Appendix D
EPA RI and ROD-Related Supporting Documents

Appendix D-1
EPA RI-Related Supporting Document

RM 1
RM 2
RM 3
RM 4
RM 5
RM 6
RM 7
RM 8
RM 8
RM 9
RM 10
RM 11
RM 12
RM 13
RM 14
RM 15
RM 16

Bathymetric Change

Feet NAVD

10 to 50.3	Shoaling
5.0 to 9.99	
2.0 to 4.99	
1.0 to 1.99	
0.5 to 0.99	
0.25 to 0.49	
-0.25 to 0.24	No Change
-0.5 to -0.26	
-1.0 to -0.51	
-2.0 to -1.01	
-5.0 to -2.01	
-10.0 to -5.01	
-33.4 to -10.01	Deepening
	No Data

0 0.225 0.45 0.9 Mile

P:\Projects\B0101_Portland_Harbor\SubTasks\B0101_86_Sect3\Production_MXDs\Final_RI_2015\Map3_1_6_BathyChange_2002_2009_RM15_v10.mxd 5/13/2015 3:17:52 PM

FEATURE SOURCES:
Transportation, Property, or Boundaries: Metro RLIS.
Channel & River Miles: US Army Corps of Engineers.
Bathymetric Information: David Evans and Associates, Inc.

Map Features
- River Miles
- Bridges
- Docks and Structures
- Navigation Channel

Outfalls
- Outfall
- Dock Drain
- Roof Drain

- Upland ECSI Sites (2008)
- Waterfront Taxlots
- River Edge +13 ft NAVD

Map 3.1-6
Portland Harbor RI/FS
Remedial Investigation Report
Bathymetric Change
January 2002 to January 2009

GASCO0066763

Appendix D-2
ROD-Related Supporting Documents

Table 6. Concentrations of PTW Defined as "Highly Toxic"

Contaminant	Highly Toxic PTW Threshold (µg/kg) (10^{-3} risk)
PCBs	200
2,3,7,8-TCDD	0.01
2,3,7,8-TCDF	0.6
1,2,3,7,8-PeCDD	0.01
2,3,4,7,8-PeCDF	0.2
1,2,3,4,6,7,8-HxCDF	0.04
DDx	7,050
cPAHs (BaP eq)	106,000

Abbreviations:
cPAH (BaP eq) – carcinogenic PAHs (benzo(a)pyrene equivalent)
DDx – dichlorodiphenyldichloroethane + dichlorodiphenyldichloroethene + dichlorodiphenyltrichloroethane
HxCDF – hexachlorodibenzofuran
PAH – polycyclic aromatic hydrocarbon
PCB – polychlorinated biphenyl
PeCDD – pentachlorodibenzo-p-dioxin
PeCDF – pentachlorodibenzofuran
PTW – principal threat waste
TCDD – tetrachlorodibenzo-p-dioxin
TCDF – tetrachlorodibenzofuran
µg/kg – microgram per kilogram

Table 7. Concentrations of PTW Defined as "Reliably Contained"

Contaminant	PTW Contaminants Reliably Contained
Dioxins/furans	At all concentrations measured at the Site
PAHs	At all concentrations measured at the Site
Chlorobenzene	At concentrations <320 µg/kg
DDx	At all concentrations measured at the Site
Naphthalene	At concentrations <140,000 µg/kg
PCBs	At all concentrations measured at the Site

Abbreviations:
DDx – dichlorodiphenyldichloroethane + dichlorodiphenyldichloroethene + dichlorodiphenyltrichloroethane
PAH – polycyclic aromatic hydrocarbon
PCB – polychlorinated biphenyl
PTW – principal threat waste
µg/kg – microgram per kilogram
< – less than

Table 17. Summary of Cleanup Levels or Targets by Media (incorporates Errata #1, dated April 3, 2018; Errata #2, dated January 14, 2020; and the Explanation of Significant Differences, dated December 9, 2019)

	Surface Water (1)				Groundwater (2)				River Bank Soil/Sediment (3)				Fish/Shellfish Tissue (4)			
Contaminant	**Unit**	**Conc.**	**RAO**	**Basis**	**Unit**	**Conc.**	**RAO**	**Basis**	**Unit**	**Conc.**	**RAO**	**Basis**	**Unit**	**Conc.**	**RAO**	**Basis**
Aldrin	µg/L	7.7E-07	RAO3	A_{HN}					µg/kg	2	RAO2	R_H	µg/kg	0.06	RAO2	R_H
Arsenic	µg/L	0.018	RAO3	A_{HN}	µg/L	0.018	RAO4	A_{HN}	mg/kg	3	RAO1	B	mg/kg	0.001	RAO2	R_H
Benzene					µg/L	0.44	RAO4	A_{HA}								
BEHP	µg/L	0.2	RAO3	A_{HA}					µg/kg	135	RAO6	R_E	µg/kg	72	RAO2	R_H
Cadmium					µg/L	0.094	RAO8	A_{EA}/R_E(5)	mg/kg	0.51	RAO5	R_E				
Chlordanes	µg/L	0.000081	RAO3	A_{HA}					µg/kg	1.4	RAO5	R_E	µg/kg	3	RAO2	R_H
Chlorobenzene					µg/L	64	RAO8	R_E								
Chromium	µg/L	100	RAO3	A_{HM}	µg/L	11	RAO8	A_{EN}								
Copper	µg/L	2.74	RAO7	R_E	µg/L	2.74	RAO8	R_E	mg/kg	359	RAO5	R_E				
Cyanide					µg/L	4	RAO4	A_{HN}								
DDx	µg/L	0.01	RAO7	R_E	µg/L	0.001	RAO8	A_{EN}/R_E	µg/kg	6.1	RAO2	R_H	µg/kg	3	RAO2	R_H
DDD	µg/L	0.000031	RAO3	A_{HA}	µg/L	0.000031	RAO4	A_{HA}	µg/kg	114	RAO5	R_E				
DDE	µg/L	0.000018	RAO3	A_{HN}	µg/L	0.000018	RAO4	A_{HN}	µg/kg	50	RAO5	R_E				
DDT	µg/L	0.000022	RAO3	A_{HA}	µg/L	0.000022	RAO4	A_{HA}	µg/kg	246	RAO5	R_E				
1,1-Dichloroethene					µg/L	7	RAO4	A_{HM}								
cis-1,2-Dichloroethene					µg/L	70	RAO4	A_{HM}								
Dieldrin									µg/kg	0.07	RAO2	R_H	µg/kg	0.06	RAO2	R_H
2,4-Dichlorophenoxyacetic acid					µg/L	70	RAO4	A_{HM}								
Ethylbenzene	µg/L	7.3	RAO7	R_E	µg/L	7.3	RAO8	R_E								
Hexachlorobenzene	µg/L	0.000029	RAO3	A_{HA}									µg/kg	0.6	RAO2	R_H
Lindane									µg/kg	5	RAO5	R_E				
Lead					µg/L	0.54	RAO8	A_{EA}/R_E	mg/kg	196	RAO5	R_E				
Manganese					µg/L	430	RAO4	R_H								
MCPP	µg/L	16	RAO3	R_H												
Mercury									mg/kg	0.085	RAO5	R_E	mg/kg	0.03	RAO2	R_H
Pentachlorophenol	µg/L	0.03	RAO3	A_{HN}	µg/L	0.03	RAO4	A_{HN}					µg/kg	2.5	RAO2	R_H
Perchlorate					µg/L	15	RAO4	A_{HM}								
PBDEs													µg/kg	1.28	RAO2	R_H
PCBs	µg/L	6.4E-6	RAO3	A_{HA}	µg/L	0.014	RAO8	A_{EN}/R_E	µg/kg	9	RAO2	B	µg/kg	0.25 (6)	RAO2	R_H
PAHs									µg/kg	23000	RAO5	R_E				
cPAHs (BaP eq)	µg/L	0.00012	RAO3	A_{HN}	µg/L	0.00012	RAO4	A_{HN}	µg/kg	774/85/1,076 (7)	RAO1	R_H	µg/kg	51.6	RAO2	R_H
Acenaphthene					µg/L	23	RAO8	R_E								
Acenaphthylene																
Anthracene					µg/L	0.73	RAO8	R_E								
Benzo(a)anthracene	µg/L	0.0012	RAO3	A_{HN}	µg/L	0.0012	RAO4	A_{HN}								
Benzo(a)pyrene	µg/L	0.00012	RAO3	A_{HN}	µg/L	0.00012	RAO4	A_{HN}								
Benzo(b)fluoranthene	µg/L	0.0012	RAO3	A_{HN}	µg/L	0.0012	RAO4	A_{HN}								
Benzo(g,h,i)perylene					µg/L	0.4	RAO8	R_E								
Benzo(k)fluoranthene	µg/L	0.0013	RAO3	A_{HA}	µg/L	0.0013	RAO4	A_{HA}								
Chrysene	µg/L	0.0013	RAO3	A_{HA}	µg/L	0.0013	RAO4	A_{HA}								
Dibenz(a,h)anthracene	µg/L	0.00012	RAO3	A_{HN}	µg/L	0.00012	RAO4	A_{HN}								
Fluoranthene					µg/L	6.2	RAO8	R_E								
Fluorene					µg/L	3.9	RAO8	R_E								
Indeno(1,2,3-c,d)pyrene	µg/L	0.0012	RAO3	A_{HN}	µg/L	0.0012	RAO4	A_{HN}								
2-Methylnaphthalene					µg/L	2.1	RAO8	R_E								
Naphthalene	µg/L	12	RAO7	R_E	µg/L	12	RAO8	R_E								
Phenanthrene					µg/L	6.3	RAO8	R_E								
Pyrene					µg/L	10	RAO8	R_E								
Dioxins/Furans (2,3,7,8-TCDD eq)	µg/L	5.1E-10	RAO3	A_{HA}					µg/kg	0.01	RAO1	R_H (8)				
1,2,3,4,7,8-HxCDF									µg/kg	0.0004	RAO2	B	µg/kg	0.00006	RAO2	R_H
1,2,3,7,8-PeCDD									µg/kg	0.0002	RAO2	B	µg/kg	0.000006	RAO2	R_H
2,3,4,7,8-PeCDF									µg/kg	0.0003	RAO2	B	µg/kg	0.00002	RAO2	R_H
2,3,7,8-TCDF									µg/kg	0.00040658	RAO2	R_H	µg/kg	0.00006	RAO2	R_H
2,3,7,8-TCDD									µg/kg	0.0002	RAO2	B	µg/kg	0.000006	RAO2	R_H
Tetrachloroethene					µg/L	0.24	RAO4	A_{HA}								
Toluene					µg/L	9.8	RAO8	R_E								
TPH-Diesel									mg/kg	91	RAO5	R_E				
Aliphatic Hydrocarbons C10-C12					µg/L	2.6	RAO8	R_E								
Tributyltin	µg/L	0.063	RAO7	A_{EA}					µg/kg	3080	RAO5	R_E				
Trichloroethene					µg/L	0.6	RAO4	A_{HN}								
2,4,5-TP (Silvex)					µg/L	50	RAO4	A_{HM}								
Vanadium					µg/L	20	RAO8	R_E								
Vinyl Chloride					µg/L	0.022	RAO4	A_{HN}								
Xylenes					µg/L	13	RAO8	R_E								
Zinc	µg/L	36.5	RAO7	A_{EA}/R_E	µg/L	36.5	RAO8	A_{EA}/R_E	mg/kg	459	RAO5	R_E				

Notes:

(1) Surface Water Cleanup Levels - RAOs 3 and 7

(2) Groundwater Cleanup Levels - RAOs 4 and 8. Note: Groundwater cleanup levels are generally the ecological risk-based or human health risk-based concentration that protects the most sensitive receptor that are relevant and protective for receptor exposures to groundwater. An exception to this is if an ARAR (promulgated standard) for a contaminant is higher than a risk-based number, but the ARAR [such as maximum contaminant levels (MCLs)] is determined to be protective, then the less protective ARAR is selected as the cleanup level.

(3) Sediment Cleanup Levels - RAOs 1, 2, 5, and 6. The lower of the PRG values for RAOs 1, 2 (sediment through Fish/Shellfish Consumption), 5, and 6 were selected as the cleanup level regardless of the exposure pathway.

(4) Fish/Shellfish Tissue Targets - RAOs 2 and 6. The lower of the PRG values for RAOs 2 and 6 were selected as the target regardless of the exposure pathway.

(5) A/R indicates that the ARARs-based number and the risk-based number are the same.

(6) The tissue target is a risk-based number and does not represent background levels. Additional data will be collected to determine background fish tissue concentrations for PCBs during design and construction of the Selected Remedy.

(7) The cleanup level for cPAHs of 774 µg/kg is based on direct contact with sediment and is applicable to nearshore sediment exclusive of recreational beaches and navigation channel sediments. The cleanup level applicable to recreational beach sediments is 85 µg/kg and the cleanup level applicable to the navigation channel sediment is 1,076 µg/kg and is based on human consumption of clams.

(8) The 2,3,7,8-TCDD eq cleanup level for river bank soil/sediment is based on RAO 1, which includes a dietary component (incidental ingestion) in addition to direct exposure. The river bank soil/sediment cleanup levels for the individual dioxin/furan congeners are based on RAO 2, which accounts for bioaccumulation from sediment through the food chain.

(9) This Table 17 identifies fish/shellfish tissue target levels and site-specific cleanup levels for each of the following media: sediment (including beaches), river bank soil, surface water, and groundwater. However, these cleanup levels represent the lowest PRG value identified across all identified site receptors for the indicated RAOs. Since exposure area averaging may impact the concentrations to which a receptor is potentially exposed, Chapter 8 and Table 16 of the ROD should be consulted in the development of remedial actions.

Table 17. Summary of Cleanup Levels or Targets by Media (incorporates Errata #1, dated April 3, 2018; Errata #2, dated January 14, 2020; and the Explanation of Significant Differences, dated December 9, 2019)

Abbreviations:

2,4,5-TP (Silvex) - 2-(2,4,5-Trichlorophenoxy)propionic acid, also known as Silvex

A_{EA} - ARAR based value from ODEQ OAR 340-41-8033, Table 30: Aquatic Life Water Quality Criteria for Toxic Pollutants (effective August 4, 2015)

A_{EN} - ARAR based value from EPA National Recommended Water Quality Criteria (NRWQC) – Aquatic Life Criteria Table (chronic)

A_{HA} - ARAR based value from ODEQ OAR 340-41-8033, Table 40: Human Health Water Quality Criteria for Toxic Pollutants (effective April 18, 2014). (chronic, organism+water)

A_{HN} - ARAR based value from EPA's National Recommended Water Quality Criteria (NRWQC) (organism+water)

A_{HM} - ARAR based value from Maximum Contaminant Level (MCL) as listed in EPA Regional Screening Levels (RSLs)

ARAR - applicable or relevant and appropriate requirement

B - Background-based number

BEHP - bis(2-ethylhexyl)phthalate

BaP eq - benzo(a)pyrene equivalent

C - carbon

Conc - concentration

cPAH - carcinogenic polycyclic aromatic hydrocarbon

DDD - dichlorodiphenyldichloroethane

DDE - dichlorodiphenyldichloroethene

DDT - dichlorodiphenyltrichloroethane

DDx - DDD + DDE + DDT

HxCDF - hexachlorodibenzofuran

MCL - maximum contaminant level

MCPP - 2-(4-chloro-2-methylphenoxy)propanoic acid

mg/kg - milligram per kilogram

PAH - polycyclic aromatic hydrocarbon

PBDE - polybrominated diphenyl ether

PCB - polychlorinated biphenyl

PeCDD - pentachlorodibenzo-p-dioxin

PeCDF - pentachlorodibenzofuran

R_E - ecological risk-based number

R_H - human health risk-based number

RAO - remedial action objective

RAO1 - Reduce cancer and non-cancer risks to people from incidental ingestion of and dermal contact with COCs in sediment and beaches to exposure levels that are acceptable for fishing, occupational, recreational, and ceremonial uses.

RAO2 - Reduce cancer and non-cancer risks to acceptable exposure levels (direct and indirect) for human consumption of COCs in fish and shellfish.

RAO3 - Reduce cancer and noncancer risks to people from direct contact (ingestion, inhalation, and dermal contact) with COCs in surface water to exposure levels that are acceptable for fishing, occupational, recreational, and potential drinking water supply.

RAO4 - Reduce migration of COCs in groundwater to sediment and surface water such that levels are acceptable in sediment and surface water for human exposure.

RAO5 - Reduce risk to benthic organisms from ingestion of and direct contact with COCs in sediment to acceptable exposure levels.

RAO6 - Reduce risks to ecological receptors that consume COCs in prey to acceptable exposure levels.

RAO7 - Reduce risks to ecological receptors from ingestion of and direct contact with COCs in surface water to acceptable exposure levels.

RAO8 - Reduce migration of COCs in groundwater to sediment and surface water such that levels are acceptable in sediment and surface water for ecological exposure.

RSL - regional screening level

TCDD - tetrachlorodibenzo-p-dioxin

TCDF - tetrachlorodibenzofurans

TPH - total petroleum hydrocarbons

µg/kg - microgram per kilogram

µg/L - microgram per liter

ROD Table 21. Sediment RALs and PTW Thresholds for Selected Remedy - Updated for ESD

Contaminants	Site Wide RALs[(1)] (µg/kg)	PTW Thresholds [(2)] (µg/kg)	Navigation Channel RALs (µg/kg)
Focused COCs			
PCBs	75	200	1,000
Total PAHs	30,000	NA	170,000
2,3,7,8-TCDD	0.0006	0.01	0.002
1,2,3,7,8-PeCDD	0.0008	0.01	0.003
2,3,4,7,8-PeCDF	0.2	0.2	1
DDx	160	7,050	650
Additional Contaminants			
2,3,7,8-TCDF	NA	0.6	NA
1,2,3,4,7,8-HxCDF	NA	0.04	NA
cPAHs (BaP Eq)	NA	774,000	NA
Chlorobenzene	NA	>320	NA
Naphthalene	NA	>140,000	NA

Notes:
1 – Site wide includes all areas of the Site except the navigation channel. FMD areas are subject to these RALs.
2 – PTW thresholds are based on highly toxic PTW values (10^{-3} risk) except chlorobenzene and naphthalene, which are threshold values for not reliably contained PTW.

Abbreviations:
BaP Eq – benzo(a)pyrene equivalent
cPAH –carcinogenic polycyclic aromatic hydrocarbon
COC – Contaminant of concern
DDx – dichlorodiphenyldichloroethane + dichlorodiphenyldichloroethene + dichlorodiphenyltrichloroethane
FMD – future maintenance dredge
HxCDF - hexachlorodibenzofuran
NA – not applicable
PAH – polycyclic aromatic hydrocarbon
PCB – polychlorinated biphenyl
PeCDD – pentachlorodibenzo-p-dioxin
PeCDF – pentachlorodibenzofuran
PTW – principal threat waste
RAL – remedial action level
TCDD – tetrachlorodibenzo-p-dioxin
TCDF – tetrachlorodibenzofuran
µg/kg – microgram per kilogram
> – greater than

Table 25a. Chemical-Specific ARARs for Remedial Action at the Portland Harbor Superfund Site

Medium	Regulation/Citation	Criterion/Standard	Comments
Protection of surface water	Clean Water Act, 33 USC 1313 and 1314 (Sections 303 and 304). Most recent 304(a) list of recommended water quality criteria, as updated up to issuance of the ROD	Under CWA Section 304(a), EPA develops recommended water quality criteria for water quality programs established by states. Two kinds of water quality criteria are developed: one for protection of human health, and one for protection of aquatic life. CWA §303 requires States to develop water quality standards based on Federal water quality criteria to protect existing and attainable use or uses (e.g., recreation, public water supply) of the receiving waters.	The most recent 304(a) recommended water quality criteria are: (1) **Relevant and Appropriate** for cleanup standards for surface water and contaminated groundwater discharging to surface water if more stringent than promulgated state criteria; (2) **Relevant and Appropriate** as criterion to apply to limit short-term impacts from dredging and capping if more stringent than promulgated state criteria; and (3) **Relevant and Appropriate** as criterion to apply to point source discharges that may occur in implementing the remedy if more stringent than promulgated state criteria.
Protection of potential drinking water sources	Safe Drinking Water Act, 42 USC 300f, 40 CFR Part 141, Subpart O, App. A. 40 CFR Part 143	Establishes Maximum Contaminant Level Goals (MCLGs) and Maximum Contaminant Levels (MCLs) to protect human health from contaminants in drinking water.	**Relevant and Appropriate** as cleanup standards for groundwater and surface water at the Site, which are potential drinking water sources.
Protection of potential drinking water sources	EPA Regional Screening Level (RSL) for Groundwater. Office of Superfund Remediation and Technology Innovation, Assessment and Remediation Division. November 2015.	Establishes acceptable risk levels for individual contaminants to protect the human health drinking water use at the 1x10-6 level for individual carcinogens or hazard quotient (HQ) of 1. They are risk-based concentrations derived from standardized equations combining exposure information assumptions with EPA toxicity data.	**To Be Considered** criteria for cleanup standards for groundwater and surface water at the Site only for contaminants of concern for which there are no MCLGs or MCLs established because the groundwater and surface water are potential drinking water sources.
Measure of protectiveness of human health and the environment in all media	Oregon Environmental Cleanup Law ORS 465.315(b)(A). Oregon Hazardous Substance Remedial Action Rules OAR 340-122-0040(2)(a) and (c), 0115(2-4).	Sets standards for degree of cleanup required for hazardous substances. Establishes acceptable risk levels for human health at $1x10^{-6}$ for individual carcinogens, $1x10^{-5}$ for multiple carcinogens, and Hazard Index of 1 for noncarcinogens.	**Applicable** standards for the final selected remedy to achieve these human health carinogen and noncarcinogen risk levels by implementation of dredging, capping, enhanced natural recovery, monitored natural recovery, off-site disposal, implementation of institutional controls and other response actions set forth in the ROD.
Protection of surface water	Water Pollution Control Act ORS 468B.048. State-wide Numeric water quality critiera set forth in OAR Part 340, Division 41, including, Toxic Substances criterion at OAR Part 340-41-0033 (Tables 30 and 40), and Designated Uses for the Willamette Basin and Numeric Water Quality Criteria specified for the Willamette Basin at OAR 340-041-340 and 340-041-0345	DEQ is authorized to administer and enforce CWA program in Oregon. The state has promulgated numeric water criteria, state-wide and specific Willamette Basin criteria, to protect Willamette Basin designated beneficial uses.	Oregon's numeric toxics water quality standards (Tables 30 and 40) are **Applicable** requirements as cleanup standards for surface water to the extent they are more stringent than Clean Water Act 304(a) recommended criterion. State promulgated numeric water quality criteria are **Applicable** standards for controls on discharges of pollutants to state waters that may violate such criteria during the implementation of remedial actions, such as setting limits on short-term impacts from dredging and capping, and limits on point source discharges that may occur in implementing the remedy. Oregon's promulated numeric water quality critiera are **Relevant and Appropriate** as cleanup standards for contaminated groundwater discharging to surface water.

Table 25b. Action-Specific ARARs for Remedial Action at the Portland Harbor Superfund Site

Action	Regulation/Citation	Criterion/Standard	Comments
Actions that discharge dredged or fill material into navigable waters	Clean Water Act, Section 404, 33 USC 1344 and Section 404(b)(1) Guidelines, 40 CFR Part 230 (Guidelines for Specification of Disposal Sites for Dredged or Fill Material)	CWA §404 regulates the discharge of dredged or fill material into waters of the U.S, including return flows from such activity. This program is implemented through regulations set forth in the 404(b)(1) guidelines, 40 CFR Part 230. The guidelines specify: the restrictions on discharge (40 CFR 230.10); the factual determinations that need to be made on short-term and long-term effects of a proposed discharge of dredged or fill material on the physical, chemical, and biological components of the aquatic environment (40 CFR 230.11) in light of Subparts C through F of the guidelines; and the findings of compliance on the restrictions (40 CFR 230.12). Subpart J of the guidelines provide the standards and critieria for the use of all types of compensatory mitigation when the response action will result in unavoidable impacts to the aquatic environment.	**Applicable** criteria and guidelines for evaluating impacts to the aquatic environment from dredging contaminated sediment, placement of capping material and enhanced monitored natural recovery mterial, and in-situ treatment of sediments that will occur in implementing the remedy. Through an initial Section 404 analysis with RI/FS information, it was determined that the remedy can be implemented in compliance with Section 404 requirements. However, more detailed remedial design information will be required to fully assess impacts and specify all of the requirements and controls that will need to be placed on dredging and placement of capping or other materials in the river, including return flows, and riverbank remediation, to minimize or avoid the impacts. Also through the 404 analysis in remedial design, exact amounts of compensatory mitigation for unavoidable loss of aquatic habitat will be determined and mitigation plans developed.
Actions that discharge pollutants to waters of U.S.	Clean Water Act, Section 402, 33 USC 1342	Regulates discharges of pollutants from point sources to waters of the U.S., and requires compliance with the standards, limitations and regulations promulgated per Sections 301, 304, 306, 307, 308 of the CWA. CWA §301(b) requires all direct dischargers to meet technology-based requirements. These requirements include, for conventional pollutants, application of the best conventional pollutant control technology (BCT), and for toxic and nonconventional pollutants, the best available technology economically achievable (BAT). Where effluent guidelines for a specific type of discharge do not exist, BCT/BAT technology-based treatment requirements are determined on a case-by-case basis using best professional judgment (BPJ). Once the BPJ determination is made, the numerical effluent discharge limits are derived by applying the levels of performance of a treatment technology to the wastewater discharge.	**Relevant and Appropriate** to remedial activities that result in a point source discharge of pollutants to the river if more stringent than state promulgated point source requirements.
Actions that discharge pollutants to waters of U.S.	Clean Water Act, 33 USC 1341, (Section 401), 40 CFR Section, 121.2(a)(3), (4) and (5) Also see OAR 340-048-0015 "When Certification Required" pursuant to Oregon state law.	Any federally authorized activity which may result in any discharge into navigable waters requires reasonable assurances that the activity will be conducted in a manner which will not violate applicable water quality standards by the imposition of any effluent limitations, other limitations, and monitoring requirements necessary to assure the discharge will comply with applicable provisions of sections 1311, 1312, 1313, 1316, and 1317 of the Clean Water Act. Oregon administrative rule OAR 340-048-0015, Provides that federally-approved activities that may result in a discharge to waters of the State requires evaluation whether an activity may proceed and meet water quality standards with conditions, which if met, will ensure that water quality standards are met.	**Relevant and Appropriate** CWA 401 requirement, if more stringent than state implementation regulations, that in-water response actions that result in a discharge of pollutants comply with water quality standards through the placement of water quality-based conditions and other requirements on the discharge deemed necessary. The **applicable** state regulations require reasonable assurance that any discharge to state waters will comply with state water quality standards. Actions to implement the remedial action that may result in discharges to state waters include, but may not be limited to, dredging, capping, placement of material for enhanced natural recovery, riverbank remediation, return flows or de-watering sediments. Conditions and other requirements deemed necessary so that state water quality standards are not violated will be placed on any such discharge.
Actions resulting in discharges to waters of the State of Oregon, including removal and fill activities	ORS 468B.025 and State water quality standards established by rule: OAR 340-041-0002 through 0059, and Willamette Basin Designated Uses and Basin-specific water quality standards at OAR 340-041-340 and OAR 340-041-345.	ORS 468B.025 prohibits pollution of any waters of the state and prohibits the discharge of any wastes into state waters if the discharge reduces the quality of the water below state water quality standards. By rule, the State establishes standards of quality and purity for the waters of the state	All state-wide and Willamette Basin-specific water quality standards, including numeric, narrative, and designated uses, are **Applicable** requirements for any discharges to surface water from point sources and remedial activities that may result in discharges to waters of the state, such as, dredge and fill, capping, placement of material for enhanced natural recovery, riverbank remediation, and return flows or de-watering sediments. State-wide and Willamette Basin-specific water quality standards are **Relevant and Appropriate** to measuring effectiveness of controls on contaminated groundwater discharging to surface water.
Actions resulting in discharges from removal and fill activities	ORS 196.825(5) -Statutory requirement to mitigate for expected adverse effects of removal and fill activities. Applicable substantive mitigation rules are: OAR 141-085-510, 141-085-680, 141-085 0685, 141-085-0690, 141-085-0710, 141-085-715.	State substantive requirements for mitigation for the reasonably expected adverse effects of removal or fill in a project development in waters of the state, including in designated Essential Indigenous Anadromous Salmonid Habitat.	**Applicable** compensatory mitigation standards and requirements for reasonably expected adverse effects, if any, from dredging, capping, placement of material for enhanced natural recovery, and riverbank remediation. The Site includes Essential Indigenous Anadromous Salmonid Habitat and the specifically-listed state regulations contain specific habitat mitigation standards not found in CWA Section 404 regulations for reasonably expected adverse effects of the dredging, capping and other remedial action activities, which will be incorporated into compensatory mitigation plans developed during remedial design.

Table 25b. Action-Specific ARARs for Remedial Action at the Portland Harbor Superfund Site

Action	Regulation/Citation	Criterion/Standard	Comments
Actions in federal navigation channels	River and Harbors Act of 1899, Section 10, 33 USC Section 403 and implementing regulations at 33 CFR Sections 322(e), 323.3, 323.4(b)-(c) and 329	The creation of any obstruction not affirmatively authorized by Congress, to the navigable capacity of any of the waters of the United States is prohibited; and it shall not be lawful to build or commence the building of any wharf, pier, dolphin, boom, weir, breakwater, bulkhead, jetty, or other structures in any port, roadstead, haven, harbor, canal, navigable river, or other water of the United States, outside established harbor lines. 33 CFR 322(e) addresses placing of aids to navigation in navigable wates is under the purview of Section 10, and must meet requirements of the U.S. Coast Guard (33 CFR 330.5(a)(1)). 33 CFR Section 323.4(b) and (c) provide if any discharge of dredged or fill material contains any toxic pollutant listed under section 307 of the CWA such discharge shall require compliance with Section 404 of the CWA. Placement of pilings, or discharge of dredged material that where the flow or circulation of waters of the United States may be impaired or the reach of such waters reduced must comply with Section 10. 33 CFR 329.4 defines the terms "navigable water of the United States" for purposes of the USACE regulations, including those addressing the discharge of dredged or fill material.	**Applicable** requirement for how remedial actions are taken or constructed in the navigation channel so as not to create an obstruction to the navigable capacity. **Applicable** to the use of aids to navigation as institutional controls for maintaining the integrity of the selected remedy. **Applicable** to the placement of pilings or discharge of dredged material that may impair the flow or circulation of waters or reach of waters of the United States.
Actions generating pesticide residue	Hazardous Waste and Hazardous Materials II. Identification and Listing of Hazardous Waste OAR 340-101-0033(6) and (7); OAR 340-100-0010(j); and OAR 340-109-0010(3) and (4)	State regulations that identify and define pesticide residue as a state hazardous waste, but which are not subject to land disposal restrictions.	**Applicable** regulations for characterizing dredged material as a state hazardous waste for off-site disposal.
Actions handling PCB remediation wastes and PCB containing material	Toxic Substances Control Act, 15 USC §2601 et seq., 40 CFR Part 761, Subpart D and OAR 340-110-0065 (1) and (2)	TSCA Subpart D regulates storage and disposal of PCB wastes and establishes requirements for handling, storage, and disposal of PCB-containing materials, including PCB remediation wastes, and sets performance standards for disposal technologies for materials/wastes with concentrations in excess of 50 milligrams per kilogram (mg/kg). Establishes decontamination standards for PCB contaminated debris. Oregon PCB storage for disposal regulations require the owners or operators of any facility using containers described in CFR 761.65(c)(7)(i) prepare and implement a Spill Prevention Control and Countermeasure (SPCC) plan as described in 40 CFR Part 112. In complying with 40 CFR Part 112, the owner or operator shall read "oil(s)" as "PCB(s)" whenever it appears. Because the remedy requires removal of sediment to specific depths and the maximum PCB concentrations detected in areas of the river to be dredged do not exceed 50 mg/kg, no substantive requirements triggered. If additional testing during remedial design identifies sediments at concentrations of 50 mg/kg PCBS, TSCA regulations may be applicable for managing dredged material for off-site disposal and listed here: 40 CFR 761.1(b)(5), 40 CFR 761.3, 40 CFR 761.50(a) and (b)3, 40 CFR 761.61(a)(5) and (b), 40 CFR 761.65(c)(9)(i)-(iii), and 40 CFR 761(c).	TSCA decontamination and disposal requirements are **Applicable** to the disposal of contaminated dredged material, debris, or surface water with PCB contamination if dredged sediment is found to contain 50 mg/kg in concentration. Based on current data, PCB concentrations in dredged sediment at or above 50 mg/kg are not expected, but if found, the cleanup will comport with this standard. Certain types of debris that may be encountered and which appears to be PCB equipment or potentially from a PCB-Containing source, will require sampling and analysis compliant with TSCA to determine if it is PCB remediation waste and needs to be disposed as such.
Risk-based limits protective of human health for air emissions associated with soil or sediment removal	Clean Air Act, 40 CFR Parts 50 and 52	Places restrictions on air emissions from stationary and mobile sources that creates threats to human health as defined in the regulations and which may be generated from equipment used to construct the remedy.	These regulations are **Relevant and Appropriate** to evaluating how emissions may be minimized or reduced during construction of the remedy.
Actions generating air emissions	Oregon Air Pollution Control ORS 468A et. seq., General Emissions Standards OAR 340-226	DEQ is authorized to administer and enforce Clean Air program in Oregon. Rules provide general emission standards for fugitive emissions of air contaminants and require highest and best practicable treatment or control of such emissions.	**Applicable** to remedial actions taking place on-site on upland properties. Could apply to earth-moving equipment, dust from vehicle traffic, and mobile-source exhaust, among other things.

Table 25b. Action-Specific ARARs for Remedial Action at the Portland Harbor Superfund Site

Action	Regulation/Citation	Criterion/Standard	Comments
Actions that involve handling of dredged sediment or riverbank soils containing asbestos	National Emission Standards for Asbestos, 40 CFR 61.150(a)(1)(i) - (v)	40 CFR 61.150(a) requires that there be no visible emissions to the outside air during collection, processing, packaging, or transporting of any asbestos-containing waste material. Subsections (a)(1)(i) and (ii) require that asbestos-containing waste material be adequately kept wet and provide how to keep such wet so as not to discharge any visible emissions to the outside air. Subsection (a)(1)(iii) requires that after wetting, seal all asbestos-containing waste material in leak-tight containers while wet; or, for materials that will not fit into containers without additional breaking, put materials into leak-tight wrapping. Subsections (a)(1)(iv) and (v) require: Label the containers or wrapped materials specified in paragraph (a)(1)(iii) of this section using warning labels specified by Occupational Safety and Health Standards of the Department of Labor, Occupational Safety and Health Administration (OSHA) under 29 CFR 1910.1001(j)(4) or 1926.1101(k)(8). The labels shall be printed in letters of sufficient size and contrast so as to be readily visible and legible. For asbestos-containing waste material to be transported off the facility site, label containers or wrapped materials with the name of the waste generator and the location at which the waste was generated.	**Relevant and Appropriate** as standards for handling dredged sediment or riverbank soils containing asbestos that is going to on-site or off-site disposal facilities. Friable asbestos may be encountered during remediation in riverbanks and in the river where landfilling or disposal of friable asbestos occurred at industrial operations using such material, such as, chemical manufacturers and ship building and dismantling operations, and where encountered the cleanup will comport with this standard.
Actions that involve off-site disposal of dredged sediment or riverbank soils containing asbestos	National Emission Standards for Asbestos, 40 CFR 61.150(b)(1) and (2) and (c)	40 CFR 61.150(b)(1) and (2) require: All asbestos-containing waste material shall be deposited as soon as is practical by the waste generator at a waste disposal site operated in accordance with the provisions of § 61.154, or an EPA-approved site that converts RACM and asbestos-containing waste material into nonasbestos (asbestos-free) material according to the provisions of § 61.155. Subsection (c) requires: Mark vehicles used to transport asbestos-containing waste material during the loading and unloading of waste so that the signs are visible. The markings must conform to the requirements of §§ 61.149(d)(1) (i), (ii), and (iii).	**Applicable** to offsite transportation, treatment and disposal of asbestos-containing waste material segregated from contaminated environmental media such as sediment and soil that is generated during dredging or excavation of sediment and riverbank soils.
Actions on the riverbanks that expose and manage on-site soils containing asbestos	National Emission Standards for Asbestos, 40 CFR 61.151(a)(2) and (3), 40 CFR 61.151(b)(1)(i) through (iii) and 40 CFR 61.151(b)(2)	40 CFR 61.151(a)(2) requires: Cover the asbestos-containing waste material with at least 15 centimeters (6 inches) of compacted nonasbestos-containing material, and grow and maintain a cover of vegetation on the area adequate to prevent exposure of the asbestos-containing waste material. In desert areas where vegetation would be difficult to maintain, at least 8 additional centimeters (3 inches) of well-graded, nonasbestos crushed rock may be placed on top of the final cover instead of vegetation and maintained to prevent emissions. 40 CFR 61.151(b)(3) requires: Cover the asbestos-containing waste material with at least 60 centimeters (2 feet) of compacted nonasbestos-containing material, and maintain it to prevent exposure of the asbestos-containing waste. 40 CFR 61.151(b)(1)(i) through (iii) requires: (1) Display warning signs at all entrances and at intervals of 100 m (328 ft) or less along the property line of the site or along the perimeter of the sections of the site where asbestos-containing waste material was deposited. The warning signs must: (i) Be posted in such a manner and location that a person can easily read the legend; and (ii) Conform to the requirements for 51 cm × 36 cm (20″ × 14″) upright format signs specified in 29 CFR 1910.145(d)(4) and this paragraph; and (iii) Display the following legend in the lower panel with letter sizes and styles of a visibility at least equal to those specified in this paragraph. Spacing between any two lines must be at least equal to the height of the upper of the two lines. 40 CFR 61.151(b)(2) requires: Fence the perimeter of the site in a manner adequate to deter access by the general public.	**Applicable** to exposed asbestos-containing waste material and soils managed in situ on riverbanks during remediation or taken off-site for disposal.
Actions generating air emissions	Fugitive Emission Requirements OAR 340-208-0205, 0208, and 0209	State regulations that prohibit any person from openly accummulating asbestos material or asbestos-containing material and sets disposal requirements for Friable Asbestos and Nonfriable Asbestos	**Applicable** to remedial actions that may encounter friable or nonfriable asbestos material or asbestos-containing material and the off-site disposal of such.

Table 25b. Action-Specific ARARs for Remedial Action at the Portland Harbor Superfund Site

Action	Regulation/Citation	Criterion/Standard	Comments
Actions that may alter waterbodies and that may effect fish and wildlife	Fish and Wildlife Coordination Act. 16 USC 662 and 663, 50 CFR 6.302(g)	Requires federal agencies to consider effects on fish and wildlife from projects that may alter a body of water and mitigate or compensate for project-related losses, which includes discharges of pollutants to water bodies.	**Applicable** to determining impacts and appropriate mitigation, if necessary, for effects on fish and wildlife from filling activities or discharges from point sources.
Actions that may affect ESA listed and State protected fish and wildlife species	ODFW Fish Management Plans for the Willamette River. OAR 635, div 500	Provides basis for in-water work (dredging and filling) windows in the Willamette River.	**Applicable** to placing restrictions on when dredging and filling can occur in the Willamette River due to presence of ESA listed and state protected species at the site.
Actions that may affect marine mammals	Marine Mammal Protection Act. 16 USC §1361 et seq. 50 CFR 216	Imposes restrictions on the taking, possession, transportation, selling, offering for sale, and importing of marine mammals.	**Applicable** to response actions that could harm marine mammals in the Willamette River and may require best management practices be used for observing and avoiding contact with such species during construction of the remedy.
Actions that may affect migratory birds	Migratory Bird Treaty Act. 16 USC §703 50 CFR §10.12	Makes it unlawful to take any migratory bird. "Take" is defined as pursuing, hunting, wounding, killing, capturing, trapping and collecting.	**Applicable** to response actions that could harm migratory birds using the Willamette River and may require use of best management practices for observing and avoiding contact with such species during construction of the remedy.
On-site actions that involve generating, handling and disposal of hazardous waste	OAR 340-100-0001(3) and OAR 340-100-0002(1)	Oregon has adopted and incorporates by reference the federal RCRA hazardous waste management program. Oregon adopted the federal Hazardous Waste Identification Rule that provides for an exclusion for dredged materials subject to the requirements of a permit under the Clean Water Act or the Marine Protection, Research, and Sanctuaries Act from RCRA Subtitle C.	Oregon's hazardous waste and materials regulations are **Applicable** to the generation, storage, handling, treatment and disposal of hazardous waste on-site and slated for off-site disposal. Oregon's hazardous waste identification rule exempts handling and on-site management of dredged materials subject to the requirements of a permit under the Clean Water Act or Marine Protection, Research, and Sanctuaries Act. However, any dredged material that will be disposed of in an off-site disposal facility must comply with these standards.
Actions generating solid wastes or hazardous wastes for off-site disposal	Solid waste defined in 40 CFR 261.2. Determining if solid waste is hazardous per 40 CFR § 262.11(a-c) and OAR 340-102-0011 - Hazardous Waste Determination	Must determine if solid waste (residue as defined in OAR 340-100-0010) is a hazardous waste using the following method: • Should first determine if waste is excluded from regulation under 40 CFR261.4; and • Must then determine if waste is listed as a hazardous waste under subpart D 40 CFR part 261 or whether the waste is (characteristic waste) identified in subpart C of 40 CFR part 261 by either: (1) Testing the waste according to the methods set forth in subpart C of 40 CFR part 261, or according to an equivalent method approved by the Administrator under 40 CFR §260.21; or (2) Applying knowledge of the hazard characteristic of the waste in light of the materials or the processes used. Additionally, Oregon has promulgated its own hazardous waste determination regulation: "(1) The provisions of this rule replace the requirements of 40 C.F.R. Sec. 262.11. (2) A person who generates a residue as defined in OAR 340-100-0010 must determine if that residue is a hazardous waste using the following method: (a) Persons should first determine if the waste is excluded from regulation under 40 C.F.R. Sec. 261.4 or OAR 340-101-0004; (b) Persons must then determine if the waste is listed as a hazardous waste in Subpart D of 40 C.F.R. Part 261; (c) Persons must then determine if the waste is listed under the following listings: NOTE: Even if the waste is listed, the person still has an opportunity under OAR 340-100-0022 to demonstrate to the Commission that the waste from their particular facility or operation is not a hazardous waste. (d) Regardless of whether a hazardous waste is listed through application of subsections (2)(b) or (2)(c) of this rule, persons must also determine whether the waste is hazardous under Subpart C of 40 C.F.R. Part 261 by either: (A) Testing the waste according to the methods set forth in Subpart C of 40 C.F.R. Part 261, or according to an equivalent method the Department approves under OAR 340-100-0021, or NOTE: In most instances, the Department will not consider approving a test method until the EPA approves it. (B) Applying knowledge of the hazard characteristic of the waste in light of the materials or the processes used."	Hazardous waste characterization and determination is **Applicable** for off-site disposal.
Actions generating dredged material hazardous waste	40 CFR § 261.4(g)	Dredged material that is subject to the requirements of Section 404 of the CWA is not a hazardous waste for purposes of regulation under RCRA.	The exemption is **Applicable** to the dredging, in-situ treatment, handling, storage or other on-site activities of dredged materials that are being managed in accordance with Section 404 analysis and approvals.

Table 25b. Action-Specific ARARs for Remedial Action at the Portland Harbor Superfund Site

Action	Regulation/Citation	Criterion/Standard	Comments
Actions generating RCRA hazardous waste that will be disposed of in a permitted off-site disposal facility	40 CFR § 264.13(a)(1)	Must obtain a detailed chemical and physical analysis on a representative sample of the waste(s), which at a minimum contains all the information that must be known to treat, store, or dispose of the waste in accordance with pertinent sections of 40 CFR 264 and 268.	This requirement is **Applicable** to characterizing dredged materials for off-site disposal.
Actions generating RCRA hazardous waste	40 CFR § 268.7(a)(1)	Must determine if the hazardous waste has to be treated before land disposed. This is done by determining if the waste meets the treatment standards in 40 CFR 268.40, 268.45, or 268.49 by testing in accordance with prescribed methods or use of generator knowledge of waste. This determination can be made concurrently with the hazardous waste determination required in 40 CFR 262.11. Must comply with the special requirements of 40 CFR § 268.9 in addition to any applicable requirements in 40 CFR § 268.7.	This requirement is **Applicable** to characterizing and treating dredged materials slated for off-site disposal.
Actions generating RCRA hazardous waste	40 CFR § 268.9(a)	Must determine each EPA Hazardous Waste Number (waste code) applicable to the waste in order to determine the applicable treatment standards under 40 CFR 268 et seq. This determination may be made concurrently with the hazardous waste determination required in Sec. 262.11 of this chapter. Must determine the underlying hazardous constituents [as defined in 40 CFR 268.2(i)] in the characteristic waste.	This requirement is **Applicable** to characterizing and treating dredged materials slated for off-site disposal.
Actions generating industrial wastewater	40 CFR § 261.4(a)(2)	Industrial wastewater discharges that are point source discharges subject to regulation under section 402 of the CWA, as amended, are not solid wastes for the purpose of hazardous waste management. [Comment: This exclusion applies only to the actual point source discharge. It does not exclude industrial wastewaters while they are being collected, stored or treated before discharge, nor does it exclude sludges that are generated by industrial wastewater treatment.]	This requirement is **Applicable** to wastewater generated by the remedy that will be discharged from a point source in accordance with Section 402 of the CWA.
Actions requiring temporary storage of hazardous waste	OAR 340-102-0034 40 CFR § 262.34(a); 40 CFR §262.34(a)(1)(i); 40 CFR § 262.34(a)(2) and (3) 40 CFR § 262.34(c)(1)	A generator may accumulate hazardous waste at the facility provided that (accumulation of RCRA hazardous waste on site as defined in 40 CFR §260.10) : • waste is placed in containers that comply with 40 CFR 265.171–173; and • the date upon which accumulation begins is clearly marked and visible for inspection on each container; • container is marked with the words "hazardous waste"; or • container may be marked with other words that identify the contents if accumulation of 55 gal. or less of RCRA hazardous waste or one quart of acutely hazardous waste listed in §261.33(e) at or near any point of generation Oregon hazardous waste regulations further require: (1) In addition to the requirements of 40 CFR 262.34, a generator may accumulate hazardous waste on-site for 90 days or less without a permit provided that, if storing in excess of 100 containers, the waste is placed in a storage unit that meets the Accumulation requirements of 40 CFR 264.175 and (2) A generator shall comply with provisions found in 40 CFR, Part 262 and each applicable requirement of 40 CFR 262.34(a), (b), (c), (d), (e), and (f).	The substantive requirements are **Applicable** to temporary storage of hazardous waste at an on-site transloading facility, but no permit will be required.
Actions resulting in the storage of solid waste	OAR 340-093-0210 and 0220	State of Oregon solid waste general provisions regarding storage and collection of solid waste and transportation related requirements for trucks servicing a solid waste collection facility.	Applicable requirements to operation of an on-site transloading facility for dredged materials slated for off-site disposal.
Actions resulting in the storage of solid waste	OAR 340-095-0010, 0020, 0030, 0050(1) & (2), 0070(2)	State of Oregon solid waste regulations for solid waste land disposal sites other than municipal solid waste landfills. Specifically, regulations related to the location siting, operating criteria, design criteria, groundwater monitoring and closure requirements for a non-municipal solid waste landfill.	**Applicable** requirements to the siting, design, operation and closure of an on-site transloading facility for dredged material slated for off-site disposal.

Table 25b. Action-Specific ARARs for Remedial Action at the Portland Harbor Superfund Site

Action	Regulation/Citation	Criterion/Standard	Comments
Actions transporting hazardous materials	49 CFR 171.1(b)	Any person who, under contract with a department or agency of the federal government, transports "in commerce," or causes to be transported or shipped, a hazardous material shall be subject to and must comply with all applicable provisions of the HMTA and HMR at 49 CFR 171 - 180 related to marking, labeling, placarding, packaging, emergency response, etc.	**Applicable** to transportation of hazardous materials.
Actions that involve storage and treatment of hazardous waste at the transloading facility	40 CFR Part 264, Subparts B, C, F, G, I, J, K, L, M, AA, BB, CC, and DD	These regulations provide standards for location, design, operation, and closure of units in which treatment of hazardous waste may occur at the transloading facility. These regulations also provide requirements for use and management of containers, tank systems, surface impoundments, waste piles, and land treatment units one or more of which may be used for the storage and treatment of hazardous waste at the transloading facility. Subparts AA, BB, and CC provide air emission standards for process vents, equipment leaks, and tanks, surface impoundments and containers may be used at the transloading facilty.	The listed requirements of Part 264 are **Applicable** to the siting, design, operation, and closure of any containers, tank systems, surface impoundments, waste piles or land treatment areas used for the storage (over 90 days) and/or treatment of hazardous waste on-site prior to disposal off-site. The specific storage system and treatment methods that may be employed at the on-site transloading facility will be determined during remedial design.

Table 25c. Location-Specific ARARs for Remedial Action at the Portland Harbor Superfund Site

Location	Regulation/Citation	Criterion/Standard	Comments
Presence of archaeologically or historically sensitive area	Native American Graves Protection and Reparation Act, 25 USC 3001-3013, 43 CFR 10	Requires Federal agencies and museums which have possession of or control over Native American cultural items (including human remains, associated and unassociated funerary items, sacred objects and objects of cultural patrimony) to compile an inventory of such items. Prescribes when such Federal agencies and museums must return Native American cultural items. "Museums" are defined as any institution or State or local government agency that receives Federal funds and has possession of, or control over, Native American cultural items.	If Native American cultural items are present on property belonging to the Oregon Division of State Lands (DSL) that is a part of the response action area, this requirement is **Applicable**. If Native American cultural items are collected by an entity which is either a federal agency or museum, then the requirements of the law are **Applicable**.
Presence of archaeologically or historically sensitive area	Indian Graves and Protected Objects ORS 97.740-760	Prohibits willful removal of cairn, burial, human remains, funerary object, sacred object or object of cultural patrimony. Provides for re-interment of human remains or funerary objects under the supervision of the appropriate Indian tribe. Proposed excavation by a professional archaeologist of a native Indian cairn or burial requires written notification to the State Historic Preservation Officer and prior written consent of the appropriate Indian tribe. Prohibits persons from excavating, injuring, destroying or damaging archaeological sites or objects on public or private lands unless authorized.	**Relevant and Appropriate** if archaeological material is encountered.
Presence of archaeologically or historically sensitive area	Archaeological Objects and Sites ORS 358.905- 955 ORS 390.235	Imposes conditions for excavation or removal of archaeological or historical materials.	**Relevant and appropriate** if archaeological material encountered.
Presence of archaeologically or historically sensitive area	National Historic Preservation Act. 16 USC 470 et seq. 36 CFR Part 800	Requires the identification of historic properties potentially affected by the agency undertaking, and assessment of the effects on the historic property and seek ways to avoid, minimize or mitigate such effects. Historic property is any district, site, building, structure, or object included in or eligible for the National Register of Historic Places, including artifacts, records, and material remains related to such a property.	**Applicable** if historic properties are potentially affected by remedial activities.
Presence of archaeologically or historically sensitive area	Archaeological and Historic Preservation Act. 16 USC 469a-1	Provides for the preservation of historical and archaeological data that may be irreparably lost as a result of a federally-approved project and mandates only preservation of the data.	**Applicable** if historical and archaeological data may be irreparably lost by implementation of the remedial activities.
Presence of floodplain as designated on FEMA Flood Insurance map	44 CFR 60.3(d)(2) and (3)	Prohibits encroachments that would result in any increase in flood levels during occurrence of base flood discharge.	FEMA flood rise requirements are considered **Relevant and Appropriate** requirements for remedial actions that involve capping or other placement of material in the river or on riverbanks that may increase flood levels.

Table 25c. Location-Specific ARARs for Remedial Action at the Portland Harbor Superfund Site

Location	Regulation/Citation	Criterion/Standard	Comments
Presence of floodplain as designated on map	Federal Emergency Management Act regulations at 44 CFR 9 (which sets forth the policy, procedure and responsibilities to implement and enforce Executive Orders 11988 (Management of Floodplain) **To Be Considered**, as amended by E.O. 13690 and 11990 (Protection of Wetlands) **To Be Considered**	44 CFR 9 (Requirements for Flood Plain Management Regulations Areas) Requires measures to reduce the risk of flood loss, minimize impact of floods, and restore and preserve the natural and beneficial values of floodplains. The Executive Orders 11988 as amended by 13690 direct federal agencies to evaluate the potential effects of action that may be taken in a floodplain and to avoid, to the extent possible, long-term and short-term adverse effects assocated wit the occupancy and modification of floodplains, and to avoid direct or indirect support of floodplain develoment wherever there is a practicable alternative. Executive Order 11990 directs that activities conducted by federal agencies avoid, to the extent possible, long-term and short-term adverse effects associated with the modification or destruction of wetlands and to avoid direct or indirect support of new construction in wetlands when there are practible alternatives.	The substantive identified FEMA regulations are **Relevant and Appropriate** for assessing impacts, if any, to the floodplain and flood storage from the response action and developing compensatory mitigation that is beneficial to floodplain values. Substantive portions of the Executive Order are **To-Be-Considered.**
Presence of wetlands	Executive Order for Wetlands Protection. Executive Order 11990 (1977) **To Be Considered**	Requires measures to avoid adversely impacting wetlands whenever possible, minimize wetland destruction, and preserve the value of wetlands.	**To Be Considered** guidelines in assessing impacts to wetlands, if any, from the response action and for developing appropriate compensatory mitigation for the project.
Presence of state-listed threatened or endangered wildlife species	Protection and Conservation Programs ORS. 496.171 to 496.182. Survival Guidelines OAR 635-100-0135	Survival Guidelines are rules for state agency actions affecting species listed under Oregon's Threatened or Endangered Wildlife Species law.	Substantive requirements of Survival Guidelines are **Relevant and Appropriate** to remedial activities affecting state-listed species.
Presence of essential fish habitat	Magnuson-Stevens Fishery Conservation and Management Act. 50 CFR Part.600.920	Requires federal agencies consult with NMFS on actions that may adversely affect Essential Fish Habitat (EFH), defined as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity."	**Applicable** because the National Marine Fisheries Service has designated the Lower Willamette River as EFH. EPA evaluated effects to EFH from the proposed remedial action in a biological assessment.
Presence of federally endangered or threatened species	Endangered Species Act. 16 USC 1536 (a)(2), Listing of endangered or threatened specieis per 50 CFR 17.11 and 17.12 or designation of critical habitat of such species listed in 50 CFR 17.95	Actions authorized, funded, or carried out by federal agencies may not jeopardize the continued existence of endangered or threatened species or result in the adverse modification of species' critical habitat. Agencies are to avoid jeopardy or take appropriate mitigation measures to avoid jeopardy.	**Applicable** to remedial actions that may impact endangered or threatened species or critical habitat that are present at the site. Listed species are found at the Site, and critical habitat for listed salmonids has been designated within the site. Coordination will occur with the National Marine Fisheries Service and US Fish and Wildlife Service regarding actions to be taken, their impacts on listed species, and measures that will be taken to reduce, minimize, or avoid such impacts so as not to jeopardize the continuted existence or adversely modify critical habitat. If take cannot be avoided, take permission from the Services will be obtained. EPA evaluated effects to listed and threatened species and critical habitat from the proposed remedial action in a preliminary biological assessment. As further details are developed in remedial design, the biological assessment will be supplemented.

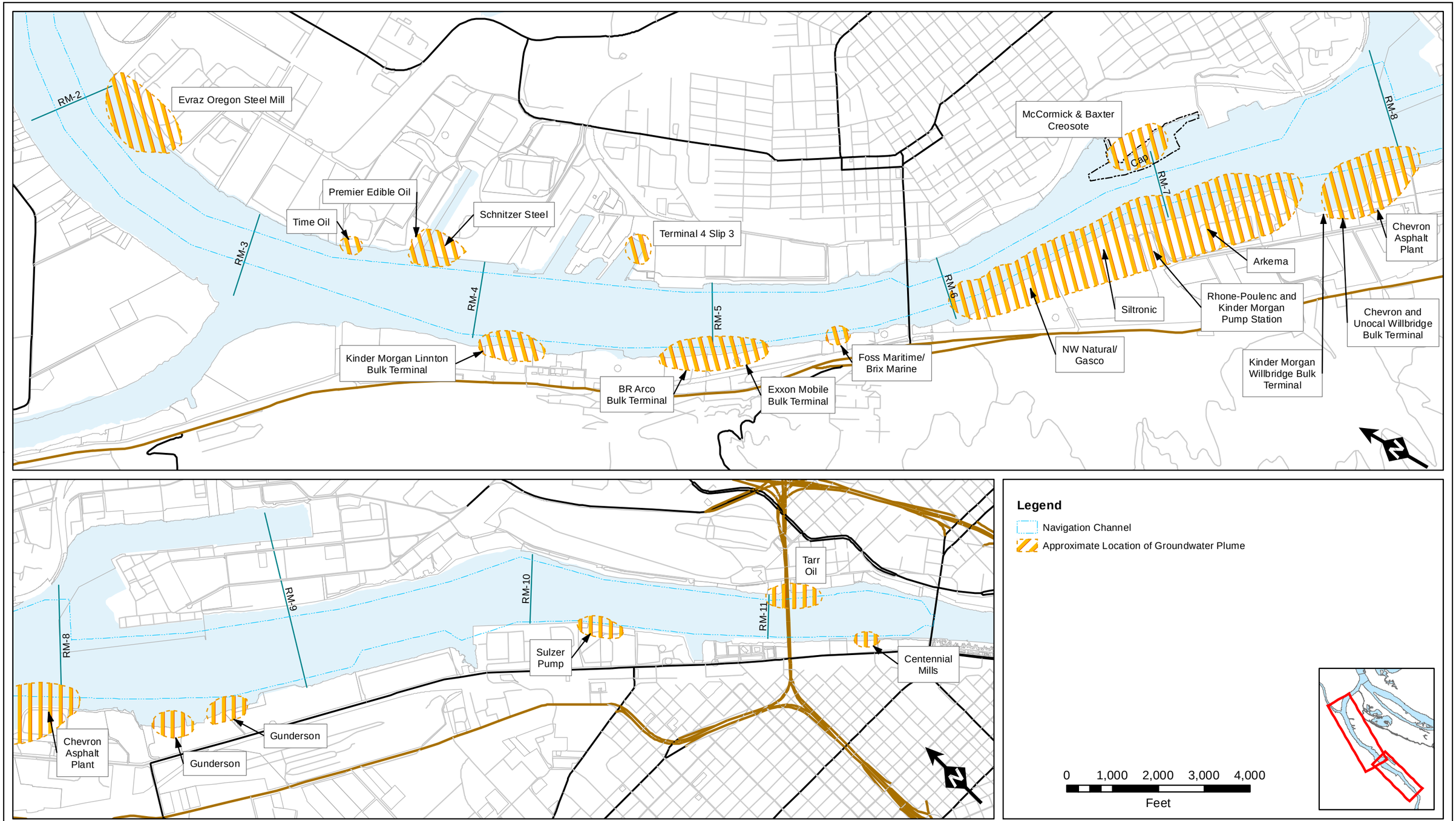


Figure 6. Portland Harbor Study Area Groundwater Plume Map

Portland Harbor Superfund Site

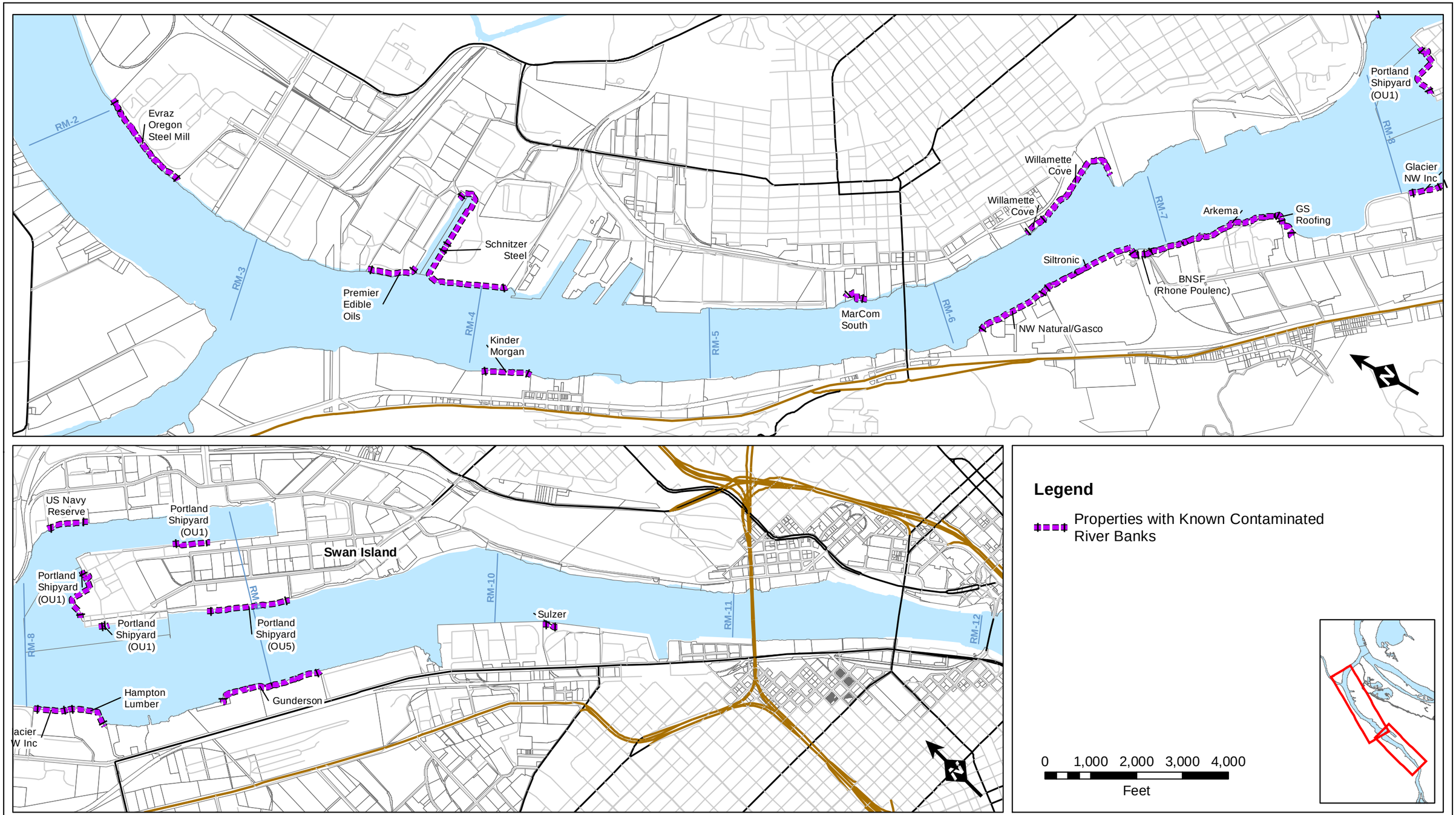
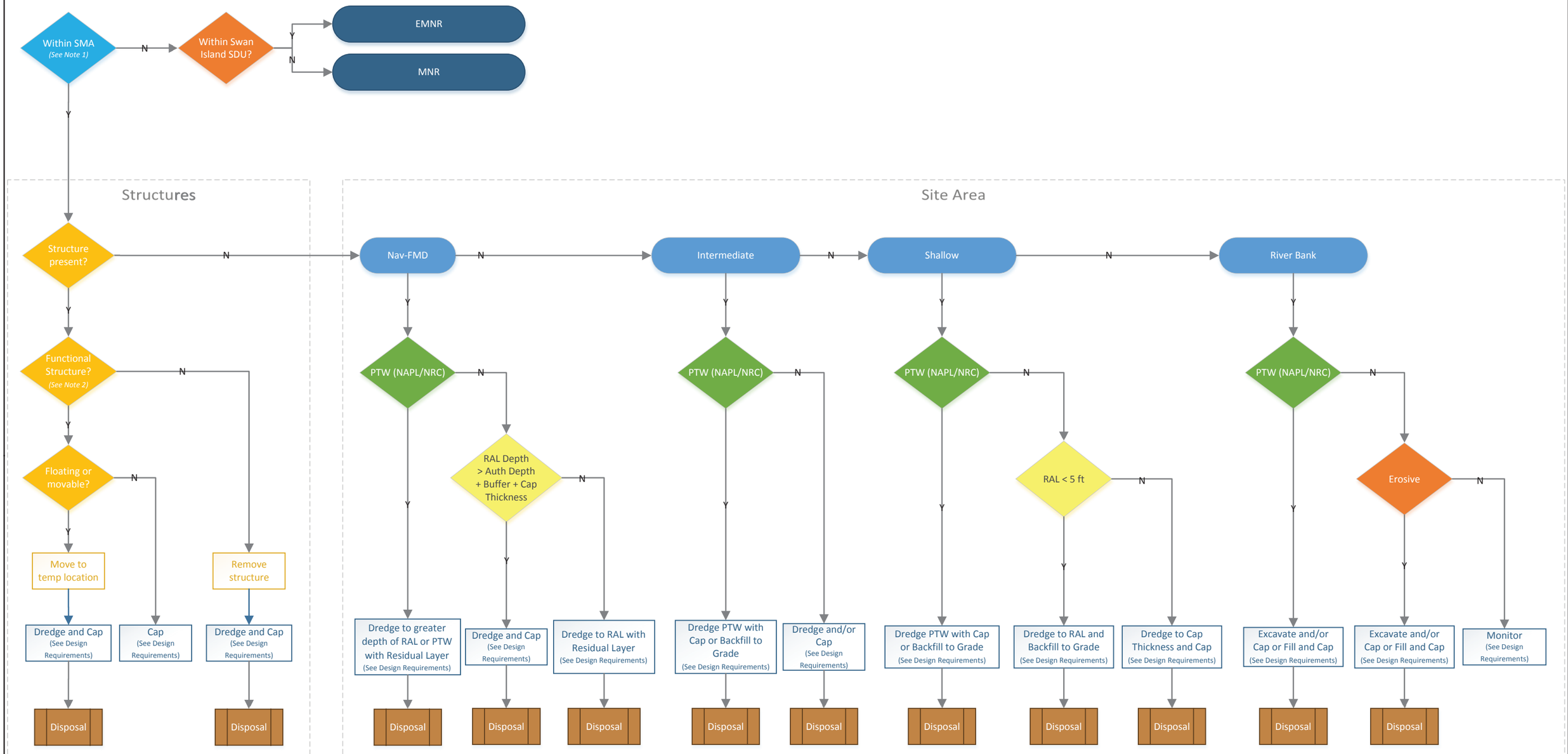


Figure 9. River Bank Areas

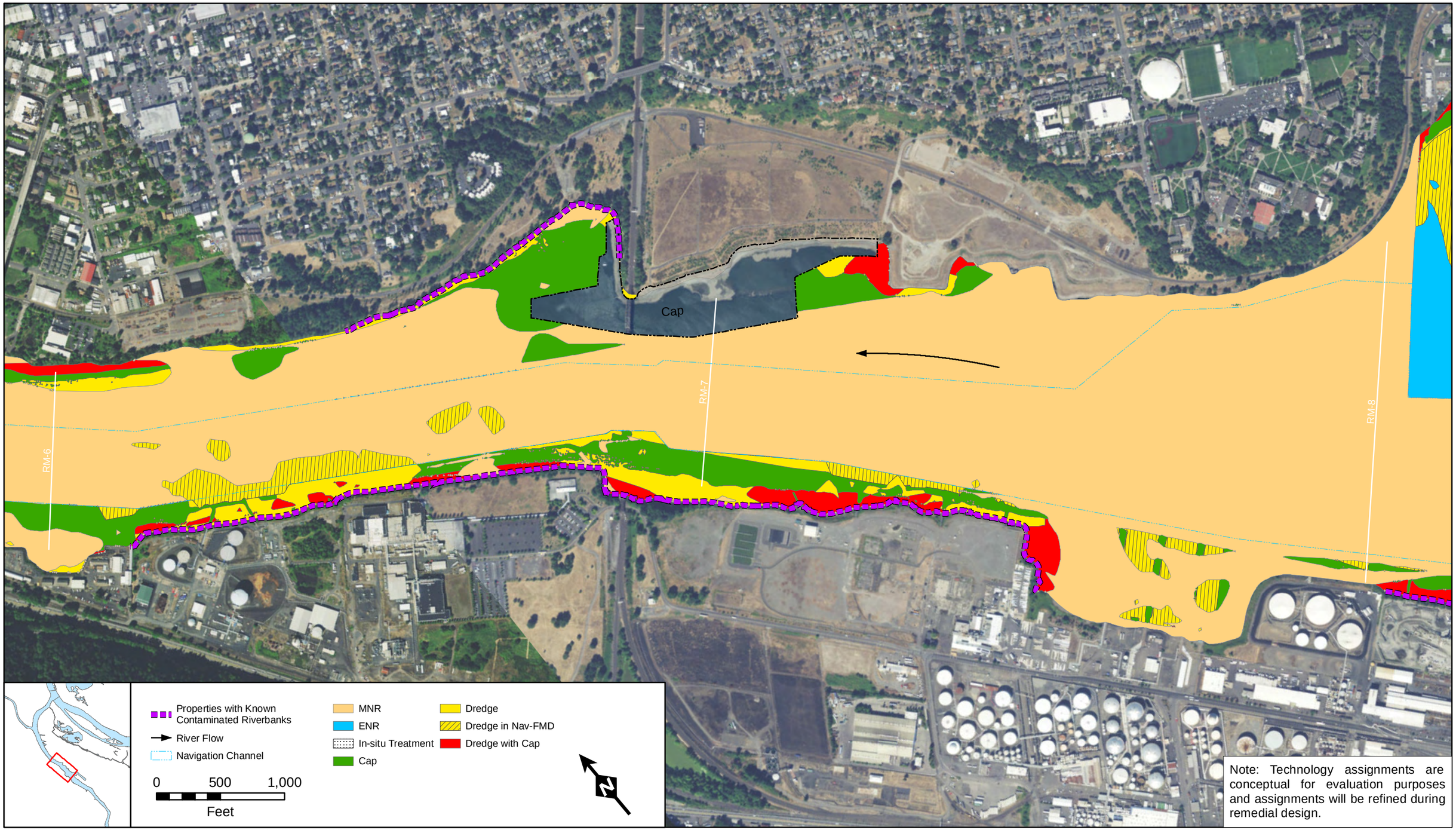
Portland Harbor Superfund Site



Notes:
(1) Contamination is defined in three dimensions.
(2) Currently operating or used to stabilize bank. Service life > 50 yrs.

Figure 28. Technology Application Decision Tree
Portland Harbor Superfund Site

Last Edited: 4/20/2016



Source Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Figure 31c. Technology Assignments, Selected Remedy
River Mile 6 to 8
Portland Harbor Superfund Site

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
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SUPERFUND &
EMERGENCY
MANAGEMENT DIVISION

September 7, 2022

MEMORANDUM

SUBJECT: Errata #3 for Portland Harbor Superfund Site Record of Decision, Table 6 and Table 21

FROM: Hunter Young, Remedial Project Manager
Superfund and Emergency Management Division

THRU: Elizabeth McKenna, Assistant Regional Counsel
U.S. Environmental Protection Agency, Region 10

TO: Portland Harbor site file

This memorandum to the site file documents errors identified in Table 6 and Table 21 of the Portland Harbor Superfund Site Record of Decision (ROD), dated January 2017 and updates Table 6 presented in Errata #1 dated April 3, 2018 and Table 21 presented in the Explanation of Significant Difference (ESD) dated December 9, 2019. In implementing remedial design it was discovered that the Principal Threat Waste (PTW) threshold value for 1,2,3,4,7,8-hexachlorodibenzofuran (HxCDF) was erroneously transcribed from the Portland Harbor Feasibility Study (FS), dated June 2016. This Errata #3 is being issued to make the correction. An explanation of the corrections being made to Appendix II, ROD Table 6 and Table 21 follows:

1. Appendix II, ROD Table 6. The PTW threshold value of 0.04 µg/kg for 1,2,3,4,7,8-HxCDF should be 0.4 µg/kg.

2. Appendix II, ROD Table 21. The PTW threshold value of 0.04 µg/kg for 1,2,3,4,7,8-HxCDF should be 0.4 µg/kg.

The attachment shows redlined corrections for each of the items above. The errors listed above do not affect the remedy. As such, they do not require an ESD or other amendment. This memorandum will be added to the site file.

Attachment
• ROD Table 6 – Updated for ESD, with Redlined Revisions for Errata #3
• ROD Table 21 – Updated for ESD, with Redlined Revisions for Errata #3

Table 6. Concentrations of PTW Defined as "Highly Toxic" - Updated for ESD, with Redlined Revisions for Errata #3

Contaminant	Highly Toxic PTW Threshold (µg/kg) (10^{-3} risk)
PCBs	200
2,3,7,8-TCDD	0.01
2,3,7,8-TCDF	0.6
1,2,3,7,8-PeCDD	0.01
2,3,4,7,8-PeCDF	0.2
1,2,3,4,7,8-HxCDF	~~0.04~~ 0.4
DDx	7,050
cPAHs (BaP eq)	774,000

Abbreviations:
cPAH (BaP eq) – carcinogenic PAHs (benzo(a)pyrene equivalent)
DDx – dichlorodiphenyldichloroethane + dichlorodiphenyldichloroethene + dichlorodiphenyltrichloroethane
HxCDF – hexachlorodibenzofuran
PAH – polycyclic aromatic hydrocarbon
PCB – polychlorinated biphenyl
PeCDD – pentachlorodibenzo-p-dioxin
PeCDF – pentachlorodibenzofuran
PTW – principal threat waste
TCDD – tetrachlorodibenzo-p-dioxin
TCDF – tetrachlorodibenzofuran
µg/kg – microgram per kilogram

Table 21. Sediment RALs and PTW Thresholds for Selected Remedy - Updated for ESD, with Redlined Revisions for Errata #3

Contaminants	Site Wide RALs[(1)] (µg/kg)	PTW Thresholds[(2)] (µg/kg)	Navigation Channel RALs (µg/kg)
Focused COCs			
PCBs	75	200	1,000
Total PAHs	30,000	NA	170,000
2,3,7,8-TCDD	0.0006	0.01	0.002
1,2,3,7,8-PeCDD	0.0008	0.01	0.003
2,3,4,7,8-PeCDF	0.2	0.2	1
DDx	160	7,050	650
Additional Contaminants			
2,3,7,8-TCDF	NA	0.6	NA
1,2,3,4,7,8-HxCDF	NA	~~0.04~~ 0.4	NA
cPAHs (BaP Eq)	NA	774,000	NA
Chlorobenzene	NA	>320	NA
Naphthalene	NA	>140,000	NA

Notes:
1 – Site wide includes all areas of the Site except the navigation channel. FMD areas are subject to these RALs.
2 – PTW thresholds are based on highly toxic PTW values (10^{-3} risk) except chlorobenzene and naphthalene, which are threshold values for not reliably contained PTW.

Abbreviations:
BaP Eq – benzo(a)pyrene equivalent
cPAH –carcinogenic polycyclic aromatic hydrocarbon
COC – Contaminant of concern
DDx – dichlorodiphenyldichloroethane + dichlorodiphenyldichloroethene + dichlorodiphenyltrichloroethane
FMD – future maintenance dredge
HxCDF - hexachlorodibenzofuran
NA – not applicable
PAH – polycyclic aromatic hydrocarbon
PCB – polychlorinated biphenyl
PeCDD – pentachlorodibenzo-p-dioxin
PeCDF – pentachlorodibenzofuran
PTW – principal threat waste
RAL – remedial action level
TCDD – tetrachlorodibenzo-p-dioxin
TCDF – tetrachlorodibenzofuran
µg/kg – microgram per kilogram
> – greater than