GeoDesign Inc
An NV5 Company

December 9, 2020

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

Attention: Robert Hood

Revised Work Plan
Stormwater Conveyance System Sampling
Former Automatic Vending Company
5001 North Lagoon Avenue
Portland, Oregon
ECSI No. 1430
GeoDesign Project: BCSAmerica-1-02

INTRODUCTION

GeoDesign, Inc. is pleased to submit this revised work plan to conduct stormwater conveyance system sampling at the Former Automatic Vending Company site located at 5001 North Lagoon Avenue in Portland, Oregon (project site). The project site includes Tax Lot 700 of Multnomah County Tax Map 1N1E20A and is in the upland portion of the Portland Harbor Superfund study area on Swan Island. The scope of services is being performed at the request of the Oregon Department of Environmental Quality (DEQ) and is intended to supplement the Source Control Evaluation (SCE) that GeoDesign recently prepared for the project site.

BACKGROUND

The project site is occupied by two buildings: a warehouse building and a shop building. The warehouse building was constructed on the project site in 1963 with additions constructed in 1969 and 1978. The warehouse building consists of an approximately 51,100-square-foot, metal-framed structure with a slab-on-grade foundation that is occupied by warehouse and office space.

The shop building is located on the southwest portion of the project site and was constructed in 1973/74 and consists of an approximately 1,200-square-foot, metal structure with a slab-on-grade foundation.

GeoDesign submitted a draft SCE of the project site to DEQ dated September 8, 2020. The SCE concluded that soil and groundwater at the project site do not appear to represent an unacceptable risk to receptors in the Portland Harbor.

The SCE stated that the majority of stormwater line infrastructure appears to have been constructed during site development in 1963 and subsequent building additions between 1969 and 1978. Stormwater collection and conveyance at the project site are accomplished through seven catch basins (CB1 through CB7), as shown on Figure 1.

GeoDesign attempted to trace the discharge point of the catch basin piping, but catch basins CB1, CB4, and CB5 were blocked by debris and the discharge locations could not be confirmed. GeoDesign was able to confirm that catch basins CB2 and CB3 discharge to the municipal stormwater system. Based on this information, it is inferred that catch basins CB1, CB4, and CB5 likely also discharge to the municipal stormwater system. The municipal stormwater system servicing the project site discharges to the Swan Island Basin at outfall S-2, located approximately 780 feet northwest of the project site. The SCE recommends conducting catch basin sediment sampling because the on-site catch basins may discharge to the Swan Island Basin.

SCOPE OF SERVICES

GeoDesign proposes conducting catch basin sediment sampling, stormwater conveyance system cleaning, and stormwater sampling (if necessary) to collect adequate information for DEQ to prepare a stormwater source control determination for the project site. The scope of services is discussed in the following sections.

CATCH BASIN SEDIMENT SAMPLING

The purpose of the proposed catch basin sediment sampling is to evaluate potential impacts to sediment within the catch basins at the project site that could potentially migrate to the Swan Island Basin and Portland Harbor. The proposed revised scope of services was prepared in accordance with the DEQ request for catch basin sampling in an email dated August 21, 2020 and DEQ comments on the initial Stormwater Conveyance System Sampling Work Plan received in a letter dated December 2, 2020. Specifically, the proposed revised scope of services includes the following:

- A sediment sample will be collected from each catch basin using a decontaminated hand auger. Each catch basin will be sampled independently instead of grouping catch basins together by proximity and collecting composite samples representing multiple catch basins as originally proposed. This revision is necessary because the catch basins are too full to determine discharge locations prior to sampling and cleanout. Sample collection with a hand auger has been selected because the catch basins are relatively full of sediment and it is the best tool to get a representative sediment sample of the entire layer of sediment in each catch basin.

- Sediment samples will be collected in accordance with the City of Portland (City) *Standard Operating Procedures, Guidance for Sampling Catch Basin Solids,* prepared by CH2M Hill, dated July 2003. Specifically, each sample will be collected as follows:
  - If stormwater is pooled in the catch basin it will be removed prior to sediment sampling. The pooled stormwater will be pumped slowly from the catch basin using a peristaltic pump and a thin layer of water will be left so that fine materials in the solids are not disturbed. Pumped water will be disposed of in the sanitary sewer. The volume of water will be documented.
  - Advance a decontaminated hand auger into the catch basin in each of the four corners and one in the center of the catch basin to obtain samples representative of both the lateral and vertical extent of sediments. The recovered material will be placed in a decontaminated stainless steel bowl and composited.
  - Collect one composite sediment sample from each catch basin into laboratory-provided jars.
  - GeoDesign will collect one duplicate sediment sample from the fourth catch basin sampled.
- The seven sediment samples and one duplicate sample will be submitted to Apex Laboratories of Tigard, Oregon, for the following analyses:
  - Gasoline-range hydrocarbons by Method NWTPH-Gx
  - Diesel- and oil-range hydrocarbons by Method NWTPH-Dx
  - Dioxins and furans by EPA Method 1613
  - VOCs by EPA Method 8260B
  - Chlorinated pesticides by EPA Method 8181
  - Chlorinated herbicides by EPA Method 8151
  - Tributyltin by EPA Method Kron
  - Phthalates by EPA Method 8270E
  - Polycyclic aromatic hydrocarbons (PAHs) by EPA Method 8270E-SIM
  - Priority 13 pollutant metals by EPA 6000/7000 Series Methods
  - Polychlorinated biphenyls (PCBs) by EPA Method 8082
- Prepare a technical memorandum that summarizes the results of the catch basin sampling and provides conclusions and recommendations as appropriate.

Portland Harbor Contaminant of Potential Concern Exclusions

GeoDesign will analyze the sediment samples for the contaminants of potential concern (COPCs) listed above. Analyses for cyanide, manganese, and vanadium will not be performed because these compounds are not potential COPCs at the project site.

STORMWATER CONVEYANCE SYSTEM CLEANING

River City Environmental will be contracted to clean the catch basins after the sediment samples have been collected as discussed above. The City Bureau of Environmental Services will be notified before cleaning activities and the stormwater line will be plugged so that sediment and wash water do not discharge into the City system. The catch basins will first be cleaned using a vacuum truck. One vacuum truck will be used to clean the catch basins connected to the stormwater system (CB1 through CB5) and a second vacuum truck will be used to clean the catch

basins connected to the sanitary system (CB6 and CB7). Once the catch basins are cleaned, the discharge lines will be jetted and scoped to clean clogged debris and evaluate the discharge locations and connections.

Samples will not be collected during cleaning activities because the sediment cannot be segregated per composite area and we cannot confirm the cleanliness of the vacuum trucks/equipment used.

STORMWATER SAMPLING

If stormwater sampling is required, GeoDesign will collect stormwater samples in accordance with the DEQ *Guidance for Evaluating the Stormwater Pathway at Upland Sites*, dated January 2009. GeoDesign will identify representative sampling locations based on the results of scoping the lines during cleaning activities. At this time, we anticipate that the on-site stormwater conveyance system functions as follows:

- CB1 connects to CB2, which discharges to the City stormwater system.
- CB5 connects to CB4, which connects to CB3, which discharges to the City stormwater system.
- CB6 connects to CB7, which discharges to the City sanitary system.

GeoDesign proposes collecting stormwater samples from the last catch basin in line before the system discharges to the City stormwater main. Based on our assumptions above, GeoDesign proposes collecting stormwater from CB2 and CB3. If scoping the lines determines that the assumed connections are incorrect, DEQ will be notified and the sampling locations will be adjusted accordingly.

GeoDesign anticipates conducting a total of four stormwater sampling events at the project site. Each stormwater sampling event will be scheduled after a dry period of at least 24 hours (less than 0.1 inch of rain) and during storm events with a minimum rainfall volume of 0.2 inch over a minimum of three hours. The proposed stormwater sampling schedule is as follows:

- Stormwater sample 1 will be collected during first flush conditions.
- Stormwater sample 2 will be collected within the first three hours of stormwater discharge.
- Stormwater sample 3 will be collected during first flush conditions.
- Stormwater sample 4 will be collected within the first three hours of stormwater discharge.

The stormwater samples will be collected in accordance with the Washington Department of Ecology *How to Do Stormwater Sampling, A Guide for Industrial Facilities*, dated December 2002. GeoDesign will fill each of the laboratory-provided containers by partially submerging the sample container into the stormwater flowing through the selected catch basin (dependent on scoping). One duplicate stormwater sample will be collected during each sampling event.

The stormwater samples will be analyzed for the COPCs identified in the sediment samples at concentrations greater than applicable regulatory screening levels. Before sampling, GeoDesign

will confirm the analytical suite in an email with DEQ. Stormwater sampling will not be conducted if COPCs are detected in sediment samples at concentrations less than applicable regulatory screening levels.

QUALITY OBJECTIVES AND CRITERIA

This section describes the field methodology for collecting and handling sediment 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.

CATCH BASIN SEDIMENT SAMPLE FIELD SCREENING

Field screening procedures will be used to evaluate the potential presence and relative magnitude of sediment impacts. Field screening is not planned in lieu of laboratory analysis. Field screening for the presence of non-volatile compounds (metals and PCBs) is not reliable with the proposed screening equipment; however, field screening for volatile compounds (total petroleum hydrocarbons and VOCs) may assist in evaluating potential impacts to individual catch basins. Field screening will be performed on sediment at the same time and location as the sediment samples collected for potential laboratory analysis.

Sheen Testing

Sheen testing will be performed by placing a small amount (typically a thumbnail size) of sediment 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 petroleum hydrocarbon compounds (e.g., gasoline and 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. 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 photoionization detector (PID) to assess relative impacts to catch basin sediment. A sample of the sediment (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 sediment contamination will escape the sediment pores and enter the air space inside the bag. The tip of the PID is then inserted into the bag, and the instrument reading is recorded in units of parts per million (ppm). PID readings of 10 ppm or greater typically indicate the presence of volatile compounds. This method of field screening is sensitive to temperature

and humidity. At higher temperatures, VOCs will more readily dissociate from the sediment and into the headspace, producing a higher PID reading. Similarly, colder temperatures will typically produce lower PID readings. For this project, a 10.6-electronvolt 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 sediment is typically stained darker than adjacent, non-contaminated sediment. 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 sediment will often yield an odor, indicating the presence of contaminants. However, 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.

SEDIMENT SAMPLING PROCEDURES

Sediment samples will be collected using a decontaminated hand auger to collect a sample representative of the entire layer of sediment in each catch basin. Disposable nitrile gloves will be worn and changed between composite areas and all reusable equipment will be decontaminated. Five discrete sediment samples will be collected from each catch basin and composited in a decontaminated stainless steel bowl. The sediment samples will be placed into laboratory-provided sample containers in the order of decreasing volatility. Sediment samples will be placed immediately on ice and standard chain-of-custody (COC) procedures will be followed. GeoDesign will collected one duplicate sediment sample and submit it for analysis of the same suite of parameters.

STORMWATER SAMPLING PROCEDURES

Stormwater samples will be collected by partially submerging laboratory-provided bottles in the stormwater of the selected catch basins. Disposable nitrile gloves will be worn and changed between each sample. GeoDesign will collect one duplicate stormwater sample and submit it for analysis of the same suite of parameters. GeoDesign will also analyze one trip blank per cooler for VOCs by EPA Method 8260B.

DECONTAMINATION PROCEDURES

All sampling equipment used in the collection of samples will be decontaminated before use. Proper decontamination procedures are critical to the collection of representative environmental samples to minimize potential cross-contamination between composite sample locations.

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

Sample processing equipment will be decontaminated before each location is sampled 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 a phosphate-free detergent solution
3. Rinse with tap water
4. Rinse with distilled water

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 the sediment 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 will be 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 identification (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 before 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
- 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 before transferring samples to the field processing area or to the analytical laboratory. At the end of each day and before 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

Measures will be taken to test, inspect, and maintain all field equipment before use. All equipment used, including the PID, hand auger, trowels, and other needed equipment, will be tested for use before personnel leaves 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

Multi-point 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 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, including site plan and description of sediment observed within each catch basin
- COC 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 catch basin sediment sampling and catch basin cleaning and scoping in a technical memorandum following receipt of the laboratory analyses. The memorandum will include the following:

- A description of project site conditions and field and sample collection activities and methods.
- A site plan depicting all sample locations and catch basin discharge points.
- Tabulated chemical analytical data.
- A discussion of the catch basin sediment chemical analytical data in relation to the ongoing SCE. Sediment data will be compared to Portland Harbor cleanup levels and Joint Source Control Strategy screening level values. Detections will be plotted on the appropriate DEQ stormwater curves.
- A discussion of catch basin cleaning protocols and scoping findings.
- Supporting information, including laboratory analytical reports and COC documents.
- Recommendations based on the sampling results.

GeoDesign will summarize the results from each stormwater sampling event in a technical memorandum following receipt of the laboratory analyses. The memorandum will include the following:

- A description of project site conditions and field and sample collection activities and methods.
- A site plan depicting all sample locations.
- Tabulated chemical analytical data.
- A discussion of the stormwater chemical analytical data in relation to the ongoing SCE. Sediment data will be compared to Portland Harbor cleanup levels and Joint Source Control Strategy screening level values. Detections will be plotted on the appropriate DEQ stormwater curves.
- Supporting information, including laboratory analytical reports and COC documents.
- Recommendations based on the sampling results.

♦ ♦ ♦

We appreciate the opportunity to submit this revised work plan. Please do not hesitate to contact us if you have questions or require additional information. GeoDesign intends to initiate the catch basin sampling upon DEQ approval of this work plan.

Sincerely,

GeoDesign, Inc.

Kyle Haggart, G.I.T.
Project Manager

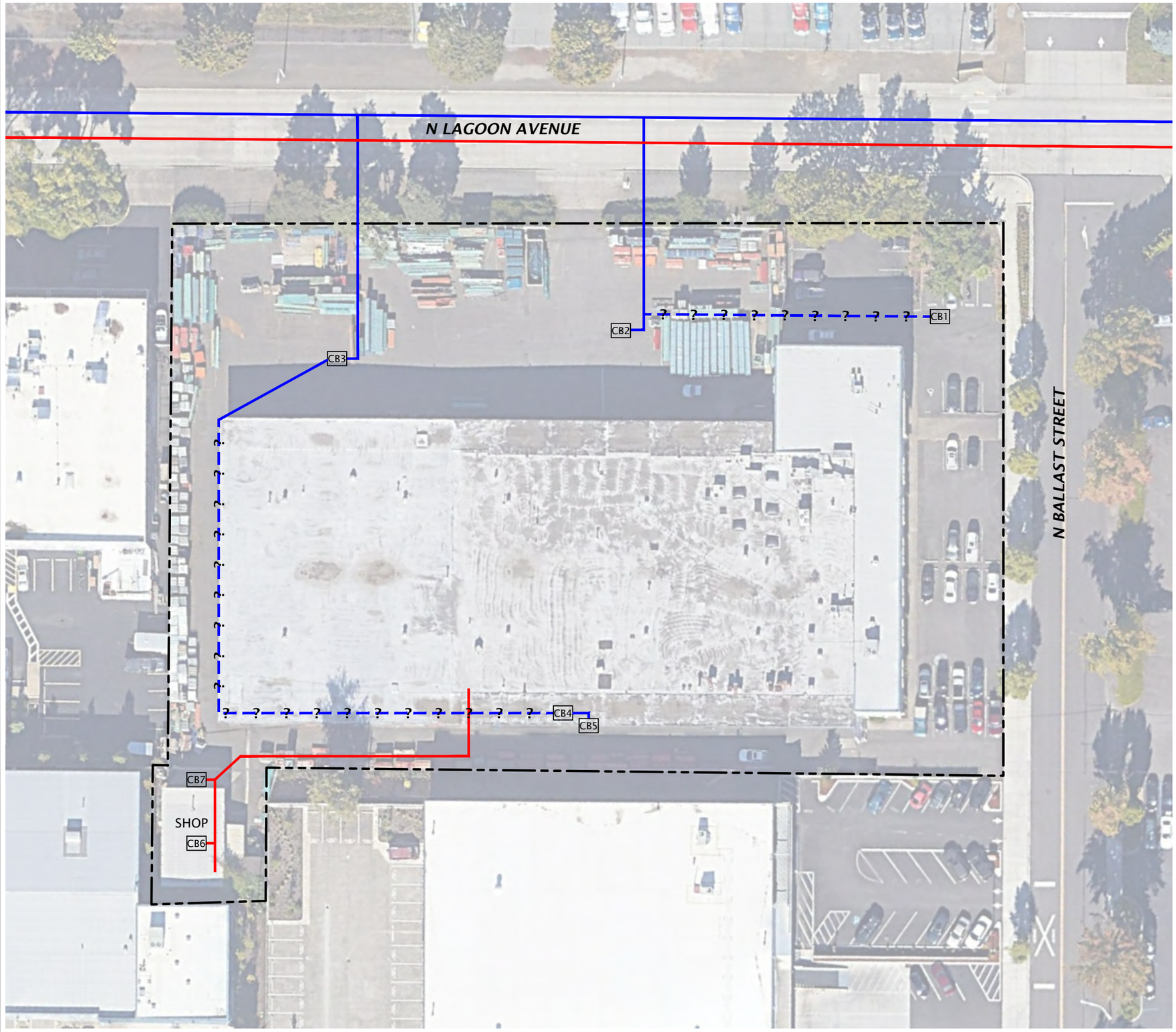
Lon R. Yandell, R.G.
Principal Geologist

Expires 06/01/2021

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

TJH:KTH:LRY:sn:kt
Attachment
One copy submitted
Document ID: BCSAmerica-1-02-120920-envwp-rev.docx

FIGURES



LEGEND:

- PROJECT SITE BOUNDARY
- STORM LINE
- INFERRED STORM LINE
- SANITARY LINE
- CB1 CATCH BASIN

0 50 100

(SCALE IN FEET)

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

SITE PLANP

FORMER AUTOMATIC VENDING COMPANY
PORTLAND, OR

FIGURE 1

BCSAMERICA-1-02

DECEMBER 2020

GeoDesign NW AN NV5 COMPANY

Printed By: mmiller | Print Date: 12/9/2020 3:24:41 PM
File Name: J:\A-D\BCSAmerica\BCSAmerica-1\BCSAmerica-1-02\Figures\CAD\BCSAmerica-1-02-SP01.dwg | Layout: FIGURE 1