**State of Oregon**
# Department of Environmental Quality

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**To:** Shore Terminals/NuStar Facility File ECSI #5130

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**Subject:** Proposed Source Control Decision
Shore Terminals LLC Portland Facility
ECSI #5130

## 1.0 Introduction

This report presents the basis for the Oregon Department of Environmental Quality's (DEQ) proposed source control decision at the Shore Terminals LLC Facility site (Shore Terminals), Environmental Cleanup Site Information (ECSI) number 5130, located at 9420 Northwest St. Helens Road (also known as U.S. Highway 30) in Portland and within the Portland Harbor Superfund Site (PHSS) (Figure 1 in Attachment 1). To prepare this source control decision, DEQ reviewed reports and other supporting documents prepared for Shore Terminals as part of the Source Control Agreement between the Shore Terminals and DEQ (LQVC-NWR-08-14) and the Voluntary Cleanup Program (VCP) agreement between Shore Terminals and DEQ (ECVC-NWR-01-15), signed December 22, 2011. Shore Terminals source control evaluations for individual potential contaminant pathways were completed in accordance with the 2005 Environmental Protection Agency (EPA)/DEQ Portland Harbor Joint Source Control Strategy, also known as the JSCS.

Based on DEQ's review of the source control evaluations and supporting documents, DEQ concludes the groundwater, overwater activities and stormwater pathways do not pose a significant current or likely future threat to the Willamette River. Remedial actions have been implemented which have reduced concentrations of PHSS Contaminants of Concern (COC) in groundwater but concentrations for some COCs remain above PHSS Clean Up Levels (CULs). Monitoring in the Northern Facility Area will need to continue for these contaminants under the site's current groundwater monitoring plan, with future modifications to consider Portland Harbor RAO achievement as a data quality objective.

## 2.0 Site Description and History

A detailed summary of site history, previous environmental investigations, and source control evaluation can be found in the following documents:

- *Riverbank Source Control Pathway: Summary of Supporting Information* (Cascadia, 2020a)
- *Groundwater Pathway Source Control Evaluation* (GeoEngineers, 2022)
- *Overwater Pathway Source Control Evaluation* (GeoEngineers, 2023b)
- *Response to* (EPA, DEQ and Five Tribes) *Comments on the Groundwater Pathway Source Control Evaluation* (GeoEngineers, 2023c)
- *WR-209 Source Control Measures* (GeoEngineers, 2023a)
- *Stormwater Pathway Source Control Evaluation* (GeoEngineers, 2023d)

## 2.1 Site Description

The Facility is an approximately 29-acre bulk petroleum storage terminal located on the western bank of the Willamette River near River Mile 5 (RM5). The Facility is divided into two areas (Northern Facility Area and Southern Facility Area) with five aboveground storage tank (AST) fields within these areas (Tank Fields 1 through 5). The location and layout of the Shore Terminals Facility are presented in Figures 1 through 5 in Attachment 1.

The Northern Facility Area is approximately 21 acres in size and consists of three tank fields (Tank Fields 1 through 3), the Loading Rack, and the P-2 dock for offloading/loading bulk fuel products as well as shop and office buildings.

The Southern Facility Area is approximately 8 acres in size and consists of two tank fields (Tank Fields 4 and 5), a dock for offloading/loading bulk fuel products, and a small office building. The location, contents, and capacity of each tank at the Facility are listed in Table 1 of the *Groundwater Pathway Source Control Evaluation*.

The Facility is bounded by St. Helens Road (Highway 30) on the west, by the Willamette River on the east, and is bisected by north-south-running railroad tracks that are operated by Portland & Western Railroad (PNWR) and occupy an easement on Oregon Department of Transportation (ODOT) property. The area is zoned Heavy Industrial.

A concrete revetment wall extends approximately 580 feet along the riverbank from the northern boundary of the Facility to the southern edge of Shop Building 5 (Figure 3, Attachment 1). The revetment wall allowed the ground surface in the area of Tank Field 1 to be raised to its current grade, provides slope stability, and prevents erosion from river action. Construction details for the revetment wall are provided in the *Revetment Wall Construction Detail Memorandum* (Cascadia, 2020b). South of the revetment wall, the riverbank is armored with riprap that extends to the southern Facility boundary.

## 2.2 Regulatory Framework

The Shore Terminals Facility was evaluated under the Source Control Agreement (LQVC-NWR-08-14) and the VCP Agreement (ECVC-NWR-01-15) between Shore Terminals and DEQ. As described in the Source Control Agreement, the 1997 Facility Record of Decision (ROD), and VCP Agreement, the portion of the Facility subject to source control evaluation is the portion above the ordinary line of high water of the Willamette River.

## 2.3 Site History

The *Groundwater Pathway Source Control Evaluation* (GeoEngineers, 2022) and the *Stormwater Pathway Source Control Evaluation* (GeoEngineers, 2023d) reports present descriptions of operations and associated potential areas of concern for the Shore Terminals Facility. A summary of the Shore Terminals Facility information presented in the source control evaluation reports is presented below.

### 2.3.1 Facility Development and Use

Based on historical records, the first ASTs in the Northern Facility Area were likely in place by 1926. Tank Fields 1 and 2 were constructed by 1948, and Tank Field 3 was constructed in approximately 1952. After 1952, additional tanks were added in Tank Fields 1 through 3 until the current configuration was reached by about 1966. The P-3 dock in the Southern Facility Area is believed to have been constructed about the same time as Tank Field 4 in 1979. Tank Field 5 was constructed in 2007.

Prior to 2003, customers were able to load product onto trucks at a southern Loading Rack in Tank Field 4. The above ground piping was reconfigured in 2003 allowing fuel product from Tank Fields4 and 5 to be delivered to customers via the Loading Rack located at the Northern Facility Area and the below grade piping is no longer in use.

### 2.3.2 Ownership History

The Southern Facility Area was owned by Time Oil Company until it was acquired by Shore Terminals in September 1999. The Northern Facility Area was owned by ExxonMobil and its predecessors from approximately 1928 until December 2001, when the product storage and transfer facilities were sold to Shore Terminals. As of 2024, Shore Terminals is an affiliate of Sunoco.

## 2.4 Current Site Use

The Facility is an active bulk petroleum and renewable fuels terminal. The Facility receives, delivers, blends, and stores a variety of virgin (i.e., non-recycled) petroleum products such as fuel oils, gasoline, diesel, ethanol, renewables, and biodiesel. Customers' petroleum product is delivered to and transferred from the Facility via marine vessels, rail cars, trucks, and pipelines.

Several companies operate in leased spaces or in the rights-of-way at the Shore Terminals Facility:

- **Cowlitz Clean Sweep (CCS).** CCS is a spill response and industrial cleaning services division of PNE Corporation that leases and operates a warehouse structure (Building 8) at the northeast corner of the Northern Facility Area (formerly occupied by Clean Rivers Cooperative).

- **Olympic Pipeline Company (OPLC).** A pipeline operated by OPLC delivers refined petroleum products, such as gasoline, diesel, and jet fuel, from the Cherry Point,

Washington refinery to facilities operated by Shore Terminals and other bulk terminals to the south. OPLC maintains a switching station (the OPLC Switching Station) on a 1/2-acre parcel in the Northern Facility Area under a lease agreement with Shore Terminals. The OPLC Switching Station includes two 2,000-barrel ASTs that are used to store mixed-grade product shipped via the OPLC pipeline.

- **Kinder Morgan.** Kinder Morgan owns and operates a refined petroleum pipeline located west of the railroad, that runs from the Portland area to Eugene. Shore Terminals uses the pipeline to deliver product to the Kinder Morgan Portland Pump Station (located several miles southeast of Shore Terminals Facility). Occasionally the Shore Terminals Facility receives customers' product via the Kinder Morgan pipeline.

Figure 2 in Attachment 1 depicts the site features located in the Northern Facility Area and the Southern Facility Area.

### 2.5 Potential Sources of Contamination

The historical research conducted for the Feasibility Study and supplemental preliminary assessment identified past activities and features that may be areas of concern as contaminant sources at the Shore Terminals Facility. Potential sources of contamination included:

- Tanker Truck Loading Rack;
- Overhead Pipe Rack;
- Heating oil tank at Terminal Office Building;
- Former Heating oil tank at Operator's Office;
- Tank Fields 1 through 5;
- Rail Car Loading/Unloading Area;
- Hazardous and Non-Hazardous Waste Storage Areas;
- P-3 Marine Loading Dock;
- P-2 Marine Loading Dock;
- P-2 Oil-Water Separator;
- P-3 Oil-Water Separator;
- Building 5 (Maintenance Shop);
- Former Yard 4 Truck Loading Rack;
- Olympic Pipeline Company leasehold; and
- Kinder Morgan pump/manifold area between Tank Fields 1 and 2.

### 2.6 Chemicals of Interest

Shore Terminals identified chemicals of interest (COIs) for source control evaluation by considering near shore sediment data and upland potential sources.

The petroleum fuel products handled at the Facility consist of hydrocarbon fractions derived from the distillation of crude oil. Polycyclic aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs), fuel additives, biodiesel and oxygenates are components of petroleum hydrocarbon and renewable fuel products also handled at the Facility.

**Near Shore Sediment Data Screening** As reported in DEQ's 2016 Portland Harbor Upland Source Control Summary Report, the sediment area of potential concern in the site's vicinity was found to have elevated concentrations (relative to preliminary remediation goals) of aluminum, barium, cobalt, copper, iron, lead, manganese, mercury, nickel, vanadium, zinc, PAHs, polychlorinated biphenyls (PCBs), delta-hexaclorocyclohexane (delta lindane), dichlorodiphenyltrichloroethane (DDT) and its degradates dichlorophenyldichloroethylene (DDE) and dichlorodiphenyldichloroethane (DDD) (collectively DDx), 1,1-dichloroethene (DCE), 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, benzene, cis-1,2-dicloroethane, cyanide, ethylbenzene, isopropyl benzene, xylenes, toluene, trichloroethane, carbon disulfide, and gasoline range hydrocarbons. Of these analytes, copper, lead, mercury, zinc, PAHs, PCBs, lindane, and DDx, have 2017 EPA Portland Harbor ROD Table 17 Riverbank soil/Sediment CULs.

**Soil, Groundwater, and Stormwater Solids Data**. COIs for the Shore Terminals Facility were developed based on historical research, previous site investigations, and routine groundwater monitoring. The investigations described below included analyses for each of these COI, summarized as follows:

- Soil: Upland soils were analyzed for metals, total petroleum hydrocarbons (TPH), VOCs, PAHs, pesticides, and semi-volatile organic compounds (SVOCs).
- Groundwater: Groundwater samples were analyzed for metals, VOCs, PAHs, ethanol, pesticides, and TPH.
- Stormwater Solids: Stormwater solids samples were analyzed for metals, PCBs, PAHs, pesticides, VOCs, and TPH.
- Stormwater: Stormwater samples were analyzed for TPH, ethanol, VOCs, PAHs, and metals.

## 2.7 Potentially Complete Pathways

Potential contaminant transport pathways evaluated at Shore Terminals include releases during overwater activities, stormwater, stormwater conveyance as a preferential groundwater migration pathway, riverbank erosion, and groundwater migration.

**Overwater Activities –** Overwater activities including fuel handling occur at the P-2 and P-3 marine loading docks. This pathway is considered potentially complete and was evaluated in the *Over Water Pathway Source Control Evaluation* (GeoEngineers, 2023b).

**Stormwater Pathway** – The stormwater drainage system at the site is divided into six drainage areas that convey stormwater to either the owned outfall WR-78, which drains the Northern Facility, outfall WR-152, which drains Tank Field 5, infiltration into the ground, or discharge to the City of Portland sanitary sewer from the P-3 oil-water separator. This complete pathway is evaluated in the *Stormwater Pathway Source Control Evaluation* (GeoEngineers, 2023d).

**WR-209 Stormwater Conveyance as a Preferential Groundwater Migration Pathway** – The invert depth of unclaimed WR-209 stormwater conveyance system is lower than seasonal water table elevations resulting in dry weather flow from groundwater intrusion This pathway was

carried forward for further evaluation in *Summary of Outfall WR-209 Investigations and Sampling* (Cascadia, 2020c); and *WR-209 Source Control Measures* (GeoEngineers, 2023a).

**Riverbank Erosion Pathway** – The site is adjacent to the river; therefore, this pathway is considered complete and was carried forward for further evaluation as described in the *Riverbank Source Control Pathway: Summary of Supporting Information* (Cascadia, 2020a). DEQ recognizes that the EPA has taken over regulatory oversight of the Shore Terminals riverbank erosion pathway. This pathway is evaluated in only a general way in this Source Control Decision.

**Groundwater Pathway -** Groundwater monitoring performed as part of the remedial investigation determined that groundwater beneath Shore Terminals flows to the Willamette River. Constituents present in groundwater have the potential to migrate to the river. This pathway was carried forward for further evaluation, including a porewater evaluation in *Groundwater Pathway Source Control Evaluation* (GeoEngineers, 2022).

## 3.0 Regulatory History

Environmental investigations and remedial actions began at the Facility in the 1960s. In 1991, ExxonMobil requested DEQ oversight of its remediation activities, and a voluntary letter agreement was executed. Following a 1996 Feasibility Study and a 1997 ROD by DEQ (the 1997 Facility ROD; DEQ, 1997), a Voluntary Cleanup Agreement between DEQ and ExxonMobil was finalized in May 2002 (ECVC-NWR-01-15).

After the sale of the property by ExxonMobil to Shore Terminals, Shore Terminals entered into a voluntary agreement for source control measures with the DEQ on October 13, 2009 (LQVC-NWR-08-14) and then agreed to comply with the ExxonMobil VCP agreement on December 22, 2011.

### 3.1 Stormwater Permits

Stormwater discharges are permitted under a National Pollutant Discharge Elimination System (NPDES) Industrial Stormwater Discharge Permit 1200-Z. The current site NPDES 1200-Z Permit (No. 109938) was issued in March 2021 and is in effect from July 2021 to June 2026. In 2023, the City of Portland issued sampling waivers for both outfalls (WR-78 and WR-152) because the outfalls consistently met the NPDES 1200-Z Permit criteria. As a result, the outfalls do not need to be monitored for compliance until the final year of the permit (July 1, 2025 to June 30, 2026).

### 3.2 Hazardous Waste Generator

The site address is identified as a hazardous waste generator under EPA identification number ORD000618017.

### 3.3 Air Quality Permits

The Shore Terminals Facility operates under a Title V permit (permit number 26-2029-TV-01).

## 4.0 Hazardous Substance Releases, Investigations and Removal Actions

Section 2.5 of the *Groundwater Pathway Source Control Evaluation* presents a list of known and potential hazardous substance releases that have occurred across the Shore Terminals Facility along with localized removal actions to address them. A summary of this information is presented in the following sections.

### 4.1 Northern Facility Releases

The Northern Facility Area was owned by ExxonMobil and its predecessors from approximately 1928 until December 2001, when Shore Terminals purchased the facility. Historical records detailing information about the releases prior to the 2001 sale of the property to Shore Terminals are limited. Shore Terminals does not know the number of historical releases at the former Exxon Mobil tract prior to ownership; however, historical records indicated at least nine recorded releases from tanks prior to 2001.

1960s through 1970s River Sheens – In the mid- to late- 1960s, petroleum hydrocarbon sheens were reported on the surface of the Willamette River. The sheens appear to have originated from surface spills, tank cleaning waste disposal, and subsurface leaks within the north and center tank fields Starting in the mid-1970s, sheens were noted further south on the river, near the south end of the center tank fields.

As an interim remedial measure around 1980, a 1,270-foot-long subsurface slurry wall was constructed extending from the south boundary of the Northern Facility Area to the northern edge of Shop Building 5 (Figure 2, Attachment 1). The subsurface slurry wall prevents historical fuel and contaminated groundwater from Tank Fields 2 and 3 from reaching the river. The subsurface slurry wall was supported by the operation of eight product recovery/groundwater extraction wells upgradient of the subsurface slurry wall. Operation of the dual-phase groundwater extraction/product recovery pumps ended when product could no longer be effectively recovered. Project details from this time period are unknown or are limited.

AST Cleaning – Prior to the early 1970s, periodic cleaning of the ASTs resulted in discharge of sludges or residual product onto surface soils within the north and center tank fields (presumed to be Tank Field 1 and Tank Field 2, respectively).

Tank 3510 Release – Gasoline was released from Tank 3510 to soil within the Tank Field 1 concrete containment area on February 22, 2006. Soil samples were collected to delineate the extent of gasoline impacts. Remediation activities included free-phase gasoline removal, shallow soil excavation, and the operation of an upland soil vapor extraction (SVE) system, (separate from the existing top of bank air sparge/soil vapor extraction [AS/SVE] system), for a period of six months. The spill response activities are documented in the *Immediate Response Report – Shore Terminals Portland Facility* (Ash Creek, 2006). Groundwater monitoring of wells in the release area indicates that the remedial activities successfully addressed the gasoline release impacts.

Tank 8006 – Pitting was observed in the base of Tank 8006 in Tank Field 3 during maintenance activities in 2007. Soil samples collected near the tank indicated gasoline impacts in the soil were limited to an area near the base of Tank 8006. Tank 8006 is approximately 200 feet from the river and is within the concrete containment area of Tank Field 3. Impacts to groundwater were not observed (Ash Creek, 2008a). No removal actions were performed.

Tanker Truck Loading Rack – In June 2008, a small quantity of gasoline was released at Bay 3 (Figure 5, Attachment 1) of the Loading Rack. Contaminated soil was not removed. Monitoring wells in this area are gauged at least monthly. Separate phase hydrocarbons (SPH) are sometimes observed in two of the three deeper aquifer monitoring wells located within the gasoline release area. SPH is removed when present. Dissolved TPH and VOCs are monitored in other wells near the Loading Rack and may exceed Site ROD requirements in the shallow and deep aquifers, yet the dissolved contamination appears to be residual and does not migrate (as discussed later in this SCD document).

Underground Heating Oil Tank – In July and August 2011, a 1,000-gallon heating oil underground storage tank (UST) was decommissioned in-place at the Shore Terminals Facility. The tank is located west of the railroad tracks, 15 feet away from the nearest building, and about 450 feet west of the Willamette River. DEQ closed its file on this project in a letter dated September 19, 2011, using DEQ's Soil Matrix Generic Remedy rules as the basis for its closure decision. The UST was pumped dry, cleaned and abandoned in-place by filling with concrete slurry. Soil beneath the tank was characterized to a depth of 17.5 feet below ground surface (bgs). No groundwater was encountered beneath the tank pit at the maximum depth explored of 19 feet bgs. Soil sampled at 17.5 feet was below detection limits for TPH as diesel (TPH Dx). One soil sample collected from a depth of 17.0 feet bgs contained 63 milligrams per kilogram (mg/Kg) TPH Dx. A sample adjacent to the UST from a depth of 7.0 feet bgs contained 2,420 mg/Kg TPH Dx. It was estimated that the volume of soil beneath the UST with possible TPH Dx contamination is 58 cubic yards. No soil was excavated from beneath the UST nor was remediation performed.

Ethanol Release – An 18,000-gallon ethanol release from a buried pipe at the southwest corner of Tank Field 1 occurred in 2011. Groundwater was impacted by the release resulting in a breakdown of mobile and residual hydrocarbons accelerating remediation in Tank Field 1. Methane was generated by the ethanol release and vapor intrusion mitigation was implemented in buildings in the Dual-Phase Extraction (DPE) Treatment area.

B99 Biodiesel Release – On June 1, 2020, approximately 1,300 gallons of B99 Biodiesel (a blend of 99 percent biodiesel and 1 percent diesel) was released to the ground surface due to a malfunctioning pump located between Tank Field 1 and Tank Field 2. Although approximately 62 cubic yards of impacted soil was removed from the site, some impacted soil could not be removed without compromising the stability of product transfer appurtenances in the release area.

1995 Olympic Pipe Line Company Release – On November 12, 1995, less than 250 gallons of jet fuel and/or diesel fuel was spilled at the OPLC leasehold. An estimated 95 percent of the fuel

was recovered using sorbent materials, a vacuum truck, and excavation of 115 tons of impacted soils.

2000 Olympic Pipe Line Company Release – In February 2000, petroleum-impacted soil was found beneath the southern AST at the OPLC leasehold. A small quantity (less than 2 cubic yards) of impacted soil was removed.

### 4.2 Southern Facility Releases

Tank 3204 – In September 1988, approximately 1,000 gallons of gasoline were released when Tank 3204 was overfilled inside Tank Field 4. Approximately 175 cubic yards of soil were removed, aerated, and placed on site.

Vapor Recovery Unit – In July 1992, approximately 250 gallons of gasoline were released from a failed gasket in the hydrocarbon Vapor Recovery Unit (VRU) inside Tank Field 4. Approximately 125 cubic yards of soil were removed, aerated and placed on site. In 1997, a SVE system was installed and operated until vapors no longer contained detectable concentrations of petroleum hydrocarbons.

2006-2007 Riverbank Sheen – On November 28, 2006, an approximately 30-foot-long petroleum hydrocarbon sheen was observed near the riprap shoreline of the Willamette River at the south end of the Facility, near the P-3 Dock. The sheen was contained with a sorbent boom and the riprap was pressure-washed to remove residual hydrocarbons in July 2007. A sheen was observed again on December 16, 2007, and was contained with sorbent booms. Additional subsurface investigations of adjacent upland areas completed in 2008 did not identify the source of the shoreline sheen and sheen has not been observed since the December 2007 event.

### 4.3 Site Investigation Soil Sampling

Soil samples have been collected from the Shoreline Terminals site since at least 1988 to characterize potential sources and/or releases. The *Groundwater Pathway Source Control Evaluation* identified the following soil remediation activities and samples that were collected during site investigations noted above:

- In 1988, a petroleum release was identified at Tank Field 4 during ownership by Time Oil Company. Approximately 175 cubic yards of petroleum-contaminated soil was removed, aerated, and placed back on site during remediation activities. No detailed Shore Terminals records exist from this event.

- Following the 1992 Tank Field 4 Vapor Recovery Unit release, soil samples were collected after the initial remediation efforts to define the extent of the impacts.

- In response to the 1995 Olympic Pipeline Company release, soil samples were collected from the excavation and demonstrated adequacy of cleanup.

- In February 2000, soil samples were collected from three soil borings near the southern AST at the Olympic Pipeline Company to evaluate a fuel release.

- Soil samples were collected to delineate the impacts from the Tank 3510 (Tank Field 1) release in 2006.

- Five soil borings (SB-1 through SB-5) were advanced near the top of the riverbank at the P-3 Dock to assess the potential source of the 2006/2007 river sheen. During the 2008 additional riverbank investigation, six soil borings (CB-6 through SB-11) were advanced and soil samples were collected upland of the P-3 Dock.

- Soil samples were collected from beneath the unused heating oil tank near the Terminal Operators' Office (immediately west of the railroad and west of Tank Field 2).

- Soil samples were collected near the footprint of Tank 8006 (Tank Field 3), after pitting was observed in the base of the tank during maintenance activities in 2007.

- Approximately 62 cubic yards of contaminated soil (between Tank Fields 1 and 2) was removed during the B99 Biodiesel remediation activities in 2020. Leachability testing of soil samples containing the B99 Biodiesel demonstrated that the product contained a leachable fraction of diesel. Most of the impacted soil was removed during the immediate response action; however, even with the use of temporary pipe and foundation support structures, some soil containing B99 Biodiesel could not be removed without compromising the stability of the many pumps and piping support foundations present in the release area.

Additional subsurface investigations have occurred prior to approximately year 2000, but due to inadequate details, those events are not included in the source control evaluation reports.

### 4.4 Groundwater Investigations

Groundwater samples have been collected during remedial investigations, remediation performance monitoring, routine monitoring events, and a focused porewater investigation.

- In the early to mid-1970s, a series of extraction wells were installed in the Northern Facility Area (Tank Fields 1 and 2) to recover contaminated groundwater and SPH from the subsurface and to prevent their migration to the river. The wells were abandoned once SPH recovery became inefficient.

- In 1977, fourteen 10-inch-diameter wells were constructed adjacent to the river at the northeastern end of the Facility (wells W-1 through W-14) and were also used to extract SPH and groundwater. Because the recovered fluid was determined to be primarily river water, use of these extraction wells was discontinued.

- In the early 1980s, a 1,270-foot-long subsurface slurry wall and eight additional 10-inch-diameter groundwater extraction wells (W-15 through W-22) located upgradient of the

subsurface slurry wall were installed to remove and prevent migration of SPH and petroleum-impacted groundwater to the Willamette River in the area of Tank Fields 1, 2 and 3.

- In January 1989, four monitoring wells (MW-1 through MW-4) were installed along the perimeter of Tank Field 4 as part of the 1988 Tank Field 4 investigation.

- In 1992, four monitoring wells (VRUMW-1 and VO-1 through VO-3) were installed by the Time Oil Company in the Southern Facility Area as part of the 1992 Tank Field 4 investigation. These wells were used for SVE.

- In 1997, an SVE system and an additional SVE well (VRUMW-2) were installed by the Time Oil Company south of Tank Field 4. The SVE system operated for 2 months until May 1997 when effluent vapors no longer contained detectable concentrations of petroleum hydrocarbons.

- In response to the Tank Field 1, Tank 3510 release in 2006, seven groundwater monitoring wells (AC-1 through AC-7) were installed.

- During the Riverbank Investigation in response to the 2006 petroleum sheen between Tank Fields 4 and 5 (near the P-3 dock), groundwater samples were collected from five soil borings (SB-1 through SB-5) in search of the source of the riverbank sheen.

- During the 2008 additional riverbank investigation between Tank Fields 4 and 5, groundwater samples were collected from six additional soil borings (SB-6 through SB-11) to search for the source of the riverbank sheen.

- Three wells (AC-8 through AC-10) were installed near the upland Loading Rack to investigate a 2008 gasoline release.

Groundwater monitoring has been continuous at the site since the 1990s.

- The current and on-going groundwater monitoring program consists of gauging 67 monitoring wells and sampling 48 wells semi-annually or annually. A list of monitoring wells is shown in Attachment 2. Groundwater samples are analyzed for TPH as gasoline (TPHg), TPHd, and TPH as heating oil (TPHo), and benzene, toluene, ethylbenzene and total xylenes (BTEX), methyl tert-butyl ether (MTBE), ethanol, PAHs, metals (arsenic, copper, and lead), and select wells are analyzed for C10-C12 aliphatic-range petroleum hydrocarbons.

Porewater investigation

- A 2021 porewater investigation was conducted to assess attenuation of COIs in groundwater migrating from the top of the riverbank to nearshore discharge points in the former DPE Treatment Area. The results are presented in Attachment 3. Groundwater

quality from top of bank wells was compared to porewater samples and evaluated for natural attenuation.

- Prior to initiating the porewater sampling program, groundwater samples were collected from five monitoring wells located at the top of the bank in the former DPE Treatment Area and analyzed for PAHs, TPHg, TPHd, TPHo, BTEX, organochlorine pesticides, dioxin/furans, and PCB congeners.

- Samples were collected via passive porewater sampling devices (PSDs), deployed at five porewater stations and five monitoring wells also within the former DPE Treatment Area in June 2021. The samples were analyzed for PAHs, dissolved metals (arsenic, copper, lead, and zinc), TPHg, BTEX, C10-C12 aliphatic-range petroleum hydrocarbons, and organochlorine pesticides.

### 4.5 Presence of Separate Phase Hydrocarbons

In the mid- to late- 1960s, petroleum hydrocarbon sheens were reported on the Willamette River. The sheens appear to have originated from surface spills and subsurface leaks within Tank Field 1 and Tank Field 2. A series of extraction wells were installed to recover SPH from the subsurface and limit migration to the river. In the early 1980s, a subsurface slurry wall and eight additional groundwater extraction wells located upgradient of the subsurface slurry wall were installed to prevent migration of SPH and petroleum-impacted groundwater to the Willamette River from Tank Fields 1, 2 and 3. The 1,270-foot-long slurry wall did not extend to the north property boundary due to subsurface utilities which limited trenching. The slurry wall location is shown on Figure 2 in Attachment 1.

In Tank Field 1, SPH is being removed intermittently from six monitoring wells in the Shallow Sand unit since 2004 using a bailer, sorbent device, or peristaltic pump. SPH has been primarily observed in wells AC-6, KWM17, and W-15, approximately 300 to 400 feet from the river, but has not been detected in respective downgradient wells. SPH in the Shallow Sand unit does not appear to present a risk to the river based on its limited volume and extent, it is being removed to the extent practicable, and long-term monitoring data show that the SPH is not migrating.

At the Tanker Truck Loading Rack, SPH has been intermittently identified in wells AC-8, AC-9, and AC-10 in the Deep Sand unit and is removed when present. The extent of SPH in this area has not changed appreciably since a gasoline release occurred in 2008, indicating the SPH is non-mobile and residual. Given that the Willamette River is more than 700 feet from the Loading Rack area, the SPH in this area does not appear to present a risk to the river.

On November 28, 2006, a petroleum sheen was observed near the shoreline of the Willamette River at the south end of the Facility (Figure 4 in Attachment 1) between Tank Fields 4 and 5. The sheen extended for a length of about 30 feet along the riprap bank around the P-3 Dock. The sheen was remediated using a sorbent boom. Investigations to evaluate the source of the sheen were performed in 2006 and 2007. Soil and groundwater samples from five borings (SB-1 through SB-5) advanced at the top of the riverbank were collected to assess if the sheen was originating from an upland source. Results of the assessment did not identify an upland source

(Ash Creek, 2007). In July 2007, the riverbank riprap armor was pressure-washed to remove residual hydrocarbons on the riverbank (Ash Creek, 2008a). No sheen was observed in the area between December 2006 and December 2007; however, a limited area of sheen on the river was again noted on December 16, 2007, and was contained via booms.

In January 2008, an additional investigation was completed to further assess a potential source of the sheen near the P-3 Dock. During that investigation, six monitoring wells were gauged for the presence/absence of SPH, and six push-probe explorations (SB-6 through SB-11) were completed for soil/groundwater sampling. Low concentrations of petroleum constituents were detected in soil and groundwater samples collected from borings SB-6 and SB-7; however, no SPH was observed in the groundwater monitoring wells and the analytical data collected from the borings did not suggest the presence of residual SPH (Ash Creek, 2008b). The sheen has not been observed since December 2007.

### 4.6 Tank Field 1 Groundwater Remedial Actions

To further address the contaminated-groundwater flow pathway in the riverfront area downgradient of Tank Field 1, between the north terminal property boundary and the north end of the groundwater cut off slurry wall (the "gap"), the previous groundwater extraction remediation system was modified to be an "Air Sparging Curtain". This gap is referred to as the DPE Treatment Area.

This AS/SVE system in the DPE Treatment Area was constructed as required by the DEQ 1997 ROD to address groundwater contamination and began operation in 2000 (Figure 3 in Attachment 1). Originally it included 8 AS wells (AS-01 through AS-08) and 21 SVE wells (KVE-01 through KVE-21) to remove petroleum constituents and ethanol from the subsurface. This AS/SVE system operated for 16 years and removed 151,900 pounds TPHg, 5 pounds BTEX, and 4,950 pounds ethanol from the subsurface (per the site Air Contaminant Discharge Permit [No. 26-0062]).

In 2009, an *Updated Focused Feasibility Study* (AME, 2009) was submitted to DEQ recommending modified dual phase (soil vapor and groundwater) extraction to augment the AS/SVE system in the DPE Treatment Area. The DPE design was developed in response to DEQ's conclusion that the AS/SVE system was not sufficiently preventing the migration of petroleum-related constituents to the Willamette River north of the slurry wall.

The soil vapor and groundwater extraction system operated from early 2011 through December 2012, and as a vapor-only extraction system from January 1 through February 5, 2013. Due to design limitations and fouling, the DPE system was unable to consistently operate at design rates and was not considered efficient to operate.

In an effort to optimize contaminant removal from groundwater in the DPE Treatment area, the DPE system was converted into a groundwater-only extraction system in 2013. The sum of remediation system modifications removed an additional 7,200 pounds TPHg, 1.7 pounds BTEX, and 1,425 pounds ethanol. In March 2016, it was determined that contaminant recovery efficiency was declining after 16 years of remediation and that the system piping was failing.

DEQ approved the shutting down of the system following the failure of system piping in 2016. The mechanical groundwater extraction/AS/SVE system has been inactive since 2016 in lieu of monitored natural attenuation of COIs from select monitoring wells in the DPE Treatment area. Since the 2016 system shut down, DEQ has not noted COI concentration rebounds in groundwater.

## 5.0 Source Control Evaluation

Because the site is located within the PHSS study area, upland source control investigations were guided by the 2005 EPA/DEQ JSCS. The objective of a source control evaluation is to identify potential sources of contamination at the site and determine if additional characterization or source control measures are needed to prevent impacts to the Willamette River. DEQ determined that the groundwater, stormwater, overwater and riverbank erosion pathways are potentially complete contaminant transport pathways. The remainder of this decision document presents DEQ's findings regarding these pathways. Oversight of the riverbank erosion pathway was transferred to EPA (DEQ, 2019) and is being evaluated as part of the in-water design work for the B1a project Area.

### 5.1 Groundwater Source Control Evaluation

Groundwater at the Facility was divided into two areas for the source control evaluation; the Southern Facility area and Northern Facility area, and is encountered in two sand units identified as the Deep Sand and Shallow Sand units. Additional details and supporting figures are presented in Section 4 of the *Groundwater Pathway Source Control Evaluation*.

Groundwater beneath the Southern Facility is first encountered in the Shallow Sand unit. Depths to groundwater typically range from 13 to 23 feet bgs and groundwater generally flows to the northeast. The Shallow Sand unit groundwater risk to the Willamette River was evaluated in the Southern Facility Area using wells MW-1 through MW-4, VRUMW-1, VRUMW-2, and VO-1.

Groundwater beneath the Northern Facility is encountered in both the Deep Sand and Shallow Sands units. Groundwater elevations beneath the central portion of the Facility indicate that the shallow groundwater movement is impeded by the slurry wall, which is keyed into the silty-clay aquitard layer. Groundwater elevations north of the slurry wall indicate that groundwater from the Shallow Sand unit flows beneath the toe of the revetment wall and discharges near the DPE Treatment Area. The Shallow Sand unit is only encountered east of the railroad tracks that bisect the Northern Facility Area. Groundwater in the Shallow Sand unit is observed at depths ranging between approximately 5 and 25 feet bgs and generally flows to the northeast toward the Willamette River. The Shallow Sand unit groundwater risk to the Willamette River was evaluated in the Northern Facility Area using wells close to the river and located in the DPE Treatment Area (i.e., EX-07L, KMW29, KMW30, KMW31, KMW32, KMW33, KMW37, MW47, MW48, and MW49). Additionally, porewater samples (PW-1 through PW-5) were collected in sediments adjacent to the former DPE Treatment area to assess the risk of contaminants in the shallow groundwater discharging to the Willamette River.

West of the railroad tracks, groundwater is encountered in the Deep Sand unit only, which is unconfined in the Northern Facility area due to structural and stratigraphic dip. Depths to groundwater in the unconfined Deep Sand unit range from 21 and 70 feet bgs and groundwater generally flows to the northeast. The Deep Sand unit groundwater risk to the Willamette River was evaluated in the Northern Facility Area using wells located near the Loading Rack (i.e., AC-8, AC-9, AC-10, KMW3, KMW10, KMW13 through KMW16, KMW23 through KMW27, MW38, MW39, and MW43 through MW46). Monitoring well MW46 is the well closest to the river.

### 5.1.1 Groundwater Pathway Screening

Groundwater data were screened to evaluate the potential for chemicals in groundwater to discharge to the river at concentrations that could cause adverse effects. Chemical testing included petroleum hydrocarbons, VOCs, PAHs, PCBs, organochlorine pesticides, dioxins and furans, and metals. Not all chemicals that are groundwater contaminants of concern for the PHSS were analyzed: rather, as summarized above, select analyses were conducted based on the potential sources of contamination on site. Chemicals not analyzed on the Shore Terminals site but are on the Portland Harbor ROD Table 17 list of groundwater COCs are limited to cadmium, chlorobenzene, chromium, cyanide, 1-1 DCE, cis-1,2-DCE, 2,4-dichlorophenoxyacetic acid, manganese, vanadium, pentachlorophenol, perchlorate, tetrachloroethylene, trichloroethylene, 2,4,5-trichlorophenol (silvex), and vinyl chloride. There are no known or suspected sources of these chemicals on the Shore Terminals site. Source control COIs at the Shore Terminals site were limited to the contaminants associated with known or suspected sources of contamination.

The groundwater pathway screening involved evaluating site concentrations relative to PHSS CULs listed in Table 17 of the Portland Harbor ROD. For all detected chemicals not identified in Table 17, results were considered against the lowest value from screening level values (SLVs) listed in either:

1. Portland Harbor Joint Source Control SLVs listed in Table 3-1 of the Portland Harbor JSCS (Note: EPA revised the National Recommended Water Quality Criteria [NRWQC] values in 2015 and DEQ revised the Ambient Water Quality Criteria [AWQC] values in 2014. The current values were used in the screening.)

2. Toxicity Reference Values (TRVs) for Transition Zone Water (TZW) and Surface Water contaminants of potential concern (COPCs) from Tables 6-43 and 6-65 of the Portland Harbor Baseline Ecological Risk Assessment (BERA) were used as SLVs when lower than the Table 3-1 value.

Groundwater results from monitoring dating back to 1990 are tabulated in Appendix L of the *Groundwater Pathway Source Control Evaluation*. The screening of the groundwater samples dating back to 1990 representing the Shallow and Deep Sand units and the porewater samples identified the following contaminants as COPCs.

- TPHs – C10 to C12 aliphatics,
- VOCs – benzene, toluene, ethylbenzene, xylenes
- Metals - arsenic, copper, and lead

- PAHs - cPAHs, benzo(a)anthracene, benzo(a)pyrene, beno(b)fluoranthene, benzo(k)fluoranthene, chrysene, benzo(a,h)anthracene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, naphthalene, pyrene, phenanthrene.

As discussed in Section 4.3.5 of the *Groundwater Pathway Source Control Evaluation*, sporadic low level detections of hexachlorobenzene, chlordane isomers, and DDx were detected in either the riverbank wells or porewater during the 2021 porewater investigation, some of which were slightly above PHSS CUL; however, based on the site Conceptual Site Model (CSM), upland groundwater monitoring, low level of detection, and nature of the sporadic detections, these constituents were not identified as COPCs and not evaluated below.

### 5.1.2 Groundwater Pathway Weight of Evidence

Chemicals identified above with concentrations that have exceeded either the PHSS CUL or JSCS SLV are further evaluated by chemical group below using weight-of-evidence approach to determine the potential for discharge to the Willamette River at concentrations that could cause adverse effects or represent a recontamination concern. The *Groundwater Pathway Source Control Evaluation* focused on data collected in the four most recent monitoring events prior to 2022, which ranged between 2018-2021 depending on the well location (see Attachment 4). Data collected during the 2021 porewater/monitoring well investigation (see Attachment 3) and four most recent semi-annual (2023 through 2024) monitoring events (see Attachment 5) are focused on in the evaluation below. Results from groundwater monitoring dating back to 1990 are tabulated in Appendix L of the *Groundwater Pathway Source Control Evaluation*.

<u>C10-C12 aliphatics</u>

***Northern Facility***

During the 2021 porewater investigation C10-C12 aliphatics were detected above PHSS CULs in three of the selected top-of-riverbank wells (KMW29, KMW31, and KMW36) at concentrations ranging from 62 to 241 micrograms per liter (µg/L) but were not detected in any of the porewater samples. Detection limits (50 µg/L) were above the PHSS CUL and slightly elevated from typically achievable limits in water samples.

During the Deep Sand Unit recent semi-annual monitoring, C10-C12 aliphatics were not analyzed. TPHd was sampled and used as a surrogate. TPHd was detected in AC-10, KMW13, MW38, MW39, and MW43, located near the Loading Rack. Concentrations range from 0.0908 to 0.659 milligrams per liter (mg/L). However, TPHd has consistently not been detected or has been detected at low concentrations in Deep Sand Unit wells closer to the Willamette River (KMW10, MW41B, MW45 and MW46) indicating the TPH plume in the Deep Sand unit beneath the Loading Dock area is stable and not migrating towards the Willamette River.

During the DPE Treatment Area recent semi-annual groundwater monitoring, all wells except for KMW33 contained concentrations of C10-C12 aliphatics greater than the PHSS CUL of 2.6 µg/L. Detection concentrations ranged from 1.01 to 33.8 µg/L and a maximum exceedance ratio of 13.

A detailed evaluation of TPH concentration in the Northern Facility is presented in Section 4 of the *Groundwater Pathway Source Control Evaluation* which presents a compelling evaluation that, based on the porewater study, an attenuation factor from 5 to 15 is present for TPH between the top of the riverbank wells and porewater. Given the lack of detection in the porewater samples, generally low and decreasing concentrations detected in the riverbank wells, and observed attenuation, DEQ does not consider C10-C12 aliphatics in Northern Facility groundwater to pose a recontamination risk or poses a significant risk to remedial action objectives (RAO) achievement. However, C10-C12 aliphatics should continue to be monitored in this area under the site's long-term monitoring program to confirm concentrations are stable or decreasing. Future modifications of the long-term monitoring program will need to consider Portland Harbor RAO achievement as a data quality objective.

***Southern Facility***

C10–C12 aliphatic hydrocarbons were not detected above the PHSS CUL in Southern Facility groundwater and are not considered COPCs for further evaluation. No additional source control action is necessary for C10-C12 aliphatics in the Southern Facility.

Benzene, Toluene, Ethylbenzene, and Total Xylenes

***Northern Facility***

During the 2021 porewater investigation, BTEX were not detected or were detected at concentrations below the PHSS CUL.

During the Deep Sand Unit recent semi-annual monitoring, BTEX concentrations exceed their respective PHSS CUL, in the Loading Rack but do not extend riverward beyond the ODOT property. Benzene is consistently detected at concentrations that exceed the PHSS CUL in groundwater collected from MW-44, but concentrations are variable and trend with fluctuations in water table elevation. Toluene, ethylbenzene, and total xylenes are often detected in MW-44 at concentrations that exceed the PHSS CULs during relatively low-water table conditions but are non-detect or detected at concentrations below the respective PHSS CULs during relatively high-water table conditions. BTEX are consistently non-detect in downgradient Deep Sand Unit wells MW-10 and MW-46. Overall, BTEX have been present in the Loading Rack area for more than 20 years and have not migrated beyond the current extent.

During the DPE Treatment Area recent semi-annual groundwater monitoring, concentrations of toluene, ethylbenzene, and total xylenes were detected but did not exceed PHSS CULs. The majority of the benzene concentrations detected in the groundwater of the DPE Treatment Area wells did not exceed PHSS CULs, with the exception of low-level benzene detections in KMW29, KMW32, KMW37, and MW-48. The highest detected value observed was 1.48 µg/L at KMW32 with an exceedance ratio of 3.

Given the limited detections of benzene detections above the PHSS CUL in groundwater monitoring wells, and lack of detections in the porewater samples, DEQ does not believe benzene in Northern Facility groundwater poses a recontamination risk or poses a significant risk

to RAO achievement. However, benzene should continue to be monitored in this area under the site's long-term monitoring program to confirm concentrations are stable or decreasing. Future modifications of the long-term monitoring program will need to consider Portland Harbor RAO achievement as a data quality objective. No additional source control action is necessary for toluene, ethylbenzene, or total xylenes in the Northern Facility.

***Southern Facility***

Concentrations of toluene, ethylbenzene, and total xylenes detected in the groundwater did not exceed PHSS CULs in the Southern Facility wells. Benzene was detected above its PHSS CUL in MW-2 with a reported concentration of 0.52 µg/L in 2012; however; concentrations have not been detected above the PHSS CUL of 0.44 µg/L in any subsequent sampling or in any other Southern Facility Area wells indicating benzene in the Southern Facility is not likely to recontaminate future sediment remedial measures, or impede the Portland Harbor ROD RAOs. No additional source control action is necessary for benzene, toluene, ethylbenzene, or total xylenes in the Southern Facility.

Metals - arsenic, copper, and lead

***Northern Facility***

Dissolved arsenic was detected in porewater and groundwater above the PHSS CUL of 0.018 µg/L during the 2021 porewater investigation. Porewater concentrations were higher than top-of-riverbank 2021 groundwater concentrations, ranging from 10.1 to 22.3 µg/L in porewater and 0.33 to 4.55 ug/L in groundwater. This may indicate arsenic concentrations in the porewater are influenced by sediment redox conditions down gradient of the riverbank wells in the DPE Treatment Area. During the Deep Sand Unit wells recent semi-annual monitoring, arsenic in wells ranged in concentrations from <1 to 69.2 µg/L and are highest near the Loading Rack (KMW13, MW38, and MW39) decreasing as groundwater approaches the Willamette River. During the DPE Treatment Area recent semi-annual groundwater monitoring, arsenic concentration ranged from <1.00 to 22.0 µg/L. The observed concentrations are below the ecological SLV of 150 µg/L, however, some are in the higher range of concentrations observed in shallow groundwater at PHSS. The higher concentrations observed in the Northern Facility are likely the result of changes in groundwater redox conditions associated with the petroleum releases. DEQ does not believe arsenic in Northern Facility groundwater poses a recontamination risk or poses a significant risk to RAO achievement. However, given the localized elevated concentrations detected in upland groundwater, arsenic should continue to be monitored in this area under the site's long-term monitoring program to confirm concentrations are stable or decreasing. Future modifications of the long-term monitoring program will need to consider Portland Harbor RAO achievement as a data quality objective.

Copper was not detected above the PHSS CUL of 2.74 µg/L in any porewater or riverbank groundwater samples during the 2021 porewater investigation. Similarly, during the Deep Sand Unit wells recent semi-annual monitoring, copper was not detected above the PHSS CUL. During the DPE Treatment Area recent semi-annual groundwater monitoring, copper concentrations slightly exceeded the PHSS CUL of 2.74 µg/L in two Shallow Sand Unit wells,

twice at EX-07L and once at KMW32 with a maximum concentration of 3.27 µg/L resulting in an exceedance ratio of 1.2. The data do not indicate the presence of a plume that is likely to recontaminate future sediment remedial measures or impact the protectiveness of the remedy. No source control action is necessary for copper in the Northern Facility.

Lead was not detected above the PHSS CUL of 0.54 µg/L in porewater samples but was in riverbank well samples collected during the 2021 porewater investigation. Concentrations were detected above the PHSS CUL in two wells, KMW29 and KMW 31, with concentrations in groundwater ranging from 0.03 to 1.78 µg/L resulting in an exceedance ratio of 3. During the Deep Sand Unit recent semi-annual monitoring events, lead concentrations ranged from <0.2 to 14 µg/L. Wells with concentrations greater than the PHSS CUL (KMW13, KMW26, MW38, MW39 and MW46) were limited to the Loading Rack area and do not extend beyond the ODOT property. During the DPE Treatment Area recent semi-annual monitoring, lead concentrations greater than the PHSS CUL were sporadic and limited in the Shallow Sand Unit (KMW29, KMW31, KMW32, and KMW37) ranging from <0.2 to 2.37 µg/L. The maximum detected concentration during recent groundwater monitoring events was detected in KMW37 and had exceedance factor of 4. The data do not indicate the presence of a plume that is likely to recontaminate future sediment remedial measures or impact the protectiveness of the remedy. No source control action is necessary for lead in the Northern Facility.

***Southern Facility***

Of the total and dissolved metals analyzed, only concentrations of dissolved arsenic were greater than the PHSS CUL of 0.018 µg/L. Dissolved arsenic concentrations ranged in the Shallow Sand Unit wells in the Southern Facility Area from non-detect to 2.43 µg/L, which is below the ecological SLV of 150 µg/L, is in the lower range of concentrations observed in shallow groundwater at PHSS and is indicative to DEQ of naturally occurring levels. The data do not indicate the presence of a plume that is likely to recontaminate future sediment remedial measures or impact the protectiveness of the remedy. No source control action is necessary for arsenic, or any other metal, in the Southern Facility.

<u>Polycyclic Aromatic Hydrocarbons</u>

***Northern Facility***

During the 2021 porewater investigation, PAHs were detected above PHSS CULs in both riverbank wells and porewater samples. In riverbank wells, benzo(a)anthracene, chrysene, benzo(a)pyrene, and carcinogenic PAHs (cPAHs) exceeded the respective PHSS CULs, with maximum concentrations of individual PAHs ranging from 0.001 to 0.828 µg/L, and 0.00149 µg/L for cPAHs. Resulting in a maximum individual PAH exceedance ratio of 8 and a maximum cPAH exceedance ratio of 12. In porewater samples, acenaphthene, benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, chrysene, dibenzo(a,h)anthracene, fluorene, phenanthrene, pyrene and cPAHs exceeded the respective PHSS CULs, with maximum concentrations of an individual PAHs ranging from 0.00025 to 48.9 ug/L, and cPAH of 0.065 ug/L. Resulting in a maximum individual PAH exceedance ratio of 292 and a maximum cPAH exceedance ratio of 541. The increased concentrations of PAHs observed in porewater samples

relative to the riverbank groundwater monitoring wells may indicate porewater is being impacted more by localized sediment contamination than by the groundwater to surface water contaminant pathway.

During the Deep Sand unit recent semi-annual monitoring, concentrations of 2-methylnaphthalene consistently exceeded the PHSS CULs in groundwater collected from monitoring wells KMW13 and MW39, located near the upland Loading Rack area, with a maximum detected value of 147 µg/L and maximum exceedance ratio of 70. Additionally, sporadic detections of benzo(a)anthracene, benzo(a)pyrene benzo(a,h)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene, naphthalene and/or cPAHs exceeded the respective PHSS CULs in wells KMW10, KMW16, MW38, MW41B, MW45, and MW46. However, individual PAHs decrease in concentration with distance from the Loading Rack area and were not detected at down gradient well MW-46, located 125 feet from the Willamette River.

During the DPE Treatment Area recent semi-annual groundwater monitoring, concentrations of detected PAHs only exceeded the PHSS CUL in two samples. Fluorene exceeded the PHSS CUL of 3.9 µg/L at KMW29 and KWM33 with a maximum detected value of 4.07 µg/L, resulting in an exceedance ratio of 1.04. Method detection limits are greater than the respective PHSS CULs for several PAHs but are consistent with levels typically achieved for the analytical method ranging between <0.0160 to <2.83 µg/L. Given the limited detections of PAHs above the PHSS CUL in groundwater riverbank monitoring wells, and the increased concentration detected in the porewater samples, DEQ does not believe PAHs in Northern Facility groundwater poses a recontamination risk or poses a significant risk to RAO achievement. However, PAHs should continue to be monitored in this area under the site's long-term monitoring program to confirm concentrations are stable or decreasing. Future modifications of the long-term monitoring program will need to consider Portland Harbor RAO achievement as a data quality objective.

***Southern Facility***

Benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, indeno(1,2,3,-cd)pyrene, and cPAHs have been detected at concentrations that exceed the respective PHSS CUL sporadically in the Shallow Sand Unit of the Southern Facility Area. However, detections are sporadic, and PAHs were not detected in any of the Southern Facility riverbank wells during most recent monitoring, which occurred in October 2021. The data do not indicate the presence of a plume that is likely to recontaminate future sediment remedial measures or impact the protectiveness of the remedy. No source control action is necessary for PAHs in the Southern Facility.

A detailed weight of evidence evaluation is presented in Section 4.7 (for the Northern Facility) and Section 5.3.4 (for the Southern Facility) of the *Groundwater Pathway Source Control Evaluation*.

### 5.1.3 Groundwater Pathway Lines of Evidence Evaluation

In alignment with Section 5.2 of the JSCS, which describes factors that need to be considered in evaluating groundwater, a lines-of-evidence evaluation is needed in consideration of the following site-specific factors:

1. Nature and extent of groundwater COPCs in each affected water-bearing zone – The nature and extent of site-related groundwater contamination have been defined as described above and in Sections 4.4 and 5.3 of the *Groundwater Pathway Source Control Evaluation*. Several contaminants have been detected above PHSS CULs in upland wells and/or porewater samples but based on the available data and the evaluation presented in the *Groundwater Source Control Evaluation* DEQ does not believe they pose a recontamination risk or pose a significant risk to RAO achievement. However, C10-C12 aliphatics, benzene, arsenic and PAHs should continue to be monitored in the Northern Facility Area under the site's long-term monitoring program to confirm concentrations are stable or decreasing. Future modifications of the long-term monitoring program will need to consider Portland Harbor RAO achievement as a data quality objective.

2. Potential presence of non-aqueous phase liquid or sheen - SPH has been detected in the Shallow and the Deep Sand units. Monitoring and removal of SPH in the Shallow Sand Unit has occurred since 2004. The SPH in the Shallow Sand Unit is limited in volume and extent, has been removed to the extent practicable, and long-term monitoring data show that the SPH is not migrating; therefore, the SPH in the Shallow Sand Unit does not appear to present a risk to the river. SPH has been intermittently identified in the Deeper Sand Unit in the Loading Rack area and has been removed when present. The extent of SPH in this area has not changed since the release occurred in 2008, indicating that SPH in the Deep Sand Unit is not mobile and does not present a risk to the river.

3. Presence of bioaccumulative chemicals - Potential bioaccumulative chemicals detected above PHSS CULs in monitoring well data include arsenic, copper, lead and PAHs.

4. Magnitude of groundwater quality exceedance –Exceedance ratios in site-wide monitoring from select monitoring events are presented in Tables 17 through 19 of the *Groundwater Source Control Evaluation*. Maximum exceedance ratios for detected concentrations from the most recent reported sampling event, October 1, 2024, are as follows:
    - DPE Treatment Areas Riverbank Wells
        - Benzene – 1.4x (0.65 µg/L at MW29)
        - C10-C12 – 10x (27.9 µg/L at KMW29)
        - Fluorene – 1.04x (4.07 µg/L at KMW29)
        - Arsenic – 777x (14 µg/L at KMW29)
        - Lead – 1.09x (0.591 µg/L at KMW31)
    - Deep Zone Monitoring Well MW46 (closest to river)
        - Arsenic – 145x (2.62 µg/L at MW46)
    - Southern Facility Riverbank Wells (Not currently in semi-annual monitoring. Most recent sampling event occurred on October 7, 2020)

- Arsenic – 135x (2.43 µg/L at MW-2)

5. Regional background concentrations for naturally occurring chemicals – Concentrations of copper and lead were generally consistent with regional background concentrations, as determined by Deep Sand Unit monitoring wells upgradient of the tank areas (KMW24 through KMW26). Background concentrations of arsenic are observed at concentrations up to 10 ug/L based on upgradient wells KMW24 through KMW26. Arsenic concentrations in groundwater are generally consistent with background in most areas of the site, except in the Deep Sand Unit in the Loading Rack Area and in riverbank well KMW-29. The dissolved arsenic concentrations detected above background in these two areas are likely attributable to historical petroleum releases that occurred at the Facility and localized redox conditions that may secondarily mobilize naturally occurring arsenic as discussed in the *2016 Portland Harbor Remedial Investigation Report*.

6. Estimate of potential contaminant loading – A mass loading assessment was conducted to estimate the recontamination risk from the Northern Facility Area groundwater to adjacent sediments (Appendix Q of the *Groundwater Pathway Source Control Evaluation*). Potential contaminant loading to the Willamette River is anticipated to be minimal given the physical properties of the contaminants detected and the infrequent CUL exceedances.

7. Potential hydraulic connection between site groundwater and surface water/sediments – Groundwater in the Shallow Sand Unit can migrate through the 1-foot-thick gap beneath the revetment wall and discharge into adjacent sediments. While a formal discharge zone mapping/analysis was not completed, a mass flux evaluation was conducted to evaluate how far groundwater from the Shallow Sand Unit in the Northern Facility Area extends into the Willamette River (Appendix Q of the *Groundwater Pathway Source Control Evaluation*.). Shallow groundwater is estimated to discharge to the Willamette River nearshore, likely within 100 feet of the riverbank bottom.

8. Potential for groundwater discharge to result in an accumulation in sediment above protective concentrations – To the extent that groundwater contaminants are currently present above PHSS CULs in site groundwater, they are not expected to reach or accumulate in sediment at concentrations of concern.

Based on these results, DEQ concludes that monitoring of arsenic, benzene, C10-C12 aliphatics and PAHs should continue at the Northern Facility, but no additional source control actions are needed to address the groundwater pathway.

### 5.2 Stormwater Source Control Evaluation

When stormwater is a potential pathway to mobilize contamination from the site to the river, source control determinations support the following findings:

1. Existing and potential facility-related contaminant sources have been identified and characterized.

2. Contaminant sources were removed or are being controlled to the extent feasible.

3. Performance monitoring conducted after source control measures were implemented supports the conclusion that the measures are effective.

4. Adequate measures are in place to ensure source control and good stormwater management measures occur in the future.

As detailed in the *Stormwater Pathway Source Control Evaluation* (GeoEngineers, 2023d) and supporting reports, investigation of the stormwater collection and conveyance system was undertaken at the site, in accordance with DEQ's 2009 *Guidance for Evaluating the Stormwater Pathway at Upland Sites.*

### 5.2.1 Stormwater Sampling COIs.

Site stormwater was analyzed for the following list of contaminants:

- Dissolved metals (aluminum, arsenic, barium, cadmium, chromium, copper, iron, manganese, mercury, silver, and zinc)
- TPH
- VOCs
- PCBs
- Phthalates
- PAHs
- Organochlorine Pesticides
- Total suspended solids (TSS)

Due to the lack of elevated sediment contaminant concentrations observed in the Portland Harbor Remedial Investigation/Feasibility Study; Portland Harbor Pre-Remedial Design Investigation and Baseline Sampling datasets offshore of the Site; and no historical sources of these contaminants on the site, the following contaminants with surface water CULs on Table 17 of the 2017 EPA ROD were not evaluated: mecoprop (MCPP), pentachlorophenol, dioxins/furans and tributyltin.

### 5.2.2 Stormwater System Configuration

The stormwater conveyance system divides the Shore Terminals property into six drainage areas. These drainage areas either infiltrate into the ground, discharge to the Willamette River, or discharge into the City of Portland sewer system. The locations and features of the stormwater conveyance system are shown on Figures 6 through 9 in Attachment 1.

<u>Drainage Areas</u>

Descriptions of the six drainage areas within the Shore Terminals property are provided below.

- Upper Terminal Drainage Area encompasses the part of the Northern Facility Area west of the ODOT property and the PNWR short line railroad. Approximately 0.2 acre of the

area is pervious and the remaining 3.5 acres are impervious. Stormwater in the impervious areas drains to catch basins and is conveyed via below-grade piping to the P-2 oil-water separator for treatment.

- P-2 Drainage Area encompasses the part of the Northern Facility east of the ODOT property and the PNWR short line, which includes Tank Fields 1 through 3; the P-2 Dock; the Railcar Loading/Unloading Area; the Hazardous/Non-Hazardous Waste Storage Area; the OPLC and Kinder Morgan pump/manifold area; and the P-2 oil-water separator. Approximately 5.4 acres of the P-2 Drainage Area are pervious and the remaining 9.3 acres of the area are impervious. Stormwater in the impervious areas drains to catch basins and is conveyed via below-grade piping to the P-2 oil-water separator for treatment. The treated stormwater is discharged to outfall WR-78 under Shore Terminals' NPDES 1200-Z permit.

- Tank Field 4 Drainage Area encompasses Tank Field 4, part of the Terminal Yard (including the P-3 oil-water separator), and the P-3 Dock in the Southern Facility Area. Approximately 2.1 acres of the Tank Field 4 Drainage Area are previous and the remaining 1.8 acres of the area are impervious. Stormwater in the impervious areas is conveyed via below-grade piping to the P-3 oil-water separator for treatment. The treated stormwater discharges to the City of Portland's sanitary sewer system.

- Tank Field 5 Drainage Area encompasses Tank Field 5 and the gravel portion of the Terminal Yard. Tank Field 5 was constructed in 2007, and the base of the tank field is completely lined. Stormwater in the tank field collects in catch basins that discharge to a Contech StormFilter® stormwater treatment system located in a subsurface vault. Pumps must be manually activated to remove the treated water from the vault for discharge to Outfall WR-152 under Shore Terminals' NPDES 1200-Z permit.

- Olympic Pipeline Company Drainage Area encompasses the OPLC Switching Station and OPLC office. Approximately 50% of the basin is impervious. Stormwater collects in the AST and operations containment areas and discharges to the OPLC oil-water separator. Treated water then accumulates in a concrete sump, which is periodically inspected by OPLC staff. If no impacts are observed, the water is pumped to a bioswale for percolation into soil. If stormwater cannot adequately percolate, an overflow weir is located at the end of the swale. This weir is sampled under NPDES permit (No. 112103) for the OPLC facility. Under DEQ oversight, improvements were made to the bioswale in 2021 to lessen stormwater runoff leaving the bioswale. However, during heavy rains, stormwater runoff from Highway 30 can enter the bioswale and overwhelm the improved system. When this occurs, OPLC stormwater may overflow from the bioswale and discharge to the railroad ditch leading to the WR-209 conveyance line intake.

- Southern Drainage Area is 2.8 acres of undeveloped and densely vegetated land. The undeveloped land is composed of an approximately 0.8-acre hillside that slopes eastward from Highway 30 and 2 flat acres located between the slope and the ODOT property. Most, if not all, of the rainfall likely infiltrates into the ground in the Southern Drainage Area; however, the drainage area also receives stormwater from a culvert that runs

beneath Highway 30. The culvert collects stormwater that drains from Forest Park, Highway 30, Germantown Road, and residential areas west of Highway 30 and discharges overland to the railroad ditch leading to the WR-209 conveyance line intake.

Outfalls

Seven stormwater outfalls are or were present at the Facility boundary with the Willamette River. Two actively discharge Facility stormwater (WR-78 and WR-152), two discharge stormwater from off-site properties (WR-202 and WR-209) and three are abandoned (WR-589, OF-23, and OF-23A). Descriptions of the outfalls are provided below.

- Outfall WR-78 is an 18-inch-diameter steel pipe that discharges stormwater from the Northern Facility Area (Figure 6 in Attachment 1). The stormwater flows to an oil-water separator, referred to as the P-2 oil-water separator, prior to discharge to the Willamette River. Prior to 2007, discharge from the outfall was regulated under NPDES1300-J Permit number 57374 issued to Shore Terminals. Since 2007, the outfall has been regulated under NPDES 1200-Z Permit number 109938 issued to Shore Terminals.

- Outfall WR-152 is a 6-inch-diameter lined corrugated metal pipe that discharges stormwater from Tank Field 5 (Figure 7 in Attachment 1). The stormwater runs through a Contech StormFilter® stormwater treatment system prior to discharge. Since 1999, the outfall has been regulated under NPDES 1200-Z Permit 109938 issued to Shore Terminals.

- Outfall WR-209 is a 24-inch-diameter concrete pipe that runs beneath Tank Field 3 and discharges stormwater from the WR-209 ditch located on property owned by ODOT and leased to PNWR (Figure 6 in Attachment 1). Ownership of the outfall and conveyance line has not been determined. Stormwater from the Shore Terminals Facility does not discharge to the WR-209 conveyance line. A catch basin located within the driveway into the Facility historically discharged to the hillside above the WR-209 ditch; however, the catch basin was abandoned in May 2020.

- Outfall WR-202 is a 48-inch-diameter corrugated steel pipe that discharges stormwater from off-site sources: the ExxonMobil Lube Plant, the ODOT right-of-way at Highway 30, and the residential area west of Highway 30 (Figure 6 in Attachment 1). No catch basins or conveyance lines from the Facility are connected to Outfall WR-202.

- Outfall WR-589 was a 4-inch-diameter corrugated steel pipe that discharged stormwater from two Facility catch basins and from roof drains of Building 8 and the attached Shop Building. At the end of 2017, Outfall WR-589 was decommissioned, and the conveyance system was reconfigured to discharge to the P-2 oil-water separator, which discharges to Outfall WR-78. The former location of Outfall WR-589 is shown on Figure 6 in Attachment 1.

- Outfall OF-23 and Outfall OF-23A are abandoned combined sewer outfalls owned by the City of Portland. The outfalls were decommissioned in approximately 1992, prior to

Shore Terminals' ownership of the Facility. The former locations of Outfall OF-23 and Outfall OF-23A are shown on Figure 6 in Attachment 1.

### 5.2.3 Stormwater Pathway Investigation and Evaluation

The stormwater source control evaluation was presented in the 2023 *Stormwater Pathway Source Control Evaluation*. The evaluation included the documentation of the stormwater collection and treatment system, review of stormwater data collected under NPDES permits, screening of solids collected from the catch basins, and screening of stormwater samples. The source control evaluation focused mainly on the Shore Terminals-owned outfalls (WR-78 and WR-152). Additional investigation and evaluation were completed for WR-209 to determine configuration of the conveyance line, evaluate groundwater intrusion, and assess the quality of stormwater entering the pipe at the ODOT property/railroad leased area and discharge at the outfall.

**Catch Basin Sampling.** A composite stormwater solids sample was collected from catch basins PS01A and PS12 in November 2012 to evaluate the quality of sediment captured in the P-2 oil-water separator. Catch basins PS01A and PS12 are located immediately upstream of the P-2 oil-water separator, which discharges to the river at outfall WR-78. Stormwater solids samples were collected from these catch basins because the volume of solids in the P-2 oil-water separator was insufficient for sampling. Catch basin PS01A receives stormwater from most of Tank Field 1 and from the Terminal Yard adjacent to Building 8. Catch basin PS12 receives stormwater from parts of Tank Fields 1, 2, and 3, the Loading Rack area, and parts of the Terminal Yard. The stormwater solids samples were analyzed for metals, PCBs, PAHs, phthalate esters, organochlorine pesticides, total organic carbon, BTEX, TPHg, TPHd, TPHo, cadmium, and zinc. Total PAHs, cPAHs, bis(2-ethylhexyl) phthalate (BEHP), and TPHd exceed PHSS CULs for Riverbank Soil/Sediment. Detected concentrations fall in the flat portion of the curve for all compounds except for total PAHs, which fall in the knee of the curve. Screening tables and a comparison to the DEQ stormwater curves are presented in Table 7 and Attachment G of *Stormwater Pathway Source Control Evaluation*, which are included in Attachment 6.

**Stormwater Sampling**. Stormwater sampling at outfalls WR-78 and WR-152 was conducted in accordance with DEQ's *Guidance for Evaluating the Stormwater Pathway at Upland Sites* (2009). Four sampling events occurred between November 2011 and November 2012. The stormwater samples were analyzed for TSS, metals, PCBs, organochlorine pesticides, VOCs, phthalates, PAHs, TPHd, TPHo, TPHg, and SVOCs. Following implementation of best management practices (BMPs) and source control measures discussed below, three additional sampling events were completed between April 2022 and April 2023 in which samples were analyzed for arsenic, aluminum, zinc, DDx compounds, BEHP, and PAHs. Screening tables and a comparison to the DEQ stormwater rank order curves are presented in Tables 2 through 10 and Attachment G of *Stormwater Pathway Source Control Evaluation*, which are included as Attachments 7, 8 and 9. Stormwater data are also collected under the site's NPDES 1200-Z permit which are presented in Attachment C of the *Stormwater Pathway Source Control Evaluation*.

Outfall WR-78

During the 2011-2012 sampling events at WR-78, several PAHs, cPAHs, DDT, DDD, DDx, total chlordanes, BEHP, arsenic, copper and zinc were detected at concentrations above surface water PHSS CULs. The detected concentrations for arsenic, copper, zinc, and BEHP were within the typical range for industrial discharge in Portland Harbor. DDD, DDT, and total chlordanes were detected in just one stormwater sample with concentrations of 0.0064 µg/L, 0.0083 µg/L, and 0.056 µg/L, respectively. Out of the four samples analyzed for total PAH concentrations, two fell on the flat part of the curve, one fell in the knee of the curve, and one fell toward the top of the curve.

During the 2022-2023 sampling event, detected concentrations of arsenic, zinc, DDD, DDE and DDT exceeded PHSS CULs for surface water. Arsenic and zinc concentrations remained in the range of typical stormwater at industrial sites in PHSS and at the lower end of these concentration ranges based on rank order curves shown in Attachment 8. DDD/DDE/DDT were detected in all three samples at low concentrations ranging from 0.000066 to 0.0012 µg/L. DDx concentrations were lower than those observed in the 2011-2012 events. Additionally, DDE and DDT have been analyzed under the NPDES permit in multiple events with similar infrequent low-level detections. While curves are not available for DDx, the observed concentrations do not suggest to DEQ that stormwater at the site is atypically elevated or that a significant source is present that needs to be addressed through additional source control.

Outfall WR-152

During the 2011-2012 sampling events at WR-152, PAHs, cPAHs, DDD, DDT, DDx, total chlordanes, arsenic, and zinc were detected at concentrations above surface water PHSS CULs. The detected concentrations for arsenic, zinc, and total PAHs were within the typical range for industrial discharge in PHSS. DDD, DDT, and total chlordanes were detected in just one stormwater sample with concentrations of 0.0049 µg/L, 0.0092 µg/L, and 0.052 µg/L, respectively.

During the 2022-2023 sampling event, detected concentrations of arsenic, zinc, and DDT exceeded PHSS CULs for surface water. Arsenic and zinc concentrations remained in the range of typical stormwater at industrial sites in PHSS and at the lower end of these concentration ranges based on rank order curves shown in Attachment 9. DDT was detected in one sample at a low concentration of 0.000062 µg/L. DDx concentrations were lower than those observed in the 2011-2012 events. Additionally, DDE and DDT have been analyzed under the NPDES permit in multiple events with similar infrequent low-level detections. While curves are not available for DDx, the observed concentrations do not suggest to DEQ that stormwater at the site is atypically elevated or that a significant source is present that needs to be addressed through additional source control.

**WR-209 Investigation and Sampling**. Numerous investigations and assessments of the conveyance line to Outfall WR-209 have been completed to understand the configuration of the conveyance line and assess the quality of stormwater discharge into and out of the outfall. Investigations determined that stormwater collects in a railroad ditch located in the Southern

Drainage Area and discharges at Outfall WR-209 via a conveyance line that runs beneath Tank Field 3. WR-209 is an unclaimed asset and is not owned by Shore Terminals.

Stormwater samples were collected from the outfall in 2002, 2003, 2006, 2008, and 2009; and from the inlet in 2003, 2006, 2008, and 2009. Concentrations of petroleum constituents (e.g., benzene, toluene, ethylbenzene, MTBE, TPHg, and naphthalene) were often greater in the outfall stormwater samples compared to the respective inlet stormwater samples. Metals concentrations were comparable between the inlet and discharge samples.

Dry weather discharge was identified in 2002. Upon further investigation in 2015, it was concluded that groundwater was likely intruding into the conveyance line because the discharge at the outfall was a higher flow rate than at the inlet. However, comparison of the discharge sample results to groundwater analytical data showed that the petroleum hydrocarbon concentrations were greater in the discharge samples collected from Outfall WR-209 than in the groundwater samples collected from nearby wells. The *2015 Source Control Evaluation* determined legacy sediments and debris in the conveyance line were likely impacting the quality of the discharge (APEX, 2015). Additional dry weather samples were collected in 2017 from Outfall WR-209.

Two rounds of conveyance line sediment and debris cleanout were performed in September and October 2022, each followed by dry weather flow sample collection. Following the second cleanout, a video inspection was performed to document that legacy sediments had been successfully removed from the conveyance line. The analytical results for the post-cleanout dry weather flow samples were non-detect or below the respective screening levels except for chrysene (estimated 0.0247 µg/L), benzo(a)anthracene (estimated 0.198 µg/L), arsenic (10.1 µg/L), and manganese (1,320 µg/L). A summary of the assessments is detailed in the *WR-209 Source Control Measures, Geoengineers, Jan. 2023.*

### 5.2.4 Stormwater Source Control Measures and Treatment

**Inactive Outfall Decommissioning.** Outfall OF-23 and Outfall OF-23A were combined sewer outfalls owned by the City of Portland and decommissioned in approximately 1992. Outfall WR-589 was decommissioned in 2017, and the conveyance system was reconfigured to discharge to the P-2 oil-water separator. The outfall locations are shown on Figure 8 in Attachment 1.

**Oil-Water Separators.** Stormwater captured in all catch basins located within the Upper Terminal and P-2 Drainage Basins flow to the P-2 oil-water separator. The P-2 oil-water separator is a baffled gravity separator with oil skimmer that discharges the treated stormwater to the Willamette River via Outfall WR-78.

Stormwater captured in the Tank Field 4 Drainage Basin and the P-3 Dock Area flows to the P-3 oil-water separator. The P-3 oil-water separator is equipped with a coalescing plate to remove petroleum and sediment. Treated stormwater from the P-3 oil-water separator discharges to the City of Portland sanitary system.

**Stormwater Filter Treatment System.** Stormwater in Tank Field 5 collects in catch basins that discharge to a Contech StormFilter® stormwater treatment system located in a subsurface vault. The system includes a filter that removes both sediment and petroleum constituents from the stormwater. Treated stormwater discharges to the Willamette River at Outfall WR-152.

**Best Management Practices.** Source control BMPs implemented at the site include catch basin inserts, routine sweeping of paved areas, and the storage of materials and wastes in covered areas or containers to further reduce sources to stormwater. The catch basin filters are replaced annually, typically during the dry season. The oil-water separators and Contech StormFilter® stormwater treatment are cleaned annually, typically during the dry season. During the annual cleaning the condition of the filter cartridges of the Contech StormFilter® system are assessed and replaced, as needed based on the evaluation of the qualified third-party contractor completing the inspection and cleaning. Additional institutional BMPs include maintaining a pollution prevention team, training, good housekeeping, inspections, preventative maintenance, spill prevention and cleanup, and recordkeeping. Stormwater is impounded behind normally-closed valves in AST and operations areas and released to the stormwater drainage system following observations of no sheen or other contaminants.

### 5.2.5 Stormwater Pathway Lines of Evidence Evaluation

In alignment with Section 5.3 of the JSCS, which describes appropriate approaches for screening of direct discharges, a weight-of-evidence evaluation was undertaken in consideration of the following site-specific factors:

1. Identification and characterization of potential sources of contaminants – Existing and potential facility-related stormwater contaminant sources were identified and characterized.

2. Magnitude of stormwater and stormwater solids exceedances at each sampling point and proximity of sampling points to the river – Stormwater and catch basin solids sampling results that exceeded the applicable PHSS CULs or JSCS SLVs were compared to DEQ charts from Appendix E: *Tools for Evaluating Stormwater Data*, which was updated in 2015. This tool was created by using contaminant concentration data from many of the stormwater and stormwater solids samples collected at Portland Harbor-area heavy industrial sites. These data were used to create a series of charts that plot rank-order samples against contaminant concentrations and are used to identify contaminant concentrations in samples that are atypically elevated. Concentrations falling within the upper/steeper portion of the curve are an indication that uncontrolled contaminant sources may be present at the site and that additional evaluation or source control measures may be needed. Concentrations that fall on the lower/flatter portion of the curve suggest that stormwater is not being unusually impacted by contaminants at the site and, while concentrations may exceed PHSS CULs or JSCS SLVs, they are within the range found in stormwater or solids from active industrial sites in PHSS.

   While select metals, DDx, select VOCs, and select PAHs were detected in one or more stormwater samples at concentrations that exceeded PHSS CULs or JSCS SLVs, all

concentrations in recent detections were within the typical range for industrial discharge in the PHSS or considered to be insignificant.

3. Regional background soil concentrations of naturally occurring chemicals for evaluating stormwater solids – Concentration of antimony, cadmium, copper, lead, and zinc were detected in catch basin solids above regional soil background levels. Operation of the oil-water separators and Contech StormFilter® stormwater treatment are expected to continue managing any potential risk associated with stormwater solids at the site.

4. Presence of bioaccumulative chemicals – Several metals, BEHP, DDx, total chlordanes and PAHs were detected in site stormwater at concentrations above surface water PHSS CULs or JSCS SLVs. Concentrations plotted on the flat portion of the rank-order curves were low or sporadic indicating these contaminants are not atypically elevated in stormwater discharge from the site.

5. Site hydrology including site conditions, size of drainage and location, and estimated size of discharge – The stormwater conveyance system divides the 29-acre Shore Terminals property into six drainage areas (Upper Terminal Drainage Area; P-2 Drainage Area; Tank Field 4 Drainage Area; Tank Field 5 Drainage Area; Olympic Pipeline Company Drainage Area; and Southern Drainage Area). The Facility is graded to direct stormwater to catch basins that are conveyed to treatment systems prior to discharging to the Willamette River or the City of Portland sanitary sewer system. Additionally, the top of the riverbank is generally slightly higher than adjacent upland areas redirecting stormwater away from the Willamette River and berms have been constructed to control runoff and run-on.

6. Stormwater system design and management – As described in Section 5.2.1, the six drainage basins are managed by infiltration or stormwater treatment systems that discharge to the Willamette River or the City of Portland sanitary sewer system. Stormwater from the Upper Terminal Drainage Area and the P-2 Drainage Area flows to the P-2 oil-water separator prior to discharging to the Willamette River at Outfall WR-78. Stormwater from Tank Field 5 flows through the Contech StormFilter® stormwater treatment system prior to discharging to the Willamette River at Outfall WR-152. Outfall WR-78 and Outfall WR-152 are managed under an NPDES 1200-Z Permit. Stormwater from the Tank Field 4 Drainage Area either infiltrates or is treated at the P-3 oil-water separator prior to discharging to the City of Portland's sanitary sewer system. Approximately half of the Olympic Pipeline Company Drainage Area is impervious and stormwater discharges to the OPLC oil-water separator. The treated stormwater is inspected and, if no impacts are observed, the stormwater is pumped to a bioswale. Most, if not all, of the rainfall likely infiltrates to the ground in the Southern Drainage Area; however, the drainage area also receives stormwater from a 6-inch culvert that runs beneath Highway 30. The culvert discharges to a ditch with leads to the WR-209 conveyance line that in turn discharges at Outfall WR-209.

7. Estimate of potential contaminant loading to the river – Supported by low concentrations of detected contaminants and TSS in stormwater, pollutant loads in stormwater from the site are not significant and will continue to be minimized under regulation by the NPDES 1200-Z permit.

Based on the information provided in the *Stormwater Pathway Source Control Evaluation* report and supplemental reports, DEQ concludes no further source control actions are required to address the stormwater pathway.

### 5.3 Overwater Activities

The *Over Water Pathway Source Control Evaluation Report* (GeoEngineers 2023b) describes the facility-specific plans and BMPs in place for over water product transfer operations at the Facility and evaluates whether these measures adequately mitigate potential product releases to the Willamette River. Approximately 35 to 50 percent of the fuel product arrives at the Terminal via ship or barge at the docks, and approximately 1 to 6 percent leaves by ship or barge from the two docks.

The Northern Facility consists of Tank Fields 1 through 3 and the P-2 dock for offloading/loading bulk fuel products. The P-2 dock was built between 1923 and 1936. All liquids from the dock surface drain to catch basins and are piped upland to the 10,000-gallon P-2 oil-water separator for eventual release to the river via outfall WR-78, following satisfactory inspection.

The Southern Facility includes Tank Fields 4 and 5 and the P-3 dock for offloading/loading bulk fuel products. The P-3 dock was built in 1979. All liquids from the dock surface drain to catch basins and are piped to an upland 5,000-gallon steel sump for disposal to the City of Portland sanitary sewer following inspection.

Spill Prevention Planning and Stormwater Control. Shore Terminals maintains several plans, including a *Spill Prevention, Control, and Countermeasures (SPCC) plan*, a *Facility Response Plan (FRP), a Storm Water Pollution Control Plan (SWPCP)*, and a *Dock Operations Manual* to provide clear prevention and response actions to mitigate the potential for releases impacting the environment. The plans include programs for mitigating the potential for a release at the docks and procedures for response actions should a spill occur.

Best Management Practices. The spill prevention plans also describe BMPs to prevent or reduce non-point sources to the Willamette River. These BMPs include structural and non-structural controls.

Conclusions and Recommendation. Shore Terminals maintains multiple detailed plans to prevent the release of contaminants to the Willamette River during its over water product transfer operations and ensures quick response times if a release does occur. The success of these plans is demonstrated by the limited number of releases that have occurred during the 23 years that Shore Terminals has been operating the Facility. A release of 75 gallons of jet fuel did reach the river from the P-3 dock approximately 20 years ago, but there has not been an over water release of product reaching the river from this dock since that time. Additionally, one gallon of hydraulic fluid is the only release that reached the river from the P-2 dock overwater operations in the 23 years of Shore Terminals' operations at the Facility.

## 5.4 Riverbanks

A *Riverbank Source Control Pathway: Summary of Supporting Information* was prepared by Cascadia Associates, LLC, on behalf of Shore Terminals, to summarize information for DEQ in transitioning of riverbank oversight to the EPA. The document is dated April 13, 2020, with a revised version (to correct units in a data table) dated Oct. 12, 2023 (Cascadia, 2020a).

The Shore Terminal Facility has approximately 2,500 feet of Willamette River shoreline. The northern 580 feet of riverbank is protected by a concrete revetment. The remaining riverbank is armored with rock riprap. Shore Terminals was identified by the EPA as a "riverbank pending characterization" due to it being adjacent to an in-river sediment management area. Based on field observations and other lines of evidence, DEQ concluded that the riverbank is not erodible and does not present a source of potential recontamination to the Willamette River. Measures have been taken to prevent site stormwater from flowing over the bank to the river.

A sheen was observed along the shoreline adjacent to the P-3 dock once in November 2006 and again in December 2007. Despite top of bank and shoreline investigations, no source for the sheen was identified. The riprapped riverbank in the sheen area was remediated via pressure washing in January 2007 with sorbent booms in river. No sheen has been observed since December 2007. Investigations using direct push borings, monitoring wells, and riverbank soil samples were completed in 2006, 2007 and 2012 and did not identify a source for the sheen. Three soil samples were collected from beneath the shoreline riprap immediately south of the P-3 dock in November 2012. Analysis of these soil samples did not identify COI that would present an unacceptable risk to the river or produce a sheen. No further investigation or source control measures were required by DEQ.

# 6.0 Summary of Source Control Decision

The Shore Terminals site has been adequately characterized. The sources, nature, and extent of contamination are understood. The overwater, groundwater and stormwater source control evaluations prepared by GeoEngineers on behalf of Shore Terminals present acceptable evaluations that generally follow the JSCS and allow DEQ to make this source control decision.

The source control decision review of migration pathways to the Willamette River identified the riverbank, overwater activities, groundwater migration and stormwater migration pathway as potentially complete pathways to the river for historical contamination at the site. Oversight of the riverbank erosion/leaching pathway has been transferred to EPA and this proposed source control decision does not make a determination for this pathway. DEQ will continue to support EPA in the assessment of this pathway through the B1a Project Area Remedial Design oversight.

DEQ's proposed source control decision for the remaining pathways is that the groundwater, stormwater and overwater pathways do not pose a significant current or likely future threat to the Willamette River.

However, while the risk of sediment recontamination above Portland Harbor remedial action levels is low for the groundwater pathway, DEQ has determined concentrations of C10-C12

aliphatic, benzene, PAHs, and arsenic could pose a risk to RAO 4 and 8 achievement if concentrations do not remain stable or continue to decrease. Monitoring in the Northern Facility Area will need to continue for these contaminants under the site's groundwater monitoring plan. Future modifications of the monitoring program will need to consider Portland Harbor RAO achievement as a data quality objective.

**Attachments:** Attachment 1: Site Location and Facility Features
Attachment 2: Current Groundwater Monitoring Program
Attachment 3: 2021 Porewater Sampling Locations and Data
Attachment 4: Groundwater Monitoring Sampling Results: 2019-2021
Attachment 5: Groundwater Monitoring Sampling Results: 2023-2024
Attachment 6: Stormwater Solids Data and Rank Order Curves
Attachment 7: Stormwater Data
Attachment 8: Stormwater Rank Order Curves – WR-78
Attachment 9: Stormwater Rank Order Curves – WR-152

**References:**

AME, 2009. Updated Focused Feasibility Study. NuStar Portland Terminal, Oregon. May 28, 2009.

APEX, 2015. Source Control Evaluation, Shore Terminals LLC: Portland, Oregon. March 16, 2015.

Ash Creek, 2006. Immediate Response Report. Shore Terminals Portland Facility, Portland, Oregon. July 31, 2006.

Ash Creek, 2007. River Bank Cleanup, Shore Terminals Portland Terminal. August 10, 2007.

Ash Creek, 2008a. Sheen Assessment Status Report, Shore Terminals Portland Terminal. January 4, 2008.

Ash Creek, 2008b. Additional Sheen Assessment Sampling, Shore Terminals Portland Terminal. March 4, 2008.

Cascadia, 2020a. Riverbank Source Control Pathway: Summary Supporting Information, Shore Terminals LLC, Portland, Oregon ECSI #5130.

Cascadia, 2020b. Revetment Wall Construction Details, Shore Terminals LLC, 9420 NW St. Helens Road (U.S. Highway 30), Portland, Oregon, ECSI #5130. October 27, 2020.

Cascadia, 2020c. Summary of Outfall WR-209 Investigations and Sampling, Shore Terminals LLC, 9420 NW St. Helens Road (US Highway 30). April 14, 2020.

DEQ, 1997. Record of Decision, Selected Remedial Action for the Mobil Oil Terminal Site, Portland, Oregon. June 1997,

DEQ, 2002. Voluntary Cleanup Agreement No. ECVC-NWR-01-15

DEQ, 2009. Guidance for Evaluation the Stormwater Pathway at Upland Sites. 2009, updated October 2010.

DEQ, 2019. Letter to Victoria Wark, Re: EPA's Guidance for River Bank Characterization and Evaluation at the Portland Harbor Superfund Site and Path Forward for Riverbank Source Control Evaluation, Shore Terminals/Nu Star, ECSI#5130. December 2, 2019.

EPA, 2016. Portland Harbor RI/FS, Remedial Investigation Report. February 8, 2016.

EPA, 2017. Record of Decision, Portland Harbor Superfund Site, Portland, Oregon. January 2017.

GeoEngineers, 2022. Groundwater Pathway Source Control Evaluation. Shore Terminals LLC Portland Facility. April 11, 2022.

GeoEngineers, 2023a. WR-209 Source Control Measures. Shore Terminals LLC Portland Facility. January 20, 2023.

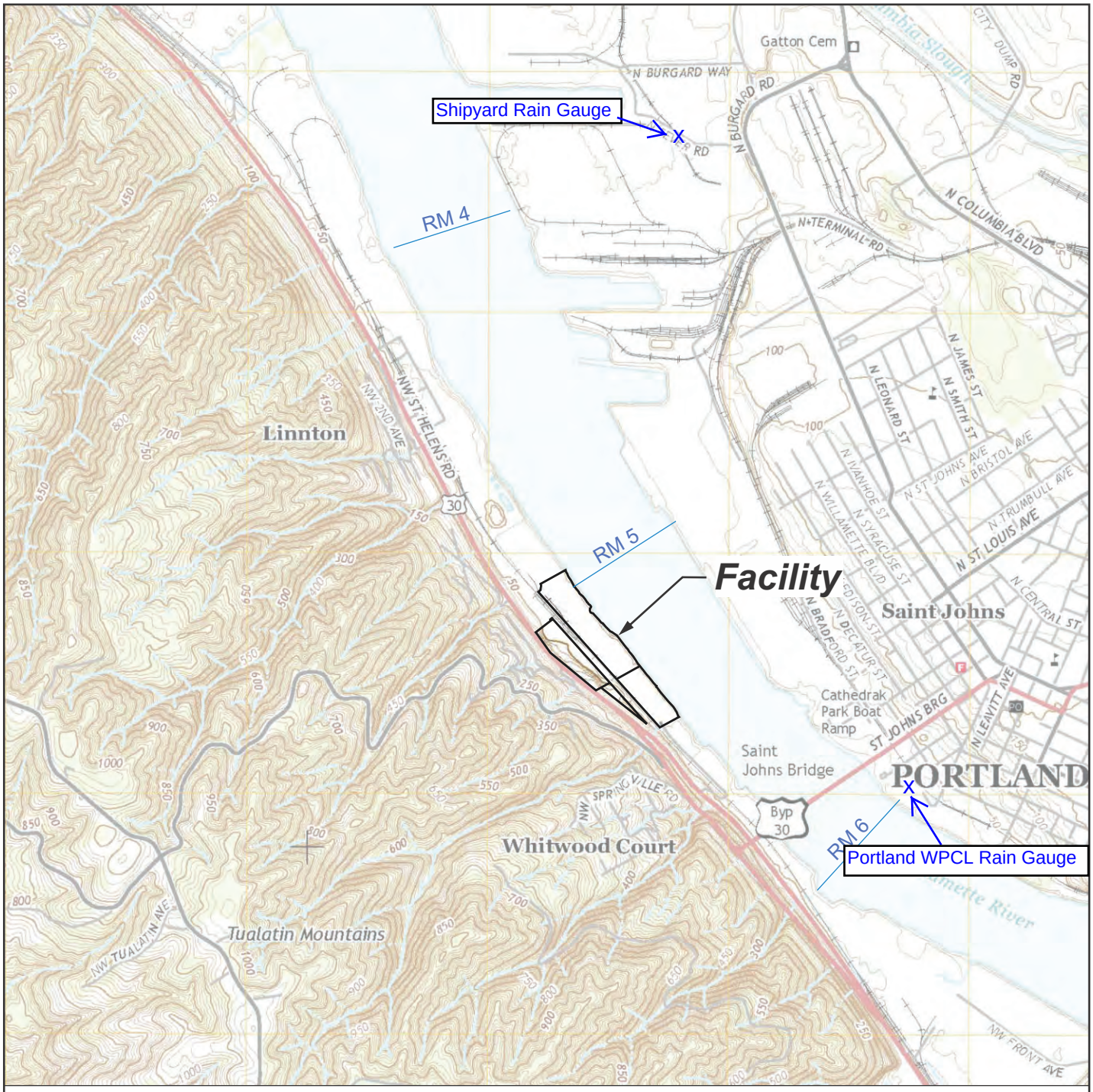
GeoEngineers, 2023b. Over Water Pathway Source Control Evaluation. Shore Terminals LLC Portland Facility. March 16, 2023.

GeoEngineers, 2023c. Response to Comments on the Groundwater Pathway Source Control Evaluation Report. Shore Terminals LLC Portland Facility. August 4, 2023.

GeoEngineers, 2023d. Stormwater Pathway Source Control Evaluation. Shore Terminals LLC Portland Facility. November 20, 2023.

# Attachment 1

Site Location and Facility Features




Base map prepared from USGS 7.5-minute quadrangle of Linnton, Oregon, dated 2014, as provided by Topozone.

0 2,000 4,000

Scale in Feet


N

# Facility Location Map

First Semi-Annual 2024 Groundwater Monitoring Report
Shore Terminals LLC Portland Facility
Portland, Oregon

GeoEngineers

| Project Number | 019001-010-16 | Figure 1 |
|---|---|---|
| August 2024 | | |

NORTHERN FACILITY AREA
(FORMER EXXONMOBIL)

SOUTHERN FACILITY AREA
(FORMER TIME OIL)

DREDGE PRISM

RM-5

WILLAMETTE RIVER

WILLAMETTE RIVER

WR-78 OUTFALL

WR-209 OUTFALL

WR-152 OUTFALL

P-2 DOCK

P-3 DOCK

P-2 OIL WATER SEPARATOR

SHOP BUILDING

BUILDING #8

BUILDING #12

SHOP BUILDING #5

AIR SPARGING CURTAIN AREA

APPROXIMATE LOCATION OF SUBSURFACE SLURRY WALL

ASPHALT AND EARTHEN BERM

DOCK PIPELINES

Former DPE Treatment Area

Seaport Midstream Partners, LLC

Tank Field 1

Tank Field 2

Tank Field 3

Tank Field 4

Tank Field 5

Foss Maritime/ Brix Maritime

Tank 3510

CONCRETE CONTAINMENT WALL

STORMWATER TREATMENT VAULT

OIL/WATER SEPARATOR

OFFICE

BULK STORAGE TANK CONTAINMENT BERM (TYPICAL)

OREGON DEPARTMENT OF TRANSPORTATION PROPERTY
(LEASED BY PORTLAND & WESTERN RAILROAD)

PAVED CROSSING

OFFICE TRAILER

OVERHEAD PIPE RACK

T.O. OFFICE

OIL/WATER SEPARATOR

BIOSWALE

OPLC SWITCHING STATION

STORM SEWER WP-209 INLET (24-INCH CAST IRON)

LUBE PLANT

BOILER HOUSE

LUBE PLANT TANK FARM

FUEL LOADING RACK

MAIN OFFICE

ST. HELENS ROAD (HIGHWAY 30)

ST. HELENS ROAD (HIGHWAY 30)

KMW34 (Abandoned)

KMW14 (Paved Over)

A

A'

***Legend:***

- **MW-1** Monitoring Well Location (Shallow Sand Unit)
- **MW41B** Monitoring Well Location (Deep Sand Unit)
- **AS-05** Air Sparging Well Location
- **KVE-01** Vapor Extraction Well Location
- **W-1** Groundwater Extraction Well Location (Currently Used for Monitoring Only)
- **DPW-10** Groundwater Extraction System Well Location (Currently Used for Monitoring Only)
- **TP-1** Temporary Vapor Monitoring Well Location
- Property Boundary
- Cross Section A-A'

Tank 3510 and Loading Rack Locations

**NOTE:** AS/SVE System and Associated Above Ground Piping Were Removed in June 2018

0 200 400

Approximate Scale in Feet

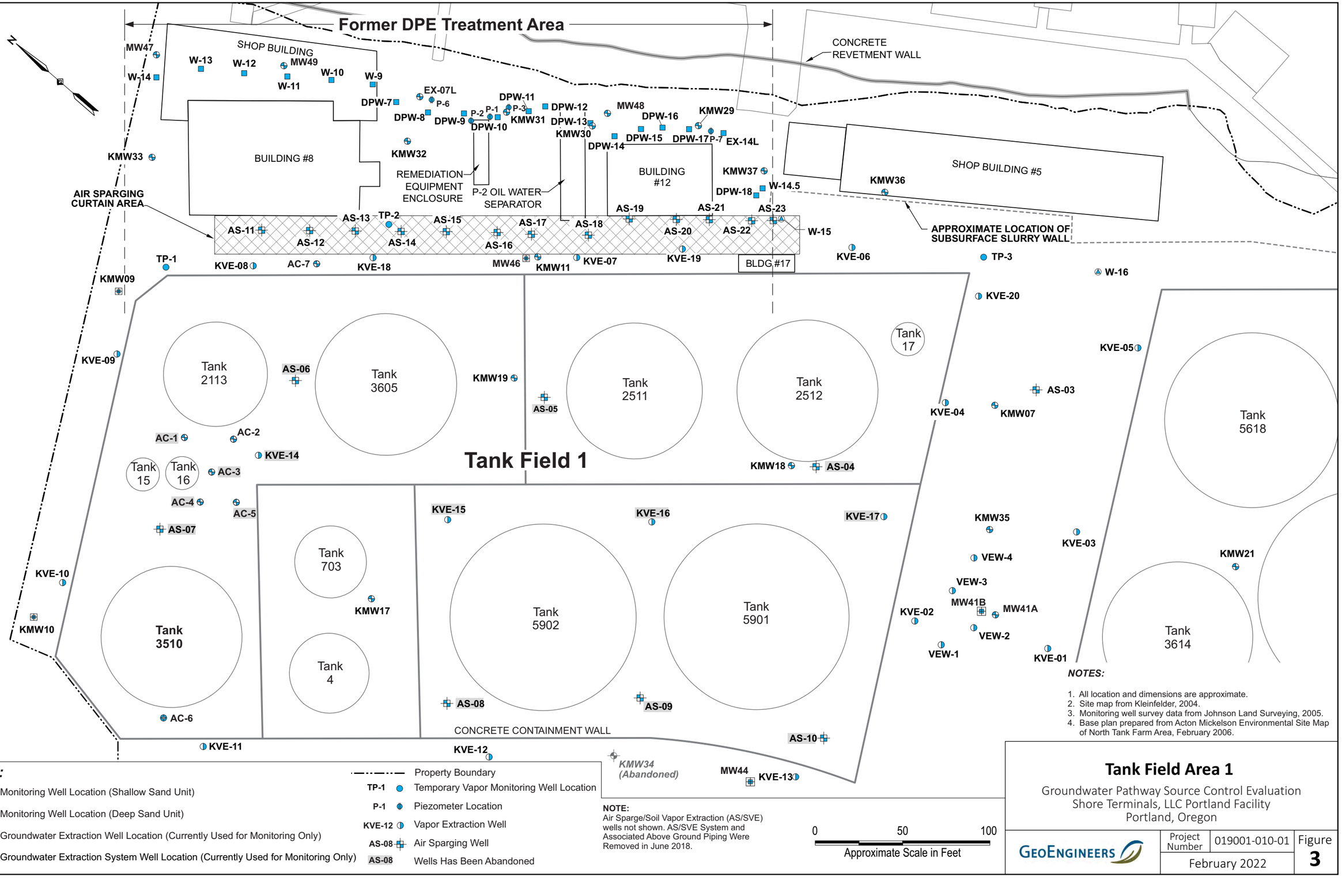
**NOTE:** Base map prepared from a Site Map by Acton Mickelson Environmental, Inc., 11-29-2005, a Spill Prevention, Control, and Countermeasure Plan, Figure 2 (Site Plan) by Hart Crowser , Inc., 10-03, and a recent aerial photograph from Google.com.

# Facility Vicinity Plan

Groundwater Pathway Source Control Evaluation
Shore Terminals LLC Portland Facility
Portland, Oregon

GeoEngineers

| Project Number | 019001-010-01 | Figure |
|---|---|---|
| February 2022 | | 2 |




***Legend:***

- **MW47** — Monitoring Well Location (Shallow Sand Unit)
- **MW41B** — Monitoring Well Location (Deep Sand Unit)
- **W-15** — Groundwater Extraction Well Location (Currently Used for Monitoring Only)
- **DPW-10** — Groundwater Extraction System Well Location (Currently Used for Monitoring Only)
- Property Boundary
- **TP-1** — Temporary Vapor Monitoring Well Location
- **P-1** — Piezometer Location
- **KVE-12** — Vapor Extraction Well
- **AS-08** — Air Sparging Well
- **AS-08** — Wells Has Been Abandoned

**NOTE:**
Air Sparge/Soil Vapor Extraction (AS/SVE) wells not shown. AS/SVE System and Associated Above Ground Piping Were Removed in June 2018.

0 50 100
Approximate Scale in Feet

***NOTES:***

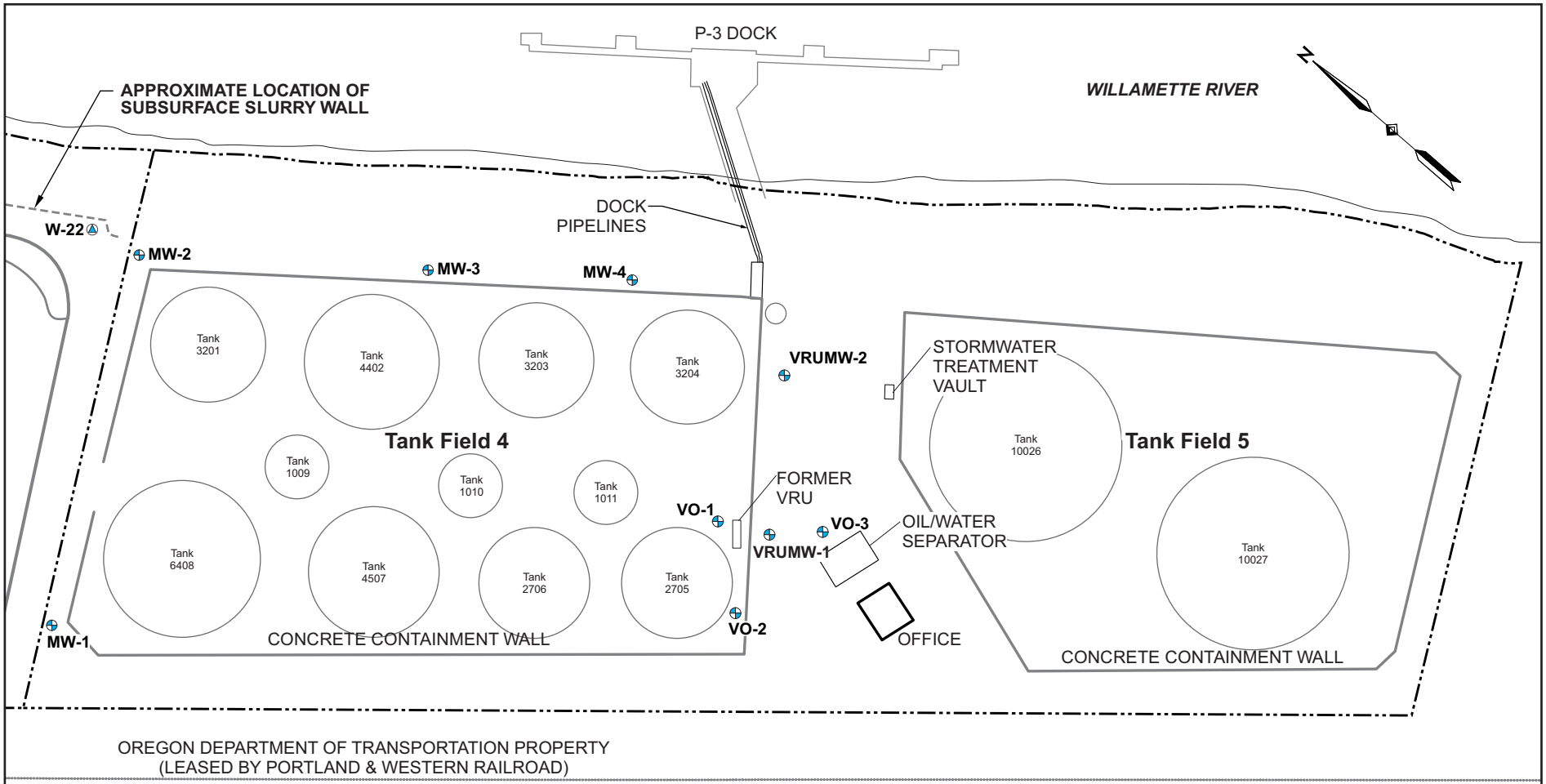
1. All location and dimensions are approximate.
2. Site map from Kleinfelder, 2004.
3. Monitoring well survey data from Johnson Land Surveying, 2005.
4. Base plan prepared from Acton Mickelson Environmental Site Map of North Tank Farm Area, February 2006.

# Tank Field Area 1

Groundwater Pathway Source Control Evaluation
Shore Terminals, LLC Portland Facility
Portland, Oregon

GeoEngineers

| Project Number | 019001-010-01 | Figure 3 |
|---|---|---|
| February 2022 | | |




0 100 200

Approximate Scale in Feet

***Legend:***

**MW-1** Monitoring Well Location (Shallow Sand Unit)

**W-22** Groundwater Extraction Well Location (Currently Used for Monitoring Only)

Property Boundary

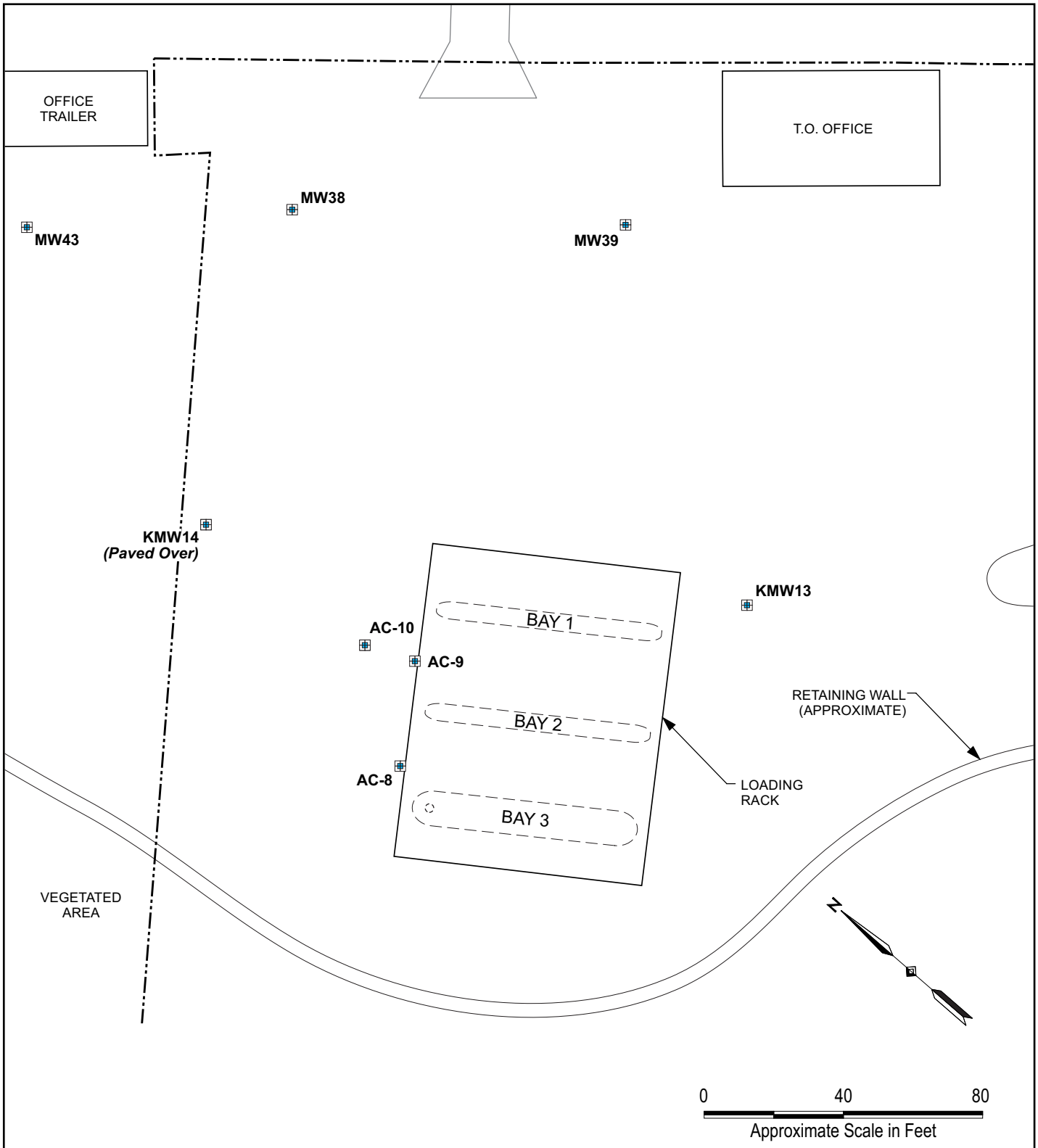
**NOTE:** Base map prepared from a Site Map by Acton Mickelson Environmental, Inc., 11-29-2005, a Spill Prevention, Control, and Countermeasure Plan, Figure 2 (Site Plan) by Hart Crowser , Inc., 10-03, and a recent aerial photograph from Google.com.

# Southern Facility Area (Former Time Oil)

Groundwater Pathway Source Control Evaluation
Shore Terminals LLC Portland Facility
Portland, Oregon

GeoEngineers

| Project Number | 019001-010-01 | Figure 4 |
|---|---|---|
| April 2022 | | |




***Legend:***

**KMW13** Monitoring Well Location (Deep Sand Unit)

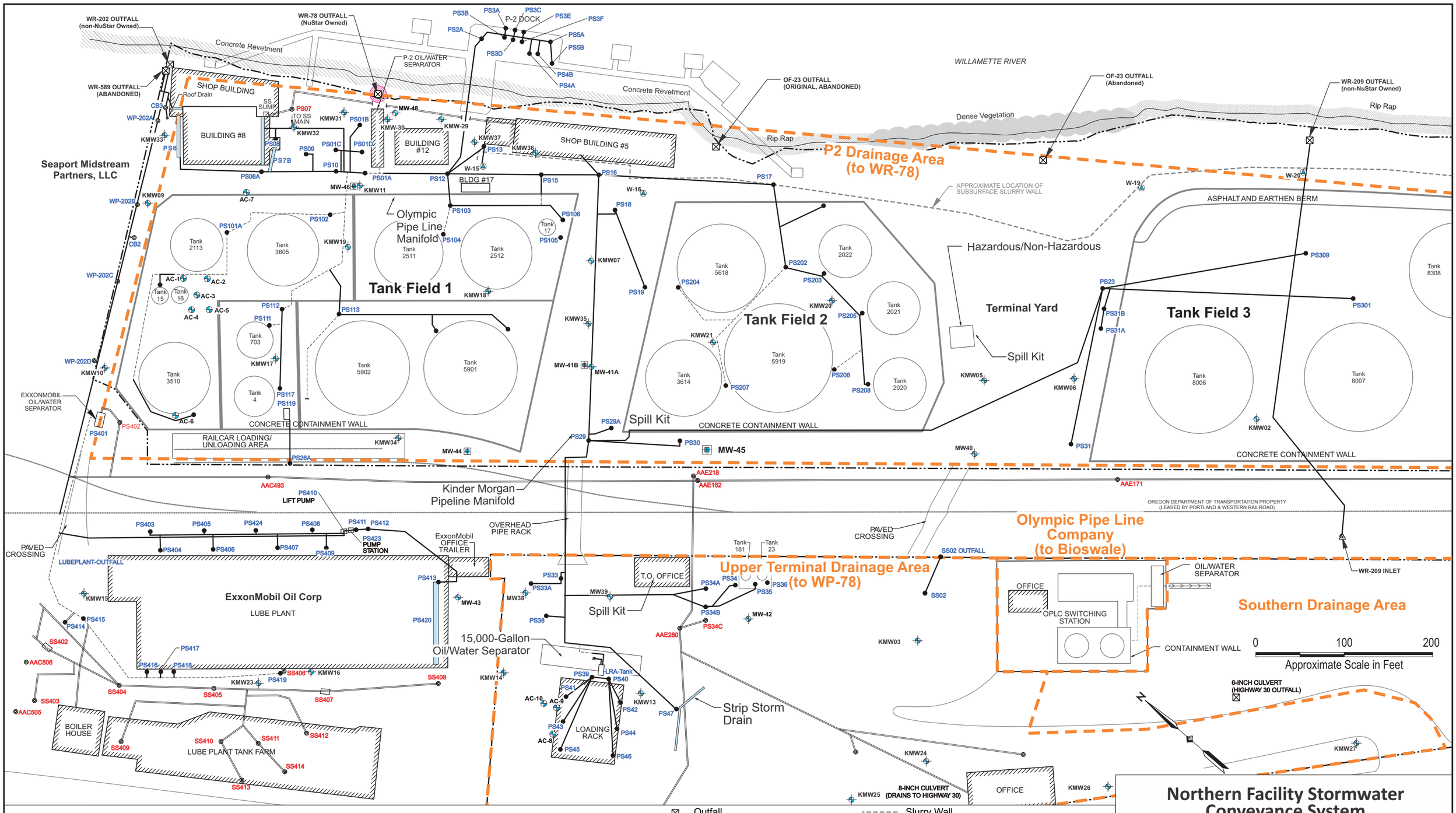
**NOTE:** Base map prepared from a Site Map by Acton Mickelson Environmental, Inc., 11-29-2005, a Spill Prevention, Control, and Countermeasure Plan, Figure 2 (Site Plan) by Hart Crowser, Inc., 10-03, and a recent aerial photograph from Google.com.

# Loading Rack Area

Groundwater Pathway Source Control Evaluation
Shore Terminals LLC Portland Facility
Portland, Oregon

GeoEngineers

| Project Number | 019001-010-01 | Figure 5 |
|---|---|---|
| February 2022 | | |




***Legend:***

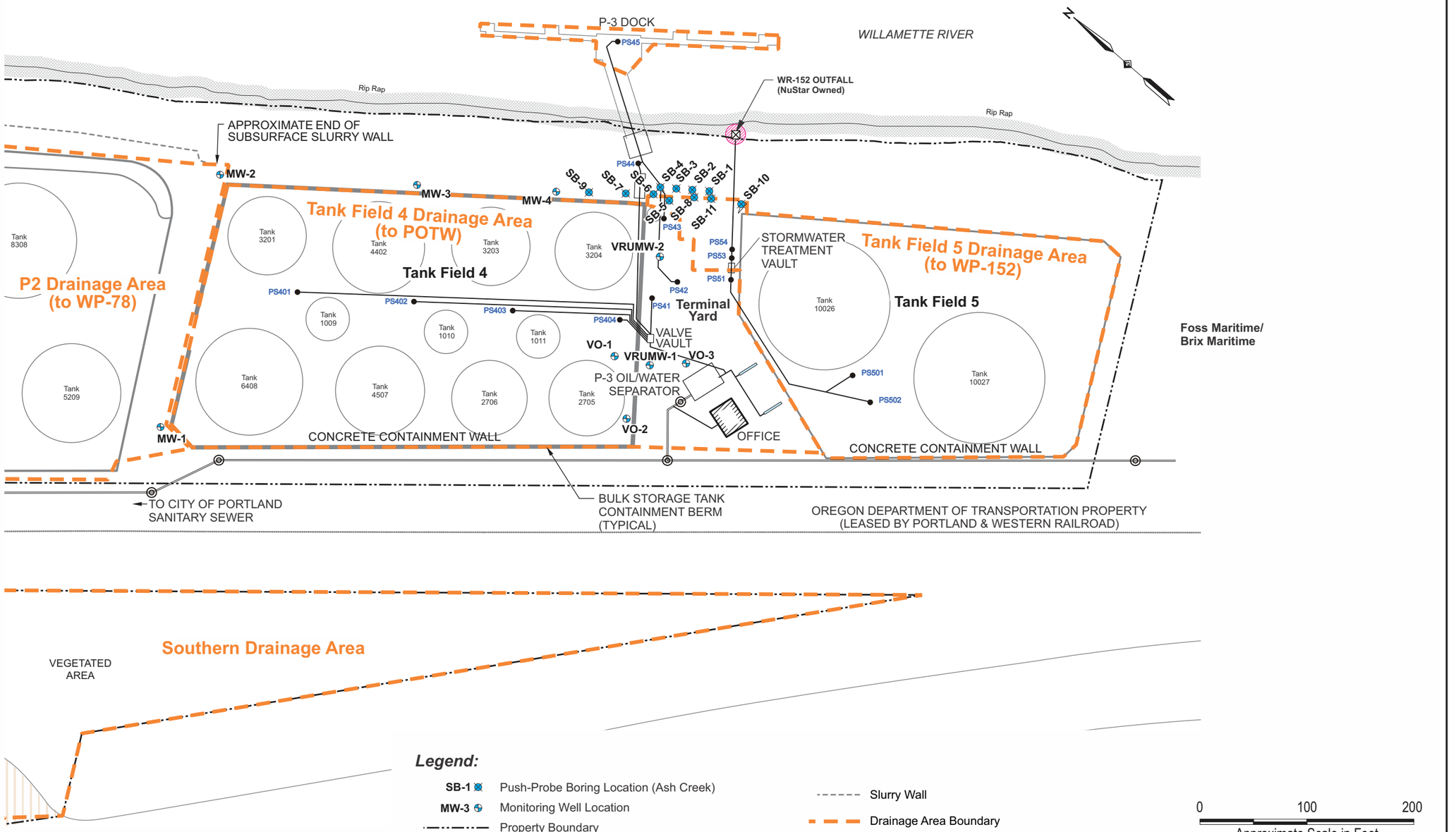
- Stormwater Sampling Location
- MW-3 — Monitoring Well Location (Time Oil or Ash Creek)
- KMW11 — Monitoring Well Location (Exxon Mobil; Shallow Sand Unit)
- MW-41B — Monitoring Well Location (Exxon Mobil; Deep Sand Unit)
- W-1 — Groundwater Extraction Well Location (Exxon Mobil) (Currently Used for Monitoring Only)
- Property Boundary
- PS07 — Catch Basin/Manhole Location Sanitary Sewer Line
- PS34B — Catch Basin/Manhole Location Storm Sewer Line
- Outfall
- Inlet
- Storm Sewer Line
- Unconfirmed Underground Piping
- Sanitary Sewer Line
- Trench Drain
- Slurry Wall
- Bioswale
- Drainage Area Boundary (Approximate)

# Northern Facility Stormwater Conveyance System

Stormwater Source Control Pathway Report
Shore Terminals, LLC Portland Facility
Portland, Oregon

GeoEngineers

| Project Number | 019001-010-12 | Figure |
|---|---|---|
| November 2023 | | 6 |




***Legend:***

- SB-1 — Push-Probe Boring Location (Ash Creek)
- MW-3 — Monitoring Well Location
- Property Boundary
- Catch Basin/Manhole Location Sanitary Sewer Line
- PS34B — Catch Basin/Manhole Location Storm Sewer Line
- Outfall
- Storm Sewer Line
- Sanitary Sewer Line
- Trench Drain
- Slurry Wall
- Drainage Area Boundary
- Stormwater Sampling Location

**NOTE:** Base map prepared from a Site Map by Acton Mickelson Environmental, Inc., 11-29-2005, Facility Drainage Maps, Figure 2 (Site Plan) by Hart Crowser, Inc., 10-03, and a recent aerial photograph from Google.com.

0 100 200

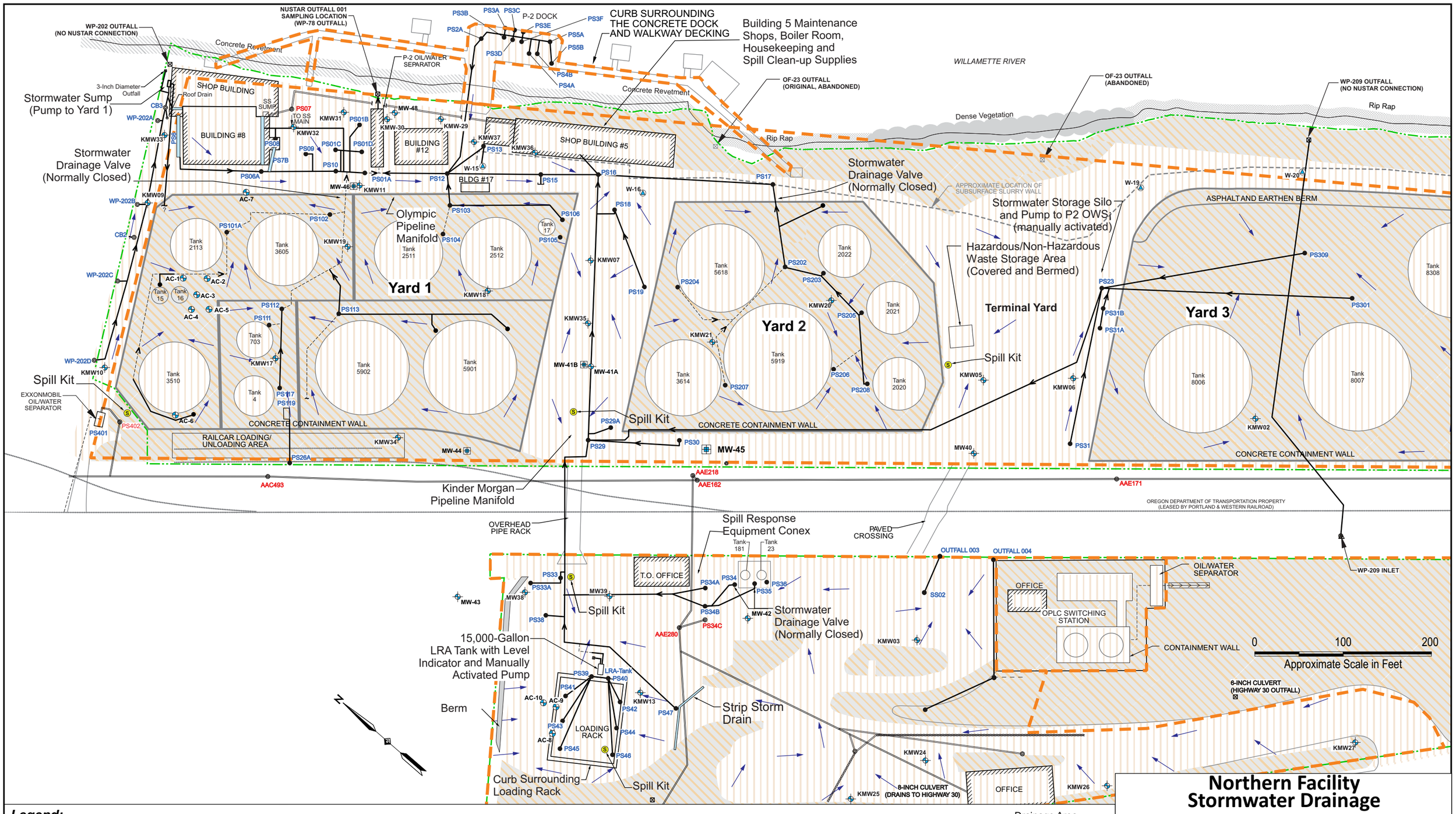
Approximate Scale in Feet

# Southern Facility Stormwater Conveyance System

Stormwater Source Control Pathway Report
Shore Terminals, LLC Portland Facility
Portland, Oregon

GeoEngineers

| Project Number | 019001-010-12 | Figure 7 |
|---|---|---|
| November 2023 | | |




## Legend:

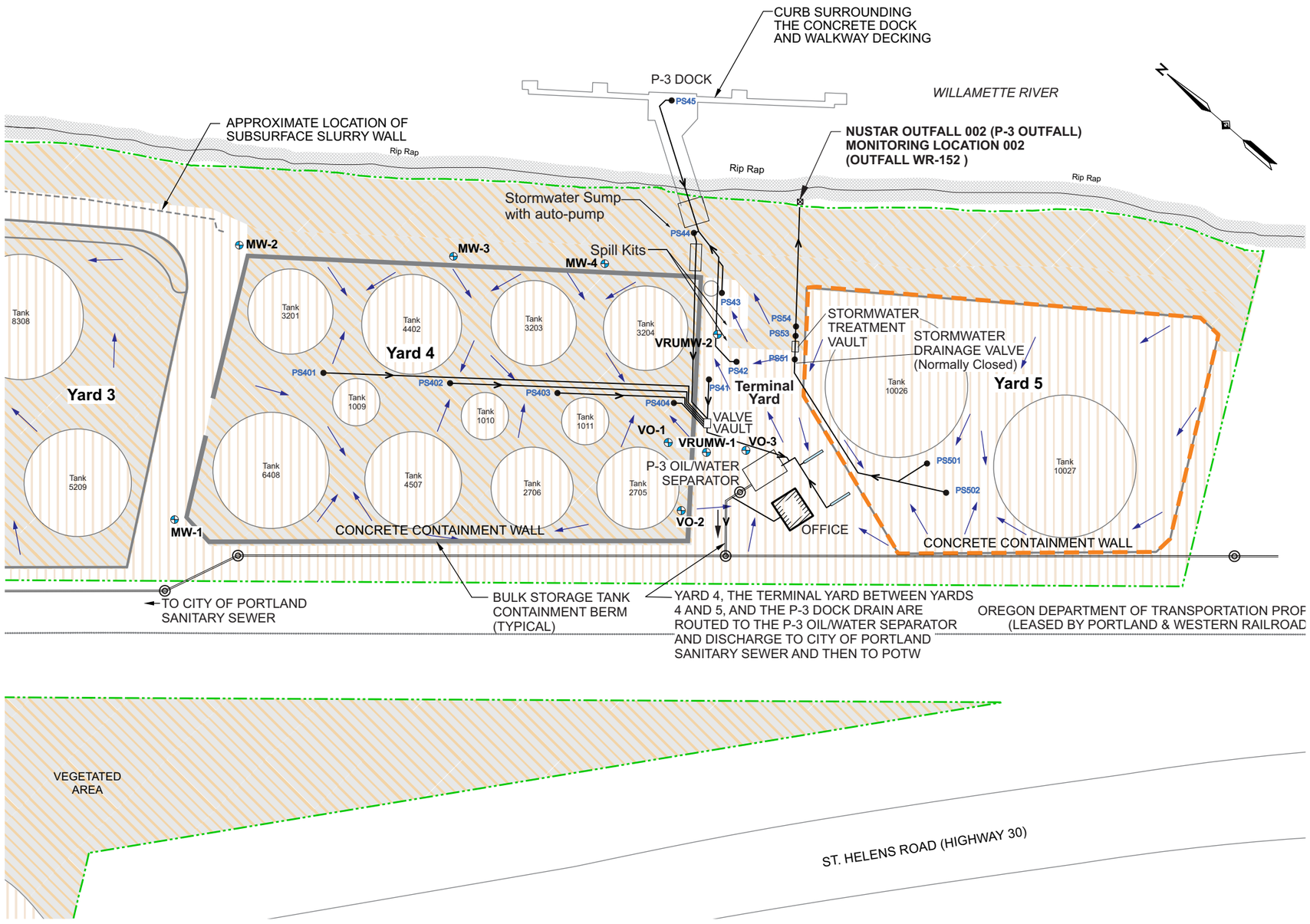
- Property Boundary
- PS07 Catch Basin/Manhole Location Sanitary Sewer Line
- PS34B Catch Basin/Manhole Location Storm Sewer Line
- Surface Water Flow
- Outfall
- Inlet
- Storm Sewer Line and Flow
- Unconfirmed Underground Piping
- Sanitary Sewer Line and Flow
- Trench Drain
- Slurry Wall
- Impervious Area
- Pervious Area
- Bioswale
- MW-3 Monitoring Well Location (Time Oil or Ash Creek)
- KMW11 Monitoring Well Location (Exxon Mobil; Shallow Sand Unit)
- MW-41B Monitoring Well Location (Exxon Mobil; Deep Sand Unit)
- W-1 Groundwater Extraction Well Location (Exxon Mobil) (Currently Used for Monitoring Only)
- Drainage Area Boundary
- Spill Kit (Spill Kit Content See Page 5-7 for description of spill kit contents.
- French Drain

# Northern Facility Stormwater Drainage

Stormwater Pollution Control Plan
Shore Terminals LLC Portland Facility
Portland, Oregon

GeoEngineers

| Project Number | 019001-010-03 | Figure |
|---|---|---|
| August 2022 | | 8 |




***Legend:***

- Property Boundary
- PS07 Catch Basin/Manhole Location Sanitary Sewer Line
- PS34B Catch Basin/Manhole Location Storm Sewer Line
- Outfall
- Storm Sewer Line and Flow
- Sanitary Sewer Line and Flow
- Trench Drain
- Slurry Wall
- Impervious Area
- Pervious Area
- Drainage Area Boundary
- Surface Water Flow
- MW-3 Monitoring Well Location (Time Oil or Ash Creek)
- KMW11 Monitoring Well Location (Exxon Mobil; Shallow Sand Unit)
- MW-41B Monitoring Well Location (Exxon Mobil; Deep Sand Unit)
- W-1 Groundwater Extraction Well Location (Exxon Mobil) (Currently Used for Monitoring Only)

0 100 200

Approximate Scale in Feet

**NOTE:** Base map prepared from a Site Map by Acton Mickelson Environmental, Inc., 11-29-2005, Facility Drainage Maps, Figure 2 (Site Plan) by Hart Crowser, Inc., 10-03, and a recent aerial photograph from Google.com.

# Southern Facility Stormwater Drainage

Stormwater Pollution Control Plan
Shore Terminals LLC Portland Facility
Portland, Oregon

GeoEngineers

| Project Number | 019001-010-03 | Figure |
|---|---|---|
| August 2022 | | 9 |

# Attachment 2

Current Groundwater Monitoring Program

# Table 1

## Groundwater Monitoring Schedule

**Shore Terminals—Portland**

**Portland, Oregon**

| Area | Well ID | Monitoring Schedule | Sampling Schedule | Field Parameters | TPHg (NWTPH-Gx) | TPHd and TPHo (NWTPH-Dx w/silica gel cleanup) | C10-C12 Aliphatic Range Hydrocarbons (EPA 8015C) | BTEX (EPA 8260B) | PAHs (EPA 8270 SIM) | Total As, Cu, Pb (EPA 6020) | Dissolved As, Cu, Pb (EPA 6020) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Tank 3510 | AC-2 | Semi-Annual | Semi-Annual | x | x | x | | x | | | |
| Tank 3510 | AC-6 | Monthly** | Levels Only | | | | | | | | |
| Tank 3510 | AC-7 | Semi-Annual | Semi-Annual | x | x | x | | x | | | |
| Loading Rack | AC-8* | Monthly**/Semi-Annual | Semi-Annual | x | x | x | | x | | | |
| Loading Rack | AC-9* | Monthly**/Semi-Annual | Semi-Annual | x | x | x | | x | | | |
| Loading Rack | AC-10* | Monthly**/Semi-Annual | Semi-Annual | x | x | x | | x | | | |
| DPE Treatment Area | EX-07L | Semi-Annual | Semi-Annual | x | x | x[1] | x | x | x[1] | x | x |
| | KMW01 | Semi-Annual | Annual | x | x | x | | x | x | x | x |
| | KMW02 | Semi-Annual | Annual | x | x | x | | x | x | x | x |
| | KMW03* | Semi-Annual | Levels Only | | | | | | | | |
| | KMW05 | Semi-Annual | Annual | x | x | x | | x | x | x | x |
| | KMW06 | Semi-Annual | Levels Only | | | | | | | | |
| Tank Field 1 | KMW07 | Semi-Annual | Annual | x | x | x | | x | x | x | x |
| | KMW09 | Semi-Annual | Annual | x | x | x | | x | x | x | x |
| | KMW10* | Semi-Annual | Semi-Annual | x | x | x | | x | x | x | x |
| Tank Field 1 | KMW11 | Semi-Annual | Semi-Annual | x | x | x | | x | x | x | x |
| Loading Rack | KMW13* | Semi-Annual | Semi-Annual | x | x | x | | x | x | x | x |
| Loading Rack | KMW14* | None | None | Well KMW14 has been removed from the groundwater monitoring program.[5] | | | | | | | |
| | KMW15* | Semi-Annual | Levels Only | | | | | | | | |
| | KMW16* | Semi-Annual | Annual | x | x | x | | x | x | x | x |
| | KMW17 | Monthly**/Semi-Annual | Semi-Annual | x | x | x | | x | x | x | x |
| Tank Field 1 | KMW18 | Semi-Annual | Semi-Annual | x | x | x | | x | x | x | x |
| Tank Field 1 | KMW19 | Semi-Annual | Semi-Annual | x | x | x | | x | x | x | x |
| | KMW20 | Semi-Annual | Annual | x | x | x | | x | x | x | x |
| | KMW21 | Semi-Annual | Annual | x | x | x | | x | x | x | x |
| | KMW23* | Semi-Annual | Levels Only | | | | | | | | |
| | KMW24* | Semi-Annual | Annual | x | | | | | | x | x |

Please refer to notes at end of table.

# Table 1

## Groundwater Monitoring Schedule

**Shore Terminals—Portland**

**Portland, Oregon**

| Area | Well ID | Monitoring Schedule | Sampling Schedule | Field Parameters | TPHg (NWTPH-Gx) | TPHd and TPHo (NWTPH-Dx w/silica gel cleanup) | C10-C12 Aliphatic Range Hydrocarbons (EPA 8015C) | BTEX (EPA 8260B) | PAHs (EPA 8270 SIM) | Total As, Cu, Pb (EPA 6020) | Dissolved As, Cu, Pb (EPA 6020) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | KMW25* | Semi-Annual | Levels Only | | | | | | | | |
| | KMW26* | Semi-Annual | Annual | x | | | | | | x | x |
| | KMW27* | Semi-Annual | Levels Only | | | | | | | | |
| DPE Treatment Area | KMW29 | Semi-Annual | Semi-Annual | x | x | x[1] | x | x | x[1] | x | x |
| DPE Treatment Area | KMW30 | Semi-Annual | Semi-Annual | x | x | x[1] | x | x | x[1] | x | x |
| DPE Treatment Area | KMW31 | Semi-Annual | Semi-Annual | x | x | x[1] | x | x | x[1] | x | x |
| DPE Treatment Area | KMW32 | Monthly**/Semi-Annual | Semi-Annual | x | x | x[1] | x | x | x[1] | x | x |
| DPE Treatment Area | KMW33 | Semi-Annual | Semi-Annual | x | x | x[1] | x | x | x[1] | x | x |
| | KMW34 | None | None | Well KMW34 was abandoned in July 2009. | | | | | | | |
| Tank Field 1 | KMW35 | Semi-Annual | Semi-Annual | x | x | x | | x | x | x | x |
| Slurry Wall Area | KMW36 | Semi-Annual | Semi-Annual | x | x | x | | x | x | x | x |
| DPE Treatment Area | KMW37 | None | None | Well KMW37 was abandoned in February 2024 | | | | | | | |
| Loading Rack | MW38* | Semi-Annual | Semi-Annual | x | x | x | | x | x | x | x |
| Loading Rack | MW39* | Semi-Annual | Semi-Annual | x | x | x | | x | x | x | x |
| Sitewide | MW40 | Semi-Annual | Annual | x | x | x | | x | x | x | x |
| | MW41A | Semi-Annual | Semi-Annual | x | x | x | | x | x | x | x |
| | MW41B* | Semi-Annual | Semi-Annual | x | x | x | | x | x | x | x |
| Loading Rack | MW42 | Semi-Annual | Annual | x | x | x | | x | x | x | x |
| Loading Rack | MW43 | Semi-Annual | Semi-Annual | x | x | x | | x | x | x | x |
| | MW44* | Semi-Annual | Semi-Annual | x | x | x | | x | x | x | x |
| Loading Rack | MW45* | Semi-Annual | Annual | x | x | x | | x | x | x | x |
| Loading Rack | MW46* | Semi-Annual | Semi-Annual | x | x | x | | x | x | x | x |
| DPE Treatment Area | MW47 | Semi-Annual | Semi-Annual | x | x | x[1] | x | x | x[1] | x | x |
| DPE Treatment Area | MW48 | Semi-Annual | Semi-Annual | x | x | x[1] | x | x | x[1] | x | x |
| DPE Treatment Area | MW49 | Semi-Annual | Semi-Annual | x | x | x[1] | x | x | x[1] | x | x |

Please refer to notes at end of table.

# Table 1

## Groundwater Monitoring Schedule

**Shore Terminals—Portland**

**Portland, Oregon**

| Area | Well ID | Monitoring Schedule | Sampling Schedule | Field Parameters | TPHg (NWTPH-Gx) | TPHd and TPHo (NWTPH-Dx w/silica gel cleanup) | C10-C12 Aliphatic Range Hydrocarbons (EPA 8015C) | BTEX (EPA 8260B) | PAHs (EPA 8270 SIM) | Total As, Cu, Pb (EPA 6020) | Dissolved As, Cu, Pb (EPA 6020) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | W-01 | None | None | | | | | | | | |
| | W-02 | None | None | | | | | | | | |
| | W-03 | None | None | | | | | | | | |
| | W-04 | None | None | | | | | | | | |
| | W-05 | None | None | | | | | | | | |
| | W-06 | None | None | | | | | | | | |
| | W-07 | None | None | | | | | | | | |
| | W-08 | None | None | | | | | | | | |
| | W-09 | None | None | | | | | | | | |
| | W-10 | None | None | | | | | | | | |
| | W-11 | None | None | | | | | | | | |
| | W-12 | None | None | | | | | | | | |
| | W-13 | None | None | | | | | | | | |
| | W-14 | None | None | | | | | | | | |
| | W-14.5 | None | None | | | | | | | | |
| | W-15 | None | None | Well W-15 was abandoned in February 2024 | | | | | | | |
| Slurry Wall Area | W-16 | Semi-Annual | Semi-Annual | x | x | x | | x | x | x | x |
| | W-17 | Semi-Annual | Levels Only | | | | | | | | |
| | W-18 | Semi-Annual | Levels Only | | | | | | | | |
| Slurry Wall Area | W-19 | Semi-Annual | Annual | x | x | x | | x | x | x | x |
| Slurry Wall Area | W-20 | Semi-Annual | Annual | x | x | x | | x | x | x | x |
| | W-21 | Semi-Annual | Levels Only | | | | | | | | |
| Slurry Wall Area | W-22 | Semi-Annual | Annual | x | x | x | | x | x | x | x |
| Southern Facility | MW-1 | Semi-Annual | Levels Only | | | | | | | | |
| Southern Facility | MW-2 | Semi-Annual | Levels Only | | | | | | | | |
| Southern Facility | MW-3 | Semi-Annual | Levels Only | | | | | | | | |
| Southern Facility | MW-4 | Semi-Annual | Levels Only | | | | | | | | |

Please refer to notes at end of table.

# Table 1

## Groundwater Monitoring Schedule

**Shore Terminals—Portland**

**Portland, Oregon**

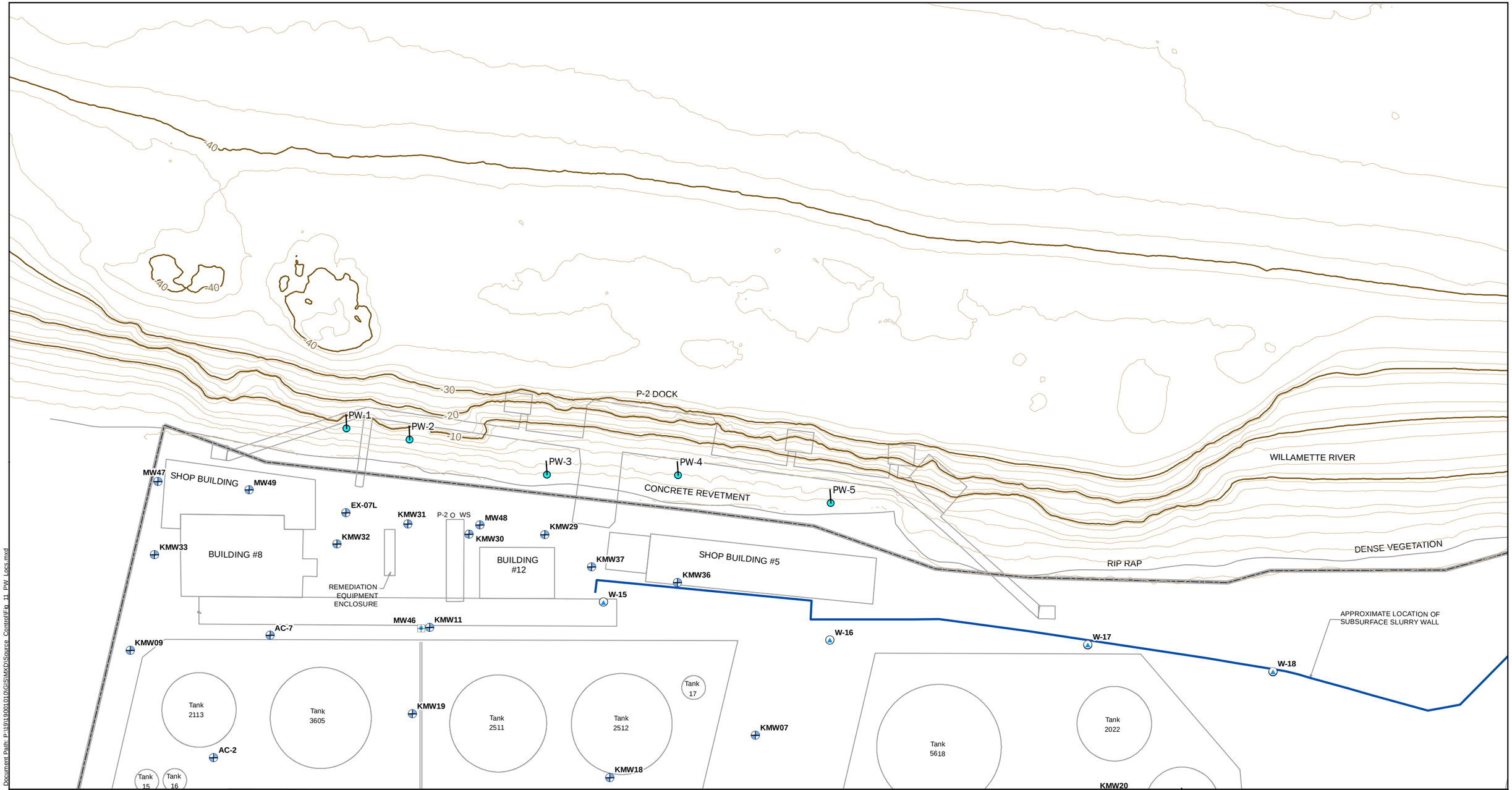
| Area | Well ID | Monitoring Schedule | Sampling Schedule | Field Parameters | TPHg (NWTPH-Gx) | TPHd and TPHo (NWTPH-Dx w/silica gel cleanup) | C10-C12 Aliphatic Range Hydrocarbons (EPA 8015C) | BTEX (EPA 8260B) | PAHs (EPA 8270 SIM) | Total As, Cu, Pb (EPA 6020) | Dissolved As, Cu, Pb (EPA 6020) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Southern Facility | VRUMW-1 | Semi-Annual | Levels Only | | | | | | | | |
| Southern Facility | VRUMW-2 | Semi-Annual | Levels Only | | | | | | | | |
| Southern Facility | VO-1 | Semi-Annual | Levels Only | | | | | | | | |
| Southern Facility | VO-2 | Semi-Annual | Levels Only | | | | | | | | |
| Southern Facility | VO-3 | Semi-Annual | Levels Only | | | | | | | | |

Notes:

1. Analysis includes glass filtration to remove particulate.
2. * = Well is screened in the Deep Sand unit.
3. ** = Monthly monitoring includes only gauging for only Separate Phase Hydrocarbons (SPH).
4. Semi-annual monitoring and sampling is typically performed in February and August. Annual sampling is typically performed in February.
5. Well KMW14 was paved over prior to the October 2017 monitoring event. In an email dated February 21, 2018, DEQ agreed that well KMW14 was not critical to monitoring the Loading Rack Area and that replacement of KMW14 was not required. Well KMW14 has been removed from the monitoring program.

# Attachment 3

2021 Porewater Sampling Locations and Data




Document Path: P:\19\19001\010\GIS\MXD\Source Control\Fig 11 PW Locs.mxd

MW47 — Monitoring Well Location (Shallow Sand Unit)

MW46 — Monitoring Well Location (Deep Sand Unit)

W-15 — Groundwater Extraction Well Location (Currently Used for Monitoring Only)

Property Line

PW-1 — Porewater Sampling Location

10 ft NAVD88 Contour

2 ft NAVD88 Contour

0 75 Feet

NOTE:

Bathymetric data provided by DEA 07/25/18.
NAVD88 = North American Vertical Datum of 1988.
Base map prepared from a Site Map by Acton Mickelson Environmental, Inc., 11-29-2005, a Spill Prevention, Control, and Countermeasure Plan, Figure 2 (Site Plan) by Hart Crowser , Inc., 10-03, and a recent aerial photograph from Google.com.

# Porewater Sampling Locations

Groundwater Pathway Source Control Evaluation Report
Shore Terminals LLC Portland Facility
Portland, Oregon

GeoEngineers

Figure 11

| 3/11/2022 | Project No.:19001-010-01 | Drawn by: ES | Checked by: IM |
|---|---|---|---|

# Table 10

## Porewater Analytical Data — TPHg, BTEX, and C10 - C12 Aliphatic-Range Hydrocarbons

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Sample ID | Field ID | Sample Date | TPHg Gasoline (mg/L) | Benzene (µg/L) | Toluene (µg/L) | Ethyl-Benzene (µg/L) | Xylenes (µg/L) | Aliphatic Hydro-carbons C10 - C12 (µg/L) |
|---|---|---|---|---|---|---|---|---|
| *1997 Site ROD Cleanup Goal* | | | -- | *40* | -- | -- | -- | -- |
| *PHSS Cleanup Level* | | | -- | *0.44* | *9.8* | *7.3* | *13* | *2.6* |
| *Portland Harbor JSCS SLV* | | | -- | *1.2* | *9.8* | *7.3* | *200* | -- |
| PW-1 | P19 | 7/26/2021 | <0.10 | <0.20 | **1.67** | <0.50 | <1.50 | <50 |
| PW-2 | P17 | 7/26/2021 | <0.10 | <0.20 | **2.31** | <0.50 | <1.50 | <50 |
| PW-3 | P27 | 7/26/2021 | <0.10 T | <0.20 T | **1.66** T | <0.50 T | <1.50 T | <50 T |
| PW-4 | P13 | 7/26/2021 | <0.10 | <0.20 | **1.72** | <0.50 | <1.50 | <50 |
| PW-5 | P28 | 7/26/2021 | <0.10 | <0.20 | **1.94** | <0.50 | <1.50 | <50 |
| KMW29 | P18 | 7/26/2021 | **1.57** V-01 | **0.28** V-01 | <1.00 V-01 | <0.50 V-01 | <1.50 V-01 | **241** |
| KMW31 | P14 | 7/26/2021 | **0.525** V-01 | <0.20 V-01 | <1.00 V-01 | <0.50 V-01 | <1.50 V-01 | **195** |
| KMW32 | P23 | 7/26/2021 | <0.10 V-01 | <0.20 V-01 | <1.00 V-01 | <0.50 V-01 | <1.50 V-01 | <50 |
| KMW33 | P21 | 7/26/2021 | <0.10 V-01 | <0.20 V-01 | <1.00 V-01 | <0.50 V-01 | <1.50 V-01 | <50 |
| KMW36 | P30 | 7/26/2021 | **0.522** V-01 | <0.20 V-01 | <1.00 V-01 | <0.50 V-01 | <1.50 V-01 | **62** |

**Notes:**

1. TPHg = Total petroleum hydrocarbons measured in the gasoline range
2. TPHd = Total petroleum hydrocarbons measured in the diesel range
3. TPHo = Total petroleum hydrocarbons measured in the heavy oil range
4. TPHg by Method NWTPH-Gx; benzene, toluene, ethylbenzene, xylenes analyzed by EPA Method 8260 B.
5. C10-C12 alphatic range hydrocarbons by Washington Dept. of Ecology VPH method.
6. Portland Harbor JSCS SLVs = 2007 Portland Harbor Joint Source Control Strategy Screening Level Values.
7. PHSS Cleanup Levels = 2017 Portland Harbor Superfund Site Record of Decision Cleanup Levels.
8. Yellow highlighted cells indicate values that are equal to or exceeding 1997 Record of Decision (ROD) Groundwater Cleanup Goals for the ExxonMobil/Shore Terminals Site.

9a. Gray highlighted cells indicate values that are equal to or exceeding PHSS Cleanup Level. If a PHSS Cleanup Level was not developed for an analyte, the JSCS SLV is used for comparison.

8b. Green highlighted cells indicate the method reporting limit is greater than the PHSS ROD Cleanup Level or the JSCS SLV (if there is no ROD Cleanup Level)

10. < = less than the laboratory reporting limit.
11. µg/L = microgram(s) per liter.
12. mg/L = milligram(s) per liter.
13. EPA = United States Environmental Protection Agency.
14. -- = Not applicable.

**Quality Assurance/Quality Control Data Qualifiers**

T = Sample(s) analyzed outside of recommended temperature.

V-01 = Sample aliquot taken from VOA vial with headspace (air bubble greater than 6 mm diameter).

# Table 11

## Porewater Analytical Data – PAHs

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Sample ID | Field ID | Sample Date | Dissolved Organic Carbon (mg/L) | Naphthalene | 2-Methylnaphthalene | 1-Methylnaphthalene | 2-Ethylnaphthalene | 1-Ethylnaphthalene | 2.6-Dimethylnaphthalene | 1.3-Dimethylnaphthalene |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Concentrations in µg/L | | | | | | |
| 1997 Site ROD Cleanup Goal | | | | *347* | -- | -- | -- | -- | -- | -- |
| PHSS Cleanup Level | | | | *12* | -- | -- | -- | -- | -- | -- |
| Portland Harbor JSCS SLV | | | | *0.2* | *0.2* | -- | -- | -- | -- | -- |
| PW-1 (T) | 19 Top | 7/26/2021 | 17.2 | 0.0134 | 0.0026 | 0.0025 | 0.0018 | 0.00056 J | 0.0021 | 0.0048 |
| PW-1 (B) | 19 Bottom | 7/26/2021 | 22.6 | 0.0089 | 0.0034 | 0.0022 | 0.0019 | 0.00072 | 0.0021 | 0.0046 |
| PW-1 | NA | NA | 19.9 | 0.0111 | 0.0030 | 0.0024 | 0.0018 | 0.00064 | 0.0021 | 0.0047 |
| PW-2 (T) | 17 Top | 7/26/2021 | 15.7 | 0.0199 | 0.0045 | 0.0020 J | 0.0022 J | 0.0029 | 0.0018 | 0.0016 |
| PW-2 (B) | 17 Bottom | 7/26/2021 | 24.5 | 0.0113 | 0.0031 | 0.0018 | 0.0027 | 0.00080 J | 0.0021 | 0.0036 |
| PW-2 | NA | NA | 20.1 | 0.0156 | 0.0038 | 0.0019 | 0.0024 | 0.00187 | 0.0020 | 0.0026 |
| PW-3 (T) | 27 Top | 7/26/2021 | 14.7 | 0.0418 | 0.0120 | 0.0366 | 0.0124 | 0.0551 | 0.0060 | 0.0958 |
| PW-3 (B) | 27 Bottom | 7/26/2021 | 28 | 0.0420 | 0.0110 | 0.0459 | 0.0194 | 0.0621 | 0.0068 | 0.0944 |
| PW-3 | NA | NA | 21.35 | 0.0419 | 0.0115 | 0.0412 | 0.0159 | 0.05857 | 0.0064 | 0.0951 |
| PW-4 (T) | 13 Top | 7/26/2021 | 20.2 | 0.1445 | 0.0200 | 0.0475 | 0.0152 | 0.2903 | 0.0427 | 7.23 |
| PW-4 (B) | 13 Bottom | 7/26/2021 | 12 | 0.0548 | 0.0180 | 0.0691 | 0.0243 | 0.2501 | 0.0298 | 4.11 |
| PW-4 | NA | NA | 16.1 | 0.0997 | 0.0190 | 0.0583 | 0.0198 | 0.27020 | 0.0363 | 5.67 |
| PW-5 (T) | 28 Top | 7/26/2021 | 18.7 | 0.0388 | 0.0110 | 0.0065 | 0.0039 | 0.0039 | 0.0028 | 0.0027 |
| PW-5 (B) | 28 Bottom | 7/26/2021 | 24.3 | 0.0436 | 0.0040 | 0.0036 | 0.0034 | 0.00084 | 0.0026 | 0.0048 |
| PW-5 | NA | NA | 21.5 | 0.0412 | 0.0075 | 0.0051 | 0.0036 | 0.00239 | 0.0027 | 0.0038 |
| KMW29 (T) | 18 Top | 7/26/2021 | 13 | 0.0097 | 0.0048 | 0.0342 | 0.2232 | 0.1284 | 2.05 | 2.79 |
| KMW29 (B) | 18 Bottom | 7/26/2021 | 13 | 0.0200 | 0.0055 | 0.0945 | 0.5717 | 0.2291 | 3.96 | 5.81 |
| KMW29 | NA | NA | 13 | 0.0148 | 0.0051 | 0.0643 | 0.3975 | 0.17871 | 3.00 | 4.30 |
| KMW31 (T) | 14 Top | 7/26/2021 | 11.5 | 0.0199 | 0.0069 | 0.0513 | 0.1092 | 0.0518 | 1.06 | 0.9459 |
| KMW31 (B) | 14 Bottom | 7/26/2021 | 11.1 | 0.0149 | 0.0103 | 0.6582 | 0.4643 | 0.2069 | 4.74 | 5.40 |
| KMW31 | NA | NA | 11.1 | 0.0174 | 0.0086 | 0.3547 | 0.2868 | 0.12935 | 2.90 | 3.17 |
| KMW32 (T) | 23 Top | 7/26/2021 | 10 | 0.0197 | 0.0041 | 0.0028 | 0.0029 | 0.0038 | 0.0010 J | 0.0011 |
| KMW32 (B) | 23 Bottom | 7/26/2021 | 11 | 0.0108 | 0.0025 | 0.0039 | 0.0030 | 0.0021 | 0.0023 | 0.0024 |
| KMW32 | NA | NA | 11.1 | 0.0153 | 0.0033 | 0.0034 | 0.0030 | 0.00293 | 0.0016 | 0.0018 |
| KMW33 (T) | 21 Top | 7/26/2021 | 9.6 | 0.0131 | 0.0062 | 0.0141 | 0.0153 | 0.1422 | 0.0025 | 0.0092 |
| KMW33 (B) | 21 Bottom | 7/26/2021 | 20 | 0.0371 | 0.0252 | 0.0658 | 0.0381 | 1.10 | 0.0194 | 0.0840 |
| KMW33 | NA | NA | 11.1 | 0.0251 | 0.0157 | 0.0400 | 0.0267 | 0.62348 | 0.0109 | 0.0466 |
| KMW36 (T) | 30 Top | 7/26/2021 | 15.9 | 0.0117 | 0.0035 | 0.0083 | 0.0136 | 0.1262 | 0.0066 | 0.0168 |
| KMW36 (B) | 30 Bottom | 7/26/2021 | 15.9 | 0.0202 | 0.0215 | 0.0430 | 0.0534 | 0.5124 | 0.0234 | 0.0554 |
| KMW36 | NA | NA | 11.1 | 0.0160 | 0.0125 | 0.0257 | 0.0335 | 0.31932 | 0.0150 | 0.0361 |

*Please refer to notes at end of table.*

# Table 11

## Porewater Analytical Data – PAHs

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Sample ID | Field ID | Sample Date | 2-Isopropylnaphthalene | Acenaphthylene | 1.2-Dimethylnaphthalene | 1.8-Dimethylnaphthalene | Acenaphthene | 2.3.5-Trimethylnaphthalene | Fluorene |
|---|---|---|---|---|---|---|---|---|---|
| | | | Concentrations in µg/L | | | | | | |
| 1997 Site ROD Cleanup Goal | | | -- | -- | -- | -- | -- | -- | -- |
| PHSS Cleanup Level | | | -- | -- | -- | -- | *23* | -- | -- |
| Portland Harbor JSCS SLV | | | -- | *0.2* | -- | -- | *0.2* | -- | -- |
| PW-1 (T) | 19 Top | 7/26/2021 | 0.00032 | 0.0034 | 0.0019 | 0.00040 J | 0.0527 | 0.0015 | 0.0054 |
| PW-1 (B) | 19 Bottom | 7/26/2021 | 0.00020 J | 0.0037 | 0.0019 | 0.00059 | 0.0488 | 0.00088 | 0.0038 |
| PW-1 | NA | NA | 0.00026 | 0.0035 | 0.0019 | 0.0005 | 0.0508 | 0.0012 | 0.0046 |
| PW-2 (T) | 17 Top | 7/26/2021 | 0.00007 J | <0.0759 | <0.01631 | <0.01454 | 0.0228 | 0.00063 | 0.0056 |
| PW-2 (B) | 17 Bottom | 7/26/2021 | 0.00019 J | <0.0759 | 0.0018 | 0.0010 | 0.0142 | 0.00069 | 0.0081 |
| PW-2 | NA | NA | 0.00013 | <0.0759 | 0.0018 | 0.0010 | 0.0185 | 0.0007 | 0.0069 |
| PW-3 (T) | 27 Top | 7/26/2021 | 0.0013 | 0.0573 | 0.1003 | 0.0096 | 2.60 | 0.4791 | 0.0806 |
| PW-3 (B) | 27 Bottom | 7/26/2021 | 0.0052 | 0.0660 | 0.1151 | 0.0154 | 3.68 | 0.6157 | 0.0585 |
| PW-3 | NA | NA | 0.00326 | 0.0616 | 0.1077 | 0.0125 | 3.14 | 0.5474 | 0.0696 |
| PW-4 (T) | 13 Top | 7/26/2021 | 0.0461 | 0.4224 | 0.5793 | 0.0460 | 48.9 E | 1.52 | 16.0 E |
| PW-4 (B) | 13 Bottom | 7/26/2021 | 0.0489 | 0.2788 | 0.5387 | 0.0269 | 27.1 E | 1.41 | 10.8 |
| PW-4 | NA | NA | 0.04751 | 0.3506 | 0.5590 | 0.0365 | 38.0 | 1.47 | 13.4 |
| PW-5 (T) | 28 Top | 7/26/2021 | 0.00010 J | 0.0058 | 0.0032 | <0.01454 | 0.0486 | 0.0010 | 0.0063 |
| PW-5 (B) | 28 Bottom | 7/26/2021 | 0.00033 | 0.0041 | 0.0033 | 0.0006 | 0.0230 | 0.0020 | 0.0055 |
| PW-5 | NA | NA | 0.00021 | 0.0050 | 0.0033 | 0.0006 | 0.0358 | 0.0015 | 0.0059 |
| KMW29 (T) | 18 Top | 7/26/2021 | 0.1035 | 0.1616 | 0.5631 | 0.0246 | 0.3383 | 3.39 | 3.22 |
| KMW29 (B) | 18 Bottom | 7/26/2021 | 0.0804 | 0.2505 | 1.50 | 0.0132 | 0.6896 | 2.39 | 4.37 |
| KMW29 | NA | NA | 0.09198 | 0.2060 | 1.03 | 0.0189 | 0.5140 | 2.89 | 3.80 |
| KMW31 (T) | 14 Top | 7/26/2021 | 0.0441 | 0.0659 | 0.2026 | 0.0308 | 0.3205 | 2.01 | 0.9162 |
| KMW31 (B) | 14 Bottom | 7/26/2021 | 0.0768 | 0.2273 | 1.18 | 0.0173 | 1.14 | 3.35 | 3.03 |
| KMW31 | NA | NA | 0.06043 | 0.1466 | 0.6924 | 0.0241 | 0.7294 | 2.68 | 1.98 |
| KMW32 (T) | 23 Top | 7/26/2021 | 0.00015 J | 0.0072 | 0.0096 | 0.0028 | <0.141 | 0.0033 | 0.0187 |
| KMW32 (B) | 23 Bottom | 7/26/2021 | 0.00056 | 0.0051 | 0.0067 | 0.0021 | 0.0120 | 0.0042 | 0.0134 |
| KMW32 | NA | NA | 0.00035 | 0.0062 | 0.0082 | 0.0024 | 0.0120 | 0.0037 | 0.0160 |
| KMW33 (T) | 21 Top | 7/26/2021 | 0.0130 | 0.1807 | 0.6044 | 0.0366 | 0.4574 | 2.18 | 2.56 |
| KMW33 (B) | 21 Bottom | 7/26/2021 | 0.0601 | 0.7370 | 3.62 | 0.0522 | 1.17 | 3.17 | 4.87 |
| KMW33 | NA | NA | 0.03655 | 0.4589 | 2.11 | 0.0444 | 0.8135 | 2.67 | 3.72 |
| KMW36 (T) | 30 Top | 7/26/2021 | 0.0419 | 0.2027 | 0.8430 | 0.0291 | 0.3501 | 1.73 | 1.15 |
| KMW36 (B) | 30 Bottom | 7/26/2021 | 0.0768 | 0.4580 | 1.95 | 0.0258 | 0.6375 | 2.30 | 1.57 |
| KMW36 | NA | NA | 0.05932 | 0.3304 | 1.39 | 0.0274 | 0.4938 | 2.01 | 1.36 |

*Please refer to notes at end of table.*

# Table 11

## Porewater Analytical Data – PAHs

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Sample ID | Field ID | Sample Date | 1-Methylfluorene | Phenanthrene | Anthracene | 2-Methylphenanthrene | 2-Methylanthracene | 1-Methylphenanthrene | 9-Methylanthracene |
|---|---|---|---|---|---|---|---|---|---|
| | | | Concentrations in µg/L | | | | | | |
| **1997 Site ROD Cleanup Goal** | | | -- | -- | -- | -- | -- | -- | -- |
| **PHSS Cleanup Level** | | | -- | -- | *0.73* | -- | -- | -- | -- |
| **Portland Harbor JSCS SLV** | | | -- | -- | -- | -- | -- | -- | -- |
| PW-1 (T) | 19 Top | 7/26/2021 | 0.0029 | 0.0086 | 0.0019 | 0.0015 | 0.0008 | 0.0012 | 0.00079 |
| PW-1 (B) | 19 Bottom | 7/26/2021 | 0.0012 | 0.0058 | 0.0005 | 0.00061 | 0.00047 | 0.00052 | 0.00033 |
| PW-1 | NA | NA | 0.0020 | 0.0072 | 0.0012 | 0.00105 | 0.00066 | 0.00087 | 0.00056 |
| PW-2 (T) | 17 Top | 7/26/2021 | <0.0261 | 0.0053 | 0.0013 | 0.00069 J | 0.00044 J | 0.0005 J | <0.00452 |
| PW-2 (B) | 17 Bottom | 7/26/2021 | <0.0261 | 0.0058 | <0.00842 | 0.00067 | 0.00047 J | 0.00052 J | 0.00027 |
| PW-2 | NA | NA | <0.0261 | 0.0056 | 0.0013 | 0.00068 | 0.00046 | 0.00051 | 0.00027 |
| PW-3 (T) | 27 Top | 7/26/2021 | 0.1855 | 1.01 | 0.0301 | 0.0846 | 0.0165 | 0.0609 | 0.0103 |
| PW-3 (B) | 27 Bottom | 7/26/2021 | 0.2890 | 2.64 | 0.0985 | 0.1467 | 0.0274 | 0.0974 | 0.0022 |
| PW-3 | NA | NA | 0.2373 | 1.8278 | 0.0643 | 0.11565 | 0.02191 | 0.07917 | 0.00628 |
| PW-4 (T) | 13 Top | 7/26/2021 | 1.27 | 21.1 E | 0.6394 | 1.11 | 0.1573 | 0.5533 | 0.0098 |
| PW-4 (B) | 13 Bottom | 7/26/2021 | 1.20 | 25.8 E | 0.2861 | 1.22 | 0.1528 | 0.5548 | 0.0115 |
| PW-4 | NA | NA | 1.24 | 23.4685 | 0.4628 | 1.16446 | 0.15504 | 0.55406 | 0.01065 |
| PW-5 (T) | 28 Top | 7/26/2021 | <0.0261 | 0.0142 | 0.0019 | 0.0016 | 0.00059 J | 0.0010 | <0.00452 |
| PW-5 (B) | 28 Bottom | 7/26/2021 | 0.0022 | 0.0144 | 0.0013 | 0.0011 | 0.00049 | 0.00074 | 0.00041 |
| PW-5 | NA | NA | 0.0022 | 0.0143 | 0.0016 | 0.00135 | 0.00054 | 0.00087 | 0.00041 |
| KMW29 (T) | 18 Top | 7/26/2021 | 4.33 | 2.93 | 0.5355 | 0.9834 | 0.1279 | 0.5387 | 0.0055 |
| KMW29 (B) | 18 Bottom | 7/26/2021 | 3.06 | 2.46 | 0.2751 | 0.4814 | 0.0548 | 0.2511 | 0.0058 |
| KMW29 | NA | NA | 3.69 | 2.6918 | 0.4053 | 0.73239 | 0.09136 | 0.39490 | 0.00564 |
| KMW31 (T) | 14 Top | 7/26/2021 | 2.55 | 0.5465 | 0.3997 | 0.4965 | 0.1552 | 0.2801 | 0.0103 |
| KMW31 (B) | 14 Bottom | 7/26/2021 | 3.23 | 1.9423 | 0.4632 | 0.9806 | 0.1128 | 0.4180 | 0.0071 |
| KMW31 | NA | NA | 2.89 | 1.2444 | 0.4314 | 0.73855 | 0.13397 | 0.34903 | 0.00869 |
| KMW32 (T) | 23 Top | 7/26/2021 | 0.0416 | 0.0150 | 0.0281 | 0.0055 | 0.0129 | 0.0103 | 0.0064 |
| KMW32 (B) | 23 Bottom | 7/26/2021 | 0.0302 | 0.0175 | 0.0441 | 0.0028 | 0.0099 | 0.0051 | 0.0057 |
| KMW32 | NA | NA | 0.0359 | 0.0163 | 0.0361 | 0.00414 | 0.01141 | 0.00768 | 0.00603 |
| KMW33 (T) | 21 Top | 7/26/2021 | 4.02 | 0.0920 | 0.6381 | 0.0037 | 0.1648 | 0.0669 | 0.0204 |
| KMW33 (B) | 21 Bottom | 7/26/2021 | 4.60 | 0.1249 | 0.6443 | 0.0103 | 0.1661 | 0.0517 | 0.0151 |
| KMW33 | NA | NA | 4.31 | 0.1084 | 0.6412 | 0.00698 | 0.16548 | 0.05930 | 0.01776 |
| KMW36 (T) | 30 Top | 7/26/2021 | 3.01 | 0.0602 | 0.6794 | 0.0044 | 0.1670 | 0.0455 | 0.0201 |
| KMW36 (B) | 30 Bottom | 7/26/2021 | 3.53 | 0.0664 | 0.8282 | 0.0029 | 0.1500 | 0.0441 | 0.0202 |
| KMW36 | NA | NA | 3.27 | 0.0633 | 0.7538 | 0.00366 | 0.15850 | 0.04483 | 0.02015 |

*Please refer to notes at end of table.*

# Table 11

## Porewater Analytical Data – PAHs

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Sample ID | Field ID | Sample Date | 2-Ethylanthracene | Fluoranthene | Pyrene | 9.10-Dimethylanthracene | 2-Tertbutylanthracene | 1-Methylpyrene | Benz(a)anthracene |
|---|---|---|---|---|---|---|---|---|---|
| | | | Concentrations in µg/L | | | | | | |
| **1997 Site ROD Cleanup Goal** | | | -- | -- | -- | -- | -- | -- | -- |
| **PHSS Cleanup Level** | | | -- | -- | -- | -- | -- | -- | *0.0012* |
| **Portland Harbor JSCS SLV** | | | -- | *0.2* | *0.2* | -- | -- | -- | *0.018* |
| PW-1 (T) | 19 Top | 7/26/2021 | 0.0010 | 0.0145 | 0.0339 | 0.0526 | 0.00017 | 0.00075 | 0.0012 |
| PW-1 (B) | 19 Bottom | 7/26/2021 | 0.0011 | 0.0046 | 0.0195 | 0.0058 | 0.00014 | 0.00029 | 0.00065 |
| PW-1 | NA | NA | 0.0011 | 0.0096 | 0.0267 | 0.0292 | 0.00016 | 0.00052 | 0.0009 |
| PW-2 (T) | 17 Top | 7/26/2021 | 0.0012 | 0.0025 | 0.0036 | <0.05612 | 0.00022 | <0.00511 | <0.00476 |
| PW-2 (B) | 17 Bottom | 7/26/2021 | 0.0013 | 0.0022 | 0.0104 | 0.0088 | 0.00015 | <0.00511 | 0.00054 |
| PW-2 | NA | NA | 0.0013 | 0.0023 | 0.0070 | 0.0088 | 0.00018 | <0.00511 | 0.0005 |
| PW-3 (T) | 27 Top | 7/26/2021 | 0.0275 | 0.2536 | 0.5206 | 0.0058 | 0.00056 | 0.0085 | 0.0145 |
| PW-3 (B) | 27 Bottom | 7/26/2021 | 0.0618 | 0.7763 | 1.75 | 0.0090 | 0.00091 | 0.0180 | 0.0474 |
| PW-3 | NA | NA | 0.0446 | 0.5149 | 1.13 | 0.0074 | 0.00074 | 0.0133 | 0.0310 |
| PW-4 (T) | 13 Top | 7/26/2021 | 0.1170 | 5.51 E | 12.6 E | 0.0067 | 0.00064 | 0.0779 | 0.2605 |
| PW-4 (B) | 13 Bottom | 7/26/2021 | 0.1309 | 5.86 E | 8.87 E | 0.0082 | 0.00091 | 0.0788 | 0.2677 |
| PW-4 | NA | NA | 0.1240 | 5.68 | 10.7 | 0.0074 | 0.00077 | 0.07834 | 0.2641 |
| PW-5 (T) | 28 Top | 7/26/2021 | 0.0010 | 0.0130 | 0.0214 | 0.0059 | 0.00026 | 0.00046 | 0.00067 |
| PW-5 (B) | 28 Bottom | 7/26/2021 | 0.0014 | 0.0073 | 0.0167 | 0.0082 | 0.00010 | <0.00511 | 0.00048 |
| PW-5 | NA | NA | 0.0012 | 0.0101 | 0.0190 | 0.0071 | 0.00018 | 0.00046 | 0.0006 |
| KMW29 (T) | 18 Top | 7/26/2021 | 0.0833 | 0.0678 | 0.1777 | 0.0061 | 0.00025 | 0.0105 | 0.0057 |
| KMW29 (B) | 18 Bottom | 7/26/2021 | 0.0422 | 0.0675 | 0.1743 | 0.0105 | 0.00016 | 0.0089 | 0.0061 |
| KMW29 | NA | NA | 0.0627 | 0.0677 | 0.1760 | 0.0083 | 0.00021 | 0.00970 | 0.0059 |
| KMW31 (T) | 14 Top | 7/26/2021 | 0.0883 | 0.0405 | 0.1611 | 0.0091 | 0.00029 | 0.0129 | 0.0025 |
| KMW31 (B) | 14 Bottom | 7/26/2021 | 0.1115 | 0.0520 | 0.2320 | 0.0136 | 0.00060 | 0.0126 | 0.0025 |
| KMW31 | NA | NA | 0.0999 | 0.0462 | 0.1965 | 0.0113 | 0.00045 | 0.01277 | 0.0025 |
| KMW32 (T) | 23 Top | 7/26/2021 | 0.0194 | 0.0090 | 0.0644 | 0.0066 | 0.0022 | 0.0099 | 0.00081 |
| KMW32 (B) | 23 Bottom | 7/26/2021 | 0.0080 | 0.0059 | 0.1018 | 0.0065 | 0.00098 | 0.0166 | 0.0013 |
| KMW32 | NA | NA | 0.0137 | 0.0074 | 0.0831 | 0.0065 | 0.00158 | 0.01326 | 0.0011 |
| KMW33 (T) | 21 Top | 7/26/2021 | 0.0248 | 0.0427 | 0.1851 | 0.0130 | 0.00036 | 0.0084 | 0.0017 |
| KMW33 (B) | 21 Bottom | 7/26/2021 | 0.0174 | 0.0385 | 0.1098 | 0.0138 | 0.00079 | 0.0106 | 0.0020 |
| KMW33 | NA | NA | 0.0211 | 0.0406 | 0.1474 | 0.0134 | 0.00058 | 0.00951 | 0.0018 |
| KMW36 (T) | 30 Top | 7/26/2021 | 0.0102 | 0.1040 | 0.2815 | 0.0048 | 0.00037 | 0.0112 | 0.0044 |
| KMW36 (B) | 30 Bottom | 7/26/2021 | 0.0087 | 0.1067 | 0.2073 | 0.0061 | 0.00026 | 0.0098 | 0.0041 |
| KMW36 | NA | NA | 0.0094 | 0.1054 | 0.2444 | 0.0055 | 0.00031 | 0.01048 | 0.0043 |

*Please refer to notes at end of table.*

# Table 11

## Porewater Analytical Data – PAHs

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Sample ID | Field ID | Sample Date | Chrysene | Benzo(b)fluoranthene | 7.12-Methylbenz(a)anthracene | Benzo(k)fluoranthene | Benzo(e)pyrene | Benzo(a)pyrene | Perylene |
|---|---|---|---|---|---|---|---|---|---|
| | | | Concentrations in µg/L | | | | | | |
| **1997 Site ROD Cleanup Goal** | | | -- | -- | -- | -- | -- | -- | -- |
| **PHSS Cleanup Level** | | | *0.0013* | *0.0012* | -- | *0.0013* | -- | *0.00012* | -- |
| **Portland Harbor JSCS SLV** | | | *0.018* | *0.018* | -- | *0.018* | -- | *0.018* | -- |
| PW-1 (T) | 19 Top | 7/26/2021 | 0.0021 | 0.00026 | <0.00177 | 0.00025 | 0.00031 | <0.01244 | 0.0031 |
| PW-1 (B) | 19 Bottom | 7/26/2021 | 0.0012 | 0.00025 | <0.00177 | 0.00011 | 0.00019 | <0.01244 | 0.0052 |
| PW-1 | NA | NA | 0.0017 | 0.00026 | <0.00177 | 0.00018 | 0.00025 | <0.01244 | 0.0042 |
| PW-2 (T) | 17 Top | 7/26/2021 | 0.00034 | <0.00153 | <0.00177 | <0.00228 | <0.00272 | <0.01244 | <0.00892 |
| PW-2 (B) | 17 Bottom | 7/26/2021 | 0.00087 | 0.00032 | 0.00014 | 0.00014 | 0.00022 | 0.0010 | 0.00053 |
| PW-2 | NA | NA | 0.0006 | 0.00032 | 0.00014 | 0.00014 | 0.00022 | 0.00101 | 0.0005 |
| PW-3 (T) | 27 Top | 7/26/2021 | 0.0183 | 0.0020 | <0.00177 | 0.0017 | 0.0017 | <0.01244 | 0.00089 |
| PW-3 (B) | 27 Bottom | 7/26/2021 | 0.0554 | 0.0054 | 0.00012 | 0.0049 | 0.0042 | <0.01244 | 0.0017 |
| PW-3 | NA | NA | 0.0369 | 0.0037 | 0.00012 | 0.00329 | 0.00293 | <0.01244 | 0.0013 |
| PW-4 (T) | 13 Top | 7/26/2021 | 0.2843 | 0.0178 | 0.00007 | 0.0194 | 0.0141 | 0.0233 | 0.0035 |
| PW-4 (B) | 13 Bottom | 7/26/2021 | 0.2530 | 0.0289 | <0.00177 | 0.0294 | 0.0199 | 0.0351 | 0.0050 |
| PW-4 | NA | NA | 0.2686 | 0.0233 | 0.00007 | 0.0244 | 0.01702 | 0.02920 | 0.0042 |
| PW-5 (T) | 28 Top | 7/26/2021 | 0.0012 | 0.00025 | <0.00177 | 0.00029 | 0.00022 | <0.01244 | 0.0019 |
| PW-5 (B) | 28 Bottom | 7/26/2021 | 0.0010 | 0.00023 | <0.00177 | 0.00017 | 0.00012 | 0.00062 | 0.0030 |
| PW-5 | NA | NA | 0.0011 | 0.00024 | <0.00177 | 0.00023 | 0.00017 | 0.00062 | 0.0024 |
| KMW29 (T) | 18 Top | 7/26/2021 | 0.0065 | 0.00025 | <0.00177 | 0.00020 | 0.00017 | <0.01244 | <0.00892 |
| KMW29 (B) | 18 Bottom | 7/26/2021 | 0.0074 | 0.00038 | <0.00177 | 0.00024 | 0.00024 | 0.00064 | <0.00892 |
| KMW29 | NA | NA | 0.0070 | 0.00031 | <0.00177 | 0.00022 | 0.00021 | 0.00064 | <0.00892 |
| KMW31 (T) | 14 Top | 7/26/2021 | 0.0042 | 0.00018 | <0.00177 | <0.00228 | 0.00015 | 0.00050 | <0.00892 |
| KMW31 (B) | 14 Bottom | 7/26/2021 | 0.0044 | 0.00022 | <0.00177 | 0.00012 | 0.00016 | <0.01244 | <0.00892 |
| KMW31 | NA | NA | 0.0043 | 0.00020 | <0.00177 | 0.00012 | 0.00016 | 0.00050 | <0.00892 |
| KMW32 (T) | 23 Top | 7/26/2021 | 0.0021 | 0.00019 | <0.00177 | <0.00228 | 0.00029 | <0.01244 | <0.00892 |
| KMW32 (B) | 23 Bottom | 7/26/2021 | 0.0031 | 0.00019 | <0.00177 | <0.00228 | 0.00028 | 0.0008 | <0.00892 |
| KMW32 | NA | NA | 0.0026 | 0.00019 | <0.00177 | <0.00228 | 0.00028 | 0.00080 | <0.00892 |
| KMW33 (T) | 21 Top | 7/26/2021 | 0.0023 | 0.00015 | <0.00177 | <0.00228 | <0.00272 | <0.01244 | <0.00892 |
| KMW33 (B) | 21 Bottom | 7/26/2021 | 0.0029 | 0.00025 | <0.00177 | <0.00228 | <0.00272 | <0.01244 | <0.00892 |
| KMW33 | NA | NA | 0.0026 | 0.00020 | <0.00177 | <0.00228 | <0.00272 | <0.01244 | <0.00892 |
| KMW36 (T) | 30 Top | 7/26/2021 | 0.0062 | 0.00015 | <0.00177 | 0.00016 | 0.00017 | 0.00056 | <0.00892 |
| KMW36 (B) | 30 Bottom | 7/26/2021 | 0.0066 | 0.00013 | 0.00013 | 0.00020 | 0.00030 | 0.0010 | 0.00041 |
| KMW36 | NA | NA | 0.0064 | 0.00014 | 0.00013 | 0.00018 | 0.00023 | 0.00079 | 0.0004 |

*Please refer to notes at end of table.*

# Table 11

## Porewater Analytical Data – PAHs

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Sample ID | Field ID | Sample Date | Indeno(123-cd)pyrene | Dibenzo(ah)anthracene | Benzo(ghi)perylene | cPAH (BaP Equiv) |
|---|---|---|---|---|---|---|
| | | | Concentrations in µg/L | | | |
| **1997 Site ROD Cleanup Goal** | | | -- | -- | -- | |
| **PHSS Cleanup Level** | | | *0.0012* | *0.00012* | -- | *0.00012* |
| **Portland Harbor JSCS SLV** | | | *0.018* | *0.018* | *0.2* | |
| PW-1 (T) | 19 Top | 7/26/2021 | 0.00005 J | 0.000050 | <0.00382 | 0.00020 |
| PW-1 (B) | 19 Bottom | 7/26/2021 | <0.00155 | 0.000050 | <0.00382 | 0.00014 |
| PW-1 | NA | NA | 0.00005 | 0.00005 | <0.00382 | 0.00017 |
| PW-2 (T) | 17 Top | 7/26/2021 | 0.00010 J | <0.00045 | <0.00382 | 0.000011 |
| PW-2 (B) | 17 Bottom | 7/26/2021 | <0.00155 | 0.000058 | <0.00382 | 0.00115 |
| PW-2 | NA | NA | 0.00010 | 0.00006 | <0.00382 | 0.00058 |
| PW-3 (T) | 27 Top | 7/26/2021 | 0.00016 | 0.00012 | 0.00045 | 0.00181 |
| PW-3 (B) | 27 Bottom | 7/26/2021 | 0.00022 | 0.00015 | 0.0012 | 0.00551 |
| PW-3 | NA | NA | 0.00019 | 0.00014 | 0.00081 | 0.00366 |
| PW-4 (T) | 13 Top | 7/26/2021 | 0.00042 | 0.00025 | 0.0024 | 0.052 |
| PW-4 (B) | 13 Bottom | 7/26/2021 | 0.00033 | 0.00025 | 0.0039 | 0.065 |
| PW-4 | NA | NA | 0.00038 | 0.00025 | 0.00313 | 0.05852 |
| PW-5 (T) | 28 Top | 7/26/2021 | 0.00012 | 0.000012 J | <0.00382 | 0.00012 |
| PW-5 (B) | 28 Bottom | 7/26/2021 | <0.00155 | 0.000047 | <0.00382 | 0.00074 |
| PW-5 | NA | NA | 0.00012 | 0.00003 | <0.00382 | 0.00043 |
| KMW29 (T) | 18 Top | 7/26/2021 | <0.00155 | 0.000044 | <0.00382 | 0.00064 |
| KMW29 (B) | 18 Bottom | 7/26/2021 | <0.00155 | 0.000059 | <0.00382 | 0.00135 |
| KMW29 | NA | NA | <0.00155 | 0.00005 | <0.00382 | 0.00099 |
| KMW31 (T) | 14 Top | 7/26/2021 | <0.00155 | 0.000048 | <0.00382 | 0.00081 |
| KMW31 (B) | 14 Bottom | 7/26/2021 | <0.00155 | 0.000067 | <0.00382 | 0.00034 |
| KMW31 | NA | NA | <0.00155 | 0.00006 | <0.00382 | 0.00058 |
| KMW32 (T) | 23 Top | 7/26/2021 | 0.00015 | 0.000019 J | <0.00382 | 0.00014 |
| KMW32 (B) | 23 Bottom | 7/26/2021 | <0.00155 | 0.000053 | <0.00382 | 0.00101 |
| KMW32 | NA | NA | 0.00015 | 0.00004 | <0.00382 | 0.00057 |
| KMW33 (T) | 21 Top | 7/26/2021 | <0.00155 | 0.000043 | <0.00382 | 0.00023 |
| KMW33 (B) | 21 Bottom | 7/26/2021 | <0.00155 | 0.000056 | <0.00382 | 0.00028 |
| KMW33 | NA | NA | <0.00155 | 0.00005 | <0.00382 | 0.00025 |
| KMW36 (T) | 30 Top | 7/26/2021 | <0.00155 | 0.000046 | <0.00382 | 0.00107 |
| KMW36 (B) | 30 Bottom | 7/26/2021 | <0.00155 | 0.000050 | 0.00015 | 0.00149 |
| KMW36 | NA | NA | <0.00155 | 0.00005 | 0.00015 | 0.00128 |

**Notes:**

1. < = less than the laboratory Estimated Quantitation Limit (EQL)

2a. Gray highlighted cells indicate values that are equal to or exceeding PHSS Cleanup Level. If a PHSS Cleanup Level was not developed for an analyte, the JSCS SLV is used for comparison.

2b. Green highlighted cells indicate the method reporting limit is greater than the PHSS ROD Cleanup Level or the JSCS SLV (if there is no ROD Cleanup Level)

3. < = less than the laboratory reporting limit.
4. µg/L = microgram(s) per liter.
5. -- = Not applicable.
6. Portland Harbor JSCS SLVs = 2007 Portland Harbor Joint Source Control Strategy Screening Level Values.
7. PHSS Cleanup Levels = 2017 Portland Harbor Superfund Site Record of Decision Cleanup Levels.

**Quality Assurance/Quality Control Data Qualifiers**

J = Reported result is an estimated value.

# Table 12

## Porewater Analytical Data – Dissolved Metals

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Sample Id | Field ID | Sample Date | Arsenic | Copper | Zinc | Lead |
|---|---|---|---|---|---|---|
| | | | Concentrations in µg/L | | | |
| 1997 Site ROD Cleanup Goal | | | *5.0* | *12* | – | *3.2* |
| PHSS Cleanup Level | | | *0.018* | *2.74* | 36 | *0.54* |
| Portland Harbor JSCS SLV | | | *0.045* | *2.7* | *36* | *0.54* |
| PW-1 (T) | 19 Top | 7/26/2021 | *17.2* | 0.72 | 0.9 J | 0.02 J |
| PW-1 (B) | 19 Bottom | 7/26/2021 | *14.6* | 0.72 | 3.0 | 0.02 J |
| PW-1 | NA | NA | *15.9* | 0.72 | 1.95 | 0.02 |
| PW-2 (T) | 17 Top | 7/26/2021 | 10.1 | 0.91 | 1.4 J | 0.02 J |
| PW-2 (B) | 17 Bottom | 7/26/2021 | 10.8 | 0.73 | 1.7 J | 0.02 J |
| PW-2 | NA | NA | *10.4* | 0.82 | 1.51 | 0.02 |
| PW-3 (T) | 27 Top | 7/26/2021 | 14.8 | 0.70 | 1.5 J | 0.03 J |
| PW-3 (B) | 27 Bottom | 7/26/2021 | 22.3 | 0.80 | 1.6 J | 0.03 J |
| PW-3 | NA | NA | *18.6* | 0.75 | 1.53 | 0.03 |
| PW-4 (T) | 13 Top | 7/26/2021 | 14.4 | 0.68 | 1.5 J | 0.04 J |
| PW-4 (B) | 13 Bottom | 7/26/2021 | 21.4 | 0.77 | 3.1 | 0.04 J |
| PW-4 | NA | NA | *17.9* | 0.73 | 2.29 | 0.04 |
| PW-5 (T) | 28 Top | 7/26/2021 | 16.2 | 0.74 | 2.1 | 0.03 J |
| PW-5 (B) | 28 Bottom | 7/26/2021 | 10.7 | 0.73 | 6.7 | 0.04 J |
| PW-5 | NA | NA | *13.4* | 0.74 | 4.43 | 0.03 |
| KMW29 (T) | 18 Top | 7/26/2021 | 4.09 | 0.67 | 2.3 | 0.33 |
| KMW29 (B) | 18 Bottom | 7/26/2021 | 8.33 | 1.05 | 2.5 | 0.76 |
| KMW29 | NA | NA | *6.21* | 0.86 | 2.40 | 0.542 |
| KMW31 (T) | 14 Top | 7/26/2021 | 1.34 | 0.69 | 2.4 | 0.26 |
| KMW31 (B) | 14 Bottom | 7/26/2021 | 3.95 | 0.74 | 5.2 | 1.78 |
| KMW31 | NA | NA | 2.64 | 0.71 | 3.76 | 1.02 |
| KMW32 (T) | 23 Top | 7/26/2021 | 0.45 | 2.66 | 7.9 | 0.29 |
| KMW32 (B) | 23 Bottom | 7/26/2021 | 0.33 | 2.65 | 8.6 | 0.28 |
| KMM32 | NA | NA | 0.39 | 2.66 | 8.27 | 0.28 |
| KMW33 (T) | 21 Top | 7/26/2021 | 0.16 J | 0.62 | 1.9 J | 0.03 J |
| KMW33 (B) | 21 Bottom | 7/26/2021 | 4.55 | 0.72 | 2.4 | 0.03 J |
| KMW33 | NA | NA | 2.36 | 0.67 | 2.16 | 0.03 |
| KMW36 (T) | 30 Top | 7/26/2021 | 0.48 | 0.97 | 2.8 | 0.15 J |
| KMW36 (B) | 30 Bottom | 7/26/2021 | 0.51 | 0.97 | 1.8 J | 0.15 J |
| KMW36 | NA | NA | 0.49 | 0.97 | 2.27 | 0.15 |

**Notes:**

1. µg/L = Microgram(s) per liter.
2. (T) = top sample interval of PSD; (B) bottom sample interval of PSD; an average concentration for each sample was calculated based on the average of the (T) and (B) sample results for each sample location.
3 NA = Not applicable
4. Yellow highlighed cells indicate values that are equal to or exceeding 1997 ROD Groundwater Cleanup Goals for the ExxonMobil/Shore Terminals Site.
5. Gray highlighted cells indicate values that are equal to or exceeding PHSS Cleanup Level. If a PHSS Cleanup Level was not developed for an analyte, the JSCS SLV is used for comparison.
6. Portland Harbor JSCS SLVs = 2007 Portland Harbor Joint Source Control Strategy Screening Level Values.
7. PHSS Cleanup Levels = 2017 Portland Harbor Superfund Site Record of Decision Cleanup Levels.

# Table 13

## Porewater Analytical Data — Organochlorine Pesticides

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Sample Location | Field ID | Sample Date | Hexachlorobenzene | alpha-BHC | Lindane (gamma-BHC) | beta-BHC | delta-BHC | Heptachlor | Aldrin | Oxychlordane | cis-Heptachlor Epoxide | trans-Heptachlor Epoxide | trans-Chlordane (gamma) | cis-Chlordane (alpha) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Concentrations in µg/L | | | | | | | | | | | |
| *1997 Site ROD Cleanup Goal* | | | – | – | – | – | – | – | – | – | – | – | – | – |
| *PHSS Cleanup Level* | | | *2.90E-05* | – | – | – | – | – | *7.70E-07* | – | – | – | *8.1E-05** | *8.1E-05** |
| *Portland Harbor JSCS SLV* | | | – | – | – | – | – | – | – | – | – | – | – | – |
| PW-1 | P19 Bottom | 7/26/2021 | **6.47E-06** J, B | <3.20E-05 | <4.71E-05 | <4.25E-05 | <6.04E-05 | <7.79E-07 | <4.30E-07 | <1.25E-06 | <2.13E-05 | <7.93E-05 | <5.97E-07 | <5.22E-07 |
| PW-2 | P17 Bottom | 7/26/2021 | **7.07E-06** J, B | <3.20E-05 | <4.71E-05 | <4.25E-05 | <6.04E-05 | <7.79E-07 | <4.30E-07 | <1.25E-06 | <2.13E-05 | <7.93E-05 | <5.97E-07 | <5.22E-07 |
| PW-3 | P27 Top | 7/26/2021 | **6.43E-06** J, B | <3.20E-05 | <4.71E-05 | <4.25E-05 | <6.04E-05 | <7.79E-07 | <4.30E-07 | <1.25E-06 | <2.13E-05 | <7.93E-05 | <5.97E-07 | <5.22E-07 |
| PW-4 | P13 Top | 7/26/2021 | **6.95E-06** J, B | <3.20E-05 | <4.71E-05 | <4.25E-05 | <6.04E-05 | <7.79E-07 | <4.30E-07 | <1.25E-06 | <2.13E-05 | <7.93E-05 | <5.97E-07 | <5.22E-07 |
| PW-5 | P28 Bottom | 7/26/2021 | **6.25E-06** J, B | <3.20E-05 | <4.71E-05 | <4.25E-05 | <6.04E-05 | <7.79E-07 | <4.30E-07 | <1.25E-06 | <2.13E-05 | <7.93E-05 | <5.97E-07 | <5.22E-07 |
| KMW29 | P18 Top | 7/26/2021 | **6.25E-06** J, B | <3.20E-05 | <4.71E-05 | <4.25E-05 | <6.04E-05 | <7.79E-07 | <4.30E-07 | <1.25E-06 | <2.13E-05 | <7.93E-05 | <5.97E-07 | <5.22E-07 |
| KMW31 | P14 Top | 7/26/2021 | **7.58E-06** J, B | <3.20E-05 | <4.71E-05 | <4.25E-05 | <6.04E-05 | <7.79E-07 | <4.30E-07 | <1.25E-06 | <2.13E-05 | <7.93E-05 | <5.97E-07 | <5.22E-07 |
| KMW32 | P23 Top | 7/26/2021 | **6.54E-06** J, B | <3.20E-05 | <4.71E-05 | <4.25E-05 | <6.04E-05 | <7.79E-07 | <4.30E-07 | <1.25E-06 | <2.13E-05 | <7.93E-05 | <5.97E-07 | <5.22E-07 |
| KMW33 | P21 Top | 7/26/2021 | <9.79E-06 | <3.20E-05 | <4.71E-05 | <4.25E-05 | <6.04E-05 | <7.79E-07 | <4.30E-07 | <1.25E-06 | <2.13E-05 | <7.93E-05 | <5.97E-07 | <5.22E-07 |
| KMW36 | P30 Top | 7/26/2021 | **8.07E-06** J, B | <3.20E-05 | <4.71E-05 | <4.25E-05 | <6.04E-05 | <7.79E-07 | <4.30E-07 | <1.25E-06 | <2.13E-05 | <7.93E-05 | <5.97E-07 | <5.22E-07 |

*Please refer to notes at end of table.*

# Table 13

## Porewater Analytical Data — Organochlorine Pesticides

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Sample Location | Field ID | Sample Date | trans-Nonachlor | Endosulfan I (alpha) | Dieldrin | Endrin | cis-Nonachlor | Endosulfan II (beta) | Endosulfan Sulfate | 4,4'-Methoxychlor | Mirex | Endrin Aldehyde | Endrin Ketone | 2,4'-DDE | 4,4'-DDE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Concentrations in µg/L | | | | | | | | | | | | |
| *1997 Site ROD Cleanup Goal* | | | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| *PHSS Cleanup Level* | | | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| *Portland Harbor JSCS SLV* | | | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| PW-1 | P19 Bottom | 7/26/2021 | <9.88E-07 | <1.96E-05 | <8.92E-06 | <5.42E-06 | <3.74E-07 | <4.02E-05 | <4.64E-06 | <3.61E-06 | <1.42E-10 | <1.43E-06 | <1.42E-05 | <4.73E-07 | **1.21E-06** J |
| PW-2 | P17 Bottom | 7/26/2021 | <9.88E-07 | <1.96E-05 | <8.92E-06 | <5.42E-06 | <3.74E-07 | <4.02E-05 | <4.64E-06 | <3.61E-06 | <1.42E-10 | <1.43E-06 | <1.42E-05 | <4.73E-07 | <4.77E-07 |
| PW-3 | P27 Top | 7/26/2021 | <9.88E-07 | <1.96E-05 | <8.92E-06 | <5.42E-06 | <3.74E-07 | <4.02E-05 | <4.64E-06 | <3.61E-06 | <1.42E-10 | <1.43E-06 | <1.42E-05 | <4.73E-07 | **1.83E-06** J |
| PW-4 | P13 Top | 7/26/2021 | <9.88E-07 | <1.96E-05 | <8.92E-06 | <5.42E-06 | <3.74E-07 | <4.02E-05 | <4.64E-06 | <3.61E-06 | <1.42E-10 | <1.43E-06 | <1.42E-05 | <4.73E-07 | **5.82E-06** J |
| PW-5 | P28 Bottom | 7/26/2021 | <9.88E-07 | <1.96E-05 | <8.92E-06 | <5.42E-06 | <3.74E-07 | <4.02E-05 | <4.64E-06 | <3.61E-06 | <1.42E-10 | <1.43E-06 | <1.42E-05 | <4.73E-07 | <4.77E-07 |
| KMW29 | P18 Top | 7/26/2021 | <9.88E-07 | <1.96E-05 | <8.92E-06 | <5.42E-06 | <3.74E-07 | <4.02E-05 | <4.64E-06 | <3.61E-06 | <1.42E-10 | <1.43E-06 | <1.42E-05 | <4.73E-07 | <4.77E-07 |
| KMW31 | P14 Top | 7/26/2021 | **1.15E-06** J | <1.96E-05 | <8.92E-06 | <5.42E-06 | <3.74E-07 | <4.02E-05 | <4.64E-06 | <3.61E-06 | <1.42E-10 | <1.43E-06 | <1.42E-05 | <4.73E-07 | <4.77E-07 |
| KMW32 | P23 Top | 7/26/2021 | <9.88E-07 | <1.96E-05 | <8.92E-06 | <5.42E-06 | <3.74E-07 | <4.02E-05 | <4.64E-06 | <3.61E-06 | <1.42E-10 | <1.43E-06 | <1.42E-05 | <4.73E-07 | **3.17E-06** J |
| KMW33 | P21 Top | 7/26/2021 | <9.88E-07 | <1.96E-05 | <8.92E-06 | <5.42E-06 | <3.74E-07 | <4.02E-05 | <4.64E-06 | <3.61E-06 | <1.42E-10 | <1.43E-06 | <1.42E-05 | <4.73E-07 | <4.77E-07 |
| KMW36 | P30 Top | 7/26/2021 | <9.88E-07 | <1.96E-05 | <8.92E-06 | <5.42E-06 | <3.74E-07 | <4.02E-05 | <4.64E-06 | <3.61E-06 | <1.42E-10 | <1.43E-06 | <1.42E-05 | <4.73E-07 | <4.77E-07 |

*Please refer to notes at end of table.*

# Table 13

## Porewater Analytical Data — Organochlorine Pesticides

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Sample Location | Field ID | Sample Date | 2,4'-DDD | 4,4'-DDD | 2,4'-DDT | 4,4'-DDT | ∑DDE | ∑DDD | ∑DDT | DDx |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Concentrations in µg/L | | | | | | | |
| *1997 Site ROD Cleanup Goal* | | | -- | -- | -- | -- | -- | -- | -- | -- |
| *PHSS Cleanup Level* | | | -- | -- | -- | -- | *1.80E-05* | *3.10E-05* | *2.20E-05* | *1.00E-03* |
| *Portland Harbor JSCS SLV* | | | -- | -- | -- | -- | -- | -- | -- | -- |
| PW-1 | P19 Bottom | 7/26/2021 | <9.68E-07 | **2.21E-06** J | <3.52E-07 | <3.83E-07 | **1.45E-06** | **2.69E-06** | 3.68E-07 | **4.51E-06** |
| PW-2 | P17 Bottom | 7/26/2021 | <9.68E-07 | <1.09E-06 | <3.52E-07 | <3.83E-07 | 4.75E-07 | 1.03E-06 | 3.68E-07 | 1.87E-06 |
| PW-3 | P27 Top | 7/26/2021 | <9.68E-07 | **5.37E-06** J | <3.52E-07 | <3.83E-07 | **2.07E-06** | **5.86E-06** | 3.68E-07 | **8.29E-06** |
| PW-4 | P13 Top | 7/26/2021 | **1.94E-05** J | **2.57E-05** J | <3.52E-07 | <3.83E-07 | **6.05E-06** | **4.51E-05** | 3.68E-07 | **5.15E-05** |
| PW-5 | P28 Bottom | 7/26/2021 | <9.68E-07 | <1.09E-06 | <3.52E-07 | <3.83E-07 | 4.75E-07 | 1.03E-06 | 3.68E-07 | 1.87E-06 |
| KMW29 | P18 Top | 7/26/2021 | <9.68E-07 | <1.09E-06 | <3.52E-07 | <3.83E-07 | 4.75E-07 | 1.03E-06 | 3.68E-07 | 1.87E-06 |
| KMW31 | P14 Top | 7/26/2021 | **3.24E-06** J | **3.02E-06** J | <3.52E-07 | <3.83E-07 | 4.75E-07 | **6.26E-06** | 3.68E-07 | **7.11E-06** |
| KMW32 | P23 Top | 7/26/2021 | **5.97E-05** | **2.86E-05** J | <3.52E-07 | <3.83E-07 | **3.40E-06** | **8.83E-05** | 3.68E-07 | **9.21E-05** |
| KMW33 | P21 Top | 7/26/2021 | <9.68E-07 | <1.09E-06 | <3.52E-07 | <3.83E-07 | 4.75E-07 | 1.03E-06 | 3.68E-07 | 1.87E-06 |
| KMW36 | P30 Top | 7/26/2021 | <9.68E-07 | <1.09E-06 | <3.52E-07 | <3.83E-07 | 4.75E-07 | 1.03E-06 | 3.68E-07 | 1.87E-06 |

**Notes:**

1. < = Concentration as reported by the analytical laboratory is less than the laboratory reporting limit.
2. µg/L = microgram(s) per liter.
3. Gray highlighted cells indicate values that are equal to or exceeding PHSS Cleanup Level. If a PHSS Cleanup Level was not developed for an analyte, the JSCS SLV is used for comparison.
4. Organochlorine Pesticides analyzed by EPA Method 1699.
5. Portland Harbor JSCS SLVs = 2007 Portland Harbor Joint Source Control Strategy Screening Level Values.
6. ∑DDD = Sum of the DDD isomers (2,4'-DDD + 4,4'-DDD). For isomers with at least one sample detection, concentrations below the DL were replaced with a value of 1/2 the DL.
7. ∑DDE = Sum of the DDE isomers (2,4'-DDE + 4,4'-DDE). For isomers with at least one sample detection, concentrations below the DL were replaced with a value of 1/2 the DL.
8. ∑DDT = Sum of the DDT isomers (2,4'-DDT + 4,4'-DDT). For isomers with at least one sample detection, concentrations below the DL were replaced with a value of 1/2 the DL.
9. DDx = ∑DDD + ∑DDE + ∑DDT
10. * ROD Cleanup Level is for Chlordanes

# Attachment 4

Groundwater Monitoring Sampling Results: 2019-2021

# Table 14

## Groundwater Analytical Data — TPH, C10 - C12 Aliphatic Range Hydrocarbons, BTEX, and MTBE

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Well ID | Sample Date | Combined TPH (mg/L) | TPHg Gasoline (mg/L) | TPHd Diesel (mg/L) | TPHo Motor Oil (mg/L) | Benzene (µg/L) | Toluene (µg/L) | Ethyl-Benzene (µg/L) | Xylenes (µg/L) | MTBE (µg/L) | **Aliphatic Hydro-carbons C10 - C12 (µg/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *1997 Site ROD Cleanup Goal* | | *1.0* | – | – | – | *40* | – | – | – | – | – |
| *PHSS Cleanup Level* | | – | – | – | – | *0.44* | *9.8* | *7.3* | *13* | – | *2.6* |
| *Portland Harbor JSCS SLV* | | – | – | – | – | *1.2* | *9.8* | *7.3* | *200* | *37* | – |
| ***Tank Field 1*** | | | | | | | | | | | |
| KMW07 | 3/13/2019 | 0.18 | 0.126 | <0.762 | <0.152 | 0.24 | <1.00 | <0.500 | <1.50 | <1.00 | – |
| | 3/13/2019 DUP | 0.23 | 0.116 | 0.0787 F-11 | <0.152 | 0.23 | <1.00 | <0.500 | <1.50 | <1.00 | – |
| | 1/28/2020 | 4.30 | 4.18 | 0.0875 B, B-02,F-18 | <0.150 | 0.894 | 0.732 J | 11.7 | 1.09 J | 2.26 | – |
| | 1/28/2020 DUP | 4.30 | 4.17 | 0.094 B, B-02,F-18 | <0.151 | 0.881 | 0.698 J | 11.8 | 1.04 J | 2.95 | – |
| | 3/25/2021 | 0.24 | <0.10 | 0.112 F-11 | <0.157 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | – |
| | 3/25/2021 DUP | 0.22 | <0.10 | 0.0953 F-11 | <0.155 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | – |
| KMW11 | 1/29/2020 | ND | <0.10 | <0.0748 | <0.150 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | – |
| | 9/30/2020 | ND | <0.10 | <0.0748 Q-30 | <0.15 Q-30 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | – |
| | 3/25/2021 | 0.57 | 0.376 | 0.111 F-13,F-20 | <0.157 | 1.34 | <1.00 | <0.50 | <1.50 | <1.00 | – |
| | 10/6/2021 | ND | <0.100 | <0.0777 | <0.155 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | – |
| KMW18 | 1/28/2020 | ND | <0.10 | <0.0769 B | <0.154 | 0.358 | <1.00 | <0.50 | <1.50 | <1.00 | – |
| | 1/28/2020 DUP | ND | <0.10 | <0.0755 B | <0.151 | 0.322 | <1.00 | <0.50 | <1.50 | <1.00 | – |
| | 9/29/2020 | 0.27 | 0.157 | 0.0416 J | <0.152 | 2.08 | 3.69 J, Q-42 | <0.50 | <1.50 | <1.00 | – |
| | 9/29/2020 DUP | 0.36 | 0.239 | 0.0487 J | <0.150 | 1.58 | 33.9 | <0.50 | <1.50 | <1.00 | – |
| | 3/23/2021 | ND | <0.10 | <0.0762 | <0.152 | 0.15 J | <1.00 | <0.50 | <1.50 | <1.00 | – |
| | 3/23/2021 DUP | ND | <0.10 | <0.0755 | <0.151 | 0.15 J | <1.00 | <0.50 | <1.50 | <1.00 | – |
| | 10/7/2021 | 0.51 | 0.39 | <0.0784 | <0.157 | 2.27 | 36.5 | <0.50 | <1.50 | <1.00 | – |
| | 10/7/2021 DUP | 0.50 | 0.377 | <0.0816 | <0.163 | 2.13 | 37.7 | <0.50 | <1.50 | <1.00 | – |

*Please refer to notes at end of table.*

# Table 14

## Groundwater Analytical Data — TPH, C10 - C12 Aliphatic Range Hydrocarbons, BTEX, and MTBE

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Well ID | Sample Date | Combined TPH (mg/L) | TPHg Gasoline (mg/L) | TPHd Diesel (mg/L) | TPHo Motor Oil (mg/L) | Benzene (µg/L) | Toluene (µg/L) | Ethyl-Benzene (µg/L) | Xylenes (µg/L) | MTBE (µg/L) | **Aliphatic Hydro-carbons C10 - C12 (µg/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *1997 Site ROD Cleanup Goal* | | *1.0* | – | – | – | *40* | – | – | – | – | – |
| *PHSS Cleanup Level* | | – | – | – | – | *0.44* | *9.8* | *7.3* | *13* | – | *2.6* |
| *Portland Harbor JSCS SLV* | | – | – | – | – | *1.2* | *9.8* | *7.3* | *200* | *37* | – |
| KMW19 | 1/28/2020 | 0.69 | 0.636 | <0.0755 B | <0.151 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | – |
| | 9/29/2020 | 0.60 | 0.444 | <0.0762 | 0.117 J | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | – |
| | 3/23/2021 | 0.65 | 0.538 | 0.0396 J,F-18 | <0.151 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | – |
| | 10/6/2021 | 0.68 | 0.566 | <0.0755 | <0.151 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | – |
| KMW35 | 1/28/2020 | 6.02 | 5.63 | 0.352 B,B-02,F-18 | <0.150 | 0.536 | <1.00 | 0.466 J | 1.71 | <1.00 | – |
| | 9/30/2020 | 6.01 | 5.49 | 0.44 F-18 | <0.0762 | 0.684 | 0.556 J | 0.707 | 1.88 | <1.00 | – |
| | 3/25/2021 | 3.10 | 2.49 | 0.532 F-20 | <0.157 | 0.233 | <1.00 | <0.50 | <1.50 | <1.00 | – |
| | 10/6/2021 | 3.55 | 2.74 | 0.735 | <0.150 | 0.21 | <1.00 | <0.50 | <1.50 | <1.00 | – |
| MW41A | 1/28/2020 | 0.22 | 0.0821 J | 0.101 B,B-02,F-13 | <0.154 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | – |
| | 9/30/2020 | 0.90 | 0.0894 J | 0.734 Q-30 | <0.152 Q-30 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | – |
| | 3/25/2021 | 0.17 | <0.10 | 0.0455 J | <0.151 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | – |
| | 10/6/2021 | 0.37 | 0.126 | 0.17 | <0.155 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | – |
| ***Tank 3510*** | | | | | | | | | | | |
| AC2 | 1/30/2020 | 0.13 | <0.10 | 0.152 J,F-13 | <0.0762 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | – |
| | 9/30/2020 | 0.20 | <0.10 | <0.0762 | 0.113 J | <0.20 | <1.00 | <0.50 | 1.66 | <1.00 | – |
| | 3/23/2021 | ND | <0.10 | <0.0748 | <0.15 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | – |
| | 10/6/2021 | ND | <0.100 | <0.0792 | <0.158 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | – |
| AC-7 | 1/30/2020 | 0.55 | 0.268 | 0.243 B,B-02,F-13 | <0.152 | 13.8 | 0.66 J | <0.50 | <1.50 | <1.00 | – |
| | 9/30/2020 | NS | NS | NS | NS | NS | NS | NS | NS | NS | – |
| | 3/24/2021 | 1.07 | 0.64 | 0.353 F-13F-20 | <0.154 | 0.31 | 1.53 | <0.50 | 1.18 J | <1.00 | – |
| | 10/5/2021 | NS | NS | NS | NS | NS | NS | NS | NS | NS | – |

*Please refer to notes at end of table.*

# Table 14

## Groundwater Analytical Data — TPH, C10 - C12 Aliphatic Range Hydrocarbons, BTEX, and MTBE

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Well ID | Sample Date | Combined TPH (mg/L) | TPHg Gasoline (mg/L) | TPHd Diesel (mg/L) | TPHo Motor Oil (mg/L) | Benzene (µg/L) | Toluene (µg/L) | Ethyl-Benzene (µg/L) | Xylenes (µg/L) | MTBE (µg/L) | **Aliphatic Hydro-carbons C10 - C12 (µg/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *1997 Site ROD Cleanup Goal* | | *1.0* | – | – | – | *40* | – | – | – | – | – |
| *PHSS Cleanup Level* | | – | – | – | – | *0.44* | *9.8* | *7.3* | *13* | – | *2.6* |
| *Portland Harbor JSCS SLV* | | – | – | – | – | *1.2* | *9.8* | *7.3* | *200* | *37* | – |
| ***Loading Rack*** | | | | | | | | | | | |
| AC-8 | 1/30/2020 | 7.12 | 6.97 | <0.0748 B | 0.116 J | 2,040 | 19.6 J | 86.5 | 47.6 | <20.0 | – |
| | 1/30/2020 DUP | 8.67 | 8.02 | 0.213 B,B-02,F-19 | 0.436 F-16 | 2,310 | 22.5 | 106 | 57.5 | <20.0 | – |
| | 9/30/2020 | 2.44 | 2.38 | <0.0755 Q-30 | <0.151 Q-30 | 718 | <20.0 | 6.60 J | <30.0 | <20.0 | – |
| | 3/25/2021 | 1.49 | 1.28 | 0.0503 J | 0.157 | 291 | 3.07 J | 16.4 | 8.30 | <5.00 | – |
| | 10/7/2021 | 7.90 | 7.6 | <0.0784 | 0.264 | 2,050 | <50.0 | <25.0 | <75.0 | <50.0 | – |
| AC-9 | 1/28/2020 | Well was not sampled due to the presence of SPH or SPH sheen. | | | | | | | | | |
| | 9/30/2020 | Well was not sampled due to the presence of SPH or SPH sheen. | | | | | | | | | |
| | 3/23/2021 | Well was not sampled due to the presence of SPH or SPH sheen. | | | | | | | | | |
| | 10/5/2021 | Well was not sampled due to the presence of SPH or SPH sheen. | | | | | | | | | |
| AC-10* | 1/28/2020 | Well was not sampled due to the presence of SPH or SPH sheen. | | | | | | | | | |
| | 9/30/2020 | Well was not sampled due to the presence of SPH or SPH sheen. | | | | | | | | | |
| | 3/23/2021 | Well was not sampled due to the presence of SPH or SPH sheen. | | | | | | | | | |
| | 10/5/2021 | Well was not sampled due to the presence of SPH or SPH sheen. | | | | | | | | | |
| KMW13 | 1/30/2020 | 6.30 | 6.03 | 0.171 B,B-02,F-18 | 0.0969 J | 100 | 10.4 | 291 | 632 | <2.50 | – |
| | 10/1/2020 | 3.34 | 3.20 | 0.0622 J | <0.151 | 122 | 18.8 | 87.1 | 201 | <5.00 | – |
| | 10/1/2020 DUP | 4.31 | 4.14 | 0.0933 F-18 | <0.151 | 145 | 22.8 | 179 | 234 | <5.00 | – |
| | 3/25/2021 | 2.71 | 2.59 | 0.0439 J,F-18 | <0.15 | 189 | 5.14 | 4.28 | 37.1 | <1.00 | – |
| | 3/25/2021 DUP | 2.68 | 2.56 | 0.0498 J,F-18 | <0.15 | 186 | 5.26 | 4.34 | 38.5 | <1.00 | – |
| | 10/7/2021 | 4.41 | 4.14 | 0.194 | <0.150 | 59.9 | 15.8 | 14.8 | 176 | <1.00 | – |
| | 10/7/2021 DUP | 4.14 | 3.89 | 0.176 | <0.151 | 62 | 14.9 | 16.1 | 161 | <1.00 | – |
| KMW14* | Well KMW14 has been removed from the groundwater monitoring program.[23] | | | | | | | | | | |

***Please refer to notes at end of table.***

# Table 14

## Groundwater Analytical Data — TPH, C10 - C12 Aliphatic Range Hydrocarbons, BTEX, and MTBE

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Well ID | Sample Date | Combined TPH (mg/L) | TPHg Gasoline (mg/L) | TPHd Diesel (mg/L) | TPHo Motor Oil (mg/L) | Benzene (µg/L) | Toluene (µg/L) | Ethyl-Benzene (µg/L) | Xylenes (µg/L) | MTBE (µg/L) | **Aliphatic Hydro-carbons C10 - C12 (µg/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *1997 Site ROD Cleanup Goal* | | *1.0* | – | – | – | *40* | – | – | – | – | – |
| *PHSS Cleanup Level* | | – | – | – | – | *0.44* | *9.8* | *7.3* | *13* | – | *2.6* |
| *Portland Harbor JSCS SLV* | | – | – | – | – | *1.2* | *9.8* | *7.3* | *200* | *37* | – |
| MW38* | 6/25/2020 | 4.64 | 4.14 | 0.462 | <0.0755 | 718 | 5.90 | 36 | 16.7 | <5.0 | – |
| | 10/1/2020 | 0.52 | 0.399 | 0.041 J | <0.151 | 49.7 | 0.557 J | <0.50 | 1.97 | <1.00 | – |
| | 3/25/2021 | 2.67 | 2.2 | 0.392 | <0.154 | 277 | 2.19 | 0.711 | 12.7 | <1.00 | – |
| | 10/7/2021 | 1.26 | 0.825 | 0.361 | <0.150 | 47.7 | <1.00 | <0.50 | 3.34 | <1.00 | – |
| MW39* | 1/30/2020 | 77.6 | 77.1 | 0.415 B,B-02,F-18 | 0.0795 J | 23,800 | 129 J | 1,140 | 510 | <250 | – |
| | 10/1/2020 | 72.4 | 72.0 | 0.319 F-18 | <0.151 | 27,700 | <500 | 643 | <750 | <500 | – |
| | 3/25/2021 | 65.6 | 65.2 | 0.359 F-18 | <0.15 | 21,200 | 101 J | 256 | 163 J | <200 | – |
| | 10/7/2021 | 84.4 | 83.9 | 0.398 | <0.150 | 22,000 | 542 | 536 | 1310 | 105 | – |
| MW40 | 2/8/2018 | 0.62 | <0.10 | 0.0682 J | 0.50 | <0.50 | <0.50 | <0.50 | <1.50 | <0.50 | – |
| | 3/13/2019 | ND | <0.10 | <0.0755 | <0.151 | 2.85 | <1.00 | <0.500 | <1.50 | <1.00 | – |
| | 1/28/2020 | ND | <0.10 | <0.0748 B | <0.150 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | – |
| | 3/23/2021 | ND | <0.10 | <0.0762 | <0.152 | 2.32 | <1.00 | <0.50 | <1.50 | 0.59 J | – |
| MW41B* | 1/28/2020 | ND | <0.10 | <0.0755 B | <0.151 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | – |
| | 9/30/2020 | ND | <0.10 | <0.0762 | <0.152 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | – |
| | 3/25/2021 | ND | <0.10 | <0.0748 | <0.15 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | – |
| | 10/6/2021 | ND | <0.100 | <0.0769 | <0.154 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | – |
| MW43 | 1/30/2020 | 14.7 | 14.5 | 0.12 B,B-02,F-18 | <0.154 | 2,150 Q-42 | 160 | 637 | 441 | <20.0 | – |
| | 9/30/2020 | 10.3 | 10.1 | 0.172 F-18 | <0.150 | 1,620 | 106 | 637 | 349 | <25.0 | – |
| | 3/25/2021 | 10.9 | 10.6 | 0.213 F-18 | <0.155 | 1,120 | 110 | 581 | 416 | <20.0 | – |
| | 10/7/2021 | 15.4 | 14.9 | 0.419 | <0.151 | 2,040 | 119 | 744 | 445 | <10.0 | – |

*Please refer to notes at end of table.*

# Table 14

## Groundwater Analytical Data — TPH, C10 - C12 Aliphatic Range Hydrocarbons, BTEX, and MTBE

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Well ID | Sample Date | Combined TPH (mg/L) | TPHg Gasoline (mg/L) | TPHd Diesel (mg/L) | TPHo Motor Oil (mg/L) | Benzene (µg/L) | Toluene (µg/L) | Ethyl-Benzene (µg/L) | Xylenes (µg/L) | MTBE (µg/L) | **Aliphatic Hydro-carbons C10 - C12 (µg/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *1997 Site ROD Cleanup Goal* | | *1.0* | – | – | – | *40* | – | – | – | – | – |
| *PHSS Cleanup Level* | | – | – | – | – | *0.44* | *9.8* | *7.3* | *13* | – | *2.6* |
| *Portland Harbor JSCS SLV* | | – | – | – | – | *1.2* | *9.8* | *7.3* | *200* | *37* | – |
| MW44 | 1/30/2020 | 0.19 | 0.117 | <0.0777 B | <0.155 | 12.2 | <1.00 | <0.50 | <1.5 | <1.00 | – |
| | 9/30/2020 | 2.99 | 2.88 | <0.0762 | <0.152 | 1,070 | 5.28 J | 11.8 | <15.0 | <10.0 | – |
| | 3/25/2021 | 1.08 | 0.964 | <0.0792 | <0.158 | 283 | 0.971 J | 0.306 J | <1.50 | <1.00 | – |
| | 10/6/2021 | 4.33 | 4.17 | 0.087 | <0.150 | 1,350 | 1.17 | 3.28 | 1.8 | <1.00 | – |
| MW45* | 2/8/2018 | 0.42 | <0.10 | 0.0395 J | 0.333 | <0.50 | <0.50 | <0.50 | <1.5 | 0.806 | – |
| | 3/13/2019 | ND | <0.10 | <0.0755 | <0.151 | <0.20 | <1.00 | <0.50 | <1.5 | <1.00 | – |
| | 1/30/2020 | ND | <0.10 | <0.0755 B | <0.151 | <0.20 | <1.00 | <0.50 | <1.50 | 0.961 J | – |
| | 3/23/2021 | ND | <0.10 | <0.08 | <0.16 | <0.20 | <1.00 | <0.50 | <1.50 | 0.68 J | – |
| MW46 | 1/29/2020 | ND | <0.10 | <0.0784 | <0.157 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | – |
| | 9/29/2020 | ND | <0.10 | <0.0762 Q-30 | <0.152 Q-30 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | – |
| | 3/25/2021 | ND | <0.10 | <0.0755 | <0.151 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | – |
| | 10/6/2021 | ND | <0.100 | <0.0792 | <0.158 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | – |
| ***DPE Treatment Area*** | | | | | | | | | | | |
| EX-07L | 1/29/2020 | ND | <0.10 | <0.05 | <0.25 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | <19.8 |
| | 9/29/2020 | ND | <0.10 | <0.05 | <0.25 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | 7.06 |
| | 3/24/2021 | ND | <0.10 | <0.05 | <0.25 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | 1.18 J |
| | 10/5/2021 | ND | <0.100 | <0.053 | <0.25 | <0.20 | <1.00 | <0.500 | <1.50 | <1.00 | 2.72 J |
| KMW29 | 1/29/2020 | 6.06 | 4.53 | 1.4 | <0.25 | 0.575 | 1.50 | 0.648 | 3.02 | <1.00 | 34.5 |
| | 9/29/2020 | 4.28 | 3.44 | 0.71 F-13 | <0.25 | 0.824 | 1.60 | 0.884 | 3.16 | <1.00 | 148 |
| | 3/24/2021 | 4.00 | 3.13 | 0.74 F-13 | <0.25 | 0.20 | <1.00 | 0.45 J | 1.80 | <1.00 | 35.3 J |
| | 10/5/2021 | 4.47 | 3.61 | 0.68 F-13 | <0.35 | 0.79 | 1.21 | 0.69 | 2.21 | <1.00 | 31.9 J |
| KMW30 | 1/29/2020 | ND | <0.10 | <0.05 | <0.25 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | <20.0 |
| | 9/29/2020 | 2.28 | 1.73 | 0.42 F-13 | <0.25 | 0.225 | <1.00 | 0.777 | <1.50 | <1.00 | 68.2 |
| | 3/24/2021 | 0.33 | 0.128 | 0.076 F-13 | <0.25 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | 8.80 |
| | 3/24/2021 DUP | 0.29 | 0.139 | <0.05 | <0.25 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | 8.20 J |
| | 10/5/2021 | 2.60 | 2.17 | 0.30 F-13 | <0.25 | 0.32 | <1.00 | 0.54 | <1.50 | <1.00 | 21.8 J |

*Please refer to notes at end of table.*

# Table 14

## Groundwater Analytical Data — TPH, C10 - C12 Aliphatic Range Hydrocarbons, BTEX, and MTBE

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Well ID | Sample Date | Combined TPH (mg/L) | TPHg Gasoline (mg/L) | TPHd Diesel (mg/L) | TPHo Motor Oil (mg/L) | Benzene (µg/L) | Toluene (µg/L) | Ethyl-Benzene (µg/L) | Xylenes (µg/L) | MTBE (µg/L) | **Aliphatic Hydro-carbons C10 - C12 (µg/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *1997 Site ROD Cleanup Goal* | | *1.0* | – | – | – | *40* | – | – | – | – | – |
| *PHSS Cleanup Level* | | – | – | – | – | *0.44* | *9.8* | *7.3* | *13* | – | *2.6* |
| *Portland Harbor JSCS SLV* | | – | – | – | – | *1.2* | *9.8* | *7.3* | *200* | *37* | – |
| KMW31 | 1/29/2020 | 1.80 | 1.13 | 0.54 | <0.25 | 0.119 J | <1.00 | <0.50 | 1.94 | <1.00 | <20.0 |
| | 1/29/2020 DUP | 1.83 | 1.12 | 0.58 | <0.25 | <0.10 | <1.00 | <0.50 | 2.0 | <1.00 | <20.0 |
| | 9/29/2020 | 1.46 | 0.966 | 0.37 F-13 | <0.25 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | 55.6 |
| | 3/24/2021 | 1.68 | 1.19 | 0.36 F-13 | <0.25 | <0.20 | <1.00 | <0.50 | 1.02 J | <1.00 | 9.58 J |
| | 10/5/2021 | 1.01 | 0.703 | 0.18 | <0.25 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | 17.3 J |
| KMW32 | 1/29/2020 | ND | <0.10 | <0.05 | <0.25 | 1.12 | <1.00 | <0.50 | <1.50 | <1.00 | <20.0 |
| | 9/29/2020 | 0.21 | <0.10 | 0.058 | <0.25 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | <5.9 |
| | 3/24/2021 | ND | <0.10 | <0.05 | <0.25 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | 1.72 J |
| | 3/24/2021 DUP | ND | <0.10 | <0.05 | <0.25 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | 1.64 J |
| | 10/5/2021 | ND | <0.100 | <0.06 | <0.25 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | 1.40 J |
| KMW33 | 1/29/2020 | 0.79 | 0.0577 J | 0.61 | <0.25 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | <20.0 |
| | 9/29/2020 | 0.40 | 0.0653 J | 0.21 | <0.25 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | 7.41 |
| | 3/24/2021 | 0.31 | <0.10 | 0.13 | <0.25 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | 1.63 J |
| | 10/6/2021 | 0.41 | 0.104 | 0.18 | <0.25 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | 5.61 J |
| KMW37 | 1/29/2020 | 1.88 | 1.38 | 0.37 | <0.25 | 0.521 | <1.00 | 0.283 J | <1.50 | 0.629 J | <20.0 |
| | 9/30/2020 | 4.46 | 3.74 | 0.59 | <0.25 | 1.37 | 1.23 | 0.746 | 2.00 | 1.93 | 164 |
| | 3/24/2021 | 3.56 | 2.89 | 0.54 F-13 | <0.25 | 1.04 | 1.05 | 0.56 | 1.30 J | <1.00 | 20.1 J |
| | 10/6/2021 | 4.57 | 3.97 | 0.47 F-13 | <0.25 | 1.18 | 1.16 | 0.6 | <1.50 | 2.11 | 28.9 |
| MW47 | 1/29/2020 | 0.96 | 0.465 | 0.37 | <0.25 | <0.20 | <1.00 | <0.50 | <1.50 | 0.543 J | 30.7 |
| | 9/29/2020 | 0.86 | 0.36 | 0.37 | <0.25 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | 24.7 |
| | 3/24/2021 | 1.18 | 0.61 | 0.44 F-13 | <0.25 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | 26.4 J |
| | 10/6/2021 | 0.80 | 0.361 | 0.29 | <0.30 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | 17.4 J |

*Please refer to notes at end of table.*

# Table 14

## Groundwater Analytical Data — TPH, C10 - C12 Aliphatic Range Hydrocarbons, BTEX, and MTBE

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Well ID | Sample Date | Combined TPH (mg/L) | TPHg Gasoline (mg/L) | TPHd Diesel (mg/L) | TPHo Motor Oil (mg/L) | Benzene (µg/L) | Toluene (µg/L) | Ethyl-Benzene (µg/L) | Xylenes (µg/L) | MTBE (µg/L) | **Aliphatic Hydro-carbons C10 - C12 (µg/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *1997 Site ROD Cleanup Goal* | | *1.0* | – | – | – | *40* | – | – | – | – | – |
| *PHSS Cleanup Level* | | – | – | – | – | *0.44* | *9.8* | *7.3* | *13* | – | *2.6* |
| *Portland Harbor JSCS SLV* | | – | – | – | – | *1.2* | *9.8* | *7.3* | *200* | *37* | – |
| MW48 | 1/29/2020 | 0.61 | 0.315 | 0.17 | <0.25 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | 76.8 |
| | 1/29/2020 DUP | 0.79 | 0.372 | 0.29 | <0.25 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | <20.0 |
| | 9/29/2020 | 0.44 | 0.204 | 0.11 | <0.25 | 0.167 J | <1.00 | <0.50 | <1.50 | <1.00 | 6.21 J |
| | 9/29/2020 DUP | 0.51 | 0.221 | 0.16 | <0.25 | 0.174 J | <1.00 | <0.50 | <1.50 | <1.00 | 7.09 J |
| | 3/24/2021 | 0.47 | 0.185 | 0.13 F-13 | <0.30 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | 5.40 J |
| | 10/5/2021 | 0.63 | 0.365 | 0.14 | <0.25 | 0.27 | <1.00 | <0.50 | <1.50 | <1.00 | 7.20 J |
| | 10/5/2021 DUP | 0.55 | 0.295 | 0.13 | <0.25 | 0.26 | <1.00 | <0.50 | <1.50 | <1.00 | 5.80 J |
| MW49 | 1/29/2020 | 1.23 | 0.734 | 0.37 | <0.25 | 0.125 J | <1.00 | <0.50 | <1.50 | <1.00 | <19.8 |
| | 9/29/2020 | 0.84 | 0.444 | 0.25 | <0.30 | 0.29 | 0.598 J | <0.50 | <1.50 | <1.00 | 5.90 |
| | 3/24/2021 | 1.39 | 0.96 | 0.30 F-13 | <0.25 | 0.26 | <1.00 | <0.50 | 0.84 J | <1.00 | 21.0 J |
| | 10/6/2021 | 0.99 | 0.579 | 0.29 | <0.25 | 0.28 | <1.00 | <0.50 | <1.50 | <1.00 | 9.39 J |
| ***Slurry Wall*** | | | | | | | | | | | |
| KMW36 | 1/30/2020 | 1.47 | 0.963 | 0.469 B,B-02,F-13 | <0.150 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | – |
| | 9/30/2020 | 1.03 | 0.787 | 0.169 F-18,Q-30 | <0.15 Q-30 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | – |
| | 3/24/2021 | 0.67 | 0.349 | 0.247 F-13,F-20 | <0.151 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | – |
| | 10/6/2021 | 1.30 | 0.821 | 0.404 | <0.152 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | – |
| W-16 | 1/29/2020 | 2.48 | 2.2 | 0.24 F-20 | <0.150 | 0.985 | 1.22 | 0.669 | 1.89 | 5.04 | – |
| | 10/1/2020 | 0.49 | 0.225 | 0.186 F-11,F-20 | <0.152 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | – |
| | 3/25/2021 | 1.15 | 0.833 | 0.234 F-11,F-20 | <0.158 | 0.223 | <1.00 | <0.50 | <1.50 | 0.943 J | – |
| | 10/6/2021 | 1.06 | 0.715 | 0.265 | <0.150 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | – |
| W-19 | 2/8/2018 | 1.00 | 0.0939 BJ | 0.574 | 0.334 | <0.50 | <0.50 | <0.50 | <1.50 | 0.198 J | – |
| | 3/15/2019 | 0.31 | 0.123 | 0.148 F-13 | <0.151 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | – |
| | 1/30/2020 | 0.57 | 0.214 | 0.319 F-13 | <0.152 | <0.20 | <1.00 | <0.50 | <1.50 | 0.685 J | – |
| | 3/25/2021 | 0.51 | 0.153 | 0.278 F-13,F-20 | <0.15 | <0.20 | <1.00 | <0.50 | <1.50 | 0.721 J | – |

*Please refer to notes at end of table.*

# Table 14

## Groundwater Analytical Data — TPH, C10 - C12 Aliphatic Range Hydrocarbons, BTEX, and MTBE

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Well ID | Sample Date | Combined TPH (mg/L) | TPHg Gasoline (mg/L) | TPHd Diesel (mg/L) | TPHo Motor Oil (mg/L) | Benzene (µg/L) | Toluene (µg/L) | Ethyl-Benzene (µg/L) | Xylenes (µg/L) | MTBE (µg/L) | **Aliphatic Hydro-carbons C10 - C12 (µg/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *1997 Site ROD Cleanup Goal* | | *1.0* | – | – | – | *40* | – | – | – | – | – |
| *PHSS Cleanup Level* | | – | – | – | – | *0.44* | *9.8* | *7.3* | *13* | – | *2.6* |
| *Portland Harbor JSCS SLV* | | – | – | – | – | *1.2* | *9.8* | *7.3* | *200* | *37* | – |
| W-20 | 2/8/2018 | 0.47 | <0.10 | 0.0609 J | 0.357 | <0.50 | <0.50 | <0.50 | <1.50 | <0.50 | – |
| | 3/15/2019 | ND | <0.10 | <0.0755 | <0.151 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | – |
| | 1/30/2020 | ND | <0.10 | <0.0755 | <0.151 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | – |
| | 3/25/2021 | ND | <0.10 | <0.0755 | <0.151 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | – |
| W-22 | 2/8/2018 | 0.36 | 0.0583 BJ | 0.0335 J | 0.27 | <0.50 | <0.50 | <0.50 | <1.50 | <0.50 | – |
| | 3/15/2019 | ND | <0.10 | <0.0755 | <0.151 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | – |
| | 1/30/2020 | ND | <0.10 | <0.0762 | <0.152 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | – |
| | 3/23/2021 | ND | <0.10 | <0.0769 | <0.154 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | – |
| ***Site-Wide*** | | | | | | | | | | | |
| KMW01 | 2/9/2018 | ND | <0.10 | <0.10 | <0.25 | 0.152 J | <0.50 | <0.50 | <1.5 | <0.50 | – |
| | 3/15/2019 | ND | <0.10 | <0.0755 | <0.151 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | – |
| | 1/29/2020 | ND | <0.10 | <0.0748 | <0.150 | <0.20 | <1.00 | <0.50 | <1.50 | 0.61 J | – |
| | 3/23/2021 | ND | <0.10 | <0.0762 | <0.152 | <0.20 | <1.00 | <0.50 | <1.50 | 0.56 J | – |
| KMW02 | 1/29/2020 | ND | <0.10 | <0.0748 | <0.150 | <0.10 | <0.50 | <0.25 | <0.75 | <0.50 | – |
| | 10/1/2020 | ND | <0.10 | <0.0762 | <0.152 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | – |
| | 3/23/2021 | 0.17 | <0.10 | <0.0784 | <0.157 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | – |
| | 10/7/2021 | ND | <0.10 | <0.0784 | <0.157 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | – |
| KMW05 | 2/8/2018 | 1.81 | 0.248 B | 0.924 | 0.634 | <0.50 | <0.50 | <0.50 | <1.50 | <0.50 | – |
| | 3/13/2019 | 1.52 | 0.313 | 0.886 F-13F-15 | 0.318 F-16 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | – |
| | 1/28/2020 | 2.37 | 0.537 | 1.24 F-15 | 0.595 F-16 | 0.151 J | <1.00 | <0.50 | <1.50 | <1.00 | – |
| | 3/23/2021 | 1.00 | 0.5 | 0.42 F-13 | <0.152 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | – |

*Please refer to notes at end of table.*

# Table 14

## Groundwater Analytical Data — TPH, C10 - C12 Aliphatic Range Hydrocarbons, BTEX, and MTBE

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Well ID | Sample Date | Combined TPH (mg/L) | TPHg Gasoline (mg/L) | TPHd Diesel (mg/L) | TPHo Motor Oil (mg/L) | Benzene (µg/L) | Toluene (µg/L) | Ethyl-Benzene (µg/L) | Xylenes (µg/L) | MTBE (µg/L) | **Aliphatic Hydro-carbons C10 - C12 (µg/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *1997 Site ROD Cleanup Goal* | | *1.0* | – | – | – | *40* | – | – | – | – | – |
| *PHSS Cleanup Level* | | – | – | – | – | *0.44* | *9.8* | *7.3* | *13* | – | *2.6* |
| *Portland Harbor JSCS SLV* | | – | – | – | – | *1.2* | *9.8* | *7.3* | *200* | *37* | – |
| KMW09 | 2/6/2018 | 0.21 | <0.10 | 0.0695 J | 0.0915 J | <0.50 | <0.50 | <0.50 | <1.5 | <0.50 | – |
| | 3/13/2019 | ND | <0.10 | <0.0755 | <0.151 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | – |
| | 1/29/2020 | ND | <0.10 | <0.0762 | <0.152 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | – |
| | 3/23/2021 | ND | <0.10 | <0.0748 | <0.15 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | – |
| KMW10 | 1/28/2020 | ND | <0.10 | <0.0755 | <0.151 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | – |
| | 9/29/2020 | ND | <0.10 | <0.0777 | <0.155 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | – |
| | 3/23/2021 | ND | <0.10 | <0.0748 | <0.15 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | – |
| | 10/7/2021 | ND | <0.100 | <0.0755 | <0.151 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | – |
| KMW16* | 2/9/2018 | 0.21 | <0.10 | 0.0345 J | <0.25 | 0.178 J | <0.50 | <0.50 | <1.5 | <0.50 | – |
| | 3/14/2019 | 0.12 | 0.0607 J | <0.0748 | <0.150 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | – |
| | 1/30/2020 | 0.15 | 0.0903 J | <0.0748 B | <0.150 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | – |
| | 3/25/2021 | 0.22 | 0.106 | <0.0748 | <0.15 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | – |
| KMW20 | 2/9/2018 | 0.21 | <0.10 | 0.0347 J | <0.25 | <0.50 | <0.50 | <0.50 | <1.5 | <0.50 | – |
| | 3/14/2019 | ND | <0.10 | <0.0748 | <0.150 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | – |
| | 1/30/2020 | ND | <0.10 | <0.0762 | <0.152 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | – |
| | 3/23/2021 | ND | <0.10 | <0.0769 | <0.154 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | – |
| KMW21 | 2/9/2018 | 0.77 | 0.0693 J | 0.603 | 0.101 J | <0.50 | <0.50 | <0.50 | <1.50 | 6.91 | – |
| | 3/14/2019 | 0.63 | 0.323 | 0.273 F-13 | <0.150 | <0.20 | <1.00 | <0.50 | <1.50 | 4.41 | – |
| | 1/30/2020 | 0.95 | 0.397 | 0.516 F-13 | <0.154 | <0.20 | <1.00 | <0.50 | <1.50 | 4.85 | – |
| | 3/23/2021 | 0.43 | 0.0975 J | 0.261 F-13 | <0.15 | <0.20 | <1.00 | <0.50 | <1.50 | 1.07 | – |

*Please refer to notes at end of table.*

# Table 14

## Groundwater Analytical Data — TPH, C10 - C12 Aliphatic Range Hydrocarbons, BTEX, and MTBE

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Well ID | Sample Date | Combined TPH (mg/L) | TPHg Gasoline (mg/L) | TPHd Diesel (mg/L) | TPHo Motor Oil (mg/L) | Benzene (µg/L) | Toluene (µg/L) | Ethyl-Benzene (µg/L) | Xylenes (µg/L) | MTBE (µg/L) | **Aliphatic Hydro-carbons C10 - C12 (µg/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *1997 Site ROD Cleanup Goal* | | *1.0* | – | – | – | *40* | – | – | – | – | – |
| *PHSS Cleanup Level* | | – | – | – | – | *0.44* | *9.8* | *7.3* | *13* | – | *2.6* |
| *Portland Harbor JSCS SLV* | | – | – | – | – | *1.2* | *9.8* | *7.3* | *200* | *37* | – |
| MW42 | 2/8/2018 | 0.43 | 0.0526 BJ | 0.0429 J | 0.331 | <1.0 | <1.0 | <1.0 | <1.50 | <1.0 | – |
| | 3/14/2019 | ND | <0.10 | <0.0748 | <0.150 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | – |
| | 1/30/2020 | ND | <0.10 | <0.0748 B | <0.150 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | – |
| | 3/25/2021 | ND | <0.10 | <0.0755 | <0.151 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | – |
| W-15 | 1/29/2020 | 2.59 | 1.72 | 0.74 | <0.25 | 0.543 | 0.828 J | 0.328 J | 1.62 | <1.00 | <19.9 |
| | 9/30/2020 | 2.48 | 1.80 | 0.55 | <0.25 | 0.465 | 0.942 J | 0.319 J | 1.98 | <1.00 | 12.2 |
| | 3/24/2021 | 2.15 | 1.58 | 0.44 F-13 | <0.25 | 0.43 | 0.6 J | 0.25 J | 1.42 J | <1.00 | 16.4 J |
| | 10/6/2021 | 2.62 | 2.04 | 0.45 F-13 | <0.25 | 0.39 | <1.00 | <0.50 | 2.2 | <1.00 | 16.5 J |
| | 10/6/2021 DUP | 2.52 | 1.96 | 0.43 F-13 | <0.25 | 0.41 | <1.00 | <0.50 | 2.32 | <1.00 | 14.2 J |
| ***Southern Facility Area*** | | | | | | | | | | | |
| MW-1 | 2/2/2012 | ND | <62.7 | <19.7 | <54.8 | <0.0135 | 0.0343 | 0.13 | 0.05 | <0.0862 | – |
| | 12/29/2020 | ND | <0.10 | <0.0755 | <0.151 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | – |
| | 12/29/2020 DUP | ND | <0.10 | <0.0755 | <0.151 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | – |
| MW-2 | 2/2/2012 | ND | <62.7 | <19.7 | <54.8 | 0.52 | 0.04 | 0.0648 | 0.08 | 1.75 | – |
| | 12/29/2020 | ND | <0.10 | <0.0755 | <0.151 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | <40.6 |
| | 3/23/2021 | ND | <0.10 | <0.0762 | <0.152 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | <2.00 |
| | 10/7/2021 | ND | <0.100 | <0.0755 | <0.151 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | <0.94 |
| MW-3 | 2/2/2012 | ND | <62.7 | <19.7 | <54.4 | 0.0135 | 0.0343 | 0.0648 | 0.04 | 0.0862 | – |
| | 12/29/2020 | ND | <0.10 | <0.0755 | <0.151 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | <40.6 |
| | 3/23/2021 | ND | <0.10 | <0.0762 | <0.152 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | 2.16 J |
| | 10/7/2021 | ND | <0.100 | <0.0762 | <0.152 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | <0.94 |
| | 10/7/2021 DUP | ND | <0.100 | <0.0755 | <0.151 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | NM |
| MW-4 | 2/2/2012 | ND | <62.7 | <19.7 | <54.2 | <0.0135 | 0.0343 | 0.0648 | – | <0.0862 | – |
| | 12/29/2020 | ND | <0.10 | <0.0755 | <0.151 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | <40.7 |
| | 3/23/2021 | ND | <0.10 | <0.0748 | <0.15 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | <2.00 |
| | 10/7/2021 | ND | <0.100 | <0.0762 | <0.152 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | <0.94 |
| VRUMW-1 | 2/2/2012 | ND | <61.5 | <19.7 | <53.8 | <0.0135 | 0.0343 | 0.09 | – | <0.0862 | – |
| | 12/28/2020 | ND | <0.10 | <0.0755 | <0.151 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | – |
| VRUMW-2 | 2/2/2012 | ND | <62.4 | <19.7 | <54.8 | <0.0135 | 0.0343 | 0.09 | – | 3.82 | – |
| | 12/28/2020 | ND | <0.10 | <0.0748 | <0.150 | <0.20 | <1.00 | <0.50 | <1.50 | 7.82 | – |

# Table 14

## Groundwater Analytical Data — TPH, C10 - C12 Aliphatic Range Hydrocarbons, BTEX, and MTBE

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Well ID | Sample Date | Combined TPH (mg/L) | TPHg Gasoline (mg/L) | TPHd Diesel (mg/L) | TPHo Motor Oil (mg/L) | Benzene (µg/L) | Toluene (µg/L) | Ethyl-Benzene (µg/L) | Xylenes (µg/L) | MTBE (µg/L) | **Aliphatic Hydro-carbons C10 - C12 (µg/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *1997 Site ROD Cleanup Goal* | | *1.0* | – | – | – | *40* | – | – | – | – | – |
| *PHSS Cleanup Level* | | – | – | – | – | *0.44* | *9.8* | *7.3* | *13* | – | *2.6* |
| *Portland Harbor JSCS SLV* | | – | – | – | – | *1.2* | *9.8* | *7.3* | *200* | *37* | – |

***Please refer to notes at end of table.***

# Table 14

## Groundwater Analytical Data — TPH, C10 - C12 Aliphatic Range Hydrocarbons, BTEX, and MTBE

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Well ID | Sample Date | Combined TPH (mg/L) | TPHg Gasoline (mg/L) | TPHd Diesel (mg/L) | TPHo Motor Oil (mg/L) | Benzene (µg/L) | Toluene (µg/L) | Ethyl-Benzene (µg/L) | Xylenes (µg/L) | MTBE (µg/L) | **Aliphatic Hydro-carbons C10 - C12 (µg/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *1997 Site ROD Cleanup Goal* | | *1.0* | – | – | – | *40* | – | – | – | – | – |
| *PHSS Cleanup Level* | | – | – | – | – | *0.44* | *9.8* | *7.3* | *13* | – | *2.6* |
| *Portland Harbor JSCS SLV* | | – | – | – | – | *1.2* | *9.8* | *7.3* | *200* | *37* | – |
| V0-1 | 2/1/2012 | ND | <61.6 | <19.7 | <53.9 | <0.0135 | 0.0343 | 0.0648 | 0.11 | <0.0862 | – |
| | 2/1/2012 DUP | ND | <62 | <19.7 | <54.2 | <0.0135 | 0.0343 | 0.0648 | 0.12 | <0.0862 | – |
| | 12/28/2020 | ND | <0.10 | <0.0755 | <0.151 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | – |
| V0-2 | 2/1/2012 | ND | <61.2 | <19.7 | <53.8 | <0.0135 | 0.0343 | 0.10 | – | <0.0862 | – |
| | 12/28/2020 | ND | <0.10 | <0.0748 | <0.150 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | – |
| V0-3 | 2/2/2012 | ND | <61.8 | <19.7 | <54.1 | <0.0135 | 0.0343 | 0.10 | – | <0.0862 | – |
| | 12/29/2020 | ND | <0.10 | <0.0748 | <0.150 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | – |

*Please refer to notes at end of table.*

# Table 14 Notes

## Groundwater Analytical Data — TPH, C10-C12 Aliphatic Range Hydrocarbons, BTEX, and MTBE

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

**Notes:**

1. TPH = Total petroleum hydrocarbons by northwest methods, with samples for diesel- and motor-oil-range analyses prepared by silica gel cleanup.
2. TPHg = Total petroleum hydrocarbons measured in the gasoline range
3. TPHd = Total petroleum hydrocarbons measured in the diesel range
4. TPHo = Total petroleum hydrocarbons measured in the heavy oil range
5. TPHg by Method NWTPH-Gx; TPHd and TPHo by NWTPH-Dx; benzene, toluene, ethylbenzene, xylenes, MTBE analyzed by EPA Method 8260 B.
6. Combined TPH = The sum of TPHg, TPHd, and TPHo. If a constituent is non-detect, half of the non-detect concentration is used to calculate the combined TPH concentration.
   If TPHg, TPHd, and TPHo are all non-detect, ND is reported for Combined TPH.
7. Portland Harbor JSCS SLVs = 2007 Portland Harbor Joint Source Control Strategy Screening Level Values.
8. PHSS Cleanup Levels = 2017 Portland Harbor Superfund Site Record of Decision Cleanup Levels.
9. Yellow highlighted cells indicate values that are equal to or exceeding 1997 Record of Decision (ROD) Groundwater Cleanup Goals for the ExxonMobil/Shore Terminals Site.

10a. Gray highlighted cells indicate values that are equal to or exceeding PHSS Cleanup Level. If a PHSS Cleanup Level was not developed for an analyte, the JSCS SLV is used for comparison.

10b. Green highlighted cells indicate the method reporting limit is greater than the PHSS ROD Cleanup Level or the JSCS SLV (if there is no ROD Cleanup Level)

11. < = less than the laboratory reporting limit.
12. µg/L = microgram(s) per liter.
13. mg/L = milligram(s) per liter.
14. EPA = United States Environmental Protection Agency.
15. MTBE = Methyl tertiary butyl ether.
16. NS = Not sampled
17. -- = Not applicable.
18. DUP = Field Duplicate.
19. * = Well is screened in Deep Sand unit.
20. ND = TPH not detected above method detection limits for TPHg, TPHd, or TPHo.
21. Well KMW14 was paved over prior to the October 2017 monitoring event. In an email dated February 21, 2018, DEQ agreed that well KMW14 was not critical to monitoring the Loading Rack Area and that replacement of KMW14 was not required. Well KMW14 has been removed from the monitoring program.

**Quality Assurance/Quality Control Data Qualifiers**

J = Reported result is an estimated value.

B = Reported analyte was present in the associated method blank.

B-02 = Reported analyte was present in the associated method blank at a level between one-half the method reporting level (MRL) and the MRL.

A-01 = Result for Diesel (Diesel Range Organics, C12-C18) is due to overlap from Gasoline or a Gasoline Range product.

F-09 = Results in the gasoline range are primarily due to overlap from a heavier fuel hydrocarbon product.

F-11 = The hydrocarbon pattern indicates possible weathered diesel, mineral oil, or a contribution from a related component.

F-13 = The chromatographic pattern does not resemble the fuel standard used for quantitation.

F-15 = Results for diesel are estimated due to overlap from the reported oil result.

F-16 = Results for oil are estimated due to overlap from the reported diesel result.

F-18 = Result for Diesel (Diesel Range Organics, C12-C24) is due to overlap from Gasoline or a Gasoline Range product.

F-19 = Results are Estimated due to the presence of multiple fuel products.

F-20 = Result for Diesel is Estimated due to overlap from Gasoline Range Organics or other VOCs.

# Table 15

## Groundwater Analytical Data – PAHs

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Well ID | Sample Date | Analytical Results (µg/L) | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1-Methylnaphthalene | 2-Methylnaphthalene | Acenaphthene | Acenaphthylene | Anthracene | Benzo(a)anthracene | Benzo(a)pyrene | Benzo(b)fluoranthene | Benzo(g,h,i)perylene | Benzo(k)fluoranthene | Chrysene | Dibenz(a,h)anthracene | Fluoranthene | Fluorene | Indeno(1,2,3-cd)pyrene | Naphthalene | Phenanthrene | Pyrene | cPAHs |
| *1997 Site ROD Cleanup Goal* | | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | *347* | -- | -- | -- |
| *2017 PHSS Cleanup Level* | | -- | -- | *23* | -- | *0.73* | *0.0012* | *0.00012* | *0.0012* | -- | *0.0013* | *0.0013* | *0.00012* | -- | -- | *0.0012* | *12* | -- | -- | 0.00012 |
| *Portland Harbor JSCS SLV* | | -- | *0.2* | *0.2* | *0.2* | -- | *0.018* | *0.018* | *0.018* | *0.2* | *0.018* | *0.018* | *0.018* | *0.2* | *0.2* | *0.018* | *0.2* | *0.2* | *0.2* | -- |
| ***Tank Field 1*** | | | | | | | | | | | | | | | | | | | | |
| KMW07 | 2/8/2018 | 63.1 | 16.8 | 0.459 | <0.05 | 0.0864 | 0.148 | 0.192 | 0.23 | 0.165 | 0.114 | 0.218 | 0.0388 J | 0.381 | 0.655 | 0.145 | 6.51 | 0.513 | 0.324 | 0.26176 |
| | 2/08/2018 DUP | 37.10 | 5.34 | 0.283 | <0.05 | 0.0485 J | 0.0169 J | 0.0132 J | 0.0232 B, J | 0.0144 B, J | <0.05 | 0.0129 J | <0.05 | 0.0462 J | 0.44 | <0.05 | 3.36 | 0.165 | 0.0423 J | 0.02484 |
| | 3/13/2019 | 3.27 | 0.108 | <0.0706 R-02 | <0.0323 | 0.0347 | <0.0161 | 0.0193 B,B-02 | 0.0254 M-05 | 0.0256 J | 0.0143 J | <0.0161 | <0.0161 | 0.0257 J | 0.0934 | 0.0175 | 0.231 M-02 | 0.0812 | 0.0231 J | 0.02671 |
| | 3/13/2019 DUP | 3.44 | <0.258 | <0.129 | <0.129 | <0.129 | <0.0646 | <0.0646 B | 0.0417 J | <0.129 | <0.0646 | <0.0323 | <0.0646 | <0.0646 | 0.108 J | <0.0323 | 0.27 M-02 | <0.258 | <0.129 | 0.04794 |
| | 1/28/2020 | 20 | 1.43 | 0.353 | <0.0721 R-02 | 0.0805 | 0.0279 M-05 | 0.0261 | 0.0337 M-05 | 0.027 J | 0.0185 M-05 | 0.0272 M-05 | 0.00894 J | 0.042 | 0.5 | 0.0287 | 1.64 | 0.247 | 0.0562 | 0.03815 |
| | 1/28/2020 DUP | 19.8 | 1.82 | 0.394 | <0.336 | <0.336 | 0.109 J | <0.168 | <0.168 | <0.336 | <0.168 | <0.168 | <0.168 | <0.336 | 0.49 | <0.168 | <3.09 R-02 | <0.671 | <0.336 | 0.12934 |
| | 3/25/2021 | 0.132 | <0.074 | <0.0578 R-02 | <0.037 | <0.037 | <0.0231 R-02 | <0.0185 | <0.0185 | <0.037 | <0.0185 | <0.0185 | <0.0185 | <0.037 | 0.0569 | <0.0185 | <0.074 | <0.074 | <0.037 | <0.0231 |
| | 3/25/2021 DUP | 0.109 | <0.0707 | <0.0353 | <0.0353 | <0.0353 | <0.0177 | <0.0177 | <0.0177 | <0.0353 | <0.0177 | <0.0177 | <0.0177 | <0.0353 | 0.0543 | <0.0177 | <0.0707 | <0.0707 | <0.0353 | <0.0177 |
| KMW11 | 10/8/2019 | <0.0698 | <0.0698 | <0.0349 | <0.0349 | <0.0349 | <0.0174 | <0.0174 | <0.0174 | <0.0349 | <0.0174 | <0.0174 | <0.0174 | <0.0349 | <0.0349 | <0.0174 | <0.109 R-02 | 0.0361 J | <0.0349 | <0.0174 |
| | 1/29/2020 | <0.0644 | <0.0644 | <0.0322 | <0.0322 | 0.0545 | 0.0173 M-05 | 0.0183 | 0.0218 | 0.0167 J | 0.012 J | 0.0144 J | <0.0161 | 0.0418 | 0.0167 J | 0.0177 | <0.0644 | 0.0384 J | 0.0392 | 0.02613 |
| | 9/30/2020 | <0.0651 | <0.0651 | <0.0508 R-02 | <0.0325 | 0.0228 J | <0.0163 | <0.0163 | <0.0163 | <0.0325 | <0.0163 | <0.0163 | <0.0163 | 0.026 J | 0.0285 J | <0.0163 | <0.0651 | 0.0561 J | 0.0305 J | <0.0163 |
| | 3/25/2021 | 1.23 | <0.0704 | 0.492 | <0.143 R-02 | 0.117 | <0.0176 | <0.0176 | <0.0176 | <0.0352 | <0.0176 | <0.0176 | <0.0176 | 0.0334 J | 0.314 | <0.0176 | <0.55 R-02 | <0.0704 | 0.033 J | <0.0176 |
| | 10/6/2021 | <0.0773 | <0.0773 | <0.0387 | <0.0387 | <0.0387 | <0.0198 | <0.0193 | <0.0193 | <0.0387 | <0.0193 | <0.0193 | <0.0193 | <0.0387 | <0.0387 | <0.0193 | <0.0773 | <0.0773 | <0.0387 | <0.0198 |
| KMW18 | 1/28/2020 | 0.119 | 0.0426 J | <0.0322 | <0.0322 | 0.0233 J | <0.0161 | <0.0161 | <0.0161 | <0.0322 | <0.0161 | <0.0161 | <0.0161 | <0.0322 | <0.0322 | <0.0161 | <0.0754 R-02 | <0.0644 | <0.0322 | <0.0161 |
| | 1/28/2020 DUP | 0.113 | 0.0417 J | <0.0321 | <0.0321 | 0.0289 J | <0.0161 | <0.0161 | <0.0161 | <0.0321 | <0.0161 | <0.0161 | <0.0161 | <0.0321 | <0.0321 | <0.0161 | <0.0703 R-02 | <0.0642 | <0.0321 | <0.0161 |
| | 9/29/2020 | 0.467 | 0.0577 J | <0.0325 | <0.0325 | <0.0406 R-02 | <0.0163 | <0.0163 | <0.0163 | <0.0325 | <0.0163 | <0.0163 | <0.0163 | <0.0325 | 0.0398 | <0.0163 | <0.16 R-02 | <0.065 | 0.0191 J | <0.0163 |
| | 9/29/2020 DUP | 0.595 | 0.0576 J | <0.0318 | <0.0318 | <0.0397 R-02 | <0.0159 | <0.0159 | <0.0159 | <0.0318 | <0.0159 | 0.00874 J | <0.0159 | 0.0183 J | 0.0457 | <0.0159 | <0.209 R-02 | <0.0636 | 0.0223 J | 0.01201 |
| | 3/23/2021 | 0.0574 J | <0.0646 | <0.0323 | <0.0323 | <0.0323 | <0.0162 | <0.0162 | <0.0162 | <0.0323 | <0.0162 | <0.0162 | <0.0162 | <0.0323 | <0.0323 | <0.0162 | <0.0646 | <0.0646 | <0.0323 | <0.0162 |
| | 3/23/2021 DUP | 0.0604 J | <0.0657 | <0.0328 | <0.0328 | <0.0328 | <0.0164 | <0.0164 | <0.0164 | <0.0328 | <0.0164 | <0.0164 | <0.0164 | <0.0328 | <0.0328 | <0.0164 | <0.0657 | <0.0657 | <0.0328 | <0.0164 |
| | 10/7/2021 | 1.19 | <0.0681 | <0.0639 | <0.0341 | 0.0656 | <0.0170 | 0.0268 | <0.0170 | <0.0341 | <0.0170 | <0.0170 | <0.0170 | <0.0341 | 0.0703 | <0.0170 | <0.319 | <0.0681 | 0.0362 | <0.0170 |
| | 10/7/2021 DUP | 1.15 | <0.0698 | <0.0655 | <0.0349 | 0.0655 | <0.0175 | <0.0175 | <0.0175 | <0.0349 | <0.0175 | <0.0175 | <0.0175 | <0.0349 | 0.065 | <0.0175 | <0.218 | <0.0698 | <0.0349 | <0.0175 |
| KMW19 | 1/28/2020 | 0.158 J | <0.259 | <0.138 R-02 | <0.129 | 0.0746 J | <0.0647 | <0.0647 | <0.0647 | <0.129 | <0.0647 | <0.0647 | <0.0647 | 0.105 J | <0.129 | <0.0647 | <0.283 R-02 | <0.259 | 0.133 | <0.0647 |
| | 9/29/2020 | 0.139 J | <0.267 | <0.134 | <0.134 | <0.134 | <0.0668 | <0.0668 | <0.0668 | <0.134 | <0.0668 | <0.0668 | <0.0668 | 0.104 J | <0.134 | <0.0668 | <0.267 | <0.267 | 0.124 J | <0.0668 |
| | 3/23/2021 | 0.106 | <0.0741 | 0.0616 | <0.0371 | 0.0412 | 0.0167 J | <0.0185 | <0.0185 | <0.0371 | <0.0185 | <0.0185 | <0.0185 | 0.0801 | 0.0343 J | <0.0185 | <0.22 R-02 | <0.0741 | 0.088 | 0.01471 |
| | 10/6/2021 | 0.12 | <0.0869 | <0.0934 | <0.0435 | 0.0456 | 0.0244 | <0.0242 | <0.0217 | <0.0435 | 0.0239 | <0.0217 | <0.0217 | 0.0587 | <0.0435 | <0.0217 | <0.163 | <0.0869 | 0.0674 | 0.01910 |

*Please refer to notes at end of table.*

# Table 15

## Groundwater Analytical Data – PAHs

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Well ID | Sample Date | Analytical Results (µg/L) | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1-Methylnaphthalene | 2-Methylnaphthalene | Acenaphthene | Acenaphthylene | Anthracene | Benzo(a)anthracene | Benzo(a)pyrene | Benzo(b)fluoranthene | Benzo(g,h,i)perylene | Benzo(k)fluoranthene | Chrysene | Dibenz(a,h)anthracene | Fluoranthene | Fluorene | Indeno(1,2,3-cd)pyrene | Naphthalene | Phenanthrene | Pyrene | cPAHs |
| *1997 Site ROD Cleanup Goal* | | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | *347* | -- | -- | -- |
| *2017 PHSS Cleanup Level* | | -- | -- | *23* | -- | *0.73* | *0.0012* | *0.00012* | *0.0012* | -- | *0.0013* | *0.0013* | *0.00012* | -- | -- | *0.0012* | *12* | -- | -- | 0.00012 |
| *Portland Harbor JSCS SLV* | | -- | *0.2* | *0.2* | *0.2* | -- | *0.018* | *0.018* | *0.018* | *0.2* | *0.018* | *0.018* | *0.018* | *0.2* | *0.2* | *0.018* | *0.2* | *0.2* | *0.2* | -- |
| KMW35 | 1/28/2020 | 266 | 38.6 | <3.55 R-02 | <1.22 R-02 | <0.325 | <0.162 | <0.162 | <0.162 | <0.325 | <0.162 | <0.162 | <0.162 | <0.325 | 8.9 | <0.162 | <1.83 R-02 | 6.23 | <0.325 | <0.162 |
| | 9/30/2020 | 216 | 12.7 | <4.21 R-02 | <1.05 R-02 | <0.674 | <0.337 | <0.337 | <0.337 | <0.674 | <0.337 | <0.337 | <0.337 | <0.674 | 8.75 | <0.337 | <1.35 | 5.38 | <0.674 | <0.337 |
| | 3/25/2021 | 73 | 0.802 | <2.07 R-02 | <0.586 R-02 | <0.253 R-02 | 0.0133 J | 0.0101 J | <0.0184 | <0.0368 | <0.0184 | <0.0184 | <0.0184 | 0.0336 J | 4.16 | <0.0184 | <0.575 R-02 | 1.7 | 0.04 | 0.01520 |
| | 10/6/2021 | 130 | <0.262 | <2.79 | <0.783 | 0.269 | 0.0223 | <0.0247 | 0.0249 | <0.0343 | <0.0172 | <0.0172 | <0.0172 | <0.0343 | 6.21 | <0.0172 | <0.630 | 3.87 | 0.0399 | 0.01974 |
| MW41A | 1/28/2020 | 3.57 | <0.261 | <0.408 R-02 | <0.131 | <0.131 | 0.0578 J | 0.0898 | 0.115 | 0.0994 J | 0.054 J | 0.0597 J | <0.0653 | 0.104 J | 0.605 | 0.0741 | <0.261 | 0.177 J | 0.11 J | 0.12375 |
| | 9/30/2020 | 10.8 | <0.264 | <0.824 R-02 | <0.303 R-02 | <0.412 R-02 | <0.0659 | <0.0659 | <0.0659 | <0.132 | <0.0659 | <0.0659 | <0.0659 | 0.0725 J | 1.44 | <0.0659 | <0.264 | 0.717 | 0.089 J | <0.0659 |
| | 3/25/2021 | 2.02 | <0.0702 | <0.439 R-02 | <0.143 R-02 | <0.0323 | 0.0101 J | <0.0176 | <0.0176 | <0.0351 | <0.0176 | <0.0176 | <0.0176 | 0.0342 J | 0.783 | <0.0176 | <0.137 R-02 | 0.126 | 0.036 | 0.01254 |
| | 10/6/2021 | 4.92 | <0.0731 | <0.377 | <0.114 | <0.137 | 0.0238 | <0.0207 | <0.0183 | <0.0366 | 0.0183 | <0.0183 | <0.0183 | 0.0521 | 0.786 | <0.0183 | <0.166 | 0.287 | 0.0603 | 0.01648 |
| ***Loading Rack*** | | | | | | | | | | | | | | | | | | | | |
| KMW13* | 1/30/2020 | 78.6 | 53.2 | <0.695 R-02 | <0.636 | <0.636 | <0.318 | <0.318 | <0.318 | <0.636 | <0.318 | <0.318 | <0.318 | <0.636 | 0.767 | <0.318 | 18.4 | <1.27 | <0.636 | <0.318 |
| | 10/1/2020 | 83.6 | 74.0 | <1.01 R-02 | <0.644 | <0.644 | <0.322 | <0.322 | <0.322 | <0.644 | <0.322 | <0.322 | <0.322 | <0.644 | 1.07 | <0.322 | 22.2 | 0.749 J | <0.644 | <0.322 |
| | 10/1/2020 DUP | 86.2 | 77.1 | <1.01 R-02 | <0.648 | <0.648 | <0.324 | <0.324 | <0.324 | <0.648 | <0.324 | <0.324 | <0.324 | <0.648 | 1.14 | <0.324 | 22.0 | 0.77 J | <0.648 | <0.324 |
| | 3/25/2021 | 23.6 | 3.74 | <0.384 R-02 | <0.0987 R-02 | <0.0351 | <0.0175 | <0.0175 | <0.0175 | <0.0351 | <0.0175 | <0.0175 | <0.0175 | <0.0351 | 0.464 | <0.0175 | <0.768 R-02 | 0.44 | 0.0219 J | <0.0175 |
| | 10/7/2021 | 37.8 | 14.4 | <0.451 | <0.101 | <0.0564 | <0.0180 | <0.0180 | <0.0180 | <0.0361 | <0.0180 | <0.0180 | <0.0180 | <0.0361 | 0.456 | <0.0180 | 0.925 | 0.222 | <0.0361 | <0.0180 |
| KMW14* | Well KMW14 has been removed from the groundwater monitoring program.[11] | | | | | | | | | | | | | | | | | | | |
| MW38* | 6/25/2020 | 47.4 | 25.7 | <2.26 | <0.226 | <0.340 | <0.0755 | <0.0755 | <0.0755 | <0.0755 | <0.0755 | <0.0755 | <0.0755 | <0.0755 | 2.51 | <0.0755 | 0.679 | 3.19 | 0.0994 | <0.0755 |
| | 10/1/2020 | 4.38 | 0.261 | <0.408 R-02 | <0.131 | <0.131 | <0.0653 | <0.0653 | <0.0653 | <0.131 | <0.0653 | <0.0653 | <0.0653 | <0.131 | 0.392 | <0.0653 | <0.261 | 0.634 | 0.119 J | <0.0653 |
| | 3/25/2021 | 27.8 | 0.204 | 1.45 | <0.244 R-02 | <0.278 R-02 | 0.0289 M-05 | 0.0169 J | <0.0178 | <0.0355 | <0.0178 | 0.0249 | <0.0178 | 0.0435 | 1.59 | <0.0178 | <0.588 R-02 | 1.57 | 0.126 | 0.02360 |
| | 10/7/2021 | 8.4 | 1.33 | <0.561 | <0.112 | <0.224 | 0.0247 | 0.0301 | 0.0189 | <0.0359 | <0.0180 | 0.0287 | <0.0180 | 0.04 | 0.573 | <0.0180 | <0.281 | 0.805 | 0.127 | 0.03745 |
| MW39* | 1/30/2020 | 146 | 250 | <3.26 | <3.26 | <3.26 | <1.63 | <1.63 | <1.63 | <3.26 | <1.63 | <1.63 | <1.63 | <3.26 | 2.91 J | <1.63 | 498 | <6.52 | <3.26 | <1.63 |
| | 10/1/2020 | 94.8 | 164 | <3.39 | <3.39 | <3.39 | <1.69 | <1.69 | <1.69 | <3.39 | <1.69 | <1.69 | <1.69 | <3.39 | 2.16 J | <1.69 | 326 | <6.77 | <3.39 | <1.69 |
| | 3/25/2021 | 88.2 | 126 | <1.43 R-02 | <0.561 R-02 | <0.199 | <0.0997 | <0.0997 | <0.0997 | <0.199 | <0.0997 | <0.0997 | <0.0997 | <0.199 | 2.06 | <0.0997 | 278 | 1.85 | <0.199 | <0.0997 |
| | 10/7/2021 | 107 | 183 | <2.14 | <1.37 | <1.37 | <0.686 | <0.686 | <0.686 | <1.37 | <0.686 | <0.686 | <0.686 | <1.37 | 1.97 | <0.686 | 228 | <2.74 | <1.37 | <0.686 |
| MW40 | 2/8/2018 | <0.25 | <0.25 | <0.05 | <0.05 | 0.0172 J | <0.05 | <0.05 | 0.00817 B, J | 0.00631 B, J | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.25 | <0.05 | <0.05 | 0.03607 |
| | 3/13/2019 | <0.0634 | <0.0634 | <0.0317 | <0.0317 | 0.0547 | 0.0094 J | <0.0159 B | 0.0135 J | <0.0317 | 0.00836 J | 0.00832 J | <0.0159 | <0.0317 | <0.0317 | 0.00793 J | <0.0634 | <0.0634 | 0.0188 J | 0.01275 |
| | 1/28/2020 | <0.0652 | <0.0652 | <0.0326 | <0.0326 | 0.0453 | <0.0163 | <0.0163 | <0.0163 | <0.0326 | <0.0163 | <0.0163 | <0.0163 | <0.0326 | <0.0326 | <0.0163 | <0.0652 | <0.0652 | <0.0326 | <0.0163 |
| | 3/23/2021 | <0.0636 | <0.0636 | <0.0318 | <0.0318 | <0.0988 R-02 | <0.0159 | <0.0159 | <0.0159 | <0.0318 | <0.0159 | <0.0159 | <0.0159 | <0.0318 | <0.0318 | <0.0159 | <0.0636 | <0.0636 | <0.0318 | <0.0159 |

*Please refer to notes at end of table.*

# Table 15

## Groundwater Analytical Data – PAHs

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Well ID | Sample Date | Analytical Results (µg/L) | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1-Methylnaphthalene | 2-Methylnaphthalene | Acenaphthene | Acenaphthylene | Anthracene | Benzo(a)anthracene | Benzo(a)pyrene | Benzo(b)fluoranthene | Benzo(g,h,i)perylene | Benzo(k)fluoranthene | Chrysene | Dibenz(a,h)anthracene | Fluoranthene | Fluorene | Indeno(1,2,3-cd)pyrene | Naphthalene | Phenanthrene | Pyrene | cPAHs |
| *1997 Site ROD Cleanup Goal* | | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | *347* | -- | -- | -- |
| *2017 PHSS Cleanup Level* | | -- | -- | *23* | -- | *0.73* | *0.0012* | *0.00012* | *0.0012* | -- | *0.0013* | *0.0013* | *0.00012* | -- | -- | *0.0012* | *12* | -- | -- | 0.00012 |
| *Portland Harbor JSCS SLV* | | -- | *0.2* | *0.2* | *0.2* | -- | *0.018* | *0.018* | *0.018* | *0.2* | *0.018* | *0.018* | *0.018* | *0.2* | *0.2* | *0.018* | *0.2* | *0.2* | *0.2* | -- |
| MW41B* | 1/28/2020 | <0.0668 | <0.0668 | <0.0334 | 0.0229 J | <0.0334 | 0.0842 | 0.158 | 0.261 | 0.171 | 0.0993 M-05 | 0.125 | 0.0365 | 0.148 | <0.0334 | 0.169 | 0.0393 J | 0.0502 J | 0.153 | 0.22425 |
| | 9/30/2020 | <0.0639 | <0.0639 | <0.0319 | <0.0319 | 0.0172 J | 0.0248 | 0.0419 | 0.0587 | 0.0439 | 0.0208 M-05 | 0.0315 | 0.00799 J | 0.0427 Q-29 | <0.0319 | 0.0367 | <0.0639 | <0.0639 | 0.0463 | 0.05711 |
| | 3/25/2021 | <0.0646 | <0.0646 | <0.0323 | <0.0323 | <0.0327 | 0.0174 M-05 | 0.0339 | 0.0537 | 0.0375 | 0.0222 M-05 | 0.0258 | <0.0161 | 0.0214 J | <0.0323 | 0.0412 | 0.0432 J | <0.0646 | 0.025 J | 0.04841 |
| | 10/6/2021 | <0.0663 | <0.0663 | <0.0331 | <0.0331 | <0.0331 | <0.0166 | <0.0204 | <0.0166 | <0.0331 | <0.0166 | <0.0166 | <0.0166 | <0.0331 | <0.0331 | <0.0166 | <0.0663 | <0.0663 | <0.0331 | <0.0204 |
| MW43 | 1/30/2020 | 128 | 281 | <0.646 | <0.646 | <0.646 | <0.323 | <0.323 | <0.323 | <0.646 | <0.323 | <0.323 | <0.323 | <0.646 | <0.646 | <0.323 | 133 | <1.29 | <0.646 | <0.323 |
| | 9/30/2020 | 125 | 277 | <0.683 | <0.683 | <0.683 | <0.341 | <0.341 | <0.341 | <0.683 | <0.341 | <0.341 | <0.341 | <0.683 | <0.683 | <0.341 | 80.0 | <1.37 | <0.683 | <0.341 |
| | 3/25/2021 | 84 | 188 | <0.383 | <0.383 | 0.0179 J | <0.191 | <0.191 | <0.191 | <0.383 | <0.191 | <0.191 | <0.191 | <0.383 | <0.383 | <0.191 | 73.5 | <0.766 | <0.383 | <0.191 |
| | 10/7/2021 | 75.6 | 170 | <0.415 | <0.415 | <0.415 | <0.207 | <0.207 | <0.207 | <0.415 | <0.207 | <0.207 | <0.207 | <0.415 | <0.415 | <0.207 | 59.6 | <0.829 | <0.415 | <0.207 |
| MW44* | 1/30/2020 | 0.0499 J | <0.0842 | <0.0421 | <0.0421 | <0.0421 | <0.0421 | <0.0421 | 0.0218 J | <0.0421 | <0.0421 | <0.0421 | <0.0421 | <0.0421 | <0.0421 | <0.0421 | <0.0842 | <0.0421 | 0.0327 J | 0.03186 |
| | 9/30/2020 | 2.61 | <0.0636 | <0.0318 | <0.0318 | <0.0318 | <0.0159 | <0.0159 | <0.0159 | <0.0318 | <0.0159 | <0.0159 | <0.0159 | <0.0318 | <0.0318 | <0.0159 | 0.422 | <0.0636 | 0.0322 | <0.0159 |
| | 3/25/2021 | 1.11 | <0.0716 | <0.0358 | <0.0358 | <0.0326 | <0.0179 | 0.00895 J | <0.0179 | <0.0358 | <0.0179 | <0.0179 | <0.0179 | <0.0358 | <0.0358 | <0.0179 | 0.125 | <0.0716 | <0.0358 | 0.01351 |
| | 10/6/2021 | 7.11 | <0.0728 | 0.0883 | <0.0364 | <0.0364 | <0.0182 | <0.0214 | <0.0182 | <0.0364 | <0.0182 | <0.0182 | <0.0182 | <0.0364 | <0.0364 | <0.0182 | 0.527 | <0.0728 | 0.0419 | <0.0182 |
| MW45* | 3/13/2019 | <0.0643 | <0.0643 | <0.0322 | <0.0322 | <0.0322 | <0.0161 | <0.0161 B | 0.0106 J | <0.0322 | <0.00804 | <0.00804 | <0.0161 | <0.0322 | <0.0322 | <0.0161 | <0.0643 | <0.0643 | <0.0322 | 0.01197 |
| | 3/13/2019 | <0.0643 | <0.0643 | <0.0322 | <0.0322 | <0.0322 | <0.0161 | <0.0161 B | 0.0106 J | <0.0322 | <0.0161 | <0.00804 | <0.0161 | <0.0322 | <0.0322 | <0.0161 | <0.0643 | <0.0643 | <0.0322 | 0.01237 |
| | 1/30/2020 | <0.0665 | <0.0665 | <0.0333 | <0.0333 | <0.0333 | 0.0118 J | 0.0244 | 0.0318 | 0.0246 J | 0.0144 J | 0.0173 | <0.0166 | 0.0291 J | <0.0333 | 0.0164 J | <0.0665 | <0.0665 | 0.0308 J | 0.03284 |
| | 3/23/2021 | <0.0652 | <0.0652 | <0.0326 | <0.0326 | <0.034 | 0.0171 M-05 | 0.0448 | 0.0672 | <0.01 | 0.0277 M-05 | 0.0253 M-05 | 0.00856 J | 0.0261 J | <0.0326 | 0.0452 | 0.0338 J | <0.0652 | 0.0289 J | 0.06163 |
| MW46* | 1/29/2020 | <0.0644 | <0.0644 | <0.0322 | <0.0322 | <0.0322 | 0.0318 | 0.0356 | 0.0451 | 0.0325 | 0.0234 M-05 | 0.0397 | <0.0161 | 0.077 | <0.0322 | 0.0261 | 0.0463 J | 0.0698 | 0.0663 | 0.04944 |
| | 9/29/2020 | <0.0653 | <0.0653 | <0.0327 | <0.0327 | <0.0327 | 0.00898 J | 0.0135 J | 0.0139 J | 0.0163 J | <0.0163 | <0.0163 | <0.0163 | 0.0188 J | <0.0327 | <0.0163 | 0.0437 J | <0.0653 | 0.018 J | 0.01831 |
| | 3/25/2021 | <0.0681 | <0.0681 | <0.034 | <0.034 | <0.146 R-02 | 0.0111 J | 0.0166 J | 0.0166 J | 0.0183 J | 0.00893 J | 0.00851 J | 0.00936 J | 0.0183 J | <0.034 | 0.014 J | <0.0681 | <0.0681 | <0.034 | 0.02268 |
| | 10/6/2021 | <0.0638 | <0.0638 | <0.0319 | <0.0319 | <0.0319 | <0.0159 | <0.0187 | <0.0159 | <0.0319 | <0.0159 | <0.0159 | <0.0159 | <0.0319 | <0.0319 | <0.0159 | 0.20 | <0.0638 | <0.0319 | <0.0187 |
| ***DPE Treatment Area*** | | | | | | | | | | | | | | | | | | | | |
| EX-07L | 1/29/2020 | NA | NA | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.40 | <0.040 | <0.04 | <0.04 |
| | 9/29/2020 | <0.40 | <0.40 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.08 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.40 | <0.04 | <0.04 | <0.04 |
| | 3/24/2021 | <0.10 | <0.10 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.02 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.10 | <0.01 | <0.01 | <0.01 |
| | 10/5/2021 | <0.10 | <0.10 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.020 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.10 | <0.010 | <0.010 | <0.010 |

*Please refer to notes at end of table.*

# Table 15

## Groundwater Analytical Data – PAHs

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Well ID | Sample Date | Analytical Results (µg/L) | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1-Methylnaphthalene | 2-Methylnaphthalene | Acenaphthene | Acenaphthylene | Anthracene | Benzo(a)anthracene | Benzo(a)pyrene | Benzo(b)fluoranthene | Benzo(g,h,i)perylene | Benzo(k)fluoranthene | Chrysene | Dibenz(a,h)anthracene | Fluoranthene | Fluorene | Indeno(1,2,3-cd)pyrene | Naphthalene | Phenanthrene | Pyrene | cPAHs |
| *1997 Site ROD Cleanup Goal* | | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | *347* | -- | -- | -- |
| *2017 PHSS Cleanup Level* | | -- | -- | *23* | -- | *0.73* | *0.0012* | *0.00012* | *0.0012* | -- | *0.0013* | *0.0013* | *0.00012* | -- | -- | *0.0012* | *12* | -- | -- | 0.00012 |
| *Portland Harbor JSCS SLV* | | -- | *0.2* | *0.2* | *0.2* | -- | *0.018* | *0.018* | *0.018* | *0.2* | *0.018* | *0.018* | *0.018* | *0.2* | *0.2* | *0.018* | *0.2* | *0.2* | *0.2* | -- |
| KMW29 | 1/29/2020 | NA | NA | 1.8 | <0.040 | 0.12 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | 3.9 | <0.04 | 0.97 | 2.6 | 0.075 | <0.04 |
| | 9/29/2020 | 11 | <0.40 | 2.0 | <0.040 | 0.16 | <0.04 | <0.04 | <0.04 | <0.08 | <0.04 | <0.04 | <0.04 | 0.62 | 4.1 | <0.04 | <0.04 | 2.2 | 0.081 | <0.04 |
| | 3/24/2021 | 16 | <0.10 | 1.4 | <0.01 | 0.14 | <0.01 | <0.01 | <0.01 | <0.02 | <0.01 | <0.01 | <0.01 | 0.054 | 4.0 | <0.01 | <0.10 | 2.8 | 0.072 | <0.01 |
| | 10/5/2021 | 13 | <0.10 | 1.6 | <0.010 | 0.13 | <0.010 | <0.010 | <0.010 | <0.020 | <0.010 | <0.010 | <0.010 | 0.051 | 3.1 | <0.010 | 0.87 | 2.4 | 0.062 | <0.010 |
| KMW30 | 1/29/2020 | NA | NA | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 |
| | 9/29/2020 | 20 | <0.40 | 0.47 | <0.04 | 0.053 | <0.04 | <0.04 | <0.04 | <0.08 | <0.04 | <0.04 | <0.04 | <0.04 | 0.82 | <0.04 | <0.40 | 0.67 | <0.04 | <0.04 |
| | 3/24/2021 | 2.9 | <0.10 | 0.10 | <0.01 | 0.015 | <0.01 | <0.01 | <0.01 | <0.02 | <0.01 | <0.01 | <0.01 | 0.013 | 0.18 | <0.01 | <0.10 | 0.069 | 0.015 | <0.01 |
| | 3/24/2021 DUP | 2.4 | <0.10 | 0.093 | <0.01 | 0.018 | <0.01 | <0.01 | <0.01 | <0.02 | <0.01 | <0.01 | <0.01 | 0.01 | 0.17 | <0.01 | <0.10 | 0.061 | 0.014 | <0.01 |
| | 10/5/2021 | 33 | <1.0 | 0.75 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.20 | <0.10 | <0.10 | <0.10 | <0.10 | 1.2 | <0.10 | <1.0 | 0.89 | <0.10 | <0.10 |
| KMW31 | 1/29/2020 | NA | NA | 0.48 | <0.04 | 0.12 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | 0.99 | <0.04 | 0.44 | 0.91 | 0.048 | <0.04 |
| | 1/29/2020 DUP | NA | NA | 0.47 | <0.04 | 0.13 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | 1.0 | <0.04 | 0.45 | 0.96 | 0.05 | <0.04 |
| | 9/29/2020 | 6.7 | <0.40 | 0.76 | <0.04 | 0.21 | <0.04 | <0.04 | <0.04 | <0.08 | <0.04 | <0.04 | <0.04 | 0.063 | 1.5 | <0.04 | <0.40 | 1.5 | 0.11 | <0.04 |
| | 9/29/2020 DUP | 6.9 | <0.40 | 0.78 | <0.04 | 0.21 | <0.04 | <0.04 | <0.04 | <0.08 | <0.04 | <0.04 | <0.04 | 0.059 | 1.5 | <0.04 | <0.40 | 1.3 | 0.11 | <0.04 |
| | 3/24/2021 | 17 | <0.10 | 0.83 | <0.01 | 0.13 | <0.01 | <0.01 | <0.01 | <0.02 | <0.01 | <0.01 | <0.01 | 0.053 | 1.5 | <0.01 | <0.10 | 1.4 | 0.09 | <0.01 |
| | 10/5/2021 | 2.0 | <0.10 | 0.35 | <0.010 | 0.13 | <0.010 | <0.010 | <0.010 | <0.020 | <0.010 | <0.010 | <0.010 | 0.05 | 0.70 | <0.010 | <0.10 | 0.20 | 0.089 | <0.010 |
| KMW32 | 1/29/2020 | NA | NA | 0.51 | <0.04 | 0.13 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | 1.0 | <0.04 | 0.41 | 0.96 | 0.05 | <0.04 |
| | 9/29/2020 | <0.40 | <0.40 | <0.40 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.08 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.40 | <0.04 | <0.04 | <0.04 |
| | 3/24/2021 | <0.10 | <0.10 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.02 | <0.01 | <0.01 | <0.01 | 0.01 | <0.01 | <0.01 | <0.10 | <0.01 | 0.038 | <0.01 |
| | 3/24/2021 DUP | <0.10 | <0.10 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.02 | <0.01 | <0.01 | <0.01 | 0.013 | <0.01 | <0.01 | <0.10 | <0.01 | 0.045 | <0.01 |
| | 10/5/2021 | <0.10 | <0.10 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.020 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.10 | <0.010 | 0.047 | <0.010 |
| KMW33 | 1/29/2020 | NA | NA | 0.67 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | 2.5 | <0.04 | <0.40 | 0.29 | 0.094 | <0.04 |
| | 9/29/2020 | <0.40 | <0.40 | 0.11 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.08 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | 0.69 | <0.04 | 0.079 | <0.04 |
| | 3/24/2021 | <0.10 | <0.10 | 0.11 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.02 | <0.01 | <0.01 | <0.01 | 0.024 | 0.46 | <0.01 | <0.10 | <0.01 | 0.054 | <0.01 |
| | 10/6/2021 | <0.10 | <0.10 | 0.56 | <0.010 | 0.077 | <0.010 | <0.010 | <0.010 | <0.020 | <0.010 | <0.010 | <0.010 | 0.023 | 1.4 | <0.010 | <0.10 | <0.010 | 0.058 | <0.010 |
| KMW37 | 1/29/2020 | NA | NA | 0.26 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | 0.57 | <0.04 | <0.04 | 0.35 | <0.04 | <0.04 |
| | 9/30/2020 | <0.40 | <0.40 | 0.35 | <0.04 | 0.059 | <0.04 | <0.04 | <0.04 | <0.08 | <0.04 | <0.04 | <0.04 | 0.065 | 0.61 | <0.04 | <0.04 | 0.57 | 0.086 | <0.04 |
| | 3/24/2021 | 0.65 | <0.10 | 0.85 | <0.01 | 0.048 | <0.01 | <0.01 | <0.01 | <0.02 | <0.01 | <0.01 | <0.01 | 0.025 | 1.8 | <0.01 | <0.10 | 0.68 | 0.031 | <0.01 |
| | 10/6/2021 | 0.24 | <0.10 | 0.33 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.020 | <0.010 | <0.010 | <0.010 | 0.059 | 0.6 | <0.010 | <0.10 | 0.49 | 0.071 | <0.010 |

*Please refer to notes at end of table.*

# Table 15

## Groundwater Analytical Data – PAHs

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Well ID | Sample Date | Analytical Results (µg/L) | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1-Methylnaphthalene | 2-Methylnaphthalene | Acenaphthene | Acenaphthylene | Anthracene | Benzo(a)anthracene | Benzo(a)pyrene | Benzo(b)fluoranthene | Benzo(g,h,i)perylene | Benzo(k)fluoranthene | Chrysene | Dibenz(a,h)anthracene | Fluoranthene | Fluorene | Indeno(1,2,3-cd)pyrene | Naphthalene | Phenanthrene | Pyrene | cPAHs |
| *1997 Site ROD Cleanup Goal* | | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | *347* | -- | -- | -- |
| *2017 PHSS Cleanup Level* | | -- | -- | *23* | -- | *0.73* | *0.0012* | *0.00012* | *0.0012* | -- | *0.0013* | *0.0013* | *0.00012* | -- | -- | *0.0012* | *12* | -- | -- | 0.00012 |
| *Portland Harbor JSCS SLV* | | -- | *0.2* | *0.2* | *0.2* | -- | *0.018* | *0.018* | *0.018* | *0.2* | *0.018* | *0.018* | *0.018* | *0.2* | *0.2* | *0.018* | *0.2* | *0.2* | *0.2* | -- |
| MW47 | 1/29/2020 | NA | NA | 1.1 | <0.04 | 0.079 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | 0.06 | 2.2 | <0.04 | <0.04 | 0.06 | 0.059 | <0.04 |
| | 9/29/2020 | <0.40 | <0.40 | 1.5 | <0.04 | 0.088 | <0.04 | <0.04 | <0.04 | <0.08 | <0.04 | <0.04 | <0.04 | 0.063 | 2.5 | <0.04 | <0.04 | 0.10 | 0.069 | <0.04 |
| | 3/24/2021 | 0.11 | <0.10 | 1 | <0.01 | 0.048 | <0.01 | <0.01 | <0.01 | <0.02 | <0.01 | <0.01 | <0.01 | 0.048 | 2.0 | <0.01 | <0.10 | 0.056 | 0.041 | <0.01 |
| | 10/6/2021 | <0.10 | <0.10 | 1.2 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.020 | <0.010 | <0.010 | <0.010 | 0.05 | 1.8 | <0.010 | <0.10 | 0.035 | 0.04 | <0.010 |
| MW48 | 1/29/2020 | NA | NA | 0.11 | <0.04 | 0.045 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | 0.045 | 0.25 | <0.04 | <0.04 | 0.51 | 0.055 | <0.04 |
| | 1/29/2020 DUP | NA | NA | 0.093 | <0.04 | 0.049 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | 0.051 | 0.25 | <0.04 | <0.04 | 0.52 | 0.061 | <0.04 |
| | 9/29/2020 | 1.8 | <0.40 | 0.079 | <0.04 | 0.077 | <0.04 | <0.04 | <0.04 | <0.08 | <0.04 | <0.04 | <0.04 | 0.042 | 0.18 | <0.04 | <0.04 | 0.40 | 0.062 | <0.04 |
| | 9/29/2020 DUP | 2.1 | <0.40 | 0.079 | <0.04 | 0.0787 | <0.04 | <0.04 | <0.04 | <0.08 | <0.04 | <0.04 | <0.04 | 0.050 | 0.22 | <0.04 | <0.04 | 0.51 | 0.081 | <0.04 |
| | 3/24/2021 | 2.9 | <0.10 | 0.084 | <0.01 | 0.036 | <0.01 | <0.01 | <0.01 | <0.02 | <0.01 | <0.01 | <0.01 | 0.030 | 0.22 | <0.01 | <0.10 | 0.27 | 0.039 | <0.01 |
| | 10/5/2021 | 0.43 | <0.10 | 0.075 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.020 | <0.010 | <0.010 | <0.010 | 0.049 | 0.10 | <0.010 | <0.10 | <0.010 | 0.075 | <0.010 |
| | 10/5/2021 DUP | 0.17 | <0.10 | 0.066 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.020 | <0.010 | <0.010 | <0.010 | 0.05 | 0.068 | <0.010 | <0.10 | <0.010 | 0.073 | <0.010 |
| MW49 | 1/29/2020 | NA | NA | 0.78 | <0.04 | 0.076 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | 0.064 | 1.3 | <0.04 | <0.40 | 0.70 | 0.078 | <0.04 |
| | 9/29/2020 | <0.40 | <0.40 | 0.5 | <0.04 | 0.043 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | 0.072 | 0.44 | <0.04 | <0.40 | <0.04 | 0.089 | <0.04 |
| | 3/24/2021 | 0.27 | <0.10 | 1.1 | <0.01 | 0.11 | <0.01 | <0.01 | <0.01 | <0.02 | <0.01 | <0.01 | <0.01 | 0.11 | 1.8 | <0.01 | <0.10 | 0.87 | 0.12 | <0.01 |
| | 10/6/2021 | <0.10 | <0.10 | 0.64 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.020 | <0.010 | <0.010 | <0.010 | 0.086 | 0.69 | <0.010 | <0.10 | 0.15 | 0.082 | <0.010 |
| ***Slurry Wall*** | | | | | | | | | | | | | | | | | | | | |
| KMW36 | 1/30/2020 | 1.12 | <0.255 | <1.6 R-02 | <0.638 R-02 | <0.598 R-02 | 0.0413 J | 0.0321 J | <0.0638 | <0.128 | <0.0638 | 0.042 J | <0.0638 | 0.27 | 1.94 | <0.0638 | <0.798 R-02 | <0.255 | 0.324 | 0.04941 |
| | 9/30/2020 | <0.255 | <0.255 | <1.59 R-02 | <0.884 R-02 | <0.771 R-02 | <0.0637 | <0.0637 | <0.0637 | <0.127 | <0.0637 | <0.0637 | <0.0637 | 0.161 Q-29 | 1.84 | <0.0637 | <0.486 R-02 | <0.255 | 0.202 | <0.0637 |
| | 3/24/2021 | 0.198 | <0.0636 | <0.745 R-02 | <0.298 R-02 | <0.397 R-02 | 0.0207 M-05 | 0.0163 | 0.0159 M-05 | <0.0318 | <0.0159 | 0.025 M-05 | <0.0159 | 0.12 | 1.11 | <0.0159 | <0.447 R-02 | <0.0636 | 0.174 | 0.02260 |
| | 10/6/2021 | <0.222 | <0.0744 | <1.67 | <0.555 | 0.398 | <0.0210 | <0.0235 | <0.0208 | <0.0355 | <0.0178 | <0.0242 | <0.0178 | 0.131 | 1.85 | <0.0178 | <0.653 | <0.0711 | 0.171 | <0.0242 |
| W-16 | 1/29/2020 | 2.11 | <0.259 | <1.21 R-02 | <0.364 R-02 | <0.202 R-02 | <0.0647 | <0.0647 | <0.0647 | <0.129 | <0.0647 | <0.0647 | <0.0647 | 0.109 J | 2.02 | <0.0647 | <0.808 R-02 | <0.259 | 0.119 J | <0.0647 |
| | 10/1/2020 | 0.202 | <0.258 | <0.605 R-02 | <0.129 | <0.129 | <0.0645 | <0.0645 | <0.0645 | <0.129 | <0.0645 | <0.0645 | <0.0645 | 0.0661 J | 0.921 | <0.0645 | <0.258 | <0.258 | 0.106 J | <0.0645 |
| | 3/25/2021 | 0.418 | <0.0717 | 0.825 | <0.28 R-02 | <0.341 R-02 | <0.0179 | <0.0179 | <0.0179 | <0.0358 | <0.0179 | <0.0179 | <0.0179 | 0.0676 | 1.62 | <0.0179 | <0.347 R-02 | <0.0717 | 0.121 | <0.0179 |
| | 10/6/2021 | 0.287 | <0.0704 | <0.693 | <0.198 | <0.215 | <0.0234 | <0.0176 | <0.0176 | <0.0352 | <0.0176 | <0.0176 | <0.0176 | 0.0704 | 1.27 | <0.0176 | <0.275 | <0.215 | 0.0783 | <0.0234 |
| W-19 | 2/8/2018 | 0.52 | 0.0548 J | 2.01 | <0.05 | 0.537 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | 0.119 | 1.22 | <0.05 | 0.379 | 0.951 | 0.209 | <0.05 |
| | 3/15/2019 | 0.241 | 0.062 J | 1.44 | <0.171 R-02 | 0.324 | <0.0161 | <0.0161 | <0.0161 | <0.0322 | <0.0161 | <0.0161 | <0.0161 | 0.0744 | 0.372 | <0.0161 | <0.352 R-02 | 0.153 | 0.147 | <0.0161 |
| | 1/30/2020 | 0.797 | <0.257 | <3.21 R-02 | <0.482 R-02 | 0.699 | <0.0642 | <0.0642 | <0.0642 | <0.128 | <0.0642 | <0.0642 | <0.0642 | 0.173 | 0.953 | <0.0642 | <0.522 R-02 | 1.25 | 0.24 | <0.0642 |
| | 3/25/2021 | 0.144 | <0.0728 | 1.89 | <0.193 R-02 | 0.02 J | 0.0132 J | <0.0182 | <0.0182 | <0.0364 | <0.0182 | 0.0123 J | <0.0182 | 0.117 | 0.158 | <0.0182 | <0.341 R-02 | 0.141 | 0.173 | 0.01418 |

*Please refer to notes at end of table.*

# Table 15

## Groundwater Analytical Data – PAHs

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Well ID | Sample Date | Analytical Results (µg/L) | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1-Methylnaphthalene | 2-Methylnaphthalene | Acenaphthene | Acenaphthylene | Anthracene | Benzo(a)anthracene | Benzo(a)pyrene | Benzo(b)fluoranthene | Benzo(g,h,i)perylene | Benzo(k)fluoranthene | Chrysene | Dibenz(a,h)anthracene | Fluoranthene | Fluorene | Indeno(1,2,3-cd)pyrene | Naphthalene | Phenanthrene | Pyrene | cPAHs |
| *1997 Site ROD Cleanup Goal* | | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | *347* | -- | -- | -- |
| *2017 PHSS Cleanup Level* | | -- | -- | *23* | -- | *0.73* | *0.0012* | *0.00012* | *0.0012* | -- | *0.0013* | *0.0013* | *0.00012* | -- | -- | *0.0012* | *12* | -- | -- | 0.00012 |
| *Portland Harbor JSCS SLV* | | -- | *0.2* | *0.2* | *0.2* | -- | *0.018* | *0.018* | *0.018* | *0.2* | *0.018* | *0.018* | *0.018* | *0.2* | *0.2* | *0.018* | *0.2* | *0.2* | *0.2* | -- |
| W-20 | 2/8/2018 | <0.25 | <0.25 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.25 | <0.05 | 0.0122 J | <0.05 |
| | 3/15/2019 | <0.0633 | <0.0633 | <0.0317 | <0.0317 | 0.0269 J | <0.0158 | <0.0158 | <0.0158 | <0.0317 | <0.0158 | <0.0158 | <0.0158 | <0.0317 | <0.0317 | <0.0158 | 0.0552 J | <0.0633 | <0.0317 | <0.0158 |
| | 1/30/2020 | <0.0648 | <0.0648 | <0.0324 | <0.0324 | 0.0222 J | <0.0162 | <0.0162 | <0.0162 | <0.0324 | <0.0162 | <0.0162 | <0.0162 | <0.0324 | <0.0324 | <0.0162 | <0.0648 | <0.0648 | 0.0367 | <0.0162 |
| | 3/25/2021 | <0.071 | <0.071 | <0.0355 | <0.0355 | <0.032 | <0.0178 | <0.0178 | <0.0178 | <0.0355 | <0.0178 | <0.0178 | <0.0178 | <0.0355 | <0.0355 | <0.0178 | <0.071 | <0.071 | <0.0355 | <0.0178 |
| W-22 | 2/8/2018 | <0.25 | <0.25 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | 0.00665 B, J | 0.00547 B, J | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.25 | <0.05 | <0.05 | 0.03592 |
| | 3/15/2019 | <0.0692 | <0.0692 | <0.0346 | <0.0346 | <0.0346 | <0.0173 | <0.0173 | <0.0173 | <0.0346 | <0.0173 | <0.0173 | <0.0173 | <0.0346 | <0.0346 | <0.0173 | 0.0633 J | <0.0692 | <0.0346 | <0.0173 |
| | 1/30/2020 | <0.0664 | <0.0664 | <0.0332 | <0.0332 | <0.0332 | <0.0166 | 0.00858 J | 0.00917 J | <0.0332 | <0.0166 | <0.0166 | <0.0166 | <0.0332 | <0.0332 | <0.0166 | <0.0664 | <0.0664 | <0.0332 | 0.0129 |
| | 3/23/2021 | <0.0639 | <0.0639 | <0.032 | <0.032 | <0.032 | <0.016 | <0.016 | <0.016 | <0.032 | <0.016 | <0.016 | <0.016 | <0.032 | <0.032 | <0.016 | <0.0639 | <0.0639 | <0.032 | <0.016 |
| ***Site-Wide*** | | | | | | | | | | | | | | | | | | | | |
| KMW01 | 2/9/2018 | <0.25 | 0.0105 J | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | 0.0299 J | <0.05 | <0.05 | <0.05 |
| | 3/15/2019 | <0.0635 | <0.0635 | <0.0318 | <0.0318 | <0.0318 | <0.0159 | <0.0159 | <0.0159 | <0.0318 | <0.0159 | <0.0159 | <0.0159 | <0.0318 | <0.0318 | <0.0159 | <0.0635 | <0.0635 | <0.0318 | <0.0159 |
| | 1/29/2020 | <0.0634 | <0.0634 | <0.0317 | <0.0317 | <0.0317 | <0.0159 | <0.0159 | <0.0159 | <0.0317 | <0.0159 | <0.0159 | <0.0159 | <0.0317 | <0.0317 | <0.0159 | <0.0634 | <0.0634 | <0.0317 | <0.0159 |
| | 3/23/2021 | <0.0643 | <0.0643 | <0.0321 | <0.0321 | <0.0321 | <0.0161 | <0.0161 | <0.0161 | <0.0321 | <0.0161 | <0.0161 | <0.0161 | <0.0321 | <0.0321 | <0.0161 | <0.0643 | <0.0643 | <0.0321 | <0.0161 |
| KMW02 | 1/29/2020 | <0.0374 | <0.0374 | <0.0187 | <0.0187 | <0.0187 | <0.0187 | 0.0165 | <0.0280 | <0.0187 | <0.0280 | <0.0187 | <0.0187 | <0.0187 | <0.0187 | <0.0187 | <0.0374 | <0.0187 | <0.0187 | 0.02220 |
| | 10/1/2020 | <0.0396 | <0.0396 | <0.0198 | <0.0198 | <0.0198 | <0.0198 | <0.0297 | <0.0297 | <0.0198 | <0.0297 | <0.0198 | <0.0198 | <0.0198 | <0.0198 | <0.0198 | <0.0396 | <0.0198 | <0.0198 | <0.0297 |
| | 3/23/2021 | <0.0412 | <0.0412 | <0.0206 | <0.0206 | <0.0206 | <0.0206 | <0.0309 | <0.0309 | <0.0206 | <0.0309 | <0.0206 | <0.0206 | <0.0206 | <0.0206 | <0.0206 | <0.0412 | <0.0206 | <0.0206 | <0.0309 |
| | 10/7/2021 | <0.0757 Q-30 | <0.0757 Q-30 | <0.0378 | <0.0378 | <0.0378 | <0.0189 | <0.0189 | <0.0189 | <0.0378 | <0.0189 | <0.0189 | <0.0189 | <0.0378 | <0.0378 | <0.0189 | <0.0757 Q-30 | <0.0757 | <0.0378 | <0.0309 |
| KMW05 | 2/8/2018 | 2.49 | 0.0357 J | 2.62 | <0.05 | 0.45 | 0.0783 | 0.0485 J | 0.0558 | 0.047 J | <0.05 | 0.179 | 0.0102 J | 0.192 | 2.67 | 0.0289 J | 0.511 | 0.739 | 0.631 | 0.07011 |
| | 3/13/2019 | 3.98 | 0.0559 J | <4.31 R-02 | <0.702 R-02 | <0.702 R-02 | 0.0511 M-05 | 0.0442 B,B-02 | 0.0371 M-05 | 0.0408 | 0.0155 J | 0.0865 M-05 | <0.0160 | 0.112 | 5.29 | 0.0266 | <0.421 R-02 | 3.85 | 0.364 | 0.05890 |
| | 1/28/2020 | 59.6 | <2.61 | <6.26 R-02 | <1.67 R-02 | <1.3 | <0.652 | <0.652 | <0.652 | <1.3 | <0.652 | <0.652 | <0.652 | <1.3 | 6.99 | <0.652 | <3.26 R-02 | 6.35 | 0.671 J | <0.652 |
| | 3/23/2021 | 3.16 | <0.145 R-02 | <6.77 R-02 | <1.21 R-02 | <0.967 R-02 | 0.014 J | 0.0116 J | <0.0193 | <0.0387 | <0.0193 | 0.0111 J | <0.0193 | 0.0551 | 8.4 | <0.0193 | <0.484 R-02 | 5.06 | 0.181 | 0.01794 |
| KMW09 | 2/6/2018 | <0.25 | <0.25 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | 0.0028 B, J | 0.00278 J | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | 0.0234 B, J | <0.05 | <0.05 | 0.03553 |
| | 3/13/2019 | <0.0651 | <0.0651 | <0.0326 | <0.0326 | 0.0275 J | <0.0163 | <0.0163 B | <0.0163 | <0.0326 | <0.0163 | <0.00814 | <0.0163 | <0.0326 | <0.0326 | <0.0163 | <0.0651 | <0.0651 | <0.0326 | <0.0163 |
| | 1/29/2020 | <0.064 | <0.064 | <0.032 | <0.032 | 0.016 J | 0.0184 | 0.018 | 0.0211 | <0.032 | 0.00936 J | 0.0163 | <0.016 | 0.0313 J | <0.032 | 0.017 | <0.064 | <0.064 | 0.0318 J | 0.025549 |
| | 3/23/2021 | <0.0639 | <0.0639 | <0.0319 | <0.0319 | <0.0319 | <0.016 | <0.016 | <0.016 | <0.0319 | <0.016 | <0.016 | <0.016 | <0.0319 | <0.0319 | <0.016 | <0.0639 | <0.0639 | <0.0319 | <0.016 |

*Please refer to notes at end of table.*

# Table 15

## Groundwater Analytical Data – PAHs

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Well ID | Sample Date | Analytical Results (µg/L) | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1-Methylnaphthalene | 2-Methylnaphthalene | Acenaphthene | Acenaphthylene | Anthracene | Benzo(a)anthracene | Benzo(a)pyrene | Benzo(b)fluoranthene | Benzo(g,h,i)perylene | Benzo(k)fluoranthene | Chrysene | Dibenz(a,h)anthracene | Fluoranthene | Fluorene | Indeno(1,2,3-cd)pyrene | Naphthalene | Phenanthrene | Pyrene | cPAHs |
| *1997 Site ROD Cleanup Goal* | | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | *347* | -- | -- | -- |
| *2017 PHSS Cleanup Level* | | -- | -- | *23* | -- | *0.73* | *0.0012* | *0.00012* | *0.0012* | -- | *0.0013* | *0.0013* | *0.00012* | -- | -- | *0.0012* | *12* | -- | -- | 0.00012 |
| *Portland Harbor JSCS SLV* | | -- | *0.2* | *0.2* | *0.2* | -- | *0.018* | *0.018* | *0.018* | *0.2* | *0.018* | *0.018* | *0.018* | *0.2* | *0.2* | *0.018* | *0.2* | *0.2* | *0.2* | -- |
| KMW10* | 1/28/2020 | <0.0639 | <0.0639 | <0.032 | <0.032 | 0.0197 J | <0.016 | 0.0106 J | 0.00919 J | <0.032 | <0.016 | <0.016 | <0.016 | <0.032 | <0.032 | <0.016 | <0.0639 | <0.0639 | <0.032 | 0.01480 |
| | 9/29/2020 | <0.0653 | <0.0653 | <0.0326 | <0.0326 | 0.02 J | <0.0163 | <0.0163 | <0.0163 | <0.0326 | <0.0163 | <0.0163 | <0.0163 | <0.0326 | <0.0326 | <0.0163 | <0.0653 | <0.0653 | <0.0326 | 0.01312 |
| | 3/23/2021 | <0.0631 | <0.0631 | <0.0316 | <0.0316 | 0.0174 J | <0.0158 | 0.0107 J | 0.00789 J | <0.0316 | <0.0158 | <0.0158 | <0.0158 | <0.0316 | <0.0316 | <0.0158 | <0.0631 | <0.0631 | <0.0316 | 0.01473 |
| | 10/7/2021 | <0.0671 | <0.0671 | <0.0336 | <0.0336 | <0.0336 | <0.0168 | <0.0168 | <0.0168 | <0.0336 | <0.0168 | <0.0168 | <0.0168 | <0.0336 | <0.0336 | <0.0168 | <0.0671 | <0.0671 | <0.0336 | <0.0168 |
| KMW16* | 2/9/2018 | <0.25 | <0.25 | <0.05 | <0.05 | <0.05 | 0.0385 J | 0.0458 | 0.0656 | 0.0562 | 0.0283 J | 0.0586 | 0.00748 J | 0.122 | <0.05 | 0.0419 J | <0.25 | 0.0347 J | 0.09 | 0.06456 |
| | 3/14/2019 | <0.064 | 0.0441 J | <0.032 | <0.032 | <0.032 | 0.013 J | 0.0204 | 0.025 M-05 | 0.0245 J | 0.012 J | 0.0139 J | <0.016 | 0.0255 J | <0.032 | 0.018 | 0.0599 J | <0.064 | 0.0261 J | 0.02814 |
| | 1/30/2020 | 0.0334 J | 0.0662 | <0.032 | <0.032 | <0.032 | 0.0165 | 0.0186 | 0.02 | <0.032 | 0.0121 J | 0.0167 | <0.016 | 0.0275 J | <0.032 | 0.0168 | 0.0468 J | <0.064 | 0.0285 J | 0.02611 |
| | 3/25/2021 | <0.068 | <0.068 | <0.034 | <0.034 | <0.034 | 0.0191 | 0.0404 | 0.0391 | 0.0298 J | 0.0174 M-05 | 0.023 | <0.017 | 0.0463 | <0.034 | 0.0196 | <0.068 | <0.068 | 0.0455 | 0.051 |
| KMW20 | 2/9/2018 | <0.25 | <0.25 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.25 | <0.05 | 0.279 | <0.05 |
| | 3/14/2019 | <0.0657 | 0.0449 J | <0.0329 | <0.0329 | <0.0329 | <0.0164 | <0.0164 | <0.0164 | <0.0329 | <0.0164 | <0.0164 | <0.0164 | <0.0329 | <0.0329 | <0.0164 | 0.0898 | <0.0657 | 0.0812 | <0.0164 |
| | 1/30/2020 | <0.0636 | <0.0636 | <0.0318 | <0.0318 | <0.0318 | <0.0159 | 0.0132 J | 0.0142 J | <0.0318 | 0.00808 J | 0.0106 J | <0.0159 | <0.0318 | <0.0318 | <0.0159 | <0.0636 | <0.0636 | 0.183 | 0.01792 |
| | 3/23/2021 | 0.0328 J | <0.0639 | <0.032 | <0.032 | <0.032 | <0.016 | 0.00799 J | <0.016 | <0.032 | <0.016 | <0.016 | <0.016 | <0.032 | <0.032 | <0.016 | 0.139 | <0.0639 | 0.0212 J | 0.01127 |
| KMW21 | 2/9/2018 | <0.258 | <0.258 | 1.69 | <0.0515 | <0.0515 | <0.0515 | <0.0515 | <0.0515 | <0.0515 | <0.0515 | <0.0515 | <0.0515 | 0.0491 J | 3.26 | <0.0515 | 0.267 | <0.0515 | 0.0495 J | <0.0515 |
| | 3/14/2019 | 0.516 | 0.0902 | <2.63 R-02 | <0.668 R-02 | 0.187 | 0.0145 J | <0.0162 | <0.0162 | <0.0324 | <0.0162 | 0.0118 J | <0.0162 | 0.0607 | 6.23 | <0.0162 | <0.334 R-02 | 2.12 | 0.0662 | 0.01291 |
| | 1/30/2020 | 1.35 | 0.771 | <4.92 R-02 | <1.35 R-02 | <0.369 R-02 | <0.0656 | <0.0656 | <0.0656 | <0.131 | <0.0656 | <0.0656 | <0.0656 | 0.121 J | 9.42 | <0.0656 | <0.533 R-02 | 7.5 | 0.137 | <0.0656 |
| | 3/23/2021 | <0.123 R-02 | <0.0655 | 1/0/1900 | <0.0717 R-02 | <0.154 R-02 | 0.0152 J | <0.0164 | <0.0164 | <0.0328 | <0.0164 | 0.00819 J | <0.0164 | 1/0/1900 | 1.22 | <0.0164 | <0.184 R-02 | <0.102 R-02 | 0.0684 | 0.01232 |
| MW42 | 2/8/2018 | 0.0098 J | <0.25 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | 0.0123 B, J | 0.0113 B, J | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | 0.0332 J | <0.05 | <0.05 | 0.03648 |
| | 3/14/2019 | <0.0638 | <0.0638 | <0.0319 | <0.0319 | <0.0319 | 0.011 J | 0.0146 J | 0.0158 J | 0.0203 J | 0.00925 J | <0.016 | <0.016 | <0.0319 | <0.0319 | 0.0108 J | 0.0395 J | <0.0638 | <0.0319 | 0.02017 |
| | 1/30/2020 | 0.0355 J | 0.0586 J | <0.032 | <0.032 | <0.032 | 0.0115 J | 0.0203 | 0.0247 | 0.0262 J | 0.0132 J | 0.0132 J | <0.016 | 0.0302 J | <0.032 | 0.0149 J | 0.0677 | 0.0348 J | 0.0292 J | 0.02766 |
| | 3/25/2021 | <0.0653 | <0.0653 | <0.0327 | 0.0176 J | <0.383 | 0.0751 | 0.185 | 0.202 | 0.144 | 0.0972 M-05 | 0.115 | 0.0216 | 0.174 | <0.0327 | 0.122 | <0.0653 | 0.0625 J | 0.165 | 0.23794 |
| W-15 | 1/29/2020 | NA | NA | 0.51 | <0.04 | 0.067 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | <0.04 | 1.1 | <0.04 | <0.04 | 0.69 | 0.06 | <0.04 |
| | 9/30/2020 | <0.40 | <0.40 | 0.81 | <0.04 | 0.085 | <0.04 | <0.04 | <0.04 | <0.08 | <0.04 | <0.04 | <0.04 | 0.050 | 1.6 | <0.04 | <0.04 | 1.10 | 0.11 | <0.04 |
| | 3/24/2021 | 0.23 | <0.10 | 0.60 | <0.01 | 0.068 | <0.01 | <0.01 | <0.01 | <0.02 | <0.01 | <0.01 | <0.01 | 0.041 | 1.3 | <0.01 | <0.10 | 0.78 | 0.081 | <0.01 |
| | 10/6/2021 | 0.10 | <0.10 | 0.33 | <0.010 | 0.024 | <0.010 | <0.010 | <0.010 | <0.020 | <0.010 | <0.010 | <0.010 | 0.015 | 0.61 | <0.010 | <0.10 | 0.42 | 0.032 | <0.010 |
| | 10/6/2021 DUP | 0.19 | <0.10 | 0.65 | <0.010 | 0.064 | <0.010 | <0.010 | <0.010 | <0.020 | <0.010 | <0.010 | <0.010 | 0.037 | 1.2 | <0.010 | <0.10 | 0.93 | 0.076 | <0.010 |

*Please refer to notes at end of table.*

# Table 15

## Groundwater Analytical Data – PAHs

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Well ID | Sample Date | Analytical Results (µg/L) | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1-Methylnaphthalene | 2-Methylnaphthalene | Acenaphthene | Acenaphthylene | Anthracene | Benzo(a)anthracene | Benzo(a)pyrene | Benzo(b)fluoranthene | Benzo(g,h,i)perylene | Benzo(k)fluoranthene | Chrysene | Dibenz(a,h)anthracene | Fluoranthene | Fluorene | Indeno(1,2,3-cd)pyrene | Naphthalene | Phenanthrene | Pyrene | cPAHs |
| *1997 Site ROD Cleanup Goal* | | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | *347* | -- | -- | -- |
| *2017 PHSS Cleanup Level* | | -- | -- | *23* | -- | *0.73* | *0.0012* | *0.00012* | *0.0012* | -- | *0.0013* | *0.0013* | *0.00012* | -- | -- | *0.0012* | *12* | -- | -- | 0.00012 |
| *Portland Harbor JSCS SLV* | | -- | *0.2* | *0.2* | *0.2* | -- | *0.018* | *0.018* | *0.018* | *0.2* | *0.018* | *0.018* | *0.018* | *0.2* | *0.2* | *0.018* | *0.2* | *0.2* | *0.2* | -- |
| ***Southern Facility Area*** | | | | | | | | | | | | | | | | | | | | |
| MW-1 | 2/2/2012 | NM | NM | <0.0054 | <0.00638 | 0.0095 | 0.0285 | 0.0381 | 0.0381 | 0.0381 | 0.019 | 0.0285 | 0.0095 | 0.0381 | <0.00587 | 0.019 | 0.019 | 0.0095 | 0.0381 | 0.04980 |
| | 12/29/2020 | <0.0649 | <0.0649 | <0.0324 | <0.0324 | <0.0324 | <0.0162 | <0.0162 | <0.0162 | <0.0324 | <0.0162 | <0.0162 | <0.0162 | <0.0324 | <0.0324 | <0.0162 | <0.0649 | <0.0649 | <0.0324 | <0.0162 |
| | 12/29/2020 DUP | <0.0646 | <0.0646 | <0.0323 | <0.0323 | <0.0323 | <0.0161 | <0.0161 | <0.0161 | <0.0323 | <0.0161 | <0.0161 | <0.0161 | <0.0323 | <0.0323 | <0.0161 | <0.0646 | <0.0646 | <0.0323 | <0.0161 |
| MW-2 | 2/2/2012 | NM | NM | 0.124 | <0.00639 | <0.00353 | 0.00703 | <0.0043 | <0.00356 | <0.00383 | <0.00696 | 0.00303 | <0.00473 | 0.0095 | <0.00587 | <0.00303 | 0.0095 | 0.0095 | 0.171 | 0.00686 |
| | 12/29/2020 | <0.0651 | <0.0651 | <0.0325 | <0.0325 | <0.0325 | <0.0163 | <0.0163 | <0.0163 | <0.0325 | <0.0163 | <0.0163 | <0.0163 | <0.0325 | <0.0325 | <0.0163 | <0.0651 | <0.0651 | 0.081 | <0.0163 |
| | 3/23/2021 | <0.0649 | <0.0649 | 0.0925 | <0.0324 | <0.0324 | 0.015 J | 0.0227 | 0.0174 | 0.0191 J | <0.0162 | 0.0114 J | <0.0162 | 0.0255 J | <0.0324 | 0.0101 J | 0.0998 | <0.0649 | 0.0908 | 0.03030 |
| | 10/7/2021 | <0.0685 | <0.0685 | <0.0342 | <0.0342 | <0.0342 | <0.0171 | <0.0171 | <0.0171 | <0.0342 | <0.0171 | <0.0171 | <0.0171 | <0.0342 | <0.0342 | <0.0171 | <0.0685 | <0.0685 | 0.0839 | <0.0171 |
| MW-3 | 2/2/2012 | NM | NM | <0.0054 | <0.00639 | <0.00353 | 0.0286 | 0.019 | 0.019 | 0.019 | 0.019 | 0.019 | 0.019 | 0.019 | <0.00587 | 0.019 | 0.019 | 0.0095 | 0.0286 | 0.02965 |
| | 12/29/2020 | <0.0634 | <0.0634 | <0.0317 | <0.0317 | <0.0317 | <0.0159 | <0.0159 | <0.0159 | <0.0317 | <0.0159 | <0.0159 | <0.0159 | <0.0317 | <0.0317 | <0.0159 | <0.0634 | <0.0634 | <0.0317 | <0.0159 |
| | 3/23/2021 | <0.0665 | <0.0665 | <0.0333 | <0.0333 | <0.0333 | <0.0166 | <0.0166 | <0.0166 | <0.0333 | <0.0166 | <0.0166 | <0.0166 | <0.0333 | <0.0333 | <0.0166 | <0.0665 | <0.0665 | <0.0333 | <0.0166 |
| | 10/7/2021 | <0.0693 | <0.0693 | <0.0347 | <0.0347 | <0.0347 | <0.0173 | <0.0173 | <0.0173 | <0.0347 | <0.0173 | <0.0173 | <0.0173 | <0.0347 | <0.0347 | <0.0173 | <0.0693 | <0.0693 | <0.0347 | <0.0173 |
| | 10/7/2021 | <0.0709 | <0.0709 | <0.0354 | <0.0354 | <0.0354 | <0.0177 | <0.0177 | <0.0177 | <0.0354 | <0.0177 | <0.0177 | <0.0177 | <0.0354 | <0.0354 | <0.0177 | <0.0709 | <0.0709 | <0.0354 | <0.0177 |
| MW-4 | 2/2/2012 | NM | NM | 0.0095 | <0.0064 | <0.00354 | 0.0191 | 0.0095 | 0.0095 | <0.00384 | 0.0095 | 0.0095 | 0.00474 | 0.0095 | <0.00589 | 0.00304 | 0.0191 | 0.0095 | 0.0095 | 0.01418 |
| | 12/29/2020 | <0.0641 | <0.0641 | <0.0321 | <0.0321 | <0.0321 | <0.016 | <0.016 | <0.016 | <0.0321 | <0.016 | <0.016 | <0.016 | <0.0321 | <0.0321 | <0.016 | <0.0641 | <0.0641 | <0.0321 | <0.016 |
| | 3/23/2021 | <0.0658 | <0.0658 | <0.0329 | <0.0329 | 0.0533 | 0.014 J | 0.0181 | 0.0144 J | <0.0329 | <0.0164 | 0.00945 J | <0.0164 | 0.0218 J | <0.0329 | <0.0164 | <0.0658 | <0.0658 | 0.0218 J | 0.02595 |
| | 10/7/2021 | <0.0701 | <0.0701 | <0.0350 | <0.0350 | <0.0350 | <0.0175 | <0.0175 | <0.0175 | <0.0350 | <0.0175 | <0.0175 | <0.0175 | <0.0350 | <0.0350 | <0.0175 | <0.0701 | <0.0701 | <0.0350 | <0.0175 |
| VRUMW-1 | 2/2/2012 | NM | NM | 0.0095 | <0.00639 | <0.00353 | 0.019 | <0.0043 | 0.0095 | 0.0095 | 0.0095 | 0.0095 | <0.00473 | 0.0095 | <0.00587 | 0.0095 | 0.019 | 0.0095 | 0.019 | 0.00962 |
| | 12/28/2020 | <0.0638 | <0.0638 | <0.0319 | <0.0319 | <0.0319 | 0.0195 | 0.0335 | 0.0299 | 0.0239 J | 0.0128 J | 0.0203 | <0.016 | 0.0407 | <0.0319 | 0.0187 | <0.0638 | <0.0638 | 0.0391 | 0.04339 |
| VRUMW-2 | 2/2/2012 | NM | NM | 0.019 | 0.0095 | 0.0095 | <0.00703 | 0.019 | <0.00356 | <0.00383 | <0.00696 | <0.00303 | <0.00473 | 0.0095 | 0.019 | <0.00303 | 0.019 | 0.0095 | 0.0095 | 0.02156 |
| | 12/28/2020 | <0.0643 | <0.0643 | <0.0321 | <0.0321 | <0.0321 | <0.0161 | 0.00964 J | <0.0161 | <0.0321 | <0.0161 | <0.0161 | <0.0161 | <0.0321 | <0.0321 | <0.0161 | <0.0643 | <0.0643 | <0.0321 | 0.01785 |
| V0-1 | 2/1/2012 | NM | NM | <0.0054 | <0.00638 | <0.00353 | 0.0095 | <0.00429 | <0.00356 | <0.00383 | <0.00695 | 0.00302 | <0.00473 | 0.0095 | <0.00587 | <0.00303 | 0.143 | 0.0095 | <0.0065 | 0.00710 |
| | 2/1/2012 DUP | NM | NM | <0.0054 | <0.00639 | <0.00353 | 0.0095 | <0.0043 | <0.00356 | <0.00383 | <0.00696 | 0.00303 | <0.00473 | <0.00354 | <0.00587 | <0.00303 | 0.162 | 0.0095 | 0.0095 | 0.00711 |
| | 12/28/2020 | 1.30 | 1.84 | <0.0318 | <0.0318 | 0.0159 J | <0.0159 | <0.0159 | <0.0159 | <0.0318 | <0.0159 | <0.0159 | <0.0159 | <0.0318 | <0.0318 | <0.0159 | 0.368 | <0.0637 | 0.0191 J | 0.02401 |
| V0-2 | 2/1/2012 | NM | NM | <0.00539 | <0.00637 | <0.00352 | 0.00701 | <0.00429 | <0.00355 | <0.00382 | <0.00694 | 0.00302 | <0.00472 | <0.00363 | <0.00586 | <0.00302 | 0.019 | 0.0095 | <0.00649 | 0.00684 |
| | 12/28/2020 | <0.0632 | <0.0632 | <0.0316 | <0.0316 | <0.0316 | <0.0158 | <0.0158 | <0.0158 | <0.0316 | <0.0158 | <0.0158 | <0.0158 | <0.0316 | <0.0316 | <0.0158 | <0.0632 | <0.0632 | <0.0316 | 0.02386 |
| V0-3 | 2/2/2012 | NM | NM | 0.0095 | <0.00639 | <0.00353 | 0.019 | <0.0043 | 0.0095 | 0.0095 | 0.0095 | 0.0095 | <0.00473 | 0.0095 | <0.00587 | 0.0095 | 0.019 | 0.0095 | 0.019 | 0.00962 |
| | 12/29/2020 | <0.0646 | <0.0646 | <0.0323 | <0.0323 | <0.0323 | <0.0162 | 0.0109 J | 0.00888 J | <0.0323 | <0.0162 | <0.0162 | <0.0162 | <0.0323 | <0.0323 | <0.0162 | <0.0646 | <0.0646 | <0.0323 | 0.01843 |

*Please refer to notes at end of table.*

# Table 15 Notes

## Groundwater Analytical Data – PAHs

### Shore Terminals LLC - Portland Facility

### Portland, Oregon

***Notes:***

1. PAH = Polycyclic aromatic hydrocarbons.
2. < = Concentration as reported by the analytical laboratory is less than the laboratory reporting limit.
3. µg/L = Microgram(s) per liter.
4. NA = Not analyzed .
5. DUP = Field Duplicate.
6. Yellow highlighted cells indicate values that are equal to or exceeding 1997 Record of Decision (ROD) Groundwater Cleanup Goals for the ExxonMobil/Shore Terminals Site.
7. Gray highlighted cells indicate values that are equal to or exceeding PHSS Cleanup Level. If a PHSS Cleanup Level was not developed for an analyte, the JSCS SLV is used for comparison.
8. Green highlighted cells indicate the method reporting limit is greater than the PHSS ROD Cleanup Level or the JSCS SLV (if there is no ROD Cleanup Level)
9. Polycyclic aromatic hydrocarbons analyzed by EPA Method 8270C with selective ion monitoring.
10. * = Well is screened in Deep Sand unit.
11. Portland Harbor JSCS SLVs = 2007 Portland Harbor Joint Source Control Strategy Screening Level Values.
12. Well KMW14 was paved over prior to the October 2017 monitoring event. In an email dated February 21, 2018, DEQ agreed that well KMW14 was not critical to monitoring the Loading Rack Area and that replacement of KMW14 was not required. Well KMW14 has been removed from the monitoring program.

**Quality Assurance/Quality Control Data Qualifiers**

J = Reported result is an estimated value.

B = Reported analyte was present in the associated method blank.

M-05 = Estimated results. Peak separation for structural isomers is insufficient for accurate quantification.

R-02 = The reporting limit for the analyte has been raised to account for interference from coeluting organic compounds present in the sample.

# Table 16

## Groundwater Analytical Data – Total and Dissolved Metals

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Well ID | Sample Date | Analytical Results (µg/L) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Total Arsenic | Total Copper | Total Lead | Total Zinc | Dissolved Arsenic | Dissolved Copper | Dissolved Lead | Dissolved Zinc |
| *ROD Groundwater Cleanup Goal* | | -- | -- | -- | -- | *5.0* | *12* | *3.2* | -- |
| *PHSS Cleanup Level* | | -- | -- | -- | -- | *0.018* | *2.74* | *0.54* | *36* |
| *Portland Harbor JSCS SLV* | | -- | -- | -- | -- | *0.045* | *2.7* | *0.54* | *36* |
| ***Tank Field 1*** | | | | | | | | | |
| KMW07 | 2/8/2018 | 41.0 | 1.31 J | 1.98 J | NA | 38.5 | <5.00 | 1.59 J | NA |
| | 2/08/2018 DUP | 41.4 | 1.02 J | 1.88 J | NA | 39.3 | <5.00 | 1.56 J | NA |
| | 3/13/2019 | 4.91 | 0.971 J | 0.325 | NA | 2.26 | <1.00 | 0.178 J | NA |
| | 3/13/2019 DUP | 5.26 | 1.06 | 0.333 | NA | 2.40 | <1.00 | 0.172 J | NA |
| | 1/28/2020 | 23.1 | 0.88 J | 1.57 | NA | 2.59 | <1.00 | 1.14 | NA |
| | 1/28/2020 DUP | 23.8 | 0.622 J | 1.44 | NA | 26.1 | <1.00 | 1.19 | NA |
| | 3/25/2021 | 5.22 | 1.49 J | 0.315 | NA | 2.49 | <2.00 | <0.20 | NA |
| | 3/25/2021 DUP | 4.89 | 1.43 J | 0.293 | NA | 2.26 | <2.00 | <0.20 | NA |
| KMW11 | 1/29/2020 | 1.76 | 6.69 | 4.72 | NA | 1.56 | <1.00 | <0.20 B | NA |
| | 9/30/2020 | 5.10 | 1.43 J | 0.136 J | <4.00 | 4.76 | <2.00 | <0.20 | <4.00 |
| | 3/25/2021 | 3.77 | 1.95 J | 0.35 | NA | 3.60 | <2.00 | 0.224 | NA |
| | 10/6/2021 | 5.61 | <2.00 | 0.204 | NA | 5.76 | <2.00 | <0.20 | NA |
| KMW18 | 1/28/2020 | 17.6 | 3.00 | 0.837 | NA | 16.1 | 0.624 J | 0.332 | NA |
| | 1/28/2020 DUP | 17.3 | 2.76 | 0.84 | NA | 15.8 | 0.595 J | 0.321 | NA |
| | 9/29/2020 | 7.19 | <2.00 | 0.271 | <4.00 | 6.81 | <2.00 | 0.239 | <4.00 |
| | 9/29/2020 DUP | 6.87 | 1.16 J | 0.276 | <4.00 | 6.84 | <2.00 | 0.195 J | <4.00 |
| | 3/23/2021 | 0.575 J | 1.31 J | 0.38 | NA | <1.00 | <2.00 | <0.20 | NA |
| | 3/23/2021 DUP | 0.627 J | 1.31 J | 0.384 | NA | <1.00 | <2.00 | <0.20 | NA |
| | 10/7/2021 | 2.14 | 2.91 | 0.728 | NA | 1.71 | <2.00 | <0.20 | NA |
| | 10/7/2021 DUP | 2.16 | 3.03 | 0.624 | NA | 1.69 | <2.00 | <0.20 | NA |

*Please refer to notes at end of table.*

# Table 16

## Groundwater Analytical Data – Total and Dissolved Metals

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Well ID | Sample Date | Analytical Results (µg/L) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Total Arsenic | Total Copper | Total Lead | Total Zinc | Dissolved Arsenic | Dissolved Copper | Dissolved Lead | Dissolved Zinc |
| *ROD Groundwater Cleanup Goal* | | -- | -- | -- | -- | *5.0* | *12* | *3.2* | -- |
| *PHSS Cleanup Level* | | -- | -- | -- | -- | *0.018* | *2.74* | *0.54* | *36* |
| *Portland Harbor JSCS SLV* | | -- | -- | -- | -- | *0.045* | *2.7* | *0.54* | *36* |
| KMW19 | 1/28/2020 | 4.16 | 1.14 | 0.441 | NA | 4.33 | <1.00 | <0.20 | NA |
| | 9/29/2020 | 4.69 | <2.00 | 0.217 | 3.05 J | 4.62 | <2.00 | <0.20 | <4.00 |
| | 3/23/2021 | 3.87 | 1.17 J | 0.446 | NA | 4.07 | <2.00 | <0.20 | NA |
| | 10/6/2021 | 4.12 | <2.00 | 0.258 | NA | 4.22 | <2.00 | <0.20 | NA |
| KMW35 | 1/28/2020 | 9.69 | 0.82 J | 2.88 | NA | 9.75 | <1.00 | 2.30 | NA |
| | 9/30/2020 | 9.20 | <2.00 | 3.12 | <4.00 | 8.90 | <2.00 | 2.69 | <4.00 |
| | 3/25/2021 | 8.72 | 1.31 J | 2.38 | NA | 8.78 | <2.00 Q-42 | 1.89 | NA |
| | 10/6/2021 | 11.3 | 6.62 | 9.16 | NA | 11.3 | <2.00 | 0.619 | NA |
| MW41A | 1/28/2020 | 3.57 | 0.695 J | 0.325 | NA | 3.33 | <1.00 | 0.226 | NA |
| | 9/30/2020 | 5.85 | <2.00 | 0.505 | <4.00 | 5.44 | <2.00 | 0.502 | <4.00 |
| | 3/25/2021 | 2.9 | <2.00 | 0.175 J | NA | 2.37 | <2.00 | 0.158 J | NA |
| | 10/6/2021 | 18.5 | <2.00 | 0.995 | NA | 7.83 | <2.00 | 0.511 | NA |
| ***Loading Rack*** | | | | | | | | | |
| KMW13* | 1/30/2020 | 13.0 | 1.76 | 2.3 | NA | 12.9 | <1.00 | 0.777 | NA |
| | 10/1/2020 | 19.6 | <2.00 | 1.66 | <4.00 | 18.6 | <2.00 | 1.37 | <4.00 |
| | 3/25/2021 | 23.5 | <2.00 | 0.351 | NA | 22.8 | <2.00 | 0.17 J | NA |
| | 3/25/2021 DUP | 22.9 | <2.00 | 0.347 | NA | 22.4 | <2.00 | 0.17 J | NA |
| | 10/7/2021 | 23.2 | 2.6 | 3.33 | NA | 26.3 | <2.00 | 0.678 | NA |
| KMW14* | Well KMW14 has been removed from the groundwater monitoring program.[12] | | | | | | | | |

*Please refer to notes at end of table.*

# Table 16

## Groundwater Analytical Data – Total and Dissolved Metals

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Well ID | Sample Date | Analytical Results (µg/L) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Total Arsenic | Total Copper | Total Lead | Total Zinc | Dissolved Arsenic | Dissolved Copper | Dissolved Lead | Dissolved Zinc |
| *ROD Groundwater Cleanup Goal* | | -- | -- | -- | -- | *5.0* | *12* | *3.2* | -- |
| *PHSS Cleanup Level* | | -- | -- | -- | -- | *0.018* | *2.74* | *0.54* | *36* |
| *Portland Harbor JSCS SLV* | | -- | -- | -- | -- | *0.045* | *2.7* | *0.54* | *36* |
| MW38* | 6/25/2020 | 32.2 | <1.00 | 2.98 | NA | 33.3 | <0.001 | <2.69 | NS |
| | 10/1/2020 | 19.9 | <2.00 | 0.331 | <4.00 | 20.0 | <2.00 | 0.331 | <4.00 |
| | 3/25/2021 | 29.1 | <2.00 | 2.45 | NA | 29.7 | <2.00 | 2.09 | NA |
| | 10/7/2021 | 28.0 | <2.00 | 0.89 | NA | 27.9 | <2.00 | 0.457 | NA |
| MW39* | 1/30/2020 | 62.1 | 1.72 | 1.74 | NA | 63.9 | <1.00 | 1.57 | NA |
| | 10/1/2020 | 61.7 | 1.08 J | 1.75 | 2.4 J | 60.4 | <2.00 | 1.40 | <4.00 |
| | 3/25/2021 | 62.2 | <2.00 | 1.19 | NA | 62.3 | <2.00 | 0.97 | NA |
| | 10/7/2021 | 66.7 | <2.00 | 1.04 | NA | 68.4 | <2.00 | 1.08 | NA |
| MW40 | 2/8/2018 | 1.44 J | 0.863 J | 0.281 J | NA | 1.33 J | 0.952 J | 0.861 J | NA |
| | 3/13/2019 | 0.705 J | <1.00 | <0.20 | NA | <1.00 | <1.00 | <0.20 | NA |
| | 1/28/2020 | <1.00 | 0.517 J | <0.20 | NA | <1.00 | 0.5 J | <0.20 | NA |
| | 3/23/2021 | <1.00 | <2.00 | <0.20 | NA | <1.00 | <2.00 | <0.20 | NA |
| MW41B* | 1/28/2020 | 1.15 | 0.921 J | 0.363 | NA | 1.10 | <1.00 | <0.20 | NA |
| | 9/30/2020 | 0.96 J | <2.00 | 0.235 | 4.19 | 0.941 J | <2.00 | <0.20 | <4.00 |
| | 3/25/2021 | 1.04 | <2.00 | <0.20 | NA | 0.925 J | <2.00 | <0.20 | NA |
| | 10/6/2021 | 1.30 | <2.00 | <0.200 | NA | 1.29 | <2.00 | <0.20 | NA |
| MW43 | 1/30/2020 | 34.5 | <1.00 | 1.04 | NA | 36.5 | <1.00 | 1.00 | NA |
| | 9/30/2020 | 33.0 | <2.00 | 0.517 | <4.00 | 33.7 | <2.00 | 0.413 | 2.61 J |
| | 3/25/2021 | 36.0 | <2.00 | 0.891 | NA | 35.0 | <2.00 | 0.712 | NA |
| | 10/7/2021 | 34.8 | <2.00 | 1.17 | NA | 35 | <2.00 | 0.561 | NA |

*Please refer to notes at end of table.*

# Table 16

## Groundwater Analytical Data – Total and Dissolved Metals

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Well ID | Sample Date | Analytical Results (µg/L) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Total Arsenic | Total Copper | Total Lead | Total Zinc | Dissolved Arsenic | Dissolved Copper | Dissolved Lead | Dissolved Zinc |
| *ROD Groundwater Cleanup Goal* | | -- | -- | -- | -- | *5.0* | *12* | *3.2* | -- |
| *PHSS Cleanup Level* | | -- | -- | -- | -- | *0.018* | *2.74* | *0.54* | *36* |
| *Portland Harbor JSCS SLV* | | -- | -- | -- | -- | *0.045* | *2.7* | *0.54* | *36* |
| MW44* | 1/30/2020 | 9.56 | <1.00 | 0.105 J | NA | 8.77 | 0.565 J | <0.20 | NA |
| | 9/30/2020 | 9.62 | <2.00 | <0.20 | <4.00 | 8.68 | <2.00 | <0.20 | <4.00 |
| | 3/25/2021 | 9.13 | <2.00 | 0.256 | NA | 8.22 | <2.00 | <0.20 | NA |
| | 10/6/2021 | 12.8 | <2.00 | <0.20 | NA | 12.9 | <2.00 | <0.20 | NA |
| MW45* | 2/8/2018 | 1.37 J | 1.48 J | <2.00 | NA | 1.51 J | 3.2 J | 5.78 | NA |
| | 3/13/2019 | 0.639 J | 1.29 | 0.101 J | NA | 0.617 J | 0.892 | <0.20 | NA |
| | 1/30/2020 | .513 J | 1.63 J | 0.11 | 2.76 J | <1.00 | 1.27 | 0.103 | <4.00 |
| | 3/23/2021 | 0.64 J | 2.21 | 0.261 | NA | 0.597 J | 1.09 J | <0.20 | NA |
| MW46* | 1/29/2020 | 0.55 J | 2.83 | 1.02 | NA | 0.575 J | 1.51 | <0.20 B | NA |
| | 9/29/2020 | 2.59 | 1.19 J | 0.311 | 2.76 J | 2.72 | <1.00 | <0.10 B | <4.00 |
| | 3/25/2021 | 2.81 | 1.31 J | 0.158 J | NA | 2.68 | <2.00 | <0.20 | NA |
| | 10/6/2021 | 3.15 | <2.00 | 0.202 | NA | 3.23 | <2.00 | <0.20 | NA |
| ***DPE Treatment Area*** | | | | | | | | | |
| EX-07L | 1/29/2020 | <1.00 | 2.47 | 0.634 | NA | <1.00 | 1.60 | <0.20 B | NA |
| | 9/29/2020 | 0.553 J | 1.40 J | 0.247 | 7.92 | <1.00 Q-42 | <2.00 | 0.132 J | 9.79 |
| | 3/24/2021 | <1.00 | 3.53 | 0.523 | NA | <1.00 | 3.55 | 0.141 J | NA |
| | 10/5/2021 | <1.00 | 2.01 | 0.27 | NA | <1.00 | <2.00 | <0.200 | NA |
| KMW29 | 1/29/2020 | 13.8 | 1.24 | 0.801 | NA | 13 | <1.00 | 0.645 | NA |
| | 9/29/2020 | 16.8 | 1.09 J | 1.28 | 2.31 J | 15.9 | <2.00 | 1.11 | <4.00 |
| | 3/24/2021 | 5.98 | 1.18 J | 0.957 | NA | 4.82 | <2.00 | 0.349 | NA |
| | 10/5/2021 | 16.2 | <2.00 | 1.06 | NA | 16.7 | <2.00 | 1.09 | NA |

*Please refer to notes at end of table.*

# Table 16

## Groundwater Analytical Data – Total and Dissolved Metals

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Well ID | Sample Date | Analytical Results (µg/L) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Total Arsenic | Total Copper | Total Lead | Total Zinc | Dissolved Arsenic | Dissolved Copper | Dissolved Lead | Dissolved Zinc |
| *ROD Groundwater Cleanup Goal* | | -- | -- | -- | -- | *5.0* | *12* | *3.2* | -- |
| *PHSS Cleanup Level* | | -- | -- | -- | -- | *0.018* | *2.74* | *0.54* | *36* |
| *Portland Harbor JSCS SLV* | | -- | -- | -- | -- | *0.045* | *2.7* | *0.54* | *36* |
| KMW30 | 1/29/2020 | <1.00 | 1.55 | 0.121 J | NA | <1.00 | 1.37 | 0.144 J,B | NA |
| | 9/29/2020 | 1.89 | 1.84 J | 0.265 | 2.61 J | 1.91 | 1.45 J | 0.223 | <4.00 |
| | 3/24/2021 | 1.27 | 2.28 | 0.128 J | NA | 1.23 | 1.49 J | <0.20 | NA |
| | 3/24/2021 DUP | 1.21 | 2.36 | 0.12 J | NA | 1.20 | 2.45 | <0.20 | NA |
| | 10/5/2021 | 4.85 | <2.00 | 0.30 | NA | 4.46 | <2.00 | 0.27 | NA |
| KMW31 | 1/29/2020 | 2.79 | 2.41 | 1.26 | NA | 2.30 | 3.63 | 0.652 | NA |
| | 1/29/2020 DUP | 2.98 | 2.39 | 1.23 | NA | 2.37 | <1.00 | 0.649 | NA |
| | 9/29/2020 | 1.66 | <2.00 | 0.954 | <4.00 | 1.62 | <2.00 | 0.874 | <4.00 |
| | 3/24/2021 | 2.07 | <2.00 | 0.417 | NA | 1.98 | <2.00 | 0.351 | NA |
| | 10/5/2021 | 1.68 | <2.00 | 0.715 | NA | 1.71 | <2.00 | 0.663 | NA |
| KMW32 | 1/29/2020 | 0.601 J | 4.62 | 0.427 | NA | 0.611 J | 3.31 | 0.116 J | NA |
| | 9/29/2020 | 0.61 J | 3.87 | 0.645 | 3.46 J | <1.00 | 1.90 J | 0.25 | <4.00 |
| | 3/24/2021 | 1.37 | 4.04 | 1.26 | NA | 1.44 | 2.0 | 0.95 | NA |
| | 3/24/2021 DUP | 1.01 | 4.46 | 1.27 | NA | 1.50 | 2.13 | 0.98 | NA |
| | 10/5/2021 | <1.00 | 6.28 | 0.593 | NA | <1.00 | 2.93 | 0.478 | NA |
| KMW33 | 1/29/2020 | 2.68 | 1.07 | 0.186 J | NA | 2.42 | <1.00 | <0.20 | NA |
| | 9/29/2020 | 1.27 | <2.00 | <0.20 | <4.00 | 1.42 | <2.00 | <0.20 | <4.00 |
| | 3/24/2021 | 1.38 | 1.89 J | 0.131 J | NA | 1.46 | <2.00 | <0.20 | NA |
| | 10/6/2021 | 1.58 | <2.00 | <0.20 | NA | 1.58 | <2.00 | <0.20 | NA |

*Please refer to notes at end of table.*

# Table 16

## Groundwater Analytical Data – Total and Dissolved Metals

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Well ID | Sample Date | Analytical Results (µg/L) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Total Arsenic | Total Copper | Total Lead | Total Zinc | Dissolved Arsenic | Dissolved Copper | Dissolved Lead | Dissolved Zinc |
| *ROD Groundwater Cleanup Goal* | | -- | -- | -- | -- | *5.0* | *12* | *3.2* | -- |
| *PHSS Cleanup Level* | | -- | -- | -- | -- | *0.018* | *2.74* | *0.54* | *36* |
| *Portland Harbor JSCS SLV* | | -- | -- | -- | -- | *0.045* | *2.7* | *0.54* | *36* |
| KMW37 | 1/29/2020 | 15.3 | 4.64 | 0.934 | NA | 18.3 | 1.09 | 0.672 | NA |
| | 9/30/2020 | 31.5 | 4.80 | 2.56 | 2.71 J | 31.5 | <2.00 | 2.13 | <4.00 |
| | 3/24/2021 | 27.4 | <2.00 | 1.76 | NA | 27.4 | <2.00 | 1.63 | NA |
| | 10/6/2021 | 23.8 | <2.00 | 2.14 | NA | 23.8 | <2.00 | 2.08 | NA |
| MW47 | 1/29/2020 | 4.65 | 1.13 | 0.682 | NA | 3.72 | <1.00 | 0.182 J | NA |
| | 9/29/2020 | 1.78 | <2.00 | 0.284 | 2.63 J | 1.62 | <2.00 | 0.188 J | <4.00 |
| | 3/24/2021 | 5.07 | 1.13 J | 0.534 | NA | 4.91 | <2.00 | 0.18 J | NA |
| | 10/6/2021 | 2.39 | <2.00 | 0.291 | NA | 2.30 | <2.00 | 0.253 | NA |
| MW48 | 1/29/2020 | 3.14 | 2.33 | 0.247 | NA | 2.57 | 0.811 J | <0.20 B | NA |
| | 1/29/2020 DUP | 3.17 | 1.88 | 0.261 | NA | 2.85 | 0.806 J | <0.20 B | NA |
| | 9/29/2020 | 3.29 | <2.00 | <0.20 | <4.00 | 3.20 | <2.00 | <0.20 | <4.00 |
| | 9/29/2020 DUP | 3.21 | 1.04 J | <0.20 | <4.00 | 3.20 | <2.00 | <0.20 | <4.00 |
| | 3/24/2021 | 1.55 | <2.00 | <0.20 | NA | 1.43 | <2.00 | <0.20 | NA |
| | 10/5/2021 | 2.71 | 2.74 | 1.39 | NA | 2.77 | <2.00 | <0.20 | NA |
| | 10/5/2021 DUP | 2.72 | <2.00 | <0.20 | NA | 2.76 | <2.00 | <0.20 | NA |
| MW49 | 1/29/2020 | 9.43 | <1.00 | 0.588 | NA | 9.19 | <1.00 | 0.219 | NA |
| | 9/29/2020 | 9.00 | <2.00 | 0.296 | <4.00 | 8.72 | <2.00 | 0.311 | <4.00 |
| | 3/24/2021 | 7.85 | <2.00 | 0.423 | NA | 7.70 | <2.00 | 0.56 | NA |
| | 10/6/2021 | 9.92 | <2.00 | 0.378 | NA | 9.97 | <2.00 | 0.416 | NA |

*Please refer to notes at end of table.*

# Table 16

## Groundwater Analytical Data – Total and Dissolved Metals

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Well ID | Sample Date | Analytical Results (µg/L) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Total Arsenic | Total Copper | Total Lead | Total Zinc | Dissolved Arsenic | Dissolved Copper | Dissolved Lead | Dissolved Zinc |
| *ROD Groundwater Cleanup Goal* | | -- | -- | -- | -- | *5.0* | *12* | *3.2* | -- |
| *PHSS Cleanup Level* | | -- | -- | -- | -- | *0.018* | *2.74* | *0.54* | *36* |
| *Portland Harbor JSCS SLV* | | -- | -- | -- | -- | *0.045* | *2.7* | *0.54* | *36* |
| ***Slurry Wall*** | | | | | | | | | |
| KMW36 | 1/29/2020 | 1.09 | <1.00 | 0.625 | NA | 0.949 J | <1.00 | 0.453 | NA |
| | 9/30/2020 | <1.00 | <2.00 | 0.275 | 2.08 J | <1.00 | <2.00 | 0.279 | <4.00 |
| | 3/24/2021 | 1.72 | <2.00 | 0.411 | NA | 1.20 | <2.00 | 0.123 J | NA |
| | 10/6/2021 | <1.00 | <2.00 | 0.275 | NA | <1.00 | <2.00 | <0.20 | NA |
| W-16 | 1/29/2020 | 18.1 | <1.00 | 1.42 | NA | 18.3 | <1.00 | 1.10 | NA |
| | 10/1/2020 | 5.44 | 1.01 J | 0.366 | 18.8 | 4.98 | <2.00 | 0.218 | 12.9 |
| | 3/25/2021 | 4.13 | <2.00 | 0.673 | NA | 3.65 | <2.00 | 0.58 | NA |
| | 10/6/2021 | 5.55 | <2.00 | 0.367 | NA | 5.53 | <2.00 | 0.226 | NA |
| W-19 | 2/8/2018 | 93 | 12.2 | 1.95 J | NA | 12.0 | 0.858 J | <2.00 | NA |
| | 3/15/2019 | 4.8 | <1.00 | <0.20 | NA | 3.83 | <1.00 | <0.20 | NA |
| | 1/30/2020 | 16.7 | <1.00 | 0.163 J | NA | 12.6 | <1.00 | <0.20 | NA |
| | 3/25/2021 | 6.07 | <2.00 | <0.20 | NA | 2.74 | <2.00 | <0.20 | NA |
| W-20 | 2/8/2018 | 26.6 | 1.93 J | 0.602 J | NA | 12.2 | 1.05 J | <2.00 | NA |
| | 3/15/2019 | 9.42 | 0.596 J | 0.103 J | NA | 0.986 J | <1.00 | <0.20 | NA |
| | 1/30/2020 | 8.09 | 0.947 J | 0.145 J | NA | 1.54 | <1.00 | <0.20 | NA |
| | 3/25/2021 | 5.32 | <2.00 | 0.147 J | NA | 0.617 J | <2.00 | <0.20 | NA |
| W-22 | 2/8/2018 | 3.21 | 8.30 | 6.06 | NA | 1.18 J | 1.18 J | 0.687 J | NA |
| | 3/15/2019 | <1.00 | 0.966 J | 0.286 | NA | <1.00 | 0.795 J | <0.20 | NA |
| | 1/30/2020 | <1.00 | 1.13 | 0.345 | NA | <1.00 | 0.683 J | <0.20 | NA |
| | 3/23/2021 | <1.00 | 1.2 J | 0.263 | NA | <1.00 | <2.00 | <0.20 | NA |

*Please refer to notes at end of table.*

# Table 16

## Groundwater Analytical Data – Total and Dissolved Metals

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Well ID | Sample Date | Analytical Results (µg/L) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Total Arsenic | Total Copper | Total Lead | Total Zinc | Dissolved Arsenic | Dissolved Copper | Dissolved Lead | Dissolved Zinc |
| *ROD Groundwater Cleanup Goal* | | -- | -- | -- | -- | *5.0* | *12* | *3.2* | -- |
| *PHSS Cleanup Level* | | -- | -- | -- | -- | *0.018* | *2.74* | *0.54* | 36 |
| *Portland Harbor JSCS SLV* | | -- | -- | -- | -- | *0.045* | *2.7* | *0.54* | *36* |
| ***Site-Wide*** | | | | | | | | | |
| KMW01 | 02/09/2018 | 1.14 J | 0.871 J | <2.00 | NA | 1.04 J | <5.00 | <2.00 | NA |
| | 3/15/2019 | 2.26 | <1.00 | 0.106 J | NA | 1.29 | <1.00 | <0.20 | NA |
| | 1/29/2020 | 1.19 | 0.000536 J | 0.113 J | NA | 0.89 J | <1.00 | <0.20 | NA |
| | 3/23/2021 | <1.00 | <2.00 | 0.14 J | NA | <1.00 | <2.00 | <0.20 | NA |
| KMW02 | 1/29/2020 | 2.41 | <1.00 | <0.20 | 3.42 | 1.95 | <1.00 | <0.20 | 2.26 |
| | 10/1/2020 | 3.44 | <2.00 | <0.20 | <4.00 | 3.19 | <2.00 | <0.20 | 2.23 |
| | 3/23/2021 | 1.82 | <2.00 | <0.20 | 3.5 | 0.697 | <2.00 | <0.20 | 3.15 |
| | 10/7/2021 | 3.52 | <2.00 | <0.20 | <4.00 | 3.13 | <2.00 | <0.20 | <4.00 |
| KMW05 | 2/8/2018 | 2.17 | <5.00 | 0.404 J | NA | 2.23 | <5.00 | 0.311 J | NA |
| | 3/13/2019 | 1.35 | 0.51 J | 0.335 | NA | 1.26 | <1.00 | 0.126 J | NA |
| | 1/28/2020 | 1.46 | <1.00 | 0.223 | NA | 1.49 | <1.00 | 0.108 J | NA |
| | 3/23/2021 | 1.16 | 1.61 J | 0.234 | NA | 1.10 | <2.00 | <0.20 | NA |
| KMW09 | 2/6/2018 | 1.01 J | 1.85 BJ | 0.388 BJ | NA | 1.08 J | 1.89 J | 0.325 J | NA |
| | 3/13/2019 | <1.00 | 1.32 | 0.109 J | NA | <1.00 | 0.75 J | <0.20 | NA |
| | 1/29/2020 | <1.00 | 1.31 | 0.324 | NA | <1.00 | 0.99 J | <0.20 B | NA |
| | 3/23/2021 | <1.00 | 1.92 J | <0.20 | NA | <1.00 | 1.06 J,Q-42 | <0.20 | NA |

*Please refer to notes at end of table.*

# Table 16

## Groundwater Analytical Data – Total and Dissolved Metals

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Well ID | Sample Date | Analytical Results (µg/L) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Total Arsenic | Total Copper | Total Lead | Total Zinc | Dissolved Arsenic | Dissolved Copper | Dissolved Lead | Dissolved Zinc |
| *ROD Groundwater Cleanup Goal* | | -- | -- | -- | -- | *5.0* | *12* | *3.2* | -- |
| *PHSS Cleanup Level* | | -- | -- | -- | -- | *0.018* | *2.74* | *0.54* | *36* |
| *Portland Harbor JSCS SLV* | | -- | -- | -- | -- | *0.045* | *2.7* | *0.54* | *36* |
| KMW10* | 1/29/2020 | 1.16 | 1.03 | 0.529 | NA | 0.993 J | <1.00 | <0.20 | NA |
| | 9/29/2020 | 1.09 | <2.00 | 0.276 | 8.53 | 0.957 J | <2.00 | <0.20 | 6.94 |
| | 3/23/2021 | 1.14 | <2.00 | 0.174 J | NA | 1.01 | <2.00 | <0.20 | NA |
| | 10/7/2021 | 1.43 | <2.00 | <0.20 | NA | 1.43 | <2.00 | <0.20 | NA |
| KMW16* | 2/9/2018 | 1.79 J | 0.632 J | 1.01 BJ | NA | 1.75 J | <5.00 | <2.00 | NA |
| | 3/14/2019 | 0.908 J | <1.00 | 0.106 J | NA | 0.919 J | <1.00 | <0.20 | NA |
| | 1/30/2020 | 0.882 J | <1.00 | <0.20 | NA | 0.864 J | <1.00 | <0.20 | NA |
| | 3/25/2021 | 0.789 J | <2.00 | 0.127 J | NA | 0.829 J | <2.00 | <0.20 | NA |
| KMW20 | 2/9/2018 | 6.20 | 0.698 J | <2.00 | NA | 1.69 J | <5.00 | 0.281 J | NA |
| | 3/14/2019 | 4.62 | <1.00 | 0.317 | NA | 0.759 J | <1.00 | <0.20 | NA |
| | 1/30/2020 | 8.74 | <1.00 | 0.193 J | NA | 1.03 | <1.00 | <0.20 | NA |
| | 3/23/2021 | 5.08 | 2.00 | 0.172 J | NA | 1.67 | <2.00 | <0.20 | NA |
| KMW21 | 2/9/2018 | 3.39 | <5.00 | <2.00 | NA | 2.69 | <5.00 | <2.00 | NA |
| | 3/14/2019 | 2.29 | <1.00 | <0.20 | NA | 2.14 | <1.00 | <0.20 | NA |
| | 1/30/2020 | 2.41 | <1.00 | <0.20 | NA | 1.98 | <1.00 | <0.20 | NA |
| | 3/23/2021 | 1.35 | <2.00 | <0.20 | NA | 0.727 J | 1.74 J | <0.20 | NA |
| KMW24* | 2/9/2018 | 9.77 | 2.94 J | 12.80 | NA | 7.80 | 0.55 J | <2.00 | NA |
| | 3/13/2019 | 6.87 | 0.774 J | 3.26 | NA | 5.89 | <1.00 | <0.20 | NA |
| | 1/30/2020 | 7.18 | 0.632 J | 1.57 | NA | 6.97 | <1.00 | <0.20 | NA |
| | 3/25/2021 | 7.13 | <2.00 | 1.31 | NA | 6.90 | <2.00 | <0.20 | NA |

*Please refer to notes at end of table.*

# Table 16

## Groundwater Analytical Data – Total and Dissolved Metals

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Well ID | Sample Date | Analytical Results (µg/L) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Total Arsenic | Total Copper | Total Lead | Total Zinc | Dissolved Arsenic | Dissolved Copper | Dissolved Lead | Dissolved Zinc |
| *ROD Groundwater Cleanup Goal* | | -- | -- | -- | -- | *5.0* | *12* | *3.2* | -- |
| *PHSS Cleanup Level* | | -- | -- | -- | -- | *0.018* | *2.74* | *0.54* | *36* |
| *Portland Harbor JSCS SLV* | | -- | -- | -- | -- | *0.045* | *2.7* | *0.54* | *36* |
| KMW26* | 2/9/2018 | 3.14 | 1.27 J | <2.00 | NA | 2.62 | 1.07 J | 0.307 J | NA |
| | 3/13/2019 | 1.99 | 0.912 J | 0.169 J | NA | 1.75 | 0.695 J | <0.20 | NA |
| | 1/30/2020 | 1.46 | 1.73 | 0.391 | NA | 1.19 | 1.15 | 0.112 J | NA |
| | 3/25/2021 | 2.30 | 1.03 J | 0.193 J | NA | 2.36 | 1.32 J | <0.20 | NA |
| MW42 | 2/8/2018 | 1.21 J | 0.594 J | 0.255 J | NA | 1.12 J | 0.72 J | <2.00 | NA |
| | 3/14/2019 | 1.24 | 0.986 J | 0.135 J | NA | <1.00 | <1.00 | <0.20 | NA |
| | 1/30/2020 | 0.534 J | <1.00 | <0.20 | NA | <1.00 | 3.14 | <0.20 | NA |
| | 3/25/2021 | <1.00 | 1.65 J,Q-42 | 0.679 | NA | <1.00 | <2.00 | <0.20 | NA |
| W-15 | 1/29/2020 | 27 | 0.543 J | 1.76 | NA | 27.6 | <1.00 | 1.18 | NA |
| | 9/30/2020 | 22.7 | <2.00 | 1.75 | 10.8 | 22.5 | <2.00 | 1.28 | <4.00 |
| | 3/24/2021 | 10.4 | <2.00 | 2 | NA | 10.2 | <2.00 | 1.41 | NA |
| | 10/6/2021 | 21.0 | <2.00 | 1.33 | NA | 20.8 | <2.00 | 1.07 | NA |
| | 10/6/2021 DUP | 21.5 | <10.0 | 3.35 | NA | 20.6 | <2.00 | 1.21 | NA |
| *Southern Facility Area* | | | | | | | | | |
| MW-1 | 2/2/2012 | 1.42 | 4.10 | 2.97 | 11.5 | 0.107 | <0.018 | <0.027 | 2.14 |
| | 12/29/2020 | <1.00 | <2.00 | 0.243 | <4.00 | <1.00 | <2.00 | <0.20 | <4.00 |
| | 12/29/2020 DUP | <1.00 | <2.00 | 0.307 | <4.00 | <1.00 | <2.00 | <0.20 | <4.00 |
| MW-2 | 2/2/2012 | 3.18 | 0.48 | 0.237 | 1.1 | 1.04 | <0.018 | <0.027 | 1.70 |
| | 12/29/2020 | 2.33 | <2.00 | <0.20 | <4.00 | 2.33 | <2.00 | <0.20 | <4.00 |
| | 3/23/2021 | 1.99 | <2.00 | 0.159 J | NA | 1.43 | <2.00 | <0.20 | NA |
| | 10/7/2021 | 2.35 | <2.00 | <0.20 | NA | 2.43 | <2.00 | <0.20 | NA |
| MW-3 | 2/2/2012 | 0.199 | 0.33 | 0.046 | 0.51 | 0.14 | <0.018 | <0.027 | 2.00 |
| | 12/29/2020 | <1.00 | <2.00 | <0.20 | <4.00 | <1.00 | <2.00 | <0.20 | <4.00 |
| | 3/23/2021 | <1.00 | <2.00 | <0.20 | NA | <1.00 | <2.00 | <0.20 | NA |
| | 10/7/2021 | <1.00 | <2.00 | <0.20 | NA | <1.00 | <2.00 | <0.20 | NA |
| | 10/7/2021 DUP | <1.00 | <2.00 | <0.20 | NA | <1.00 | <2.00 | <0.20 | NA |

*Please refer to notes at end of table.*

# Table 16

## Groundwater Analytical Data – Total and Dissolved Metals

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Well ID | Sample Date | Analytical Results (µg/L) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Total Arsenic | Total Copper | Total Lead | Total Zinc | Dissolved Arsenic | Dissolved Copper | Dissolved Lead | Dissolved Zinc |
| *ROD Groundwater Cleanup Goal* | | -- | -- | -- | -- | *5.0* | *12* | *3.2* | -- |
| *PHSS Cleanup Level* | | -- | -- | -- | -- | *0.018* | *2.74* | *0.54* | 36 |
| *Portland Harbor JSCS SLV* | | -- | -- | -- | -- | *0.045* | *2.7* | *0.54* | *36* |
| MW-4 | 2/2/2012 | 0.389 | 0.941 | 0.079 | 3.2 | 0.144 | <0.018 | <0.027 | 2.65 |
| | 12/29/2020 | <1.00 | <2.00 | <0.20 | <4.00 | <1.00 | <2.00 | <0.20 | <4.00 |
| | 3/23/2021 | <1.00 | <2.00 | <0.20 | NA | <1.00 | <2.00 | <0.20 | NA |
| | 10/7/2021 | <1.00 | <2.00 | <0.20 | NA | <1.00 | <2.00 | <0.20 | NA |
| VRUMW-1 | 2/2/2012 | 1.03 | 0.48 | 0.119 | 2.52 | 0.764 | <0.018 | <0.027 | 2.08 |
| | 12/28/2020 | 1.00 | <2.00 | <0.20 | 2.14 J | 0.886 J | <2.00 | <0.20 | <4.00 |
| VRUMW-2 | 2/2/2012 | 0.701 | 0.861 | 0.166 | 3.08 | 0.399 | 0.42 | <0.027 | 1.90 |
| | 12/28/2020 | 1.66 | <2.00 | 0.23 | 5.84 | 1.44 | <2.00 | <0.20 | <4.00 |
| VO-1 | 2/1/2012 | 0.257 | 0.36 | <0.014 | 1.1 | <0.032 | <0.018 | <0.027 | 1.20 |
| | 2/1/2012 DUP | 0.276 | <0.151 | <0.014 | 0.52 | <0.032 | <0.018 | <0.027 | 2.55 |
| | 12/28/2020 | 0.541 J | <2.00 | <0.20 | <4.00 | <1.00 | <2.00 | <0.20 | <4.00 |
| VO-2 | 2/2/2012 | 0.351 | <0.151 | <0.014 | 0.65 | 0.309 | <0.018 | <0.027 | 1.70 |
| | 12/28/2020 | <1.00 | <2.00 | <0.20 | <4.00 | <1.00 | <2.00 | <0.20 | <4.00 |
| VO-3 | 2/2/2012 | 0.35 | 1.24 | 0.103 | 4.25 | 0.262 | 0.991 | <0.027 | 5.00 |
| | 12/29/2020 | <1.00 | <2.00 | 0.12 J | <4.00 | <1.00 | <2.00 | <0.20 | <4.00 |

**Notes:**

1. < = Concentration as reported by analytical laboratory is less than the laboratory reporting limit.
2. µg/L = Microgram(s) per liter.
3. EPA = United States Environmental Protection Agency.
4. NS = Not sampled.
5. NA = Not analyzed. Zinc is not a part of the approved monitoring program and is not typically included in the analysis suite; however, it was identified as a
6. DUP = Field Duplicate.
7. Yellow highlighed cells indicate values that are equal to or exceeding 1997 ROD Groundwater Cleanup Goals for the ExxonMobil/Shore Terminals Site.
8. Gray highlighted cells indicate values that are equal to or exceeding PHSS Cleanup Level. If a PHSS Cleanup Level was not developed for an analyte, the JSCS SLV is used for comparison.
9. Green highlighted cells indicate the method reporting limit is greater than the PHSS ROD Cleanup Level or the JSCS SLV (if there is no ROD Cleanup Level)
10. * = Well is screened in Deep Sand unit.
11. Data prior to December 22, 2011 were recorded and previously reported by ExxonMobil.
12. Portland Harbor JSCS SLVs = 2007 Portland Harbor Joint Source Control Strategy Screening Level Values.
13. Well KMW14 was paved over prior to the October 2017 monitoring event. In an email dated February 21, 2018, DEQ agreed that well KMW14 was not critical to monitoring the Loading Rack Area and that replacement of KMW14 was not required. Well KMW14 has been removed from the monitoring program.
14. -- = Not applicable.

**Quality Assurance/Quality Control Data Qualifiers:** J = Reported result is an estimated value; B = Reported analyte was present in the associated method blank.

# Table 17

## Groundwater Analytical Data — Exceedance Factors (TPH, C10 - C12 Aliphatic-Range Hydrocarbons, and BTEX)

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Well ID | Sample Date | Exceedance Factors | | | | | |
|---|---|---|---|---|---|---|---|
| | | Combined TPH | Benzene | Toluene | Ethyl-Benzene | Xylenes | Aliphatic Hydro-carbons C10 - C12 |
| *1997 Site ROD Cleanup Goal (µg/L)* | | *1.0* | *40* | – | – | – | – |
| *PHSS Cleanup Level (µg/L)* | | – | *0.44* | *9.8* | *7.3* | *13* | *2.6* |
| *Portland Harbor JSCS SLV (µg/L)* | | – | *1.2* | *9.8* | *7.3* | *200* | – |
| ***Tank Field 1*** | | | | | | | |
| KMW07 | 3/13/2019 | – | – | – | – | – | NA |
| | 3/13/2019 DUP | – | – | – | – | – | NA |
| | 1/28/2020 | 4.30 | 2.03 | – | 1.60 | – | NA |
| | 1/28/2020 DUP | 4.30 | 2.00 | – | 1.62 | – | NA |
| | 3/25/2021 | – | – | – | – | – | NA |
| | 3/25/2021 DUP | – | – | – | – | – | NA |
| KMW11 | 1/29/2020 | – | – | – | – | – | NA |
| | 9/30/2020 | – | – | – | – | – | NA |
| | 3/25/2021 | – | 3.05 | – | – | – | NA |
| | 10/6/2021 | – | – | – | – | – | NA |
| KMW18 | 1/28/2020 | – | – | – | – | – | NA |
| | 1/28/2020 DUP | – | – | – | – | – | NA |
| | 9/29/2020 | – | 4.73 | – | – | – | NA |
| | 9/29/2020 DUP | – | 3.59 | 3.46 | – | – | NA |
| | 3/23/2021 | – | – | – | – | – | NA |
| | 3/23/2021 DUP | – | – | – | – | – | NA |
| | 10/7/2021 | – | – | – | – | – | NA |
| | 10/7/2021 DUP | – | – | – | – | – | NA |

***Please refer to notes at end of table.***

# Table 17

## Groundwater Analytical Data — Exceedance Factors (TPH, C10 - C12 Aliphatic-Range Hydrocarbons, and BTEX)

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Well ID | Sample Date | Exceedance Factors | | | | | |
|---|---|---|---|---|---|---|---|
| | | Combined TPH | Benzene | Toluene | Ethyl-Benzene | Xylenes | Aliphatic Hydro-carbons C10 - C12 |
| *1997 Site ROD Cleanup Goal (µg/L)* | | *1.0* | *40* | – | – | – | – |
| *PHSS Cleanup Level (µg/L)* | | – | *0.44* | *9.8* | *7.3* | *13* | *2.6* |
| *Portland Harbor JSCS SLV (µg/L)* | | – | *1.2* | *9.8* | *7.3* | *200* | – |
| KMW19 | 1/28/2020 | – | – | – | – | – | NA |
| | 9/29/2020 | – | – | – | – | – | NA |
| | 3/23/2021 | – | – | – | – | – | NA |
| | 10/6/2021 | – | – | – | – | – | NA |
| KMW35 | 1/28/2020 | 6.02 | 1.22 | – | – | – | NA |
| | 9/30/2020 | 6.01 | 1.55 | – | – | – | NA |
| | 3/25/2021 | 3.10 | – | – | – | – | NA |
| | 10/6/2021 | 3.55 | – | – | – | – | NA |
| MW41A | 1/28/2020 | – | – | – | – | – | NA |
| | 9/30/2020 | – | – | – | – | – | NA |
| | 3/25/2021 | – | – | – | – | – | NA |
| | 10/6/2021 | – | – | – | – | – | NA |
| ***Tank 3510*** | | | | | | | |
| AC2 | 1/30/2020 | – | – | – | – | – | NA |
| | 9/30/2020 | – | – | – | – | – | NA |
| | 3/23/2021 | – | – | – | – | – | NA |
| | 10/6/2021 | – | – | – | – | – | NA |
| AC-7 | 1/30/2020 | – | 31.4 | – | – | – | NA |
| | 9/30/2020 | – | – | – | – | – | NA |
| | 3/24/2021 | 1.07 | – | – | – | – | NA |
| | 10/5/2021 | – | – | – | – | – | NA |

***Please refer to notes at end of table.***

# Table 17

**Groundwater Analytical Data — Exceedance Factors (TPH, C10 - C12 Aliphatic-Range Hydrocarbons, and BTEX)**

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Well ID | Sample Date | Exceedance Factors | | | | | |
|---|---|---|---|---|---|---|---|
| | | Combined TPH | Benzene | Toluene | Ethyl-Benzene | Xylenes | Aliphatic Hydro-carbons C10 - C12 |
| *1997 Site ROD Cleanup Goal (µg/L)* | | *1.0* | *40* | – | – | – | – |
| *PHSS Cleanup Level (µg/L)* | | – | *0.44* | *9.8* | *7.3* | *13* | *2.6* |
| *Portland Harbor JSCS SLV (µg/L)* | | – | *1.2* | *9.8* | *7.3* | *200* | – |
| ***Loading Rack*** | | | | | | | |
| AC-8 | 1/30/2020 | 7.12 | 51.0 | 2.00 | 11.8 | 3.7 | NA |
| | 1/30/2020 DUP | 8.67 | 57.8 | 2.30 | 14.5 | 4.4 | NA |
| | 9/30/2020 | 2.44 | 18.0 | 2.04 | -- | 2.31 | NA |
| | 3/25/2021 | 1.49 | 7.28 | – | 2.25 | – | NA |
| | 10/7/2021 | 7.90 | 51.3 | 5.10 | 3.42 | 5.77 | NA |
| AC-9 | 1/28/2020 | Well was not sampled due to the presence of SPH or SPH sheen. | | | | | |
| | 9/30/2020 | Well was not sampled due to the presence of SPH or SPH sheen. | | | | | |
| | 3/23/2021 | Well was not sampled due to the presence of SPH or SPH sheen. | | | | | |
| | 10/5/2021 | Well was not sampled due to the presence of SPH or SPH sheen. | | | | | |
| AC-10* | 1/28/2020 | Well was not sampled due to the presence of SPH or SPH sheen. | | | | | |
| | 9/30/2020 | Well was not sampled due to the presence of SPH or SPH sheen. | | | | | |
| | 3/23/2021 | Well was not sampled due to the presence of SPH or SPH sheen. | | | | | |
| | 10/5/2021 | Well was not sampled due to the presence of SPH or SPH sheen. | | | | | |
| KMW13 | 1/30/2020 | 6.30 | 2.50 | 1.06 | 39.9 | 48.6 | NA |
| | 10/1/2020 | 3.34 | 3.05 | 1.92 | 11.9 | 15.5 | NA |
| | 10/1/2020 DUP | 4.31 | 3.63 | 2.33 | 24.5 | 18.0 | NA |
| | 3/25/2021 | 2.71 | 4.73 | – | -- | 2.85 | NA |
| | 3/25/2021 DUP | 2.68 | 4.65 | – | -- | 2.96 | NA |
| | 10/7/2021 | 4.41 | 1.50 | 1.61 | 2.03 | 13.5 | NA |
| | 10/7/2021 DUP | 4.14 | 1.55 | 1.52 | 2.21 | 12.4 | NA |
| KMW14* | Well KMW14 has been removed from the groundwater monitoring program.[23] | | | | | | |

***Please refer to notes at end of table.***

# Table 17

**Groundwater Analytical Data — Exceedance Factors (TPH, C10 - C12 Aliphatic-Range Hydrocarbons, and BTEX)**

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Well ID | Sample Date | Exceedance Factors | | | | | |
|---|---|---|---|---|---|---|---|
| | | Combined TPH | Benzene | Toluene | Ethyl-Benzene | Xylenes | Aliphatic Hydro-carbons C10 - C12 |
| *1997 Site ROD Cleanup Goal (µg/L)* | | *1.0* | *40* | – | – | – | – |
| *PHSS Cleanup Level (µg/L)* | | – | *0.44* | *9.8* | *7.3* | *13* | *2.6* |
| *Portland Harbor JSCS SLV (µg/L)* | | – | *1.2* | *9.8* | *7.3* | *200* | – |
| MW38* | 6/25/2020 | 4.64 | 18.0 | – | 4.93 | 1.28 | NA |
| | 10/1/2020 | – | 1.24 | – | – | – | NA |
| | 3/25/2021 | 2.67 | 6.93 | – | – | – | NA |
| | 10/7/2021 | 1.26 | 1.19 | – | – | – | NA |
| MW39* | 1/30/2020 | 77.6 | 595 | 13.2 | 156 | 39.2 | NA |
| | 10/1/2020 | 72.4 | 693 | 51.0 | 88.1 | 57.7 | NA |
| | 3/25/2021 | 65.6 | 530 | 10.3 | 35.1 | 12.5 | NA |
| | 10/7/2021 | 84.4 | 550 | 55.3 | 73.4 | 101 | NA |
| MW40 | 2/8/2018 | – | – | – | – | – | NA |
| | 3/13/2019 | – | 6.48 | – | – | – | NA |
| | 1/28/2020 | – | – | – | – | – | NA |
| | 3/23/2021 | – | 5.27 | – | – | – | NA |
| MW41B* | 1/28/2020 | – | – | – | – | – | NA |
| | 9/30/2020 | – | – | – | – | – | NA |
| | 3/25/2021 | – | – | – | – | – | NA |
| | 10/6/2021 | – | – | – | – | – | NA |
| MW43 | 1/30/2020 | 14.7 | 53.8 | 16.3 | 87.3 | 33.9 | NA |
| | 9/30/2020 | 10.3 | 40.5 | 10.8 | 87.3 | 26.8 | NA |
| | 3/25/2021 | 10.9 | 28.0 | 11.2 | 79.6 | 32.0 | NA |
| | 10/7/2021 | 15.4 | 51.0 | 12.1 | 102 | 34.2 | NA |

***Please refer to notes at end of table.***

# Table 17

**Groundwater Analytical Data — Exceedance Factors (TPH, C10 - C12 Aliphatic-Range Hydrocarbons, and BTEX)**

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Well ID | Sample Date | Exceedance Factors | | | | | |
|---|---|---|---|---|---|---|---|
| | | Combined TPH | Benzene | Toluene | Ethyl-Benzene | Xylenes | Aliphatic Hydro-carbons C10 - C12 |
| *1997 Site ROD Cleanup Goal (µg/L)* | | *1.0* | *40* | – | – | – | – |
| *PHSS Cleanup Level (µg/L)* | | – | *0.44* | *9.8* | *7.3* | *13* | *2.6* |
| *Portland Harbor JSCS SLV (µg/L)* | | – | *1.2* | *9.8* | *7.3* | *200* | – |
| MW44 | 1/30/2020 | – | 27.7 | – | – | – | NA |
| | 9/30/2020 | 2.99 | 26.8 | – | 1.6 | – | NA |
| | 3/25/2021 | 1.08 | 7.08 | – | – | – | NA |
| | 10/6/2021 | 4.33 | 33.8 | – | – | – | NA |
| MW45* | 2/8/2018 | – | – | – | – | – | NA |
| | 3/13/2019 | – | – | – | – | – | NA |
| | 1/30/2020 | – | – | – | – | – | NA |
| | 3/23/2021 | – | – | – | – | – | NA |
| MW46 | 1/29/2020 | – | – | – | – | – | NA |
| | 9/29/2020 | – | – | – | – | – | NA |
| | 3/25/2021 | – | – | – | – | – | NA |
| | 10/6/2021 | – | – | – | – | – | NA |
| ***DPE Treatment Area*** | | | | | | | |
| EX-07L | 1/29/2020 | – | – | – | – | – | 7.6 |
| | 9/29/2020 | – | – | – | – | – | 2.7 |
| | 3/24/2021 | – | – | – | – | – | – |
| | 10/5/2021 | – | – | – | – | – | 1.05 |
| KMW29 | 1/29/2020 | 6.06 | 1.3 | – | – | – | 13.3 |
| | 9/29/2020 | 4.28 | 1.9 | – | – | – | 56.9 |
| | 3/24/2021 | 4.00 | – | – | – | – | 13.6 |
| | 10/5/2021 | 4.47 | – | – | – | – | 12.3 |
| KMW30 | 1/29/2020 | – | – | – | – | – | 7.69 |
| | 9/29/2020 | 2.28 | – | – | – | – | 26.2 |
| | 3/24/2021 | – | – | – | – | – | 3.38 |
| | 3/24/2021 DUP | – | – | – | – | – | 3.15 |
| | 10/5/2021 | 2.60 | – | – | – | – | 8.38 |

***Please refer to notes at end of table.***

# Table 17

**Groundwater Analytical Data — Exceedance Factors (TPH, C10 - C12 Aliphatic-Range Hydrocarbons, and BTEX)**

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Well ID | Sample Date | Exceedance Factors | | | | | |
|---|---|---|---|---|---|---|---|
| | | Combined TPH | Benzene | Toluene | Ethyl-Benzene | Xylenes | Aliphatic Hydro-carbons C10 - C12 |
| *1997 Site ROD Cleanup Goal (µg/L)* | | *1.0* | *40* | – | – | – | – |
| *PHSS Cleanup Level (µg/L)* | | – | *0.44* | *9.8* | *7.3* | *13* | *2.6* |
| *Portland Harbor JSCS SLV (µg/L)* | | – | *1.2* | *9.8* | *7.3* | *200* | – |
| KMW31 | 1/29/2020 | 1.80 | -- | -- | -- | -- | 7.69 |
| | 1/29/2020 DUP | 1.83 | -- | -- | -- | -- | 7.69 |
| | 9/29/2020 | 1.46 | -- | -- | -- | -- | 21.4 |
| | 3/24/2021 | 1.68 | -- | -- | -- | -- | 3.68 |
| | 10/5/2021 | 1.01 | -- | -- | -- | -- | 6.65 |
| KMW32 | 1/29/2020 | -- | 2.5 | -- | -- | -- | 7.69 |
| | 9/29/2020 | -- | -- | -- | -- | -- | 2.27 |
| | 3/24/2021 | -- | -- | -- | -- | -- | -- |
| | 3/24/2021 DUP | -- | -- | -- | -- | -- | -- |
| | 10/5/2021 | -- | -- | -- | -- | -- | -- |
| KMW33 | 1/29/2020 | -- | -- | -- | -- | -- | 7.69 |
| | 9/29/2020 | -- | -- | -- | -- | -- | 2.85 |
| | 3/24/2021 | -- | -- | -- | -- | -- | -- |
| | 10/6/2021 | -- | -- | -- | -- | -- | 2.16 |
| KMW37 | 1/29/2020 | 1.88 | 1.2 | -- | -- | -- | 7.69 |
| | 9/30/2020 | 4.46 | 3.1 | -- | -- | -- | 63.1 |
| | 3/24/2021 | 3.56 | 2.4 | -- | -- | -- | 7.73 |
| | 10/6/2021 | 4.57 | 2.7 | -- | -- | -- | 11.1 |
| MW47 | 1/29/2020 | -- | -- | -- | -- | -- | 11.8 |
| | 9/29/2020 | -- | -- | -- | -- | -- | 9.50 |
| | 3/24/2021 | 1.18 | -- | -- | -- | -- | 10.2 |
| | 10/6/2021 | -- | -- | -- | -- | -- | 6.69 |

***Please refer to notes at end of table.***

# Table 17

**Groundwater Analytical Data — Exceedance Factors (TPH, C10 - C12 Aliphatic-Range Hydrocarbons, and BTEX)**

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Well ID | Sample Date | Exceedance Factors | | | | | |
|---|---|---|---|---|---|---|---|
| | | Combined TPH | Benzene | Toluene | Ethyl-Benzene | Xylenes | Aliphatic Hydro-carbons C10 - C12 |
| *1997 Site ROD Cleanup Goal (µg/L)* | | *1.0* | *40* | – | – | – | – |
| *PHSS Cleanup Level (µg/L)* | | – | *0.44* | *9.8* | *7.3* | *13* | *2.6* |
| *Portland Harbor JSCS SLV (µg/L)* | | – | *1.2* | *9.8* | *7.3* | *200* | – |
| MW48 | 1/29/2020 | – | – | – | – | – | 29.5 |
| | 1/29/2020 DUP | – | – | – | – | – | 7.69 |
| | 9/29/2020 | – | – | – | – | – | 2.39 |
| | 9/29/2020 DUP | – | – | – | – | – | 2.73 |
| | 3/24/2021 | – | – | – | – | – | 2.08 |
| | 10/5/2021 | – | – | – | – | – | 2.77 |
| | 10/5/2021 DUP | – | – | – | – | – | 2.23 |
| MW49 | 1/29/2020 | 1.23 | – | – | – | – | 7.62 |
| | 9/29/2020 | – | – | – | – | – | 2.27 |
| | 3/24/2021 | 1.39 | – | – | – | – | 8.08 |
| | 10/6/2021 | – | – | – | – | – | 3.61 |
| ***Slurry Wall*** | | | | | | | |
| KMW36 | 1/30/2020 | 1.47 | – | – | – | – | NA |
| | 9/30/2020 | 1.03 | – | – | – | – | NA |
| | 3/24/2021 | – | – | – | – | – | NA |
| | 10/6/2021 | 1.30 | – | – | – | – | NA |
| W-16 | 1/29/2020 | 2.48 | 2.2 | – | – | – | NA |
| | 10/1/2020 | – | – | – | – | – | NA |
| | 3/25/2021 | 1.15 | – | – | – | – | NA |
| | 10/6/2021 | 1.06 | – | – | – | – | NA |
| W-19 | 2/8/2018 | – | – | – | – | – | NA |
| | 3/15/2019 | – | – | – | – | – | NA |
| | 1/30/2020 | – | – | – | – | – | NA |
| | 3/25/2021 | – | – | – | – | – | NA |

***Please refer to notes at end of table.***

# Table 17

**Groundwater Analytical Data — Exceedance Factors (TPH, C10 - C12 Aliphatic-Range Hydrocarbons, and BTEX)**

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Well ID | Sample Date | Exceedance Factors | | | | | |
|---|---|---|---|---|---|---|---|
| | | Combined TPH | Benzene | Toluene | Ethyl-Benzene | Xylenes | Aliphatic Hydro-carbons C10 - C12 |
| *1997 Site ROD Cleanup Goal (µg/L)* | | *1.0* | *40* | – | – | – | – |
| *PHSS Cleanup Level (µg/L)* | | – | *0.44* | *9.8* | *7.3* | *13* | *2.6* |
| *Portland Harbor JSCS SLV (µg/L)* | | – | *1.2* | *9.8* | *7.3* | *200* | – |
| W-20 | 2/8/2018 | – | – | – | – | – | NA |
| | 3/15/2019 | – | – | – | – | – | NA |
| | 1/30/2020 | – | – | – | – | – | NA |
| | 3/25/2021 | – | – | – | – | – | NA |
| W-22 | 2/8/2018 | – | – | – | – | – | NA |
| | 3/15/2019 | – | – | – | – | – | NA |
| | 1/30/2020 | – | – | – | – | – | NA |
| | 3/23/2021 | – | – | – | – | – | NA |
| ***Site-Wide*** | | | | | | | |
| KMW01 | 2/9/2018 | – | – | – | – | – | NA |
| | 3/15/2019 | – | – | – | – | – | NA |
| | 1/29/2020 | – | – | – | – | – | NA |
| | 3/23/2021 | – | – | – | – | – | NA |
| KMW02 | 1/29/2020 | – | – | – | – | – | NA |
| | 10/1/2020 | – | – | – | – | – | NA |
| | 3/23/2021 | – | – | – | – | – | NA |
| | | | | | | | NA |
| KMW05 | 2/8/2018 | 1.81 | – | – | – | – | NA |
| | 3/13/2019 | 1.52 | – | – | – | – | NA |
| | 1/28/2020 | 2.37 | – | – | – | – | NA |
| | 3/23/2021 | 1.00 | – | – | – | – | NA |

***Please refer to notes at end of table.***

# Table 17

**Groundwater Analytical Data — Exceedance Factors (TPH, C10 - C12 Aliphatic-Range Hydrocarbons, and BTEX)**

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Well ID | Sample Date | Exceedance Factors | | | | | |
|---|---|---|---|---|---|---|---|
| | | Combined TPH | Benzene | Toluene | Ethyl-Benzene | Xylenes | Aliphatic Hydro-carbons C10 - C12 |
| *1997 Site ROD Cleanup Goal (µg/L)* | | *1.0* | *40* | – | – | – | – |
| *PHSS Cleanup Level (µg/L)* | | – | *0.44* | *9.8* | *7.3* | *13* | *2.6* |
| *Portland Harbor JSCS SLV (µg/L)* | | – | *1.2* | *9.8* | *7.3* | *200* | – |
| KMW09 | 2/6/2018 | – | – | – | – | – | NA |
| | 3/13/2019 | – | – | – | – | – | NA |
| | 1/29/2020 | – | – | – | – | – | NA |
| | 3/23/2021 | – | – | – | – | – | NA |
| KMW10 | 1/28/2020 | – | – | – | – | – | NA |
| | 9/29/2020 | – | – | – | – | – | NA |
| | 3/23/2021 | – | – | – | – | – | NA |
| | 10/7/2021 | – | – | – | – | – | NA |
| KMW16* | 2/9/2018 | – | – | – | – | – | NA |
| | 3/14/2019 | – | – | – | – | – | NA |
| | 1/30/2020 | – | – | – | – | – | NA |
| | 3/25/2021 | – | – | – | – | – | NA |
| KMW20 | 2/9/2018 | – | – | – | – | – | NA |
| | 3/14/2019 | – | – | – | – | – | NA |
| | 1/30/2020 | – | – | – | – | – | NA |
| | 3/23/2021 | – | – | – | – | – | NA |
| KMW21 | 2/9/2018 | – | – | – | – | – | NA |
| | 3/14/2019 | – | – | – | – | – | NA |
| | 1/30/2020 | – | – | – | – | – | NA |
| | 3/23/2021 | – | – | – | – | – | NA |

***Please refer to notes at end of table.***

# Table 17

**Groundwater Analytical Data — Exceedance Factors (TPH, C10 - C12 Aliphatic-Range Hydrocarbons, and BTEX)**

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Well ID | Sample Date | Exceedance Factors | | | | | |
|---|---|---|---|---|---|---|---|
| | | Combined TPH | Benzene | Toluene | Ethyl-Benzene | Xylenes | Aliphatic Hydro-carbons C10 - C12 |
| *1997 Site ROD Cleanup Goal (µg/L)* | | *1.0* | *40* | – | – | – | – |
| *PHSS Cleanup Level (µg/L)* | | – | *0.44* | *9.8* | *7.3* | *13* | *2.6* |
| *Portland Harbor JSCS SLV (µg/L)* | | – | *1.2* | *9.8* | *7.3* | *200* | – |
| MW42 | 2/8/2018 | – | – | – | – | – | NA |
| | 3/14/2019 | – | – | – | – | – | NA |
| | 1/30/2020 | – | – | – | – | – | NA |
| | 3/25/2021 | – | – | – | – | – | NA |
| W-15 | 1/29/2020 | 2.59 | 1.2 | – | – | – | 7.7 |
| | 9/30/2020 | 2.48 | 1.1 | – | – | – | 4.7 |
| | 3/24/2021 | 2.15 | – | – | – | – | 6.3 |
| | 10/6/2021 | 2.62 | – | – | – | – | 6.3 |
| | 10/6/2021 DUP | 2.52 | – | – | – | – | 5.5 |
| ***Southern Facility Area*** | | | | | | | |
| MW-1 | 2/2/2012 | – | – | – | – | – | NA |
| | 12/29/2020 | – | – | – | – | – | NA |
| | 12/29/2020 DUP | – | – | – | – | – | NA |
| MW-2 | 2/2/2012 | – | 1.2 | – | – | – | NA |
| | 12/29/2020 | – | – | – | – | – | 15.6 |
| | 3/23/2021 | – | – | – | – | – | – |
| | 10/7/2021 | – | – | – | – | – | – |
| MW-3 | 2/2/2012 | – | – | – | – | – | NA |
| | 12/29/2020 | – | – | – | – | – | 15.6 |
| | 3/23/2021 | – | – | – | – | – | – |
| | 10/7/2021 | – | – | – | – | – | – |
| | 10/7/2021 DUP | – | – | – | – | – | NM |
| MW-4 | 2/2/2012 | – | – | – | – | – | NA |
| | 12/29/2020 | – | – | – | – | – | 15.7 |
| | 3/23/2021 | – | – | – | – | – | – |
| | 10/7/2021 | – | – | – | – | – | – |
| VRUMW-1 | 2/2/2012 | – | – | – | – | – | NA |
| | 12/28/2020 | – | – | – | – | – | NA |
| VRUMW-2 | 2/2/2012 | – | – | – | – | – | NA |
| | 12/28/2020 | – | – | – | – | – | NA |

# Table 17

**Groundwater Analytical Data — Exceedance Factors (TPH, C10 - C12 Aliphatic-Range Hydrocarbons, and BTEX)**
**Shore Terminals LLC - Portland Facility**
**Portland, Oregon**

| Well ID | Sample Date | Exceedance Factors | | | | | |
|---|---|---|---|---|---|---|---|
| | | Combined TPH | Benzene | Toluene | Ethyl-Benzene | Xylenes | Aliphatic Hydro-carbons C10 - C12 |
| *1997 Site ROD Cleanup Goal (µg/L)* | | *1.0* | *40* | – | – | – | – |
| *PHSS Cleanup Level (µg/L)* | | – | *0.44* | *9.8* | *7.3* | *13* | *2.6* |
| *Portland Harbor JSCS SLV (µg/L)* | | – | *1.2* | *9.8* | *7.3* | *200* | – |

***Please refer to notes at end of table.***

# Table 17

**Groundwater Analytical Data — Exceedance Factors (TPH, C10 - C12 Aliphatic-Range Hydrocarbons, and BTEX)**

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Well ID | Sample Date | Exceedance Factors | | | | | |
|---|---|---|---|---|---|---|---|
| | | Combined TPH | Benzene | Toluene | Ethyl-Benzene | Xylenes | Aliphatic Hydro-carbons C10 - C12 |
| *1997 Site ROD Cleanup Goal (µg/L)* | | *1.0* | *40* | – | – | – | – |
| *PHSS Cleanup Level (µg/L)* | | – | *0.44* | *9.8* | *7.3* | *13* | *2.6* |
| *Portland Harbor JSCS SLV (µg/L)* | | – | *1.2* | *9.8* | *7.3* | *200* | – |
| V0-1 | 2/1/2012 | – | -- | – | -- | – | NA |
| | 2/1/2012 DUP | – | -- | – | -- | – | NA |
| | 12/28/2020 | – | -- | – | -- | – | NA |
| V0-2 | 2/1/2012 | – | -- | – | -- | – | NA |
| | 12/28/2020 | – | -- | – | -- | – | NA |
| V0-3 | 2/2/2012 | – | -- | – | -- | – | NA |
| | 12/29/2020 | – | -- | – | -- | – | NA |

***Please refer to notes at end of table.***

# Table 17 Notes

## Groundwater Analytical Data — Exceedance Factors (TPH, C10 - C12 Aliphatic-Range Hydrocarbons, and BTEX)

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

**Notes:**

1. TPH = Total petroleum hydrocarbons by northwest methods, with samples for diesel- and motor-oil-range analyses prepared by silica gel cleanup.
2. TPHg = Total petroleum hydrocarbons measured in the gasoline range
3. TPHd = Total petroleum hydrocarbons measured in the diesel range
4. TPHo = Total petroleum hydrocarbons measured in the heavy oil range
5. TPHg by Method NWTPH-Gx; TPHd and TPHo by NWTPH-Dx; benzene, toluene, ethylbenzene, xylenes, MTBE analyzed by EPA Method 8260 B.
6. Combined TPH = The sum of TPHg, TPHd, and TPHo. If a constituent is non-detect, half of the non-detect concentration is used to calculate the combined TPH concentration.
   If TPHg, TPHd, and TPHo are all non-detect, ND is reported for Combined TPH.
7. Portland Harbor JSCS SLVs = 2007 Portland Harbor Joint Source Control Strategy Screening Level Values.
8. PHSS Cleanup Levels = 2017 Portland Harbor Superfund Site Record of Decision Cleanup Levels.
9. Yellow highlighted cells indicate values that are equal to or exceeding 1997 Record of Decision (ROD) Groundwater Cleanup Goals for the ExxonMobil/Shore Terminals Site.

10a. Gray highlighted cells indicate values that are equal to or exceeding PHSS Cleanup Level. If a PHSS Cleanup Level was not developed for an analyte, the JSCS SLV is used for comparison.

10b. Green highlhlight indicates the method reporting limit is greater than the PHSS ROD Cleanup Level or the JSCS SLV (if there is no ROD Cleanup Level)

11. < = less than the laboratory reporting limit.
12. µg/L = microgram(s) per liter.
13. mg/L = milligram(s) per liter.
14. EPA = United States Environmental Protection Agency.
16. NS = Not sampled
17. -- = Not applicable.
18. DUP = Field Duplicate.
19. * = Well is screened in Deep Sand unit.
20. ND = TPH not detected above method detection limits for TPHg, TPHd, or TPHo.
21. Well KMW14 was paved over prior to the October 2017 monitoring event. In an email dated February 21, 2018, DEQ agreed that well KMW14 was not critical to monitoring the Loading Rack Area and that replacement of KMW14 was not required. Well KMW14 has been removed from the monitoring program.
22. The exceedance factor is the ratio of the analyte concentration and either the 1997 ROD Cleanup Goal, PHSS Cleanup Level Level, or JSCS SLV, as appropriate.

# Table 18

## Groundwater Analytical Data – Exceedance Factors (PAHs)

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Well ID | Sample Date | Exceedance Factors | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1-Methylnaphthalene | 2-Methylnaphthalene | Acenaphthene | Acenaphthylene | Anthracene | Benzo(a)anthracene | Benzo(a)pyrene | Benzo(b)fluoranthene | Benzo(g,h,i)perylene | Benzo(k)fluoranthene | Chrysene | Dibenz(a,h)anthracene | Fluoranthene | Fluorene | Indeno(1,2,3-cd)pyrene | Naphthalene | Phenanthrene | Pyrene |
| *1997 Site ROD Cleanup Goal (µg/L)* | | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | *347* | -- | -- |
| *2017 PHSS Cleanup Level (µg/L)* | | -- | -- | *23* | -- | *0.73* | *0.0012* | *0.00012* | *0.0012* | -- | *0.0013* | *0.0013* | *0.00012* | -- | -- | *0.0012* | *12* | -- | -- |
| *Portland Harbor JSCS SLV (µg/L)* | | -- | *0.2* | *0.2* | *0.2* | -- | *0.018* | *0.018* | *0.018* | *0.2* | *0.018* | *0.018* | *0.018* | *0.2* | *0.2* | *0.018* | *0.2* | *0.2* | *0.2* |
| ***Tank Field 1*** | | | | | | | | | | | | | | | | | | | |
| KMW07 | 2/8/2018 | -- | 84 | -- | -- | -- | 123 | 1,600 | 192 | -- | 88 | 168 | 323 | 1.9 | 3.3 | 121 | -- | 2.6 | 1.6 |
| | 2/08/2018 DUP | -- | 27 | -- | -- | -- | 14 | 110 | 19 | -- | -- | 10 | -- | -- | 2.2 | -- | -- | -- | -- |
| | 3/13/2019 | -- | -- | -- | -- | -- | -- | 161 | 21 | -- | 11 | -- | -- | -- | -- | 15 | -- | -- | -- |
| | 3/13/2019 DUP | -- | -- | -- | -- | -- | -- | -- | 35 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 1/28/2020 | -- | 7.2 | -- | -- | -- | 23 | 218 | 28 | -- | 14 | 21 | 75 | -- | 2.5 | 24 | -- | 1.2 | -- |
| | 1/28/2020 DUP | -- | 9.1 | -- | -- | -- | 91 | -- | -- | -- | -- | -- | -- | -- | 2.5 | -- | -- | -- | -- |
| | 3/25/2021 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 3/25/2021 DUP | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| KMW11 | 10/8/2019 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 1/29/2020 | -- | -- | -- | -- | -- | 14 | 153 | 18 | -- | 9.2 | 11 | -- | -- | -- | -- | -- | -- | -- |
| | 9/30/2020 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 3/25/2021 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1.6 | -- | -- | -- | -- |
| | 10/6/2021 | -- | -- | -- | -- | -- | 17 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| KMW18 | 1/28/2020 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 1/28/2020 DUP | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 9/29/2020 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 9/29/2020 DUP | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 6.7 | -- | -- | -- | -- | -- | -- | -- |
| | 3/23/2021 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 3/23/2021 DUP | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 10/7/2021 | -- | -- | -- | -- | -- | -- | 223 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 10/7/2021 DUP | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| KMW19 | 1/28/2020 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 9/29/2020 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 3/23/2021 | -- | -- | -- | -- | -- | 14 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 10/6/2021 | -- | -- | -- | -- | -- | 20 | -- | -- | -- | 18 | -- | -- | -- | -- | -- | -- | -- | -- |

***Please refer to notes at end of table.***

# Table 18

## Groundwater Analytical Data – Exceedance Factors (PAHs)

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Well ID | Sample Date | Exceedance Factors | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1-Methylnaphthalene | 2-Methylnaphthalene | Acenaphthene | Acenaphthylene | Anthracene | Benzo(a)anthracene | Benzo(a)pyrene | Benzo(b)fluoranthene | Benzo(g,h,i)perylene | Benzo(k)fluoranthene | Chrysene | Dibenz(a,h)anthracene | Fluoranthene | Fluorene | Indeno(1,2,3-cd)pyrene | Naphthalene | Phenanthrene | Pyrene |
| *1997 Site ROD Cleanup Goal (µg/L)* | | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | *347* | -- | -- |
| *2017 PHSS Cleanup Level (µg/L)* | | -- | -- | *23* | -- | *0.73* | *0.0012* | *0.00012* | *0.0012* | -- | *0.0013* | *0.0013* | *0.00012* | -- | -- | *0.0012* | *12* | -- | -- |
| *Portland Harbor JSCS SLV (µg/L)* | | -- | *0.2* | *0.2* | *0.2* | -- | *0.018* | *0.018* | *0.018* | *0.2* | *0.018* | *0.018* | *0.018* | *0.2* | *0.2* | *0.018* | *0.2* | *0.2* | *0.2* |
| KMW35 | 1/28/2020 | -- | 193 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 45 | -- | -- | 31 | -- |
| | 9/30/2020 | -- | 64 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 44 | -- | -- | 27 | -- |
| | 3/25/2021 | -- | 4.0 | -- | -- | -- | 11 | 84 | -- | -- | -- | -- | -- | -- | 21 | -- | -- | 8.5 | -- |
| | 10/6/2021 | -- | -- | -- | -- | -- | 19 | -- | 21 | -- | -- | -- | -- | -- | 31 | -- | -- | 19 | -- |
| MW41A | 1/28/2020 | -- | -- | -- | -- | -- | 48 | -- | 96 | -- | 42 | 46 | -- | -- | 3.0 | -- | -- | -- | -- |
| | 9/30/2020 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 7.2 | -- | -- | 3.6 | -- |
| | 3/25/2021 | -- | -- | -- | -- | -- | 8 | -- | -- | -- | -- | -- | -- | -- | 3.9 | -- | -- | -- | -- |
| | 10/6/2021 | -- | -- | -- | -- | -- | 20 | -- | -- | -- | 14 | -- | -- | -- | 3.9 | -- | -- | 1.4 | -- |
| ***Loading Rack*** | | | | | | | | | | | | | | | | | | | |
| KMW13* | 1/30/2020 | -- | 266 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 3.8 | -- | 1.5 | -- | -- |
| | 10/1/2020 | -- | 370 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 5.4 | -- | 1.9 | 3.7 | -- |
| | 10/1/2020 DUP | -- | 386 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 5.7 | -- | 1.8 | 3.9 | -- |
| | 3/25/2021 | -- | 19 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 2.3 | -- | -- | 2.2 | -- |
| | 10/7/2021 | -- | 72 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 2.3 | -- | -- | 1.1 | -- |
| KMW14* | Well KMW14 has been removed from the groundwater monitoring program.[11] | | | | | | | | | | | | | | | | | | |
| MW38* | 6/25/2020 | -- | 129 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 13 | -- | -- | 16 | -- |
| | 10/1/2020 | -- | 1.3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 2.0 | -- | -- | 3.2 | -- |
| | 3/25/2021 | -- | 1.0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.2 | 8.0 | -- | -- | 7.9 | -- |
| | 10/7/2021 | -- | 6.7 | -- | -- | -- | -- | 251 | 16 | -- | -- | 22 | -- | 0.2 | 2.9 | -- | -- | 4.0 | -- |
| MW39* | 1/30/2020 | -- | 1,250 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 15 | -- | 1.4 | -- | -- |
| | 10/1/2020 | -- | 820 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 11 | -- | 27 | -- | -- |
| | 3/25/2021 | -- | 630 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 10 | -- | 23 | 9.3 | -- |
| | 10/7/2021 | -- | 915 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 9.9 | -- | 19 | -- | -- |
| MW40 | 2/8/2018 | -- | -- | -- | -- | -- | -- | -- | 6.8 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 3/13/2019 | -- | -- | -- | -- | -- | 7.8 | -- | 11 | -- | 6.4 | 6.4 | -- | -- | -- | 6.6 | -- | -- | -- |
| | 1/28/2020 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 3/23/2021 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |

***Please refer to notes at end of table.***

# Table 18

## Groundwater Analytical Data – Exceedance Factors (PAHs)

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Well ID | Sample Date | Exceedance Factors | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1-Methylnaphthalene | 2-Methylnaphthalene | Acenaphthene | Acenaphthylene | Anthracene | Benzo(a)anthracene | Benzo(a)pyrene | Benzo(b)fluoranthene | Benzo(g,h,i)perylene | Benzo(k)fluoranthene | Chrysene | Dibenz(a,h)anthracene | Fluoranthene | Fluorene | Indeno(1,2,3-cd)pyrene | Naphthalene | Phenanthrene | Pyrene |
| *1997 Site ROD Cleanup Goal (µg/L)* | | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | *347* | -- | -- |
| *2017 PHSS Cleanup Level (µg/L)* | | -- | -- | *23* | -- | *0.73* | *0.0012* | *0.00012* | *0.0012* | -- | *0.0013* | *0.0013* | *0.00012* | -- | -- | *0.0012* | *12* | -- | -- |
| *Portland Harbor JSCS SLV (µg/L)* | | -- | *0.2* | *0.2* | *0.2* | -- | *0.018* | *0.018* | *0.018* | *0.2* | *0.018* | *0.018* | *0.018* | *0.2* | *0.2* | *0.018* | *0.2* | *0.2* | *0.2* |
| MW41B* | 1/28/2020 | -- | -- | -- | -- | -- | 70 | 1,317 | 218 | -- | 76 | 96 | 304 | -- | -- | 141 | -- | -- | -- |
| | 9/30/2020 | -- | -- | -- | -- | -- | 21 | 349 | 49 | -- | 16 | 24 | 67 | -- | -- | 31 | -- | -- | -- |
| | 3/25/2021 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 10/6/2021 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| MW43 | 1/30/2020 | -- | 1,405 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 11 | -- | -- |
| | 9/30/2020 | -- | 1,385 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 6.7 | -- | -- |
| | 3/25/2021 | -- | 940 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 6.1 | -- | -- |
| | 10/7/2021 | -- | 850 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 5.0 | -- | -- |
| MW44* | 1/30/2020 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 9/30/2020 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 3/25/2021 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 10/6/2021 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| MW45* | 3/13/2019 | -- | -- | -- | -- | -- | -- | -- | 8.8 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 3/13/2019 | -- | -- | -- | -- | -- | -- | -- | 8.8 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 1/30/2020 | -- | -- | -- | -- | -- | 9.8 | 203 | 27 | -- | 11 | 13 | -- | -- | -- | 14 | -- | -- | -- |
| | 3/23/2021 | -- | -- | -- | -- | -- | 14 | 373 | 56 | -- | 21 | 19 | 7 | -- | -- | 38 | -- | -- | -- |
| MW46* | 1/29/2020 | -- | -- | -- | -- | -- | 27 | 297 | 38 | -- | 18 | 31 | -- | -- | -- | 22 | -- | -- | -- |
| | 9/29/2020 | -- | -- | -- | -- | -- | 7.5 | 113 | 12 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 3/25/2021 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 12 | -- | -- | -- |
| | 10/6/2021 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| ***DPE Treatment Area*** | | | | | | | | | | | | | | | | | | | |
| EX-07L | 1/29/2020 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 9/29/2020 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 3/24/2021 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 10/5/2021 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |

***Please refer to notes at end of table.***

# Table 18

## Groundwater Analytical Data – Exceedance Factors (PAHs)

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Well ID | Sample Date | Exceedance Factors | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1-Methylnaphthalene | 2-Methylnaphthalene | Acenaphthene | Acenaphthylene | Anthracene | Benzo(a)anthracene | Benzo(a)pyrene | Benzo(b)fluoranthene | Benzo(g,h,i)perylene | Benzo(k)fluoranthene | Chrysene | Dibenz(a,h)anthracene | Fluoranthene | Fluorene | Indeno(1,2,3-cd)pyrene | Naphthalene | Phenanthrene | Pyrene |
| *1997 Site ROD Cleanup Goal (µg/L)* | | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | *347* | -- | -- |
| *2017 PHSS Cleanup Level (µg/L)* | | -- | -- | *23* | -- | *0.73* | *0.0012* | *0.00012* | *0.0012* | -- | *0.0013* | *0.0013* | *0.00012* | -- | -- | *0.0012* | *12* | -- | -- |
| *Portland Harbor JSCS SLV (µg/L)* | | -- | *0.2* | *0.2* | *0.2* | -- | *0.018* | *0.018* | *0.018* | *0.2* | *0.018* | *0.018* | *0.018* | *0.2* | *0.2* | *0.018* | *0.2* | *0.2* | *0.2* |
| KMW29 | 1/29/2020 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 20 | -- | -- | 13 | -- |
| | 9/29/2020 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 21 | -- | -- | 11 | -- |
| | 3/24/2021 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 20 | -- | -- | 14 | -- |
| | 10/5/2021 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 16 | -- | -- | 12 | -- |
| KMW30 | 1/29/2020 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 9/29/2020 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 4.1 | -- | -- | 3.4 | -- |
| | 3/24/2021 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 3/24/2021 DUP | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 10/5/2021 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 6.0 | -- | -- | 4.5 | -- |
| KMW31 | 1/29/2020 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 5.0 | -- | -- | 4.6 | -- |
| | 1/29/2020 DUP | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 5.0 | -- | -- | 4.8 | -- |
| | 9/29/2020 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 7.5 | -- | -- | 7.5 | -- |
| | 9/29/2020 DUP | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 7.5 | -- | -- | 6.5 | -- |
| | 3/24/2021 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 7.5 | -- | -- | 7.0 | -- |
| | 10/5/2021 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 3.5 | -- | -- | 1.0 | -- |
| KMW32 | 1/29/2020 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 5.0 | -- | -- | 4.8 | -- |
| | 9/29/2020 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 3/24/2021 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 3/24/2021 DUP | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 10/5/2021 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| KMW33 | 1/29/2020 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 13 | -- | -- | 1.5 | -- |
| | 9/29/2020 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 4.0 |
| | 3/24/2021 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 2.3 | -- | -- | -- | -- |
| | 10/6/2021 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 7.0 | -- | -- | -- | -- |
| KMW37 | 1/29/2020 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 2.9 | -- | -- | 1.8 | -- |
| | 9/30/2020 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 3.1 | -- | -- | 2.9 | -- |
| | 3/24/2021 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 9.0 | -- | -- | 3.4 | -- |
| | 10/6/2021 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 3.0 | -- | -- | -- | -- |

***Please refer to notes at end of table.***

# Table 18

## Groundwater Analytical Data – Exceedance Factors (PAHs)

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Well ID | Sample Date | Exceedance Factors | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1-Methylnaphthalene | 2-Methylnaphthalene | Acenaphthene | Acenaphthylene | Anthracene | Benzo(a)anthracene | Benzo(a)pyrene | Benzo(b)fluoranthene | Benzo(g,h,i)perylene | Benzo(k)fluoranthene | Chrysene | Dibenz(a,h)anthracene | Fluoranthene | Fluorene | Indeno(1,2,3-cd)pyrene | Naphthalene | Phenanthrene | Pyrene |
| *1997 Site ROD Cleanup Goal (µg/L)* | | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | *347* | -- | -- |
| *2017 PHSS Cleanup Level (µg/L)* | | -- | -- | *23* | -- | *0.73* | *0.0012* | *0.00012* | *0.0012* | -- | *0.0013* | *0.0013* | *0.00012* | -- | -- | *0.0012* | *12* | -- | -- |
| *Portland Harbor JSCS SLV (µg/L)* | | -- | *0.2* | *0.2* | *0.2* | -- | *0.018* | *0.018* | *0.018* | *0.2* | *0.018* | *0.018* | *0.018* | *0.2* | *0.2* | *0.018* | *0.2* | *0.2* | *0.2* |
| MW47 | 1/29/2020 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 11 | -- | -- | -- | -- |
| | 9/29/2020 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 13 | -- | -- | -- | -- |
| | 3/24/2021 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 10 | -- | -- | -- | -- |
| | 10/6/2021 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 9.0 | -- | -- | -- | -- |
| MW48 | 1/29/2020 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1.3 | -- | -- | 2.6 | -- |
| | 1/29/2020 DUP | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1.3 | -- | -- | 2.6 | -- |
| | 9/29/2020 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 2.0 | -- |
| | 9/29/2020 DUP | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1.1 | -- | -- | 2.6 | -- |
| | 3/24/2021 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1.1 | -- | -- | 1.4 | -- |
| | 10/5/2021 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 10/5/2021 DUP | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| MW49 | 1/29/2020 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 6.5 | -- | -- | 3.5 | -- |
| | 9/29/2020 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 2.2 | -- | -- | -- | -- |
| | 3/24/2021 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 9.0 | -- | -- | 4.4 | -- |
| | 10/6/2021 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 3.5 | -- | -- | -- | -- |
| ***Slurry Wall*** | | | | | | | | | | | | | | | | | | | |
| KMW36 | 1/30/2020 | -- | -- | -- | -- | -- | 34 | 268 | -- | -- | -- | 32 | -- | 1.4 | 9.7 | -- | -- | -- | 1.6 |
| | 9/30/2020 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 9.2 | -- | -- | -- | 1.0 |
| | 3/24/2021 | -- | -- | -- | -- | -- | 17 | 136 | -- | -- | -- | 19 | -- | -- | 5.6 | -- | -- | -- | -- |
| | 10/6/2021 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 9.3 | -- | -- | -- | -- |
| W-16 | 1/29/2020 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 10 | -- | -- | -- | -- |
| | 10/1/2020 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 4.6 | -- | -- | -- | -- |
| | 3/25/2021 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8.1 | -- | -- | -- | -- |
| | 10/6/2021 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 6.4 | -- | -- | -- | -- |
| W-19 | 2/8/2018 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 6.1 | -- | -- | 4.8 | 1.0 |
| | 3/15/2019 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1.9 | -- | -- | -- | -- |
| | 1/30/2020 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 4.8 | -- | -- | 6.3 | 1.2 |
| | 3/25/2021 | -- | -- | -- | -- | -- | 11 | -- | -- | -- | -- | 9.5 | -- | -- | -- | -- | -- | -- | -- |

***Please refer to notes at end of table.***

# Table 18

## Groundwater Analytical Data – Exceedance Factors (PAHs)

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Well ID | Sample Date | Exceedance Factors | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1-Methylnaphthalene | 2-Methylnaphthalene | Acenaphthene | Acenaphthylene | Anthracene | Benzo(a)anthracene | Benzo(a)pyrene | Benzo(b)fluoranthene | Benzo(g,h,i)perylene | Benzo(k)fluoranthene | Chrysene | Dibenz(a,h)anthracene | Fluoranthene | Fluorene | Indeno(1,2,3-cd)pyrene | Naphthalene | Phenanthrene | Pyrene |
| *1997 Site ROD Cleanup Goal (µg/L)* | | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 347 | -- | -- |
| *2017 PHSS Cleanup Level (µg/L)* | | -- | -- | 23 | -- | 0.73 | 0.0012 | 0.00012 | 0.0012 | -- | 0.0013 | 0.0013 | 0.00012 | -- | -- | 0.0012 | 12 | -- | -- |
| *Portland Harbor JSCS SLV (µg/L)* | | -- | 0.2 | 0.2 | 0.2 | -- | 0.018 | 0.018 | 0.018 | 0.2 | 0.018 | 0.018 | 0.018 | 0.2 | 0.2 | 0.018 | 0.2 | 0.2 | 0.2 |
| W-20 | 2/8/2018 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 3/15/2019 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 1/30/2020 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 3/25/2021 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| W-22 | 2/8/2018 | -- | -- | -- | -- | -- | -- | -- | 5.5 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 3/15/2019 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 1/30/2020 | -- | -- | -- | -- | -- | -- | 72 | 7.6 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 3/23/2021 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| ***Site-Wide*** | | | | | | | | | | | | | | | | | | | |
| KMW01 | 2/9/2018 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 3/15/2019 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 1/29/2020 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 3/23/2021 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| KMW02 | 1/29/2020 | -- | -- | -- | -- | -- | -- | 248 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 10/1/2020 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 3/23/2021 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| KMW05 | 2/8/2018 | -- | -- | -- | -- | -- | 65 | 404 | 47 | -- | -- | 138 | 85 | -- | 13 | 24 | -- | 3.7 | -- |
| | 3/13/2019 | -- | -- | -- | -- | -- | 43 | 368 | 31 | -- | 12 | 67 | -- | -- | 26 | 22 | -- | 19 | 1.8 |
| | 1/28/2020 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 35 | -- | -- | 32 | 3.4 |
| | 3/23/2021 | -- | -- | -- | -- | -- | 12 | 97 | -- | -- | -- | 9 | -- | -- | 42 | -- | -- | 25 | -- |
| KMW09 | 2/6/2018 | -- | -- | -- | -- | -- | -- | -- | 2.3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 3/13/2019 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 1/29/2020 | -- | -- | -- | -- | -- | 15 | 150 | 18 | -- | 7.2 | 13 | -- | -- | -- | 14 | -- | -- | -- |
| | 3/23/2021 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |

***Please refer to notes at end of table.***

# Table 18

## Groundwater Analytical Data – Exceedance Factors (PAHs)

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Well ID | Sample Date | Exceedance Factors | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1-Methylnaphthalene | 2-Methylnaphthalene | Acenaphthene | Acenaphthylene | Anthracene | Benzo(a)anthracene | Benzo(a)pyrene | Benzo(b)fluoranthene | Benzo(g,h,i)perylene | Benzo(k)fluoranthene | Chrysene | Dibenz(a,h)anthracene | Fluoranthene | Fluorene | Indeno(1,2,3-cd)pyrene | Naphthalene | Phenanthrene | Pyrene |
| *1997 Site ROD Cleanup Goal (µg/L)* | | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | *347* | -- | -- |
| *2017 PHSS Cleanup Level (µg/L)* | | -- | -- | *23* | -- | *0.73* | *0.0012* | *0.00012* | *0.0012* | -- | *0.0013* | *0.0013* | *0.00012* | -- | -- | *0.0012* | *12* | -- | -- |
| *Portland Harbor JSCS SLV (µg/L)* | | -- | *0.2* | *0.2* | *0.2* | -- | *0.018* | *0.018* | *0.018* | *0.2* | *0.018* | *0.018* | *0.018* | *0.2* | *0.2* | *0.018* | *0.2* | *0.2* | *0.2* |
| KMW10* | 1/28/2020 | -- | -- | -- | -- | -- | -- | 88 | 7.7 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 9/29/2020 | -- | -- | -- | -- | -- | -- | -- | 14 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 3/23/2021 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 10/7/2021 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| KMW16* | 2/9/2018 | -- | -- | -- | -- | -- | 32 | 382 | 55 | -- | 22 | 45 | 62 | -- | -- | 35 | -- | -- | -- |
| | 3/14/2019 | -- | -- | -- | -- | -- | 11 | 170 | 21 | -- | 9.2 | 11 | -- | -- | -- | 15 | -- | -- | -- |
| | 1/30/2020 | -- | -- | -- | -- | -- | 14 | 155 | 17 | -- | 9.3 | 13 | -- | -- | -- | 14 | -- | -- | -- |
| | 3/25/2021 | -- | -- | -- | -- | -- | 16 | 337 | 33 | -- | 13.4 | 18 | -- | -- | -- | 16 | -- | -- | -- |
| KMW20 | 2/9/2018 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1.4 |
| | 3/14/2019 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 1/30/2020 | -- | -- | -- | -- | -- | -- | 110 | 12 | -- | 6.2 | 8.2 | -- | -- | -- | -- | -- | -- | -- |
| | 3/23/2021 | -- | -- | -- | -- | -- | -- | 67 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| KMW21 | 2/9/2018 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 16 | -- | -- | -- | -- |
| | 3/14/2019 | -- | -- | -- | -- | -- | 12 | -- | -- | -- | -- | 9.1 | -- | -- | 31 | -- | -- | 11 | -- |
| | 1/30/2020 | -- | 3.9 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 47 | -- | -- | 38 | -- |
| | 3/23/2021 | -- | -- | -- | -- | -- | 13 | -- | -- | -- | -- | 6.3 | -- | -- | 6.1 | -- | -- | -- | -- |
| MW42 | 2/8/2018 | -- | -- | -- | -- | -- | -- | -- | 10 | -- | -- | 38 | -- | -- | -- | -- | -- | -- | -- |
| | 3/14/2019 | -- | -- | -- | -- | -- | 9.2 | 122 | 13 | -- | 7.1 | -- | -- | -- | -- | 9.0 | -- | -- | -- |
| | 1/30/2020 | -- | -- | -- | -- | -- | 9.6 | 169 | 21 | -- | 10 | 10 | -- | -- | -- | 12 | -- | -- | -- |
| | 3/25/2021 | -- | -- | -- | -- | -- | 62.6 | 1542 | 168 | -- | 75 | 88 | 180 | -- | -- | 102 | -- | -- | -- |
| W-15 | 1/29/2020 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 5.5 | -- | -- | 3.5 | -- |
| | 9/30/2020 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8.0 | -- | -- | 5.5 | -- |
| | 3/24/2021 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 6.5 | -- | -- | 3.9 | -- |
| | 10/6/2021 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 3.05 | -- | -- | 2.1 | -- |
| | 10/6/2021 DUP | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 6.0 | -- | -- | 4.7 | -- |

***Please refer to notes at end of table.***

# Table 18

## Groundwater Analytical Data – Exceedance Factors (PAHs)

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Well ID | Sample Date | Exceedance Factors | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1-Methylnaphthalene | 2-Methylnaphthalene | Acenaphthene | Acenaphthylene | Anthracene | Benzo(a)anthracene | Benzo(a)pyrene | Benzo(b)fluoranthene | Benzo(g,h,i)perylene | Benzo(k)fluoranthene | Chrysene | Dibenz(a,h)anthracene | Fluoranthene | Fluorene | Indeno(1,2,3-cd)pyrene | Naphthalene | Phenanthrene | Pyrene |
| *1997 Site ROD Cleanup Goal (µg/L)* | | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 347 | -- | -- |
| *2017 PHSS Cleanup Level (µg/L)* | | -- | -- | 23 | -- | 0.73 | 0.0012 | 0.00012 | 0.0012 | -- | 0.0013 | 0.0013 | 0.00012 | -- | -- | 0.0012 | 12 | -- | -- |
| *Portland Harbor JSCS SLV (µg/L)* | | -- | 0.2 | 0.2 | 0.2 | -- | 0.018 | 0.018 | 0.018 | 0.2 | 0.018 | 0.018 | 0.018 | 0.2 | 0.2 | 0.018 | 0.2 | 0.2 | 0.2 |
| ***Southern Facility Area*** | | | | | | | | | | | | | | | | | | | |
| MW-1 | 2/2/2012 | -- | -- | -- | -- | -- | 24 | 318 | 32 | -- | 15 | 22 | 79 | -- | -- | 16 | -- | -- | -- |
| | 12/29/2020 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 12/29/2020 DUP | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| MW-2 | 2/2/2012 | -- | -- | -- | -- | -- | 5.9 | -- | -- | -- | -- | 2.3 | -- | -- | -- | -- | -- | -- | -- |
| | 12/29/2020 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 3/23/2021 | -- | -- | -- | -- | -- | 13 | 189 | 15 | -- | -- | 8.8 | -- | -- | -- | 8.4 | -- | -- | -- |
| | 10/7/2021 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| MW-3 | 2/2/2012 | -- | -- | -- | -- | -- | 23.8 | 158.3 | 15.8 | -- | 14.6 | 14.6 | 158.3 | -- | -- | 15.8 | -- | -- | -- |
| | 12/29/2020 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 3/23/2021 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 10/7/2021 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 10/7/2021 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| MW-4 | 2/2/2012 | -- | -- | -- | -- | -- | 16 | 79 | 7.9 | -- | 7.3 | 7.3 | 40 | -- | -- | 2.5 | -- | -- | -- |
| | 12/29/2020 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 3/23/2021 | -- | -- | -- | -- | -- | 12 | 151 | 12 | -- | -- | 7.3 | -- | -- | -- | -- | -- | -- | -- |
| | 10/7/2021 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| VRUMW-1 | 2/2/2012 | -- | -- | -- | -- | -- | 16 | -- | 7.9 | -- | 7.3 | 7.3 | -- | -- | -- | 7.9 | -- | -- | -- |
| | 12/28/2020 | -- | -- | -- | -- | -- | 16 | 279 | 25 | -- | 9.8 | 16 | -- | -- | -- | 16 | -- | -- | -- |
| VRUMW-2 | 2/2/2012 | -- | -- | -- | -- | -- | -- | 158 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 12/28/2020 | -- | -- | -- | -- | -- | -- | 80 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| VO-1 | 2/1/2012 | -- | -- | -- | -- | -- | 7.9 | -- | -- | -- | -- | 2.3 | -- | -- | -- | -- | -- | -- | -- |
| | 2/1/2012 DUP | -- | -- | -- | -- | -- | 7.9 | -- | -- | -- | -- | 2.3 | -- | -- | -- | -- | -- | -- | -- |
| | 12/28/2020 | -- | 9.2 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| VO-2 | 2/1/2012 | -- | -- | -- | -- | -- | 5.8 | -- | -- | -- | -- | 2.3 | -- | -- | -- | -- | -- | -- | -- |
| | 12/28/2020 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| VO-3 | 2/2/2012 | -- | -- | -- | -- | -- | 16 | -- | 7.9 | -- | 7.3 | 7.3 | -- | -- | -- | 7.9 | -- | -- | -- |
| | 12/29/2020 | -- | -- | -- | -- | -- | -- | 91 | 7.4 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |

***Please refer to notes at end of table.***

# Table 18 Notes

## Groundwater Analytical Data – Exceedance Factors (PAHs)

### Shore Terminals LLC - Portland Facility

### Portland, Oregon

**Notes:**

1. PAH = Polycyclic aromatic hydrocarbons.
2. < = Concentration as reported by the analytical laboratory is less than the laboratory reporting limit.
3. µg/L = Microgram(s) per liter.
4. NA = Not analyzed .
5. DUP = Field Duplicate.
6. Yellow highlighted cells indicate values that are equal to or exceeding 1997 Record of Decision (ROD) Groundwater Cleanup Goals for the ExxonMobil/Shore Terminals Site.
7. Gray highlighted cells indicate values that are equal to or exceeding PHSS Cleanup Level. If a PHSS Cleanup Level was not developed for an analyte, the JSCS SLV is used for comparison.
8. Polycyclic aromatic hydrocarbons analyzed by EPA Method 8270C with selective ion monitoring.
9. * = Well is screened in Deep Sand unit.
10. Portland Harbor JSCS SLVs = 2007 Portland Harbor Joint Source Control Strategy Screening Level Values.
11. Well KMW14 was paved over prior to the October 2017 monitoring event. In an email dated February 21, 2018, DEQ agreed that well KMW14 was not critical to monitoring the Loading Rack Area and that replacement of KMW14 was not required. Well KMW14 has been removed from the monitoring program.
12. The exceedance factor is the ratio of the analyte concentration and either the 1997 ROD Cleanup Goal, PHSS Cleanup Level Level, or JSCS SLV, as appropriate.

# Table 19

## Groundwater Analytical Data – Exceedance Factors (Dissolved Metals)

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Well ID | Sample Date | Exceedance Factors | | | |
|---|---|---|---|---|---|
| | | Dissolved Arsenic | Dissolved Copper | Dissolved Lead | Dissolved Zinc |
| *ROD Groundwater Cleanup Goal (µg/L)* | | 5.0 | 12 | 3.2 | -- |
| *PHSS Cleanup Level (µg/L)* | | 0.018 | 2.74 | 0.54 | 36 |
| *Portland Harbor JSCS SLV (µg/L)* | | 0.045 | 2.7 | 0.54 | 36 |
| ***Tank Field 1*** | | | | | |
| KMW07 | 2/8/2018 | 7.7 | -- | 2.9 | -- |
| | 2/08/2018 DUP | 7.9 | -- | 2.9 | -- |
| | 3/13/2019 | 126 | -- | -- | -- |
| | 3/13/2019 DUP | 133 | -- | -- | -- |
| | 1/28/2020 | 144 | -- | 2.1 | -- |
| | 1/28/2020 DUP | 5.2 | -- | 2.2 | -- |
| | 3/25/2021 | 138 | -- | -- | -- |
| | 3/25/2021 DUP | 126 | -- | -- | -- |
| KMW11 | 1/29/2020 | 87 | -- | -- | -- |
| | 9/30/2020 | 264 | -- | -- | -- |
| | 3/25/2021 | 200 | -- | -- | -- |
| | 10/6/2021 | 1.2 | -- | -- | -- |
| KMW18 | 1/28/2020 | 3.2 | -- | -- | -- |
| | 1/28/2020 DUP | 3.2 | -- | -- | -- |
| | 9/29/2020 | 1.4 | -- | -- | -- |
| | 9/29/2020 DUP | 1.4 | -- | -- | -- |
| | 3/23/2021 | -- | -- | -- | -- |
| | 3/23/2021 DUP | -- | -- | -- | -- |
| | 10/7/2021 | 95 | -- | -- | -- |
| | 10/7/2021 DUP | 94 | -- | -- | -- |

***Please refer to notes at end of table.***

# Table 19

## Groundwater Analytical Data – Exceedance Factors (Dissolved Metals)

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Well ID | Sample Date | Exceedance Factors | | | |
|---|---|---|---|---|---|
| | | Dissolved Arsenic | Dissolved Copper | Dissolved Lead | Dissolved Zinc |
| *ROD Groundwater Cleanup Goal (µg/L)* | | 5.0 | 12 | 3.2 | -- |
| *PHSS Cleanup Level (µg/L)* | | 0.018 | 2.74 | 0.54 | 36 |
| *Portland Harbor JSCS SLV (µg/L)* | | 0.045 | 2.7 | 0.54 | 36 |
| KMW19 | 1/28/2020 | 241 | -- | -- | -- |
| | 9/29/2020 | 257 | -- | -- | -- |
| | 3/23/2021 | 226 | -- | -- | -- |
| | 10/6/2021 | 234 | -- | -- | -- |
| KMW35 | 1/28/2020 | 2.0 | -- | 4.3 | -- |
| | 9/30/2020 | 1.8 | -- | 5.0 | -- |
| | 3/25/2021 | 1.8 | -- | 3.5 | -- |
| | 10/6/2021 | 2.3 | -- | 1.1 | -- |
| MW41A | 1/28/2020 | 3.33 | -- | -- | -- |
| | 9/30/2020 | 1.1 | -- | -- | -- |
| | 3/25/2021 | 2.37 | -- | -- | -- |
| | 10/6/2021 | 1.6 | -- | -- | -- |
| ***Loading Rack*** | | | | | |
| KMW13* | 1/30/2020 | 2.6 | -- | 1.4 | -- |
| | 10/1/2020 | 3.7 | -- | 2.5 | -- |
| | 3/25/2021 | 4.6 | -- | -- | -- |
| | 3/25/2021 DUP | 4.5 | -- | -- | -- |
| | 10/7/2021 | 5.3 | -- | 1.3 | -- |
| KMW14* | Well KMW14 has been removed from the groundwater monitoring program.[12] | | | | |

***Please refer to notes at end of table.***

# Table 19

## Groundwater Analytical Data – Exceedance Factors (Dissolved Metals)

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Well ID | Sample Date | Exceedance Factors | | | |
|---|---|---|---|---|---|
| | | Dissolved Arsenic | Dissolved Copper | Dissolved Lead | Dissolved Zinc |
| *ROD Groundwater Cleanup Goal (µg/L)* | | 5.0 | 12 | 3.2 | -- |
| *PHSS Cleanup Level (µg/L)* | | 0.018 | 2.74 | 0.54 | 36 |
| *Portland Harbor JSCS SLV (µg/L)* | | 0.045 | 2.7 | 0.54 | 36 |
| MW38* | 6/25/2020 | 6.7 | -- | -- | -- |
| | 10/1/2020 | 4.0 | -- | -- | -- |
| | 3/25/2021 | 5.9 | -- | 3.9 | -- |
| | 10/7/2021 | 5.6 | -- | -- | -- |
| MW39* | 1/30/2020 | 12.8 | -- | 2.9 | -- |
| | 10/1/2020 | 12.1 | -- | 2.6 | -- |
| | 3/25/2021 | 12.5 | -- | 1.8 | -- |
| | 10/7/2021 | 13.7 | -- | 2.0 | -- |
| MW40 | 2/8/2018 | 74 | -- | 1.6 | -- |
| | 3/13/2019 | -- | -- | -- | -- |
| | 1/28/2020 | -- | -- | -- | -- |
| | 3/23/2021 | -- | -- | -- | -- |
| MW41B* | 1/28/2020 | 61 | -- | -- | -- |
| | 9/30/2020 | 52 | -- | -- | -- |
| | 3/25/2021 | 51 | -- | -- | -- |
| | 10/6/2021 | 72 | -- | -- | -- |
| MW43 | 1/30/2020 | 7.3 | -- | 1.9 | -- |
| | 9/30/2020 | 6.7 | -- | -- | -- |
| | 3/25/2021 | 7.0 | -- | 1.3 | -- |
| | 10/7/2021 | 7.0 | -- | 1.0 | -- |

***Please refer to notes at end of table.***

# Table 19

## Groundwater Analytical Data – Exceedance Factors (Dissolved Metals)

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Well ID | Sample Date | Exceedance Factors | | | |
|---|---|---|---|---|---|
| | | Dissolved Arsenic | Dissolved Copper | Dissolved Lead | Dissolved Zinc |
| *ROD Groundwater Cleanup Goal (µg/L)* | | 5.0 | 12 | 3.2 | -- |
| *PHSS Cleanup Level (µg/L)* | | 0.018 | 2.74 | 0.54 | 36 |
| *Portland Harbor JSCS SLV (µg/L)* | | 0.045 | 2.7 | 0.54 | 36 |
| MW44* | 1/30/2020 | 1.8 | -- | -- | -- |
| | 9/30/2020 | 1.7 | -- | -- | -- |
| | 3/25/2021 | 1.6 | -- | -- | -- |
| | 10/6/2021 | 2.6 | -- | -- | -- |
| MW45* | 2/8/2018 | 84 | 1.2 | 1.8 | -- |
| | 3/13/2019 | 34 | -- | -- | -- |
| | 1/30/2020 | -- | -- | -- | -- |
| | 3/23/2021 | 33 | -- | -- | -- |
| MW46* | 1/29/2020 | 32 | -- | -- | -- |
| | 9/29/2020 | 151 | -- | -- | -- |
| | 3/25/2021 | 149 | -- | -- | -- |
| | 10/6/2021 | 179 | -- | -- | -- |
| ***DPE Treatment Area*** | | | | | |
| EX-07L | 1/29/2020 | -- | -- | -- | -- |
| | 9/29/2020 | -- | -- | -- | -- |
| | 3/24/2021 | -- | 1.3 | -- | -- |
| | 10/5/2021 | -- | -- | -- | -- |
| KMW29 | 1/29/2020 | 2.6 | -- | 1.2 | -- |
| | 9/29/2020 | 3.2 | -- | 2.1 | -- |
| | 3/24/2021 | 268 | -- | -- | -- |
| | 10/5/2021 | 3.3 | -- | 2.0 | -- |

***Please refer to notes at end of table.***

# Table 19

## Groundwater Analytical Data – Exceedance Factors (Dissolved Metals)

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Well ID | Sample Date | Exceedance Factors | | | |
|---|---|---|---|---|---|
| | | Dissolved Arsenic | Dissolved Copper | Dissolved Lead | Dissolved Zinc |
| *ROD Groundwater Cleanup Goal (µg/L)* | | *5.0* | *12* | *3.2* | -- |
| *PHSS Cleanup Level (µg/L)* | | *0.018* | *2.74* | *0.54* | 36 |
| *Portland Harbor JSCS SLV (µg/L)* | | *0.045* | *2.7* | *0.54* | *36* |
| KMW30 | 1/29/2020 | -- | -- | -- | -- |
| | 9/29/2020 | 106 | -- | -- | -- |
| | 3/24/2021 | 68 | -- | -- | -- |
| | 3/24/2021 DUP | 67 | -- | -- | -- |
| | 10/5/2021 | 248 | -- | -- | -- |
| KMW31 | 1/29/2020 | 128 | 1.3 | 1.2 | -- |
| | 1/29/2020 DUP | 132 | -- | 1.2 | -- |
| | 9/29/2020 | 90 | -- | 1.6 | -- |
| | 3/24/2021 | 110 | -- | -- | -- |
| | 10/5/2021 | 95 | -- | 1.2 | -- |
| KMW32 | 1/29/2020 | 34 | 1.2 | 0.116 J | -- |
| | 9/29/2020 | -- | -- | -- | -- |
| | 3/24/2021 | 80 | -- | 1.8 | -- |
| | 3/24/2021 DUP | 83 | -- | 1.8 | -- |
| | 10/5/2021 | -- | 1.1 | -- | -- |
| KMW33 | 1/29/2020 | 134 | -- | -- | -- |
| | 9/29/2020 | 79 | -- | -- | -- |
| | 3/24/2021 | 81 | -- | -- | -- |
| | 10/6/2021 | 88 | -- | -- | -- |

***Please refer to notes at end of table.***

# Table 19

## Groundwater Analytical Data – Exceedance Factors (Dissolved Metals)

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Well ID | Sample Date | Exceedance Factors | | | |
|---|---|---|---|---|---|
| | | Dissolved Arsenic | Dissolved Copper | Dissolved Lead | Dissolved Zinc |
| *ROD Groundwater Cleanup Goal (µg/L)* | | *5.0* | *12* | *3.2* | -- |
| *PHSS Cleanup Level (µg/L)* | | *0.018* | *2.74* | *0.54* | 36 |
| *Portland Harbor JSCS SLV (µg/L)* | | *0.045* | *2.7* | *0.54* | *36* |
| KMW37 | 1/29/2020 | 3.7 | -- | 1.2 | -- |
| | 9/30/2020 | 6.3 | -- | 3.9 | -- |
| | 3/24/2021 | 5.5 | -- | 3.0 | -- |
| | 10/6/2021 | 4.8 | -- | 3.9 | -- |
| MW47 | 1/29/2020 | 207 | -- | -- | -- |
| | 9/29/2020 | 90 | -- | -- | -- |
| | 3/24/2021 | 273 | -- | -- | -- |
| | 10/6/2021 | 128 | -- | -- | -- |
| MW48 | 1/29/2020 | 143 | -- | -- | -- |
| | 1/29/2020 DUP | 158 | -- | -- | -- |
| | 9/29/2020 | 178 | -- | -- | -- |
| | 9/29/2020 DUP | 178 | -- | -- | -- |
| | 3/24/2021 | 79 | -- | -- | -- |
| | 10/5/2021 | 154 | -- | -- | -- |
| | 10/5/2021 DUP | 153 | -- | -- | -- |
| MW49 | 1/29/2020 | 1.8 | -- | -- | -- |
| | 9/29/2020 | 1.7 | -- | -- | -- |
| | 3/24/2021 | 1.5 | -- | 1.04 | -- |
| | 10/6/2021 | 2.0 | -- | -- | -- |

***Please refer to notes at end of table.***

# Table 19

## Groundwater Analytical Data – Exceedance Factors (Dissolved Metals)

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Well ID | Sample Date | Exceedance Factors | | | |
|---|---|---|---|---|---|
| | | Dissolved Arsenic | Dissolved Copper | Dissolved Lead | Dissolved Zinc |
| *ROD Groundwater Cleanup Goal (µg/L)* | | 5.0 | 12 | 3.2 | -- |
| *PHSS Cleanup Level (µg/L)* | | 0.018 | 2.74 | 0.54 | 36 |
| *Portland Harbor JSCS SLV (µg/L)* | | 0.045 | 2.7 | 0.54 | 36 |
| ***Slurry Wall*** | | | | | |
| KMW36 | 1/29/2020 | 53 | -- | -- | -- |
| | 9/30/2020 | -- | -- | -- | -- |
| | 3/24/2021 | 67 | -- | -- | -- |
| | 10/6/2021 | -- | -- | -- | -- |
| W-16 | 1/29/2020 | 3.7 | -- | 2.04 | -- |
| | 10/1/2020 | 277 | -- | -- | -- |
| | 3/25/2021 | 203 | -- | 1.08 | -- |
| | 10/6/2021 | 1.1 | -- | -- | -- |
| W-19 | 2/8/2018 | 2.4 | -- | -- | -- |
| | 3/15/2019 | 213 | -- | -- | -- |
| | 1/30/2020 | 2.5 | -- | -- | -- |
| | 3/25/2021 | 152 | -- | -- | -- |
| W-20 | 2/8/2018 | 2.4 | -- | -- | -- |
| | 3/15/2019 | 55 | -- | -- | -- |
| | 1/30/2020 | 86 | -- | -- | -- |
| | 3/25/2021 | 34 | -- | -- | -- |
| W-22 | 2/8/2018 | 66 | -- | 1.27 | -- |
| | 3/15/2019 | -- | -- | -- | -- |
| | 1/30/2020 | -- | -- | -- | -- |
| | 3/23/2021 | -- | -- | -- | -- |

*Please refer to notes at end of table.*

# Table 19

## Groundwater Analytical Data – Exceedance Factors (Dissolved Metals)

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Well ID | Sample Date | Exceedance Factors | | | |
|---|---|---|---|---|---|
| | | Dissolved Arsenic | Dissolved Copper | Dissolved Lead | Dissolved Zinc |
| *ROD Groundwater Cleanup Goal (µg/L)* | | *5.0* | *12* | *3.2* | – |
| *PHSS Cleanup Level (µg/L)* | | *0.018* | *2.74* | *0.54* | 36 |
| *Portland Harbor JSCS SLV (µg/L)* | | *0.045* | *2.7* | *0.54* | *36* |
| ***Site-Wide*** | | | | | |
| KMW01 | 02/09/2018 | 58 | -- | -- | -- |
| | 3/15/2019 | 72 | -- | -- | -- |
| | 1/29/2020 | 49 | -- | -- | -- |
| | 3/23/2021 | – | -- | -- | -- |
| KMW02 | 1/29/2020 | 108 | -- | -- | -- |
| | 10/1/2020 | 177 | -- | -- | -- |
| | 3/23/2021 | 39 | -- | -- | -- |
| | 10/7/2021 | 174 | -- | -- | -- |
| KMW05 | 2/8/2018 | 124 | -- | -- | -- |
| | 3/13/2019 | 70 | -- | -- | -- |
| | 1/28/2020 | 83 | -- | -- | -- |
| | 3/23/2021 | 61 | -- | -- | -- |
| KMW09 | 2/6/2018 | 60 | -- | -- | -- |
| | 3/13/2019 | – | -- | -- | -- |
| | 1/29/2020 | – | -- | -- | -- |
| | 3/23/2021 | – | -- | -- | -- |

***Please refer to notes at end of table.***

# Table 19

## Groundwater Analytical Data – Exceedance Factors (Dissolved Metals)

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Well ID | Sample Date | Exceedance Factors | | | |
|---|---|---|---|---|---|
| | | Dissolved Arsenic | Dissolved Copper | Dissolved Lead | Dissolved Zinc |
| *ROD Groundwater Cleanup Goal (µg/L)* | | *5.0* | *12* | *3.2* | -- |
| *PHSS Cleanup Level (µg/L)* | | *0.018* | *2.74* | *0.54* | 36 |
| *Portland Harbor JSCS SLV (µg/L)* | | *0.045* | *2.7* | *0.54* | *36* |
| KMW10* | 1/29/2020 | 55 | -- | -- | -- |
| | 9/29/2020 | 53 | -- | -- | -- |
| | 3/23/2021 | 56 | -- | -- | -- |
| | 10/7/2021 | 79 | -- | -- | -- |
| KMW16* | 2/9/2018 | 97 | -- | -- | -- |
| | 3/14/2019 | 51 | -- | -- | -- |
| | 1/30/2020 | 48 | -- | -- | -- |
| | 3/25/2021 | 46 | -- | -- | -- |
| KMW20 | 2/9/2018 | 94 | -- | -- | -- |
| | 3/14/2019 | 42 | -- | -- | -- |
| | 1/30/2020 | 57 | -- | -- | -- |
| | 3/23/2021 | 93 | -- | -- | -- |
| KMW21 | 2/9/2018 | 149 | -- | -- | -- |
| | 3/14/2019 | 119 | -- | -- | -- |
| | 1/30/2020 | 110 | -- | -- | -- |
| | 3/23/2021 | 40 | -- | -- | -- |
| KMW24* | 2/9/2018 | 1.6 | -- | -- | -- |
| | 3/13/2019 | 1.2 | -- | -- | -- |
| | 1/30/2020 | 1.4 | -- | -- | -- |
| | 3/25/2021 | 1.4 | -- | -- | -- |

***Please refer to notes at end of table.***

# Table 19

## Groundwater Analytical Data – Exceedance Factors (Dissolved Metals)

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Well ID | Sample Date | Exceedance Factors | | | |
|---|---|---|---|---|---|
| | | Dissolved Arsenic | Dissolved Copper | Dissolved Lead | Dissolved Zinc |
| *ROD Groundwater Cleanup Goal (µg/L)* | | *5.0* | *12* | *3.2* | – |
| *PHSS Cleanup Level (µg/L)* | | *0.018* | *2.74* | *0.54* | 36 |
| *Portland Harbor JSCS SLV (µg/L)* | | *0.045* | *2.7* | *0.54* | *36* |
| KMW26* | 2/9/2018 | 146 | -- | -- | -- |
| | 3/13/2019 | 97 | -- | -- | -- |
| | 1/30/2020 | 66 | -- | -- | -- |
| | 3/25/2021 | 131 | -- | -- | -- |
| MW42 | 2/8/2018 | 62 | -- | -- | -- |
| | 3/14/2019 | – | -- | -- | -- |
| | 1/30/2020 | – | 1.1 | -- | -- |
| | 3/25/2021 | – | -- | -- | -- |
| W-15 | 1/29/2020 | 5.5 | -- | 2.19 | -- |
| | 9/30/2020 | 4.5 | -- | 2.37 | -- |
| | 3/24/2021 | 2.0 | -- | 2.61 | -- |
| | 10/6/2021 | 4.2 | -- | 1.98 | -- |
| | 10/6/2021 DUP | 4.1 | -- | 2.24 | -- |
| ***Southern Facility Area*** | | | | | |
| MW-1 | 2/2/2012 | 5.9 | -- | -- | -- |
| | 12/29/2020 | – | -- | -- | -- |
| | 12/29/2020 DUP | – | -- | -- | -- |
| MW-2 | 2/2/2012 | 58 | -- | -- | -- |
| | 12/29/2020 | 129 | -- | -- | -- |
| | 3/23/2021 | 79 | -- | -- | -- |
| | 10/7/2021 | 135 | -- | -- | -- |
| MW-3 | 2/2/2012 | 7.8 | -- | -- | -- |
| | 12/29/2020 | – | -- | -- | -- |
| | 3/23/2021 | – | -- | -- | -- |
| | 10/7/2021 | – | -- | -- | -- |
| | 10/7/2021 DUP | – | -- | -- | -- |

***Please refer to notes at end of table.***

# Table 19

## Groundwater Analytical Data – Exceedance Factors (Dissolved Metals)

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Well ID | Sample Date | Exceedance Factors | | | |
|---|---|---|---|---|---|
| | | Dissolved Arsenic | Dissolved Copper | Dissolved Lead | Dissolved Zinc |
| *ROD Groundwater Cleanup Goal (µg/L)* | | *5.0* | *12* | *3.2* | -- |
| *PHSS Cleanup Level (µg/L)* | | *0.018* | *2.74* | *0.54* | 36 |
| *Portland Harbor JSCS SLV (µg/L)* | | *0.045* | *2.7* | *0.54* | *36* |
| MW-4 | 2/2/2012 | 8.0 | -- | -- | -- |
| | 12/29/2020 | -- | -- | -- | -- |
| | 3/23/2021 | -- | -- | -- | -- |
| | 10/7/2021 | -- | -- | -- | -- |
| VRUMW-1 | 2/2/2012 | 42.4 | -- | -- | -- |
| | 12/28/2020 | 49.2 | -- | -- | -- |
| VRUMW-2 | 2/2/2012 | 22.2 | -- | -- | -- |
| | 12/28/2020 | 80.0 | -- | -- | -- |
| VO-1 | 2/1/2012 | -- | -- | -- | -- |
| | 2/1/2012 DUP | -- | -- | -- | -- |
| | 12/28/2020 | -- | -- | -- | -- |
| VO-2 | 2/2/2012 | 17.2 | -- | -- | -- |
| | 12/28/2020 | -- | -- | -- | -- |
| VO-3 | 2/2/2012 | 14.6 | -- | -- | -- |
| | 12/29/2020 | -- | -- | -- | -- |

**Notes:**

1. < = Concentration as reported by analytical laboratory is less than the laboratory reporting limit.
2. µg/L = Microgram(s) per liter.
3. EPA = United States Environmental Protection Agency.
4. NS = Not sampled.
5. NA = Not analyzed. Zinc is not a part of the approved monitoring program and is not typically included in the analysis suite; however, it was
6. DUP = Field Duplicate.
7. Yellow highlighed cells indicate values that are equal to or exceeding 1997 ROD Groundwater Cleanup Goals for the ExxonMobil/Shore Terminals Site.
8. Gray highlighted cells indicate values that are equal to or exceeding PHSS Cleanup Level. If a PHSS Cleanup Level was not developed for an analyte, the JSCS SLV is used for comparison.
9. * = Well is screened in Deep Sand unit.
10. Data prior to December 22, 2011 were recorded and previously reported by ExxonMobil.
11. Portland Harbor JSCS SLVs = 2007 Portland Harbor Joint Source Control Strategy Screening Level Values.

12. Well KMW14 was paved over prior to the October 2017 monitoring event. In an email dated February 21, 2018, DEQ agreed that well KMW14 was not critical to monitoring the Loading Rack Area and that replacement of KMW14 was not required. Well KMW14 has been removed from the monitoring program.

13. -- = Not applicable.
14. The exceedance factor is the ratio of the analyte concentration and either the 1997 ROD Cleanup Goal, PHSS Cleanup Level Level, or JSCS

# Table 20

## Groundwater Elevation and SPH Thickness Measurements

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Well ID | Date | Reference Elevation (feet)[1] | Depth To SPH (feet) | Depth To Groundwater (feet) | SPH Thickness (feet) | Groundwater Elevation (feet) | Notes |
|---|---|---|---|---|---|---|---|
| *Tank Field 1* | | | | | | | |
| KMW07 | 1/27/2020 | 32.63 | -- | 11.84 | -- | 20.79 | -- |
| | 9/28/2020 | 32.63 | -- | 14.25 | -- | 18.38 | -- |
| | 3/22/2021 | 32.63 | -- | 11.36 | -- | 21.27 | -- |
| | 10/4/2021 | 32.63 | -- | 14.04 | -- | 18.59 | -- |
| KMW11 | 1/27/2020 | 30.57 | -- | 15.13 | -- | 15.44 | -- |
| | 9/28/2020 | 30.57 | -- | 16.34 | -- | 14.23 | -- |
| | 3/22/2021 | 30.57 | -- | 15.19 | -- | 15.38 | -- |
| | 10/4/2021 | 30.57 | -- | 16.02 | -- | 14.55 | -- |
| KMW18 | 1/27/2020 | 34.49 | -- | 14.11 | -- | 20.38 | -- |
| | 9/28/2020 | 34.49 | -- | 16.55 | -- | 17.94 | -- |
| | 3/22/2021 | 34.49 | -- | 13.90 | -- | 20.59 | -- |
| | 10/4/2021 | 34.49 | -- | 16.36 | -- | 18.13 | -- |
| KMW19 | 1/27/2020 | 32.01 | -- | 13.70 | -- | 18.31 | -- |
| | 9/28/2020 | 32.01 | -- | 15.12 | -- | 16.89 | -- |
| | 3/22/2021 | 32.01 | -- | 13.56 | -- | 18.45 | -- |
| | 10/4/2021 | 32.01 | -- | 14.52 | -- | 17.49 | -- |
| KMW35 | 1/27/2020 | 33.37 | -- | 12.16 | -- | 21.21 | -- |
| | 9/28/2020 | 33.37 | -- | 14.77 | -- | 18.60 | -- |
| | 3/22/2021 | 33.37 | -- | 11.83 | -- | 21.54 | -- |
| | 10/4/2021 | 33.37 | -- | 14.49 | -- | 18.88 | -- |
| MW41A | 1/27/2020 | 33.84 | -- | 12.14 | -- | 21.70 | -- |
| | 9/28/2020 | 33.84 | -- | 14.90 | -- | 18.94 | -- |
| | 3/22/2021 | 33.84 | -- | 12.04 | -- | 21.80 | -- |
| | 10/4/2021 | 33.84 | -- | 14.59 | -- | 19.25 | -- |
| *Tank 3510* | | | | | | | |
| AC-2 | 1/27/2020 | 29.54 | -- | 13.55 | -- | 15.99 | -- |
| | 9/28/2020 | 29.54 | -- | 16.39 | -- | 13.15 | -- |
| | 3/22/2021 | 29.54 | -- | 12.04 | -- | 17.50 | -- |
| | 10/4/2021 | 32.97 | -- | 18.98 | -- | 13.99 | Well Resurveyed 12/2021 |
| AC-7 | 1/27/2020 | 30.52 | -- | 16.65 | -- | 13.87 | -- |
| | 9/28/2020 | 30.52 | -- | 19.09 | -- | 11.43 | -- |
| | 3/22/2021 | 30.52 | -- | 17.55 | -- | 12.97 | -- |
| | 10/4/2021 | 30.52 | -- | 18.94 | -- | 11.58 | -- |
| *Loading Rack* | | | | | | | |
| AC-8* | 1/27/2020 | 42.90 | -- | 14.41 | -- | 28.49 | -- |
| | 9/28/2020 | 42.90 | -- | 15.38 | -- | 27.52 | -- |
| | 3/22/2021 | 42.90 | -- | 13.30 | -- | 29.60 | -- |
| | 10/4/2021 | 42.90 | -- | 15.40 | -- | 27.50 | -- |
| AC-9* | 1/27/2020 | 42.82 | 15.92 | 16.62 | 0.70 | 26.77 | -- |
| | 9/28/2020 | 42.82 | 17.00 | 17.10 | 0.10 | 25.80 | -- |
| | 3/22/2021 | 42.82 | 14.10 | 14.15 | 0.05 | 28.71 | -- |
| | 10/4/2021 | 42.82 | 16.99 | 17.03 | 0.04 | 25.82 | -- |

*Please refer to notes at end of table.*

# Table 20

## Groundwater Elevation and SPH Thickness Measurements

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Well ID | Date | Reference Elevation (feet)[1] | Depth To SPH (feet) | Depth To Groundwater (feet) | SPH Thickness (feet) | Groundwater Elevation (feet) | Notes |
|---|---|---|---|---|---|---|---|
| AC-10* | 1/27/2020 | 43.30 | 16.48 | 16.72 | 0.24 | 26.77 | -- |
| | 9/28/2020 | 43.30 | 17.46 | 17.59 | 0.13 | 25.82 | -- |
| | 3/22/2021 | 43.30 | 14.32 | 14.84 | 0.52 | 28.88 | |
| | 10/4/2021 | 43.05 | 17.32 | 17.44 | 0.12 | 25.71 | Well Resurveyed 12/2021 |
| KMW13* | 1/27/2020 | 44.01 | -- | 17.09 | -- | 26.92 | -- |
| | 9/28/2020 | 44.01 | -- | 18.30 | -- | 25.71 | -- |
| | 3/22/2021 | 44.01 | -- | 15.48 | -- | 28.53 | -- |
| | 10/4/2021 | 44.01 | -- | 18.18 | -- | 25.83 | -- |
| KMW14* | Well KMW14 has been removed from the groundwater monitoring program.[12] | | | | | | |
| MW38* | 1/27/2020 | 41.85 | -- | NM | -- | -- | Inaccessible |
| | 9/28/2020 | 41.85 | -- | 16.37 | -- | 25.48 | -- |
| | 3/22/2021 | 41.85 | -- | 13.89 | -- | 27.96 | -- |
| | 10/4/2021 | 41.85 | -- | 16.30 | -- | 25.55 | -- |
| MW39* | 1/27/2020 | 42.21 | -- | 15.60 | -- | 26.61 | -- |
| | 9/28/2020 | 42.21 | -- | 16.84 | -- | 25.37 | -- |
| | 3/22/2021 | 42.21 | -- | 14.40 | -- | 27.81 | -- |
| | 10/4/2021 | 42.07 | -- | NM | -- | NM | Well Resurveyed 12/2021 |
| MW40 | 1/27/2020 | 34.12 | -- | 12.04 | -- | 22.08 | -- |
| | 9/28/2020 | 34.12 | -- | 15.63 | -- | 18.49 | -- |
| | 3/22/2021 | 34.12 | -- | 12.26 | -- | 21.86 | -- |
| | 10/4/2021 | 34.12 | -- | 15.72 | -- | 18.40 | -- |
| MW43* | 1/27/2020 | 41.78 | -- | 15.25 | -- | 26.53 | -- |
| | 9/28/2020 | 41.78 | -- | 16.25 | -- | 25.53 | -- |
| | 3/22/2021 | 41.78 | -- | 13.70 | -- | 28.08 | -- |
| | 10/4/2021 | 41.78 | -- | 16.18 | -- | 25.60 | -- |
| MW41B* | 1/27/2020 | 34.00 | -- | 8.20 | -- | 25.80 | -- |
| | 6/28/2020 | 34.00 | -- | 9.28 | -- | 24.72 | -- |
| | 3/22/2021 | 34.00 | -- | 8.79 | -- | 25.21 | -- |
| | 10/4/2021 | 34.00 | -- | 9.25 | -- | 24.75 | -- |
| MW44* | 1/27/2020 | 32.65 | -- | 6.18 | -- | 26.47 | -- |
| | 9/28/2020 | 32.65 | -- | 7.51 | -- | 25.14 | -- |
| | 3/22/2021 | 32.65 | -- | 5.36 | -- | 27.29 | -- |
| | 10/4/2021 | 32.65 | -- | 7.40 | -- | 25.25 | -- |
| MW45* | 1/27/2020 | 32.97 | -- | 7.02 | -- | 25.95 | -- |
| | 9/28/2020 | 32.97 | -- | 8.24 | -- | 24.73 | -- |
| | 3/22/2021 | 32.97 | -- | 6.72 | -- | 26.25 | -- |
| | 10/4/2021 | 32.97 | -- | | -- | NM | -- |
| MW46* | 1/27/2020 | 30.04 | -- | 9.64 | -- | 20.40 | -- |
| | 9/28/2020 | 30.04 | -- | 12.31 | -- | 17.73 | -- |
| | 3/22/2021 | 30.04 | -- | 10.40 | -- | 19.64 | -- |
| | 10/4/2021 | 30.21 | -- | 12.79 | -- | 17.42 | Well Resurveyed 12/2021 |

*Please refer to notes at end of table.*

# Table 20

## Groundwater Elevation and SPH Thickness Measurements

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Well ID | Date | Reference Elevation (feet)[1] | Depth To SPH (feet) | Depth To Groundwater (feet) | SPH Thickness (feet) | Groundwater Elevation (feet) | Notes |
|---|---|---|---|---|---|---|---|
| *DPE Treatment Area* | | | | | | | |
| EX-07L | 1/27/2020 | 29.70 | -- | 18.07[2] | -- | 11.63 | Angled Well (25°) |
| | 9/28/2020 | 29.70 | -- | 22.51[2] | -- | 7.19 | Angled Well (25°) |
| | 3/22/2021 | 29.70 | -- | 20.71[2] | -- | 8.99 | Angled Well (25°) |
| | 10/4/2021 | 29.70 | -- | 22.25[2] | -- | 7.45 | Angled Well (25°) |
| KMW29 | 1/27/2020 | 30.74 | -- | 19.27 | -- | 11.47 | -- |
| | 9/28/2020 | 30.74 | -- | 22.13 | -- | 8.61 | -- |
| | 3/22/2021 | 30.74 | -- | 20.97 | -- | 9.77 | -- |
| | 10/4/2021 | 30.74 | -- | 22.28 | -- | 8.46 | -- |
| KMW30 | 1/27/2020 | 30.13 | -- | 18.95 | -- | 11.18 | -- |
| | 9/28/2020 | 30.13 | -- | 22.51 | -- | 7.62 | -- |
| | 3/22/2021 | 30.13 | -- | 21.13 | -- | 9.00 | -- |
| | 10/4/2021 | 30.13 | -- | 22.75 | -- | 7.38 | -- |
| KMW31 | 1/27/2020 | 30.55 | -- | 19.35 | -- | 11.20 | -- |
| | 9/28/2020 | 30.55 | -- | 23.38 | -- | 7.17 | -- |
| | 3/22/2021 | 30.55 | -- | 21.79 | -- | 8.76 | -- |
| | 10/4/2021 | 30.55 | -- | 23.43 | -- | 7.12 | -- |
| KMW32 | 1/27/2020 | 30.27 | -- | 18.59 | -- | 11.68 | -- |
| | 9/28/2020 | 30.27 | -- | 22.57 | -- | 7.70 | -- |
| | 3/22/2021 | 30.27 | -- | 20.51 | -- | 9.76 | -- |
| | 10/4/2021 | 30.11 | -- | 22.23 | -- | 7.88 | Well Resurveyed 12/2021 |
| KMW33 | 1/27/2020 | 30.83 | -- | 18.51 | -- | 12.32 | -- |
| | 9/28/2020 | 30.83 | -- | 23.21 | -- | 7.62 | -- |
| | 3/22/2021 | 30.83 | -- | 20.63 | -- | 10.20 | -- |
| | 10/4/2021 | 30.83 | -- | 22.92 | -- | 7.91 | -- |
| KMW37 | 1/27/2020 | 30.54 | -- | 18.48 | -- | 12.06 | -- |
| | 9/28/2020 | 30.54 | -- | 20.82 | -- | 9.72 | -- |
| | 3/22/2021 | 30.54 | -- | 19.51 | -- | 11.03 | -- |
| | 10/4/2021 | 30.54 | -- | 21.01 | -- | 9.53 | -- |
| MW47 | 1/27/2020 | 30.23 | -- | 19.08 | -- | 11.15 | -- |
| | 9/28/2020 | 30.23 | -- | 24.04 | -- | 6.19 | -- |
| | 3/22/2021 | 30.23 | -- | 22.08 | -- | 8.15 | -- |
| | 10/4/2021 | 30.23 | -- | 24.00 | -- | 6.23 | -- |
| MW48 | 1/27/2020 | 30.36 | -- | 19.22 | -- | 11.14 | -- |
| | 9/28/2020 | 30.36 | -- | 22.67 | -- | 7.69 | -- |
| | 3/22/2021 | 30.36 | -- | 21.38 | -- | 8.98 | -- |
| | 10/4/2021 | 30.36 | -- | 22.98 | -- | 7.38 | -- |
| MW49 | 1/27/2020 | 29.81 | -- | 18.54 | -- | 11.27 | -- |
| | 9/28/2020 | 29.81 | -- | 23.32 | -- | 6.49 | -- |
| | 3/22/2021 | 29.81 | -- | 21.76 | -- | 8.05 | -- |
| | 10/4/2021 | 29.81 | -- | 23.15 | -- | 6.66 | -- |

*Please refer to notes at end of table.*

# Table 20

## Groundwater Elevation and SPH Thickness Measurements

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Well ID | Date | Reference Elevation (feet)[1] | Depth To SPH (feet) | Depth To Groundwater (feet) | SPH Thickness (feet) | Groundwater Elevation (feet) | Notes |
|---|---|---|---|---|---|---|---|
| *Slurry Wall* | | | | | | | |
| KMW36 | 1/27/2020 | 31.00 | -- | 14.23 | -- | 16.77 | -- |
| | 9/28/2020 | 31.00 | -- | 16.47 | -- | 14.53 | -- |
| | 3/22/2021 | 31.00 | -- | 14.08 | -- | 16.92 | -- |
| | 10/4/2021 | 31.00 | -- | 17.33 | -- | 13.67 | -- |
| W-16 | 1/27/2020 | 30.30 | -- | 9.59 | -- | 20.71 | -- |
| | 9/28/2020 | 30.30 | -- | 11.90 | -- | 18.40 | -- |
| | 3/22/2021 | 30.30 | -- | 10.37 | -- | 19.93 | -- |
| | 10/4/2021 | 31.55 | -- | 13.09 | -- | 18.46 | Well Resurveyed 12/2021 |
| W-19 | 1/27/2020 | 29.70 | -- | 11.22 | -- | 18.48 | -- |
| | 9/28/2020 | 29.70 | -- | 13.77 | -- | 15.93 | -- |
| | 3/22/2021 | 29.70 | -- | 10.42 | -- | 19.28 | -- |
| | 10/4/2021 | 29.70 | -- | 13.76 | -- | 15.94 | -- |
| W-20 | 1/27/2020 | 30.32 | -- | 14.24 | -- | 16.08 | -- |
| | 9/28/2020 | 30.32 | -- | 16.42 | -- | 13.90 | -- |
| | 3/22/2021 | 30.32 | -- | 14.59 | -- | 15.73 | -- |
| | 10/4/2021 | 30.32 | -- | 16.60 | -- | 13.72 | -- |
| W-22 | 1/27/2020 | 31.40 | -- | 16.28 | -- | 15.12 | -- |
| | 9/28/2020 | 31.40 | -- | 19.71 | -- | 11.69 | -- |
| | 3/22/2021 | 31.40 | -- | 16.75 | -- | 14.65 | -- |
| | 10/4/2021 | 31.40 | -- | 19.47 | -- | 11.93 | -- |
| *Site-Wide* | | | | | | | |
| KMW01 | 1/27/2020 | 35.48 | -- | 17.87 | -- | 17.61 | -- |
| | 9/28/2020 | 35.48 | -- | 22.29 | -- | 13.19 | -- |
| | 3/22/2021 | 35.48 | -- | 18.65 | -- | 16.83 | -- |
| | 10/4/2021 | 35.48 | -- | 21.50 | -- | 13.98 | -- |
| KMW02 | 1/27/2020 | 34.64 | -- | 12.69 | -- | 21.95 | -- |
| | 9/28/2020 | 34.64 | -- | 14.93 | -- | 19.71 | -- |
| | 3/22/2021 | 34.64 | -- | 13.99 | -- | 20.65 | -- |
| | 10/4/2021 | 34.64 | -- | 14.28 | -- | 20.36 | -- |
| KMW03* | 1/27/2020 | 38.24 | -- | NM | -- | NM | Inaccessible |
| | 9/28/2020 | 38.24 | -- | 6.50 | -- | 31.74 | -- |
| | 3/22/2021 | 38.24 | -- | 4.69 | -- | 33.55 | -- |
| | 10/4/2021 | 38.24 | -- | 6.51 | -- | 31.73 | -- |
| KMW05 | 1/27/2020 | 33.68 | -- | 12.49 | -- | 21.19 | -- |
| | 9/28/2020 | 33.68 | -- | 15.62 | -- | 18.06 | -- |
| | 3/22/2021 | 33.68 | -- | 12.18 | -- | 21.50 | -- |
| | 10/4/2021 | 33.68 | -- | 15.58 | -- | 18.10 | -- |
| KMW06 | 1/27/2020 | 32.80 | -- | NM | -- | -- | Inaccessible |
| | 9/29/2020 | 32.80 | -- | 14.83 | -- | 17.97 | -- |
| | 3/22/2021 | 32.80 | -- | 11.48 | -- | 21.32 | -- |
| | 10/4/2021 | 32.80 | -- | 14.81 | -- | 17.99 | -- |

*Please refer to notes at end of table.*

# Table 20

## Groundwater Elevation and SPH Thickness Measurements

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Well ID | Date | Reference Elevation (feet)[1] | Depth To SPH (feet) | Depth To Groundwater (feet) | SPH Thickness (feet) | Groundwater Elevation (feet) | Notes |
|---|---|---|---|---|---|---|---|
| KMW09 | 1/27/2020 | 31.39 | -- | 16.48 | -- | 14.91 | -- |
| | 9/28/2020 | 31.39 | -- | 17.99 | -- | 13.40 | -- |
| | 3/22/2021 | 31.39 | -- | 17.32 | -- | 14.07 | -- |
| | 10/4/2021 | 31.39 | -- | 17.65 | -- | 13.74 | -- |
| KMW10* | 1/27/2020 | 31.99 | -- | 4.45 | -- | 27.54 | -- |
| | 9/28/2020 | 31.99 | -- | 7.13 | -- | 24.86 | -- |
| | 3/22/2021 | 31.99 | -- | 5.04 | -- | 26.95 | -- |
| | 10/4/2021 | 31.99 | -- | 6.10 | -- | 25.89 | -- |
| KMW15* | 1/27/2020 | 40.98 | -- | 5.65 | -- | 35.33 | -- |
| | 9/28/2020 | 40.98 | -- | 7.97 | -- | 33.01 | -- |
| | 3/22/2021 | 40.98 | -- | 6.44 | -- | 34.54 | -- |
| | 10/4/2021 | 40.98 | -- | 7.39 | -- | 33.59 | -- |
| KMW16* | 1/27/2020 | 41.87 | -- | 15.18 | -- | 26.69 | -- |
| | 9/28/2020 | 41.87 | -- | 15.68 | -- | 26.19 | -- |
| | 3/22/2021 | 41.87 | -- | 12.01 | -- | 29.86 | -- |
| | 10/4/2021 | 41.87 | -- | 15.69 | -- | 26.18 | -- |
| KMW17 | 1/27/2020 | 35.47 | 15.44 | 15.61 | 0.17 | 20.00 | Corrected Using SPH density 0.81 |
| | 9/28/2020 | 35.47 | 21.95 | 22.30 | 0.35 | 13.45 | Corrected Using SPH density 0.81 |
| | 3/22/2021 | 35.47 | 17.35 | 17.38 | 0.03 | 18.11 | Corrected Using SPH density 0.81 |
| | 10/4/2021 | 35.47 | 20.80 | 20.81 | 0.01 | 14.67 | Corrected Using SPH density 0.81 |
| KMW20 | 1/27/2020 | 34.24 | -- | 11.18 | -- | 23.06 | -- |
| | 9/28/2020 | 34.24 | -- | 12.84 | -- | 21.40 | -- |
| | 3/22/2021 | 34.24 | -- | 11.21 | -- | 23.03 | -- |
| | 10/4/2021 | 34.24 | -- | 12.76 | -- | 21.48 | -- |
| KMW21 | 1/27/2020 | 33.93 | -- | 12.38 | -- | 21.55 | -- |
| | 9/28/2020 | 33.93 | -- | 15.12 | -- | 18.81 | -- |
| | 3/22/2021 | 33.93 | -- | 11.98 | -- | 21.95 | -- |
| | 10/4/2021 | 33.93 | -- | 14.96 | -- | 18.97 | -- |
| KMW23* | 1/27/2020 | 42.57 | -- | 9.91 | -- | 32.66 | -- |
| | 9/28/2020 | 42.57 | -- | 10.56 | -- | 32.01 | -- |
| | 3/22/2021 | 42.57 | -- | 8.69 | -- | 33.88 | -- |
| | 10/4/2021 | 42.57 | -- | 10.59 | -- | 31.98 | -- |
| KMW24* | 1/27/2020 | 62.00 | -- | 4.68 | -- | 57.32 | -- |
| | 9/28/2020 | 62.00 | -- | 8.85 | -- | 53.15 | -- |
| | 3/22/2021 | 62.00 | -- | 6.30 | -- | 55.70 | -- |
| | 10/4/2021 | 62.00 | -- | 8.03 | -- | 53.97 | -- |
| KMW25* | 1/27/2020 | 61.36 | -- | 14.79 | -- | 46.57 | -- |
| | 9/28/2020 | 61.36 | -- | 18.64 | -- | 42.72 | -- |
| | 3/22/2021 | 61.36 | -- | 14.68 | -- | 46.68 | -- |
| | 10/4/2021 | 61.36 | -- | 17.50 | -- | 43.86 | -- |

*Please refer to notes at end of table.*

# Table 20

## Groundwater Elevation and SPH Thickness Measurements

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Well ID | Date | Reference Elevation (feet)[1] | Depth To SPH (feet) | Depth To Groundwater (feet) | SPH Thickness (feet) | Groundwater Elevation (feet) | Notes |
|---|---|---|---|---|---|---|---|
| KMW26* | 1/27/2020 | 74.48 | -- | 2.83 | -- | 71.65 | -- |
| | 9/28/2020 | 74.48 | -- | 9.24 | -- | 65.24 | -- |
| | 3/22/2021 | 74.48 | -- | 3.26 | -- | 71.22 | -- |
| | 10/4/2021 | 74.48 | -- | 6.31 | -- | 68.17 | -- |
| KMW27* | 1/27/2020 | 92.04 | -- | NM | -- | -- | Could Not Be Located |
| | 9/29/2020 | 92.04 | -- | 22.69 | -- | 69.35 | -- |
| | 3/22/2021 | 92.04 | -- | 21.78 | -- | 70.26 | -- |
| | 10/4/2021 | 92.04 | -- | 22.72 | -- | 69.32 | -- |
| MW42* | 1/27/2020 | 43.04 | -- | 14.92 | -- | 28.12 | -- |
| | 9/28/2020 | 43.04 | -- | 16.67 | -- | 26.37 | -- |
| | 3/22/2021 | 43.04 | -- | 13.99 | -- | 29.05 | -- |
| | 10/4/2021 | 43.04 | -- | 16.51 | -- | 26.53 | -- |
| W-15 | 1/27/2020 | 29.26 | -- | 10.94 | -- | 18.32 | -- |
| | 9/28/2020 | 29.26 | -- | 12.37 | -- | 16.89 | -- |
| | 3/22/2021 | 29.26 | -- | 11.81 | -- | 17.45 | -- |
| | 10/4/2021 | 30.49 | 13.66 | 13.66 | Sheen | 16.83 | Well Resurveyed 12/2021 |
| W-17 | 1/27/2020 | 31.15 | -- | 9.72 | -- | 21.43 | -- |
| | 9/28/2020 | 31.15 | -- | 13.77 | -- | 17.38 | -- |
| | 3/22/2021 | 31.15 | -- | 9.54 | -- | 21.61 | -- |
| | 10/4/2021 | 31.15 | -- | 12.65 | -- | 18.50 | -- |
| W-18 | 1/27/2020 | 30.00 | -- | 9.48 | -- | 20.52 | -- |
| | 9/28/2020 | 30.00 | -- | 11.98 | -- | 18.02 | -- |
| | 3/22/2021 | 30.00 | -- | 8.31 | -- | 21.69 | -- |
| | 10/4/2021 | 30.00 | -- | 11.99 | -- | 18.01 | -- |
| W-21 | 1/27/2020 | 29.79 | -- | 11.91 | -- | 17.88 | -- |
| | 9/28/2020 | 29.79 | -- | 17.82 | -- | 11.97 | -- |
| | 3/22/2021 | 29.79 | -- | 13.60 | -- | 16.19 | -- |
| | 10/4/2021 | 29.79 | -- | 16.83 | -- | 12.96 | -- |
| *Southern Facility Area* | | | | | | | |
| MW-1 | 1/27/2020 | 33.58 | -- | 13.47 | -- | 20.11 | -- |
| | 9/28/2020 | 33.58 | -- | DRY | -- | -- | -- |
| | 3/22/2021 | 33.58 | | 14.29 | | 19.29 | -- |
| | 10/4/2021 | 33.58 | | 17.53 | | 16.05 | -- |
| MW-2 | 1/27/2020 | 32.90 | -- | 18.99 | -- | 13.91 | -- |
| | 9/28/2020 | 32.90 | -- | 22.31 | -- | 10.59 | -- |
| | 3/22/2021 | 32.90 | -- | 19.42 | -- | 13.48 | -- |
| | 10/4/2021 | 32.90 | -- | 21.76 | -- | 11.14 | -- |
| MW-3 | 1/27/2020 | 33.67 | -- | 19.52 | -- | 14.15 | -- |
| | 9/28/2020 | 33.67 | -- | 22.40 | -- | 11.27 | -- |
| | 3/22/2021 | 33.67 | -- | 20.04 | -- | 13.63 | -- |
| | 10/4/2021 | 33.67 | -- | 22.17 | -- | 11.50 | -- |

*Please refer to notes at end of table.*

# Table 20

## Groundwater Elevation and SPH Thickness Measurements

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Well ID | Date | Reference Elevation (feet)[1] | Depth To SPH (feet) | Depth To Groundwater (feet) | SPH Thickness (feet) | Groundwater Elevation (feet) | Notes |
|---|---|---|---|---|---|---|---|
| MW-4 | 1/27/2020 | 33.82 | -- | 19.62 | -- | 14.20 | -- |
| | 9/28/2020 | 33.82 | -- | 22.36 | -- | 11.46 | -- |
| | 3/22/2021 | 33.82 | -- | 20.50 | -- | 13.32 | -- |
| | 10/4/2021 | 33.82 | -- | 22.00 | -- | 11.82 | -- |
| VRUMW-1 | 1/27/2020 | 32.51 | -- | 13.86 | -- | 18.65 | -- |
| | 9/28/2020 | 32.51 | -- | 14.79 | -- | 17.72 | -- |
| | 3/22/2021 | 32.51 | -- | 14.40 | -- | 18.11 | -- |
| | 10/4/2021 | 32.51 | -- | 14.81 | -- | 17.70 | -- |
| VRUMW-2 | 1/27/2020 | 32.98 | -- | 17.98 | -- | 15.00 | -- |
| | 9/28/2020 | 32.98 | -- | 20.86 | -- | 12.12 | -- |
| | 3/22/2021 | 32.98 | -- | 19.18 | -- | 13.80 | -- |
| | 10/4/2021 | 32.98 | -- | 20.70 | -- | 12.28 | -- |
| VO-1 | 1/27/2020 | 35.73 | -- | 18.26 | -- | 17.47 | -- |
| | 9/28/2020 | 35.73 | -- | 21.64 | -- | 14.09 | -- |
| | 3/22/2021 | 35.73 | -- | 19.72 | -- | 16.01 | -- |
| | 10/4/2021 | 35.73 | -- | 20.97 | -- | 14.76 | -- |
| VO-2 | 1/27/2020 | 35.66 | -- | 16.11 | -- | 19.55 | -- |
| | 9/28/2020 | 35.66 | -- | 16.78 | -- | 18.88 | -- |
| | 3/22/2021 | 35.66 | -- | 16.51 | -- | 19.15 | -- |
| | 10/4/2021 | 35.66 | -- | 16.61 | -- | 19.05 | -- |
| VO-3 | 1/27/2020 | 32.98 | -- | 13.85 | -- | 19.13 | -- |
| | 9/28/2020 | 32.98 | -- | 15.10 | -- | 17.88 | -- |
| | 3/22/2021 | 32.98 | -- | 14.66 | -- | 18.32 | -- |
| | 10/4/2021 | 32.98 | -- | 15.12 | -- | 17.86 | -- |

| River Gauge | Date | Reference Elevation (feet)[4] | Depth To SPH (feet) | River Stage (feet)[5] | SPH Thickness (feet) | River Elevation (feet)[6] | Notes |
|---|---|---|---|---|---|---|---|
| Willamette River | 1/27/2020 | 2.92 | -- | 7.79 | -- | 10.71 | -- |
| | 9/28/2020 | 2.92 | -- | 2.26 | -- | 5.18 | -- |
| | 3/22/2021 | 2.92 | -- | 2.92 | -- | 5.84 | -- |
| | 10/4/2021 | 2.92 | -- | 2.44 | -- | 5.36 | -- |

**Notes:**

1. Reference elevation (i.e., top of casing) relative to City of Portland Datum, survey conducted in July 2005. City of Portland Datum is 1.375 feet below NGVD 29 (sea level).
2. Reported depth to groundwater is corrected from the field measurement for the 25° angle from vertical.
3. Groundwater elevation is corrected where SPH is observed by using the SPH density stated in the "Notes" column.
4. Reference elevation (i.e., top of casing) relative to City of Portland Datum. This is the gauge height at USGS Sta. 14211720 in feet.
5. Mean daily river stage at USGS Sta. 14211720 in feet.
6. Mean daily river elevation at USGS Sta. 14211720 relative to City of Portland Datum in feet.
7. USGS = United States Geological Survey.
8. SPH = Separate-phase hydrocarbons.
9. NM = Not measured.
10. NGVD 29 = National Geodetic Vertical Datum of 1929.
11. * = Well is screened in Deep Sand unit.
12. Well KMW14 was paved over prior to the October 2017 monitoring event. In an email dated February 21, 2018, DEQ agreed that well KMW14 was not critical to monitoring the Loading Rack Area and that replacement of KMW14 was not required. Well KMW14 has been removed from the monitoring program.

# Table 21

## SPH Monitoring and Removal

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Date | SPH Thickness (feet) | | | | | | | | | | SPH/Water Mix Removed (gallons) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | KMW17 | W-15 | KMW32 | AC-6 | AC-8 | AC-9 | AC-10 | KMW13[a] | MW38[d] | MW39[d] | |
| 1/5/2011 | 0.11[b] | NP | NP | 2.50 | -- | -- | -- | -- | -- | -- | 0.7 |
| 1/19/2011 | 0.04[b] | -- | -- | 3.19 | NP | Sheen | NP | -- | -- | -- | 0.8 |
| 2/9/2011 | -- | -- | -- | 4.09 | -- | -- | -- | -- | -- | -- | 0.8 |
| 2/21/2011 | 1.10[b] | NP | NP | 2.12 | -- | -- | -- | -- | -- | -- | 0.8 |
| 3/2/2011 | -- | -- | -- | 1.96 | -- | -- | -- | -- | -- | -- | 0.4 |
| 3/8/2011 | -- | -- | -- | 1.58 | -- | -- | -- | -- | -- | -- | 0.2 |
| 3/28/2011 | 0.30[b] | NP | NP | 3.55 | -- | -- | -- | -- | -- | -- | 1.1 |
| 4/13/2011 | 0.14[b] | NP | NP | 3.18 | -- | -- | -- | -- | -- | -- | 0.8 |
| 4/20/2011 | -- | -- | -- | 1.87 | -- | -- | -- | -- | -- | -- | 0.3 |
| 4/26/2011 | -- | -- | -- | 1.41 | -- | -- | -- | -- | -- | -- | 0.2 |
| 4/29/2011 | -- | -- | -- | 0.88 | -- | -- | -- | -- | -- | -- | 0.1 |
| 5/4/2011 | 0.33[b] | NP | NP | 1.48 | -- | -- | -- | -- | -- | -- | 0.5 |
| 5/10/2011 | -- | -- | -- | 1.35 | -- | -- | -- | -- | -- | -- | 0.2 |
| 5/17/2011 | -- | -- | -- | 1.75 | -- | -- | -- | -- | -- | -- | 0.2 |
| 5/31/2011 | -- | -- | -- | 3.48 | -- | -- | -- | -- | -- | -- | 0.6 |
| 6/8/2011 | -- | -- | -- | -- | NP | NP | NP | -- | -- | -- | -- |
| 6/9/2011 | 0.23[b] | NP | NP | 2.39 | -- | -- | -- | -- | -- | -- | 0.7 |
| 6/16/2011 | -- | -- | -- | 1.85 | -- | -- | -- | -- | -- | -- | 0.3 |
| 6/29/2011 | -- | -- | -- | 3.61 | -- | -- | -- | -- | -- | -- | 0.7 |
| 7/8/2011 | 0.01[b] | NP | NP | 2.46 | -- | -- | -- | -- | -- | -- | 0.7 |
| 7/21/2011 | -- | -- | -- | 3.45 | -- | -- | -- | -- | -- | -- | 0.8 |
| 7/22/2011 | -- | -- | -- | 0.08 | -- | -- | -- | -- | -- | -- | <0.1 |
| 8/2/2011 | -- | -- | -- | 2.53 | -- | -- | -- | -- | -- | -- | 0.5 |
| 8/9/2011 | -- | -- | -- | 1.34 | -- | -- | -- | -- | -- | -- | 0.2 |
| 8/23/2011 | 0.18[b] | NP | NP | -- | -- | -- | -- | -- | -- | -- | 0.3 |
| 8/26/2011 | -- | -- | -- | 1.68 | NP | NP | NP | -- | -- | -- | 0.2 |
| 8/30/2011 | -- | -- | -- | 0.21 | -- | -- | -- | -- | -- | -- | <0.1 |
| 9/7/2011 | -- | -- | -- | 0.26 | -- | -- | -- | -- | -- | -- | <0.1 |
| 9/14/2011 | 0.01[b] | NP | NP | 0.15 | -- | -- | -- | -- | -- | -- | 0.1 |
| 9/21/2011 | -- | -- | -- | 0.17 | -- | -- | -- | -- | -- | -- | <0.1 |
| 10/7/2011 | -- | -- | -- | 0.21 | -- | -- | -- | -- | -- | -- | <0.1 |
| 10/12/2011 | SPH[b] | NP | NP | 0.08 | -- | -- | -- | -- | -- | -- | <0.1 |
| 10/19/2011 | -- | -- | -- | 0.17 | -- | -- | -- | -- | -- | -- | <0.1 |
| 11/4/2011 | -- | -- | -- | 0.34 | -- | -- | -- | -- | -- | -- | <0.1 |
| 11/7/2011 | -- | -- | -- | 0.12 | -- | -- | -- | -- | -- | -- | <0.1 |
| 11/29/2011 | SPH[b] | NP | NP | 5.72 | -- | -- | -- | -- | -- | -- | 1.1 |
| 11/30/2011 | -- | -- | -- | -- | NP | NP | 0.01 | -- | -- | -- | -- |
| 12/9/2011 | -- | -- | -- | 4.19 | -- | -- | -- | -- | -- | -- | 0.7 |
| 12/21/2011 | SPH[b] | NP | NP | 3.04 | -- | -- | -- | -- | -- | -- | 0.5 |

*Please refer to notes at end of table.*

# Table 21

## SPH Monitoring and Removal

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Date | SPH Thickness (feet) | | | | | | | | | | SPH/Water Mix Removed (gallons) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | KMW17 | W-15 | KMW32 | AC-6 | AC-8 | AC-9 | AC-10 | KMW13[a] | MW38[d] | MW39[d] | |
| 1/25/2012 | -- | -- | -- | 6.20 | -- | -- | -- | -- | -- | -- | 2.0 |
| 2/22/2012 | Sheen | NP | NP | 3.00 | NP | NP | NP | -- | -- | -- | -- |
| 3/14/2012 | -- | -- | -- | ~4[c] | -- | -- | -- | -- | -- | -- | 2.3 |
| 3/20/2012 | 0.12[b] | Sheen | NP | 1.86 | -- | -- | -- | -- | -- | -- | 2.0 |
| 4/3/2012 | -- | -- | -- | 4.12 | -- | -- | -- | -- | -- | -- | 1.5 |
| 4/17/2012 | 0.01[b] | NP | NP | 4.10 | -- | NP | NP | -- | -- | -- | 1.6 |
| 5/8/2012 | -- | -- | -- | 3.99 | NP | NP | NP | -- | -- | -- | 1.0 |
| 5/22/2012 | 0.15[b] | NP | Sheen | 3.76 | -- | -- | -- | -- | -- | -- | 1.8 |
| 7/3/2012 | 0.1b | NP | NP | 3.98 | -- | -- | -- | -- | -- | -- | 2.8 |
| 6/5/2012 | -- | -- | -- | 4.51 | -- | -- | -- | -- | -- | -- | 1.0 |
| 6/21/2012 | 0.03[b] | NP | NP | 3.78 | -- | NP | NP | -- | -- | -- | 1.2 |
| 7/3/2012 | 0.10 | NP | NP | 3.98 | -- | -- | -- | -- | -- | -- | 2.8 |
| 8/27/2012 | 0.13 | NP | NP | -- | -- | -- | -- | -- | -- | -- | 0.25 |
| 9/12/2012 | -- | NP | NP | -- | -- | NP | NP | -- | -- | -- | 0.0 |
| 9/17/2012 | Sheen | NP | NP | 1.37 | NP | NP | 0.01 | -- | -- | -- | 0.0 |
| 9/21/2012 | -- | -- | -- | -- | -- | NP | NP | -- | -- | -- | -- |
| 9/27/2012 | Sheen | -- | -- | 0.69 | NP | -- | -- | -- | -- | -- | 0.5 |
| 10/11/2012 | -- | -- | -- | 0.10 | -- | -- | -- | -- | -- | -- | 0.0 |
| 10/24/2012 | NP | NP | NP | 2.30 | -- | 0.01 | 0.01 | -- | -- | -- | 0.6 |
| 11/19/2012 | NP | NP | NP | 0.88 | -- | -- | -- | -- | -- | -- | 0.3 |
| 12/4/2012 | -- | -- | -- | 4.56 | NP | NP | NP | -- | -- | -- | 1.5 |
| 12/6/2012 | 0.04 | NP | NP | -- | -- | -- | -- | -- | -- | -- | 0.0 |
| 12/18/2012 | Sheen | -- | -- | 4.49 | -- | NP | Sheen | -- | -- | -- | -- |
| 1/15/2013 | Sheen | NP | -- | 3.35 | NP | NP | NP | -- | -- | -- | 1.5 |
| 2/11/2013 | 0.02 | NP | NP | 1.55 | NP | NP | NP | -- | -- | -- | -- |
| 2/26/2013 | -- | -- | -- | 1.25 | -- | -- | -- | -- | -- | -- | 1.0 |
| 3/13/2013 | 0.01 | NP | NP | 3.24 | NP | NP | NP | -- | -- | -- | 1.0 |
| 3/28/2013 | 0.40 | -- | -- | 2.85 | -- | -- | -- | -- | -- | -- | 0.8 |
| 4/8/2013 | Sheen | NP | NP | 1.10 | NP | NP | NP | -- | -- | -- | 2.0 |
| 4/22/2013 | -- | -- | -- | 3.60 | -- | -- | -- | -- | -- | -- | 2.0 |
| 5/6/2013 | -- | NP | NP | 1.00[c] | -- | -- | -- | -- | -- | -- | 1.0 |
| 5/20/2013 | Sheen | NP | NP | 1.01 | NP | NP | Sheen | -- | -- | -- | 1.0 |
| 6/17/2013 | 0.40 | NP | NP | 0.70 | NP | NP | NP | -- | -- | -- | 1.0 |
| 7/1/2013 | 0.01 | NP | NP | 0.34 | NP | NP | NP | -- | -- | -- | 0.1 |
| 7/29/2013 | -- | -- | -- | 2.17 | -- | -- | -- | -- | -- | -- | 0.4 |
| 8/12/2013 | 0.10 | NP | NP | 0.30 | NP | NP | NP | -- | -- | -- | 0.1 |
| 9/16/2013 | Sheen | NP | NP | 1.27 | NP | 0.01 | 0.01 | -- | -- | -- | 0.9 |
| 9/26/2013 | 0.10 | NP | NP | 0.15 | NP | 0.01 | 0.01 | -- | -- | -- | 0.1 |
| 10/10/2013 | 0.20 | NP | NM | 0.50 | NP | NP | NP | -- | -- | -- | 0.2 |
| 11/4/2013 | 0.05 | Sheen | NP | 2.19 | NP | 0.05 | 0.04 | -- | -- | -- | 0.4 |
| 11/18/2013 | 0.05 | NP | NP | 0.35 | NP | NP | NP | -- | -- | -- | 0.1 |
| 12/10/2013 | 0.05 | NP | NP | 0.24 | NP | SHEEN | NP | -- | -- | -- | 0.1 |

*Please refer to notes at end of table.*

# Table 21

## SPH Monitoring and Removal

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Date | SPH Thickness (feet) | | | | | | | | | | SPH/Water Mix Removed (gallons) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | KMW17 | W-15 | KMW32 | AC-6 | AC-8 | AC-9 | AC-10 | KMW13[a] | MW38[d] | MW39[d] | |
| 1/27/2014 | 0.05 | NP | NP | 0.95 | NP | NP | 0.01 | -- | -- | -- | 0.2 |
| 2/11/2014 | 0.13 | NP | NP | 1.99 | NP | 0.01 | 0.01 | -- | -- | -- | 0.4 |
| 3/10/2014 | 0.02 | NP | NP | 0.03 | NP | NP | NP | -- | -- | -- | 0.02 |
| 3/26/2014 | 0.05 | NP | NP | 0.60 | NP | NP | NP | -- | -- | -- | 0.13 |
| 4/8/2014 | 0.07 | NP | NP | 4.55 | NP | NP | NP | -- | -- | -- | 0.8 |
| 4/21/2014 | 0.05 | NP | NP | 5.95 | NP | NP | NP | -- | -- | -- | 1.0 |
| 5/5/2014 | 0.03 | NP | NP | 0.90 | NP | NP | NP | -- | -- | -- | 0.2 |
| 5/19/2014 | 0.08 | NP | NP | 3.81 | NP | NP | NP | -- | -- | -- | 0.7 |
| 6/3/2014 | 0.01 | NP | NP | 0.82 | NP | NP | NP | -- | -- | -- | 0.1 |
| 7/2/2014 | 0.02 | NP | NP | 2.01 | NP | NP | NP | -- | -- | -- | 0.3 |
| 7/28/2014 | 0.05 | NP | NP | 2.70 | NP | NP | NP | -- | -- | -- | 0.5 |
| 8/28/2014 | NP | NP | NP | 1.50 | 0.01 | NP | NP | -- | -- | -- | 0.2 |
| 9/10/2014 | 0.25 | NP | NP | -- | -- | -- | 0.01 | 0.1 | -- | -- | 0.01 |
| 9/12/2014 | -- | -- | -- | 0.75 | 0.03 | 0.02 | 0.01 | Sheen | -- | -- | 0.1 |
| 9/22/2014 | 0.05 | NP | NP | 0.80 | 0.01 | 0.01 | 0.05 | Sheen | -- | -- | 0.2 |
| 10/6/2014 | 0.10 | -- | NP | 0.70 | 0.01 | NP | 0.01 | -- | -- | -- | 0.2 |
| 10/20/2014 | 0.30 | NP | Sheen | 0.45 | 0.01 | 0.01 | 0.02 | Sheen | -- | -- | 0.3 |
| 11/18/2014 | 0.05 | NP | NP | 2.0 | NP | 0.01 | 0.01 | 0.01 | -- | -- | 0.4 |
| 12/1/2014 | 1.40 | NP | NP | 2.0 | 0.01 | 0.01 | 0.01 | 0.01 | -- | -- | 1.2 |
| 12/29/2014 | 0.07 | NP | NP | 1.83 | NP | 0.02 | 0.01 | 0.01 | -- | -- | 0.3 |
| 1/27/2015 | 1.33 | NP | NP | 2.0 | NP | NP | NP | NP | -- | -- | 1.2 |
| 2/9/2015 | 0.05 | NP | NP | 1.3 | NP | NP | NP | -- | -- | -- | 0.2 |
| 2/26/2015 | 0.50 | -- | -- | 1.5 | -- | -- | -- | -- | -- | -- | 1.3 |
| 3/12/2015 | 0.05 | NP | NP | 1.59 | NP | NP | NP | NP | -- | -- | 1.0 |
| 3/23/2015 | 0.01 | NP | NP | 4.15 | NP | NP | NP | NP | -- | -- | -- |
| 4/2/2015 | 0.02 | NP | NP | 3.5 | NP | NP | NP | NP | -- | -- | 4.0 |
| 4/17/2015 | 0.11 | NP | NP | 1.00 | NP | NP | NP | NP | -- | -- | 2.0 |
| 4/28/2015 | 0.10 | NP | NP | 1.00 | NP | NP | NP | NP | -- | -- | 1.8 |
| 5/12/2015 | Sheen | NP | NP | 1.00 | NP | NP | NP | NP | -- | -- | 4.0 |
| 5/29/2015 | 0.04 | NP | NP | 1.52 | NP | NP | NP | NP | -- | -- | 0.5 |
| 6/12/2015 | 0.02 | NP | NP | 0.46 | NP | NP | NP | NP | -- | -- | 0.3 |
| 6/26/2015 | Sheen | NP | NP | 1.00 | NP | NP | NP | NP | -- | -- | 3.0 |
| 7/9/2015 | 1.70 | NP | NP | 0.70 | NP | NP | NP | NP | -- | -- | 1.5 |
| 7/21/2015 | 0.25 | NP | NP | 0.55 | NP | NP | NP | NP | -- | -- | 0.8 |
| 8/6/2015 | 0.01 | NP | NP | 0.20 | NP | NP | NP | NP | -- | -- | 0.3 |
| 8/20/2015 | 0.05 | NP | NP | 0.66 | NP | NP | NP | NP | -- | -- | 0.5 |
| 9/2/2015 | 0.35 | NP | NP | 1.65 | NP | NP | NP | NP | -- | -- | 1.3 |
| 9/16/2015 | 0.20 | NP | NP | 0.67 | NP | NP | NP | NP | -- | -- | 1.1 |
| 9/28/2015 | 0.10 | NP | NP | 0.41 | NP | 0.06 | 0.02 | NP | -- | -- | -- |
| 10/16/2015 | 0.20 | NP | NP | 0.66 | NP | NP | 0.01 | NP | -- | -- | 3.5 |
| 10/29/2015 | 0.20 | NP | SHEEN | 0.60 | NP | 2.01 | 0.05 | SHEEN | -- | -- | 5.1 |

*Please refer to notes at end of table.*

# Table 21

## SPH Monitoring and Removal

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Date | SPH Thickness (feet) | | | | | | | | | | SPH/Water Mix Removed (gallons) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | KMW17 | W-15 | KMW32 | AC-6 | AC-8 | AC-9 | AC-10 | KMW13[a] | MW38[d] | MW39[d] | |
| 11/2/2015 | NM | NM | NM | NM | NP | 1.91 | 0.02 | NM | -- | -- | 1.5 |
| 11/10/2015 | 0.50 | NP | SHEEN | 0.40 | NP | 0.6 | 0.03 | NP | -- | -- | 4.9 |
| 11/18/2015 | NM | NM | NM | NM | NM | 1.40 | NM | NM | -- | -- | 0.8 |
| 11/24/2015 | 0.60 | NP | SHEEN | 0.25 | NP | 1.20 | 0.04 | NP | -- | -- | 2.4 |
| 12/4/2015 | NM | NM | NM | NM | NM | 1.15 | NM | NM | -- | -- | 0.5 |
| 12/10/2015 | 0.60 | NP | SHEEN | 0.41 | NP | 0.90 | SHEEN | NM | -- | -- | 3.8 |
| 12/16/2015 | NM | NM | NM | NM | NM | 1.30 | NM | NM | -- | -- | 0.8 |
| 12/21/2015 | 1.00 | NP | NP | 1.10 | SHEEN | 0.1 | NP | NM | -- | -- | 3.3 |
| 1/7/2016 | 0.40 | NP | NP | 4.30 | NP | 0.1 | NP | NP | -- | -- | 2.5 |
| 1/21/2016 | 1.10 | NP | NP | 3.75 | NP | 0.06 | NP | NP | -- | -- | 3.8 |
| 2/4/2016 | 1.08 | NP | NP | 3.84 | NP | 0.1 | NP | NP | -- | -- | 3.7 |
| 2/17/2016 | 3.00 | NP | NP | 2.90 | SHEEN | SHEEN | SHEEN | SHEEN | -- | -- | 3.8 |
| 3/4/2016 | 1.85 | NP | NP | 2.95 | SHEEN | 0.02 | SHEEN | NP | -- | -- | 1.5 |
| 3/14/2016 | 1.20 | NP | NP | 1.90 | NP | 0.03 | SHEEN | NP | SHEEN | SHEEN | 4.8 |
| 3/28/2016 | 0.51 | NP | NP | 2.42 | NP | 0.04 | NP | NP | SHEEN | SHEEN | 4.0 |
| 4/11/2016 | 0.50 | NP | NP | 1.80 | NP | 0.01 | 0.01 | NP | SHEEN | SHEEN | 3.5 |
| 5/2/2016 | 0.45 | NP | NP | 1.88 | SHEEN | SHEEN | SHEEN | SHEEN | NM | NM | 3.3 |
| 5/23/2016 | 0.23 | NP | NP | 4.03 | NP | SHEEN | SHEEN | NP | NM | NM | 3.0 |
| 6/6/2016 | 1.25 | NP | NP | 1.63 | NP | SHEEN | SHEEN | NP | NP | NP | 3.0 |
| 6/21/2016 | 3.50 | NP | NP | 3.50 | NP | 0.04 | 0.03 | NP | SHEEN | NP | 3.1 |
| 7/7/2016 | 0.45 | NP | NP | 3.14 | NP | 0.02 | 0.02 | NP | NP | NP | 3.0 |
| 7/20/2016 | 0.25 | NP | NP | 1.04 | NP | NP | NP | NP | NP | NP | 1.8 |
| 8/4/2016 | 0.31 | NP | NP | 0.46 | NP | 0.01 | SHEEN | NP | NP | NP | 2.0 |
| 8/18/2016 | 0.13 | NP | NP | 0.34 | NP | 0.02 | NP | NP | NP | NP | 0.8 |
| 8/31/2016 | 0.17 | NP | NP | 0.36 | NP | 0.03 | 0.01 | NP | NP | NP | 1.8 |
| 9/19/2016 | 0.02 | NP | NP | 0.50 | NP | 0.06 | 0.01 | NP | SHEEN | NP | 1.5 |
| 10/6/2016 | 0.02 | NP | NP | 0.44 | NP | 0.03 | 0.03 | NM | NM | NM | 0.5 |
| 10/20/2016 | 0.01 | NP | NP | 4.57 | NP | NP | NP | NP | NP | NP | 1.8 |
| 11/4/2016 | 0.01 | NP | NP | 3.87 | SHEEN | SHEEN | SHEEN | NP | SHEEN | NP | 1.0 |
| 12/1/2016 | 0.28 | NP | NP | 5.10 | NP | NP | NP | NP | NP | NP | 2.0 |
| 12/13/2016 | 0.95 | NP | NP | 4.50 | NP | NP | NP | NP | NP | NP | 2.5 |
| 1/5/2017 | 0.02 | NP | NP | 4.52 | NP | NP | NP | NP | NP | NP | 2.5 |
| 2/14/2017 | 0.15 | NP | NP | 5.51 | NP | NP | NP | NP | NP | NP | 2.5 |
| 3/20/2017 | 0.25 | NP | NP | 5.53 | NP | NP | NP | NP | NP | NP | 2.5 |
| 4/11/2017 | 0.34 | NP | NP | 3.61 | NP | NP | NP | NP | NP | NP | 2.5 |
| 5/11/2017 | 0.65 | NP | NP | 4.63 | NP | NP | NP | NP | NP | NP | 3.0 |
| 6/13/2017 | 0.99 | NP | NP | 5.18 | NP | NP | NP | NP | NP | NP | 2.5 |
| 7/13/2017 | 1.98 | NP | NP | 4.58 | NP | NP | NP | NP | NP | NP | 2.5 |
| 8/16/2017 | 0.30 | NP | NP | 2.39 | NP | NP | NP | NP | NP | NP | 1.0 |
| 9/8/2017 | 0.30 | NP | NP | 1.00 | NP | NP | NP | NP | NP | NP | 0.8 |

*Please refer to notes at end of table.*

# Table 21

## SPH Monitoring and Removal

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Date | SPH Thickness (feet) | | | | | | | | | | SPH/Water Mix Removed (gallons) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | KMW17 | W-15 | KMW32 | AC-6 | AC-8 | AC-9 | AC-10 | KMW13[a] | MW38[d] | MW39[d] | |
| 10/16/2017 | 0.50 | NP | NP | 0.28 | NP | 0.01 | SHEEN | NP | NP | NP | 0.5 |
| 11/16/2017 | 1.00 | NP | NP | 2.00 | SHEEN | SHEEN | SHEEN | NP | SHEEN | NP | 2.5 |
| 12/8/2017 | 0.20 | NP | NP | 4.00 | NP | NP | NP | NP | SHEEN | SHEEN | 1.5 |
| 1/18/2018 | 1.00 | NP | NP | 2.13 | NP | SHEEN | NP | NP | NP | NP | 1.5 |
| 2/5/2018 | 0.38 | NP | NP | 4.85 | NP | NP | NP | NP | NP | NP | 1.0 |
| 3/28/2018 | 0.40 | NP | NP | 3.60 | NP | NP | NP | NP | SHEEN | NP | 2.3 |
| 4/26/2018 | 0.04 | NP | NP | 0.12 | NP | SHEEN | NP | NP | SHEEN | NP | 0.3 |
| 5/31/2018 | 0.20 | NP | NP | 0.40 | NP | NP | NP | NP | NP | NP | 0.3 |
| 6/21/2018 | 0.30 | NP | NP | 2.75 | NP | NP | NP | NP | NP | NP | 0.6 |
| 7/25/2018 | 0.32 | NP | NP | 2.00 | NP | NP | NP | NP | NP | NP | 0.4 |
| 8/23/2018 | 0.18 | SHEEN | NP | 0.34 | NP | NP | NP | NP | NP | NP | 0.7 |
| 9/21/2018 | 0.04 | SHEEN | NP | 0.59 | NP | NP | NP | NP | NP | NP | 0.4 |
| 10/15/2018 | NM | NP | NP | NM | NP | NP | 0.01 | NP | NP | NP | NM |
| 11/20/2018 | 0.18 | NP | NP | 2.83 | NP | NP | SHEEN | NP | NP | NP | 0.6 |
| 12/20/2018 | 0.02 | NP | NP | 5.04 | NP | 1.2 | 0.03 | NP | NP | NP | 1.7 |
| 1/24/2019 | 0.18 | NP | NP | 5.46 | NP | 0.60 | SHEEN | NM | NP | NP | 0.9 |
| 2/21/2019 | 0.63 | NP | NP | 5.69 | NP | 0.20 | SHEEN | NP | NP | NP | 1.3 |
| 3/15/2019 | 0.50 | NP | NP | 4.43 | NP | 0.15 | SHEEN | NP | NP | NP | 3.0 |
| 4/26/2019 | 0.20 | NP | NP | 4.00 | NP | 0.05 | SHEEN | NP | SHEEN | NP | 2.3 |
| 5/23/2019 | 0.07 | NP | NP | 3.62 | NP | 0.09 | 0.02 | NP | NP | NP | 2.1 |
| 6/27/2019 | 0.15 | NP | NM | 2.39 | SHEEN | 0.14 | 0.10 | NP | NP | NP | 2.2 |
| 7/17/2019 | 0.09 | NP | NP | 0.99 | NP | 0.11 | 0.04 | NP | NP | NP | 0.7 |
| 8/22/2019 | 0.47 | NP | NP | 1.35 | NP | NP | NP | NP | NM | NP | 0.8 |
| 9/25/2019 | 0.15 | NP | NP | 1.97 | NP | NP | SHEEN | NP | NM | NP | 0.5 |
| 10/7/2019 | 0.88 | NP | NP | 1.85 | NP | 0.07 | 0.1 | NP | NM | NP | 3.3 |
| 11/20/2019 | 0.33 | NP | NP | 2.05 | NP | SHEEN | NP | NP | NM | NP | 0.6 |
| 12/19/2019 | 0.28 | NP | NP | 1.69 | NP | SHEEN | NP | NP | NM | NP | 0.4 |
| 1/27/2020 | 0.17 | NP | NP | 6.36 | SHEEN | 0.90 | 0.24 | NP | NM | NP | 6.5 |
| 2/22/2020 | 0.96 | NP | NP | 1.88 | NP | 0.09 | SHEEN | NP | NM | NP | 1.75 |
| Field work was not completed in March 2020 due to ongoing COVID-19 pandemic. | | | | | | | | | | | -- |
| Field work was not completed in April 2020 due to ongoing COVID-19 pandemic. | | | | | | | | | | | -- |
| 5/14/2020 | 0.23 | NP | NP | 1.96 | NP | 0.16 | 0.04 | NP | NM | NP | 4.0 |
| 6/25/2020 | 0.93 | NP | NP | 2.05 | NP | 0.03 | NP | NP | NP | NP | 4.0 |
| 7/23/2020 | 0.92 | NP | NP | 2.06 | NP | NP | NP | NP | NP | NP | 3.0 |
| 8/27/2020 | 0.65 | NP | NP | 1.15 | NP | 0.02 | 0.03 | NP | NP | NP | 3.8 |
| 9/28/2020 | 0.35 | NP | NP | 0.89 | NP | 0.10 | 0.13 | NP | NP | NP | 3.2 |
| 10/30/2020 | 0.04 | NP | NP | 1.53 | NP | 0.06 | 0.04 | NP | NP | NP | 2.5 |
| 11/24/2020 | 0.01 | NP | NP | 4.65 | NP | 0.62 | 0.59 | NP | NP | NP | 2.9 |
| 12/28/2020 | 0.02 | NP | NP | 2.09 | NP | 0.14 | NP | NP | NP | NP | 3.5 |
| 1/27/2021 | 0.03 | NP | NP | 2.71 | NP | 0.56 | 0.24 | NP | NP | NP | 4.3 |
| 2/19/2021 | 0.01 | NP | NP | 5.32 | NP | 0.17 | 0.36 | NP | NP | NP | 2.5 |

*Please refer to notes at end of table.*

# Table 21

## SPH Monitoring and Removal

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Date | SPH Thickness (feet) | | | | | | | | | | SPH/Water Mix Removed (gallons) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | KMW17 | W-15 | KMW32 | AC-6 | AC-8 | AC-9 | AC-10 | KMW13[a] | MW38[d] | MW39[d] | |
| 3/22/2021 | 0.03 | NP | NP | 2.89 | NP | 0.15 | 0.52 | NP | NP | NP | 3.5 |
| 4/29/2021 | 0.11 | NP | NP | 3.97 | NP | 0.03 | 1.18 | NP | NP | NP | 3.5 |
| 5/24/2021 | 0.01 | NP | NP | 1.94 | NP | 0.05 | 0.78 | NP | NP | NP | 1.5 |
| 6/23/2021 | 0.02 | NP | NP | 3.11 | NP | 0.01 | 0.52 | NP | NP | NP | 2.0 |
| 7/26/2021 | 0.01 | NP | NP | 1.80 | NP | 0.02 | 0.20 | NP | NP | NP | 2.3 |
| 8/26/2021 | 0.02 | NP | NP | 1.50 | NP | 0.02 | 0.29 | NP | NP | NP | 2.5 |
| 9/28/2021 | 0.01 | NP | NP | 1.30 | NP | 0.02 | 0.27 | NP | NP | NP | 2.1 |
| 10/4/2021 | 0.01 | NP | NP | 0.99 | NP | 0.04 | 0.12 | NP | NP | NP | 2.6 |
| 11/23/2021 | 0.06 | NP | NP | 3.98 | NP | 0.97 | 0.14 | NP | NP | NP | 6.5 |
| 12/17/2021 | 0.03 | NP | NP | 6.67 | NP | 0.15 | NP | NP | NP | NP | 2.5 |

**Notes:**

1. SPH = separate phase hydrocarbons.
2. [a] Prior to September 2014, SPH was not measured in well KMW13 on a monthly basis.
3. [b] Oil sorbent socks maintained in well.
4. [c] Thickness estimated from column observed in disposable bailer.
5. [d] Wells MW38 and MW39 were not guaged on a monthly basis prior to SPH being measured in March 2016.
6. NM = Not measured.
7. NP = SPH not detected in well.
8. Sheen = sheen was detected in well; measurable SPH was not detected.
9. Data prior to December 22, 2011 were recorded and previously reported by ExxonMobil.

# Table 24

## Groundwater Analytical Data – Organochlorine Pesticides (Southern Facility Area)

Shore Terminals LLC - Portland Facility

Portland, Oregon

| Well ID | Sample Date | Analytical Results (µg/L) | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Aldrin | Alpha BHC | Beta BHC | Delta BHC | Gamma BHC (Lindane) | cis-Chlordane | trans-Chlordane | 4,4'-DDD | 4,4'-DDE | 4,4'-DDT | Dieldrin | Endosulfan I | Endosulfan II | Endosulfan Sulfate | Endrin | Endrin Aldehyde | Endrin Ketone | Heptachlor | Heptachlor Epoxide | Methoxychlor | Chlordane | Toxaphene |
| *1997 Site ROD Cleanup Goal* | | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| *2017 PHSS Cleanup Level* | | -- | -- | -- | -- | -- | -- | -- | *0.000031* | *0.000018* | *0.000022* | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| *Portland Harbor JSCS SLV* | | *0.00005* | *0.0049* | *0.017* | *0.037* | *0.052* | -- | -- | *0.00022* | *0.00031* | *0.00022* | *0.0042* | *0.051* | *0.051* | *89* | *0.036* | -- | -- | *0.000079* | *0.000039* | *0.03* | *0.0008* | *0.0002* |
| MW-2 | 12/29/2020 | <0.00952 | <0.00952 | <0.00952 | <0.00952 | <0.00952 | <0.00952 | <0.00952 | <0.00952 | <0.00952 | <0.00952 | <0.00952 | <0.00952 | <0.00952 | <0.00952 | <0.00952 | <0.00952 | <0.00952 | <0.00952 | <0.00952 | <0.0286 | <0.357 | <0.357 |
| MW-3 | 12/29/2020 | <0.00952 | <0.00952 | <0.00952 | <0.00952 | <0.00952 | <0.00952 | <0.00952 | <0.00952 | <0.00952 | <0.00952 | <0.00952 | <0.00952 | <0.00952 | <0.00952 | <0.00952 | <0.00952 | <0.00952 | <0.00952 | <0.00952 | <0.0286 | <0.357 | <0.357 |
| MW-4 | 12/29/2020 | <0.0190 | <0.0190 | <0.0190 | <0.0190 | <0.0190 | <0.0190 | <0.0190 | <0.0190 | <0.0190 | <0.0190 | <0.0190 | <0.0190 | <0.0190 | <0.0190 | <0.0190 | <0.0190 | <0.0190 | <0.0190 | <0.0190 | <0.0571 | <0.714 | <0.714 |

***Notes:***

1. < = Concentration is less than the laboratory reporting limit.
2. µg/L = microgram(s) per liter.
3. Yellow highlighted cells indicate values that are equal to or exceeding 1997 Record of Decision (ROD) Groundwater Cleanup Goals for the ExxonMobil/Shore Terminals Site.
4. Gray highlighted cells indicate values that are equal to or exceeding PHSS Cleanup Level. If a PHSS Cleanup Level was not developed for an analyte, the JSCS SLV is used for comparison.
5. Organochlorine Pesticides analyzed by EPA Method 8081B.
6. Portland Harbor JSCS SLVs = 2007 Portland Harbor Joint Source Control Strategy Screening Level Values.
7. PHSS Cleanup Levels = 2017 Portland Harbor Superfund Site Record of Decision (ROD) Cleanup Levels.

# Table 25

## Groundwater Analytical Data – Dioxins and Furans (Southern Facility Area)

**Shore Terminals LLC - Portland Facility**

**Portland, Oregon**

| Well ID | Sample Date | Concentrtions are in pg/L | | | | |
|---|---|---|---|---|---|---|
| | | **1,2,3,4,7,8-HxCDF** | **1,2,3,7,8-PeCDD** | **2,3,4,7,8-PeCDF** | **2,3,7,8-TCDD** | **2,3,7,8-TCDF** |
| *ROD Groundwater Cleanup Goal* | | -- | -- | -- | -- | -- |
| *PHSS Cleanup Level* | | -- | -- | -- | -- | -- |
| *Portland Harbor JSCS SLV* | | -- | -- | -- | *0.0051* | -- |
| MW-2 | 12/29/2020 | <2.71 | <2.63 | <1.16 | <2.08 | <1.53 |
| MW-3 | 12/29/2020 | <1.65 | <2.31 | <1.10 | <2.11 | <1.67 |
| MW-4 | 12/29/2020 | <1.50 | <1.79 | <0.976 | <1.40 | <1.00 |

***Notes:***

1. < = Concentration is less than the laboratory reporting limit.
2. pg/L = picograms per liter
3. Portland Harbor JSCS SLVs = 2007 Portland Harbor Joint Source Control Strategy Screening Level Values.
4. PHSS Cleanup Levels = 2017 Portland Harbor Superfund Site Record of Decision (ROD) Cleanup Levels.
5. Yellow highlighed cells indicate values that are equal to or exceeding 1997 ROD Groundwater Cleanup Goals for the ExxonMobil/Shore Terminals Site.
6. Gray highlighted cells indicate values that are equal to or exceeding PHSS Cleanup Level. If a PHSS Cleanup Level was not developed for an analyte, the JSCS SLV is used for comparison.
7. Analysis for dioxins/furans by EPA Method 1613B.

# Table 26

## Groundwater Analytical Data – PCB Aroclors (Southern Facility Area)

**Shore Terminals LLC - Portland Facility**
**Portland, Oregon**

| Well ID | Sample Date | Concentrations in micrograms per liter (µg/L) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | **PCB 1016** | **PCB 1221** | **PCB 1232** | **PCB 1242** | **PCB 1248** | **PCB 1254** | **PCB 1260** | **Total PCBs** |
| *ROD Groundwater Cleanup Goal* | | -- | -- | -- | -- | -- | -- | -- | -- |
| *PHSS Cleanup Level* | | -- | -- | -- | -- | -- | -- | -- | *0.014* |
| *Portland Harbor JSCS SLV* | | *0.96* | *0.034* | *0.034* | *0.034* | *0.034* | *0.033* | *0.34* | -- |
| MW-2 | 12/29/2020 | <0.0935 | <0.0935 | <0.0935 | <0.0935 | <0.0935 | <0.0935 | <0.0935 | <0.0935 |
| MW-3 | 12/29/2020 | <0.0935 | <0.0935 | <0.0935 | <0.0935 | <0.0935 | <0.0935 | <0.0935 | <0.0935 |
| MW-4 | 12/29/2020 | <0.0935 | <0.0935 | <0.0935 | <0.0935 | <0.0935 | <0.0935 | <0.0935 | <0.0935 |

**Notes:**

1. PCB = polychlorinated biphenyl
2. µg/L = micrograms per liter
3. Portland Harbor JSCS SLVs = 2007 Portland Harbor Joint Source Control Strategy Screening Level Values.
4. PHSS Cleanup Levels = 2017 Portland Harbor Superfund Site Record of Decision Cleanup Levels.
5. Yellow highlighted cells indicate values that are equal to or exceeding 1997 Record of Decision (ROD) Groundwater Cleanup Goals for the ExxonMobil/Shore Terminals Site.
6. Gray highlighted cells indicate values that are equal to or exceeding PHSS Cleanup Level. If a PHSS Cleanup Level was not developed for an analyte, the JSCS SLV is used for comparison.
7. < = Concentration is less than the laboratory reporting limit.
8. Total PCBs calculated using 1/2 the detection limit for nondetects when at least one aroclor was above the detection limit. Total PCBs were reported as the highest detection limit when no aroclors were detected in a sample.
9. Analysis for PCBs by EPA Method 8082A.

# Attachment 5

Groundwater Monitoring Sampling Results: 2023-2024

# Table 5

## Groundwater Analytical Data—TPH, BTEX, MTBE, and Aliphatic Hydrocarbons

**Shore Terminals—Portland**

**Portland, Oregon**

| Well ID | Sample Date | Combined TPH (mg/L) | TPHg Gasoline (mg/L) | TPHd Diesel (mg/L) | TPHo Motor Oil (mg/L) | Benzene (µg/L) | Toluene (µg/L) | Ethyl-Benzene (µg/L) | Xylenes (µg/L) | MTBE (µg/L) | Aliphatic Hydrocarbons C10 - C12 (µg/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *1997 Site ROD Cleanup Goal* | | *1.0* | -- | -- | -- | *40* | -- | -- | -- | -- | -- |
| *PHSS Cleanup Level* | | -- | -- | -- | -- | *0.44* | *9.8* | *7.3* | *13* | -- | *2.6* |
| *Portland Harbor JSCS SLV* | | -- | -- | -- | -- | *1.2* | *9.8* | *7.3* | *200* | *37* | -- |
| ***Tank Field 1*** | | | | | | | | | | | |
| KMW07 | 3/25/2021 | 0.24 | <0.10 | 0.112 F-11 | <0.157 | <0.20 | <1.00 | <0.50 | <1.50 | *<1.00* | -- |
| | 3/25/2021 DUP | 0.22 | <0.10 | 0.0953 F-11 | <0.155 | <0.20 | <1.00 | <0.50 | <1.50 | *<1.00* | -- |
| | 3/23/2022 | 0.23 | <0.100 | 0.109 F-11 | <0.150 | <0.20 | <1.00 | <0.50 | <1.50 | -- | -- |
| | 3/23/2022 DUP | 0.24 | <0.100 | 0.111 F-11 | <0.150 | <0.20 | <1.00 | <0.50 | <1.50 | -- | -- |
| | 3/1/2023 | ND | <0.100 | <0.0755 | <0.151 | <0.20 | <1.00 | <0.50 | <1.50 | -- | -- |
| | 2/27/2024 | ND | <0.100 | <0.0777 | <0.155 | <0.20 | <1.00 | <0.50 | <1.50 | -- | -- |
| KMW11 | 3/1/2023 | 0.42 | 0.300 | <0.0769 | <0.154 | 0.21 | <1.00 | <0.50 | <1.50 | -- | -- |
| | 10/10/2023 | ND | <0.100 | <0.0762 | <0.152 | <0.20 | <1.00 | <0.50 | <1.50 | -- | -- |
| | 2/28/2024 | 0.79 | 0.553 | 0.159 F-13 | <0.155 | 0.33 | <1.00 | <0.50 | <1.50 | -- | -- |
| | 10/1/2024 | 0.22 | 0.104 | <0.0784 | <0.157 | <0.200 | <1.00 | <0.50 | <1.50 | -- | -- |
| KMW18 | 3/2/2023 | ND | <0.100 | <0.0769 | <0.154 | <0.20 | <1.00 | <0.50 | <1.50 | -- | -- |
| | 3/2/2023 DUP | ND | <0.100 | <0.0769 | <0.154 | <0.20 | <1.00 | <0.50 | <1.50 | -- | -- |
| | 10/12/2023 | ND | <0.100 | <0.0769 | <0.154 | 0.21 | <1.00 | <0.50 | <1.50 | -- | -- |
| | 10/12/2023 DUP | ND | <0.100 | <0.0762 | <0.152 | 0.27 | <1.00 | <0.50 | <1.50 | -- | -- |
| | 2/28/2024 | ND | <0.100 | <0.0762 | <0.152 | <0.20 | <1.00 | <0.50 | <1.50 | -- | -- |
| | 2/28/2024 DUP | ND | <0.100 | <0.0769 | <0.154 | <0.20 | <1.00 | <0.50 | <1.50 | -- | -- |
| | 10/2/2024 | 0.56 | 0.447 | <0.0762 | <0.152 | 0.61 | <1.00 | <0.50 | <1.50 | -- | -- |
| | 10/2/2024 DUP | 0.57 | 0.446 | <0.0808 | <0.162 | 0.63 | <1.00 | <0.50 | <1.50 | -- | -- |

Please refer to notes at end of table.

# Table 5

## Groundwater Analytical Data—TPH, BTEX, MTBE, and Aliphatic Hydrocarbons

**Shore Terminals—Portland**

**Portland, Oregon**

| Well ID | Sample Date | Combined TPH (mg/L) | TPHg Gasoline (mg/L) | TPHd Diesel (mg/L) | TPHo Motor Oil (mg/L) | Benzene (µg/L) | Toluene (µg/L) | Ethyl-Benzene (µg/L) | Xylenes (µg/L) | MTBE (µg/L) | Aliphatic Hydrocarbons C10 - C12 (µg/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *1997 Site ROD Cleanup Goal* | | *1.0* | -- | -- | -- | *40* | -- | -- | -- | -- | -- |
| *PHSS Cleanup Level* | | -- | -- | -- | -- | *0.44* | *9.8* | *7.3* | *13* | -- | *2.6* |
| *Portland Harbor JSCS SLV* | | -- | -- | -- | -- | *1.2* | *9.8* | *7.3* | *200* | *37* | -- |
| KMW19 | 3/2/2023 | 0.43 | 0.314 | <0.0755 | <0.151 | <0.20 | <1.00 | <0.50 | <1.50 | -- | -- |
| | 10/12/2023 | 0.71 | 0.591 | <0.0769 | <0.154 | <0.20 | <1.00 | <0.50 | <1.50 | -- | -- |
| | 2/28/2024 | 0.59 | 0.476 | <0.0777 | <0.155 | <0.20 | <1.00 | <0.50 | <1.50 | -- | -- |
| | 10/2/2024 | 0.56 | 0.437 | <0.0825 | <0.165 | <0.200 | <1.00 | <0.50 | <1.50 | -- | -- |
| KMW35 | 3/1/2023 | 0.65 | 0.484 | 0.0921 F-13, F-20 | <0.151 | <0.20 | <1.00 | <0.50 | <1.50 | -- | -- |
| | 10/10/2023 | 3.66 | 3.13 | 0.452 F-13 | <0.152 | <0.20 | 1.46 | <0.50 | <1.50 | -- | -- |
| | 2/27/2024 | 0.25 | <0.100 | 0.120 F-11 | <0.158 | <0.20 | <1.00 | <0.50 | <1.50 | -- | -- |
| | 10/2/2024 | 3.66 | 3.02 | 0.554 F-13 | <0.165 | <0.200 | <1.00 | <0.50 | <1.50 | -- | -- |
| MW41A | 3/1/2023 | ND | <0.100 | <0.0777 | <0.155 | <0.20 | <1.00 | <0.50 | <1.50 | -- | -- |
| | 10/12/2023 | 0.40 | 0.171 | 0.149 | <0.154 | <0.20 | <1.00 | <0.50 | <1.50 | -- | -- |
| | 2/27/2024 | ND | <0.100 | <0.0833 | <0.167 | <0.20 | <1.00 | <0.50 | <1.50 | -- | -- |
| | 10/1/2024 | 0.33 | 0.148 | 0.105 F-13 | <0.163 | <0.200 | <1.00 | <0.50 | <1.50 | -- | -- |
| **Tank 3510** | | | | | | | | | | | |
| AC-2 | 3/2/2023 | ND | <0.100 | <0.0769 | <0.154 | <0.20 | <1.00 | <0.50 | <1.50 | -- | -- |
| | 10/12/2023 | Well dewatered before sampling could occur | | | | | | | | | |
| | 2/28/2024 | ND | <0.100 | <0.0777 | <0.155 | <0.20 | <1.00 | <0.50 | <1.50 | -- | -- |
| | 10/1/2024 | Well dewatered before sampling could occur | | | | | | | | | |
| AC-7 | 3/7/2023 | 1.90 | 1.65 | 0.174 | <0.154 | 0.21 | 3.00 | <0.50 | 2.05 | -- | -- |
| | 10/10/2023 | Well dewatered before sampling could occur | | | | | | | | | |
| | 2/28/2024 | 1.16 | 0.860 | 0.221 | <0.154 | <0.20 | 1.55 | <0.50 | <1.50 | -- | -- |
| | 10/1/2024 | Well dewatered before sampling could occur | | | | | | | | | |

Please refer to notes at end of table.

# Table 5

## Groundwater Analytical Data—TPH, BTEX, MTBE, and Aliphatic Hydrocarbons

**Shore Terminals—Portland**

**Portland, Oregon**

| Well ID | Sample Date | Combined TPH (mg/L) | TPHg Gasoline (mg/L) | TPHd Diesel (mg/L) | TPHo Motor Oil (mg/L) | Benzene (µg/L) | Toluene (µg/L) | Ethyl-Benzene (µg/L) | Xylenes (µg/L) | MTBE (µg/L) | Aliphatic Hydrocarbons C10 - C12 (µg/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *1997 Site ROD Cleanup Goal* | | *1.0* | -- | -- | -- | *40* | -- | -- | -- | -- | -- |
| *PHSS Cleanup Level* | | -- | -- | -- | -- | *0.44* | *9.8* | *7.3* | *13* | -- | *2.6* |
| *Portland Harbor JSCS SLV* | | -- | -- | -- | -- | *1.2* | *9.8* | *7.3* | *200* | *37* | -- |
| ***Loading Rack*** | | | | | | | | | | | |
| AC-8 | 3/3/2023 | 1.43 | 1.32 | <0.0762 F-01 | <0.152 | 331 | 2.66 | 17.9 | 5.8 | -- | -- |
| | 10/13/2023 | 3.45 | 3.33 | <0.0769 | <0.154 | 604 | 7.07 | 66.0 | 33.1 | -- | -- |
| | 2/29/2024 | Well was not sampled due to the presence of SPH or SPH sheen. | | | | | | | | | |
| | 10/2/2024 | 4.53 | 4.39 | <0.0964 | <0.193 | 1,290 | 12.0 | 73.2 | 22.2 | <5.00 | -- |
| AC-9 | 3/3/2023 | Well was not sampled due to the presence of SPH or SPH sheen. | | | | | | | | | |
| | 10/11/2023 | 33.0 | 32.6 | 0.316 F-18 | <0.154 | 2,580 | 131 | 1,480 | 1,680 | -- | -- |
| | 2/29/2024 | Well was not sampled due to the presence of SPH or SPH sheen. | | | | | | | | | |
| | 10/1/2024 | Well was not sampled due to the presence of SPH or SPH sheen. | | | | | | | | | |
| AC-10* | 3/3/2023 | 16.5 | 16.3 | 0.127 F-18 | <0.152 | 523 | 40.5 | 333 | 1,110 | -- | -- |
| | 10/11/2023 | 8.98 | 8.8 | 0.137 F-18 | <0.154 | 354 | 18.7 | 181 | 397 | -- | -- |
| | 3/1/2024 | 20.5 | 20.1 | 0.345 F-18 | <0.154 | 738 | 57.3 | 484 | 1,520 | <10.0 | -- |
| | 10/1/2024 | Well was not sampled due to the presence of SPH or SPH sheen. | | | | | | | | | |
| KMW13* | 3/3/2023 | 2.28 | 2.17 | <0.0755 | <0.151 | 134 | 6.56 | 4.13 | 32.8 | -- | -- |
| | 3/3/2023 DUP | 2.49 | 2.37 | <0.0769 | <0.154 | 134 | 6.75 | 4.35 | 34.2 | -- | -- |
| | 10/13/2023 | 7.37 | 7.19 | 0.102 F-11, F-20 | <0.154 | 116 | 18.3 | 262 | 596 | -- | -- |
| | 10/13/2023 DUP | 4.83 | 4.66 | 0.0908 F-11, F-20 | <0.154 | 83 | 14.7 | 218 | 403 | -- | -- |
| | 3/8/2024 | 3.51 | 3.17 | 0.267 F-20 | <0.152 | 114 | 4.16 | 2.38 | 25.8 | <1.00 | -- |
| | 3/8/2024 DUP | 3.42 | 3.07 | 0.268 F-20 | <0.155 | 106 | 4.08 | 2.39 | 26.2 | <1.00 | -- |
| | 10/2/2024 | 3.89 | 3.60 | 0.216 F-13 | <0.152 | 68.8 | 12.8 | 36.8 | 147 | <1.00 | -- |
| | 10/2/2024 DUP | 3.53 | 3.18 | 0.268 F-13 | <0.154 | 64.9 | 12.0 | 29.3 | 132 | <1.00 | -- |
| KMW14* | Well KMW14 has been removed from the groundwater monitoring program.[21] | | | | | | | | | | |

**Please refer to notes at end of table.**

# Table 5

## Groundwater Analytical Data—TPH, BTEX, MTBE, and Aliphatic Hydrocarbons

**Shore Terminals—Portland**

**Portland, Oregon**

| Well ID | Sample Date | Combined TPH (mg/L) | TPHg Gasoline (mg/L) | TPHd Diesel (mg/L) | TPHo Motor Oil (mg/L) | Benzene (µg/L) | Toluene (µg/L) | Ethyl-Benzene (µg/L) | Xylenes (µg/L) | MTBE (µg/L) | Aliphatic Hydrocarbons C10 - C12 (µg/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *1997 Site ROD Cleanup Goal* | | *1.0* | -- | -- | -- | *40* | -- | -- | -- | -- | -- |
| *PHSS Cleanup Level* | | -- | -- | -- | -- | *0.44* | *9.8* | *7.3* | *13* | -- | *2.6* |
| *Portland Harbor JSCS SLV* | | -- | -- | -- | -- | *1.2* | *9.8* | *7.3* | *200* | *37* | -- |
| MW38* | 3/3/2023 | 3.50 | 3.3 | 0.118 F-13 | <0.155 | 321 | 3.51 | 3.03 | 15.3 | -- | -- |
| | 10/11/2023 | 0.94 | 0.82 | <0.0784 | <0.157 | 32.7 | <1.00 | 0.65 | 3.02 | -- | -- |
| | 3/1/2024 | 1.21 | 0.99 | 0.139 F-18 | <0.154 | 10.8 | <1.00 | <0.50 | 2.92 | <1.00 | -- |
| | 10/2/2024 | 2.17 | 1.85 B-02 | 0.239 F-13 | <0.152 | 145 | 2.08 | 1.75 | 6.77 | *<1.00* | -- |
| MW39* | 3/3/2023 | 75.1 | 74.8 | 0.196 F-18 | <0.154 | 19,000 | <250 | 168 | <375 | -- | -- |
| | 10/11/2023 | 106 | 106.0 | 0.109 F-18 | <0.151 | 32,900 | 402 | 165 | <375 | -- | -- |
| | 2/27/2024 | 37.7 | 37.3 | 0.302 F-18 | <0.154 | 26,300 | 96.1 | 200 | 180 | 92.1 | -- |
| | 10/2/2024 | 65.7 | 65.0 | 0.659 F-13 | <0.152 | 23,900 | 120 | 140 | 102 | 85.0 | -- |
| MW42* | 3/25/2021 | ND | <0.10 | <0.0755 | <0.151 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | -- |
| | 3/24/2022 | ND | <0.100 | <0.0777 | <0.155 | <0.20 | <1.00 | <0.50 | <1.50 | -- | -- |
| | 3/7/2023 | ND | <0.100 | <0.0769 | <0.154 | <0.20 | <1.00 | <0.50 | <1.50 | -- | -- |
| | 3/8/2024 | ND | <0.100 | <0.0784 H-02 | <0.157 H-02 | <0.20 | <1.00 | <0.50 | <1.50 | -- | -- |
| MW41B* | 3/1/2023 | ND | <0.100 | <0.0777 | <0.155 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | -- |
| | 10/10/2023 | ND | <0.100 | <0.0769 | <0.154 | <0.20 | <1.00 | <0.50 | <1.50 | -- | -- |
| | 2/27/2024 | ND | <0.100 | <0.0825 | <0.165 | <0.20 | <1.00 | <0.50 | <1.50 | -- | -- |
| | 10/1/2024 | ND | <0.100 | <0.0777 | <0.155 | <0.20 | <1.00 | <0.50 | <1.50 | -- | -- |
| MW43 | 3/2/2023 | 12.9 | 12.6 | 0.184 F-18 | <0.154 | 1,060 | 100 | 538 | 439 | -- | -- |
| | 10/10/2023 | 15.8 | 15.5 | 0.202 F-18 | <0.152 | 1,670 | 137 | 938 | 492 | -- | -- |
| | 2/27/2024 | 10.6 | 10.3 | 0.196 F-18 | <0.155 | 720 | 72.6 | 532 | 321 | <10.0 | -- |
| | 10/2/2024 | 10.9 | 10.3 | 0.522 F-13 | <0.154 | 935 | 76.3 | 558 | 310 | -- | -- |

**Please refer to notes at end of table.**

# Table 5

## Groundwater Analytical Data—TPH, BTEX, MTBE, and Aliphatic Hydrocarbons

**Shore Terminals—Portland**

**Portland, Oregon**

| Well ID | Sample Date | Combined TPH (mg/L) | TPHg Gasoline (mg/L) | TPHd Diesel (mg/L) | TPHo Motor Oil (mg/L) | Benzene (µg/L) | Toluene (µg/L) | Ethyl-Benzene (µg/L) | Xylenes (µg/L) | MTBE (µg/L) | Aliphatic Hydrocarbons C10 - C12 (µg/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *1997 Site ROD Cleanup Goal* | | *1.0* | -- | -- | -- | *40* | -- | -- | -- | -- | -- |
| *PHSS Cleanup Level* | | -- | -- | -- | -- | *0.44* | *9.8* | *7.3* | *13* | -- | *2.6* |
| *Portland Harbor JSCS SLV* | | -- | -- | -- | -- | *1.2* | *9.8* | *7.3* | *200* | *37* | -- |
| MW44 | 3/1/2023 | 0.24 | 0.127 | <0.0755 | <0.151 | 18.3 | <1.00 | <0.50 | <1.50 | -- | -- |
| | 3/1/23 DUP | ND | <0.100 | <0.0769 | <0.154 | 8.66 | <1.00 | <0.50 | <1.50 | -- | -- |
| | 10/11/2023 | 17.4 | 17.3 | <0.0784 | <0.157 | 4,510 | 22.1 | 71.9 | 18.0 | -- | -- |
| | 2/27/2024 | 1.13 | 1.01 | <0.0808 | <0.162 | 286 | <2.00 | <1.00 | <3.00 | <2.00 | -- |
| | 2/27/2024 DUP | 1.14 | 1.02 | <0.0816 | <0.163 | 284 | <2.00 | <1.00 | <3.00 | -- | -- |
| | 10/3/2024 | 11.1 | 10.8 | 0.221 F-13 | <0.162 | 3,780 | 15.8 | 36.6 | 15.8 | <5.00 | -- |
| MW45* | 3/23/2021 | ND | <0.10 | <0.08 | <0.16 | <0.20 | <1.00 | <0.50 | <1.50 | 0.68 J | -- |
| | 3/25/2022 | ND | <0.100 | <0.0748 | <0.150 | <0.20 | <1.00 | <0.50 | <1.50 | -- | -- |
| | 3/2/2023 | ND | <0.100 | <0.0769 | <0.154 | <0.20 | <1.00 | <0.50 | <1.50 | 1.11 | -- |
| | 2/28/2024 | ND | <0.100 | <0.0808 | <0.162 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | -- |
| MW46 | 3/1/2023 | ND | <0.100 | <0.0769 | <0.154 | <0.20 | <1.00 | <0.50 | <1.50 | -- | -- |
| | 10/10/2023 | ND | <0.100 | <0.0769 | <0.154 | <0.20 | <1.00 | <0.50 | <1.50 | -- | -- |
| | 2/28/2024 | ND | <0.100 | <0.0769 | <0.154 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | -- |
| | 10/1/2024 | ND | <0.100 | <0.0808 | <0.162 | <0.20 | <1.00 | <0.50 | <1.50 | -- | -- |
| ***DPE Treatment Area*** | | | | | | | | | | | |
| EX-07L | 3/1/2023 | ND | <0.100 | <0.0769 | <0.154 | <0.20 | <1.00 | <0.50 | <1.50 | -- | 1.01 J* |
| | 10/10/2023 | ND | <0.100 | <0.0762 | <0.152 | <0.20 | <1.00 | <0.50 | <1.50 | -- | 3.98 J** |
| | 2/27/2024 | ND | <0.100 | <0.0777 | <0.155 | <0.20 | <1.00 | <0.50 | <1.50 | -- | # |
| | 9/30/2024 | 0.23 | <0.100 | 0.0982 F-11, CONT | <0.154 | <0.20 | <1.00 | <0.50 | <1.50 | -- | <39.9 |
| KMW29 | 2/28/2023 | 3.07 | 2.82 | 0.170 F-13, F-20 | <0.154 | 0.35 | <1.00 | <0.50 | <1.50 | -- | 32.0 J |
| | 10/9/2023 | 3.20 | 2.81 | 0.313 F-13 | <0.152 | 0.44 | <1.00 | <0.50 | 1.57 | -- | 25.6 J** |
| | 2/27/2024 | 3.57 | 3.32 | 0.172 F-18 | <0.163 | <0.20 | <1.00 | <0.50 | <1.50 | -- | # |
| | 10/1/2024 | 3.74 | 3.19 | 0.468 F-13, CONT | <0.154 | 0.65 | <1.00 | <0.50 | 1.53 | -- | 27.9 |
| KMW30 | 2/28/2023 | 0.38 | 0.264 | <0.0769 | <0.154 | <0.20 | <1.00 | <0.50 | <1.50 | -- | 6.2 J |
| | 10/9/2023 | 0.34 | 0.229 | <0.0755 | <0.151 | <0.20 | <1.00 | <0.50 | <1.50 | -- | 12.2 J** |
| | 2/26/2024 | ND | <0.100 | <0.0808 | <0.162 | <0.20 | <1.00 | <0.50 | <1.50 | -- | # |
| | 10/1/2024 | 0.91 | 0.651 | 0.182 F-13, CONT | <0.154 | <0.20 | <1.00 | <0.50 | <1.50 | -- | <39.9 |
| | 10/1/2024 DUP | 0.90 | 0.657 | 0.165 F-13, CONT | <0.151 | <0.20 | <1.00 | <0.50 | <1.50 | -- | <40.0 |

Please refer to notes at end of table.

# Table 5

## Groundwater Analytical Data—TPH, BTEX, MTBE, and Aliphatic Hydrocarbons

**Shore Terminals—Portland**

**Portland, Oregon**

| Well ID | Sample Date | Combined TPH (mg/L) | TPHg Gasoline (mg/L) | TPHd Diesel (mg/L) | TPHo Motor Oil (mg/L) | Benzene (µg/L) | Toluene (µg/L) | Ethyl-Benzene (µg/L) | Xylenes (µg/L) | MTBE (µg/L) | Aliphatic Hydrocarbons C10 - C12 (µg/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *1997 Site ROD Cleanup Goal* | | *1.0* | -- | -- | -- | *40* | -- | -- | -- | -- | -- |
| *PHSS Cleanup Level* | | -- | -- | -- | -- | *0.44* | *9.8* | *7.3* | *13* | -- | *2.6* |
| *Portland Harbor JSCS SLV* | | -- | -- | -- | -- | *1.2* | *9.8* | *7.3* | *200* | *37* | -- |
| KMW31 | 2/28/2023 | 1.30 | 1.11 | 0.118 F-13, F-20 | <0.151 | <0.20 | <1.00 | <0.50 | <1.50 | -- | 19.2 J |
| | 2/28/2023 DUP | 1.45 | 1.25 | 0.120 F-13, F-20 | <0.154 | <0.20 | <1.00 | <0.50 | <1.50 | -- | 21.5 J |
| | 10/10/2023 | 1.47 | 1.23 | 0.163 F-13 | <0.152 | <0.20 | <1.00 | <0.50 | <1.50 | -- | 18.1 J** |
| | 10/10/2023 DUP | 1.65 | 1.42 | 0.158 F-13 | <0.152 | <0.20 | <1.00 | <0.50 | <1.50 | -- | 19.4 J** |
| | 2/27/2024 | 1.20 | 0.952 | 0.168 F-18 | <0.160 | <0.20 | <1.00 | <0.50 | <1.50 | -- | # |
| | 2/27/2024 DUP | 0.97 | 0.771 | 0.116 F-18 | <0.168 | <0.20 | <1.00 | <0.50 | <1.50 | -- | # |
| | 10/1/2024 | 1.93 | 1.61 | 0.245 F-13, CONT | <0.154 | <0.20 | <1.00 | <0.50 | <1.50 | -- | <40.0 |
| | 10/1/2024 DUP | 1.63 | 1.18 | 0.374 F-13, CONT | <0.154 | <0.20 | <1.00 | <0.50 | <1.50 | -- | <39.9 |
| KMW32 | 3/1/2023 | ND | <0.100 | <0.0769 | <0.154 | <0.20 | <1.00 | <0.50 | <1.50 | -- | 2.69 J* |
| | 10/10/2023 | ND | <0.100 | <0.0769 | <0.154 | <0.20 | <1.00 | <0.50 | <1.50 | -- | 1.19 J** |
| | 2/26/2024 | ND | <0.100 | <0.0769 | <0.154 | 1.48 | <1.00 | <0.50 | <1.50 | -- | # |
| | 10/1/2024 | 0.42 | 0.18 | 0.161 F-11, CONT | <0.154 | <0.20 | <1.00 | <0.50 | <1.50 | -- | <39.9 |
| KMW33 | 2/28/2023 | ND | <0.100 | <0.0816 | <0.163 | <0.20 | <1.00 | <0.50 | <1.50 | -- | 1.51 J |
| | 10/10/2023 | 0.30 | <0.100 | 0.174 F-13 | <0.154 | <0.20 | <1.00 | <0.50 | <1.50 | -- | 1.93 J** |
| | 2/26/2024 | 0.22 | <0.100 | 0.0941 | <0.154 | <0.20 | <1.00 | <0.50 | <1.50 | -- | # |
| | 10/1/2024 | 0.44 | 0.115 | 0.246 F-13, CONT | <0.155 | <0.20 | <1.00 | <0.50 | <1.50 | -- | <39.9 |
| KMW37 | 10/11/2022 | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| | 2/28/2023 | 3.12 | 2.88 | 0.146 F-13, F-20 | <0.186 | 0.52 | <1.00 | <0.50 | <1.50 | -- | 26.4 J |
| | 10/10/2023 | 5.50 | 5.38 | <0.0769 | <0.154 | 0.95 | 1.39 | 0.58 | 1.92 | -- | 33.8** |
| | Well KMW37 was decommissioned prior to the February 2024 monitoring event | | | | | | | | | | |
| MW47 | 2/28/2023 | 0.59 | 0.38 | 0.133 F-13, F-20 | <0.154 | <0.20 | <1.00 | <0.50 | <1.50 | -- | 27.5 J |
| | 10/10/2023 | 0.66 | 0.445 | 0.139 F-13 | <0.151 | <0.20 | <1.00 | <0.50 | <1.50 | -- | 19.4 J** |
| | 2/26/2024 | 0.65 | 0.289 | 0.283 F-11 | <0.155 | <0.20 | <1.00 | <0.50 | <1.50 | -- | # |
| | 10/1/2024 | 1.08 | 0.651 | 0.354 F-13, CONT | <0.157 | <0.20 | <1.00 | <0.50 | <1.50 | -- | <40.0 |

**Please refer to notes at end of table.**

# Table 5

## Groundwater Analytical Data—TPH, BTEX, MTBE, and Aliphatic Hydrocarbons

**Shore Terminals—Portland**

**Portland, Oregon**

| Well ID | Sample Date | Combined TPH (mg/L) | TPHg Gasoline (mg/L) | TPHd Diesel (mg/L) | TPHo Motor Oil (mg/L) | Benzene (µg/L) | Toluene (µg/L) | Ethyl-Benzene (µg/L) | Xylenes (µg/L) | MTBE (µg/L) | Aliphatic Hydrocarbons C10 - C12 (µg/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *1997 Site ROD Cleanup Goal* | | *1.0* | -- | -- | -- | *40* | -- | -- | -- | -- | -- |
| *PHSS Cleanup Level* | | -- | -- | -- | -- | *0.44* | *9.8* | *7.3* | *13* | -- | *2.6* |
| *Portland Harbor JSCS SLV* | | -- | -- | -- | -- | *1.2* | *9.8* | *7.3* | *200* | *37* | -- |
| MW48 | 2/28/2023 | 0.30 | 0.185 | <0.0755 | <0.151 | <0.20 | <1.00 | <0.50 | <1.50 | -- | 10.1 J |
| | 2/28/2023 DUP | 0.30 | 0.186 | <0.0755 | <0.151 | <0.20 | <1.00 | <0.50 | <1.50 | -- | 8.8 J |
| | 10/9/2023 | 0.32 | 0.202 | <0.0769 | <0.154 | <0.20 | <1.00 | <0.50 | <1.50 | -- | 7.60 J** |
| | 10/9/2023 DUP | 0.30 | 0.187 | <0.0769 | <0.154 | <0.20 | <1.00 | <0.50 | <1.50 | -- | 8.06 J** |
| | 2/26/2024 | ND | <0.100 | <0.0808 | <0.162 | 1.00 | <1.00 | <0.50 | <1.50 | -- | # |
| | 2/26/2024 DUP | ND | <0.100 | <0.0777 | <0.155 | 0.94 | <1.00 | <0.50 | <1.50 | -- | # |
| | 10/1/2024 | 0.38 | 0.211 | 0.0909 F-11, CONT | <0.152 | <0.20 | <1.00 | <0.5 | <1.50 | -- | <40.0 |
| MW49 | 2/28/2023 | 1.04 | 0.835 | 0.132 F-13, F-20 | <0.154 | <0.20 | <1.00 | <0.50 | <1.50 | -- | 18.6 J |
| | 10/10/2023 | 1.26 | 0.945 | 0.235 F-13 | <0.151 | 0.27 | <1.00 | <0.50 | <1.50 | -- | 15.7 J** |
| | 2/27/2024 | 1.08 | 0.697 | 0.307 F-11 | <0.154 | <0.20 | <1.00 | <0.50 | <1.50 | -- | # |
| | 10/1/2024 | 1.66 | 1.15 | 0.425 F-13, CONT, PRES | <0.160 | <0.20 | <1.00 | <0.50 | <1.50 | -- | <40.0 |
| ***Slurry Wall*** | | | | | | | | | | | |
| KMW36 | 3/7/2023 | 0.27 | <0.100 | 0.132 F-13 | <0.170 | <0.20 | <1.00 | <0.50 | <1.50 | -- | -- |
| | 10/10/2023 | 0.87 | 0.483 | 0.306 | <0.154 | <0.20 | <1.00 | <0.50 | <1.50 | -- | -- |
| | 2/29/2024 | 0.23 | <0.100 | 0.100 F-13 | <0.162 | <0.20 | <1.00 | <0.50 | <1.50 | -- | -- |
| | 10/1/2024 | 0.89 | 0.512 | 0.301 F-13 | <0.155 | <0.20 | <1.00 | <0.50 | <1.50 | -- | -- |
| W-16 | 3/1/2023 | 0.81 | 0.656 | 0.0780 F-13, F-20 | <0.154 | <0.20 | <1.00 | <0.50 | <1.50 | -- | -- |
| | 10/11/2023 | 1.35 | 1.04 | 0.233 F-20 | <0.154 | <0.20 | <1.00 | <0.50 | <1.50 | -- | -- |
| | 2/29/2024 | 1.19 | 0.823 | 0.288 F-13 | <0.158 | <0.20 | <1.00 | <0.50 | <1.50 | -- | -- |
| | 10/2/2024 | 1.35 | 1.01 B-02 | 0.260 F-13 | <0.162 | 0.20 | <1.00 | <0.50 | <1.50 | -- | -- |
| W-19 | 3/25/2021 | 0.51 | 0.153 | 0.278 F-13,F-20 | <0.15 | <0.20 | <1.00 | <0.50 | <1.50 | 0.721 J | -- |
| | 3/25/2022 | 0.65 | 0.229 | 0.348 F-13 | <0.151 | <0.20 | <1.00 | <0.50 | <1.50 | -- | -- |
| | 3/2/2023 | 0.23 | <0.100 | 0.101 F-13 | <0.157 | <0.20 | <1.00 | <0.50 | <1.50 | -- | -- |
| | 2/29/2024 | 0.37 | 0.147 | 0.141 F-13 | <0.168 | <0.20 | <1.00 | <0.50 | <1.50 | -- | -- |

Please refer to notes at end of table.

# Table 5

## Groundwater Analytical Data—TPH, BTEX, MTBE, and Aliphatic Hydrocarbons

**Shore Terminals—Portland**

**Portland, Oregon**

| Well ID | Sample Date | Combined TPH (mg/L) | TPHg Gasoline (mg/L) | TPHd Diesel (mg/L) | TPHo Motor Oil (mg/L) | Benzene (µg/L) | Toluene (µg/L) | Ethyl-Benzene (µg/L) | Xylenes (µg/L) | MTBE (µg/L) | Aliphatic Hydrocarbons C10 - C12 (µg/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *1997 Site ROD Cleanup Goal* | | *1.0* | -- | -- | -- | *40* | -- | -- | -- | -- | -- |
| *PHSS Cleanup Level* | | -- | -- | -- | -- | *0.44* | *9.8* | *7.3* | *13* | -- | *2.6* |
| *Portland Harbor JSCS SLV* | | -- | -- | -- | -- | *1.2* | *9.8* | *7.3* | *200* | *37* | -- |
| W-20 | 3/25/2021 | ND | <0.10 | <0.0755 | <0.151 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | -- |
| | 3/25/2022 | ND | <0.100 | <0.0748 | <0.150 | <0.20 | <1.00 | <0.50 | <1.50 | -- | -- |
| | 3/2/2023 | ND | <0.100 | <0.0769 | <0.154 | <0.20 | <1.00 | <0.50 | <1.50 | -- | -- |
| | 2/29/2024 | ND | <0.100 | <0.0777 | <0.155 | <0.20 | <1.00 | <0.50 | <1.50 | -- | -- |
| W-22 | 3/23/2021 | ND | <0.10 | <0.0769 | <0.154 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | -- |
| | 3/25/2022 | ND | <0.100 | <0.0762 | <0.152 | <0.20 | <1.00 | <0.50 | <1.50 | -- | -- |
| | 3/2/2023 | ND | <0.100 | <0.0769 | <0.154 | <0.20 | <1.00 | <0.50 | <1.50 | -- | -- |
| | 2/29/2024 | ND | <0.100 | <0.0784 | <0.157 | <0.20 | <1.00 | <0.50 | <1.50 | -- | -- |
| ***Site-Wide*** | | | | | | | | | | | |
| KMW01 | 3/23/2021 | ND | <0.10 | <0.0762 | <0.152 | <0.20 | <1.00 | <0.50 | <1.50 | 0.56 J | -- |
| | 3/25/2022 | ND | <0.100 | <0.0792 | <0.158 | <0.20 | <1.00 | <0.50 | <1.50 | -- | -- |
| | 3/3/2023 | ND | <0.100 | <0.0769 | <0.154 | <0.20 | <1.00 | <0.50 | <1.50 | -- | -- |
| | 2/28/2024 | ND | <0.100 | <0.0825 | <0.165 | <0.20 | <1.00 | <0.50 | <1.50 | -- | -- |
| KMW02 | 3/7/2023 | ND | <0.100 | <0.0833 | <0.167 | <0.20 | <1.00 | <0.50 | <1.50 | -- | -- |
| | 10/11/2023 | ND | <0.100 | <0.0769 | <0.154 | <0.20 | <1.00 | <0.50 | <1.50 | -- | -- |
| | 2/28/2024 | ND | <0.100 | <0.0825 | <0.165 | <0.20 | <1.00 | <0.50 | <1.50 | -- | -- |
| | 10/3/2024 | ND | <0.100 | <0.0792 | <0.158 | <0.20 | <1.00 | <0.50 | <1.50 | -- | -- |
| KMW05 | 3/23/2021 | 1.00 | 0.5 | 0.42 F-13 | <0.152 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | -- |
| | 3/24/2022 | 1.23 | 0.406 | 0.746 F-13 | <0.155 | <0.20 | <1.00 | <0.50 | <1.50 | -- | -- |
| | 3/1/2023 | 1.01 | 0.602 | 0.328 F-13, F-20 | <0.154 | <0.20 | <1.00 | <0.50 | <1.50 | -- | -- |
| | 2/28/2024 | 0.97 | 0.413 | 0.472 F-13 | <0.162 | <0.20 | <1.00 | <0.50 | <1.50 | -- | -- |

Please refer to notes at end of table.

# Table 5

## Groundwater Analytical Data—TPH, BTEX, MTBE, and Aliphatic Hydrocarbons

**Shore Terminals—Portland**

**Portland, Oregon**

| Well ID | Sample Date | Combined TPH (mg/L) | TPHg Gasoline (mg/L) | TPHd Diesel (mg/L) | TPHo Motor Oil (mg/L) | Benzene (µg/L) | Toluene (µg/L) | Ethyl-Benzene (µg/L) | Xylenes (µg/L) | MTBE (µg/L) | Aliphatic Hydrocarbons C10 - C12 (µg/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *1997 Site ROD Cleanup Goal* | | *1.0* | -- | -- | -- | *40* | -- | -- | -- | -- | -- |
| *PHSS Cleanup Level* | | -- | -- | -- | -- | *0.44* | *9.8* | *7.3* | *13* | -- | *2.6* |
| *Portland Harbor JSCS SLV* | | -- | -- | -- | -- | *1.2* | *9.8* | *7.3* | *200* | *37* | -- |
| KMW09 | 3/23/2021 | ND | <0.10 | <0.0748 | <0.15 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | -- |
| | 3/22/2022 | ND | <0.100 | <0.0784 | <0.157 | <0.20 | <1.00 | <0.50 | <1.50 | -- | -- |
| | 3/7/2023 | ND | <0.100 | <0.0769 | <0.154 | <0.20 | <1.00 | <0.50 | <1.50 | -- | -- |
| | 2/28/2024 | ND | <0.100 | <0.0769 | <0.154 | <0.20 | <1.00 | <0.50 | <1.50 | -- | -- |
| KMW10 | 6/29/2023 | ND | <0.100 | <0.0748 | <0.150 | 0.42 | <1.00 | <0.50 | <1.50 | -- | -- |
| | 10/12/2023 | ND | <0.100 | <0.0769 | <0.154 | 1.10 | <1.00 | <0.50 | <1.50 | -- | -- |
| | 2/28/2024 | ND | <0.100 | <0.0784 | <0.157 | <0.20 | <1.00 | <0.50 | <1.50 | -- | -- |
| | 10/1/2024 | ND | <0.100 | <0.0777 | <0.155 | <0.20 | <1.00 | <0.50 | <1.50 | -- | -- |
| KMW16* | 3/25/2021 | 0.22 | 0.106 | <0.0748 | <0.15 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | -- |
| | 3/24/2022 | 0.27 | 0.152 F-12 | <0.0769 | <0.154 | <0.20 | <1.00 | <0.50 | <1.50 | -- | -- |
| | 3/2/2023 | 0.28 | 0.164 F-12 | <0.0769 | <0.154 | <0.20 | <1.00 | <0.50 | <1.50 | -- | -- |
| | 2/27/2024 | 0.26 | 0.139 F-12 | <0.0777 | <0.155 | <0.20 | <1.00 | <0.50 | <1.50 | -- | -- |
| KMW20 | 3/23/2021 | ND | <0.10 | <0.0769 | <0.154 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | -- |
| | 3/24/2022 | ND | <0.100 | <0.0762 | <0.152 | <0.20 | <1.00 | <0.50 | <1.50 | -- | -- |
| | 3/3/2023 | ND | <0.100 | <0.0762 | <0.152 | <0.20 | <1.00 | <0.50 | <1.50 | -- | -- |
| | 2/29/2024 | ND | <0.100 | <0.0777 | <0.155 | <0.20 | <1.00 | <0.50 | <1.50 | -- | -- |
| KMW21 | 3/23/2021 | 0.43 | 0.0975 J | 0.261 F-13 | <0.15 | <0.20 | <1.00 | <0.50 | <1.50 | 1.07 | -- |
| | 3/24/2022 | 0.43 | <0.100 | 0.308 F-13 | <0.150 | <0.20 | <1.00 | <0.50 | <1.50 | -- | -- |
| | 3/3/2023 | 0.36 | 0.111 | 0.175 F-13 | <0.151 | <0.20 | <1.00 | <0.50 | <1.50 | -- | -- |
| | 2/29/2024 | 0.40 | 0.109 | 0.210 F-13 | <0.157 | <0.20 | <1.00 | <0.50 | <1.50 | -- | -- |

**Please refer to notes at end of table.**

# Table 5

## Groundwater Analytical Data—TPH, BTEX, MTBE, and Aliphatic Hydrocarbons

**Shore Terminals—Portland**

**Portland, Oregon**

| Well ID | Sample Date | Combined TPH (mg/L) | TPHg Gasoline (mg/L) | TPHd Diesel (mg/L) | TPHo Motor Oil (mg/L) | Benzene (µg/L) | Toluene (µg/L) | Ethyl-Benzene (µg/L) | Xylenes (µg/L) | MTBE (µg/L) | Aliphatic Hydrocarbons C10 - C12 (µg/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *1997 Site ROD Cleanup Goal* | | *1.0* | -- | -- | -- | *40* | -- | -- | -- | -- | -- |
| *PHSS Cleanup Level* | | -- | -- | -- | -- | *0.44* | *9.8* | *7.3* | *13* | -- | *2.6* |
| *Portland Harbor JSCS SLV* | | -- | -- | -- | -- | *1.2* | *9.8* | *7.3* | *200* | *37* | -- |
| MW40 | 3/23/2021 | ND | <0.10 | <0.0762 | <0.152 | 2.32 | <1.00 | <0.50 | <1.50 | 0.59 J | -- |
| | 3/24/2022 | 0.59 | 0.476 F-03 | <0.0762 | <0.152 | 148 | <1.00 | <0.50 | <1.50 | <1.00 | -- |
| | 3/2/2023 | ND | <0.100 | <0.0769 | <0.154 | <0.20 | <1.00 | <0.50 | <1.50 | <1.00 | -- |
| | 2/28/2024 | ND | <0.100 | <0.0842 | <0.168 | <0.20 | <1.00 | <0.50 | <1.50 | -- | -- |
| W-15 | 10/13/2022 | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| | 3/2/2023 | 1.36 | 1.16 | 0.12 | <0.154 | <0.20 | <1.00 | <0.50 | <1.50 | -- | 8.81 J* |
| | 10/10/2023 | 3.06 | 2.7 | 0.285 F-13 | <0.152 | 0.30 | <1.00 | <0.50 | 1.63 | -- | 32.2 J** |
| | Well W-15 was decommissioned prior to the February 2024 monitoring event | | | | | | | | | | |

**Please refer to notes at end of table.**

# Table 5

## Groundwater Analytical Data—TPH, BTEX, MTBE, and Aliphatic Hydrocarbons

**Shore Terminals—Portland**

**Portland, Oregon**

### Notes:

1. TPH = Total petroleum hydrocarbons by northwest methods, with samples for diesel- and motor-oil-range analyses prepared by silica gel cleanup.
2. TPHg = Total petroleum hydrocarbons measured in the gasoline range
3. TPHd = Total petroleum hydrocarbons measured in the diesel range
4. TPHo = Total petroleum hydrocarbons measured in the heavy oil range
5. TPHg by Method NWTPH-Gx; TPHd and TPHo by NWTPH-Dx; benzene, toluene, ethylbenzene, xylenes, MTBE analyzed by EPA Method 8260 B.
6. Combined TPH = The sum of TPHg, TPHd, and TPHo. If a constituent is non-detect, half of the non-detect concentration is used to calculate the combined TPH concentration.
   If TPHg, TPHd, and TPHo are all non-detect, ND is reported for Combined TPH.
7. Portland Harbor JSCS SLVs = 2007 Portland Harbor Joint Source Control Strategy Screening Level Values.
8. PHSS Cleanup Levels = 2017 Portland Harbor Superfund Site Record of Decision Cleanup Levels.
9. Yellow highlighted cells indicate values that are equal to or exceeding 1997 Record of Decision (ROD) Groundwater Cleanup Goals for the ExxonMobil/Shore Terminals Site.
10. Gray highlighted cells indicate values that are equal to or exceeding PHSS Cleanup Level. If a PHSS Cleanup Level was not developed for an analyte, the JSCS SLV is used for comparison.
11. < = less than the laboratory reporting limit.
12. µg/L = microgram(s) per liter.
13. mg/L = milligram(s) per liter.
14. EPA = United States Environmental Protection Agency.
15. MTBE = Methyl tertiary butyl ether.
16. NS = Not sampled
17. – = Not applicable.
18. DUP = Field Duplicate.
19. * = Well is screened in Deep Sand unit.
20. ND = TPH not detected above method detection limits for TPHg, TPHd, or TPHo.
21. Well KMW14 was paved over prior to the October 2017 monitoring event. In an email dated February 21, 2018, DEQ agreed that well KMW14 was not critical to monitoring the Loading Rack Area and that replacement of KMW14 was not required. Well KMW14 has been removed from the monitoring program.

### Quality Assurance/Quality Control Data Qualifiers

CONT = The sample container was not provided by Apex Laboratories, and has not been verified as part of the Apex Quality System

J = Reported result is an estimated value.

F-03 = The result for this hydrocarbon range is elevated due to the presence of individual analyte peaks in the quantitation range that are not representative of the fuel pattern reported.

F-11 = The hydrocarbon pattern indicates possible weathered diesel, mineral oil, or a contribution from a related component.

F-12 = The result for this hydrocarbon range is pimarily due to the presence of individual analyte peaks in the quantitation range. No fuel pattern detected.

F-13 = The chromatographic pattern does not resemble the fuel standard used for quantitation.

F-18 = Result for Diesel (Diesel Range Organics, C12–C24) is due to overlap from Gasoline or a Gasoline Range product.

F-19 = Results are Estimated due to the presence of multiple fuel products.

F-20 = Result for Diesel is Estimated due to overlap from Gasoline Range Organics or other VOCs.

PRES = Incomplete field preservation. Additional preservative was added to adjust the pH within the appropriate range for this analysis.

* = A lower control criterion was exceeded for Dodecane-d26 and spike recovery of some or all analytes.

** = The spike recovery of n-Decane for Laboratory Control Sample (LCS) KQ2318656-02 was outside the lower control criterion. The error associated with reduced recovery indicated a potential low bias.

# = C10–C12 data is not being reported for the February 2024 monitoring event due to data quality concerns which are described in the Data Quality Review, provided as Appendix C.

# Table 6

## Groundwater Analytical Data—PAHs

**Shore Terminals—Portland**

**Portland, Oregon**

| Well ID | Sample Date | Analytical Results (µg/L) | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | -Methylnaphthalen | -Methylnaphthalen | Acenaphthene | Acenaphthylene | Anthracene | Benzo(a)anthracene | Benzo(a)pyrene | Benzo(b)fluoranthen | Benzo(g,h,i)perylene | Benzo(k)fluoranthen | Chrysene | Dibenz(a,h)anthracer | Fluoranthene | Fluorene | Indeno(1,2,3-cd)pyre | Naphthalene | Phenanthrene | Pyrene |
| *1997 Site ROD Cleanup Goal* | | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | 347 | – | – |
| *2017 PHSS Cleanup Level* | | – | – | 23 | – | 0.73 | 0.0012 | 0.00012 | 0.0012 | – | 0.0013 | 0.0013 | 0.00012 | – | – | 0.0012 | 12 | – | – |
| *Portland Harbor JSCS SLV* | | – | 0.2 | 0.2 | 0.2 | – | 0.018 | 0.018 | 0.018 | 0.2 | 0.018 | 0.018 | 0.018 | 0.2 | 0.2 | 0.018 | 0.2 | 0.2 | 0.2 |
| ***Tank Field 1*** | | | | | | | | | | | | | | | | | | | |
| KMW07 | 3/25/2021 | 0.132 | <0.074 | <0.0578 R-02 | <0.037 | <0.037 | <0.0231 R-02 | <0.0185 | <0.0185 | <0.037 | <0.0185 | <0.0185 | <0.0185 | <0.037 | 0.0569 | <0.0185 | <0.074 | <0.074 | <0.037 |
| | 3/25/2021 DUP | 0.109 | <0.0707 | <0.0353 | <0.0353 | <0.0353 | <0.0177 | <0.0177 | <0.0177 | <0.0353 | <0.0177 | <0.0177 | <0.0177 | <0.0353 | 0.0543 | <0.0177 | <0.0707 | <0.0707 | <0.0353 |
| | 3/23/2022 | <0.0833 | <0.0833 | <0.0417 | <0.0417 | <0.0417 | <0.0208 | <0.0208 | <0.0208 | <0.0417 | <0.0208 | <0.0208 | <0.0208 | <0.0417 | <0.0417 | <0.0208 | <0.0833 | <0.0833 | <0.0417 |
| | 3/23/2022 DUP | <0.0762 | <0.0762 | <0.0381 | <0.0381 | <0.0381 | <0.0191 | <0.0191 | <0.0191 | <0.0381 | <0.0191 | <0.0191 | <0.0191 | <0.0381 | <0.0381 | <0.0191 | <0.0762 | <0.0762 | <0.0381 |
| | 3/2/2023 | <0.0664 | <0.0664 | <0.0332 R-02 | <0.0332 | <0.0332 | <0.0166 | <0.0166 | <0.0166 | <0.0332 | <0.0166 | <0.0166 | <0.0166 | <0.0332 | 0.0411 | <0.0166 | <0.0664 R-02 | <0.0664 | <0.0332 |
| | 2/27/2024 | 0.18 | <0.0845 | <0.0793 R-02 | <0.0423 | <0.0423 | <0.0211 | <0.0211 | <0.0211 | <0.0423 | <0.0211 | <0.0211 | <0.0211 | <0.0423 | 0.0867 | <0.0211 | <0.172 R-02 | <0.0845 | <0.0423 |
| KMW11 | 3/2/2023 | 0.978 | <0.0754 | <0.530 R-02 | <0.177 R-02 | <0.177 R-02 | <0.0188 | <0.0188 | <0.0188 | <0.0377 | <0.0188 | <0.0188 | <0.0188 | <0.0377 | 0.532 | <0.0188 | <0.825 R-02 | 0.225 | <0.0377 |
| | 10/10/2023 | <0.0830 | <0.0830 | <0.0415 | <0.0415 | <0.0415 | <0.0207 | <0.0207 | <0.0207 | <0.0415 | <0.0207 | <0.0207 | <0.0207 | <0.0415 | <0.0415 | <0.0207 | <0.130 R-02 | <0.0830 | <0.0415 |
| | 2/28/2024 | 1.49 | <0.0794 | <0.583 R-02 | <0.124 R-02 | <0.0993 R-02 | 0.18 | <0.0845 | <0.0793 R-02 | <0.0423 | <0.0423 | <0.0211 | <0.0211 | <0.0211 | <0.0423 | <0.0211 | <0.0211 | <0.0211 | <0.0423 |
| | 10/1/2024 | <0.0662 | <0.0662 | <0.0331 | <0.0331 | <0.0331 | <0.0166 | <0.0166 | <0.0166 | <0.0331 | <0.0166 | <0.0166 | <0.0166 | <0.0331 | <0.0331 | <0.0166 | <0.124 R-02 | <0.0662 | <0.0331 |
| KMW18 | 3/2/2023 | <0.0653 | <0.0653 | <0.0326 | <0.0326 | <0.0326 | <0.0163 | <0.0163 | <0.0163 | <0.0326 | <0.0163 | <0.0163 | <0.0163 | <0.0326 | <0.0326 | <0.0163 | <0.0653 | <0.0653 | <0.0326 |
| | 3/2/2023 DUP | <0.0742 | <0.0742 | <0.0371 | <0.0371 | <0.0371 | <0.0186 | <0.0186 | <0.0186 | <0.0371 | <0.0186 | <0.0186 | <0.0186 | <0.0371 | <0.0371 | <0.0186 | <0.0742 | <0.0742 | <0.0371 |
| | 10/12/2023 | 0.105 | <0.0646 | <0.0323 | <0.0323 | <0.0606 R-02 | <0.0162 | <0.0162 | <0.0162 | <0.0323 | <0.0162 | <0.0162 | <0.0162 | <0.0323 | <0.0323 | <0.0162 | <0.0646 | <0.0646 | 0.0428 |
| | 10/12/2023 DUP | 0.409 | <0.0652 | <0.0326 | <0.0326 | <0.0713 R-02 | <0.0163 | <0.0163 | <0.0163 | <0.0326 | <0.0163 | <0.0163 | <0.0163 | <0.0326 | <0.0326 | <0.0163 | <0.173 R-02 | <0.0652 | 0.0574 |
| | 2/28/2024 | <0.0646 | <0.0646 | <0.0323 | <0.0323 | <0.0323 | <0.0161 | <0.0161 | <0.0161 | <0.0323 | <0.0161 | <0.0161 | <0.0161 | <0.0323 | <0.0323 | <0.0161 | <0.0646 | <0.0646 | <0.0323 |
| | 2/28/2024 DUP | <0.0642 | <0.0642 | <0.0321 | <0.0321 | <0.0321 | <0.0160 | <0.0160 | <0.0160 | <0.0321 | <0.0160 | <0.0160 | <0.0160 | <0.0321 | <0.0321 | <0.0160 | <0.0642 | <0.0642 | <0.0321 |
| | 10/2/2024 | 1.95 | <0.0713 | <0.0357 | <0.0357 | <0.0490 R-02 | <0.0178 | <0.0178 | <0.0178 | <0.0357 | <0.0178 | <0.0178 | <0.0178 | <0.0357 | 0.0441 | <0.0178 | <0.579 R-02 | <0.0713 | 0.049 Q-29 |
| | 10/2/2024 DUP | 2.24 | <0.0699 | <0.0525 R-02 | <0.0350 | <0.0557 R-02 | <0.0175 | <0.0175 | <0.0175 | <0.0350 | <0.0175 | <0.0175 | <0.0175 | <0.0350 | 0.0437 | <0.0175 | <0.688 R-02 | <0.0699 | 0.0542 Q-29 |
| KMW19 | 3/2/2023 | 0.142 | <0.0828 | 0.0471 | <0.0414 | 0.044 | <0.0207 | <0.0207 | <0.0207 | <0.0414 | <0.0207 | <0.0207 | <0.0207 | 0.0523 | <0.0414 | <0.0207 | <0.517 R-02 | <0.0828 | 0.0631 |
| | 10/12/2023 | 0.127 | <0.0760 | <0.0831 R-02 | <0.0380 | 0.0385 | <0.0190 | <0.0190 | <0.0190 | <0.0380 | <0.0190 | <0.0190 | <0.0190 | 0.0631 | <0.0380 | <0.0190 | <0.475 R-02 | <0.0760 | 0.0698 |
| | 2/28/2024 | 0.126 | <0.0897 | <0.0701 R-02 | <0.0449 | <0.0449 | <0.0224 | <0.0224 | <0.0224 | <0.0449 | <0.0224 | <0.0224 | <0.0224 | <0.0449 | <0.0449 | <0.0224 | <0.435 R-02 | <0.0897 | <0.0449 |
| | 10/2/2024 | 0.126 | <0.0764 | <0.0716 R-02 | <0.0382 | 0.0439 | <0.0191 | <0.0191 | <0.0191 | <0.0382 | <0.0191 | <0.0191 | <0.0191 | 0.0506 | 0.0568 Q-29 | <0.0191 | <0.465 R-02 | <0.0764 | 0.0582 |

Please refer to notes at end of table.

# Table 6

## Groundwater Analytical Data—PAHs

**Shore Terminals—Portland**

**Portland, Oregon**

| Well ID | Sample Date | Analytical Results (µg/L) | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | -Methylnaphthalen | -Methylnaphthalen | Acenaphthene | Acenaphthylene | Anthracene | Benzo(a)anthracene | Benzo(a)pyrene | enzo(b)fluoranthen | Benzo(g,h,i)perylene | enzo(k)fluoranthen | Chrysene | ibenz(a,h)anthracer | Fluoranthene | Fluorene | deno(1,2,3-cd)pyre | Naphthalene | Phenanthrene | Pyrene |
| *1997 Site ROD Cleanup Goal* | | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | *347* | – | – |
| *2017 PHSS Cleanup Level* | | – | – | *23* | – | *0.73* | *0.0012* | *0.00012* | *0.0012* | – | *0.0013* | *0.0013* | *0.00012* | – | – | *0.0012* | *12* | – | – |
| *Portland Harbor JSCS SLV* | | – | *0.2* | *0.2* | *0.2* | – | *0.018* | *0.018* | *0.018* | *0.2* | *0.018* | *0.018* | *0.018* | *0.2* | *0.2* | *0.018* | *0.2* | *0.2* | *0.2* |
| KMW35 | 3/2/2023 | <0.0651 | <0.0651 | <0.0325 | 0.0488 | 0.12 | 0.0167 M-05 | <0.0163 | 0.0273 | <0.0325 | <0.0163 | 0.0203 M-05 | <0.0163 | <0.0325 | <0.0325 | 0.0187 | <0.0651 | <0.0651 | <0.0325 |
| | 10/10/2023 | 57.9 | <0.153 R-02 | < 1.88 R-02 | <0.647 R-02 | 0.238 | <0.0188 | <0.0188 | <0.0188 | <0.0376 | <0.0188 | <0.0188 | <0.0188 | <0.0376 | 5.5 | <0.0188 | <1.08 R-02 | 2.11 | <0.0376 |
| | 2/27/2024 | 1.49 | <0.0822 | <0.0770 R-02 | <0.0411 | 0.0493 | <0.0205 | <0.0205 | <0.0205 | <0.0411 | <0.0205 | <0.0205 | <0.0205 | <0.0411 | 0.166 | <0.0205 | <0.0822 | <0.0822 | <0.0411 |
| | 10/2/2024 | 41.0 | <0.719 | <1.82 R-02 | <0.562 R-02 | <0.360 | <0.180 | <0.180 | <0.180 | <0.360 | <0.180 | <0.180 | <0.180 | <0.360 | 5.24 | <0.180 | <1.18 R-02 | 1.35 | <0.360 |
| MW41A | 3/2/2023 | 0.332 | <0.0714 | <0.335 R-02 | <0.112 R-02 | <0.134 R-02 | <0.0178 | <0.0178 | <0.0178 | <0.0357 | <0.0178 | <0.0178 | <0.0178 | <0.0357 | 0.438 | <0.0178 | <0.279 R-02 | 0.0839 | <0.0357 |
| | 10/12/2023 | 1.66 | <0.0703 | <0.429 R-02 | <0.165 R-02 | <0.0989 R-02 | <0.0176 | <0.0176 | <0.0176 | <0.0352 | <0.0176 | <0.0176 | <0.0176 | 0.044 | 0.755 | <0.0176 | <0.385 R-02 | 0.515 | 0.0484 |
| | 2/27/2024 | 0.276 | <0.0738 | <0.0807 R-02 | <0.0369 | <0.0369 | <0.0184 | <0.0184 | <0.0184 | <0.0369 | <0.0184 | <0.0184 | <0.0184 | <0.0369 | 0.0945 | <0.0184 | <0.0738 | <0.0738 | <0.0369 |
| | 10/1/2024 | 0.745 | <0.0711 | <0.333 R-02 | <0.0733 R-02 | <0.111 R-02 | <0.0178 | <0.0178 | <0.0178 | <0.0356 | <0.0178 | <0.0178 | <0.0178 | <0.0356 | 0.460 | <0.0178 | <0.278 R-02 | 0.158 | 0.04 |
| ***Loading Rack*** | | | | | | | | | | | | | | | | | | | |
| KMW13* | 3/3/2023 | 18.4 | 7.87 | <0.390 | <0.390 | <0.390 | <0.195 | <0.195 | <0.195 | <0.390 | <0.195 | <0.195 | <0.195 | <0.390 | <0.390 | <0.195 | 1.61 | <0.781 | <0.390 |
| | 3/3/23 DUP | 18 | 7.87 | <0.450 | <0.450 | <0.450 | <0.225 | <0.225 | <0.225 | <0.450 | <0.225 | <0.225 | <0.225 | <0.450 | <0.450 | <0.225 | 1.51 | <0.900 | <0.450 |
| | 10/13/2023 | 32.7 | 19.2 | <0.376 | <0.376 | <0.376 | <0.188 | <0.188 | <0.188 | <0.376 | <0.188 | <0.188 | <0.188 | <0.376 | 0.409 | <0.188 | 24.3 | <0.752 | <0.376 |
| | 10/13/2023 DUP | 36.5 | 19.5 | <0.368 | <0.368 | <0.368 | <0.184 | <0.184 | <0.184 | <0.368 | <0.184 | <0.184 | <0.184 | <0.368 | 0.488 | <0.184 | 21.7 | <0.736 | <0.368 |
| | 3/8/2024 | 20.4 | 0.628 | <0.381 R-02 | <0.0861 R-02 | <0.0394 | <0.0197 | <0.0197 | <0.0197 | <0.0394 | <0.0197 | <0.0197 | <0.0197 | <0.0394 | 0.493 | <0.0197 | <0.898 R-02 | 0.373 | <0.0394 |
| | 3/8/2024 DUP | 21.3 | 0.634 | <0.385 R-02 | <0.0963 R-02 | <0.0385 | <0.0193 | <0.0193 | <0.0193 | <0.0385 | <0.0193 | <0.0193 | <0.0193 | <0.0385 | 0.502 | <0.0193 | <0.867 R-02 | 0.362 | <0.0385 |
| | 10/2/2024 | 33 | 7.49 | <0.367 | <0.367 | <0.367 | <0.183 | <0.183 | <0.183 | <0.367 | <0.183 | <0.183 | <0.183 | <0.367 | 0.518 | <0.183 | 6.27 | <0.734 | <0.367 |
| | 10/2/2024 DUP | 28.8 | 6.98 | <0.364 | <0.364 | <0.364 | <0.182 | <0.182 | <0.182 | <0.364 | <0.182 | <0.182 | <0.182 | <0.364 | 0.487 | <0.182 | 6.55 | <0.729 | <0.364 |
| KMW14* | | Well KMW14 has been removed from the groundwater monitoring program.[11] | | | | | | | | | | | | | | | | | |
| MW38* | 3/3/2023 | 9.06 | 0.766 | <0.760 R-02 | <0.128 | <0.280 R-02 | <0.0640 | <0.0640 | <0.0640 | <0.128 | <0.0640 | <0.0640 | <0.0640 | <0.128 | 0.768 | <0.0640 | <0.520 | 1.04 | <0.128 |
| | 10/11/2023 | 6.57 | <0.307 | <0.528 R-02 | <0.154 | <0.154 | <0.0768 | <0.0768 | <0.0768 | <0.154 | <0.0768 | <0.0768 | <0.0768 | <0.154 | 0.515 | <0.0768 | <0.480 R-02 | 0.726 | <0.154 |
| | 3/1/2024 | 7.14 | 0.322 | <0.773 R-02 | <0.145 | <0.145 | <0.0727 | <0.0727 | <0.0727 | <0.145 | <0.0727 | <0.0727 | <0.0727 | <0.145 | 0.785 | <0.0727 | <0.545 R-02 | 1.14 | <0.145 |
| | 10/2/2024 | 25.0 | 3.21 | <1.37 R-02 | <0.351 | <0.351 | <0.176 | <0.176 | <0.176 | <0.351 | <0.176 | <0.176 | <0.176 | <0.351 | 1.75 | <0.176 | <0.922 R-02 | 1.95 | <0.351 |
| MW39* | 3/3/2023 | 56.1 | 72.5 | <0.990 R-02 | <0.792 | <0.792 | <0.396 | <0.396 | <0.396 | <0.792 | <0.396 | <0.396 | <0.396 | <0.792 | 1.14 | <0.396 | 47.6 | <1.58 | <0.792 |
| | 10/11/2023 | 61.5 | 46.5 | <0.976 R-02 | <0.781 | <0.781 | <0.391 | <0.391 | <0.391 | <0.781 | <0.391 | <0.391 | <0.391 | <0.781 | 1.17 | <0.391 | 6.95 | < 1.56 | <0.781 |
| | 2/27/2024 | 97.3 | 147 | <1.21 R-02 | <0.773 | <0.773 | <0.387 | <0.387 | <0.387 | <0.773 | <0.387 | <0.387 | <0.387 | <0.773 | 1.78 | <0.387 | 19.6 | 1.64 | <0.773 |
| | 10/2/2024 | 60.6 | 24.9 | <0.965 R-02 | <0.753 | <0.753 | <0.377 | <0.377 | <0.377 | <0.753 | <0.377 | <0.377 | <0.377 | <0.753 | 1.43 | <0.377 | 5.03 | <1.51 | <0.753 |
| MW42* | 3/25/2021 | <0.0653 | <0.0653 | <0.0327 | 0.0176 J | <0.383 | 0.0751 | 0.185 | 0.202 | 0.144 | 0.0972 M-05 | 0.115 | 0.0216 | 0.174 | <0.0327 | 0.122 | <0.0653 | 0.0625 J | 0.165 |
| | 3/24/2022 | <0.0641 | <0.0641 | <0.0321 | <0.0321 | <0.0321 | <0.0160 | <0.0160 | <0.0160 | <0.0321 | <0.0160 | <0.0160 | <0.0160 | <0.0321 | <0.0321 | <0.0160 | <0.0641 | <0.0641 | <0.0321 |
| | 3/7/2023 | <0.0648 | <0.0648 | <0.0324 | <0.0324 | <0.0324 | <0.0162 | <0.0162 | <0.0162 | <0.0324 | <0.0162 | <0.0162 | <0.0162 | <0.0324 | <0.0324 | <0.0162 | <0.0648 | <0.0648 | <0.0324 |
| | 3/8/2024 | <0.0642 | <0.0642 | <0.0321 | <0.0321 | <0.0321 | <0.0161 | <0.0161 | <0.0161 | <0.0321 | <0.0161 | <0.0161 | <0.0161 | <0.0321 | <0.0321 | <0.0161 | <0.0642 | <0.0642 | <0.0321 |

Please refer to notes at end of table.

# Table 6

## Groundwater Analytical Data—PAHs

**Shore Terminals—Portland**

**Portland, Oregon**

| Well ID | Sample Date | Analytical Results (µg/L) | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | -Methylnaphthalen | -Methylnaphthalen | Acenaphthene | Acenaphthylene | Anthracene | Benzo(a)anthracene | Benzo(a)pyrene | Benzo(b)fluoranthen | Benzo(g,h,i)perylene | Benzo(k)fluoranthen | Chrysene | Dibenz(a,h)anthracer | Fluoranthene | Fluorene | Indeno(1,2,3-cd)pyrer | Naphthalene | Phenanthrene | Pyrene |
| *1997 Site ROD Cleanup Goal* | | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | *347* | – | – |
| *2017 PHSS Cleanup Level* | | – | – | *23* | – | *0.73* | *0.0012* | *0.00012* | *0.0012* | – | *0.0013* | *0.0013* | *0.00012* | – | – | *0.0012* | *12* | – | – |
| *Portland Harbor JSCS SLV* | | – | *0.2* | *0.2* | *0.2* | – | *0.018* | *0.018* | *0.018* | *0.2* | *0.018* | *0.018* | *0.018* | *0.2* | *0.2* | *0.018* | *0.2* | *0.2* | *0.2* |
| MW41B* | 3/2/2023 | <0.0682 | <0.0682 | <0.0341 | <0.0341 | <0.0341 | 0.0256 | 0.0379 | 0.0665 | 0.0452 | 0.0264 M-05 | 0.0337 | <0.0170 | 0.0366 | <0.0341 | 0.0528 | <0.0682 | <0.0682 | 0.0392 |
| | 10/10/2023 | <0.0649 | <0.0649 | <0.0324 | <0.0324 | <0.0324 | <0.0162 | <0.0162 | <0.0162 | <0.0324 | <0.0162 | <0.0162 | <0.0162 | <0.0324 | <0.0324 | <0.0162 | <0.0649 | <0.0649 | <0.0324 |
| | 2/27/2024 | <0.0654 | <0.0654 | <0.0327 | <0.0327 | <0.0327 | 0.0163 | 0.0323 | 0.0527 | 0.0376 | 0.0172 M-05 | 0.0249 | <0.0163 | <0.0327 | <0.0327 | 0.0364 | <0.0654 | <0.0654 | <0.0327 |
| | 10/1/2024 | <0.0669 | <0.0669 | <0.0335 | <0.0335 | <0.0335 | <0.0167 | <0.0167 | <0.0167 | <0.0335 | <0.0167 | <0.0167 | <0.0167 | <0.0335 | <0.0335 | <0.0167 | <0.0669 | <0.0669 | <0.0335 |
| MW43 | 3/2/2023 | 87.8 | 204 | <0.414 | <0.414 | <0.414 | <0.207 | <0.207 | <0.207 | <0.414 | <0.207 | <0.207 | <0.207 | <0.414 | <0.414 | <0.207 | 22.6 | <0.828 | <0.414 |
| | 10/10/2023 | 76.5 | 165 | <0.120 R-02 | <0.0426 | <0.0426 | <0.0213 | <0.0213 | <0.0213 | <0.0426 | <0.0213 | <0.0213 | <0.0213 | <0.0426 | 0.098 | <0.0213 | 17.2 | <0.0852 | <0.0426 |
| | 2/27/2024 | 98.8 | 172 | <0.743 | <0.743 | <0.743 | <0.372 | <0.372 | <0.372 | <0.743 | <0.372 | <0.372 | <0.372 | <0.743 | <0.743 | <0.372 | 17.9 | <1.49 | <0.743 |
| | 10/2/2024 | 67.5 | 167 | <0.707 | <0.707 | <0.707 | <0.354 | <0.354 | <0.354 | <0.707 | <0.354 | <0.354 | <0.354 | <0.707 | <0.707 | <0.354 | 14.0 | <1.41 | <0.707 |
| MW44* | 3/2/2023 | 0.147 | <0.0650 | <0.0325 | <0.0325 | <0.0325 | <0.0163 | <0.0163 | <0.0163 | <0.0325 | <0.0163 | <0.0163 | <0.0163 | <0.0325 | <0.0325 | <0.0163 | <0.0650 | <0.0650 | <0.0325 |
| | 3/2/23 DUP | 0.173 | <0.0654 | <0.0327 | <0.0327 | <0.0327 | <0.0164 | <0.0164 | <0.0164 | <0.0327 | <0.0164 | <0.0164 | <0.0164 | <0.0327 | <0.0327 | <0.0164 | <0.0654 | <0.0654 | <0.0327 |
| | 10/11/2023 | < 18.4 R-02 | <0.0736 | <0.184 R-02 | <0.0690 R-02 | 0.0791 | <0.0184 | <0.0184 | <0.0184 | <0.0368 | <0.0184 | <0.0184 | <0.0184 | <0.0368 | <0.0920 R-02 | <0.0184 | <4.21 R-02 | <0.0736 | 0.0515 |
| | 2/27/2024 | 1.09 | <0.0778 | <0.0389 | <0.0389 | <0.0389 | <0.0195 | <0.0195 | <0.0195 | <0.0389 | <0.0195 | <0.0195 | <0.0195 | <0.0389 | <0.0389 | <0.0195 | 0.168 | <0.0778 | <0.0389 |
| | 2/27/2024 DUP | 0.897 | <0.0804 | <0.0402 | <0.0402 | <0.0402 | <0.0201 | <0.0201 | <0.0201 | <0.0402 | <0.0201 | <0.0201 | <0.0201 | <0.0402 | <0.0402 | <0.0201 | <0.226 R-02 | <0.0804 | <0.0402 |
| | 10/3/2024 | 18.5 | <0.279 | <0.174 R-02 | <0.139 | <0.139 | <0.0697 | <0.0697 | <0.0697 | <0.139 | <0.0697 | <0.0697 | <0.0697 | <0.139 | <0.139 | <0.0697 | 2.1 | <0.279 | <0.139 |
| MW45* | 3/23/2021 | <0.0652 | <0.0652 | <0.0326 | <0.0326 | <0.034 | 0.0171 M-05 | 0.0448 | 0.0672 | 0.0558 | 0.0277 M-05 | 0.0253 M-05 | 0.00856 J | 0.0261 J | <0.0326 | 0.0452 | 0.0338 J | <0.0652 | 0.0289 J |
| | 3/25/2022 | <0.0648 | <0.0648 | <0.0324 | <0.0324 | <0.0324 | <0.0162 | <0.0162 | <0.0162 | <0.0324 | <0.0162 | <0.0162 | <0.0162 | <0.0324 | <0.0324 | <0.0162 | <0.0648 | <0.0648 | <0.0324 |
| | 3/2/2023 | <0.0666 | <0.0666 | <0.0333 | <0.0333 | <0.0333 | <0.0166 | <0.0166 | <0.0166 | <0.0333 | <0.0166 | <0.0166 | <0.0166 | <0.0333 | <0.0333 | <0.0166 | <0.0666 | <0.0666 | <0.0333 |
| | 2/28/2024 | <0.0686 | <0.0686 | <0.0343 | <0.0343 | <0.0343 | <0.0171 | <0.0171 | <0.0171 | <0.0343 | <0.0171 | <0.0171 | <0.0171 | <0.0343 | <0.0343 | <0.0171 | <0.0686 | <0.0686 | <0.0343 |
| MW46* | 3/2/2023 | <0.639 | <0.639 | <0.0319 | <0.0319 | <0.0319 | <0.0160 | <0.0160 | <0.0160 | <0.0319 | <0.0160 | <0.0160 | <0.0160 | <0.0319 | <0.0319 | <0.0160 | <0.0639 | <0.0639 | <0.0319 |
| | 10/10/2023 | <0.0665 | <0.0665 | <0.0333 | <0.0333 | <0.0333 | <0.0166 | <0.0166 | <0.0166 | <0.0333 | <0.0166 | <0.0166 | <0.0166 | <0.0333 | <0.0333 | <0.0166 | <0.0665 | <0.0665 | <0.0333 |
| | 2/28/2024 | <0.0669 | <0.0669 | <0.0335 | <0.0335 | <0.0335 | <0.0167 | <0.0167 | <0.0167 | <0.0335 | <0.0167 | <0.0167 | <0.0167 | <0.0335 | <0.0335 | <0.0167 | <0.0669 | <0.0669 | <0.0335 |
| | 10/1/2024 | <0.0697 | <0.0697 | <0.0348 | <0.0348 | <0.0348 | <0.0174 | <0.0174 | <0.0174 | <0.0348 | <0.0174 | <0.0174 | <0.0174 | <0.0348 | <0.0348 | <0.0174 | <0.0697 | <0.0697 | <0.0348 |
| ***DPE Treatment Area*** | | | | | | | | | | | | | | | | | | | |
| EX-07L | 3/2/2023 | <0.0668 | <0.0668 | <0.0334 | <0.0334 | <0.0626 R-02 | <0.0167 | <0.0167 | <0.0167 | <0.0334 | <0.0167 | <0.0167 | <0.0167 | <0.0334 | 0.0705 | <0.0167 | <0.0668 | <0.0668 | <0.0334 |
| | 10/10/2023 | <0.0818 | <0.0818 | <0.0895 R-02 | <0.0409 | <0.166 R-02 | <0.0205 | <0.0205 | <0.0205 | <0.0409 | <0.0205 | <0.0205 | <0.0205 | <0.0409 | <0.0895 R-02 | <0.0205 | <0.217 R-02 | <0.0818 | <0.0409 |
| | 2/27/2024 | <0.0646 | <0.0646 | <0.0323 | <0.0323 | <0.0606 R-02 | <0.0162 | <0.0162 | <0.0162 | <0.0323 | <0.0162 | <0.0162 | <0.0162 | <0.0323 | <0.0323 | <0.0162 | <0.0646 | <0.0646 | <0.0323 |
| | 9/30/2024 | <0.0643 | <0.0643 | <0.0573 R-02 | <0.0322 | <0.121 R-02 | <0.0161 | <0.0161 | <0.0161 | <0.0322 | <0.0161 | <0.0161 | <0.0161 | <0.0322 | <0.0322 | <0.0161 | <0.181 R-02 | <0.0643 | <0.0322 |

Please refer to notes at end of table.

# Table 6

## Groundwater Analytical Data—PAHs

**Shore Terminals—Portland**

**Portland, Oregon**

| Well ID | Sample Date | Analytical Results (µg/L) | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | -Methylnaphthalen | -Methylnaphthalen | Acenaphthene | Acenaphthylene | Anthracene | Benzo(a)anthracene | Benzo(a)pyrene | Benzo(b)fluoranthen | Benzo(g,h,i)perylene | Benzo(k)fluoranthen | Chrysene | ibenz(a,h)anthracer | Fluoranthene | Fluorene | deno(1,2,3-cd)pyre | Naphthalene | Phenanthrene | Pyrene |
| *1997 Site ROD Cleanup Goal* | | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | *347* | – | – |
| *2017 PHSS Cleanup Level* | | – | – | *23* | – | *0.73* | *0.0012* | *0.00012* | *0.0012* | – | *0.0013* | *0.0013* | *0.00012* | – | – | *0.0012* | *12* | – | – |
| *Portland Harbor JSCS SLV* | | – | *0.2* | *0.2* | *0.2* | – | *0.018* | *0.018* | *0.018* | *0.2* | *0.018* | *0.018* | *0.018* | *0.2* | *0.2* | *0.018* | *0.2* | *0.2* | *0.2* |
| KMW29 | 2/28/2023 | 25.1 | <0.907 | <2.83 R-02 | <0.709 R-02 | <0.454 | <0.227 | <0.227 | <0.227 | <0.454 | <0.227 | <0.227 | <0.227 | <0.454 | 2.95 | <0.227 | <2.13 R-02 | 2.80 | <0.454 |
| | 10/9/2023 | 19.6 | <0.787 | < 2.21 R-02 | <0.492 R-02 | <0.393 | <0.197 | <0.197 | <0.197 | <0.393 | <0.197 | <0.197 | <0.197 | <0.393 | 2.77 | <0.197 | <1.48 R-02 | 0.94 | <0.393 |
| | 2/27/2024 | 49.6 | <0.779 | <2.80 R-02 | <0.730 R-02 | <0.389 | <0.195 | <0.195 | <0.195 | <0.389 | <0.195 | <0.195 | <0.195 | <0.389 | 3.94 | <0.195 | <2.07 R-02 | 3.48 | <0.389 |
| | 10/1/2024 | 22.9 | <0.698 | <2.51 R-02 | <0.545 R-02 | <0.349 | <0.174 | <0.174 | <0.174 | <0.349 | <0.174 | <0.174 | <0.174 | <0.349 | 4.07 | <0.174 | <1.42 R-02 | 2.26 | <0.349 |
| KMW30 | 2/28/2023 | 8.82 R-02 | <0.0853 | <0.467 R-02 | <0.120 R-02 | <0.107 R-02 | <0.0213 | <0.0213 | <0.0213 | <0.0427 | <0.0213 | <0.0213 | <0.0213 | <0.0427 | 0.460 | <0.0213 | <0.507 R-02 | 0.145 | <0.0427 |
| | 10/9/2023 | 3.46 | <0.0649 | <0.112 R-02 | <0.0325 | 0.067 | <0.0162 | <0.0162 | <0.0162 | <0.0325 | <0.0162 | <0.0162 | <0.0162 | <0.0325 | 0.150 | <0.0162 | <0.690 R-02 | 0.0759 | <0.0325 |
| | 2/26/2024 | 2.08 | <0.0760 | <0.119 R-02 | <0.0380 | <0.0380 | <0.0190 | <0.0190 | <0.0190 | <0.0380 | <0.0190 | <0.0190 | <0.0190 | <0.0380 | 0.113 | <0.0190 | <0.297 R-02 | <0.0760 | <0.0380 |
| | 10/1/2024 | 13.8 | <0.0647 | <0.364 R-02 | <0.0738 R-02 | 0.112 | <0.0162 | <0.0162 | <0.0162 | <0.0323 | <0.0162 | <0.0162 | <0.0162 | <0.0323 | 0.584 | <0.0162 | <0.910R-02 | 0.331 | <0.0323 |
| | 10/1/2024 DUP | 10.2 | <0.0652 | <0.306 R-02 | <0.0611 R-02 | 0.0986 | <0.0163 | <0.0163 | <0.0163 | <0.0326 | <0.0163 | <0.0163 | <0.0163 | <0.0326 | 0.426 | <0.0163 | <0.805 R-02 | 0.242 | <0.0326 |
| KMW31 | 2/28/2023 | 15.8 | <0.643 | <1.21 R-02 | <0.322 | <0.322 | <0.161 | <0.161 | <0.161 | <0.322 | <0.161 | <0.161 | <0.161 | <0.322 | 1.11 | <0.161 | <0.905 R-02 | 1.41 | <0.322 |
| | 2/28/2023 DUP | 14.3 | <0.647 | <1.31 R-02 | <0.324 | <0.324 | <0.162 | <0.162 | <0.162 | <0.324 | <0.162 | <0.162 | <0.162 | <0.324 | 1.16 | <0.162 | <0.910 R-02 | 1.58 | <0.324 |
| | 10/10/2023 | 12.6 | <0.756 | < 1.06 R-02 | <0.378 | <0.378 | <0.189 | <0.189 | <0.189 | <0.378 | <0.189 | <0.189 | <0.189 | <0.378 | 1.14 | <0.189 | <0.756 | 1.44 | <0.378 |
| | 10/10/2023 DUP | 12 | <0.865 | < 1.22 R-02 | <0.433 | <0.433 | <0.216 | <0.216 | <0.216 | <0.433 | <0.216 | <0.216 | <0.216 | <0.433 | 1.12 | <0.216 | <0.865 | 1.57 | <0.433 |
| | 2/27/2024 | 14.3 | <0.851 | <1.20 R-02 | <0.426 | <0.426 | <0.213 | <0.213 | <0.213 | <0.426 | <0.213 | <0.213 | <0.213 | <0.426 | 1.07 | <0.213 | <0.851 | 1.00 | <0.426 |
| | 2/27/2024 DUP | 9.3 | <0.862 | <1.08 R-02 | <0.431 | <0.431 | <0.215 | <0.215 | <0.215 | <0.431 | <0.215 | <0.215 | <0.215 | <0.431 | 0.905 | <0.215 | <0.862 | 0.921 | <0.431 |
| | 10/1/2024 | 13.8 | <0.646 | <1.31 R-02 | <0.323 | <0.323 | <0.162 | <0.162 | <0.162 | <0.323 | <0.162 | <0.162 | <0.162 | <0.323 | 1.32 | <0.162 | <0.818 R-02 | 1.53 | <0.323 |
| | 10/1/2024 DUP | 13.9 | <0.698 | <1.20 R-02 | <0.349 | <0.349 | <0.175 | <0.175 | <0.175 | <0.349 | <0.175 | <0.175 | <0.175 | <0.349 | 1.24 | <0.175 | <0.786 R-02 | 1.39 | <0.349 |
| KMW32 | 3/1/2023 | <0.0671 | <0.0671 | <0.0336 | <0.0336 | <0.0734 R-02 | <0.0168 | <0.0168 | <0.0168 | <0.0336 | <0.0168 | <0.0168 | <0.0168 | <0.0336 | <0.0336 | <0.0168 | <0.136 R-02 | <0.0671 | <0.0336 |
| | 10/10/2023 | <0.0640 | <0.0640 | <0.0320 | <0.0320 | <0.0500 R-02 | <0.0160 | <0.0160 | <0.0160 | <0.0320 | <0.0160 | <0.0160 | <0.0160 | <0.0320 | <0.0320 | <0.0160 | <0.0900 R-02 | <0.0640 | 0.0616 |
| | 2/26/2024 | <0.0659 | <0.0659 | <0.0329 | <0.0329 | <0.0823 R-02 | <0.0165 | <0.0165 | <0.0165 | <0.0329 | <0.0165 | <0.0165 | <0.0165 | <0.0329 | <0.0329 | <0.0165 | <0.0659 | <0.0659 | <0.0329 |
| | 10/1/2024 | 0.262 R-02 | <0.0655 | <0.0471 R-02 | <0.0328 | <0.0430 | <0.0164 | <0.0164 | <0.0164 | <0.0328 | <0.0164 | <0.0266 R-02 | <0.0164 | <0.0328 | 0.0614 | <0.0164 | <0.307 R-02 | <0.0655 | 0.075 |
| KMW33 | 2/28/2023 | <0.0655 | <0.0655 | <0.520 R-02 | <0.312 R-02 | <0.312 R-02 | <0.0166 | <0.0166 | <0.0166 | <0.0333 | <0.0166 | <0.0166 | <0.0166 | <0.0333 | 0.688 | <0.0166 | <0.125 R-02 | <0.0655 | <0.0831 |
| | 10/10/2023 | 0.504 | <0.137 R-02 | 0.731 | <0.123 R-02 | <0.0960 R-02 | <0.0220 | <0.0220 | <0.0220 | <0.0439 | <0.0220 | <0.0220 | <0.0220 | <0.110 R-02 | <0.0439 | <0.0220 | 3.39 | <0.165 R-02 | 0.111 |
| | 2/26/2024 | <0.0802 | <0.0802 | <0.438 R-02 | <0.113 R-02 | <0.225 R-02 | <0.0200 | <0.0200 | <0.0200 | <0.0401 | <0.0200 | <0.0376 R-02 | <0.0200 | <0.0401 | 0.761 | <0.0200 | <0.113 R-02 | <0.0802 | 0.0571 |
| | 10/1/2024 | <0.0923 R-02 | <0.0738 | <1.30 R-02 | <0.404 R-02 | <0.358 R-02 | <0.0185 | <0.0185 | <0.0185 | <0.0369 | <0.0185 | <0.0185 | <0.0185 | <0.0369 | 3.21 | <0.0185 | 0.351 | <0.0738 | 0.0443 |
| KMW37 | 10/11/2022 | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| | 2/28/2023 | 0.728 | <0.189 R-02 | <1.89 R-02 | <0.503 R-02 | <0.189 R-02 | <0.0201 | <0.0201 | <0.0201 | <0.0402 | <0.0201 | <0.0201 | <0.0201 | <0.0402 | 3.17 | <0.0201 | <2.26 R-02 | 0.801 | 0.0463 |
| | 10/10/2023 | 0.668 | 0.169 | <0.628 R-02 | <0.279 R-02 | <0.126 R-02 | <0.0223 | <0.0223 | <0.0223 | <0.0446 | <0.0223 | <0.0223 | <0.0223 | 0.0686 | 0.918 | <0.0223 | < 1.95 R-02 | 0.345 | 0.0842 |
| | KMW37 was decommissioned prior to the February 2024 monitoring event | | | | | | | | | | | | | | | | | | |

Please refer to notes at end of table.

# Table 6

## Groundwater Analytical Data—PAHs

**Shore Terminals—Portland**

**Portland, Oregon**

| Well ID | Sample Date | Analytical Results (µg/L) | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | -Methylnaphthalen | -Methylnaphthalen | Acenaphthene | Acenaphthylene | Anthracene | Benzo(a)anthracene | Benzo(a)pyrene | enzo(b)fluoranthen | Benzo(g,h,i)perylene | enzo(k)fluoranthen | Chrysene | ibenz(a,h)anthracer | Fluoranthene | Fluorene | deno(1,2,3-cd)pyre | Naphthalene | Phenanthrene | Pyrene |
| *1997 Site ROD Cleanup Goal* | | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | *347* | – | – |
| *2017 PHSS Cleanup Level* | | – | – | *23* | – | *0.73* | *0.0012* | *0.00012* | *0.0012* | – | *0.0013* | *0.0013* | *0.00012* | – | – | *0.0012* | *12* | – | – |
| *Portland Harbor JSCS SLV* | | – | *0.2* | *0.2* | *0.2* | – | *0.018* | *0.018* | *0.018* | *0.2* | *0.018* | *0.018* | *0.018* | *0.2* | *0.2* | *0.018* | *0.2* | *0.2* | *0.2* |
| MW47 | 2/28/2023 | <0.386 R-02 | <0.0823 | <2.70 R-02 | <0.643 R-02 | 0.141 R-02 | <0.0206 | <0.0206 | <0.0206 | <0.0411 | <0.0206 | <0.0206 | <0.0206 | 0.0823 | 3.46 | <0.0206 | <1.67 R-02 | <0.103 R-02 | 0.0957 |
| | 10/10/2023 | <0.115 R-02 | <0.0670 | 1.28 | <0.136 R-02 | <0.0629 R-02 | <0.0168 | <0.0168 | <0.0168 | <0.0335 | <0.0168 | <0.0168 | <0.0168 | 0.0612 | 1.46 | <0.0168 | < 1.15 R-02 | <0.0670 | 0.0763 |
| | 2/26/2024 | <0.655 | <0.655 | 1.35 | <0.511 R-02 | <0.327 | <0.164 | <0.164 | <0.164 | <0.327 | <0.164 | <0.164 | <0.164 | <0.327 | 2.48 | <0.164 | <1.12 R-02 | <0.655 | <0.327 |
| | 10/1/2024 | <0.687 | <0.687 | <2.15 R-02 | <0.451 R-02 | <0.343 | <0.172 | <0.172 | <0.172 | <0.343 | <0.172 | <0.172 | <0.172 | <0.343 | 3.57 | <0.172 | <1.29 R-02 | <0.687 | <0.343 |
| MW48 | 2/28/2023 | 5.96 | <0.0643 | <0.251 R-02 | <0.101 R-02 | <0.101 R-02 | <0.0161 | <0.0161 | <0.0161 | <0.322 | <0.0161 | <0.0161 | <0.0161 | <0.0322 | 0.302 | <0.0161 | <0.553 R-02 | 0.317 | 0.0346 |
| | 2/28/23 DUP | 5.99 | <0.0649 | <0.254 R-02 | <0.0913 R-02 | <0.101 R-02 | <0.0162 | <0.0162 | <0.0162 | <0.0325 | <0.0162 | <0.0162 | <0.0162 | <0.0325 | 0.294 | <0.0162 | <0.558 R-02 | 0.303 | 0.0373 |
| | 10/9/2023 | 3.37 | <0.0648 | <0.152 R-02 | <0.0608 R-02 | 0.0915 | <0.0162 | <0.0162 | <0.0162 | <0.0324 | <0.0162 | <0.0162 | <0.0162 | 0.0332 | 0.194 | <0.0162 | <0.456 R-02 | 0.111 | 0.0446 |
| | 10/9/2023 DUP | 3.85 | <0.0651 | <0.163 R-02 | <0.0610 R-02 | 0.0947 | <0.0163 | <0.0163 | <0.0163 | <0.0325 | <0.0163 | <0.0163 | <0.0163 | 0.0337 | 0.215 | <0.0163 | <47.8 R-02 | 0.127 | 0.0463 |
| | 2/26/2024 | 0.416 | <0.0817 | <0.0409 | <0.0409 | <0.0409 | <0.0204 | <0.0204 | <0.0204 | <0.0409 | <0.0204 | <0.0204 | <0.0204 | <0.0409 | 0.0659 | <0.0204 | 0.205 | <0.0817 | <0.0409 |
| | 2/26/2024 DUP | 0.715 | <0.0663 | <0.0829 R-02 | <0.0331 | 0.0439 | <0.0166 | <0.0166 | <0.0166 | <0.0331 | <0.0166 | <0.0166 | <0.0166 | <0.0331 | 0.065 | <0.0166 | 0.259 | <0.0663 | <0.0331 |
| | 10/1/2024 | 0.842 | <0.0644 | <0.0704 R-02 | <0.0322 | 0.093 | <0.0161 | <0.0161 | <0.0161 | <0.0322 | <0.0161 | <0.0161 | <0.0161 | <0.0322 | 0.0914 | <0.0161 | <0.443 R-02 | <0.0644 | <0.0322 |
| MW49 | 2/28/2023 | 0.221 | <0.0760 R-02 | <2.02 R-02 | <0.475 R-02 | <0.475 R-02 | <0.0190 | <0.0190 | <0.0190 | <0.380 | <0.0190 | <0.0190 | <0.0190 | 0.109 | 2.47 | <0.0190 | <1.19 R-02 | 1.54 | 0.138 |
| | 10/10/2023 | 0.262 | <0.106 R-02 | < 1.64 R-02 | <0.469 R-02 | 0.297 | <0.0352 R-02 | <0.0188 | <0.0188 | <0.0376 | <0.0188 | <0.0188 | <0.0188 | 0.100 | 1.78 | <0.0188 | < 1.23 R-02 | 0.89 | 0.14 |
| | 2/27/2024 | <1.57 | <1.57 | <1.97 | <0.787 | <0.787 | <0.394 | <0.394 | <0.394 | <0.787 | <0.394 | <0.394 | <0.394 | <0.787 | 2.29 | <0.394 | <1.57 | <1.57 | <0.787 |
| | 10/1/2024 | <0.699 | <0.699 | <1.75 R-02 | <0.350 | <0.350 | <0.175 | <0.175 | <0.175 | <0.350 | <0.175 | <0.175 | <0.175 | <0.350 | 2.62 | <0.175 | <1.05 R-02 | 1.29 | <0.350 |
| ***Slurry Wall*** | | | | | | | | | | | | | | | | | | | |
| KMW36 | 3/7/2023 | <0.154 R-02 | <0.0676 | <0.211 R-02 | <0.0951 R-02 | <0.137 R-02 | <0.0201 R-02 | <0.0169 | <0.0169 | <0.0338 | <0.0169 | <0.0222 R-02 | <0.0169 | 0.0701 | 0.206 | <0.0169 | <0.316 R-02 | <0.0782 R-02 | 0.134 |
| | 10/10/2023 | <0.369 R-02 | <0.215 R-02 | < 1.23 R-02 | <0.451 R-02 | 0.314 | <0.0164 | <0.0164 | <0.0164 | <0.0328 | <0.0164 | <0.0164 | <0.0164 | 0.105 | 1.41 | <0.0164 | <1.23 R-02 | <0.0820 R-02 | 0.13 |
| | 2/29/2024 | <0.195 R-02 | <0.0833 | <0.352 R-02 | <0.0911 R-02 | <0.234 R-02 | <0.0208 | <0.0208 | <0.0208 | <0.0417 | <0.0208 | <0.0208 | <0.0208 | <0.0417 | 0.574 | <0.0208 | <0.378 R-02 | <0.0833 | 0.0922 |
| | 10/1/2024 | <0.162 R-02 | <0.101 R-02 | <1.21 R-02 | <0.333 R-02 | 0.414 | <0.0162 | <0.0162 | <0.0162 | <0.0323 | <0.0162 | <0.0162 | <0.0162 | 0.126 | 1.52 | <0.0162 | <1.11 R-02 | <0.0728R-02 | 0.157 |
| W-16 | 3/2/2023 | 0.657 | <0.0650 | <0.864 R-02 | <0.203 R-02 | <0.112 R-02 | <0.0508 R-02 | <0.0163 | <0.0163 | <0.0325 | <0.0163 | <0.0508 R-02 | <0.0163 | 0.0411 | 1.41 | <0.0163 | <0.813 R-02 | 0.196 | 0.0768 |
| | 10/11/2023 | 0.119 | <0.0652 | <0.774 R-02 | <0.183 R-02 | <0.255 R-02 | <0.0163 | <0.0163 | <0.0163 | <0.0326 | <0.0163 | <0.0163 | <0.0163 | 0.0644 | 1.44 | <0.0163 | <0.631 R-02 | <0.214 R-02 | 0.099 |
| | 2/29/2024 | 0.172 | <0.0993 | <0.730 R-02 | <0.0931 R-02 | <0.0621 R-02 | <0.0248 | <0.0248 | <0.0248 | <0.0497 | <0.0248 | <0.0248 | <0.0248 | <0.0497 | 1.35 | <0.0248 | <0.559 | <0.124 | 0.0695 |
| | 10/2/2024 | 0.331 | <0.0686 | <1.18 R-02 | <0.225 R-02 | <0.0643 R-02 | <0.0171 | <0.0171 | <0.0171 | <0.0343 | <0.0171 | <0.0171 | <0.0171 | 0.072 Q-29 | 2.52 | <0.0171 | <1.06 R-02 | <0.246 R-02 | 0.114 Q-29 |
| W-19 | 3/25/2021 | 0.144 | <0.0728 | 1.89 | <0.193 R-02 | 0.02 J | 0.0132 J | <0.0182 | <0.0182 | <0.0364 | <0.0182 | 0.0123 J | <0.0182 | 0.117 | 0.158 | <0.0182 | <0.341 R-02 | 0.141 | 0.173 |
| | 3/25/2022 | 0.431 | 0.079 | <2.42 R-02 | <0.364 R-02 | <0.303 R-02 | <0.0194 | <0.0194 | <0.0194 | <0.0388 | <0.0194 | <0.0194 | <0.0194 | 0.0766 | 1.28 | <0.0194 | <0.909 R-02 | <0.424 R-02 | 0.137 |
| | 3/2/2023 | <0.0748 | <0.0748 | <0.117 R-02 | 0.203 | <0.117 R-02 | <0.0187 | <0.0187 | <0.0187 | <0.0374 | <0.0187 | <0.0187 | <0.0187 | <0.0374 | <0.0374 | <0.0187 | <0.140 R-02 | <0.0748 | 0.101 |
| | 2/29/2024 | <0.151 R-02 | <0.0808 | <1.20 R-02 | <0.151 R-02 | <0.252 R-02 | <0.0202 | <0.0202 | <0.0202 | <0.0404 | <0.0202 | <0.0202 | <0.0202 | 0.0621 | 0.235 | <0.0202 | <0.808 | <0.0808 | 0.134 |

Please refer to notes at end of table.

# Table 6

## Groundwater Analytical Data—PAHs

**Shore Terminals—Portland**

**Portland, Oregon**

| Well ID | Sample Date | Analytical Results (µg/L) | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | -Methylnaphthalen | -Methylnaphthalen | Acenaphthene | Acenaphthylene | Anthracene | Benzo(a)anthracene | Benzo(a)pyrene | Benzo(b)fluoranthen | Benzo(g,h,i)perylene | Benzo(k)fluoranthen | Chrysene | Dibenz(a,h)anthracer | Fluoranthene | Fluorene | Indeno(1,2,3-cd)pyrer | Naphthalene | Phenanthrene | Pyrene |
| *1997 Site ROD Cleanup Goal* | | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | 347 | – | – |
| *2017 PHSS Cleanup Level* | | – | – | 23 | – | 0.73 | 0.0012 | 0.00012 | 0.0012 | – | 0.0013 | 0.0013 | 0.00012 | – | – | 0.0012 | 12 | – | – |
| *Portland Harbor JSCS SLV* | | – | 0.2 | 0.2 | 0.2 | – | 0.018 | 0.018 | 0.018 | 0.2 | 0.018 | 0.018 | 0.018 | 0.2 | 0.2 | 0.018 | 0.2 | 0.2 | 0.2 |
| W-20 | 3/25/2021 | <0.071 | <0.071 | <0.0355 | <0.0355 | <0.032 | <0.0178 | <0.0178 | <0.0178 | <0.0355 | <0.0178 | <0.0178 | <0.0178 | <0.0355 | <0.0355 | <0.0178 | <0.071 | <0.071 | <0.0355 |
| | 3/25/2022 | <0.0732 | <0.0732 | <0.0366 | <0.0366 | <0.0366 | <0.0183 | <0.0183 | <0.0183 | <0.0366 | <0.0183 | <0.0183 | <0.0183 | <0.0366 | <0.0366 | <0.0183 | <0.0732 | <0.0732 | <0.0366 |
| | 3/2/2023 | <0.0777 | <0.0777 | <0.0388 | <0.0388 | <0.0388 | 0.0257 | <0.0194 | 0.0199 | <0.0388 | 0.0218 | <0.0194 | <0.0194 | <0.0388 | <0.0388 | <0.0194 | <0.0777 | <0.0777 | <0.0388 |
| | 2/29/2024 | <0.0776 | <0.0776 | <0.0388 | <0.0388 | <0.0388 | <0.0194 | <0.0194 | <0.0194 | <0.0388 | <0.0194 | <0.0194 | <0.0194 | <0.0388 | <0.0388 | <0.0194 | <0.0776 | <0.0776 | <0.0388 |
| W-22 | 3/23/2021 | <0.0639 | <0.0639 | <0.032 | <0.032 | <0.032 | <0.016 | <0.016 | <0.016 | <0.032 | <0.016 | <0.016 | <0.016 | <0.032 | <0.032 | <0.016 | <0.0639 | <0.0639 | <0.032 |
| | 3/25/2022 | <0.0678 | <0.0678 | <0.0339 | <0.0339 | <0.0339 | <0.0169 | <0.0169 | <0.0169 | <0.0339 | <0.0169 | <0.0169 | <0.0169 | <0.0339 | <0.0339 | <0.0169 | <0.0678 | <0.0678 | <0.0339 |
| | 3/2/2023 | <0.0668 | <0.0668 | <0.0334 | <0.0334 | <0.0334 | <0.0167 | <0.0167 | <0.0167 | <0.0334 | <0.0167 | <0.0167 | <0.0167 | <0.0334 | <0.0334 | <0.0167 | <0.0668 | <0.0668 | <0.0334 |
| | 2/29/2024 | <0.0731 | <0.0731 | <0.0365 | <0.0365 | <0.0365 | <0.0183 | <0.0183 | <0.0183 | <0.0365 | <0.0183 | <0.0183 | <0.0183 | <0.0365 | <0.0365 | <0.0183 | <0.0731 | <0.0731 | <0.0365 |
| ***Site-Wide*** | | | | | | | | | | | | | | | | | | | |
| KMW01 | 3/23/2021 | <0.0643 | <0.0643 | <0.0321 | <0.0321 | <0.0321 | <0.0161 | <0.0161 | <0.0161 | <0.0321 | <0.0161 | <0.0161 | <0.0161 | <0.0321 | <0.0321 | <0.0161 | <0.0643 | <0.0643 | <0.0321 |
| | 3/25/2022 | <0.0648 | <0.0648 | <0.0324 | <0.0324 | <0.0324 | <0.0162 | <0.0162 | <0.0162 | <0.0324 | <0.0162 | <0.0162 | <0.0162 | <0.0324 | <0.0324 | <0.0162 | <0.0648 | <0.0648 | <0.0324 |
| | 3/3/2023 | <0.0662 | <0.0662 | <0.0331 | <0.0331 | <0.0331 | <0.0165 | <0.0165 | <0.0165 | <0.0331 | <0.0165 | <0.0165 | <0.0165 | <0.0331 | <0.0331 | <0.0165 | <0.0662 | <0.0662 | <0.0331 |
| | 2/28/2024 | <0.0678 | <0.0678 | <0.0339 | <0.0339 | <0.0339 | <0.0170 | <0.0170 | <0.0170 | <0.0339 | <0.0170 | <0.0170 | <0.0170 | <0.0339 | <0.0339 | <0.0170 | <0.0678 | <0.0678 | <0.0339 |
| KMW02 | 3/7/2023 | <0.0742 | <0.0742 | <0.0371 | <0.0371 | <0.0371 | <0.0186 | <0.0186 | <0.0186 | <0.0371 | <0.0186 | <0.0186 | <0.0186 | <0.0371 | <0.0371 | <0.0186 | <0.0742 | <0.0742 | <0.0371 |
| | 10/11/2023 | <0.0772 | <0.0772 | <0.0386 | <0.0386 | <0.0386 | <0.0193 | <0.0193 | <0.0193 | <0.0386 | <0.0193 | <0.0193 | <0.0193 | <0.0386 | <0.0386 | <0.0193 | <0.0772 | <0.0772 | <0.0386 |
| | 2/28/2024 | <0.0885 | <0.0885 | <0.0442 | <0.0442 | <0.0442 | <0.0221 | <0.0221 | <0.0221 | <0.0442 | <0.0221 | <0.0221 | <0.0221 | <0.0442 | <0.0442 | <0.0221 | <0.0885 | <0.0885 | <0.0442 |
| | 10/3/2024 | <0.0706 | <0.0706 | <0.0353 | <0.0353 | <0.0353 | <0.0177 | <0.0177 | <0.0177 | <0.0353 | <0.0177 | <0.0177 | <0.0177 | <0.0353 | <0.0353 | <0.0177 | <0.0706 | <0.0706 | <0.0353 |
| KMW05 | 3/23/2021 | 3.16 | <0.145 R-02 | <6.77 R-02 | <1.21 R-02 | <0.967 R-02 | 0.014 J | 0.0116 J | <0.0193 | <0.0387 | <0.0193 | 0.0111 J | <0.0193 | 0.0551 | 8.40 | <0.0193 | <0.484 R-02 | 5.06 | 0.181 |
| | 3/24/2022 | 2.54 | 0.123 | <5.52 R-02 | <0.799 R-02 | <0.799 R-02 | <0.0232 | <0.0232 | <0.0232 | <0.0465 | <0.0232 | <0.0232 | <0.0232 | <0.0465 | 8.39 | <0.0232 | <0.653 R-02 | 3.59 | 0.152 |
| | 3/2/2023 | 3.62 | 0.149 | <6.10 R-02 | <1.52 R-02 | <1.02 R-02 | 0.0354 | 0.0402 | 0.0569 | <0.0325 | <0.0163 | 0.0496 | <0.0163 | 0.128 | 8.40 | 0.0297 | <1.02 R-02 | 6.01 | 0.272 |
| | 2/28/2024 | 1.32 | 0.118 | <5.37 R-02 | <0.725 R-02 | <0.580 R-02 | <0.0232 | <0.0232 | <0.0232 | <0.0464 | <0.0232 | <0.0232 | <0.0232 | <0.0464 | 6.57 | <0.0232 | <1.02 R-02 | 4.28 | 0.129 |
| KMW09 | 3/23/2021 | <0.0639 | <0.0639 | <0.0319 | <0.0319 | <0.0319 | <0.016 | <0.016 | <0.016 | <0.0319 | <0.016 | <0.016 | <0.016 | <0.0319 | <0.0319 | <0.016 | <0.0639 | <0.0639 | <0.0319 |
| | 3/22/2022 | <0.0713 | <0.0713 | <0.0357 | <0.0357 | <0.0357 | <0.0178 | <0.0178 | <0.0178 | <0.0357 | <0.0178 | <0.0178 | <0.0178 | <0.0357 | <0.0357 | <0.0178 | <0.0713 | <0.0713 | <0.0357 |
| | 3/7/2023 | <0.0654 | <0.0654 | <0.0327 | <0.0327 | <0.0327 | <0.0163 | <0.0163 | <0.0163 | <0.0327 | <0.0163 | <0.0163 | <0.0163 | <0.0327 | <0.0327 | <0.0163 | <0.0654 | <0.0654 | <0.0327 |
| | 2/28/2024 | <0.0646 | <0.0646 | <0.0323 | <0.0323 | <0.0323 | <0.0161 | <0.0161 | <0.0161 | <0.0323 | <0.0161 | <0.0161 | <0.0161 | <0.0323 | <0.0323 | <0.0161 | <0.0646 | <0.0646 | <0.0323 |

Please refer to notes at end of table.

# Table 6

## Groundwater Analytical Data—PAHs

**Shore Terminals—Portland**

**Portland, Oregon**

| Well ID | Sample Date | Analytical Results (µg/L) | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | -Methylnaphthalen | -Methylnaphthalen | Acenaphthene | Acenaphthylene | Anthracene | Benzo(a)anthracene | Benzo(a)pyrene | enzo(b)fluoranthen | Benzo(g,h,i)perylene | enzo(k)fluoranthen | Chrysene | ibenz(a,h)anthracer | Fluoranthene | Fluorene | deno(1,2,3-cd)pyre | Naphthalene | Phenanthrene | Pyrene |
| *1997 Site ROD Cleanup Goal* | | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | 347 | – | – |
| *2017 PHSS Cleanup Level* | | – | – | 23 | – | 0.73 | 0.0012 | 0.00012 | 0.0012 | – | 0.0013 | 0.0013 | 0.00012 | – | – | 0.0012 | 12 | – | – |
| *Portland Harbor JSCS SLV* | | – | 0.2 | 0.2 | 0.2 | – | 0.018 | 0.018 | 0.018 | 0.2 | 0.018 | 0.018 | 0.018 | 0.2 | 0.2 | 0.018 | 0.2 | 0.2 | 0.2 |
| KMW10* | 6/29/2023 | <0.0687 | <0.0687 | <0.0343 | <0.0343 | <0.0343 | <0.0172 | <0.0172 | <0.0172 | <0.0343 | <0.0172 | <0.0172 | <0.0172 | <0.0343 | <0.0343 | <0.0172 | <0.0687 | <0.0687 | <0.0343 |
| | 10/12/2023 | <0.0697 | <0.0697 | <0.0349 | <0.0349 | <0.0349 | <0.0174 | <0.0174 | <0.0174 | <0.0349 | <0.0174 | <0.0174 | <0.0174 | <0.0349 | <0.0349 | <0.0174 | <0.0697 | <0.0697 | <0.0349 |
| | 2/28/2024 | <0.0788 | <0.0788 | <0.0394 | <0.0394 | <0.0394 | <0.0197 | <0.0197 | <0.0197 | <0.0394 | <0.0197 | <0.0197 | <0.0197 | <0.0394 | <0.0394 | <0.0197 | <0.0788 | <0.0788 | <0.0394 |
| | 10/1/2024 | <0.0684 | <0.0684 | <0.0342 | <0.0342 | <0.0342 | <0.0171 | <0.0171 | <0.0171 | <0.0342 | <0.0171 | <0.0171 | <0.0171 | <0.0342 | <0.0342 | <0.0171 | <0.0684 | <0.0684 | <0.0342 |
| KMW16* | 3/25/2021 | <0.068 | <0.068 | <0.034 | <0.034 | <0.034 | 0.0191 | 0.0404 | 0.0391 | 0.0298 J | 0.0174 M-05 | 0.023 | <0.017 | 0.0463 | <0.034 | 0.0196 | <0.068 | <0.068 | 0.0455 |
| | 3/24/2022 | <0.0647 | <0.0647 | <0.0323 | <0.0323 | <0.0323 | <0.0162 | <0.0162 | 0.0222 | <0.0323 | <0.0162 | <0.0162 | <0.0162 | <0.0323 | <0.0323 | 0.0166 | <0.0647 | <0.0647 | <0.0323 |
| | 3/2/2023 | <0.0650 | <0.0650 | <0.0325 | <0.0325 | <0.0162 | <0.0162 | <0.0162 | <0.0162 | <0.0325 | <0.0162 | <0.0162 | <0.0162 | <0.0325 | <0.0325 | <0.0162 | <0.0650 | <0.0650 | <0.0325 |
| | 2/27/2024 | <0.0661 | <0.0661 | <0.0331 | <0.0331 | <0.0331 | <0.0165 | <0.0165 | <0.0165 | <0.0331 | <0.0165 | <0.0165 | <0.0165 | <0.0331 | <0.0331 | <0.0165 | 0.174 | <0.0661 | <0.0331 |
| KMW20 | 3/23/2021 | 0.0328 J | <0.0639 | <0.032 | <0.032 | <0.032 | <0.016 | 0.00799 J | <0.016 | <0.032 | <0.016 | <0.016 | <0.016 | <0.032 | <0.032 | <0.016 | 0.139 | <0.0639 | 0.0212 J |
| | 3/24/2022 | <0.0748 | <0.0748 | <0.0374 | <0.0374 | <0.0374 | <0.0187 | <0.0187 | <0.0187 | <0.0374 | <0.0187 | <0.0187 | <0.0187 | <0.0374 | <0.0374 | <0.0187 | <0.0748 | <0.0748 | <0.0374 |
| | 3/3/2023 | <0.0661 | <0.0661 | <0.0330 | <0.0330 | <0.0330 | <0.0165 | <0.0165 | <0.0165 | <0.0330 | <0.0165 | <0.0165 | <0.0165 | <0.0330 | <0.0330 | <0.0165 | <0.0661 | <0.0661 | 0.0508 |
| | 2/29/2024 | <0.0802 | <0.0802 | <0.0401 | <0.0401 | <0.0401 | <0.0200 | <0.0200 | <0.0200 | <0.0401 | <0.0200 | <0.0200 | <0.0200 | <0.0401 | <0.0401 | <0.0200 | <0.0802 | <0.0802 | <0.0401 |
| KMW21 | 3/23/2021 | <0.123 R-02 | <0.0655 | 0.545 | <0.0717 R-02 | <0.154 R-02 | 0.0152 J | <0.0164 | <0.0164 | <0.0328 | <0.0164 | 0.00819 J | <0.0164 | 0.0393 | 1.22 | <0.0164 | <0.184 R-02 | <0.102 R-02 | 0.0684 |
| | 3/24/2022 | <0.0821 | <0.0821 | <0.0411 | 0.0616 | <0.0898 R-02 | <0.0205 | <0.0205 | <0.0205 | <0.0411 | <0.0205 | <0.0205 | <0.0205 | <0.0411 | <0.128 R-02 | <0.0205 | <0.0821 | <0.0821 | <0.0411 |
| | 3/3/2023 | <0.0881 | <0.0881 | <0.0440 | <0.0440 | <0.0440 | <0.0220 | <0.0220 | <0.0220 | <0.0440 | <0.0220 | <0.0220 | <0.0220 | <0.0440 | <0.0440 | <0.0220 | <0.124 R-02 | <0.0881 | <0.0440 |
| | 2/29/2024 | <0.120 R-02 | <0.0852 | <1.20 R-02 | <0.133 R-02 | <0.133 R-02 | <0.0213 | <0.0213 | <0.0213 | <0.0426 | <0.0213 | <0.0213 | <0.0213 | <0.0426 | 2.67 | <0.0213 | <0.532 R-02 | <0.0852 | 0.0559 |
| MW40 | 3/23/2021 | <0.0636 | <0.0636 | <0.0318 | <0.0318 | <0.0988 R-02 | <0.0159 | <0.0159 | <0.0159 | <0.0318 | <0.0159 | <0.0159 | <0.0159 | <0.0318 | <0.0318 | <0.0159 | <0.0636 | <0.0636 | <0.0318 |
| | 3/24/2022 | 1/0/1900 | <0.0735 | <0.0367 | <0.0367 | 0.0478 | <0.0184 | <0.0184 | <0.0184 | <0.0367 | <0.0184 | <0.0184 | <0.0184 | <0.0367 | <0.0367 | <0.0184 | 0.464 | <0.0735 | <0.0367 |
| | 3/2/2023 | <0.0664 | <0.0664 | <0.0332 | <0.0332 | 0.0469 | <0.0166 | <0.0166 | <0.0166 | <0.0332 | <0.0166 | <0.0166 | <0.0166 | <0.0332 | <0.0332 | <0.0166 | <0.0664 | <0.0664 | <0.0332 |
| | 2/28/2024 | <0.0785 | <0.0785 | <0.0392 | <0.0392 | 0.0461 | <0.0196 | <0.0196 | <0.0196 | <0.0392 | <0.0196 | <0.0196 | <0.0196 | <0.0392 | <0.0392 | <0.0196 | <0.0785 | <0.0785 | <0.0392 |
| W-15 | 10/13/2022 | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| | 3/2/2023 | 0.26 | <0.0748 | <0.818 R-02 | <0.234 R-02 | <0.234 R-02 | <0.0187 | <0.0187 | <0.0187 | <0.0374 | <0.0187 | <0.0187 | <0.0187 | 0.0388 | 1.12 | <0.0187 | <1.05 R-02 | 0.394 | 0.105 |
| | 10/10/2023 | 0.389 | <0.158 R-02 | < 1.21 R-02 | <0.231 R-02 | <0.146 R-02 | <0.0195 | <0.0195 | <0.0195 | <0.0390 | <0.0195 | <0.0195 | <0.0195 | 0.0458 | 1.63 | <0.0195 | < 1.17 R-02 | 0.528 | 0.125 |
| | Well W-15 was decommissioned prior to the February 2024 monitoring event | | | | | | | | | | | | | | | | | | |

**Please refer to notes at end of table.**

# Table 6

## Groundwater Analytical Data—PAHs

### Shore Terminals—Portland

### Portland, Oregon

**Notes:**

1. PAH = Polycyclic aromatic hydrocarbons.
2. < = Concentration as reported by the analytical laboratory is less than the laboratory reporting limit.
3. µg/L = Microgram(s) per liter.
4. NA = Not analyzed .
5. DUP = Field Duplicate.
6. Yellow highlighted cells indicate values that are equal to or exceeding 1997 Record of Decision (ROD) Groundwater Cleanup Goals for the ExxonMobil/Shore Terminals Site.
7. Gray highlighted cells indicate values that are equal to or exceeding PHSS Cleanup Level. If a PHSS Cleanup Level was not developed for an analyte, the JSCS SLV is used for comparison.
8. Polycyclic aromatic hydrocarbons analyzed by EPA Method 8270C with selective ion monitoring.
9. * = Well is screened in Deep Sand unit.
10. Portland Harbor JSCS SLVs = 2007 Portland Harbor Joint Source Control Strategy Screening Level Values.
11. Well KMW14 was paved over prior to the October 2017 monitoring event. In an email dated February 21, 2018, DEQ agreed that well KMW14 was not critical to monitoring the Loading Rack Area and that replacement of KMW14 was not required. Well KMW14 has been removed from the monitoring program.

**Quality Assurance/Quality Control Data Qualifiers**

J = Reported result is an estimated value.

M-05 = Estimated results. Peak separation for structural isomers is insufficient for accurate quantification.

Q-29 = Recovery for Lab Control Spike (LCS) is above the upper control limit. Data may be biased high.

R-02 = The reporting limit for the analyte has been raised to account for interference from coeluting organic compounds present in the sample.

# Table 7

## Groundwater Analytical Data—Total and Dissolved Metals

**Shore Terminals—Portland**

**Portland, Oregon**

| Well ID | Sample Date | Analytical Results (µg/L) | | | | | |
|---|---|---|---|---|---|---|---|
| | | Total Arsenic | Total Copper | Total Lead | Dissolved Arsenic | Dissolved Copper | Dissolved Lead |
| *ROD Groundwater Cleanup Goal* | | -- | -- | -- | *5.0* | *12* | *3.2* |
| *PHSS Cleanup Level* | | -- | -- | -- | *0.018* | *2.74* | *0.54* |
| *Portland Harbor JSCS SLV* | | -- | -- | -- | *0.045* | *2.7* | *0.54* |
| ***Tank Field 1*** | | | | | | | |
| KMW07 | 3/25/2021 | 5.22 | 1.49 J | 0.315 | 2.49 | <2.00 | <0.20 |
| | 3/25/2021 DUP | 4.89 | 1.43 J | 0.293 | 2.26 | <2.00 | <0.20 |
| | 3/23/2022 | 2.67 | <2.00 | 0.213 | <1.00 | <2.00 | <0.20 |
| | 3/23/2022 DUP | 2.75 | <2.00 | <0.20 | <1.00 | <2.00 | <0.20 |
| | 3/2/2023 | <1.00 | <2.00 | <0.20 | <1.00 | <2.00 | <0.20 |
| | 2/27/2024 | 1.69 | <2.00 | <0.200 | <1.00 | <2.00 | <0.200 |
| KMW11 | 3/2/2023 | 3.23 | <2.00 | 0.363 | 3.20 | <2.00 | <0.20 |
| | 10/10/2023 | 4.34 | <2.00 | 0.296 | 4.27 | <2.00 | <0.20 |
| | 2/28/2024 | 3.89 | <2.00 | 0.231 | 3.87 | <2.00 | <0.200 |
| | 10/1/2024 | 4.58 | <2.00 | 0.41 | 4.45 | <2.00 | <0.200 |
| KMW18 | 3/2/2023 | <1.00 | <2.00 | <0.20 | <1.00 | <2.00 | <0.20 |
| | 3/2/2023 DUP | <1.00 | <2.00 | <0.20 | <1.00 | <2.00 | <0.20 |
| | 10/12/2023 | <1.00 | <2.00 | <0.20 | <1.00 | <2.00 | <0.20 |
| | 10/12/2023 DUP | <1.00 | <2.00 | <0.20 | <1.00 | <2.00 | <0.20 |
| | 2/28/2024 | <1.00 | <2.00 | <0.200 | <1.00 | <2.00 | <0.200 |
| | 2/28/2024 DUP | <1.00 | <2.00 | <0.200 | <1.00 | <2.00 | <0.200 |
| | 10/2/2024 | <1.00 | <2.00 | 0.234 | <1.00 | <2.00 | <0.200 |
| | 10/2/2024 DUP | <1.00 | <2.00 | 0.243 | <1.00 | <2.00 | <0.200 |

Please refer to notes at end of table.

# Table 7

## Groundwater Analytical Data—Total and Dissolved Metals

**Shore Terminals—Portland**

**Portland, Oregon**

| Well ID | Sample Date | Analytical Results (µg/L) | | | | | |
|---|---|---|---|---|---|---|---|
| | | Total Arsenic | Total Copper | Total Lead | Dissolved Arsenic | Dissolved Copper | Dissolved Lead |
| *ROD Groundwater Cleanup Goal* | | -- | -- | -- | *5.0* | *12* | *3.2* |
| *PHSS Cleanup Level* | | -- | -- | -- | *0.018* | *2.74* | *0.54* |
| *Portland Harbor JSCS SLV* | | -- | -- | -- | *0.045* | *2.7* | *0.54* |
| KMW19 | 3/2/2023 | 4.38 | <2.00 | 0.407 | 4.51 | <2.00 | <0.20 |
| | 10/12/2023 | 4.33 | < 2.00 | <0.20 | 4.21 | < 2.00 | <0.20 |
| | 2/28/2024 | 4.32 | <2.00 | 0.492 | 4.29 | <2.00 | 0.25 |
| | 10/2/2024 | 4.22 | <2.00 | 0.26 | 4.01 | <2.00 | <0.200 |
| KMW35 | 3/2/2023 | 3.78 | <2.00 | 0.562 | 4.50 | <2.00 | 0.536 |
| | 10/10/2023 | 11 | <2.00 | 1.23 | 11.5 | <2.00 | 1.06 |
| | 2/27/2024 | 1.56 | <2.00 | 0.713 | 1.21 | <2.00 | 0.208 |
| | 10/2/2024 | 11.9 | <2.00 | 1.36 | 11.7 | <2.00 | 1.04 |
| MW41A | 3/2/2023 | 6.01 | <2.00 | <0.20 | 7.43 | <2.00 | 0.263 |
| | 10/12/2023 | 10.9 | <2.00 | 0.389 | 9.37 | <2.00 | <0.20 |
| | 2/27/2024 | 2.02 | <2.00 | <0.200 | 1.45 | <2.00 | <0.200 |
| | 10/1/2024 | 9.28 | <2.00 | 0.405 | 8.99 | <2.00 | <0.200 |
| ***Loading Rack*** | | | | | | | |
| KMW13* | 3/3/2023 | 18.2 | <2.00 | 0.488 | 19.3 | <2.00 | 0.306 |
| | 3/3/2023 DUP | 17.6 | <2.00 | 0.358 | 20.0 | <2.00 | <0.308 |
| | 10/13/2023 | 21.3 | <2.00 | 1.67 | 20.6 | <2.00 | 0.745 |
| | 10/13/2023 DUP | 21.7 | <2.00 | 1.20 | 20.7 | <2.00 | 0.734 |
| | 3/8/2024 | 15.7 | <2.00 | 0.249 | 16.5 | <2.00 | 0.200 |
| | 3/8/2024 DUP | 15.8 | <2.00 | 0.221 | 16.6 | <2.00 | <0.200 |
| | 10/2/2024 | 19.8 | <2.00 | 0.69 | 22.5 | <2.00 | 0.595 |
| | 10/2/2024 DUP | 21.8 | <2.00 | 0.868 | 22.6 | <2.00 | 0.627 |
| KMW14* | Well KMW14 has been removed from the groundwater monitoring program.[12] | | | | | | |

**Please refer to notes at end of table.**

# Table 7

## Groundwater Analytical Data—Total and Dissolved Metals

**Shore Terminals—Portland**

**Portland, Oregon**

| Well ID | Sample Date | Analytical Results (µg/L) | | | | | |
|---|---|---|---|---|---|---|---|
| | | Total Arsenic | Total Copper | Total Lead | Dissolved Arsenic | Dissolved Copper | Dissolved Lead |
| *ROD Groundwater Cleanup Goal* | | -- | -- | -- | *5.0* | *12* | *3.2* |
| *PHSS Cleanup Level* | | -- | -- | -- | *0.018* | *2.74* | *0.54* |
| *Portland Harbor JSCS SLV* | | -- | -- | -- | *0.045* | *2.7* | *0.54* |
| MW38* | 3/3/2023 | 28.1 | <2.00 | 0.251 | 30.5 | <2.00 | 0.299 |
| | 10/11/2023 | 31.6 | <2.00 | 0.49 | 31.3 | <2.00 | 0.408 |
| | 3/1/2024 | 26.3 | <2.00 | 0.272 | 29.6 | <2.00 | 0.248 |
| | 10/2/2024 | 41.9 | <2.00 | 1.22 | 42.2 | <2.00 | 0.974 |
| MW39* | 3/3/2023 | 64.7 | <2.00 | 1.09 | 67.4 | <2.00 | 1.02 |
| | 10/11/2023 | 67.2 | <2.00 | 1.54 | 66.8 | <2.00 | 1.31 |
| | 2/27/2024 | 69.6 | <2.00 | 1.76 | 66.6 | <2.00 | 1.73 |
| | 10/2/2024 | 67.7 | <2.00 | 2.06 | 69.2 | <2.00 | 1.77 |
| MW42* | 3/25/2021 | <1.00 | 1.65 J,Q-42 | 0.679 | <1.00 | <2.00 | <0.20 |
| | 3/24/2022 | <1.00 | <2.00 | <0.20 | <1.00 | <2.00 | <0.20 |
| | 3/7/2023 | <1.00 | <2.00 | <0.20 | <1.00 | <2.00 | <0.20 |
| | 3/8/2024 | <1.00 | <2.00 | 7.52 | <1.00 | <2.00 | <0.200 |
| MW41B* | 3/2/2023 | <1.00 | 2.5 | 0.254 | <1.00 | <2.00 | <0.20 |
| | 10/10/2023 | <1.00 | <2.00 | <0.20 | <1.00 | <2.00 | <0.20 |
| | 2/27/2024 | 1.03 | <2.00 | <0.200 | <1.00 | <2.00 | <0.200 |
| | 10/1/2024 | 1.07 | <2.00 | <0.200 | 1.04 | <2.00 | <0.200 |
| MW43 | 3/2/2023 | 36 | <2.00 | 0.772 | 36.6 | <2.00 | 0.544 |
| | 10/10/2023 | 40.6 | <2.00 | 1.25 | 37.3 | <2.00 | 0.427 |
| | 2/27/2024 | 39.8 | <2.00 | 39.5 | 38.6 | <2.00 | 0.410 |
| | 10/2/2024 | 43.2 | <2.00 | 0.831 | 41.3 | <2.00 | 0.613 |

Please refer to notes at end of table.

# Table 7

## Groundwater Analytical Data—Total and Dissolved Metals

**Shore Terminals—Portland**

**Portland, Oregon**

| Well ID | Sample Date | Analytical Results (µg/L) | | | | | |
|---|---|---|---|---|---|---|---|
| | | Total Arsenic | Total Copper | Total Lead | Dissolved Arsenic | Dissolved Copper | Dissolved Lead |
| *ROD Groundwater Cleanup Goal* | | -- | -- | -- | *5.0* | *12* | *3.2* |
| *PHSS Cleanup Level* | | -- | -- | -- | *0.018* | *2.74* | *0.54* |
| *Portland Harbor JSCS SLV* | | -- | -- | -- | *0.045* | *2.7* | *0.54* |
| MW44* | 3/2/2023 | 6.99 | <2.00 | <0.20 | 7.82 | <2.00 | <0.20 |
| | 3/2/23 DUP | 6.44 | <2.00 | <0.20 | 7.81 | <2.00 | <0.20 |
| | 10/11/2023 | 13.9 | <2.00 | <0.20 | 13.7 | <2.00 | <0.20 |
| | 2/27/2024 | 13 | <2.00 | <0.200 | 9.83 | <2.00 | <0.200 |
| | 10/3/2024 | 14.2 | <2.00 | <0.200 | 13.9 | <2.00 | <0.200 |
| MW45* | 3/23/2021 | 0.64 J | 2.21 | 0.261 | 0.597 J | 1.09 J | <0.20 |
| | 3/25/2022 | <1.00 | <2.00 | <0.20 | <1.00 | <2.00 | <0.20 |
| | 3/2/2023 | <1.00 | <2.00 | <0.20 | <1.00 | <2.00 | <0.20 |
| | 2/28/2024 | <1.00 | <2.00 | <0.200 | <1.00 | <2.00 | <0.200 |
| MW46* | 3/2/2023 | 2.3 | <2.00 | <0.20 | 2.83 | <2.00 | <0.20 |
| | 10/10/2023 | 2.25 | <2.00 | <0.20 | 2.29 | <2.00 | <0.20 |
| | 2/28/2024 | 2.84 | <2.00 | 14.0 | 2.90 | <2.00 | <0.200 |
| | 10/1/2024 | 2.61 | <2.00 | <0.200 | 2.62 | <2.00 | <0.200 |
| ***DPE Treatment Area*** | | | | | | | |
| EX-07L | 3/2/2023 | <1.00 | 2.57 | <0.20 | <1.00 | 2.82 | <0.20 |
| | 10/10/2023 | 2.85 | <2.00 | <0.20 | 2.98 | <2.00 | <0.20 |
| | 2/27/2024 | <1.00 | 3.32 | <0.200 | <1.00 | 3.27 | <0.200 |
| | 9/30/2024 | 2.15 | <2.00 | <0.200 | 2.42 | <2.00 | <0.200 |
| KMW29 | 2/28/2023 | 11.2 | <2.00 | 0.482 | 11.5 | <2.00 | 0.420 |
| | 10/9/2023 | 13.3 | <2.00 | 0.638 | 13.5 | <2.00 | 0.674 |
| | 2/29/2024 | 10.3 | <2.00 | 0.226 | 9.86 | <2.00 | <0.200 |
| | 10/1/2024 | 12.8 | <2.00 | 0.564 | 14.0 | <2.00 | 0.553 |

Please refer to notes at end of table.

# Table 7

## Groundwater Analytical Data—Total and Dissolved Metals

**Shore Terminals—Portland**

**Portland, Oregon**

| Well ID | Sample Date | Analytical Results (µg/L) | | | | | |
|---|---|---|---|---|---|---|---|
| | | Total Arsenic | Total Copper | Total Lead | Dissolved Arsenic | Dissolved Copper | Dissolved Lead |
| *ROD Groundwater Cleanup Goal* | | -- | -- | -- | *5.0* | *12* | *3.2* |
| *PHSS Cleanup Level* | | -- | -- | -- | *0.018* | *2.74* | *0.54* |
| *Portland Harbor JSCS SLV* | | -- | -- | -- | *0.045* | *2.7* | *0.54* |
| KMW30 | 2/28/2023 | 1.84 | <2.00 | <0.20 | 2.29 | <2.00 | <0.20 |
| | 10/9/2023 | 1.23 | 2.11 | <0.20 | 1.30 | <2.00 | <0.20 |
| | 2/26/2024 | 1.23 | <2.00 | <0.200 | <1.00 | <2.00 | <0.200 |
| | 10/1/2024 | 2.95 | <2.00 | <0.200 | 3.29 | <2.00 | <0.200 |
| | 10/1/2024 DUP | 2.99 | <2.00 | <0.200 | 3.21 | <2.00 | <0.200 |
| KMW31 | 2/28/2023 | 1.59 | <2.00 | 0.502 | 1.67 | <2.00 | 0.470 |
| | 2/28/2023 DUP | 1.61 | <2.00 | 0.52 | 1.80 | <2.00 | 0.475 |
| | 10/10/2023 | 1.59 | <2.00 | 0.658 | 1.73 | <2.00 | 0.650 |
| | 10/10/2023 DUP | 1.68 | <2.00 | 0.863 | 1.83 | <2.00 | 0.743 |
| | 2/27/2024 | 1.45 | <2.00 | 0.705 | 1.25 | <2.00 | 0.487 |
| | 2/27/2024 DUP | 1.21 | <2.00 | 31.8 | 1.41 | <2.00 | 0.339 |
| | 10/1/2024 | 2.62 | <2.00 | 0.539 | 2.81 | <2.00 | 0.546 |
| | 10/1/2024 DUP | 2.60 | <2.00 | 0.543 | 2.83 | <2.00 | 0.591 |
| KMW32 | 3/2/2023 | <1.00 | 2.33 | 1.03 | <1.00 | <2.00 | 0.789 |
| | 10/10/2023 | <1.00 | <2.00 | 0.375 | <1.00 | <2.00 | 0.338 |
| | 2/26/2024 | 1.04 | 3.24 | 0.466 | 1.21 | 3.01 | 0.432 |
| | 10/1/2024 | 2.43 | <2.00 | 0.421 | 2.65 | <2.00 | 0.300 |
| KMW33 | 2/28/2023 | 1.62 | <2.00 | <0.20 | 1.46 | <2.00 | <0.20 |
| | 10/10/2023 | 1.93 | <2.00 | <0.20 | 2.61 | <2.00 | <0.20 |
| | 2/26/2024 | 2.32 | <2.00 | <0.200 | 1.92 | <2.00 | <0.200 |
| | 10/1/2024 | 8.93 | <2.00 | <0.200 | 8.12 | <2.00 | <0.200 |

Please refer to notes at end of table.

# Table 7

## Groundwater Analytical Data—Total and Dissolved Metals

**Shore Terminals—Portland**

**Portland, Oregon**

| Well ID | Sample Date | Analytical Results (µg/L) | | | | | |
|---|---|---|---|---|---|---|---|
| | | Total Arsenic | Total Copper | Total Lead | Dissolved Arsenic | Dissolved Copper | Dissolved Lead |
| *ROD Groundwater Cleanup Goal* | | -- | -- | -- | *5.0* | *12* | *3.2* |
| *PHSS Cleanup Level* | | -- | -- | -- | *0.018* | *2.74* | *0.54* |
| *Portland Harbor JSCS SLV* | | -- | -- | -- | *0.045* | *2.7* | *0.54* |
| KMW37 | 10/11/2022 | NS | NS | NS | NS | NS | NS |
| | 2/28/2023 | 20.8 | <2.00 | 1.63 | 21.4 | <2.00 | 1.55 |
| | 10/10/2023 | 20.7 | <2.00 | 2.37 | 22.0 | <2.00 | 2.21 |
| | KMW37 was decommissioned prior to the February 2024 monitoring event | | | | | | |
| MW47 | 2/28/2023 | 3.69 | <2.00 | <0.20 | 3.83 | <2.00 | <0.20 |
| | 10/10/2023 | 1.81 | <2.00 | <0.20 | 1.86 | <2.00 | <0.20 |
| | 2/26/2024 | 2.33 | 2.34 | <0.200 | 2.42 | <2.00 | <0.200 |
| | 10/1/2024 | 1.66 | <2.00 | <0.200 | 1.75 | <2.00 | <0.200 |
| MW48 | 2/28/2023 | 2.08 | <2.00 | <0.20 | 2.25 | <2.00 | <0.20 |
| | 2/28/2023 DUP | 2.31 | <2.00 | <0.20 | 2.28 | <2.00 | <0.20 |
| | 10/9/2023 | 1.63 | <2.00 | <0.20 | 1.68 | <2.00 | <0.20 |
| | 10/9/2023 DUP | 1.52 | <2.00 | <0.20 | 1.78 | <2.00 | <0.20 |
| | 2/26/2024 | 1.24 | 3.45 | <0.200 | 1.05 | <2.00 | <0.200 |
| | 2/26/2024 DUP | 1.14 | <2.00 | <0.200 | 1.00 | <2.00 | <0.200 |
| | 10/1/2024 | 1.74 | <2.00 | <0.200 | 1.83 | <2.00 | <0.200 |
| MW49 | 2/28/2023 | 8.54 | <2.00 | 0.504 | 8.40 | <2.00 | 0.405 |
| | 10/10/2023 | 8.41 | <2.00 | 0.279 | 11.5 | <2.00 | 0.206 |
| | 2/27/2024 | 9.03 | <2.00 | 0.425 | 8.48 | <2.00 | 0.396 |
| | 10/1/2024 | 8.91 | <2.00 | 0.319 | 8.21 | <2.00 | 0.388 |

Please refer to notes at end of table.

# Table 7

## Groundwater Analytical Data—Total and Dissolved Metals

**Shore Terminals—Portland**

**Portland, Oregon**

| Well ID | Sample Date | Analytical Results (µg/L) | | | | | |
|---|---|---|---|---|---|---|---|
| | | Total Arsenic | Total Copper | Total Lead | Dissolved Arsenic | Dissolved Copper | Dissolved Lead |
| *ROD Groundwater Cleanup Goal* | | -- | -- | -- | *5.0* | *12* | *3.2* |
| *PHSS Cleanup Level* | | -- | -- | -- | *0.018* | *2.74* | *0.54* |
| *Portland Harbor JSCS SLV* | | -- | -- | -- | *0.045* | *2.7* | *0.54* |
| ***Slurry Wall*** | | | | | | | |
| KMW36 | 3/7/2023 | 3.14 | <2.00 | 0.288 | 2.96 | <2.00 | 0.215 |
| | 10/10/2023 | <1.00 | <2.00 | <0.20 | <1.00 | <2.00 | <0.20 |
| | 2/29/2024 | 1.74 | <2.00 | 0.513 | 1.31 | <2.00 | <0.200 |
| | 10/1/2024 | <1.00 | <2.00 | <0.200 | <1.00 | <2.00 | <0.200 |
| W-16 | 3/2/2023 | 2.26 | <2.00 | <0.440 | 1.98 | <2.00 | 0.372 |
| | 10/11/2023 | 3.06 | <2.00 | 0.8 | 1.51 | <2.00 | <0.20 |
| | 2/29/2024 | 2.27 | <2.00 | 0.676 | 1.40 | <2.00 | 0.399 |
| | 10/2/2024 | 1.90 | <2.00 | 0.468 | 1.76 | <2.00 | 0.284 |
| W-19 | 3/25/2021 | 6.07 | <2.00 | <0.20 | 2.74 | <2.00 | <0.20 |
| | 3/25/2022 | 3.96 | <2.00 | <0.20 | 2.86 | <2.00 | <0.20 |
| | 3/2/2023 | 3.8 | <2.00 | <0.20 | 1.87 | <2.00 | <0.20 |
| | 2/29/2024 | 5.7 | <2.00 | <0.200 | 2.49 | <2.00 | <0.200 |
| W-20 | 3/25/2021 | 5.32 | <2.00 | 0.147 J | 0.617 J | <2.00 | <0.20 |
| | 3/25/2022 | 1.96 | <2.00 | <0.20 | <1.00 | <2.00 | <0.20 |
| | 3/2/2023 | 1.75 | <2.00 | <0.20 | <1.00 | 2.28 | <0.20 |
| | 2/29/2024 | 2.12 | <2.00 | <0.200 | <1.00 | <2.00 | <0.200 |
| W-22 | 3/23/2021 | <1.00 | 1.2 J | 0.263 | <1.00 | <2.00 | <0.20 |
| | 3/25/2022 | <1.00 | <2.00 | <0.20 | <1.00 | <2.00 | <0.20 |
| | 3/2/2023 | <1.00 | <2.00 | 0.289 | <1.00 | <2.00 | <0.20 |
| | 2/29/2024 | <1.00 | <2.00 | 0.201 | <1.00 | <2.00 | <0.200 |

Please refer to notes at end of table.

# Table 7

## Groundwater Analytical Data—Total and Dissolved Metals

**Shore Terminals—Portland**

**Portland, Oregon**

| Well ID | Sample Date | Analytical Results (µg/L) | | | | | |
|---|---|---|---|---|---|---|---|
| | | Total Arsenic | Total Copper | Total Lead | Dissolved Arsenic | Dissolved Copper | Dissolved Lead |
| *ROD Groundwater Cleanup Goal* | | -- | -- | -- | *5.0* | *12* | *3.2* |
| *PHSS Cleanup Level* | | -- | -- | -- | *0.018* | *2.74* | *0.54* |
| *Portland Harbor JSCS SLV* | | -- | -- | -- | *0.045* | *2.7* | *0.54* |
| ***Site-Wide*** | | | | | | | |
| KMW01 | 3/23/2021 | <1.00 | <2.00 | 0.14 J | <1.00 | <2.00 | <0.20 |
| | 3/25/2022 | <1.00 | <2.00 | <0.20 | <1.00 | <2.00 | <0.20 |
| | 3/3/2023 | 1.18 | <2.00 | <0.20 | 1.69 | <2.00 | <0.20 |
| | 2/28/2024 | <1.00 | <2.00 | <0.200 | <1.00 | <2.00 | <0.200 |
| KMW02 | 3/7/2023 | 2.9 | <2.00 | <0.20 | <1.00 | <2.00 | <0.20 |
| | 10/11/2023 | 4.82 | <2.00 | <0.20 | 2.85 | <2.00 | <0.20 |
| | 2/28/2024 | 3.75 | <2.00 | <0.200 | 2.09 | <2.00 | <0.200 |
| | 10/3/2024 | 3.45 | <2.00 | <0.200 | 2.85 | <2.00 | <0.200 |
| KMW05 | 3/23/2021 | 1.16 | 1.61 J | 0.234 | 1.10 | <2.00 | <0.20 |
| | 3/24/2022 | 1.15 | <2.00 | <0.20 | 1.06 | <2.00 | <0.20 |
| | 3/2/2023 | 1.02 | <2.00 | <0.20 | 1.21 | <2.00 | <0.20 |
| | 2/28/2024 | 1.23 | <2.00 | <0.200 | 1.06 | <2.00 | <0.200 |
| KMW09 | 3/23/2021 | <1.00 | 1.92 J | <0.20 | <1.00 | 1.06 J,Q-42 | <0.20 |
| | 3/22/2022 | <1.00 | <2.00 | 0.371 | <1.00 | <2.00 | <0.20 |
| | 3/7/2023 | <1.00 | <2.00 | 0.334 | <1.00 | <2.00 | <0.20 |
| | 2/28/2024 | <1.00 | <2.00 | <0.200 | <1.00 | <2.00 | <0.200 |

Please refer to notes at end of table.

# Table 7

## Groundwater Analytical Data—Total and Dissolved Metals

**Shore Terminals—Portland**

**Portland, Oregon**

| Well ID | Sample Date | Analytical Results (µg/L) | | | | | |
|---|---|---|---|---|---|---|---|
| | | Total Arsenic | Total Copper | Total Lead | Dissolved Arsenic | Dissolved Copper | Dissolved Lead |
| *ROD Groundwater Cleanup Goal* | | -- | -- | -- | *5.0* | *12* | *3.2* |
| *PHSS Cleanup Level* | | -- | -- | -- | *0.018* | *2.74* | *0.54* |
| *Portland Harbor JSCS SLV* | | -- | -- | -- | *0.045* | *2.7* | *0.54* |
| KMW10* | 6/29/2023 | 3.21 | <2.00 | <0.780 | 1.53 | <2.00 | <0.20 |
| | 10/12/2023 | 6.85 | <2.00 | 1.5 | 6.68 | <2.00 | <0.20 |
| | 2/28/2024 | 2.81 | <2.00 | 0.311 | <1.00 | <2.00 | <0.200 |
| | 10/1/2024 | 1.08 | <2.00 | <0.200 | <1.00 | <2.00 | <0.200 |
| KMW16* | 3/25/2021 | 0.789 J | <2.00 | 0.127 J | 0.829 J | <2.00 | <0.20 |
| | 3/24/2022 | <1.00 | <2.00 | <0.20 | <1.00 | <2.00 | <0.20 |
| | 3/2/2023 | <1.00 | <2.00 | <0.20 | <1.00 | <2.00 | <0.20 |
| | 2/27/2024 | <1.00 | <2.00 | <0.20 | <1.00 | <2.00 | <0.200 |
| KMW20 | 3/23/2021 | 5.08 | 2 | 0.172 J | 1.67 | <2.00 | <0.20 |
| | 3/24/2022 | 3.03 | <2.00 | <0.20 | <1.00 | <2.00 | <0.20 |
| | 3/3/2023 | 1.91 | <2.00 | <0.20 | <1.00 | <2.00 | <0.20 |
| | 2/29/2024 | 2.13 | <2.00 | <0.200 | 1.52 | <2.00 | <0.200 |
| KMW21 | 3/23/2021 | 1.35 | <2.00 | <0.20 | 0.727J | 1.74 J | <0.20 |
| | 3/24/2022 | 1.31 | <2.00 | <0.20 | <1.00 | <2.00 | <0.20 |
| | 3/3/2023 | 1.18 | <2.00 | <0.20 | <1.00 | <2.00 | <0.20 |
| | 2/29/2024 | 1.04 | <2.00 | <0.200 | <1.00 | <2.00 | <0.200 |
| KMW24* | 3/25/2021 | 7.13 | <2.00 | 1.31 | 6.90 | <2.00 | <0.20 |
| | 3/25/2022 | 8.19 | 2.06 | 7.16 | 6.61 | <2.00 | <0.20 |
| | 3/23/2023 | 7.2 | <2.00 | 0.584 | 7.88 | <2.00 | <0.20 |
| | 2/29/2024 | 8.77 | <2.00 | <0.200 | 8.34 | <2.00 | <0.200 |

Please refer to notes at end of table.

# Table 7

## Groundwater Analytical Data—Total and Dissolved Metals

**Shore Terminals—Portland**

**Portland, Oregon**

| Well ID | Sample Date | Analytical Results (µg/L) | | | | | |
|---|---|---|---|---|---|---|---|
| | | Total Arsenic | Total Copper | Total Lead | Dissolved Arsenic | Dissolved Copper | Dissolved Lead |
| *ROD Groundwater Cleanup Goal* | | -- | -- | -- | *5.0* | *12* | *3.2* |
| *PHSS Cleanup Level* | | -- | -- | -- | *0.018* | *2.74* | *0.54* |
| *Portland Harbor JSCS SLV* | | -- | -- | -- | *0.045* | *2.7* | *0.54* |
| KMW26* | 3/25/2021 | 2.3 | 1.03 J | 0.193 J | 2.36 | 1.32 J | <0.20 |
| | 3/25/2022 | 2.94 | <2.00 | <0.20 | 2.49 | <2.00 | <0.20 |
| | 3/3/2023 | 7.02 | 2.75 | 1.3 | 5.92 | 2.65 | 0.897 |
| | 2/27/2024 | 3.94 | <2.00 | 0.28 | 3.44 | <2.00 | <0.200 |
| MW40 | 3/23/2021 | <1.00 | <2.00 | <0.20 | <1.00 | <2.00 | <0.20 |
| | 3/24/2022 | <1.00 | <2.00 | <0.20 | <1.00 | <2.00 | <0.20 |
| | 3/2/2023 | <1.00 | <2.00 | <0.20 | <1.00 | <2.00 | <0.20 |
| | 2/28/2024 | <1.00 | <2.00 | <0.200 | <1.00 | <2.00 | <0.200 |
| W-15 | 10/13/2022 | NS | NS | NS | NS | NS | NS |
| | 3/2/2023 | 2.59 | <2.00 | 1.21 | 2.45 | <2.00 | 1.17 |
| | 10/10/2023 | 8.7 | <2.00 | 1.27 | 8.62 | <2.00 | 1.01 |
| | W-15 was decommissioned prior to the February 2024 monitoring event | | | | | | |

Please refer to notes at end of table.

# Table 7

## Groundwater Analytical Data—Total and Dissolved Metals

### Shore Terminals—Portland

### Portland, Oregon

**Notes:**

1. < = Concentration as reported by analytical laboratory is less than the laboratory reporting limit.
2. µg/L = Microgram(s) per liter.
3. EPA = United States Environmental Protection Agency.
4. NS = Not sampled.
5. NA = Not analyzed. Zinc is not a part of the approved monitoring program and is not typically included in the analysis suite; however, it was identified as a potential constituent of concern in the 1997 Record of Decision (ROD) and was included in this monitoring event to assist in completing the groundwater pathway source control evaluation currently being conducted.
6. DUP = Field Duplicate.
7. Yellow highlighed cells indicate values that are equal to or exceeding 1997 ROD Groundwater Cleanup Goals for the ExxonMobil/Shore Terminals Site.
8. Gray highlighted cells indicate values that are equal to or exceeding PHSS Cleanup Level. If a PHSS Cleanup Level was not developed for an analyte, The JSCS SLV is used for comparison.
9. * = Well is screened in Deep Sand unit.
10. Data prior to December 22, 2011 were recorded and previously reported by ExxonMobil.
11. Portland Harbor JSCS SLVs = 2007 Portland Harbor Joint Source Control Strategy Screening Level Values.
12. Well KMW14 was paved over prior to the October 2017 monitoring event. In an email dated February 21, 2018, DEQ agreed that well KMW14 was not critical to monitoring the Loading Rack Area and that replacement of KMW14 was not required. Well KMW14 has been removed from the monitoring program.
13. -- = Not applicable.

**Quality Assurance/Quality Control Data Qualifiers:**

J = Reported result is an estimated value.

# Attachment 6

Stormwater Solids Data and Rank Order Curves

# Table 7

## Stormwater Solids Data

**Shore Terminals, LLC–Portland Facility**

**Portland, Oregon**

| | Units | JSCS SLV[4] | | ROD Cleanup Level for PHSS | TEF[9] | OWS-WP-78 (Catch Basins PS01A and PS12) 11/8/2012 | |
|---|---|---|---|---|---|---|---|
| | | MacDonald PECs and other SQVs | DEQ 2007 Bioaccumulative Sediment SLVs | | | | |
| | | Toxicity | Bioaccumulation | | | Concentration | Qualifier |
| **Metals by EPA Method 200/7470** | | | | | | | |
| Aluminum | mg/kg | -- | -- | -- | -- | 4,800 | -- |
| Antimony | mg/kg | 64 | -- | -- | -- | 5.75 | -- |
| Arsenic | mg/kg | 33 | 7 | 3 | -- | 2.31 | -- |
| Barium | mg/kg | -- | -- | -- | -- | -- | -- |
| Cadmium | mg/kg | 5 | 1 | 0.51 | -- | 1.87 | -- |
| Chromium | mg/kg | 111 | -- | -- | -- | 26.9 | -- |
| Copper | mg/kg | 149 | -- | 359 | -- | 99.8 | -- |
| Lead | mg/kg | 128 | 17 | 196 | -- | 86.8 | -- |
| Manganese | mg/kg | 1,100 | -- | -- | -- | 223 | -- |
| Mercury | mg/kg | 1.1 | 0.07 | 0.085 | -- | 0.0199 | -- |
| Nickel | mg/kg | 48.6 | -- | -- | -- | 18 | -- |
| Selenium | mg/kg | 5 | 2 | -- | -- | -- | -- |
| Silver | mg/kg | 5 | -- | -- | -- | 0.207 | -- |
| Zinc | mg/kg | 459 | -- | 459 | -- | 632 | -- |
| **Polycyclic Aromatic Hydrocarbons (PCBs) as Aroclors by EPA Method 8082** | | | | | | | |
| Aroclor 1016 | µg/kg | 0.53 | -- | -- | -- | <0.102 | U |
| Aroclor 1221 | µg/kg | -- | -- | -- | -- | <0.102 | U |
| Aroclor 1232 | µg/kg | -- | -- | -- | -- | <0.102 | U |
| Aroclor 1242 | µg/kg | -- | -- | -- | -- | <0.102 | U |
| Aroclor 1248 | µg/kg | 1.5 | -- | -- | -- | <0.102 | U |
| Aroclor 1254 | µg/kg | 0.3 | -- | -- | -- | <0.102 | U |
| Aroclor 1260 | µg/kg | 0.2 | -- | -- | -- | <0.102 | U |
| Aroclor 1262 | µg/kg | -- | -- | -- | -- | <0.102 | U |
| Aroclor 1268 | µg/kg | -- | -- | -- | -- | <0.102 | U |
| Total PCBs | µg/kg | 0.676 | 0.00039 | 9 | -- | <0.102 | U |
| **Polycyclic Aromatic Hydrocarbons by EPA Method 8270SIM** | | | | | | | |
| 1-Methylnaphthalene | mg/kg | -- | -- | -- | -- | -- | -- |
| 2-Methylnaphthalene[1] | mg/kg | 200 | -- | -- | -- | -- | -- |
| Acenaphthene[1] | mg/kg | 300 | -- | -- | -- | 167 | -- |
| Acenaphthylene[1] | mg/kg | 200 | -- | -- | -- | 93.3 | -- |
| Anthracene[1] | mg/kg | 845 | -- | -- | -- | 300 | -- |
| Benzo(a)anthracene[2,3] | mg/kg | 1,050 | -- | -- | 0.1 | 1,430 | J3 |
| Benzo(a)pyrene[3] | mg/kg | 1,450 | -- | -- | 1 | 1,950 | -- |
| Benzo(b)fluoranthene[2,3] | mg/kg | -- | -- | -- | 0.1 | 2,840 | -- |
| Benzo(g,h,i)perylene[2] | mg/kg | 300 | -- | -- | 0.01 | 1,940 | -- |
| Benzo(k)fluoranthene[2,3] | mg/kg | 13,000 | -- | -- | 0.01 | 677 | -- |
| Carbazole | mg/kg | 1,600 | -- | -- | -- | -- | -- |
| Chrysene[2,3] | mg/kg | 1,290 | -- | -- | 0.001 | 2,000 | J3 |
| Dibenz(a,h)anthracene[3] | mg/kg | 1,300 | -- | -- | 1 | 693 | -- |
| Fluoranthene[2] | mg/kg | 2,230 | 37,000 | -- | -- | 4,130 | J3 |
| Fluorene[1] | mg/kg | 536 | -- | -- | -- | 163 | -- |
| Indeno(1,2,3-cd)pyrene[3] | mg/kg | 100 | -- | -- | 0.1 | 1,730 | J3 |
| Naphthalene[1] | mg/kg | 561 | -- | -- | -- | 70 | J3 |
| Phenanthrene[1] | mg/kg | 1,170 | -- | -- | -- | 2,200 | J3 |
| Pyrene[2] | mg/kg | 1,520 | 1,900 | -- | -- | 3,490 | J3 |
| Total LPAH | mg/kg | -- | -- | -- | -- | 4,423 | T |
| Total HPAH | mg/kg | -- | -- | -- | -- | 16,507 | T |
| Total cPAH (BaP eq) | mg/kg | -- | -- | 12 | -- | 3,271 | T |
| Total PAHs | mg/kg | -- | -- | 23,000 | -- | 23,873 | T |

**Please refer to notes at end of table.**

# Table 7

## Stormwater Solids Data

**Shore Terminals, LLC–Portland Facility**

**Portland, Oregon**

| | Units | JSCS SLV[4] | | ROD Cleanup Level for PHSS | TEF[9] | OWS-WP-78 (Catch Basins PS01A and PS12) 11/8/2012 | |
|---|---|---|---|---|---|---|---|
| | | MacDonald PECs and other SQVs | DEQ 2007 Bioaccumulative Sediment SLVs | | | | |
| | | Toxicity | Bioaccumulation | | | Concentration | Qualifier |
| **Phthalate Esters by EPA Method 8270B** | | | | | | | |
| Bis(2-ethylhexyl)phthalate | mg/kg | 800 | 330 | 135 | -- | **3,940** | -- |
| Butyl benzyl phthalate | mg/kg | -- | -- | -- | -- | **907** | -- |
| Diethyl phthalate | mg/kg | 600 | -- | -- | -- | **33.3** | -- |
| Dimethyl phthalate | mg/kg | -- | -- | -- | -- | **19.3** | J |
| Di-n-butyl phthalate | mg/kg | 100 | 60 | -- | -- | **95** | -- |
| Di-n-octyl phthalate | mg/kg | -- | -- | -- | -- | **70** | -- |
| **Organochlorine Pesticides by EPA Method 8081B w/low MDLs** | | | | | | | |
| 4,4'-DDD | mg/kg | 28 | 0.33 | -- | -- | **0.693** | J |
| 4,4'-DDE | mg/kg | 31.3 | 0.33 | -- | -- | <0.0695 | U |
| 4,4'-DDT | mg/kg | 62.9 | 0.33 | -- | -- | **2.99** | -- |
| Total DDx | mg/kg | -- | -- | 6.1 | -- | 3.68 | T |
| Aldrin | mg/kg | 40 | -- | 2 | -- | <0.176 | U |
| alpha-BHC | mg/kg | -- | -- | -- | -- | <0.291 | U |
| alpha-Chlordane | mg/kg | -- | -- | -- | -- | <0.073 | U |
| beta-BHC | mg/kg | -- | -- | -- | -- | <0.165 | U |
| Chlordane | mg/kg | 17.6 | 0.37 | -- | -- | <6.67 | U |
| delta-BHC | mg/kg | -- | -- | -- | -- | <0.102 | U |
| Dieldrin | mg/kg | 61.8 | 0.0081 | 0.07 | -- | <0.0545 | U |
| Endosulfan I | mg/kg | -- | -- | -- | -- | **1.13** | -- |
| Endosulfan II | mg/kg | -- | -- | -- | -- | <.0535 | J |
| Endosulfan sulfate | mg/kg | -- | -- | -- | -- | <0.0655 | U |
| Endrin | mg/kg | 207 | -- | -- | -- | <0.263 | U |
| Endrin aldehyde | mg/kg | -- | -- | -- | -- | **86.7** | -- |
| Endrin ketone | mg/kg | -- | -- | -- | -- | <0.184 | U |
| gamma-BHC (Lindane) | mg/kg | 4.99 | -- | 5 | -- | <0.198 | U |
| gamma-Chlordane | mg/kg | -- | -- | -- | -- | <0.0685 | U |
| Total Chlordanes | mg/kg | 17.6 | 0.37 | 1.4 | -- | -- | -- |
| Heptachlor | mg/kg | 10 | -- | -- | -- | <0.161 | U |
| Heptachlor epoxide | mg/kg | 16 | -- | -- | -- | <0.128 | U |
| Methoxychlor | mg/kg | -- | -- | -- | -- | <0.128 | U |
| Toxaphene | mg/kg | -- | -- | -- | -- | <6.67 | U |
| **Organochlorine Pesticides by EPA Method 8081A** | | | | | | | |
| 4,4'-DDD | mg/kg | 28 | 0.33 | -- | -- | **0.752** | J |
| 4,4'-DDE | mg/kg | 31.3 | 0.33 | -- | -- | <0.0695 | U |
| 4,4'-DDT | mg/kg | 62.9 | 0.33 | -- | -- | **3.27** | -- |
| Total DDx | mg/kg | -- | -- | 6.1 | -- | **4.02** | T |
| Aldrin | mg/kg | 40 | -- | 2 | -- | <0.176 | U |
| alpha-BHC | mg/kg | -- | -- | -- | -- | <0.291 | U |
| alpha-Chlordane | mg/kg | -- | -- | -- | -- | <0.073 | U |
| beta-BHC | mg/kg | -- | -- | -- | -- | <0.165 | U |
| Chlordane | mg/kg | 17.6 | 0.37 | -- | -- | <6.67 | U |
| delta-BHC | mg/kg | -- | -- | -- | -- | <0.102 | U |
| Dieldrin | mg/kg | 61.8 | 0.0081 | 0.07 | -- | <0.0545 | U |

Please refer to notes at end of table.

# Table 7

## Stormwater Solids Data

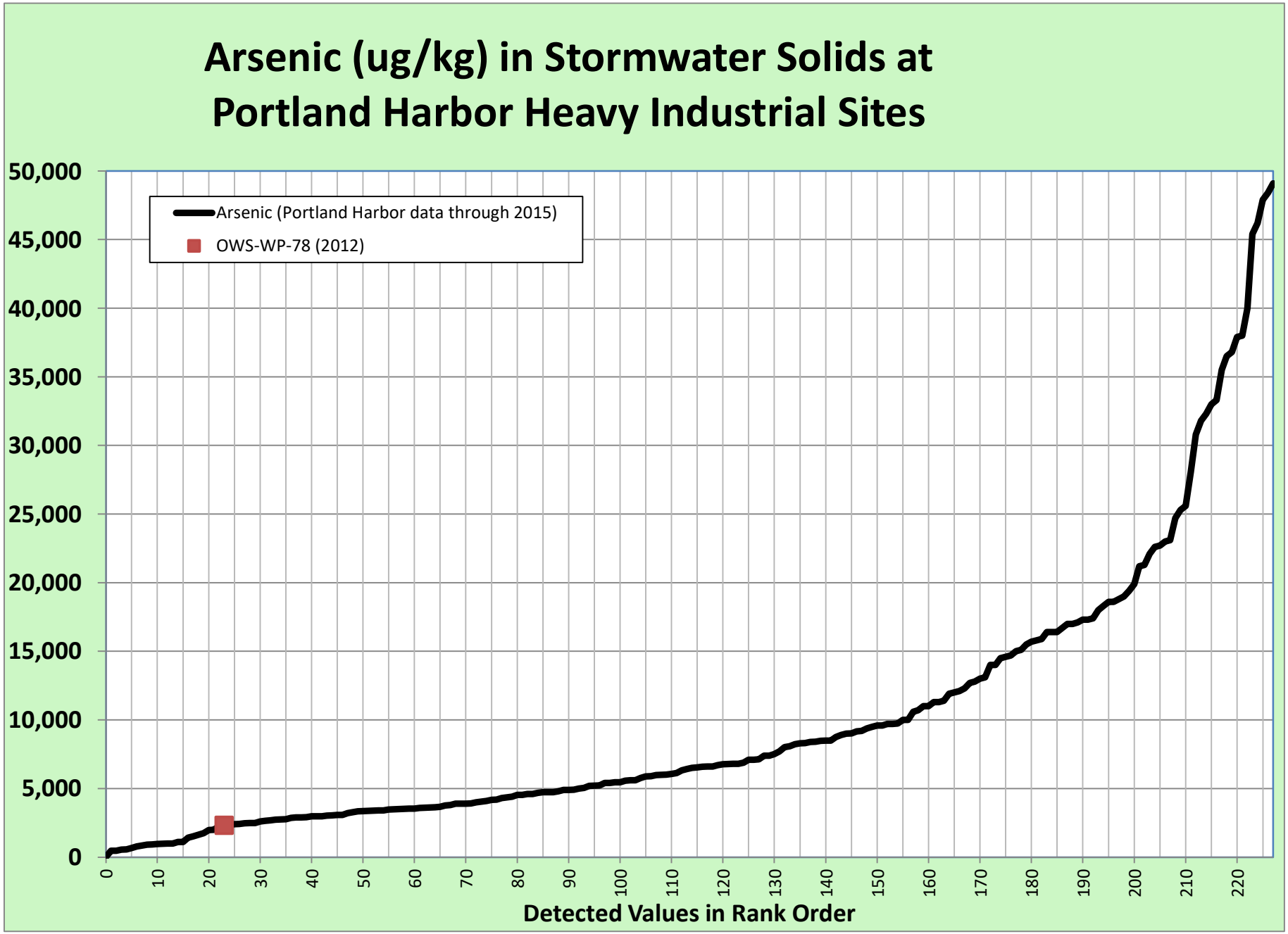
**Shore Terminals, LLC–Portland Facility**

**Portland, Oregon**

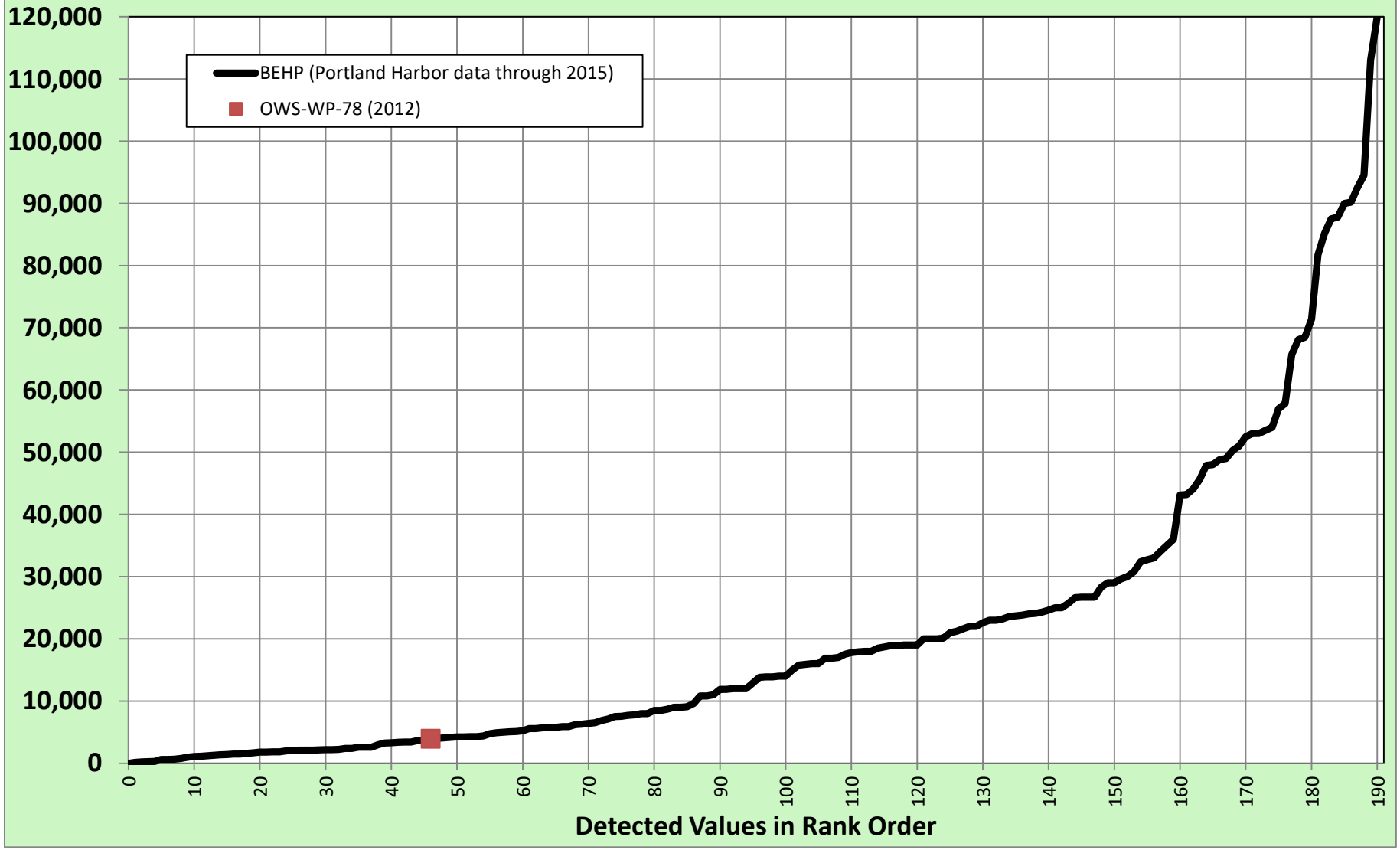
| | Units | JSCS SLV[4] | | ROD Cleanup Level for PHSS | TEF[9] | OWS-WP-78 (Catch Basins PS01A and PS12) 11/8/2012 | |
|---|---|---|---|---|---|---|---|
| | | MacDonald PECs and other SQVs | DEQ 2007 Bioaccumulative Sediment SLVs | | | | |
| | | Toxicity | Bioaccumulation | | | Concentration | Qualifier |
| **Organochlorine Pesticides by EPA Method 8081A (continued)** | | | | | | | |
| Endosulfan I | mg/kg | -- | -- | -- | -- | <0.0855 | U |
| Endosulfan II | mg/kg | -- | -- | -- | -- | **1.04** | J |
| Endosulfan sulfate | mg/kg | -- | -- | -- | -- | <0.0655 | U |
| Endrin | mg/kg | 207 | -- | -- | -- | <0.263 | U |
| Endrin aldehyde | mg/kg | -- | -- | -- | -- | **84.5** | -- |
| Endrin ketone | mg/kg | -- | -- | -- | -- | <0.184 | U |
| gamma-BHC (Lindane) | mg/kg | 4.99 | -- | 5 | -- | <0.198 | U |
| gamma-Chlordane | mg/kg | -- | -- | -- | -- | <0.0685 | U |
| Total Chlordanes | mg/kg | -- | -- | 1.4 | -- | -- | -- |
| Heptachlor | mg/kg | 10 | -- | -- | -- | <0.161 | U |
| Heptachlor epoxide | mg/kg | 16 | -- | -- | -- | <0.128 | U |
| Methoxychlor | mg/kg | -- | -- | -- | -- | <0.128 | U |
| Toxaphene | mg/kg | -- | -- | -- | -- | <6.67 | U |
| **BTEX by EPA Method 8260B** | | | | | | | |
| Benzene | mg/kg | -- | -- | -- | -- | <1.10 | U |
| Ethylbenzene | mg/kg | -- | -- | -- | -- | <1.03 | U |
| Toluene | mg/kg | -- | -- | -- | -- | **4.3** | J |
| m,p-Xylene | mg/kg | -- | -- | -- | -- | <1.84 | U |
| o-Xylene | mg/kg | -- | -- | -- | -- | **1.02** | J,J3 |
| **Total Petroleum Hydrocarbons (TPH) by NWTPH-Dx and NWTPH-Gx** | | | | | | | |
| Gasoline | mg/kg | -- | -- | -- | -- | **72.9** | A |
| Diesel | mg/kg | -- | -- | 91 | -- | **1,260** | J3 |
| Heavy Oil | mg/kg | -- | -- | -- | -- | **2,230** | A2 |
| **Total Organic Carbon by Method Plumb, et al. 1981** | | | | | | | |
| Total Organic Carbon | mg/kg | -- | -- | -- | -- | **32,000** | -- |

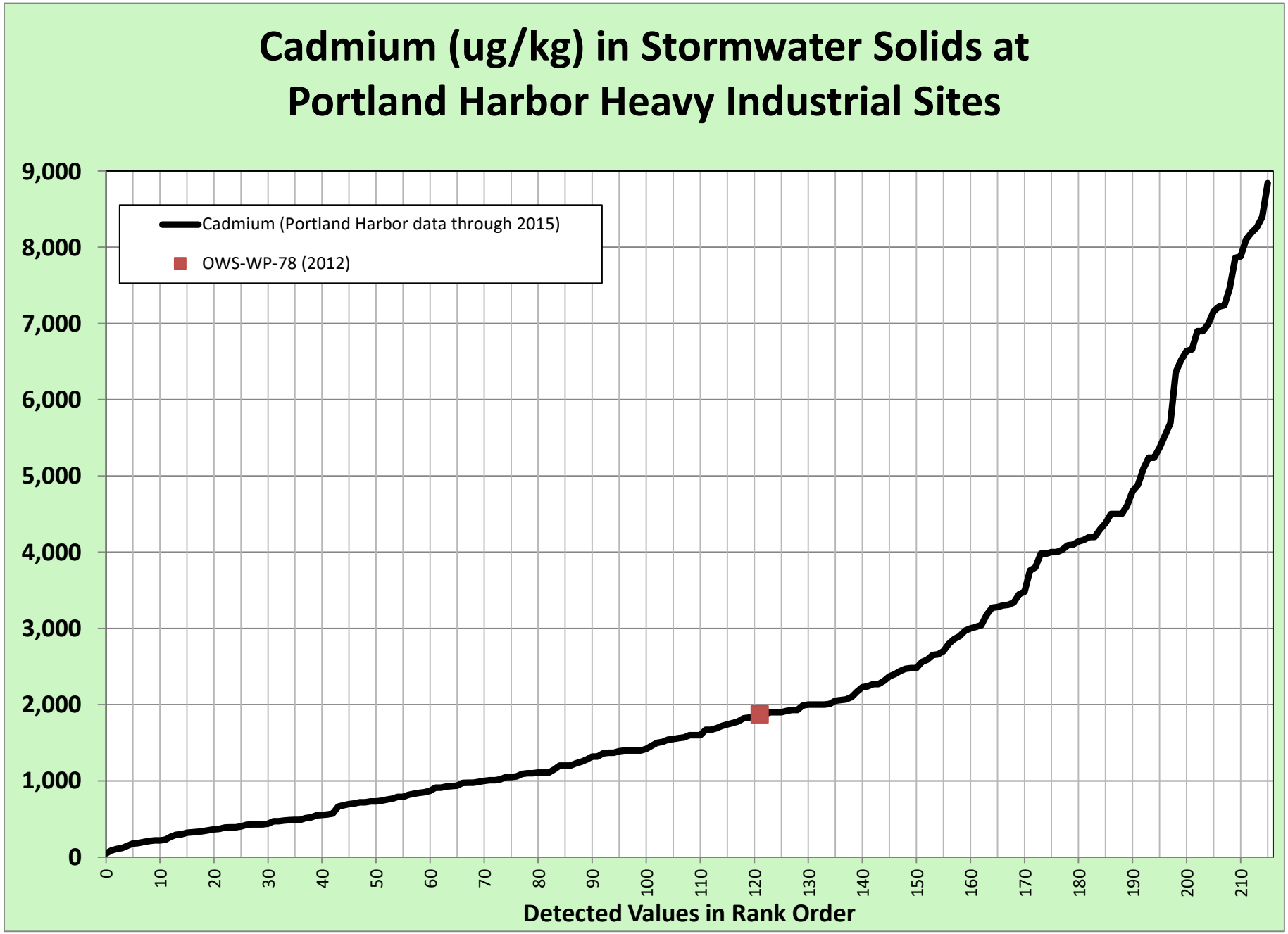
**Notes:**

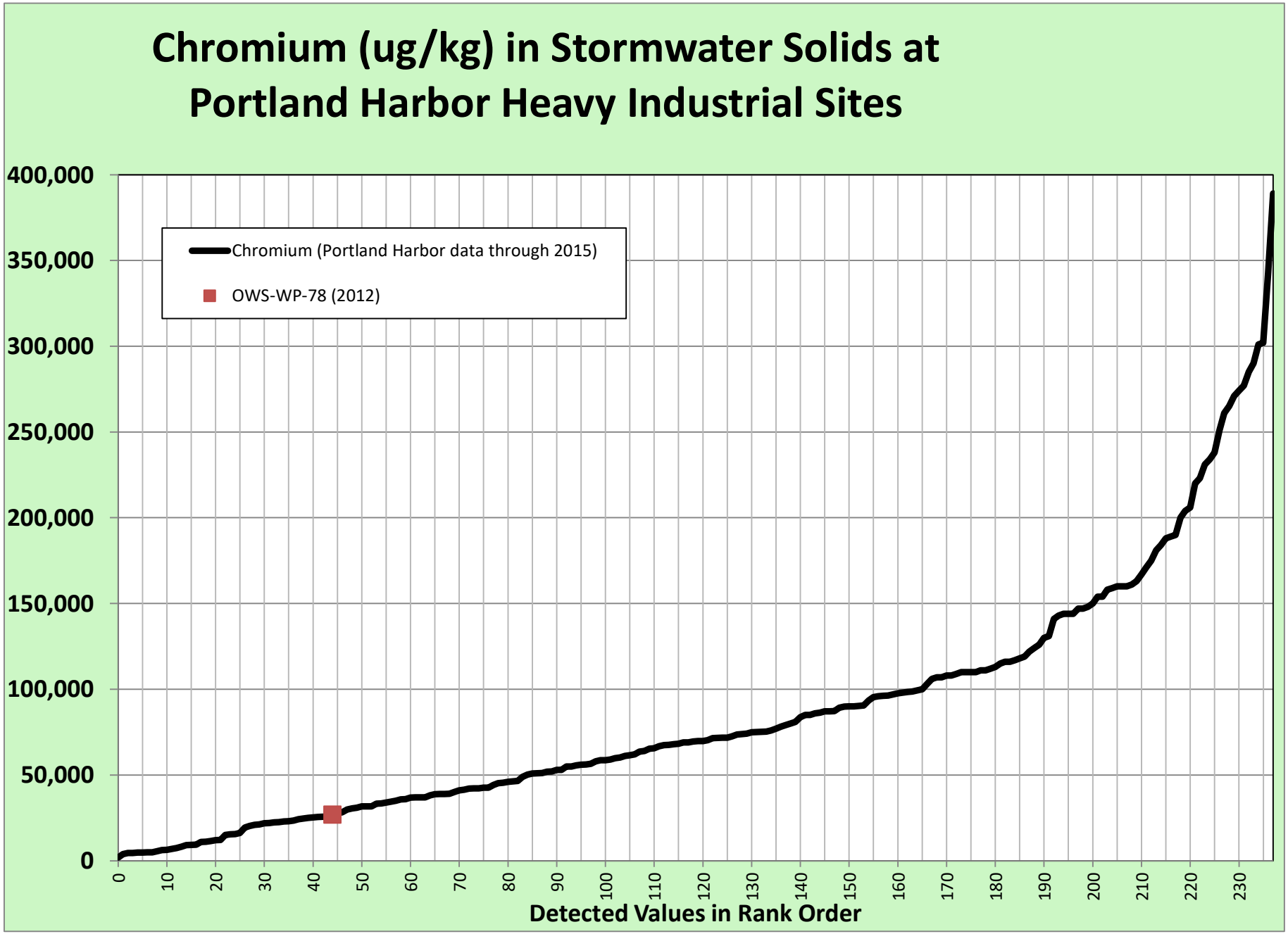
1. Light Polycyclic Aromatic Hydrocarbon (LPAH).
2. Heavy Polycyclic Aromatic Hydrocarbon (HPAH).
3. Carcinogenic Polycyclic Aromatic Hydrocarbon (cPAH).
4. The source of each SLV is documented in Table 3.1 of the Portland Harbor Joint Source Control Strategy, which can be viewed at http://www.deq.state.or.us/lq/cu/nwr/PortlandHarbor/docs/JSCSFinalTable03_1.pdf.
5. At Portland Harbor sites, drinking water MCLs and PRGs are also used as screening levels, per the JSCS. These values are applied when they are lower than all other screening values.
6. National Pollutant Discharge Elimination System (NPDES) permit issued July 19, 2013 for discharge of treated groundwater from the Northwest Natural/Gasco remediation site.
7. SLV = Screening Level Value.
8. Cleanup Level = Cleanup level documented in the Portland Harbor Superfund Site (PHSS) ROD, which can be viewed at https://semspub.epa.gov/work/10/100036257.pdf.
9. TEF = Toxicity Equivalency Factor.
10. TEF is used to evaluate the toxic effects of PAHs relative to benzo(a)pyrene as discussed in Oregon DEQ Human Health Risk Assessment Guidance, which can be viewed at http://www.oregon.gov/deq/FilterDocs/HumanHealthRiskAssessmentGuidance.pdf.
11. **Bold** = Detected above the method reporting limit (MRL).
12. < = Not detected at or above the method detection limit (MDL) shown.
13. U = Not detected at or above the MDL shown.
14. -- = Not analyzed, not available, or not applicable.
15. Yellow shading indicates an MDL exceeding the PHSS ROD Cleanup Level; gray shading indicates a detection exceeding the PHSS ROD Cleanup Level.
16. µg/L = Micrograms per liter.
17. mg/L = Milligrams per liter.
18. J = Analyte detected below quantitation limits.
19. J3 = Analyte detected in method blank, detection in sample was less than or equal to five times the detected concentration from the method blank.
20. A2 = Sample contains a lube oil range organic not identified as a specific hydrocarbon product. The result was quantified against the lube oil calibration standard.
21. EQ = Exceedance Quotient (calculated as concentration/screening level).
22. A = Sample contains a gasoline range organic not identified as a specific hydrocarbon product. The result was quantified against gasoline calibration standards.
23. T = Value is the sum of 6+ detected concentrations.
24. Elevated = concentration is in the "elevated range" of stormwater discharges from industrial sites as defined by JSCS guidance Appendix E.
25. Typical = concentration is in the "typical range" of stormwater discharges from industrial sites as defined by JSCS guidance Appendix E.
26. *= Dissolved analyte concentration.
27. DDD = Dichlorodiphenyldichloroethane.
28. DDE = Dichlorodiphenyldichloroethylene.
29. DDT = Dichlorodiphenyltrichloroethane.
30. Total DDD = Sum of the concentrations of DDD isomers.
31. Total DDE = Sum of the concentrations of DDE isomers.
32. Total DDT = sum of the concentrations of DDT isomers.
33. Total DDx = sum of the concentrations of 2,4 and 4,4 isomers of DDD, DDE, and DDT.

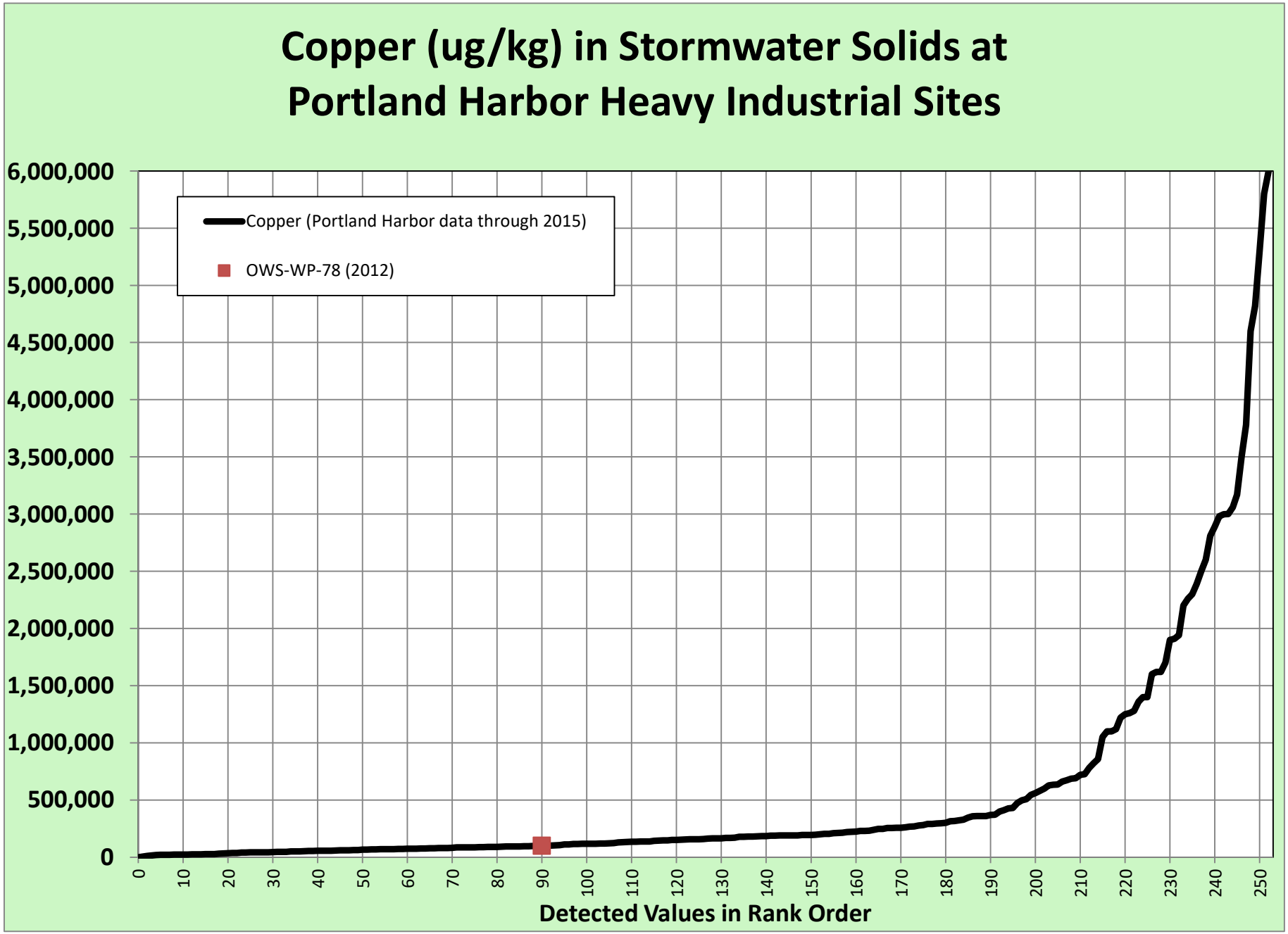

Arsenic (ug/kg) in Stormwater Solids at Portland Harbor Heavy Industrial Sites
Arsenic (Portland Harbor data through 2015)
OWS-WP-78 (2012)
50,000
45,000
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
190
200
210
220
Detected Values in Rank Order

# Bis(2-Ethylhexyl)phthalate (ug/kg) in Stormwater Solids at Portland Harbor Heavy Industrial Sites

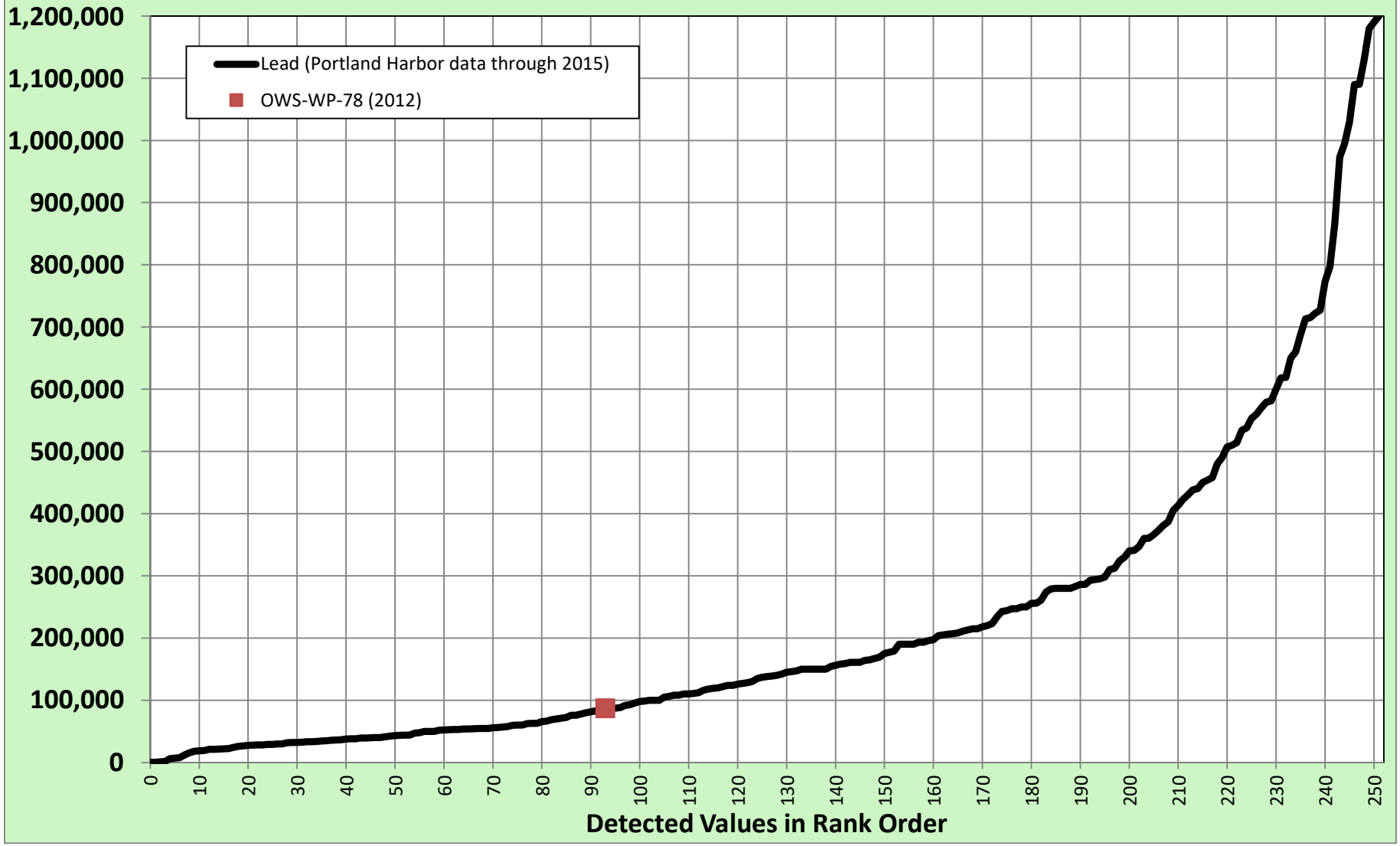


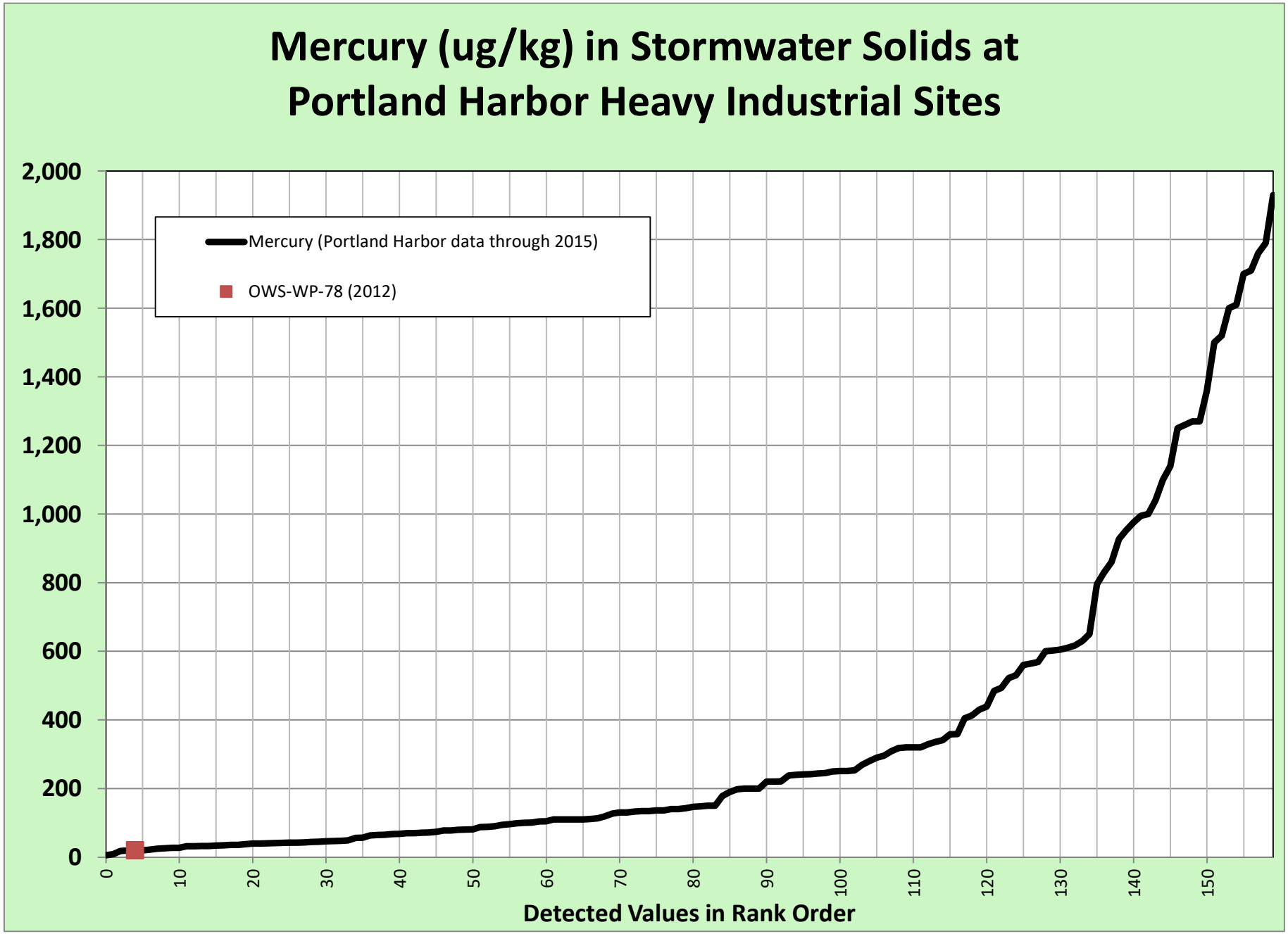

Cadmium (ug/kg) in Stormwater Solids at Portland Harbor Heavy Industrial Sites
9,000
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
Cadmium (Portland Harbor data through 2015)
OWS-WP-78 (2012)
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
190
200
210
Detected Values in Rank Order


Chromium (ug/kg) in Stormwater Solids at Portland Harbor Heavy Industrial Sites
400,000
350,000
300,000
250,000
200,000
150,000
100,000
50,000
0
Chromium (Portland Harbor data through 2015)
OWS-WP-78 (2012)
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
190
200
210
220
230
Detected Values in Rank Order

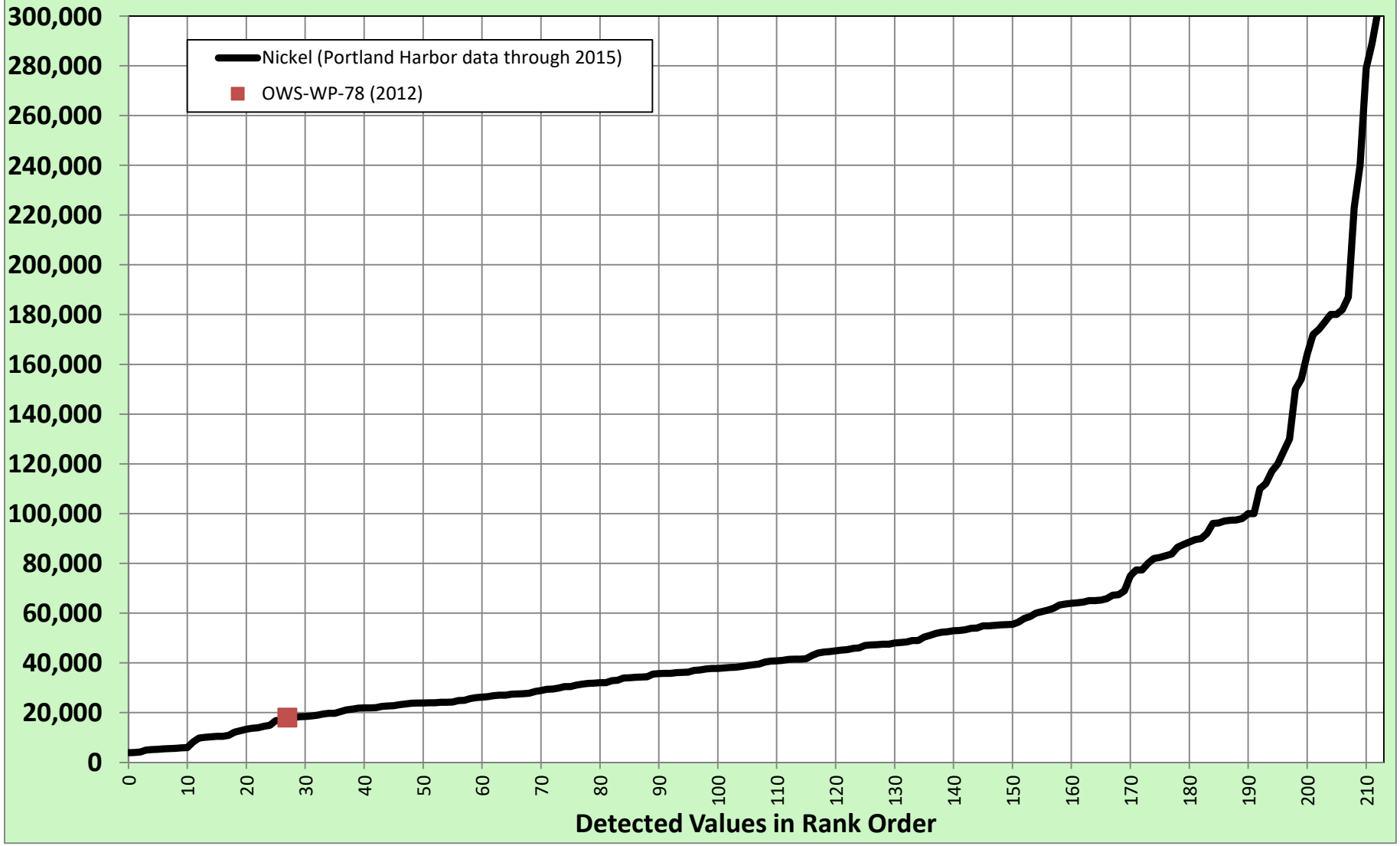

Copper (ug/kg) in Stormwater Solids at Portland Harbor Heavy Industrial Sites
6,000,000
5,500,000
5,000,000
4,500,000
4,000,000
3,500,000
3,000,000
2,500,000
2,000,000
1,500,000
1,000,000
500,000
0
Copper (Portland Harbor data through 2015)
OWS-WP-78 (2012)
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
190
200
210
220
230
240
250
Detected Values in Rank Order

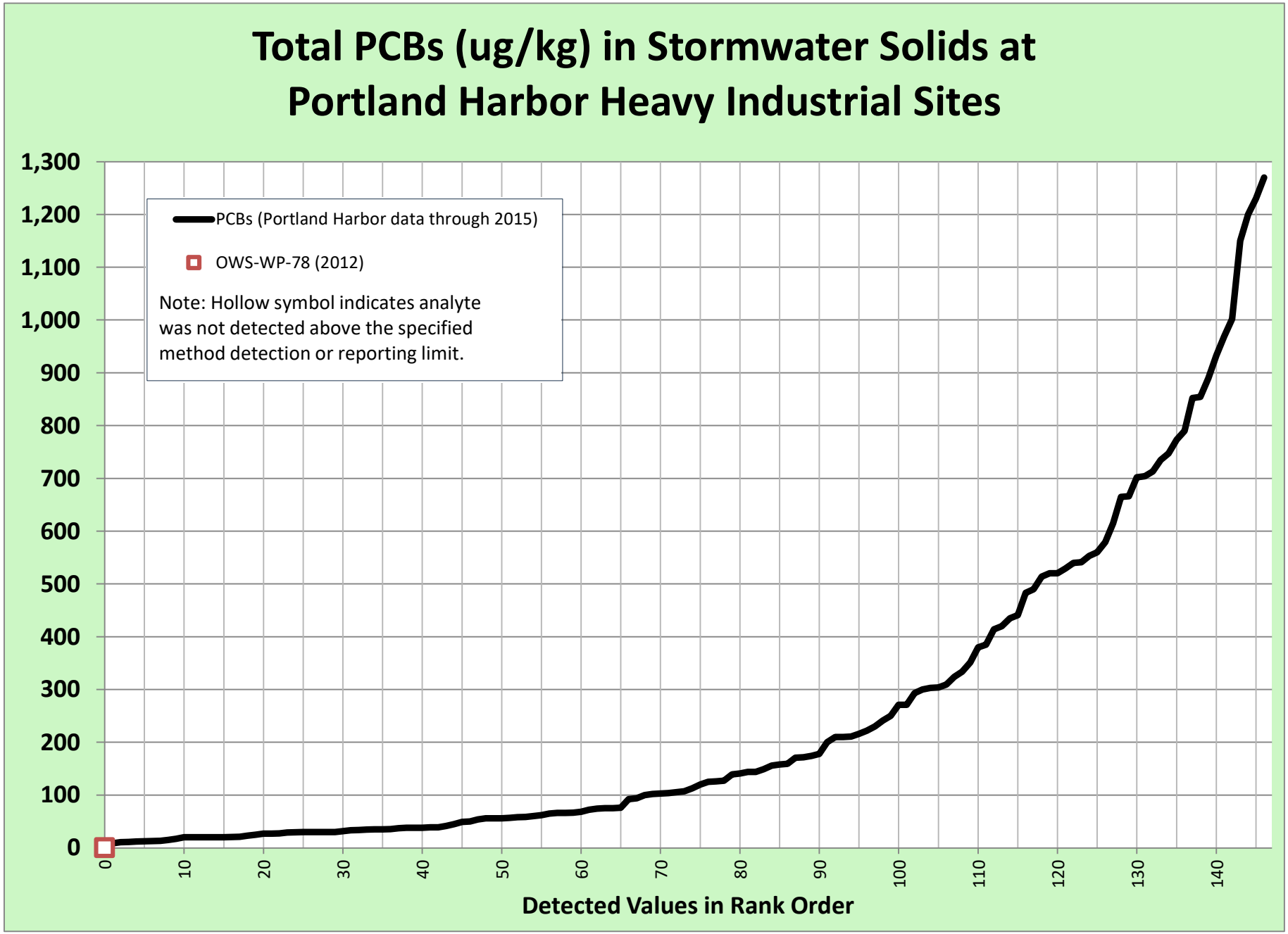
# Lead (ug/kg) in Stormwater Solids at Portland Harbor Heavy Industrial Sites



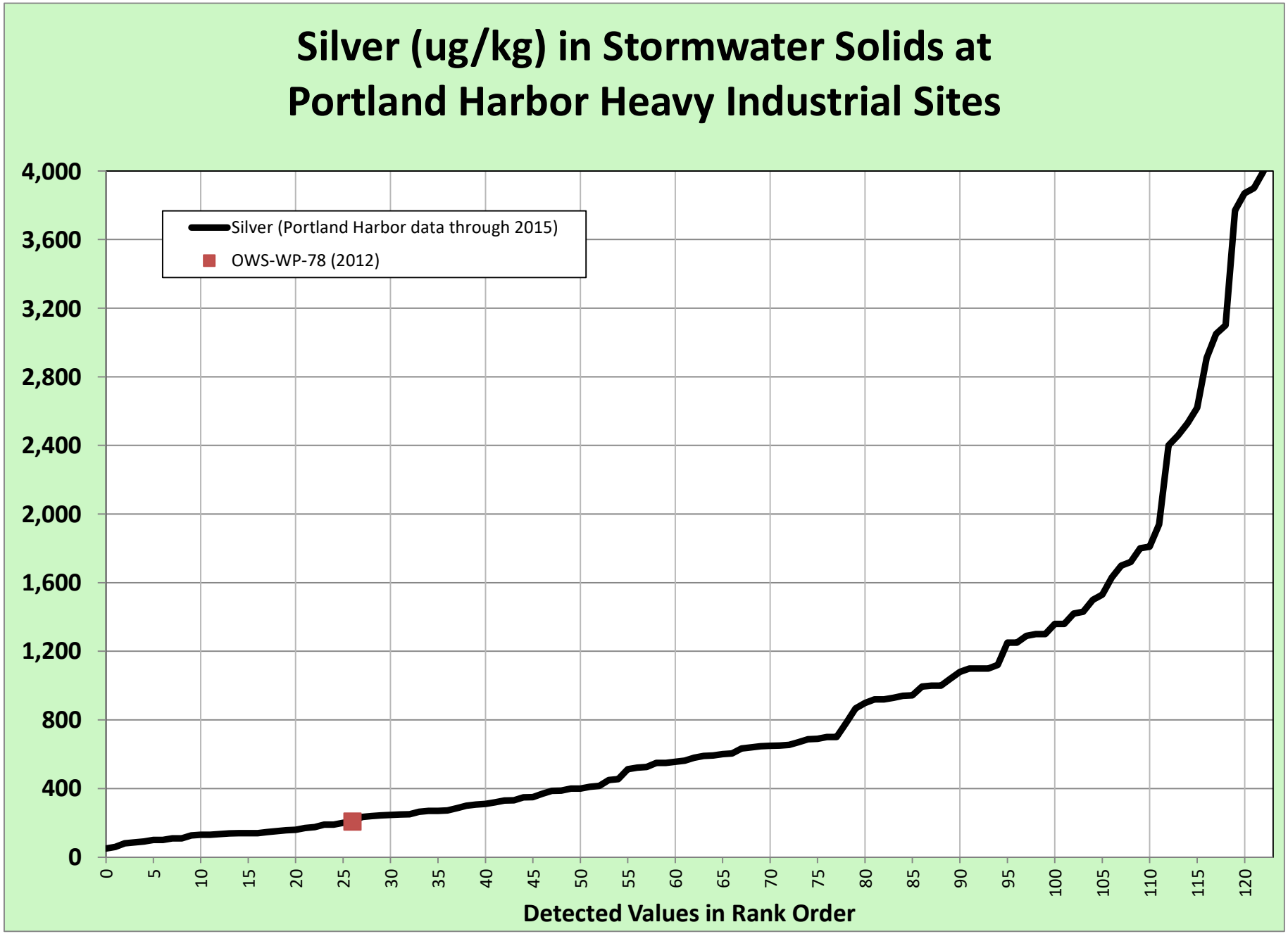

Mercury (ug/kg) in Stormwater Solids at Portland Harbor Heavy Industrial Sites
Mercury (Portland Harbor data through 2015)
OWS-WP-78 (2012)
2,000
1,800
1,600
1,400
1,200
1,000
800
600
400
200
0
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
Detected Values in Rank Order

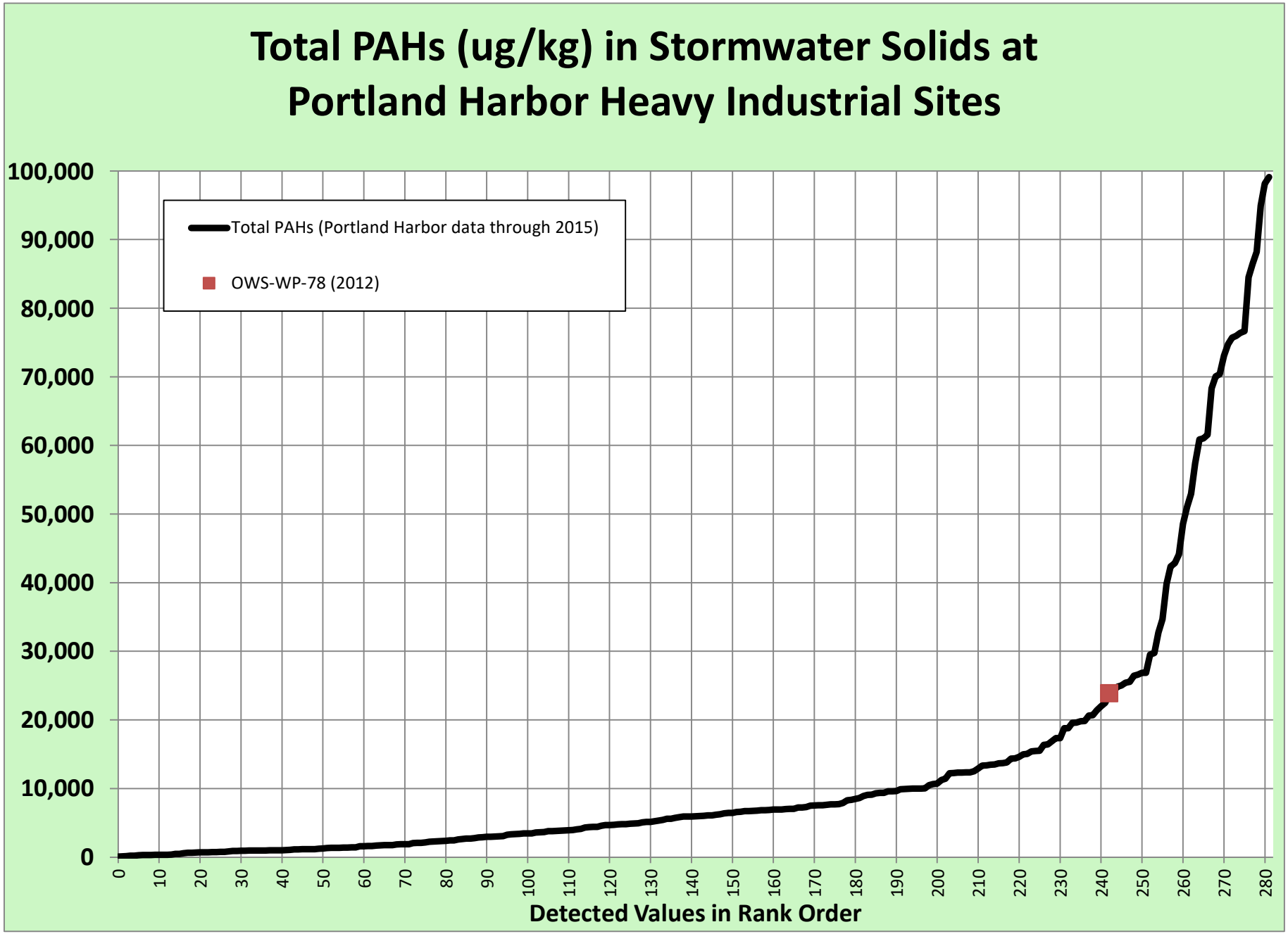
# Nickel (ug/kg) in Stormwater Solids at Portland Harbor Heavy Industrial Sites

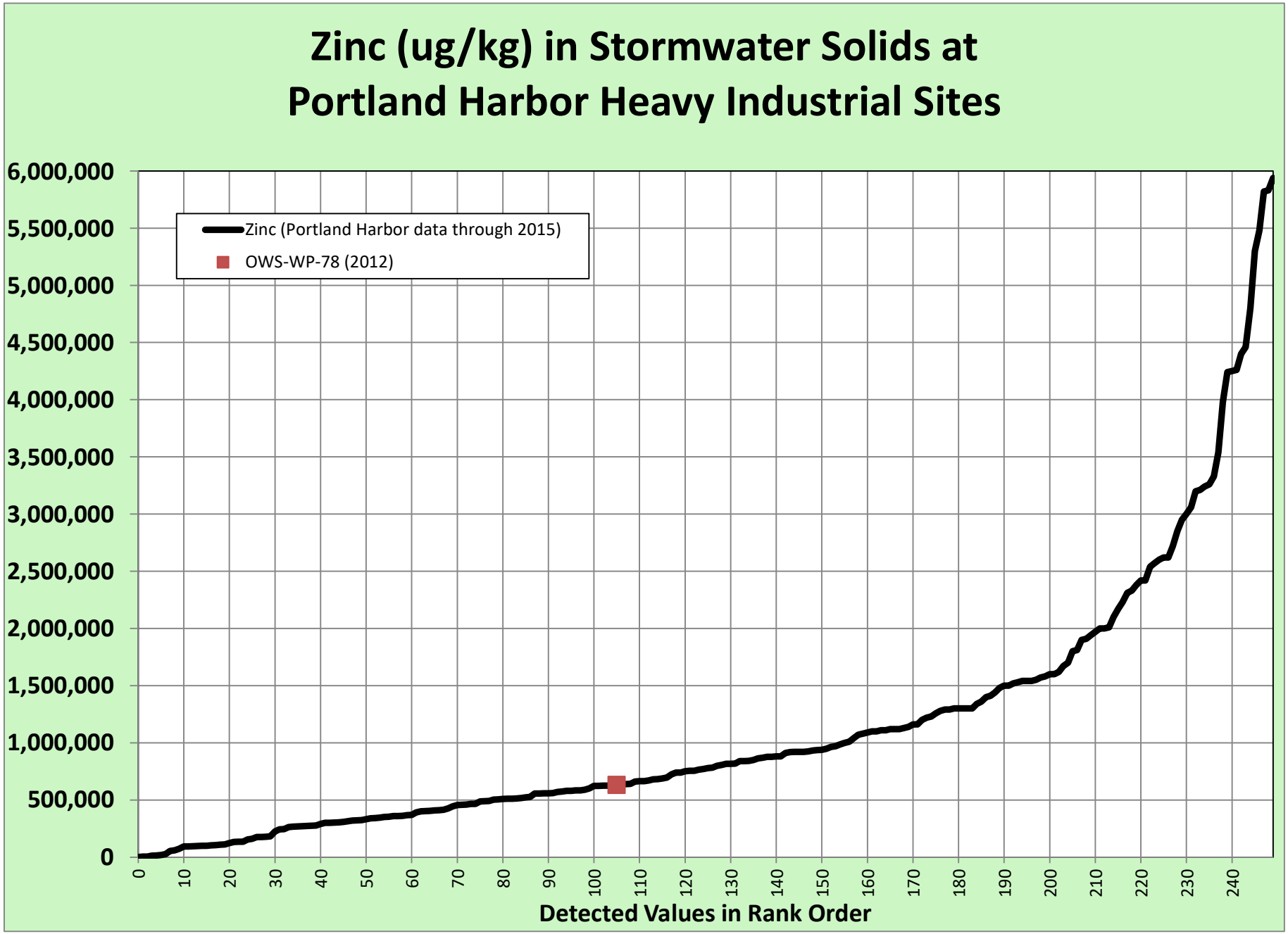



Total PCBs (ug/kg) in Stormwater Solids at Portland Harbor Heavy Industrial Sites
1,300
1,200
1,100
1,000
900
800
700
600
500
400
300
200
100
0
PCBs (Portland Harbor data through 2015)
OWS-WP-78 (2012)
Note: Hollow symbol indicates analyte was not detected above the specified method detection or reporting limit.
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
Detected Values in Rank Order

# Silver (ug/kg) in Stormwater Solids at Portland Harbor Heavy Industrial Sites




Total PAHs (ug/kg) in Stormwater Solids at Portland Harbor Heavy Industrial Sites
Total PAHs (Portland Harbor data through 2015)
OWS-WP-78 (2012)
100,000
90,000
80,000
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
190
200
210
220
230
240
250
260
270
280
Detected Values in Rank Order


Zinc (ug/kg) in Stormwater Solids at
Portland Harbor Heavy Industrial Sites
6,000,000
5,500,000
5,000,000
4,500,000
4,000,000
3,500,000
3,000,000
2,500,000
2,000,000
1,500,000
1,000,000
500,000
0
Zinc (Portland Harbor data through 2015)
OWS-WP-78 (2012)
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
190
200
210
220
230
240
Detected Values in Rank Order

# Attachment 7

Stormwater Data

# Table 2

## Stormwater Analytical Results—Total Suspended Solids

### Shore Terminals–Portland

### Portland, Oregon

| Location ID | Sample Date | Analytical Results (mg/L) |
|---|---|---|
| | | TSS Concentration |
| Outfall WR-78 | 11/16/2011 | **11** |
| | 1/24/2012 | **7** |
| | 4/3/2012 | **5** |
| | 11/29/2012 | <1.1 |
| | 4/17/2023 | <5.00 |
| Outfall WR-152 | 11/16/2011 | **5** |
| | 1/24/2012 | <1.1 |
| | 4/3/2012 | <1.1 |
| | 11/29/2012 | <1.1 |
| | 4/17/2023 | <5.00 |

Notes:

1. mg/L = Milligram(s) per liter.
2. Total Suspended Solids by EPA Method 160.2
3. PHSS Cleanup Levels for surface water from U.S. EPA Record of Decision Portland Harbor Superfund Site, Portland, Oregon, January 2017 are not available for TPH.
4. JSCS SLV = Screening Level Values from Portland Harbor Joint Source Control Strategy (JSCS), December 2005; not available for TPH.
5. **Bold** cells indicates that the compound was detected above the laboratory method detection limit.
6. < = Concentration as reported by analytical laboratory is less than the method detection limit.

# Table 3

## WR-78 and WR-152 Analytical Results—TPH

### Shore Terminals–Portland

### Portland, Oregon

| Location ID | Sample Date | Analytical Results | | |
|---|---|---|---|---|
| | | TPHg (mg/L) | TPHd (mg/L) | TPHo (mg/L) |
| ***1997 Site ROD Cleanup Goal*** | | -- | -- | -- |
| ***2017 PHSS Cleanup Level*** | | -- | -- | -- |
| ***Portland Harbor JSCS SLV*** | | -- | -- | -- |
| | | Conc. | Conc. | Conc. |
| Outfall WR-78 | 11/16/2011 | 0.080 J, J3 | 0.19 | 0.22 J3 |
| | 1/24/2012 | 0.460 J3 | 0.128 A1 | 0.160 J, J3 |
| | 4/3/2012 | 0.00309 A | 0.355 A1, L, J3 | 0.29 A2, J3 |
| | 11/29/2012 | <0.0108 | 0.0877 J3 | 0.119 J, J3 |
| Outfall WR-152 | 11/16/2011 | **0.074 J, J3** | <0.0788 | **0.197 J, J3** |
| | 1/24/2012 | **0.021 J, J3** | **0.63 J** | **0.90 J, J3** |
| | 4/3/2012 | <0.0108 | <0.76 | **0.141 J, J3** |
| | 11/29/2012 | <0.0108 | **0.0714 J, J3** | **0.0792 J, J3** |

Notes:

1. mg/L = Milligram(s) per liter.
2. Total Petroleum Hydrocarbons as gasoline (TPHg) analyzed by NWTPH-Gx; TPH as diesel (TPHd) and TPH as oil (TPHo) analyzed by NWTPH-Dx.
3. PHSS Cleanup Levels for surface water from U.S. EPA Record of Decision Portland Harbor Superfund Site, Portland, Oregon, January 2017 are not available for TPH.
4. JSCS SLV = Screening Level Values from Portland Harbor Joint Source Control Strategy (JSCS), December 2005; not available for TPH.

Qualifiers:

J = Analyte detected below quantitation limits

J3 = Analyte detected in method blank, detection in sample was less than or equal to five times the dtected concentration from the method blank.

A = Sample contains a gasoline range organic not identified as a specific hydrocarbon product. The result was quantified against gasoline calibration standards.

A1 = Sample contains a diesel range organic not identified as a specifric hydrocarbon product. The result was quantified against the diesel calibration standards.

A2 = Sample contains a lube oil range organic not identified as a specific hydrocarbon product. The result was quantified against the lube oil calibration standard.

L = Diesel result is biased high due to amount of Diesel contained in the sample.

# Table 4

## WR-78 and WR-152 Analytical Results—VOCs

Shore Terminals–Portland

Portland, Oregon

| Location ID | Sample Date | Analytical Results (µg/L) | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Benzene | Toluene | Ethylbenzene | m,p-Xylene | o-Xylene | Xylenes (total) | 1,1,1,2- Tetrachloroethane | 1,1,1- Trichloroethane (TCA) | 1,1,2,2- Tetrachloroethane | 1,1,2- Trichloroethane | 1,1- Dichloroethane | 1,2,3- Trichlorobenzene | 1,2,3- Trichloropropane | 1,2- Dichloroethane (EDC) | cis-1,2-Dichloroethlyene | 1,2- Dichloropropane | 1,2- Dibromoethane (EDB) | 1,3,5- Trimethylbenzene | 2,2- Dichloropropane | 2- Butanone (MEK) |
| ***2017 PHSS Cleanup Level*** | | – | – | *7.3* | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – |
| ***Portland Harbor JSCS SLV*** | | *1.2* | *9.8* | *7.3* | *1.8* | *13* | *200* | *2.5* | *11* | *0.33* | *1.2* | *47* | – | *0.0095* | *0.73* | *61* | *0.97* | *0.033* | – | – | *7,100* |
| | | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. |
| WR-78 | 11/16/2011 | <0.0135 | <0.0343 | <0.0648 | <0.0238 | **0.11 J** | **0.11 J** | <0.0495 | <0.0559 | <0.0759 | <0.0793 | <0.0223 | – | <0.0679 | <0.0551 | **0.12 J, J3** | <0.0165 | <0.0755 | – | – | <1.48 |
| | 1/24/2012 | **2.99** | **37** | **4.72** | **30.6** | **15.8** | **46.4** | <0.0495 | <0.0559 | **0.14 J, J3** | <0.0793 | <0.0223 | – | **0.28** | <0.0551 | <0.035 | <0.0165 | <0.00755 | – | – | <1.48 |
| | 4/3/2012 | **2.66** | **6.27** | **0.0648** | **2.28** | **12.7** | **14.98** | <0.0495 | <0.0559 | <0.0759 | <0.0793 | <0.0223 | – | <0.00068 | – | <0.035 | – | <0.0755 | – | – | <1.48 |
| | 11/29/2012 | <0.031 | <0.0572 | **0.09** | <0.186 | <0.0312 | – | <0.057 | <0.0528 | <0.148 | <0.204 | <0.0851 | **0.32** | <0.167 | **0.09** | – | <0.0964 | <0.108 | <0.031 | <0.088 | <0.333 |
| WR-152 | 11/16/2011 | <0.0135 | <0.0343 | **0.12 J** | <0.0238 | <0.0286 | <0.0286 | <0.0495 | <0.0559 | <0.0759 | <0.0793 | <0.0223 | – | <0.0679 | <0.0551 | **0.035 J3** | <0.0165 | <0.0755 | – | – | <1.48 |
| | 1/24/2012 | <0.0135 | **0.2 J** | <0.0648 | **0.12 J** | <0.0286 | **0.12 J** | <0.0495 | <0.0559 | **0.18 J, J3** | <0.0759 | <0.0223 | – | <0.0679 | <0.0551 | <0.035 | <0.0165 | <0.0755 | – | – | <1.48 |
| | 4/3/2012 | <0.0135 | <0.0343 | <0.08 | <0.0238 | <0.0286 | <0.0286 | <0.0495 | <0.0559 | <0.0759 | <0.0793 | <0.0223 | – | <0.00068 | – | <0.035 | – | <0.0755 | – | – | <1.48 |
| | 11/29/2012 | <0.031 | <0.0572 | **0.09 J, J3** | <0.186 | <0.0312 | – | <0.057 | <0.0528 | <0.148 | <0.204 | <0.0851 | **0.18 J, J3** | <0.167 | **0.1 J, J3** | – | <0.0964 | <0.108 | <0.031 | <0.088 | <0.333 |

**Notes:**

1. < = Concentration as reported by analytical laboratory is less than the method detection limit.
2. µg/L = Microgram(s) per liter.
3. Volatile Organic Compounds (VOCs) analyzed by EPA Method 8260B.
4. PHSS Cleanup Levels for surface water from U.S. EPA Record of Decision Portland Harbor Superfund Site, Portland, Oregon, January 2017.
5. JSCS SLV = Screening Level Values from Portland Harbor Joint Source Control Strategy (JSCS), December 2005.
6. **Bold** cells indicates that the compound was detected above the laboratory method detection limit.
7. Gray highlighted cells indicate values that are equal to or exceeding PHSS Cleanup Level. If a PHSS Cleanup Level was not developed for an analyte, the JSCS SLV is used for comparison.
8. Light green highlighted cells indicatemethod detection limits (MDLs) that are equal to or exceeding PHSS Cleanup Level. If a PHSS Cleanup Level was not developed for an analyte, the JSCS SLV is used for comparison.

**Quality Assurance/Quality Control Data Qualifiers.**

J = Reported result is an estimated value.

J3 = The associated batch QC was outside the established quality control range for precision.

# Table 4

## WR-78 and WR-152 Analytical Results—VOCs

Shore Terminals–Portland

Portland, Oregon

| Location ID | Sample Date | | Analytical Results (µg/L) | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2- Chlorotoluene | 2- Hexanone | 4- Methyl-2-Pentanone (MIBK) | Acetone | Acrylonitrile | Bromobenzene | Bromochloromethane | Bromodichloromethane | Bromoform | Bromomethane | sec-Butylbenzene | Carbon Disulfide | Carbon Tetrachloride | Chlorobenzene | Chlorodibromomethane | Chloroethane | Chloroform | Chloromethane | cis-1,3-Dichloropropene | Dibromomethane |
| ***2017 PHSS Cleanup Level*** | | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – |
| ***Portland Harbor JSCS SLV*** | | – | *99* | *170* | *1,500* | *0.12* | – | – | *1.1* | *8.5* | *8.7* | – | *0.92* | *0.51* | *50* | *0.79* | *23* | *0.17* | *2.1* | *0.055* | *61* |
| | | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. |
| WR-78 | 11/16/2011 | – | <0.236 | <1.1 | <1.1 | <0.0529 | – | <0.0683 | <0.0467 | <0.067 | <0.0672 J3 | – | <0.0619 | <0.059 | <0.0521 | – | <0.0717 | **0.33** | **0.1 J** | <0.0479 | <0.0781 |
| | 1/24/2012 | – | <0.236 | <1.1 | **4.3 J, J3** | <0.0529 | – | <0.0683 | <0.0467 | <0.067 | <0.0672 | – | <0.0619 | <0.059 | <0.0521 | – | <0.0717 | <0.0384 | <0.0178 | <0.0479 | <0.0781 |
| | 4/3/2012 | – | <0.236 | <1.1 | <1.1 | <0.0529 | – | <0.0683 | <0.0467 | <0.067 | <0.0672 | – | <0.0619 | <0.059 | <0.0521 | – | <0.0717 | <0.0384 | <0.0178 | <0.00479 | <0.0781 |
| | 11/29/2012 | <0.0247 | <0.214 | <0.435 | **1.99** | <0.059 | – | <0.13 | <0.055 | **0.39** | **0.67** | <0.0295 | <0.0584 | <0.0727 | <0.07 | – | <0.203 | <0.0659 | **0.34** | <0.077 | <0.0595 |
| WR-152 | 11/16/2011 | – | <0.236 | <1.1 | <1.1 | <0.0529 | – | <0.0683 | <0.0467 | <0.067 | <0.0672 | – | <0.0619 | <0.059 | <0.0521 | – | <0.0717 | <0.0384 | <0.0178 | <0.0479 | <0.0781 |
| | 1/24/2012 | – | <1.1 | <1.1 | **4.0 J, J3** | <0.0529 | – | <0.0683 | <0.0467 | <0.067 | <0.0672 | – | <0.0619 | <0.059 | <0.0521 | – | <0.0717 | <0.0384 | <0.0178 | <0.00479 | <0.0781 |
| | 4/3/2012 | – | <0.236 | <1.1 | <1.1 | <0.0529 | – | <0.0683 | <0.0467 | <0.067 | <0.0672 | – | <0.0619 | <0.059 | <0.0521 | – | <0.0717 | <0.0384 | <0.0178 | <0.00479 | <0.0781 |
| | 11/29/2012 | <0.0247 | <0.214 | <0.435 | **7.82 J, J3** | <0.059 | – | <0.13 | <0.055 | **0.44 J, J3** | **0.78 J** | <0.0295 | <0.0584 | <0.0727 | <0.07 | – | <0.203 | **0.41 J** | **0.38 J, J3** | <0.077 | <0.0595 |

# Table 4

## WR-78 and WR-152 Analytical Results—VOCs

Shore Terminals–Portland

Portland, Oregon

| Location ID | Sample Date | Analytical Results (µg/L) | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Dichlorodifluoromethane | Isopropylbenzene | Methylene chloride | Styrene | Trichlorofluoromethane | Methyl tert-butyl ether | Tetrachloroethene (PCE) | trans-1,2-Dichloroethene | trans-1,3-Dichloropropene | Trichloroethene (TCE) | Vinyl Chloride | n-Butylbenzene | n-Propylbenzene | 1,2-Dichlorobenzene | 1,3-Dichlorobenzene | 1,4-Dichlorobenzene | 1,2,4-Trichlorobenzene | Hexachlorobutadiene |
| ***2017 PHSS Cleanup Level*** | | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – |
| ***Portland Harbor JSCS SLV*** | | *390* | *660* | *8.9* | *100* | *1,300* | *37* | *0.12* | *110* | *0.055* | *0.17* | *0.015* | – | – | *49* | *14* | *2.8* | *8.2* | *0.86* |
| | | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. |
| WR-78 | 11/16/2011 | <0.0333 | <0.0299 | <3.58 | <0.0261 | <0.0727 | <0.0862 | <0.103 | <0.0366 | <0.0575 | <0.0273 | <0.0171 | – | – | – | – | – | – | <0.142 |
| | 1/24/2012 | <0.0333 | **0.65** | <3.58 | <0.0261 | <0.0727 | <0.0862 | <0.0103 | <0.0366 | <0.00575 | <0.00273 | <0.00171 | – | – | – | – | – | – | <0.142 |
| | 4/3/2012 | <0.0333 | <0.0299 | <3.58 | – | <0.0273 | <0.0862 | <0.00103 | <0.0366 | <0.00575 | <0.0273 | <0.00171 | – | – | – | – | – | – | <0.142 |
| | 11/29/2012 | <0.0818 | <0.0361 | <0.681 | <0.0281 | <0.0848 | <0.0626 | <0.0672 | <0.083 | <0.0393 | **0.1** | <0.155 | <0.0607 | <0.0324 | <0.054 | <0.0655 | <0.038 | **0.1** | **0.22 J, J3** |
| WR-152 | 11/16/2011 | <0.0333 | <0.0299 | <3.58 | <0.0261 | <0.0727 | <0.0862 | <0.103 | <0.0366 | <0.0575 | <0.0273 | <0.0171 | – | – | – | – | – | – | <0.142 |
| | 1/24/2012 | <0.0333 | <0.0648 | <3.58 | <0.0261 | <0.0727 | <0.0862 | <0.0103 | **0.0366 J** | <0.00575 | <0.0273 | <0.00171 | – | – | – | – | – | – | <0.142 |
| | 4/3/2012 | <0.0333 | <0.0299 | <3.58 | – | <0.0273 | <0.0862 | <0.00103 | <0.0366 | <0.00575 | <0.0273 | <0.00171 | – | – | – | – | – | – | <0.142 |
| | 11/29/2012 | <0.0818 | <0.0361 | <0.681 | <0.0281 | <0.0848 | <0.0626 | <0.0672 | <0.083 | <0.0393 | <0.087 | <0.155 | <0.0607 | <0.0324 | <0.054 | <0.0655 | **0.05 J, J3** | <0.0872 | **0.16 J, J3** |

# Table 5

## WR-78 and WR-152 Analytical Results—PAHs

Shore Terminals–Portland

Portland, Oregon

| Location ID | Sample Date | Analytical Results (µg/L) | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1-Methylnaphthalene | 2-Methylnaphthalene | Acenaphthene | Acenaphthylene | Anthracene | Benzo(a)anthracene | Benzo(a)pyrene | Benzo(b)fluoranthene | Benzo(g,h,i)perylene | Benzo(k)fluoranthene | Chrysene | Dibenz(a,h)anthracene | Fluoranthene | Fluorene | Indeno(1,2,3-cd)pyrene | Naphthalene | Phenanthrene | Pyrene | Carcinogenic PAHs | Total PAHs |
| ***2017 PHSS Cleanup Level*** | | – | *2.1* | *23* | – | *0.73* | *0.0012* | *0.00012* | *0.0012* | *0.4* | *0.0013* | *0.0013* | *0.00012* | *6.2* | *3.9* | *0.0012* | *12* | *6.3* | *10* | *0.00012* | – |
| ***Portland Harbor JSCS SLV*** | | – | *0.2* | *0.2* | *0.2* | – | *0.018* | *0.018* | *0.018* | *0.2* | *0.018* | *0.018* | *0.018* | *0.2* | *0.2* | *0.018* | *0.2* | *0.2* | *0.2* | *0.00012* | – |
| ***TEF*** | | | | | | | *0.1* | *1* | *0.1* | *0.01* | *0.1* | *0.001* | *1* | | | *0.1* | | | | | |
| WR-78 | 11/16/2011 | – | **0.001 J** | **0.003 J** | **0.001 J** | **0.001 J** | **0.008** | **0.009** | **0.02** | **0.013** | **0.004 J** | **0.01** | **0.003 J** | **0.02** | **0.003 J** | **0.009** | **0.007** | **0.009** | **0.019** | **0.016** | **0.140** |
| | 1/24/2012 | – | **0.815** | **0.0807 J3** | **<0.00671** | **0.0215** | **0.0441** | **0.054** | **0.0886** | **0.0678** | **0.012 J** | **0.06** | **0.0084 J** | **0.105 J3** | **0.0353** | **0.0568** | **0.762 J3** | **0.0536 J3** | **0.0988 J3** | **0.083** | **2.367** |
| | 4/3/2012 | – | **11.4** | **0.0546** | **0.0122** | **0.0103** | **0.0295** | **0.00176 J** | **0.064** | **0.015** | **0.0106** | **0.0415** | **0.00127** | **0.113** | **0.0124** | **0.204 J** | **6.44** | **0.0722 J3** | **0.0832** | **0.034** | **18.566** |
| | 11/29/2012 | – | – | **0.0189 J** | **0.00943 J** | <0.008 | **0.0189 J, J3** | **0.00943 J** | **0.00943 J** | **0.00943 J, J3** | <0.0073 | **0.00943 J** | <0.00558 | **0.00943 J** | **0.00943 J** | **0.00943 J, J3** | <0.0133 | **0.00943 J, J3** | **0.00943 J** | **0.013** | **0.149** |
| | 4/18/2022 | <0.0381 | <0.0381 | <0.0190 | <0.0190 | <0.0190 | <0.0190 | <0.0286 | <0.0286 | <0.0190 | <0.0286 | <0.0190 | <0.0190 | **0.0225** | <0.0190 | <0.0190 | <0.0381 | **0.0196** | **0.0205** | **0.029** | **0.229** |
| | 11/4/2022 | <0.0408 | <0.0408 | <0.0204 | <0.0204 | <0.0204 | <0.0204 | <0.0306 | <0.0306 | <0.0204 | <0.0306 | <0.0204 | <0.0204 | **0.0288** | <0.0204 | <0.0204 | <0.0408 | <0.0204 | **0.0278** | **0.031** | **0.245** |
| | 4/17/2023 | <0.0639 | <0.0639 | <0.0319 | <0.0319 | <0.0319 | <0.0160 | <0.0160 | <0.0160 | <0.0319 | <0.0160 | <0.0160 | <0.0160 | <0.0319 | <0.0319 | <0.160 | <0.0639 | <0.0639 | <0.0319 | **0.027** | 0.0639 |
| WR-152 | 11/16/2011 | – | <0.000743 | **0.001 J** | <0.000671 | <0.00037 | **0.003 J** | <0.000451 | **0.001 J** | <0.000402 | **0.001 J** | **0.001 J** | <0.000497 | **0.001 J** | <0.000617 | <0.000318 | **0.001 J** | **0.001 J** | **0.002 J** | **0.0004** | **0.014** |
| | 1/24/2012 | – | **0.0074 J** | **0.014 J, J3** | <0.00670 | **0.0069 J** | <0.00738 | **0.0051 J** | <0.00374 | <0.00402 | <0.000731 | **0.0075 J** | <0.00497 | **0.015 J, J3** | **0.0071 J** | **0.0053 J** | **0.013 J, J3** | **0.0017 J, J3** | **0.014 J, J3** | **0.0060** | **0.110** |
| | 4/3/2012 | – | **0.00273 J** | **0.00444 J** | **0.0117** | **0.00973** | **0.0156** | **0.00187 J** | **0.00449 J** | **0.0048 J** | **0.00822** | **0.00547** | **0.00289 J** | **0.0137 J** | **0.00236 J** | **0.00384 J** | **0.00136** | **0.00758 J3** | **0.0045** | **0.0070** | **0.105** |
| | 11/29/2012 | – | – | **0.00951 J** | <0.00945 | **0.00951 J** | **0.00951 J, J3** | **0.00951 J** | **0.00951 J** | **0.00951 J, J3** | <0.00736 | **0.00951 J** | <0.00563 | **0.00951 J** | **0.00951 J** | **0.00951 J, J3** | **0.0495 J3** | **0.00951 J, J3** | **0.00951 J** | **0.0120** | **0.171** |
| | 4/18/2022 | <0.0388 | <0.0388 | <0.0194 | <0.0194 | <0.0194 | <0.0194 | <0.0291 | <0.0291 | <0.0194 | <0.0291 | <0.0194 | <0.0194 | <0.0194 | <0.0194 | <0.0194 | <0.0388 | <0.0194 | <0.0194 | <0.0291 | 0.0388 |
| | 11/4/2022 | <0.0377 | <0.0377 | <0.0189 | <0.0189 | <0.0189 | <0.0189 | <0.0283 | <0.0283 | <0.0189 | <0.0283 | <0.0189 | <0.0189 | <0.0189 | <0.0189 | <0.0189 | <0.0377 | <0.0189 | <0.0189 | <0.0283 | 0.0377 |
| | 4/17/2023 | <0.0639 | <0.0639 | <0.0319 | <0.0319 | <0.0319 | <0.0160 | <0.0160 | <0.0160 | <0.0319 | <0.0160 | <0.0160 | <0.0160 | <0.0319 | <0.0319 | <0.0160 | <0.0639 | <0.0639 | <0.0319 | <0.0319 | 0.0639 |

**Notes:**

1. PAH = Polycyclic aromatic hydrocarbons.
2. < = Concentration as reported by analytical laboratory is less than the method detection limit.
3. -- = not analyzed or concentration does not exceed the PHSS Cleanup Level or JSCS SLV.
4. µg/L = Micrograms per liter.
5. PHSS Cleanup Levels for surface water from U.S. EPA Record of Decision Portland Harbor Superfund Site, Portland, Oregon, January 2017.
6. JSCS SLV = Screening Level Values from Portland Harbor Joint Source Control Strategy (JSCS), December 2005.
7. **Bold** cells indicates that the compound was detected above the laboratory method detection limit.
8. Gray highlighted cells indicate the screening value used to screen and the results that are equal to or exceeding the screening level. PHSS Cleanup Levels are used; if a PHSS Cleanup Level was not developed for an analyte, the JSCS SLV is used for comparison.
9. Light green highlighted cells indicatemethod detection limits (MDLs) that are equal to or exceeding PHSS Cleanup Level. If a PHSS Cleanup Level was not developed for an analyte, the JSCS SLV is used for comparison.
10. Polycyclic aromatic hydrocarbons analyzed by EPA Method 8270 with selective ion monitoring.
11. TEF = Toxic equivalency factor.
12. TEF is used to evaluate the toxic effects of PAHs relative to benzo(a)pyrene as discussed in Oregon DEQ Human Health Risk Assessment Guidance, which can be viewed at http://www.oregon.gov/deq/FilterDocs/HumanHealthRiskAssessmentGuidance.pdf

**Quality Assurance/Quality Control Data Qualifiers:**

J = Reported result is an estimated value.

J3 = The associated batch QC was outside the established quality control range for precision.

# Table 6

## NuStar-owned Outfalls WR-78 and WR-152 Analytical Results—Dissolved Metals

Shore Terminals–Portland

Portland, Oregon

| Location ID | Sample Date | Analytical Results (µg/L) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Aluminum | Antimony | Arsenic | Cadmium | Total Chromium | Copper | Lead | Manganese | Mercury | Nickel | Selenium | Silver | Zinc |
| ***1997 Site ROD Cleanup Goal*** | | -- | -- | 5.0 | -- | -- | 12 | 3.2 | -- | -- | -- | -- | -- | -- |
| ***2017 PHSS Cleanup Level*** | | -- | -- | 0.018 | -- | 100 | 2.74 | -- | -- | -- | -- | -- | -- | 36.5 |
| ***Portland Harbor JSCS SLV*** | | 50 | 6 | 0.045 | 0.094 | 100 | 2.7 | 0.54 | 50 | 0.77 | 16 | 5 | 0.12 | 36 |
| | | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. |
| WR-78 | 11/16/2011 | **5.9 J** | 0.38 J | **0.281** | **0.258** | **0.228** | **2.54** | **0.137** | **7.43** | <0.01 | **1.18** | -- | <0.005 | **112** |
| | 1/24/2012 | **172** | 0.27 J | **0.485** | **0.147** | **0.317** | **2.55** | **1.87** | **16.8** | <0.01 | **0.655** | -- | **0.0062** | **74.6** |
| | 4/3/2012 | **214** | 0.211 J | **0.866** | **0.212** | **0.414** | **3.38** | **2.12** | **31.8** | <0.1 | **0.813** | -- | **0.02 J** | **91.1** |
| | 11/29/2012 | **144** | 0.26 J | **0.53** | **0.139** | **2.01** | **2.63** | **7.62** | **22.9** | <0.0114 | **0.97** | -- | <0.005 | **55** |
| | 4/18/2022 | **151** | -- | <1.00 | -- | -- | -- | -- | -- | -- | -- | -- | -- | **52.1** |
| | 11/4/2022 | **1,500** | -- | **1.34** | -- | -- | -- | -- | -- | -- | -- | -- | -- | **64.1** |
| | 4/17/2023 | **214** | -- | <1.00 | -- | -- | -- | -- | -- | -- | -- | -- | -- | **47.4** |
| WR-152 | 11/16/2011 | **6.2 J** | **0.09 J** | **0.533** | <0.0209 | **0.658** | **1.61** | **1.14** | **6.85** | <0.01 | **0.38 J** | -- | <0.006 | **84.3** |
| | 1/24/2012 | **160** | **0.075 J** | **0.161** | **0.031 J** | **0.335** | **1.34** | **0.34** | **6.61** | <0.01 | **0.33 J, J3** | -- | **0.085** | **76.6** |
| | 4/3/2012 | **42.7** | <0.5 | **0.179** | **0.036 J** | **0.207** | **0.856** | **0.115** | **5.69** | <0.1 | **0.768 J** | -- | **0.025** | **58** |
| | 11/29/2012 | **66.2** | **0.14 J** | **0.343** | **0.0149** | **0.32** | **1.38** | **0.246** | **3.2** | <0.0114 | **0.331 J** | -- | <0.005 | **57.5** |
| | 4/18/2022 | -- | -- | <1.00 | -- | -- | -- | -- | -- | -- | -- | -- | -- | **46.7** |
| | 11/4/2022 | **56.6** | -- | <1.00 | -- | -- | -- | -- | -- | -- | -- | -- | -- | **71.3** |
| | 4/17/2023 | **--** | -- | <1.00 | -- | -- | -- | -- | -- | -- | -- | -- | -- | **17.8** |

Notes:

1. < = Concentration as reported by analytical laboratory is less than the method detection limit.
2. µg/L = Microgram(s) per liter.
3. Total Metals analyzed by EPA Method 6020.
4. PHSS Cleanup Levels for surface water from U.S. EPA Record of Decision Portland Harbor Superfund Site, Portland, Oregon, January 2017.
5. JSCS SLV = Screening Level Values from Portland Harbor Joint Source Control Strategy (JSCS), December 2005.
6. **Bold** cells indicates that the compound was detected above the laboratory method detection limit.
7. Gray highlighted cells indicate values that are equal to or exceeding PHSS Cleanup Level; light green highlighting indicates the MDL exceeds the PHSS Cleanup Level. If a PHSS Cleanup Level was not developed for an analyte, the JSCS SLV is used for comparison.
8. -- = not analyzed or concentration does not exceed the PHSS Cleanup Level or JSCS SLV.

Quality Assurance/Quality Control Data Qualifiers

J = Reported result is an estimated value.

# Table 7

## NuStar-owned Outfalls WR-78 and WR-152 Analytical Results—Organochlorine P

Shore Terminals–Portland

Portland, Oregon

| Location ID | Sample Date | Analytical Results (µg/L) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | α - BHC | β - BHC | γ - BHC (Lindane) | δ - BHC | Heptachlor | Heptachlor epoxide | Aldrin | Chlordane | Endosulfan alpha- | Endosulfan beta- | Endosulfan sulfate | Dieldrin | Endrin | Endrin aldehyde | Endrin ketone |
| ***2017 PHSS Cleanup Level*** | | – | – | – | – | – | – | *0.00000077* | – | – | – | – | – | – | – | – |
| ***Portland Harbor JSCS SLV*** | | *0.0049* | *0.017* | *0.052* | *0.037* | *0.000079* | *0.000039* | *0.00005* | *0.00081* | *0.051* | *0.051* | *89* | *0.0042* | *0.036* | – | – |
| | | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. |
| WR-78 | 11/16/2011 | <0.000025 | <0.000037 | <0.000036 | <0.000034 | <0.000053 | <0.000042 | <0.000006 | <0.0000019 | <0.000036 | <0.000045 | <0.000051 | <0.000004 | <0.000052 | <0.000039 | <0.000045 |
| | 1/24/2012 | <0.000025 | <0.000037 | <0.000036 | <0.000034 | <0.000053 | <0.000042 | <0.000006 | <0.0000019 | <0.000036 | <0.000045 | <0.000051 | <0.000004 | <0.000052 | <0.000039 | <0.000045 |
| | 4/3/2012 | <0.000025 | <0.000037 | <0.000036 | <0.000034 | <0.000053 | <0.000042 | <0.000006 | <0.0000019 | <0.000036 | <0.000045 | <0.000051 | <0.000004 | <0.000052 | <0.000039 | <0.000045 |
| | 11/29/2012 | <0.000025 | <0.000037 | <0.00000371 | <0.000034 | <0.00000198 | <0.000042 | <0.00000180 | <0.0000189 | <0.000036 | <0.000045 | <0.00000104 | <0.00004 | <0.000052 | <0.000000971 | <0.0000011 |
| | 4/18/2022 | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – |
| | 11/4/2022 | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – |
| | 4/17/2023 | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – |
| WR-152 | 11/16/2011 | <0.000025 | <0.000037 | <0.000036 | <0.000034 | <0.000053 | <0.000042 | <0.000006 | <0.0000019 | <0.000036 | <0.000045 | <0.000051 | <0.000004 | <0.000052 | <0.000039 | <0.000045 |
| | 1/24/2012 | <0.000025 | <0.000037 | <0.000036 | <0.000034 | <0.000053 | <0.000042 | <0.000006 | <0.0000019 | <0.000036 | <0.000045 | <0.000051 | <0.000004 | <0.000052 | <0.000039 | <0.000045 |
| | 4/3/2012 | <0.000025 | <0.000037 | <0.000036 | <0.000034 | <0.000053 | <0.000042 | <0.000006 | <0.0000019 | <0.000036 | <0.000045 | <0.000051 | <0.000004 | <0.000052 | <0.000039 | <0.000045 |
| | 11/29/2012 | <0.000025 | <0.000037 | <0.000036 | <0.000034 | <0.000053 | <0.00000129 | <0.000006 | <0.0000019 | <0.000036 | <0.000045 | <0.000051 | <0.000004 | <0.000000905 | <0.000039 | <0.000045 |
| | 4/18/2022 | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – |
| | 11/4/2022 | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – |
| | 4/17/2023 | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – |

**Notes:**

1. < = Concentration as reported by analytical laboratory is less than the method detection limit.
2. µg/L = Microgram(s) per liter.
3. Organochlorine pesticides analyzed by EPA Method 8081B.
4. PHSS Cleanup Levels for surface water from U.S. EPA Record of Decision Portland Harbor Superfund Site, Portland, Oregon, January 2017.
5. JSCS SLV = Screening Level Values from Portland Harbor Joint Source Control Strategy (JSCS), December 2005
6. **Bold** cells indicates that the compound was detected above the laboratory method detection limit.
7. Gray highlighted cells indicate values that are equal to or exceeding PHSS Cleanup Level; light green highlighting indicates the MDL exceeds the PHSS Cleanup Level. If a PHSS Cleanup Level was not developed for an analyte, the JSCS SLV is used for comparison.

**Quality Assurance/Quality Control Data Qualifiers.**

H = Sample was analyzed outside of method holding time

T = Value is the sum of detected concentrations

J = Analyte detected below quantitation limits

# Table 7

NuStar-owned Outfalls WR-78 and WR-152 Analytical Results—Organochlorine Pest

Shore Terminals–Portland

Portland, Oregon

| Location ID | Sample Date | Analytical Results (µg/L) | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Methoxychlor | Toxaphene | Oxy chlordane | cis - nonachlor | trans - nonachlor | 2,4'-DDD | 2,4'-DDE | 2,4'-DDT | 4,4'-DDD | 4,4'-DDE | 4,4'-DDT | Total DDD | Total DDE | Total DDT | Total DDx | alpha-Chlordane | gamma-Chlordane | Total Chlordanes |
| ***2017 PHSS Cleanup Level*** | | – | – | – | – | – | *0.000031* | *0.000018* | *0.000022* | *0.000031* | *0.000018* | *0.000022* | *0.000031* | *0.000018* | *0.000022* | *0.01* | – | – | *0.000081* |
| ***Portland Harbor JSCS SLV*** | | *0.03* | *0.0002* | – | – | *7,100* | *0.00022* | *0.00031* | *0.00022* | *0.00022* | *0.00031* | *0.00022* | *0.00022* | *0.00031* | *0.00022* | – | – | – | – |
| | | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. |
| WR-78 | 11/16/2011 | <0.000028 | <0.000042 | <0.000019 | <0.000033 | <0.000056 | – | – | – | <0.000061 | <0.000051 | <0.000043 | – | – | – | – | <0.000041 | <0.00005 | – |
| | 1/24/2012 | <0.000028 | <0.000042 | <0.000019 | <0.000033 | <0.000056 | – | – | – | <0.000042 | <0.000036 | <0.000058 | – | – | – | – | <0.000041 | <0.00005 | – |
| | 4/3/2012 | <0.000028 | <0.000042 | – | – | <0.000056 | – | – | – | <0.000042 | <0.000036 | <0.000058 | – | – | – | – | <0.000041 | <0.00005 | – |
| | 11/29/2012 | <0.000028 | <0.0000189 | – | – | – | – | – | – | **0.0064H** | <0.00000121 | **0.0083H** | – | – | **0.0083 T** | **0.0147 T** | <0.000041 | **0.0056 H** | **0.0056 T** |
| | 4/18/2022 | – | – | – | – | – | **0.000030 J (1)** | **0.000025 J** | <0.000040 | **0.000036 J** | **0.000044 J** | **0.000081 J** | **0.000066** | **0.000069** | **0.000101** | **0.000236** | – | – | – |
| | 11/4/2022 | – | – | – | – | – | **0.000223** | **0.000023 J** | **0.000151 J** | **0.000362** | **0.00022** | **0.00106** | **0.000585** | **0.000243** | **0.001211** | **0.002039** | – | – | – |
| | 4/17/2023 | – | – | – | – | – | **0.000046 J** | **0.000021 J** | **0.000073 J** | **0.000052 J** | **0.000074 J** | **0.000488** | **0.000098** | **0.000095** | **0.000561** | **0.000754** | – | – | – |
| WR-152 | 11/16/2011 | <0.000028 | <0.000042 | <0.000019 | <0.000033 | <0.000056 | – | – | – | <0.000061 | <0.000051 | <0.000043 | – | – | – | – | <0.000041 | <0.00005 | – |
| | 1/24/2012 | <0.000028 | <0.000042 | <0.000019 | <0.000033 | <0.000056 | – | – | – | <0.000042 | <0.000036 | <0.000058 | – | – | – | – | <0.000041 | <0.00005 | – |
| | 4/3/2012 | <0.000028 | <0.000042 | – | – | <0.000056 | – | – | – | <0.000042 | <0.000036 | <0.000058 | – | – | – | – | <0.000041 | <0.00005 | – |
| | 11/29/2012 | <0.00000355 | <0.000042 | – | – | – | – | – | – | **0.0049** | <0.000036 | **0.0092** | – | – | **0.0092 T** | **0.0141 T** | <0.000041 | **0.0052** | **0.0052 T** |
| | 4/18/2022 | – | – | – | – | – | <0.000020 | <0.000016 | <0.000040 | <0.000014 | <0.000012 | <0.000050 | <0.000020 | <0.000016 | <0.000050 | <0.000050 | – | – | – |
| | 11/4/2022 | – | – | – | – | – | <0.000020 | <0.000016 | <0.000040 | <0.000014 | **0.000014 J** | <0.000050 | <0.000020 | **0.000022 J** | <0.000050 | **0.000057** | – | – | – |
| | 4/17/2023 | – | – | – | – | – | <0.000020 | **0.000016 J** | <0.000040 | <0.000014 | <0.000012 | **0.000062 J** | <0.000020 | **0.000022 J** | **0.000082** | **0.000114** | – | – | – |

# Table 8

## NuStar-owned Outfalls WR-78 and WR-152 Analytical Results—PCBs

**Shore Terminals–Portland**

**Portland, Oregon**

| Location ID | Sample Date | Analytical Results (µg/L) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | **Aroclor 1016** | **Aroclor 1221** | **Aroclor 1232** | **Aroclor 1242** | **Aroclor 1248** | **Aroclor 1254** | **Aroclor 1260** | **Aroclor 1262** | **Aroclor 1268** | **Total PCBs** |
| ***2017 PHSS Cleanup Level*** | | – | -- | -- | – | – | -- | -- | – | – | 0.0000064 |
| ***Portland Harbor JSCS SLV*** | | 0.96 | 0.034 | 0.034 | 0.034 | 0.034 | 0.033 | 0.034 | -- | – | 0.000064 |
| | | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. |
| WR-78 | 11/16/2011 | <0.0039 | <0.0039 | <0.0039 | <0.0039 | <0.0039 | <0.0039 | <0.0039 | <0.0039 | <0.0039 | <0.0039 |
| | 1/24/2012 | <0.00444 | <0.00444 | <0.00444 | <0.00444 | <0.00444 | <0.00444 | <0.00444 | <0.00444 | <0.00444 | <0.00444 |
| | 4/3/2012 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 |
| | 11/29/2012 | <0.0037 | <0.0037 | <0.0037 | <0.0037 | <0.0037 | <0.0037 | <0.0037 | <0.0037 | <0.0037 | <0.0037 |
| WR-152 | 11/16/2011 | <0.0039 | <0.0039 | <0.0039 | <0.0039 | <0.0039 | <0.0039 | <0.0039 | <0.0039 | <0.0039 | <0.0039 |
| | 1/24/2012 | <0.00421 | <0.00421 | <0.00421 | <0.00421 | <0.00421 | <0.00421 | <0.00421 | <0.00421 | <0.00421 | <0.00421 |
| | 4/3/2012 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 | <0.004 |
| | 11/29/2012 | <0.00368 | <0.00368 | <0.00368 | <0.00368 | <0.00368 | <0.00368 | <0.00368 | <0.00368 | <0.00368 | <0.00368 |

**Notes:**

1. < = Concentration as reported by analytical laboratory is less than the method detection limit.
2. µg/L = Microgram(s) per liter.
3. PCB Aroclors by EPA Method 8082
4. PHSS Cleanup Levels for surface water from U.S. EPA Record of Decision Portland Harbor Superfund Site, Portland, Oregon, January 2017.
5. JSCS SLV = Screening Level Values from Portland Harbor Joint Source Control Strategy (JSCS), December 2005.
6. **Bold** cells indicates that the compound was detected above the laboratory method detection limit.
7. Gray highlighted cells indicate values that are equal to or exceeding PHSS Cleanup Level; light green highlighting indicates the MDL exceeds the PHSS Cleanup Level. If a PHSS Cleanup Level was not developed for an analyte, the JSCS SLV is used for comparison.
8. -- = not analyzed or concentration does not exceed the PHSS Cleanup Level or JSCS SLV.

# Table 9

## NuStar-owned Outfalls WR-78 and WR-152 Analytical Results—Phthalates

Shore Terminals–Portland

Portland, Oregon

| Location ID | Sample Date | Analytical Results (µg/L) | | | | | |
|---|---|---|---|---|---|---|---|
| | | Dimethylphthalate | Diethylphthalate | Di-n-butylphthalate | Butylbenzylphthalate | Di-n-octylphthalate | bis(2-Ethylhexyl)phthalate |
| ***2017 PHSS Cleanup Level*** | | -- | -- | -- | -- | -- | 0.2 |
| ***Portland Harbor JSCS SLV*** | | 3 | 3 | 3 | 3 | 3 | 2.2 |
| | | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. |
| WR-78 | 11/16/2011 | <0.277 | <0.309 | <0.379 | <0.168 | <0.150 | <0.291 |
| | 1/24/2012 | <0.277 | <0.309 | <0.379 | <0.168 | **0.17** | **0.3 J** |
| | 4/3/2012 | <0.277 | <0.309 | <0.379 | <0.168 | <0.379 | <0.291 |
| | 11/29/2012 | <0.265 | <0.295 | <0.362 | <0.16 | <0.143 | **0.382 J** |
| | 10/21/2021 | -- | -- | -- | -- | -- | <0.374 |
| | 4/18/2022 | -- | -- | -- | -- | -- | <0.381 |
| | 11/4/2022 | -- | -- | -- | -- | -- | <0.612 A-01 |
| | 4/17/2023 | -- | -- | -- | -- | -- | <0.399 |
| WR-152 | 11/16/2011 | <0.277 | <0.309 | <0.379 | <0.168 | <0.15 | <0.291 |
| | 1/24/2012 | <0.277 | <0.309 | <0.379 | **0.26** | **0.3** | <0.291 |
| | 4/3/2012 | <0.277 | <0.309 | <0.379 | <0.168 | <0.379 | <0.291 |
| | 11/29/2012 | <0.261 | <0.292 | <0.142 | <0.158 | <0.142 | <0.275 |
| | 10/21/2021 | -- | -- | -- | -- | -- | <0.381 |
| | 4/18/2022 | -- | -- | -- | -- | -- | <0.388 |
| | 11/4/2022 | -- | -- | -- | -- | -- | <0.377 |
| | 4/17/2023 | -- | -- | -- | -- | -- | <0.399 |

**Notes:**

1. < = Concentration as reported by analytical laboratory is less than the method detection limit.
2. µg/L = Microgram(s) per liter.
3. Phthalate Esters by EPA Method 8270B
4. PHSS Cleanup Levels for surface water from U.S. EPA Record of Decision Portland Harbor Superfund Site, Portland, Oregon, January 2017.
5. JSCS SLV = Screening Level Values from Portland Harbor Joint Source Control Strategy (JSCS), December 2005.
6. **Bold** cells indicates that the compound was detected above the laboratory method detection limit.
7. Gray highlighted cells indicate values that are equal to or exceeding PHSS Cleanup Level. If a PHSS Cleanup Level was not developed for an analyte, the JSCS SLV is used for comparison.
8. -- = not analyzed or concentration does not exceed the PHSS Cleanup Level or JSCS SLV.
9. A-01 = The Reporting Limit for this analyte has been raised due to the analyte being detected in the method blank.

# Table 10

## NuStar-owned Outfalls WR-78 and WR-152 Analytical Results—SVOCs

Shore Terminals–Portland

Portland, Oregon

| Location ID | Sample Date | Analytical Results (µg/L) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1,2-Dichlorobenzene | 1,3-Dichlorobenzene | 1,4-Dichlorobenzene | 1,2,4-Trichlorobenzene | Hexachlorobenzene | 2-Chloronaphthalene | Hexachloroethane | Hexachlorobutadiene |
| ***2017 PHSS Cleanup Level*** | | – | – | – | – | *0.000029* | – | – | – |
| ***Portland Harbor JSCS SLV*** | | *49* | *14* | *2.8* | *8.2* | *0.00029* | *490* | *3.3* | *0.86* |
| | | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. | Conc. |
| WR-78 | 11/16/2011 | – | – | – | – | <0.18 | – | <0.114 | <0.142 |
| | 1/24/2012 | – | – | – | – | <0.18 | – | <0.114 | <0.142 |
| | 4/3/2012 | – | – | – | – | <0.18 | – | <0.114 | <0.142 |
| | 11/29/2012 | <0.054 | <0.0655 | <0.038 | **0.1** | – | – | – | **0.22** |
| WR-152 | 11/16/2011 | – | – | – | – | <0.18 | – | <0.114 | <0.142 |
| | 1/24/2012 | – | – | – | – | <0.18 | – | <0.114 | <0.142 |
| | 4/3/2012 | – | – | – | – | <0.18 | – | <0.114 | <0.142 |
| | 11/29/2012 | <0.054 | <0.0655 | **0.05** | <0.0872 | – | – | – | **0.16** |

### Notes:

1. PAH = Polycyclic aromatic hydrocarbons.
2. < = Concentration as reported by analytical laboratory is less than the method detection limit.
3. – = not analyzed or concentration does not exceed the PHSS Cleanup Level or JSCS SLV.
4. µg/L = Micrograms per liter.
5. PHSS Cleanup Levels for surface water from U.S. EPA Record of Decision Portland Harbor Superfund Site, Portland, Oregon, January 2017.
6. JSCS SLV = Screening Level Values from Portland Harbor Joint Source Control Strategy (JSCS), December 2005.
7. **Bold** cells indicates that the compound was detected above the laboratory method detection limit.
8. Gray highlighted cells indicate values that are equal to or exceeding PHSS Cleanup Level. If a PHSS Cleanup Level was not developed for an analyte, the JSCS SLV is used for comparison.
9. Polycyclic aromatic hydrocarbons analyzed by EPA Method 8270 with selective ion monitoring.
10. Semivolatile Organic Compounds by EPA Method 8270B

### Quality Assurance/Quality Control Data Qualifiers:

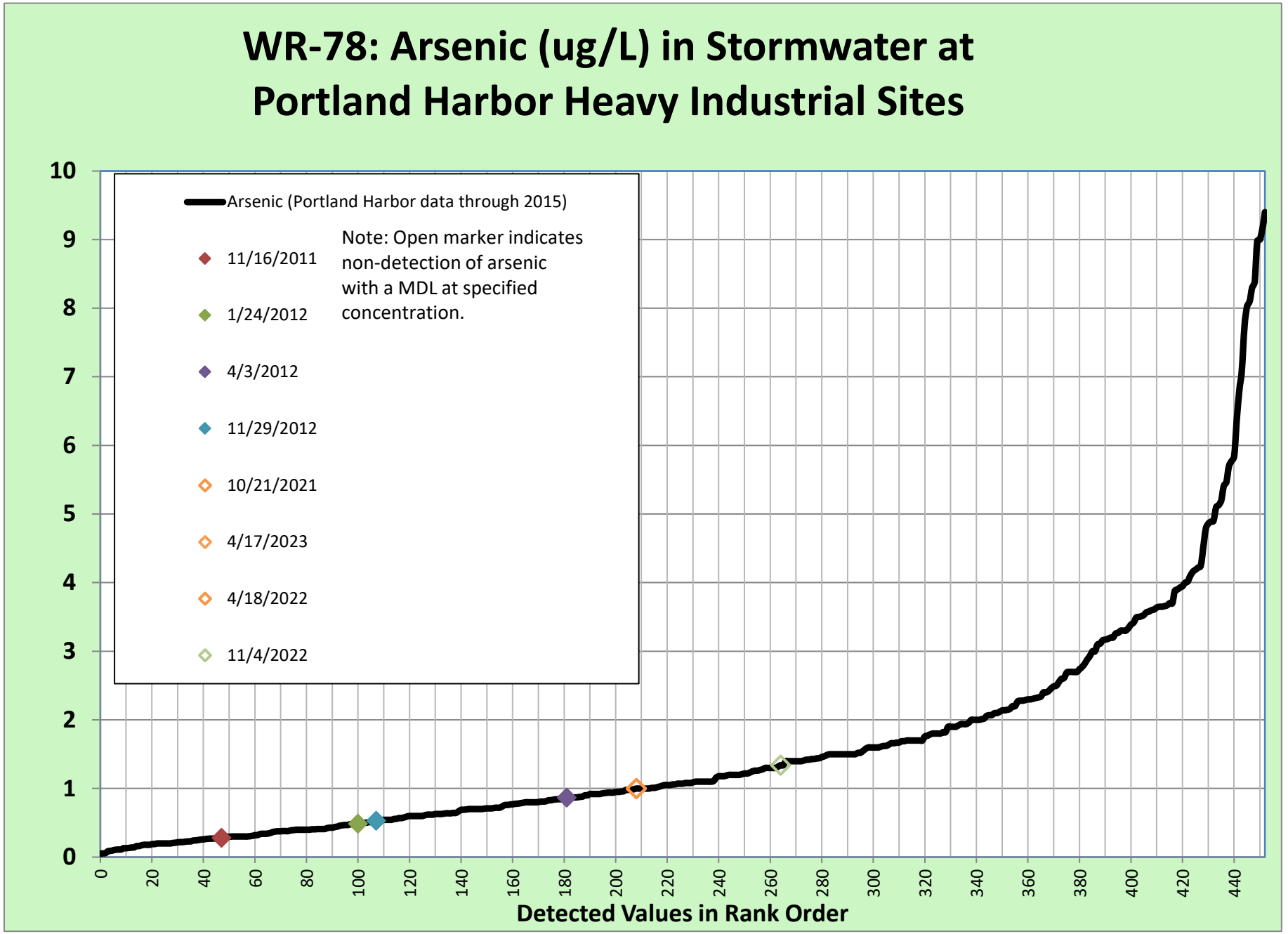
J = Reported result is an estimated value.

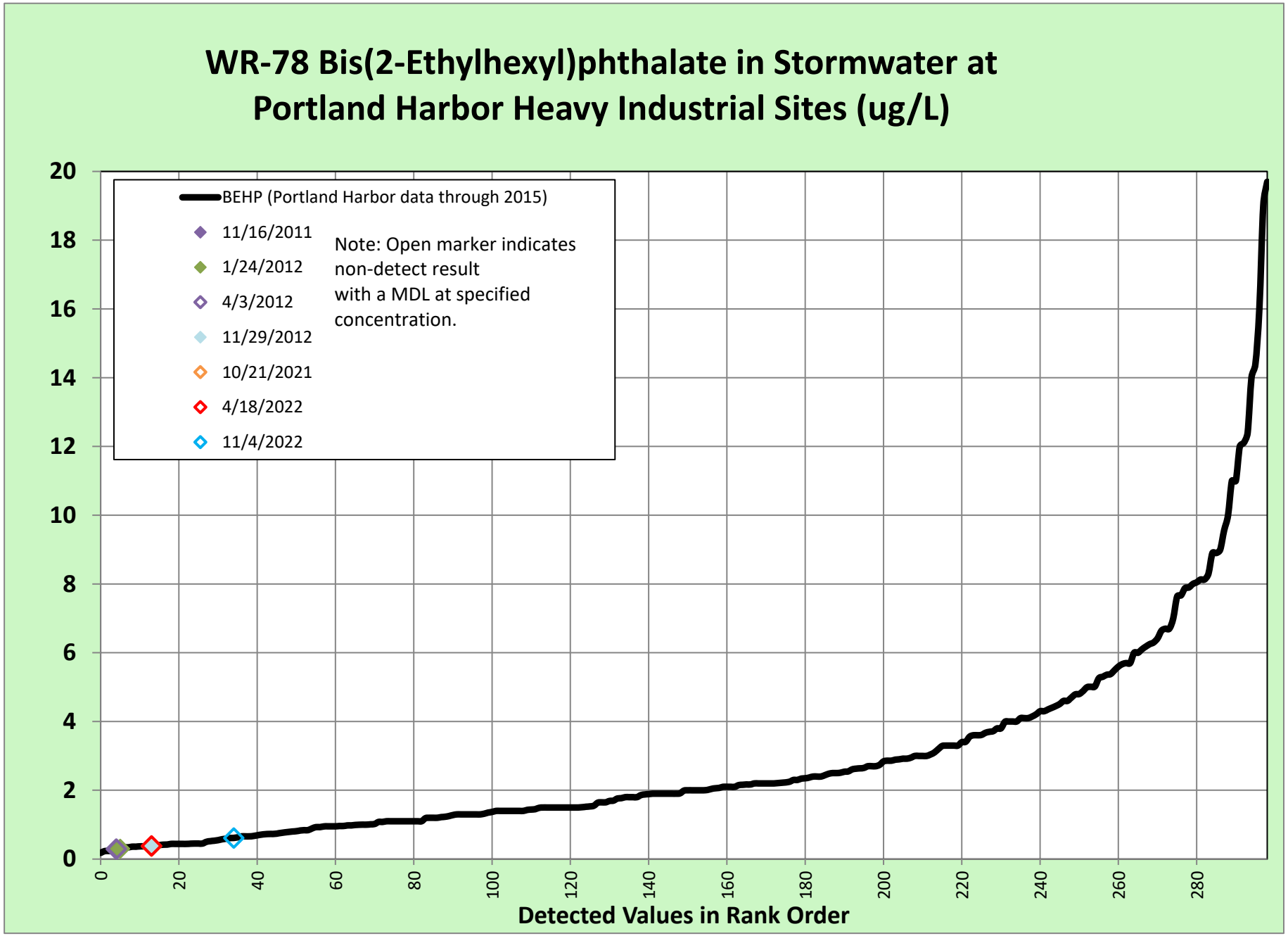
J3 = The associated batch QC was outside the established quality control range for precision.

# Attachment 8

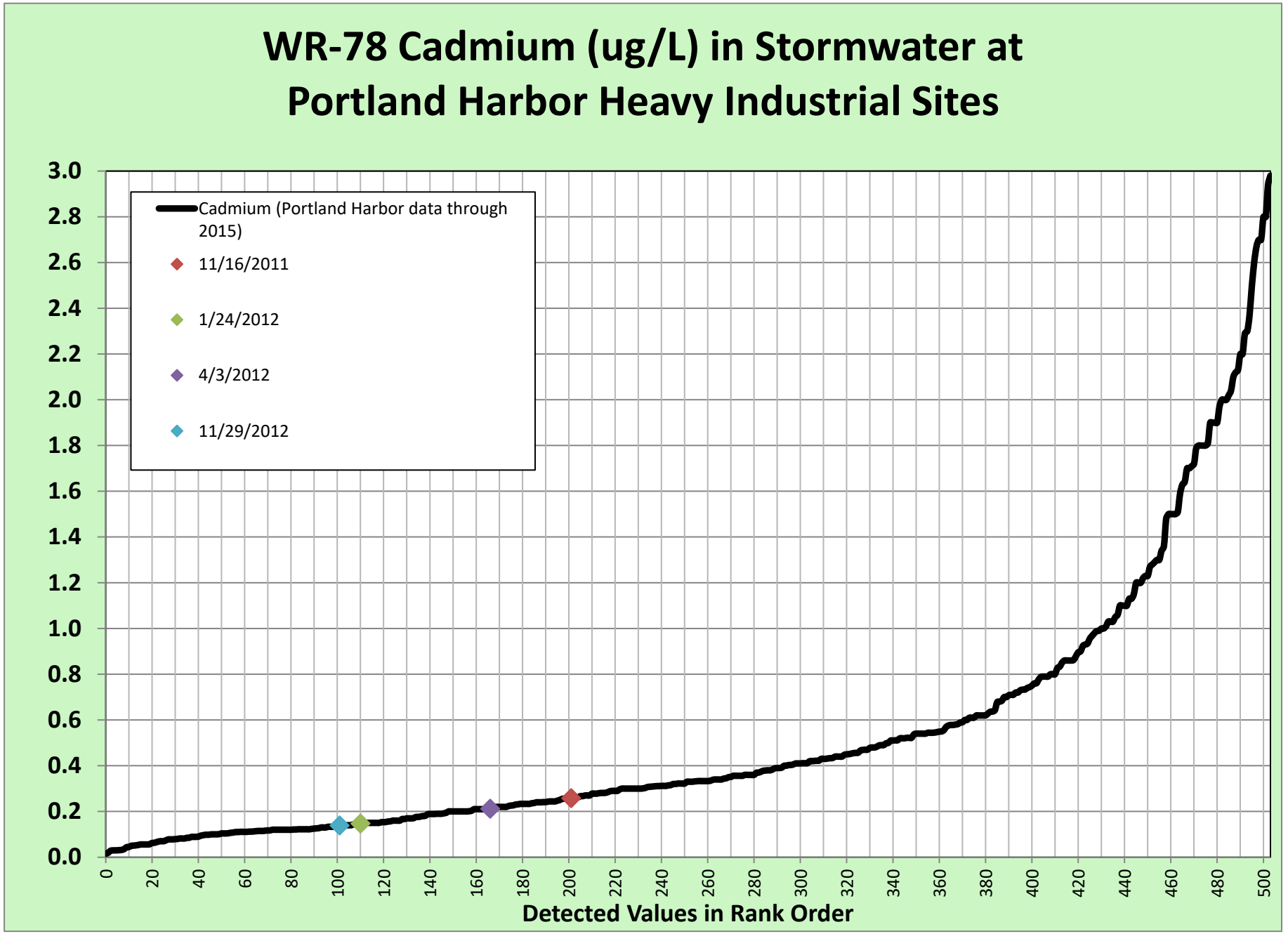
Stormwater Rank Order Curves – WR-78

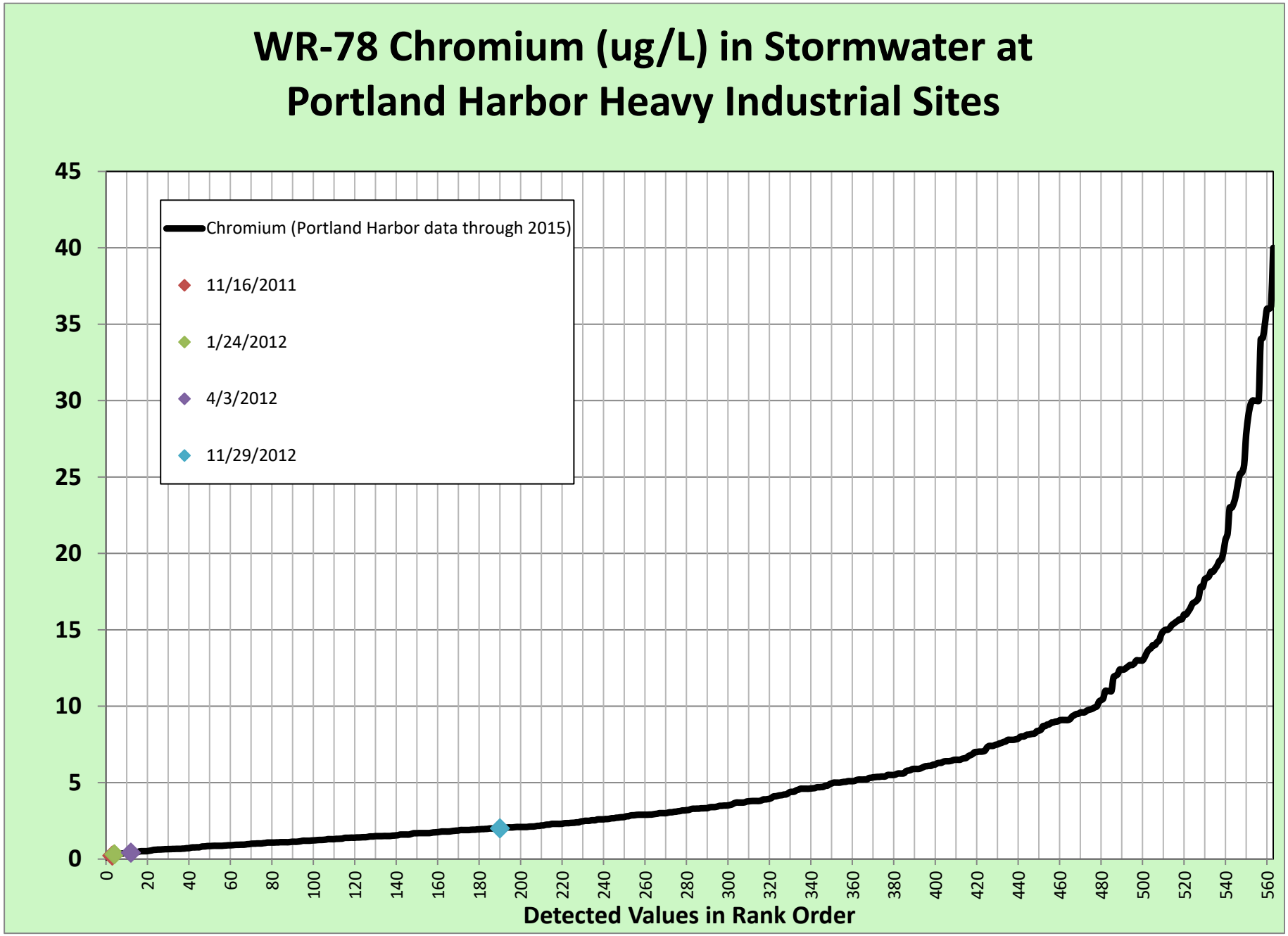
# WR-78: Arsenic (ug/L) in Stormwater at Portland Harbor Heavy Industrial Sites



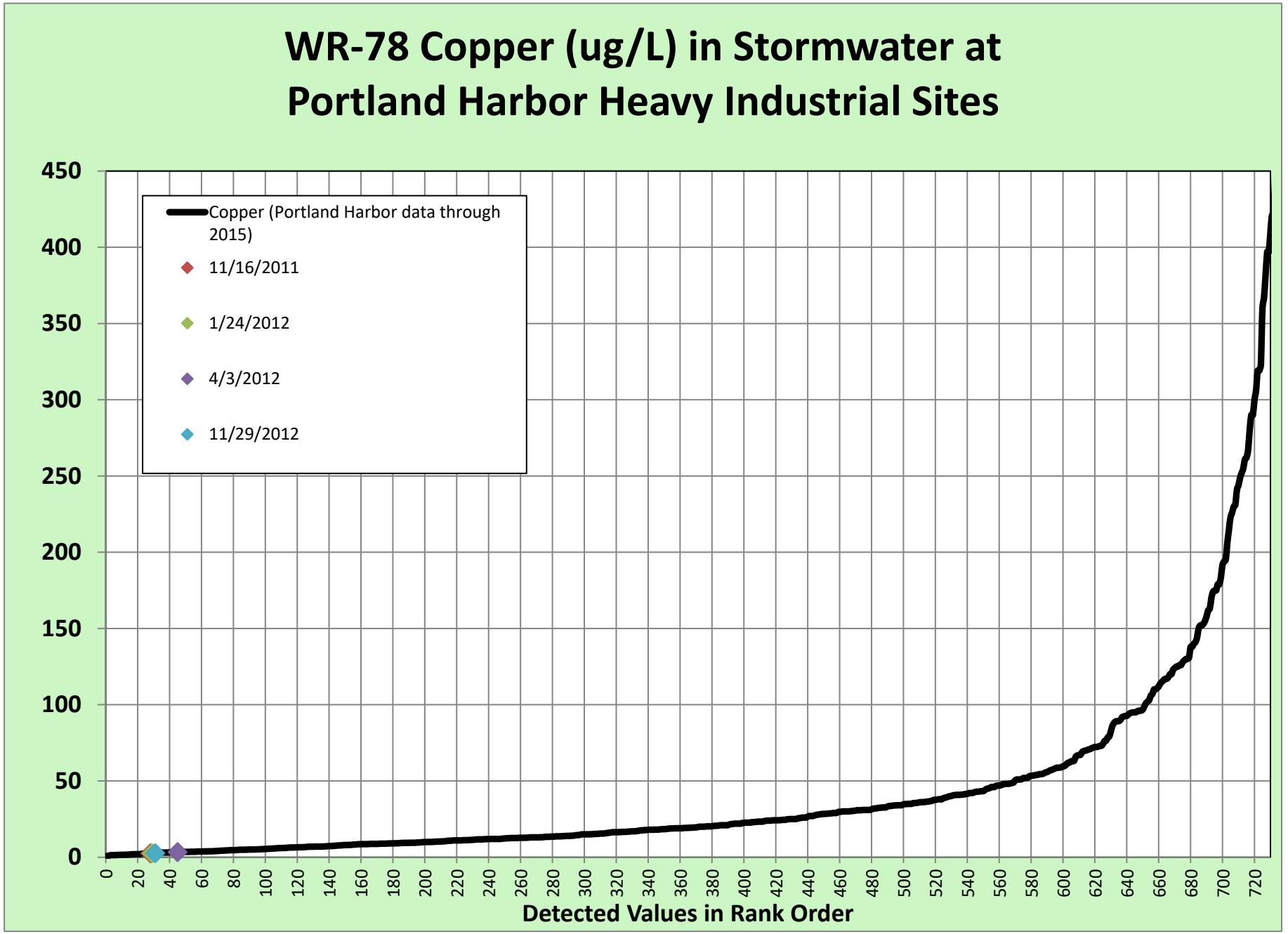

WR-78 Bis(2-Ethylhexyl)phthalate in Stormwater at Portland Harbor Heavy Industrial Sites (ug/L)
BEHP (Portland Harbor data through 2015)
11/16/2011
1/24/2012
4/3/2012
11/29/2012
10/21/2021
4/18/2022
11/4/2022
Note: Open marker indicates non-detect result with a MDL at specified concentration.
20
18
16
14
12
10
8
6
4
2
0
0
20
40
60
80
100
120
140
160
180
200
220
240
260
280
Detected Values in Rank Order

# WR-78 Cadmium (ug/L) in Stormwater at Portland Harbor Heavy Industrial Sites

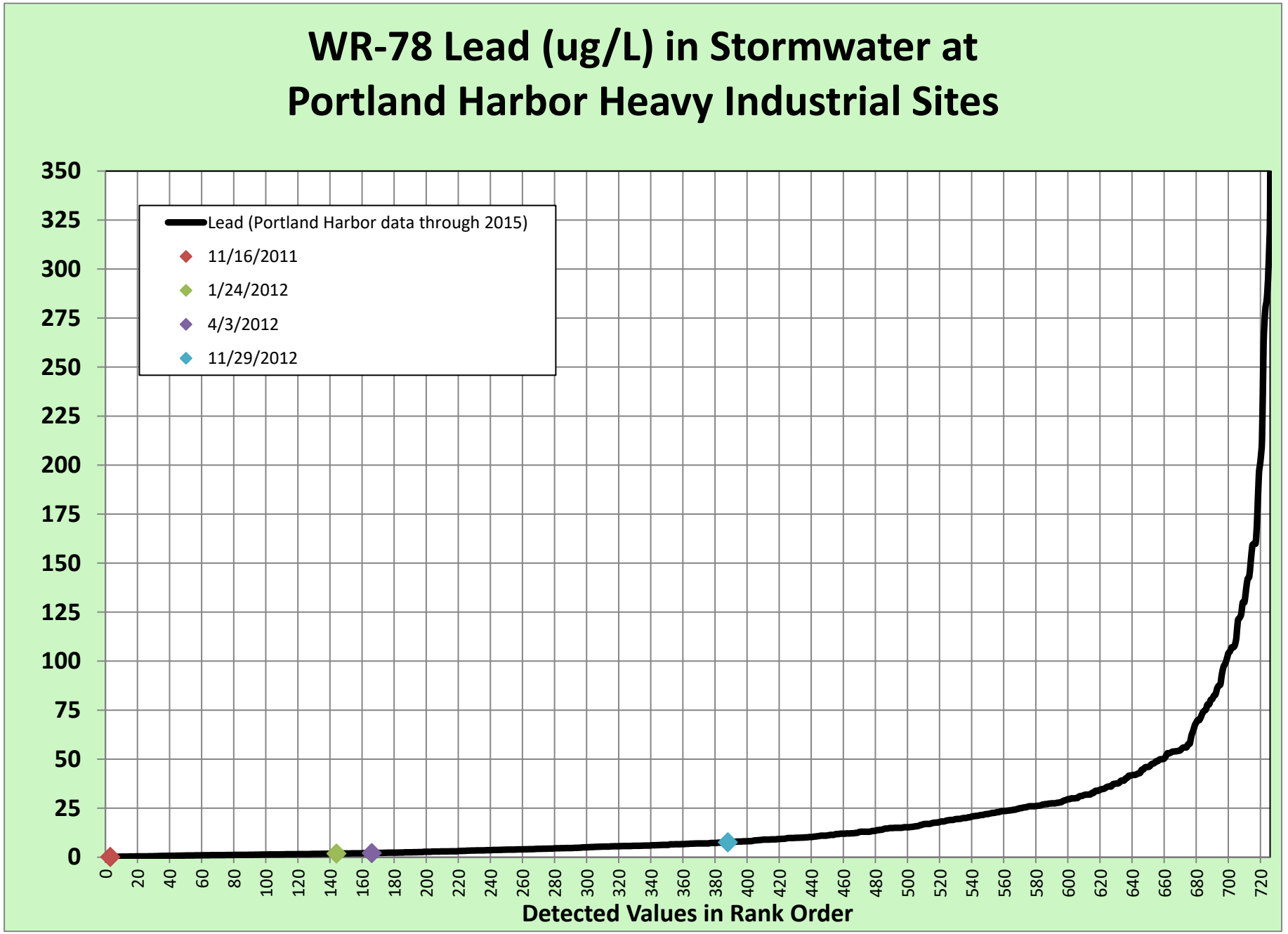


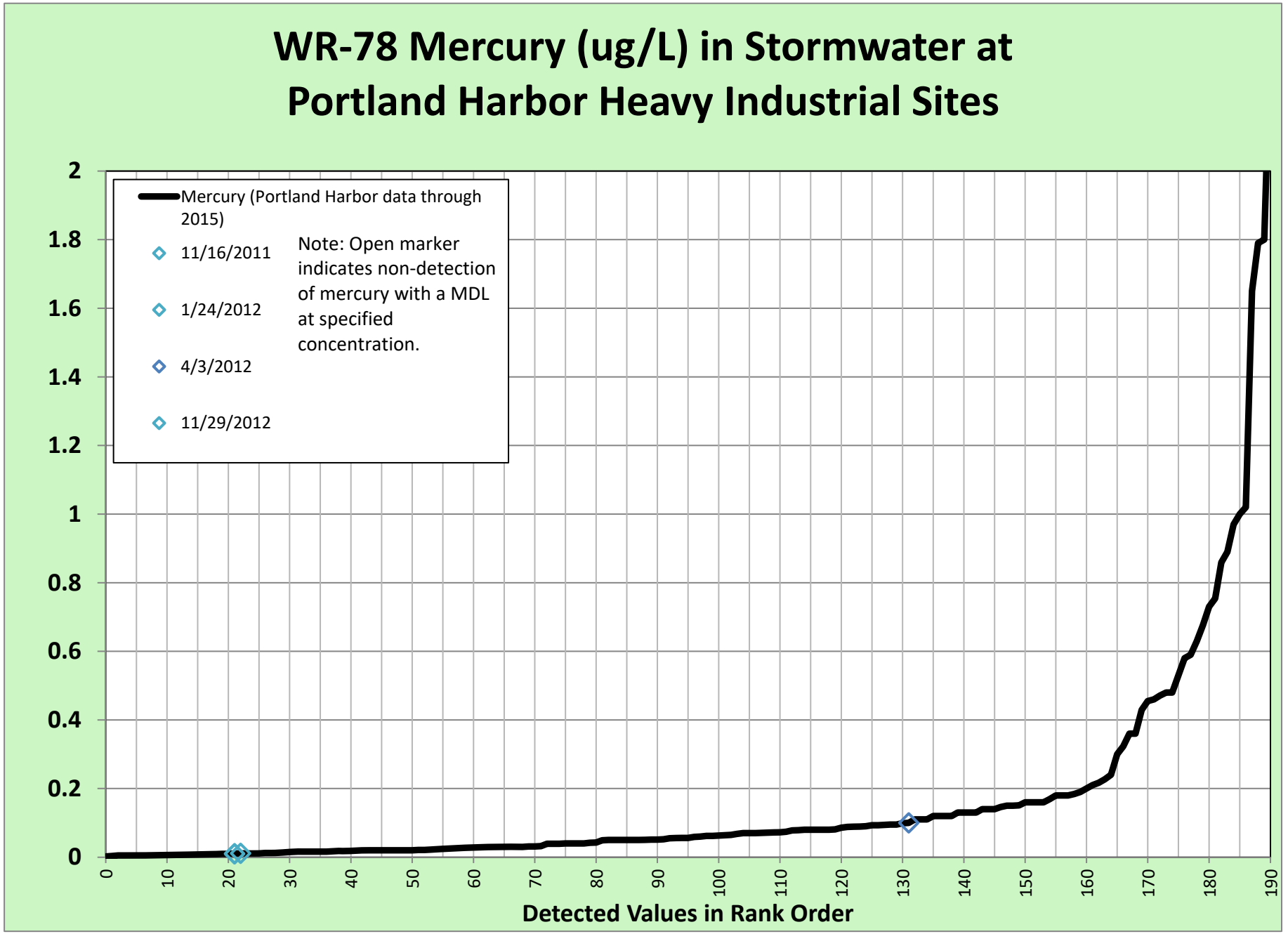

WR-78 Chromium (ug/L) in Stormwater at Portland Harbor Heavy Industrial Sites
Chromium (Portland Harbor data through 2015)
11/16/2011
1/24/2012
4/3/2012
11/29/2012
45
40
35
30
25
20
15
10
5
0
0
20
40
60
80
100
120
140
160
180
200
220
240
260
280
300
320
340
360
380
400
420
440
460
480
500
520
540
560
Detected Values in Rank Order

# WR-78 Copper (ug/L) in Stormwater at Portland Harbor Heavy Industrial Sites

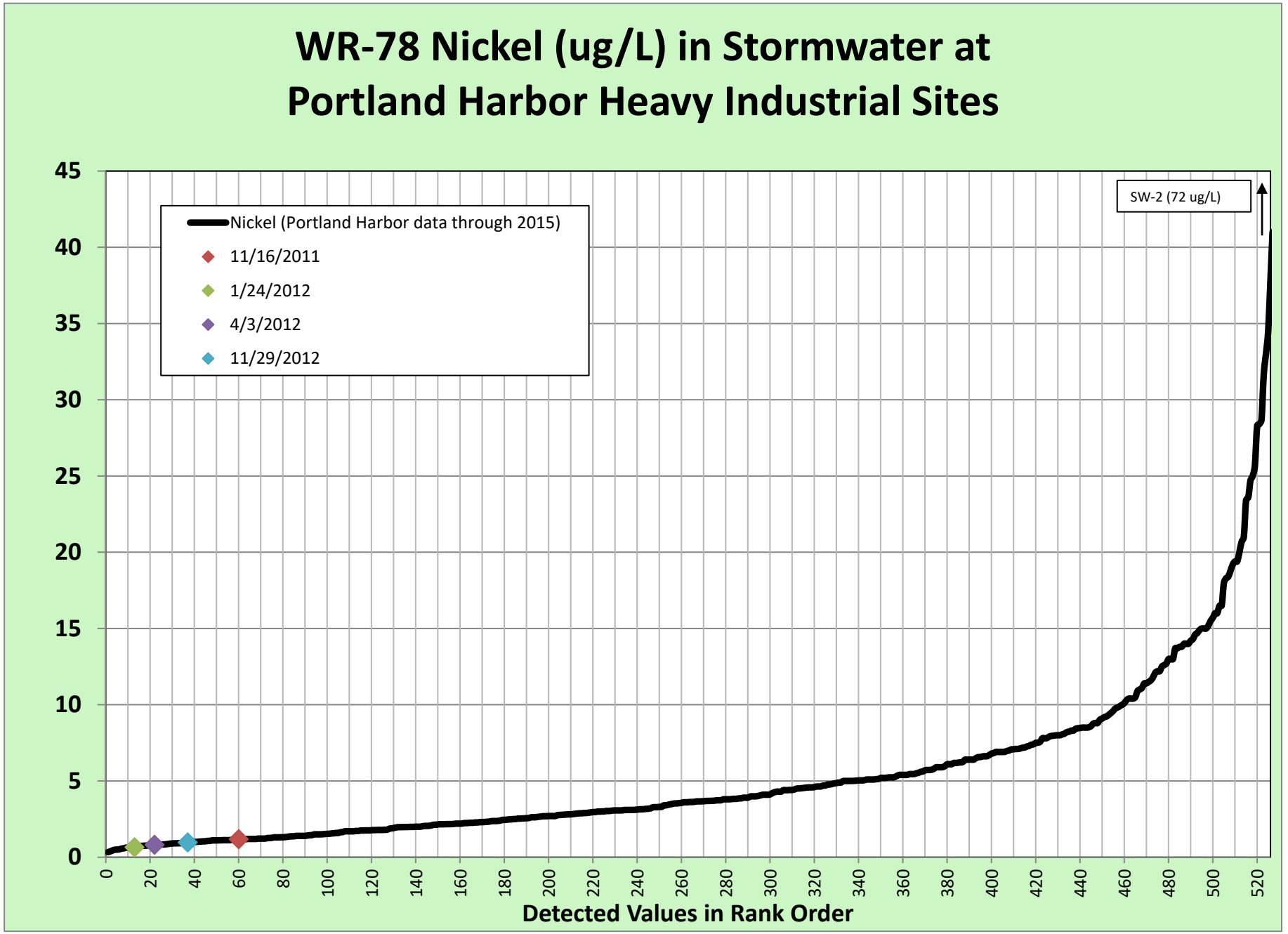


# WR-78 Lead (ug/L) in Stormwater at Portland Harbor Heavy Industrial Sites

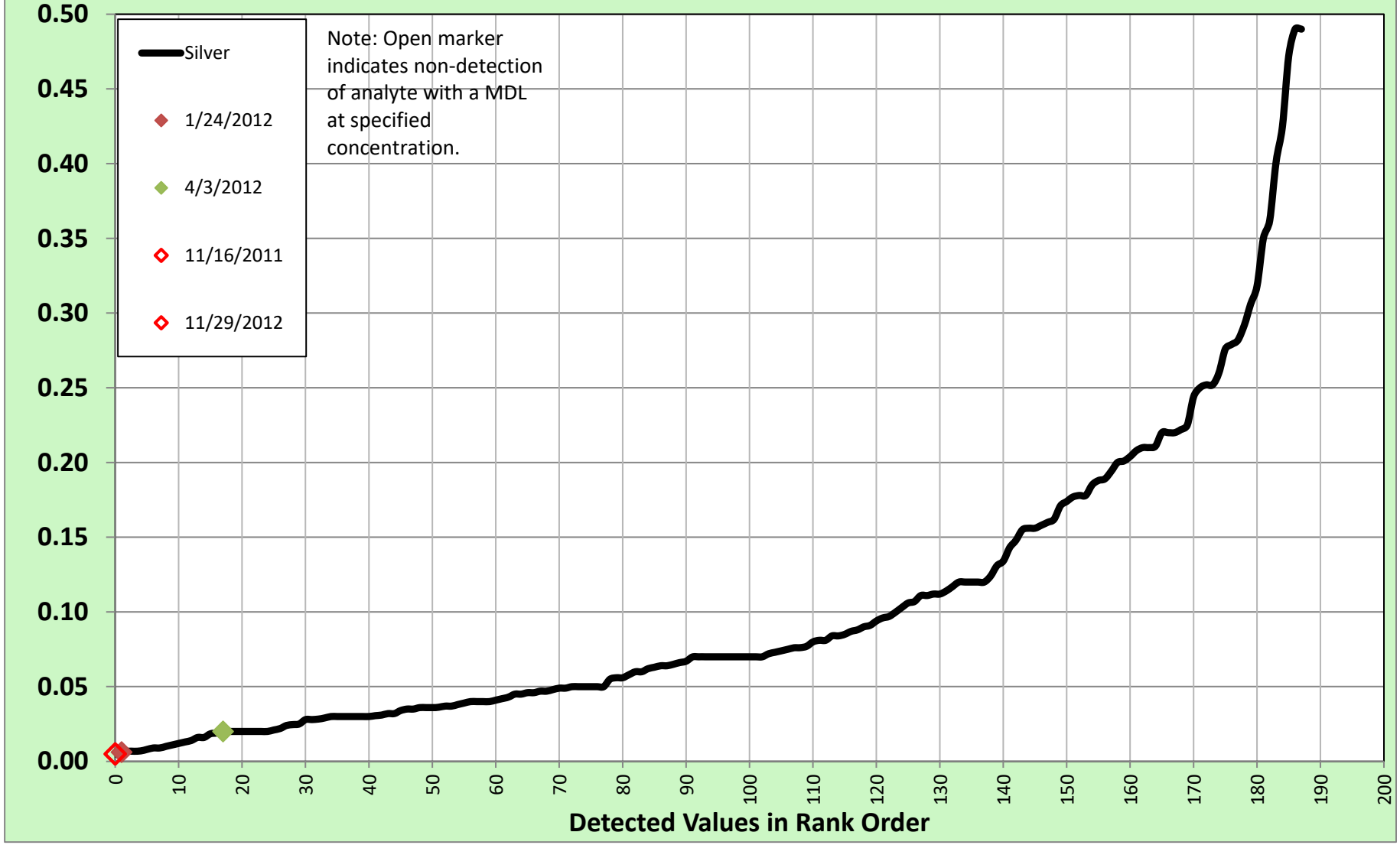


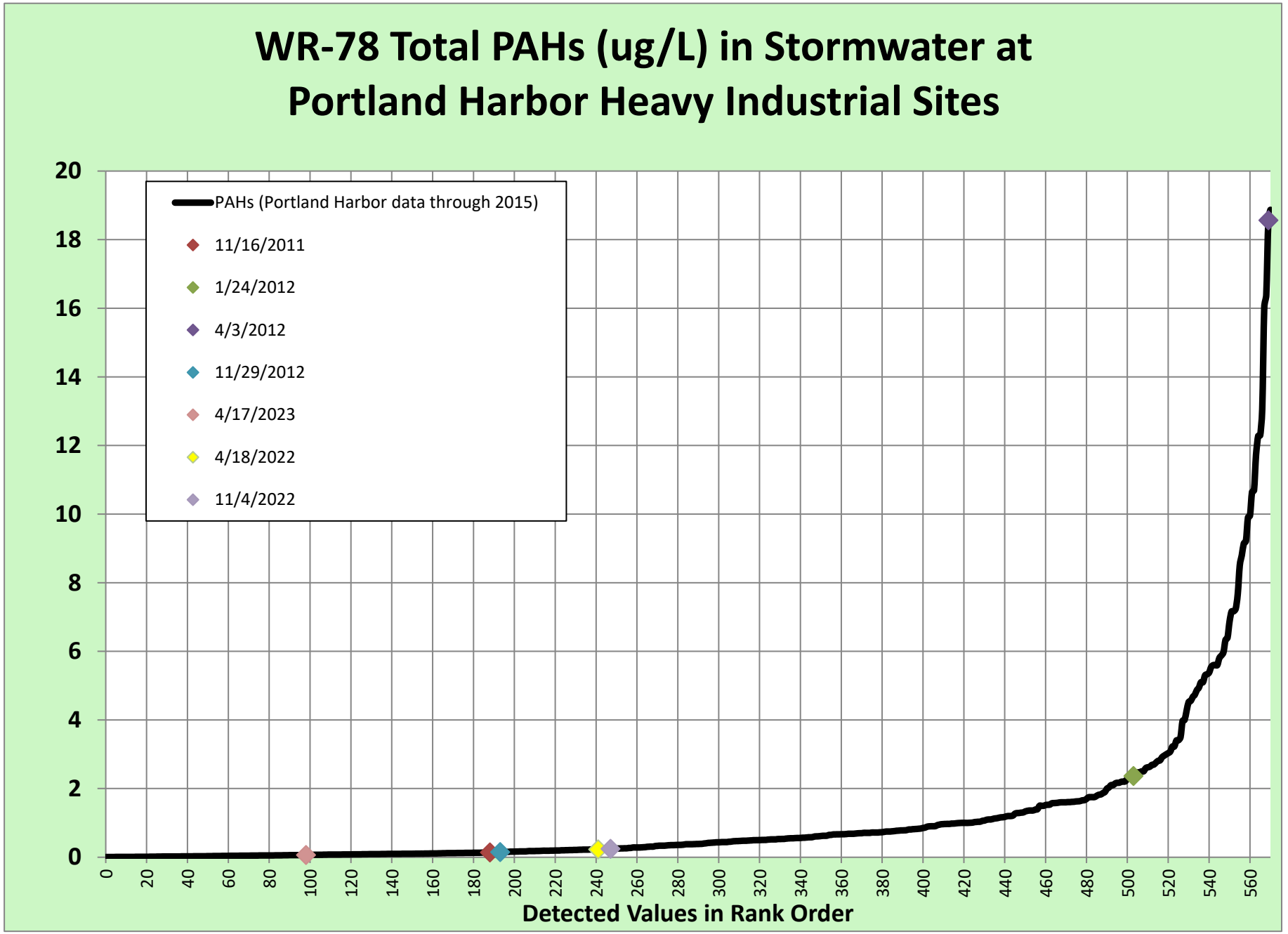

WR-78 Mercury (ug/L) in Stormwater at Portland Harbor Heavy Industrial Sites
Mercury (Portland Harbor data through 2015)
11/16/2011
1/24/2012
4/3/2012
11/29/2012
Note: Open marker indicates non-detection of mercury with a MDL at specified concentration.
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190
Detected Values in Rank Order

# WR-78 Nickel (ug/L) in Stormwater at Portland Harbor Heavy Industrial Sites

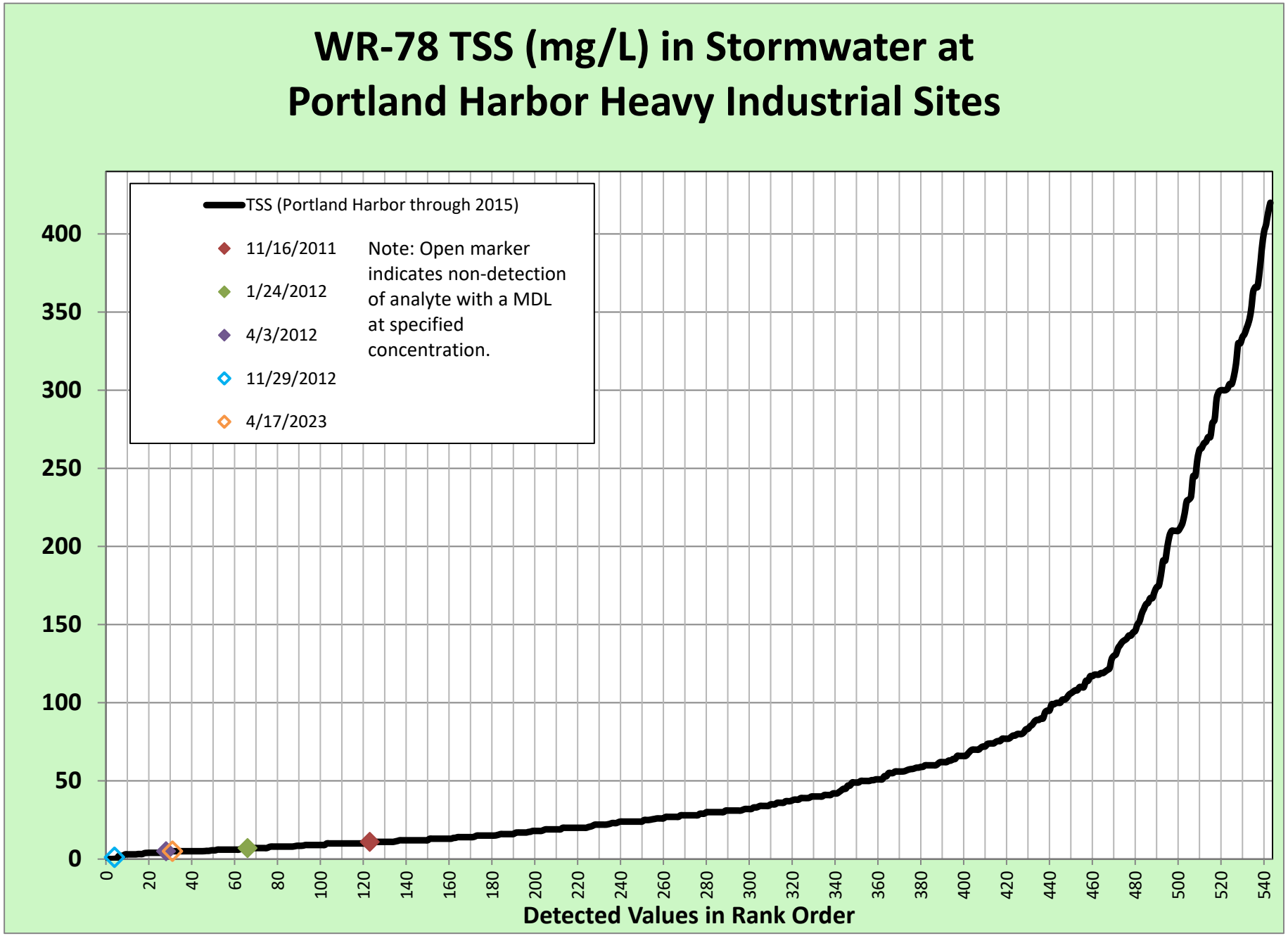


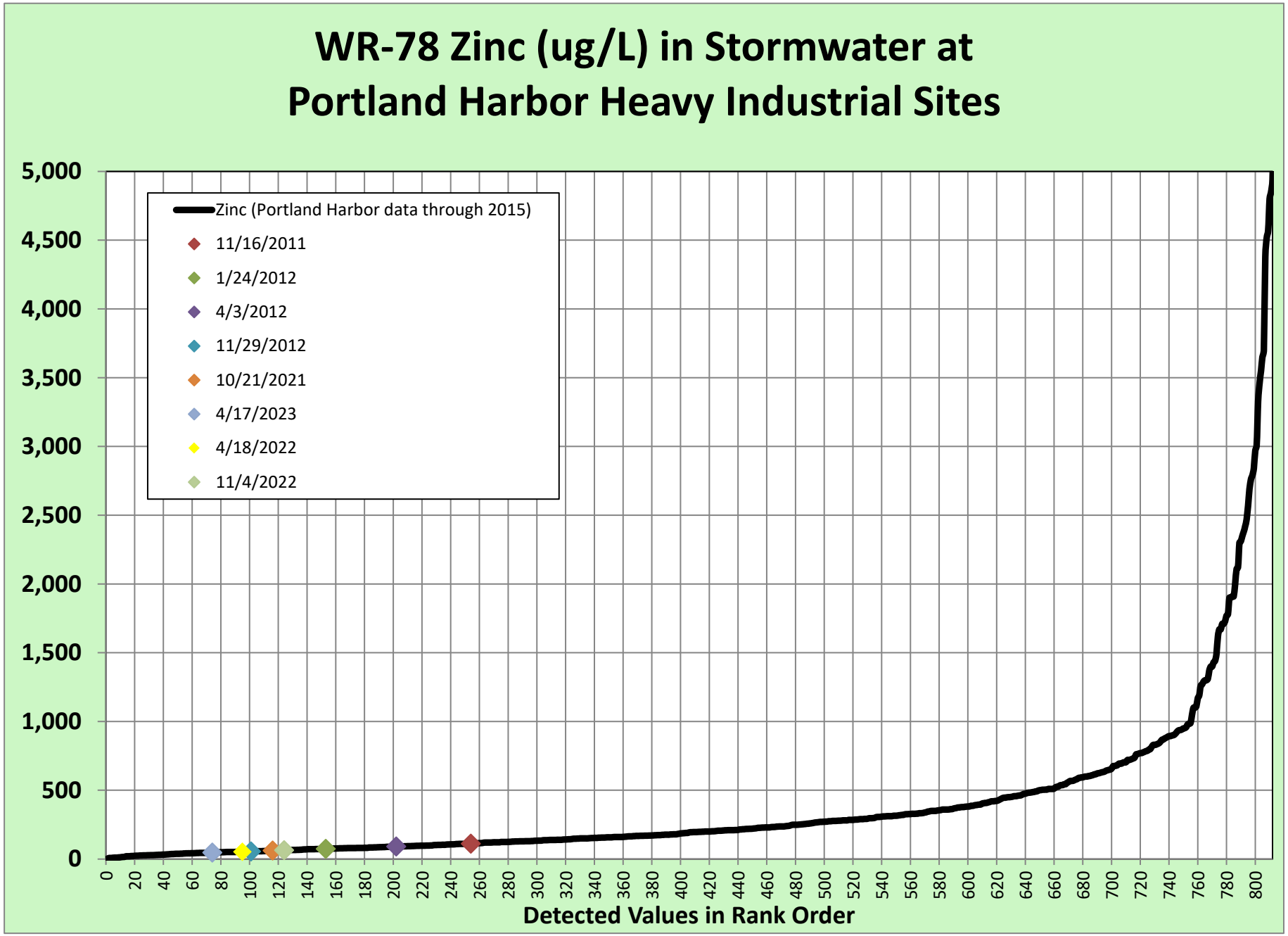
# WR-78 Silver (ug/L) in Stormwater at Portland Harbor Heavy Industrial Sites




WR-78 Total PAHs (ug/L) in Stormwater at Portland Harbor Heavy Industrial Sites
PAHs (Portland Harbor data through 2015)
11/16/2011
1/24/2012
4/3/2012
11/29/2012
4/17/2023
4/18/2022
11/4/2022
20
18
16
14
12
10
8
6
4
2
0
0
20
40
60
80
100
120
140
160
180
200
220
240
260
280
300
320
340
360
380
400
420
440
460
480
500
520
540
560
Detected Values in Rank Order

# WR-78 TSS (mg/L) in Stormwater at Portland Harbor Heavy Industrial Sites

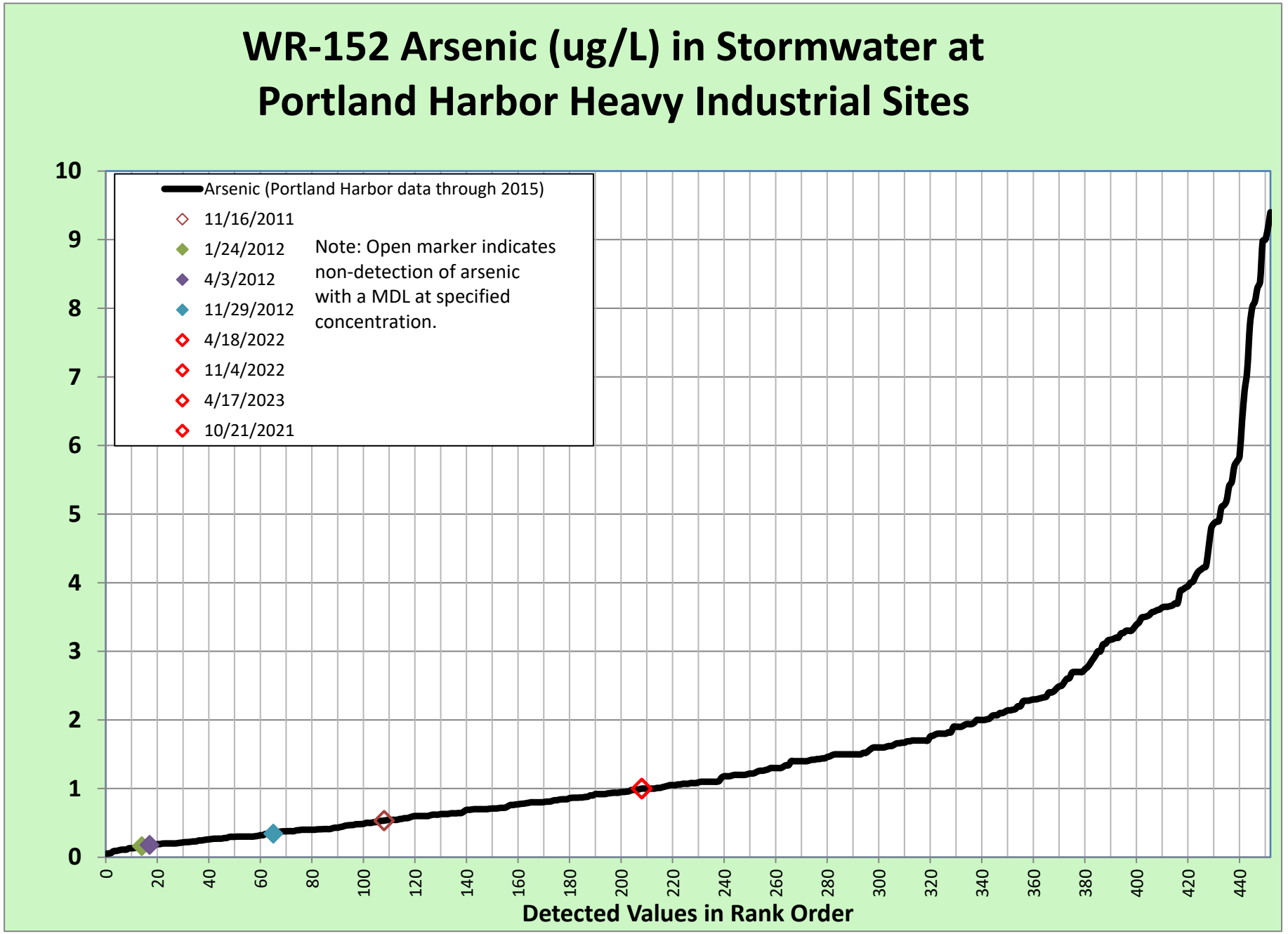


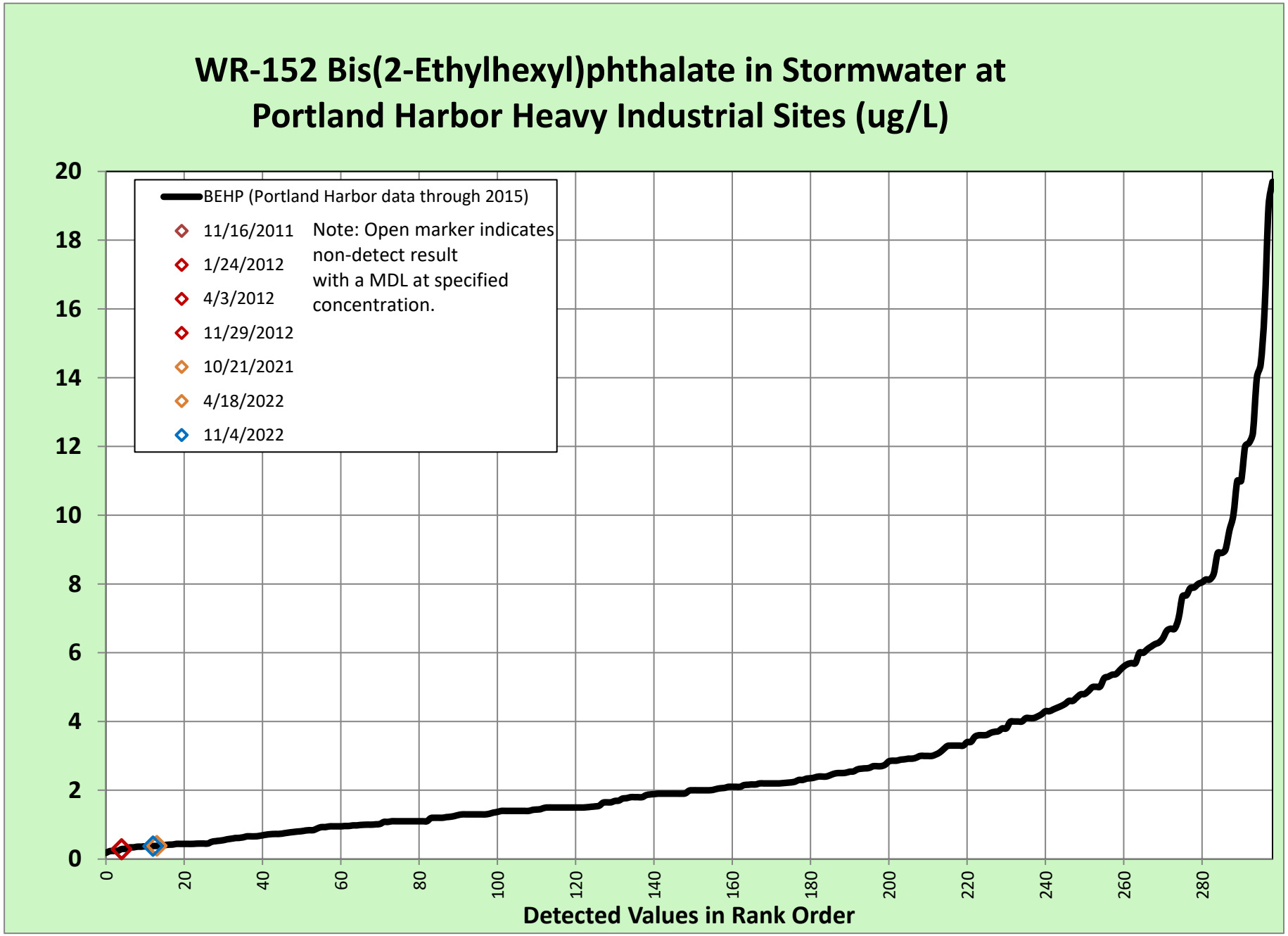

WR-78 Zinc (ug/L) in Stormwater at
Portland Harbor Heavy Industrial Sites
5,000
4,500
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
Zinc (Portland Harbor data through 2015)
11/16/2011
1/24/2012
4/3/2012
11/29/2012
10/21/2021
4/17/2023
4/18/2022
11/4/2022
0
20
40
60
80
100
120
140
160
180
200
220
240
260
280
300
320
340
360
380
400
420
440
460
480
500
520
540
560
580
600
620
640
660
680
700
720
740
760
780
800
Detected Values in Rank Order

# Attachment 9

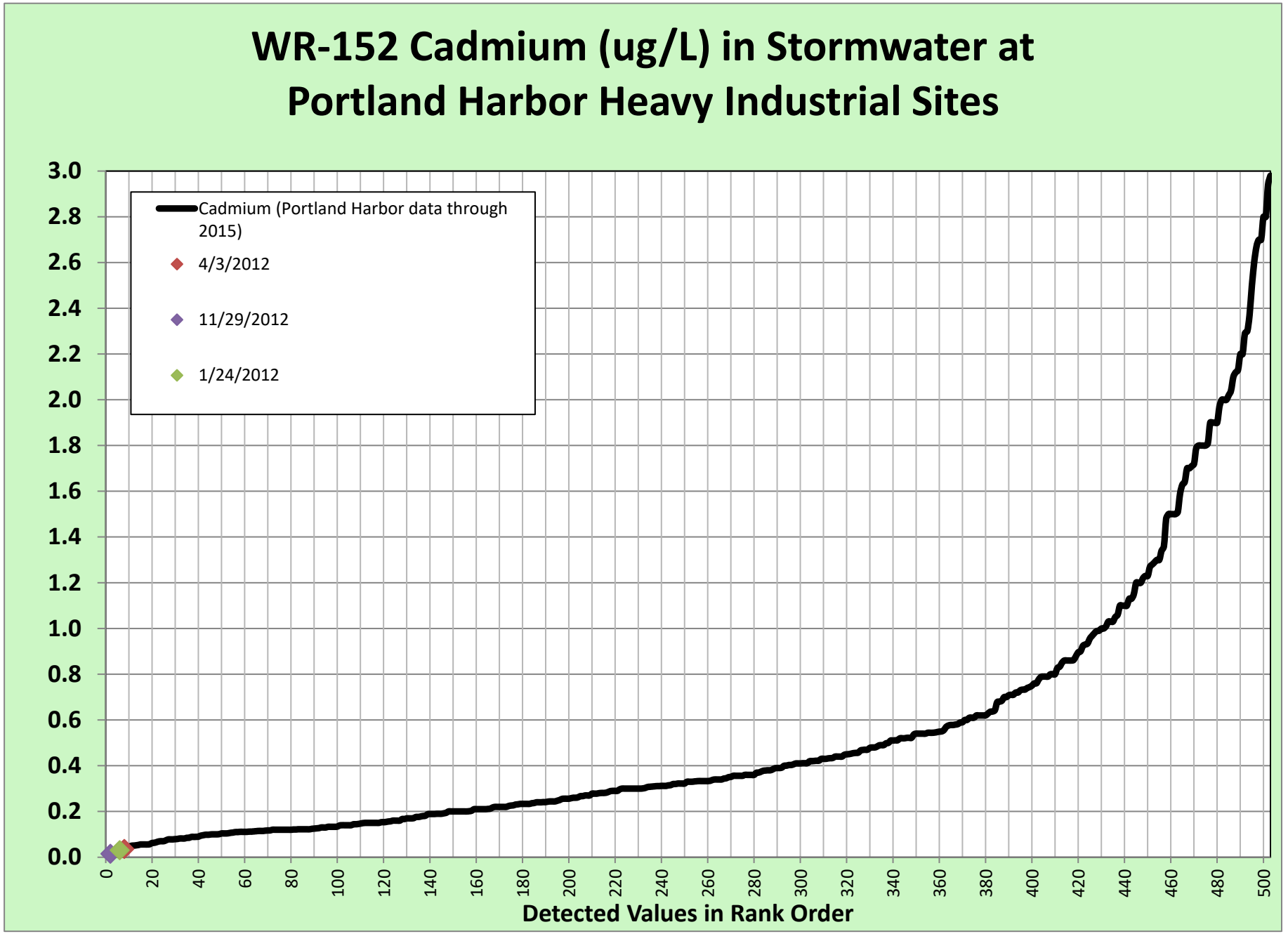
Stormwater Rank Order Curves – WR-152

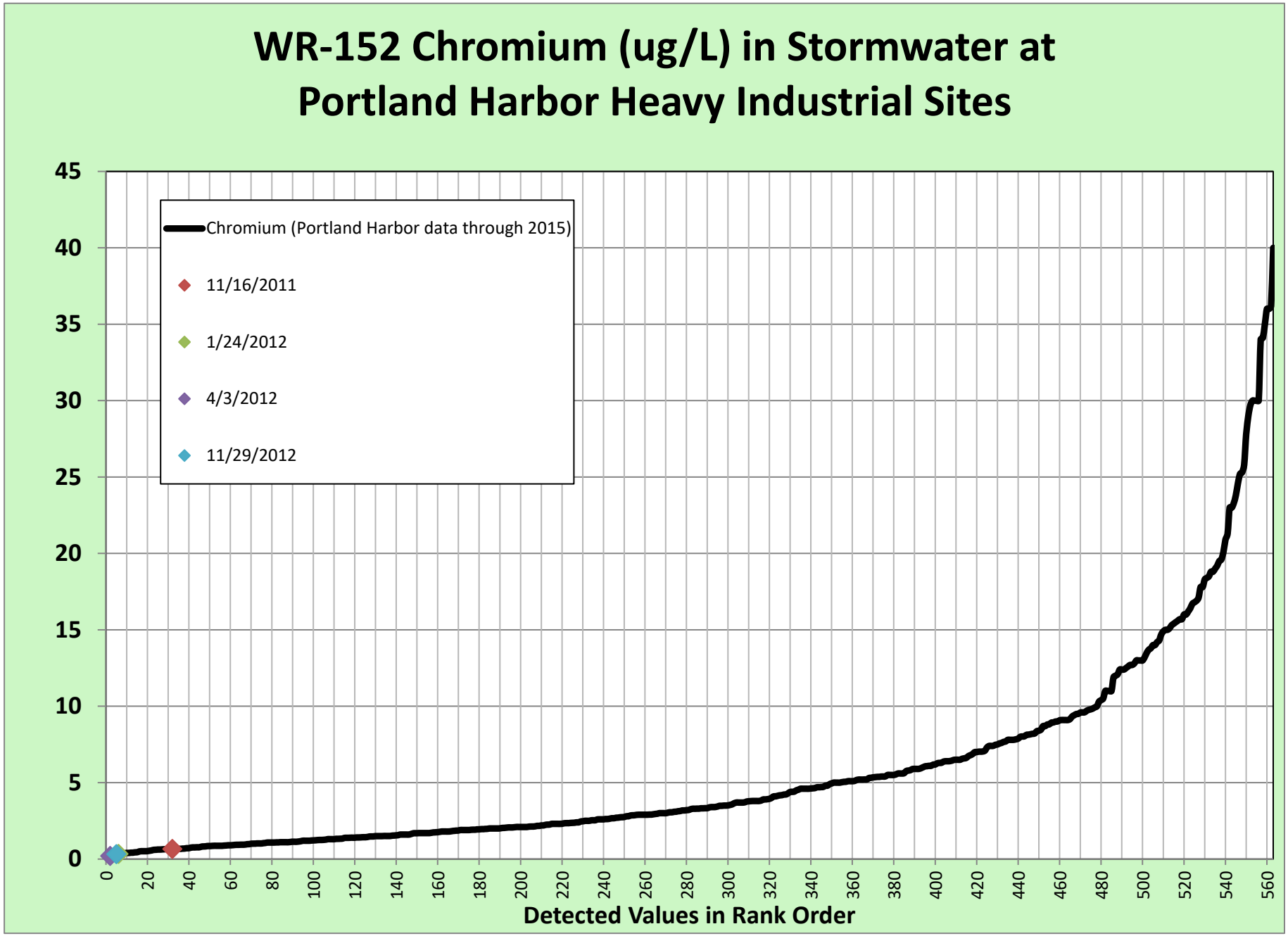
# WR-152 Arsenic (ug/L) in Stormwater at Portland Harbor Heavy Industrial Sites



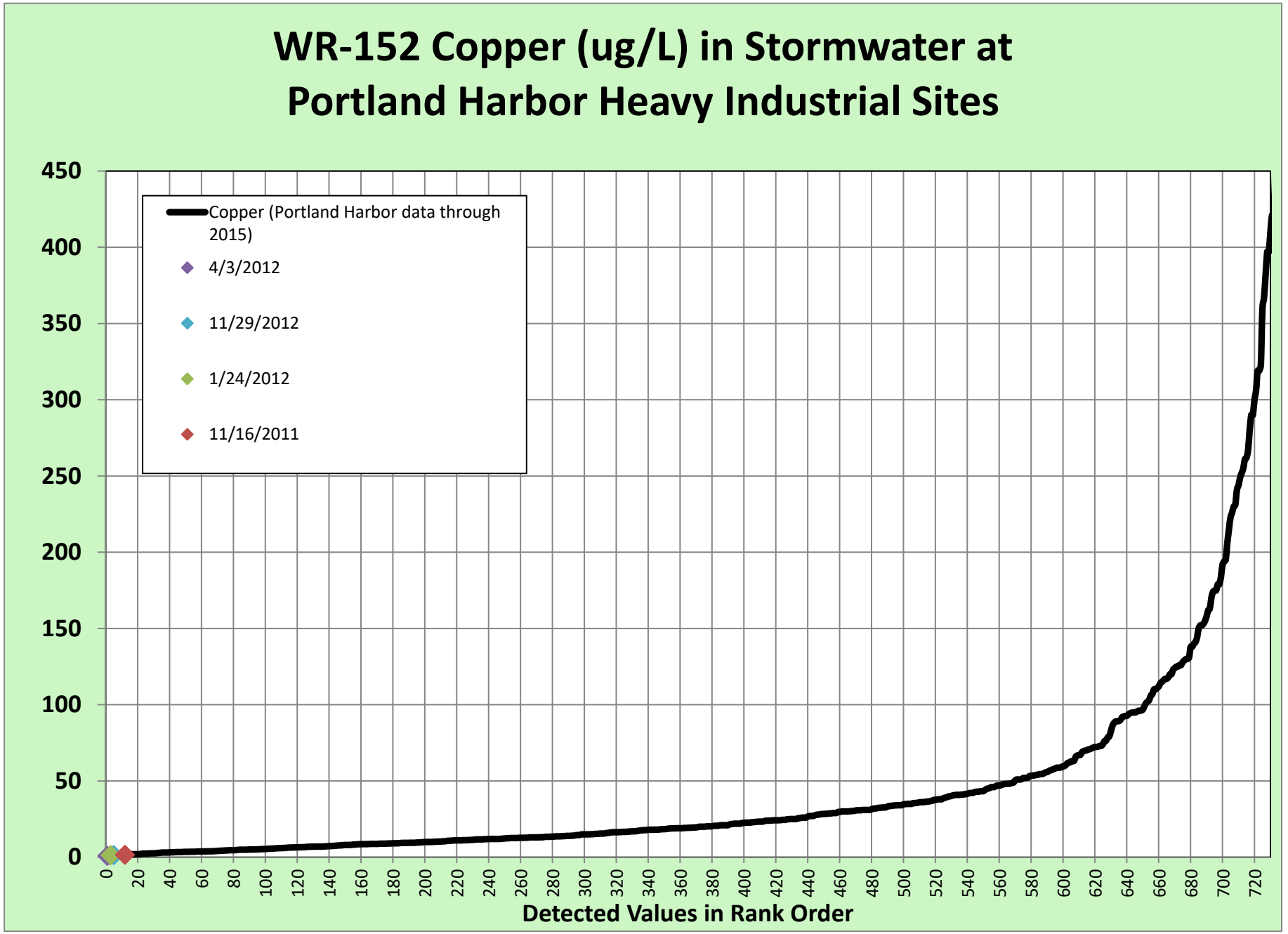

WR-152 Bis(2-Ethylhexyl)phthalate in Stormwater at Portland Harbor Heavy Industrial Sites (ug/L)
BEHP (Portland Harbor data through 2015)
11/16/2011
1/24/2012
4/3/2012
11/29/2012
10/21/2021
4/18/2022
11/4/2022
Note: Open marker indicates non-detect result with a MDL at specified concentration.
20
18
16
14
12
10
8
6
4
2
0
0
20
40
60
80
100
120
140
160
180
200
220
240
260
280
Detected Values in Rank Order

# WR-152 Cadmium (ug/L) in Stormwater at Portland Harbor Heavy Industrial Sites

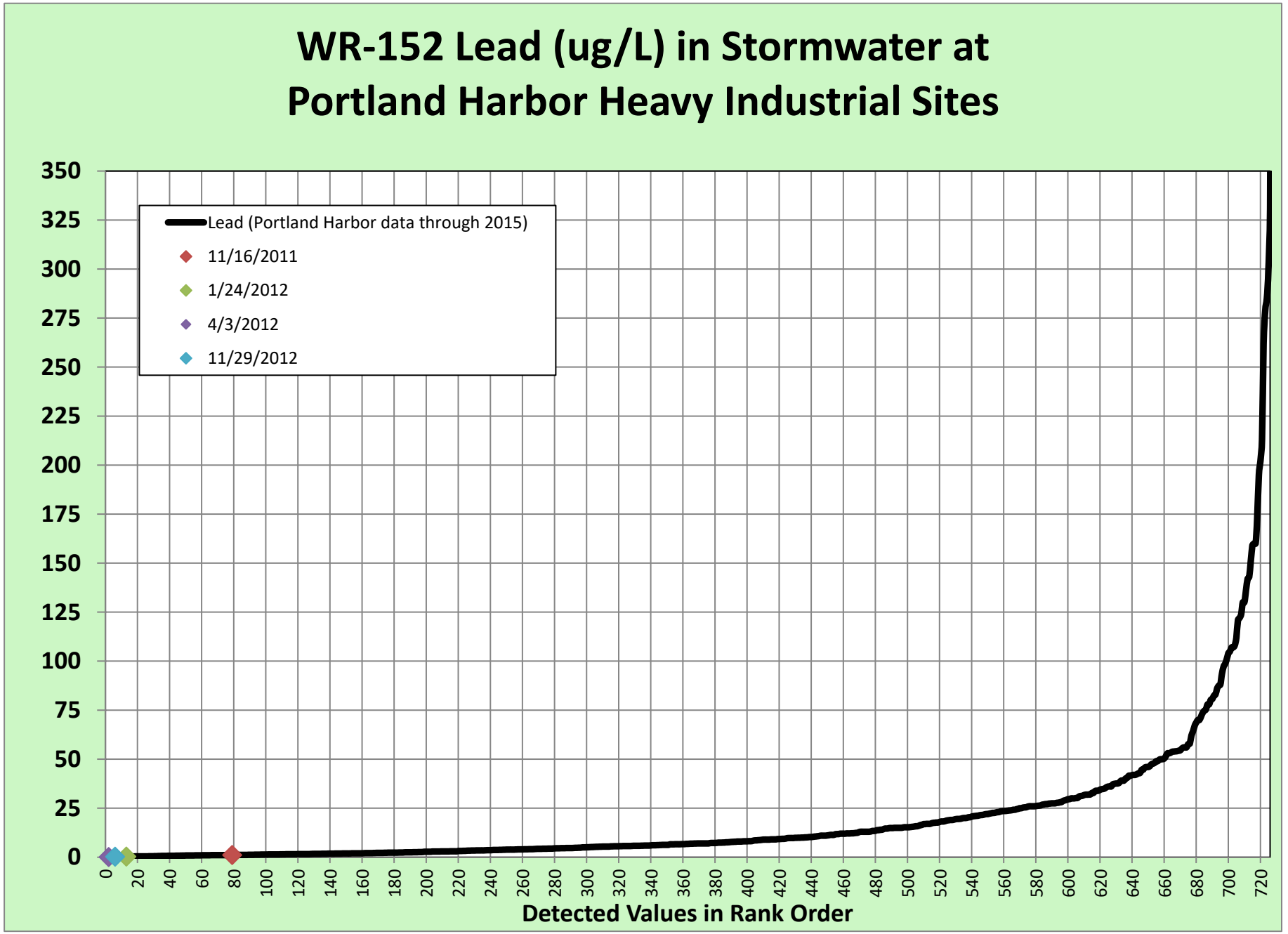



WR-152 Chromium (ug/L) in Stormwater at Portland Harbor Heavy Industrial Sites
Chromium (Portland Harbor data through 2015)
11/16/2011
1/24/2012
4/3/2012
11/29/2012
45
40
35
30
25
20
15
10
5
0
0
20
40
60
80
100
120
140
160
180
200
220
240
260
280
300
320
340
360
380
400
420
440
460
480
500
520
540
560
Detected Values in Rank Order

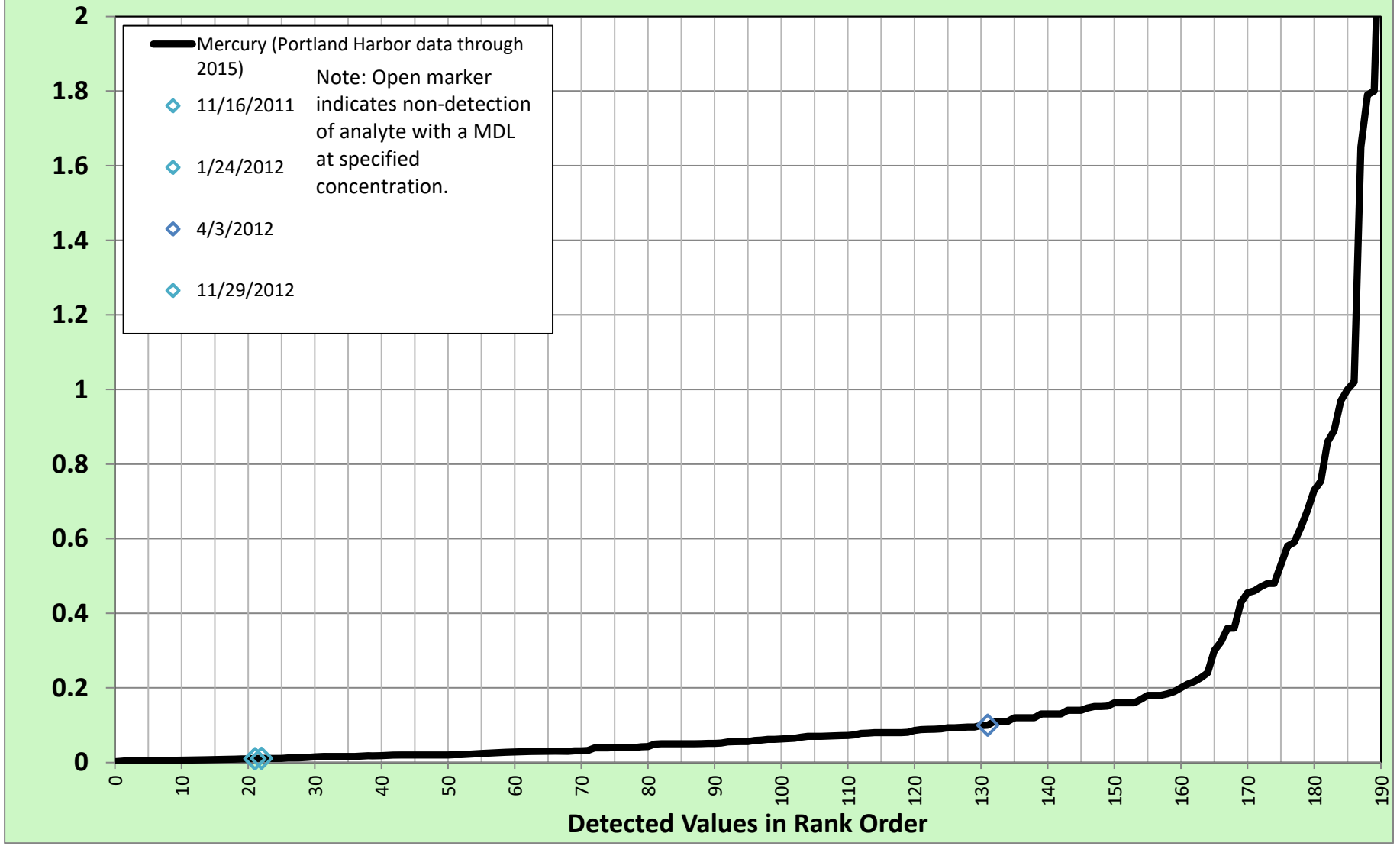
# WR-152 Copper (ug/L) in Stormwater at Portland Harbor Heavy Industrial Sites



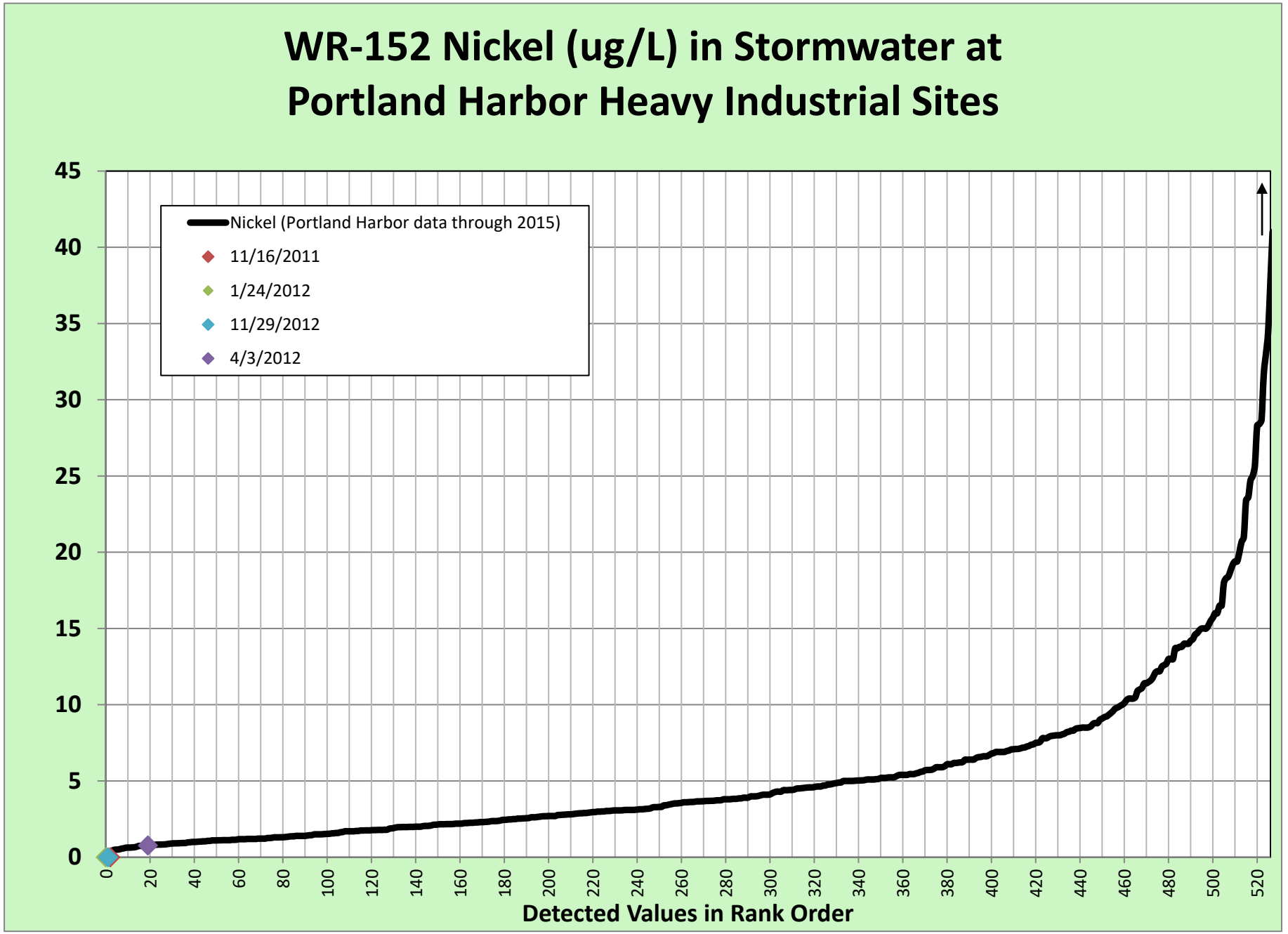
# WR-152 Lead (ug/L) in Stormwater at Portland Harbor Heavy Industrial Sites

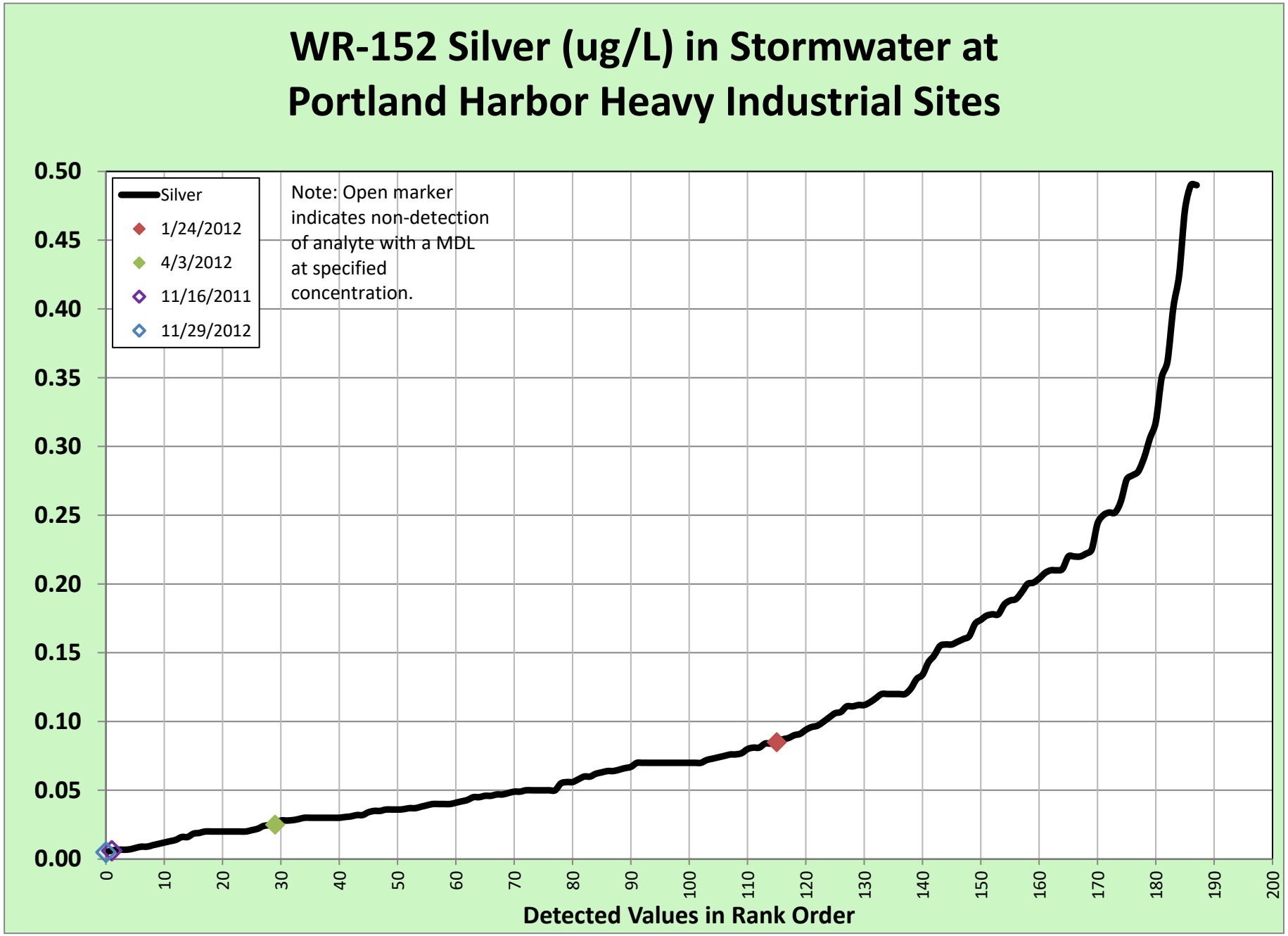


# WR-152 Mercury (ug/L) in Stormwater at Portland Harbor Heavy Industrial Sites

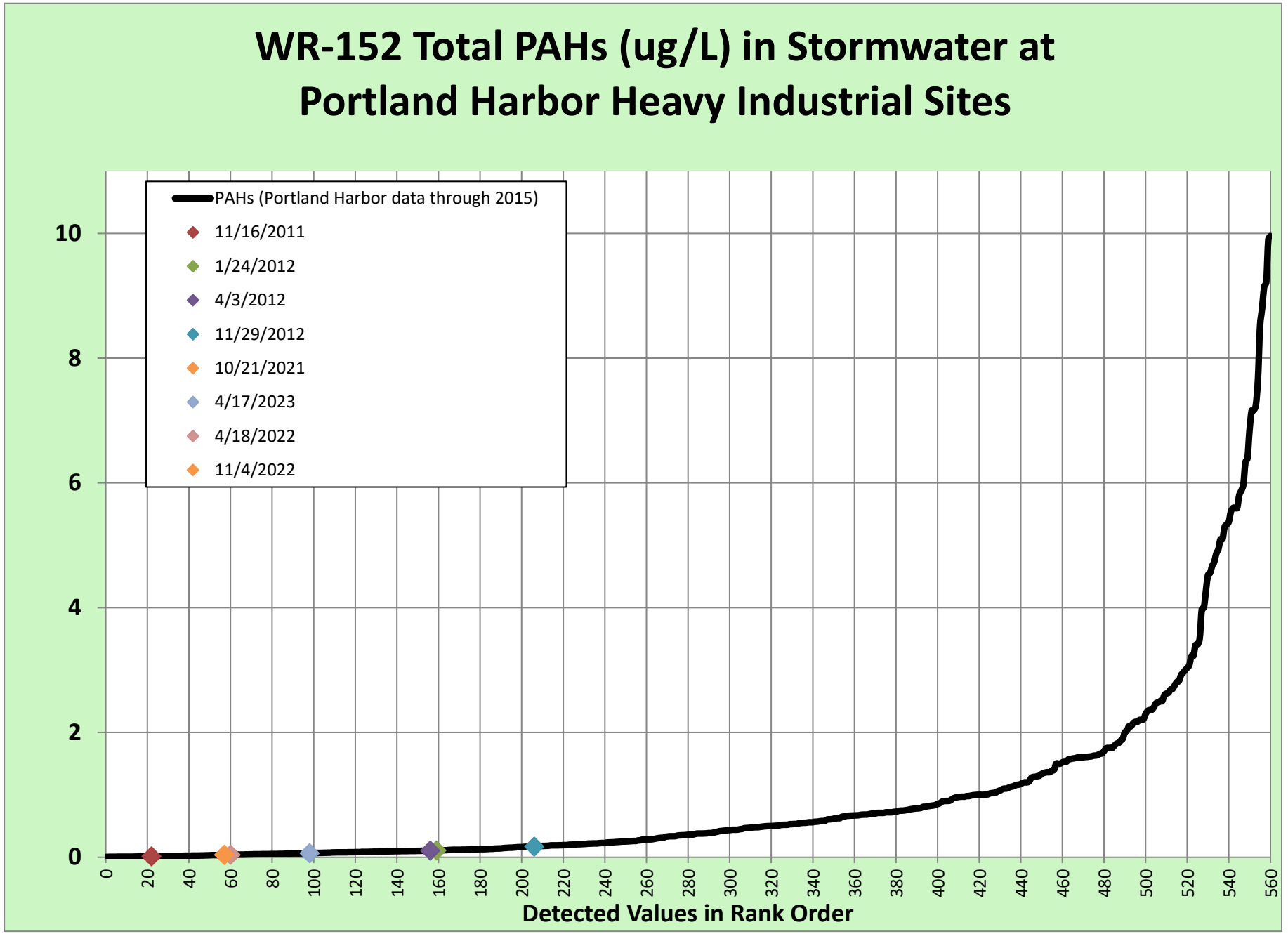


# WR-152 Nickel (ug/L) in Stormwater at Portland Harbor Heavy Industrial Sites

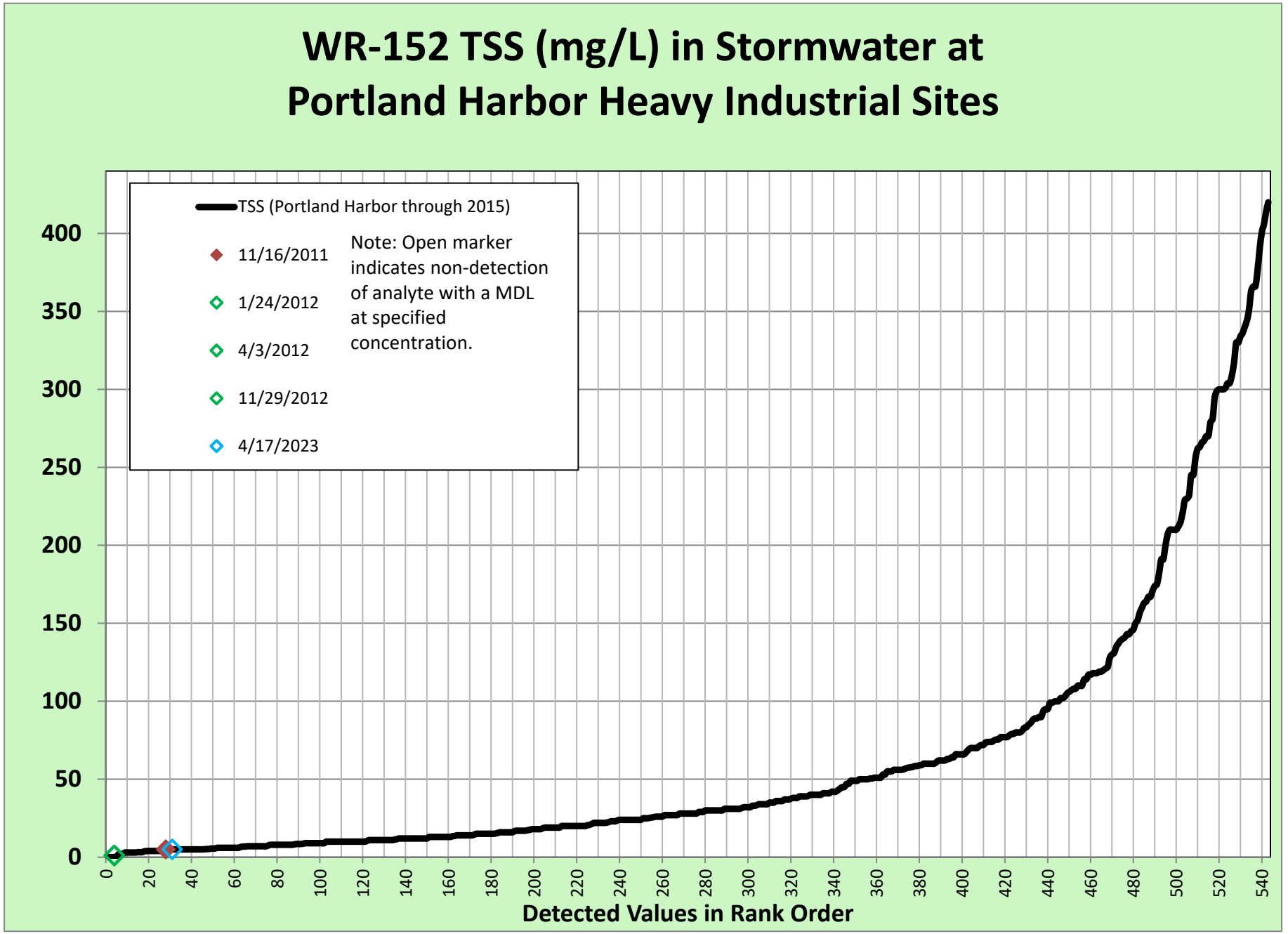


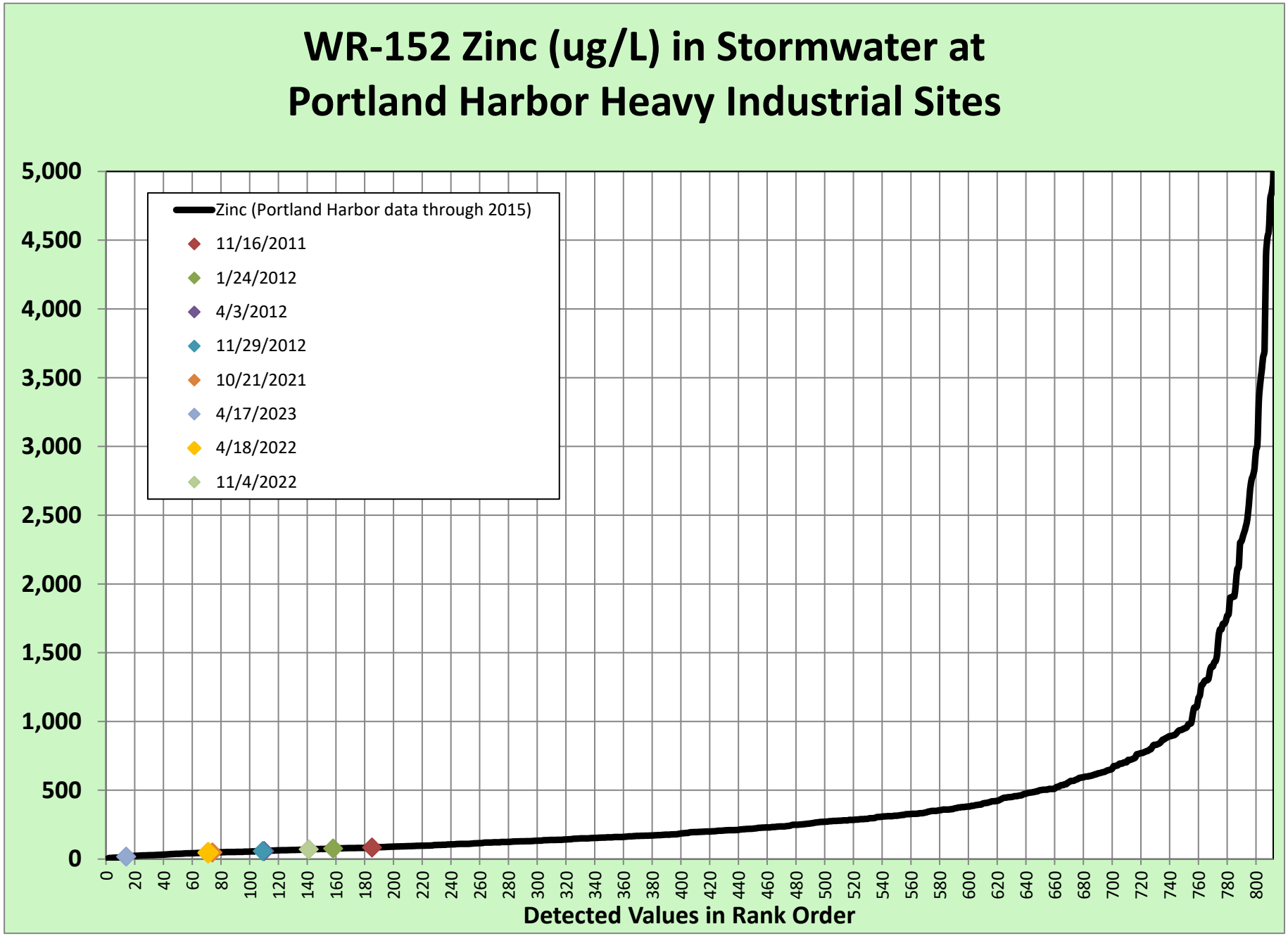

WR-152 Silver (ug/L) in Stormwater at Portland Harbor Heavy Industrial Sites
Silver
1/24/2012
4/3/2012
11/16/2011
11/29/2012
Note: Open marker indicates non-detection of analyte with a MDL at specified concentration.
0.50
0.45
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
190
200
Detected Values in Rank Order

# WR-152 Total PAHs (ug/L) in Stormwater at Portland Harbor Heavy Industrial Sites



# WR-152 TSS (mg/L) in Stormwater at Portland Harbor Heavy Industrial Sites




WR-152 Zinc (ug/L) in Stormwater at
Portland Harbor Heavy Industrial Sites
Zinc (Portland Harbor data through 2015)
11/16/2011
1/24/2012
4/3/2012
11/29/2012
10/21/2021
4/17/2023
4/18/2022
11/4/2022
5,000
4,500
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
0
20
40
60
80
100
120
140
160
180
200
220
240
260
280
300
320
340
360
380
400
420
440
460
480
500
520
540
560
580
600
620
640
660
680
700
720
740
760
780
800
Detected Values in Rank Order