CONTAMINATED MEDIA MANAGEMENT PLAN

2407 NW 28th Avenue Development
2407 NW 28th Avenue
Portland, Oregon
DEQ ECSI Site I.D. 5103
DEQ LUST File No. 26-92-0071

For
Oregon Department of Environmental Quality
July 14, 2023

Project: Accretech-1-01

NV5

July 14, 2023

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

Attention: Rebecca Digiustino

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NV5 is pleased to submit this CMMP for the 2407 NW 28th Avenue development located at 2407 NW 28th Avenue in Portland, Oregon (subject property). This CMMP addresses the management of known and potentially contaminated media that could be encountered during site redevelopment. This document is intended to be used by the excavation contractor during earthwork activities and should be used in conjunction with the NPDES 1200-C permit and any project specifications provided to the contractor by the project developer pertaining to the handling, segregation, management, characterization, reuse, and/or disposal of impacted soil, clean soil, debris, and/or groundwater at the subject property.

Sincerely,

NV5

Kyle R. Sattler, L.G. (Washington)
Principal Geologist

cc: Sada Nagata, Accretech SBS Inc.
Sarah Young, O'Brien Design + Build

CBS:KRS:kt
Attachments
One copy submitted
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TABLE OF CONTENTS

TABLE OF CONTENTS

ACRONYMS AND ABBREVIATIONS

BGS	below ground surface
BMP	best management practice
CFR	Code of Federal Regulations
CFSL	Clean Fill Screening Level
CMMP	Contaminated Media Management Plan
CREC	controlled recognized environmental condition
CSM	conceptual site model
DEQ	Oregon Department of Environmental Quality
ECSI	Environmental Cleanup Site Information
EEM	Evergreen Environmental Management
EES	Easement and Equitable Servitude
EPA	U.S. Environmental Protection Agency
ESA	Environmental Site Assessment
ESCP	Erosion and Sediment Control Plan
HCP	Hazard Communication Plan
HSP	Health and Safety Plan
HVOC	halogenated volatile organic compound
I.D.	identification
LUST	Leaking Underground Storage Tank
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
mg/wipe	milligrams per wipe
mil	milli-inch
MSL	mean sea level
NA	not applicable
ND	not detected
NE	not established
NFA	No Further Action
NITI	no inhalation toxicity information
not detected	compound not detected at a concentration equal to or greater than the laboratory method reporting limit or reporting detection limit
NPDES	National Pollutant Discharge Elimination System
NR	not reported
OSHA	Occupational Safety and Health Administration
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PCE	tetrachloroethene
PID	photoionization detector
PPE	personal protective equipment
ppm	parts per million
RBC	risk-based concentration
RBDM	*Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites*
RCRA	Resource Conservation and Recovery Act

ROW	right-of-way
SLV	screening level value
SSO	site safety officer
TCE	trichloroethene
TCLP	toxicity characteristic leaching procedure
µg/L	micrograms per liter
UIC	underground injection control
UST	underground storage tank
VCP	Voluntary Cleanup Program
VOC	volatile organic compound

1.0 INTRODUCTION

This CMMP has been prepared for the 2407 NW 28th Avenue development located at 2407 NW 28th Avenue in Portland, Oregon (subject property). This CMMP supersedes the March 2010 CMMP prepared for the subject property that was previously submitted to DEQ and Multnomah County as part of an EES that was recorded with the property deed. The EES is considered an institutional control that stipulates the current engineering control (the existing surface concrete and asphalt acting as a "cap" preventing unacceptable exposures to future site occupants, construction workers, and excavation workers) must be maintained to be effective. The EES also stipulates that the property owner, operator, or contractor must notify DEQ prior to disturbing the existing cap and that the cap must be repaired to pre-disturbance condition as soon as possible following the completion of excavation activities.

This CMMP is intended to assist the construction team in field identification and management of contaminated media (soil and groundwater) as well as clean soil and debris that could be encountered at the subject property during construction. This CMMP includes field protocol for identification, response actions, communication, removal, segregation, temporary storage or stockpiling, transportation, treatment, and disposal of contaminated media, clean soil, and debris. Acronyms and abbreviations used herein are defined above, immediately following the Table of Contents.

A site-specific HSP and directions to Legacy Good Samaritan Medical Center are presented in the Appendix. The attached HSP was created solely for use by NV5 employees. However, contractors may adopt the HSP with proper modifications, as needed, to address the type of work they will be completing at the subject property.

2.0 SUBJECT PROPERTY DESCRIPTION

The subject property includes Tax Lots 0600 and 0700 of Multnomah County Tax Map 1N1E29DB and encompasses 1.3 acres developed with a warehouse, a storage building, an office building, and paved parking areas. The subject property structures were constructed between 1923 and 1960. The subject property is situated at an elevation of approximately 40 feet above MSL. The topography at the subject property is generally level. Based on a review of previous environmental investigations for the subject property, shallow groundwater beneath the subject property has been encountered at depths between approximately 11 and 15 feet BGS and the shallow groundwater flow direction varies from east-northeast (toward the Willamette River) to west-northwest (toward Balch Creek). The subject property is shown relative to surrounding physical features on Figure 1. The subject property layout is shown on Figure 2.

The subject property is listed on the DEQ ECSI database (Site I.D. 5103) and DEQ LUST database (LUST No. 26-92-0071). The LUST listing received a conditional NFA from DEQ in 2009, and the ECSI listing received a conditional NFA in 2011.

3.0 PLANNED REDEVELOPMENT

It is our understanding that the current subject property structures will be demolished and a new, two-story commercial building with paved surface parking will be constructed. We also understand that below-ground structures are not planned at this time. During redevelopment activities, the existing cap (the surface concrete and asphalt) at the subject property will also be demolished to accommodate construction of the new commercial building and paved surface parking area. At the completion of the redevelopment activities, we anticipate that future receptors will be protected from exposure to residual soil contamination potentially exceeding current DEQ *Soil Ingestion, Direct Contact, and Inhalation* RBCs by the newly constructed commercial structure and asphalt-paved area, which will act as a new engineering control.

4.0 REGULATORY SCREENING LEVELS

The following sections describe DEQ's regulatory screening levels used to evaluate risk to future receptors at the subject property.

4.1 DEQ RBCs

DEQ has established generic RBCs for various contaminants, exposure pathways, and receptors to evaluate risk to human health and the environment. DEQ determined in their March 24, 2010, staff report, that based on the local land use and zoning (heavily industrial with some central employment-zoned areas to the east), the likely applicable exposure pathways for the subject property are as follows:

- Future construction and excavation worker exposure via direct contact, ingestion, and inhalation of surface (less than 3 feet BGS) and subsurface (greater than 3 feet BGS) soil.
- Future construction, excavation, and utility worker exposure via direct contact with groundwater.
- Current and future occupational worker exposure due to inhalation of indoor and outdoor air due to volatilization from soil.
- Current and future occupational worker exposure due to inhalation of indoor and outdoor air due to volatilization from groundwater.

Based on our understanding of the future development at the subject property, we concur with the above exposure pathways and receptors but recommend including occupational receptors as also being exposed to soil contamination via direct contact, ingestion, and inhalation of surface (less than 3 feet BGS) and subsurface (greater than 3 feet BGS) soil. The RBCs associated with these exposure pathways and receptors used to compare previous chemical analytical results are referred to as the "applicable DEQ RBCs" in this CMMP. For clarity, and in summary, the following exposure pathways and receptors are considered complete at the subject property:

- *Soil Ingestion, Dermal Contact, and Inhalation* for occupational, construction worker, and excavation worker receptors
- *Vapor Intrusion into Buildings* for occupational receptors
- *Volatilization to Outdoor Air* for occupational receptors

GeoDesign, Inc. (now NV5) previously compared historical soil and groundwater sample results to then-established applicable DEQ RBCs for the exposure pathways considered complete by DEQ. Detected concentrations of VOCs in soil and groundwater did not exceed the DEQ *Vapor Intrusion into Buildings* and *Volatilization to Outdoor Air* RBCs for the receptors noted by DEQ. Detected concentrations of metals and petroleum hydrocarbons beneath the concrete floor of the former forge shop exceeded the *Soil Ingestion, Dermal Contact, and Inhalation* RBCs for occupational receptors.

Since 2010, DEQ has updated the RBCs, most recently in June 2023. In addition to changes in numerous RBC values (they generally have become more conservative), DEQ no longer uses soil RBCs to evaluate risk for the *Vapor Intrusion into Buildings* exposure pathway. DEQ now relies on soil gas and sub-slab vapor data to evaluate risk from this exposure pathway. Consequently, depending on the magnitude of the residual contamination during construction activities, future soil gas data may need to be collected during redevelopment activities to evaluate risk to human health from the *Vapor Intrusion into Buildings* exposure pathway. Soil gas data could also be collected prior to redevelopment activities, but, depending on the results, additional soil gas data may still be required during redevelopment activities.

4.2 DEQ CFSLs

In 2019, DEQ published an internal management directive[1], which includes CFSLs, to use as guidance when evaluating disposal options for soil with low levels of contamination. Soil that does not appear stained, does not have a chemical or petroleum odor, and does not contain contamination at concentrations greater than the DEQ CFSLs can be reused on site or disposed of off site without restrictions. Soil that exhibits staining, exhibits odors, or contains contaminants at concentrations greater than DEQ CFSLs does not meet DEQ's definition of "clean fill" and requires disposal at a RCRA Subtitle D landfill or other DEQ-approved facility. To facilitate characterization of soil for disposal purposes, soil chemical analytical results were also compared to established DEQ CFSLs.

4.3 EPA CRITERIA

EPA has also established maximum allowable limits for select analytes that allows disposal of soil as non-hazardous solid waste. If the select analytes are detected at concentrations greater than the EPA non-hazardous landfill disposal limits, the soil is considered hazardous and requires disposal and treatment (if necessary) at a RCRA Subtitle C Landfill (such as Chemical Waste Management's Arlington facility located in Arlington, Oregon). Therefore, chemical analytical results, where applicable, are also compared to the EPA non-hazardous landfill disposal limits.

5.0 BACKGROUND

The following sections describe the background of the subject property, including a bibliography of previous reports, a description of the subject property development history, a description of the subsurface soil and groundwater conditions at the subject property, and a summary of previous subsurface investigations conducted at the subject property.

[1] DEQ's Internal Management Directive titled *Clean Fill Determinations*, updated February 21, 2019

5.1 BIBLIOGRAPHY

The purpose of this section is to summarize available information related to the historical site development and subsurface conditions at the subject property. Our knowledge of the subject property is based on the following environmental reports:

- *Phase One Environmental Site Assessment; Schmitt Forge Property; 2407-2415 NW 28th Avenue; Portland, Oregon 97210,* prepared by Evergreen Environmental Management, LLC (EEM), dated April 2, 2008
- *Report of Initial Environmental Services; Former Schmitt Forge Property; 2407 NW 28th Avenue; Portland, Oregon,* prepared by GeoDesign, Inc., dated August 13, 2008
- *Supplemental Former Bunker Oil UST Investigation and Quarterly Groundwater Monitoring; SFI Property; 2407 NW 28th Avenue; Portland, Oregon; DEQ LUST File No. 26-92-0071,* prepared by GeoDesign, Inc., dated October 9, 2008
- *Groundwater Monitoring and Sampling Report; SFI Property; 2407 NW 28th Avenue; Portland, Oregon; DEQ ECSI Site No. 5103*, prepared by GeoDesign, Inc., dated January 26, 2009
- *Groundwater Monitoring and Sampling Report; SFI Property; 2407 NW 28th Avenue; Portland, Oregon; DEQ ECSI Site No. 5103,* prepared by GeoDesign, Inc., dated March 18, 2009
- *UIC Registration; SFI Property; 2406 NW 28th Avenue; Portland, Oregon*, prepared by GeoDesign, Inc., dated May 20, 2009
- *Groundwater Monitoring and Sampling Report; SFI Property; 2407 NW 28th Avenue; Portland, Oregon; DEQ ECSI Site No. 5103,* prepared by GeoDesign, Inc., dated June 24, 2009
- *Report of Remedial Activities; SFI Property; 2407 NW 28th Avenue; Portland, Oregon*, prepared by GeoDesign, Inc., dated June 30, 2009
- *Stormwater Source Control Evaluation Report; SFI Property; 2407 NW 28th Avenue; Portland, Oregon*, prepared by GeoDesign, Inc., dated March 11, 2010
- *Focused Feasibility Study; SFI Property; 2407 NW 28th Avenue; Portland, Oregon,* prepared by GeoDesign, Inc., dated March 11, 2010
- *Contaminated Media Management Plan; SFI Property; 2407 NW 28th Avenue; Portland, Oregon,* prepared by GeoDesign, Inc., dated March 23, 2010
- *Memorandum Re: Staff Report and Conditional No Further Action Recommendation; SFI Property, 2407 NW 28th Avenue, Portland, Oregon; Tax Lots 1N1E29DB 00600 and 00700; Multnomah County; ECSI #5103,* prepared by DEQ, dated March 24, 2010
- *Source Control Decision: SFI Property – ECSI #5103*, prepared by DEQ, dated March 31, 2010
- *Conditional No Further Action Determination; SFI Property (ECSI #5103); 2407 NW 28th Avenue; Portland, Oregon; Tax lots 1NE29DB 0600 & 0700; ECSI #5103,* prepared by DEQ, dated June 14, 2010
- *Technical Memorandum Re: Contaminated Media Management Plan – Soil Summary 2011; Former Schmitt Steel / Forge Company; 2407 NW 28th Avenue; Portland, OR 97210; DEQ ECSI File #5103,* prepared by Grant Associates, dated February 8, 2012
- *Phase I Environmental Site Assessment Update; Former SFI property; 2407 and 2415 NW 28th Avenue; Portland, Oregon; DEQ ECSI Site No. 5103,* prepared by GeoDesign, Inc., dated December 23, 2013

5.2 SUBJECT PROPERTY DEVELOPMENT HISTORY

The subject property was originally developed as a steel foundry and metal forge facility in the mid-1920s by West Coast Iron and Steel Company. SFI took occupancy of the subject property sometime prior to 1940 and operated the subject property as a steel foundry and metal forge facility continuously through 1992. The subject property was purchased by Bill Naito Company in 1992, at which time the equipment and tooling associated with the former steel foundry and metal forge operations were removed from the subject property. Sometime after 1992, the floors of the on-site structures were capped with concrete and/or asphalt. By 2013, the subject property was occupied by BWG LLC (a wood truss manufacturer and heavy timber fabricator) and Advanced Seismic Hardware (a metal fabrication company). The subject property is currently owned by Accretech SBS, Inc.

5.3 SUBSURFACE CONDITIONS

The following sections describe subsurface soil and groundwater conditions at the subject property.

5.3.1 Soil

Subsurface conditions at the subject property include fill material consisting of fine to coarse gravel with varying amounts of sand from beneath the asphalt/concrete pavement to depths between approximately 15.9 and 18.5 feet BGS. The fill material is underlain by native gray, fine sand with some clay or gray clay with some silt to the maximum depth explored of 20 feet BGS.

5.3.2 Groundwater

Groundwater was encountered in monitoring wells located near the northeast portion of the subject property at depths between approximately 11 and 15 feet BGS. The direction of shallow groundwater flow beneath the northeast portion of the subject property varies from west-northwest to east-northeast. Free "floating" product was detected on the groundwater table in monitoring well MW-1 during each monitoring event.

5.4 PREVIOUS SUBSURFACE INVESTIGATIONS

The results of previous environmental investigations are summarized in the sections below. The associated exploration locations are shown on Figure 2. Soil sample analytical data are summarized in Tables 1 through 7. A summary of groundwater elevation data is presented in Table 8. Groundwater sample analytical data are summarized in Tables 9 and 10.

5.4.1 EEM (2008)

EEM completed a Phase I ESA of the subject property in April 2008. At the time of the April 2008 Phase I ESA, the subject property was developed with the existing facilities, which had been vacant since forge operations ceased in 1992 with the exception of periodic occupancy by Studio Concepts, an assembler of Rose Festival parade floats. The April 2008 Phase I ESA included a review of five previous environmental reports for the subject property, including a December 1991 preliminary site assessment, an April 1992 limited soils investigation, a December 1992 modified environmental site assessment, a May 1993 subsurface soil and groundwater assessment, and a February 2005 Phase I ESA.

The results of the April 2008 Phase I ESA indicated the presence of the following environmental concerns at the subject property: (1) an open DEQ LUST file associated with a former 8,000-gallon bunker oil UST located near the northeast corner of the subject property (DEQ LUST File No. 26-92-0071), (2) low levels of HVOCs in groundwater beneath the northeast portion of the subject property, (3) abandoned transformer bodies and potential PCB-contaminated soil in a former transformer vault, and (4) petroleum- and metals-impacted surface soil throughout the existing on-site structures.

It should be noted that the analytical method used during the 1992 and 1993 investigations at the subject property (EPA Method 418.1) did not separately quantify diesel- and oil-range hydrocarbons and is not used today to quantify "heavy" range hydrocarbons for comparison to current regulatory screening levels. However, since oil-range hydrocarbons were the predominant product identified during the qualitative hydrocarbon identification analysis by Method NWTPH-HCID (Table 1), it is likely the hydrocarbons detected via this method are associated with heavy oil-range hydrocarbons (and not gasoline- or diesel-range hydrocarbons). DEQ has not established RBCs or CFSLs for oil-range hydrocarbons. Therefore, we conservatively compared the analytical results via EPA Method 418.1 to the applicable DEQ RBCs for diesel-range hydrocarbons in Table 1. Based on a comparison, the analytical results for total petroleum hydrocarbon concentrations (via EPA Method-418.1) to the current applicable DEQ RBCs and CFSLs indicates that the majority of the surface and near-surface soil beneath the former forge shop exceeds the DEQ *Soil Ingestion, Dermal Contact, and Inhalation* RBCs for occupational and/or construction worker receptors, and the DEQ corresponding CFSLs.

Cadmium, chromium, and/or lead also were detected in select samples collected from borings B-6, B-7, and B-8 and test pits TP-1, TP-3, and TP-8 at concentrations greater than the applicable DEQ CFSLs. In addition, total lead was detected in two soil samples collected from test pit TP-1 at depths of 1.2 feet and 4.2 feet BGS at concentrations greater than the EPA non-hazardous landfill disposal limit threshold value of 100 mg/kg. Further lead analysis by the TCLP method was not conducted; therefore, it is unknown at this time if the soil represented by the samples collected from test pit TP-1 is hazardous and, if excavated, would require disposal and treatment (if necessary) at a RCRA Subtitle C Landfill.

5.4.2 GeoDesign (August 2008)

GeoDesign completed initial environmental services at the subject property in August 2008. The scope of services included the completion of a soil boring (DP-1) near the northeast corner of the subject property to evaluate for the presence of HVOCs previously detected in groundwater, monitoring and sampling of the three existing groundwater monitoring wells (MW-1 through MW-3) to facilitate closure of DEQ LUST File No. 26-92-0071, and sampling of seven transformer bodies and other debris located in a storage vault at the subject property. In addition, because the subject property is located in the Portland Harbor superfund cleanup initial study area, the scope of services also included tasks intended to assess the condition and construction of the stormwater drainage system.

The results of the initial environmental services indicated that free "floating" product was present in the subsurface in the vicinity of the 8,000-gallon bunker oil UST and that the magnitude and extent of soil and groundwater contamination in the vicinity of the UST had not

been fully delineated. In addition, the detected concentrations of HVOCs in groundwater were below applicable DEQ RBCs established at the time of the investigation and are also below the current applicable DEQ RBCs. PAHs were either not detected or were detected at concentrations less than the applicable DEQ RBCs established at the time of the investigation and the current applicable DEQ RBCs. The contaminated groundwater appeared to be from an off-site source. Finally, PCBs were present in one of the seven transformer bodies in the transformer storage vault (at concentrations less than applicable DEQ RBCs established at the time of the investigation and the current applicable DEQ RBCs), and the on-site stormwater conveyance system discharged to the City of Portland combined sewer system.

5.4.3 GeoDesign (October 2008)

The subject property was entered into the DEQ VCP in late 2008 (DEQ ECSI Site No. 5103), and DEQ concurrently closed LUST File 26-92-0071. The October 2008 supplemental former bunker oil UST investigation and quarterly groundwater monitoring report summarized the results of a subsurface investigation in the vicinity of the former bunker oil UST, including the completion of seven direct-push soil borings (DP-2 through DP-6, MW-4, and MW-5), installation of groundwater monitoring wells in two of the direct-push borings (MW-4 and MW-5), and monitoring and sampling of the newly installed monitoring wells and the three previously established wells (MW-1 through MW-3) as part of the first quarterly groundwater monitoring event. The report also summarized the results of a preliminary CSM, a Beneficial Water Use Determination, and a Beneficial Land Use Determination.

As summarized in the October 2008 report, diesel- and heavy oil-range hydrocarbons and PAHs were not detected at concentrations greater than applicable DEQ RBCs established at the time in subsurface soil samples collected in the vicinity of the former bunker oil UST. However, the detected concentrations of diesel-range hydrocarbons in the vicinity of the former bunker oil UST exceed the current DEQ *Soil Ingestion, Dermal Contact, and Inhalation* RBC for construction worker receptors. The PAH benzo(a)pyrene was detected in a sample collected from boring DP-3 (14.5 feet BGS) at a concentration greater than the applicable DEQ *Soil Ingestion, Dermal Contact, and Inhalation* RBC for occupational receptors and the corresponding DEQ CFSL. In addition, as many as eight PAHs were detected in samples collected from borings DP-2 (at 12 feet BGS), DP-3 (at 14.5 feet BGS), and DP-5 (at 14 feet BGS) at concentrations less than the current applicable DEQ RBCs and greater than the corresponding DEQ CFSLs. VOCs and PAHs were either not detected or were detected at concentrations less than applicable DEQ RBCs established at the time of the monitoring event and the current applicable DEQ RBCs in groundwater samples collected from monitoring wells MW-2 through MW-4. A small amount of free product was observed in monitoring well MW-1; however, the product appeared isolated to the immediate vicinity of the former UST cavity based on the results of direct-push borings and groundwater samples collected from nearby down-gradient monitoring well MW-4.

The report recommended removing surface soil present in the unpaved portion of the transformer storage vault, collecting confirmation soil samples from the limits of the remedial excavation, and preparing a Soil Management Plan for the subject property if future redevelopment was anticipated. In addition, the report indicated that a minimum of three additional quarterly groundwater monitoring events would be required in order for DEQ to evaluate the subject property for a possible NFA determination.

5.4.4 GeoDesign (January 2009)

The second quarterly groundwater monitoring event completed in December 2008 included measuring the depth to water and analyzing groundwater samples collected from monitoring wells MW-2 through MW-5. PAHs and VOCs were either not detected or were detected at concentrations less than applicable DEQ RBCs established at the time of the monitoring event and the current applicable DEQ RBCs in the groundwater samples collected.

5.4.5 GeoDesign (March 2009)

The third quarterly groundwater monitoring event completed in March 2009 included measuring the depth to water and analyzing groundwater samples collected from monitoring wells MW-2 through MW-5. PAHs and VOCs were either not detected or were detected at concentrations less than applicable DEQ RBCs established at the time of the monitoring event and the current applicable DEQ RBCs in the groundwater samples collected.

5.4.6 GeoDesign (May 2009)

Based on the subject property's location in the Portland Harbor Initial Study Area, GeoDesign completed an evaluation of the facility's storm sewer system as part of the voluntary cleanup process. The results of the evaluation indicated that one of the six on-site catch basins (CB-5) was not connected to the storm sewer system and appeared to serve as a stormwater sump or drywell. Therefore, DEQ indicated that catch basin CB-5 would be subject to DEQ's UIC regulations. In addition, a second on-site catch basin was no longer functioning because the discharge lines had been capped. The May 2009 UIC registration letter proposed decommissioning both of these catch basins during forthcoming remedial activities by removing the catch basin serving as a stormwater sump or drywell catch and sealing the non-functioning catch basin.

5.4.7 GeoDesign (June 24, 2009)

The fourth quarterly groundwater monitoring event completed in June 2009 included measuring the depth to water and analyzing groundwater samples collected from monitoring wells MW-2 through MW-5. PAHs and VOCs were either not detected or were detected at concentrations less than applicable DEQ RBCs established at the time of the monitoring event and the current applicable DEQ RBCs in the groundwater samples collected.

5.4.8 GeoDesign (June 30, 2009)

The remedial services summarized in this report included removing the transformer bodies and approximately 10 cubic yards of impacted surface soil from the transformer storage vault; collecting three confirmation soil samples from the limits of the excavation (SS-1 through SS-3); backfilling the excavation with imported crushed rock; and decommissioning three of the on-site catch basins, including the catch basin serving as a stormwater sump or drywell (CB-5), the non-functioning catch basin (CB-4), and a catch basin located in a storage building on the north portion of the subject property (CB-2).

Confirmation soil sample analytical results indicated that soil formerly exhibiting concentrations of mineral/insulating oil and PCBs greater than applicable DEQ RBCs had been effectively removed. However, diesel-range hydrocarbons were detected in the confirmation soil samples at concentrations greater than the current applicable DEQ *Soil Ingestion, Dermal Contact, and*

Inhalation RBCs for occupational and/or construction worker receptors. Contaminants of interest were either not detected at concentrations above the laboratory method detection limits, were detected at concentrations less than applicable DEQ RBCs, and/or were detected at concentrations within the range of naturally occurring background concentrations in a confirmation soil sample collected from beneath the catch basin serving as a stormwater sump or drywell. The report concluded that, based on the applicable DEQ RBCs established at the time of the investigation, no further investigative or remedial activities appeared warranted in these areas and requested an NFA determination for the subject property following successful completion of a stormwater source control evaluation (described in Section 5.4.9).

5.4.9 GeoDesign (March 11, 2010)

GeoDesign's stormwater source control evaluation included completing a camera survey of the on-site stormwater conveyance system, collecting sediment samples from three of the on-site catch basins (CB-1, CB-3, and CB-6), subcontracting a local street sweeping subcontractor to remove loose debris and dust present on impervious surfaces at the subject property, subcontracting with a local environmental services contractor to clean the on-site stormwater conveyance system, and collecting post-cleaning stormwater samples during two separate, qualifying rainfall events. The report also presented the final CSM for the subject property.

Some contaminants of concern were detected in post-cleaning stormwater samples at concentrations greater than DEQ stormwater SLVs; however, these exceedances are common given the conservative nature of DEQ stormwater SLVs, and the results of the post-source control measure sampling indicated that source control measures had been effective. Further, direct stormwater discharge from the subject property to the Portland Harbor only occurs during heavy rain events because stormwater is directed to a combined sewer line.

5.4.10 GeoDesign (March 11, 2010)

GeoDesign's March 2010 focused feasibility study identified and evaluated viable alternatives to address residual contamination at the subject property, including surface and near-surface soil beneath the west portion of Tax Lot 0600 and residual free product in the vicinity of the former bunker oil UST. The focused feasibility study developed remedial action objectives, completed an initial screening and comparative analysis of viable remedial options, and recommended preferred remedial alternatives for the subject property. The recommended remedial action to address the surface and near-surface soil at the former forge shop was to maintain the existing asphalt and concrete cap. The recommended remedial action for addressing residual free product in the vicinity of the former bunker oil UST was to maintain hydraulic containment and the existing cap.

5.4.11 GeoDesign (March 23, 2010)

GeoDesign's March 2010 CMMP presented a plan intended to assist contractors or on-site workers in field identification and management of contaminated media (soil and groundwater) that may be encountered during on-site earthwork-related construction activities. The CMMP included field protocol for identification, response actions, communications, removal, temporary storage or stockpiling, transportation, and treatment and/or disposal of contaminated media. The CMMP was submitted to Multnomah County as part of an EES recorded with the property deed.

5.4.12 DEQ (March 24, 2010)

DEQ's March 2010 staff report and conditional NFA recommendation summarized site conditions, site history, and the previous investigative and remedial activities completed at the subject property. DEQ indicated that removal of impacted soil from the former transformer storage vault and the stormwater source control measures had removed potential exposure risks from those areas and that the residual concentrations of petroleum hydrocarbons, metals, and other organic compounds (e.g., PAHs) measured in stormwater runoff samples were unlikely to present a threat to human health or the Willamette River.

DEQ indicated that the EES, which stipulated restrictions on disturbing or removing the cap over the former forge shop floor and Bunker C UST areas, along with the guidance provided in the CMMP, would sufficiently protect future occupational, construction workers, and excavation workers on the site from future exposures to contaminated soil and shallow groundwater on the site. DEQ concluded that the SFI property was protective of public health and the environment and required no further remedial action; DEQ recommended a conditional NFA determination.

5.4.13 DEQ (March 31, 2010)

DEQ's March 2010 source control decision memorandum presented DEQ's comments to GeoDesign's stormwater source control measures. DEQ determined that the following criteria had been met: existing and potential contaminant sources had been identified and characterized, contaminant sources were being controlled to the extent feasible, adequate measures were in place to ensure source control and good stormwater management measures, and that contaminants in stormwater at concentrations greater than DEQ stormwater SLVs were not likely to result in significant sediment contamination in the Willamette River. DEQ concluded that no further stormwater evaluation or source control measures were warranted at the subject property.

5.4.14 DEQ (June 2010)

DEQ issued a conditional NFA determination for the subject property on June 14, 2010. The conditional NFA letter indicated that future property owners would be responsible for maintaining conditions at the subject property described in the EES recorded with the property deed, including maintaining the existing non-engineered cap and following the protocols specified in the March 2010 CMMP. The EES also stipulates that the property owner, operator, or contractor must notify DEQ prior to disturbing the existing cap and that the cap must be repaired to pre-disturbance condition as soon as possible following the completion of excavation activities.

5.4.15 Grant Associates (2012)

Grant Associates was retained to oversee on-site excavation activities in accordance with the March 2010 CMMP for the subject property. The February 2012 CMMP soil summary memorandum indicated that two excavations were completed at the subject property within the warehouse and shop building on Tax Lot 0700 to accommodate facilities associated with the new occupant, including a pit to collect sawdust beneath a large truss saw and a pit for a subsurface fire suppression check valve. Soil samples collected from the truss saw pit excavation did not indicate the presence of contamination in the soil samples analyzed. Oil-range hydrocarbons were detected in soil samples collected from the fire suppression check valve excavation. Approximately 12.7 tons of impacted soil was removed from the fire

suppression valve excavation and disposed of at the Hillsboro landfill. Groundwater was reportedly not encountered in either of the completed excavations.

5.4.16 GeoDesign (2013)

GeoDesign conducted a Phase I ESA Update for the subject property in 2013. The Phase I ESA Update identified residual contamination present at the subject property as a CREC due to the engineering control of the existing asphalt and concrete cap. GeoDesign recommended that future excavations and other ground disturbance activities should be completed in accordance with the specifications of the March 2010 CMMP and the existing asphalt and concrete cap should be maintained in accordance with the EES.

6.0 CONTAMINANT INFORMATION

The following sections describe the distribution of contaminants throughout the subject property and the maximum contaminant concentrations detected in soil and groundwater samples collected from the subject property.

6.1 SOIL

Subsurface soil beneath the northeastern portion of the subject property, in the vicinity of the former 8,000-gallon bunker oil UST, has been impacted with residual bunker oil product, diesel- and heavy oil-range hydrocarbons, and PAHs at depths between approximately 10 and 16 feet BGS. Near-surface soil in the west portion of the forge shop has been impacted with heavy oil-range hydrocarbons, PCBs, and select metals. Minor concentrations of PCBs and insulating oil were also detected in confirmation soil samples collected at a depth of approximately 3 feet BGS from a remedial excavation completed in the former transformer storage vault. The approximate extent of known soil contamination is shown on Figure 2. A summary of soil sample chemical analytical data is presented in Tables 1 through 7.

6.2 GROUNDWATER

Groundwater beneath the northeast portion of the subject property has been impacted with petroleum hydrocarbons, PAHs, and VOCs. While groundwater samples collected from the monitoring wells at the subject property from between April 1993 and June 2009 did not contain PAHs or VOCs at concentrations greater than applicable DEQ RBCs established at the time of the monitoring event and the current applicable DEQ RBCs, free product was observed in monitoring well MW-1 during several of these monitoring events. The approximate extent of known groundwater contamination is shown on Figure 2. A summary of groundwater elevation data is presented in Table 8, and historical groundwater sample chemical analytical data is presented in Tables 9 and 10.

7.0 WORKER SAFETY

Prior to beginning earthwork activities, the owner, operator, or contractor must prepare and implement a site-specific HCP. The HCP fulfills “worker right to know” requirements (29 CFR 1926.59). If completed by the contractor, a copy of the HCP must be submitted to the owner prior to the start of work on the project. During work on the project, the HCP must be posted at the subject property. The contractor is responsible for notifying subcontractors of

pertinent environmental conditions. Subcontractors may either adopt the contractor's HCP or must prepare their own HCP. This document should be used in conjunction with, not in place of, the HCP and the project specifications. Each contractor and subcontractor is responsible for the safety of its employees, including compliance with applicable OSHA regulations and compliance with the technical specifications manual for the project. In addition to implementation of an HCP, the owner, operator, or contractor should prepare and implement a site-specific HSP in accordance with OSHA requirements to ensure adequate protection for their workers while on site.

8.0 SOIL MANAGEMENT

Based on the known subsurface conditions at the subject property, soil generated during redevelopment that exceeds applicable DEQ RBCs and/or does not qualify as clean fill will require disposal as non-hazardous waste at a RCRA Subtitle D landfill (such as Waste Management's Hillsboro facility) or other DEQ-approved facility. Soil contaminants that exceed hazardous waste thresholds will require disposal at a RCRA Subtitle C landfill (such as Chemical Waste Management's Arlington facility) or other DEQ-approved facility.

Based on a comparison of the analytical results to current applicable DEQ RBCs, there are three general areas of the subject property where residual contamination remains at concentrations greater than one or more applicable DEQ RBCs: (1) petroleum hydrocarbons, metals, and PCB contamination in near-surface soil in the area beneath the concrete floor of the former forge shop; (2) diesel-range hydrocarbons from the former limits of the remedial excavation conducted in the former transformer storage vault; and (3) diesel- and heavy oil-range hydrocarbons and PAHs in subsurface soil beneath the northeast portion of the subject property, in the vicinity of the former 8,000-gallon bunker oil UST. In addition, based on the results of previous assessments, soil beneath a majority of the subject property (beneath the former forge shop, near the northeast portion of the subject property, and in the vicinity of the former transformer vault) generally does not qualify as clean fill because of the presence of petroleum-related contaminants at concentrations greater than corresponding DEQ CFSLs.

As described in Section 4.1, DEQ no longer uses soil RBCs to evaluate risk for the *Vapor Intrusion into Buildings* exposure pathway. Consequently, soil gas and/or sub-slab vapor confirmation soil samples will likely be required to evaluate potentially unacceptable risk from residual petroleum-contaminated soil volatilizing and migrating into the planned commercial building. DEQ has not yet finalized their new vapor intrusion guidance document, and it will likely be necessary to engage DEQ during the construction activities to confirm appropriate vapor intrusion risk is being evaluated. Should over-excavation of contaminated soil not be considered a remedial alternative during construction, it may be necessary to install a properly engineered soil vapor barrier/ventilation system beneath the commercial building to mitigate potential unacceptable vapor intrusion risk.

8.1 IDENTIFICATION AND MANAGEMENT OF CONTAMINATED SOIL

This section describes the protocol to properly field screen and manage soil and debris that will be encountered during subject property redevelopment.

8.1.1 Petroleum-Contaminated Soil

The four primary physical indicators of petroleum-related contamination in soil include staining, water sheen, elevated PID readings, and petroleum-like odor. During excavation activities, soil should be continuously observed for evidence of staining, elevated PID readings, and sheen. Odor can be subjective, and inhalation of vapors from impacted soil is harmful to human health. Therefore, odor is considered an inadvertent field indicator and will not be used for continuous screening of soil.

Staining: In general, soil that is contaminated with petroleum hydrocarbons exhibits gray or black staining, although other contaminants and natural conditions may also cause staining.

Sheen: Sheen is another indication of petroleum contamination. Soil with a sheen may appear shiny and reflective. Sheens from heavily impacted soil may appear iridescent with rainbow-like colors. Sheens may also be observed in contaminated groundwater.

PID Readings: PID readings involve the measurement of headspace vapors originating from a soil sample. PID screening is performed by placing a soil sample in a plastic bag. Air is captured in the bag, and the bag is shaken to expose the soil to the air trapped in the bag. The probe of a PID is inserted into the bag, which measures VOC vapor (petroleum constituent) concentrations in units of ppm. A PID is designed to quantify VOC vapor concentrations in the range between 1 and 2,000 ppm. Our review of the extensive historical data indicates that a PID reading exceeding 10 ppm may indicate the presence of soil not expected to meet DEQ CFSLs.

Odor: Petroleum products, solvents, and other types of contaminated soil may release vapors when exposed to the atmosphere. If concentrated enough, these vapors will be interpreted as an odor. Odors may also be present in contaminated groundwater.

8.1.2 Metals-Contaminated Soil

Soil impacted with metals does not generally present visual indicators of contamination. It is possible that soil may appear to be clean based on the lack of staining but may need to be handled as contaminated soil based on the results of chemical analytical testing.

8.1.3 PCB-Contaminated Soil

The primary indicator of PCB-related contamination in soil is visual discoloration; however, PCB-contaminated soil at the subject property has been encountered concurrently with petroleum hydrocarbon-impacted soil. If discolored soil is encountered during excavation work, the contractor should follow soil handling procedures outlined in Section 8.2.

8.2 SOIL FIELD SCREENING PROTOCOL

Continuous field screening during excavation activities is not anticipated. If previously undocumented areas of soil contamination are encountered during excavation, an environmental professional should be retained to field screen soil during excavation. If necessary, soil field screening should be conducted at an approximate frequency of one 5-point composite soil sample per approximately 50 cubic yards of soil or more frequently as needed. The 50-cubic-yard screening frequency is estimated based on the collective results of prior environmental explorations completed on site, our understanding of total excavation volume,

and our prior experience on similar projects. Field screening will focus on soil that appears to have indications of petroleum hydrocarbon-related impact. If evidence of contamination is not observed in each excavation area, a random sample will be collected for field screening. The field screening process includes the following:

- Observe the sidewalls and base of the excavation for evidence of possible contamination.
- Collect five grab soil samples by hand or trowel (approximately one hand full) that are representative of the material being excavated. If used, the trowel will be decontaminated between sampling intervals.
- Combine and thoroughly homogenize the five grab soil samples into one 5-point composite soil sample using a stainless steel bowl and either a stainless steel trowel or spoon.
- Retain a portion of the composite soil sample (approximately the size of half a sugar cube) for sheen testing that includes dropping the soil into a black pan to observe the degree of soil sheen (no sheen, slight sheen, moderate sheen, or heavy sheen).
- The majority of the composite soil sample will be placed into a plastic bag with trapped air. The bagged sample is allowed to sit for approximately one minute and then tested for headspace vapors using a hand-held PID. Based on the routine field screening process and the use of standard bag size, we can assume that the amount of trapped air in each bag is approximately equivalent for all field-screened samples. Calibration of the PID will be conducted on a daily basis and will be recorded in a calibration log. The calibration log will document the PID model calibration standard used and background level after calibration.
- Field screening documentation (i.e., staining, sheen, and/or headspace vapor measurements) and a brief description of the soil type will be recorded in soil field screening logs. The field logs will indicate areas and associated volumes of excavated material requiring stockpiling for further evaluation.

Field management of excavated soil will be supported using the field screening and decision matrix summarized below. If field screening indicates sheens, staining, discoloration, or headspace PID measurements exceeding 10 ppm, the soil will not be managed as clean fill. Conversely, if excavated soil does not exhibit any sheen, does not appear stained or discolored, does not generate PID measurements above 10 ppm, and meets the physical characteristics of clean fill as defined by DEQ[2], the material can be managed as clean fill.

<table>
<tr><th>Sheen Results</th><th>PID Results (ppm)</th><th>Visual</th><th>Action</th></tr>
<tr><td>No sheen</td><td><10.0</td><td>No staining, discoloration, odor, or debris</td><td>No action needed; material can be managed as clean fill.</td></tr>
<tr><td colspan="3">If any one of the three field screening indicators below are exceeded, follow the appropriate action.</td><td rowspan="2">Soil should be stockpiled in accordance with Section 8.5 or directly loaded for off-site disposal.</td></tr>
<tr><td>Slight sheen, moderate sheen, or heavy sheen</td><td>>10.0</td><td>Staining, discoloration, odor, or debris</td></tr>
</table>

[2] DEQ Internal Management Directive titled Clean Fill Determinations, dated February 21, 2019

8.3 LOADING AND HAULING

Material intended for off-site disposal can be loaded directly into trucks for transport to the receiving facility once the appropriate permitting has been completed and field screening protocols implemented, as appropriate. All truck loading should occur on site. The contractor must exercise care during loading of impacted material to help minimize spillage of the material onto the ground surface. All trucks leaving the subject property containing impacted material will be free of loose soil on the exterior of the trucks and may require covers. Impacted soil loaded into trucks should be covered if weather conditions could cause soil to blow out (dry, warm, or windy conditions) during transport to the disposal facility. The contractor must use care not to track soil onto roads and must routinely wash down the roads if soil is being tracked onto them. Trucks should not be allowed to leave the subject property if liquids are draining from the load. Transport tracking tickets may be required, which document the haul to the approved disposal facility for each truck leaving the subject property.

8.4 OFF-SITE TRANSPORT AND DISPOSAL

The excavation contractor is responsible for obtaining appropriate permits from the permitted landfill facility(s) prior to hauling the impacted soil or other materials to their facility. The earthwork contractor will likely need to provide a copy of the chemical analytical laboratory report(s) to the selected disposal facility. The receiving facility may require additional sampling be conducted prior to accepting exported clean fill. Copies of the permit should accompany each load transported to the selected disposal facility.

Disposal facilities often have the following requirements prior to accepting soil at their facility:

- Contaminated soil will not be received without first completing a soil profile sheet, obtaining a permit (to be completed by the earthwork contractor), have an approval of credit application on file, and have pre-approval from the disposal facility.
- Trucks will be permitted to weigh in as negotiated with the facility.
- Material may be sampled during delivery by the disposal facility. Comparisons may be made between the submitted profile and on-site analysis. Any material's profile that does not compare to delivered material may be rejected.
- Exported soil must not contain any free liquids or foreign material (i.e., rebar, fittings, cans, wood, etc.). Truck loads found with excessive foreign material may be reloaded and returned to the customer or screened, sorted, and disposed of by the disposal facility for an additional fee.
- The owner shall be notified and approve of all off-site soil disposal locations regardless of soil quality.

8.5 STOCKPILE MANAGEMENT

Soil generated during mass excavation can be temporarily stockpiled in areas designated by representatives of the owner. Contaminated material that is placed in temporary stockpiles must be well maintained at all times. All contaminated stockpiled material must be placed on impermeable plastic sheeting (minimum 6-mil-thick) with a berm around the perimeter of the stockpile. The plastic sheeting and berm must be constructed to prevent runoff of soil and contaminants to surrounding areas. The berm can be constructed with hay bales, dimensional lumber, or other equivalent methods. The bottom plastic sheeting should be lapped over the

berm materials and the soil stockpile covered with plastic sheeting to prevent erosion or leaching of contaminants to underlying soil and prevent exposure to precipitation and wind. Plastic sheeting that covers the soil stockpile should be secured using sandbags or equivalent.

Stockpiles must be clearly designated as to the nature of the stockpiled soil (e.g., contaminated soil versus clean fill), either with signage or stakes with different colored flagging. The locations and nature of each on-site stockpile should be discussed during daily work meetings. All stockpiles will be located on the subject property, unless DEQ approves an off-site soil stockpile location. Following removal, the stockpile areas should be restored to a pre-stockpile condition. Residual plastic or debris should not be left unattended at the subject property and must be properly disposed of following stockpile removal.

8.6 DEBRIS

The fill material encountered beneath the subject property includes areas of wood debris and demolition debris (i.e., brick, mortar, glass). In addition, a void that contains large debris is present beneath the concrete slab south of the former forge shop and east of the warehouse. The concrete debris is assumed to not be contaminated; therefore, it should not require special handling or disposal. If material is screened and segregated, the owner or contractor should maintain documentation indicating the volume of material recycled and the selected recycling facility. Debris that cannot be recycled and that does not require disposal at a permitted landfill may be disposed of as solid waste at a construction debris landfill, subject to the terms and conditions of the accepting facility. If segregated material is disposed of at a construction debris landfill, the owner should maintain documentation indicating the volume of material disposed and the selected disposal facility.

If necessary, based on the requirements of the selected disposal facility, and if encountered, wood debris in excavated soil should be segregated from soil and other non-organic debris during excavation activities and prior to transport and off-site disposal. The contractor should visually observe soil during excavation activities for evidence of wood or non-organic debris. Soil with more than 10 percent organic material should be segregated from soil containing little or no organic debris. Segregated material that cannot be direct-loaded for transportation and disposal should be stockpiled in accordance with Section 8.5.

8.7 WHEEL WASH

Standard site entry BMPs, including rock pads at the entrances/exits to the construction site and gravel filter berms, will be implemented at the subject property in accordance with Section 4.2 of the City of Portland's *Erosion Control Manual,* dated October 2022. If sediment is tracked off site during construction, additional BMPs shall be implemented, including washing wheels before vehicles leave the site. Wheel washing will be completed on the rock pad or in an approved wheel wash structure, as specified in Section 3.13 of the City of Portland's *Erosion Control Manual*. The wheels will be washed before crossing the rock pad to leave the site.

8.8 EROSION AND DUST CONTROL

Exposed soil will become susceptible to erosion by wind and water; therefore, erosion control measures should be planned carefully and in place before excavation and stockpiling begin. Silt fences, hay bales, and/or granular haul roads will be used as required to reduce sediment

transport during construction to acceptable levels. Measures to reduce erosion should be implemented in accordance with State of Oregon, City of Portland, and Multnomah County regulations regarding erosion control. In general, erosion control measures must limit sediment transport to less than 1 ton per acre per year, as calculated by the Universal Soil Loss equation. Erosion and dust control measures will be presented in an ESCP for on- and off-site portions of the subject property. The anticipated erosion and dust control measures to be outlined in the ESCP include the use of sediment fences, inlet protection, gravel construction entrances, and biofilter bags where necessary.

8.9 RE-ESTABLISHMENT OF PROTECTIVE CAP

As previously stated, the property owner, operator, or contractor must notify DEQ prior to disturbing the existing cap. After earthwork activities are completed at the subject property, if contamination remains beneath the planned new commercial building and the asphalt parking area at concentrations greater than applicable DEQ RBCs for the *Soil Ingestion, Dermal Contact, and Inhalation* exposure pathway (under an occupational exposure scenario), the newly constructed commercial building and asphalt parking area will continue to serve as an engineering control to help prevent exposure to this soil. The future cap will likely be institutionalized via an amended EES. The amended EES will likely stipulate that the cap must be repaired to pre-disturbance condition as soon as possible following the completion of future excavation activities and that appropriate measures should be taken to minimize exposure to excavated soil prior to cap replacement.

8.10 CONFIRMATION SOIL SAMPLING

Following excavation activities at the subject property, it is recommended that confirmation soil samples are collected from the limits of the excavation at a rate of one composite soil sample per 5,000 square feet of excavation area. Each composite soil sample should consist of four to five discrete soil samples. The confirmation soil samples will be analyzed for gasoline-range hydrocarbons by Method NWTPH-Gx, diesel- and oil-range hydrocarbons by Method NWTPH-Dx, VOCs by EPA Method 8260B, PAHs by EPA Method 8270E SIM, RCRA 8 total metals by EPA Methods 6020B/7471B, and/or PCBs by EPA Method 8082A.

As described in Section 5.4.1, quantifying petroleum hydrocarbons via the EPA Method 418.1 analysis is outdated and will not be used to analyze future confirmation soil samples. Analyzing the future confirmation soil samples for diesel- and oil-range hydrocarbons by Method NWTPH-Dx will allow direct comparison to the current DEQ RBCs.

As described in Sections 4.1 and 8.0, soil gas and/or sub-slab vapor confirmation soil samples will likely be required to evaluate potentially unacceptable risk from residual petroleum-contaminated soil volatilizing and migrating into the planned commercial building. DEQ has not yet finalized their new vapor intrusion guidance document, and it will likely be necessary to engage DEQ during the construction activities to confirm appropriate vapor intrusion risk is being evaluated. Should over-excavation of contaminated soil not be considered a remedial alternative during construction, it may be necessary to install a properly engineered soil vapor barrier/ventilation system beneath the commercial building to mitigate unacceptable vapor intrusion risk.

The confirmation sample results will be included in a Construction Completion Report for the project, if required.

8.11 RECORD KEEPING

The contractor, property owner, or operator should maintain all records and/or receipts associated with cap disturbance and/or the final disposition of contaminated soil that may be encountered during future earthwork activities. These records and receipts should be kept on file with facility records.

8.12 IMPORTED FILL MATERIAL

All fill material imported to the subject property shall consist of either a manufactured rock product (e.g., ¾-inch-minus crushed rock from a permitted rock quarry) or must be free of contaminants at concentrations exceeding DEQ CFSLs. It is the contractor's responsibility to ensure all imported fill material meets these criteria and provide the owner with the imported origin information and accompanying documentation demonstrating the material meets DEQ CFSLs if not using a manufactured rock product. In addition, if evidence of contamination is observed in imported fill material, the contractor should reject the imported backfill and identify an alternate source. Also, material imported as structural backfill should be evaluated and approved by the geotechnical engineer before placement on the subject property.

8.13 CONTRACTOR REPORTING REQUIREMENTS

The contractor is responsible for keeping a detailed daily record of all soil excavation, stockpiling, export, and disposal. This includes the purpose, origin, destination, and volume of soil that is transported off site for disposal. The contractor is responsible for preparing a daily field report for distribution to representatives of the owner that identifies the estimated quantity of soil interred, the source of the interred soil, and the number of truckloads of soil transported off site and includes disposal receipts for soil disposed of off site.

9.0 POTENTIAL GROUNDWATER/FREE PRODUCT MANAGEMENT

If free product is encountered during construction, the contractor should arrange to have the free product generated during the construction activities pumped from the excavation(s) using vacuum trucks (it is anticipated only a limited volume of free product may be present that may require removal during excavation) and subsequently disposed of at a DEQ-approved recycling or disposal facility. It is the contractor's responsibility to obtain appropriate permits for free product disposal.

If the quantity of water encountered during construction merits dewatering, the contractor should arrange to have the water generated during construction activities pumped from the excavation(s) using vacuum trucks (if only a limited volume of perched water requires removal during excavation) and subsequently disposed of or pumped to temporary storage tanks for management. Containerized water will require handling in accordance with an NPDES 1200-C permit. It is the contractor's responsibility to obtain appropriate permits for construction water discharge.

Since groundwater was impacted with VOCs at concentrations less than current applicable DEQ RBCs (Table 10), groundwater generated during dewatering activities should be managed as potentially contaminated media if field screening evidence of contamination is observed. Petroleum-impacted groundwater can be identified in the field by sheen and odor with the same indicators as soil as described in Section 8.1.

If impacted groundwater is identified during construction, contingencies to address unacceptable contaminant levels in the effluent stream will be employed. A typical treatment system could include a series of 20,000-gallon storage tanks equipped with chitosan socks, carbon adsorption filters, sand filters, and/or bag filters to remove sediments and contaminants (if necessary). The excavation contractor is responsible for obtaining the necessary discharge permits; setup, maintenance, and modification of the treatment system; effluent testing; discharge metering; and agency reporting. If construction dewatering is anticipated, we recommend the project engineer or contractor contact the City of Portland to determine (1) what permits are required for discharge of water to the City of Portland's sanitary or stormwater system, (2) the allowable discharge contaminant and volume limits, and (3) the available capacity for the proposed discharge rates.

If substantial and ongoing construction dewatering is anticipated, a site-specific dewatering plan may be required by the City of Portland. DEQ may also need to review and approve the dewatering plan if the selected discharge location is a "storm-only" discharge point.

10.0 UNFORESEEN CONDITIONS

In the event that undocumented petroleum contamination or other potentially hazardous conditions are encountered that are not addressed in this CMMP, the earthwork contractor shall cease work and notify the owner. The earthwork contractor will then barricade or otherwise isolate the area and avoid filling the area until authorized to do so by the owner. The earthwork contractor shall not replace any known or suspected contaminated soil in any excavation area without prior approval by the owner.

10.1 USTS

In the event an undocumented UST is encountered during construction, the contractor should cease work in the area of the discovery and notify the owner so the UST can be decommissioned by a licensed UST service provider in accordance with current DEQ rules and regulations. If contaminated soil is encountered in the vicinity of a UST during construction, it should be managed in accordance with the protocol established in this CMMP. Additional soil sampling and characterization of potentially contaminated soil may be necessary.

10.2 SEPTIC SYSTEMS/CESSPOOLS

In the event historical septic systems are encountered, the contractor should obtain a decommissioning permit from the City of Portland; pump out any remaining sewage in the septic system; and either completely remove the septic system or fill the septic tank or cesspool with ¾-inch-minus gravel, sand, or concrete slurry. Material imported to fill septic tanks or cesspools should be evaluated and approved by the geotechnical engineer before placement on the subject property.

11.0 LIMITATIONS

This CMMP has been prepared for DEQ and Accretech SBS, Inc. This CMMP is not intended for use by others, and the information contained herein is not applicable to other sites. Reliance by other parties must be approved by NV5 in accordance with our standard contractual process for third-party reliance. This CMMP is based on interpretations of surface and subsurface conditions based on data from select soil and groundwater samples collected from limited portions of the subject property. The results of the analyses only indicate the presence or absence of those chemical constituents analyzed in those discrete sample locations. It is always possible that contamination could exist between the widely spaced exploration locations. Analytical data from the laboratory samples should only be considered as indicators of site conditions and not a guarantee of the absence of subsurface impact in areas not sampled.

Our services have been executed in accordance with the generally accepted practices in this area at the time this CMMP was prepared. No warranty or other conditions, express or implied, should be understood.

♦ ♦ ♦

We appreciate the opportunity to work with you on this project. Please contact us if you have any questions regarding this CMMP.

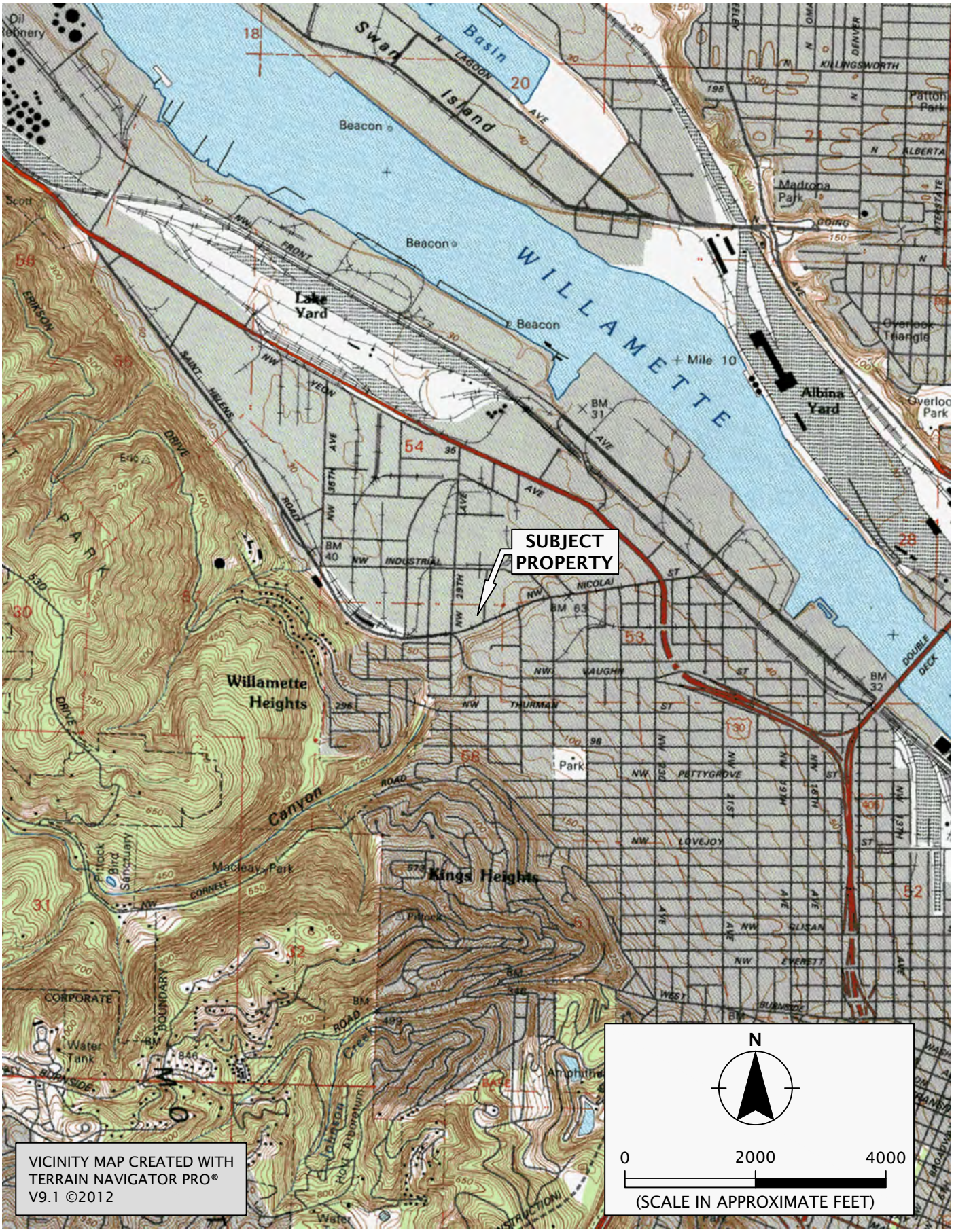
Sincerely,

NV5

Caroline B. Siegel
Environmental Staff

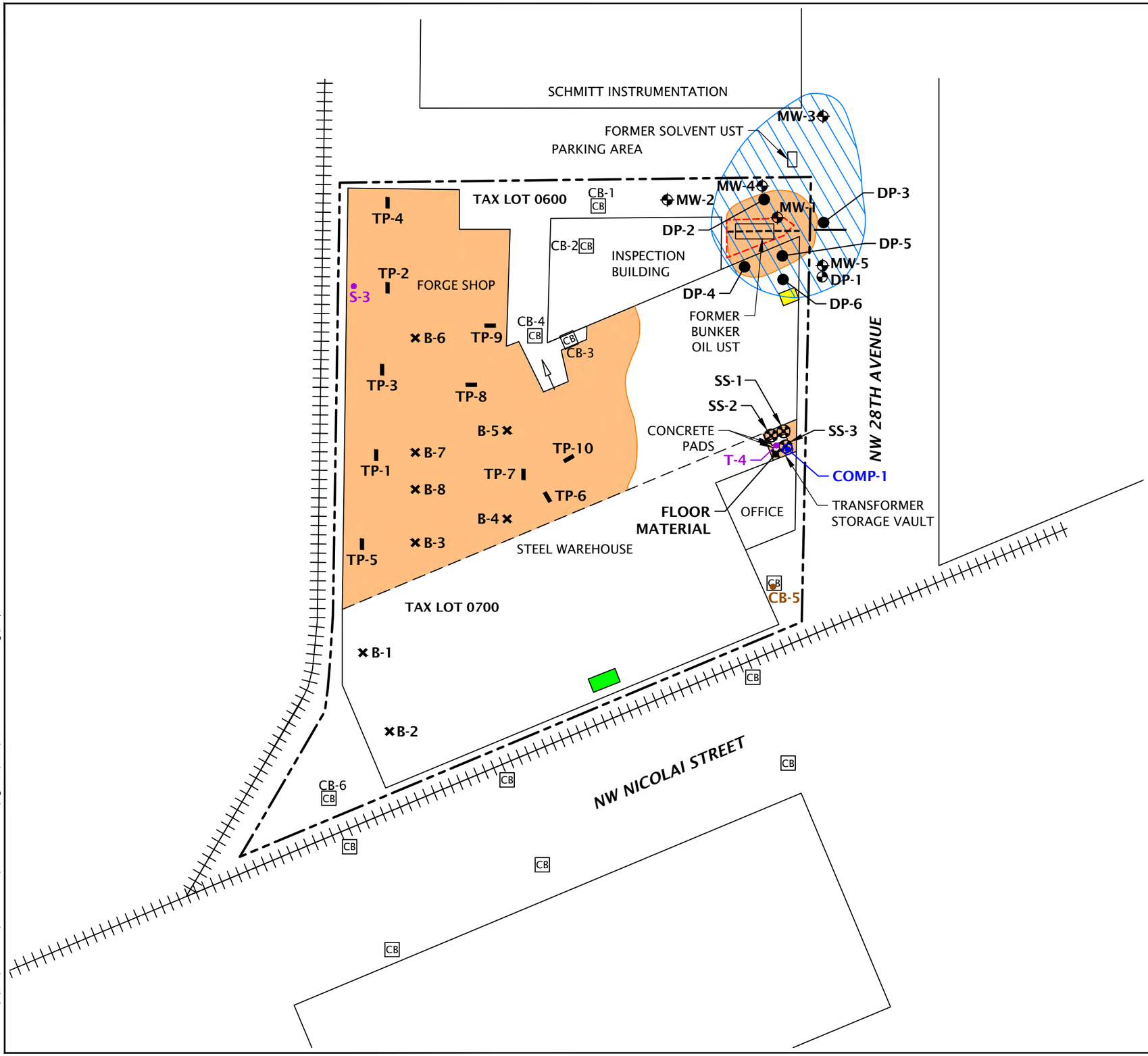
Kyle R. Sattler, L.G. (Washington)
Principal Geologist

FIGURES



NV5	ACCRETECH-1-01	**VICINITY MAP**	
	JULY 2023	2407 NW 28TH AVENUE DEVELOPMENT PORTLAND, OR	**FIGURE 1**

Printed By: mmiller | Print Date: 7/5/2023 12:26:37 PM
File Name: J:\A-D\Accretech\Accretech-1\Accretech-1-01\Figures\CAD\Accretech-1-01-VM01.dwg | Layout: FIGURE 1



LEGEND:

- SUBJECT PROPERTY BOUNDARY
- TAX LOT BOUNDARY
- APPROXIMATE LIMITS OF 1992 REMEDIAL EXCAVATION
- CB-1 CB — CATCH BASIN
- CB-5 • — CONFIRMATION SOIL SAMPLE LOCATION
- SS-1 ⊗ — CONFIRMATION SOIL SAMPLE LOCATION
- MW-1 ⊕ — GROUNDWATER MONITORING WELL
- DP-1 ⊕ — DIRECT-PUSH BORING (GEODESIGN INC., JULY 2005)
- DP-2 ● — DIRECT-PUSH BORING (GEODESIGN INC., SEPTEMBER 2008)
- S-3/T-4 • — SURFACE SOIL SAMPLE (HART CROWSER, MARCH 1992)
- B-1 ✕ — SURFACE AND/OR NEAR-SURFACE SAMPLE (HART CROWSER, MARCH 1992)
- ✕ — FLOOR MATERIAL WIPE SAMPLE (EEM, FEBRUARY 2008)
- TP-1 ▬ — TEST PIT (HART CROWSER, MARCH 1993)
- COMP-1 ◉ — COMPOSITE SURFACE SOIL SURVEY (GEODESIGN INC., 2008)
- APPROXIMATE EXTENT OF KNOWN SOIL CONTAMINATION
- APPROXIMATE EXTENT OF KNOWN GROUNDWATER CONTAMINATION
- FIRE SUPPRESSION CHECK VALVE EXCAVATION (GRANT ASSOCIATES, 2012)
- TRUSS EQUIPMENT FOOTING EXCAVATION (GRANT ASSOCIATES, 2012)

N

0 50 100

(SCALE IN FEET)

SITE PLAN BASED ON IMAGE PROVIDED BY HART CROWSER

SITE PLAN

2407 NW 28TH AVENUE DEVELOPMENT
PORTLAND, OR

FIGURE 2

ACCRETECH-1-01

JULY 2023

NV5

TABLES

TABLE 1
Summary of Soil Sample Chemical Analytical Results
Petroleum Hydrocarbons, HVOCs, and PCBs
Steel Warehouse and Forge Shop
2407 NW 28th Avenue Development
2407 NW 28th Avenue
Portland, Oregon

Sample I.D.	Sample Location	Sample Depth (feet BGS)	Sample Date	Hydrocarbon Identification Method NWTPH-HCID (mg/kg)			Total Petroleum Hydrocarbons EPA Method 418.1[1] (mg/kg)	HVOCs[2] EPA Method 8010 (µg/kg)	PCBs EPA Method 8080 (mg/kg)
				Gasoline-Range	Diesel-Range	Oil-Range			
B1/S2	Western Portion of Steel Warehouse	0.5 - 0.75	03/03/92	--	--	--	--	Methylene chloride - 44	--
B2/S2	Western Portion of Steel Warehouse	0.5 - 0.75	03/03/92	--	--	--	--	Methylene chloride - 48	--
B3/S1	Western Portion of Forge Shop	0.5	03/03/92	ND	ND	DET	62,000	Methylene chloride - 65	--
B4/S1	Western Portion of Forge Shop	0 - 0.5	03/03/92	ND	DET	DET	250,000	--	--
B5/S2	Western Portion of Forge Shop	0 - 0.5	03/03/92	ND	ND	DET	3,900	--	--
B6/S2	Western Portion of Forge Shop	0 - 0.5	03/03/92	ND	ND	DET	6,600	--	--
B7/S1	Western Portion of Forge Shop	0 - 0.5	03/03/92	ND	ND	DET	15,000	Methylene chloride - 71	--
B8/S1	Western Portion of Forge Shop	0 - 0.5	03/03/92	ND	ND	DET	1,300	Methylene chloride - 65	--
SS #3	Western Portion of Forge Shop	0 - 0.5	03/03/92	ND	ND	DET	4,600	Methylene chloride - 60	7.4
TP-1/S-1	Western Portion of Forge Shop	1.2	03/18/93	--	--	--	4,100	--	--
TP-1/S-2	Western Portion of Forge Shop	4.2	03/18/93	--	--	--	460	--	--
TP-2/S-1	Western Portion of Forge Shop	1.2	03/18/93	--	--	--	320	--	--
TP-3/S-1	Western Portion of Forge Shop	2.8	03/18/93	--	--	--	350	--	--
TP-4/S-2	Western Portion of Forge Shop	2.7	03/18/93	--	--	--	58	--	--
TP-5/S-1	Western Portion of Forge Shop	1.3	03/18/93	--	--	--	61	--	--
TP-5/S-2	Western Portion of Forge Shop	4.8	03/18/93	--	--	--	490	--	--
TP-6/S-1	Central Portion of Forge Shop	1.7	03/18/93	--	--	--	6,600	--	--
TP-6/S-2	Central Portion of Forge Shop	4.2	03/18/93	--	--	--	4,000	--	--
TP-7/S-1	Central Portion of Forge Shop	1.3	03/18/93	--	--	--	4,500	--	--
TP-7/S-2	Central Portion of Forge Shop	3.7	03/18/93	--	--	--	1,900	--	--
TP-8/S-1	Western Portion of Forge Shop	1.8	03/18/93	--	--	--	47,000	--	--
TP-8/S-2	Western Portion of Forge Shop	4.3	03/18/93	--	--	--	29,000	--	--
TP-9/S-1	Western Portion of Forge Shop	1.3	03/18/93	--	--	--	860	--	--
TP-9/S-2	Western Portion of Forge Shop	4.5	03/18/93	--	--	--	1,400	--	--
TP-10/S-1	Central Portion of Forge Shop	0.8	03/18/93	--	--	--	2,000	--	--

TABLE 1
Summary of Soil Sample Chemical Analytical Results
Petroleum Hydrocarbons, HVOCs, and PCBs
Steel Warehouse and Forge Shop
2407 NW 28th Avenue Development
2407 NW 28th Avenue
Portland, Oregon

Sample I.D.	Sample Location	Sample Depth (feet BGS)	Sample Date	Hydrocarbon Identification Method NWTPH-HCID (mg/kg)			Total Petroleum Hydrocarbons EPA Method 418.1[1] (mg/kg)	HVOCs[2] EPA Method 8010 (µg/kg)	PCBs EPA Method 8080 (mg/kg)
				Gasoline-Range	Diesel-Range	Oil-Range			
DEQ Generic RBCs[3]									
Soil Ingestion, Dermal Contact, and Inhalation									
Occupational				NE	NE	NE	14,000	Methylene chloride - 1,600	0.59
Construction Worker				NE	NE	NE	4,600	Methylene chloride - 2,100	4.9
Excavation Worker				NE	NE	NE	>Max	Methylene chloride - 58,000	140
Volatilization to Outdoor Air									
Occupational				NE	NE	NE	>Max	Methylene chloride - >Csat	>Csat
DEQ CFSLs[4]				NE	NE	NE	1,100	Methylene chloride - 0.14	>Csat

Notes:
1. This analytical method is outdated, and corresponding DEQ RBCs and CFSLs do not exist for this method. Based on the results of the NWTPH-HCID analyses, the detected concentrations using this methodare conservatively compared to current DEQ RBCs and CFSLs for diesel-range hydrocarbons.
2. Other HVOCs were not detected. The detected concentrations of methylene chloride exceed the DEQ CFSL, but do not exceed the applicable DEQ RBCs.
3. DEQ Generic RBCs dated May 2018, amended June 2023
4. DEQ CFSLs dated February 21, 2019
>Csat: This soil RBC exceeds the limit of three-phase equilibrium partitioning. Refer to Appendix D of DEQ's RBDM guidance document for the corresponding value of Csat. Soil concentrations in excess of Csat indicate that free product might be present.
DET: detected at a concentration greater than the reporting or detection limit shown
>Max: The constituent RBC for this pathway is calculated as greater than 1,000,000 mg/kg or 1,000,000 mg/L. Therefore, this substance is deemed not to pose risks in this scenario.
ND: not detected at concentrations greater than the reporting or detection limit shown
Bolding indicates analyte detection.
Shading indicates analyte detection at a concentration greater than DEQ RBCs and/or CFSLs.
--: not analyzed

TABLE 2
Summary of Soil Sample Chemical Analytical Results
Total and Leachable Metals
Steel Warehouse and Forge Shop
2407 NW 28th Avenue Development
2407 NW 28th Avenue
Portland, Oregon

Sample I.D.	Sample Location	Sample Depth (feet BGS)	Sample Date	Total Metals EPA Methods 3050/6010 (mg/kg)			Leachable Metals EPA Methods 3050/6010 (mg/kg)		
				Cadmium	Chromium	Lead	Cadmium	Chromium	Lead
B-6	Western Portion of Forge Shop	0 - 0.5	03/03/92	**11.2**	**723**	**75.2**	--	--	--
B-7	Western Portion of Forge Shop	0 - 0.5	03/03/92	**14.9**	**1,170**	**36.5**	0.1 U	**0.69**	0.5 U
B-8	Western Portion of Forge Shop	0 - 0.5	03/03/92	**15.6**	**897**	**9.95**	0.1 U	**0.69**	0.5 U
TP-1/S-1	Western Portion of Forge Shop	1.2	03/18/93	6.0 U	**110**	**5,890**[1]	--	--	--
TP-1/S-2	Western Portion of Forge Shop	4.2	03/18/93	0.5 U	**18**	**310**[1]	--	--	--
TP-3/S-1	Western Portion of Forge Shop	2.8	03/18/93	**0.7**	**13**	**59**	--	--	--
TP-8/S-2	Western Portion of Forge Shop	4.3	03/18/93	5.0 U	**360**	50 U	--	--	--
DEQ Generic RBCs[2]									
Soil Ingestion, Dermal Contact, and Inhalation									
Occupational				1,100	>Max	800	NE	NE	NE
Construction Worker				350	530,000	800	NE	NE	NE
Excavation Worker				9,700	>Max	800	NE	NE	NE
Volatilization to Outdoor Air									
Occupational				NV	NV	NV	NE	NE	NE
DEQ CFSLs[3] **(Portland Basin)**				0.63	76	28	NE	NE	NE

Notes:
1. Total lead concentrations for these sample exceed the EPA landfill threshold value of 100 mg/kg. Follow-up TCLP analysis was not performed.
2. DEQ Generic RBCs dated May 2018, amended June 2023
3. DEQ CFSLs dated February 21, 2019
>Max: The constituent RBC for this pathway is calculated as greater than 1,000,000 mg/kg or 1,000,000 mg/L. Therefore, this substance is deemed not to pose risks in this scenario.
NV: chemical is considered non-volatile
U: Not detected. Reporting or detection limit shown.
Bolding indicates analyte detection.
Shading indicates analyte detection at a concentration greater than DEQ RBCs and/or CFSLs.
--: not analyzed

TABLE 3
Summary of Soil Sample and Surface Wipe Sample Chemical Analytical Results
Petroleum Hydrocarbons, PAHs, and PCBs
Tranformer Storage Vault
2407 NW 28th Avenue Development
2407 NW 28th Avenue
Portland, Oregon

Sample I.D.	Sample Date	Diesel- and Oil-Range Hydrocarbons Method NWTPH-Dx (mg/kg)		PAHs[1] EPA Method 8270C-SIM (mg/kg)	PCBs[2] EPA Method 8080/8082 (mg/kg)	PCBs[2] EPA Method 8082 (mg/wipe)
		Diesel-Range	Oil-Range			
T-4[4]	03/03/92	--	--	--	0.0019[3]	0.0005 U
Floor Material[4]	02/15/08	--	--	--	--	0.0005 U
Comp-1[4]	07/08/08	32,800	18,400	ND	0.360 U	--
SS-1	05/20/09	25,600	5,300	--	0.0251[3]	--
SS-2	05/20/09	5,770	1,570	--	0.0209[3]	--
SS-3	05/20/09	5,650	1,350	--	0.0212[3]	--
DEQ Generic RBCs[5]						
Soil Ingestion, Dermal Contact, and Inhalation						
Occupational		14,000	NE	Varies	0.59	NE
Construction Worker		4,600	NE	Varies	4.9	NE
Excavation Worker		>Max	NE	Varies	140	NE
Volatilization to Outdoor Air						
Occupational		>Max	NE	Varies	>Csat	NE
DEQ CFSLs[6]		1,100	NE	Varies	0.23	NE

TABLE 3
Summary of Soil Sample and Surface Wipe Sample Chemical Analytical Results
Petroleum Hydrocarbons, PAHs, and PCBs
Tranformer Storage Vault
2407 NW 28th Avenue Development
2407 NW 28th Avenue
Portland, Oregon

Notes:
1. PAHs analyzed include acenaphthene, acenaphthylene, anthracene, benz(a)anthracene, benzo(a)pyrene, enzo(b)fluoranthene, benzo(k)fluoranthene, benzo(g,h,i)perylene, chrysene, dibenz(a,h)anthracene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, naphthalene, phenanthrene, and pyrene.
2. PCBs analyzed include Aroclor 1016, Aroclor 1221, Aroclor 1232, Aroclor 142, Aroclor 1248, Aroclor 1254, and Aroclor 1260.
3. The specific aroclor detected was not reported.
4. Material represented by this sample was subsequently removed from the subject property during a May 2009 remedial excavation.
5. DEQ Generic RBCs dated May 2018, amended June 2023
6. DEQ CFSLs dated February 21, 2019

>Csat: This soil RBC exceeds the limit of three-phase equilibrium partitioning. Refer to Appendix D of DEQ's RBDM guidance document for the corresponding value of Csat. Soil concentrations in excess of Csat indicate that free product might be present.

>Max: The constituent RBC for this pathway is calculated as greater than 1,000,000 mg/kg or 1,000,000 mg/L. Therefore, this substance is deemed not to pose risks in this scenario.

ND: not detected at concentrations greater than the reporting or detection limit shown

U: Not detected. Reporting or detection limit shown.

Bolding indicates analyte detection.

Shading indicates analyte detection at a concentration greater than DEQ RBCs and/or CFSLs.

--: not analyzed

TABLE 4
Summary of Soil Sample Chemical Analytical Results
Petroleum Hydrocarbons
Former Bunker Oil UST
2407 NW 28th Avenue Development
2407 NW 28th Avenue
Portland, Oregon

Sample I.D.	Sample Location	Sample Depth (feet BGS)	Sample Date	Hydrocarbon Identification Method NWTPH-HCID (mg/kg)			Total Petroleum Hydrocarbons EPA Method 418.1[1] (mg/kg)	Heavy Oil-Range Hydrocarbons Method TPH-Bunker C[1] (mg/kg)	Diesel- and Oil-Range Hydrocarbons Method NWTPH-Dx (mg/kg)	
				Gasoline-Range	Diesel-Range	Oil-Range			Diesel-Range	Oil-Range
A	Beneath Western End of UST	NR	03/03/92	ND	**DET**	ND	**1,500**	--	--	--
A (Duplicate)	Beneath Western End of UST	NR	03/03/92	ND	**DET**	ND	--	--	--	--
B	Beneath Eastern End of UST	NR	03/03/92	--	--	--	**1,300**	--	--	--
B (Duplicate)	Beneath Eastern End of UST	NR	03/03/92	--	--	--	**1,280**	--	--	--
1	Northern Sidewall	17.5	04/10/92	--	--	--	--	**5,400**	--	--
2	Eastern Sidewall	17.5	04/10/92	--	--	--	--	**16,700**	--	--
3	Western Sidewall	17.5	04/10/92	--	--	--	--	100 U	--	--
MW-1/S-3	MW-1	15	04/06/93	--	--	--	**12,000**	--	--	--
MW-2/S-3	MW-2	15	04/06/93	--	--	--	20.0 U	--	--	--
MW-3/S-3	MW-3	15	04/06/93	--	--	--	20.0 U	--	--	--
DP-2-12.0	DP-2	12	09/02/08	--	--	--	--	--	**3,720**	**4,040**
DP-3-14.5	DP-3	14.5	09/02/08	--	--	--	--	--	**12,600**	**13,300**
DP-4-17.0	DP-4	17	09/02/08	--	--	--	--	--	36.8 U	73.6 U
DP-5-14	DP-5	14	09/02/08	--	--	--	--	--	**2,380**	**4,020**
DP-6-17	DP-6	17	09/02/08	--	--	--	--	--	33.2 U	66.4 U
MW-4-16.5	MW-4	16.5	09/02/08	--	--	--	--	--	28.1 U	56.3 U
MW-5-14.5	MW-5	14.5	09/02/08	--	--	--	--	--	31.7 U	63.4 U
DEQ Generic RBCs[2]										
Soil Ingestion, Dermal Contact, and Inhalation										
Occupational				NE	NE	NE	14,000	14,000	14,000	NE
Construction Worker				NE	NE	NE	4,600	4,600	4,600	NE
Excavation Worker				NE	NE	NE	>Max	>Max	>Max	NE
Volatilization to Outdoor Air										
Occupational				NE	NE	NE	>Max	>Max	>Max	NE
DEQ CFSLs[3]				NE	NE	NE	1,100	1,100	1,100	NE

TABLE 4
Summary of Soil Sample Chemical Analytical Results
Petroleum Hydrocarbons
Former Bunker Oil UST
2407 NW 28th Avenue Development
2407 NW 28th Avenue
Portland, Oregon

1. This analytical method is outdated, and corresponding DEQ RBCs and CFSLs do not exist for this method. Based on the results of the NWTPH-HCID analyses, the detected concentrations using this method are conservatively compared to current DEQ RBCs and CFSLs for diesel-range hydrocarbons.
2. DEQ Generic RBCs dated May 2018, amended June 2023
3. DEQ CFSLs dated February 21, 2019
>Max: The constituent RBC for this pathway is calculated as greater than 1,000,000 mg/kg or 1,000,000 mg/L. Therefore, this substance is deemed not to pose risks in this scenario.
DET: detected at a concentration greater than the reporting or detection limit shown
ND: not detected at concentrations greater than the reporting or detection limit shown
NR: not recorded
U: Not detected. Reporting or detection limit shown.
Bolding indicates analyte detection.
Shading indicates analyte detection at a concentration greater than DEQ RBCs and/or CFSLs.
--: not analyzed

TABLE 5
Summary of Soil Sample Chemical Analytical Results
PAHs
Former Bunker Oil UST
2407 NW 28th Avenue Development
2407 NW 28th Avenue
Portland, Oregon

Sample I.D. (depth in feet BGS)	Sample Location	Sample Depth (feet BGS)	Sample Date	PAHs EPA Method 8270C SIM (mg/kg)															
				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	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Pyrene
DP-2-12.0	DP-2	12	09/02/08	**2.990**	**0.780 J**	**2.520**	**1.900 J**	**0.938 J**	**0.534 J**	0.125 U	**0.401 J**	**2.870**	0.0559 U	**1.010 J**	**3.440**	**0.267 J**	**0.383 J**	**11.200**	**4.830**
DP-3-14.5	DP-3	14.5	09/02/08	**6.880**	**1.390 J**	**4.790**	**3.770**	**2.210 J**	**1.070 J**	0.205 U	**1.010 J**	**5.400**	**0.378 J**	**1.810 J**	**6.560**	**0.529 J**	**0.467 J**	**19.700**	**9.500**
DP-4-17.0	DP-4	17	09/02/08	0.00295 U	0.00193 U	0.00177 U	0.00452 U	0.00488 U	0.00722 U	0.00293 U	0.00119 U	0.00440 U	0.00131 U	0.00259 U	0.00551 U	0.00137 U	0.00523 U	0.00876 U	0.00279 U
DP-5-14	DP-5	14	09/02/08	**0.519 J**	**0.106 J**	**0.382 J**	**0.463 J**	**0.233 J**	0.305 U	0.124 U	**0.387 J**	**0.535 J**	**0.105 J**	**0.169 J**	**0.499 J**	**0.181 J**	0.221 U	**1.330 J**	**1.000 J**
DP-6-17	DP-6	17	09/02/08	0.00256 U	0.00168 U	**0.00357 J**	**0.00411 J**	0.00424 U	0.00628 U	0.00254 U	0.00104 U	0.00383 U	0.00114 U	**0.0158 J**	0.00480 U	0.00111 U	0.00455 U	**0.0190 J**	**0.0131 J**
MW-4-16.5	MW-4	16.5	09/02/08	0.00276 U	0.00181 U	0.00166 U	0.00424 U	0.00457 U	0.00678 U	0.00274 U	0.00112 U	0.00413 U	0.00123 U	**0.00423 J**	0.00517 U	0.00120 U	0.00491 U	0.00822 U	**0.0111 J**
MW-5-14.5	MW-5	14.5	09/02/08	0.00182 U	0.00119 U	0.00110 U	0.00279 U	0.00301 U	0.00447 U	0.00181 U	0.000738 U	0.00272 U	0.00812 U	0.00160 U	0.00341 U	0.000788 U	0.00324 U	0.00541 U	0.00172 U
DEQ Generic RBCs[1]																			
Soil Ingestion, Dermal Contact, and Inhalation																			
Occupational				70,000	NE	350,000	21	2.1	21	210	NE	2,100	2.1	30,000	47,000	21	23	NE	23,000
Construction Worker				21,000	NE	110,000	170	17	170	1,700	NE	17,000	17	10,000	14,000	170	580	NE	7,500
Excavation Worker				590,000	NE	>Max	4,800	490	4,900	49,000	NE	490,000	490	280,000	390,000	4,900	16,000	NE	210,000
Volatilization to Outdoor Air																			
Occupational				>Max	NE	>Max	>Csat	NV	NV	NV	NE	NV	NV	NV	>Max	NV	83	NE	>Max
DEQ CFSLs[2]				0.25	120	6.8	0.73	0.11	1.1	11	25	3.1	0.11	10	3.7	1.1	0.077	5.5	10

Notes:
1. DEQ Generic RBCs dated May 2018, amended June 2023
2. DEQ CFSLs dated February 21, 2019
>Csat: This soil RBC exceeds the limit of three-phase equilibrium partitioning. Refer to Appendix D of DEQ's RBDM guidance document for the corresponding value of Csat. Soil concentrations in excess of Csat indicate that free product might be present.
J: The identification of the analyte is acceptable; the reported value is an estimate.
>Max: The constituent RBC for this pathway is calculated as greater than 1,000,000 mg/kg or 1,000,000 mg/L. Therefore, this substance is deemed not to pose risks in this scenario.
NV: chemical is considered non-volatile
U: Not detected. Reporting or detection limit shown.
Bolding indicates analyte detection.
Shading indicates analyte detection at a concentration greater than DEQ RBCs and/or CFSLs.

TABLE 6
Summary of Soil Sample Chemical Analytical Results
Petroleum Hydrocarbons, VOCs, PAHs, and PCBs
Catch Basin CB-5
2407 NW 28th Avenue Development
2407 NW 28th Avenue
Portland, Oregon

Sample I.D.	Sample Date	Diesel- and Oil-Range Hydrocarbons Method NWTPH-Dx (mg/kg)		VOCs[1] EPA Method 8260B (mg/kg)	PAHs[2] EPA Method 8270C-SIM (mg/kg)	PCBs[3] EPA Method 8082A (mg/kg)
		Diesel-Range	Oil-Range			
CB-5	05/21/09	40.2 U	80.4 U	ND	ND	ND
DEQ Generic RBCs[4]						
Soil Ingestion, Dermal Contact, and Inhalation						
Occupational		14,000	NE	Varies	Varies	0.59
Construction Worker		4,600	NE	Varies	Varies	4.9
Excavation Worker		>Max	NE	Varies	Varies	140
Volatilization to Outdoor Air						
Occupational		>Max	NE	Varies	Varies	>Csat
DEQ CFSLs[5]		1,100	NE	Varies	Varies	0.23

TABLE 6
Summary of Soil Sample Chemical Analytical Results
Petroleum Hydrocarbons, VOCs, PAHs, and PCBs
Catch Basin CB-5
2407 NW 28th Avenue Development
2407 NW 28th Avenue
Portland, Oregon

Notes:

1. VOCs analyzed include acetone, benzene, bromobenzne, bromochloromethane, bromodichloromethane, bromoform, bromomethane, 2-butanone, n-butylbenzene, sec-butylbenzene, tert-butylbenzene, carbon tetrachloride, chlorobenzene, chloroethane, chloroform, chloromethane, 2-chlorotoluene, 1,2-dibromo-3-chloropropane, dibromochloromethane, 1,2-dibromoethane, dibromomethane, 1,2-dichlorobenzene, 1,3-dichlorobenzene, 1,4-dichlorobenzene, dichlorodifluoromethane, 1,1-dichloroethane, 1,2-dichloroethane, 1,1-dichloroethene, cis-1,2-dichloroethene, trans-1,2-dichloroethene, 1,2-dichloropropane, 1,2-dichloropropane, 2,2-dichloropropane, 1,1-dichloropropene, cis-1,3-dichloropropene, trans-1,3-dichloropropene, ethylbenzene, hexachlorobutadiene, 2-hexanone, isopropylbenzene, 4-isopropyltoluene, 4-methyl-2-pentanone, methyl tert-butyl ether, methylene chloride, naphthalene, n-propylbenzene, styrene, 1,1,1,2-tetrachloroethane, 1,1,2,2-tetrachloroethane, tetrachloroethene, toluene, 1,2,3-trichlorobenzene, 1,2,4-trichlorobenzene, 1,1,1-trichloroethane, 1,1,2-trichloroethane, trichloroethene, trichlorofluoromethane, 1,2,3-trichloropropane, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, vinyl chloride, and xylenes.
2. PAHs analyzed include 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, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, naphthalene, phenanthrene, and pyrene.
3. PCBs analyzed include Aroclor 1016, Aroclor 1221, Aroclor 1232, Aroclor 1242, Aroclor 1248, Aroclor 1254, and Aroclor 1260.
4. DEQ Generic RBCs dated May 2018, amended June 2023
5. DEQ CFSLs dated February 21, 2019

>Csat: This soil RBC exceeds the limit of three-phase equilibrium partitioning. Refer to Appendix D of DEQ's RBDM guidance document for the corresponding value of Csat. Soil concentrations in excess of Csat indicate that free product might be present.

>Max: The constituent RBC for this pathway is calculated as greater than 1,000,000 mg/kg or 1,000,000 mg/L. Therefore, this substance is deemed not to pose risks in this scenario.

ND: not detected at concentrations greater than the reporting or detection limit shown

U: Not detected. Reporting or detection limit shown.

TABLE 7
Summary of Soil Sample Chemical Analytical Results
Total Metals
Catch Basin CB-5
2407 NW 28th Avenue Development
2407 NW 28th Avenue
Portland, Oregon

Sample I.D.	Sample Date	Total Metals EPA Method 6020 (mg/Kg)			
		Cadmium	Chromium	Lead	Zinc
CB-5	05/21/09	1.48 U	**35.0**	**6.53**	**64.3**
DEQ Generic RBCs[1]					
Soil Ingestion, Dermal Contact, and Inhalation					
Occupational		1,100	>Max	800	NE
Construction Worker		350	530,000	800	NE
Excavation Worker		9,700	>Max	800	NE
Volatilization to Outdoor Air					
Occupational		NV	NV	NV	NE
DEQ CFSLs[2] (Portland Basin)		0.63	76	28	180

Notes:
1. DEQ Generic RBCs dated May 2018, amended June 2023
2. DEQ CFSLs dated February 21, 2019

>Max: The constituent RBC for this pathway is calculated as greater than 1,000,000 mg/kg or 1,000,000 mg/L. Therefore, this substance is deemed not to pose risks in this scenario.

NV: chemical is considered non-volatile

U: Not detected. Reporting or detection limit shown.

Bolding indicates analyte detection.

TABLE 8
Summary of Groundwater Elevations
2407 NW 28th Avenue Development
2407 NW 28th Avenue
Portland, Oregon

Well I.D.	Date Measured	Well Casing Elevation[1] (feet)	Depth to Free Product[2] (feet BGS)	Depth to Groundwater[2] (feet BGS)	Groundwater Elevation (feet)
MW-1	04/08/93	100.00	ND	13.08	86.92
	02/22/08		NR	NR	NR
	07/08/08		13.80	NA[3]	NA[3]
	09/03/08		NA[4]	NA[3]	NA[3]
	12/31/08		NA[4]	NA[3]	NA[3]
	03/03/09		NA[4]	NA[3]	NA[3]
	06/10/09		NA[4]	NA[3]	NA[3]
MW-2	04/08/93	99.42	ND	12.61	86.81
	02/22/08		ND	NR	NR
	07/08/08		ND	13.30	86.12
	09/03/08		ND	13.81	85.61
	12/31/08		ND	11.17	88.25
	03/03/09		ND	12.73	86.69
	06/10/09		ND	12.98	86.44
MW-3	04/08/93	99.14	ND	12.28	86.86
	02/22/08		ND	NR	NR
	07/08/08		ND	13.00	86.14
	09/03/08		ND	13.53	85.61
	12/31/08		ND	11.29	87.85
	03/03/09		ND	12.50	86.64
	06/10/09		ND	12.73	86.41
MW-4	09/03/08	99.72	ND	14.09	85.63
	12/31/08		ND	11.52	88.20
	03/03/09		ND	12.91	86.81
	06/10/09		ND	13.18	86.54
MW-5	09/03/08	100.34	ND	14.56	85.78
	12/31/08		ND	11.96	88.38
	03/03/09		ND	13.26	87.08
	06/10/09		ND	13.59	86.75

Notes:
1. Well casing elevations for monitoring wells MW-1 through MW-3 as reported by Hart Crowser, April 1993.
   Well casing elevations for monitoring wells MW-4 and MW-5 as surveyed by GeoDesign personnel. Elevations are based on an assumed elevation of 100.0 feet for monitoring well MW-1.
2. Measured from the top of the well casing
3. Could not be determined due to the presence of free product
4. Depth to product not measured

TABLE 9
Summary of Groundwater Sample Chemical Analytical Results
PAHs
2407 NW 28th Avenue Development
2407 NW 28th Avenue
Portland, Oregon

Well I.D.	Sample Date	PAHs EPA Method 8270C SIM (µg/L)															
		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	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Pyrene
MW-1	04/08/93	**8.1**	**27**	**11**	**3.6**	**3.9**	**4.1**	**2.2**	**11**	**6.5**	**7**	**91**	**9.4**	**2**	**9.1**	**41**	**11**
	02/22/08	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF
	09/03/08	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF
	07/09/08	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF
	12/31/08	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF
	03/03/09	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF
	06/10/09	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF
MW-2	04/08/93	0.5 U	1.0 U	0.05 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.2 U	0.1 U	0.1 U	0.1 U	0.5 U	0.05 U	0.1 U
	02/22/08	0.0377 U	0.0377 U	0.0377 U	0.0377 U	0.0377 U	0.0377 U	0.0377 U	0.0377 U	0.0377 U	0.0377 U	0.0377 U	0.0377 U	0.0377 U	0.0377 U	0.0377 U	0.0377 U
	07/09/08	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF
	09/03/08	0.0417 U	0.0417 U	0.0417 U	0.0417 U	0.0417 U	0.0417 U	0.0417 U	0.0417 U	0.0417 U	0.0417 U	0.0417 U	0.0417 U	0.0417 U	0.0417 U	0.0417 U	0.0417 U
	12/31/08	0.0377 U	0.0377 U	0.0377 U	0.0377 U	0.0377 U	0.0377 U	0.0377 U	0.0377 U	0.0377 U	0.0377 U	0.0377 U	0.0377 U	0.0377 U	0.0377 U	0.0377 U	0.0377 U
	03/03/09	0.0381 U	0.0381 U	0.0381 U	0.0381 U	0.0381 U	0.0381 U	0.0381 U	0.0381 U	0.0381 U	0.0381 U	0.0381 U	0.0381 U	0.0381 U	0.0381 U	0.0381 U	0.0381 U
	06/10/09	0.0385 U	0.0385 U	0.0385 U	0.0385 U	0.0385 U	0.0385 U	0.0385 U	0.0385 U	0.0385 U	0.0385 U	0.0385 U	0.0385 U	0.0385 U	0.0385 U	0.0385 U	0.0385 U
MW-3	04/08/93	0.5 U	1.0 U	0.05 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.2 U	0.1 U	0.1 U	0.1 U	0.5 U	0.05 U	0.1 U
	02/22/08	0.0374 U	0.0374 U	0.0374 U	0.0374 U	0.0374 U	0.0374 U	0.0374 U	0.0374 U	0.0374 U	0.0374 U	0.0374 U	0.0374 U	0.0374 U	**0.0477**	0.0374 U	0.0374 U
	07/09/08	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF
	09/03/08	0.0417 U	0.0417 U	0.0417 U	0.0417 U	0.0417 U	0.0417 U	0.0417 U	0.0417 U	0.0417 U	0.0417 U	0.0417 U	0.0417 U	0.0417 U	**0.0485**	0.0417 U	0.0417 U
	12/31/08	0.0377 U	0.0377 U	0.0377 U	0.0377 U	0.0377 U	0.0377 U	0.0377 U	0.0377 U	0.0377 U	0.0377 U	0.0377 U	0.0377 U	0.0377 U	**0.0459**	0.0377 U	0.0377 U
	03/03/09	0.0377 U	0.0377 U	0.0377 U	0.0377 U	0.0377 U	0.0377 U	0.0377 U	0.0377 U	0.0377 U	0.0377 U	0.0377 U	0.0377 U	0.0377 U	**0.0485**	0.0377 U	0.0377 U
	06/10/09	0.0404 U	0.0404 U	0.0404 U	0.0404 U	0.0404 U	0.0404 U	0.0404 U	0.0404 U	0.0404 U	0.0404 U	0.0404 U	0.0404 U	0.0404 U	**0.0691**	0.0404 U	0.0404 U
MW-4	09/03/08	0.0417 U	0.0417 U	0.0417 U	0.0417 U	0.0417 U	0.0417 U	0.0417 U	0.0417 U	0.0417 U	0.0417 U	0.0417 U	**0.0505**	0.0417 U	0.0417 U	0.0417 U	**0.0531**
	12/31/08	0.0381 U	0.0381 U	0.0381 U	0.0381 U	0.0381 U	0.0381 U	0.0381 U	0.0381 U	0.0381 U	0.0381 U	0.0381 U	0.0381 U	0.0381 U	0.0381 U	0.0381 U	0.0381 U
	03/03/09	0.0377 U	0.0377 U	0.0377 U	0.0377 U	0.0377 U	0.0377 U	0.0377 U	0.0377 U	0.0377 U	0.0377 U	0.0377 U	0.0377 U	0.0377 U	0.0377 U	0.0377 U	**0.0487**
	06/10/09	0.0400 U	0.0400 U	0.0400 U	0.0400 U	0.0400 U	0.0400 U	0.0400 U	0.0400 U	0.0400 U	0.0400 U	0.0400 U	0.0400 U	0.0400 U	**0.0469**	0.0400 U	**0.0629**
MW-5	09/03/08	0.0800 U	0.0800 U	0.0800 U	0.0800 U	0.0800 U	0.0800 U	0.0800 U	0.0800 U	0.0800 U	0.0800 U	0.0800 U	0.0800 U	0.0800 U	0.0800 U	0.0800 U	0.0800 U
	12/31/08	0.0381 U	0.0381 U	0.0381 U	0.0381 U	0.0381 U	0.0381 U	0.0381 U	0.0381 U	0.0381 U	0.0381 U	0.0381 U	0.0381 U	0.0381 U	0.0381 U	0.0381 U	0.0381 U
	03/03/09	0.0381 U	0.0381 U	0.0381 U	0.0381 U	0.0381 U	0.0381 U	0.0381 U	0.0381 U	0.0381 U	0.0381 U	0.0381 U	0.0381 U	0.0381 U	0.0381 U	0.0381 U	0.0381 U
	06/10/09	0.0385 U	0.0385 U	0.0385 U	0.0385 U	0.0385 U	0.0385 U	0.0385 U	0.0385 U	0.0385 U	0.0385 U	0.0385 U	0.0385 U	0.0385 U	0.0385 U	0.0385 U	0.0385 U

TABLE 9
Summary of Groundwater Sample Chemical Analytical Results
PAHs
2407 NW 28th Avenue Development
2407 NW 28th Avenue
Portland, Oregon

Well I.D.	Sample Date	PAHs EPA Method 8270C SIM (µg/L)															
		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	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Pyrene
DEQ Generic RBCs[1]																	
Volatilization to Outdoor Air																	
Occupational		>S	NE	>S	>S	NV	NV	NV	NE	NV	NV	NV	>S	NV	16,000	NE	>S
Vapor Intrusion into Buildings - Chronic																	
Commercial		NITI	NE	NITI	2,300	NV	NV	NV	NE	NV	NV	NITI, NV	NITI	NV	50	NE	NITI
Vapor Intrusion into Buildings - Acute																	
Commercial		NE	NE	NE	NE	NV	NE	NE	NE	NE	NE	NE	NE	NE	83,000	NE	NE
Groundwater in Excavation																	
Construction/Excavation Worker		>S	NE	>S	>S	>S	>S	>S	NE	>S	>S	>S	>S	>S	500	NE	>S

Notes:
1. DEQ Generic RBCs dated May 2018, amended June 2023
NAF: Not analyzed due to the presence of free product
NV: chemical is considered non-volatile
>S: This groundwater RBC exceeds the solubility limit. Refer to Appendix D of DEQ's RBDM guidance document for the corresponding value of S. Groundwater concentrations in excess of S indicate that free product may be present.
U: Not detected. Reporting or detection limit shown.
Bolding indicates analyte detection.

TABLE 10
Summary Groundwater Sample Chemical Analytical Results
VOCs
2407 NW 28th Avenue Development
2407 NW 28th Avenue
Portland, Oregon

Well I.D.	Sample Date	VOCs EPA Method 8260B (µg/L)							
		Benzene	cis-1,2-Dichloroethene	Ethylbenzene	PCE	Toluene	TCE	Vinyl Chloride	Total Xylenes
MW-1	04/08/93	**8.6**	--	**4.4**	--	ND	--	ND	**22**
	02/22/08	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF
	09/03/08	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF
	07/09/08	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF
	12/31/08	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF
	03/03/09	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF
	06/10/09	NAF	NAF	NAF	NAF	NAF	NAF	NAF	NAF
MW-2	04/08/93	**1.1**	--	0.5 U	--	0.5 U	--	ND	0.5 U
	02/22/08	ND	0.500 U	ND	0.500 U	ND	0.500 U	ND	ND
	07/09/08	ND	0.500 U	ND	0.500 U	ND	0.500 U	ND	ND
	09/03/08	ND	0.500 U	ND	0.500 U	ND	0.500 U	ND	ND
	12/31/08	ND	0.500 U	ND	0.500 U	ND	0.500 U	ND	ND
	03/03/09	ND	0.500 U	ND	0.500 U	ND	0.500 U	ND	ND
	06/10/09	ND	0.500 U	ND	**0.830**	ND	0.500 U	ND	ND
MW-3	04/08/93	0.5 U	0.500 U	**0.9**	**0.850**	**0.7**	0.500 U	ND	**2.3**
	02/22/08	ND	**2.06**	ND	**2.33**	ND	0.500 U	**1.06**	ND
	07/09/08	ND	0.500 U	ND	**0.850**	ND	0.500 U	ND	ND
	09/03/08	ND	**2.17**	ND	0.500 U	ND	0.500 U	ND	ND
	12/31/08	ND	0.500 U	ND	**1.08**	ND	0.500 U	ND	ND
	03/03/09	ND	**0.990**	ND	**2.63**	ND	**0.760**	ND	ND
	06/10/09	ND	**1.74**	ND	**1.62**	ND	**1.22**	ND	ND
MW-4	09/03/08	ND	**6.63**	ND	**1.04**	ND	**0.890**	ND	ND
	12/31/08	ND	**0.550**	ND	**13.8**	ND	**0.500**	ND	ND
	03/03/09	ND	**1.96**	ND	**6.95**	ND	**2.67**	ND	ND
	06/10/09	ND	**2.12**	ND	**2.18**	ND	**5.43**	ND	ND
MW-5	09/03/08	ND	0.500 U	ND	**1.43**	ND	0.500 U	ND	ND
	12/31/08	ND	0.500 U	ND	**1.85**	ND	0.500 U	ND	ND
	03/03/09	ND	0.500 U	ND	**1.38**	ND	0.500 U	ND	ND
	06/10/09	ND	0.500 U	ND	**0.92**	ND	0.500 U	ND	ND

TABLE 10
Summary Groundwater Sample Chemical Analytical Results
VOCs
2407 NW 28th Avenue Development
2407 NW 28th Avenue
Portland, Oregon

Well I.D.	Sample Date	VOCs EPA Method 8260B (µg/L)							
		Benzene	cis-1,2-Dichloroethene	Ethylbenzene	PCE	Toluene	TCE	Vinyl Chloride	Total Xylenes
DEQ Generic RBCs[1]									
Volatilization to Outdoor Air									
Occupational		14,000	>S	43,000	>S	>S	20,000	5,900	>S
Vapor Intrusion into Buildings - Chronic									
Commercial		12	1,800	31	130	150,000	13	3.3	3,300
Vapor Intrusion into Buildings - Acute									
Commercial		650	NE	420,000	330	160,000	27	4,600	200,000
Groundwater in Excavation									
Construction/Excavation Worker		1,800	18,000	4,500	5,600	220,000	430	960	23,000

Notes:
1. DEQ Generic RBCs dated May 2018, amended June 2023
NAF: Not analyzed due to the presence of free product
ND: not detected at concentrations greater than the reporting or detection limit shown
>S: This groundwater RBC exceeds the solubility limit. Refer to Appendix D of DEQ's RBDM guidance document for the corresponding value of S. Groundwater concentrations in excess of S indicate that free product may be present.
U: Not detected. Reporting or detection limit shown.
Bolding indicates analyte detection.
--: not analyzed

APPENDIX

APPENDIX

SITE-SPECIFIC HEALTH AND SAFETY PLAN

INTRODUCTION

Each contractor conducting work at the subject property is individually responsible for the health and safety of their employees. This includes the implementation of any training requirements, HSPs, monitoring, and any other specific requirements for the type of work being completed by the contractor. This HSP should be available to NV5 employees who will be working at the subject property and can be used to assist the contractor in preparation of their employee hazard communication and health and safety programs for the subject property. This HSP is intended solely for the use of NV5 employees while providing on-site observation, monitoring, and sampling; is provided in this document for reference only; and is not a replacement for each contractor's specific HSP. Contractors may adopt this HSP with the proper modifications to address the type of work they will be completing at the subject property.

This HSP establishes the policies and procedure that will help minimize risk to on-site workers, visitors, and the public. The procedures and guidelines contained herein are based on the current available information at the time of this HSPs preparation. Specific requirements will be revised when new information is received or conditions change.

SUBJECT PROPERTY BACKGROUND

A summary the environmental history and background of the subject property is presented in Section 5.0 of the CMMP.

SUBJECT PROPERTY LOCATION

Location: 2407 NW 28th Avenue; Portland, Oregon

Description: The subject property encompasses 1.3 acres developed with a warehouse, a storage building, an office building, and paved parking areas.

Contracting Company or Agency: To be determined

SCOPE OF WORK (NV5)

Objectives: Observe soil conditions, excavation activities, and/or construction; provide field screening of soil disturbed during development earthwork activities, if necessary; collect confirmation soil samples from limits of excavation and/or soil stockpiles, as appropriate; and document site activities

ON-SITE ORGANIZATION AND COORDINATION

The following personnel are designated to carry out the stated job functions on site. (Note: One person may carry out more than one job function.)

Project Manager:	To be determined
SSO:	To be determined
Site Supervisor:	To be determined
Field Personnel:	To be determined
Subcontractor(s):	NA
Client Contact:	Sada Nagata

The Project Manager has overall responsibility for all activities on site, including implementation of the site safety plan. The Project Manager may delegate this function to the SSO.

The SSO is responsible for helping to ensure that work crews comply with all site safety and health requirements.

All other site personnel are responsible for understanding and complying with all site safety and health requirements.

SUBJECT PROPERTY CONTROL

The subject property will be a secured construction site, but some work may be completed in the ROWs surrounding the subject property. Excavations deeper than 4 feet BGS should be properly shored and fenced to prevent excavation collapse and falls into the excavation.

EMPLOYEE TRAINING

All NV5 personnel working at the subject property and that might come in contact with contaminated media will have received 24 or 40 hours of OSHA training on safe work practices for hazardous waste sites. In addition, personnel are required to receive eight hours of OSHA refresher training annually. Managers and supervisors are required to receive eight hours of OSHA training for safe management of hazardous waste site operations. All training will comply with 29 CFR 1910.120. Site-specific training will be held at the beginning of the project. Daily site safety meetings will be held on site and a record kept.

MEDICAL SURVEILLANCE

Pre-employment and periodic medical examinations are required for personnel working at hazardous waste sites. The medical examination must be completed within the prior 12-month period. A statement deeming the worker fit-for-duty is required from a licensed physician. Medical records are accessible by workers.

HAZARD/RISK ASSESSMENT

This section discusses chemical, physical, and environmental hazards to workers at the subject property. The table below lists major hazards associated with these tasks and methods to mitigate the hazards. The table below discusses physical hazards identified with the subject property, including those associated with fire, use of heavy equipment, slip/trip/fall, lifting, tool and equipment, and heat stress.

Daily tailgate safety meetings will be held at the start of each workday to discuss potential chemical, physical, and environmental hazards and preventative safety measures. Attendance will be mandatory for all employees. Task hazard analyses have been developed for each major field activity/work phase and are presented in the table below. The following sections describe the specific hazards anticipated in more detail and the control measures to be implemented to minimize or eliminate each hazard. This information will be used to augment daily safety meetings intended to heighten safety and hazard awareness on the job.

HAZARDS ASSOCIATED WITH TASKS

The main hazards associated with site construction are struck-by and inhalation, contact, and/or ingestion of contaminants. Other potential hazards associated with site activity are analyzed as detailed in the table below.

Hazard Sources and Mitigation During Field Activities and Hazard Project Tasks Mitigation Methods

Hazard	Project Tasks	Mitigation Methods
Slip/trip/fall	All tasks	Maintain good housekeeping. Limit work area with boundary marking tape and signs. Slip/trip/fall hazards will be addressed through an ongoing proactive housekeeping program that eliminates elements in the work area that have potential for causing loss of footing.
Struck-by	All tasks	Maintain a safe distance from any heavy equipment. Workers should not stand within the swing radius or reach of heavy equipment.
Explosion/fire	All tasks	Smoking is not permitted in the work zones. Any free-phase petroleum or gasoline will be stored in appropriate containers. Signs indicating flammable liquids should be posted where appropriate. Appropriate fire extinguishers will be available to site personnel during field activities. Open-flame ignition sources will be restricted from the work area (smoking, etc.)

Hazard Sources and Mitigation During Field Activities and Hazard Project Tasks Mitigation Methods (continued)

Hazard	Project Tasks	Mitigation Methods
Inhalation, contact, and ingestion of organic vapors and inorganic metals containing dust	Excavation, sampling, and monitoring	Level D PPE is typically adequate. If PID readings in the breathing zone indicate conditions require upgrading to air-purifying respirators (Modified Level C PPE) in accordance with the guidance presented below, an addendum to this HSP will be submitted for review and approval. • <5 ppm in the breathing zone = no action is required • 5 to 25 ppm in the breathing zone for 5 minutes or more = upgrade to Modified Level C (i.e., put on respirator) • >25 ppm in the breathing zone for 5 minutes or more = stop work and leave work area, then evaluate options In general, remain upwind of contaminated material whenever possible. Wear disposable gloves and safety glasses with side shields when handling soil and sampling water. Avoid smoking at all times during the mass excavation activities. Employ dust control methods (misting or wetting during excavation). Chewing tobacco and eating should also be avoided during excavation work to prevent ingestion of site contaminants.
Contact with contaminated soil and groundwater	Excavation, sampling, and monitoring	Level D PPE is typically adequate. Wear appropriate coveralls, gloves, and protective eyewear. No eating, smoking, or drinking on site.
Weather extremes	All tasks	Use dress consistent with weather conditions. Implement worker rotation and rest period schedules. Adjust workday to avoid exposure.

HAZARD ANALYSIS

Chemical(s)	Petroleum hydrocarbons, PAHs, VOCs, PCBs, and metals
Heavy Equipment	Yes
Confined Space	Not anticipated
Flammability	NA
Reactivity	NA
Heat	Occasional warm periods
Cold	Occasional cold periods
Flammability	NA

Reactivity	NA
Drums	NA
Terrain	Potential excavation with steep sidewalls
Oxygen Deficient	NA
Electrical	NA
Corrosivity	NA
Noise	Construction equipment noise will be present during the entire work period
Altitude	NA
Radiation	NA
Wildlife	NA
Ergonomic	NA
Drilling	NA
Excavation	Construction equipment will be present for excavation
Biological Agent	NA
Explosives	NA
Vehicles	Cars, freight trucks, construction vehicles

PERSONAL PROTECTIVE EQUIPMENT

Based on the evaluation of potential hazards, the following levels of personal protection have been designated for the applicable work areas or tasks:

Location	Job Function	Levels of Protection
Exclusion Zone	**All Tasks**	**D**
		A B C D Other
		A B C D Other
		A B C D Other
Contamination Reduction Zone	**All Tasks**	**D**
		A B C D Other
		A B C D Other

Specific protective equipment for each level of protection is as follows:

Level A

Level C (Modified) Level D with an air purifying respirator

Level B _____

Level D Hard hat, safety vest, work boots; eye protection and ear protection if construction equipment is operating.

Other _____

DOWNGRADING CHANGES TO THE SPECIFIED LEVELS OF PROTECTION SHALL NOT BE MADE WITHOUT THE APPROVAL OF THE SITE SAFETY OFFICER.

DECONTAMINATION PROCEDURE

Personnel and equipment leaving the Exclusion Zone shall be thoroughly decontaminated. The standard level **NA** decontamination protocol shall be used with the following decontamination stations:

(1)_____ (2)_____
(3)_____ (4)_____
(5)_____ (6)_____
(7)_____ (8)_____
(9)_____ (10)_____

The decontamination station will be located immediately adjacent to the Exclusion Zone. The decontamination solution will be **NA**.

Emergency decontamination will include the following stations: **Soap and Water – Rinse Water – Eye-Wash Station**

Equipment decontamination will be as follows: **Trisodium phosphate and water**

EMERGENCIES

Closest Hospital	Legacy Good Samaritan Medical Center	
Address	2014 NW 22nd Avenue, Portland	Phone 503-413-7711
Distance	1.3 miles – see attached map	
Ambulance		Phone 911
Police		Phone 911
Fire		Phone 911
NV5	Office Phone: 503-968-8787	

Emergency Equipment is available on site at the following locations:

First Aid Kit	In Vehicle
Eye Wash	In Vehicle
Fire Extinguisher	On Site
Other	

The following standard emergency procedures will be used by on-site personnel. The SSO shall be notified of any on-site emergencies and will be responsible for helping ensure that the appropriate procedures are followed.

Personnel Injury in the Exclusion Zone: Upon notification of an injury in the Exclusion Zone, the designated emergency signal of three horn blasts shall be sounded. All site personnel will assemble at the decontamination line. The rescue team will enter the Exclusion Zone (if required) to remove the injured person to the hotline. The SSO will evaluate the nature of the injury, and the impacted person should be decontaminated to the extent possible prior to movement to the Support Zone. Appropriate first aid and arrangement for an ambulance will be made with the designated medical facility (if required). No persons will re-enter the Exclusion Zone until the cause of the injury or symptoms is determined.

Personnel Injury in the Support Zone: Upon notification of an injury in the Support Zone, the SSO will assess the nature of the injury. If the cause of the injury or loss of the injured person does not affect the performance of site personnel, operations may continue with the appropriate first aid and necessary follow-up as stated above. If the injury increases the risk to others, the designated emergency signal of three horn blasts will be sounded and all site personnel shall move to the decontamination line for further instructions. Activities on site will stop until the added risk is removed or minimized.

Fire/Explosion: Upon notification of a fire or explosion on site, the designated emergency signal of three horn blasts will be sounded and all site personnel will assemble at the decontamination line. The fire department will be alerted and all personnel will move to a safe distance from the involved area.

PPE Failure: If any site worker experiences a failure or alteration of PPE that affects the protection factor, that person and his buddy will immediately leave the Exclusion Zone. Re-entry will not be permitted until the equipment has been repaired or replaced.

Other Equipment Failure: If any other equipment on site fails to operate properly, the Site Supervisor will be notified and then determine the effect of the failure on continuing operations on site. If the failure affects the safety of personnel or prevents completion of project objectives, all personnel will leave the Exclusion Zone until the situation is evaluated and appropriate actions taken.

Emergency Escape Routes: The following routes are designated for use in situations where egress from the Exclusion Zone cannot occur through the decontamination line (describe alternate routes to leave the area in emergencies):

To be determined upon arrival on site

In all situations, when an on-site emergency results in evacuation of the Exclusion Zone, personnel will not re-enter until:

1. The conditions resulting in the emergency have been corrected.
2. The hazards have been re-assessed.
3. The Site Safety Plan has been reviewed.
4. Site personnel have been briefed on any changes to the Site Safety Plan.

ATTACHMENT 1
HAZARD ANALYSIS

HAZARD	PREVENTION	TREATMENT
Traffic to and from site	Defensive driving	Call 911 and insurance company
Hot weather	Wear sunscreen, drink water	Re-hydrate
Slips, trips, falls, cuts	Caution	Antibiotic ointment
Construction equipment	Eye contact with operator, PPE, caution	Call 911
Soil sampling	Use protective PPE	Call 911 or on-site assistance

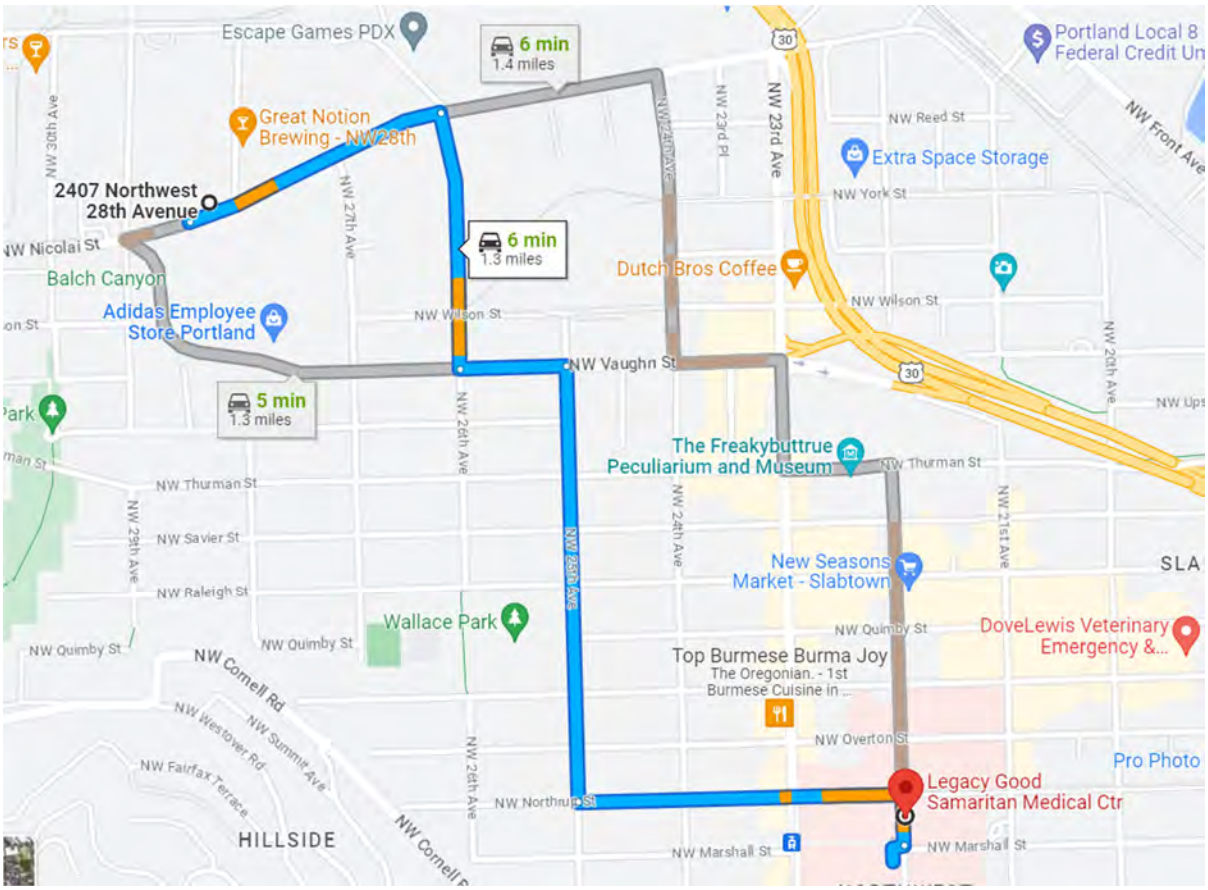
If additional physical hazards are identified during site work, document the conditions and contact the Project Manager.

ATTACHMENT 2
SITE SAFETY PLAN ACKNOWLEDGMENT

All site personnel have read the above plan and are familiar with its provisions.

Name	Company	Date
Site Safety Officer		
Project Manager		
Site Personnel		

Map to Hospital
Legacy Good Samaritan Medical Center
2014 NW 22nd Avenue
Portland, OR 97210



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