

# Maintenance Dredging at a Superfund Site Challenges for Navigation in Portland Harbor

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# Outline

1

Lower Willamette River/ Portland Harbor Overview

2

Impediments to Dredging

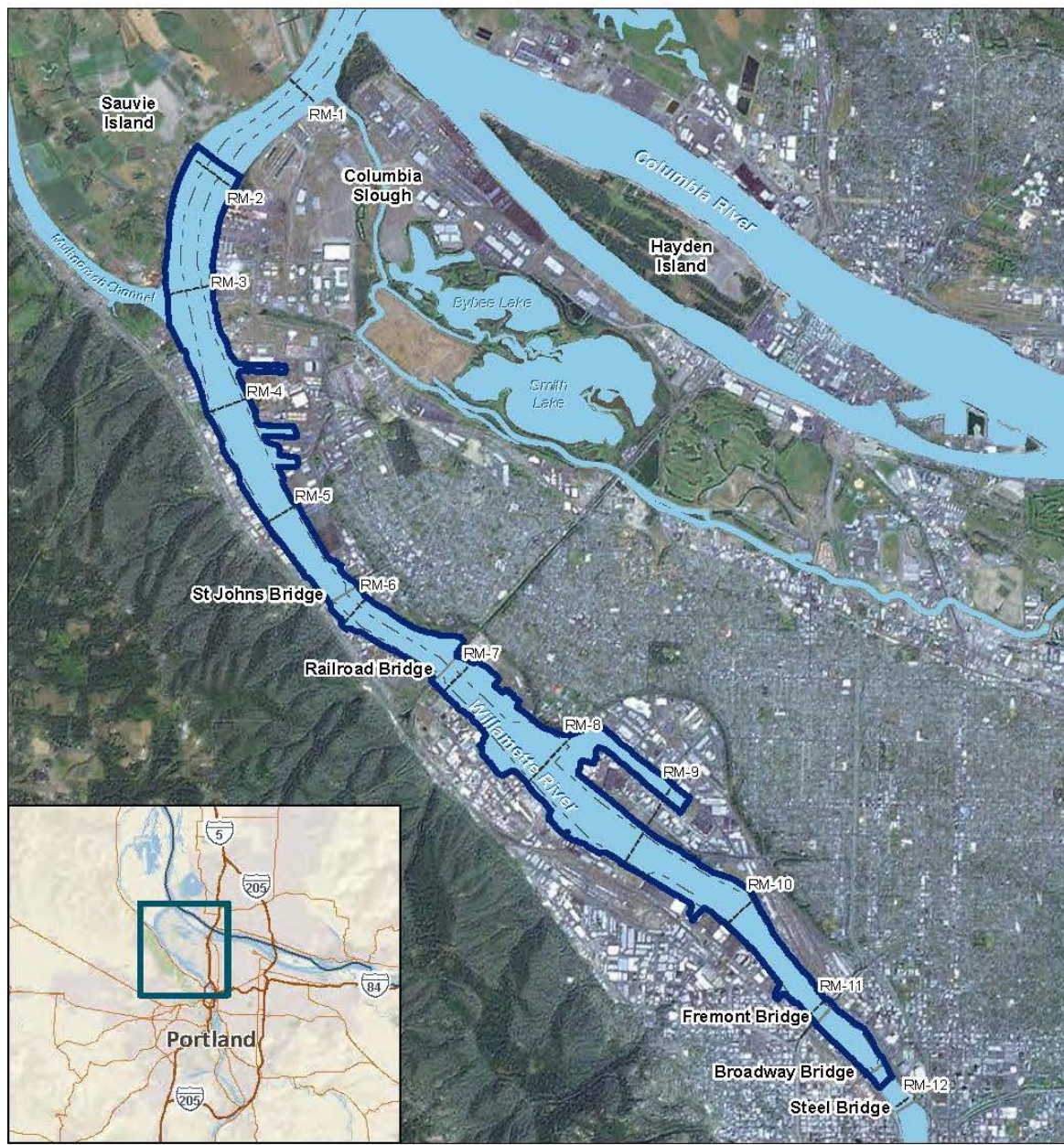
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Case Study - Maintenance Dredging as Part of an Early Remedial Action

4

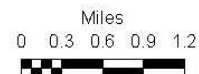
Case Study - Challenges Remaining after Record of Decision

# Portland Harbor Superfund Site



## LEGEND

- Portland Harbor Study Area
- River miles
- Navigation Channel







# Regulatory History

1999 - Sediment contamination documented in Willamette River

2000 – Site added to the National Priorities List

2001 – Nine member Lower Willamette Group (LWG) agreed to complete the remedial investigation/feasibility study (RI/FS)

2002 – US EPA, Oregon DEQ, USACE Share Responsibilities:

EPA: In-water investigation, remediation

DEQ: Upland remediation and source control

USACE: Dredging permits; maintenance dredging

2011 – Draft RI Report submitted by LWG

2012 – Draft FS Report submitted by LWG

2016 – EPA prepares final RI and FS reports

2017 – Record of Decision (ROD) signed in January





- Nine miles of river
- 100s of chemicals of potential concern
- Dozens of major potentially responsible parties (PRPs)
- Over 200 minor PRPs
- >\$1 Billion spent on investigation
- Over 15 years to complete the remedial investigation (2001-2016)







Letter of Agreement  
Between the  
U.S. Environmental Protection Agency, Region 10, the  
Oregon Department of Environmental Quality and  
the U. S. Army Corps of Engineers, Portland District  
Concerning the  
Lower Willamette River

under the CWA are obtained from ODEQ. EPA will review permits and permit applications and make recommendations to USACE, which may include permit conditions, modifications, or work stoppage. EPA will ensure that the impact of USACE's permitting activities on the RI/FS CWA.

cha Rivers and the Willamette Falls, USACE will coordinate with EPA and obtain from ODEQ any  
with certifications required under the CWA. EPA will ensure that the impact of USACE's Federal  
US. channel maintenance dredging responsibilities on the RI/FS are evaluated. EPA will coordinate  
acti



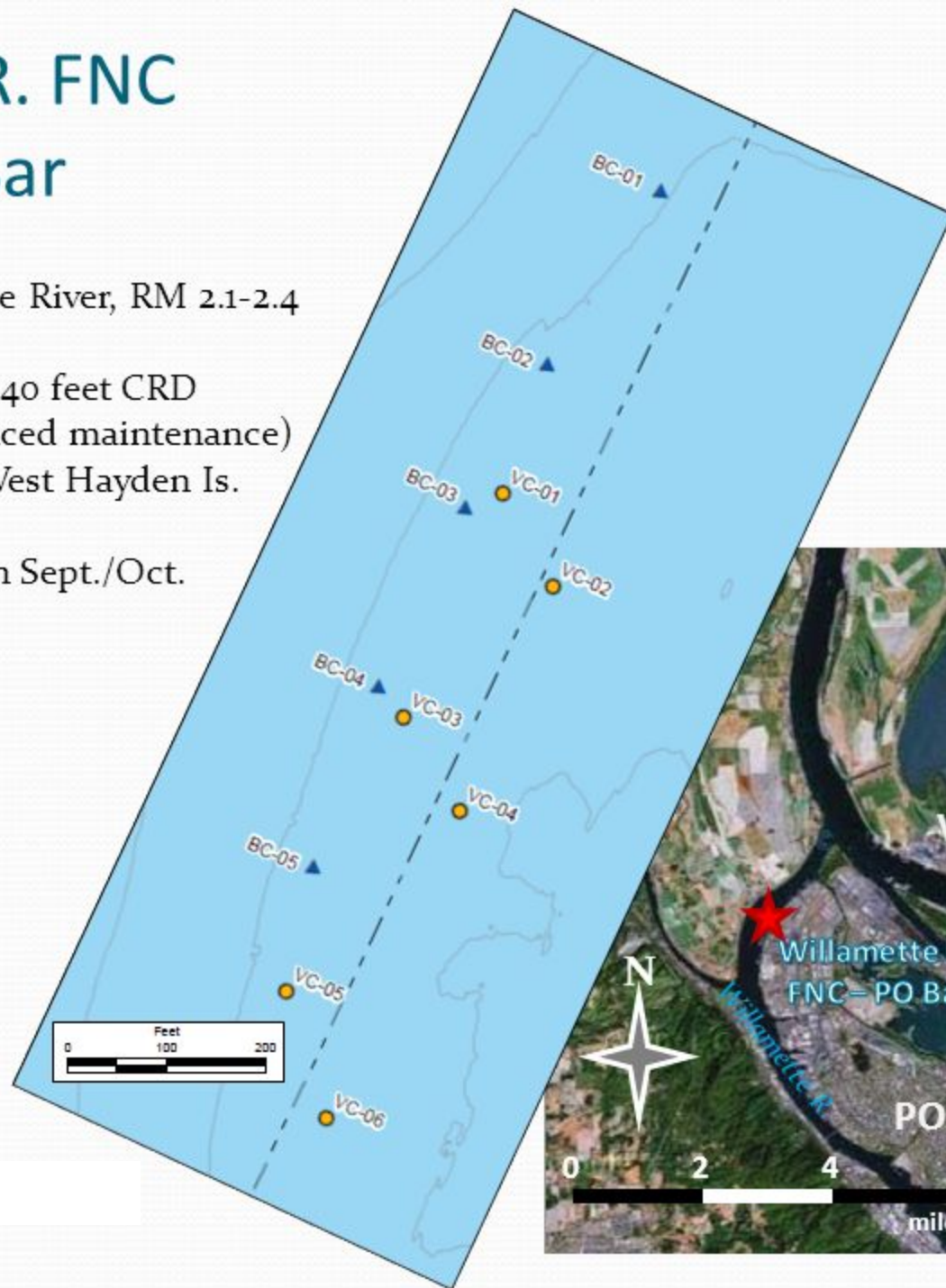
# US Army Corps of Engineers – Willamette River Navigation Channel Maintenance

- Historically, dredged 500,000 to 750,000 cubic yards of sediment every three to five years
- Last significant maintenance dredging in 1997
- In 2007 and 2008, the USACE worked on a Dredged Material Management Plan (DMMP) for the 40-ft deep Navigation Channel
- September 2008, the USACE suspended work on the DMMP pending the outcome of the Superfund investigation and cleanup
- Only work has been the removal of about 50,000 cubic yards of material from a hazardous shoal at Post Office Bar in Fall 2011 (next slide)
- Records of Decision signed in January 2017; to date USACE has not resumed work on the DMMP

# Willamette R. FNC Post Office Bar

## DETAILS

- Location: Willamette River, RM 2.1-2.4
- Volume: 52,300 cy
- Depth: Dredged to -40 feet CRD  
(plus 2 feet advanced maintenance)
- Disposal: Upland, West Hayden Is.  
Placement Site
- Project completed in Sept./Oct.  
2011





# Port of Portland Terminal 4 - Maintenance Dredging Combined with Early Remedial Action



- 1995 - 35,000 cubic yards of contaminated sediment removed
- 2003 - Early Action agreement signed with US EPA
- 2008 - Removed 13,000 cubic yards and capped 8,000 square feet



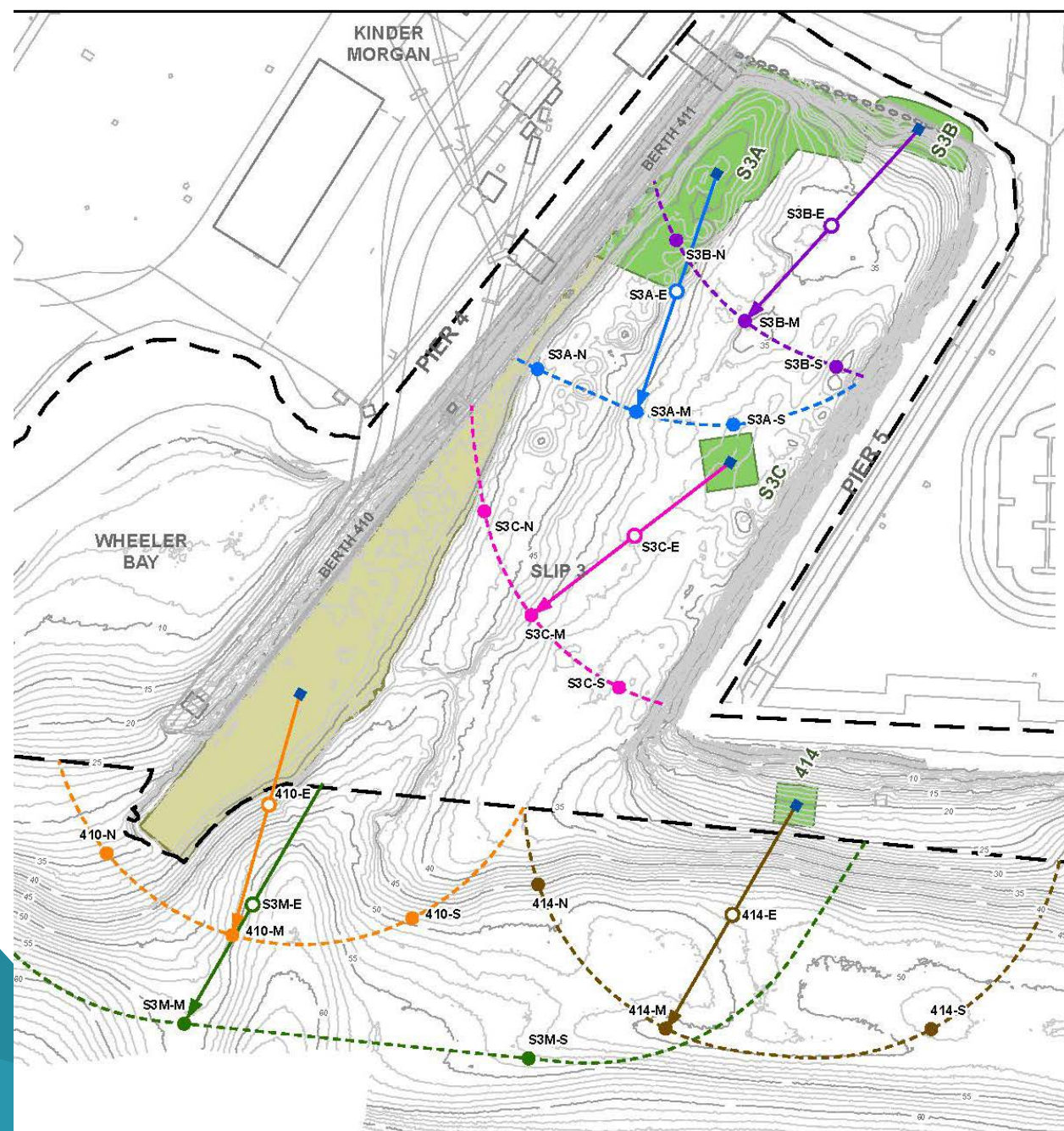


**LEGEND:**

- WHEELER BAY SHORELINE STABILIZATION
- HEAD OF SLIP 3 CAP
- BERTH 411 "PLUS" DREDGING
- SAND LAYER
- BERTH 410 DREDGING
- DSL PROPERTY LINE

**Figure 2. Final  
Removal Action  
Work Plan, Terminal  
4 Phase I Removal  
Action.  
Anchor, 2008**





- Water Quality Monitoring Location
- Early Warning Monitoring Location
- Water Quality Background Sample
- Approximate Center of Construction Activity
- - - Compliance Boundary
- ➔ Assumed Primary Downcurrent Direction
- Phase 1 Area (B411 Plus Dredge & Cap Areas)
- B410 Maintenance Dredge Area
- ▮ Removal Action Boundary

**Figure 8. Final Removal Action Completion Report, Terminal 4 Phase I Removal Action. Anchor, 2009**



# Challenges Remaining After the Record of Decision

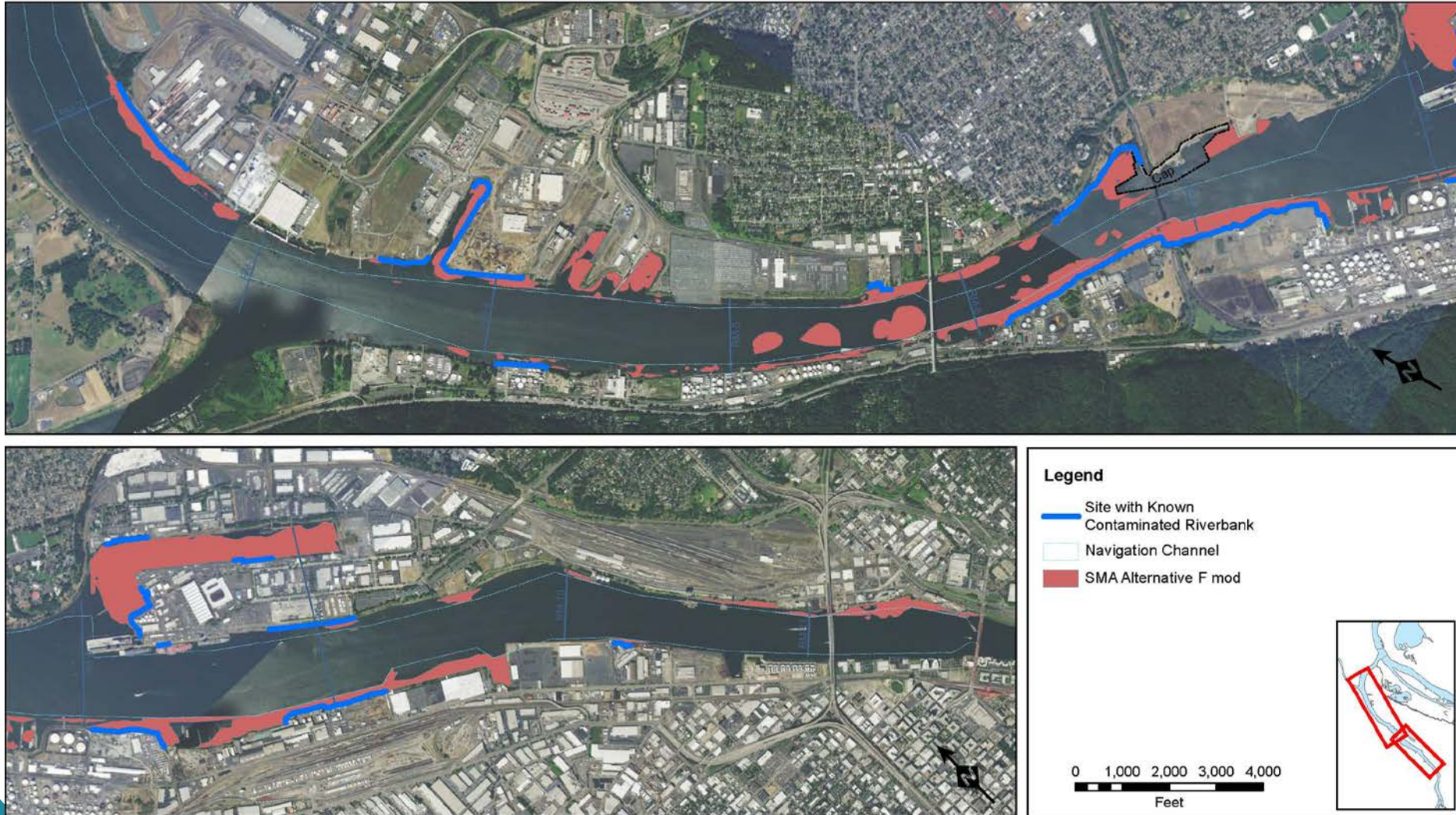


Figure 30. Sediment Management Areas, Selected Remedy

EPA Record of Decision, 2017



# Record of Decision (Jan 2017): Specified Less Conservative Remedial Action Levels (RALs) within the Federal Navigation Channel than Along the Shorelines

Within the Navigation Channel

Focused COC	RAL ( $\mu\text{g/kg}$ )				
	PTW	Alt B +PTW	Alt D	Alt E	Alt F
PCBs	200	200	500	200	75
Total PAHs	870,000	170,000	69,000	35,000	13,000
2,3,7,8-TCDD	0.01	0.002	0.002	0.0006	0.0006
1,2,3,7,8-PeCDD	0.01	0.003	0.0008	0.0008	0.0008
2,3,4,7,8-PeCDF	0.2	0.2	1	0.2	0.2
DDx	7,050	650	450	300	160

Everywhere Else

# Remedial Goals Change Abruptly at the Edge of the Navigation Channel

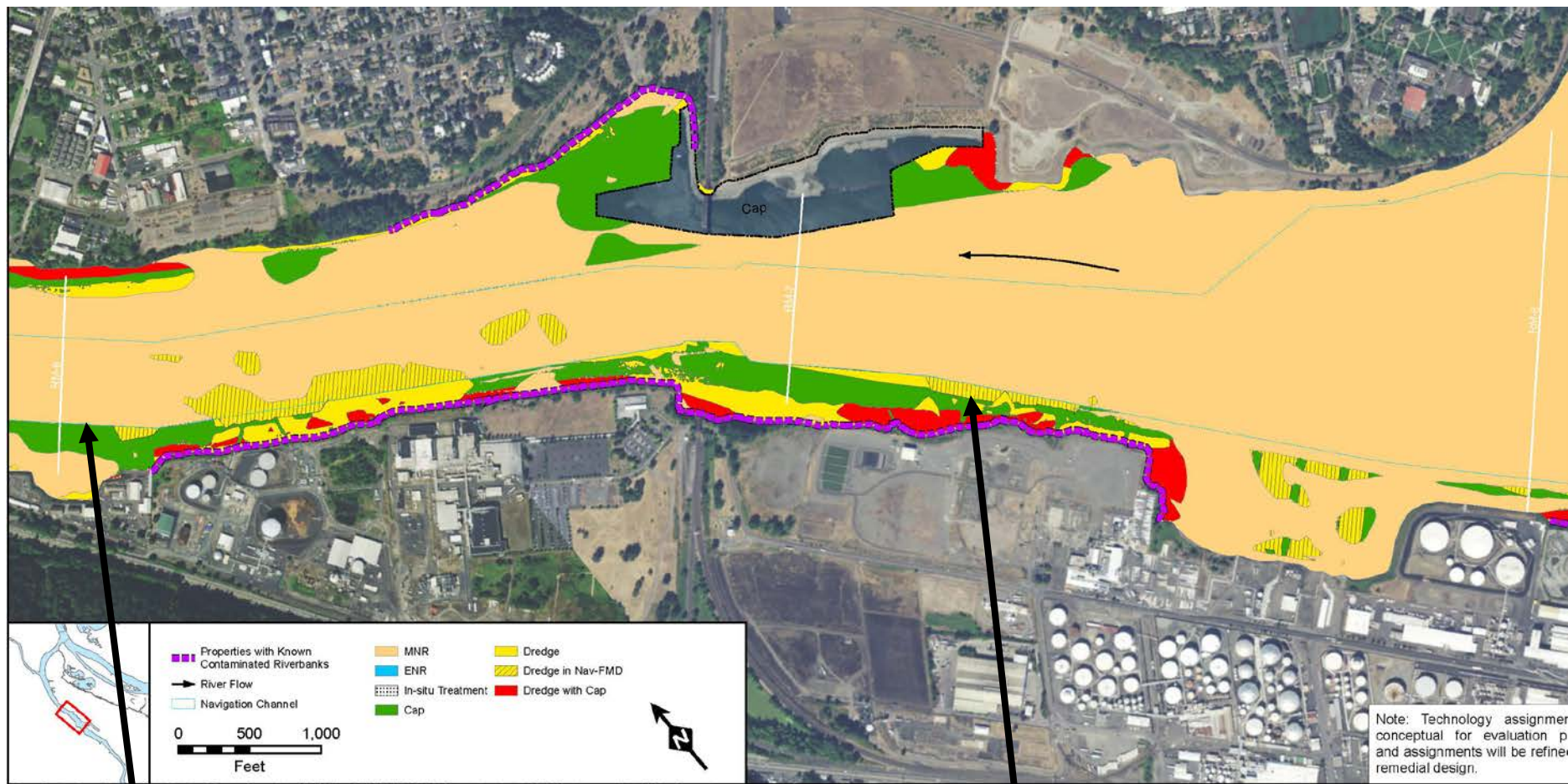


Figure 31c. Technology Assignments, Selected Remedy  
River Mile 6 to 8  
Portland Harbor Superfund Site

**Remedial Footprints  
Abruptly Stop**

**Maintenance Dredge for Facility Access  
Subject to More Stringent Standards**

**HALEY  
ALDRICH**



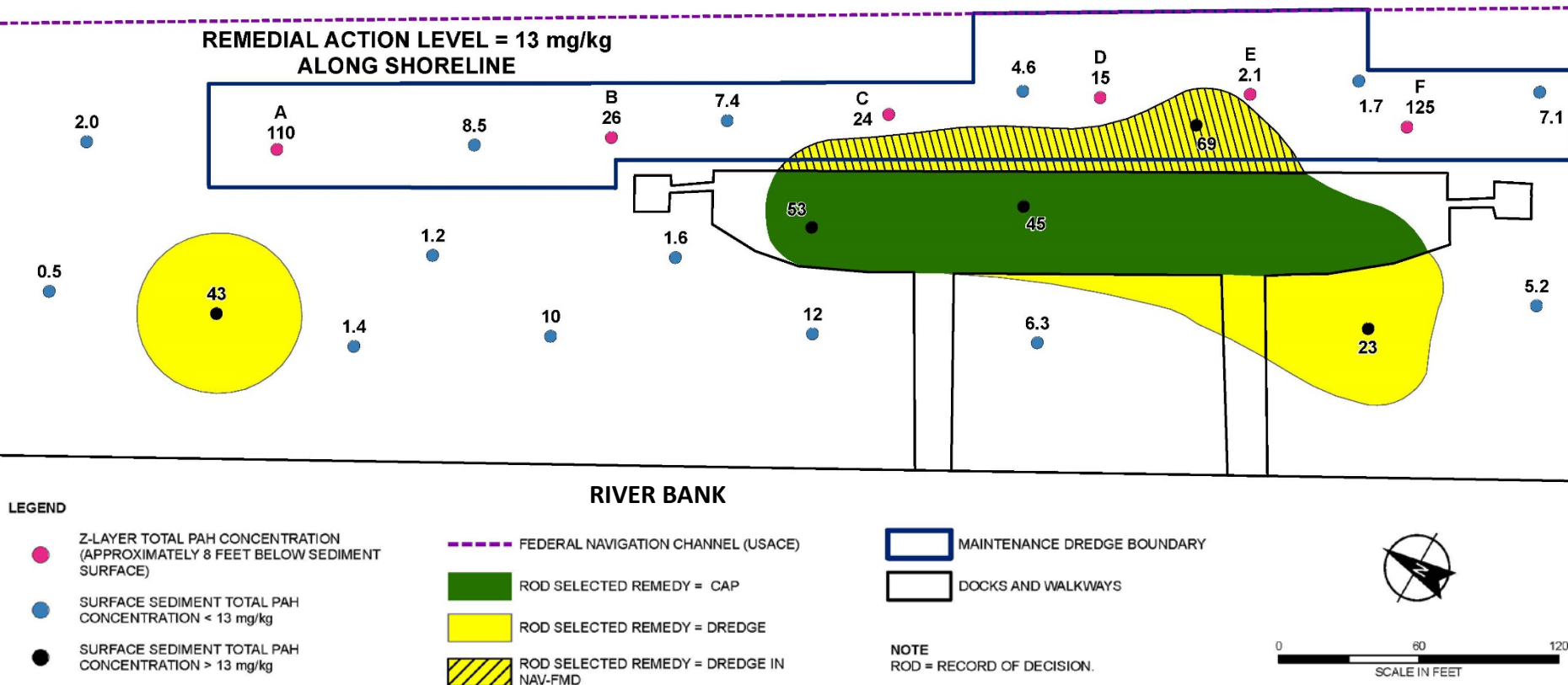
# Hypothetical Example of Difficulty Faced for Maintenance Dredging

Surface Sediment Concentrations are Below Nearshore RAL.

Z-layer Concentrations are Below Navigation Channel RAL, but Above Nearshore RAL

REMEDIAL ACTION LEVEL = 170 mg/kg  
WITHIN NAVIGATION CHANNEL

REMEDIAL ACTION LEVEL = 13 mg/kg  
ALONG SHORELINE



# Questions?

