Gray-green; moist; mostly elastic silt; slight odor					
12		MH	Elastic Silt Gray; hard; mostly silt					
14						DP-9:15	1900	
16			End of Boring					
18								
20								

Client: Colony Specialty

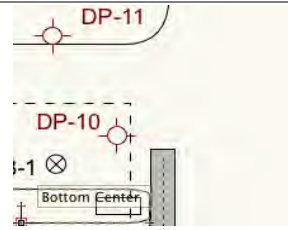
Location: 7833 SE 28th St Mercer Island, Wa

Date of Drilling: 9/6/12

Logged by: K. Addis

Total depth: 10' bgs

Site Map



SUBSURFACE PROFILE				SAMPLE			Sheen	Comments
Depth (ft)	Lithology	USCS Name	Description	Interval	Recovery	Sample		
0			Ground Surface					
0			Concrete					
0		SM	Silty Sand Gray-mottled; moist; mostly silt with some sand and few gravel			DP-10:2.5	56.9	
2							2171	
4								
6								
8		ML	Silt with Sand Tan; moist; mostly silt with some sand and trace gravel			DP-10:8	3400	
10			End of Boring				2500	
12								
14								
16								
18								
20								

Client: Colony Specialty

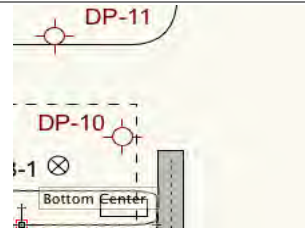
Location: 7833 SE 28th St Mercer Island, Wa

Date of Drilling: 9/6/12

Logged by: K. Addis

Total depth: 10' bgs

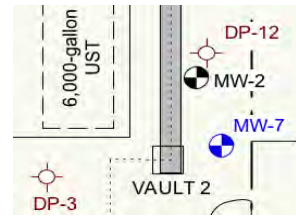
Site Map



SUBSURFACE PROFILE				SAMPLE			Sheen	Comments
Depth (ft)	Lithology	USCS Name	Description	Interval	Recovery	Sample		
0			Ground Surface					
0			Landscaping Bark					
0 - 2	SM	SM	Silty Sand Tan; damp; mostly silty sand with trace gravel			DP-11:3	26	
2 - 4	ML	ML	Silt with Sand Gray; moist; mostly silt with 2" sand seam at 4.5'				3	
4 - 6	ML	ML	Silt with Sand Brown; damp; mostly silt with 1" sand seam at 8'			DP-11:5	4	
6 - 10			Increasing gravel				3	
10			End of Boring					
12								
14								
16								
18								
20								

Client: Colony Specialty
Location: 7833 SE 28th St Mercer Island
Date of Drilling: 9/6/12
Logged by: K. Addis
Total depth: 15'

Site Map



SUBSURFACE PROFILE				SAMPLE			Sheen	Comments
Depth (ft)	Lithology	USCS Name	Description	Interval	Recovery	Sample		
0			Ground Surface					
0 - 1		SM	Asphalt					
1 - 6		SM	Silty Sand Brown-mottled orange; damp; mostly fine to medium silty sand with gravel			DP-12:3	0.0	
6 - 6.5		MH	Elastic Silt Gray; moist; saturated; high plasticity; mostly silt			DP-12:6		
6.5 - 8		SP	Poorly-Graded Sand Gray; saturated; medium dense; mostly fine to medium sand				12.0	
8 - 9.5		SP	Poorly-Graded Sand with Gravel Mottled gray; moist; very dense; mostly fine to medium sand with gravel				4.0	
9.5 - 15		MH	Elastic Silt Gray; moist; high plasticity; mostly silt				0.0	
15			End of Boring					

Client: Colony Specialty

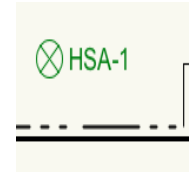
Site Map

Location: 7833 SE 28th ST, Mercer Island, Wa

Date of Drilling: 9/10/12

Logged by: K. Addis

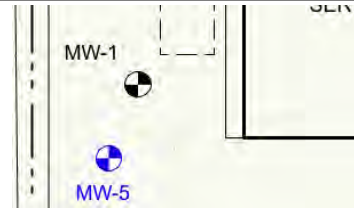
Total depth: 10' bgs



SUBSURFACE PROFILE				SAMPLE			Sheen	Comments
Depth (ft)	Lithology	USCS Name	Description	Interval	Recovery	Sample		
0			Ground Surface					
0 - 4		GP	Poorly-Graded Gravel with Sand Brown; moist; mostly fine gravel with sand; no odor				0.0	
4 - 6		ML	Silt Brown-gray; damp; mostly silt				0.0	
6 - 8						HSA-1:4.5		
8 - 10						HSA-1:9	0.0	
10 - 20			End of Boring					On Rock Refusal at 10' feet

Client: Colony Specialty
Location: 7833 SE 28th St Mercer Island, WA
Date of Drilling: 9/10/12
Logged by: K. Addis
Total depth: 20' bgs

Site Map



SUBSURFACE PROFILE				SAMPLE				Well Completion Details	Comments
Depth (ft)	Lithology	USCS Name	Description	Interval Recovery	Blow Counts	Sample	PID		
0			Ground Surface						
0			Asphalt						
0		ML	Silt Gray; moist; very stiff; mostly silt				0.2		
2									
4									
6					9 13 18	MW-5:2.5	7.8		
8									
10			Becomes hard		18 24 29		0.2		
12									
14									
16		SP-SM	Poorly-Graded Sand with Silt Gray; saturated; very dense; mostly fine sand with few silt		21 50-6"	MW-5:15	0.3		
18		SP-SM	Poorly-Graded Sand with Silt Gray; saturated; very dense; mostly fine sand						
20			End of Boring		19 50-6"		0.0		
22									
24									

Drilled By: Cascade
Drill Method: HSA
Project #: 63402.0

Hole Size: 8"
Datum: NAD 83/98; NAVD 88
Sheet: 1 of 1

Client: Colony Specialty

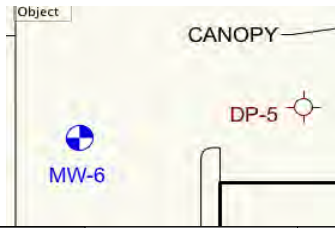
Location: 7833 SE 28th St Mercer Island WA

Date of Drilling: 9/10/12

Logged by: K. Addis

Total depth: 21' bgs

Site Map



SUBSURFACE PROFILE				SAMPLE				Well Completion Details	Comments
Depth (ft)	Lithology	USCS Name	Description	Interval Recovery	Blow Counts	Sample	PID		
0			Ground Surface						
0			Asphalt						
2	SP-SM		Poorly-Graded Sand with Silt Brown; moist; sand with some silt						
4	ML		Silt Gray-brown; damp; mostly silt		19 29 43	MW-6:5	0.2		
6									
8									
10	ML		Silt Gray; damp; mostly silt and gravel		12 25 40		0.1		
12									
14	ML		Silt Gray; wet; hard; mostly silt with some trace gravel						
16					12 19 30	MW-6:16.5	0.0		
18	SP		Poorly-Graded Sand Gray; saturated; very dense mostly fine sand with trace silt at 20.5' graded to medium sand with trace silt.						
20					22 50-6"		0.0		
22			End of Boring						18' ATD
24									

Drilled By: Cascade
Drill Method: HSA
Project #: 63402.0

Hole Size: 8"
Datum: NAD 83/98; NAVD 88
Sheet: 1 of 1

Boring/Well: MW-7

Client: Colony Specialty

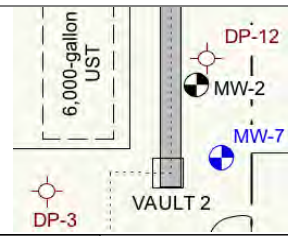
Location: 7833 SE 28th ST Mercer Island, Wa

Date of Drilling: 9/11/12

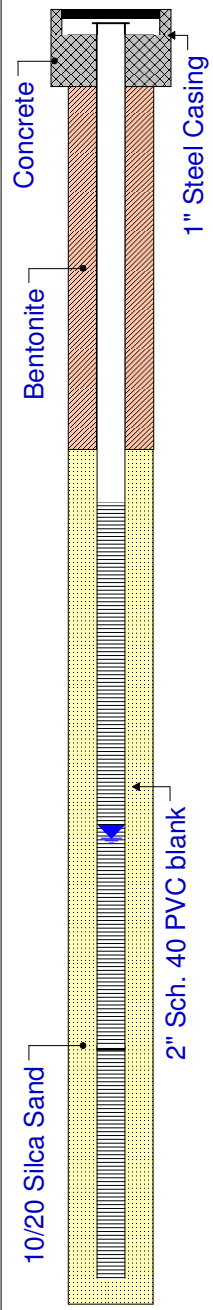
Logged by: K. Addis

Total depth: 25' bgs

Site Map



SUBSURFACE PROFILE			SAMPLE				Well Completion Details	Comments
Depth (ft)	Lithology	USCS Name	Description	Interval Recovery	Blow Counts	Sample		
0			Ground Surface					
0-1	Asphalt		Asphalt					
1-2	Fill		Fill					
2-3	Asphalt		Asphalt					
3-4	Fill		Fill					
4-5	Asphalt		Asphalt					
5-6	Fill		Fill					
6-8	ML	ML	Silt with Sand Rust-stained; brown-gray; moist; mostly silt with some sand and few gravel		15 26 26	MW-7:6.5	174	
8-10	SP-SM	SP-SM	Poorly-Graded Sand with Silt Gray; moist-wet; very dense; mostly fine sand with some silt and few gravel					
10-12					27 50-5"	MW-7:11.5	12.5	
12-14	MH	MH	Elastic Silt Gray; saturated; rust-stained					
14-16					50-4"		2.4	
16-20								
20-22	SP	SP	Poorly-Graded Sand with Silt Gray; saturated; very dense; mostly fine to medium sand		50-6"			
22-24								
24-26					50-6"		0.6	
26			End of Boring					



Drilled By: Cascade
Drill Method: HSA
Project #: 63402.0

Hole Size: 8"
Datum: NAD83/98; NAVD 88
Sheet: 1 of 1

Client: Colony Specialty

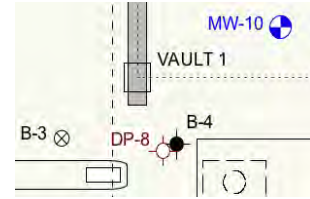
Location: 7833 SE 28th St, Mercer Island WA

Date of Drilling: 9/12/12

Logged by: K. Addis

Total depth: 25' bgs

Site Map



SUBSURFACE PROFILE				SAMPLE				Well Completion Details	Comments
Depth (ft)	Lithology	USCS Name	Description	Interval Recovery	Blow Counts	Sample	PID		
0			Ground Surface						
0			Asphalt						
0-2	SW		Well-Graded Sand with Gravel Brown; moist; mostly fine to coarse sand with some gravel and few silt				14 153		
2-4	ML		Silt Brown-gray; rust-stained; moist; mostly silt and clay with few gravel and sand		27 50-6"	MW-10:6	1600		
4-6	ML		Silt Gray; rust-stained; moist; hard; mostly silt and clay						
6-10	ML		Silt Gray; damp; hard; mostly silt		22 50-6"	MW-10:11	14.6		
10-12									
12-16	ML		Silt Gray; damp; hard; mostly silt		50-6"				
16-18									
18-20	ML		Silt with Sand Gray; damp; hard; mostly silt with few gravel and trace sand		27 50-6"	MW-10:21	18		
20-22									
22-24	SP-SM		Poorly-Graded Sand with Silt gray; saturated; mostly fine to medium sand with silty sand seams 2"		29 50-6"		88		
24-26									
26			End of Boring						
28									
30									

Client: Colony Specialty

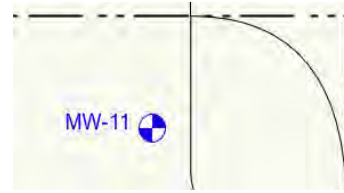
Location: 7833 SE 28th St Mercer Island, Wa

Date of Drilling: 9/11/12

Logged by: K. Addis

Total depth: 25' bgs

Site Map



SUBSURFACE PROFILE				SAMPLE				Well Completion Details	Comments
Depth (ft)	Lithology	USCS Name	Description	Interval Recovery	Blow Counts	Sample	PID		
0			Ground Surface						
0			Asphalt						
2		SP-SM	Poorly-Graded Sand with Silt Rust-stained gray; moist; mostly fine to medium sand with few silt						
4		ML	Silt with Sand Gray-blue; moist; hard; mostly silt with some sand and few gravel (fill)			MW-11:3	12.6		
6				50-6"		MW-11:5.5	2846		
8		ML	Silt with Sand Gray; moist; hard; mostly silt with little sand and trace gravel						
10				50-6"			52.6		
12									
14									
16		SM	Silty Sand with Gravel Gray; moist; very dense; mostly fine sand with some silt and some gravel						
18									
20				50-4"			0.7		
22		SP	Poorly-Graded Sand with Gravel Gray; saturated; very dense; mostly fine to medium sand and few gravel						
24									
26			End of Boring	50-6"			0.4		
28									
30									

Drilled By: Cascade
Drill Method: HSA
Project #: 63402.0

Hole Size: 8"
Datum: NAD 83/98; NAVD88
Sheet: 1 of 1



SITE ADDRESS 7833 SE 28th St, Mercer Island, WA		CLIENT: Colony Specialty	CASING MATERIAL AND SIZE: 4" Sch 40 PVC Blank
DRILLING CONTRACTOR: Cascade Drilling, L.P.		PROJECT #: 63402.2	SCREEN SIZE: 0.010"
DRILLING EQUIPMENT: CME-75		DATE: August 27, 2013	SCREEN INTERVAL: 3.5'-8.5'
DRILLING METHOD: Air Knife to 4'; HSA (10") to 8.5'		GROUND SURFACE ELEV. FT AMSL: 92.14'	FILTER PACK: #2/12 Silica Sand
LOGGED BY: K. Addis L.G.		TOTAL DEPTH: 8.5'	FILTER PACK INTERVAL: 2.5'-8.5"

Depth (feet)	USCS	Description USCS name; Color; Moisture; Density; Plasticity; Dilatancy; EPI description; Other	Interval & % Recovery	Blows per 6"	Sample	PID (ppm)	Well Construction
0		ASPHALT (2")					
		GRAVEL BASE (6")					
2	MH	SANDY ELASTIC SILT; reddish brown; damp; very stiff; non plastic; mostly silt with some sand, minor clay, and few gravel (Roots at 1' to 3')					
4	MH	ELASTIC SILT WITH SAND; reddish gray; damp; very stiff; no plasticity; no dilatancy; mostly silt with minor clay, minor sand, and few gravel	80	6-10-11	SVE-1:5	1075	
8	MH	ELASTIC SILT; dark gray; damp; hard; medium plasticity; no dilatancy; mostly silt with minor clay, trace sand and trace gravel	80	9-14-18		62	
10						42	
12							
14							

NOTES: No groundwater at time of drilling.



SITE ADDRESS 7833 SE 28th St, Mercer Island, WA		CLIENT: Colony Specialty	CASING MATERIAL AND SIZE: 4" Sch 40 PVC Blank
DRILLING CONTRACTOR: Cascade Drilling, L.P.		PROJECT #: 63402.2	SCREEN SIZE: 0.010"
DRILLING EQUIPMENT: CME-75		DATE: August 27, 2013	SCREEN INTERVAL: 3'-8'
DRILLING METHOD: Air Knife to 4'; HSA (10") to 8'		GROUND SURFACE ELEV. FT AMSL: 92.37'	FILTER PACK: #2/12 Silica Sand
LOGGED BY: K. Addis L.G.		TOTAL DEPTH: 8'	FILTER PACK INTERVAL: 2'-8'

Depth (feet)	USCS	Description USCS name; Color; Moisture; Density; Plasticity; Dilatancy; EPI description; Other	Interval & % Recovery	Blows per 6"	Sample	PID (ppm)	Well Construction
0		ASPHALT (3")					<p>Traffic-rated monument with concrete surface seal</p> <p>Bentonite</p> <p>PVC blank</p> <p>Sand pack</p> <p>Well screen</p> <p>End Cap</p>
		GRAVEL OVER ASPHALT (3") (Mottled)					
2	MH	ELASTIC SILT WITH SAND; grayish brown; damp; hard; medium plasticity; slow dilatancy; mostly silt with minor clay and minor sand, trace gravel					
4	MH		80	10-19-25	SVE-2:5	330	
6							
8	MH	ELASTIC SILT; dark gray; damp; hard; medium plasticity; no dilatancy; mostly silt with minor clay and few sand	80	18-22-28	SVE-2:9	56	
10							
12							
14							

NOTES: No groundwater at time of drilling.



SITE ADDRESS 7833 SE 28th St, Mercer Island, WA		CLIENT: Colony Specialty	CASING MATERIAL AND SIZE: 2" Sch 40 PVC Blank
DRILLING CONTRACTOR: Cascade Drilling, L.P.		PROJECT #: 63402.2	SCREEN SIZE: 0.010"
DRILLING EQUIPMENT: CME-75		DATE: August 27, 2013	SCREEN INTERVAL: 5'-10'
DRILLING METHOD: Air Knife to 5.4'; HSA (10") to 10'		GROUND SURFACE ELEV. FT AMSL: 92.02'	FILTER PACK: #2/12 Silica Sand
LOGGED BY: K. Addis L.G.		TOTAL DEPTH: 10'	FILTER PACK INTERVAL: 3'-10'

Depth (feet)	USCS	Description USCS name; Color; Moisture; Density; Plasticity; Dilatancy; EPI description; Other	Interval & % Recovery	Blows per 6"	Sample	PID (ppm)	Well Construction
0		ASPHALT (2") GRAVEL BASE (4") SILTY SAND WITH GRAVEL; dark greenish gray; moist; medium dense; mostly fine sand with some silt and minor gravel					Traffic-rated monument with concrete surface seal
2							Bentonite PVC blank
4	SM						
6			100	10-11-10	MW-12S:6	1465	Sand pack
8	MH	SANDY ELASTIC SILT; dark gray; moist; hard; medium plasticity; no dilatancy; mostly silt with some sand, minor clay, and trace gravel					Well screen
10			100	15-22-22	MW-12S:10	47	End Cap
12							
14							

NOTES: No groundwater at time of drilling.



SITE ADDRESS 7833 SE 28th St, Mercer Island, WA		CLIENT: Colony Specialty	CASING MATERIAL AND SIZE: 2" Sch 40 PVC Blank
DRILLING CONTRACTOR: Cascade Drilling, L.P.		PROJECT #: 63402.2	SCREEN SIZE: 0.010"
DRILLING EQUIPMENT: CME-75		DATE: August 28, 2013	SCREEN INTERVAL: 20'-25'
DRILLING METHOD: Air Knife to 5'; HSA (14") to 15'; HSA (8") to 25'		GROUND SURFACE ELEV. FT AMSL: 92.05'	FILTER PACK: #2/12 Silica Sand
LOGGED BY: K. Addis L.G.		TOTAL DEPTH: 25'	FILTER PACK INTERVAL: 18'-20'

Depth (feet)	USCS	Description USCS name; Color; Moisture; Density; Plasticity; Dilatancy; EPI description; Other	Interval & % Recovery	Blows per 6"	Sample	PID (ppm)	Well Construction
0		ASPHALT (2") WITH GRAVEL BASE (4")					Traffic-rated monument with concrete surface seal
0 - 7.8	SM	SILTY SAND WITH GRAVEL; dark bluish gray; moist; medium dense; mostly fine sand with some silt and minor gravel					
6.0 - 6.2			100	4-8-8		430	Bentonite
6.2 - 7.8						460	PVC blank
7.8 - 10.2	MH	ELASTIC SILT WITH GRAVEL; dark gray; dry; hard; medium plasticity; no dilatancy; mostly silt with minor clay, few gravel, and few sand; silty sand lens at 10.2'-10.5'					
10.0 - 10.2			100	11-31-30		6.5	
14.0 - 14.2							Bentonite pellet seal



SITE ADDRESS 7833 SE 28th St, Mercer Island, WA		CLIENT: Colony Specialty	CASING MATERIAL AND SIZE: 2" Sch 40 PVC Blank
DRILLING CONTRACTOR: Cascade Drilling, L.P.		PROJECT #: 63402.2	SCREEN SIZE: 0.010"
DRILLING EQUIPMENT: CME-75		DATE: August 28, 2013	SCREEN INTERVAL: 20'-25'
DRILLING METHOD: Air Knife to 5'; HSA (14") to 15'; HSA (8") to 25'		GROUND SURFACE ELEV. FT AMSL: 92.05'	FILTER PACK: #2/12 Silica Sand
LOGGED BY: K. Addis L.G.		TOTAL DEPTH: 25'	FILTER PACK INTERVAL: 18'-20'

Depth (feet)	USCS	Description USCS name; Color; Moisture; Density; Plasticity; Dilatancy; EPI description; Other	Interval & % Recovery	Blows per 6"	Sample	PID (ppm)	Well Construction
16	MH	SANDY ELASTIC SILT WITH GRAVEL; dark gray; moist; hard; medium plasticity; no dilatancy; mostly silt with some sand and minor gravel; silty sand lens at 16.0-16.3' saturated lens	60	20-22-24	MW-12D:16	0.2	
18		As above; low plasticity; more silt than clay	50	36-50/6"		0	
20	SP	POORLY-GRADED SAND; dark gray; wet; dense; mostly fine to medium sand with trace gravel; organics at 26.0'-26.5'	100	16-17-20		0	
22							
24							
26							

NOTES: Groundwater at 8.5' after well installation

Date: 1/7/16	Soil Boring Log	Boring Name: MW-13
Project Name: Mercer Island Shell (Former BP)	Location: Northwest Corner of Intersection	
Address: 7833 SE 28th Street Mercer Island, Washington		

Depth	Sample	Blows	PID	USCS	Description	Well Construction
5		7 12 15	0.0	ML/CL	Air knifed to 5 feet Moist to wet, medium to dark gray, silty clay to clayey silt Sample MW13-7	<p>Well constructed of 2-inch-diameter PVC well casing with 0.010-inch screen 4 to 16 feet bgs 2/12 silica sand</p>
10		7 7 7	0.0	ML/CL	Moist to wet, grayish-green and tan mottled, silty clay	
15		50 24 50	0.0	SM	Saturated, medium gray, silty fine-grained sand	
				ML/CL	Dry to damp, greenish-gray, silty clay	
20					Total depth drilled = 16 feet	
25						
30						
35						

PUGET ENVIRONMENTAL P.L.L.C. 4616 25th Avenue NE #143 Seattle, Washington 98105 Project 15083-012916 JPM	Driller Name: Cascade Drilling/Curtis	Sampling Method: 3-inch x 18-inch split spoon
	Drilling Method: Limited Access Hollow Stem Auger	Weather Conditions: Cloudy, 40s
	Diameter: 8 inches	

Date: 1/7/16	Soil Boring Log	Boring Name: MW-14
Project Name: Mercer Island Shell (Former BP)	Location: Northeast Corner of Intersection	
Address: 7833 SE 28th Street Mercer Island, Washington		

Depth	Sample	Blows	PID	USCS	Description	Well Construction
5		10 12 17	0.0	ML/CL	Air knifed to 5 feet Damp to moist greenish-gray and dark gray mottled, silty clay Sample MW14-7.5	
10						
15		4 5 6	0.0	▼	Wet, medium gray clay, medium plasticity As above, saturated	
20		4 7 9			Total depth drilled = 19 feet	Well constructed of 2-inch-diameter PVC well casing with 0.010-inch screen 4 to 19 feet bgs 2/12 silica sand
25						
30						
35						

PUGET ENVIRONMENTAL P.L.L.C. 4616 25th Avenue NE #143 Seattle, Washington 98105 Project 15083-012916 JPM	Driller Name: Cascade Drilling/Curtis	Sampling Method: 3-inch x 18-inch split spoon
	Drilling Method: Limited Access Hollow Stem Auger	Weather Conditions: Cloudy, 40s
	Diameter: 8 inches	

Date: 1/8/16	Soil Boring Log	Boring Name: MW-15
Project Name: Mercer Island Shell (Former BP)	Location: Southeast Corner of Intersection	
Address: 7833 SE 28th Street Mercer Island, Washington		

Depth	Sample	Blows	PID	USCS	Description	Well Construction
5					Air knifed to 5 feet	
10	10 12 17	4 7 7	0.0	ML/CL	Moist, blue-gray clay with silt, medium plasticity Sample MW15-7.5	
15	27 50/6		0.0	▼	As above As above with interbedded coarse sand and gravel Saturated at 15 feet	
20					Total depth drilled = 15 feet	Well constructed of 2-inch-diameter PVC well casing with 0.010-inch screen 5 to 15 feet bgs 2/12 silica sand
25						
30						
35						

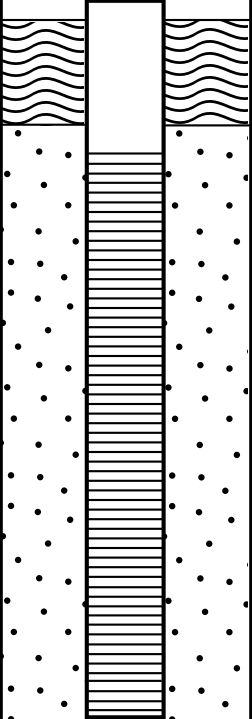
PUGET ENVIRONMENTAL P.L.L.C. 4616 25th Avenue NE #143 Seattle, Washington 98105 Project 15083-012916 JPM	Driller Name: Cascade Drilling/Curtis	Sampling Method: 3-inch x 18-inch split spoon
	Drilling Method: Limited Access Hollow Stem Auger	Weather Conditions: Cloudy, 40s
	Diameter: 8 inches	

Date: 8/31/16	Soil Boring Log	Boring Name: MW-16
Project Name: Mercer Island Shell (Former BP)	Location: North side of 28th Street	
Address: 7833 SE 28th Street Mercer Island, Washington		

Depth	Sample	Blows	PID	USCS	Description	Well Construction
					Air knifed to 5 feet	
5		11 50/6	0.0		Damp, medium grayish-brown, silty clay to clayey silt with trace gravel	
		45 50/6	0.0	ML/CL	Damp, medium grayish-brown with orange mottling, silty clay to clayey silt with trace gravel	
10			0.0		Damp to wet, medium grayish-brown, silty clay to clayey silt with trace gravel	
		50/6	0.0			
15		30 50/6	0.0	SM	Saturated, medium gray, clayey silty fine-grained sand	
		50/6			Saturated, medium gray, clayey silty fine-grained sand	
20					Total depth drilled = 19.5 feet	Well constructed of 2-inch-diameter PVC well casing with 0.010-inch screen 4.5 to 19.5 feet bgs 2/12 silica sand
25						
30						
35						

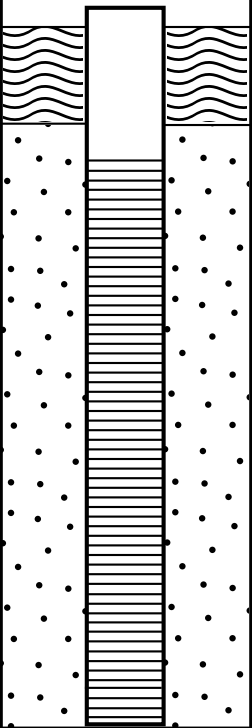
PUGET ENVIRONMENTAL P.L.L.C. 4616 25th Avenue NE #143 Seattle, Washington 98105 Project 15083-012916 JPM	Driller Name: Cascade Drilling/Curtis	Sampling Method: 3-inch x 18-inch split spoon
	Drilling Method: Limited Access Hollow Stem Auger	Weather Conditions:
	Diameter: 8 inches	Cloudy, 50s

Date: 8/31/16	Soil Boring Log	Boring Name: MW-17
Project Name: Mercer Island Shell (Former BP)	Location: North side of 28th Street	
Address: 7833 SE 28th Street Mercer Island, Washington		

Depth	Sample	Blows	PID	USCS	Description	Well Construction
					Air knifed to 5 feet	
5		11 20 20	0.0	ML/CL	Damp to moist, grayish-tan, silty clay to clayey silt	
		45 50/6	0.0			
10		40 50/6	0.0			
15		30 50/6	0.0			
20		30 50/6			Damp to moist, medium gray, silty clay to clayey silt	
					Total depth drilled = 19.5 feet	Well constructed of 2-inch-diameter PVC well casing with 0.010-inch screen 4.5 to 19.5 feet bgs 2/12 silica sand
25						
30						
35						

PUGET ENVIRONMENTAL P.L.L.C. 4616 25th Avenue NE #143 Seattle, Washington 98105 Project 15083-012916 JPM	Driller Name: Cascade Drilling/Curtis	Sampling Method: 3-inch x 18-inch split spoon
	Drilling Method: Limited Access Hollow Stem Auger	Weather Conditions:
	Diameter: 8 inches	Cloudy, 50s

Date: 9/1/16	Soil Boring Log	Boring Name: MW-18
Project Name: Mercer Island Shell (Former BP)	Location: East side of 80th Street	
Address: 7833 SE 28th Street Mercer Island, Washington		

Depth	Sample	Blows	PID	USCS	Description	Well Construction
					Air knifed to 5 feet	
5		11 11 10	3.0	ML/CL	Damp to moist, medium grayish-brown, silty clay to clayey silt with trace gravel	
10		4 9 10	0.5		Moist to wet, bluish-gray, silty clay to clayey silt	
15		3 3 15 20 20	0.0 0.0	▼	Saturated, bluish-gray, silty clay to clayey silt	
20		50/6			Saturated, bluish-gray, silty clay to clayey silt	
					Saturated, bluish-gray, fine-grained sandy clayey silt	
					Total depth drilled = 20 feet	Well constructed of 2-inch-diameter PVC well casing with 0.010-inch screen 5 to 20 feet bgs 2/12 silica sand
25						
30						
35						

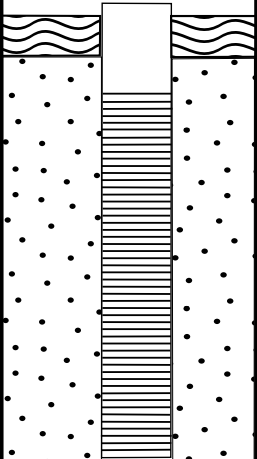
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	Drilling Method: Limited Access Hollow Stem Auger	Weather Conditions: Cloudy, 50s
	Diameter: 8 inches	

Date: 2/8/17	Soil Boring Log	Boring Name: MW-20
Project Name: Mercer Island Shell (Former BP)	Location: West Side of 80th Avenue SE, South of Site	
Address: 7833 SE 28th Street Mercer Island, Washington		

Depth	Sample	Blows	PID	USCS	Description	Well Construction
5		14	0.0		Air knifed to 5 feet	
		20	0.0		Damp, greenish-gray and brownish-orange mottled, silty clay	
		25	0.0	ML/CL	@ 8 feet, wet, grayish-green	
		12	0.0			
		16	0.0			
10		22	0.0			
15		8	0.0	▼	@ 16.5 feet, saturated	
		12				
		15				
20		50/6			As above, with fine-grained sand	
25		18		SP	Saturated, dark gray, fine- to medium-grained sand, few fines	
		50/6				
30					Total depth drilled = 24 feet	Well constructed of 2-inch-diameter PVC well casing with 0.010-inch screen 4 to 24 feet bgs
35						2/12 silica sand

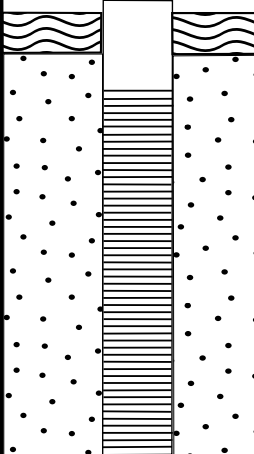
PUGET ENVIRONMENTAL P.L.L.C. 4616 25th Avenue NE #143 Seattle, Washington 98105 Project 15083-041417 JM	Driller Name: Cascade Drilling/Curtis	Sampling Method: 3-inch x 18-inch split spoon
	Drilling Method: Limited Access Hollow Stem Auger	Weather Conditions: Rainy, 40s
	Diameter: 8 inches	

Date: 1/30/19	Soil Boring Log	Boring Name: MW-21
Project Name: Mercer Island Shell	Location: Northeast Corner	
Address: 7833 SE 28th Street Mercer Island, Washington		

Depth	Sample	Blows	PID	Description	Well Construction
5		35	0.0	Air-knifed to approximately 5 feet Moist, bluish gray, silty clay, trace fine-grained sand Sample B21-6	
10		50/6		Moist to wet, bluish-gray silty clay with fine-grained sand.	
15				Total depth = 14 feet	Well constructed of 2-inch diameter PVC well casing with 0.010-inch screen 2/12 silica sand
20					
25					
30					
35					

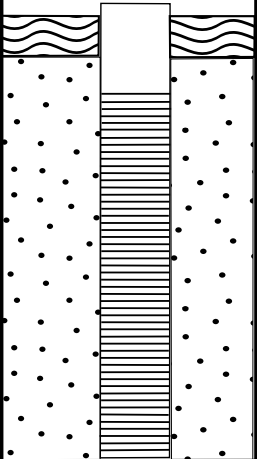
PUGET ENVIRONMENTAL P.L.L.C. 4616 25th Avenue NE #143 Seattle, Washington 98105 (206) 518-4887 PugetEnvironmental.com	Driller Name: Cascade-Curtis	Sampling Method: 3-inch x 18-inch split spoon
	Drilling Method: Hollow Stem Auger	Weather Conditions: Cloudy
	Diameter: 8 inches	
		Page <u>1</u> of <u>1</u>

Date: 1/30/19	Soil Boring Log	Boring Name: MW-22
Project Name: Mercer Island Shell	Location: North Of Site In SE 28th Street	
Address: 7833 SE 28th Street Mercer Island, Washington		

Depth	Sample	Blows	PID	Description	Well Construction
5		60/6	0.0	Air-knifed to approximately 5 feet Damp, light brown, fine-grained sand with cobbles and clay. Sample B22-6	 <p>Well constructed of 2-inch diameter PVC well casing with 0.010-inch screen 2/12 silica sand</p>
10				Total depth = 14 feet	
15					
20					
25					
30					
35					

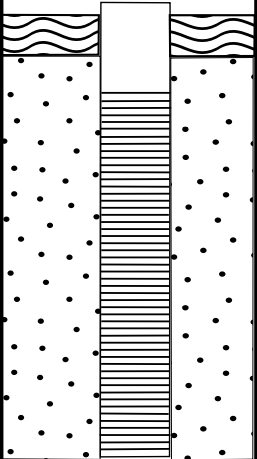
PUGET ENVIRONMENTAL P.L.L.C. 4616 25th Avenue NE #143 Seattle, Washington 98105 (206) 518-4887 PugetEnvironmental.com	Driller Name: Cascade-Curtis	Sampling Method: 3-inch x 18-inch split spoon
	Drilling Method: Hollow Stem Auger	Weather Conditions: Cloudy
	Diameter: 8 inches	Page <u>1</u> of <u>1</u>

Date: 1/31/19	Soil Boring Log	Boring Name: MW-23
Project Name: Mercer Island Shell	Location: Southeast In 80th Avenue SE	
Address: 7833 SE 28th Street Mercer Island, Washington		

Depth	Sample	Blows	PID	Description	Well Construction
5		14	0.0	Air-knifed to approximately 5 feet Moist, bluish gray, silty clay, fine-grained sand. Sample B23-6	
10		15 17		Total depth = 14 feet	
15					Well constructed of 2-inch diameter PVC well casing with 0.010-inch screen 2/12 silica sand
20					
25					
30					
35					

PUGET ENVIRONMENTAL P.L.L.C. 4616 25th Avenue NE #143 Seattle, Washington 98105 (206) 518-4887 PugetEnvironmental.com	Driller Name: Cascade-Curtis	Sampling Method: 3-inch x 18-inch split spoon
	Drilling Method: Hollow Stem Auger	Weather Conditions: Cloudy
	Diameter: 8 inches	Page <u>1</u> of <u>1</u>

Date: 1/31/19	Soil Boring Log	Boring Name: MW-24
Project Name: Mercer Island Shell	Location: West Of Service Building	
Address: 7833 SE 28th Street Mercer Island, Washington		

Depth	Sample	Blows	PID	Description	Well Construction
5		35,50/ 5	0.0	Air-knifed to approximately 5 feet Wet, blueish-gray, silty clay, trace fine-grained sand. Sample B24-6, B24-7 Dry, light brown with orange mottling, silty clay, trace fine-grained sand. Moist to wet, bluish gray, silty clay with fine-grained sand.	
15				Total depth = 14 feet	Well constructed of 2-inch diameter PVC well casing with 0.010-inch screen 2/12 silica sand
20					
25					
30					
35					

PUGET ENVIRONMENTAL P.L.L.C. 4616 25th Avenue NE #143 Seattle, Washington 98105 (206) 518-4887 PugetEnvironmental.com	Driller Name: Cascade-Curtis	Sampling Method: 3-inch x 18-inch split spoon
	Drilling Method: Hollow Stem Auger	Weather Conditions: Cloudy
	Diameter: 8 inches	Page <u>1</u> of <u>1</u>

APPENDIX B

Allstructure Engineering Shoring Plan

PLOT DATE: 01/22/2021 9:35:39 AM

GENERAL STRUCTURAL NOTES

PROJECT SCOPE:
DESIGN IS FOR THE TEMPORARY SHORING FOR THE REMOVAL OF CONTAMINATED SOIL AT THE PROJECT PROPERTY. THE TEMPORARY SHORING IS TO BE INSTALLED, INCLUDING THE TIEBACKS AND THE TESTING OF THE TIEBACKS, THEN THE CONTAMINATED MATERIAL IS TO BE EXCAVATED AND REPLACED WITH CLEAN STRUCTURAL FILL.

DESIGN CRITERIA:
DESIGN WAS BASED ON THE RECOMMENDATIONS OF THE CALIFORNIA TRENCHING AND SHORING MANUAL. SOI LOADING BASED ON GEOTECHNICAL REPORT DATED NOVEMBER 20,2020 BY SOUTH SOUND GEOTECHNICAL CONSULTING AND ADDITIONAL COMMUNICATIONS. THIS DESIGN IS NOT CONSIDERED COMPLETE UNTIL THE LOADING USED FOR THIS DESIGN IS REVIEWED AND APPROVED BY THE GEOTECHNICAL ENGINEER.

ACTIVE EARTH PRESSURE: 35 PCF
PASSIVE EARTH PRESSURE: 300 PCF
SOIL ARCHING: 2X PILE DIAMETER
SURCHARGE: 300 PSF
TIE-BACK BOND STRENGTH: 1,000 PSF

EXISTING CONDITIONS:
THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS, DIMENSIONS AND ELEVATIONS. THE CONTRACTOR SHALL NOTIFY THE ARCHITECT/ENGINEER OF ANY DISCREPANCIES FROM CONDITIONS SHOWN ON THE DRAWINGS PRIOR TO THE START OF THE WORK.

SUBMITTALS:
SHOP DRAWINGS SHALL BE SUBMITTED TO THE ARCHITECT/ENGINEER PRIOR TO FABRICATION AND CONSTRUCTION REGARDING ALL STRUCTURAL ITEMS, INCLUDING THE FOLLOWING:

STEEL FABRICATIONS AND TIEBACK ANCHORAGE INFORMATION

IF THE SHOP DRAWINGS DIFFER FROM, OR ADD TO THE DESIGN OF THE STRUCTURAL DRAWINGS, THEY SHALL BE CLEARLY IDENTIFIED. ANY CHANGES TO THE STRUCTURAL DRAWINGS SHALL BE SUBMITTED TO THE ARCHITECT/ENGINEER AND ARE SUBJECT TO REVIEW AND ACCEPTANCE OF THE ENGINEER.

EARTHWORK:
PROTECT INCOMPLETE WORK FROM FLOODING DURING STORMS OR OTHER CAUSES, THOROUGHLY BRACE OR OTHERWISE PROTECT ALL STRUCTURES NOT STABLE AGAINST UPLIFT DURING CONSTRUCTION. TAKE ALL NECESSARY PRECAUTIONS TO PREVENT DISTURBANCE OF AND TO PROPERLY DRAIN THE AREAS UPON WHICH CONCRETE IS TO BE POURED. DO NOT ALLOW WATER TO ACCUMULATE IN EXCAVATIONS. REMOVE WATER TO PREVENT SOFTENING OF THE BASE FOUNDATIONS. CONVEY WATER REMOVED FROM THE EXCAVATIONS AND RAINWATER TO TEMPORARY DRAINAGE DITCHES OR OTHER STRUCTURES OUTSIDE THE EXCAVATION LIMITS FOR THIS STRUCTURE. ENSURE THAT THE WATERING OPERATIONS WILL NOT ADVERSELY EFFECT FOUNDATIONS. MAINTAIN THE EXCAVATION FREE FROM GROUND WATER FOR THE TIME REQUIRED TO COMPLETE THE WORK IN A PROPER WORKMANLIKE MANNER. REMOVE LOOSE OR DISTURBED SOIL FROM THE BOTTOMS OF EXCAVATION. FOOTINGS SHALL BEAR ON UNDISTURBED NATIVE SOIL OR COMPACTED STRUCTURAL FILL.

METALS:
ALL STRUCTURAL AND MISCELLANEOUS STEEL: ASTM A36 (FY=36,000 PSI) UNLESS NOTED OTHERWISE
ALL WF STEEL: ASTM A992 (FY=50,000 PSI)
T.S. COLUMN: ASTM A500, GRADE "B" (FY=46,000 PSI).
ALL BOLTS: ASTM A307 UNLESS NOTED OTHERWISE.
WELDING: PER AWS STANDARDS. E70XX ELECTRODE AND BY AWS QUALIFIED WELDERS.
ALL STEEL SHALL HAVE SHOP COAT IN ACCORDANCE WITH ARCHITECTURAL SPECIFICATIONS.
ALL EXPOSED STEEL BELOW FINISH GRADE TO BE COATED WITH ASPHALTIC PAINT PRIOR TO BACKFILLING.

DESIGN, FABRICATION, AND ERECTION SHALL BE IN ACCORDANCE WITH THE "AISC SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS". WELDING SHALL CONFORM TO THE AWS CODES FOR ARC AND GAS WELDING IN BUILDING CONSTRUCTION AND SHALL BE 3/16" MINIMUM UNLESS OTHERWISE NOTED. WELDING SHALL BE BY AWS CERTIFIED WELDERS. PREQUALIFIED WELDING PROCEDURES ARE TO BE USED, UNLESS AWS QUALIFICATION IS SUBMITTED TO THE ARCHITECT/ENGINEER PRIOR TO FABRICATION.

PILE AND TIEBACK ANCHORS:

TIEBACK ANCHORS SHALL BE DRILLED IN "TITAN" INJECTION ANCHOR (30/16) OR ENGINEERED APPROVED ALTERNATIVE PLACED IN AN AUGERED HOLE HOLE USING CENTERING ELEMENTS EVERY 10 FEET. ANCHORS SHALL HAVE A PVC COVER TO FORM A NO-LOAD ZONE. FOR THE INJECTION ANCHOR THE RATE OF DRILLING SHALL BE SUCH THAT A 12" GROUT ANNULUS (GROUT BULB) IS FORMED AROUND THE TIE-BACK ANCHOR.

CEMENT SHALL BE ASTM150, TYPE I OR II

CARE AND CONTROL OF SURFACE WATER RUN-OFF AND GROUND WATER SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.

THE CONTRACTOR SHALL IMMEDIATELY SUSPEND ACTIVITIES IF GROUND SUBSIDENCE IS OBSERVED IF THE WALL IS ADVERSELY AFFECTED.

INSPECTION:
SPECIAL INSPECTIONS: IN ACCORDANCE WITH SECTION 1704 OF THE 2014 OSSC AND APPLICABLE SECTIONS OF THE PROJECT SPECIFICATIONS. SPECIAL INSPECTIONS ARE TO BE PERFORMED BY AN INDEPENDENT TESTING LABORATORY EMPLOYED BY THE OWNER FOR THE FOLLOWING AREAS OF WORK:

STEEL WELDING
PILE INSTALLATION AND EXCAVATION PER GEOTECHNICAL ENGINEER

STRUCTURAL OBSERVATIONS:
STRUCTURAL OBSERVATIONS BY THE ENGINEER OF RECORD OR AN APPOINTED REPRESENTATIVE SHALL BE REQUIRED AT THE FOLLOWING TIMES DURING CONSTRUCTION:

NONE REQUIRED

FIELD TESTING:
ANCHOR PROOF-LOAD TESTS AND VERIFICATION TEST SHALL BE PERFORMED IN GENERAL CONFORMANCE WITH THE LATEST EDITION OF THE RECOMMENDATIONS BY THE FEDERAL HIGHWAY ADMINISTRATION.

FOUR (4) GROUND ANCHOR SHALL BE PROOF-LOAD TESTED. TESTED ANCHORS SHALL HAVE A GROUTED LENGTH OF MORE THAN 10 FEET, BUT LESS THAN 15 FEET. PROOF TESTING LOAD (DTL) SHALL BE CALCULATED BASED ON THE ACTUAL GROUTED LENGTH: $DTL = 2.97 \text{ KIPS/FOOT OF GROUTED LENGTH}$.

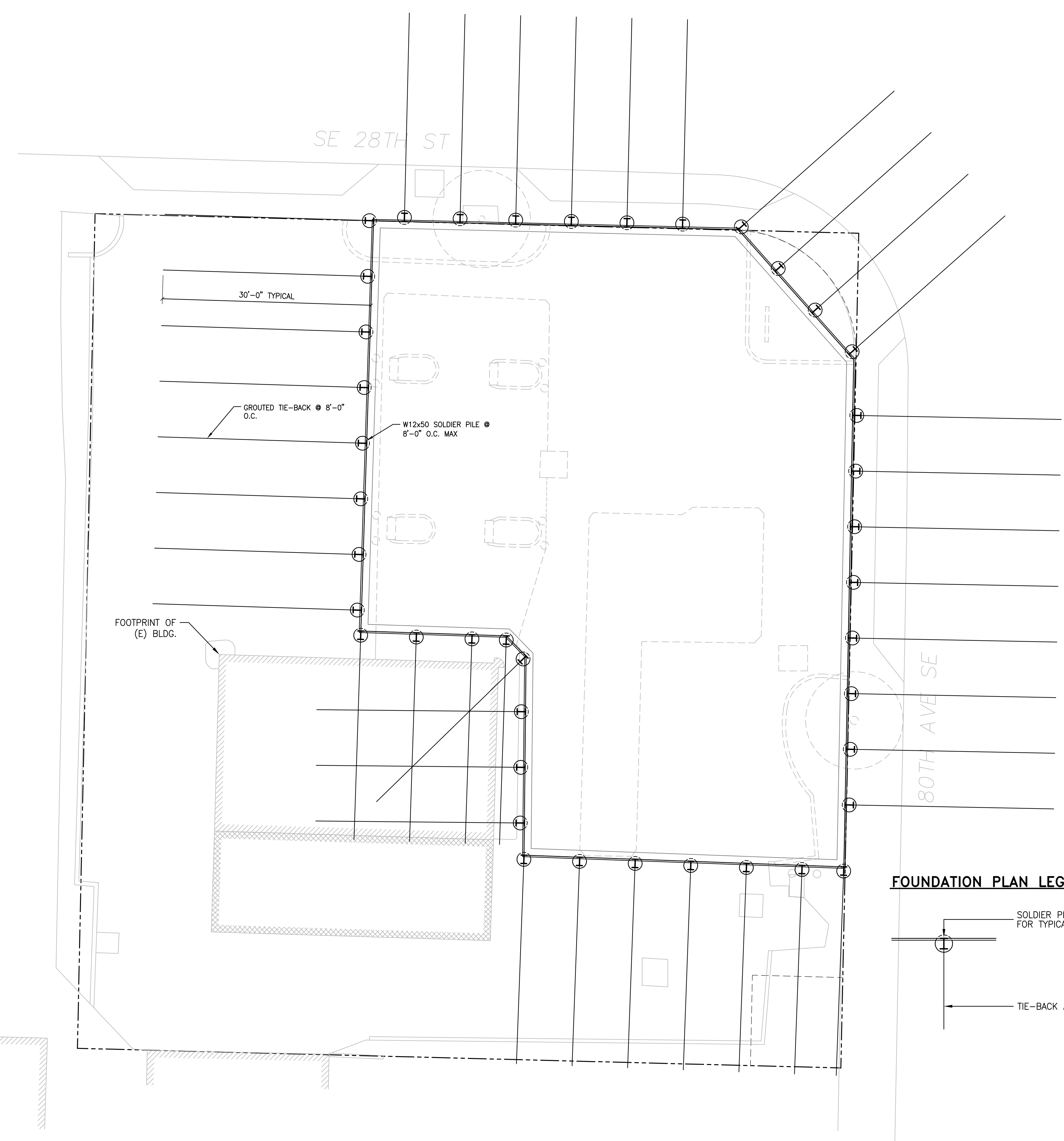
THE PROOF-LOAD TEST SHALL BE PERFORMED BY LOADING THE GROUND ANCHOR IN INCREMENTS OF 25% OF THE DESIGN LOAD TO A MAXIMUM LOAD (DTL). THE GROUND ANCHOR MOVEMENT WITH RESPECT TO AN INDEPENDENT FIXED REFERENCE (CREEP) SHALL BE MEASURED TO THE NEAREST 0.0001 INCH AT THE ALIGNMENT LOAD AND AT EACH INCREMENT OF LOAD. AT LOAD INCREMENT OTHER THAN THE MAXIMUM TEST LOAD, THE LOAD SHALL BE HELD JUST LONG ENOUGH TO OBTAIN THE READING.

THE MAXIMUM LOAD (DTL) SHALL BE HELD FOR TEN (10) MINUTES. THE JACK SHALL BE ADJUSTED AS NECESSARY IN ORDER TO MAINTAIN A CONSTANT LOAD. THE LOAD-HOLD PERIOD SHALL START AS SOON AS THE MAXIMUM TEST LOAD IS APPLIED TO THE GROUND ANCHOR MOVEMENT WITH RESPECT TO A FIXED REFERENCE (CREEP) SHALL BE MEASURED AND RECORDED AT 1 MINUTE, 2, 3, 4, 5, 6 AND 10 MINUTES. IF THE CREEP BETWEEN ONE (1) MINUTE AND TEN (10) MINUTES EXCEEDS 0.040 INCHES THE TEST LOAD SHALL BE HELD FOR AN ADDITIONAL 50 MINUTES. ANCHOR MOVEMENTS SHALL BE MEASURED AT 15, 20, 30, 40, 50 AND 60 MINUTES. THE CREEP VERSUS THE LOGARITHM OF TIME SHALL BE PLOTTED. IF THE CREEP RATE IS LESS THAN 0.080 INCHES BETWEEN 6 AND 60 MINUTES, THE TEST SHALL BE CONSIDERED SUCCESSFUL.

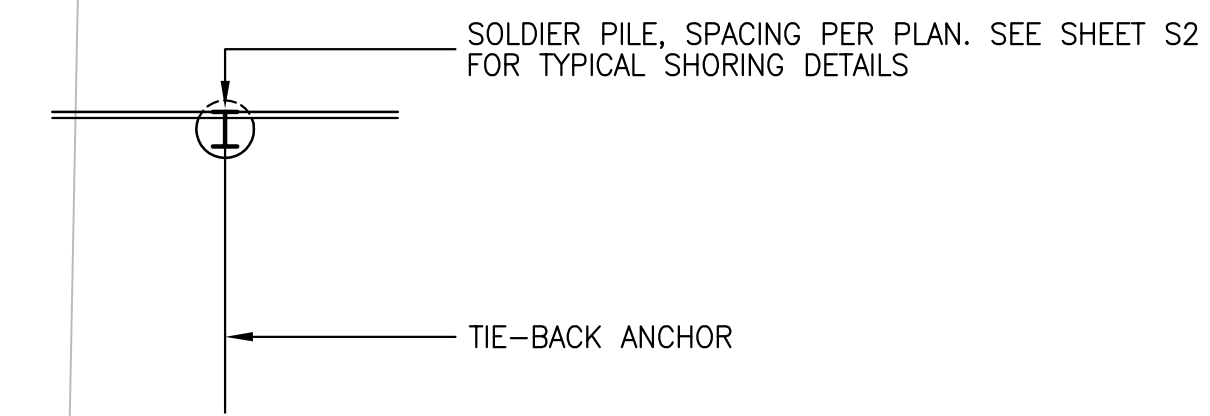
ANCHORS THAT DO NOT SATISFY THE ACCEPTANCE CRITERIA SHALL BE REPLACED OR REDESIGNED OR RETESTED.

ONE (1) GROUND ANCHOR SHALL BE VERIFICATION TESTED. TESTED ANCHORS SHALL HAVE A GROUTED LENGTH OF MORE THAN 10 FEET, BUT LESS THAN 14.5 FEET. VERIFICATION TESTING LOAD (VTL) SHALL BE CALCULATED BASED ON THE ACTUAL GROUTED LENGTH: $DTL = 3.996 \text{ KIPS/FOOT OF GROUTED LENGTH}$. LOADS SHALL BE APPLIED IN ACCORDANCE WITH THE ATTACHED SCHEDULE.

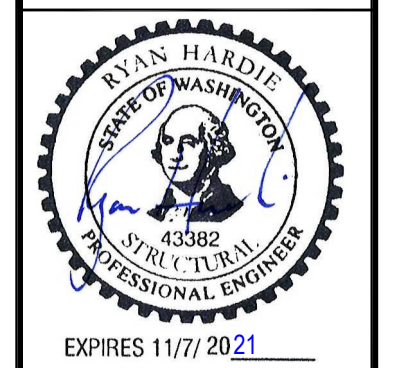
HOLD EACH LOAD INCREMENT FOR AT LEAST 10 MINUTES. MONITOR THE VERIFICATION TEST NAIL FOR CREEP AT THE VTL LOAD INCREMENT. MEASURE AND RECORD NAIL MOVEMENTS DURING THE CREEP PORTION OF THE TEST IN INCREMENTS OF 1 MINUTE, 2, 3, 4, 5, 6, 10, 20, 30, 50 AND 60 MINUTES. MAINTAIN THE LOAD DURING THE CREEP TEST WITHIN 2 PERCENT OF THE INTENDED LOAD BY USE OF THE LOAD CELL. IF THE MOVEMENT IS LESS THAN 0.08 INCHES BETWEEN THE 6 AND 60 MINUTE READINGS AND THE CREEP RATE IS LINEAR OR DECREASING THROUGHOUT THE CREEP TEST LOAD HOLD PERIOD THE TEST IS CONSIDERED SUCCESSFUL. IF PULL OUT FAILURE DOES NOT OCCUR AT THE END OF THE VERIFICATION TEST THEN THE TEST IS CONSIDERED SUCCESSFUL. PULLOUT IS DEFINED AS THE CONTINUED MOVEMENT OF THE TEST LOAD WITH THE INABILITY TO FURTHER INCREASE THE TEST LOAD. RECORD THE PULLOUT FAILURE LOAD AS PART OF THE TEST DATA.



FOUNDATION PLAN LEGEND



ALLSTRUCTURE
Engineering LLC
16154 SW Upper Boones Ferry Rd • Portland, Oregon 97224
v: 503.620.4314 • f: 503.620.4304 • www.allstructure.com



MERCER ISLAND SHELL
ALTERATION/REHABILITATION
MERCER ISLAND, WA

GENERAL NOTES
SHORING PLAN

ISSUE:
THESE DRAWINGS ARE THE PROPERTY OF ALLSTRUCTURE ENGINEERING LLC AND ARE NOT TO BE USED OR REPRODUCED IN ANY MANNER EXCEPT WITH THE PROPER WRITTEN PERMISSION OF ALLSTRUCTURE ENGINEERING LLC.

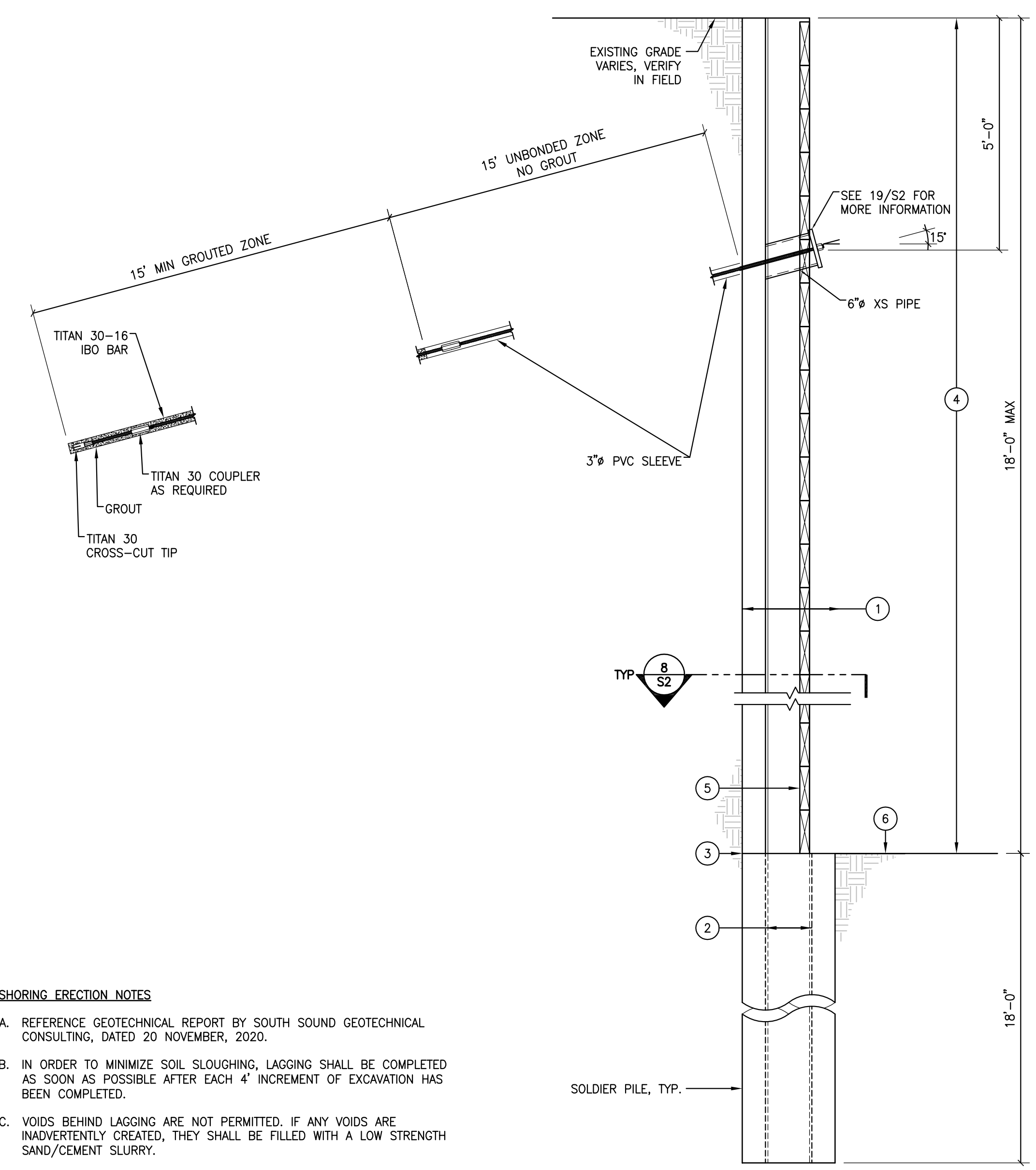
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DRAWN BY: RH
CHK'D BY: RH

SHEET
S1
PROJECT No.:
20420.00

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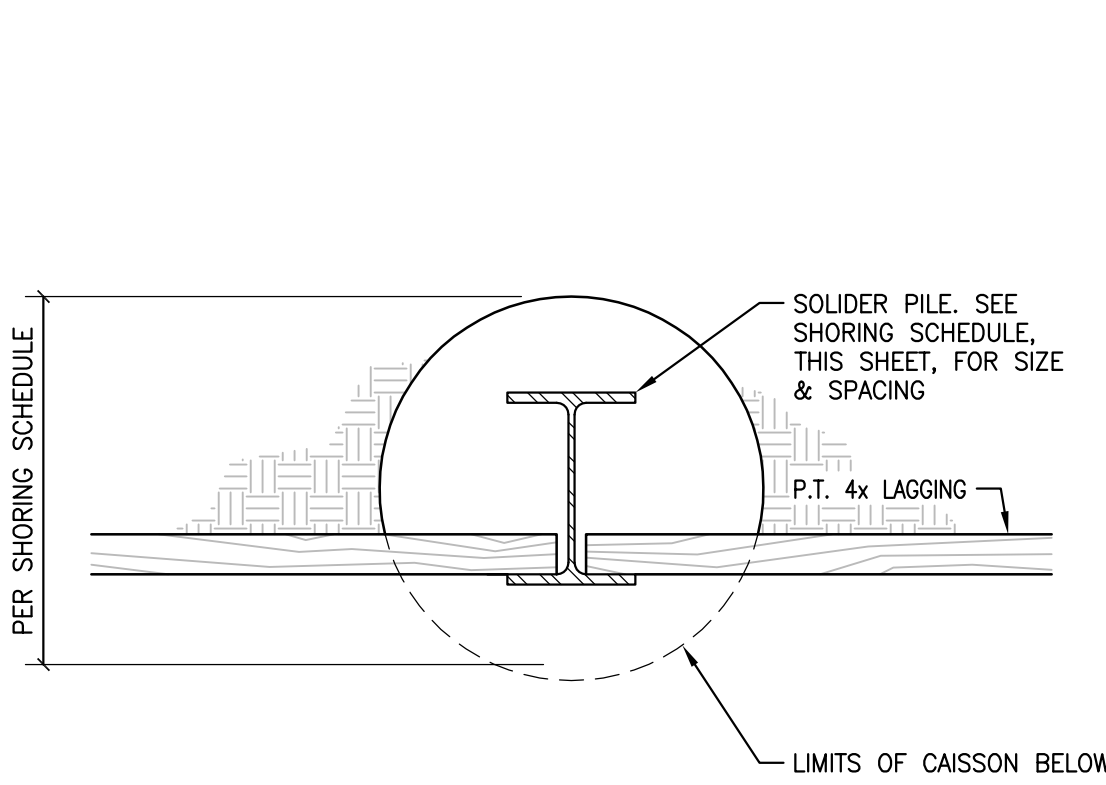
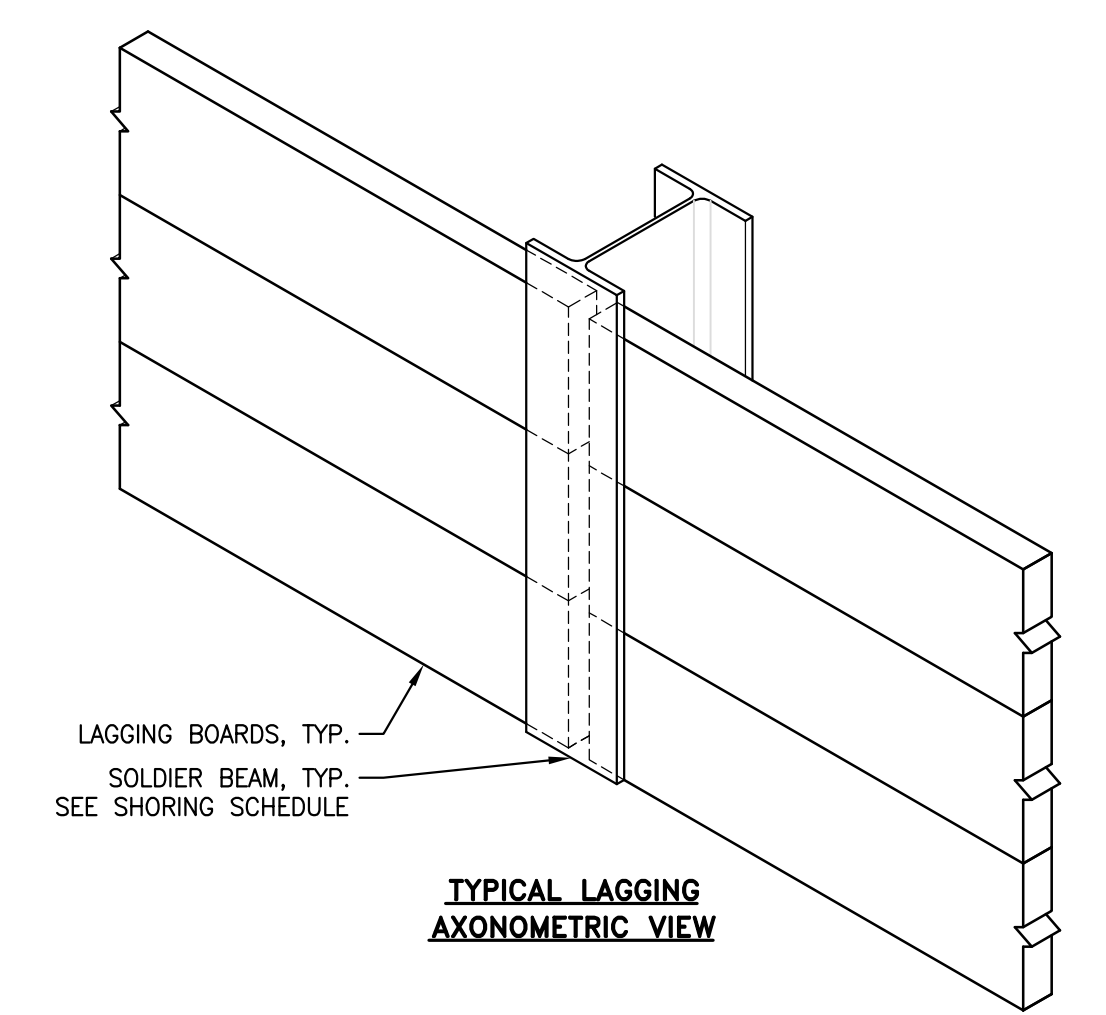
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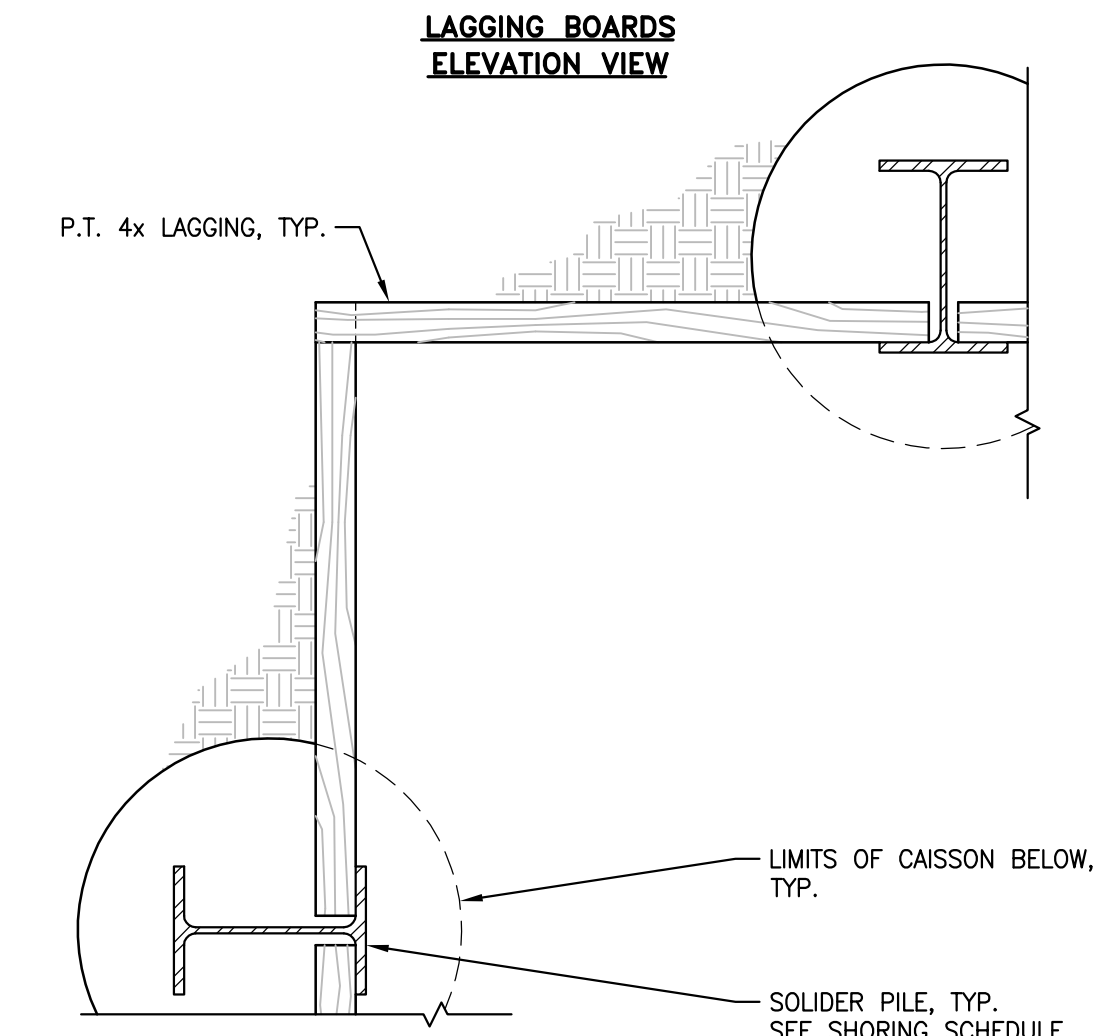
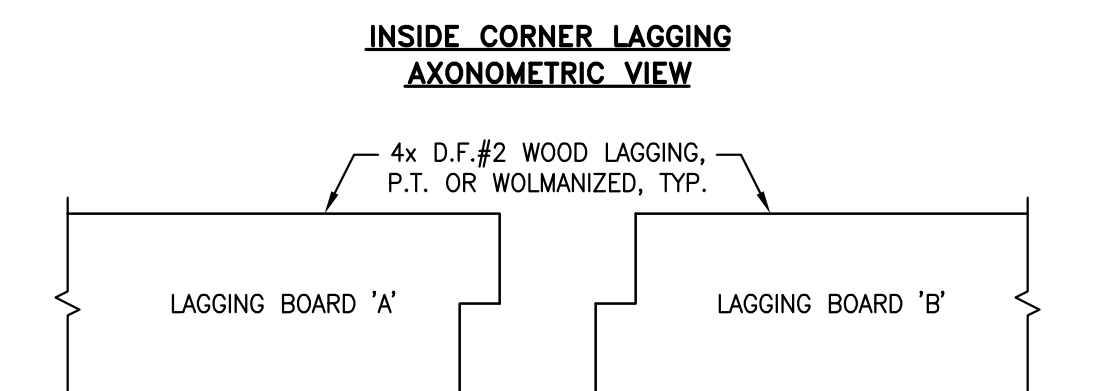
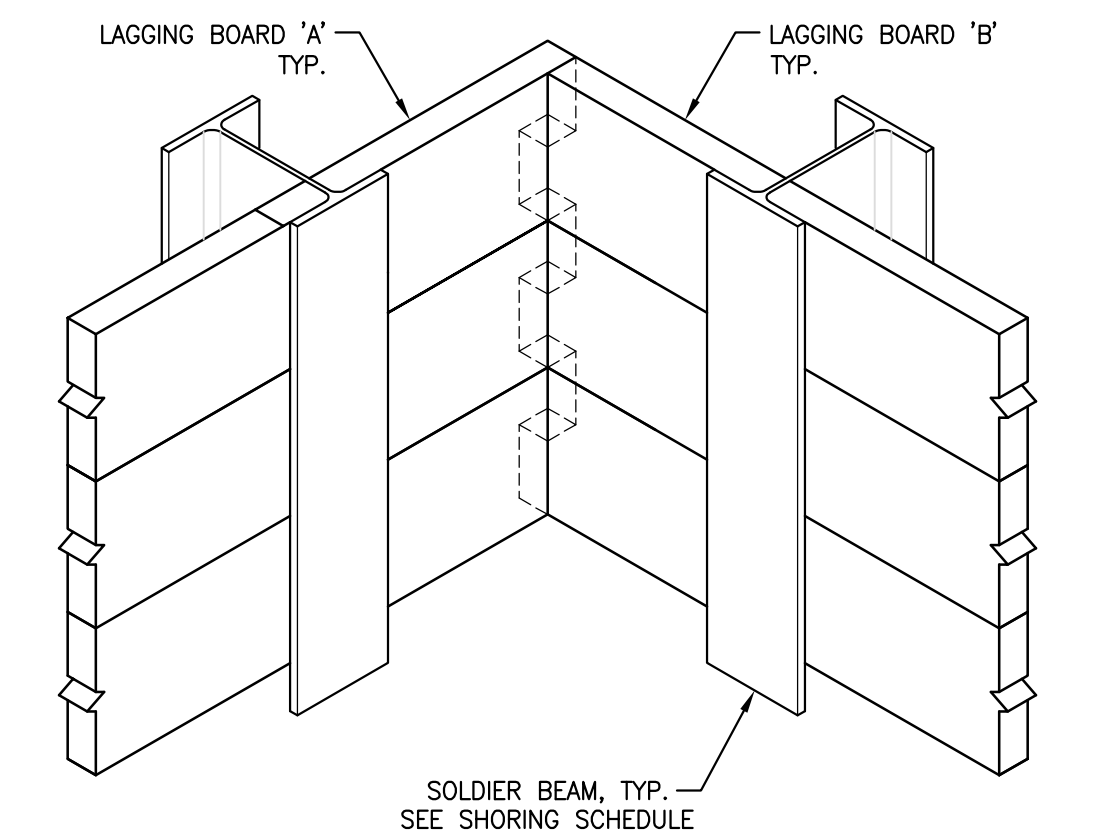
- SHORING ERECTION NOTES**
- REFERENCE GEOTECHNICAL REPORT BY SOUTH SOUND GEOTECHNICAL CONSULTING, DATED 20 NOVEMBER, 2020.
 - IN ORDER TO MINIMIZE SOIL SLOUGHING, LAGGING SHALL BE COMPLETED AS SOON AS POSSIBLE AFTER EACH 4' INCREMENT OF EXCAVATION HAS BEEN COMPLETED.
 - VOIDS BEHIND LAGGING ARE NOT PERMITTED. IF ANY VOIDES ARE INADVERTENTLY CREATED, THEY SHALL BE FILLED WITH A LOW STRENGTH SAND/CEMENT SLURRY.
 - ANY LAGGING LEFT IN PLACE SHALL BE PRESSURE-TREATED WITH CREOSOTE OR SIMILAR SUBSTANCE TO IMPEDE WOOD DETERIORATION.
- SHORING ERECTION PROCEDURE**
- DRILL CAISSONS TO DEPTHS INDICATED IN SHORING SCHEDULE.
 - PLACE SOLDIER PILES. W12X50, TYPICAL UNO.
 - FILL CAISSON TO BOTTOM OF FOOTING ELEVATION WITH 2000 PSI CONCRETE AND THE REMAINDER OF THE HOLE WITH LEAN CONCRETE OR SOIL CEMENT AND ALLOW TO SET FOR 48 HOURS.
 - EXCAVATE EXISTING SOIL TO LIMITS INDICATED AT 4'-0" MAX. OR AS DIRECTED BY GEOTECHNICAL ENGINEER.
 - PLACE 6x LAGGING. REPEAT STEPS 4 THRU 5 UNTIL EXCAVATION IS COMPLETED TO BOTTOM OF FOOTING ELEVATION.
 - LIMITS OF EXCAVATION PROVIDED FOR REFERENCE ONLY. SEE PLANS. ACTUAL LIMITS OF EXCAVATION TO BE DETERMINED IN FIELD. CONTACT EOR IF LIMITS DEVIATE SIGNIFICANTLY FROM THE PLANS.

7
S2
NO SCALE
SOLDIER PILE INSTALLATION

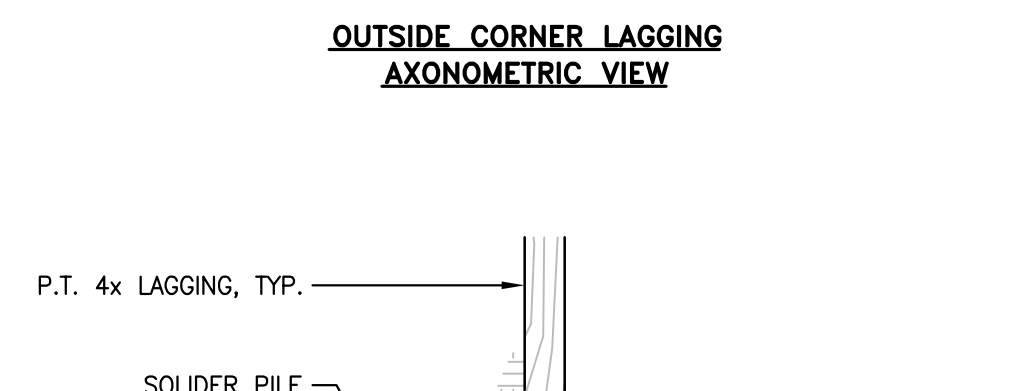
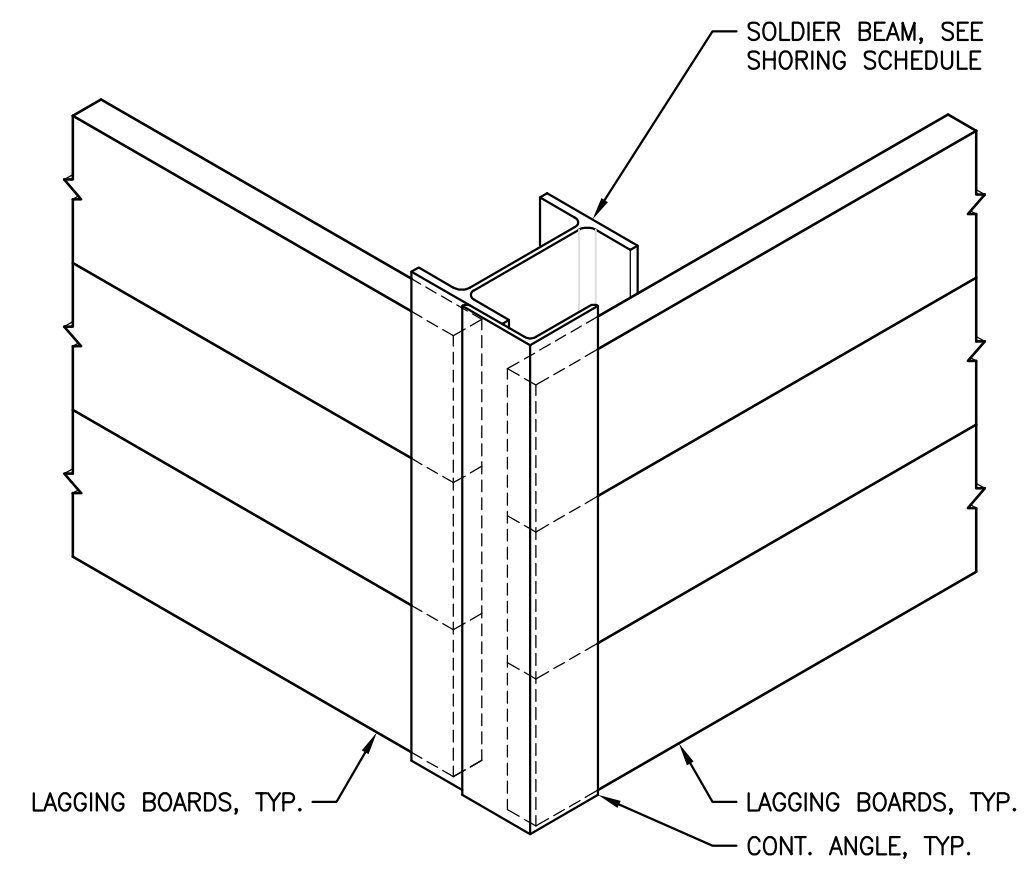
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S2
NO SCALE
SOLDIER PILE NOTES



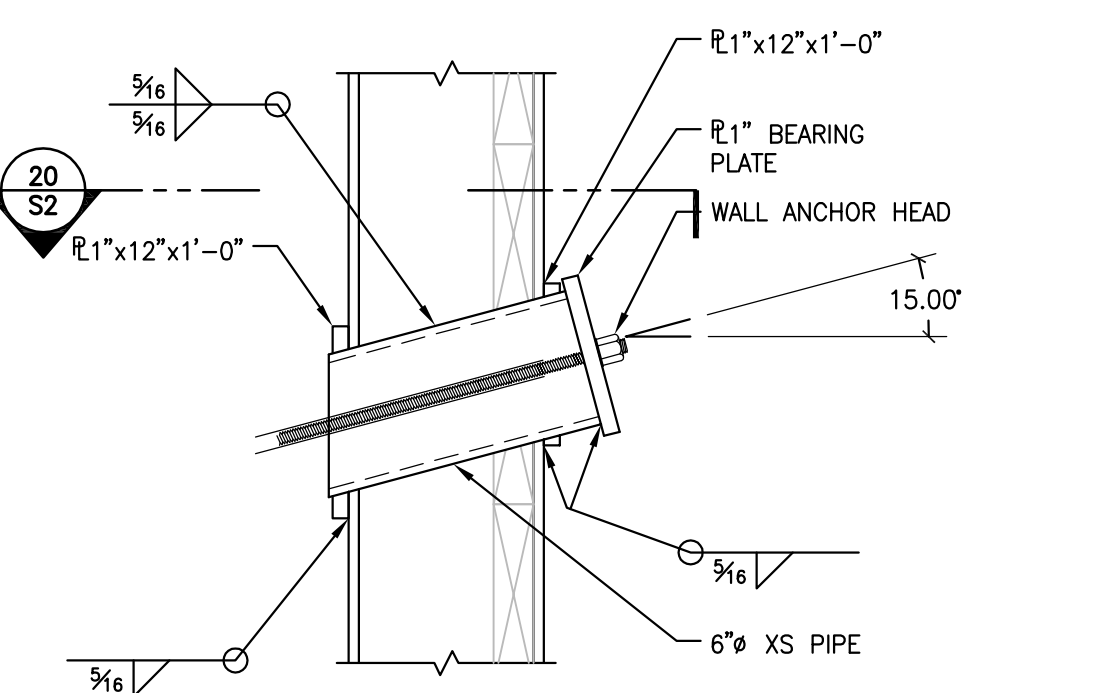
8
S2
1"=1'-0"
TYPICAL SOLDIER PILE & LAGGING



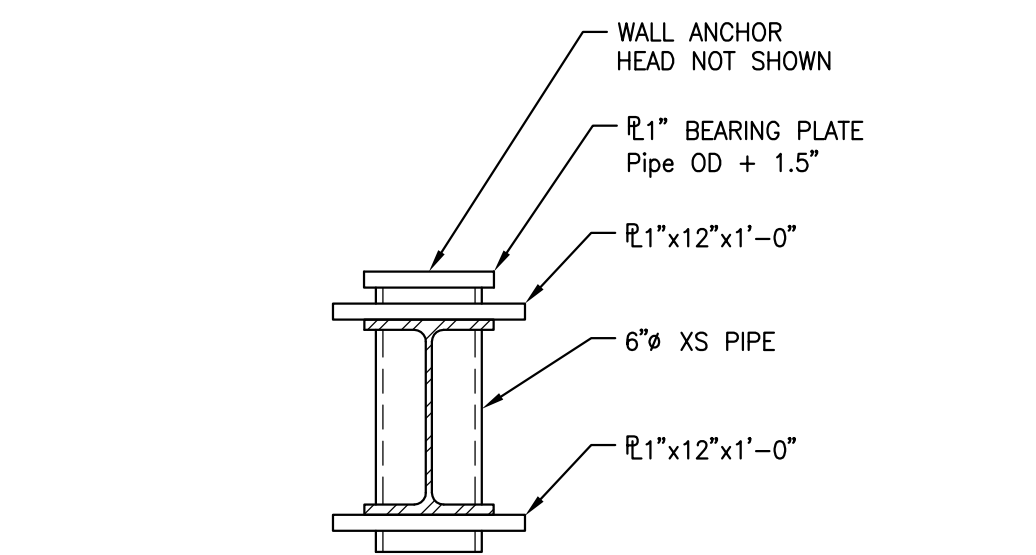
9
S2
1"=1'-0"
LAGGING AT INSIDE CORNER



10
S2
1"=1'-0"
LAGGING AT OUTSIDE CORNER



19
S2
1"=1'-0"
SOLDIER PILE W/TIE BACK THRU WEB



20
S2
1"=1'-0"
SECTION THRU SOLDIER PILE

APPENDIX C

Report Limitations and Guidelines for Use

REPORT LIMITATIONS AND USE GUIDELINES

Reliance Conditions for Third Parties

This report was prepared for the exclusive use of the Client. No other party may rely on this report or the product of our services without the express written consent of Aspect Consulting, LLC (Aspect). This limitation is to provide our firm with reasonable protection against liability claims by third parties with whom there would otherwise be no contractual conditions or limitations and guidelines governing their use of the report. Within the limitations of scope, schedule and budget, our services have been executed in accordance with our Agreement with the Client and recognized standards of professionals in the same locality and involving similar conditions.

Services for Specific Purposes, Persons and Projects

Aspect has performed the services in general accordance with the scope and limitations of our Agreement. This report has been prepared for the exclusive use of the Client and their authorized third parties, approved in writing by Aspect. This report is not intended for use by others, and the information contained herein is not applicable to other properties.

This report is not, and should not, be construed as a warranty or guarantee regarding the presence or absence of hazardous substances or petroleum products that may affect the subject property. The report is not intended to make any representation concerning title or ownership to the subject property. If real property records were reviewed, they were reviewed for the sole purpose of determining the subject property's historical uses. All findings, conclusions, and recommendations stated in this report are based on the data and information provided to Aspect, current use of the subject property, and observations and conditions that existed on the date and time of the report.

Aspect structures its services to meet the specific needs of our clients. Because each environmental study is unique, each environmental report is unique, prepared solely for the specific client and subject property. This report should not be applied for any purpose or project except the purpose described in the Agreement.

This Report Is Project-Specific

Aspect considered a number of unique, project-specific factors when establishing the Scope of Work for this project and report. You should not rely on this report if it was:

- Not prepared for you
- Not prepared for the specific purpose identified in the Agreement
- Not prepared for the specific real property assessed
- Completed before important changes occurred concerning the subject property, project or governmental regulatory actions

If changes are made to the project or subject property after the date of this report, Aspect should be retained to assess the impact of the changes with respect to the conclusions contained in the report.

Geoscience Interpretations

The geoscience practices (geotechnical engineering, geology, and environmental science) require interpretation of spatial information that can make them less exact than other engineering and natural science disciplines. It is important to recognize this limitation in evaluating the content of the report. If you are unclear how these "Report Limitations and Use Guidelines" apply to your project or site, you should contact Aspect.

Discipline-Specific Reports Are Not Interchangeable

The equipment, techniques and personnel used to perform an environmental study differ significantly from those used to perform a geotechnical or geologic study and vice versa. For that reason, a geotechnical engineering or geologic report does not usually address any environmental findings, conclusions or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. Similarly, environmental reports are not used to address geotechnical or geologic concerns regarding the subject property.

Environmental Regulations Are Not Static

Some hazardous substances or petroleum products may be present near the subject property in quantities or under conditions that may have led, or may lead, to contamination of the subject property, but are not included in current local, state or federal regulatory definitions of hazardous substances or petroleum products or do not otherwise present potential liability. Changes may occur in the standards for appropriate inquiry or regulatory definitions of hazardous substance and petroleum products; therefore, this report has a limited useful life.

Property Conditions Change Over Time

This report is based on conditions that existed at the time the study was performed. The findings and conclusions of this report may be affected by the passage of time (for example, Phase I ESA reports are applicable for 180 days), by events such as a change in property use or occupancy, or by natural events, such as floods, earthquakes, slope failure or groundwater fluctuations. If more than six months have passed since issuance of our report, or if any of the described events may have occurred following the issuance of the report, you should contact Aspect so that we may evaluate whether changed conditions affect the continued reliability or applicability of our conclusions and recommendations.

Phase I ESAs – Uncertainty Remains After Completion

Aspect has performed the services in general accordance with the scope and limitations of our Agreement and the current version of the “Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process”, ASTM E1527, and U.S. Environmental Protection Agency (EPA)'s Federal Standard 40 CFR Part 312 "Innocent Landowners, Standards for Conducting All Appropriate Inquiries".

No ESA can wholly eliminate uncertainty regarding the potential for recognized environmental conditions in connection with subject property. Performance of an ESA study is intended to reduce, but not eliminate, uncertainty regarding the potential for environmental conditions affecting the subject property. There is always a potential that areas with contamination that were not identified during this ESA exist at the subject property or in the study area. Further evaluation of such potential would require additional research, subsurface exploration, sampling and/or testing.

Historical Information Provided by Others

Aspect has relied upon information provided by others in our description of historical conditions and in our review of regulatory databases and files. The available data does not provide definitive information with regard to all past uses, operations or incidents affecting the subject property or adjacent properties. Aspect makes no warranties or guarantees regarding the accuracy or completeness of information provided or compiled by others.

Exclusion of Mold, Fungus, Radon, Lead, and HBM

Aspect's services do not include the investigation, detection, prevention or assessment of the presence of molds, fungi, spores, bacteria, and viruses, and/or any of their byproducts. Accordingly, this report does not include any interpretations, recommendations, findings, or conclusions regarding the detection, assessment, prevention or abatement of molds, fungi, spores, bacteria, and viruses, and/or any of their byproducts. Aspect's services also do not include the investigation or assessment of hazardous building materials (HBM) such as asbestos, polychlorinated biphenyls (PCBs) in light ballasts, lead based paint, asbestos-containing building materials, urea-formaldehyde insulation in on-site structures or debris or any other HBMs. Aspect's services do not include an evaluation of radon or lead in drinking water, unless specifically requested.