

May 19, 2020

Oregon Department of Environmental Quality
700 NE Multnomah Street, Suite 600
Portland, OR 97232

Attention: Rob Hood

Work Plan
Supplemental Limited Site Investigation
Former Automatic Vending Company
5001 North Lagoon Avenue
Portland, Oregon
ECSI No. 1430
GeoDesign Project: BCSAmerica-1-01-03

INTRODUCTION

GeoDesign, Inc. is pleased to submit this work plan to conduct a supplemental limited site investigation (LSI) at the Former Automatic Vending Company site located at 5001 North Lagoon Avenue in Portland, Oregon (project site). The project site is in the upland portion of the Portland Harbor Superfund area on Swan Island. The project site is located on Tax Lot 700 of Multnomah County Tax Map 1N1E20A and is occupied by a 47,460-square-foot warehouse and an approximately 1,200-square-foot shop formerly used as a truck repair shop and most recently used for general storage. The project site layout is shown on Figures 1 and 2.

BACKGROUND

It appears the project site formerly contained six underground storage tanks (USTs) that included one 10,000-gallon and three 20,000-gallon gasoline USTs, one 550-gallon motor oil UST, and one 1,000-gallon waste oil UST. These six USTs were decommissioned by removal in the 1990s from the locations shown on Figures 1 and 2. A release was not observed during decommissioning of the four gasoline USTs. Oil-impacted soil was observed during decommissioning of the motor oil and waste oil USTs formerly located on the project site. Approximately 134 tons of petroleum-impacted soil were excavated from the motor oil and waste oil UST pit and disposed of off site. The approximate limits of the excavation associated with decommissioning of the oil USTs are shown on Figure 2.

Subsequently, PEMCO advanced four borings (B-1 through B-4) west of the remedial excavation (outside of the project site boundary) to delineate the extent of impacted soil left in place. The locations of the PEMCO borings are shown on Figure 2. Chemical analytical results of the soil samples collected from the borings indicated that heavy oil was detected in fill material at concentrations of up to 2,000 milligrams per kilogram (mg/kg) collected from boring B-3. PEMCO and the Oregon Department of Environmental Quality (DEQ) concluded that detection of heavy oil appeared to be associated with fill material and was not related to the UST release. DEQ issued a No Further Action (NFA) determination in May 1997 for Leaking Underground Storage Tank File No. 26-91-0415, which was associated with these USTs. However, DEQ listed the project site as DEQ Environmental Cleanup Site Information (ECSI) No. 1430 due to detections of oil in the undocumented fill material.

K&S Environmental, Inc. (K&S) conducted a Phase I Environmental Site Assessment (ESA) at the project site in December 2018. The text and figures from the K&S Phase I ESA are presented in Attachment A. The Phase I ESA identified in-ground hydraulic hoists and catch basins located in the project site structure as a recognized environmental condition (REC) at the project site. The Phase I ESA also identified open ECSI File No. 1430 as a REC at the project site.

Subsequently, K&S conducted a subsurface investigation by advancing four borings (shown on Figure 2) at the project site to evaluate potential soil impacts to the subsurface from the hydraulic hoists and catch basins. The maximum detected concentrations of diesel- and oil-range hydrocarbons, tetrachloroethene (PCE), and polychlorinated biphenyls (PCBs) were detected in soil samples from boring B-3 (at approximately 7 feet below ground surface [BGS]) at concentrations of 25,800 mg/kg, 17,000 mg/kg, 10.3 mg/kg, and 0.109 mg/kg, respectively.

The two in-ground hydraulic hoists formerly located inside the shop structure were removed in March 2019. A product sample collected of the hydraulic fluid indicated that PCBs were not detected at concentrations greater than the laboratory reporting limits. K&S observed the excavation of approximately 45.25 tons of impacted soil from the project site and disposed of it off site. Residual impacted soil was left in place because additional excavation would have resulted in undermining the building. A total of seven confirmation soil samples were collected from the limits of the excavation (shown on Figure 2). The maximum detected concentrations of diesel-range hydrocarbons, PCE, and PCBs were detected in confirmation soil sample C3 at concentrations of 3,600 mg/kg, 3.42 mg/kg, and 0.0339 mg/kg, respectively.

GeoDesign reviewed available building records for the project site at the City of Portland Development Services. A blueprint of the project site from 1973 depicts that the two catch basins located at the shop discharge to the municipal sanitary sewer. Building records do not indicate where the remainder of the catch basins discharge.

GeoDesign conducted an LSI at the shop building that included advancing 13 direct-push borings (DP-1 through DP-13) for the collection of soil and/or groundwater samples at the locations shown on Figure 2. The results of the LSI indicated the following:

- Elevated concentrations of chemicals of potential concern (COPCs) above applicable DEQ RBCs were not detected in soil samples collected in the vicinity of the former hydraulic hoists. Based on this, it appears that both the lateral and vertical extents of impacts have been adequately evaluated and the remedial excavation conducted by K&S in March 2019 adequately remediated the impacts to soil from the release.
- Fill material was encountered in borings DP-11 through DP-13 that extended vertically from beneath the pavement to a concrete slab buried between 7.5 and 8.5 feet BGS. COPCs were detected in the fill material at concentrations greater than Portland Harbor cleanup levels (CULs), DEQ Joint Source Control Strategy (JSCS) screening level values (SLVs), and/or DEQ risk-based concentrations (RBCs). The fill material was interpreted to likely be an area-wide unit associated with the former airport.
- Groundwater samples were collected from borings DP-1 through DP-3. COPCs were not detected in the three groundwater samples at concentrations greater than applicable DEQ RBCs. PCE, trichloroethene (TCE), benzyl alcohol, arsenic, copper, and/or lead were detected in the three groundwater samples at concentrations greater than Portland Harbor CULs and/or DEQ JSCS SLVs. However, the concentrations were relatively low and did not appear to represent a significant risk to the Portland Harbor.

SCOPE OF SERVICES

The purpose of the supplemental LSI described in this work plan is to evaluate the remainder of the project site to facilitate an NFA determination for the entire project site. DEQ has requested that additional soil and groundwater samples be collected to delineate the fill material and to acquire data to support a source control decision. The specific scope of services is discussed in the following sections.

CATCH BASIN EVALUATION

The City of Portland utility maps depict a stormwater main beneath North Lagoon Avenue with lateral service lines entering the project site on the northwest and northeast portions of the project site. GeoDesign proposes scoping a catch basin in the paved area of the project site closest to one of these laterals to determine the discharge location. If the catch basin is determined to discharge to the City of Portland municipal storm sewer system, it will be assumed that the remainder of the catch basins (excluding the two near the shop) discharge to the storm system. The City of Portland utility map is presented in Attachment B.

SOIL AND GROUNDWATER ASSESSMENT

GeoDesign proposes advancing six direct-push borings at the project site for the collection of soil and groundwater samples. The proposed boring locations are shown on Figure 1. However, the actual locations of borings may be modified in the field based on access or the presence of overhead or underground utilities or obstructions. The specific scope of services includes the following:

- Prepare a site-specific Health and Safety Plan.
- Contact Oregon's one-call Utility Notification Center to mark the location of public utilities beneath the project site.

- Subcontract a private utility locator to clear the proposed boring locations of utility conflicts prior to drilling.
- Subcontract a licensed driller to advance the borings using direct-push drilling methods.
- Advance six direct-push soil borings at the project site approximately 10 feet into groundwater or refusal, whichever comes first. The proposed boring locations are intended to provide a spatial distribution of data across the entire project site and further evaluate impacts detected in the area of the shop. The proposed boring locations are shown on Figure 1. GeoDesign proposes advancing two borings approximately 50 feet northeast and 50 feet southeast of the shop to further evaluate the extent of impacts observed during the previous LSI. GeoDesign also proposes advancing one boring in the center of the project site and three borings in the northeast, northwest, and southeast corners of the project site to evaluate if the fill material is present across the entire project site and to evaluate groundwater conditions on the boundaries of the project site and the potential for on-site migration of contaminants.
- Continuously field screen soil from each boring to the extent practical and maintain a log of each boring. Field screening will include visual and olfactory observation, water sheen testing, and headspace vapor measurements using a 10.6-electronvolt (eV) photoionization detector (PID) to quantitatively estimate the presence of volatile organic compounds (VOCs).
- Collect and containerize at least one soil sample from each boring based on field screening results for potential chemical analysis. A soil sample will be collected of fill material (if encountered) and an additional soil sample will be collected of native material below the fill material.
- Soil samples selected for chemical analysis will be placed in laboratory-prepared sample jars with Teflon™-lined lids and immediately placed in an ice chest and kept cool until delivery to the laboratory. The jars will be packed full to minimize headspace in the containers. Soil samples collected for VOC analyses will be collected in volatile organic analysis vials consistent with U.S. Environmental Protection Agency (EPA) Method 5035A preservation procedures for VOC sampling. Standard chain-of-custody (COC) procedures will be observed during transport of the samples to the laboratory.
- Groundwater samples will be collected from each of the six proposed borings. The groundwater samples will be collected from temporary wells (slotted PVC piping) installed in each of the direct-push borings.
- Collect grab groundwater samples using a peristaltic pump and dedicated high-density polyethylene tubing or a new, disposable bailer. Each well will be purged to reduce turbidity prior to collecting a groundwater sample.
- Containerize soil cuttings, purge water, and decontamination water in 55-gallon drums.
- All explorations will be decommissioned using bentonite chips immediately upon the conclusion of field work for this LSI.

ANALYTICAL PROGRAM

Based on the known historical uses of the project site and the results of the LSI conducted in 2019, soil samples collected during the proposed supplemental LSI will be analyzed for the following:

- Gasoline-range hydrocarbons by Method NWTPH-Gx
- Diesel- and oil-range hydrocarbons by Method NWTPH-Dx
- VOCs by EPA Method 5035A/8260B
- Polycyclic aromatic hydrocarbons (PAHs) by Method 8270D-SIM
- RCRA 8 total metals by EPA Method 6020
- Total copper and zinc by EPA Method 6020
- PCBs by EPA Method 8082

The two soil samples with the greatest detected concentrations of petroleum hydrocarbons will also be analyzed for volatile petroleum hydrocarbons (VPH) by Method WA VPH and extractable petroleum hydrocarbons (EPH) by Method WA EPH.

Based on the known historical uses of the project site and the results of the LSI conducted in 2019, groundwater samples collected during the proposed supplemental LSI will be analyzed for the following:

- Gasoline-range hydrocarbons by Method NWTPH-Gx
- Diesel- and oil-range hydrocarbons by Method NWTPH-Dx
- VOCs by EPA Method 8260B
- Semi-volatile organic compounds (SVOCs) by EPA Method 8270D-SIM
- Total and dissolved arsenic, copper, and lead by EPA Method 6020

The two groundwater samples with the greatest detected concentrations of petroleum hydrocarbons will also be analyzed for VPH by Method WA VPH and EPH by Method WA EPH. Follow-up analysis will not be conducted if petroleum hydrocarbons are not detected at concentrations greater than the laboratory reporting limits.

The achievable detection limits by Apex Laboratories, of Tigard, Oregon, for the COPCs in groundwater are presented in Attachment C. Groundwater analytes with reporting limits greater than the Portland Harbor CULs are presented in the table below.

Analyte	Reporting Limit (µg/L)	Cleanup Value (µg/L)
Arsenic	0.0500	0.018
Cadmium	0.200	0.091
Benzo(a)anthracene	0.00400	0.0012
Benzo(a)pyrene	0.00400	0.00012
Benzo(b)fluoranthene	0.00400	0.0012
Benzo(k)fluoranthene	0.00400	0.0013
Chrysene	0.00400	0.0013
Dibenzo(a,h)anthracene	0.00400	0.00012
Indeno(1,2,3-c,d)pyrene	0.00400	0.0012
TPH-Diesel (C10-C12 Aliphatic)	25.0	2.6

TPH: total petroleum hydrocarbon
µg/L: micrograms per liter

Analytes with detection limits that exceed the cleanup values are also highlighted in Attachment C. If the samples need to be diluted during analysis, it is possible that additional analyte reporting limits will exceed cleanup values.

PORTLAND HARBOR CHEMICAL OF CONCERN EXCLUSIONS

GeoDesign proposes analyzing soil and groundwater samples for the COPCs listed above. We propose eliminating analyses for pesticides, herbicides, cyanide, manganese, vanadium, dioxins, furans, and tributyltin as these compounds are not potential COPCs at the project site. Based on understanding of project site history, there is no known historical agricultural use and the project site has not been occupied by businesses that use, store, or manufacture equipment or chemicals that would contain these compounds. Therefore, these compounds are not considered chemicals of concern (COCs).

Previous chemical analytical data indicates the primary semi-volatile organic COCs are PAHs. Therefore, GeoDesign proposes limiting SVOCs for soil samples to PAHs, including acenaphthene, acenaphthylene, anthracene, benz(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(g,h,i)perylene, chrysene, dibenz(a,h)anthracene, dibenzofuran, fluoranthene, fluorene, ideno(1,2,3-cd)pyrene, 1-methylnaphthalene, 2-methylnaphthalene, naphthalene, phenanthrene, and pyrene.

QUALITY OBJECTIVES AND CRITERIA

This section describes the field methodology for collecting and handling soil and groundwater samples for chemical analyses and quality assurance/quality control (QA/QC) procedures. Elements include sample handling and custody requirements, analytical methods, QA/QC, instrument/equipment testing and frequency, inspection and maintenance, instrument calibration, supply inspection/acceptance, non-direct measurements, and data management.

SOIL SAMPLE FIELD SCREENING

Field screening procedures will be used to evaluate the potential presence and relative magnitude of soil impacts. Field screening is not planned in lieu of laboratory analysis. Field screening for the presence of metals and PCBs is not reliable with the proposed screening equipment; however, elevated TPH, VOC, and PAH concentrations may be identified to help assist in soil sample selection. Field screening samples will be collected at the same time and location as the potential laboratory analytical samples.

Sheen Testing

Sheen testing will be performed by placing a small amount (typically a thumbnail size) of soil into a “sheen pan” containing a small amount of water. Typically, a black prospector’s pan is used; however, any dark-colored container is suitable. The presence of heavier-weight compounds (i.e., transformer oil) may create a colored sheen on the water surface. Sheen is categorized based on the brilliance and spreading. The categories for sheen are Slight, Moderate, and Heavy Sheen. Representative examples of each category are discussed as follows:

- **Slight Sheen:** Sheen is sparse and does not spread quickly. Often appears blotchy. Some naturally occurring biogenic compounds can yield blotchy, non-brilliant sheens.
- **Moderate Sheen:** Sheen is typically brilliant and spreads moderately quickly. Does not completely cover the water surface.
- **Heavy Sheen:** Sheen is brilliant and spreads very quickly, covering the water surface.

Headspace Vapor Testing

Headspace vapor testing is a field screening technique that incorporates the use of a PID to assess relative impacts to soil. A sample of the soil (approximately one handful or slightly less) is placed into a plastic bag. The plastic bag is sealed in a fashion that allows a significant amount of air into the bag, and the bag is shaken and/or allowed to sit for a period of time (typically a few minutes). The volatile component of soil contamination will escape the soil pores and enter the air space inside the bag. The tip of the PID is then inserted into the bag, and the instrument reading in units of parts per million (ppm) is recorded. PID readings of 10 ppm or greater typically indicate measurable quantities of volatile contaminants. This method of field screening is sensitive to temperature and humidity. At higher temperatures, VOCs will more readily dissociate from the soil and into the headspace, producing a higher PID reading. Similarly, colder temperatures will typically produce lower PID readings. For this project a 10.6-eV PID will be used.

Visual and Olfactory

Visual and olfactory field screening methods also will be employed during field work. These observations are typically recorded on field reports to convey general (non-quantitative) contamination observations.

- **Visual:** Contaminated soil is typically stained darker than adjacent, non-contaminated soil. Often a gray color is noted where petroleum impacts are significant. This is due to the reducing environment (low oxygen content) typically associated with contamination.
- **Olfactory (Odor):** Contaminated soil, sediment, and water will often yield an odor. The field sampler should NOT make it common practice to repeatedly smell pieces of contaminated material. This increases the frequency and magnitude of exposure to potentially harmful chemicals.

SOIL SAMPLING PROCEDURES

A direct-push drill rig (e.g., Geoprobe®) is a hydraulically powered probing device. A direct-push rig typically consists of a powered percussion hammer that is slide-mounted on a derrick and has a 4.5-foot stroke. The derrick assembly hydraulically folds and unfolds from the traveling or storage position in the rear portion of a truck- or track-mounted vehicle. The derrick can be adjusted to ensure it is vertical. The direct-push rig uses the weight of the vehicle and a hydraulically powered percussion hammer to advance 3- to 5-foot-long rods into the ground. The drill rods vary in thickness but can have an inside diameter of 1.5 to 3 inches and an outside diameter of 2 to 3.5 inches. A direct-push drill rig is capable of collecting discrete subsurface soil samples with a special soil sampling probe that is screwed onto the end of the lead rod. The sampler consists of the sample tube, cutting shoe, piston tip and piston rod, drive head, and a piston stop pin. A 5-foot-long, acrylic liner fits inside the sample tube, allowing the collection of

a 5-foot-long continuous soil sample. The driller retrieves the acrylic liner from the sampler and splits the liner so the soil contents can be examined, field screened, and retained in containers for laboratory analysis.

The following procedures will be performed to collect subsurface soil samples. Disposable nitrile gloves will be worn and changed between sampling.

- Spread the acrylic liner to expose the soil core.
- Log the soil core to document lithological conditions encountered. Conduct field screening at applicable sections of the soil core to identify the most impacted portion(s) of the core to collect for laboratory analysis.
- Immediately transfer a sample from the selected part of the soil core to labeled, laboratory-prepared sample containers. If field screening results for an individual core are consistent, and do not exhibit elevated readings, technical staff will use discretion on the sampled interval.
- Place soil samples into sample containers in the order of volatility. For example, VOC samples first; TPH organics second; followed by PAH, PCB, and metals last.
- For VOC analysis, collect a representative, undisturbed portion from the interior of the core and containerize/preserve in accordance with EPA Method 5035A. Place samples collected for other analyses into 4- and/or 8-ounce, glass jars with Teflon™-lined lids. Attempt to completely fill the jars so that minimum headspace remains in the sample jar. Avoid sample disturbance to minimize volatilization of chemicals.
- After collecting a sufficient volume of sample for the particular analysis, place the labeled sample jars in an iced cooler for temporary storage. The samples will be immediately preserved according to proper packaging and storage procedures. Unless specified otherwise, the samples should be cooled to 4 ± 2 degrees Celsius and maintained at that temperature throughout delivery to the laboratory until the samples are analyzed.
- Use a field notebook and boring log to record a description of the soil type comprising the core, the percent recovery, the depth of the core and sample retained for analysis, the time the sample was collected, and results of field screening analysis. Record the soil sample on the soil sample form and COC. Classify soil in accordance with Unified Soil Classification System methodology.
- Decontaminate re-usable equipment between samples according to the procedures discussed in this Work Plan.

GROUNDWATER SAMPLING PROCEDURES (GRAB SAMPLES)

Groundwater samples will be collected from each of the boring locations. Grab groundwater samples will be collected from direct-push borings using temporary Schedule 40 PVC wells consisting of a 10-foot PVC slotted screen connected to an appropriate amount of blank PVC into the open borehole. Each groundwater sample will be collected using a peristaltic pump with new polyethylene and silicone tubing. A new disposal bailer will be used to collect grab groundwater samples if groundwater is located deeper than the limits of the peristaltic pump (approximately 25 feet BGS). Groundwater present in the borehole is pumped through the screen and into the sample containers. Additional purging may be conducted if sufficient recharge is encountered in an effort to reduce turbidity in the sample.

Groundwater samples will be transferred into laboratory-prepared sample containers and kept cool during transport to the testing laboratory. As applicable, the sample containers will be filled completely to eliminate headspace in the containers. COC procedures will be observed during transport of the groundwater samples to the testing laboratory.

SAMPLE QA/QC

The laboratory will provide trip blank samples for each sample cooler. The purpose of the trip blank is to detect and identify any VOC contamination of the samples from traveling to and from the laboratory. The trip blank samples will be kept with the sampling containers throughout the investigation. All trip blanks will be analyzed for VOCs by EPA Method 8260.

In addition, one duplicate groundwater sample will be collected from the central boring. The duplicate groundwater sample will be collected by sequentially filling laboratory-provided containers as close together in time as practical. The duplicate groundwater sample will be analyzed for the following:

- Gasoline-range hydrocarbons by Method NWTPH-Gx
- Diesel- and oil-range hydrocarbons by Method NWTPH-Dx
- VOCs by EPA Method 8260B
- SVOCs by EPA Method 8270D-SIM
- Total and dissolved arsenic, copper, and lead by EPA Method 6020

DECONTAMINATION PROCEDURES

All sampling equipment used in the collection of samples will be decontaminated prior to being taken into the field. Proper decontamination procedures are critical to the collection of representative environmental samples.

Decontamination will be performed on all sample re-usable processing equipment that comes into contact with sampling media, including tools, stainless steel implements, water level indicators, trowels, etc. Decontamination will be performed between each sampling location.

Sample processing equipment will be decontaminated prior to sampling each location using the following procedures:

1. Rinse with tap water and scrub with a scrub brush until free of large particles (e.g., sediment or soil)
2. Wash with phosphate-free detergent solution
3. Rinse with tap water
4. Rinse with distilled water

Any equipment that cannot be cleaned in a satisfactory manner will not be used for further sampling activities.

SAMPLE HANDLING AND CUSTODY

This section describes how individual samples will be processed, labeled, tracked, stored, and transported to the laboratory for analysis. In addition, this section describes sample custody

procedures. Sample possession and handling must be traceable from the time of sample collection, through laboratory and data analyses, to delivery of the sample results to the recipient.

Containers

Samples for chemical analyses will be placed in laboratory-prepared, labeled containers appropriate for the sample media and individual analyses requested. Each container will be placed in a cooler with ice.

A completed sample label will be affixed to each sample container at the time of sample collection. Sample labels will be waterproof and self-adhering and will contain the project number, project name, sample I.D., chemical preservation (if any), date and time of collection, and initials of the person(s) preparing the sample. At the laboratory, a unique sample identifier will be assigned to each sample (using either project I.D. or laboratory I.D.).

Storage

All samples will be stored on ice at approximately 4 ± 2 degrees Celsius in sturdy, durable coolers in the field prior to delivery to the laboratory.

Custody Procedures

Samples are considered to be in custody if they are (1) in the custodian's possession or view, (2) retained in a secured place (under lock) with restricted access, or (3) placed in a container and secured with an official seal(s) such that the sample cannot be reached without breaking the seal(s). Custody procedures will be used for all samples throughout collection, transport, and analyses.

Custody procedures will be initiated during sample collection. A COC form will accompany the samples between the time of collection to the time of analyses. Each person who has custody of the samples will sign the COC form and ensure that the samples are not left unattended unless properly secured. Minimum documentation of sample handling and custody will include the following:

- Sample location, project name, and unique I.D. number
- Sample collection date and time
- Any special notations on sample characteristics or anomalies
- Initials of the person who collected the sample
- Date sample was sent to the analytical laboratory

The sampler will be responsible for all tracking and custody procedures for samples in the field. The GeoDesign project manager will be responsible for final sample inventory and will maintain custody documentation. The field sampler will also complete COC forms prior to transferring samples to the field processing area or to the analytical laboratory. At the end of each day, and prior to transfer, COC entries will be made for all samples. Information on the labels will be checked against sample log entries, and sample tracking forms and samples will be checked. COC forms will accompany all samples. The COC forms will be signed at each point of transfer. Copies of all COC forms will be retained and included as appendices to subsequent project

reports. Samples will be hand delivered to the analytical laboratory. The field sampler or GeoDesign project manager will confirm that the laboratory has accepted delivery of the shipment at the specified time.

The laboratory will confirm that COC forms are properly signed upon receipt of the samples and will note questions or observations concerning sample integrity on the COC forms or other sample receiving paperwork. The laboratory will contact the field sampler and/or GeoDesign project manager immediately if discrepancies are discovered between the COC forms, sample labels, and/or the sample shipment upon receipt. The laboratory will track each sample through all stages of laboratory processing using a sample tracking record. The sample tracking record must contain, at a minimum, the name/initials of individuals responsible for performing the analyses, dates of sample extraction/preparation and analysis, and the types of analyses being performed.

INSTRUMENT TESTING, INSPECTION, AND MAINTENANCE

Prior to each field event, measures will be taken to test, inspect, and maintain all field equipment. All equipment used, including the PID, water level meters, and other required equipment, will be tested for use before leaving for the field event.

Field personnel will be responsible for overseeing the testing, inspection, and maintenance of all field equipment. The laboratory project manager will be responsible for ensuring that laboratory equipment testing, inspection, and maintenance requirements are met. The methods used in calibrating the analytical instrumentation are described in the following section.

INSTRUMENT CALIBRATION AND FREQUENCY

Multipoint initial calibration will be performed by the laboratory on each analytical instrument at the start of the project, after each major interruption to the instrument, and when any continuing calibration does not meet the specified criteria. The number of points used in the initial calibration is defined in each analytical method.

Calibration of analytical equipment used for chemical analyses includes instrument blanks or continuing calibration blanks, which provide information on the stability of the baseline established. Continuing calibration blanks will be analyzed immediately after the continuing calibration verification at a frequency of one blank for every 10 samples analyzed for inorganic analyses and one blank for every 12 hours or 10 to 20 samples for organic analyses. If the continuing calibration does not meet the specified criteria, the analysis must stop. Analysis may resume after corrective actions have been taken to meet the method specifications. All project samples analyzed by an instrument found to be out of compliance must be re-analyzed.

In the field, the following equipment will be calibrated:

- The PID will be calibrated each morning before use in the field in accordance with the manufacturer's instructions. This includes using a known concentration of laboratory-grade calibration gas, typically a cylinder of gas with a concentration of 100 ppm, to calibrate the instrument. Periodically throughout the day the PID accuracy will be checked using the calibration gas; readings should be within 10 percent (+ or -) of the concentration. If not, the

PID will be re-calibrated in the field until the instrument reads the correct concentration of the calibrated gas. The daily calibration procedure will be recorded in the field log.

SUPPLIES AND CONSUMABLES

Field personnel for each sampling event will have a checklist of supplies required for each day in the field. Field personnel will gather and check these supplies daily for satisfactory conditions before each field event. Supplies and consumables for field sampling will be inspected upon delivery and accepted if the condition of the supplies is satisfactory. For example, sample containers will be inspected to help ensure that they are the correct size and quantity and were not damaged in shipment.

DOCUMENTATION AND RECORDS

The following sections describe documentation and records needed for field observations and laboratory analyses.

Field Objectives

Field activities will be recorded by GeoDesign personnel. Daily field reports will provide a description of all sampling activities, correspondence associated with field sampling activities, sampling personnel, and weather conditions, plus a record of all modifications to the procedures and plans identified in this Work Plan. Field reports are intended to provide sufficient data and observations to enable participants to reconstruct events that occurred during the sampling period.

The following forms will also be used to record pertinent information after sample collection:

- Field report
- Exploration Key and Soil Classification System
- Boring/Geoprobe® log
- Groundwater sampling form
- Sub-slab vapor sampling form

Laboratory Reports

The laboratory will be responsible for performing internal QA audits on sample receiving procedures, sample tracking and handling, analyses, and analytical data review and reporting. The laboratory must implement corrective action procedures to remedy and prevent re-occurrences of any deficiencies identified during these internal QA reviews and/or audits performed by third parties. Corrective action reports relating specifically to this project should be submitted immediately to the GeoDesign project manager.

The laboratory will provide a data deliverable package that includes electronic forms and hard copies as requested. The data deliverable package must include the following elements:

- **Case narrative:** This summary, in the form of a cover letter, must present any problems encountered during any aspect of sample receipt or analysis. The summary will include, but not be limited to, a discussion of QC, sample shipment, sample storage, and analytical difficulties. Any problems encountered by the laboratory and their resolutions will be documented in the case narrative.
- **Sample receiving and handling records:** Legible copies of the completed COC forms and any other laboratory sample receiving records must be provided in the data package. This documentation will include the date and time of sample receipt, the condition of the samples as received by the laboratory with clear descriptions of any anomalies (e.g., broken or leaking sample containers), and the temperature of the cooler(s) upon receipt as measured by infrared devices or temperature blanks. Internal tracking of the samples throughout the laboratory should also be documented and available if requested (i.e., internal custody records do not need to be part of the standard deliverable package). The temperatures of all refrigerators and freezers used for storing samples must be recorded daily and be within laboratory specifications. These records must be made available upon request, although they do not need to be included in the standard data deliverable package.
- **Sample results:** The data package will summarize the results for each sample analyzed. The summary will include the following information, when applicable:
 - Field sample I.D. name and the corresponding laboratory I.D. code
 - Sample matrix
 - Date of sample extraction or digestion
 - Date and time of analysis
 - Weight and/or volume of sample or extract used for analysis
 - Dilution or concentration factors for the sample analysis
 - Percent solids (for analyses with results expressed in dry weight)
 - Instrument I.D. used for analysis
 - Reporting limits adjusted for sample volumes, dilutions, and/or percent solids (associated method detection limits must be available in the electronic data deliverable, if requested)
 - All data qualifiers and their definitions
- **QA/QC summaries:** These summaries will contain the results of all QA/QC samples and calibrations. Each QA/QC sample analysis will be documented with the same information required for the sample results (see above, as applicable).

REPORTING ACTIVITIES

GeoDesign will summarize the results from the LSI in a report following receipt of the laboratory analyses. The report will include the following:

- A description of project site conditions and field and sample collection activities and methods.
- Background information, including results from previous investigations at the project site.
- A site plan depicting all sample locations.
- Tabulated chemical analytical data.
- A Conceptual Site Model.
- A discussion of the catch basin evaluation.

- A discussion of the chemical analytical data. Soil and groundwater data will be compared to the applicable DEQ RBCs for occupational and excavation/construction worker receptors, Portland Harbor CULs, and JSCS SLVs. Based on the findings, recommendations for further assessment or other activities will be provided as appropriate.
- Supporting information, including laboratory analytical reports and COC documents.

◆ ◆ ◆

We appreciate the opportunity to submit this Work Plan. Please do not hesitate to contact us if you have questions or require any additional information.

Sincerely,

GeoDesign, Inc.



Kyle Haggart, G.I.T.
Project Manager



Lon R. Yandell, R.G.
Principal Geologist

cc: John Jansen, BCS America LLC (via email only)

KTH:LRY:kt

Attachments

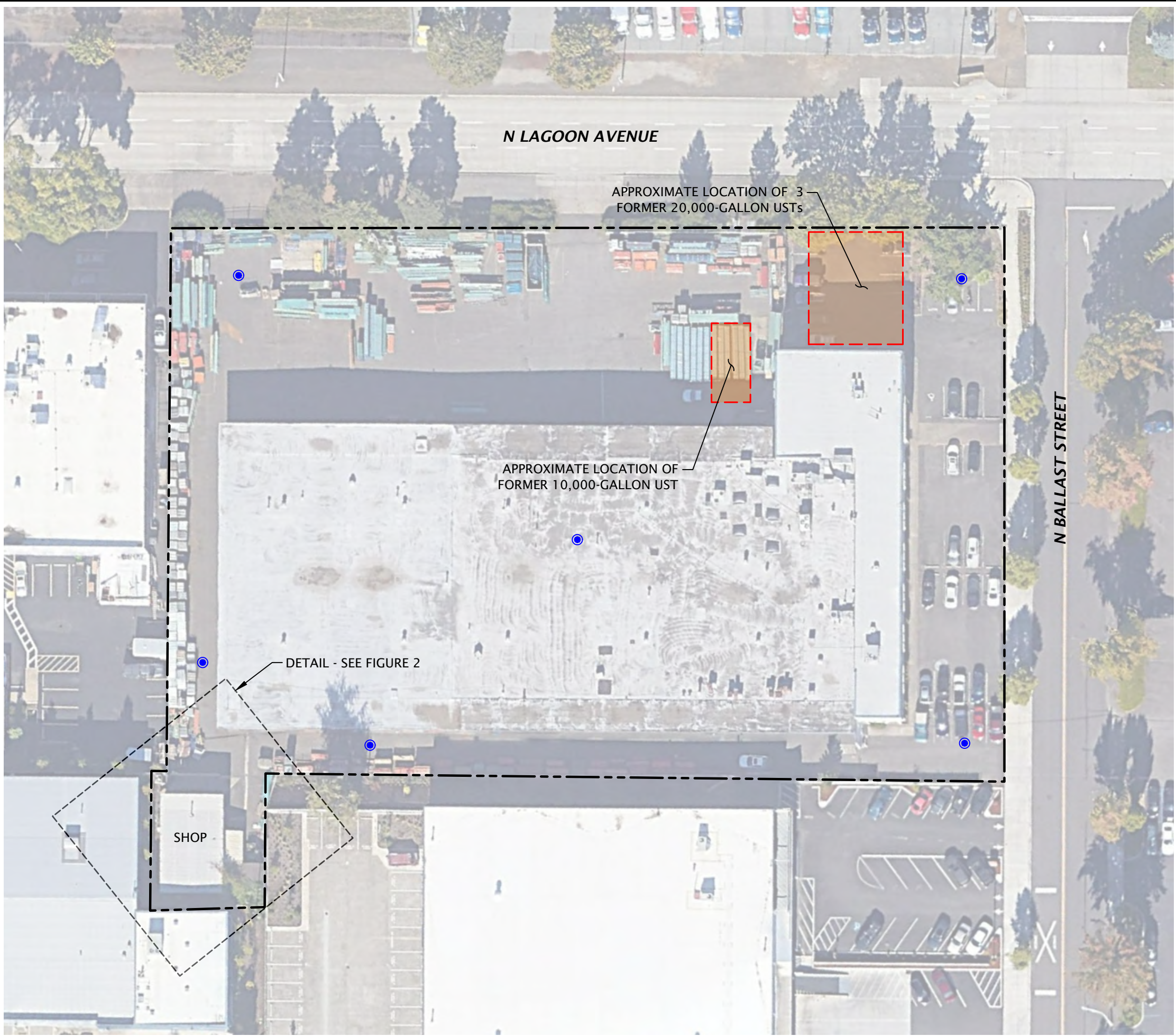
One copy submitted

Document ID: BCSAmerica-1-01-03-051920-enwp.docx

© 2020 GeoDesign, Inc. All rights reserved.

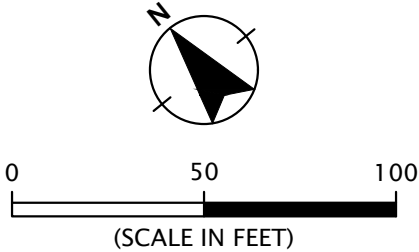
FIGURES

Printed By: mmiller | Print Date: 5/19/2020 1:45:13 PM
File Name: J:\A-D\BCSAmerica\BCSAmerica-1-01-03-Supp LSI\Figures\CAD\BCSAmerica-1-01-03-SP02.dwg | Layout: FIGURE 1



LEGEND:

- PROJECT SITE BOUNDARY
- PROPOSED DIRECT-PUSH BORING
- - - - - DETAIL AREA (SEE FIGURE 2)



SITE PLAN BASED ON AERIAL PHOTOGRAPH
OBTAINED FROM GOOGLE EARTH PRO®,
FEBRUARY 28, 2020

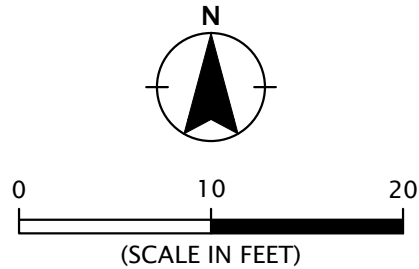
	SITE PLAN	
	BCSAMERICA-1-01-03	FIGURE 1
FORMER AUTOMATIC VENDING COMPANY PORTLAND, OR		
MAY 2020		

Printed By: mmiller | Print Date: 5/19/2020 1:45:20 PM
File Name: J:\A-D\BCSAmerica\BCSAmerica-1-01-03-Supp LSI\Figures\CAD\BCSAmerica-1-01-03-SP01.dwg | Layout: FIGURE 2

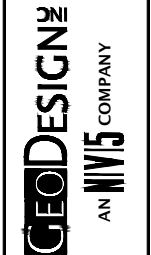


LEGEND:

- DP-1 DIRECT-PUSH BORING (GEODESIGN, 2019)
- B-1 BORING (PEMCO, 1991)
- B-1 BORING (K&S ENVIRONMENTAL, 2019)
- C-1 CONFIRMATION SOIL SAMPLE (K&S ENVIRONMENTAL, 2019)
- UST REMEDIAL EXCAVATION (1991)
- HYDRAULIC HOIST REMEDIAL EXCAVATION (2019)
- CATCH BASIN



SITE PLAN BASED ON AERIAL PHOTOGRAPH
OBTAINED FROM GOOGLE EARTH PRO®,
FEBRUARY 28, 2020

 AN NVIS COMPANY	BCSAMERICA-1-01-03	SITE PLAN - SHOP DETAIL	
	MAY 2020	FORMER AUTOMATIC VENDING COMPANY PORTLAND, OR	
		FIGURE 2	

ATTACHMENT A

K&S Environmental, Inc.

**Phase 1 Environmental
Site Assessment
(per ASTM E1527-13 & AAI Requirements)**

Project Site (project #6170)
Commercial Property (Tax Lot 700 & 1100)
5001 N. Lagoon Avenue
Portland, Oregon 97217

**Prepared for:
John R Estey Trust**

Prepared by: Misty Silva, Environmental Professional

December 7, 2018

K&S Environmental, Inc.
4475 SW. Scholls Ferry Rd., Ste 256
Portland, OR 97225
(503) 291-1454

TABLE OF CONTENTS

	Page
1.0 EXECUTIVE SUMMARY	1
2.0 INTRODUCTION	5
2.1 Special Terms and Conditions	5
2.2 Involved Parties	5
2.3 Confidentiality & User Reliance	5
2.4 Significant Assumptions	5
2.5 Purpose and Scope of Work	5
2.6 Previous Environmental/Geotechnical Investigations.....	6
3.0 SITE DESCRIPTION	8
3.1 Location and Legal Description	8
3.2 Site and Vicinity Characteristics	8
3.3 Past Uses of Property (summary)	9
3.4 Current Uses of Property	9
3.5 Current Uses of Adjoining Properties	10
4.0 USER PROVIDED INFORMATION	11
4.1 Title Records	11
4.2 Environmental Liens, Activity or Use Limitations	11
4.3 Specialized Knowledge	11
4.4 Valuation Reduction for Environmental Liens	11
4.5 Owner, Property Manager, and Occupant Information	11
4.6 Reason for Phase 1 Environmental Site Assessment	11
4.7 Other Related Information	11
5.0 RECORDS REVIEW	12
5.1 Standard Environmental Records Sources	12
5.1.1 Subject Property	12
5.1.2 Adjacent Property	12
5.2 Additional Environmental Sources	14
5.2.1 Fire Department	14
5.3 Physical Setting Source	14
5.3.1 Soil/Geologic Conditions	14
5.3.2 Hydrologic Conditions	14
5.4 Historical Use Information	14
5.4.1 Aerial Photographs	14
5.4.2 Historical Maps	15
5.4.3 Historical City Directories	15
5.4.4 County Tax Assessors Records/Title Info	16
5.4.5 History of Swan Island by William F. Willingham	16
5.4.6 Historical Permits	17
6.0 SITE RECONNAISSANCE	18
6.1 Methodology and Limiting Condition	18
6.2 General Site Setting	18
6.3 Site Investigation	18
6.3.1 Underground Storage Tanks	18
6.3.2 Aboveground Storage Tanks.....	18
6.3.3 Polychlorinated Biphenyl's	19
6.3.4 Waste Generation and Disposal	19
6.3.5 Containerized Materials	19
6.3.6 Drains/Drywells	19
6.3.7 Surface Stains.	19
6.3.8 In-ground Hoist.	19
7.0 INTERVIEWS	20
8.0 DATA GAPS & EVALUATION OF NON-SCOPE ENVIRONMENTAL CONSIDERATIONS.....	21
8.1 Data Gaps	21
8.2 Evaluation of Other Non-Scope Environmental Considerations.....	21
9.0 RESULTS OF INVESTIGATION	22
9.1 Recognized Environmental Conditions	22
9.2 Recognized Environmental Conditions Off Site.....	23
9.3 De Minimis Conditions	23
9.4 Other.....	23
9.5 Deviations	23
10.0 CERTIFICATION & SIGNATURES OF ENVIRONMENTAL PROFESSIONAL(S)	24
11.0 STATEMENT OF LIMITATIONS.....	24
12.0 REFERENCES	25

APPENDICES

Appendix A	- Site Maps
Appendix B	- Assessors Records - Portlandmaps.com
Appendix C	- Historical Sanborn Fire Insurance Maps - Historical City Directories
Appendix D	- Site Photos - Historical Aerial Photos
Appendix E	- Questionnaire
Appendix F	- DEQ ECSI Site Summary/NFA (for tank decommissioning/cleanup) - PEMCO Reports
Appendix G	- EDR Report
Appendix H	- Statement of Qualifications - Certificate of Insurance

1.0 EXECUTIVE SUMMARY

At the request of John R. Estey Trust, K&S Environmental (K&S) performed a Phase I Environmental Site Assessment at the property located at 5001 N. Lagoon Avenue in Portland, Oregon 97217 (Tax Lots 700 & 1100). Records compiled by federal, state, and local agencies were reviewed for the subject property and adjacent properties. These records included the **Multnomah** County Tax Assessor's and Recorder's records, the Oregon Historical Society records, and select records maintained by the EPA and the Oregon DEQ. Environmental Data Resources (EDR) was utilized to perform part of the Federal, State, Local and Tribal records review.

This investigation presents a review of readily available information and limited observations of the site. This information is accurate to the best of K&S Environmental's knowledge.

Subject Property:

A field inspection of the property was conducted in November 2018 that consisted of a walk-through inspection of the subject property. At this time, observations were made of the subject property and the neighboring properties. The subject property consists of approximately 2.67 acres of land on Swan Island in Multnomah County. The property is occupied by a divided distribution warehouse, shop building (former truck repair shop), parking lot and storage yard. Building occupants consist of BCS America, Total Handling Solutions, Temp Control Mechanical and Green State of Mind. The subject property is currently owned by John R. Estey Trust.

The distribution warehouse building consists of approximately 47,460 square feet and was built in 1963. The distribution warehouse building is equipped with concrete floors and overhead doors. The administrative section of the building (BCS America/Temp Control Mechanical) consists of a reception area, conference room, general office areas, break area, restrooms and utility/storage rooms. The distribution warehouse area is shared by BCS America & Total Handling Solutions. BCS America uses their areas of the warehouse for storage and distribution of new landscape/agricultural equipment and some limited assembly work. Total Handling Solutions uses the warehouse space for storage/distribution of metal racking systems and some assembly/rework. Green State of Mind occupies an isolated section of the warehouse (former commercial kitchen with freezers/coolers) with a separate/private access. Green State of Mind manufactures cannabis candy products for distribution to cannabis retail businesses. Exterior areas of the subject property consist of an asphalt paved parking lot, fenced in storage yard with asphalt and concrete areas and various landscaped areas.

The repair shop building was built in 1974 and consists of approximately 1200 square feet. The repair shop building is used for storage by Total Handling Solutions. The shop area consists of concrete floors with two service bays and overhead doors. Additional site features observed inside the shop consist of an in-ground hoist system and a grated floor drain or sump. Exterior areas of the shop consist of a storage shed and a concrete pad outside of service bay doors. There is a graded drain in the concrete pad outside of the shop area. The property representatives indicate that the drains discharge to the city sewer to the best of their knowledge. Historical permits also indicate that catch basin drains on the property discharge to the sanitary sewer.

Historical records indicate that areas of the subject property and Swan Island were originally used as Portland's Airport from 1927 to 1940. The 1936 historical aerial photo indicates that the area of the subject property was vacant of building structures and may have been the tail end of one of the airstrips. The Portland Airport was moved to its current location in 1940. The 1944 historical aerial photo indicates that the subject property was part of a large parking lot and may have been partially occupied by the building near the west side of the subject property. The divided building west may have been a large administrative operations building as part of the shipyards. The building layout did not appear consistent with warehouse or manufacturing use. Other features in the 1944 photo indicate several structures consistent with barracks or housing units east of the subject property. Historical Swan Island records indicate that during World War II, Swan Island was the site of one of the Kaiser Shipyards and worker housing (see more historical info in section 5.4.5).

The parking lot and housing units were not present in the 1956 aerial photo and the area of the subject property appeared mostly vacant except for part of the building on the west adjoining property. The subject property was redeveloped in 1963 with the construction of the original section of the existing warehouse building and parking lot. Historical permits indicate a warehouse addition in 1969 and an office addition in 1978 (also identified in aerials). Historical permits indicate the construction of the existing truck shop building in 1973.

Historical city directories and permits indicate that the property was primarily used as a distribution warehouse for candy and vending machine businesses from the 1960's to around 2013(Canteen Vending/Automatic Vending). It is assumed that the truck repair shop (also owned by Canteen Vending) was used to service vending machine delivery trucks. Additional uses included some catering & entertainment occupants (amusement/coffee/restaurant supply). Part of the existing warehouse that is now occupied by Green State of Mind still has commercial kitchen features that were used by some of the catering occupants. BCS America has occupied the property since November of 2014. Temp Control Mechanical has occupied the property since May of 2016. Total Handling Solutions has occupied the property since March of 2015. Green State of Mind has occupied the property since August of 2016.

Additional historical information related to Swan Island (History of Swan Island by William F. Willingham) can be found in section 5.4.5.

Regulatory Records:

The subject property is listed on the RCRA-non Gen, Underground Storage Tank (UST), Leaking Underground Storage Tank (LUST), Environmental Cleanup (ECIS) and Confirmed Release (CRL) databases. The listings are under Automatic Vending Company. The UST database indicates that six underground storage tanks were removed from the site in Fall 1991 by PEMCO. No contamination was detected in the gasoline tank excavation. Heavy oil contamination was discovered during the motor oil and waste oil decommissioning's. Approximately 134 tons of petroleum contaminated soil were excavated from the site and disposed of at Hillsboro Landfill. Confirmation sampling found 900 ppm TPH along the side of one pit. When the extent of the remaining contamination was investigated in May 1992, a mixture of demolition debris and dirt was encountered. The debris included concrete, rebar, wire mesh, drywall, and brick. The sandy dirt showed no obvious contamination but tested up to 2,000 ppm TPH. Due to the elevated concentrations found outside of the tank pit and nature of the fill material with mixed debris, PEMCO concluded that the fill material had been contaminated from the beginning and was not

the result of leaking USTs. PEMCO thought that the debris could be from the old Portland Airport that formerly existed on-site.

Because the contaminated fill was apparently not the result of the leaking USTs, the site was referred to the environmental cleanup department for possible further action. DEQ's Environmental Cleanup Department recommended a preliminary Site Assessment (PA) to determine history of activities at the site and the extent of the debris material. Because the contaminants are likely to move slowly, DEQ recommends that the PA be given a low priority. DEQ's UST Section sent an NFA letter 5/16/97 - it was limited to tank-related issues only, and excluded historical contamination that resulted from unknown, non-UST sources. DEQ's file indicates several correspondence letters between DEQ, the Automatic Vending Company and the Estey Corporation. In summary, it appears that the Estey Corporation was arguing to avoid being placed on the Environmental Cleanup and Confirmed Release databases. Ultimately the site was listed on both databases by DEQ and it appears that additional investigation or assessments to resolve the regulatory listing were never completed.

Adjacent and Nearby Sites:

The regulatory records review indicates that there are 20 Leaking Underground Storage Tank (LUST) sites within 1/2 mile of the subject property, 26 Environmental Cleanup Sites (ECSI) within 1 mile of the subject property, 2 Voluntary Cleanup Site within 1/2 mile of the subject property and 8 Oregon Confirmed Release sites within 1 mile of the subject property. Several of the sites have cleanup completion dates listed and some of the sites may appear on more than one list. A more detailed report of sites located within the ASTM standard radius of the subject property can be found in section 5.1.2 and in **Appendix G**.

Conclusion:

The results of this investigation represent a review of current conditions, based on available information and limited observations. K&S Environmental, Inc. has performed a Phase 1 Environmental Site Assessment in conformance with the scope and limitations of ASTM Practice E 1527-13 of the property located at 5001 N. Lagoon Avenue in Portland, Oregon 97217 (Tax Lots 700 & 1100). Any exceptions to, or deletions from this practice are described in Section 9.5 of this report. This assessment has revealed the following *recognized environmental conditions* in connection with the property:

- ***DEQ Environmental Cleanup Sites and Confirmed Release Sites Listing:*** The subject property is identified in the DEQ Environmental Cleanup Sites (ECSI) database and the Confirmed Release Sites (CRL) database with an open file status. The listing is under Automatic Vending Company and Estey Co. The DEQ records indicate that the site does not have regulatory closure and is still an active cleanup site requiring additional investigation. The listings are under Automatic Vending Company.

The UST database indicates that six underground storage tanks were removed from the site in Fall 1991 by PEMCO. No contamination was detected in the gasoline tank excavation. Heavy oil contamination was discovered during the motor oil and waste oil decommissioning's. Approximately 134 tons of petroleum contaminated soil were excavated from the site and disposed of at Hillsboro Landfill. Confirmation sampling found 900 ppm TPH along the side of one pit. When the extent of the remaining contamination was investigated in May 1992, a mixture of demolition debris and dirt was

encountered. The debris included concrete, rebar, wire mesh, drywall, and brick. The sandy dirt showed no obvious contamination but tested up to 2,000 ppm TPH. Due to the elevated concentrations found outside of the tank pit and nature of the fill material with mixed debris, PEMCO concluded that the fill material had been contaminated from the beginning and was not the result of leaking USTs. PEMCO thought that the debris could be from the old Portland Airport that formerly existed on-site.

Because the contaminated fill was apparently not the result of the leaking USTs, the site was referred to the DEQ Environmental Cleanup Department for possible further action. DEQ's Cleanup Department recommended a preliminary Site Assessment (PA) to determine history of activities at the site and the extent of the debris material. Because the contaminants are likely to move slowly, DEQ recommends that the PA be given a low priority. DEQ's UST Section sent an NFA letter 5/16/97 - it was limited to tank-related issues only, and excluded historical contamination that resulted from unknown, non-UST sources. DEQ's file indicates several correspondence letters between DEQ, the Automatic Vending Company and the Estey Corporation. In summary, it appears that the Estey Corporation was arguing to avoid being placed on the Environmental Cleanup and Confirmed Release databases. Ultimately the site was listed on both databases by DEQ and it appears that additional investigation or assessments to resolve the regulatory listing were never completed. Copies of prior reports and DEQ correspondence can be found in Appendix F.

Opinion: The open regulatory file on the DEQ ECSI database and CRL database is a *recognized environmental condition*. K&S recommends entering the DEQ's Voluntary Cleanup Program and performing the necessary site investigations needed to obtain regulatory closure.

- **In-ground Hoist:** K&S observed one below ground hoist system in the former truck repair shop at the site. It is K&S's understanding that the hoist is not currently in use. In-ground hoist systems have a potential to leak hydraulic oil in the soil.

Opinion: K&S recommends performing subsurface investigations around the hoist to verify there is no subsurface contamination present.

- **Grated Drains:** K&S observed two separate grated drains or sumps in the area of the former truck repair shop. One drain is located inside of the shop and one drain is located in the concrete pad just outside of the service bay door of the shop. Historical permits indicate that all catch basin drains at the site discharge to the City sanitary sewer. A sheen and minor stains were observed around the drain that was outside of the shop (see photo).

Opinion: Due to historical uses of the property as a truck repair shop, there is a potential that automotive related fluids (likely petroleum based products) were inadvertently discharged to the drains. It is K&S's opinion that additional investigation is warranted. Soil samples around the drains should be collected to confirm that there are no subsurface impacts. As a general housekeeping practice and routine site management activity the sump/drain should be pumped out & cleaned.

2.0 INTRODUCTION

2.1 SPECIAL TERMS AND CONDITIONS

This Site Assessment was completed based on the *All Appropriate Inquiry* rule for Phase 1 Environmental Site Assessments. All work was completed by an Environmental Professional (Misty Silva) as required and defined in the AAI rule. In addition, the project and conclusions were reviewed by an Environmental Engineer (Bill Knutson, P.E.).

2.2 INVOLVED PARTIES

This report presents the results of a Phase 1 Environmental Site Assessment of the property located at 5001 N. Lagoon Avenue in Portland, Oregon 97217 (Tax Lots 700 & 1100). K&S was retained by John R. Estey Trust to perform the assessment for the purpose of evaluating the site for any *recognized environmental conditions*. The Assessors records indicate that the owner of the subject property is John R. Estey Trust.

2.3 CONFIDENTIALITY & USER RELIANCE

Under the contract agreement between K&S Environmental and John R. Estey Trust, K&S will not disclose confidential data, including the conclusion or recommendations, to anyone other than the undersigned, including the owner of the property, borrower, or any other individual connected directly or indirectly to this transaction, unless authorized by the undersigned. Authorized "Users" of this Phase 1 Environmental Site Assessment is JFC Lacey, LLC. Reliance by others is prohibited without the permission of John R. Estey Trust & K&S Environmental, Inc.

2.4 SIGNIFICANT ASSUMPTIONS

It is assumed that all interviews, agency records, site conditions and historical information obtained for this report were provided in good faith, is accurate and complete to the point of being reasonably ascertainable data satisfying the *All Appropriate Inquiry* requirements.

2.5 PURPOSE AND SCOPE OF WORK

The purpose of the Phase 1 Environmental Site Assessment was to evaluate the site for recognized environmental conditions, as defined below. The ESA may also satisfy one of the requirements for the innocent landowner, contiguous property owner, or bona fide prospective purchaser limitations on CERCLA liability (hereinafter, the "landowner liability protections," or "LLPs"); that is, the practice that constitutes "*all appropriate inquiry* into the previous ownership and uses of the property consistent with good commercial or customary practice".

As defined in the American Society of Testing and Materials (ASTM) Practice E 1527-13, recognized environmental conditions means the presence or likely presence of any hazardous substance or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, ground water, or surface water of the property. The term includes hazardous substances or petroleum products even under conditions in compliances with laws. The term is not intended to include *de minimus* conditions that generally do not present a material risk of harm to human health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate government agencies.

The Scope of Work was based on the AAI rule for Phase 1 Environmental Site Assessments and ASTM E 1527-13.

The Scope of Work included:

- * The Phase 1 Environmental Site Assessment was performed by an Environmental Professional as required and defined in the AAI rule.
- * A historical review of records related to the subject property to ascertain whether evidence exists that prior usage may have contributed to a potential risk for environmental concern. The review of historical databases included information on file with the pertinent county, Sanborn Fire Insurance maps, city directories, aerial photographs and prior environmental reports if available.
- * Review a current database report of available federal, state and local regulatory agency lists of known or potential hazardous waste sites or landfills, and sites currently under investigation for environmental concerns. The records review will also include available Tribal records, Engineering & Institutional Control sites as required by the AAI rule.
- * Performed a physical inspection of the subject property to identify and assess potential characteristics of environmental concern. This involved physically walking around the subject property and through any accessible structures on the subject property. The physical inspection was documented via field notes and photographs. At the time of the physical inspection, K&S Environmental also observed business types and obvious business practices adjacent to the subject property that may potentially impact it.
- * Conducted interviews with the property owner and occupants to evaluate site history and operations.
- * Preparing and submitting a final written report of all pertinent data collected including observations and recommendations for the site.
- * Sampling and analysis were not included as part of this Phase 1 Environmental Site Assessment.

2.6 PREVIOUS ENVIRONMENTAL/GEOTECHNICAL INVESTIGATIONS

The subject property is listed on the RCRA-non Gen, Underground Storage Tank (UST), Leaking Underground Storage Tank (LUST), Environmental Cleanup (ECIS) and Confirmed Release (CRL) databases. The listings are under Automatic Vending Company. The UST database indicates that six underground storage tanks were removed from the site in Fall 1991 by PEMCO. No contamination was detected in the gasoline tank excavation. Heavy oil contamination was discovered during the motor oil and waste oil decommissioning's. Approximately 134 tons of petroleum contaminated soil were excavated from the site and disposed of at Hillsboro Landfill. Confirmation sampling found 900 ppm TPH along the side of one pit. When the extent of the remaining contamination was investigated in May 1992, a mixture of demolition debris and dirt was encountered. The debris included concrete, rebar, wire mesh, drywall, and brick. The sandy dirt showed no obvious contamination but tested up to 2,000 ppm TPH. Due to the elevated concentrations found outside of the tank pit and nature of the fill material with mixed debris, PEMCO concluded that the fill material had been contaminated from the beginning and was not

the result of leaking USTs. PEMCO thought that the debris could be from the old Portland Airport that formerly existed on-site.

Because the contaminated fill was apparently not the result of the leaking USTs, the site was referred to the environmental cleanup department for possible further action. DEQ's Environmental Cleanup Department recommended a preliminary Site Assessment (PA) to determine history of activities at the site and the extent of the debris material. Because the contaminants are likely to move slowly, DEQ recommends that the PA be given a low priority. DEQ's UST Section sent an NFA letter 5/16/97 - it was limited to tank-related issues only, and excluded historical contamination that resulted from unknown, non-UST sources. DEQ's file indicates several correspondence letters between DEQ, the Automatic Vending Company and the Estey Corporation. In summary, it appears that the Estey Corporation was arguing to avoid being placed on the Environmental Cleanup and Confirmed Release databases. Ultimately the site was listed on both databases by DEQ and it appears that additional investigation or assessments to resolve the regulatory listing were never completed.

3.0 SITE DESCRIPTION

3.1 LOCATION AND LEGAL DESCRIPTION

- Site Address: 5001 N. Lagoon Avenue Portland, Oregon 97217 (Swan Island)
- Historical Addresses: None
- County: Multnomah County
- Map & Tax Lot: Township 1 N., Range 1 E., Section 20AD W.M. Tax Lot 700 & 1100
- Zoning – IG2 (General Industrial 2)

3.2 SITE AND VICINITY CHARACTERISTICS

The subject property consists of two Tax Lots in Multnomah County, Oregon. Tax Lot 700 of the subject consists of approximately .07 acres of land. Tax Lot 1100 of the subject consists of approximately 2.60 acres of land. The location is also known under the Federal Rectangular Quadrant System as being within Section 20AD, Township 1-North, Range 1-East of the Willamette Meridian. The subject property is bound on the north by N. Lagoon and on the west by N. Ballast Street. The subject property is zoned as General Industrial 2 (IG2) and is serviced by municipal utilities. The property is occupied by a divided distribution warehouse, shop building (former truck repair shop), parking lot and storage yard. Building occupants consist of BCS America, Total Handling Solutions, Temp Control Mechanical and Green State of Mind. The subject property is currently owned by John R. Estey Trust.

The distribution warehouse building consists of approximately 47,460 square feet and was built in 1963. The distribution warehouse building is equipped with concrete floors and overhead doors. The administrative section of the building (BCS America/Temp Control Mechanical) consists of a reception area, conference room, general office areas, break area, restrooms and utility/storage rooms. The distribution warehouse area is shared by BCS America & Total Handling Solutions. BCS America uses their areas of the warehouse for storage and distribution of new landscape/agricultural equipment and some limited assembly work. Total Handling Solutions uses the warehouse space for storage/distribution of metal racking systems and some assembly/rework. Green State of Mind occupies an isolated section of the warehouse (former commercial kitchen) with a separate/private access. Green State of Mind manufactures cannabis candy products for distribution to cannabis retail businesses. Exterior areas of the subject property consist of an asphalt paved parking lot, fenced in storage yard with asphalt and concrete areas and various landscaped areas.

The repair shop building was built in 1974 and consists of approximately 1200 square feet. The repair shop building is used for storage by Total Handling Solutions. The shop area consists of concrete floors with two service bays and overhead doors. Additional site features observed inside the shop consist of an in-ground hoist system and a grated floor drain or sump. Exterior areas of the shop consist of a storage shed and a concrete pad outside of service bay doors. There is a graded drain in the concrete pad outside of the shop area. The property representatives indicate that the drains discharge to the city sewer to the best of their knowledge. Historical permits also indicate that catch basin drains on the property discharge to the sanitary sewer.

3.3 PAST USES OF THE PROPERTY (summary)

Historical records indicate that areas of the subject property and Swan Island were originally used as Portland's Airport from 1927 to 1940. The 1936 historical aerial photo indicates that the area of the subject property was vacant of building structures and may have been the tail end of one of the airstrips. The Portland Airport was moved to its current location in 1940. The 1944 historical aerial photo indicates that the subject property was part of a large parking lot and may have been partially occupied by the building near the west side of the subject property. The divided building west may have been a large administrative operations building as part of the shipyards. The building layout did not appear consistent with warehouse or manufacturing use. Other features in the 1944 photo indicate several structures consistent with barracks or housing units east of the subject property. Historical Swan Island records indicate that during World War II, Swan Island was the site of one of the Kaiser Shipyards and worker housing (see more historical info in section 5.4.5).

The parking lot and housing units were not present in the 1956 aerial photo and the area of the subject property appeared mostly vacant except for part of the building on the west adjoining property. The subject property was redeveloped in 1963 with the construction of the original section of the existing warehouse building and parking lot. Historical permits indicate a warehouse addition in 1969 and an office addition in 1978 (also identified in aerials). Historical permits indicate the construction of the existing truck shop building in 1973.

Historical city directories and permits indicate that the property was primarily used as a distribution warehouse for candy and vending machine businesses from the 1960's to around 2013(Canteen Vending/Automatic Vending). It is assumed that the truck repair shop (also owned by Canteen Vending) was used to service vending machine delivery trucks. Additional uses included some catering & entertainment occupants (amusement/coffee/restaurant supply). Part of the existing warehouse that is now occupied by Green State of Mind still has commercial kitchen features that were used by some of the catering occupants. BCS America has occupied the property since November of 2014. Temp Control Mechanical has occupied the property since May of 2016. Total Handling Solutions has occupied the property since March of 2015. Green State of Mind has occupied the property since August of 2016.

Additional historical information related to Swan Island (History of Swan Island by William F. Willingham) can be found in section 5.4.5.

3.4 CURRENT USES OF THE PROPERTY

The subject property consists of approximately 2.67 acres of land on Swan Island in Multnomah County. The property is occupied by a divided warehouse building, shop building (former truck repair shop), parking lot and storage yard. Building occupants consist of BCS America, Total Handling Solutions, Temp Control Mechanical and Green State of Mind. The subject property is currently owned by John R. Estey Trust.

The main warehouse building consists of approximately 47,460 square feet and was built in 1963. The main warehouse building is equipped with concrete floors and overhead doors. The administrative section of the building (BCS America/Temp Control Mechanical) consists of a reception area, conference room, general office areas, break area, restrooms and utility rooms. The main warehouse area is shared by BCS America & Total Handling Solutions. BCS America uses their portions of the warehouse for storage and distribution of new agricultural products and some limited assembly work. Total Handling Solutions uses the warehouse space for

storage/distribution of metal racking systems and some assembly/rework. Green State of Mind occupies an isolated section of the warehouse with a separate/private access. Green State of Mind makes cannabis candy products for distribution to cannabis retail businesses. Exterior areas of the subject property consist of an asphalt paved parking lot, fenced in storage yard with asphalt and concrete areas and various landscaped areas.

The repair shop building was built in 1974 and consists of approximately 1200 square feet. The repair shop building is used for storage by Total Handling Solutions. The shop area consists of concrete floors with two service bays and overhead doors. Additional site features observed inside the shop consist of an in-ground hoist system and a grated floor drain or sump. Exterior areas of the shop consist of a storage shed and a concrete pad outside of service bay doors. There is a graded drain outside of the shop area. The property representatives indicate that the drains discharge to the city sewer to the best of their knowledge.

3.5 CURRENT USES OF ADJOINING PROPERTIES Most of the properties surrounding the subject property are occupied by commercial and industrial properties.

4.0 USER PROVIDED INFORMATION

4.1 TITLE RECORDS

User did not provide any title records or preliminary title report.

4.2 ENVIRONMENTAL LIENS, ACTIVITY OR USE LIMITATIONS

The county records did not indicate any environmental liens against the subject property.

4.3 SPECIALIZED KNOWLEDGE

None Provided.

4.4 VALUATION REDUCTION FOR ENVIRONMENTAL LIENS

None Provided.

4.5 OWNER, PROPERTY MANAGER, AND OCCUPANT INFORMATION

The property representatives interviewed at the time of the Assessment was John Jansen (occupant/owner representative). The current property owner is listed as John R. Estey Trust.

4.6 REASON FOR PHASE 1 ENVIRONMENTAL SITE ASSESSMENT

K&S Environmental, Inc performed this Phase 1 Environmental Site Assessment for the purpose of identifying *Recognized Environmental Conditions (RECS)* at the property. It is K&S's understanding that the Phase 1 ESA was required as condition of a property transaction.

4.7 OTHER RELATED INFORMATION

None

5.0 RECORDS REVIEW

5.1 STANDARD ENVIRONMENTAL RECORD SOURCES

Environmental Data Resources (EDR) was retained to provide current listings of government databases for sites located within the ASTM/AAI standard radius of the subject site including Tribal, Engineering, and Institutional Control sites. The database report also provides a summary of the regulatory status of the subject site. A copy of the EDR report can be found in **Appendix G**. A summary of the findings of the EDR report is listed below.

5.1.1 Subject Property

The subject property is listed on the RCRA-non Gen, Underground Storage Tank (UST), Leaking Underground Storage Tank (LUST), Environmental Cleanup (ECSI) and Confirmed Release (CRL) databases. The listings are under Automatic Vending Company. The UST database indicates that six underground storage tanks were removed from the site in Fall 1991 by PEMCO. No contamination was detected in the gasoline tank excavation. Heavy oil contamination was discovered during the motor oil and waste oil decommissioning's. Approximately 134 tons of petroleum contaminated soil were excavated from the site and disposed of at Hillsboro Landfill. Confirmation sampling found 900 ppm TPH along the side of one pit. When the extent of the remaining contamination was investigated in May 1992, a mixture of demolition debris and dirt was encountered. The debris included concrete, rebar, wire mesh, drywall, and brick. The sandy dirt showed no obvious contamination but tested up to 2,000 ppm TPH. Due to the elevated concentrations found outside of the tank pit and nature of the fill material with mixed debris, PEMCO concluded that the fill material had been contaminated from the beginning and was not the result of leaking USTs. PEMCO thought that the debris could be from the old Portland Airport that formerly existed on-site.

Because the contaminated fill was apparently not the result of the leaking USTs, the site was referred to the environmental cleanup department for possible further action. DEQ's Environmental Cleanup Department recommended a preliminary Site Assessment (PA) to determine history of activities at the site and the extent of the debris material. Because the contaminants are likely to move slowly, DEQ recommends that the PA be given a low priority. DEQ's UST Section sent an NFA letter 5/16/97 - it was limited to tank-related issues only, and excluded historical contamination that resulted from unknown, non-UST sources. DEQ's file indicates several correspondence letters between DEQ, the Automatic Vending Company and the Estey Corporation. In summary, it appears that the Estey Corporation was arguing to avoid being placed on the Environmental Cleanup and Confirmed Release databases. Ultimately the site was listed on both databases by DEQ and it appears that additional investigation or assessments to resolve the regulatory listing were never completed. See Section 9.1 for opinion and recommendations.

5.1.2 Adjacent Property - Summary

The regulatory records review indicates that there are 20 Leaking Underground Storage Tank (LUST) sites within 1/2 mile of the subject property, 26 Environmental Cleanup Sites (ECSI) within 1 mile of the subject property, 2 Voluntary Cleanup Site within 1/2 mile of the subject property and 8 Oregon Confirmed Release sites within 1 mile of the subject property. Several of the sites have cleanup completion dates listed and some of the sites may appear on more than one list. A summary of sites with activities or

conditions that have the potential to adversely affect the environment is included in the section below.

*Temp Control Mechanical Corp located at 4800 N. Channel Avenue is listed on the RCRA-CESQG, UST and LUST databases. The UST database indicates that two tanks were decommissioned at the site. The LUST database indicates that the cleanup completion/closure date is listed as February 1994. DEQ issued a No Further Action letter to the site. The RCRA database indicates that the site is a conditionally exempt generator with no violations. The site is located within 1/8 mile east of the subject property (across the Ballast Street).

*Tyler-Dawson located at 5051 N. Lagoon is listed on the HSIS, UST and LUST databases. The UST database indicates that six tanks were decommissioned at the site. The LUST database indicates that the cleanup completion/closure date is listed as March 1991. The site is located within 1/8 mile north-northeast of the subject property.

*Pacific Detroit Diesel/US Environmental Services located at 5061 N. Lagoon is listed on the RCRA-non-gen, Manifest, UST and LUST databases. The RCRA database indicates that the site has been verified as a non-generator. The UST database indicates that two tanks were decommissioned at the site. The LUST database indicates that the cleanup completion/closure date was June 1989 & May 1992. The site is located within 1/8 mile north-northwest of the subject property.

*Pacific Detroit Diesel/US Environmental Services located at 5061 N. Lagoon is listed on the RCRA-non-gen, Manifest, UST and LUST databases. The RCRA database indicates that the site has been verified as a non-generator. The UST database indicates that two tanks were decommissioned at the site. The LUST database indicates that the cleanup completion/closure date was June 1989 & May 1992. The site is located within 1/8 mile north-northwest of the subject property.

*Marine Propulsion Svc. located at 5520 N. Channel is listed on the RCRA-non-gen & Manifest databases. The RCRA database indicates that the site has been verified as a non-generator. The site is located within 1/8 mile west of the subject property.

All other sites are greater than 1/8 mile and at least 700 feet away from the subject property.

*** LUST SITES SUMMARY & OPINION**

Four of the 20 LUST sites identified in the EDR report are located within 1/8 mile of the subject property. All four LUST sites within 1/8 mile have cleanup completion dates and regulatory closure (NFA). All other LUST sites are greater than 1/8 mile away and most have cleanup completion dates/closure status. *Due to the distance away from the subject property, gradient and/or regulatory records review, the potential for concern of contaminants from adjacent properties impacting the subject property appears to be minimal.*

***OTHER CONTAMINATED SITES - SUMMARY & OPINION**

With the exception of the subject property, none of the Environmental Cleanup sites (ECSI), voluntary cleanup sites (VCP) or confirmed release sites (CRL) are within 1/8

mile of the subject property. *Based on the review of regulatory record, regulatory closure, gradient and/or distance away from the subject property, the potential for concern of contaminants from these adjacent properties impacting the subject property appears to be minimal.*

5.2 ADDITIONAL ENVIRONMENTAL SOURCES

5.2.1 Fire Marshals Office

The Oregon State Fire Marshall's Computer database (CR2K) was researched for any reported incidents at the subject property. The database did not identify any reported incidents on the subject property or immediately adjacent properties.

5.3 PHYSICAL SETTING SOURCE

5.3.1 Soil/Geologic Conditions: According to the Soil Survey of Multnomah County, Oregon printed by the United States Department of Agriculture Soil Conservation Service, the soils in the area of the subject property are characterized as urban land, 0 to 3 percent slopes. This miscellaneous area is in the central part of Multnomah County, mainly in the City of Portland. Eighty five percent or more of the soils are covered with office buildings, service buildings, hotels and motels, industrial buildings and yards, streets and sidewalks, parking lots and railroads. Some areas are not covered by works and structures, but most of these have been so altered during construction that to separate them in mapping was not practical. The original soils were silt loam, loam, silty clay loam, and gravelly loam and were commonly over stratified sand and gravel at a depth of 4 to 6 feet

5.3.2 Hydrologic Conditions: Surface water in the near proximity of the site consists of the Swan Island Lagoon located within 1/8 mile north and the Willamette River located within 1/8 mile south. The subject property is not listed in the National Wetland inventory. Well logs in the general area indicate that groundwater is 17 to 30 feet deep.

5.4 HISTORICAL USE INFORMATION

A historical review of records related to the subject property was conducted to ascertain whether evidence exists that prior usage may have contributed to a potential risk for environmental contamination. The review included examination of ownership records when available, city directories, and historical maps.

5.4.1 Aerial Photographs:

Historical aerial photographs were reviewed at the University of Oregon and on Portlandmaps.com on line service. Photographs were reviewed for the following years: 1936, 1944, 1956, 1964, 1970, 1980, 1990, 2005 and 2017. A chronological summary is included below.

Review Comments

- 1936** Subject property appears to be vacant of building structures and may be the tail end or buffer to a runway at the former Portland Airport. N. Ballast has not been constructed. K&S identified the area of the subject property and Ballast Street based on an angled feature and tree lines near the north water channel that appeared consistent from 1936 to 1980. Surrounding area appears to be vacant undeveloped land or airport runways.
- 1944** Subject property appears developed as part of a large parking lot and may be partially occupied by the corner of what appears to be a large office building (that is mostly on the west adjoining property. Property south appear to be part of the same parking lot and properties further south appear to be ship yards. Property east appears to be several buildings with the same configuration (ship yard housing units).
- 1956** The subject property appears to have been cleared except for the west side that may be occupied by part of the office building. Old parking lot on property has been removed and the office building may be abandoned. The worker housing units east of the subject property (noted in 1944) also appear to have been removed.
- 1964** The subject property appears redeveloped with the construction of part of the existing distribution warehouse and parking lot. The auto shop building on Tax Lot 1100 does not appear constructed (area vacant). N. Ballast appears constructed. Properties south and west appear developed with existing warehouse buildings. Property east appears relatively vacant
- 1970** The subject property warehouse building appears expanded. The property east appears commercially developed with the construction of the existing building.
- 1980** The auto shop building on tax lot 1100 appears constructed. The office section of the building appears expanded. Surrounding area appears more developed.
- 1990** Subject property appears relatively the same. The channel area north of Ballast Street where the angled feature/tree line was used as a reference appears to be filled in to expand the shoreline.
- 2005** Subject property and adjacent properties appear the same.
- 2017** Subject property and adjacent properties appear the same.

5.4.2 Historical Maps

Sanborn Fire Insurance Maps were researched at the Oregon Historical Society Library and through prior reports provided by the current property owner. Below is a summary of the map findings. Copies of the Sanborn maps can be found in **Appendix C**.

1969	Subject property – Candy/Vending Warehouse Adjacent properties –Vacant west, warehouse east, electrical supplies warehouse south
------	--

5.4.3 City Directories:

Historical city directories for **Portland** were researched at the Oregon Historical Library and through prior reports provided by the property owner. Below is a summary of

listings found for the subject property. A detailed report of historical listings for the subject property and adjacent property can be found in Appendix C.

Address not listed in Historical City Directories from 1936 to 1955	
1965	Canteen Co of Oregon Tiffany Division Vending Machine
1970	Canteen Co. of Oregon Vending Machines
1975	Canteen Co. of Oregon Vending Machines
1985	Canteen Co. of Oregon Vending Machines Automatic Cigarette Service Canteen Refreshment Service Imperial Food & Vending Quality Buffet Food Services Advanced Muzak Systems Music
2003	Geri Calstoy London Catering Inc. Imperial Food & Vending Service
2008	Canteen Vending Compass Group USA ACS Melody Amusement Co Canteen Refreshment Services
2013	Canteen Refreshment Service Quality Buffet Mobil Catering Canteen Vending Services Melody Amusement

5.4.4 County Tax Assessors Records/Title Info:

The Multnomah County Tax Assessors and Auditors records were also researched to review property characteristics and ownership. The Assessors records indicate that the property is currently owned by John R. Estey Trust.

5.4.5 History of Swan Island by William F. Willingham:

Swan Island sits about eight miles above the mouth of the Willamette River. The island has played a significant role in the development of waterborne commerce in Oregon and the history of the Port of Portland. It was first noted as Willow Island on an 1844 chart by Lt. John Wilkes in the atlas accompanying the report of the U.S. Exploring Expedition. It is not known why the name was changed to Swan Island. A bar in the Willamette River at Swan Island obstructed navigation, and as early as 1873 the U.S. Army Corps of Engineers began congressionally authorized improvements at the location, consisting mostly of dredging. This improvement work was essential to keep the ship channel open on the Willamette and Columbia rivers between Portland and the Pacific Ocean.

Under natural conditions, two channels existed at Swan Island, requiring annual dredging to maintain navigation around the island. In 1876, the army engineer in charge of the Portland office, Major James Wilson, recommended closing one channel and focusing all maintenance efforts on the other. Because of the cost and disruption to commerce, the Corps did not immediately carry out Major Wilson's plan; but in 1927, the Port of Portland received permission from Congress to permanently close the north channel of Swan Island and dredge a 35-by-1,155-foot channel on the south side of the island. The Port had purchased the island in 1922 to facilitate the navigation improvements needed at that point on the Willamette River.

From 1927 to 1940, Swan Island was the site of Portland's airport. Congress had allowed the Port of Portland to connect Swan Island to the mainland with fill so that a runway could be built. The fill for the runway and the addition of dredged material from the excavation of the main navigation channel increased the size of Swan Island by three times, to 900 acres. The Port completed the airstrip in time for a visit by Charles Lindbergh in September 1927. The increase in air traffic over the next decade necessitated a larger airport, and in 1940 the airport was moved to its current location in northeast Portland along the Columbia River.

During World War II, Swan Island was the site of one of the Kaiser Shipyards and worker housing. At the request of the United States government, contractor and industrialist Henry J. Kaiser developed a major shipbuilding operation at Portland and across the Columbia at Vancouver, Washington. Between 1942 and 1945, the Kaiser shipyards produced 147 T-2 tankers at Swan Island, making it the Liberty and Victory ship capital of the United States. In all, 455 ships were produced at Kaiser's Oregon shipyards during World War II. The temporary worker housing created on Swan Island during the war was used to accommodate some of the people displaced by the Vanport flood in 1948. Many of the displaced had to remain for up to a year at Swan Island because of the post-war housing shortage in Portland.

After World War II, Swan Island became the center for Port of Portland operations including the dry dock and ship repair facilities. Since Swan Island is centrally located in Portland's harbor, many industrial operations have developed there, especially for distribution, warehousing, and manufacturing activities.

5.4.6 Historical Permits:

Historical plumbing permits indicate a new building in 1962 for Canteen of Oregon. Several permits were reviewed. A list of historical permits is summarized below.

1962	Plumbing permit for new building. Owner listed as Canteen of OR. Permit indicates that parking lot catch basins discharge to city sewer. No drywells indicated.
1969	Plumbing permit for warehouse addition. Owner still listed as Canteen of OR.
1973	Plumbing permit for truck service building. Owner still listed as Canteen of OR. Two catch basins installed. No drywells listed.
1978	Plumbing permit for two story office addition. Owner still listed as Canteen of OR.

6.0 SITE RECONNAISSANCE

6.1 METHODOLOGY AND LIMITING CONDITION

The site reconnaissance consisted of a visual inspection of the interior and exterior areas of the subject property. Observations of the subject property and adjacent properties were documented via field notes & photographs. There were no adverse conditions limiting the site reconnaissance.

6.2 GENERAL SITE SETTING

The subject property consists of two Tax Lots in Multnomah County, Oregon. Tax Lot 700 of the subject consists of approximately .07 acres of land. Tax Lot 1100 of the subject consists of approximately 2.60 acres of land. The location is also known under the Federal Rectangular Quadrant System as being within Section 20AD, Township 1-North, Range 1-East of the Willamette Meridian. The subject property is bound on the north by N. Lagoon and on the west by N. Ballast Street. The subject property is zoned as General Industrial 2 (IG2) and is serviced by municipal utilities. The property is occupied by a divided warehouse building, shop building (former truck repair shop), parking lot and storage yard.

6.3 SITE INVESTIGATION OBSERVATIONS

6.3.1 Underground Storage Tanks (USTs)

The subject property is listed on the UST & LUST databases. The listings are under Automatic Vending Company. The UST database indicates that six underground storage tanks were removed from the site in Fall 1991 by PEMCO. No contamination was detected in the gasoline tank excavation. Heavy oil contamination was discovered during the motor oil and waste oil decommissioning's. Approximately 134 tons of petroleum contaminated soil were excavated from the site and disposed of at Hillsboro Landfill. Confirmation sampling found 900 ppm TPH along the side of one pit. When the extent of the remaining contamination was investigated in May 1992, a mixture of demolition debris and dirt was encountered. The debris included concrete, rebar, wire mesh, drywall, and brick. The sandy dirt showed no obvious contamination but tested up to 2,000 ppm TPH. Due to the elevated concentrations found outside of the tank pit and nature of the fill material with mixed debris, PEMCO concluded that the fill material had been contaminated from the beginning and was not the result of leaking USTs. DEQ's UST Section sent an NFA letter 5/16/97 - it was limited to tank-related issues only, and excluded historical contamination that resulted from unknown, non-UST sources.

Potential Concerns/Recommendations: None

6.3.2 Aboveground Storage Tanks (ASTs)

K&S did not observe any evidence of existing aboveground storage tanks on the subject property.

Potential Concerns/Recommendations: None.

6.3.3 Polychlorinated Biphenyl's (PCBs)

K&S observed one pad mounted transformer on or near the subject property. K&S did not observe any evidence of leakage around the transformer.

Potential Concerns/Recommendations: None

6.3.4 Waste Generation and Disposal

K&S did not observe any evidence of hazardous waste generation or disposal on the subject property. The property owner/representative indicated that the facility does not store or generate any hazardous waste.

Potential Concerns/Recommendations: None

6.3.5 Containerized Materials & Drums

K&S did not observe any containerized materials or industrial drums on the subject property other than routine cleaners, lubricating oils, food grade products, containers of automotive fluids in truck shop and touchup paints. All of the containerized materials appeared to be properly stored, labeled and free of any leaks or spills.

Potential Concerns/Recommendations: None

6.3.6 Drains/Drywells

K&S observed two separate grated drains or sumps in the area of the former truck repair shop. One drain is located inside of the shop and one drain is located in the concrete pad just outside of the service bay door of the shop. Historical permits indicate that all catch basin drains at the site discharge to the City sanitary sewer and did not indicate any drywells. A sheen and minor stains were observed around the drain that was outside of the shop (see photo).

Potential Concerns/Recommendations: Due to historical uses of the property as a truck repair shop, there is a potential that automotive related fluids (likely petroleum based products) were inadvertently discharged to the drains. It is K&S's opinion that additional investigation is warranted. Soil samples around the drains should be collected to confirm that there are no subsurface impacts. As a general housekeeping practice and routine site management activity the sump/drain should be pumped out & cleaned.

6.3.7 Surface Stains

K&S observed some staining and a sheen around the drain outside of the truck repair shop. The staining appeared to be confined to the concrete pad.

Potential Concerns/Recommendations: None

6.3.8 In-ground Hoist:

K&S observed one below ground hoist system in the former truck repair shop at the site. It is K&S's understanding that the hoist is not currently in use. In-ground hoist systems have a potential to leak hydraulic oil in the soil.

Potential Concerns/Recommendations: K&S recommends performing subsurface investigations around the hoist to verify there is no subsurface contamination present.

7.0 INTERVIEWS

Interviews are conducted to collect additional information about the past and present activities of the subject property or adjacent properties that may be useful in identifying any potential environmental concerns.

7.1 INTERVIEW 1 (On-site/questionnaire)

In November of 2018, environmental specialist Misty Silva conducted an informal interview with Mr. John Jansen of BCS America, LLC (Occupant/Owner Representative). Mr. Jansen indicated that the property was developed around the 1960's as a distribution warehouse. The warehouse was occupied by a vending machine business. Additional uses included some catering & entertainment occupants (amusement/coffee/restaurant supply). Part of the existing warehouse that is now occupied by Green State of Mind still has commercial kitchen features that were used by some of the catering occupants. Mr. Jansen indicated that BCS America has occupied the property since November of 2014, Temp Control Mechanical has occupied the property since May of 2016, Total Handling Solutions has occupied the property since March of 2015 and Green State of Mind has occupied the property since August of 2016. Mr. Jansen was not aware of any existing environmental concerns with the subject property.

8.0 DATA GAPS & EVALUATION OF OTHER NON-SCOPE ENVIRONMENTAL CONSIDERATIONS

8.1 DATA GAPS

Documentation of data gaps as defined in AAI: a lack of or inability to obtain information required by the standards and practices listed in the regulation despite good faith efforts to gather such information. Data gaps found during the assessment are documented below. An opinion of the significance of each data gap is also included.

8.1.1 Title Report/Property Liens: K&S's scope of work did not include any title report information (property liens) unless the client provided such a report to K&S at the time of the Assessment.

Opinion: Given the historical uses of the property, it is not likely that this data gap would have a significant influence in reference to environmental impacts on the subject property. K&S does not have any recommendations for this data gap.

8.1.2 Purchase Price and Fair Market Value: The relationship of the purchase price and fair market value was not included in this report. Such information is only included and disclosed if the client supplies K&S with substantial documentation of the purchase agreement, appraisal and market value of the property. Otherwise, K&S will assume that the client prefers that the purchase information be kept confidential.

Opinion: It is not likely that this data gap would have a significant influence in reference to environmental impacts on the subject property. K&S does not have any recommendations for this data gap.

8.2 EVALUATION OF OTHER NON-SCOPE ENVIRONMENTAL CONSIDERATIONS

8.2.1 Radon: Radon is a radioactive, colorless, odorless, naturally occurring gas that seeps through the soil, rock, and water and collects in homes, basements, and confined areas in building structures. Radon gas is produced when certain natural radioactive minerals break down or decay. These natural minerals are always present in the environment in slight amounts and are found in increased quantities in particular geologic deposits.

The presence of Radon gas does not appear to be a problem in the area of the subject property. According to information in the EDR report, 33 sites in the area have been tested for radon. The sites had an average activity of 1.530 pCi/L in the living areas and 2.630 pCi/L in the basement. The EPA recommends that home owners fix their homes if radon levels above 4 picocuries per liter (pCi/L) are found and confirmed. The Federal EPA Radon Zone for Multnomah County is 2. Zone 2 indoor average level >2pCi/L and <4pCi/L. Based on the available Radon data for the area, it appears that Radon in the area of the subject property does not appear to be a concern.

8.2.2 Asbestos Containing Material (ACM)

An asbestos survey was not performed as part of this site assessment.

9.0 RESULTS OF INVESTIGATION **(FINDINGS, OPINIONS, RECOMMENDATIONS)**

9.1 RECOGNIZED ENVIRONMENTAL CONDITIONS ON SITE

The results of this investigation represent a review of current conditions, based on available information and limited observations. K&S Environmental, Inc. has performed a Phase I Environmental Site Assessment in conformance with the scope and limitations of ASTM Practice E 1527-13 of the property located at 5001 N. Lagoon Avenue in Portland, Oregon 97217 (Tax Lots 700 & 1100). Any exceptions to, or deletions from this practice are described in Section 9.5 of this report. This assessment has revealed the following *recognized environmental conditions* in connection with the property:

- ***DEQ Environmental Cleanup Sites and Confirmed Release Sites Listing:*** The subject property is identified in the DEQ Environmental Cleanup Sites (ECSI) database and the Confirmed Release Sites (CRL) database with an open file status. The listing is under Automatic Vending Company and Estey Co. The DEQ records indicate that the site does not have regulatory closure and is still an active cleanup site requiring additional investigation. The listings are under Automatic Vending Company.

The UST database indicates that six underground storage tanks were removed from the site in Fall 1991 by PEMCO. No contamination was detected in the gasoline tank excavation. Heavy oil contamination was discovered during the motor oil and waste oil decommissioning's. Approximately 134 tons of petroleum contaminated soil were excavated from the site and disposed of at Hillsboro Landfill. Confirmation sampling found 900 ppm TPH along the side of one pit. When the extent of the remaining contamination was investigated in May 1992, a mixture of demolition debris and dirt was encountered. The debris included concrete, rebar, wire mesh, drywall, and brick. The sandy dirt showed no obvious contamination but tested up to 2,000 ppm TPH. Due to the elevated concentrations found outside of the tank pit and nature of the fill material with mixed debris, PEMCO concluded that the fill material had been contaminated from the beginning and was not the result of leaking USTs. PEMCO thought that the debris could be from the old Portland Airport that formerly existed on-site.

Because the contaminated fill was apparently not the result of the leaking USTs, the site was referred to the DEQ Environmental Cleanup Department for possible further action. DEQ's Cleanup Department recommended a preliminary Site Assessment (PA) to determine history of activities at the site and the extent of the debris material. Because the contaminants are likely to move slowly, DEQ recommends that the PA be given a low priority. DEQ's UST Section sent an NFA letter 5/16/97 - it was limited to tank-related issues only, and excluded historical contamination that resulted from unknown, non-UST sources. DEQ's file indicates several correspondence letters between DEQ, the Automatic Vending Company and the Estey Corporation. In summary, it appears that the Estey Corporation was arguing to avoid being placed on the Environmental Cleanup and Confirmed Release databases. Ultimately the site was listed on both databases by DEQ and it appears that additional investigation or assessments to resolve the regulatory listing were never completed.

Opinion: The open regulatory file on the DEQ ECSI database and CRL database is a *recognized environmental condition*. K&S recommends entering the DEQ's Voluntary Cleanup Program and performing the necessary site investigations needed to obtain regulatory closure.

- **In-ground Hoist:** K&S observed one below ground hoist system in the former truck repair shop at the site. It is K&S's understanding that the hoist is not currently in use. In-ground hoist systems have a potential to leak hydraulic oil in the soil.

Opinion: K&S recommends performing subsurface investigations around the hoist to verify there is no subsurface contamination present.

- **Grated Drains:** K&S observed two separate grated drains or sumps in the area of the former truck repair shop. One drain is located inside of the shop and one drain is located in the concrete pad just outside of the service bay door of the shop. Historical permits indicate that all catch basin drains at the site discharge to the City sanitary sewer. A sheen and minor stains were observed around the drain that was outside of the shop (see photo).

Opinion: Due to historical uses of the property as a truck repair shop, there is a potential that automotive related fluids (likely petroleum based products) were inadvertently discharged to the drains. It is K&S's opinion that additional investigation is warranted. Soil samples around the drains should be collected to confirm that there are no subsurface impacts. As a general housekeeping practice and routine site management activity the sump/drain should be pumped out & cleaned.

9.2 RECOGNIZED ENVIRONMENTAL CONDITIONS OFF SITE

Based on the review of regulatory records, regulatory closure, gradient and/or distance away from the subject property, the potential for concern of contaminants or potential environmental liabilities from adjacent properties impacting the subject property appears to be minimal. The owner of the subject property would not generally be considered a primary potentially responsible party for any cleanup that may be required from contamination originating from other properties. **It is reasonable and prudent to believe that the risk of contamination impacting the subject property from adjacent properties is so minimal that no further investigation of adjacent sites is warranted and K&S has no further recommendations for any off site issues.**

9.3 DE MINIMIS CONDITIONS

None

9.4 OTHER POTENTIAL CONCERNS

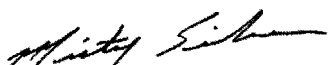
None

9.5 DEVIATIONS:

None

10.0 ENVIRONMENTAL PROFESSIONAL SIGNATURE/CERTIFICATION

This Phase 1 Environmental Site Assessment was performed under the conditions of, and in accordance with the guidelines outlined in, ASTM E1527-13, *Standard Practice for Environmental Site Assessments: Phase 1 Environmental Site Assessment Process*. I declare that I meet the definition of an Environmental Professional as defined by the AAI Rule. I declare that I have the qualifications, training and experience to assess the property and have developed and performed all appropriate inquiries in conformance with the standards and practices set forth in 40 C.F.R. Part 312. Any deviations from the standards are identified in section 9.5.



Misty Silva
Environmental Professional
K&S Environmental, Inc.
Tax ID #93-1203816
OR Contractors License #112907
WA Contractors License #KSENV**04

11.0 STATEMENT OF LIMITATIONS

A Phase 1 Environmental Site Assessment is not a comprehensive investigation. All portions of this Phase 1 investigation were conducted in a manner that is consistent with the generally accepted practices of such investigations now being performed in Oregon and Washington. This investigation is limited to a visual inspection of the subject property and surrounding area, and a review of the readily available records and databases mentioned in the body of this report. Because a Phase 1 investigation is limited in nature, K&S Environmental cannot accept responsibility for conditions arising after the investigation described in this report was performed, for conditions which were not perceptible at the subject property during the investigation, or through activities or incidents that have occurred and gone unreported to the databases that were reviewed during the course of investigation for this report.

K&S Environmental, Inc.

12.0 REFERENCES

- * OR Department of Environmental Quality (UST Cleanup NFA/Correspondence/ECSI Status)
- * Oregon Water Resource Department (well logs)
- * Oregon Historical Society (Sanborn Maps/Metsker Maps/City Directories)
- * City of Portland
- * Multnomah County Tax Assessors & Recorders (Ownership Records/Plat Map/Appraisal Cards)
- * Oregon State Fire Marshals Office
- * Portland Fire Marshals Office
- * Public Library
- * University of Oregon (aerial photographs)
- * Soil Survey of Multnomah County, Oregon printed by the United States Department of Agriculture Soil Conservation Service
- * Environmental Data Resources (EDR) (Regulatory/Tribal Records Review)
- * Googlemaps.com (Aerial Photo's and Topo Maps)
- * John Jansen of BCS America, LLC– (occupant/property owner representative) –Interview
- * Tank Decommissioning. PEMCO, December 1991
- * Environmental Site Assessment. PEMCO, December 1991
- * Subsurface Investigation. PEMCO, July 1992
- * William F. Willingham –History of Swan Island (internet)

APPENDIX A

Site Maps



2017

NE1/4 SEC. 20 T.1N. R.1E. W.M.
MULTNOMAH COUNTY
1" = 200'

CANCELLED NO.
400
401
500
600
800
801



ATTACHMENT B



ATTACHMENT C

Apex Laboratories
Analytical Method Information

9/14/2018

Ag (Silver) - 200.8 - Total in Water (EPA 200.8)

Method Header: Total Metals by EPA 200.8 (ICPMS)

Container: 250 mL Poly - Nitric (HNO3)

Preservation/Storage: HNO3 to pH<2

Hold Time(s): Sampled to Analyzed: 180 days

Extraction Method: EPA 3015A

Prep Amounts: Initial Amt: 45.00 mL

Final Amt: 50.00 mL

Dilution: 1.00

Analyte	MDL	Reporting Limit	Surrogate %R	Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike / LCS %R	Blank Spike / LCS RPD
Silver	0.100	0.200 ug/L		20	70 - 130	20	85 - 115	20

Analyte	MDL	Reporting Limit	Surrogate %R	Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike / LCS %R	Blank Spike / LCS RPD
Arsenic	0.500	1.00 ug/L		20	70 - 130	20	85 - 115	20

Analyte	MDL	Reporting Limit	Surrogate %R	Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike / LCS %R	Blank Spike / LCS RPD
Beryllium	0.100	0.200 ug/L		20	70 - 130	20	85 - 115	20

Analyte	MDL	Reporting Limit	Surrogate %R	Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike / LCS %R	Blank Spike / LCS RPD
Cadmium	0.0400	0.200 ug/L		20	70 - 130	20	85 - 115	20

Analyte	MDL	Reporting Limit	Surrogate %R	Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike / LCS %R	Blank Spike / LCS RPD
Chromium	0.400	1.00 ug/L		20	70 - 130	20	85 - 115	20

Analyte	MDL	Reporting Limit	Surrogate %R	Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike / LCS %R	Blank Spike / LCS RPD
Copper	0.500	1.00 ug/L		20	70 - 130	20	85 - 115	20

Analyte	MDL	Reporting Limit	Surrogate %R	Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike / LCS %R	Blank Spike / LCS RPD
Mercury	0.0400	0.0800 ug/L		20	70 - 130	20	85 - 115	20

Analyte	MDL	Reporting Limit	Surrogate %R	Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike / LCS %R	Blank Spike / LCS RPD
---------	-----	-----------------	--------------	---------------	-----------------	------------------	----------------------	-----------------------

Reviewed By: _____

Date: ____/____/____

Apex Laboratories
Analytical Method Information

9/14/2018

Ni (Nickel) - 200.8 - Total in Water (EPA 200.8)

Method Header: Total Metals by EPA 200.8 (ICPMS)

Container: 250 mL Poly - Nitric (HNO3) **Preservation/Storage:** HNO3 to pH<2

Hold Time(s): Sampled to Analyzed: 180 days

Extraction Method: EPA 3015A

Prep Amounts: Initial Amt: 45.00 mL Final Amt: 50.00 mL Dilution: 1.00

Analyte	MDL	Reporting Limit	Surrogate %R	Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike / LCS %R	LCS RPD
Nickel	0.500	1.00 ug/L		20	70 - 130	20	85 - 115	20

Analyte	MDL	Reporting Limit	Surrogate %R	Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike / LCS %R	LCS RPD
Lead	0.100	0.200 ug/L		20	70 - 130	20	85 - 115	20

Analyte	MDL	Reporting Limit	Surrogate %R	Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike / LCS %R	LCS RPD
Antimony	0.500	1.00 ug/L		20	70 - 130	20	85 - 115	20

Analyte	MDL	Reporting Limit	Surrogate %R	Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike / LCS %R	LCS RPD
Selenium	0.500	1.00 ug/L		20	70 - 130	20	85 - 115	20

Analyte	MDL	Reporting Limit	Surrogate %R	Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike / LCS %R	LCS RPD
Thallium	0.100	0.200 ug/L		20	70 - 130	20	85 - 115	20

Analyte	MDL	Reporting Limit	Surrogate %R	Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike / LCS %R	LCS RPD
Zinc	2.00	4.00 ug/L		20	70 - 130	20	85 - 115	20

Reviewed By: _____

Date: ____/____/____

9/14/2018

Method Header:	<u>Inactive</u>		
Container:	8 oz Glass Jar	Preservation/Storage:	0-6 degrees C
Hold Time(s):	Sampled to Analyzed: 180 days		
Extraction Method:	EPA 3051A		
Prep Amounts:	Initial Amt: 0.50 g	Final Amt: 50.00 mL	Dilution: 10.00

Analyte	MDL	Reporting	Surrogate	Duplicate	Matrix Spike		Blank Spike / LCS	
		Limit	%R	RPD	%R	RPD	%R	RPD
Zinc	1.00	4.00 mg/kg		40	70 - 130	40	85 - 115	20

Apex Laboratories
Analytical Method Information

9/14/2018

Ag (Silver) - 200.8 - Total in Liquid (EPA 200.8)

Method Header: Inactive

Container: 8 oz Glass Jar **Preservation/Storage:** 0-6 degrees C

Hold Time(s): Sampled to Analyzed: 180 days

Extraction Method: EPA 3051A

Prep Amounts: Initial Amt: 0.50 g Final Amt: 50.00 mL Dilution: 10.00

Analyte	MDL	Reporting Limit	Surrogate %R	Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike / LCS %R	Blank Spike / LCS RPD
Silver	0.100	1.00 mg/kg		40	70 - 130	40	85 - 115	20

Analyte	MDL	Reporting Limit	Surrogate %R	Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike / LCS %R	Blank Spike / LCS RPD
Arsenic	0.200	2.00 mg/kg		40	70 - 130	40	85 - 115	20

Analyte	MDL	Reporting Limit	Surrogate %R	Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike / LCS %R	Blank Spike / LCS RPD
Beryllium	0.200	1.00 mg/kg		40	70 - 130	40	85 - 115	40

Analyte	MDL	Reporting Limit	Surrogate %R	Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike / LCS %R	Blank Spike / LCS RPD
Cadmium	0.100	1.00 mg/kg		40	70 - 130	40	85 - 115	20

Analyte	MDL	Reporting Limit	Surrogate %R	Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike / LCS %R	Blank Spike / LCS RPD
Chromium	0.100	2.00 mg/kg		40	70 - 130	40	85 - 115	20

Analyte	MDL	Reporting Limit	Surrogate %R	Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike / LCS %R	Blank Spike / LCS RPD
Copper	1.00	2.00 mg/kg		20	70 - 130	20	85 - 115	20

Analyte	MDL	Reporting Limit	Surrogate %R	Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike / LCS %R	Blank Spike / LCS RPD
Mercury	0.0300	0.0800 mg/kg		40	70 - 130	20	85 - 115	20

Analyte	MDL	Reporting Limit	Surrogate %R	Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike / LCS %R	Blank Spike / LCS RPD
---------	-----	-----------------	--------------	---------------	-----------------	------------------	----------------------	-----------------------

Reviewed By: _____

Date: ____/____/____

Apex Laboratories
Analytical Method Information

9/14/2018

Ni (Nickel) - 200.8 - Total in Liquid (EPA 200.8)

Method Header: Inactive

Container: 8 oz Glass Jar

Preservation/Storage: 0-6 degrees C

Hold Time(s): Sampled to Analyzed: 180 days

Extraction Method: EPA 3051A

Prep Amounts: Initial Amt: 0.50 g

Final Amt: 50.00 mL

Dilution: 10.00

Analyte	MDL	Reporting Limit	Surrogate %R	Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike / LCS %R	LCS RPD
Nickel	0.200	2.00 mg/kg		40	70 - 130	40	85 - 115	20

Analyte	MDL	Reporting Limit	Surrogate %R	Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike / LCS %R	LCS RPD
Lead	0.100	1.00 mg/kg		40	70 - 130	40	85 - 115	20

Analyte	MDL	Reporting Limit	Surrogate %R	Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike / LCS %R	LCS RPD
Antimony	0.100	1.00 mg/kg		40	70 - 130	40	85 - 115	20

Analyte	MDL	Reporting Limit	Surrogate %R	Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike / LCS %R	LCS RPD
Selenium	0.400	2.00 mg/kg		40	70 - 130	40	85 - 115	20

Analyte	MDL	Reporting Limit	Surrogate %R	Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike / LCS %R	LCS RPD
Thallium	0.100	1.00 mg/kg		40	70 - 130	40	85 - 115	20

Analyte	MDL	Reporting Limit	Surrogate %R	Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike / LCS %R	LCS RPD
Zinc	1.00	4.00 mg/kg		40	70 - 130	40	85 - 115	20

Reviewed By: _____

Date: ____/____/____

As (Arsenic) - 200.8 - ULTRA-LOW Total in Water (EPA 200.8)

Method Header: Total Metals by EPA 200.8 (ICPMS) - Low Level

Container: 250 mL Poly - Nitric (HNO₃) **Preservation/Storage:** HNO₃ to pH<2

Hold Time(s): Sampled to Analyzed: 180 day:

Extraction Method: EPA 3015A

Prep Amounts: Initial Amt: 45.00 mL Final Amt: 50.00 mL Dilution: 1.00

Analyte	MDL	Reporting Limit	Surrogate %R	Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike / LCS %R	Blank Spike / LCS RPD
Arsenic	0.0350	0.0500 ug/L		20	70 - 130	20	85 - 115	20

Reviewed By: _____

Date: ____/____/____

8270 SIM PAH (1-2mL FV) in Water (EPA 8270D (SIM))

Method Header: Polyaromatic Hydrocarbons (PAHs) by EPA 8270D SIM

Container: 1 L Amber Glass - Non Preserved **Preservation/Storage:** 0-6 degrees C

Hold Time(s): Sampled to Prepared: 7 days | Prepared to Analyzed: 40 days

Extraction Method: EPA 3510C (Acid Extraction)

Prep Amounts: Initial Amt: 1,000.00 mL Final Amt: 1.00 mL Dilution: 1.00

Analyte	MDL	Reporting Limit	Surrogate %R	Duplicate RPD	Matrix Spike %R	Spike RPD	Blank Spike / LCS %R	RPD
Acenaphthene	0.0100	0.0200 ug/L		30	47 - 122	30	47 - 122	30
Acenaphthylene	0.0100	0.0200 ug/L		30	41 - 130	30	41 - 130	30
Anthracene	0.0100	0.0200 ug/L		30	57 - 123	30	57 - 123	30
Benz(a)anthracene	0.0100	0.0200 ug/L		30	58 - 125	30	58 - 125	30
Benzo(a)pyrene	0.0100	0.0200 ug/L		30	54 - 128	30	54 - 128	30
Benzo(b)fluoranthene	0.0100	0.0200 ug/L		30	53 - 131	30	53 - 131	30
Benzo(k)fluoranthene	0.0100	0.0200 ug/L		30	57 - 129	30	57 - 129	30
Benzo(g,h,i)perylene	0.0100	0.0200 ug/L		30	50 - 134	30	50 - 134	30
Chrysene	0.0100	0.0200 ug/L		30	59 - 123	30	59 - 123	30
Dibenz(a,h)anthracene	0.0100	0.0200 ug/L		30	51 - 134	30	51 - 134	30
Dibenzofuran	0.0100	0.0200 ug/L		30	53 - 120	30	53 - 120	30
Fluoranthene	0.0100	0.0200 ug/L		30	57 - 128	30	57 - 128	30
Fluorene	0.0100	0.0200 ug/L		30	52 - 124	30	52 - 124	30
Indeno(1,2,3-cd)pyrene	0.0100	0.0200 ug/L		30	52 - 133	30	52 - 133	30
1-Methylnaphthalene	0.0200	0.0400 ug/L		30	41 - 120	30	41 - 120	30
2-Methylnaphthalene	0.0200	0.0400 ug/L		30	40 - 121	30	40 - 121	30
Naphthalene	0.0200	0.0400 ug/L		30	40 - 121	30	40 - 121	30
Phenanthrene	0.0100	0.0200 ug/L		30	59 - 120	30	59 - 120	30
Pyrene	0.0100	0.0200 ug/L		30	57 - 126	30	57 - 126	30
surr: 2-Fluorobiphenyl (Surr)			44 - 120					
surr: p-Terphenyl-d14 (Surr)			50 - 133					

8270D ULL PAH (Scan) in Water (EPA 8270D LVI)

Method Header: Polyaromatic Hydrocarbons (PAHs) by EPA 8270D (Large Volume Injection)
Container: 1 L Amber Glass - Non Preserved **Preservation/Storage:** 0-6 degrees C
Hold Time(s): Sampled to Prepared: 7 days | Prepared to Analyzed: 40 days
Extraction Method: EPA 3511 (Bottle Extraction)
Prep Amounts: Initial Amt: 1,000.00 mL Final Amt: 2.00 mL Dilution: 1.00

Analyte	MDL	Reporting Limit	Surrogate %R	Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike / LCS %R	Blank Spike / LCS RPD
Acenaphthene	0.00200	0.00400 ug/L		30	47 - 122	30	47 - 122	30
Acenaphthylene	0.00500	0.0100 ug/L		30	41 - 130	30	41 - 130	30
Anthracene	0.00500	0.0100 ug/L		30	57 - 123	30	57 - 123	30
Benz(a)anthracene	0.00200	0.00400 ug/L		30	58 - 125	30	58 - 125	30
Benzo(a)pyrene	0.00200	0.00400 ug/L		30	54 - 128	30	54 - 128	30
Benzo(b)fluoranthene	0.00200	0.00400 ug/L		30	53 - 131	30	53 - 131	30
Benzo(k)fluoranthene	0.00200	0.00400 ug/L		30	57 - 129	30	57 - 129	30
Benzo(g,h,i)perylene	0.00200	0.00400 ug/L		30	50 - 134	30	50 - 134	30
Chrysene	0.00200	0.00400 ug/L		30	59 - 123	30	59 - 123	30
Dibenz(a,h)anthracene	0.00200	0.00400 ug/L		30	51 - 134	30	51 - 134	30
Fluoranthene	0.0100	0.0200 ug/L		30	57 - 128	30	57 - 128	30
Fluorene	0.00200	0.00400 ug/L		30	52 - 124	30	52 - 124	30
Indeno(1,2,3-cd)pyrene	0.00200	0.00400 ug/L		30	52 - 133	30	52 - 133	30
1-Methylnaphthalene	0.0100	0.0200 ug/L		30	41 - 120	30	41 - 120	30
2-Methylnaphthalene	0.0100	0.0200 ug/L		30	40 - 121	30	40 - 121	30
Naphthalene	0.0100	0.0200 ug/L		30	40 - 121	30	40 - 121	30
Phenanthrene	0.00500	0.0100 ug/L		30	59 - 120	30	59 - 120	30
Pyrene	0.00500	0.0100 ug/L		30	57 - 126	30	57 - 126	30
surr: Acenaphthylene-d8 (Surr)			41 - 130					
surr: Benzo(a)pyrene-d12 (Surr)			54 - 128					

NWTPH-Dx (Diesel/Oil) in Water (NWTPH-Dx)

Method Header: Diesel and/or Oil Hydrocarbons by NWTPH-Dx
Container: 1 L Amber Glass - HCL **Preservation/Storage:** HCl to pH<2, 0-6 deg C
Hold Time(s): Sampled to Prepared: 14 days | Prepared to Analyzed: 40 days
Extraction Method: EPA 3510C (Fuels/Acid Ext.)
Prep Amounts: Initial Amt: 1,000.00 mL Final Amt: 5.00 mL Dilution: 1.00

Analyte	MDL	Reporting Limit	Surrogate %R	Duplicate RPD	Matrix Spike %R	Matrix Spike RPD	Blank Spike / LCS %R	Blank Spike / LCS RPD
Diesel	0.100	0.200 mg/L		30	50 - 150	50	58 - 115	20
Oil	0.200	0.400 mg/L		30				
surr: o-Terphenyl (Surr)	0.0200		50 - 150					

Apex Laboratories
Analytical Method Information

9/18/2018

NWTPH-Dx (Diesel/Oil) Low Level in Water (NWTPH-Dx)

Method Header: Diesel and/or Oil Hydrocarbons by NWTPH-Dx
Container: 1 L Amber Glass - HCL **Preservation/Storage:** HCl to pH<2, 0-6 deg C
Hold Time(s): Sampled to Prepared: 14 days | Prepared to Analyzed: 40 days
Extraction Method: EPA 3510C (Fuels/Acid Ext.)
Prep Amounts: Initial Amt: 1,000.00 mL Final Amt: 2.00 mL Dilution: 1.00

Analyte	MDL	Reporting Limit	Surrogate %R	Duplicate RPD	Matrix Spike %R	Blank Spike / LCS %R	RPD
Diesel	0.0400	0.0800 mg/L		30	50 - 150	52 - 120	20
Oil	0.0800	0.160 mg/L		30			
surr: o-Terphenyl (Surr)	0.00100		50 - 150				

Reviewed By: _____

Date: ____/____/____



Analytical Method Information

Analyte	DL	LOD	LOQ / RL	Surrogate %R	Duplicate RPD	Matrix Spike %R	RPD	Blank Spike / LCS %R	RPD
WA VPH (WA VPH) in Water									
Preservation: HCl, pH <2									
Container: VOA Vial, Amber, 40 mL, HCL									
Minimum Sample Volume: 120 mL				Hold Time: 14 days					
C5-C6 Aliphatics	25.0 ug/L	50.0 ug/L	50.0 ug/L			70 - 130	30	70 - 130	30
C6-C8 Aliphatics	25.0 ug/L	50.0 ug/L	50.0 ug/L			70 - 130	30	70 - 130	30
C8-C10 Aliphatics	25.0 ug/L	50.0 ug/L	50.0 ug/L			70 - 130	30	70 - 130	30
C10-C12 Aliphatics	25.0 ug/L	50.0 ug/L	50.0 ug/L			70 - 130	30	70 - 130	30
C8-C10 Aromatics	25.0 ug/L	50.0 ug/L	50.0 ug/L			70 - 130	30	70 - 130	30
C10-C12 Aromatics	25.0 ug/L	50.0 ug/L	50.0 ug/L			70 - 130	30	70 - 130	30
C12-C13 Aromatics	25.0 ug/L	50.0 ug/L	50.0 ug/L			70 - 130	30	70 - 130	30
Methyl tert-butyl Ether	2.50 ug/L	5.00 ug/L	5.00 ug/L			70 - 130	30	70 - 130	30
Benzene	2.50 ug/L	5.00 ug/L	5.00 ug/L			70 - 130	30	70 - 130	30
Toluene	2.50 ug/L	5.00 ug/L	5.00 ug/L			70 - 130	30	70 - 130	30
Ethylbenzene	2.50 ug/L	5.00 ug/L	5.00 ug/L			70 - 130	30	70 - 130	30
m,p-Xylene	5.00 ug/L	10.0 ug/L	10.0 ug/L			70 - 130	30	70 - 130	30
o-Xylene	2.50 ug/L	5.00 ug/L	5.00 ug/L			70 - 130	30	70 - 130	30
1,2,3-Trimethylbenzene	2.50 ug/L	5.00 ug/L	5.00 ug/L			70 - 130	30	70 - 130	30
Naphthalene	2.50 ug/L	5.00 ug/L	5.00 ug/L			70 - 130	30	70 - 130	30
1-Methylnaphthalene	2.50 ug/L	5.00 ug/L	5.00 ug/L			70 - 130	30	70 - 130	30
n-Pentane	2.50 ug/L	5.00 ug/L	5.00 ug/L			70 - 130	30	70 - 130	30
n-Hexane	2.50 ug/L	5.00 ug/L	5.00 ug/L			70 - 130	30	70 - 130	30
n-Octane	2.50 ug/L	5.00 ug/L	5.00 ug/L			70 - 130	30	70 - 130	30
n-Decane	2.50 ug/L	5.00 ug/L	5.00 ug/L			70 - 130	30	70 - 130	30
n-Dodecane	2.50 ug/L	5.00 ug/L	5.00 ug/L			70 - 130	30	70 - 130	30
surr: PID: 2,5-Dibromotoluene				60 - 140					
surr: FID: 2,5-Dibromotoluene				60 - 140					

Analytical Method Information

Printed: 11/06/2018 11:58 am

8260C Full List in Water (EPA 8260C)

Preservation: HCl to pH<2, 0-6 deg C

Container: 40 mL VOA - HCL

Amount Required: 40

Hold Time: 14 days

Analyte	MDL	Reporting Limit	Surrogate %Rec	Duplicate RPD	----Matrix Spike---- %Rec RPD	--Blank Spike / LCS-- %Rec RPD
Acetone	10.0	20.0 ug/L		30	39-160	30
Acrylonitrile	1.00	2.00 ug/L		30	63-135	30
Benzene	0.100	0.200 ug/L		30	79-120	30
Bromobenzene	0.250	0.500 ug/L		30	80-120	30
Bromochloromethane	0.500	1.00 ug/L		30	78-123	30
Bromodichloromethane	0.500	1.00 ug/L		30	79-125	30
Bromoform	0.500	1.00 ug/L		30	66-130	30
Bromomethane	5.00	5.00 ug/L		30	53-141	30
2-Butanone (MEK)	5.00	10.0 ug/L		30	56-143	30
n-Butylbenzene	0.500	1.00 ug/L		30	75-128	30
sec-Butylbenzene	0.500	1.00 ug/L		30	77-126	30
tert-Butylbenzene	0.500	1.00 ug/L		30	78-124	30
Carbon disulfide	5.00	10.0 ug/L		30	64-133	30
Carbon tetrachloride	0.500	1.00 ug/L		30	72-136	30
Chlorobenzene	0.250	0.500 ug/L		30	80-120	30
Chloroethane	5.00	5.00 ug/L		30	60-138	30
Chloroform	0.500	1.00 ug/L		30	79-124	30
Chloromethane	2.50	5.00 ug/L		30	50-139	30
2-Chlorotoluene	0.500	1.00 ug/L		30	79-122	30
4-Chlorotoluene	0.500	1.00 ug/L		30	78-122	30
Dibromochloromethane	0.500	1.00 ug/L		30	74-126	30
1,2-Dibromo-3-chloropropane	2.50	5.00 ug/L		30	62-128	30
1,2-Dibromoethane (EDB)	0.250	0.500 ug/L		30	77-121	30
Dibromomethane	0.500	1.00 ug/L		30	79-123	30
1,2-Dichlorobenzene	0.250	0.500 ug/L		30	80-120	30
1,3-Dichlorobenzene	0.250	0.500 ug/L		30	80-120	30
1,4-Dichlorobenzene	0.250	0.500 ug/L		30	79-120	30
Dichlorodifluoromethane	0.500	1.00 ug/L		30	32-152	30
1,1-Dichloroethane	0.200	0.400 ug/L		30	77-125	30
1,2-Dichloroethane (EDC)	0.200	0.400 ug/L		30	73-128	30
1,1-Dichloroethene	0.200	0.400 ug/L		30	71-131	30
cis-1,2-Dichloroethene	0.200	0.400 ug/L		30	78-123	30
trans-1,2-Dichloroethene	0.200	0.400 ug/L		30	75-124	30
1,2-Dichloropropane	0.250	0.500 ug/L		30	78-122	30
1,3-Dichloropropane	0.500	1.00 ug/L		30	80-120	30
2,2-Dichloropropane	0.500	1.00 ug/L		30	60-139	30
1,1-Dichloropropene	0.500	1.00 ug/L		30	79-125	30
cis-1,3-Dichloropropene	0.500	1.00 ug/L		30	75-124	30
trans-1,3-Dichloropropene	0.500	1.00 ug/L		30	73-127	30
Ethylbenzene	0.250	0.500 ug/L		30	79-121	30
Hexachlorobutadiene	2.50	5.00 ug/L		30	66-134	30
n-Hexane	5.00	10.0 ug/L		30	48-143	30
2-Hexanone	5.00	10.0 ug/L		30	57-139	30
Isopropylbenzene	0.500	1.00 ug/L		30	72-131	30
4-Isopropyltoluene	0.500	1.00 ug/L		30	77-127	30
Methylene chloride	1.50	3.00 ug/L		30	74-124	30
4-Methyl-2-pentanone (MIBK)	5.00	10.0 ug/L		30	67-130	30
Methyl tert-butyl ether (MTBE)	0.500	1.00 ug/L		30	71-124	30
Naphthalene	1.00	2.00 ug/L		30	61-128	30
n-Propylbenzene	0.250	0.500 ug/L		30	76-126	30
Styrene	0.500	1.00 ug/L		30	78-123	30
1,1,1,2-Tetrachloroethane	0.200	0.400 ug/L		30	78-124	30
1,1,2,2-Tetrachloroethane	0.250	0.500 ug/L		30	71-121	30
Tetrachloroethene (PCE)	0.200	0.400 ug/L		30	74-129	30

Analytical Method Information

Printed: 11/06/2018 11:58 am

(Continued)

8260C Full List in Water (EPA 8260C) (Continued)

Analyte	MDL	Reporting Limit	Surrogate %Rec	Duplicate RPD	----Matrix Spike----	--Blank Spike / LCS--	
					%Rec	RPD	%Rec RPD
Tetrahydrofuran	5.00	10.0 ug/L		30	57-133	30	80-120 30
Toluene	0.500	1.00 ug/L		30	80-121	30	80-120 30
1,2,3-Trichlorobenzene	1.00	2.00 ug/L		30	69-129	30	80-120 30
1,2,4-Trichlorobenzene	1.00	2.00 ug/L		30	69-130	30	80-120 30
1,1,1-Trichloroethane	0.200	0.400 ug/L		30	74-131	30	80-120 30
1,1,2-Trichloroethane	0.250	0.500 ug/L		30	80-120	30	80-120 30
Trichloroethene (TCE)	0.200	0.400 ug/L		30	79-123	30	80-120 30
Trichlorofluoromethane	1.00	2.00 ug/L		30	65-141	30	80-120 30
1,2,3-Trichloropropane	0.500	1.00 ug/L		30	73-122	30	80-120 30
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)	1.00	2.00 ug/L		30	70-136	30	80-120 30
1,2,4-Trimethylbenzene	0.500	1.00 ug/L		30	76-124	30	80-120 30
1,3,5-Trimethylbenzene	0.500	1.00 ug/L		30	75-124	30	80-120 30
Isobutyl alcohol	250	250 ug/L		30	70-130	30	70-130 30
Vinyl chloride	0.200	0.400 ug/L		30	58-137	30	80-120 30
m,p-Xylene	0.500	1.00 ug/L		30	80-121	30	80-120 30
o-Xylene	0.250	0.500 ug/L		30	78-122	30	80-120 30
Xylenes, total	0.750	1.50 ug/L		30	79-121	30	80-120 30
trans-1,4-Dichloro-2-butene	5.00	10.0 ug/L		30	70-130	30	70-130 30
Surr: 1,4-Difluorobenzene (Surr)				80-120			
Surr: Toluene-d8 (Surr)				80-120			
Surr: 4-Bromofluorobenzene (Surr)				80-120			
Pentafluorobenzene (ISTD)							
Chlorobenzene-d5 (ISTD)							
1,4-Dichlorobenzene-d4 (ISTD)							

Analytical Method Information

Printed: 11/06/2018 12:00 pm

8260C SIM LL Vols in Water (EPA 8260C SIM)

Preservation: HCl to pH<2, 0-6 deg C

Container: 40 mL VOA - HCL

Amount Required: 40

Hold Time: 14 days

Analyte	MDL	Reporting Limit	Surrogate %Rec	Duplicate RPD	----Matrix Spike---- %Rec RPD	--Blank Spike / LCS-- %Rec RPD
Benzene	0.0500	0.100 ug/L		30	79-120 30	80-120 30
Toluene	0.0500	0.100 ug/L		30	80-121 30	80-120 30
Ethylbenzene	0.0500	0.100 ug/L		30	79-121 30	80-120 30
m,p-Xylene	0.100	0.200 ug/L		30	80-121 30	80-120 30
o-Xylene	0.0500	0.100 ug/L		30	78-122 30	80-120 30
1,2,4-Trimethylbenzene	0.0500	0.100 ug/L		30	76-124 30	80-120 30
1,3,5-Trimethylbenzene	0.0500	0.100 ug/L		30	75-124 30	80-120 30
Carbon disulfide	0.0500	0.100 ug/L		30	64-133 30	80-120 30
Chloroform	0.0500	0.100 ug/L		30	79-124 30	80-120 30
Chloromethane	0.500	1.00 ug/L		30	50-139 30	80-120 30
1,2-Dibromo-3-chloropropane	0.100	0.200 ug/L		30	62-128 30	80-120 30
1,2-Dibromoethane (EDB)	0.0100	0.0200 ug/L		30	77-121 30	80-120 30
1,1-Dichloroethane	0.0100	0.0200 ug/L		30	77-125 30	80-120 30
1,2-Dichloroethane (EDC)	0.0100	0.0200 ug/L		30	73-128 30	80-120 30
1,1-Dichloroethene	0.0100	0.0200 ug/L		30	71-131 30	80-120 30
cis-1,2-Dichloroethene	0.0100	0.0200 ug/L		30	78-123 30	80-120 30
trans-1,2-Dichloroethene	0.0100	0.0200 ug/L		30	75-124 30	80-120 30
1,2-Dichloropropane	0.0100	0.0200 ug/L		30	78-122 30	80-120 30
cis-1,3-Dichloropropene	0.0100	0.0200 ug/L		30	75-124 30	80-120 30
trans-1,3-Dichloropropene	0.0100	0.0200 ug/L		30	73-127 30	80-120 30
Methyl tert-butyl ether (MTBE)	0.0100	0.0200 ug/L		30	71-124 30	80-120 30
Naphthalene	0.0500	0.100 ug/L		30	61-128 30	80-120 30
1,1,2,2-Tetrachloroethane	0.0100	0.0200 ug/L		30	71-121 30	80-120 30
Tetrachloroethene (PCE)	0.0100	0.0200 ug/L		30	74-129 30	80-120 30
1,1,2-Trichloroethane	0.0100	0.0200 ug/L		30	80-120 30	80-120 30
Trichloroethene (TCE)	0.0100	0.0200 ug/L		30	79-123 30	80-120 30
1,2,3-Trichloropropane	0.0500	0.100 ug/L		30	73-122 30	80-120 30
Vinyl chloride	0.0100	0.0200 ug/L		30	58-137 30	80-120 30
Surr: 1,4-Difluorobenzene (Surr)			70-130			
Surr: Toluene-d8 (Surr)			70-130			
Surr: 4-Bromofluorobenzene (Surr)			70-130			
Pentafluorobenzene (ISTD)						
Chlorobenzene-d5 (ISTD)						
1,4-Dichlorobenzene-d4 (ISTD)						