PNG ENVIRONMENTAL, INC.

TECHNICAL MEMORANDUM

To: Mr. Gary Rehnberg

From: Samantha Biles, P.E. and Brad Berggren, R.G., P.E.

Date: May 5, 2023

Subject: 2022/2023 Focused Soil, Groundwater, and Soil Vapor Investigation
East Side Plating Plant #4
Portland, Oregon

PNG Environmental, Inc. (PNG) is providing the results of a focused investigation at the East Side Plating (ESP) Plant #4 Facility located at 310 SE Stephens Street, Portland, Oregon (Figure 1 and Figure 2). This was the second focused investigation at Plant #4; the previous investigation was completed in August 2022. The recent soil, groundwater, and soil vapor investigation was conducted to further document environmental conditions at and adjacent to the facility. This memorandum summarizes the results of a focused investigation conducted in February and March 2023.

INVESTIGATION ACTIVITIES

Pre-Drilling Activities

Prior to beginning drilling activities, Plant #4 was surveyed to identify specific sampling locations based on historical building use and current access. Once drilling and sampling locations with adequate access were selected, each location was cleared for utilities.

Because some of the proposed boring locations were outside of Plant #4 in the City of Portland street and sidewalk, PNG submitted a Bore Hole Test Permit and a Simple Street Use Permit to the City of Portland. The permit request was approved by the City of Portland and issued to PNG and Cascade Drilling.

Push Probe Borings

In August 2022, Cascade Drilling completed the installation of nine 2-inch diameter push probe borings at the Plant #4 facility (B-1 through B-9). On February 21st through 28th, Cascade Drilling completed the installation of five 2-inch diameter push probe borings at the Plant #4 facility (B-10 through B-14). Boring locations are shown on Figure 2. Continuous soil core samples were evaluated in the field for indications of environmental contamination (i.e., odor, discoloration). All five 2023 borings were terminated at 55 feet below ground surface (bgs). Soils encountered generally consisted of finer grained materials (silts and sandy silts) near the surface and transitioned below approximately 20 feet bgs to more coarse-grained materials (silty sands and gravels) with depth. Ten soil quality samples were collected from each boring location, one sample approximately every five feet. Groundwater was encountered at between 46 and 50 feet bgs. A temporary well point was installed at 55 feet bgs and groundwater was collected using a peristaltic pump, consistent with PNG's Standard Operating Procedure (SOP).

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One groundwater grab sample was collected from each boring (a total of 5 groundwater samples).

Soil samples were sent to Pace Analytical for analysis. All soil samples were analyzed for hydrocarbon identification (HCID). Onsite boring soil samples (collected from borings B-12, 13, 14) were analyzed for VOCs (all samples) and priority pollutant 13 metals (5 and 10 feet bgs samples, only).

Groundwater samples were also sent to Pace Analytical for analysis. Groundwater samples were analyzed for gasoline and diesel-extended range total petroleum hydrocarbons (TPH) by NW Methods TPH-G and TPH-Dx, volatile organic compounds (VOCs) by U.S. Environmental Protection Agency (EPA) Method 8260b, and total and dissolved priority pollutant metals by EPA Methods 6010/7470/7471. In addition, groundwater samples were sent to Enthalpy Analytical for analysis of PFAS compounds by Method 537 modified (PFAS Isotope Dilution).

A single soil vapor sample was collected from approximately 5-feet bgs at each push probe boring location (B-10 through B-14) consistent with PNG's SOP, for a total of five soil vapor samples. These samples were also sent to Pace Analytical for analysis. All vapor samples were analyzed for VOCs and TPH-G by Method TO-15.

Cross-Slab Vapor Pins

During the previous 2022 investigation at Plant #4, a network of three cross-slab Cox-Colvin vapor pins (SG-1 through SG-3) were installed in the northeast portion of the building to facilitate the collection of sub-slab soil gas samples. On February 10, 2023, an additional 10 cross-slab vapor pins were installed (SG-4 through SG-13), expanding the vapor pin network through the facility.

On March 2, 2023, soil gas samples were collected consistent with PNG's SOP from the newly installed vapor pin locations (SG-4 through SG-13) for a total of 10 soil gas samples, consistent with PNG's SOP. Soil gas samples were sent to Pace Analytical for analysis. All soil gas samples were analyzed for VOCs and TPH-G by Method TO-15.

INVESTIGATION RESULTS

Upon receipt from the laboratory, soil, groundwater, and soil vapor analytical results were tabulated and data validation was completed. The results from the 2022 and 2023 investigations are summarized on Tables 1 through 6.

Responsible parties (RPs) may use generic screening levels for hazardous substances established under Oregon Department of Environmental Quality's (DEQ's) Risk-Based Decision Making (RBDM) guideline to streamline the risk assessment process. In terms of the latter, Oregon DEQ has compiled default risk-based screening-reference levels for common exposure-pathway receptor-scenarios that may be utilized in lieu of site-specific risk calculations (OAR 340-122-0115). In particular, the pre-calculated risk-based concentrations (RBCs) represent the concentration of a contaminant of interest (COI) in the impacted medium (e.g., soil, groundwater, or air) that potentially represents an unacceptable risk level. Accordingly, soil, groundwater and soil vapor results were screened against Oregon DEQ human health RBCs for individual chemicals (DEQ 2018) per their Risk-Based Decision Making (RBDM) for the Remediation of Contaminated Sites guidance document (DEQ 2017) and EPA's Vapor Intrusion Screening Levels (VISL).

DEQ's RBDM guidance identifies exposure pathways by which a receptor may be exposed to a chemical, including incidental ingestion, inhalation, and dermal contact with the affected medium. The ESP Plant #4 property is currently zoned as IG1 (General Industrial 1) and this zoning is not expected to change in the near future. The current and reasonably anticipated future use of East Side Plating Plant #4 property is for commercial purposes and, as such, the applicable exposure-pathway receptor-scenarios for occupational uses were used as screening criteria. Occupational use is also consistent with the land use immediately surrounding the property. Although the potential for exposure to contaminated groundwater through ingestion is not considered reasonably likely, occupational drinking water RBCs are provided for reference purposes. In addition, multiple DEQ project managers have indicated that DEQ is in the process of updating their vapor intrusion guidance and is planning to base the updated vapor intrusion screening RBCs on EPA's VISLs. For that reason, EPA's VISLs have been provided for comparison.

The analytical results from the investigation are summarized below.

SOIL

- Metals: During the previous investigation in August 2022, nine soil borings were completed within the footprint of the Plant #4 property. Several metals (arsenic, cadmium, chromium, copper, nickel, silver and zinc) were detected in soil at concentrations that exceed Portland Basin regional default background concentrations established by Oregon DEQ (DEQ). None of the detected metals concentrations, except arsenic, exceed occupational risk-based concentration (RBC) screening levels established by DEQ. Only arsenic, which was detected at concentrations up to 16 mg/kg, exceeds the occupational and construction worker RBCs for ingestion, dermal contact, and inhalation. The occupational and construction worker RBCs for arsenic are 1.9 mg/kg and 15 mg/kg, respectively. Note that the Portland Basin regional default background concentration for arsenic is 8.8 mg/kg.

  During the recent 2023 investigation, five soil borings were completed outside the footprint of the building to the north (B-10 and B-11) in Stephens St., west (B-12 and B-13), and to the south (B-14). Only two metals (cadmium and nickel) were detected in soil samples from these borings at concentrations that exceed Portland Basin regional default background concentrations established by DEQ. None of the detected metals concentrations exceed occupational risk-based screening levels established by DEQ.

- Total Petroleum Hydrocarbons (TPH): TPH as Gasoline (GRO) was not detected in any of the soil samples that were analyzed for TPH. TPH as diesel (DRO) and oil (RRO) were only detected in two of the 50 soil samples analyzed (soil sample from Boring B-10 collected at a depth of 5 feet bgs and the soil sample from B-14 collected at a depth of 10 feet bgs). No TPH concentrations exceed the DEQ occupational or construction worker RBCs, except for the TPH RRO concentration detected in the soil sample from B-10 located in Stephens St. offsite to the north of Plant #4 (5,040 mg/kg compared to the construction worker RBC of 4,600 mg/kg).

- Volatile Organic Compounds (VOCs): VOCs were not detected in the 30 soil samples analyzed, except for relatively low concentrations detected in four samples: Boring B-12 from 15 feet bgs and three deep samples from below the groundwater

table at about 50 feet bgs (boring locations B-12, 13, 14). No VOCs were detected at concentrations that exceeded an occupational RBC established by DEQ.

GROUNDWATER

- Metals: Various concentrations of total (unfiltered) metals (arsenic, beryllium, cadmium, chromium, copper, lead, nickel, selenium, thallium, and zinc) were detected in the five groundwater grab samples collected from the temporary well points. Generally, detections of metals in groundwater were at relatively low concentrations. The push probe methodology for collecting screening-level groundwater samples will typically result in more turbid samples containing suspended and colloidal material that may contain naturally occurring metals (sourced from suspended soil in the water sample) and may not be representative of the true quality of groundwater. As such, dissolved (filtered) metals in groundwater samples were also collected. The results of filtered sample analysis only detected a small subset of the aforementioned metals (copper, nickel, and thallium) and at much lower concentrations and frequency. Consistent with the August 2022 results, none of the detected metal concentrations exceed occupational RBCs. Municipal drinking water is available in this City of Portland area and ingestion/inhalation of tap water derived from groundwater in the vicinity of the Plant #4 facility is not considered reasonably likely.
- Total Petroleum Hydrocarbons (TPH): TPH as GRO, DRO, and RRO were not detected in any of the five groundwater samples collected to the north, west and south of Plant #4, and correspondingly do not exceed any occupational RBCs.
- Volatile Organic Compounds (VOCs): Tetrachloroethene (PCE) and Trichloroethene (TCE) were detected in nearly every groundwater sample collected at low part per million concentrations. PCE concentrations ranged from not detected to 2.7 micrograms per liter (ug/L). TCE concentrations ranged from 1.1 to 34 ug/L. The greater TCE concentrations (26 and 34 ug/L) were detected in groundwater samples collected from borings B-10 and B-11 located offsite to the north of Plant #4 in SE Stephens St. TCE concentrations detected in groundwater samples collected on the Plant #4 property are all less than 13 ug/L. In addition, three other VOCs were detected at relatively low concentrations (ethylbenzene, total xylenes, and chloroform), one detection each, from either B-11 or B-14.

  Consistent with the August 2022 results, some of the detected TCE concentrations (three of the five samples) exceed DEQ's occupational RBC for ingestion/inhalation from tap water of 3.3 ug/L. As mentioned previously, municipal drinking water is available in this City of Portland area and ingestion/inhalation of tap water derived from groundwater in the vicinity of the Plant #4 facility is not considered likely.

  Also consistent with August 2022 results, no other VOCs were detected at concentrations that exceed current occupational RBCs. In addition, none of the VOCs detected in groundwater samples exceed EPA's VISL, except TCE. The low part per billion (ppb) TCE concentrations detected in six of the eight groundwater samples (ranging from 3.0 to 34 ug/L) exceed the EPA VISL of 2.18 ug/L. Preliminary conversations with DEQ staff suggest the DEQ updated groundwater screening RBC for this vapor intrusion into a building pathway may be 13 ug/L (current DEQ RBC screening value is 3,700 ug/L). If the DEQ updated RBC

becomes 13 ug/L, then only three sample results exceed this value (two offsite samples to the north in SE Stephens St. with TCE concentrations of 26 and 24 ug/L and one onsite sample with a TCE concentration of 13 ug/L). The observation of PCE and TCE at low ppb levels in all groundwater samples collected to the north, west and south of Plant #4 suggests a more general regional groundwater quality condition.

- Per- and Polyfluoroalkyl Substances (PFAS): Five groundwater samples were analyzed for PFAS compounds. Six PFAS compounds were detected at low part per trillion concentrations in every groundwater sample collected. These PFAS results from the February 2023 event are consistent with August 2022 results. The same six PFAS compounds were detected in groundwater samples collected during both investigations and with similarly low-level concentrations. The observation of these PFAS compounds at low part per trillion (ppt) levels in all groundwater samples collected to the north, west and south of Plant #4 suggests a more general regional groundwater quality condition.

  Currently, PFAS compounds are not defined as hazardous substances in Oregon. However, recent discussions with DEQ have implied they plan to regulate PFAS within the next year. As such, Oregon does not currently have published screening values for these compounds. Temporarily, until Oregon values are released, the Regional Screening Levels (RSLs) for Resident Soil to Groundwater by Environmental Protection Agency (EPA) are often used for comparison. Of these detected PFAS compounds, only one compound, perfluorooctanesulfonic acid (PFOS) exceeds an EPA RSL.

SOIL VAPOR

- Total Petroleum Hydrocarbons (TPH): TPH as GRO concentrations ranged from nondetect at laboratory reporting limits to 8,180 ug/m^3 in samples collected from the five boring locations (B-10 through B-14). Similarly, GRO concentrations ranged from nondetect to 14,200 ug/m^3 in the 10 sub-slab soil gas samples collected from vapor pins SG-4 through SG-13. None of the detected concentrations exceed the current DEQ occupational RBC for vapor intrusion into buildings.
- Volatile Organic Compounds (VOCs): Multiple VOCs were detected in the fifteen soil vapor samples collected during the 2023 investigation. TCE is the only VOC detected that exceeds the current Oregon DEQ occupational RBC for vapor intrusion into buildings. TCE was detected in all 15 soil vapor samples at a range of 2.4 to 34,900 ug/m^3, with four samples (soil gas samples SG-6, 7, 8, 9 collected from beneath the Plant #4 concrete floor) exceeding the RBC screening level of 2,900 ug/m^3. The highest TCE concentrations were detected at locations primarily in the northeastern quadrant of the building. TCE concentrations in all sub-slab soil gas samples from beneath the building and two of the shallow soil vapor samples (B-10 and B-11 north of the Plant #4 building) collected from the five borings outside the building also exceed the EPA VISL of 29.2 ug/m^3.

  In addition, the ethylbenzene concentration in two shallow soil vapor samples (B-10 and B-11) and the xylene concentration in one shallow soil vapor sample (B-10) exceed the EPA VISLs. Although EPA VISLs do not currently apply in Oregon, it is PNG's understanding that the forthcoming DEQ guidance update will likely include the use of these EPA soil vapor screening levels as a basis for the updated DEQ

soil vapor intrusion RBCs. Ethylbenzene and xylene do not exceed the current DEQ RBC for occupational vapor intrusion into buildings.

OBSERVATIONS

- During the previous investigation in 2022, several metals (arsenic, cadmium, chromium, copper, nickel, silver and zinc) were detected in soil beneath the concrete floor slab at concentrations that exceed Portland Basin regional default background concentrations established by Oregon DEQ (DEQ). None of the detected metals concentrations, except arsenic, exceed occupational risk-based concentration (RBC) screening levels established by DEQ.

  During the recent 2023 investigation, five soil borings were completed outside the footprint of the building to the north in Stephens St., to the west, and to the south. Only two metals (cadmium and nickel) were detected in soil samples from these borings at concentrations that exceed Portland Basin regional default background concentrations established by DEQ. None of the detected metals concentrations exceed occupational risk-based screening levels established by DEQ.

  Commonly in similar situations with soil identified with elevated concentrations of metals contained beneath concrete floor slabs, a Contaminated Media Management Plan (CMMP) is developed to ensure that these soils are properly handled and managed if the overlying concrete floor is removed or disturbed allowing potential exposure of the soil.

- PCE and TCE were detected at low part per billion concentrations in nearly every groundwater sample collected (north, west, and south of Plant #4). Similarly, six PFAS compounds were also detected at low part per trillion concentrations in every groundwater sample collected. These PCE, TCE and PFAS results from the February 2023 event are consistent with August 2022 results. The observation of these VOC and PFAS compounds at low levels in all groundwater samples collected to the north, west and south of Plant #4 suggests a more regional groundwater quality condition.

- TCE concentrations at four locations (SG-6 through SG-9) exceed the current DEQ occupational RBC for vapor intrusion into buildings of 2,900 ug/m^3, with the highest concentration detected at SG-9 (34,900 ug/m^3). TCE concentrations in all sub-slab soil gas samples collected beneath the Plant #4 building floor exceed the EPA Vapor Intrusion Screening Level (VISL) of 29.2 ug/m^3. Commonly in similar situations with VOC concentrations in soil gas beneath a building's floor slab that represent a potentially unacceptable risk to human health from vapor intrusion into the building's interior, an active sub-slab depressurization (SSD) vapor mitigation system is installed to protect against potential vapor intrusion. Active SSD systems are common and reliable systems used to mitigate VOC vapor intrusion from sub-slab soil gas into indoor air. EPA defines SSD as a system designed to achieve lower sub-slab air pressure relative to indoor air pressure by use of a fan-powered vent drawing air from beneath the slab. The resulting pressure differential (i.e., lower pressure beneath the slab relative to indoor air pressure) prevents soil gases from flowing or migrating into the building, thus reducing or mitigating intrusion of VOCs into the building. An active SSD system commonly includes suction pits, risers and piping, exhaust fans, exhaust stacks, SSD system monitoring points, and differential pressure monitoring.

Typically, with an active SSD system, one or more suction pits are constructed below the floor slab and connected to a vent pipe. A fan is attached to the vent pipe to lower the air pressure beneath the floor slab (i.e., depressurize) and withdraw soil gas from beneath the slab. Sub-slab soil gas is exhausted by the fan and discharged to outdoor air above the building roof line through an exhaust or vent stack. Monitoring points and devices are installed with the SSD system to confirm operation and allow monitoring of system performance.

ATTACHMENTS

Table 1 – Soil Analytical Results – Total Metals
Table 2 – Soil Analytical Results – Fuels and Volatile Organic Compounds
Table 3 – Groundwater Analytical Results – Total and Dissolved Metals and Cyanide
Table 4 – Groundwater Analytical Results – Volatile Organic Compounds
Table 5 – Groundwater Analytical Results - PFAS
Table 6 – Soil Vapor Analytical Results – Volatile Organic Compounds

Figure 1 – Site Location Map
Figure 2 – Site Features

TABLES

Table 1
Soil Analytical Results - Total Metals (mg/kg)
East Side Plating Plant #4
Portland, Oregon

Sample ID	Sample Date	Antimony	Arsenic	Beryllium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Zinc
B1/1.5	08/22/2022	4.0 U	13	3.3 U	1.3 U	26	31	15	0.053 U	23	3.3 U	0.67 U	2.7 U	81
B1/14.5	08/22/2022	3.3 U	3.0	2.7 U	1.1 U	31	25	2.9	0.028 U	17	2.7 U	0.54 U	2.2 U	57
B2/1.5	08/22/2022	4.0 U	13	3.3 U	1.3 U	40	28	14	0.053 U	20	3.3 U	0.67 U	2.7 U	80
B2/14.5	08/22/2022	3.3 U	2.7	2.8 U	1.1 U	16	27	4.4	0.044 U	16	2.8 U	0.55 U	2.2 U	60
B3/1.5	08/22/2022	3.7 U	9.5	3.1 U	1.2 U	26	17	11	0.049 U	16	3.1 U	0.61 U	2.4 U	74
B3/14.5	08/22/2022	3.2 U	2.3	2.7 U	1.1 U	9.6	22	2.8	0.043 U	14	2.7 U	0.54 U	2.2 U	50
B4/1.5	08/23/2022	4.3 U	12	3.5 U	52	171	30	14	0.057 U	29	3.5 U	0.71 U	2.8 U	102
B4/14.5	08/23/2022	3.6 U	1.7	3.0 U	1.2 U	9.3	20	2.7	0.048 U	11	3.0 U	0.59 U	2.4 U	51
B5/1.5	08/23/2022	3.9 U	14	3.2 U	4.9	26	12,000	18	0.052 U	421	3.2 U	0.65 U	2.6 U	94
B5/14.5	08/23/2022	3.4 U	3.1	2.8 U	1.1 U	11	27	3.0	0.045 U	11	2.8 U	0.56 U	2.2 U	52
B6/1.5	08/23/2022	3.9 U	6.8	3.3 U	55	26	143	73	0.12	5,890	3.3 U	0.93	2.6 U	3,280 U
B6/14.5	08/23/2022	3.2 U	1.7	2.7 U	19	14	22	2.1 U	0.043 U	242	2.7 U	0.53 U	2.1 U	42
B7/1.5	08/23/2022	3.4 UJ	4.5	2.8 U	1.1 U	28	23 J	4.4 J	0.045 U	61 J	2.8 U	0.56 U	2.2 UJ	58 J
B7/14.5	08/23/2022	3.4 U	2.0	2.8 U	1.1 U	26	24	2.7	0.045 U	14	2.8 U	0.56 U	2.2 U	46
B8/1.5	08/23/2022	4.1 U	4.6	3.4 U	1.4 U	18	19	5.5	0.054 U	62	3.4 U	0.68 U	2.7 U	60
B8/14.5	08/23/2022	3.3 U	1.7	2.7 U	1.1 U	8.4	17	3.0	0.043 U	42	2.7 U	0.54 U	2.2 U	50
B9/1.5	08/23/2022	4.1 U	16	3.4 U	1.4 U	392	25	59	0.055 U	9.7	3.4 U	1.2	2.7 U	249
B9/14.5	08/23/2022	3.2 U	3.1	2.7 U	9.4	14	20	2.9	0.043 U	84	2.7 U	0.53 U	2.1 U	178
B12/5	02/27/2023	4.1 U	7.9	3.4 U	1.4 U	20	22	13	0.054 U	18	3.4 U	0.68 U	2.7 U	73
B12/10	02/27/2023	3.3 U	1.9	2.8 U	1.1 U	10	16	3.7	0.044 U	14	2.8 U	0.55 U	2.2 U	50
B13/5	02/27/2023	4.1 U	8.5	3.4 U	26	19	24	13	0.055 U	29	3.4 U	0.68 U	2.7 U	75
B13/10	02/27/2023	4.0 U	4.8	3.3 U	1.3 U	19	20	6.7	0.053 U	24	3.3 U	0.66 U	2.6 U	65
B14/5	02/27/2023	3.8 U	4.5	3.2 U	1.8	32	22	6.8	0.051 U	106	3.2 U	0.64 U	2.6 U	83
B14/10	02/27/2023	3.2 U	2.4	2.7 U	2.4	30	29	4.5	0.043 U	31	2.7 U	0.54 U	2.2 U	54
DEQ RBC Screening Level Criteria for Soil[a]														
Ingestion, Dermal Contact, and Inhalation														
Occupational		NA	1.9	2,300	1,100	>Max	47,000	800	350	22,000	NA	5,800	NA	NA
Construction Worker		NA	15	700	350	530,000	14,000	800	110	7,000	NA	1,800	NA	NA
Excavation Worker		NA	420	19,000	9,700	>Max	390,000	800	2,900	190,000	NA	49,000	NA	NA
Volatilization to Outdoor Air														
Occupational		NA	NV	NV	NV	NV	NV	NV	NV	NV	NA	NV	NA	NA
Vapor Intrusion into Buildings														
Occupational		NA	NV	NV	NV	NV	NV	NV	NV	NV	NA	NV	NA	NA
Default Background Concentrations[b]														
Portland Basin		0.56	8.8	2.0	0.63	76	34	79	0.23	47	0.71	0.82	5.2	180

Note:
[a] Oregon Department of Environmental Quality (DEQ) Generic Risk-based concentrations (revised May 2018).
[b] DEQ, Background Levels of Metals in Soils for Cleanups Fact Sheet, Table 1 (updated January 25, 2018)
Metals analyzed by EPA Method 6020B
Mercury analyzed by EPA Method 7471B
mg/kg = milligrams per kilogram
J = Data Validation Qualifier. The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample. See the data validation report for additional information.
U = Undetected at method reporting limit shown
NA = Not applicable
>Max indicates the DEQ regards this concentration as not being "physically possible" since the constituent RBC exceeds likely free-phase levels
NV = This chemical is considered "nonvolatile" for purposes of the exposure calculations.

Table 2
Soil Analytical Results - Fuels and Volatile Organic Compounds (mg/kg)
East Side Plating Plant #4
Portland, Oregon

Location	Sample Date	GRO	DRO	RRO	PCE	TCE	cis-1,2-DCE	trans-1,2-DCE	1,1-DCE	Vinyl Chloride	1,1,1-TCA	1,1,2-TCA	1,1-DCA	Benzene	Ethylbenzene	Toluene	Total Xylenes	Naphthalene
B4/1.5	08/23/2022	6.8 U	5.7 U	14 U	0.0068 U	0.0034	0.0068 U	0.014 U	0.0068 U	0.0068 U	0.0068 U	0.0068 U	0.0068 U	0.0027 U	0.0068 U	0.014 U	0.018 U	0.034 U
B4/14.5	08/23/2022	5.2 U	4.8 U	12 U	0.0052 U	0.0021 U	0.0052 U	0.010 U	0.0052 U	0.0052 U	0.0052 U	0.0052 U	0.0052 U	0.0021 U	0.0052 U	0.010 U	0.014 U	0.026 U
B5/1.5	08/23/2022	-	-	-	0.0057 U	0.0023 U	0.0057 U	0.012 U	0.0057 U	0.0057 U	0.0057 U	0.0057 U	0.0057 U	0.0023 U	0.0057 U	0.012 U	0.015 U	0.029 U
B6/1.5	08/23/2022	-	-	-	0.34	4.0	0.031	0.0097 U	0.0049 U	0.0049 U	0.0070	0.0049 U	0.0049 U	0.0019 U	0.0076	0.0097 U	0.038	0.024 U
B7/1.5	08/23/2022	-	-	-	0.0052 U	0.0021 U	0.0052 U	0.010 U	0.0052 U	0.0052 U	0.0052 U	0.0052 U	0.0052 U	0.0021 U	0.0052 U	0.010 U	0.014 U	0.026 U
B8/1.5	08/23/2022	-	-	-	0.0065 U	0.0050	0.0065 U	0.013 U	0.0065 U	0.0065 U	0.0065 U	0.0065 U	0.0065 U	0.0026 U	0.0065 U	0.013 U	0.017 U	0.033 U
B9/1.5	08/23/2022	-	-	-	0.0078 U	0.0031 U	0.0078 U	0.016 U	0.0078 U	0.0078 U	0.0078 U	0.0078 U	0.0078 U	0.0031 U	0.0078 U	0.016 U	0.020 U	0.039 UJ
B10/5	02/21/2023	54 U	713	5,040	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B10/10	02/21/2023	5.2 U	5.2 U	13 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B10/15	02/21/2023	4.3 U	4.3 U	11 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B10/20	02/21/2023	4.2 U	4.2 U	11 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B10/25	02/21/2023	4.5 U	4.5 U	11 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B10/30	02/21/2023	4.4 U	4.4 U	11 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B10/35	02/21/2023	4.5 U	4.5 U	11 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B10/40	02/21/2023	4.6 U	4.6 U	12 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B10/45	02/21/2023	4.9 U	4.9 U	12 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B10/50	02/21/2023	5.0 U	5.0 U	13 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B11/5	02/22/2023	5.6 U	5.6 U	14 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B11/10	02/22/2023	4.5 U	4.5 U	11 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B11/15	02/22/2023	4.8 U	4.8 U	12 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B11/20	02/22/2023	4.9 U	4.9 U	12 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B11/25	02/22/2023	4.6 U	4.6 U	11 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B11/30	02/22/2023	4.4 U	4.4 U	11 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B11/35	02/22/2023	5.3 U	5.3 U	13 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B11/40.5	02/22/2023	4.8 U	4.8 U	12 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B11/45	02/22/2023	4.4 U	4.4 U	11 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B11/50	02/22/2023	5.3 U	5.3 U	13 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B12/5	02/27/2023	5.4 U	5.4 U	14 U	0.0053 U	0.0021 U	0.0053 U	0.011 U	0.0053 U	0.0053 U	0.0053 U	0.0053 U	0.0053 U	0.0021 U	0.0053 U	0.011 U	0.014 U	0.027 U
B12/10	02/27/2023	4.4 U	4.4 U	11 U	0.0030 U	0.0012 U	0.0030 U	0.0060 U	0.0030 U	0.0030 U	0.0030 U	0.0030 U	0.0030 U	0.0012 U	0.0030 U	0.0060 U	0.0078 U	0.015 U
B12/15	02/27/2023	4.4 U	4.4 U	11 U	0.0030 U	0.0013	0.0030 U	0.0060 U	0.0030 U	0.0030 U	0.0030 U	0.0030 U	0.0030 U	0.0012 U	0.0030 U	0.0060 U	0.0078 U	0.015 U
B12/20	02/27/2023	4.6 U	4.6 U	12 U	0.0036 U	0.0014 U	0.0036 U	0.0071 U	0.0036 U	0.0036 U	0.0036 U	0.0036 U	0.0036 U	0.0014 U	0.0036 U	0.0071 U	0.0093 U	0.018 U
B12/25	02/27/2023	4.2 U	4.2 U	11 U	0.0031 U	0.0012 U	0.0031 U	0.0062 U	0.0031 U	0.0031 U	0.0031 U	0.0031 U	0.0031 U	0.0012 U	0.0031 U	0.0062 U	0.0080 U	0.015 U
B12/30	02/27/2023	4.2 U	4.2 U	11 U	0.0031 U	0.0012 U	0.0031 U	0.0062 U	0.0031 U	0.0031 U	0.0031 U	0.0031 U	0.0031 U	0.0012 U	0.0031 U	0.0062 U	0.0081 U	0.016 U
B12/35	02/27/2023	4.3 U	4.3 U	11 U	0.0028 U	0.0011 U	0.0028 U	0.0057 U	0.0028 U	0.0028 U	0.0028 U	0.0028 U	0.0028 U	0.0011 U	0.0028 U	0.0057 U	0.0074 U	0.014 U
B12/40	02/27/2023	4.2 U	4.2 U	11 U	0.0029 U	0.0012 U	0.0029 U	0.0059 U	0.0029 U	0.0029 U	0.0029 U	0.0029 U	0.0029 U	0.0012 U	0.0029 U	0.0059 U	0.0076 U	0.015 U
B12/45	02/27/2023	4.5 U	4.5 U	11 U	0.0031 U	0.0017	0.0031 U	0.0062 U	0.0031 U	0.0031 U	0.0031 U	0.0031 U	0.0031 U	0.0012 U	0.0031 U	0.0062 U	0.0081 U	0.016 U
B12/50	02/27/2023	4.5 U	4.5 U	11 U	0.0043	0.0032	0.0032 U	0.0063 U	0.0032 U	0.0032 U	0.0032 U	0.0032 U	0.0032 U	0.0013 U	0.0032 U	0.0063 U	0.0082 U	0.016 U
B13/5	02/27/2023	5.5 U	5.5 U	14 U	0.0044 U	0.0018 U	0.0044 U	0.0089 U	0.0044 U	0.0044 U	0.0044 U	0.0044 U	0.0044 U	0.0018 U	0.0044 U	0.0089 U	0.012 U	0.022 U
B13/10	02/27/2023	5.3 U	5.3 U	13 U	0.0043 U	0.0017 U	0.0043 U	0.0086 U	0.0043 U	0.0043 U	0.0043 U	0.0043 U	0.0043 U	0.0017 U	0.0043 U	0.0086 U	0.011 U	0.021 U
B13/15	02/27/2023	4.3 U	4.3 U	11 U	0.0030 U	0.0012 U	0.0030 U	0.0060 U	0.0030 U	0.0030 U	0.0030 U	0.0030 U	0.0030 U	0.0012 U	0.0030 U	0.0060 U	0.0078 U	0.015 U
B13/20	02/27/2023	4.5 U	4.5 U	11 U	0.0032 U	0.0013 U	0.0032 U	0.0064 U	0.0032 U	0.0032 U	0.0032 U	0.0032 U	0.0032 U	0.0013 U	0.0032 U	0.0064 U	0.0083 U	0.016 U
B13/25	02/27/2023	4.2 U	4.2 U	11 U	0.0030 U	0.0012 U	0.0030 U	0.0060 U	0.0030 U	0.0030 U	0.0030 U	0.0030 U	0.0030 U	0.0012 U	0.0030 U	0.0060 U	0.0078 U	0.015 U
B13/30	02/27/2023	4.3 U	4.3 U	11 U	0.0039 U	0.0016 U	0.0039 U	0.0078 U	0.0039 U	0.0039 U	0.0039 U	0.0039 U	0.0039 U	0.0016 U	0.0039 U	0.0078 U	0.010 U	0.020 U
B13/35	02/27/2023	5.0 U	5.0 U	13 U	0.0038 U	0.0015 U	0.0038 U	0.0075 U	0.0038 U	0.0038 U	0.0038 U	0.0038 U	0.0038 U	0.0015 U	0.0038 U	0.0075 U	0.0098 U	0.019 U
B13/40	02/27/2023	4.2 U	4.2 U	11 U	0.0029 U	0.0012 U	0.0029 U	0.0059 U	0.0029 U	0.0029 U	0.0029 U	0.0029 U	0.0029 U	0.0012 U	0.0029 U	0.0059 U	0.0077 U	0.015 U
B13/45	02/27/2023	5.2 U	5.2 U	13 U	0.0040 U	0.0016 U	0.0040 U	0.0079 U	0.0040 U	0.0040 U	0.0040 U	0.0040 U	0.0040 U	0.0016 U	0.0040 U	0.0079 U	0.010 U	0.020 U
B13/50	02/27/2023	4.9 U	4.9 U	12 U	0.0038 U	0.0022	0.0038 U	0.0076 U	0.0038 U	0.0038 U	0.0038 U	0.0038 U	0.0038 U	0.0015 U	0.0038 U	0.0076 U	0.0098 U	0.019 U
B14/5	02/27/2023	5.1 U	5.1 U	13 U	0.0041 U	0.0016 U	0.0041 U	0.0082 U	0.0041 U	0.0041 U	0.0041 U	0.0041 U	0.0041 U	0.0016 U	0.0041 U	0.0082 U	0.011 U	0.020 U
B14/10	02/27/2023	4.3 U	21	79	0.0030 U	0.0012 U	0.0030 U	0.0059 U	0.0030 U	0.0030 U	0.0030 U	0.0030 U	0.0030 U	0.0012 U	0.0030 U	0.0059 U	0.0077 U	0.015 U
B14/15	02/27/2023	4.3 U	4.3 U	11 U	0.0029 U	0.0012 U	0.0029 U	0.0058 U	0.0029 U	0.0029 U	0.0029 U	0.0029 U	0.0029 U	0.0012 U	0.0029 U	0.0058 U	0.0075 U	0.015 U
B14/20	02/27/2023	4.4 U	4.4 U	11 U	0.0030 U	0.0012 U	0.0030 U	0.0061 U	0.0030 U	0.0030 U	0.0030 U	0.0030 U	0.0030 U	0.0012 U	0.0030 U	0.0061 U	0.0079 U	0.015 U
B14/25	02/27/2023	4.5 U	4.5 UJ	11 U	0.0036 U	0.0014 U	0.0036 U	0.0072 U	0.0036 U	0.0036 U	0.0036 U	0.0036 U	0.0036 U	0.0014 U	0.0036 U	0.0072 U	0.0093 U	0.018 U
B14/30	02/27/2023	4.3 U	4.3 U	11 U	0.0031 U	0.0012 U	0.0031 U	0.0062 U	0.0031 U	0.0031 U	0.0031 U	0.0031 U	0.0031 U	0.0012 U	0.0031 U	0.0062 U	0.0081 U	0.016 U
B14/35	02/27/2023	5.0 U	5.0 U	12 U	0.0037 U	0.0015 U	0.0037 U	0.0075 U	0.0037 U	0.0037 U	0.0037 U	0.0037 U	0.0037 U	0.0015 U	0.0037 U	0.0075 U	0.0097 U	0.019 U
B14/40	02/27/2023	4.4 U	4.4 U	11 U	0.0039 U	0.0016 U	0.0039 U	0.0078 U	0.0039 U	0.0039 U	0.0039 U	0.0039 U	0.0039 U	0.0016 U	0.0039 U	0.0078 U	0.010 U	0.020 U

Table 2
Soil Analytical Results - Fuels and Volatile Organic Compounds (mg/kg)
East Side Plating Plant #4
Portland, Oregon

Location	Sample Date	GRO	DRO	RRO	PCE	TCE	cis-1,2-DCE	trans-1,2-DCE	1,1-DCE	Vinyl Chloride	1,1,1-TCA	1,1,2-TCA	1,1-DCA	Benzene	Ethylbenzene	Toluene	Total Xylenes	Naphthalene
B14/45	02/27/2023	5.3 U	5.3 U	13 U	0.0042 U	0.0017 U	0.0042 U	0.0085 U	0.0042 U	0.0042 U	0.0042 U	0.0042 U	0.0042 U	0.0017 U	0.0042 U	0.0085 U	0.011 U	0.021 U
B14/50.5	02/28/2023	5.1 U	5.1 U	13 U	0.0065	0.0016 U	0.0041 U	0.0082 U	0.0041 U	0.0041 U	0.0041 U	0.0041 U	0.0041 U	0.0016 U	0.0041 U	0.0082 U	0.011 U	0.021 U
DEQ RBC Screening Level Criteria for Soil[a]																		
Ingestion, Dermal Contact, and Inhalation																		
Occupational		20,000	14,000	14,000	1,000	51	2,300	23,000	29,000	4.4	870,000	26	260	37	150	88,000	25,000	23
Construction Worker		9,700	4,600	4,600	1,800	130	710	7,100	13,000	34	470,000	54	3,200	380	1,700	28,000	20,000	580
Excavation Worker		>Max	>Max	>Max	50,000	3,700	20,000	200,000	370,000	950	>Max	1,500	89,000	11,000	49,000	770,000	560,000	16,000
Volatilization to Outdoor Air																		
Occupational		69,000	>Max	>Max	>Csat	96	>Max	>Max	>Csat	89	>Csat	24	240	50	160	>Csat	>Csat	83
Vapor Intrusion into Buildings																		
Occupational		>Max	>Max	>Max	36	2.3	>Max	>Max	630	2.2	>Csat	4.2	5.9	2.1	17	>Csat	>Csat	83
Leaching to Groundwater																		
Occupational		130	>Max	>Max	1.9	0.087	4.5	51	32	0.010	880	0.029	0.20	0.10	0.90	490	100	0.34

Notes:
[a]Oregon Department of Environmental Quality (DEQ) Generic Risk-based Concentrations (RBCs) (revised May 2018)
Volatile organic compounds (VOCs) analyzed by EPA Method 8260D
Gasoline range organics (GRO) analyzed by Method NWTPH-Gx
Diesel and Oil range organics (DRO and RRO) analyzed by Method NWTPH-Dx
DCA = Dichloroethane
DCE = Dichloroethene
PCE = Tetrachloroethene
TCA = Trichloroethane
TCE = Trichloroethene
mg/kg = Milligrams per kilogram
U = Undetected at method reporting limit shown
J = Data Validation Qualifier. The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample. See the data validation report for additional information.
- = Not analyzed for this parameter
NA = Not applicable
>Max indicates the DEQ regards this concentration as not being "physically possible" since the constituent RBC exceeds likely free-phase levels
>Csat = This soil RBC exceeds the limit of three-phase equilibrium partitioning. Refer to "ChemData" page of the RBDM for the corresponding value of Csat. Soil concentrations in excess of Csat indicate that free product might be present. See Section B.2.1.4 for additional information.

Table 3
Groundwater Analytical Results - Total and Dissolved Metals and Cyanide (ug/L)
East Side Plating Plant #4
Portland, Oregon

Sample ID	Sample Date	Total Antimony	Dissolved Antimony	Total Arsenic	Dissolved Arsenic	Total Beryllium	Dissolved Beryllium	Total Cadmium	Dissolved Cadmium	Hexavalent Chromium	Total Chromium	Dissolved Chromium	Total Copper	Dissolved Copper	Total Lead	Dissolved Lead	Total Mercury	Dissolved Mercury	Total Nickel	Dissolved Nickel
B-1	08/22/2022	4.0 U	4.0 U	2.0 U	2.0 U	2.0 U	2.0 U	1.0 U	1.0 U	2.3	3.2	3.4	5.0 U	5.0 U	2.0 U	2.0 U	2.0 U	0.20 U	4.2	4.0
B-2	08/22/2022	4.0 U	4.0 U	2.0 U	2.0 U	2.0 U	2.0 U	1.0 U	1.0 U	0.53	2.0 U	2.0 U	7.7	7.2	2.0 U	2.0 U	0.20 U	0.20 U	17	16
B-3	08/23/2022	4.0 U	4.0 U	2.0 U	2.0 U	2.0 U	2.0 U	1.0 U	1.0 U	0.50 U	2.0 U	2.0 U	18	16	2.0 U	2.0 U	0.20 U	0.20 U	13	13
B-10	02/21/2023	4.0 U	4.0 U	10	2.0 U	8.8	2.0 U	3.7 J	1.0 U	-	140	2.0 U	175	5.0 U	14	2.0 U	2.0 U	0.20 U	175	5.0
B-11	02/22/2023	4.0 U	4.0 U	6.8 J	2.0 U	4.5	2.0 U	6.9	1.0 U	-	46	2.0 U	110 J	5.0 U	21	2.0 U	2.0 U	0.20 U	84 J	3.2
B-12	02/27/2023	40 U	4.0 U	152	2.0 U	25	2.0 U	10 U	1.0 U	-	903	2.0 U	862	5.0 U	268	2.0 U	2.0 U	0.20 U	742	4.2
B-13	02/27/2023	40 U	4.0 U	85	2.0 U	20 U	2.0 U	10 U	1.0 U	-	630	2.0 U	529	6.6	163	2.0 U	2.0 U	0.20 U	455	4.5
B-14	02/28/2023	40 U	4.0 U	69	2.0 U	20 U	2.0 U	10 U	1.0 U	-	151	2.0 U	228	5.0 U	106	2.0 U	2.0 U	0.20 U	699	98
Volatilization to Outdoor Air																				
Occupational		NA	NA	NA	NA	NA	NA	NA	NA	NV	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vapor Intrusion into Buildings																				
Occupational		NA	NA	NA	NA	NA	NA	NA	NA	NV	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
GW in an Excavation																				
Construction/Excavation		NA	NA	6,300	6,300	270,000	270,000	130,000	130,000	9,400	>S / 9,400	>S / 9,400	5,400,000	5,400,000	>S	>S	>S	>S	>S	>S

Table 3
Groundwater Analytical Results - Total and Dissolved Metals and Cyanide (ug/L)
East Side Plating Plant #4
Portland, Oregon

Sample ID	Sample Date	Total Selenium	Dissolved Selenium	Total Silver	Dissolved Silver	Total Thallium	Dissolved Thallium	Total Zinc	Dissolved Zinc	Total Cyanide
B-1	08/22/2022	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	25 U	25 U	5.0 U
B-2	08/22/2022	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	25 U	25 U	5.0 U
B-3	08/23/2022	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	25 U	25 U	5.0 U
B-10	02/21/2023	6.6	2.0 U	2.0 U	2.0 U	2.0 U	4.5	353	25 U	-
B-11	02/22/2023	3.6 J	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	341	25 U	-
B-12	02/27/2023	20 U	2.0 U	20 U	2.0 U	20 U	2.0 U	2,080	25 U	-
B-13	02/27/2023	20 U	2.0 U	20 U	2.0 U	20 U	2.0 U	1,300	25 U	-
B-14	02/28/2023	20 U	2.0 U	20 U	2.0 U	20 U	2.0 U	580	25 U	-
Volatilization to Outdoor Air										
Occupational		NA	NA	NA	NA	NA	NA	NA	NA	NV
Vapor Intrusion into Buildings										
Occupational		NA	NA	NA	NA	NA	NA	NA	NA	NV
GW in an Excavation										
Construction/Excavation		NA	NA	1,100,000	1,100,000	NA	NA	NA	NA	81,000

Table 3
Groundwater Analytical Results - Total and Dissolved Metals and Cyanide (ug/L)
East Side Plating Plant #4
Portland, Oregon

Note:
[a] Oregon Department of Environmental Quality (DEQ) Generic Risk-Based Concentrations (revised May 2018)
Metals by EPA Method 6020B
Hexavalent Chromium by Method SM3500Cr C-2011
Mercury by EPA Method 7470A
Cyanide by Method SM 4500CN E-2011
ug/L = Micrograms per Liter
U = Undetected at method reporting limit shown
J = Data Validation Qualifier. The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample. See data validation report for additional information.
- = Not analyzed for this parameter
NA = Not applicable
NV = This chemical is considered "nonvolatile" for purposes of the exposure calculations.
>S = This groundwater RBC exceeds the solubility limit. Refer to Appendix D of the RBDM for the corresponding value of S. Groundwater concentrations in excess of S indicate that free product may be present. See Section B.2.1.4 for additional information.

Table 4
Groundwater Analytical Results - Volatile Organic Compounds (ug/L)
East Side Plating Plant #4
Portland, Oregon

Location	Sample Date	GRO	DRO	RRO	PCE	TCE	cis-1,2-DCE	trans-1,2-DCE	1,1-DCE	Vinyl Chloride	1,1,1-TCA	1,1,2-TCA	1,1-DCA	Benzene	Ethylbenzene	Toluene	Total Xylenes	Naphthalene
B-1	08/22/2022	100 U	142	424	0.50 U	2.1	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	1.5 U	2.5 UJ
B-2	08/22/2022	100 U	111 U[1]	278 U[1]	4.1	12	1.2	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	1.5 U	2.5 UJ
B-3	08/23/2022	100 U	188 [1]	295 U[1]	5.1	13	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	1.5 U	2.5 U
B-10	02/21/2023	100 U	100 U	250 U	1.2	26	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	1.5 U	2.5 U
B-11	02/22/2023	100 U	100 U	250 U	1.2	34	0.52	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	1.5 U	2.5 U
B-12	02/27/2023	200 U	100 U	250 U	1.0 U	3.9	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	3.0 U	5.0 U
B-13	02/27/2023	100 U	111 U	278 U	1.6	3.0	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	1.5 U	2.5 U
B-14	02/28/2023	100 U	111 U[1]	278 U[1]	2.7	1.1	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.69	0.50 U	2.5	2.5 U
DEQ RBC Screening Level Criteria for Groundwater[a]																		
Ingestion/Inhalation from Tapwater																		
Occupational		450	430	430	48	3.3	260	2,600	1,400	0.49	37,000	1.3	13	2.1	6.4	6,300	830	0.72
Volatilization to Outdoor Air																		
Occupational		>S	>S	>S	>S	20,000	>S	>S	2,400,000	5,900	>S	21,000	68,000	14,000	43,000	>S	>S	16,000
Vapor Intrusion into Buildings																		
Occupational		>S	>S	>S	48,000	3,700	>S	>S	360,000	880	>S	11,000	14,000	2,800	8,200	>S	>S	11,000
GW in an Excavation																		
Construction/Excavation		14,000	>S	>S	5,600	430	18,000	180,000	44,000	960	1,100,000	49	10,000	1,800	4,500	220,000	23,000	500
EPA Vapor Intrusion Screening Levels[b]																		
Commercial		NA	NA	NA	24.2	2.18	105	45.7	82.1	2.45	3,110	2.6	33.4	6.93	15.2	8,070	162	20.1

Notes:
[a] Oregon Department of Environmental Quality (DEQ) Generic Risk-Based Concentrations (RBCs) (revised May 2018)
[b] Environmental Protection Agency (EPA), Vapor Intrusion Screening Level (VISL) Calculator.
[1] Laboratory Qualifier. An aliquot for anaysis was taken from the original container received due to the level of sediment present in the sample. Rinsing of the original container for inclusion in the sample extraction was not performed.
Volatile organic compounds (VOCs) analyzed by EPA Method 8260D
Gasoline Range Organics (GRO) analyzed by Method NWTPH-Gx
Diesel and Residual Range Organics (DRO and RRO) analyzed by Method NWTPH-Dx
ug/L = Micrograms per Liter
DCA = Dichloroethane
DCE = Dichloroethene
PCE = Tetrachloroethene
TCA = Trichloroethane
TCE = Trichloroethene
U = Undetected at method reporting limit shown
J = Data Validation Qualifier. The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- = Not analyzed for this parameter
NA = Not applicable or Not available
>S = This groundwater RBC exceeds the solubility limit. Refer to Appendix D of the RBDM for the corresponding value of S. Groundwater concentrations in excess of S indicate that free product may be present. See Section B.2.1.4 for additional information.

Table 5
Groundwater Analytical Results - Per- and Polyfluoroalkyl Substances (PFAS) (ng/L)
East Side Plating Plant #4
Portland, Oregon

Sample ID	Sample Date	PFBS	PFHxA	HFPO-DA	PFHpA	ADONA	PFHxS	PFOA	PFNA	PFOS	9C1-PF3ONS	PFDA	MeFOSAA	EtFOSAA	PFUnA	11Cl-PF3OUdS	PFDoA	PFTrDA	PFTeDA
B-1	08/22/2022	13	23	2.0 U	3.0	2.0 U	10	16	2.0 U	573	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
B-2	08/22/2022	21	15	2.0 U	3.2	2.0 U	26	5.6 J	2.0 U	61	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
B-3	08/23/2022	6.5	9.1	2.0 U	4.2	2.0 U	21	11	2.0 U	78	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 UJ
B-10	02/21/2023	5.9	8.4	1.9 U	5.3	1.9 U	20	16	1.9 U	80	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
B-11	02/22/2023	6.6	9.3	1.9 U	5.1	1.9 U	17	16	3.0	107	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
B-12	02/27/2023	3.5	4.5	1.8 U	2.9	1.8 U	8.0	8.1	1.8 U	28	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U
B-13	02/27/2023	4.0	3.4	1.9 U	2.1	1.9 U	5.6	4.3	1.9 U	16	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
B-14	02/28/2023	3.8	6.7	1.9 U	3.8	1.9 U	7.0	8.0	1.9 U	22	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
EPA Regional Screening Levels[1]																			
Carcinogenic		-	-	-	-	-	-	1,100	-	-	-	-	-	-	-	-	-	-	
Noncarcinogenic		6,000	-	60	-	-	390	60	59	40	-	-	-	-	-	-	-	-	

Notes:
[1] Environmental Protection Agency (EPA) Regional Screening Level (RSL) Resident Soil to GW Table, May 2022.
PFAS analyzed by PFAS Isotope Dilution (Modified Method 537, Vista Analytical Laboratory).
PFBS = Perfluorbutanesulfonic acid
PFHxA = Perfluorohexanoic acid
HFPO-DA = Hexafluoropropylene oxide dimer acid
PFHpA = Perfluoroheptanoic acid
ADONA = 4,8-dioxa-3H-perfluorononanoic acid
PFHxS = Perfluorohexanesulfonoic acid
PFOA = Perfluorooctanoic acid
PFNA = Perfluorononaoic acid
PFOS = Perfluorooctanesulfonic acid
9C1-PF3ONS = 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid
PFDA = Perfluorodecanoic acid
MeFOSAA = N-Methylperfluoro-1-octanesulfonamido acetic acid
EtFOSAA = N-Ethyperfluoro-1-octanesulfonamido acetic acid
PFUnA = Perfluoroundecanoic acid
11Cl-PF3OUds = 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid
PFDoA = Perfluorododecanoic acid
PFTrDA = Perfluorotridecanoic acid
PFTeDA = Perfluorotetradecanoic acid
ug/L = Micrograms per Liter
J = Data Validation Qualifier. The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
U = Undetected at method reporting limit shown

Table 6

Soil Vapor Analytical Results - Volatile Organic Compounds (ug/m^3)

East Side Plating Plant #4

Portland, Oregon

Location	Date	Gasoline	Benzene	Toluene	Ethylbenzene	Total Xylenes	PCE	TCE	cis-1,2-DCE	trans-1,2-DCE	1,1-DCE	1,1-DCA	Vinyl Chloride	Freon 12	Chloromethane
SG-1	08/31/2022	-	1.7	17	7.6	47	5,590	3,740	1.1	0.79 U	0.79 U	1.1	0.51 U	2.3	0.41 U
SG-2	08/31/2022	-	1.1	20	8.8	51	957	1,610	0.79 U	0.79 U	0.79 U	0.80 U	0.51 U	2.1	0.41 U
SG-3	08/31/2022	-	0.83	20	9.8	60	434	1,080	0.79 U	1.7	0.79 U	2.0	0.51 U	2.3	0.41 U
B-10	02/21/2023	8,180	34	186	715	3,330	165	45	0.79 U	0.79 U	0.79 U	0.80 U	0.51 U	0.99 U	0.86
B-11	02/22/2023	4,590	27	127	228	1,070	285	1,130	86	2.7	0.79 U	0.80 U	0.51 U	2.0	0.98
B-12	02/22/2023	826 U	1.4	11	9.0	48	5.7	9.0	0.79 U	0.79 U	0.79 U	0.80 U	0.51 U	2.4	0.81
B-13	02/27/2023	1,170 J	14	105	54	233	1.4 U	2.4	0.79 U	0.79 U	0.79 U	0.80 U	0.51 U	2.4	1.6
B-14	02/27/2023	826 U	5.1	35	29	135	18	12	0.79 U	0.79 U	0.79 U	0.80 U	0.51 U	2.5	0.41 U
SG-4	03/02/2023	1,280 J	0.64 U	1.9 U	3.1	12	686	308	0.79 U	0.79 U	0.79 U	0.80 U	0.51 U	0.99 U	0.41 U
SG-5	03/02/2023	1,690 J	0.64 U	1.9 U	1.9	8.1	1,060	1,820	4.5	0.79 U	0.79 U	0.80 U	0.51 U	2.2	0.41 U
SG-6	03/02/2023	826,000 U	0.99	1.9 U	2.6	9.5	35,800	23,800	112	16	3.4	16	0.51 U	2.2	0.41 U
SG-7	03/02/2023	14,200	4.3	1.9 U	3.1	17	5,210	26,400	1,240	113	6.3	19	0.51 U	2.1	0.41 U
SG-8	03/02/2023	4,670	0.64 U	1.9 U	2.1	7.4	1,430	6,000	10	9.4	1.7	19	0.51 U	2.2	0.41 U
SG-9	03/02/2023	12,400	1.6	1.9 U	1.0	4.7	443	34,900	54	8.2	7.7	73	0.51 U	2.1	0.43
SG-10	03/02/2023	1,250 J	0.64 U	2.7	2.6	11	930	304	0.79 U	0.79 U	0.79 U	0.80 U	0.51 U	1.9	0.41 U
SG-11	03/02/2023	826 U	0.64 U	1.9 U	2.2	9.8	40	58	0.79 U	0.79 U	0.79 U	0.80 U	0.51 U	1.7	0.41 U
SG-12	03/02/2023	3,260	0.64 U	1.9	3.3	15	259	342	0.79 U	0.79 U	0.79 U	0.80 U	0.51 U	2.1	0.41 U
SG-13	03/02/2023	1,620 J	0.64 U	7.5	3.7	16	1,370	377	1.4	1.1	1.4	1.9	0.51 U	2.2	0.41 U
DEQ RBC Screening Level Criteria for Soil Gas[a]															
Vapor Intrusion Into Buildings															
Occupational		1,700,000	1,600	21,900,000	4,900	440,000	47,000	2,900	>Pv	>Pv	880,000	7,700	2,800	NA	390,000
DEQ RBC Screening Level Criteria for Air[a]															
Inhalation															
Occupational		1,700	1.6	22,000	4.9	440	47	2.9	>Pv	>Pv	880	7.7	2.8	NA	390
EPA Vapor Intrusion Screening Levels[b]															
Commercial		NA	52.4	73,000	164	1,460	584	29.2	584	584	2,920	256	92.9	1,460	1,310

Table 6

Soil Vapor Analytical Results - Volatile Organic Compounds (ug/m^3)

East Side Plating Plant #4

Portland, Oregon

Location	Date	Chloroform	1,1,1-TCA	Carbon Tetrachloride	1,3-Butadiene	Freon 11	Ethanol	Acetone	2-Propanol	Carbon Disulfide	Methylene Chloride	n-Hexane	2-Butanone	Cyclohexane	1,4-Dioxane
SG-1	08/31/2022	75	94	1.3 U	4.4 U	1.5	13	5.4	3.1 U	0.62 U	0.69 U	2.2 U	3.7 U	0.69 U	0.72 U
SG-2	08/31/2022	0.97 U	85	1.3 U	4.4 U	1.5	136	12	3.1 U	0.62 U	0.69 U	2.2 U	6.6	0.69 U	0.72 U
SG-3	08/31/2022	15	40	1.3 U	4.4 U	1.6	76	15	3.8	0.99	1.1	2.2 U	6.6	0.69 U	1.4
B-10	02/21/2023	0.97 U	1.1 U	1.3 U	13	1.1 U	219 J	103	22	0.62 U	0.69 U	124	40	43	0.72 U
B-11	02/22/2023	0.97 U	1.1 U	1.3 U	4.4 U	1.1 U	70	105	14	0.78	0.69 U	70	27	28	0.72 U
B-12	02/22/2023	13	1.1 U	1.3 U	4.4 U	1.4	18	48	15	0.62 U	0.69 U	2.2 U	10	0.90	0.72 U
B-13	02/27/2023	0.97 U	1.1 U	1.3 U	4.4 U	1.3	49	36	13	1.0	1.3	13	7.1	1.9	0.72 U
B-14	02/27/2023	22	1.4	1.3 U	4.4 U	6.7	17	25	4.0	0.62 U	0.69 U	5.5	4.3	0.69 U	0.72 U
SG-4	03/02/2023	22	5.0	1.3 U	4.4 U	2.3	10	3.0 U	3.1 U	0.62 U	0.69 U	2.2 U	3.7 U	0.69 U	0.72 U
SG-5	03/02/2023	3.5	65	1.3 U	4.4 U	1.2	5.5	3.0 U	3.3	0.62 U	0.69 U	2.2 U	3.7 U	0.69 U	0.72 U
SG-6	03/02/2023	47	32	1.3 U	4.4 U	1.4	2.6	3.0 U	3.1 U	0.62 U	0.69 U	2.2 U	3.7 U	0.69 U	0.72 U
SG-7	03/02/2023	57	134	1.3 U	4.4 U	3.4	63	16	8.8	0.62 U	0.69 U	2.2 U	3.7 U	0.77	0.72 U
SG-8	03/02/2023	236	11	1.3 U	4.4 U	4.8	3.4	4.3	3.1 U	0.62 U	4.9	2.2 U	3.7 U	0.69 U	0.72 U
SG-9	03/02/2023	34	45	1.3 U	4.4 U	1.4	22	5.9	3.1 U	0.62 U	3.4	2.2 U	3.7 U	2.2	0.72 U
SG-10	03/02/2023	2.0	7.1	1.3 U	4.4 U	3.2	38	34	12	0.62 U	2.8	2.2 U	7.2	0.69 U	0.72 U
SG-11	03/02/2023	0.97 U	1.1 U	1.3 U	4.4 U	1.7	2.4 U	3.0 U	3.1 U	0.62 U	0.69 U	2.2 U	3.7 U	0.69 U	0.72 U
SG-12	03/02/2023	9.4	8.8	1.3 U	4.4 U	7.1	25	46	8.8	0.62 U	0.69 U	2.2 U	9.3	0.69 U	0.72 U
SG-13	03/02/2023	128	10	1.3 U	4.4 U	3.9	89	28	6.4	0.62 U	0.69 U	12	3.9	1.2	0.72 U
DEQ RBC Screening Level Criteria for Soil Gas[a]															
Vapor Intrusion Into Buildings															
Occupational		530	21,900,000	2,000	NA	3,100,000	NA	NA	NA	NA	NA	NA	NA	NA	2,500
DEQ RBC Screening Level Criteria for Air[a]															
Inhalation															
Occupational		0.53	22,000	2.0	NA	3,100	NA	NA	NA	NA	NA	NA	NA	NA	2.5
EPA Vapor Intrusion Screening Levels[b]															
Commercial		17.8	73,000	68.1	13.6	NA	NA	NA	2,920	10,200	8,760	10,200	73,000	87,600	81.8

Table 6

Soil Vapor Analytical Results - Volatile Organic Compounds (ug/m^3)

East Side Plating Plant #4

Portland, Oregon

Location	Date	Tetrahydrofuran	4-Methyl-2-pentanone	Cumene	Propylbenzene	4-Ethyltoluene	1,3,5-TMB	1,2,4-TMB	1,3-Dichlorobenzene
SG-1	08/31/2022	0.59 U	5.1 U	0.98 U	-	0.98 U	0.98 U	2.5	1.2 U
SG-2	08/31/2022	0.59 U	5.1 U	0.98 U	-	0.98 U	0.98 U	2.9	1.2 U
SG-3	08/31/2022	0.59 U	5.1 U	0.98 U	-	0.98 U	1.0	3.6	1.2 U
B-10	02/21/2023	0.59 U	7.5	0.98 U	-	83	31	99	1.2 U
B-11	02/22/2023	0.59 U	5.1 U	0.98 U	-	38	14	48	1.2 U
B-12	02/22/2023	0.59 U	5.1 U	0.98 U	-	6.9	3.8	14	1.2 U
B-13	02/27/2023	0.59 U	5.1 U	3.0	-	8.4	8.4	23	1.2 U
B-14	02/27/2023	0.59 U	5.1 U	1.6	-	5.2	4.6	15	1.2 U
SG-4	03/02/2023	0.59 U	5.1 U	0.98 U	-	1.5	1.2	5.3	1.2 U
SG-5	03/02/2023	0.59 U	5.1 U	0.98 U	-	0.98 U	0.98 U	1.7	1.2 U
SG-6	03/02/2023	0.59 U	5.1 U	0.98 U	-	0.98 U	0.98 U	3.7	1.2 U
SG-7	03/02/2023	0.59 U	5.1 U	0.98 U	-	0.99	3.1	0.98 U	1.2 U
SG-8	03/02/2023	0.59 U	5.1 U	0.98 U	-	0.98 U	0.98 U	2.4	1.2 U
SG-9	03/02/2023	0.78	5.1 U	0.98 U	-	0.98 U	0.98 U	0.98 U	1.2 U
SG-10	03/02/2023	0.59 U	5.1 U	0.98 U	-	0.98 U	0.98 U	3.4	1.2 U
SG-11	03/02/2023	0.59 U	5.1 U	0.98 U	-	0.98 U	0.98 U	1.1	1.2 U
SG-12	03/02/2023	0.59 U	10	0.98 U	-	0.98 U	0.98 U	2.5	1.2 U
SG-13	03/02/2023	0.59 U	5.1 U	0.98 U	-	0.98 U	0.98 U	1.3	1.2 U
DEQ RBC Screening Level Criteria for Soil Gas[a]									
Vapor Intrusion Into Buildings									
Occupational		NA	NA	1,800,000	NA	NA	260,000	260,000	NA
DEQ RBC Screening Level Criteria for Air[a]									
Inhalation									
Occupational		NA	NA	1,800	NA	NA	260	260	NA
EPA Vapor Intrusion Screening Levels[b]									
Commercial		29,200	43,800	5,840	NA	NA	876	876	NA

Table 6

Soil Vapor Analytical Results - Volatile Organic Compounds (ug/m^3)

East Side Plating Plant #4

Portland, Oregon

Notes:

[a] Oregon Department of Environmental Quality (DEQ) Generic Risk-based concentrations (revised May 2018)

[b] Environmental Protection Agency (EPA), Vapor Intrusion Screening Level (VISL) Calculator.

Volatile organic compounds (VOCs) analyzed by Modified TO-15/TO-15 SIM

ug/m^3 = Micrograms per cubic meter

DCA = Dichloroethane

DCE = Dichloroethene

PCE = Tetrachloroethene

TCA = Trichloroethane

TMB = Trimethylbenzene

Freon 12 = Dichlorodifluoromethane

Freon 11 = Trichlorofluoromethane

U = Undetected at method reporting limit shown

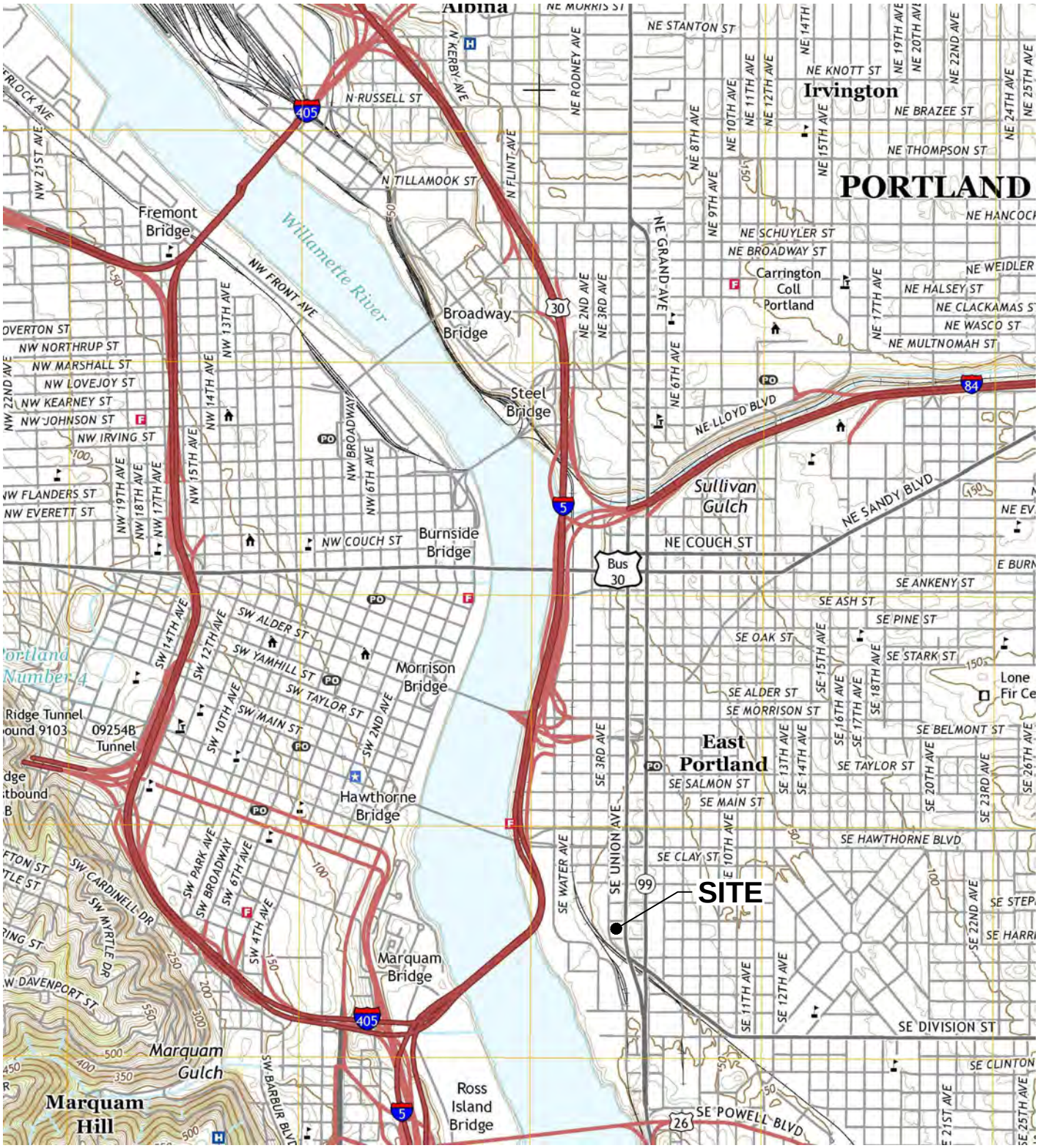
J = Data Validation Qualifier. The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample. See Data Validation report for more information.

NA = Not Available

- = Not applicable or not analyzed for this parameter

>Pv = The air concentration reported for the RBC exceeds the vapor pressure of the pure chemical. It can be assumed that this constituent cannot create an unacceptable risk by this pathway.

FIGURES



APPROXIMATE SCALE IN FEET

0 1000 2000 4000

NOTE: USGS, PORTLAND QUADRANGLE
OREGON-WASHINGTON
7.5 MINUTE SERIES (TOPOGRAPHIC)

PNG ENVIRONMENTAL, INC.
6665 SW Hampton St., Ste. 101 TEL (503) 620-2387
Tigard, OR 97223 FAX (503) 620-2977

DATE:	7-14-22
FILE NAME:	1197-03
DRAWN BY:	JJT
APPROVED BY:	SV

EAST SIDE PLATING PLANT #4
310 SE STEPHENS ST.
PORTLAND, OR.

VICINITY MAP

Project No. 1197-03
Figure No. 1

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LEGEND

- ● Soil Boring Location
- ▲ Vapor Pin Location

N

APPROXIMATE SCALE IN FEET

0 30 60

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PNG ENVIRONMENTAL, INC. 6665 SW Hampton St., Ste. 101 TEL (503) 620-2387 Tigard, OR 97223 FAX (503) 620-2977	DATE: 3-14-23 FILE NAME: 1197-03 DRAWN BY: JJT APPROVED BY: SV	EAST SIDE PLATING PLANT #4 310 SE STEPHENS ST. PORTLAND, OR.	SITE FEATURES	Project No. 1197-03 Figure No. 2