

Prepared by:
Dredged Material Management Office
Seattle District, US Army Corps of Engineers

Memorandum for Record

October 16, 2025

Subject: Suitability Determination Memorandum for the Port of Seattle, Terminal 18 Maintenance Dredging (NWS-2024-311-WRD).

Introduction

This suitability determination memorandum (SDM) documents the consensus regarding the suitability of the proposed dredged material for unconfined aquatic disposal and antidegradation as determined by the Dredged Material Management Program (DMMP) agencies (U.S. Army Corps of Engineers, Washington Departments of Ecology and Natural Resources, and the U.S. Environmental Protection Agency).

Project Description

The Port of Seattle's Terminal 18 (T18) is located on Harbor Island at the southern end of Elliott Bay in Seattle, Washington (Figure 1). The facility is a marine industrial area used as a container terminal and provides berthing areas for deep draft ocean vessels. This project is within the boundaries of the Lower Duwamish Superfund Site. Previous sediment characterizations in the area have detected chemicals of concern above the DMMP screening levels. The Port is proposing to dredge to a target elevation of -52 feet MLLW plus up to 1 foot of overdredge (to -53 feet MLLW) to accommodate the need to place anti-degradation clean cover material.

Project Summary

Waterbody	East Waterway of the Duwamish River
Water classification	Marine
Project rank	High
Total proposed dredging volume (cy)	6,000
Target proposed dredging depth	-52 ft MLLW
Max. proposed dredging depth (includes 1-foot overdepth allowance)	-53 ft MLLW
Proposed disposal location(s)	Upland
Dredged Material Management Units (DMMUs): No. of stations	1 Surface DMMU
EIM Study ID	POSEW25
USACE Regulatory Reference Number	NWS-2024-311-WRD
Sampling and Analysis Plan (SAP) Approval Date	January 17, 2025 (Landau Associates and Windward, 2025a)
Sampling Date(s)	January 20 – 24, 2025
Testing Parameters	DMMP marine COCs plus dioxins and furans (DF) and tributyltin (TBT)
Biological Testing	Bioassays and Bioaccumulation triggered
Sediment Characterization Report (SCR) Approval Date	October 16, 2025 (Landau Associates and Windward, 2025b)
Suitability Outcome	All material unsuitable for open-water disposal
Recency Expiration Date (High = 3 years)	January 24, 2028
Antidegradation Assessment	Placement of a clean sand cover required for DMMU 1

Sampling and Analysis Description

Sediment sampling for chemical analysis was conducted in the East Waterway between January 20 and 24, 2025, aboard a sampling vessel operated by Research Support Services (RSS). Mudline elevation at each sampling location was measured using a fathometer and real time kinematic (RTK) positioning. Figure 2 shows the sediment sampling locations. Table 1 lists the sampling station and recovery details for the entire sampling effort. Deviations can be found in the Sediment Characterization Report (Landau and Windward, 2025b).

Samples were submitted to Analytical Resources (ARI; Tukwila, WA) for chemical and physical analysis. ARI subcontracted AM Test Laboratories (Kirkland, WA) to complete the sulfide analyses.

Data Validation

Landau Associates (Seattle, WA) conducted an EPA Stage 2B review and validation of all chemistry data. The validation process resulted in some additional J and UJ qualified data (estimated values) and U qualified data (analytes associated with method blank detections) beyond those assigned by the lab, based on specified protocol or technical advisory.

Twelve analytes were rejected by the data validator. The analytes and rational for rejection are summarized in the table below. Due to the material going upland and a clean sand cover being placed, the analytes were not reanalyzed.

Sample ID	Analyte	Concentration	Reason for rejection
T18-2025-S1-CS	Dibenzo(a,h)anthracene	19.8 (µg/kg dw)	Low SRM recovery
	Di-n-octyl Phthalate	9.9 (µg/kg dw)	Low SRM recovery
	bis(2-Ethylhexyl) Phthalate	39.5 (µg/kg dw)	Low SRM recovery
	2,4-Dimethylphenol	9.9 (µg/kg dw)	Low LCS and/or LCSD recovery
	Benzoic Acid	98.8 (µg/kg dw)	Low MS/MSD recoveries
	N-Nitrosodiphenylamine	9.9 (µg/kg dw)	Low SRM recovery
T18-2025-S1-02-Z	Dibenzo(a,h)anthracene	19.9 (µg/kg dw)	Low SRM recovery
	Di-n-octyl Phthalate	10 (µg/kg dw)	Low SRM recovery
	bis(2-Ethylhexyl) Phthalate	39.8 (µg/kg dw)	Low SRM recovery
	2,4-Dimethylphenol	10 (µg/kg dw)	Low LCS and/or LCSD recovery
	N-Nitrosodiphenylamine	10 (µg/kg dw)	Low SRM recovery
T18-2025-S1-03-Z	Antimony	0.19 (mg/kg dw)	Low MS/MSD recoveries
Notes: dw – dry weight SRM – standard reference material LCS/D – laboratory control sample/duplicate MS/D – matrix spike/duplicate			

Completeness was not 100%; the remaining reported data are usable as qualified. The full data validation report can be found in Appendix C of the Sediment Characterization Report (Landau Associates and Windward, 2025b).

Analytical Testing Results

Results for T18 are reported in the Sediment Characterization Report (Landau and Windward, 2025b). Table 2 summarizes the analytical results for the surface DMMU composite alongside the DMMP marine

guidelines. The Z-layer and ZA-layer analysis were compared to the Washington State Sediment Management Standards (SMS) and the Apparent Effect Thresholds (AET) and are reported in Table 3. Marine guideline comparisons are for determining suitability for disposal at a DMMP open water disposal site. Exceedances of the DMMP screening level (SL) occurred in the surface composite. Exceedances of SMS occurred in four of the five Z/ZA-layer samples. All exceedances are discussed below.

PCB Aroclors. Total PCB Aroclors is the summation of seven PCBs and is reported in dry weight (dw) for comparison to the benthic SL, and organic carbon (OC) normalized units for comparison to the SMS and BT. Exceedance of the dw SL was detected in the surface composite. In addition, four Z-layer samples (T18-2025-S1-02-Z, T18-2025-S1-02-ZA, T18-2025-S1-03-Z, T18-2025-S1-03-ZA) had an OC-normalized SMS exceedance.

Dioxins/furans. D/F Congeners were evaluated due to being a chemical of concern. The surface composite exceeded the SL (TEQ > 4 ng/kg).

Biological Results

Bioassays were run concurrently with the chemistry data. The standard suite of three marine bioassays were conducted by EcoAnalysts of Port Gamble, Washington using *Eohaustorius estuaries* for the amphipod test, *Neanthes arenaceodentata* for the infaunal growth test, and *Mytilus galloprovincialis* for the larval test. Two reference samples from Carr Inlet (Horsehead Bay and Fox Island, WA) were collected in order to provide suitable grain size matches.

A summary of the bioassay tests is in the table below and the detailed results are shown in Table 4. All bioassays passed the negative control and reference sediment performance standards. There were no significant water quality deviations. All tests passed with no hits.

Sample ID	Amphipod mortality	Juvenile infaunal growth	Larval development	Final determination
T18-2025-S1-CS	Pass	Pass	Pass	PASS

Bioaccumulation testing was also run concurrently with chemistry and bioassays. However, the tissues were not submitted for chemical analysis as open-water disposal was no longer being pursued.

DMMP Determinations

Suitability Determination

Sediment from T18 has PCB Aroclors and dioxin/furan congeners. The project proponent has opted to take all material upland and not seek a suitability for open-water disposal. All 6,000 cy of material are considered unsuitable for open-water disposal without further testing (bioaccumulation).

Antidegradation Determination

The sediment to be exposed by dredging must meet the State's Antidegradation Standard (Ecology, 2013) as outlined by DMMP guidance (DMMP, 2008). The sediment to be exposed by dredging must meet the State's Antidegradation Standard (Ecology, 2013) as outlined by DMMP guidance (DMMP, 2008). The Z-layer samples had exceedances for PCB Aroclors. To meet antidegradation in DMMU 1, a minimum of a 9-inch clean sand cover must be placed after dredging is complete within the dredge footprint. As part of CERCLA coordination, two post-dredge samples within the perimeter and one post-

dredge sample near T18-S1-03Z are required. Data will be evaluated by EPA CERCLA as part of the Remedial Investigation.

Debris Management

The DMMP agencies implemented a debris screening requirement following the 2015 SMARM in order to prevent the disposal of solid waste and debris at open-water disposal sites in Puget Sound (DMMP, 2015). Based on this sediment characterization, the DMMP did not identify or require additional debris assessment or management practices/techniques for use on this project.

Notes and Clarifications

The decisions documented in this memorandum do **not** constitute final agency approval of the project. During the public comment period that follows a public notice, resource agencies will provide input on the overall project. A final decision will be made after full consideration of agency input, and after an alternatives analysis is done under section 404(b)(1) of the Clean Water Act.

The DMMP does not make specific beneficial use determinations. However, these data are available for the assessment of project-specific beneficial use by the project proponent, permitting agencies, local health jurisdictions and/or the owner of a receiving property.

Projects proposing to use one of the DMMP open-water disposal sites must submit their application for a Site Use Authorization (SUA) to the Washington State Department of Natural Resources (DNR) at least 4 weeks prior to dredging. Applications submitted less than 4 weeks prior to dredging may be subject to delays.

Hydraulically - dredged material may not be placed at non-dispersive sites.

A pre-dredge meeting with DNR, Ecology and the Corps of Engineers is required at least 7 days prior to dredging. A dredging quality control plan must be developed and submitted to the USACE Seattle District's Regulatory Branch and Ecology. Refer to the USACE permit and Ecology 401 certification for project-specific submittal requirements and timelines.

References

- Dredged Material Management Program, 2008. *Quality of Post-Dredge Sediment Surfaces (Updated)*. A Clarification Paper Prepared by David Fox (USACE), Erika Hoffman (EPA) and Tom Gries (Ecology) for the Dredged Material Management Program, June 2008.
- Dredged Material Management Program, 2015. *Debris Screening Requirements for Dredged Material Disposed at Open-Water Sites*. Final DMMP Clarification Paper. October 02, 2015.
- Dredged Material Management Program, 2021. *Dredged Material Evaluation and Disposal Procedures User Manual*. Dredged Material Management Office, U.S. Army Corps of Engineers, Seattle District.
- Ecology, 2013. *Sediment Management Standards – Chapter 173-204 WAC*. Washington State Department of Ecology, February 2013.
- Landau Associates and Windward Environmental, 2025a. *Sediment Characterization Sampling and Analysis Plan*, Port of Seattle, Terminal 18, Seattle, Washington. Prepared for Port of Seattle. Submitted to the Dredged Material Management Program, January 2025.
- Landau Associates and Windward Environmental, 2025b. *Sediment Characterization Data Report*, Port of Seattle, Terminal 18, Seattle, Washington. Prepared for Port of Seattle. Submitted to the Dredged Material Management Program, October 2025.

Agency Signatures

The signed copy is on file in the Dredged Material Management Office, Seattle District U.S. Army Corps of Engineers

Date Sarah Benson – U.S. Army Corps of Engineers, Seattle District

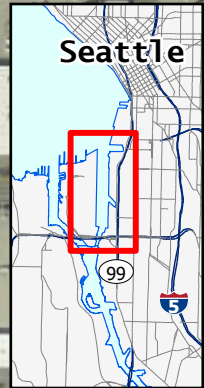
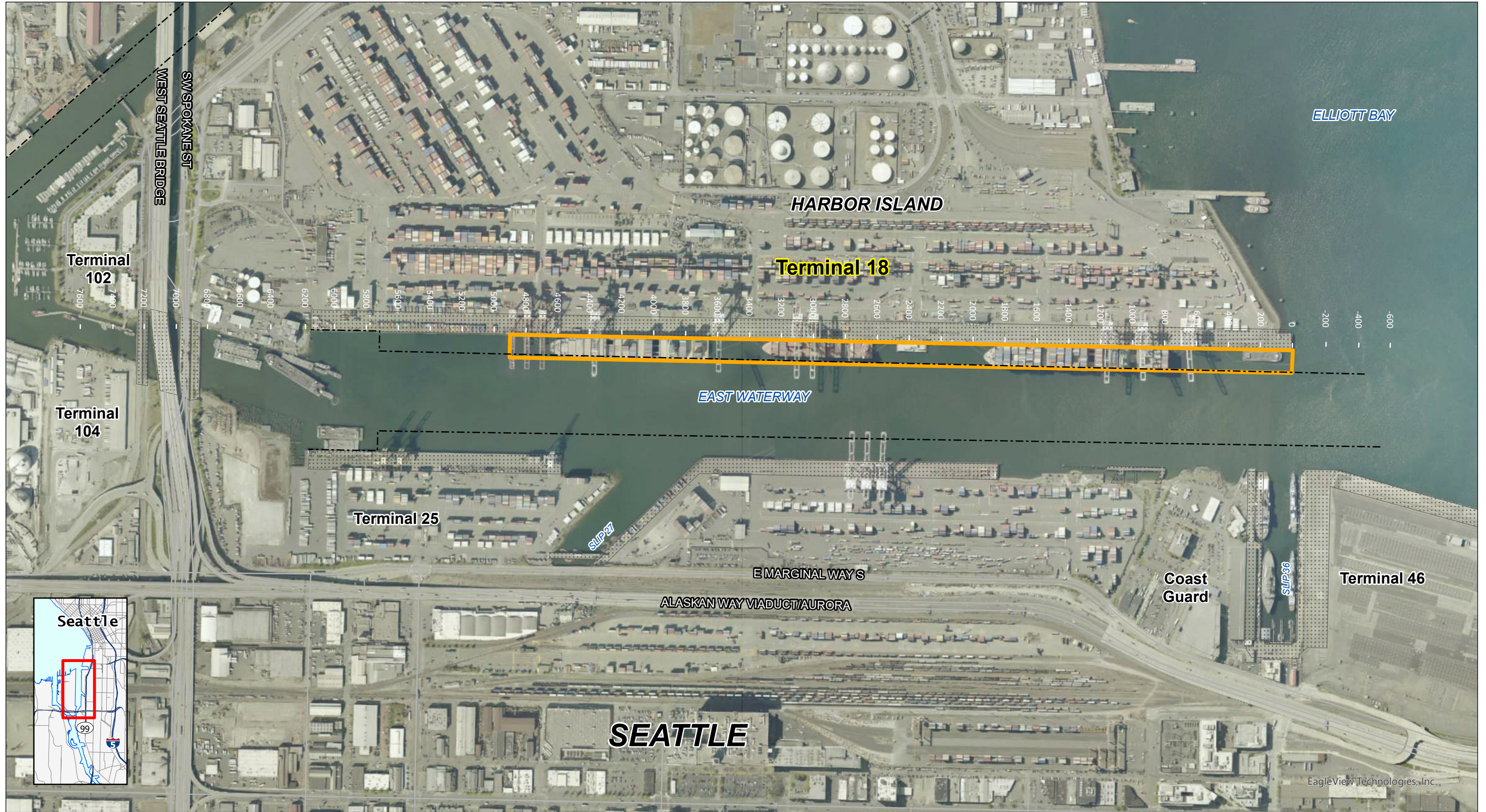
Date Whitney Conard, PhD. – U.S. Environmental Protection Agency, Region 10

Date Laura Inouye, PhD. – Washington State Department of Ecology

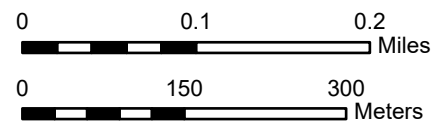
Date Shannon Soto – Washington State Department of Natural Resources

Copies Furnished:
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Prepared by nicolas, 9/11/2025, W:\Projects\Port of Seattle - Dredging ID\GIS\Maps and Analysis\Data Report\Data Report.aprx



EagleView Technologies, Inc.



Terminal 18 project area

Federal Navigation Channel

Figure 1. East Waterway Vicinity Map

TERMINAL 18 SEDIMENT
CHARACTERIZATION DATA REPORT

SEPTEMBER 16, 2025

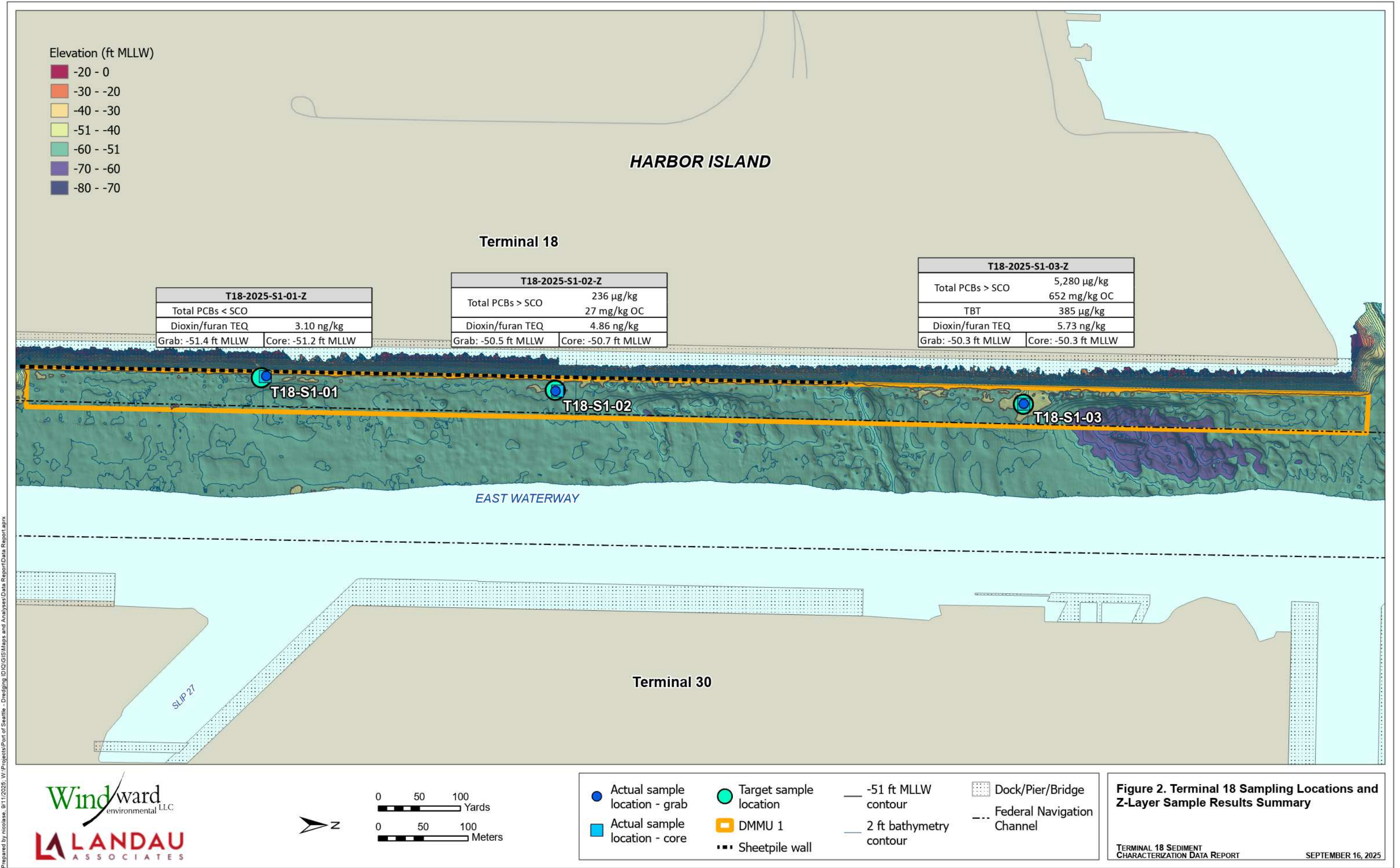


Table 1
Field Location and Sample Data
T-18 Sediment Characterization
Port of Seattle

Station	Sample	Target Coordinates (Northing/Easting) ^a		Field Coordinates (Northing/Easting) ^a		Field Coordinates (Latitude/Longitude)		Distance (ft) (Target to Field)	Bathy Elevation (ft MLLW) ^b	Sample ID	Sample Thickness	Sample Elevation (Top) (ft MLLW)	Sample Elevation (Bottom) (ft MLLW)
T-18 DMMU 1													
T18-S01-01	Grab	215018	1267111	215036	1267105	47.5795	-122.3460	19.5	-51.4	T18-2025-S1-CS	1.0 ft (30 cm)	-51.4	-52.4
T18-S01-01	Core			215032	1267108	47.5794	-122.3459	15.2	-51.2	T18-2025-S1-01-Z	2.0 ft	-53.0	-55.0
										T18-2025-S1-01-ZA	2.0 ft	-55.0	-57.0
T18-S01-02	Grab	216092	1267157	216093	1267160	47.5824	-122.3458	3.0	-50.5	T18-2025-S1-CS	1.0 ft (30 cm)	-50.5	-51.5
T18-S01-02	Core			216101	1267160	47.5824	-122.3458	9.3	-50.7	T18-2025-S1-02-Z	2.0 ft	-53.0	-55.0
										T18-2025-S1-02-ZA	2.0 ft	-55.0	-57.0
T18-S01-03	Grab	217803	1267208	217804	1267207	47.5870	-122.3458	2.4	-50.3	T18-2025-S1-CS	1.0 ft (30 cm)	-50.3	-51.3
T18-S01-03	Core			217804	1267208	47.5870	-122.3458	1.4	-50.3	T18-2025-S1-03-Z	2.0 ft	-53.0	-55.0
										T18-2025-S1-03-ZA	2.0 ft	-55.0	-57.0

Notes:^a US State Plane, WA North Zone, NAD 83, Units of US Survey Feet^b 2024 Port of Seattle Survey Information**Abbreviations and Acronyms:**

bathy = bathymetric

cm = centimeter

DMMU = dredged material management unit

ft = feet

ID = identification

MLLW = mean lower low water

Table 2
Surface Sediment Sample Results
Terminal 18
Port of Seattle

Screening Notes:

Orange shading = exceeds DMMP Screening Level

							Field Sample Identification, Sample Date, Laboratory Sample Delivery Group	
							T18-2025-S1-CS 1/22/2025 25A0398	
Analyte Group	Analyte	DW Result Units	SL Units	DMMP			Dry Weight (see DW Results Units)	mg/kg OC
				Screening Level	Bioaccumulation Trigger	Max. Level		
Dioxin/Furan Congeners	1,2,3,4,6,7,8-HpCDD	ng/kg	--	--	--	--	137	--
Dioxin/Furan Congeners	1,2,3,4,6,7,8-HpCDF	ng/kg	--	--	--	--	31.6	--
Dioxin/Furan Congeners	1,2,3,4,7,8,9-HpCDF	ng/kg	--	--	--	--	2.52	--
Dioxin/Furan Congeners	1,2,3,4,7,8-HxCDD	ng/kg	--	--	--	--	1.17	--
Dioxin/Furan Congeners	1,2,3,4,7,8-HxCDF	ng/kg	--	--	--	--	3.81	--
Dioxin/Furan Congeners	1,2,3,6,7,8-HxCDD	ng/kg	--	--	--	--	4.77	--
Dioxin/Furan Congeners	1,2,3,6,7,8-HxCDF	ng/kg	--	--	--	--	1.11	--
Dioxin/Furan Congeners	1,2,3,7,8,9-HxCDD	ng/kg	--	--	--	--	2.32	--
Dioxin/Furan Congeners	1,2,3,7,8,9-HxCDF	ng/kg	--	--	--	--	0.599 J	--
Dioxin/Furan Congeners	1,2,3,7,8-PeCDD	ng/kg	--	--	--	--	0.988 J	--
Dioxin/Furan Congeners	1,2,3,7,8-PeCDF	ng/kg	--	--	--	--	0.570 J	--
Dioxin/Furan Congeners	2,3,4,6,7,8-HxCDF	ng/kg	--	--	--	--	2.20	--
Dioxin/Furan Congeners	2,3,4,7,8-PeCDF	ng/kg	--	--	--	--	1.21	--
Dioxin/Furan Congeners	2,3,7,8-TCDD	ng/kg	--	--	--	--	0.187 U	--
Dioxin/Furan Congeners	2,3,7,8-TCDF	ng/kg	--	--	--	--	4.56 J	--
Dioxin/Furan Congeners	OCDD	ng/kg	--	--	--	--	1060	--
Dioxin/Furan Congeners	OCDF	ng/kg	--	--	--	--	75.3	--
Dioxin/Furan Congeners	Total HpCDD	ng/kg	--	--	--	--	348	--
Dioxin/Furan Congeners	Total HpCDF	ng/kg	--	--	--	--	114	--
Dioxin/Furan Congeners	Total HxCDD	ng/kg	--	--	--	--	45.3	--
Dioxin/Furan Congeners	Total HxCDF	ng/kg	--	--	--	--	50.6	--
Dioxin/Furan Congeners	Total PeCDD	ng/kg	--	--	--	--	7.62 J	--
Dioxin/Furan Congeners	Total PeCDF	ng/kg	--	--	--	--	29.3	--
Dioxin/Furan Congeners	Total TCDD	ng/kg	--	--	--	--	3.34	--
Dioxin/Furan Congeners	Total TCDF	ng/kg	--	--	--	--	25.3	--
Dioxin/Furan Congeners	Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL/EMPC)	ng/kg	ng/kg dw	4 (a)	10	nc	5.57 J	--
Dioxin/Furan Congeners	Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0)	ng/kg	ng/kg dw	4 (a)	10	nc	5.47 J	--
PCB Aroclors	Aroclor 1016	µg/kg	--	--	--	--	2.0 U	--
PCB Aroclors	Aroclor 1221	µg/kg	--	--	--	--	2.0 U	--
PCB Aroclors	Aroclor 1232	µg/kg	--	--	--	--	2.0 U	--
PCB Aroclors	Aroclor 1242	µg/kg	--	--	--	--	2.0 U	--
PCB Aroclors	Aroclor 1248	µg/kg	--	--	--	--	23.3	--
PCB Aroclors	Aroclor 1254	µg/kg	--	--	--	--	70.4	--
PCB Aroclors	Aroclor 1260	µg/kg	--	--	--	--	96.2 J	--
PCB Aroclors	Aroclor 1262	µg/kg	--	--	--	--	2.0 U	--
PCB Aroclors	Aroclor 1268	µg/kg	--	--	--	--	2.0 U	--
PCB Aroclors	Total PCB Aroclors	µg/kg	µg/kg dw	130	38 mg/kg OC	3,100	189.9	26
Conventional Parameters	Total Solids	%	--	--	--	--	69.80	--

Table 2
Surface Sediment Sample Results
Terminal 18
Port of Seattle

Screening Notes:

Orange shading = exceeds DMMP Screening Level

							Field Sample Identification, Sample Date, Laboratory Sample Delivery Group	
							T18-2025-S1-CS 1/22/2025 25A0398	
Analyte Group	Analyte	DW Result Units	SL Units	DMMP			Dry Weight (see DW Results Units)	mg/kg OC
				Screening Level	Bioaccumulation Trigger	Max. Level		
Conventional Parameters	Nitrogen, Ammonia as N	mg/kg	mg/kg dw	nc	nc	nc	4.58	--
Conventional Parameters	Sulfide, Total	mg/kg	mg/kg dw	nc	nc	nc	65.9	--
Conventional Parameters	Total Organic Carbon	%	--	--	--	--	0.74	--
Metals	Antimony	mg/kg	mg/kg dw	150	150	200	0.21 U	--
Metals	Arsenic	mg/kg	mg/kg dw	57	507.1	700	4.74	--
Metals	Cadmium	mg/kg	mg/kg dw	5.1	11.3	14	0.21	--
Metals	Chromium, Total	mg/kg	mg/kg dw	260	260	nc	14.2 J+	--
Metals	Copper	mg/kg	mg/kg dw	390	1027	1300	30.6	--
Metals	Lead	mg/kg	mg/kg dw	450	975	1200	20.5	--
Metals	Mercury	mg/kg	mg/kg dw	0.41	1.5	2.3	0.126	--
Metals	Selenium	mg/kg	mg/kg dw	nc	3	nc	0.71 U	--
Metals	Silver	mg/kg	mg/kg dw	6.1	6.1	8.4	0.27 J	--
Metals	Zinc	mg/kg	mg/kg dw	410	2783	3800	54.0	--
Pesticides	4,4'-DDD	µg/kg	µg/kg dw	16	nc	nc	0.50 U	--
Pesticides	4,4'-DDE	µg/kg	µg/kg dw	9	nc	nc	0.50 U	--
Pesticides	4,4'-DDT	µg/kg	µg/kg dw	12	nc	nc	0.50 U	--
Pesticides	Total DDT	µg/kg	µg/kg dw	6.9	50	69	0.50 U	--
Pesticides	Aldrin	µg/kg	µg/kg dw	6.9	50	69	0.50 U	--
Pesticides	cis-Chlordane	µg/kg	--	--	--	--	0.25 U	--
Pesticides	Oxychlordane	µg/kg	--	--	--	--	0.50 UJ	--
Pesticides	trans-Chlordane	µg/kg	--	--	--	--	0.50 U	--
Pesticides	cis-Nonachlor	µg/kg	--	--	--	--	0.50 U	--
Pesticides	trans-Nonachlor	µg/kg	--	--	--	--	0.50 UJ	--
Pesticides	Total Chlordane	µg/kg	µg/kg dw	2.8	37	nc	0.50 U	--
Pesticides	Dieldrin	µg/kg	µg/kg dw	1.9	nc	1,700	0.50 U	--
Pesticides	Heptachlor	µg/kg	µg/kg dw	1.5	nc	270	0.25 U	--
SVOCs-LPAH	Total LPAH	µg/kg	µg/kg dw	5,200	nc	29,000	76.3	--
SVOCs-LPAH	Naphthalene	µg/kg	µg/kg dw	2,100	nc	2,400	10.7 J	--
SVOCs-LPAH	Acenaphthylene	µg/kg	µg/kg dw	560	nc	1,300	9.9 U	--
SVOCs-LPAH	Acenaphthene	µg/kg	µg/kg dw	500	nc	2,000	9.9 U	--
SVOCs-LPAH	Fluorene	µg/kg	µg/kg dw	540	nc	3,600	19.8 U	--
SVOCs-LPAH	Phenanthrene	µg/kg	µg/kg dw	1,500	nc	21,000	55.5	--
SVOCs-LPAH	Anthracene	µg/kg	µg/kg dw	960	nc	13,000	10.1 J-	--
SVOCs-LPAH	2-Methylnaphthalene	µg/kg	µg/kg dw	670	nc	1,900	9.9 U	--
SVOCs-HPAH	Total HPAH	µg/kg	µg/kg dw	12,000	nc	69,000	439.8	--
SVOCs-HPAH	Fluoranthene	µg/kg	µg/kg dw	1,700	4,600	30,000	97.7	--
SVOCs-HPAH	Pyrene	µg/kg	µg/kg dw	2,600	11,980	16,000	84.3	--
SVOCs-HPAH	Benzo(a)anthracene	µg/kg	µg/kg dw	1,300	nc	5,100	23.3 J-	--
SVOCs-HPAH	Chrysene	µg/kg	µg/kg dw	1,400	nc	21,000	46 J-	--
SVOCs-HPAH	Total Benzofluoranthenes	µg/kg	µg/kg dw	3,200	nc	9,900	66 J-	--

Table 2
Surface Sediment Sample Results
Terminal 18
Port of Seattle

Screening Notes:

Orange shading = exceeds DMMP Screening Level

							Field Sample Identification, Sample Date, Laboratory Sample Delivery Group	
							T18-2025-S1-CS 1/22/2025 25A0398	
Analyte Group	Analyte	DW Result Units	SL Units	DMMP			Dry Weight (see DW Results Units)	mg/kg OC
				Screening Level	Bioaccumulation Trigger	Max. Level		
SVOCs-HPAH	Benzo(a)pyrene	µg/kg	µg/kg dw	1,600	nc	3,600	24.9 J-	--
SVOCs-HPAH	Indeno(1,2,3-cd)pyrene	µg/kg	µg/kg dw	600	nc	4,400	19.8 U	--
SVOCs-HPAH	Dibenzo(a,h)anthracene	µg/kg	µg/kg dw	230	nc	1,900	R	--
SVOCs-HPAH	Benzo(g,h,i)perylene	µg/kg	µg/kg dw	670	nc	3,200	97.6	--
Chlorinated Hydrocarbons	1,4-Dichlorobenzene	µg/kg	µg/kg dw	110	nc	120	2.5 U	--
Chlorinated Hydrocarbons	1,2-Dichlorobenzene	µg/kg	µg/kg dw	35	nc	110	2.5 U	--
Chlorinated Hydrocarbons	1,2,4-Trichlorobenzene	µg/kg	µg/kg dw	31	nc	64	4.9 U	--
Chlorinated Hydrocarbons	Hexachlorobenzene	µg/kg	µg/kg dw	22	168	230	2.5 U	--
Phthalates	Dimethyl Phthalate	µg/kg	µg/kg dw	71	nc	1,400	9.9 U	--
Phthalates	Diethyl Phthalate	µg/kg	µg/kg dw	200	nc	1,200	34.6 U	--
Phthalates	Di-N-Butyl Phthalate	µg/kg	µg/kg dw	1,400	nc	5,100	9.9 U	--
Phthalates	Butyl Benzyl Phthalate	µg/kg	µg/kg dw	63	nc	970	9.9 U	--
Phthalates	Di-n-octyl Phthalate	µg/kg	µg/kg dw	1,300	nc	8,300	R	--
Phthalates	bis(2-Ethylhexyl) Phthalate	µg/kg	µg/kg dw	6,200	nc	6,200	R	--
Phenols	Phenol	µg/kg	µg/kg dw	420	nc	1,200	89.9	--
Phenols	2-Methylphenol	µg/kg	µg/kg dw	63	nc	77	9.9 U	--
Phenols	4-Methylphenol	µg/kg	µg/kg dw	670	nc	3,600	14.8 U	--
Phenols	2,4-Dimethylphenol	µg/kg	µg/kg dw	29	nc	210	R	--
Phenols	Pentachlorophenol	µg/kg	µg/kg dw	400	504	690	49.4 UJ	--
Other SVOCs	Benzyl Alcohol	µg/kg	µg/kg dw	57	nc	870	19.8 U	--
Other SVOCs	Benzoic Acid	µg/kg	µg/kg dw	650	nc	760	R	--
Other SVOCs	Dibenzofuran	µg/kg	µg/kg dw	540	nc	1700	19.8 U	--
Other SVOCs	Hexachlorobutadiene	µg/kg	µg/kg dw	11	nc	270	2.5 U	--
Other SVOCs	N-Nitrosodiphenylamine	µg/kg	µg/kg dw	28	nc	130	R	--
Organometals	Tri-n-butyltin	µg/kg	µg/kg dw	73	73	nc	4.49 J	--
Grain Size	Particle/Grain Size, Phi Scale < -2.25 Gravel	%	--	--	--	--	0.1 U	--
Grain Size	Particle/Grain Size, Phi Scale -2.25 to -2	%	--	--	--	--	0.1 U	--
Grain Size	Particle/Grain Size, Phi Scale -2 to -1	%	--	--	--	--	0.4	--
Grain Size	Particle/Grain Size, Phi Scale -1 to 0 Sand	%	--	--	--	--	0.4	--
Grain Size	Particle/Grain Size, Phi Scale 0 to 1	%	--	--	--	--	1.5	--
Grain Size	Particle/Grain Size, Phi Scale 1 to 2	%	--	--	--	--	25.5	--
Grain Size	Particle/Grain Size, Phi Scale 2 to 3	%	--	--	--	--	28.3	--
Grain Size	Particle/Grain Size, Phi Scale 3 to 4	%	--	--	--	--	16.5	--
Grain Size	Particle/Grain Size, Phi Scale 4 to 5 Silt	%	--	--	--	--	4.7	--
Grain Size	Particle/Grain Size, Phi Scale 5 to 6	%	--	--	--	--	3	--
Grain Size	Particle/Grain Size, Phi Scale 6 to 7	%	--	--	--	--	3.6	--
Grain Size	Particle/Grain Size, Phi Scale 7 to 8	%	--	--	--	--	3.7	--
Grain Size	Particle/Grain Size, Phi Scale 8 to 9 Clay	%	--	--	--	--	2.6	--
Grain Size	Particle/Grain Size, Phi Scale 9 to 10	%	--	--	--	--	1.4	--
Grain Size	Particle/Grain Size, Phi Scale >10	%	--	--	--	--	8.2	--

Table 2
Surface Sediment Sample Results
Terminal 18
Port of Seattle

Notes:

Bold = detected result

(a) Dioxin/furan (D/F) TEQ screening value is the Disposal Site Management Objective.

EPA 1613 D/F TEQs calculated in accordance with Dredged Material Evaluation and Disposal Procedures User Manual (May 2025).

Where totals were calculated, only detected constituents were included in the sum, with nondetects treated as zero.

In the event a total value was calculated and all results were nondetect, the minimum RL was used as the total.

In the event multiple detected results were reported by the laboratory, the greater of the two results is reported in this table.

Benzo(b) and benzo(k) reported by AR but are not included in this table because total benzofluoranthenes were already reported.

U = The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

UJ = The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

J+ = The result is an estimated quantity and the result may be biased high.

J- = The result is an estimated quantity and the result may be biased low.

R = The data are unusable. The sample results are rejected due to serious deficiencies in meeting quality control criteria. The analyte may or may not be present in the sample.

Acronyms/Abbreviations

µg/kg = micrograms per kilogram

AR = Analytical Resources

AET = Apparent Effects Threshold

DDD = Dichlorodiphenyldichloroethane

DDT = Dichlorodiphenyltrichloroethane

D/F = dioxin/furan

DMMP = Dredged Material Management Program

dw = dry weight

EDL = estimated detection limit

EMPC = estimated maximum potential concentration

EPA = US Environmental Protection Agency

HPAH = high molecular weight polycyclic aromatic hydrocarbons

HpCDD = heptachlorooxanthrene

HpCDF = heptachlorodibenzofuran

HxCDD = Hexachlorodibenzo-p-dioxin

HxCDF = hexachlorodibenzofuran

LPAH = low molecular weight polycyclic aromatic hydrocarbons

max. = maximum

mg/kg = milligrams per kilogram

N = nitrogen

nc = no criterion/criteria

ng/kg = nanograms per kilogram

OC = organic carbon

OCDD = octachlorodibenzodioxin

OCDF = octachlorodibenzofuran

PCB = polychlorinated biphenyl

PeCDD = pentachlorodibenzo-p-dioxin

PeCDF = pentachlorodibenzofuran

RL = reporting limit

SCO = sediment cleanup objective

SL = screening level

SMS = sediment management standards

SVOC = semivolatile organic compound

TEQ = toxicity equivalence

TCDD = tetrachlorodibenzo-p-dioxin

TCDF = tetrachlorodibenzofuran

TOC = total organic carbon

WHO = World Health Organization

Table 3
Z-Layer Sediment Sample Results
Terminal 18
Port of Seattle

Screening Notes:		Field Sample Identification, Sample Date, Laboratory Sample Delivery Group													
	Orange shading = exceeds AET SCO	T18-2025-S1-01-Z 1/20/2025 25A0365													
	Purple shading = exceeds SMS SCO	T18-2025-S1-02-Z 1/22/2025 25A0398													
	Yellow shading = sample TOC result is <0.5% or >3.5% and the results were compared to AET values, based on DW	T18-2025-S1-02-ZA 1/22/2025 25C0641													
Analyte Group	Analyte	Result Units (Dry Weight)	Marine Sediment Chemical Criteria			Dry Weight (see DW Results Units)	mg/kg OC	Dry Weight (see DW Results Units)	mg/kg OC	Dry Weight (see DW Results Units)	mg/kg OC	Dry Weight (see DW Results Units)	mg/kg OC	Dry Weight (see DW Results Units)	mg/kg OC
			SMS SCO	Units	AET SCO										
Dioxin/Furan Congeners	1,2,3,4,6,7,8-HpCDD	ng/kg	--		--	82.6	--	99.3	--	148	--	145	--	96.6	--
Dioxin/Furan Congeners	1,2,3,4,6,7,8-HpCDF	ng/kg	--		--	18.9	--	36.3	--	65.2	--	30.9	--	39.8	--
Dioxin/Furan Congeners	1,2,3,4,7,8,9-HpCDF	ng/kg	--		--	1.31	--	3.12	--	3.66	--	2.11	--	2.22	--
Dioxin/Furan Congeners	1,2,3,4,7,8-HxCDD	ng/kg	--		--	0.485 U	--	0.676 U	--	1.14	--	1.30	--	1.70	--
Dioxin/Furan Congeners	1,2,3,4,7,8-HxCDF	ng/kg	--		--	1.60	--	4.12	--	8.34	--	3.50	--	4.89	--
Dioxin/Furan Congeners	1,2,3,6,7,8-HxCDD	ng/kg	--		--	3.07	--	3.71	--	6.83	--	5.20	--	3.62	--
Dioxin/Furan Congeners	1,2,3,6,7,8-HxCDF	ng/kg	--		--	0.424 U	--	1.26	--	3.09	--	1.51	--	1.37	--
Dioxin/Furan Congeners	1,2,3,7,8,9-HxCDD	ng/kg	--		--	1.20	--	2.38	--	3.11	--	2.48	--	1.14	--
Dioxin/Furan Congeners	1,2,3,7,8,9-HxCDF	ng/kg	--		--	0.343 U	--	0.999	--	2.26	--	0.369 U	--	1.12	--
Dioxin/Furan Congeners	1,2,3,7,8-PeCDD	ng/kg	--		--	0.644 J	--	0.763 U	--	1.41	--	1.14	--	0.706 U	--
Dioxin/Furan Congeners	1,2,3,7,8-PeCDF	ng/kg	--		--	0.294 U	--	0.929 J	--	1.19	--	0.797 J	--	0.829 J	--
Dioxin/Furan Congeners	2,3,4,6,7,8-HxCDF	ng/kg	--		--	0.997 U	--	0.584 U	--	4.34 J	--	0.609 J	--	2.22	--
Dioxin/Furan Congeners	2,3,4,7,8-PeCDF	ng/kg	--		--	0.738 U	--	1.48	--	3.01	--	1.17	--	1.82	--
Dioxin/Furan Congeners	2,3,7,8-TCDD	ng/kg	--		--	0.128 U	--	0.294 U	--	0.624 UJ	--	0.153 U	--	0.315 J-	--
Dioxin/Furan Congeners	2,3,7,8-TCDF	ng/kg	--		--	2.89	--	5.42 J	--	0.277 UJ	--	5.46 J	--	0.298 U	--
Dioxin/Furan Congeners	OCDD	ng/kg	--		--	634	--	704	--	1020	--	1040	--	613	--
Dioxin/Furan Congeners	OCDF	ng/kg	--		--	45.0	--	79.4	--	165	--	62.1	--	94.8	--
Dioxin/Furan Congeners	Total HpCDD	ng/kg	--		--	200	--	223	--	284	--	344	--	177	--
Dioxin/Furan Congeners	Total HpCDF	ng/kg	--		--	67.5	--	131	--	234	--	104	--	125	--
Dioxin/Furan Congeners	Total HxCDD	ng/kg	--		--	24.9	--	34.5	--	50.6	--	47.8	--	28.4	--
Dioxin/Furan Congeners	Total HxCDF	ng/kg	--		--	26.0	--	56.7	--	114	--	42.2	--	50.6	--
Dioxin/Furan Congeners	Total PeCDD	ng/kg	--		--	2.12	--	6.73	--	5.01	--	2.87	--	5.88	--
Dioxin/Furan Congeners	Total PeCDF	ng/kg	--		--	20.6	--	44.3	--	58.2	--	19.6	--	24.3	--
Dioxin/Furan Congeners	Total TCDD	ng/kg	--		--	2.26	--	5.87	--	6.61 J	--	2.06	--	3.58	--
Dioxin/Furan Congeners	Total TCDF	ng/kg	--		--	17.4	--	36.7	--	57.3	--	26.6	--	22.8	--
Dioxin/Furan Congeners	Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL/EMPC)	ng/kg	--		--	3.04 J	--	4.47 J	--	8.11 J	--	5.73 J	--	4.46 J	--
Dioxin/Furan Congeners	Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0)	ng/kg	--		--	2.75 J	--	3.88 J	--	7.78 J	--	5.63 J	--	4.09 J	--
PCB Aroclors	Aroclor 1016	µg/kg	--		--	2.0 U	--	2.0 U	--	2.0 UJ	--	40.0 U	--	2.0 U	--
PCB Aroclors	Aroclor 1221	µg/kg	--		--	2.0 U	--	2.0 U	--	2.0 U	--	40.0 U	--	2.0 U	--
PCB Aroclors	Aroclor 1232	µg/kg	--		--	2.0 U	--	2.0 U	--	2.0 UJ	--	40.0 U	--	2.0 U	--
PCB Aroclors	Aroclor 1242	µg/kg	--		--	2.0 U	--	2.0 U	--	2.0 U	--	40.0 U	--	2.0 U	--
PCB Aroclors	Aroclor 1248	µg/kg	--		--	23.1	--	37.4	--	30.6 J	--	40.0 U	--	44.7	--
PCB Aroclors	Aroclor 1254	µg/kg	--		--	47.5	--	77.8	--	59.4	--	1830	--	97.0	--
PCB Aroclors	Aroclor 1260	µg/kg	--		--	48.5	--	121	--	81.7	--	3450	--	86.0	--
PCB Aroclors	Aroclor 1262	µg/kg	--		--	2.0 U	--	2.0 U	--	2.0 UJ	--	40.0 U	--	2.0 U	--
PCB Aroclors	Aroclor 1268	µg/kg	--		--	2.0 U	--	2.0 U	--	2.0 UJ	--	40.0 U	--	2.0 U	--
PCB Aroclors	Total PCB Aroclors	µg/kg	12	mg/kg OC	130	119.1	31	236.2	27	172	20	5280	652	228	28
Conventional Parameters	Total Solids	%	--		--	75.49	--	71.57	--	--	--	71.39	--	--	--
Conventional Parameters	Nitrogen, Ammonia as N	mg/kg	--		--	4.04	--	2.05	--	--	--	9.92	--	--	--
Conventional Parameters	Sulfide, Total	mg/kg	--		--	385	--	98.6	--	--	--	120	--	--	--
Conventional Parameters	Total Organic Carbon	%	--		--	0.39	--	0.86	--	0.86	--	0.81 J	--	0.81 J	--
Metals	Antimony	mg/kg	--		--	0.19 U	--	0.20 U	--	--	--	R	--	--	--
Metals	Arsenic	mg/kg	57	mg/kg dw	57	3.17	--	5.59	--	--	--	5.20	--	--	--

Table 3
Z-Layer Sediment Sample Results
Terminal 18
Port of Seattle

Screening Notes:

	Orange shading = exceeds AET SCO
	Purple shading = exceeds SMS SCO
	Yellow shading = sample TOC result is <0.5% or >3.5% and the results were compared to AET values, based on DW

Screening Notes:															
	Orange shading = exceeds AET SCO					Field Sample Identification, Sample Date, Laboratory Sample Delivery Group									
	Purple shading = exceeds SMS SCO					T18-2025-S1-01-Z		T18-2025-S1-02-Z		T18-2025-S1-02-ZA		T18-2025-S1-03-Z		T18-2025-S1-03-ZA	
	Yellow shading = sample TOC result is <0.5% or >3.5% and the results were compared to AET values, based on DW					1/20/2025 25A0365		1/22/2025 25A0398		1/22/2025 25C0641		1/20/2025 25A0365		1/20/2025 25C0643	
Analyte Group	Analyte	Result Units (Dry Weight)	Marine Sediment Chemical Criteria			Dry Weight (see DW Results Units)	mg/kg OC	Dry Weight (see DW Results Units)	mg/kg OC	Dry Weight (see DW Results Units)	mg/kg OC	Dry Weight (see DW Results Units)	mg/kg OC	Dry Weight (see DW Results Units)	mg/kg OC
			SMS SCO	Units	AET SCO										
Metals	Cadmium	mg/kg	5.1	mg/kg dw	5.1	0.18	--	0.42	--	--	--	0.29	--	--	--
Metals	Chromium, Total	mg/kg	260	mg/kg dw	260	11.0	--	16.4 J+	--	--	--	13.9	--	--	--
Metals	Copper	mg/kg	390	mg/kg dw	390	26.8	--	46.4	--	--	--	41.8 J	--	--	--
Metals	Lead	mg/kg	450	mg/kg dw	450	11.4	--	34.8	--	--	--	30.0	--	--	--
Metals	Mercury	mg/kg	0.41	mg/kg dw	0.41	0.0732	--	0.136	--	--	--	0.110	--	--	--
Metals	Selenium	mg/kg	--		--	0.63 U	--	0.68	--	--	--	0.86	--	--	--
Metals	Silver	mg/kg	6.1	mg/kg dw	6.1	0.17 J	--	0.32	--	--	--	0.32 J	--	--	--
Metals	Zinc	mg/kg	410	mg/kg dw	410	50.2	--	64.1	--	--	--	62.6	--	--	--
Pesticides	4,4'-DDD	µg/kg	--		--	0.50 U	--	0.50 U	--	--	--	0.50 U	--	--	--
Pesticides	4,4'-DDE	µg/kg	--		--	0.50 U	--	0.50 U	--	--	--	0.50 U	--	--	--
Pesticides	4,4'-DDT	µg/kg	--		--	0.50 U	--	0.50 U	--	--	--	0.50 U	--	--	--
Pesticides	Total DDT	µg/kg	--		--	0.50 U	--	0.50 U	--	--	--	0.50 U	--	--	--
Pesticides	Aldrin	µg/kg	--		--	0.50 U	--	0.50 U	--	--	--	0.50 U	--	--	--
Pesticides	cis-Chlordane	µg/kg	--		--	0.25 U	--	0.25 U	--	--	--	0.25 U	--	--	--
Pesticides	Oxychlordane	µg/kg	--		--	0.50 UJ	--	0.50 UJ	--	--	--	0.50 UJ	--	--	--
Pesticides	trans-Chlordane	µg/kg	--		--	0.50 U	--	0.50 U	--	--	--	0.50 U	--	--	--
Pesticides	cis-Nonachlor	µg/kg	--		--	0.50 U	--	0.50 U	--	--	--	0.50 U	--	--	--
Pesticides	trans-Nonachlor	µg/kg	--		--	0.50 UJ	--	0.50 UJ	--	--	--	0.50 UJ	--	--	--
Pesticides	Total Chlordane	µg/kg	--		--	0.50 U	--	0.50 U	--	--	--	0.50 U	--	--	--
Pesticides	Dieldrin	µg/kg	--		--	0.50 U	--	0.50 U	--	--	--	0.50 U	--	--	--
Pesticides	Heptachlor	µg/kg	--		--	0.25 U	--	0.25 U	--	--	--	0.25 U	--	--	--
SVOCs-LPAH	Total LPAH	µg/kg	370	mg/kg OC	5,200	891.3	229	242.2	28	--	--	140.4	17	--	--
SVOCs-LPAH	Naphthalene	µg/kg	99	mg/kg OC	2,100	371 J	95	105	12	--	--	27.4	3.38	--	--
SVOCs-LPAH	Acenaphthylene	µg/kg	66	mg/kg OC	1,300	10 U	2.56 U	10 U	1.16 U	--	--	10 U	1.23 U	--	--
SVOCs-LPAH	Acenaphthene	µg/kg	16	mg/kg OC	500	87.6	22	21.8	2.5	--	--	11.1 J	1.4 J	--	--
SVOCs-LPAH	Fluorene	µg/kg	23	mg/kg OC	540	99	25	25.8	3.0	--	--	20 U	2.5 U	--	--
SVOCs-LPAH	Phenanthrene	µg/kg	100	mg/kg OC	1,500	134	34	42.6	5.0	--	--	47.6	5.9	--	--
SVOCs-LPAH	Anthracene	µg/kg	220	mg/kg OC	960	50.7	13	27.6 J-	3.2	--	--	20 J	2.5 J	--	--
SVOCs-LPAH	2-Methylnaphthalene	µg/kg	38	mg/kg OC	670	149	38	19.4 J	2.3 J	--	--	14.3 J	1.8 J	--	--
SVOCs-HPAH	Total HPAH	µg/kg	960	mg/kg OC	12,000	822.6	211	1717.4	200	--	--	524.8	65	--	--
SVOCs-HPAH	Fluoranthene	µg/kg	160	mg/kg OC	1,700	76.6	20	55.1	6.4	--	--	51.7	6.4	--	--
SVOCs-HPAH	Pyrene	µg/kg	1,000	mg/kg OC	2,600	280	72	1060	123	--	--	88	11	--	--
SVOCs-HPAH	Benzo(a)anthracene	µg/kg	110	mg/kg OC	1,300	41	11	47 J-	5.5	--	--	29.1	3.6	--	--
SVOCs-HPAH	Chrysene	µg/kg	110	mg/kg OC	1,400	75.8	19	86.4 J-	10	--	--	50.8	6.3	--	--
SVOCs-HPAH	Total Benzofluoranthenes	µg/kg	230	mg/kg OC	3,200	207	53	235 J-	27	--	--	186	23	--	--
SVOCs-HPAH	Benzo(a)pyrene	µg/kg	99	mg/kg OC	1,600	91.4	23	102 J-	12	--	--	77.5	9.6	--	--
SVOCs-HPAH	Indeno(1,2,3-cd)pyrene	µg/kg	34	mg/kg OC	600	23.9	6.1	23.9	2.8	--	--	20.2	2.5	--	--
SVOCs-HPAH	Dibenzo(a,h)anthracene	µg/kg	12	mg/kg OC	230	20 U	5.1 U	R	R	--	--	20 U	2.5 U	--	--
SVOCs-HPAH	Benzo(g,h,i)perylene	µg/kg	31	mg/kg OC	670	26.9	6.9	108	13	--	--	21.5	2.7	--	--
Chlorinated Hydrocarbons	1,4-Dichlorobenzene	µg/kg	3.1	mg/kg OC	110	10.3	2.6	2.5 U	0.29 U	--	--	58.1	7.17	--	--
Chlorinated Hydrocarbons	1,2-Dichlorobenzene	µg/kg	2.3	mg/kg OC	35	1.2 U	0.31 U	2.5 U	0.29 U	--	--	2.5 U	0.31 U	--	--
Chlorinated Hydrocarbons	1,2,4-Trichlorobenzene	µg/kg	0.81	mg/kg OC	31	2.5 U	0.31 U	5.0 U	0.58 U	--	--	5.0 U	0.62 U	--	--
Chlorinated Hydrocarbons	Hexachlorobenzene	µg/kg	0.38	mg/kg OC	22	1.2 U	0.31 U	2.5 U	0.29 U	--	--	2.5 U	0.31 U	--	--
Phthalates	Dimethyl Phthalate	µg/kg	53	mg/kg OC	71	10.0 U	2.6 U	10.0 U	1.2 U	--	--	10.0 U	1.2 U	--	--
Phthalates	Diethyl Phthalate	µg/kg	61	mg/kg OC	200	34.6 U	8.9 U	34.9 U	4.1 U	--	--	34.9 U	4.3 U	--	--

Table 3
Z-Layer Sediment Sample Results
Terminal 18
Port of Seattle

Screening Notes:

	Orange shading = exceeds AET SCO
	Purple shading = exceeds SMS SCO
	Yellow shading = sample TOC result is <0.5% or >3.5% and the results were compared to AET values, based on DW

Field Sample Identification, Sample Date, Laboratory Sample Delivery Group														
			T18-2025-S1-01-Z 1/20/2025 25A0365			T18-2025-S1-02-Z 1/22/2025 25A0398			T18-2025-S1-02-ZA 1/22/2025 25C0641			T18-2025-S1-03-Z 1/20/2025 25A0365		
Analyte Group	Analyte	Result Units (Dry Weight)	Marine Sediment Chemical Criteria			Dry Weight (see DW Results Units)	mg/kg OC		Dry Weight (see DW Results Units)	mg/kg OC		Dry Weight (see DW Results Units)	mg/kg OC	
			SMS SCO	Units	AET SCO									
Phthalates	Di-N-Butyl Phthalate	µg/kg	220	mg/kg OC	1,400	10.0 U	2.6 U		10.0 U	1.2 U		--	--	--
Phthalates	Butyl Benzyl Phthalate	µg/kg	4.9	mg/kg OC	63	10.0 U	2.6 U		10.0 U	1.2 U		--	--	--
Phthalates	Di-n-octyl Phthalate	µg/kg	58	mg/kg OC	6,200	10.0 U	2.6 U		R	R		--	--	--
Phthalates	bis(2-Ethylhexyl) Phthalate	µg/kg	47	mg/kg OC	1,300	39.9 U	10 U		R	R		--	--	--
Phenols	Phenol	µg/kg	420	µg/kg dw	420	21.5	--		10.6 J	--		--	--	--
Phenols	2-Methylphenol	µg/kg	63	µg/kg dw	63	10.0 U	--		10.0 U	--		--	--	--
Phenols	4-Methylphenol	µg/kg	670	µg/kg dw	670	15.0 U	--		14.9 U	--		--	--	--
Phenols	2,4-Dimethylphenol	µg/kg	29	µg/kg dw	29	14.5 J+	--		R	--		--	--	--
Phenols	Pentachlorophenol	µg/kg	360	µg/kg dw	360	25.0 U	--		49.8 UJ	--		--	--	--
Other SVOCs	Benzyl Alcohol	µg/kg	57	µg/kg dw	57	20.0 U	--		19.9 U	--		--	--	--
Other SVOCs	Benzoic Acid	µg/kg	650	µg/kg dw	650	99.8 U	--		99.6 UJ	--		--	--	--
Other SVOCs	Dibenzofuran	µg/kg	15	mg/kg OC	540	121	31		25.6	3.0		--	--	--
Other SVOCs	Hexachlorobutadiene	µg/kg	3.9	mg/kg OC	11	1.2 U	0.31 U		2.5 U	0.29 U		--	--	--
Other SVOCs	N-Nitrosodiphenylamine	µg/kg	11	mg/kg OC	28	10.0 U	2.6 U		R	R		--	--	--
Organometals	Tri-n-butyltin	µg/kg	--		--	43.0 J+	11		4.35 J	0.51		1.92 U	0.22 U	--
Grain Size	Particle/Grain Size, Phi Scale < -2.25 Gravel	%	--		--	3	--		0.3 J	--		--	--	--
Grain Size	Particle/Grain Size, Phi Scale -2.25 to -2	%	--		--	0.8	--		0.1	--		--	--	--
Grain Size	Particle/Grain Size, Phi Scale -2 to -1	%	--		--	4	--		0.2 J	--		--	--	--
Grain Size	Particle/Grain Size, Phi Scale -1 to 0 Sand	%	--		--	6.5	--		0.4	--		--	--	--
Grain Size	Particle/Grain Size, Phi Scale 0 to 1	%	--		--	11.6	--		1.7	--		--	--	--
Grain Size	Particle/Grain Size, Phi Scale 1 to 2	%	--		--	38.5	--		33.8	--		--	--	--
Grain Size	Particle/Grain Size, Phi Scale 2 to 3	%	--		--	12.0	--		22.3	--		--	--	--
Grain Size	Particle/Grain Size, Phi Scale 3 to 4	%	--		--	7.9	--		14.4	--		--	--	--
Grain Size	Particle/Grain Size, Phi Scale 4 to 5 Silt	%	--		--	1.7	--		7.5 J	--		--	--	--
Grain Size	Particle/Grain Size, Phi Scale 5 to 6	%	--		--	2.9	--		2.7	--		--	--	--
Grain Size	Particle/Grain Size, Phi Scale 6 to 7	%	--		--	5	--		4.8	--		--	--	--
Grain Size	Particle/Grain Size, Phi Scale 7 to 8	%	--		--	2	--		2.7	--		--	--	--
Grain Size	Particle/Grain Size, Phi Scale 8 to 9 Clay	%	--		--	0.2	--		1.8	--		--	--	--
Grain Size	Particle/Grain Size, Phi Scale 9 to 10	%	--		--	0.1	--		1	--		--	--	--
Grain Size	Particle/Grain Size, Phi Scale >10	%	--		--	4	--		6.3	--		--	--	--

Table 3
Z-Layer Sediment Sample Results
Terminal 18
Port of Seattle

Notes:

Bold = detected result

Marine Sediment Criteria are from SCUM Table 8-1.

EPA 1613 D/F TEQs calculated in accordance with Dredged Material Evaluation and Disposal Procedures User Manual (May 2025).

Where totals were calculated, only detected constituents were included in the sum, with nondetects treated as zero.

In the event a total value was calculated and all results were nondetect, the minimum RL was used as the total.

In the event multiple detected results were reported by the laboratory, the greater of the two results is reported in this table.

Benzo(b) and benzo(k) reported by AR but are not included in this table because total benzofluoranthenes were already reported.

U = The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

UJ = The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

J+ = The result is an estimated quantity and the result may be biased high.

J- = The result is an estimated quantity and the result may be biased low.

R = The data are unusable. The sample results are rejected due to serious deficiencies in meeting quality control criteria. The analyte may or may not be present in the sample.

Acronyms/Abbreviations

µg/kg = micrograms per kilogram

AET = Apparent Effects Threshold

AR = Analytical Resources

DDD = Dichlorodiphenyldichloroethane

DDT = Dichlorodiphenyltrichloroethane

D/F = dioxin/furan

DW = dry weight

EDL = estimated detection limit

EMPC = estimated maximum potential concentration

EPA = US Environmental Protection Agency

HPAH = high molecular weight polycyclic aromatic hydrocarbons

HpCDD = heptachlorooxanthrene

HpCDF = heptachlorodibenzofuran

HxCDD = Hexachlorodibenzo-p-dioxin

HxCDF = hexachlorodibenzofuran

LPAH = low molecular weight polycyclic aromatic hydrocarbons

mg/kg = milligrams per kilogram

N = nitrogen

ng/kg = nanograms per kilogram

OC = organic carbon

OCDD = octachlorodibenzodioxin

OCDF = octachlorodibenzofuran

PeCDD = pentachlorodibenzo-p-dioxin

PeCDF = pentachlorodibenzofuran

PCB = polychlorinated biphenyl

RL = reporting limit

SCO = sediment cleanup objective

SCUM = Sediment Cleanup User's Manual

SMS = sediment management standards

SVOC = semivolatile organic compound

TCDF = 2,3,7,8-Tetrachlorodibenzofuran

TEQ = toxicity equivalence

TOC = total organic carbon

Table 4
Bioassay Test Results
Terminal 18
Port of Seattle

Sample	10-day Amphipod Mortality (%)				Larval Development ^a			20-day Juvenile Polychaete Survival and Growth						
	Mean	SD	2-Hit	1-Hit	Mean	2-Hit	1-Hit	Mortality (%)	MIG (mg/ind/day)		MIG % of Control	MIG % of Reference	2-Hit	1-Hit
									Mean	SD				
Control	0	0			0.89			0	0.54	0.14				
ECO 34 (Reference)	2	5			0.89			0	0.85	0.34				
T18-2025-S1-CS	2	3	Pass	Pass	0.88	Pass	Pass	0	0.82	0.82	1.54	0.975	Pass	Pass

Notes:

^a Control data were normalized to the stocking density; reference and project treatments were normalized to the control.

Abbreviations and Acronyms:

mg/ind/day = milligrams per individual per day

MIG = mean individual growth rate

SD = standard deviation